Volume III

APPENDIX: State Reports

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

Disclaimer

This report was prepared with the support of the U.S. Environmental Protection Agency Office of Solid Waste under a cooperative agreement with the Western Governors' Association, cooperative agreement No. CX-816270-01-0. However, any findings, conclusions, or recommendations expressed herein are those of the authors and do not necessarily reflect the views of either EPA or the Western Governors' Association.

Appendices and excerpted pages from other documents are included in this report, and as a result, page numbers may not be consecutive.

TABLE OF CONTENTS

ALABAMA

STATE OF ALABAMA

DEPARTMENT OF INDUSTRIAL RELATIONS

STATE PROGRAMS DIVISION

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS

NON-FUEL MINERALS

April 1991

STATE OF ALABAMA
INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
DEFINITIONS

INACTIVE OR ABANDONED MINE:	Pit must have been idle (without a surface mining permit) for at least one year with no apparent attempts at reclamation and no indication that reclamation will take place.
POLLUTED WATER:	Underground aquifers or surface water bodies impacted by offsite sedimentation or acid drainage from exposed minerals or unauthorized dumps on the mine site. Severity of erosion not considered.
MINE DUMPS:	Include spoil piles, waste materials, rock dumps, industrial or household refuse and trash dumps.
DISTURBED LAND:	All land stripped of vegetation, covered by stock piles, overburden or waste material and which has not revegetated to a similar condition or returned to a similar use as surrounding land.
HIGHWALLS:	Vertical or nearly vertical final cuts greater than 6 feet in height.
MINE OPENINGS:	Any opening (vertical or horizontal) to an underground mine where human entrance is possible.
SUBSIDENCE PRONE:	Areas over abandoned underground mine workings which are subject to collapse.
HAZARDOUS STRUCTURES:	Buildings, foundations, processing plants, abandoned equipment, etc. which endanger people.

STATE OF ALABAMA
INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(NON-FUEL MINERALS)

I. DATA SUMMARY

(Attached)

II. NARRATIVE SUMMARY

A. Background

1. History of Non-Fuel Mining in Alabama

The mining industry in Alabama had its inception around the turn of the century, with records on iron ore production dating back to 1880. Then, in the early 1900's, sand, gravel and clays were mined in modest quantities, with production increasing with demand for construction materials. Gradually, in the 1920's, limestone and marble quarries were established in central Alabama, with production of other minerals commencing during that decade. Construction demand increased from that time forward, resulting in increased production of all minerals in the state.

Certain minerals mined in the past are subeconomic at present due to changes in demand resulting from technological advancements and economic circumstances. Other minerals once thought to be of little or no economic value could well be considered valuable in the future. Factors such as improvements in transportation, together with availability of electrical power or water resources, are likely to bring about changes in the economic value of various mineral deposits. Given the variety of non-fuel mineral deposits in Alabama, increased mining of currently produced minerals, as well as those once considered subeconomic, is expected.

2. Current Production and Trends

In 1989, Alabama ranked twenty-first nationally in value of non-fuel minerals produced with an estimated value of $483,079,000. The principal non-fuel minerals produced were limestone, sand, gravel, dolomite, clay, marble and shale. Continued demand is anticipated for industrial non-fuel minerals, especially near urban areas where the need for construction materials is greatest. Over 1.5 billion tons of these major minerals have been mined in Alabama since records have been kept. Current trends show increases in production of dolomite, kaolin, bauxite, clay, shale and granite, with corresponding decreases in the production of limestone, chert, building stone, marble and talc.

There are currently over 400 permitted non-fuel surface mining operations in the state, with an estimated 20,000+ acres disturbed. Over 2,000 permitted acres are abandoned each year, based on recent trends. In addition to permitted sites, an estimated 1,000 pits are being operated by city, county and state road departments. There are perhaps another 500 operations that are either exempt from permit and bond requirements or operated illegally. Consequently, there may be as many as 1,900 active non-fuel surface mining sites in the state.

Stronger demand is expected for non-fuel minerals with increases in population and technological advances that continue to improve the economic feasibility of mining and processing more minerals. Industrial, commercial and highway construction continue to demand increasing volumes of construction ores for building materials. Increased non-fuel surface mining will contribute to the growing acreage of inactive abandoned mine lands and associated environmental hazards. A comprehensive on-the-ground inventory of abandoned non-fuel surface mined lands would be required in order to fully comprehend the magnitude of hazards associated with these sites. An aggressive non-fuel surface mining reclamation program is urgently needed to curtail and correct the hazards associated with these abandoned mine lands.

B. Existing Legislation

1. Alabama Surface Mining Act of 1969

The need for regulation of mining activities and reclamation standards first became apparent with the passage of the Alabama Surface Mining Act of 1969 (Code of Alabama, 1975, Sections 9-16-1 through 9-16-15). This first attempt at regulating surface mining in the state included all minerals. Then, in 1975, the regulation of coal mining was separated out by the passage of the Alabama Surface Mining and Reclamation Act of 1975 (Code of Alabama, 1975, Sections 9-16-30 through 9-16-53). The Surface Mining Act of 1969 was simultaneously amended to exempt chert, limestone, marble, dolomite and coal from ADIR permit and bond requirements. Also exempted were the activities of city, county and state road departments, as well as their contractors, incident to their activities in constructing, repairing and maintaining the public road system in Alabama. The only other enhancement of the law came with the passage of rules and regulations in 1988. Several unsuccessful attempts have been made to revise and strengthen the Surface Mining Act of 1969, with little support for tighter environmental controls, increased bonding, or additional funding for enforcement.

The Surface Mining Act of 1969 is administered by the Department of Industrial Relations and requires an operator to file an application with a $250.00 permit fee and proper reclamation bond coverage in the amount of $150.00 per acre. The permit can be renewed annually and bonded acreage is increased with the size of the operation. Bonded acreage may be released if properly reclaimed in accordance with the law. All reclamation must be completed within three years of the date of expiration of the permit. If not, the reclamation bond may be forfeited and deposited into the Surface Mining Reclamation Fund. These bonds are earmarked for reclamation of the specific sites to which the bonds apply. Unfortunately, no reclamation using forfeited bonds has been carried out to date, mainly because the bonds so designated are woefully inadequate to conduct any meaningful amount of reclamation.

Alabama law requires that an operator "carry on grading of affected land to reduce peaks and ridges to a rolling topography, cover the face of any toxic material left exposed by the surface mining operation and divert water from the mining operation in a manner designed to reduce erosion, siltation or other damage to streams and natural watercourses." Afterwards, the site must be revegetated by planting with pine trees to establish a minimum of 425 trees per acre one year after planting. In lieu of these grading and revegetation requirements, the operator may elect to reclaim the land for range, agricultural or horticultural, homesite, recreational, industrial or commercial use.

Alabama's permit and bond requirements fall far short of ensuring that non-fuel surface mine sites are identified and properly reclaimed after mining. The bond of $150.00 per acre does not give operators much of an incentive to reclaim sites after mining. Furthermore, funding has traditionally been scarce to hire the personnel needed to effectively regulate the mining of non-fuel minerals statewide. Stronger legislation is needed to regulate mining and reclamation, supported by funding for personnel to insure adequate enforcement.

2. <u>Alabama Water Pollution Control Act (as amended, 1984 and 1988)</u>

This legislation established the Water Improvement Commission to regulate discharges from mining operations, processing plants and storage facilities. This act required permitting of discharges from mining areas and other areas associated with mining wastes.

3. <u>Alabama Environmental Management Act (as amended, 1984 and 1988)</u>

This legislation established the Alabama Department of Environmental Management and assimilated the personnel and duties of the Water Improvement Commission into this new agency.

Discharge permit fees currently range from $500.00 for non-coal operations to $1,200.00 for coal mining operations with an associated processing plant. These permits are issued for 5-year periods and establish certain discharge limitations. Sampling and analysis of discharges is required twice monthly. When an operation is terminated, the operator must provide proof that reclamation standards have been met and that discharges do not warrant treatment over a period of 6 months to one year.

C. Mining and Milling Methods

The mining of most non-fuel minerals in Alabama is accomplished using surface mining methods. Years ago, red iron ore was mined by underground methods in the central portion of the state, leaving hundreds of open mine portals and shafts as a reminder of that era. Most limestone is mined by the open quarry method; however, some limestone has been and continues to be mined by the underground method.

Surface mining methods involve mining these deposits in their natural state or exposing them by removing overburden and then mining directly from the exposed deposits. Sand and gravel are often mined using a hydraulic dredge designed to pump sand and gravel to a washer for screening and sorting into various grades. These minerals are also dry-screened or dumped into a crude hopper and washed to segregate the sand and gravel.

Bauxite and various clays are mined by removing the overburden and mining directly from the deposits, which are then stockpiled for later use. These commodities are then transported to a processing site where they are crushed, cleaned and heated to produce various products such as fire clays, refractory clays, pottery clays, bricks and clay briquettes.

Limestone, marble and dolomite are mined by drilling, blasting and cutting the stone in open surface quarries as well as underground. Stone is then crushed on site into various grades of construction aggregates and agricultural lime. The chalk form of limestone is mined by removing overburden and mining the mineral using front-end loaders, pans and bulldozers. Eventually, the chalk is crushed for use in cement manufacturing.

D. Health Impacts

Non-fuel surface mining activities impact public health in a number of ways. The most obvious impact is bare, denuded soil that is subject to erosion and offsite sedimentation. Recent surveys by the U.S.D.A.-Soil Conservation Service indicate that over 206 tons of soil per acre per year leave abandoned mine lands in the form of sediment or air-borne dust. Unless topsoil is stockpiled and redistributed over the mined areas, vegetative recovery is very slow, allowing extensive erosion and offsite movement of sediment and various pollutants from the site. Polluted mine drainage originates from abandoned sites containing exposed acidic minerals, and from corroded tanks holding diesel fuel, gasoline, asphalt and other chemicals.

The most prevalent contamination of water resources is to the surface waters of the state. Heavy rains cause rapid offsite movement of exposed soil and other materials directly into streams. Abandoned mine sites are frequently used as public dumps containing various household and industrial hazardous wastes. Toxic drainage from these dumps migrates rapidly into streams during periods of heavy rainfall.

A less dramatic, but more serious form of pollution is the leaching of toxic materials into underground aquifers. Contamination of these aquifers can be chronic and extremely hazardous in the immediate vicinity of abandoned surface mines. A number of private wells and municipal supplies in Alabama are reportedly affected by this type of pollution, as toxic chemicals move laterally and rapidly once they have entered an underground aquifer, thereby resulting in contamination of areas at considerable distances from abandoned mine sites.

E. Safety Hazards

Safety hazards of almost every description can be found on Alabama's abandoned surface mined lands. As in most states, abandoned mines in Alabama are often situated near residential areas and/or are used for recreational purposes. The general public is frequently unaware of the inherent dangers associated with abandoned mines.

Highwalls represent one of the most dangerous hazards. Several deaths have occurred in Alabama as the result of small children and adults falling from a highwall, or from the collapse of a highwall. Injuries and fatalities have also occurred as the result of vehicles running off highwalls.

Hundreds of mine openings and airshafts remain as a result of underground mining of iron ore and limestone in central Alabama. Accidents and deaths have occurred when children and adults fell into an airshaft or mine opening and were killed or drowned.

Underground and surface mining methods often result in water impoundments and flooded excavations if left unreclaimed. Both children and adults are attracted to these areas for swimming, boating and fishing. These impoundments are usually very deep and can contain steep dropoffs. More deaths are recorded in Alabama each year due to drownings in abandoned impoundments and flooded excavations than any other hazard associated with abandoned mines.

Many hazardous structures remain on abandoned surface mines, particularly where a processing plant was utilized. Persons attracted to such sites can be injured or killed should an unstable structure collapse. Dilapidated equipment often remains at these sites, as well as old tanks containing contaminated water, diesel fuel, gasoline or asphalt.

F. Environmental and Economic Impacts

Mine sites can degrade the environment indefinitely if left unreclaimed. Air quality is negatively impacted by fugitive dust blown from denuded mining sites. This dust can affect offsite flora and fauna, or can be inhaled by humans. Some abandoned sites contain heavy metals that can be picked up and transported by the wind for miles. These metals can then be ingested or inhaled by fish, wildlife and humans. This type of problem is prevalent only during dry, windy seasons, and although not a continual source of pollution in Alabama, is an important consideration.

Surface and groundwater aquifers can be contaminated by leaching of toxic chemicals, heavy metals and unauthorized hazardous wastes dumped into abandoned pits. Heavy rains cause increased sedimentation of streams and natural watercourses when dissolved metals and soil particles are discharged from abandoned sites. Critical habitats for a number of endangered fish and wildlife species are impacted by long-term offsite discharge of sediment, fuel spills, acid and oxygen-deficient runoff from Alabama abandoned mines.

Surrounding vegetation at abandoned mine sites is adversely affected by sedimentation, heavy metals contained in air and water, and toxic drainage from acidic wastes and unauthorized dumps. The long-term effects on surrounding vegetation are not easily quantified, but those areas do tend to require longer recovery periods than other environmental impacts. Bottomland hardwoods are more susceptible to these pollutants.

ADIR's file review of abandoned non-fuel mine sites indicates that nearly 100,000 acres would be considered inactive and/or abandoned. An on-the-ground, comprehensive statewide inventory would be needed to more accurately document the extent of mine-related damage. In addition to the health, safety and environmental impacts discussed, there is also a significant loss of productive land, which must be taxed at a minimal rate. Unless legislation is passed to more effectively regulate non-fuel surface mining and address the issue of reclaiming the ever-growing number of abandoned sites, Alabama's tax base will continue to erode along with its environment.

G. Reclamation Efforts

The Surface Mining Act of 1969 provides for the forfeiture of an operator's reclamation bond for failure to reclaim a site. Forfeited bonds are deposited into the Surface Mining Reclamation Fund and earmarked for reclamation of specific sites covered by those bonds. However, the bond amount of $150.00 per acre is not nearly enough to accomplish any meaningful degree of reclamation of these abandoned sites, and no additional funds have been appropriated for that purpose. Hence, no reclamation of abandoned non-fuel sites has been initiated with forfeited bond monies since the law was passed.

STATE OF ALABAMA
INACTIVE/ABANDONED MINE LANDS
DATA SUMMARY REFERENCE GUIDE

1. Alabama Dept. of Environmental Management
   Mining Section
   Montgomery, Al
   Contact: Mr. Steve Foster
   Phone: 271-7700

2. U.S. Dept. of Agriculture
   Soil Conservation Service
   Auburn, Al
   Contact: Mr. Jerry Johnson
   Phone: 821-8070

3. U.S. Forest Service
   Alabama Supervisor
   Montgomery, Al
   Contact: Mr. Don Kite
   Phone: 832-4470

4. Alabama Geological Survey
   Mineral Resources Division
   Tuscaloosa, Al
   Contact: Mr. Lewis Dean
   Phone: 349-2852

5. Alabama Development Office
   Montgomery, Al
   Contact: Mr. Tom McGuire
   Phone: 263-0048

6. Alabama Highway Department
   Montgomery, Al
   Contact: Mr. Jack Caraway
   Phone: 242-6324

7. Alabama Dept. of Conservation and Natural Resources
   Game and Fish Division
   Montgomery, Al
   Contact: Mr. Jon Hornsby
   Phone: 242-3628

8. Alabama Dept. of Industrial Relations
   State Programs Division
   Montgomery, Al
   Contact: Mr. Bill Guyette
   Phone: 242-8265

9. Alabama Surface Mining Act of 1969
   (Code of Alabama, 1975, Sections 9-16-1 through 9-16-15)

10. Minerals in Alabama, 1989 - Information Series 64H
Geological Survey of Alabama
Mineral Resources Division
Lewis S. Dean, Editor

11. Alabama Dept. of Industrial Relations
Division of Safety & Inspection - 1990 Annual Report
Contact: Mr. Jerry Scharf
Phone: 254-1275

12. Geology of Alabama - Special Report No. 14
Geological Survey of Alabama, Second Printing 1979
George Adams, Charles Butts, L.W. Stepheson, Wythe Cook

STATE OF ALABAMA
INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Barite	#1206 58-1	A & B Mineral, Inc. 302 Dublin Place Montgomery, Al 36108	Shelby	36	20S	1E	1	5
					Subtotal:		1	5
Bauxite	#2 6-2	Mullite Co. of America P.O. Box 556 Eufaula, Al 36027	Barbour	21	9N	27E	35	40
Bauxite	#2600 6-11	Mullite Co. of America P.O. Box 556 Eufaula, Al 36027	Barbour	36	10N	27E	15	15
Bauxite	#2601 6-15	Mullite Co. of America P.O. Box 556 Eufaula, Al 36027	Barbour	12	9N	26E	5	5
Bauxite	#3099 6-1	Burdette Wood Route 1, Box 260 Eufaula, Al 36027	Barbour	19	9N	28E	2	4
Bauxite	#1 37-1	Abbeville Lime Co. Abbeville, Al 36310	Henry	13	8N	28E	1	10
Bauxite	#1341 37-2	Abbeville Lime Co. Abbeville, Al 36310	Henry	13	8N	28E	12	12
Bauxite	#3710 37-14	Harbison-Walker Refractories One Gateway Center Pittsburgh, Pa 15222	Henry	5	8N	28E	10	15
Bauxite	#3195 37-15	Harbison-Walker Refractories One Gateway Center Pittsburgh, Pa 15222	Henry	3	8N	27E	8	10

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Bauxite	#3789 37-16	Harbison-Walker Refractories One Gateway Center Pittsburgh, Pa 15222	Henry	3	8N	27E	15	20
Bauxite	#2347 37-11	Harbison-Walker Refractories Route 5, Box 58 Eufaula, Al 36027	Henry	4	8N	27E	2	10
Bauxite	#3220 37-1	Mullite Co. of America P.O. Box 556 Eufaula, Al 36027	Henry	32	9N	29E	5	5
						Subtotal:	110	166
Chert	#2232 31-1	Melvin Carroll Route 2, Box 37B Attalla, Al 35954	Etowah	33	11S	5E	1	5
Chert	#1632 31-1	John L. Lay Star Route, Box 65 Guntersville, Al 35976	Etowah	29	12S	7E	1	35
Chert	#1989 59-1	Mrs. L. M. Cox Route 2, Box 181 B Ashville, Al 35953	St. Clair	20	14S	4E	1	5
Chert	#1627 59-1	W.J.L. Hawkins 4004 Rainbow Drive P.O. Box 342 Gadsden, Al 35902	St. Clair	3	14S	5E	1	10
						Subtotal:	4	55

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Clay	#3909 5-2	E.R. Brantley Contracting Route 1, Box 1450 Foley, Al 36535	Baldwin	32	6S	3E	3	6
Clay	#3910 5-4	E.R. Brantley Const. Co. P.O. Box 837 Foley, Al 36535	Baldwin	28	5S	2E	1	2
Clay	#3973 5-2	Brunson Construction Co. 35 Station Street P.O. Box 336 Saraland, Al 36571	Baldwin	32	4S	2E	8	8
Clay	#2665 5-1	Fairhope Clay Products, Inc. Route 1, Box 78 Fairhope, Al 36532	Baldwin	30	6S	3E	3	3
Clay	#3978 5-1	Eugene R. Fell 33592 Sunset Drive Elberta, Al 36530	Baldwin	22	7S	6E	5	5
Clay	#1032 5-2	Gulf Landscaping Gulf Shores, Al 36542	Baldwin	9	8S	5E	½	2
Clay	#1040 5-1	South Alabama Trucking, Inc. P.O. Box 200 Atmore, Al 36502	Baldwin	11	3N	4E	1	1
Clay	#3147 5-1	Spanish Cove Corporation Star Route Box 4082 Lillian, Al 36549	Baldwin	27	7S	6E	4	20
Clay	#1352 5-1	John W. West Star Route Box 726 Lillian, Al 36549	Baldwin	9	2S	5E	1	10

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Clay	#1746 6-1	McKenzie Construction Co. P.O. Box 206 Eufaula, Al 36027	Barbour	24	11N	28E	2	4
Clay	#1798 8-1	Philadelphia Clay Co. Route 1, Box 580 Warrior, Al 35180	Blount	31	13S	1W	4	10
Clay	#1327 8-1	Tan Yard S & G Co. Route 3 Altoona, Al 35952	Blount	16	11S	3E	2	5
Clay	#3811 8-2	Warrior Clay Co. Route 1, 9500 Dades Hill Rd. Warrior, Al 35180	Blount	33	13S	2W	1	4
Clay	#1 11-1	Coosa Clay Co., Inc. P.O. Box 1366 Anniston, Al 36201	Calhoun	19	15S	8E	2	5
Clay	#2864 11-4	Dixie Clay Co. P.O. Drawer 909 Jacksonville, Al 36265	Calhoun	19	15S	8E	2	20
Clay	#1055 11-1	Celeste B. Lackey P.O. Box 55 Munford, Al 36268	Calhoun	11	16S	7E	1	4
Clay	#1729 13-1	St. John Clay Co. Route 2, Box 130 B Ragland, Al 35131	Cherokee	24	11S	11E	1	5
Clay	#1819 13-2	St. John Clay Co. Route 2, Box 130 B Ragland, Al 35131	Cherokee	25	11S	11E	15	30

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Clay	#2341 14-1	Jenkins Brick Company P.O. Box 91 Montgomery, Al 36101	Chilton	34	24N	13E	1	1
Clay	#2523 14-2	Jenkins Brick Company P.O. Box 91 Montgomery, Al 36101	Chilton	19	23N	13E	1	4
Clay	#3240 14-3	Jenkins Brick Company P.O. Box 91 Montgomery, Al 36101	Chilton	3	23N	13E	3	3
Clay	#2426 16-1	Butts & Billingsley Const. Co. P.O. Box U Childersburg, Al 35044	Clarke	33	8N	3E	1	40
Clay	#3495 20-1	United Material & Ship., Inc. P.O. Box 1326 Florence, Al 35631	Colbert	23	4S	15W	10	10
Clay	#1 26-1	Bondy's Ford, Inc. Ross Clark Circle Dothan, Al 36301	Dale	30	4N	26E	1	3
Clay	#1279 26-1	Burns Clay Products P.O. Box 61 Newton, Al 36352	Dale	9	24E	4N	2	5
Clay	#3573 26-8	Couch, Inc. P.O. Box 7106 Dothan, Al 36303	Dale	32,33	5N	25E	4	6
Clay	#2950 28-1	WBK, Inc. P.O. Box 967 Rainsville, Al 35986	DeKalb	24	3S	9E	5	6

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Clay	#3715 32-1	Willett Clay Co. Route 1, Box 706 Empire, Al 35063	Fayette	24	15S	10W	5	5
Clay	#3816 38-10	Couch, Inc. 1020 Twitchell Rd. Dothan, Al 36303	Houston	34	4N	27E	2	6
Clay	#3682 1-1	B & B Clay Co. 1736 Dads Hill Lane Warrior, Al 35180	Jefferson	8	14S	2W	10	10
Clay	#1664 1-1	Birmingham Clay Products Co. #20 Office Park Circle-Rm. 101 Birmingham, Al 35223	Jefferson	4,5	19S	3W	3	10
Clay	#3338 1-1	Overton Clay Products, Inc. 234 Brown Marks Bldg. Birmingham, Al 35203	Jefferson	2	18S	1W	17	17
Clay	#3832 2-1	Margaret H. Aubrey 1685 Knollwood Dr., #681 Mobile, Al 36609	Mobile	36	5S	3W	1	4
Clay	#3820 2-3	Brunson Construction Co. 35 Station Street Saraland, Al 36571	Mobile	32	5S	2W	20	25
Clay	#3821 2-4	Brunson Construction Co. 35 Station Street Saraland, Al 36571	Mobile	24	2S	2W	18	18
Clay	#3883 2-5	Brunson Construction Co. 35 Station Street Saraland, Al 36571	Mobile	4	3S	2W	17	17

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Clay	#3972 2-6	Brunson Construction Co. 35 Station Street Saraland, Al 36571	Mobile	22	3S	2W	3	3
Clay	#3698 2-7	Brunson Construction Co. 35 Station Street Saraland, Al 36571	Mobile	22	3S	2W	4	4
Clay	#3208 2-1	Pauline Colquett/Ken Kastorff 2208 East Hillwood Drive Mobile, Al 36605	Mobile	3	4S	3W	5	5
Clay	#2906 2-1	Couch, Inc. P.O. Box 7106 Dothan, Al 36302	Mobile	17	6S	2W	4	6
Clay	#3850 2-1	Bill Davis Contractor, Inc. 5909 Moffat Road Mobile, Al 36618	Mobile	3	4S	3W	2	10
Clay	#2262 2-1	Clarence Dickens 4813 Nevius Road Mobile, Al 36619	Mobile	30	5S	2W	1	5
Clay	#3809 2-2	Far Construction Company, Inc. 4350 Sollie Road Mobile, Al 36619	Mobile	30	5S	2W	4	10
Clay	#692 2-2	Garry Gurley 7006 Victor Road Mobile, Al 36608	Mobile	24	4S	4W	1	1
Clay	#1947 2-1	Hamilton Trucking & Excavating Route 1, Box 39 Theodore, Al 36582	Mobile	8	7S	2W	1.36	2

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Clay	#2 2-2	M & D Construction Company 1603 Mill Avenue Moss Point, Ms 39563	Mobile	31	6S	3W	1	5
Clay	#1886 2-2	John H. Maples Hauling Co., Inc. Route 11, Box 258-A Mobile, Al 36693	Mobile	28	4S	3W	10	10
Clay	#3286 2-3	John H. Maples Hauling Co., Inc. Route 20, Box 476 Mobile, Al 36619	Mobile	25	4S	3W	10	10
Clay	#3916 2-4	John H. Maples Hauling Co., Inc. Route 20, Box 76 Mobile, Al 36609	Mobile	10	4S	3W	4	4
Clay	#3221 2-1	Gary L. Moore 4813 Nevius Road Mobile, Al 36619	Mobile	30	5S	2W	1	8
Clay	#3025 2-1	M. C. Williams Contracting Co. 1000 Schillingers Road Mobile, Al 36608	Mobile	19	4S	2W	8	8
Clay	#2368 2-1	Yates Construction Company 4350 Sollie Road Mobile, Al 36619	Mobile	30	5S	2W	10	50
Clay	#3500 57-1	Bickerstaff Clay Products P.O. Box 1178 Columbus, Ga 31993	Russell	25	17N	30E	14.5	20
Clay	#3627 64-5	Cordova Clay P.O. Box 100 Cordova, Al 35550	Walker	4	15S	6W	32	32

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Clay	#3560 64-1	Willett Clay Co. Route 1, Box 706 Empire, Al 35063	Walker	35	14S	5W	10	10
Clay	#3561 64-2	Willett Clay Co. Route 1, Box 706 Empire, Al 35063	Walker	19	15S	9W	5	5
Clay	#3892 64-3	Willett Clay Co. Route 1, Box 706 Empire, Al 35063	Walker	25	14S	5W	4	4
Clay	#3560 64-1	Willett Clay Co. Route 1, Box 706 Empire, Al 35063	Walker	35	14S	5W	10	10
Clay	#3890 65-3	Bailey Constr. Co., Inc. P.O. Box 99 Wagarville, Al 36585	Washington	12	3N	1W	2	2
Clay	#3576 66-1	Butts & Billingsley Const. Co. P.O. Box 1035 Jackson, Al 36545	Wilcox	34	13N	7E	1	60
Clay	#3519 67-3	Southern Clay & Energy Route 6, Box 104 T2 Haleyville, Al 35565	Winston	6	11S	10W	5	12
Clay	#3350 67-1	Southern Clay & Energy, Inc. Route 6, Box 103 T4B Haleyville, Al 35565	Winston	17	10S	10W	5	5
Clay	#3919 64-1	Winn Construction Co. P.O. Box 216 Nauvoo, Al 35578	Winston	9	12S	9W	4	5
						Subtotal:	339	640

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Clay, Gravel	#1 5-1	E.R. Brantley P.O. Box 469 Bay Minette, Al 36507	Baldwin	27	2S	3E	3.3	4
Clay, Gravel	#1175 8-1	Brooksville Sand Co., Inc. P.O. Box 338 Arab, Al 35016	Blount	20	10S	2E	6	10
Clay, Gravel	#3543 11-1	St. John Clay Co., Inc. P.O. Box 125 Ohatchee, Al 36271	Calhoun	11	15S	5E	3	10
Clay, Gravel	#2842 11-2	St. John Clay Co., Inc. P.O. Box 125 Ohatchee, Al 36271	Calhoun	11	15S	5E	4	10
Clay, Gravel	#3824 11-3	St. John Clay Co., Inc. P.O. Box 125 Ohatchee, Al 36271	Calhoun	13	15S	5E	9	60
Clay, Gravel	#3884 16-1	Brunson Construction Co., Inc. 35 Station Street Saraland, Al 36571	Clarke	9	7N	3E	7	7
Clay, Gravel	#3612 16-2	Brunson Construction Co., Inc. 35 Station Street Saraland, Al 36571	Clarke	14,15	9N	4E	6	6
Clay, Gravel	#3974 16-3	Brunson Construction Co., Inc. 35 Station Street Saraland, Al 36571	Clarke	14	7N	2E	3	3
Clay, Gravel	#1622 31-1	J.C. Bartlett & Higgins Const. Route 3, Box 271 Gadsden, Al 35901	Etowah	30	11S	6E	2	4

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Clay, Gravel	#1461 40-1	Fayco, Inc. P.O. Box 29 Fayette, Al 35555	Lamar	26	15S	16W	1	12
Clay, Gravel	#1902 40-1	John T. Mixon, Jr. Route 3, Box 60 Sulligent, Al 35586	Lamar	11	13S	15W	4	8
Clay, Gravel	#1896 49-1	Fayco, Inc. P.O. Box 29 Fayette, Al 35555	Marion	13	13S	12W	6	10
Clay, Gravel	#1371 49-1	Robert Goggans Gann Route 5, Box 262 Hamilton, Al 35570	Marion	3	10S	15W	2	5
Clay, Gravel	#3490 64-1	Rusty's Const. Co. Route 2, Box 236-B Jasper, Al 35501	Walker	23	13S	8W	2	3
						Subtotal:	58	152
Clay, Shale	#3106 7-1	West Blocton Shale & Clay Co. P.O. Box 185 West Blocton, Al 35184	Bibb	32	21S	5W	10	5
						Subtotal:	10	5

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Sand	#2 5-2	Carver Mining Company Route 2 Foley, Al 36535	Baldwin	17	8S	4E	1	40
Sand	#2575 5-2	O. A. Rawson Construction P.O. Box 312 Foley, Al 36536	Baldwin	38	8S	4E	1.5	15
Sand	#1223 5-1	H. C. Weaver P. O. Box 8 Orange Beach, Al 36561	Baldwin	7	8S	4E	2	10
Sand	#3795 35-1	A. D. Sewell Route 1, Box 264 Forkland, Al 36470	Greene	32	19N	3E	10	10
Sand	#4010 38-1	Lingo Sand Company, Inc. 3400 Lingo Road Dothan, Al 36303	Houston	33,34	4N	26E	4	17
Sand	#1099 1-1	Industrial Sand Co. P.O. Box 246 Trussville, Al 35173	Jefferson	14	16S	1W	1	2
Sand	#3668 46-5	U.S. Silica Co., Inc. P.O. Box 442 Hurtsboro, Al 36860	Macon	11	15N	25E	10	4
Sand	#3717 48-1	River City Industries P.O. Drawer A Demopolis, Al 36732	Marengo	28	16N	3E	2	15
Sand	#1147 2-1	Al. Asphalt Paving Co., Inc. Route 6, Box 39 Eight Mile, Al 36613	Mobile	22	3S	2W	3	40

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Sand	#3819 2-1	Brunson Construction Co. 35 Station Street Saraland, Al 36571	Mobile	22	3S	2W	4	5
Sand	#1744 2-1	H.E. Busby Sand & Gravel Co. P.O. Box 502 Theodore, Al 36582	Mobile	3	6S	2W	3	25
Sand	#3826 2-2	Dickens Hauling Company 4813 Nevius Road Mobile, Al 36619	Mobile	31	6S	2W	5	5
Sand	#3419 2-3	Dickens Hauling Company 4813 Nevius Road Mobile, Al 36619	Mobile	7	5S	2W	5	10
Sand	#1235 2-2	Dirt Sales, Inc. 5237 Henry Road Eight Mile, Al 36613	Mobile	28	3S	2W	5	60
Sand	#3429 2-1	Dirt Unlimited, Inc. P.O. Box 439 Semmes, Al 36575	Mobile	9	3S	3W	3	10
Sand	#1313 2-1	H & J Sand Co., Inc. Route 3, Box 157D Grand Bay, Al 36541	Mobile	3	7S	3W	1	20
Sand	#3100 2-1	K. J. Harris Route 18, Box 245A Mobile, Al 36608	Mobile	15	4S	3W	1	1
Sand	#3428 2-1	Hults Sand Company P.O. Box 776 Kemah, Tx 77565	Mobile	5	6S	5W	7	40

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Sand	#3914 2-1	Jackson Creek Sand Company Route 2, Box 29 Wilmer, Al 36587	Mobile	16	6S	3W	4	10
Sand	#3781 57-4	U.S. Silica Co., Inc. P.O. Box 442 Hurtsboro, Al 36860	Russell	4	15N	27E	10	5
Sand	#3985 57-5	U.S. Silica Co., Inc. P.O. Box 442 Hurtsboro, Al 36860	Russell	5	15N	27E	5	10
Sand	#3773 57-8	U.S. Silica Co., Inc. P.O. Box 442 Hurtsboro, Al 36860	Russell	7	15N	27E	10	10
Sand	#3738	C & B Ready Mix (James D. Beech) P.O. Box 883 Chatom, Al 36518	Washington	48,50	6N	1E	3	120
Sand	#2682 63-1	E. J. Martin Const. P.O. Box 37 Vance, Al 35490	Tuscaloosa	17	21S	6W	1	5
Sand	#3046 63-2	U.S. Silica Co., Inc. Route 4, Box 587 Tuscaloosa, Al 35405	Tuscaloosa	27	21S	10W	5	5
						Subtotal:	106	494

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Sand, Clay	#3602 5-1	Scott's Trucking HC 75, Box 910 Foley, Al 36526	Baldwin	17	8S	4E	2	50
Sand, Clay	#1 5-1	Smith Construction Company Hwy 59 & W. 2nd Avenue Gulf Shores, Al	Baldwin	7	8S	4E	0.5	5
Sand, Clay	#3454 8-1	Royal Sand & Clay Co., Inc. P.O. Box 612 Snead, Al 35952	Blount	11	11S	1E	6	6
Sand, Clay	#3076 2-1	John H. Shank Route 9, Box 216UV Eight Mile, Al 36613	Mobile	8	3N	2E	1	6
						Subtotal:	9.5	67
Sand, Gravel	#3438 4-1	Coastal Asphalt & Constr. Co. 1129 Adams Avenue Montgomery, Al 36104	Autauga	22	19N	16E	5	40
Sand, Gravel	#990 4-1	Dixie Sand & Gravel Co., Inc. P.O. Box 1128 Montgomery, Al 36102	Autauga	26	17N	16E	5	85
Sand, Gravel	#3280 4-1	F & M. Gravel Company Route 5, Box 103 Wetumpka, Al 36092	Autauga	2	19N	16E	5	40
Sand, Gravel	#2988 4-1	Hunter Station-Russell, Inc. P.O. Box 397 Prattville, Al 36067	Autauga	16	17N	14E	6	30

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Sand, Gravel	#1 5-1	C. E. Colquett 2412 Millwood Drive Mobile, Al 36606	Baldwin	13	7S	3E	1	4
Sand, Gravel	#2145 5-1	Friese Materials, Inc. P.O. Box 190B Daphne, Al	Baldwin	8	2S	2E	2.5	10
Sand, Gravel	#2532 5-1	Norris Sand & Gravel, Inc. Route 1, Box 117 Perdido, Al 36562	Baldwin	4	3N	4E	5	5
Sand, Gravel	#1 5-1	Turner Sand & Gravel Route A, Box 60 Atmore, Al 36502	Baldwin	4	3N	4E	4	15
Sand, Gravel	#2863 7-1	T & G Sand & Gravel 2815 10th Court, South Birmingham, Al 35233	Bibb	12	22S	6W	3	3
Sand, Gravel	#3843 11-1	APAC-Alabama, Inc. Hodges Division P. O. Box 460 Anniston, Al 36202	Calhoun	29	15S	9E	10	60
Sand, Gravel	#2971 11-1	M-Earth of Al., Inc. P.O. Box 283 Anniston, Al 36202	Calhoun	29	15S	5E	2	120
Sand, Gravel	#2777 11-1	Mohawk Sand & Silica, Inc. 1624 Forrest Avenue Gadsden, Al 35901	Calhoun	19	14S	6E	15	30

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Sand, Gravel	#2176 13-3	James Ray St. John P.O. Box 246 Ragland, Al 35131	Cherokee	26	11S	11E	2	10
Sand, Gravel	#3095 14-1	Southern Silica Company Route 2, Box 1135 Clanton, Al 35045	Chilton	10	20N	14E	1	120
Sand, Gravel	#3996 16-4	Levoyde Bradford Route 1, Box 133 Dickinson, Al 36436	Clarke	33	9N	4E	28	28
Sand, Gravel	#3540 16-1	East Clarke County Gravel Co. Star Route 3, Box 69 Jackson, Al 36545	Clarke	9	7N	3E	2	20
Sand, Gravel	#3792 16-2	East Clarke County Gravel Co. Star Route 3, Box 69 Jackson, Al 36545	Clarke	24	7N	2E	1	5
Sand, Gravel	#3806 16-1	Fuller Gravel Route 1, Box C-1 Whatley, Al 36482	Clarke	21	8N	4E	1	2
Sand, Gravel	#479 16-3	Gulf Coast Gravel Co., Inc. Route 1, Box 229 Grove Hill, Al 36451	Clarke	14	9N	4E	1	12
Sand, Gravel	#1242 16-1	Harden & Harden Sand & Gravel P.O. Box 417, Pollard Roads Daphne, Al 36526	Clarke	22	7N	2E	3	15
Sand, Gravel	#1265 16-2	Harden & Harden Sand & Gravel P.O. Box 417 Daphne, Al 36526	Clarke	14	7N	2E	3	5

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Sand, Gravel	#1 16-1	Jackson Sand & Gravel Co. Walker Springs, Al	Clarke	25	7N	2E	10	50
Sand, Gravel	#149 16-2	Jackson Sand & Gravel Co. Walker Springs, Al	Clarke	10,11	8N	2E	10	10
Sand, Gravel	#2424 18-1	King Mines Resorts, Inc. Route 1, Box 128 Delta, Al 36258	Cleburne	22,23	17S	9E	5	5
Sand, Gravel	#3922 19-1	Southland Sand & Gravel, Inc. Route 4, Box 471 Elba, Al 36323	Coffee	19	5N	20E	2	20
Sand, Gravel	#2400 21-1	J. B. Ammons Construction, Inc. P.O. Box 486 Spanish Fort, Al 36527	Conecuh	4	4N	9E	1	30
Sand, Gravel	#1580 21-1	Andrews Sand & Gravel Route 1, Box 181-A Monroeville, Al 36460	Conecuh	30	5N	9E	2	2
Sand, Gravel	#3380 21-1	Conecuh Gravel, Inc. Route 1 Repton, Al 36454	Conecuh	33	5N	9E	3	30
Sand, Gravel	#2383 21-1	Nolan Cooper Route 2, Box 308 Robertsdale, Al 36567	Conecuh	33	5N	3E	1	10
Sand, Gravel	#3998 21-1	Richard Eady Star Route, Box 442 Bay Minette, Al 36507	Conecuh	30	5N	9E	2	8
Sand, Gravel	#1347 21-1	Gulf Coast Gravel Co. 303 S. Carney St. Atmore, Al 36502	Conecuh	20	4N	7E	1	20

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Sand, Gravel	#3175 21-1	Kendrick Sand & Gravel Route E, Box 151 Evergreen, Al 36401	Conecuh	30	5N	9E	2	8
Sand, Gravel	#2923 21-1	Middleton Dredging & Gravel P.O. Box 20 Lenox, Al 36454	Conecuh	33	5N	9E	1	40
Sand, Gravel	#3154 21-1	Ray's Rock Company P.O. Box 283 Perdido, Al 36562	Conecuh	4	4N	9E	2	4
Sand, Gravel	#2922 21-1	Red's Sand & Gravel Co. Route 1, Box 68-C Flomaton, Al 36441	Conecuh	24	5N	8E	3	60
Sand, Gravel	#389 21-1	Santa Rosa Concrete Co. Group 501 Elmira Street Milton, Fl 32570	Conecuh	10	4N	9E	5	15
Sand, Gravel	#1397 21-2	Smith-Kelly Supply Company P.O. Box 1227 Mobile, Al 36601	Conecuh	20	4N	7E	6	10
Sand, Gravel	#2685 21-1	Southern Material Co., Inc. Route 1, Box 26(B) Perdido, Al 36562	Conecuh	30	5N	8E	1	10
Sand, Gravel	#2925 27-1	Central Alabama Materials, Inc. P.O. Box 323 Tyler, Al 36785	Dallas	26,27	17N	12E	8	40
Sand, Gravel	#3759 27-1	Cosby-Carmichael, Inc. P.O. Box 597 Selma, Al 36701	Dallas	9	16N	11E	10	8

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Sand, Gravel	#3775 27-2	Cosby-Carmichael, Inc. P.O. Box 597 Selma, Al 36701	Dallas	5,8	16N	11E	5	15
Sand, Gravel	#2886 27-3	Cosby-Carmichael, Inc. P.O. Box 597 Selma, Al 36701	Dallas	34	17N	11E	3	20
Sand, Gravel	#3246 27-4	Cosby-Carmichael, Inc. P.O. Box 597 Selma, Al 36701	Dallas	9	17N	12E	5	20
Sand, Gravel	#3687 27-2	Hamilton Sand & Gravel, Inc. Route 1 Marion Junction, Al 36759	Dallas	32,31	15N	9E	5	20
Sand, Gravel	#3863 27-2	S & S Materials P.O. Box 640 Panama City, Fl 32402	Dallas	24	16W	10E	5	50
Sand, Gravel	#1560 27-1	Smith-Kelly Supply Company P.O. Box 1227 Mobile, Al 36601	Dallas	27	17N	12E	5	10
Sand, Gravel	#1 28-1	Dixie Mining, Inc. Scenic Road, Route 1 Ft. Payne, Al 35967	DeKalb	24	7N	9E	6	6
Sand, Gravel	#3947 29-1	Alpine Mining Co., Inc. P.O. Box 1710 Montgomery, Al 36103	Elmore	15	17N	17E	15	15
Sand, Gravel	#3592 29-1	D & J Gravel Company, Inc. Route 5, Box 270 Wetumpka, Al 36092	Elmore	8	18N	18E	10	10

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Sand, Gravel	#1052 30-2	Arnold Sand & Gravel Route 2, Box 648 Cantonment, Fl 32533	Escambia	12	1N	8E	3	10
Sand, Gravel	#989 30-1	Campbell Sand & Gravel Co. Route 1, Box 242 Flomaton, Al 36441	Escambia	21	3N	8E	6	20
Sand, Gravel	#1644 30-2	Campbell Sand & Gravel Co. Route 1, Box 242 Flomaton, Al 36441	Escambia	28	3N	8E	3	10
Sand, Gravel	#3865 30-3	Campbell Sand & Gravel Co. 930 Campbell Road Century, Fl 32535	Escambia	13	3N	3E	6	60
Sand, Gravel	#3807 30-1	Clyde's Sand & Gravel Co. Route 3, Box 46-A Century, Fl 32535	Escambia	3	1N	7E	11	72
Sand, Gravel	#4022 30-2	Clyde's Sand & Gravel Co. Route 3, Box 46A Century, Fl 32535	Escambia	16	2N	7E	1	9
Sand, Gravel	#3753 30-1	Conecuh Gravel DBA Bay Concrete Company P.O. Box 653 Robertsdale, Al 36567	Escambia	13	2N	5E	6	60
Sand, Gravel	#2911 30-1	D & D Gravel P.O. Box 7142 Pensacola, Fl 32514	Escambia	28	2N	7E	25	100
Sand, Gravel	#1 30-1	Escambia Materials Route 2, Box 370 Cantonment, Fl 32533	Escambia	22	3N	8E	20	20

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Sand, Gravel	#2 30-2	Escambia Materials Route 2, Box 370 Cantonment, Fl 32533	Escambia	22	3N	8E	4	4
Sand, Gravel	#3647 30-2	Friese Trucking & Materials P.O. Box 152 Atmore, Al 36504	Escambia	31,32	2N	6E	2	35
Sand, Gravel	#3950 30-1	Roy Parker & Sons Gravel Co. Route 3, Box 115 Milton, Fl 32970	Escambia	26	3N	7E	2	10
Sand, Gravel	#3010 30-1	Red's Sand & Gravel Company Route 1, Box 98 Flomaton, Al 36441	Escambia	13,14	1N	7E	0	50
Sand, Gravel	#1705 30-1	Santa Rosa Concrete Co., Inc. 501 Elmira Street Milton, Fl 32570	Escambia	21	3N	9E	11	15
Sand, Gravel	#2 30-2	Santa Rosa Concrete Co., Inc. 501 Elmira Street Milton, Fl 32570	Escambia	20	3N	9E	5	15
Sand, Gravel	#1706 30-3	Santa Rosa Concrete Co., Inc. 501 Elmira Street Milton, Fl 32570	Escambia	13	3N	8E	5	15
Sand, Gravel	#1 31-1	Akron Sand Company Aliceville, Al 35442	Etowah	1,2	13S	6E	0	20
Sand, Gravel	#2155 31-1	Boozer & Power Const. Co. 842 N. 37th St. Gadsden, Al 35904	Etowah	26	11S	6E	1	4

35

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Sand, Gravel	#2833 31-1	Pollard Sand Co., Inc. Route 2, Box 361-C Gadsden, Al 35903	Etowah	12	11S	7E	2	10
Sand, Gravel	#2705 32-1	David "Chuck" Beasley Route 1, Box 407A Winfield, Al 35594	Fayette	29	13S	12W	2	15
Sand, Gravel	#4027 32-1	West Alabama Sand & Gravel, Inc. P.O. Box 688 Fayette, Al 35555	Fayette	10	15S	12W	1	3
Sand, Gravel	#3140 32-1	White Springs Sand & Gravel P.O. Box 137 Glen Allen, Al 35559	Fayette	1	14S	12W	28	35
Sand, Gravel	#3969 33-1	EDSU, Inc. P.O. Box 963 Russellville, Al 35653	Franklin	35	7S	11W	5	20
Sand, Gravel	#2555 33-1	Rhea Greenwell Greenwell Enterprises, Inc. P.O. Drawer E Decatur, Al 35602	Franklin	12	7S	13W	15	30
Sand, Gravel	#2818 33-1	Spruce Pine Sand & Gravel Co. P.O. Box 49 Athens, Al 35611	Franklin	5,7,8	8S	11W	113	113
Sand, Gravel	#3108 33-1	Trapptown Sand Co. P.O. Box 49 Athens, Al 35611	Franklin	6	8S	10W	4	30
Sand, Gravel	#3068 35-1	Forkland Sand & Gravel Co., Inc. P.O. Box 186 Forkland, Al 36740	Greene	6	19N	13W	1	1

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Sand, Gravel	#3562 36-1	Alabama Sand & Gravel P.O. Box 1666 Tuscaloosa, Al 35403	Hale	22	23N	4E	2	3
Sand, Gravel	#3997 36-1	APAC-Alabama, Inc. P.O. Box 818 Birmingham, Al 35201	Hale	29	23N	4E	16.5	20
Sand, Gravel	#3441 36-1	Stewart Properties, Inc. P.O. Box 415 Tuscaloosa, Al 35402	Hale	30	23N	4E	5	30
Sand, Gravel	#3216 40-1	Pikeville Sand & Gravel, Inc. P.O. Box 881 Guin, Al 35563	Lamar	10	12S	14W	20	8
Sand, Gravel	#1 45-1	Central Sand & Gravel P. O. Box 54 Stanton, Al 36790	Lowndes	29	16N	14E	4	4
Sand, Gravel	#1630 45-1	D. T. Gregory P.O. Box 18 Burkville, Al 36725	Lowndes	7	15N	15E	2	2
Sand, Gravel	#1 46-1	Alabama Silica Box 116 Slippery Rock, Pa 16057	Macon	7	17N	20E	2	2
Sand, Gravel	#4001 47-1	Madison Materials, Inc. P.O. Box 306 Guntersville, Al 35976	Madison	15	6S	2E	22	40
Sand, Gravel	#3798 49-1	Bobby Boyett, Mine Foreman Hamilton Sand & Gravel Route 4, Box 79 Hamilton, Al 35570	Marion	5	11S	14W	16	120

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Sand, Gravel	#3296 49-1	Bull Mountain Sand & Gravel P.O. Box 465 Sumiton, Al 35148	Marion	18	9S	15W	2	2
Sand, Gravel	#427 50-1	Alpine Sand & Gravel Co., Inc. P.O. Box 791 Alexander City, Al 35010	Marshall	23	8S	2E	4	10
Sand, Gravel	#2893 51-4	Campbell Sand & Gravel Co. Route 1, Box 242 Flomaton, Al 36441	Monroe	25	5N	7E	3	20
Sand, Gravel	#3613 51-1	Henry C. Childs Construction Co. P.O. Box 66 Frisco City, Al 36445	Monroe	24	6N	7E	2	20
Sand, Gravel	#1697 51-2	H & H Gravel Company Repton, Al 36475	Monroe	11	5N	8E	3	3
Sand, Gravel	#2998 51-3	H & H Gravel Company Linox, Al 36454	Monroe	34	6N	7E	3	3
Sand, Gravel	#3517 51-1	Norris Sand & Gravel Co., Inc. Route 1, Box 117 Perdido, Al 36562	Monroe	32	5N	6E	5	10
Sand, Gravel	#2806 51-1	Roy Parker & Sons Gravel Co. Route 3, Box 115 Milton, Fl 32570	Monroe	34	4N	5E	2	10
Sand, Gravel	#2425 51-1	Sandco Sand & Gravel Co., Inc. P.O. Box 1221 Monroeville, Al 36461	Monroe	24	6N	7E	30	20

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Sand, Gravel	#3399 51-1	Stacey Construction Route 1, Box 225-B Monroeville, Al 36460	Monroe	22	6N	7E	2	50
Sand, Gravel	#2917 51-2	Tho-Mac Trucking & Gravel, Inc. P.O. Box 965 Atmore, Al 36504	Monroe	33	5N	6E	5	40
Sand, Gravel	#3381 51-3	Tho-Mac Gravel, Inc. P.O. Box 965 Atmore, Al 36504	Monroe	28	5N	6E	4	50
Sand, Gravel	#2388 3-1	Al. Asphalt Contractors, Inc. P.O. Box 1003 Montgomery, Al 36102	Montgomery	29	17N	19E	4	10
Sand, Gravel	#2387 3-2	Al. Asphalt Contractors, Inc. P.O. Box 1003 458 So. Lawrence St. Montgomery, Al 36102	Montgomery	35	17N	19E	20	20
Sand, Gravel	#2386 3-3	Al. Asphalt Contractors, Inc. P.O. Box 1003 458 So. Lawrence St. Montgomery, Al 36102	Montgomery	28	17N	19E	20	20
Sand, Gravel	#3867 3-4	Capital City Asphalt Co. APAC-Alabama, Inc. P.O. Box 9126 Montgomery, Al 36108	Montgomery	32	17N	19E	20	20
Sand, Gravel	# 3-1	L. D. Chapman Gravel Co. Bought by Delta Haulers 3-1	Montgomery	3,10	16N	20E	5	5

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Sand, Gravel	#3034 3-1	Delta Haulers, Inc. P.O. Drawer 218 Pike Road, Al 36064	Montgomery	3,10	16N	20E	5	5
Sand, Gravel	#1145 3-1	Dixie Sand & Gravel Co., Inc. P.O. Box 1128 Montgomery, Al 36102	Montgomery	32	16N	17W	5	40
Sand, Gravel	#2014 3-1	Elrod & Froggy Bottom Route 5, Box 332 Montgomery, Al 36117	Montgomery	32	17N	19E	7	5
Sand, Gravel	#3788 3-1	Greer Sand & Gravel Route 3, Box 340-D Montgomery, Al 36110	Montgomery	18	17N	18E	12	12
Sand, Gravel	#3956 3-1	Hickory Bend Farms P.O. Box 17551 Montgomery, Al 36117	Montgomery	1,2	16N	20E	4	4
Sand, Gravel	#3957 3-2	Hickory Bend Farms P.O. Box 17551 Montgomery, Al 36117	Montgomery	3	16N	20E	3	20
Sand, Gravel	#3287 3-2	Swanner Transfer & Storage Co. 3445 Aronov Avenue Montgomery, Al 36108	Montgomery	24	17N	18E	1	60
Sand, Gravel	#2332 3-1	Swanner-Shine Route 3, Box 514 Montgomery, Al 36110	Montgomery	19	17N	19E	3	15
Sand, Gravel	#3952 3-4	Thackston Trucking 216 Townsend Dr. Montgomery, Al 36117	Montgomery	14	16N	20E	1	9

40

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Sand, Gravel	#3393 57-1	The Concrete Company, Inc. P.O. Box 7877 Columbus, Ga 31908	Russell	1	16N	30E	5	5
Sand, Gravel	#360 60-2	Gainesville Sand & Gravel Co. Box 37 Gainesville, Al 35464	Sumter	1	21N	2W	2	6
Sand, Gravel	#1 60-1	Marengo Concrete Products Co. P.O. Drawer A Demopolis, Al 36732	Sumter	30	19N	2E	3	30
Sand, Gravel	#3318 60-1	River City Industries P.O. Drawer A Demopolis, Al 36732	Sumter	30	19N	2E	4	40
Sand, Gravel	#3043 60-1	West Alabama Supply Route 1, Box 86 Livingston, Al 35470	Sumter	16,21	21N	1W	4	50
Sand, Gravel	#3887 60-2	W.G. Yates & Sons Construction P.O. Box 456 Philadelphia, MS 39350	Sumter	15	23N	2W	28	28
Sand, Gravel	#3273 63-1	Al-Tenn Sand & Gravel P.O. Box 266 Peterson, Al 35478	Tuscaloosa	33,34	20S	8W	63	63
Sand, Gravel	#1346 63-1	American Sand & Gravel Co. P.O. Box 3198, Eastdale Station Tuscaloosa, Al 35401	Tuscaloosa	34	20S	8W	6	20
Sand, Gravel	#3570 63-1	Black Widow Resources, Inc. P.O. Box 36965 Birmingham, Al 35236	Tuscaloosa	6	19S	8W	2	15

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Sand, Gravel	#3805 63-1	Dunn Construction Co. Route 2, Box 551 Cottondale, Al 35453	Tuscaloosa	27 33,34	20S	8W	93	93
Sand, Gravel	#3712 63-1	Northport Sand and Gravel Co. P.O. Box 807 Northport, Al 35476	Tuscaloosa	17	21S	10W	2	60
Sand, Gravel	#3621 63-2	Northport Sand and Gravel Co. P.O. Box 807 Northport, Al 35476	Tuscaloosa	29	20S	11W	5	5
Sand, Gravel	#179 63-2	W. T. Ratliff Co. P.O. Box 1111 Knoxville, Al 37901	Tuscaloosa	28	19S	9W	7	40
Sand, Gravel	#1 63-1	Yazoo Gravel Co. P.O. Box 2348 Tuscaloosa, Al 35401	Tuscaloosa	17	21S	10W	2	10
Sand, Gravel	#3387 64-1	Winfield Sand & Gravel Route 2, Box 172 Empire, Al 35063	Walker	3	15S	5W	40	80
						Subtotal:	1,052	3,248

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Shale	#2536 63-1	H. C. Cobern Woodstock, Al 35188	Bibb, Tusc.	2	20S	6W	3	15
Shale	#1621 8-1	F & W Co., Inc. 812 2nd Avenue East Oneonta, Al 35121	Blount	4	13S	1W	3	25
Shale	#2638 8-2	Arvel E. Hallmark, Pres. Hallmark Trucking, Inc. P.O. Box 87 Locust Fork, Al 35097	Blount	25, 36	13S	2W	8	8
Shale	#3123 8-3	Arvel E. Hallmark, Pres. Hallmark Trucking, Inc. P.O. Box 87 Locust Fork, Al 35097	Blount	2	14S	2W	9	3
Shale	#3941 8-5	Arvel E. Hallmark, Pres. Hallmark Trucking, Inc. P.O. Box 87 Locust Fork, Al 35097	Blount	6	14S	1W	7	80
Shale	#3713 28-3	Stephen Black P.O. Box 551 Rainsville, Al 35986	DeKalb	34	7S	7E	10	6
Shale	#3714 28-4	Stephen Black P.O. Box 551 Rainsville, Al 35986	DeKalb	23,34	7S	7E	12	2
Shale	#3818 28-5	Stephen Black P.O. Box 551 Rainsville, Al 35986	DeKalb	26	7S	7E	10	15
Shale	#3127 28-1	Moccasin Bend Docks P.O. Box 565 Signal Mountain, Tn 37377	DeKalb	28	5S	9E	19	6

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Shale	None 28-1	Southern Minerals Corp. Charles E. Botcher Hold'em, Inc. P.O. Box 548 Oneonta, Al 35121	DeKalb	Unknown			5.2	5.2
Shale	#2912 39-1	Jackson County Shale and Clay Route 1, Box 80 Flat Rock, Al 35966	Jackson	7	3S	9E	37	37
Shale	#2825 39-1	Luma, Inc. P.O. Box 158 Ft. Payne, Al 35967	Jackson	11	3S	9E	15.7	20
Shale	#2898 39-1	S & W, Inc. Route 1, Box 768 Flat Rock, Al 35966	Jackson	3	3W	8E	4	1
Shale	#2823 39-1	T-Square, Inc. P.O. Box 745 Ft. Payne, Al 35967	Jackson	26	1S	9E	5	1
Shale	#3103 39-2	T-Square, Inc. P.O. Box 745 Ft. Payne, Al 35967	Jackson	5	2S	10E	8	10
Shale	#1 1-1	Glen-Gery Corporation 227 North 5th Street Reading, Pa 19603	Jefferson	33	19S	4W	2	10
Shale	#3071 1-1	Arvel H. Hallmark, Pres. Hallmark Trucking, Inc. P.O. Box 87 Locust Fork, Al 35097	Jefferson	22	14S	3W	4	5

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Shale	#3379 1-1	MDR, Inc. P.O. Box 106 Warrior, Al 35180	Jefferson	19	14S	2W	2	1
Shale	#4002 1-1	W.C. Management 300 Vestavia Pkwy., Suite 3900 Birmingham, Al 35216	Jefferson	36	14S	3W	15	15
Shale	#3244 49-4	Northwest Mineral Corp. Route 1 Bear Creek, Al 35543	Lamar	4,5	12S	14W	34	34
Shale	#3248 49-1	Black Warrior Const. Co. P.O. Box 132 Lynn, Al 35575	Marion	27	11S	11W	10	24
Shale	#4029 49-2	Mega Services, Inc. Route 2, Box 284 Carbon Hill, Al 35549	Marion	26	12S	11W	12	4
Shale	#3215 49-1	Northwest Alabama Reclamation Route 3, Box 183-A Nauvoo, Al 35578	Marion	33	12S	11W	7	7
Shale	#2839 49-1	Northwest Mineral Route 3, Box 345 Hamilton, Al 35570	Marion	18	10S	12W	1	5
Shale	#2910 49-2	Northwest Mineral Route 6, Box 50 Hamilton, Al 35570	Marion	19	10S	12W	2	3
Shale	#2933 49-3	Northwest Mineral P.O. Box 191 Bear Creek, Al 35543	Marion	18	10S	12W	1	3

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Shale	#3665 59-1	Acmar Coal, Inc. 1020 Keller Drive Moody, Al 35004	St. Clair	27	16S	1E	5	20
Shale	#1790 59-1	K. L. Corbin Route 1 Steele, Al 35953	St. Clair	33	13S	3E	1	5
Shale	#3899 64-13	Cordova Clay Co., Inc. P. O. Box 100 Cordova, Al 35550	Walker	27	14S	6W	14	14
Shale	#1 64-1	Clay & Shale Shippers 1405 Heflin Ave., West Birmingham, Al 35214	Walker	26	14S	7W	2	2
Shale	#3911 64-1	Holliday Hauling & Mining Co. P.O. Box 707 Jasper, Al 35501	Walker	3	14S	8W	5	1
Shale	#4031 64-1	Mega Services, Inc. Rt. 2, Box 284 Carbon Hill, Al 35549	Walker	29	14S	7W	2	2
Shale	#3431 64-1	Pyramid Products, Inc. P.O. Box 344 Sumiton, Al 35148	Walker	2	14S	8W	15	20
Shale	#3992 64-2	Rusty's Const. Co. Route 7, Box 76 Jasper, Al 35501	Walker	33	14S	5W	2	3
Shale	#3214 67-1	W. C. Cumins Route 6, Box 2A Haleyville, Al 35565	Winston	17	10S	10W	14	15

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS
(PERMITTED CONSTRUCTION/INDUSTRIAL ORES)

MINERAL	PERMIT/ FILE NO.	COMPANY NAME & ADDRESS	COUNTY	SEC.	TWP.	RANGE	BONDED ACRES	DISTURBED ACRES
Shale	#1 67-1	Lanco Coal Co. P.O. Box 97 Nauvoo, Al 35578	Winston	1	12N	9W	2	8
Shale	#4030 67-1	Mega Services, Inc. Route 2, Box 284 Carbon Hill, Al 35549	Winston	4	12S	10W	15	15
Shale	#3199 67-1	Southern Minerals & Development P.O. Box 182 Bear Creek, Al 35543	Winston	17	10S	10W	5	40
Shale	#3494 67-2	Southern Minerals & Development P.O. Box 91 Delmar, Al 35551	Winston	1	10S	10W	15	40
Shale	#2897 67-1	TerraClear, Inc. P.O. Box 657 Oak Tree Plaza Hwy. 5 North Haleyville, Al 35565	Winston	17	10S	10W	5	40
						Subtotal:	347	570
						GRAND TOTAL:	2,037	5,402

STATE OF ALABAMA

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS

DATA SUMMARY TABLE

Mineral Type	Mining Type		Ownership		Features	Units	Cost (#11)
METALLIC ORES (#1)	Mines	N/A	Federal	0	Polluted Water	N/A	
Iron Ore	Millsites	N/A	Private	100%	Mine Dumps	N/A	
			State	0	Disturbed Land	N/A (#12)	
					Highwalls	N/A	
					Mine Openings	N/A	
					Haz. Structures	N/A	
					Subsidence Prone	N/A	
CONSTRUCTION ORES	Mines	210	Federal	0	Polluted Water	N/A	
PERMITTED (#2)	Millsites	N/A	Private	100%	Mine Dumps	N/A	
Shale			State	0	Disturbed Land	4531 acres	15,858,500
Sand & Clay					Highwalls	N/A	
Sand & Gravel					Haz. Structures	N/A	
Clay & Gravel							
Sand							
INDUSTRIAL ORES	Mines	75	Federal	0	Polluted Water	N/A	
PERMITTED (#2)	Millsites	N/A	Private	100%	Mine Dumps	N/A	
Barite			State	0	Disturbed Land	816 acres	2,856,000
Bauxite					Highwalls	N/A	
Clay					Haz. Structures	N/A	
CONSTRUCTION	Mines	285	Federal	0	Polluted Water	N/A	
INDUSTRIAL ORES	Millsites	N/A	Private	100%	Mine Dumps	N/A	
UNPERMITTED (#3,4)			State	0	Disturbed Land	5347 acres	18,714,500
					Highwalls	N/A	
					Haz. Structures	N/A	

N/A NOT AVAILABLE

STATE OF ALABAMA

INVENTORY OF INACTIVE AND ABANDONED MINE LANDS

DATA SUMMARY TABLE

	Mining Type		Ownership		Features	Units	Cost (#11)
CONSTRUCTION & INDUSTRIAL ORES City-County-State (#5,6)	Mines	630	Federal	0	Polluted Water	N/A	
	Millsites	0	Private	100%	Mine Dumps	N/A	
			State	0	Disturbed Land	4,800 acres	16,800,000
					Highwalls	N/A	
OTHER REGULATED MATERIALS (#7) Barite Bentonite Graphite Mica Slate Talc Tripoli Stone	Mines	N/A	Federal	0	Polluted Water	N/A	
	Millsites	N/A	Private	100%	Mine Dumps	N/A	
			State	0	Disturbed Land	N/A	
					Highwalls	N/A	
					Haz. Structures	N/A	
PRE-LAW MINING (#8)	Mines	N/A	Federal	0	Polluted Water	N/A	
	Millsites	N/A	Private	100%	Mine Dumps	N/A	
			State	0	Disturbed land	N/A (#12)	
					Highwalls	N/A	
					Haz. Structures	N/A	
UNREGULATED MATERIALS (#9) Marble Limestone Dolomite Chert	Mines	N/A	Federal	0	Polluted Water	N/A	
	Millsites	N/A	Private	100%	Mine Dumps	N/A	
			State	0	Disturbed Land	N/A (#12)	
					Highwalls	N/A	
					Haz. Structures	N/A	
					Subsidence Prone (#10)	N/A	

N/A NOT AVAILABLE

Total Disturbed Land	15,494 Acres
Total Estimated Cost to Reclaim	$54,229,000
Less Forfeited Reclamation Bonds	57,219
Net Reclamation Cost	$54,171,781

STATE OF ALABAMA
DATA SUMMARY TABLE
COMMENTS

#1) Widespread iron ore mining occurred in Alabama through the early 1950's. Both underground and surface mines are known to exist. No information is available on the number of mines, the number of mill sites or the acreage affected.

#2) From the Inventory of Inactive and Abandoned Mine Lands. (Construction/Industrial Ores).

#3) Due to understaffing, weak enforcement provisions and lack of funding, less than 50% of non-fuel surface mine operators have made a practice of applying for mining permits since Alabama's surface mining law was enacted in 1970.

#4) Estimated figures from known trends occurring on permitted sites.

#5) Surface mines used for the sole purpose of constructing, repairing or maintaining city, county or state highways are exempt from permitting requirements. Consequently, no records exist as to their location, number or size.

#6) County engineers have estimated at least 630 sites covering more than 4,800 acres which are actively being used in the state for road construction purposes. From field observations and inquiries about pit origins, it can be concluded that at least as many abandoned county pits exist as active ones.

#7) "Other regulated materials" have been mined in Alabama sporadically, and sometimes intensively in certain areas. With a few exceptions, only the county of operation is known. Building stone is still being mined, although no permits are on file and no information is available.

#8) Prior to October 1, 1970, all surface mining in Alabama was completely unregulated.

#9) Limestone, dolomite, marble and chert pits are exempt from State permitting requirements. No information is available as to acreage disturbed by the extraction of such minerals in Alabama.

#10) Abandoned underground limestone quarries do exist in Alabama, but their number and size are unknown.

#11) The average cost to reclaim as abandoned non-fuel surface mine in Alabama is estimated to be $3500 per disturbed acre. The cost to reclaim other features listed in the data summary table would be included in that figure, should they happen to occur on a particular site.

#12) Although no records are available to provide for an accurate estimate of disturbed land associated with the mining of metallic ores, pre-law mining and the mining of unregulated materials, thousands of acres are known to exist across the state.

ARKANSAS

INACTIVE/ABANDONED MINE DATA SUMMARY

STATE OF ARKANSAS NARRATIVE SUMMARY

1.0 INTRODUCTION

Commercial mining of noncoal minerals began in Arkansas in the middle 1800's. A variety of mineral commodities have been mined since it's beginning, for such minerals as antimony, iron, manganese, mercury, nickel, silver, zinc, lead, asphalt, diamond, phosphate, bauxite, barite, clay, gypsum, sand, gravel, limestone, nepheline syenite, novaculite, quartz, silica sand, slate, soapstone, and vanadium. Only the latter fourteen are still mined in Arkansas.

Much of the early mining in Arkansas was done underground. Though not all sites have been located, more than 500 portals and shafts have been at least partially documented and the search for more continues. Many of these began as an open cut mine and then went underground. The old lead, zinc, and antimony mines are estimated to have constituted 80% of the underground mining operations. At present, the only underground mining in Arkansas are the limestone and silica sand mines in north-central Arkansas.

2.0 MINING AND MILLING METHODS

Mining since the early 1900's has been almost exclusively open cut mining. Without regulation, open cut mining has left the state with thousands of acres of unreclaimed open pits, dangerous highwalls, miles of polluted streams, potentially polluted water impoundments, decaying mine structures, rusting equipment, exposed mine faces that contain acid bearing materials, and hundreds of acres of mine waste dumps.

Beneficiation over the years for some commodities required crushing and/or sizing, such as sand and gravel. Many of these operations have left large piles of unsold materials, water filled pits, deteriorating process equipment, and sedimentation ponds with eroding levies.

Some commodities like bauxite and barite required crushing, roasting, and chemical and/or electrolytic processing. These processes have left large tailings ponds (some fifty or more feet high) with pH levels at both extremes of the pH scale.

3.0 HEALTH AND SAFETY IMPACTS

Noncoal mining methods have created some of the most severe health and safety hazards in Arkansas. Physical hazards include unprotected mine openings, highwalls, flooded excavations, spoil ridges, deteriorating mine structures, subsidence features, and shallow ponds with bottoms like quicksand. All of which have a magnet-like attraction to the public.

In some areas, subsidence is slowly encroaching on adjacent property, threatening homes, farm facilities, and pasture land. Worse still is the fact that from 1986 through 1988, six (6) people drowned in water filled mining excavations. From 1985 through 1990, of the nine (9) people who died from injuries sustained in falls from cliff, at least two occurred at an abandoned mine site.

Though the potential exists for ground water/water supplies to be contaminated as a result of acid mine water and disposal of process waste, sufficient monitoring has not been done to determine the magnitude of such contamination.

4.0 ENVIRONMENTAL IMPACTS

Monitoring has confirmed that past extraction and beneficiation of minerals mined in Arkansas has left many miles of streams either dead or diminished in quality. In addition, there exists other streams on which no study has been conducted. There also exists hundreds of acres of water impoundments with low pH, suspended solids, sulfates and other pollutants that possess the potential to cause serious environmental harm to surface waters as well as ground water. Abandoned underground bauxite mines are also creating problems. Some of these tunnels have filled with acid mine water from the open pits. This water is then surfacing elsewhere and getting into nearby streams. The scope of this problem is, as yet, unknown.

5.0 LAWS AND REGULATIONS

Except for human safety requirements for underground mining operations, no mining regulations existed in the state prior to 1971. In that year, the Arkansas General Assembly passed Act 236, entitled the Arkansas Open Cut Land Reclamation Act. This Act charged the Department of Pollution Control and Ecology with the responsibility of enforcing the new law. In 1977 Act 236 was replaced with Act 336 which was amended in 1987. In 1991, Act 336 was replaced by Act 827.

Since 1971, noncoal mine operators have been required to comply with certain mining and reclamation restrictions such as preparing a reclamation plan and posting a bond to assure completion of the reclamation. The 1991 changes to the open cut law will eliminate the bonding exemptions that now exist. The purpose of this law was to prevent the continued growth in the number of inactive or abandoned mine sites that are a threat to public safety and the environment.

Currently, no state laws have been enacted to provide for the reclamation of the inactive or abandoned mine site.

6.0 RECLAMATION EFFORTS

There is no formal program in Arkansas dedicated to reclamation of inactive or abandoned sites (IAM). Location and documentation of open cut IAMs only recently became possible. As these sites are located, an attempt is made to determine who the operator was, and when the site was mined. If the mining was done post 1971, then it may be possible to locate the operator(s) and arrange for reclamation of the site. However, most of the time, the current land owner, either did not own the land when it was mined, does not remember when it was mined or does not remember who mined it. Currently, the only possibility of getting prelaw sites reclaimed is if the site is permittedd under current law or is reclaimed as part of an adjacent permitted site. Thus, most of the sites will remain as they are unless some program is established to allow the State to reclaim these sites.

NONCOAL INVENTORY
INACTIVE/ABANDONED MINES[1]

STATE OF ARKANSAS

DEPARTMENT OF POLLLUTION CONTROL AND ECOLOGY
SURFACE MINING AND RECLAMATION DIVISION

OPEN CUT DATA SUMMARY[2]

Mineral[3]	Length of[4] Highwall (mi)		Polluted[5] Water (mi)		Mine[6] Dumps(ac)		Hazardous[7] Structures (ea)		Disturbed[8] Land (ac)		
Sand & Gravel	8.4				135.2		36		1080		
Quarry Stone	11.6				76.5		4		354		
Clay	0.15				0		0		15		
Shale	0.18				0		0		7		
Barite	2.05				20		2		530		
Bauxite	3.03		73.0		900		2		1800		
Iron	0.10				0		0		6		
Quartz	1				1		0		1		
TOTAL	26.51		73.0		1132.7		44		3793		
COST	$954,360[9]	+	$54,750,000[10]	+	$78,008,845[11]	+	$132,000[12]	+	$2,465,450[13]	=	$136,310,635

UNDER GROUND DATA SUMMARY[14]

Mineral	Mine Entrance[15]		Mine Air Shafts[16]		Mine Dumps[17] Disturbed Land (ac)		
Lead/Zinc	198		198		98		
Mercury	67		67		33		
Antimony	44		44		22		
Other[18]	100		100		50		
TOTAL	409		409		203		
COST	$6,135,000[19]	+	$2,863,000[20]	+	$131,950[21]	=	$9,129,95

TOTAL:$145,440,585.0

INACTIVE ABANDONED MINE INVENTORY SUMMARY
STATE OF ARKANSAS
FOOTNOTES

1. Inactive/abandoned mines (IAMs) are defined as properties where there is no continuing reclamation responsibility by the owner or claimant/lessee to remediate the impact of past noncoal mining. Sites reported in this data summary are not covered by any mining permits, reclamation bonds, state or federal licenses or any reclamation contracts.

   As specified in the Narrative Summary, the Arkansas Department of Pollution Control and Ecology only regulates open cut mining operations. A part of this program is the documentation of IAMs. It is estimated that, to date, approximately one-half of the sand and gravel sites and one-third of the quarry sites have been documented. It is believed that all other sites have been documented. The numbers used are projections based on the current information. Quartz mining is growing in Arkansas, thus, few sites are abandoned. Most of the quartz mining is done on national Forest Service land. If abandoned by the operator, the Forest Service will reclaim the site

2. Included with this report package is a Data Summary Table and narrative. The quality of the data and basis of its reliability is reported in these Footnotes.

3. The acres listed for each mineral type include the disturbed or impacted land resulting from mining/milling/processing activities within the IAM noncoal site. This acreage total includes health and safety hazards, unvegetated areas, and environmental degradation on and off site.

4. Highwalls are defined as the face of exposed overburden and mineral in an open cut or strip mining operation. Reclamation of these sites would involve excavation and embankment, regrading, or blast and terrace procedures.

5. The data reported is from the Arkansas Department of Pollution Control and Ecology's current Section 305(b) report to the U.S. EPA. The data is derived from monitored streams only. Many smaller streams are not included because they are not monitored.

6. Mine dumps are defined to include waste rock dumps, tailings impoundments, hazardous waste, or overburden stock piles. Reclamation of these sites could involve any of the following: grade out and/or relocate mine waste, construct drainage systems, install erosion netting, dispose of hazardous waste, apply soil amendments, and revegetate disturbances.

7. Hazardous structures are defined as noncoal related

structures, foundations, abandoned excavation equipment, etc. which could pose a hazard to people being in, on, or around them. Remediation of these hazards involves demolition, removal, or restoration.

8. Disturbed land means any land which has not been revegetated to a similar condition or has a utility similar to surrounding land. Included in this definition are disturbances such as open pits, portal areas, haul roads, and waste water treatment ponds. Reclamation of these sites would involve revegetation efforts which could be performed without earthwork.

9. The cost for highwall reclamation is an estimate based on an average of the current cost in Arkansas to move fill material less than 500 feet ($0.60/yd.) and greater than 500 feet ($1.30/yd.). The average highwall is approximately 20 feet high. Grading this to a three feet horizontal to one foot vertical calculates to $36,000 per mile inclusive of 30% for administrative costs.

10. The cost for reclamation of a stream is a figure for which little background information is possessed. Based on professional judgement the state of Montana estimated reclamation of High Impact streams to cost $1,000,000/mile and Moderate Impact streams to cost $500,000/mile. The stream miles reported here are totally without aquatic life or severely limited. For lack of a better method to judge this reclamation cost, an average of the two Montana categories is used ($750,000).

11. Reclamation of noncoal impacts as defined in the mine dump category are diverse and would be site specific. Based on information gathered to date: 1) the average mine dump is fifteen feet high, 2) a total of 232.7 acres of mine dump exists not including the bauxite mine dumps, 3) it will cost $0.60/yard to move this material, and 4) all material will be put into the excavation from which it came. The average bauxite mine dump is thirty feet high. There is approximately 900 acres of this material to be moved at a cost of $1.30/yard to place it back in the excavation.Thirty percent is added for estimated administrative costs, including design and construction oversight.

12. Remediation of hazardous structure is a cost not yet incurred in Arkansas. However, the cost factor used by the state of Montana ($3,000/structure) would probably apply in Arkansas.

13. Reclamation of disturbed land was limited by definition to include only revegetation efforts. Based on actual reclamation cost in Arkansas, $650/acre has been utilized for this estimate, 30% of which is estimated as administrative costs.

14. Since Arkansas does not regulate underground noncoal mines, it was necessary to depend on information obtained from the State Geology Department concerning quantity and condition of underground mining operations.

15. Most underground mines had only one entrance and one air shaft. However, some were shallow and had no air shaft while others were deep and had many air shafts. For this report each entrance is assumed to have one air shaft.

16. See footnote 15.

17. The documents reviewed at the State Geology Department were not prepared with reclamation in mind, so spoil materials and affected area at the mines site were not addressed. For this report, the following assumption is made: Affected surface area at each site is assumed to be one-half acre inclusive of spoil area.

18. Other minerals mined in Arkansas include iron, manganese, nickel, silver, diamonds, phosphate and bauxite. For this report these abandoned mine sites are estimated to number about one hundred.

19. The estimated average cost of closure for noncoal mine entrances is $15,000/entrance. This figure is based on the current average cost for closure of coal mine entrances.

20. The estimated average cost of closure for air shafts is $7,000/shaft. This figure is based on the current average cost for closure of coal mine air shafts.

21. The majority of the underground mines in Arkansas are in the Ozark and Ouachita Mountains. Regrading with heavy equipment would not be feasible. In all probability it would do more esthetic and environmental harm than would be repaired. Revegetation only is included in this category at $650 per acre.

ILLINOIS

NARRATIVE SUMMARY
NON-COAL MINES
INACTIVE AND ABANDONED MINES
STATE OF ILLINOIS

Introduction

The beginnings of the non-coal industry in Illinois are unknown with the exception of selected minerals. The first recorded fluorspar mine was recorded in 1842. Production continues today from four sites with one active mill. The majority of fluorspar production has been from underground mining. With the growth and development of the Chicago area in the 1800's it is apparent the was a demand for stone products. Both sand and gravel and limestone are readily available in this portion of the state. Lead and zinc production from underground mines began in the late 1700's in northwest Illinois with last active underground site closing in 1975. Peat mining continues in the northeastern part of the state. There are a variety of sites which have been mined historically for clay and shale for bricks, ceramics, absorbant clay products. Shales and limestones are mined for cement. Silica has been mined for many years for glass manufacture as well as tripoli and ganister (fine grained and amorphous silica). Available site specific information is found in a more comprehensive document (Sherrill) prepared for this report.

Specific processing wastes.

Ore wastes are associated with the several of these minerals. For the purposes of the inventory all known mine sites were counted. In this paragraph however mine spoils and pit water are not considered as mine waste. Mine waste will be identified as a processing waste, either as a coarse or fine (slurry) waste product. Fluorspar production today results in an impounded slurry waste. No water quality problems are noted with these operations. Most of the older sites did not process the ore using today's techniques resulting in no specific waste piles. Coarse waste from fluorspar was sold as road rock but is not currently generated. Clay mines may or may not wash their product depending on purity and end product. Waste from clay mines (absorbant clay) is an impounded high clay waste left in slurry ponds. This material is non-toxic and readily vegetates. Clay dust from brick manufacturing is disposed of in approved landfills. Peat mines do not produce a waste. Excavated areas typically fill with water to form a lake.

Silica (glass) operations wash their mineral resulting in a fine soil/silica waste which is impounded. Cement operation only produce a kiln waste which is understood not to be considered a waste subject to this review. Limestone and sand and gravel operations may wash their minerals according to local conditions and product demands. The wastes are either fine soil particles or fine limestone particles. Tripoli operations do not produce a waste. The lead/zinc operations all now abandoned, were underground mines and have produced numerous waste piles of waste ore and sinkholes from shafts. These sites have the most potential for environmental concern, however information is limited.

Health and Safety Concerns

The primary health and safety concerns of the non-coal abandoned sites are unprotected highwalls and mine openings. Current Mine Safety and Health Administration regulations 30 CFR 57.20021 require the sealing or entrance barriers after mine closure. Both permitted and non-permitted non-coal mines in Illinois are exempt from highwall sloping or backfilling. Due to the depth of pits particularly limestone quarries the sloping of highwalls is not, in most instances, practical or desirable, as excessive land and reserves would be used to achieve the slope. There are no current regulations for the fencing of highwalls, however fencing does commonly occur at quarries near urban areas.

Environmental Impacts

The main environmental impact of the abandoned non-coal mining industry is non-point scurce sediment loss from overburden deposition. With rare exception toxic (acidic) overburden is not encountered. With the possible exception of fluorspar and lead/zinc, due to lack of information, none of the mine waste would be considered toxic or produce potentially toxic discharge. The fluorspar industry must monitor fluorine discharges as an added parameter under their NPDES permits.

Laws and Regulations

The state of Illinois, Abandoned Mined Land Reclamation Council, has recently begun to work on a limited number of non-coal sites under the Title IV portion of the federal coal law SMCRA. The state is now authorized to spend a maximum of two per cent (two hundred thousand dollars per year) of their annual budget on non-coal sites where extreme hazards are present. This authorization beginning 1989 will continue until 1994. Present activities are filling twenty open fluorspar and lead mine shafts. Illinois began reclamation regulation of the non-coal industry in 1962. Reclamation standards of this industry increased in 1971 to require the overburden to be graded to a rolling topography. From 1962 to 1971 the overburden ridges were required to be struck off and vegetated. Currently pit excavations may be left dry or to form lakes. Highwalls may be left ungraded or not backfilled. Support areas such as processing and storage areas are not subject to reclamation regulations.

Reclamation Efforts

Reclamation planning of non regulated abandoned site began in 1990 and site work will continue through 1994. Twenty open fluorspar and lead mine shafts have been identified for OSM Title IV funding for 1990 and 1991. The inventory presented assumes all active sites have some abandoned or non-regulated portions within the total affected acreage.

NON-COAL INVENTORY - INACTIVE AND ABANDONED MINES
STATE OF ILLINOIS
ILLINOIS DEPARTMENT OF MINES AND MINERALS
LAND RECLAMATION DIVISION
AGENCY CONTACT DEAN SPINDLER
(217) 782-4970

CONSTRUCTION/COMMERCIAL ORES

TYPE	# OF SITES	FEATURE (see footnotes)	UNITS	# OF UNITS	COST $
SAND AND GRAVEL	839	POLLUTED WATER	MILES	0	$0
LIMESTONE	484	MINE DUMPS	ACRES	100	$200,000
CEMENT	5	DISTURBED LAND	ACRES	32555	$65,110,000
PEAT	7	HIGHWALLS	MILES	1011	$27,950,000
		MINE OPENINGS	#	UNKWN	$0
		SUBSIDENCE PRONE	ACRES	NA	$0
		HAZARDOUS STRUCTURE	#	UNKWN	$0
SUBTOTAL	1335				$93,260,000

METALLIC ORES

TYPE	# OF SITES	FEATURE (see footnotes)	UNITS	# OF UNITS	COST $
LEAD/ZINC	212	POLLUTED WATER	MILES	UNKWN	$0
FLUORSPAR/		MINE DUMPS	ACRES	100	$1,000,000
ASSOC. MINERALS	213	DISTURBED LAND	ACRES	850	$1,700,000
(Zn,Ba,Pb)		HIGHWALLS	MILES	0	$10,640,000
		MINE OPENINGS	#	>400	$1,600,000
		SUBSIDENCE PRONE	ACRES	UNKWN	$0
		HAZARDOUS STRUCTURE	#	UNKWN	$0
SUBTOTAL	425				$14,940,000

INDUSTRIAL ORES

TYPE	# OF SITES	FEATURE (see footnotes)	UNITS	# OF UNITS	COST $
SILICA	4	POLLUTED WATER	MILES	0	$0
CLAY	110	MINE DUMPS	ACRES	300	$600,000
TRIPOLI/	19	DISTURBED LAND	ACRES	1538	$3,076,000
GANISTER		HIGHWALLS	MILES	63	$1,522,400
		MINE OPENINGS	#	>10	$40,000
		SUBSIDENCE PRONE	ACRES	UNKWN	$0
		HAZARDOUS STRUCTURE	#	UNKWN	$0
SUBTOTAL	133				$5,238,400
TOTAL	1893			APPROX.	$113,000,000

NON-COAL INVENTORY
INACTIVE AND ABANDONED MINES
STATE OF ILLINOIS
FOOTNOTES

1. Inactive and abandoned mines (IAMs) are defined as areas where there is no reclamation responsibility to the Ill Department of Mines and Minerals. This will include many sites that are periodically active or active sites that have abandoned areas on the site. This will also include numerous permit exempt sites for which only mineral and location is known. Exact activity status is unknown.

2. Average acres per site has been estimated from experience with active sites. There is no accurate acreage database for permit exempt sites which represents the majority of these sites.

3. Ownership information is not available. Tripoli and fluorspar mining disturbances are know to occur on federal land.

4. Polluted water would be defined as water quality as a direct result of the mining activity which would not meet the federal Clean Water Act. There are no known sources of polluted water created as a result of non-coal mining. Sediment loss appears to be the main impact for these sites.

5. Mine dumps would be defined as ore waste piles and impounded fine waste (slurry ponds). Slurry pond reclamation requirements under the current state law require promoting natural reforestation within the ponds. Reclamation of IAM sites would be similar.

6. Disturbed land would be defined as land affected by overburden removal or deposition, mineral processing, storage and transportation other than used as a mine dump.

7. Hazardous highwall would be defined as the vertical face of the unmined mineral and overburden. All highwalls are inherently dangerous if ungraded or unprotected from public access. The grading or backfilling of many pits, particularly limestone quarries, is not considered practical due to loss of mineral reserves due to depth of excavation(> 200 feet), and relatively thin overburden (5-30 feet). Fencing may be an appropriate alternative. The estimated cost of fencing is $10/linear foot.

8. Hazardous mine openings would be defined as any unsealed opening into an underground mine (shaft, slope or drift). Shaft sealing includes removal of debris, backfilling and capping.

9. Subsidence prone areas would be defined as area overlying undermined area where inadequate roof support was left for long term stability. The acreage cannot be determined, however subsidence has been associated with tripoli and lead mining.

10. Hazardous structures would be defined as buildings and processing structures abandoned on site. The removal of these structures has not been nor is currently regulated. Most mines have some type of these structures of which some are portable and are removed after the site is inactive. No cost estimate can be calculated due to lack of available information.

STATE OF ILLINOIS
NON-COAL INVENTORY
INACTIVE AND ABANDONED MINES
REFERENCE GUIDE

1. Anderson, R.C. 1964. Sand and Gravel Resources of Dekalb County, Ill. State Geol. Survey (ISGS) Circ. 367, 16pp.

2. Anderson, R.C. 1967. Sand and Gravel Resources Along the Rock River in Illinois, ISGS Circ. 414, 17pp.

3. Bastin, E.S. 1931. The Fluorspar Deposits of Hardin and Pope Counties, Illinois. ISGS Bulletin 68, 116pp.

4. Baxter, J.W. et al. 1963. Areal Geology of the Illinois Fluorspar District Part 1. ISGS Circ. 342, 43pp.

5. Baxter, J.W. and G.A. Desborough. 1965. Areal Geology of the Illinois Fluorspar District Part 2. ISGS Circ. 385, 40pp.

6. Bradbury, J.C. 1957. Outlying Occurrences of Galena, Sphalerite, and Fluorite in Illinois. ISGS Ind. Min. Notes 7, 5pp.

7. Bradbury, J.C. et al. 1968. Fluorspar in Illinois. ISGS Circ. 420, 64pp.

8. Cook, W.J. Jr. 1979. Non-Coal Subsurface Mines in Illinois. Ill. Inst. of Nat. Resources. Earth Materials Tech. Sect. 353pp. The purpose of this inventory was to locate and describe site conditions at underground mines. Most of these site are abandoned.

9. Ekblaw, G.E.and J.E.Lamar. 1964. Sand and Gravel Resources of Northeastern Illinois. ISGS Circ. 359, 8pp.

10. Hickman, T.J. and J.R. Nawrot. 1980. Preliminary Evaluation of Potentially Hazardous Fluorspar Mine Entries. Ill. Abandoned Mine Land Reclamation Council (IAMLRC) Summary Report 23pp.

11. Hickman, T.J. and J.R. Nawrot. 1980. Evaluation of Potentially Hazardous Mine Entries Phase II. Ill. Abandoned Mine Land Reclamation Council (IAMLRC) Summary Report 31pp. This report was prepared for the Illinois Abandoned Mine Land Reclamation Council by the Southern Ill. Univ. Coop. Wild. Res. Lab. to identify sites potentially eligible for reclamation under SMCRA.

12. Hester, N.C. 1970. Sand and Gravel Resources of Sangamon County, Illinois. ISGS Circ. 452, 18pp.

13. Hester, N.C. and R.C. Anderson. 1969. Sand and Gravel Resources of Macon County, Illinois. ISGS Circ. 446, 16pp.

14. Hunter, R.E. and J.P. Kempton. 1967. Sand and Gravel Resources of Boone County, Illinois. ISGS Circ. 417, 14pp.

15. Illinois Dept. of Mines and Minerals - Land Reclamation Div. 1991. NON-COAL DATABASE. This database contains site information on permitted and non-permitted sites since 1971. The current land reclamation law exempts the majority of non-coal mines in the state due to size and/or overburden thickness. Numerous non-permitted sites are inspected for site condition changes. The database also records reclamation and closure of permitted sites.

16. Illinois Dept. of Transportation. 1988. Sources and Producers of Aggregates for Highway Construction in Illinois. Illinois Department of Transportation, Bulletin 23. This publication is periodically updated and has been produced for approximately 70 years.

17. Jacobs, A.M. 1971. Geology for Planning in St. Clair County, Illinois. ISGS Circ. 465, 35pp.

18. Labotka, T.C. and N.C. Hester. 1971. Sand and Gravel Resources of Mason County, Illinois. ISGS Circ. 464, 18pp.

19. Krey, P. and J.E. Lamar. 1925. Limestone Resources of Illinois. ISGS Bull. 46, 392pp.

20. Lamar, J.E. 1953. Siliceous Materials of Extreme Southern Illinois. ISGS RI 166, 39pp.

21. Lamar, J.E. 1965. Industrial Minerals and Metals of Illinois. ISGS Educational Series ES 8, 48pp.

22. Lamar, J.E. 1959. Limestone Resources of Extreme Southern Illinois. ISGS RI 211, 81pp.

23. Larsen, J.I. 1973. Geology for Planning in Lake County, Illinois. ISGS Circ. 481, 43pp.

24. Levine, C.R. 1973. Geology of the Clear Creek Tripoli Deposits of Alexander County, Illinois. M.S. Thesis, Southern Ill. Univ.

25. Masters, J.M. 1978. Sand and Gravel and Peat Resources in Northeastern Illinois. ISGS Circ. 503, 11pp.

26. McHenry County Department of Planning. 1990. McHenry County Inventory of Earth Extraction Operations. 257pp.

27. Reinertsen, D.L. 1984. Fluorite: Illinois State Mineral. ISGS Educational Ext. Publication Geogram 9, 2pp.

28. Samson, I. and J.M. Masters. 1990. Directory of Illinois Mineral Producers 1988-1989. ISGS IMN 103, 103pp. This publication is periodically updated.

29. Sherrill, J. et al. 1991. Non-Coal Mineral Site Directory. This directory is a compilation of the location of all known sources of non-coal mines in Illinois prepared by the Southern Ill. Univ. Coop. Wild. Res. Lab. for the Illinois Department of Mines and Minerals. Some site specific information is available.

30. Stevens, D.F. 1942. Directory of Illinois Clay and Clay Products Producers. ISGS Circ. 78, 35pp.

31. U.S. Department of Interior, Bureau of Mines. 1990. State Mineral Summaries 1990. 159pp.

INDIANA

INDIANA
NON-COAL MINERAL EXTRACTION DATA SUMMARY
INTRODUCTION

The State of Indiana does not have a comprehensive automated or manual database of non-coal mineral extraction sites, active or inactive. There are numerous sources of information on these sites, but the data is kept by different agencies in different forms. The Indiana Department of Natural Resources is the agency that has compiled this information.

The Indiana Geological Survey (IGS), a division of the Indiana Department of Natural Resources, keeps the best available data on active sites. These records are kept in card files and on typewritten lists. The IGS maintains excellent control of information on active operations and associated geologic data. Unfortunately, the Survey has not had the resources to update and computerize their historical, inactive, and abandoned mine data.

In 1986, the Indiana General Assembly enacted the Mineral Extraction Mine Reclamation Program. The program was administered by the Division of Reclamation, Indiana Department of Natural Resources. This program was an attempt to regulate the sand, gravel, and limestone industries. The program was repealed the following year. During the time the program was in effect, a database was developed to inventory the state's sand, gravel, and limestone (excluding dimension limestone) active and inactive sites and operations. The database is essentially incomplete due to the short duration of the program and the emphasis on active commercial sites. However, a high volume of raw data was recorded and a basic computerized database format was developed.

Non-coal mining in Indiana consists of sand, gravel, limestone (crushed and dimension), peat, marl, gypsum, clay, shale (including oil shale), and sandstone. The major industries in Indiana which account for the largest number of sites are sand, gravel, and limestone. Historical production of the other commodities has not been significant by comparison. Recording of the production of other commodities has not been consistently documented.

MINING METHODS

Surface mining is the basic method of extraction of non-coal minerals in Indiana. Mining consists of removal of topsoil, excavation to the pit, and direct extraction of the desired commodity. Waste material associated is limited. Disposable waste material consists of soil, occasionally shale, and, in the case of dimension limestone, large blocks of limestone that are extracted but not marketable. The limestone block piles are the most dramatic form of waste material.

Soil may be stockpiled or sold for fill. Shale and subsoil clay are hauled to the most convenient location adjacent to the site. Quarrying involves the occasional use of blasting agents. The material that is extracted is crushed or graded and transported to its final destination. Nearly all processing occurs on or near the operation. Limestone block waste is piled out of the way of the active portion of the quarry.

When extraction is complete and an operation is abandoned, effects of the extraction remain. Lakes, ponds, craters, haul roads, bare parking areas, equipment, and structures are left in place. With dimension stone removal, sheer stone walls, large blocks and block piles are also present. With sand and gravel operations, highwalls and ridges of moved material remain.

Many of the sites are reclaimed by nature, as vegetation encroaches on the roads, bare spots, and heaps of material. The ponds and lakes checked by DoR contained fish. Mine operations near populated areas or urban centers are often reclaimed by the operators or landowners for residential, commercial, and recreational development.

HEALTH AND SAFETY IMPACTS

Non-coal mining methods and mine waste do not create a significant impact on the health and safety of the public. The hazards which exist on these abandoned sites include lakes, vertical cliffs, and abandoned buildings. The lakes, especially in dimension stone sites, are very deep and have cliffs instead of gradual banks for sides. There is a constant danger of accidental drownings. Most of these sites have "no trespassing" signs posted, but the temptation of these sites remains a continuous threat.

The steep cliffs of pits and quarries are a hazard, especially when located close to roads with no guardrail. Abandoned structures and equipment pose a hazard, as they are very attractive to children as play areas.

ENVIRONMENTAL IMPACTS

Waste material which is disposed of near mining sites, if not immediately vegetated, may cause erosion problems. Sedimentation into nearby surface water is also a problem. These problems are temporary in most cases, as the sites are either used by man or overgrown by nature.

The integration of toxic materials associated with non-coal mineral extraction mines is insignificant. More toxic materials are dumped on the soil by spillage at heavy equipment fueling on site than by the material itself.

One effect of these extractions is that large areas may be left barren or unproductive after the extraction is completed. The large flat barren floors of extensive gravel, sand, and stone sites that are not water filled are examples of areas larger than some farms that are rendered useless.

LAWS AND REGULATIONS

There are no current laws or regulations which specifically address the non-coal mineral industry or problems associated with non-coal mine waste. The Indiana General Assembly enacted a program which regulated the sand, gravel, and limestone industries in 1986. The legislation provided for the establishment of the Mineral Extraction Mine Reclamation program (IC 14-4-9). This law was repealed the following year due to pressure from the industry. The failure of the program was largely due to permitting and bonding requirements which would have adversely affected smaller operations.

A plan to address legislative activity regarding non-coal mineral extraction is needed. Support for such legislation should be cultivated among lawmakers. The enactment of a federal program should encourage positive legislative action at the state level.

RECLAMATION EFFORTS

Non-coal reclamation in Indiana is the responsibility of the operator. Abandoned sites are most often left to be reclaimed by nature. Sites which are favorable for commercial development are reclaimed promptly with the postmining land use clearly planned.

A preliminary study compiled by the Indiana Geological Survey estimated the percentage of lands disturbed for extraction that were reclaimed by nature. The figure for sand, gravel, peat, and marl sites was over fifty percent. About five percent of crushed limestone quarries were reclaimed by nature. The figure for dimension stone was less than one percent.

As mentioned earlier, dimension limestone quarries are a unique reclamation problem. Because of the nature of the material, about fifty percent of the stone extracted from the quarry is waste. Stone that does not fit precise specifications, has flaws or color differentiation, is disposed of on site. This stone is not toxic, but does cause some health and safety problems. Aesthetics of these sites are also important, especially where they adjoin urban areas.

CURRENT MINE WASTE DATA BASE SUMMARY

Data from four sources is represented in the Mine Waste Data Base. Each of the sources is briefly outlined below. The two databases mentioned earlier are a product of the Indiana Department of Natural Resources. The second two are from federal information sources. Each database prioritizes its information differently. Two common elements missing from all four are estimates of affected acreage and estimates of cost to reclaim. The assessment of these databases has changed from our original submission, due to field verification of a sampling of the data from each one.

Indiana Department of Natural Resources, Division of Reclamation

The only automated database of the four used was the IDNR, DoR Sand, Gravel, and Limestone program data. This information was assembled during Indiana's sand and gravel program which ended in 1987.

The database has several features that make it unique and useful. It is computerized with the information recorded in an RBASE program. It also references almost every extraction site in Indiana.

Information was initially gathered by studying each of the 705 topographic quad mapsheets that represent Indiana for indicators of extraction activity. The information was then recorded in the database, with no entry in the comments section. In many cases, there was also no entry in the operation type section. As the sites were visited, brief notes were recorded in these portions of the database. Photos were also taken in some cases and converted to slides. The slides are stored in a ring binder and coded so they can be associated with the entry in the computer.

There are several weak points in the database. The locations of sites, recorded in the cadastral system, are recorded only down to section which is an insufficient degree of detail. When more than one site is located in a section, a number is placed in the operation type column or in the comments section to indicate the number of sites. There is no differentiation between sites.

The comments are often inaccurate or give no information. Examples of these comments include: locating a site on the west side of a road when it was on the east, "Both abandoned-no photos", "Abandoned Checked 3-25-88", "both abandoned-unstable highwalls", "couldn't stop for photo. checked 1-26-89", "abandoned-too far for photo", "abandoned, now a lake.(no film)". A five word entry the includes the words "no film" does not give working knowledge of a site.

Additionally, no files were made for the sites. These files would contain the hard copy information, such as inspection reports, more detailed site descriptions, and photographs.

No reports of inspection or field trip results reports were made.

Indiana Department of Natural Resources, Indiana Geological Survey

The IGS database is large, accurate, and unwieldy. It records site location down to quarter quarter section in the cadastral system of actively producing sites. Addresses, company officers, and directions to the sites are included. There are two forms of data recording. A card file with manual entries for the sites is the repository of detailed data. Additionally, different sections publish booklets with operator information.

The strength of this data is its accuracy. Fourteen IGS data sites were checked and all data recorded on each site was correct. The two individuals in IGS that DoR staff dealt with, Todd Thompson and Curtis Ault, were very knowledgeable and helpful.

Mineral Resource Data System, U. S. Geological Survey

This database is extremely detailed. It is automated, but the data used here was received in printed tabular form. Each site has a two page description of the mineral available, extraction activity, geological data, and location. The locations are recorded in one or more system: Geodetic Coordinates, Cadastral, and Universal Transverse Mercator Coordinates.

The MRDS system deals with minerals other than limestone, sand, and gravel. It records findings of minerals, such as iron and fluoride, that are present in the state but have never been developed. The two sites that are relevant to the DoR database were gypsum extraction sites.

The two sites relevant to Mine Waste were also checked. MRDS data was found to be accurate in detail. Their locations were recorded in the cadastral system.

United States Department of the Interior, Mineral Availability System

The Mineral Availability System catalogues stone, coal, clay, sand and gravel, iron, magnesium, sodium, silicon, aluminum, fluoride, calcium, lead, sulphur, gypsum, and tungsten availability sites. Most of the sites, other than coal, stone, sand, and gravel, are under the heading of "raw prospects", indicating that they have never been developed. Other data in the system includes active or past producer status and name of the site operator, if known.

The data from five MAS sites was checked and found to be accurate. There was a problem with integrating the MAS data into the total database. All site locations were recorded only by county and longitude and latitude (Geodetic) coordinates. There is an overlap of entries between this and the other databases. Time was not available to convert all of the location data into a common system and eliminate these duplicate entries.

DATABASE RECOMMENDATIONS

This database is to be the source of reference and management tool for a reclamation and regulatory effort. It is currently a combination of the DoR Sand and Gravel database, the IGS database, the MRDS system, and the MAS system. Much accurate, useful data has been recorded and is available. But, for it to fulfill its purpose, it must be developed. The automated portion must be made more responsive to user requests for information, and the hard copy portion must contain more documentation of site status.

Recommendations for further development of the database are as follows:

1. Record site locations by all three coordinate systems (UTM, Cadastral, and Geodetic coordinates) and enter this in the computerized portion of the database as well as the hard copy files. Where the DoR database lists a section with more than one site, give each site a unique entry in the database. As soon as this is accomplished, a sort of current data will be done by location (UTM is the most efficient sorting data field) and duplicate entries will be eliminated. Any new data submissions, no matter what location system is used, can be checked against existing entries in the database. This single step eliminates duplication of effort and refines the database to a single entry per site.

DoR has added a column to the original database for UTM coordinates and recorded a UTM for each site that was visited during database verification field trips.

2. Notify the USGS of any changes that should be made to topo quad maps. Where an activity is indicated on the map and no longer exists on the ground, the USGS should be notified so that when a particular quad is republished it will no longer indicate that activity.

DoR has contacted USGS for procedures to forward this information.

3. Expand the number of data tables in the automated system. There is currently only one table which records location, site type, and comments. The comments section is overused and does not give data that can be sorted readily and converted to numerical data. There should be five tables with key columns that link the data in them.

The first table would hold data on location to include county, topographic quadrant map name, Cadastral, UTM, and Geodetic coordinates, site or operation type, whether the site is active or inactive, and whether the site has been reclaimed or not.

The second table would be keyed to the first by quad name and UTM. It will contain only active sites and give the name, address, and phone number of operators, approximate size of the operation, and information on production at the site. The date of the last site check would also be recorded.

The third table would contain sites that are not active but have not been reclaimed. Again, quad and UTM will be the link to other tables. Size and reclamation cost estimates will be included here, as will date of last visit. A priority system will also indicate the order in which these will be reclaimed.

The fourth table will contain sites that are under reclamation construction. This table will indicate project number, design and construction status, estimated cost, actual cost, and status until the site is reclaimed. Again quad, UTM, and last check date will be included.

The fifth table is for reclaimed sites. The three standards, quad, UTM, and last check will be present, along with information on the method of reclamation (reclaimed by nature, operator, landowner, etc). It should also indicate the date that information on the site reclamation was communicated to the USGS, so that future publication editions of USGS maps will no longer indicate the quarry, pit, or activity that has been reclaimed.

4. Create a hard copy document file on each site. This should include the inspection reports for the site, information on sources of data for the site, photographs of the site, and a map of the site (a copy of the portion of the quad where the site is located). Any other information on the site should be stored here. The slides that are part of the DoR database will be sorted, made into photographs, and filed by site. These files will be organized in order of quad map and UTM. Each site file will be color coded as to status (active, inactive but not reclaimed, reclaimed).

In the case of some of the extensive dimension stone quarries, aerial photos must be acquired for the site files. Some of these sites have disturbed more than a square mile of surface area. Surface photos and descriptions do not provide sufficient information.

DoR staff have created a file for each of the sites that were visited during field trips to verify the database. These files contain the information listed above.

5. Field check each site in the database. As stated earlier, there is almost no recorded information available as to what is actually on the ground in terms of acreage affected, estimates of reclamation costs, photographs, or status of sites.

CONCLUSIONS

The current data available gives DoR a good starting point for a definitive database. Data as it exists in each base is adequate for the current user. No site that is referenced either by a symbol on the topo quad or in the printed data is missing from the database. Some sites where undefined activity exists (such as new farm ponds) are also in the base. Written information on all active operations is available.

The database in its present form has not been developed to a level of detail required for programmatic usage. Hard files only exist on sites visited by DoR to validate the database. Sites are not sorted by status. Locations are not recorded in a way that precludes duplication of entries.

In order for the Division of Reclamation to bring this database to the desired level of detail and accessibility, several things are required. There must be a considerable expansion of the amount of electronically recorded data. A definitive set of hard copy files must be created. Field checks of the existing data must be done to verify the database.

Costs for these activities are outlined in the Task I submission.

NOTE: The Indiana Mine Waste Data Base is too voluminous for inclusion in this report but is available from either the Interstate Mining Compact or from the Indiana DoR.

ANNEX A FIELD TRIP NARRATIVE

Members of the Division of Reclamation made three field trips to sites listed in the database. The purpose of the trips was to check the printed data against actual conditions on the ground. Checks were made of data from all four of the sources included in the base. In all, 47 sites on 41 topographic quads in 22 counties were visited.

To create a standard record format for our findings, a data form was developed by staff. Photographs were also taken at the sites. A filing system, using quad sheet name, UTM, and color codes for status of the sites was initiated. Computer data was updated and a data table for UTM coordinates was added to the computer database as a method of sorting the data and eliminating duplication. These changes set the foundation for future development of the Indiana Mine Waste Information System.

Another result of the field work was that four duplicate entries were eliminated from the database and one entry that included two completely separate sites was recorded as two.

ANNEX B FIELD FINDINGS

Andrews Quad, Huntington County, UTM 0625140 4511960, Site completely reclaimed by nature. In Psearch by location, no other data.

a) reclaimed by nature, should be reported to USGS for deletion from future printing

Bargersville Quad, Johnson County, UTM 0565930 4483400, abandoned gravel pit in the center of a rowcrop field. Psearch data correct.

Bedford West, Lawrence County, UTM 0540180 4301470, abandoned dimension limestone quarry. Psearch data correct.

Blocher Quad, Scott County, UTM 0617000 4283000, Scott County Sand and Gravel, an active crushed limestone site. Listed in the IGS data system. Existing data correct.

Bloomington Quad, Monroe County, UTM 0538600 4331200, large abandoned dimension limestone site. Psearch data correct.

Bluffton Quad, Wells County, UTM 0650900 4802800, An abandoned sand and gravel site. Location listed in PSearch without elaboration.

Brownstown Quad, Jackson County, UTM 0578300 4303550, County Materials, active sand and gravel site. Listed in IGS data system. Existing data correct.

Brownstown Quad, Jackson County, UTM 0581640 4304070, abandoned small limestone quarry within town of Brownstown, approx 4 acres. Listed in PSEARCH. Existing data correct.

Brownstown Quad, Jackson County, UTM 0582430 4304500, abandoned clay pit, kilns, and structures. Listed in PSEARCH. Existing data correct.

Brownstown Quad, Jackson County, UTM 0585500 4506500, abandoned site, hazardous due to cliffs close to roadside with no guardrail. Listed in PSEARCH. Existing data correct.

Butlersville Quad, Jennings County, UTM 0619400 4319450, Kentucky Stone Co/Berry Materials, a large, active, crushed limestone site. Listed in IGS data system and MAS data system. Existing data correct.

Butlersville Quad, Jennings County, UTM 0627350 4323780, abandoned limestone quarry, overgrown, trash, sheer cliffs. Listed in PSEARCH. Existing data correct.

Charleston Quad, Clark County, UTM 0610300 4249800, Sellersburg Stone Company, a large, active crushed limestone operation, approx 320 acres. Listed in IGS data system and MAS system. Existing data correct.

Charleston Quad, Clark County, UTM 0611000 4255000, Coplay Cement Co. Speed Plant, a limestone extraction and cement production site over one square mile. Listed in IGS data system. Existing data correct.

Clear Creek Quad, Monroe County, UTM 0541000 4326200, a huge, abandoned, dimension limestone site. Psearch data correct.

Cloverdale Quad, Putnam County, UTM 0518900 4375200, large quarry, abandoned and overgrown. In both IGS and Psearch data bases correct.

Corydon West Quad, Harrison County, UTM 0575890 4230195, an abandoned pit in the middle of a subdivision. Listed in PSEARCH. Existing data correct.

Corydon West Quad, Harrison County, UTM 0575750 4224430, Mathes Stone Company, an active crushed limestone site. Listed in the IGS data system and MAS data system. Existing data correct.

Forrest Hill Quad, Decatur County, UTM 0619297 4358695, an abandoned and overgrown site. The site has been reclaimed by nature. Listed in PSEARCH. Existing data correct.

Greencastle Quad, Putnam County, UTM 0518900 4387800, site totally reclaimed. The only evidence of the site is a flat area on a hillside. Shown as quarry on USGS map. Psearch data correct.

Hagerstown Quad, Wayne County, UTM 0658000 4420500, Hagerstown Sand and Gravel, active. IGS data correct.

Hayden Quad, Jennings County, UTM 0610425 4315900, Berry Materials, a limestone aggregate site. Listed in IGS data system and MAS data system. Existing data correct.

Hindustan Quad, Monroe County, UTM 0544300 4347700, Landfill shown as an unlabeled purple crosshatched area on the USGS topo. Psearch data is correct.

Huron Quad, Martin County, UTM 0524900 4281400, active gypsum mine and plant. MRDS data Correct.

Koleen Quad, Greene County, UTM 0511520 4309210, Abandoned coal mine shown as a quarry on USGS topo. Psearch data Correct.

Koleen Quad, Greene County, UTM 0511870 4309620, abandoned coal mine shown as quarry on USGS topo. Psearch data correct.

Laconia Quad, Harrison County, UTM 0580176 4219460, abandoned limestone extraction site close to road. Listed in PSEARCH. Existing data correct.

Lanesville Quad, Harrison County, UTM 0593090 4220530, US Silica, an active site processing white sand. Listed in PSEARCH as an abandoned site. existing data was incorrect.

Martinsville Quad, Morgan County, UTM 0548700 4368700, abandoned gravel pit, now a lake. Psearch data correct as to location, no information recorded from visit.

Mooresville Quad, Morgan County, UTM 0562500 4379400, large active site. IGS and Psearch data duplicate each other. Both correct, however IGS data more detailed.

Mauckport Quad,Harrison County, UTM 0571000 4208500, Lucas Corp, a very large, active sand and gravel site. Listed in IGS data, PSEARCH and the MAS system. Existing data correct.

Modoc Quad, Randolph County, UTM 0654950 4441870, Abandoned sand and gravel pit. In PSearch database, correct.

Mount Etna, Huntington County, UTM 0625060 4511560, abandoned site, part of the Salamonie River bed. In PSearch by location, correct square mile section.

North Vernon Quad, Jennings County, UTM 0618000 4320300, Lee's Ready Mix, a concrete plant and extraction site. Listed in PSEARCH as an abandoned site. Existing data was incorrect on this site.

New Castle East, Henry County, UTM 0624050 4425420, Active pit of very small operator. In Psearch, data correct.

New Castle West Quad, Henry County, UTM 0633600 4421600, Roberts Farm Supply, operation is part of farm. Listed in Psearch, correct.

Oolitic Quad, Lawrence County, UTM 0541000 4307000, active site over one square mile, dimension limestone. Psearch identifies this as two sites, one abandoned, one active. This is incorrect, as it is all one site.

Ossian Quad, Wells County, UTM 0648150 4528150, Not a mine of any sort. This is a pond constructed by the land owner. It is above the original topography of the area. Listed in PSearch database. inclusion in existing data incorrect. Database corrected.

Palmyra Quad, Floyd County, UTM 0585500 42485880, abandoned site reclaimed by nature. Listed in PSEARCH. Existing data correct.

Pennville Quad, Jay County, UTM 0658400 4484300, Active site. IGS data is Correct.

Petroleum Quad, Jay County, UTM 0656850 4407710, An abandoned sand and gravel site. Listed in PSearch, location is correct as to section. However, caption data describes site on west side of road. Site is actually on east side. Error.

Redkey Quad, Randolph County, UTM 0656000 4460700, active crushed limestone site. Correct in both IGS and Psearch.

Salem Quad, Washington County, UTM 0578530 4271700, an abandoned limestone quarry. Listed in PSEARCH. Existing data correct.

Salem Quad, Washington County, UTM 0578640 4269090, an abandoned limestone pit. Not listed in current data or shown on USGS quad maps. Discovered during field trips.

Shoals Quad, Martin County, UTM 0521400 4286300, active Gypsum site. MRDS data correct.

Spencer Quad, Owen County, UTM 0517000 4349400, abandoned dimension limestone quarry. In Psearch location correct, however caption entry "too far for photo" is incorrect. On our inspection we took photographs of the site while walking over it.

Uniondale Quad, Wells County, UTM 06533370 4514530, Active site, Erie Stone Company. Listed correctly in IGS data. One portion listed in Psearch, site as whole misslocated.

ANNEX C STATISTICAL DATA

The numerical data is as follows

1. There are 92 Counties in the Database. 22 or 23.9% were visited .

2. There are 705 Quad Mapsheets in the Database. 41 or 5.8% were visited.

3. There are 1940 Sites in the Database. 47 or 2.4% were visited.

4. Of the 1940 sites, 642 are indicated as active. 1298 abandoned sites.

5. 47 sites were visited: 25 were abandoned, 4 reclaimed by nature, 21 required reclamation, 2 sites were not related to mineral extraction, 20 were active.

6. Of the 25 sites which are indicated as abandoned, 16% are indicated as reclaimed by nature. 84% require some level of reclamation.

7. Of 1298 abandoned sites in the database
   1090 for reclamation
   208 reclaimed by nature

8. Psearch Sites: 34 were visited, with 7 or 20.6% containing incorrect information.

9. MRDS Sites: 2 were visited, with all data recorded for them being correct.

10. MAS Sites: 5 were visited, with all data recorded for them being correct.

11. IGS Sites: 14 were visited, with all data recorded for them being correct.

NON-COAL INVENTORY INACTIVE/ABANDONED MINES

STATE OF INDIANA

DATA SUMMARY -REVISED-

MINERAL TYPE	MINING METHOD	NUMBER OF ABANDONED SITES IDENTIFIED IN DATABASE	FEATURES	units		cost
Clay	Surface Mining	49				
			Disturbed Lands	acres	580	2,900,000.00
			Highwalls	feet	3,720	35,227.00
			Polluted Water	miles	0	0.00
			Mine Dumps	acres	37	744,000.00
			Mine Openings	number	0	0.00
			Hazardous Structures	number	6	18,000.00
			Subsidence Prone	acres	0	0.00
			Other			0.00
Dolomite	Surface Mining	5				
			Disturbed Lands	acres	264	1,320,000.00
			Highwalls	feet	1,410	13,352.00
			Polluted Water	miles	0	0.00
			Mine Dumps	acres	0	0.00
			Mine Openings	number	0	0.00
			Hazardous Structures	number	0	0.00
			Subsidence Prone	acres	0	0.00
			Other			0.00
Gravel	Surface Mining	10				
			Disturbed Lands	acres	330	1,650,000.00
			Highwalls	feet	4,230	40,057.00
			Polluted Water	miles	0	0.00
			Mine Dumps	acres	42	846,000.00
			Mine Openings	number	0	0.00
			Hazardous Structures	number	0	0.00
			Subsidence Prone	acres	0	0.00
			Other			0.00
Gypsum	Surface Mining	1				
			Disturbed Lands	acres	0	0.00
			Highwalls	feet	0	0.00
			Polluted Water	miles	0	0.00
			Mine Dumps	acres	0	0.00
			Mine Openings	number	0	0.00
			Hazardous Structures	number	0	0.00
			Subsidence Prone	acres	0	0.00
			Other			0.00

NON-COAL INVENTORY INACTIVE/ABANDONED MINES

STATE OF INDIANA

DATA SUMMARY -REVISED-

MINERAL TYPE	MINING METHOD	NUMBER OF ABANDONED SITES IDENTIFIED IN DATABASE	FEATURES	units		cost
Limestone (agg)	Surface Mining	70				
			Disturbed Lands	acres	3,080	15,400,000.00
			Highwalls	feet	15,510	146,875.00
			Polluted Water	miles	0	0.00
			Mine Dumps	acres	28	564,000.00
			Mine Openings	number	0	0.00
			Hazardous Structures	number	0	0.00
			Subsidence Prone	acres	0	0.00
			Other			0.00
Limestone (dimen)	Surface Mining	51				
			Disturbed Lands	acres	4,300	21,500,000.00
			Highwalls	feet	11,400	107,955.00
			Polluted Water	miles	0	0.00
			Mine Dumps	acres	11	228,000.00
			Mine Openings	number	0	0.00
			Hazardous Structures	number	0	0.00
			Subsidence Prone	acres	0	0.00
			Other			0.00
Marl	Surface Mining	2				
			Disturbed Lands	acres	40	200,000.00
			Highwalls	feet	0	0.00
			Polluted Water	miles	0	0.00
			Mine Dumps	acres	0	0.00
			Mine Openings	number	0	0.00
			Hazardous Structures	number	0	0.00
			Subsidence Prone	acres	0	0.00
			Other			0.00
Peat	Surface Mining	No Identified Abandoned sites				
			Disturbed Lands	acres	0	0.00
			Highwalls	feet	0	0.00
			Polluted Water	miles	0	0.00
			Mine Dumps	acres	0	0.00
			Mine Openings	number	0	0.00
			Hazardous Structures	number	0	0.00
			Subsidence Prone	acres	0	0.00
			Other			0.00

NON-COAL INVENTORY INACTIVE/ABANDONED MINES

STATE OF INDIANA

DATA SUMMARY -REVISED-

MINERAL TYPE	MINING METHOD	NUMBER OF ABANDONED SITES IDENTIFIED IN DATABASE	FEATURES	units		cost
Sand	Surface Mining	21				
			Disturbed Lands	acres	1,254	6,270,000.00
			Highwalls	feet	4,230	40,057.00
			Polluted Water	miles	0	0.00
			Mine Dumps	acres	0	0.00
			Mine Openings	number	0	0.00
			Hazardous Structures	number	0	0.00
			Subsidence Prone	acres	0	0.00
			Other			0.00
Sand and Gravel	Surface Mining	499				
			Disturbed Lands	acres	41,370	206,850,000.00
			Highwalls	feet	95,880	907,955.00
			Polluted Water	miles	0	0.00
			Mine Dumps	acres	353	7,050,000.00
			Mine Openings	number	0	0.00
			Hazardous Structures	number	17	51,000.00
			Subsidence Prone	acres	0	0.00
			Other			0.00
Sandstone	Surface Mining	8				
			Disturbed Lands	acres	528	2,640,000.00
			Highwalls	feet	4,230	40,057.00
			Polluted Water	miles	0	0.00
			Mine Dumps	acres	0	0.00
			Mine Openings	number	0	0.00
			Hazardous Structures	number	0	0.00
			Subsidence Prone	acres	0	0.00
			Other			0.00
Shale	Surface Mining	5				
			Disturbed Lands	acres	100	500,000.00
			Highwalls	feet	2,480	23,485.00
			Polluted Water	miles	0	0.00
			Mine Dumps	acres	37	744,000.00
			Mine Openings	number	0	0.00
			Hazardous Structures	number	1	3,000.00
			Subsidence Prone	acres	0	0.00
			Other			0.00

NON-COAL INVENTORY INACTIVE/ABANDONED MINES

STATE OF INDIANA

DATA SUMMARY -REVISED-

MINERAL TYPE	MINING METHOD	NUMBER OF ABANDONED SITES IDENTIFIED IN DATABASE	FEATURES	units		cost
Whetstone		2				
			Disturbed Lands	acres	0	0.00
			Highwalls	feet	0	0.00
			Polluted Water	miles	0	0.00
			Mine Dumps	acres	0	0.00
			Mine Openings	number	0	0.00
			Hazardous Structures	number	0	0.00
			Subsidence Prone	acres	0	0.00
			Other			0.00
UNKNOWN		519				
			Disturbed Lands	acres	34,254	171,270,000.00
			Highwalls	feet	80,370	761,080.00
			Polluted Water	miles	0	0.00
			Mine Dumps	acres	367	7,332,000.00
			Mine Openings	number	0	0.00
			Hazardous Structures	number	16	48,000.00
			Subsidence Prone	acres	0	0.00
			Other			0.00
Aluminum	Elements found in					
Calcium	the MAS database.		Disturbed Lands	acres	0	0.00
Magnesium	No verification as		Highwalls	feet	0	0.00
Perlite	to actual mining.		Polluted Water	miles	0	0.00
Tungsten			Mine Dumps	acres	0	0.00
			Mine Openings	number	0	0.00
			Hazardous Structures	number	0	0.00
			Subsidence Prone	acres	0	0.00
		21	Other			0.00
Lead	Elements found in					
Sulfer	Lake County on the		Disturbed Lands	acres	0	0.00
Fluorine	MAS database.		Highwalls	feet	0	0.00
	Not likely mined		Polluted Water	miles	0	0.00
	at this location.		Mine Dumps	acres	0	0.00
			Mine Openings	number	0	0.00
			Hazardous Structures	number	0	0.00
			Subsidence Prone	acres	0	0.00
		5	Other			0.00

NON-COAL INVENTORY INACTIVE/ABANDONED MINES

STATE OF INDIANA

DATA SUMMARY -REVISED-

MINERAL TYPE	MINING METHOD	NUMBER OF ABANDONED SITES IDENTIFIED IN DATABASE	FEATURES	units	cost
TOTAL		1268			
			Disturbed Lands	acres	430,500,000.00
			Highwalls	feet	2,116,100.00
			Polluted Water	miles	0.00
			Mine Dumps	acres	17,508,000.00
			Mine Openings	number	0.00
			Hazardous Structures	number	120,000.00
			Subsidence Prone	acres	0.00
			Other		0.00
	GRANT TOTAL				450,244,100.00

* Sites in the database are commonly identified only down to township, range, section. The database is not consistant and often indicates more than one site within a section. UNKNOWN sites have been identified on quad maps, however, no documented information is available and the sites have not been visited.

INACTIVE/ABANDONED MINE INVENTORY SUMMARY
STATE OF INDIANA

FOOTNOTES

1. Inactive/abandoned mines have been identified as properties where there is no continuing reclamation responsibilities by the owner or any individual to remediate the impact of past non-coal mining. Sites reported in the database and summary are not covered by any permit. reclamation bond or state and federal licenses.

2. The acres listed for each mineral include the disturbed or impacted land resulting from mining of a non-coal mineral. The acreage is an estimate based on actual field verification and projecting the average toward the database site listing. The State of Indiana does not have a comprehensive automated database of non-coal mineral sites.

3. There are four sources represented in the Mine Waste Data Summary. Most of the database is based on the information assembled from Indiana's sand and gravel program which ended in 1987. Other sources included the Indiana Geological Survey database, the Mineral Resource Data System from the U. S. Geological Survey, and the U. S. Dept. of the Interior, Mineral Availability System. Not all of the data was compatible to the established database. Querying specific information is not reliable. The database information is reported with a 60% confidence level.

4. The Data Summary is based on the Mine Waste database information, field verification, and the estimated cost for reclamation using the Department of Natural Resource's Abandoned Mine Lands (AML) program resources documentation.

5. Disturbed Lands has been identified as any land which has been affected by the mining of a mineral. Included in this definition are disturbances such as open pits, haul roads, exploration boreholes, and waste water treatment ponds. Reclamation of these sites would involve grading and revegetation efforts

6. Highwalls are defined as the face of exposed overburden and mineral in an open cut or strip mining operation. Reclamation of these sites would involve the possible excavation and embankment, fencing or guardrail installation, regrading, or blast and terrace procedures.

7. Polluted water is defined as the number of stream miles which do not meet the fishable goals of the federal Clean Water Act. Database information does not include this type of information at this time. During field verification of the database, no harmful effects were noted to streams. The abandoned sites have stabilized and the minerals extracted did not adversely degrade or pollute the surface hydrology over a long period of time.

8. Mine Dumps are identified to include waste rock dumps, overburden stock piles, hazardous waste, and trash or refuse dumping. Reclamation of these sites would include grading, burying, or relocating the waste. Disposal of hazardous waste would involve identification and special handling as required by federal standards. The reclamation of dimension limestone sites is not included in the reclamation figures. These sites involve the extraction of large limestone blocks which were not marketable. About 50% of the limestone extracted is not usable and is left on the surface. The cost of reclamation to return these blocks of limestone to the pits would be extreme.

9. Mine openings are defined as vertical or drift openings associated with underground mining. No information was identified concerning this type of mining. Reclamation of these sites would consist of permanent closure which include backfilling, blasting, and engineered structures (concrete shaft caps).

10. Hazardous structures are identified as buildings, foundations, headframes, etc. which could pose a hazard to people being in, on, or around them. Remediation of these hazards involves demolition or removal of the structures.

11. Subsidence prone features were not identified in the database. Field investigations were on surface mined sites. Subsidence prone areas are those sites where shallow mines existed that may be subject to ground surface collapse in the future. Reclamation is not considered for these features until collapse has been identified. At that time reclamation is consistent with treatment of hazardous mine openings.

12. The "other" feature category reports acreage totals of impacted land exhibiting environmental degradation from non-coal mining without displaying surface disturbance. Included are acres of contaminated stream banks and soils.

13. Mineral type indicating "unknown" are site locations identified in the database but for which the extracted mineral is not known. As indicated before, the database is not comprehensive. Under the sand and gravel program, when the database was initially developed, sites were identified from a variety of sources. The most predominant source was the U.S.G.S. quad maps. Site locations were identified on quad maps to be field checked for accuracy and verification at a later time. The program was discontinued before these sites could be investigated.

14. The following explanation is the rational and basis for the cost estimates presented in the report:

Utilizing the Mine Waste Database, all inactive/abandoned sites were identified. This data was ranked by mineral type. Comments were examined and associated with the designated feature. Field investigations were conducted to achieve a random sampling of the sites. An Abandoned Non-coal Mine Waste Data Sheet (see attachment) was developed to assist and identify site features. These data sheets were tallied by averages and means. Results were compiled for relational adjustment to each known mineral by percentage. "Unknown" sites were identified and estimated as a percentage relating to the "known" mineral type sites.

There were a few sites in the Mine Waste Database where the mineral element was entered from the MAS database. Due to the nature of the mineral and the location, these sites were not utilized as verifiable data. The minerals specified were aluminum, calcium, magnesium, perlite, tungsten, lead, sulfur, and fluorine.

DISTURBED LANDS - Reclamation of disturbed land includes open pits, haul roads, exploration boreholes, and waste water treatment ponds. Reclamation of these sites would involve grading and revegetation efforts. In Indiana, reclamation would cost $3,000/acre, 25% of which would include administrative costs. Reclamation costs were based on Indiana's AML program cost figures.

HIGHWALLS - Reclamation costs for the reduction of highwalls within the non-coal sites were based on Indiana's AML program cost figures. The resulting cost indicated $50,000/mile of highwall. Administrative costs are included at 25% of the cost.

POLLUTED WATER - Stream contamination associated with the non-coal abandoned sites were determined to be insignificant. No cost estimates were associated with this feature.

MINE DUMPS - Reclamation of mine dumps are diverse and site specific. Related costs from the Indiana AML program were identified and applied to this category. A $20,000/acre cost figure was developed, which includes a 25% estimated cost of administrative activities.

MINE OPENINGS - Mine openings for non-coal sites were estimated at $800/opening. These figures were generated from the Indiana AML program. No information was confirmed within the database as to the existence of mine openings.

HAZARDOUS STRUCTURES - Actual cost of structure demolition on non-coal abandoned sites was projected at $3,000/structure. This estimate was generated from the Indiana AML program.

SUBSIDENCE PRONE - No reclamation costs were estimated for these features as their remediation would be covered under one of the other categories after surface collapse has occurred.

OTHER - The acreage totals of impacted land exhibiting environmental degradation from non-coal mining without displaying surface disturbance were considered to be minor. No cost estimates were associated with this feature.

ABANDONED NON-COAL MINE WASTE
DATA SHEET

Date ____________

COUNTY ____________________ QUAD ____________________

Township ______ Range ______ Section ____________________

UTM ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

OPERATION

Mine Name: ______________________________ if known
Address: ______________________________
____

Type of Operation:

Sand	☐	Sand & Gravel	☐
Limestone (agg)	☐	Limestone (dimen)	☐
Peat/Marl	☐	Gypsum	☐
Sandstone	☐	Clay	☐
Shale	☐	Other: ____________	☐

SITE CONDITIONS

AFFECTED AREA:

Approximate Acres ______
Impoundments: ______ size ______
Highwalls ______ length ______
Waste Piles ______ comments ______________________
____
____

Roads ______ Length ______
Buildings ______
Prevailing Drainage ______________________
Nearest Stream ______________________
distance ______________________
Nearest Residence ______________________
distance ______________________

Reclaimed by Nature Yes ____ No ____
If no, approximate acres to be reclaimed ____________

COMMENTS

VEGETATION

IOWA

Iowa Department of Agriculture and Land Stewardship

DALE M. COCHRAN
SECRETARY OF AGRICULTURE

SHIRLEY DANSKIN-WHITE
DEPUTY SECRETARY OF AGRICULTURE

HENRY A. WALLACE BUILDING
DES MOINES, IOWA 50319

June 14, 1991

Greg Conrad, Executive Director
Interstate Mining Compact
459B Carlisle Drive
Herndon, Virginia 22070

RE: Mine Wastes Study/Inactive and Abandoned Mines - Task II

Dear Mr. Conrad:

As previously discussed with you by phone, Iowa was unable to participate as a grant recipient under the auspices of your grant from the U.S. Environmental Protection Agency (EPA), but does appreciate this opportunity to provide input to the process and inventory which you have initiated.

With this cover letter, we are providing supporting information related to the Task II inventory tasks for Inactive and Abandoned Mine (IAM) sites in Iowa.

Statutory authority for licensing, bonding, and reclamation of non-fuel mineral operations in Iowa is provided in Iowa Code Chapter 83A which is specifically delegated to the Division of Soil Conservation of the Iowa Department of Agriculture and Land Stewardship. The Division is also assigned responsibility for coal programs which are authorized in a separate statute, Iowa Code Chapter 83.

I am the primary contact person for both statutes as Chief of the Division's Mines and Minerals Bureau. My immediate supervisor is James B. Gulliford who is the Administrator of the Division of Soil Conservation.

Mr. Gulliford in turn serves at the pleasure of Iowa Secretary of Agriculture Dale M. Cochran who is an elected state official and is the department head of the Iowa Department of Agriculture and Land Stewardship.

Mining operations for non-fuel minerals in Iowa includes some 1100 to 1200 active sites. Materials produced include limestone, sand and gravel, clay, and gypsum. The bulk of the sites are either limestone quarries or sand and gravel pits. Most operations are surface mines or open quarries. Active sites once developed, remain serviceable and productive for a number of years.

Iowa's current reclamation statute, Iowa Code Chapter 83A, was first enacted in 1968. It has since been amended in 1973 and 1985. The Division also has administrative rules for administration of its policies pursuant to 83A (Iowa Administrative Code 27-60).

Inactive and abandoned sites are not a significant problem in the State. The 1968 law encompassed most sites that were operating and has caused some reclamation to be affected on most sites prior to their release.

While the Iowa law allows the operator to leave impoundments, pit floors, haul roads, and highwalls, provided that overburden piles are graded and vegetated, and other disturbed areas and stockpile areas are also reclaimed and vegetated, IAM sites--including those released by the Division since 1968--do not constitute significant environmental problems either locally or on a state-wide basis. Neither is the need for reclamation of those sites a significant issue either locally or state-wide.

Many of the IAM sites have become wildlife habitat or recreational areas. The Division is not aware of any IAM sites in the State of Iowa that could be classified as generators of mine waste.

Active operations that discharge water must permit with and meet the requirements of the Iowa Department of Natural Resources pursuant to the National Pollution Discharge Elimination System (NPDES).

A minimum bond of $2000 per site is presently being maintained on all 1150 actively registered non-fuel sites, with bond established at a rate of approximately $500 per acre for non-minimum operations.

Iowa does not have accurate data on IAM acreage, either inactive or abandoned. We would estimate remediation costs for the purpose of eliminating known non-fuel mine wastes to essentially be negligible.

Please call or write if we can provide additional clarification.

Thanks again for the opportunity to participate.

Sincerely,

Kenneth R. Tow, Chief
Mines and Minerals Bureau
Division of Soil Conservation
515-281-6147

KRT:tk
C:\RED\614GC.DOC

LOUISIANA

IMCC / Interstate Coalition on Mine Waste

State of Louisiana

Narrative Summary - Task II

June, 1991

Louisiana Department of Natural Resources
Office of Conservation
Injection and Mining Division

Table of Contents

Task II
Narrative Summary

1.0 INTRODUCTION

The background regarding Louisiana's involvement in noncoal mine evaluations began on August 2, 1982, when a cooperative agreement financed by 100% funding between state and Federal authorities was approved for the purpose of assembling information required for the preparation of Louisiana's Abandoned Mine Land (AML) Reclamation Plan and initiation of Louisiana's AML Reclamation Plan. The initial charge of the program was to inventory and reclaim abandoned coal sites; however, the forty-nine coal sites identified in Louisiana were found to pose no significant threat as a result of natural reclamation processes.

Upon completion of coal site investigations, program activities were shifted to inventory and evaluation of noncoal abandoned mine lands across the state. All inventory work was accomplished by either Louisiana Office of Conservation (Office) personnel or by a contractor, Southern Services. Inventory efforts were completed in 1990, as well as initial reclamation need assessments for over 90% of the inactive and abandoned sites inventoried. Inactive and abandoned mine lands are those upon which there are no current mining operations or activities.

2.0 MINING HISTORY

The mining industry (noncoal) in Louisiana has existed since the first settlements during the sixteenth century, as material was needed to serve as fill for low areas. More recent noncoal mining activities are in evidence throughout the state. Only a very limited number have been the subject of any reclamation effort. Where reclamation activities have been attempted, they fall well short of the standards set forth by the State's surface coal mining law. Tracts ranging from a few acres to over 4,000 acres have been identified. Noncoal mining activities include the recovery of iron ore, sand, gravel, bentonite clay, gypsum, sandstone and various other mineral resources.

3.0 MINERALS MINED

In previous years, iron ore was mined for smelting purposes, but is now mined exclusively as a road base material. Iron ore removal has most often been accomplished by hilltop removal operations, in which the reserves are excavated down to the underlying clayey materials. Operators of these mine areas seldom, if ever, carried out reclamation activities following removal of the ore.

Sand and gravel operations cover wider expanses of land, are deeper (resulting in more drastic highwalls), and are more closely related to surface and groundwater sources than other types of mining which have occurred in the state. These factors cause sand and gravel operations to be among the most detrimental noncoal mining activities in the state. Large expanses of land have been rendered virtually useless as a result of sand and gravel mining activities.

A minimal amount of bentonite clay mining has occurred, almost exclusively in one parish. Gypsum, locally known as "Winnrock" is mined in Winn Parish for production of a relatively high quality road base material. Sandstone mining occurs in a relatively narrow band across the middle of the state where the Catahoula Sandstone outcrops. Much of this resource remains untapped due to its occurrence on Federally owned lands. Studies indicate that land disturbances remnant of these lesser mining activities involve an extremely limited number of acres and are therefore not considered as a major portion of all mining activities.

4.0 HEALTH AND SAFETY IMPACTS

Noncoal mining has produced significant health and safety hazards in Louisiana. Health hazards may result due to the fact that many abandoned mine sites have been utilized for waste disposal by both illegal dumpers and ill-advised municipal waste disposers. This can cause a great potential for direct connection to underground sources of drinking water. Improper disposal of waste material into abandoned mine lands offers harborage for insects and vermin. Also, shallow stagnant strip pit lakes provide excellent breeding sites for mosquitoes as well as other pests and vermin.

Physical hazards include highwalls, flooded excavations, hazardous structures. Abandoned highwalls are a common problem, with vertical or near vertical embankments being left unprotected and ungraded. Dangers caused by their presence includes the risk of slope failure, as well as the danger to persons who may unintentionally walk or drive over these man-made cliffs. Their presence near populated places and well travelled roads is common and poses a severe threat. Those in more isolated places pose an additional threat to the many outdoorsmen in Louisiana who hunt, fish hike and participate in other outdoor sports and recreational activities in these areas. Excessively deep and often unstable water impoundments have been created as a result of many of the abandoned mining operations in the state. The possibility of drowning in one of these impoundments is serious. Abandoned mine facilities pose a threat of injury since, in many cases, equipment and structures have not been secured so as to prevent exploration by unwary children and adults alike.

5.0 ENVIRONMENTAL IMPACTS

Abandoned mines in Louisiana have impacted tens of thousands of acres. The potential for and reality of erosion and resultant downstream sedimentation is extremely high. The total destruction of vegetative materials during mining activities, along with he almost complete absence of revegetation efforts, has resulted in drastically increased erosion and sediment production rates. The lack of reclamation and the resultant erosion has resulted in a significant acreage of wasteland. While this acreage makes up a small percentage of the State as a whole, the presence of this wasteland is an important problem. In many cases, these lands have been totally removed from any productive use.

Many of the abandoned mine lands in Louisiana exist in areas which, prior to mining operations, offered high suitable habitat for many forms of wildlife. Degradation of these lands by mining activities without subsequent reclamation has resulted in a possible net loss of available habitat.

6.0 LAWS AND REGULATIONS

Louisiana currently has no laws or regulations governing the reclamation of non-coal mining activities. The Office introduced legislation during the 1991 regular session of the Louisiana Legislature which would authorize the regulation of non-coal surface mining in Louisiana. After making it out of the House Natural Resources Committee with a positive recommendation, the proposed "Louisiana Non-Coal Surface Mining Act" was defeated in June of 1991 by the full House of Representatives. It is uncertain at this time as to any future action regarding this legislation. At the current time, active mine operators must comply with current EPA and Louisiana Dept. of Environmental Quality (DEQ) regulations regarding any discharges from the minesites. In addition, they fall under the Mine Safety and Health Administration (MSHA).

7.0 INVENTORY STATISTICS

	SITES	ACRES	% OF SITES
ACTIVE MINING OPERATIONS	299	50,525	24%
INACTIVE/ABANDONED TOTAL	947	81,197	76%

INACTIVE/ABANDONED SITES (BY NEED)

	SITES	ACRES	% OF IAM
w/ Reclamation needed	301	35,347	44%
w/ Minimal to no reclamation need	559	28,480	35%
Reclamation needs to be assessed	87	17,370	21%

TOTAL INVENTORIED SITES 1,246
TOTAL DISTURBED ACREAGE 131,722

8.0 RECLAMATION EFFORTS

Reclamation of noncoal mining sites is not required by any state or Federal Law or Regulations. As a result, the majotity of the reclamation that has taken place is that which results from natural processes. Occasionally landowners will include reclamation requirements in lease agreements with mining companies. To date, no efforts have been undertaken by the Office to reclaim any of the abandoned sites.

9.0 PROGRAM IMPACTS

9.1 Staffing Costs

It is anticipated that a two (2) to three (3) year compliance period will be necessary for implementation of the proposed regulatory program, with an estimated 200 to 300 permits to be processed during the initial permitting period.

Each application will require an average of 120 man-hours to process, requiring nine (9) employees to handle the total yearly load. It is anticipated that the annual operating budget for handling these permits will be approximately $500,000. Justification for the number of hours required to process each application (120) is as follows:

Technical review - 80 man hours

applicant meetings, permit document review and comment, review of supplementary submittals, and completeness determination.

Administrative review and approval - 40 man hours

public hearings, bonding and insurance approval, permit issuance/denial.

The suggested staff would be as follows:

six technical staff members
two clerical assistants
one program supervisor

A basic budgetary breakdown would be as follows:

$ 50,000 per employee year (salary, fringe benefits & overhead)
X 9 employees

$450,000 annual operating expenses

9.2 Remediation Costs

It has been estimated that the 301 sites that comprise the reclamation needed category will require an average of $2,500 per acre for reclamation to be accomplished. The 559 sites comprising the minimal to no reclamation needed category would require an average of

$1,500 per acre. This comes out to approximately $ 88,367,500 and $ 26,083,480, respectively, for the two categories.

The total cost for reclamation of the sites identified in the inventory is approximately $114,450,980. This figure does not take into account the acreage that is becomes abandoned each year as a result of either cessation of operations by an operator or mined out land. It has been estimated that land disturbance will continue at a rete of about 1,000 acres per year.

Costs for remediation of offsite damages, such as impacted streams, has not yet been ascertained. Site inspection notes and impacted drainage system data have been assembled for use in development of an impact assessment document proposed for completion in the future.

10.0 RECLAMATION SCORING CRITERIA

FUTURE MINING POTENTIAL

0	-	Active Mining Operations
1 to 3	-	Planned or Permitted Remining
4 to 6	-	Probable remining within next 10 years
7 to 9	-	Minimal probability of remining within next 10 years
10	-	No possibility of remining

PUBLIC HEALTH AND SAFETY RISK(S)

0	-	No impact
1 to 3	-	Identifiable potential with no current impact
4 to 6	-	Existing minimal impact with identifiable potential for extreme impact
7 to 10	-	Existing or imminent severe adverse impacts

DEGREE OF ENVIRONMENTAL DEGRADATION

0	-	Area not affected
1 to 3	-	Area affected is actual area to be reclaimed
4 to 6	-	Area affected is actual project area and there will be some impact to surrounding lands or water
7 to 10	-	Area affected is actual project area with a continuing large problem affecting surrounding lands and waters

WATER QUALITY IMPACTS

0	-	No impact to water resources
1 to 3	-	Water quality slightly impacted for drinking, especially with minor amounts of toxic materials or suspended solids
4 to 6	-	Water quality for drinking purposes does not meet potable standards, and pollutant, toxicants and suspended solids affect agricultural, recreational and fishing quality
7 to 10	-	Creates a severe threat for use for any purpose; toxicants, pollutants and solids could cause a fish kill

The above scoring data was rated to establish a single site score from "0" to "100", with "0" equating to "No reclamation Need". In assessing the scores, it should be noted that only an active site with no impact will receive a score of "0", while a site with no potential for future mining and no reclamation would receive a score of "20". The basis for scoring is as follows:

Future Mining Potential	*	2.0
Public Health and Safety Risks	*	3.0
Degree of Environmental Degradation	*	2.5
Water Quality Impacts	*	2.5

11.0 SCORING RESULTS

As previously stated, the scoring criteria have been used to quantify reclamation need scores for 666 of the 1,246 inventoried sites, with data extrapolation being utilized to bracket scores for an additional 384 sites, bringing the scored total to 1,050. Reclamation need scores have been grouped in the following score ranges to provide a simpler means of data interpretation:

Minimal to No Impact/Reclamation Needs	0-25
Moderately Low Impact/Reclamation Need	25-40
Moderate Impact/Reclamation Need	40-60
Moderately High Impact/Reclamation Need	60-70
High Impact/Reclamation Need	70-80
Very High Impact/Reclamation Need	80-90
Extremely High Impact/Reclamation Need	90-100

Reclamation need scoring results are depicted by the above groupings in the Data Sheets in Attachment 1.

12.0 CLOSING REMARKS

The current status of the Abandoned Mine Land (noncoal) Inventory for Louisiana may be summarized as follows:

1,246 Noncoal sites have been inventoried across the state

299 sited were found to be currently active

Impact/reclamation need evaluations have been conducted on 190 of these sites, with evaluation results indicating the following:

High to Moderately High Impact/Reclamation Need	29 out of 190
Moderate Impact Reclamation Need	78 out of 190
Moderately Low Impact/Reclamation Need	53 out of 190
Minimal to No Impact/Reclamation Need	30 out of 190

Supplemental investigations are proposed to determine the degree of impact/reclamation need for the remaining 109 active sites for which scoring data has not been developed.

Combined quantitative and qualitative site evaluations have been utilized to characterize the level of impact/reclamation need for the 860 inactive/abandoned noncoal siteS across the state as follows:

Very High to Extremely High Impact/Reclamation Need	12 out of 860
High to Moderately High Impact/Reclamation Need	39 out of 860
Moderate Impact Reclamation Need	132 out of 860
Moderately Low Impact/Reclamation Need	118 out of 860
Minimal to No Impact/Reclamation Need	559 out of 860

Supplemental investigations are proposed to determine the degree of impact/reclamation need for 11 known inactive sites and 76 sites not previously inspected.

Impact/reclamation need scoring data have been developed for 1,050 of the 1,246 sites inventoried to date, representing an 84.3% completion level. Data developed from these investigations have been used to rank the inventoried sites in regard to severity of the safety and environmental risk posed.

13.0 BIBLIOGRAPHY

Louisiana Abandoned Mine Reclamation Plan, Louisiana Department of Natural Resources, Office of Conservation, January, 1986

Louisiana Non-Coal AML Inventory Update 1989/90 Final Project Report, Volume 1, Louisiana Department of Natural Resources, Baton Rouge, LA, November, 1990 (Prepared by Southern Services, Shreveport, LA)

Attachment 1

DATA SHEETS

IMPACT/RECLAMATION NEED SCORING
INACTIVE MINING OPERATIONS

PARISH	SITE NO.	STATUS	MINERAL	FUTURE POTENTIAL	RISK ANALYSIS	ENV. IMPACT	WATER IMPACT	AFFECTED ACREAGE	AFFECTED STREAM(S)	SCORE
INACTIVE SITES WITH EXTREMELY HIGH IMPACT/RECLAMATION NEED:										
EAST BATON ROUGE	EBR060109	Inactive	Clay	10	10	10	10	400	Mississippi River	100.0
EVANGELINE	EV020102	Inactive	Sand, clay and gravel	10	10	10	10	600	Bayou Cocodrie	100.0
EVANGELINE	EV020101	Inactive	Sand, clay, gravel	9	10	10	10	600	Bayou Cocodrie	98.0
RAPIDES	RA01N0207	Inactive	Sand and gravel	7	10	10	10	100	Cocodrie Lake	94.0
ST. TAMMANY	ST051201	Inactive	Sand and gravel	7	10	10	10	320	Bogue Chitto River	94.0
WASHINGTON	WS021305	Inactive	Sand, clay and gravel	10	7	10	10	50	Pearl River	91.0
									COUNT:	6
INACTIVE SITES WITH VERY HIGH IMPACT/RECLAMATION NEED:										
EVANGELINE	EV010101	Inactive	Sand, clay and gravel	9	7	10	10	160	Bayou Cocodrie	89.0
GRANT	GR070110	Pre-77 w/Need	Unspecified	10	9	10	6	800	Little River	87.0
TANGIPAHOA	TA050702	Inactive	Sand and gravel	10	10	7	7	100	Ponchatoula Creek	85.0
RAPIDES	RA010208	Inactive	Clay and gravel	9	10	7	7	10	Spring Creek	83.0
OUACHITA	OA170203	Pre-77 w/Need	Unspecified	10	9	8	6	420	Ouachita River	82.0
RAPIDES	RA040201	Inactive	Sand, gravel and clay	1	10	10	10	40	Saline Lake	82.0
									COUNT:	6
INACTIVE SITES WITH HIGH IMPACT/RECLAMATION NEED:										
OUACHITA	OA160301	Pre-77 w/Need	Unspecified	10	8	8	6	Unspecified	Ouachita River	79.0
EVANGELINE	EV020103	Inactive	Sand, clay, silt	9	6	7	10	40	Bayou Cocodrie	78.5
GRANT	GR050103	Pre-77 w/Need	Unspecified	10	7	10	5	Unspecified	Bayou Rigolette	78.5
EVANGELINE	EV060101	Inactive	Sand, clay, gravel	10	7	7	7	10	Bayou Des Cannes	76.0
WASHINGTON	WS031402	Inactive	Sand and gravel	10	7	7	7	40	Pearl River	76.0
RAPIDES	RA010110	Inactive	Clay and gravel	9	7	7	7	200	Indian Creek Reservoir	74.0
WEBSTER	WB190902	Recent Mining	sand, gravel	9	7	7	7	25	Lake Bistineau	74.0
EAST BATON ROUGE	EBR0601W08	INACTIVE	Clay	10	6	7	7	40	Mississippi River	73.0
WASHINGTON	WS011302	Inactive	Sand, gravel and clay	10	6	7	7	2	Pearl River	73.0
WASHINGTON	WS041202	Inactive	Sand and gravel	10	6	7	7	100	Bogue Chitto River	73.0
OUACHITA	OA190503	Pre-77 w/Need	Unspecified	9	8	6	6	Unspecified	Bayou Lafourche	72.0

IMPACT/RECLAMATION NEED SCORING
INACTIVE MINING OPERATIONS

PARISH	SITE NO.	STATUS	MINERAL	FUTURE POTENTIAL	RISK ANALYSIS	ENV. IMPACT	WATER IMPACT	AFFECTED ACREAGE	AFFECTED STREAM(S)	SCORE
INACTIVE SITES WITH HIGH IMPACT/RECLAMATION NEED (Continued):										
BEAUREGARD	BE131201	Inactive	Sand and gravel	9	7	7	6	100	Sabine River	71.5
ST. TAMMANY	ST061401	Inactive	Sand, gravel and clay	10	7	6	6	10	West Pearl River	71.0
TANGIPAHOA	TA060703	Inactive	Sand	10	6	6	7	160	Natalbany River	70.5
SABINE	SB051202	Pre-77 w/Need	Unspecified	10	5	6	8	Unspecified	Toledo Bend Reservoir	70.0
ST. TAMMANY	ST051102	Inactive	Clay	7	7	7	7	10	Bogue Falaya	70.0
									COUNT:	16
INACTIVE SITES WITH MODERATELY HIGH IMPACT/RECLAMATION NEED:										
BEAUREGARD	BE031203	Inactive	Sand and gravel	9	7	6	6	100	Sabine River	69.0
WASHINGTON	WS011303	Inactive	Sand, clay and gravel	9	6	7	6	100	Pearl River	68.5
GRANT	GR060302	Pre-77 w/Need	Unspecified	7	8	7	5	Unspecified	Bayou Rigolette	68.0
RAPIDES	RA010108	Inactive	Clay and gravel	6	7	7	7	20	Indian Creek Reservoir	68.0
RED RIVER	RR130801	Recent Mining	clay, gravel	10	6	6	6	50	Black Lake Bayou	68.0
ST. TAMMANY	ST071402	Inactive	Sand, gravel and clay	10	6	6	6	40	West Pearl River	68.0
TANGIPAHOA	TA060810	Inactive	Sand and gravel	10	6	6	6	20	Tangipahoa River	68.0
WASHINGTON	WS041208	Inactive	Sand and gravel	10	5	7	6	320	Bogue Chitto River	67.5
GRANT	GR060201	Pre-77 w/Need	Unspecified	5	7	7	7	Unspecified	Bayou Rigolette	66.0
LINCOLN	LN180302	Recent Mining	clay, gravel	9	6	6	6	5	Dugdemona River	66.0
LASALLE	LS080302	Pre-77 w/Need	Unspecified	7	9	5	5	Unspecified	Catahoula Lake	66.0
RAPIDES	RA010109	Inactive	Clay and gravel	9	6	6	6	300	Indian Creek Reservoir	66.0
TANGIPAHOA	TA040703	Inactive	Sand and gravel	9	4	7	7	800	Tangipahoa River	65.0
UNION	UN200304	Pre-77 w/Need	Unspecified	10	7	6	3	Unspecified	Ouachita River	63.5
WASHINGTON	WS031401	Inactive	Sand and gravel	10	7	6	3	50	Pearl River	63.5
WASHINGTON	WS031001	Inactive	Sand and gravel	9	5	6	6	1,000	Bogue Chitto River	63.0
WEST FELICIANA	WF020309	Inactive	Sand and gravel	6	6	7	6	200	Bayou Sara	62.5
EAST FELICIANA	EF040101	Inactive	Clay and gravel	7	6	6	6	60	Thompson Creek	62.0
TANGIPAHOA	TA020701*	Inactive	Sand and gravel	10	4	6	6	6	Tangipahoa River	62.0
ST. TAMMANY	ST051104	Inactive	Unspecified	7	4	7	7	200	Bogue Falaya	61.0
CATAHOULA	CH090514	Recent Mining	clay, gravel	6	6	6	6	300	Ouachita River	60.0
TANGIPAHOA	TA020703	Inactive	Sand and gravel	7	7	10	0	1,000	Tangipahoa River	60.0
WASHINGTON	WS031105*	Inactive	Sand and gravel	6	6	6	6	250	Bogue Chitto River	60.0
									COUNT:	23

IMPACT/RECLAMATION NEED SCORING
INACTIVE MINING OPERATIONS

PARISH	SITE NO.	STATUS	MINERAL	FUTURE POTENTIAL	RISK ANALYSIS	ENV. IMPACT	WATER IMPACT	AFFECTED ACREAGE	AFFECTED STREAM(S)	SCORE
INACTIVE SITES WITH MODERATE IMPACT/RECLAMATION NEED:										
WEBSTER	WB180918	Pre-77 w/Need	Unspecified	7	6	6	5	Unspecified	Lake Bistineau	59.5
TANGIPAHOA	TA010805	Inactive	Sand, gravel and clay	4	7	6	6	20	Tangipahoa River	59.0
VERMILION	VM120501	Inactive	Sulfur	10	3	6	6	20	Lake Peigneur	59.0
WASHINGTON	WS031002	Inactive	Sand and gravel	7	5	6	6	250	Bogue Chitto River	59.0
BEAUREGARD	BE031204	Inactive	Sand, gravel & clay	10	6	4	4	14	Sabine River	58.0
WEBSTER	WB191003	Pre-77 w/Need	Unspecified	5	6	7	5	Unspecified	Lake Bistineau	58.0
WEBSTER	WB220902	Recent Mining	clay, ironstone	10	6	4	4	5	Bayou Dorcheat	58.0
WEBSTER	WB231101	Recent Mining	clay, sand, gravel	10	6	4	4	100	Bayou Bodcau	58.0
WASHINGTON	WS021304	Inactive	Sand and gravel	10	6	5	3	20	Pearl River	58.0
EAST FELICIANA	EF030202	Inactive	Sand and gravel	7	4	6	6	700	Thompson Creek	56.0
LINCOLN	LN190201	Pre-77 w/Need	Unspecified	10	7	5	1	Unspecified	Bayou D'Arbonne Lake	56.0
RED REIVER	RR130810	Recent Mining	clay, gravel	9	6	4	4	3	Black Lake Bayou	56.0
TANGIPAHOA	TA040707	Inactive	Sand and gravel	7	4	6	6	300	Tangipahoa River	56.0
UNION	UN200303	Pre-77 w/Need	Unspecified	9	6	6	2	Unspecified	Ouachita River	56.0
VERNON	VN021106	Inactive	Sand and gravel	7	4	6	6	20	Bayou Anacoco	56.0
RED RIVER	RR130803	Pre-77 w/Need	Unspecified	7	8	5	2	Unspecified	Black Lake Bayou	55.5
TANGIPAHOA	TA030703	Inactive	Sand and gravel	8	3	6	6	480	Tangipahoa River	55.0
CATAHOULA	CH100716	Recent Mining	clay, sand, gravel	6	4	6	6	20	Ouachita River	54.0
PLAQUEMINES	PL152402	Inactive	Sand and clay	6	4	6	6	10	Mississippi River	54.0
WASHINGTON	WS021003	Inactive	Sand and gravel	6	4	6	6	160	Bogue Chitto River	54.0
BEAUREGARD	BE030701	Inactive	Clay and gravel	10	6	3	3	20	Bundick Lake	53.0
BIENVILLE	BN150902	Pre-77 w/Need	Unspecified	9	5	6	2	Unspecified	Black Lake Bayou	53.0
TANGIPAHOA	TA040708	Inactive	Sand and gravel	9	5	4	4	160	Tangipahoa River	53.0
VERNON	VN010704	Inactive	Sand and gravel	7	3	6	6	80	Little Six Mile Creek	53.0
WEST FELICIANA	WF010203	Inactive	Sand, gravel and clay	10	6	3	3	5	Bayou Sara	53.0
WASHINGTON	WS011405	Inactive	Sand and gravel	7	3	6	6	60	Pearl River	53.0
WASHINGTON	WS041106	Inactive	Unspecified	7	3	6	6	100	Bogue Chitto River	53.0
RAPIDES	RA050206	Inactive	Sand, gravel and clay	9	4	5	4	100	Saline Lake	52.5
BEAUREGARD	BE021101	Inactive	Sand and gravel	10	4	4	4	50	Bayou Anacoco	52.0
EAST BATON ROUGE	EBR050101	Inactive	Clay and Sand	10	4	4	4	2	Comite River	52.0
RAPIDES	RA020204	Inactive	Sand, gravel and clay	10	4	4	4	300	Bayou Boeuf	52.0
ST. LANDRY	SL060401	Inactive	Sand and gravel	10	4	4	4	40	Bayou Teche	52.0
TAMMANY	ST051301	Inactive	Sand and gravel	10	4	4	4	160	Little Brushy Branch	52.0
TANGIPAHOA	TA030705*	Inactive	Sand and gravel	10	4	4	4	400	Tangipahoa River	52.0
TANGIPAHOA	TA030707	Inactive	Sand and gravel	10	4	4	4	60	Tangipahoa River	52.0

IMPACT/RECLAMATION NEED SCORING

INACTIVE MINING OPERATIONS

PARISH	SITE NO.	STATUS	MINERAL	FUTURE POTENTIAL	RISK ANALYSIS	ENV. IMPACT	WATER IMPACT	AFFECTED ACREAGE	AFFECTED STREAM(S)	SCORE
INACTIVE SITES WITH MODERATE IMPACT/RECLAMATION NEED (Continued):										
TANGIPAHOA	TA040701	Inactive	Sand and gravel	10	4	4	4	250	Tangipahoa River	52.0
VERNON	VN010909	Inactive	Clay and gravel	10	4	4	4	100	Bayou Anacoco	52.0
WEBSTER	WB191002	Pre-77 w/Need	Unspecified	5	4	7	5	Unspecified	Lake Bistineau	52.0
WASHINGTON	WS031106*	Inactive	Sand and gravel	7	6	5	3	160	Bogue Chitto River	52.0
RAPIDES	RA020301	Inactive	Clay and gravel	7	4	6	4	80	Calcasieu River	51.0
BEAUREGARD	BE031206	Inactive	Sand and gravel	9	4	4	4	200	Sabine River	50.0
EAST BATON ROUGE	EBR050201*	Inactive	Clay and Sand	10	5	3	3	5	Amite River	50.0
EAST BATON ROUGE	EBR060201	Inactive	Sand and gravel	9	4	4	4	2	Comite River	50.0
LINCOLN	LN180301	Recent Mining	clay, gravel	9	4	4	4	2	Cypress Crekk	50.0
LASALLE	LS080201	Recent Mining	clay, gravel	9	4	4	4	30	Little River	50.0
RED RIVER	RR130827	Recent Mining	clay, gravel	9	4	4	4	2	Black Lake	50.0
ST. TAMMANY	ST061301	Inactive	Sand and gravel	7	7	3	3	10	Pearl River	50.0
WEBSTER	WB180904	Pre-77 w/Need	Unspecified	10	0	10	2	Unspecified	Lake Bistineau	50.0
WEBSTER	WB190904	Pre-77 w/Need	Unspecified	10	0	10	2	Unspecified	Lake Bistineau	50.0
WEBSTER	WB190905	Pre-77 w/Need	Unspecified	10	0	10	2	Unspecified	Lake Bistineau	50.0
WEBSTER	WB190906	Pre-77 w/Need	Unspecified	10	0	10	2	Unspecified	Lake Bistineau	50.0
WEBSTER	WB190907	Pre-77 w/Need	Unspecified	10	0	10	2	Unspecified	Lake Bistineau	50.0
WEBSTER	WB190916	Pre-77 w/Need	Unspecified	10	0	10	2	Unspecified	Lake Bistineau	50.0
BEAUREGARD	BE021103	Inactive	Sand and gravel	10	4	4	3	10	Bayou Anacoco	49.5
OUACHITA	OA190504	Pre-77 w/Need	Unspecified	7	6	3	4	Unspecified	Bayou Lafourche	49.5
WEST BATON ROUGE	WBR071101	Inactive	Sand, gravel and clay	10	4	3	4	30	Choctaw Bayou	49.5
LIVINGSTON	LV060203	Inactive	Sand and gravel	10	3	4	4	60	Amite River	49.0
LIVINGSTON	LV060204	Inactive	Sand and gravel	10	3	4	4	50	Amite River	49.0
RAPIDES	RA030302	Inactive	Clay and gravel	7	5	4	4	10	Kincaid Reservoir	49.0
RAPIDES	RA0401E04	Inactive	Sand, gravel and clay	10	3	4	4	5	Red River	49.0
RAPIDES	RA050207	Inactive	Sand, gravel and clay	10	3	4	4	50	Saline Lake	49.0
RED RIVER	RR140805	Recent Mining	clay, gravel	10	3	4	4	50	Black Lake Bayou	49.0
WASHINGTON	WS011402	Inactive	Sand, gravel and clay	10	3	4	4	20	Pearl River	49.0
WASHINGTON	WS021406	Inactive	Sand and gravel	10	3	4	4	40	Pearl River	49.0
WASHINGTON	WS031004	Inactive	Sand and gravel	10	3	4	4	640	Bogue Chitto River	49.0
WASHINGTON	WS041105	Inactive	Unspecified	7	5	4	4	40	Bogue Chitto River	49.0
OUACHITA	OA170320	Pre-77 w/Need	Unspecified	8	5	7	0	Unspecified	Ouachita River	48.5
ST. TAMMANY	ST051309	Inactive	Gravel	10	7	2	1	10	Pearl River	48.5
BOSSIER	BO211201	Recent Mining	clay, ironstone	5	6	4	4	5	Caney Creek	48.0
TANGIPAHOA	TA050710	Inactive	Sand and gravel	7	3	5	5	10	Natalbany River	48.0

IMPACT/RECLAMATION NEED SCORING
INACTIVE MINING OPERATIONS

PARISH	SITE NO.	STATUS	MINERAL	FUTURE POTENTIAL	RISK ANALYSIS	ENV. IMPACT	WATER IMPACT	AFFECTED ACREAGE	AFFECTED STREAM(S)	SCORE
INACTIVE SITES WITH MODERATE IMPACT/RECLAMATION NEED (Continued):										
UNION	UN200402	Pre-77 w/Need	Unspecified	9	5	5	1	Unspecified	Ouachita River	48.0
WASHINGTON	WS041206	Inactive	Sand and gravel	9	5	3	3	250	Bogue Chitto River	48.0
CADDO	CA221504	Recent Mining	sand, gravel	9	3	4	4	5	Black Bayou Lake	47.0
CALCASIEU	CC091001	Inactive	Sand and clay	10	9	0	0	25	Houston River	47.0
EAST FELICIANA	EF030201	Inactive	Sand and gravel	9	3	4	4	300	Thompson Creek	47.0
GRANT	GR080108	Recent Mining	clay, sand, gravel	1	5	6	6	5	Little River	47.0
OUACHITA	OA180301	Pre-77 w/Need	Unspecified	7	6	5	1	Unspecified	Ouachita River	47.0
TANGIPAHOA	TA010702	Inactive	Sand, gravel and clay	10	4	3	3	3	Tangipahoa River	47.0
TANGIPAHOA	TA020702	Inactive	Gravel and clay	10	4	3	3	2	Tangipahoa River	47.0
TANGIPAHOA	TA050701	Inactive	Clay	10	4	3	3	10	Natalbany River	47.0
TANGIPAHOA	TA070703	Inactive	Sand and gravel	10	4	3	3	5	Natalbany River	47.0
WEBSTER	WB180922	Pre-77 w/Need	Unspecified	8	2	7	3	Unspecified	Lake Bistineau	47.0
WASHINGTON	WS031301	Inactive	Unspecified	10	4	3	3	2	Pearl River	47.0
WASHINGTON	WS021404	Inactive	Sand and gravel	10	3	4	3	160	Pearl River	46.5
ST. CHARLES	SC132001	Inactive	Sand and clay	4	6	4	4	200	Mississippi River	46.0
ST. TAMMANY	ST061001	Inactive	Clay and sand	7	4	4	4	40	Tchefuncta River	46.0
VERNON	VN010908	Inactive	Clay and gravel	10	7	1	1	50	Bayou Anacoco	46.0
WEBSTER	WB191001	Pre-77 w/Need	Unspecified	5	2	10	2	Unspecified	Bayou D'Arbonne	46.0
WEBSTER	WB180933	Pre-77 w/Need	Unspecified	9	0	8	3	Unspecified	Lake Bistineau	45.5
CADDO	CA171401	Pre-77 w/Need	Unspecified	7	6	2	3	Unspecified	Wallace Lake	44.5
OUACHITA	OA170312	Pre-77 w/Need	Unspecified	10	4	4	1	Unspecified	Ouachita River	44.5
RED RIVER	RR140806	Pre-77 w/Need	Unspecified	7	6	4	1	Unspecified	Black Lake Bayou	44.5
CADDO	CA211603	Recent Mining	clay, ironstone	10	3	3	3	10	Caddo Lake	44.0
DESOTO	DS131202	Recent Mining	clay, ironstone	10	3	3	3	200	Smithport Lake	44.0
GRANT	GR080204	Pre-77 w/Need	Unspecified	1	4	6	6	100	Little River	44.0
IBERVILLE	IV091301	Inactive	Clay	10	3	3	3	50	Bayou Grosse Tete	44.0
OUACHITA	OA170305	Pre-77 w/Need	Unspecified	10	3	4	2	Unspecified	Ouachita River	44.0
RAPIDES	RA010113	Inactive	Clay and gravel	10	3	3	3	40	Indian Creek Reservoir	44.0
RAPIDES	RA050203*	Inactive	Gravel	10	3	3	3	60	Flagon Bayou	44.0
ST. TAMMANY	ST061402	Inactive	Unspecified	10	3	3	3	50	Pearl River	44.0
TANGIPAHOA	TA020704	Inactive	Clay and gravel	10	3	3	3	2	Tangipahoa River	44.0
TANGIPAHOA	TA030706	Inactive	Sand and gravel	10	3	3	3	80	Tangipahoa River	44.0
TANGIPAHOA	TA060702	Inactive	Clay	10	3	3	3	20	Yellow Water River	44.0
WEBSTER	WB170902	Recent Mining	clay, sand, gravel	6	4	4	4	15	Lake Bistineau	44.0
WINN	WN090503	Recent Mining	clay, gravel, sand	6	4	4	4	5	Natachie Lake	44.0

IMPACT/RECLAMATION NEED SCORING
INACTIVE MINING OPERATIONS

PARISH	SITE NO.	STATUS	MINERAL	FUTURE POTENTIAL	RISK ANALYSIS	ENV. IMPACT	WATER IMPACT	AFFECTED ACREAGE	AFFECTED STREAM(S)	SCORE
INACTIVE SITES WITH MODERATE IMPACT/RECLAMATION NEED (Continued):										
WASHINGTON	WS021301	Inactive	Sand and gravel	10	3	3	3	Unspecified	Pearl River	44.0
WASHINGTON	WS021303	Inactive	Clay	10	3	3	3	2	Pearl River	44.0
WASHINGTON	WS021405	Inactive	Sand and gravel	10	3	3	3	20	Pearl River	44.0
EAST BATON ROUGE	EBR050302	Inactive	Sand and gravel	10	1	4	4	350	Amite River	43.0
LASALLE	LS080210	Recent Mining	clay, gravel	10	1	4	4	5	Little River	43.0
LASALLE	LS090201	Recent Mining	sandy clay	7	3	4	4	10	Little River	43.0
VERNON	VN0180602	Inactive	Clay, sand and gravel	7	3	4	4	30	Little Six Mile Creek	43.0
WEBSTER	WB180920	Pre-77 w/Need	Unspecified	9	0	7	3	Unspecified	Lake Bistineau	43.0
WASHINGTON	WS021006	Inactive	Sand and gravel	7	3	4	4	80	Bogue Chitto River	43.0
RAPIDES	RA010401	Inactive	Gravel	10	5	3	0	10	Calcasieu River	42.5
DESOTO	DS121215	Recent Mining	clay, ironstone	9	3	3	3	20	Bayou San Patricio	42.0
LINCOLN	LN170503	Recent Mining	clay, gravel	9	3	3	3	10	Dugdemona River	42.0
RAPIDES	RA040302	Inactive	Clay, sand and gravel	9	3	3	3	2	Bayou Rapides	42.0
SABINE	SB081302	Recent Mining	clay	9	3	3	3	10	Toledo Bend Reservoir	42.0
ST. HELENA	SH040304	Inactive	Sand and gravel	9	3	3	3	100	Amite River	42.0
VERNON	VN010901	Inactive	Clay, sand and gravel	9	3	3	3	50	Bayou Anacoco	42.0
WEBSTER	WB200901	Recent Mining	clay, gravel	9	3	3	3	2	Lake Bistineau	42.0
WEBSTER	WB230901	Recent Mining	clay, gravel	9	3	3	3	20	Bayou Dorcheat	42.0
WEST FELICIANA	WF010305	Inactive	Sand and gravel	5	4	4	4	4	Bayou Sara	42.0
WASHINGTON	WS041109	Inactive	Unspecified	9	3	3	3	40	Bogue Chitto River	42.0
GRANT	GR080202	Recent Mining	clay, gravel	1	3	6	6	5	Bayou Rigolette	41.0
OUACHITA	OA180202	Pre-77 w/Need	Unspecified	6	3	5	3	Unspecified	Ouachita River	41.0
RED RIVER	RR130826	Recent Mining	clay, gravel	7	4	3	3	2	Black Lake	41.0
LASALLE	LS070301	Recent Mining	clay, gravel	4	4	4	4	5	Catahoula Lake	40.0
LIVINGSTON	LV060202	Inactive	Sand and gravel	10	0	4	4	200	Amite River	40.0
ST. CHARLES	SC132002	Inactive	Sand and clay	6	6		4	4	Mississippi River	40.0
WASHINGTON	WS041209	Inactive	Sand and gravel	8	3	3	3	20	Bogue Chitto River	40.0

COUNT: 132

IMPACT/RECLAMATION NEED SCORING
INACTIVE MINING OPERATIONS

PARISH	SITE NO.	STATUS	MINERAL	FUTURE POTENTIAL	RISK ANALYSIS	ENV. IMPACT	WATER IMPACT	AFFECTED ACREAGE	AFFECTED STREAM(S)	SCORE
INACTIVE SITES WITH MODERATELY LOW IMPACT/RECLAMATION NEED:										
GRANT	GR070210	Pre-77 w/Need	Unspecified	5	4	4	3	Unspecified	Bayou Rigolette	39.5
LINCOLN	LN190202	Pre-77 w/Need	Unspecified	10	4	3	0	Unspecified	Bayou D'Arbonne Lake	39.5
TANGIPAHOA	TA040704	Inactive	Sand and gravel	10	3	2	2	320	Tangipahoa River	39.0
WEST FELICIANA	WF010202	Inactive	Clay and gravel	10	3	3	1	5	Bayou Sara	39.0
UNION	UN200301	Pre-77 w/Need	Unspecified	7	4	5	0	Unspecified	Ouachita River	38.5
ACADIA	AC080201	Inactive	Sand and gravel	9	0	4	4	10	Bayou des Cannes	38.0
CLAIBORNE	CL200602	Pre-77 w/Need	Unspecified	9	0	6	2	Unspecified	Lake Claiborne	38.0
DESOTO	DS121305	Recent Mining	clay, ironstone	10	1	3	3	20	Bayou Na Bonchasse	38.0
EAST BATON ROUGE	EBR040301	Inactive	Sand and gravel	7	3	3	3	200	Amite River	38.0
LINCOLN	LN180102	Recent Mining	clay, gravel	9	0	4	4	2	Ouachita River	38.0
NATCHITOCHES	NA120602	Recent Mining	clay, gravel	10	1	3	3	5	Saline Lake	38.0
RED RIVER	RR120805	Recent Mining	clay, gravel	7	3	3	3	40	Black Lake	38.0
TANGIPAHOA	TA040702	Inactive	Sand and gravel	7	3	3	3	50	Tangipahoa River	38.0
TANGIPAHOA	TA060804	Inactive	Sand and gravel	10	1	3	3	10	Tangipahoa River	38.0
WEBSTER	WB220903	Recent Mining	clay, ironstone	10	1	3	3	5	Bayou Dorcheat	38.0
WEBSTER	WB230902	Recent Mining	clay, gravel	10	1	3	3	100	Bayou Dorcheat	38.0
CADDO	CA221505	Recent Mining	clay, ironstone	4	3	4	4	5	Black Bayou Lake	37.0
LASALLE	LS070304	Recent Mining	clay, gravel	7	1	4	4	10	Catahoula Lake	37.0
LASALLE	LS070307	Recent Mining	clay, gravel	4	3	4	4	5	Catahoula Lake	37.0
JACKSON	JA150101	Pre-77 w/Need	Unspecified	5	3	6	1	Unspecified	Castor Creek	36.5
RED RIVER	RR130818	Pre-77 w/Need	Unspecified	5	3	4	3	Unspecified	Black Lake Bayou	36.5
TANGIPAHOA	TA030901	Inactive	Clay and gravel	10	3	3	0	40	Tangipahoa River	36.5
LINCOLN	LN180402	Recent Mining	clay, gravel	6	3	3	3	5	Dugdemona River	36.0
LINCOLN	LN190303	Recent Mining	clay, gravel	9	1	3	3	2	Dugdemona River	36.0
RAPIDES	RA010406	Inactive	Sand and clay	9	1	3	3	2	Calcasieu River	36.0
UNION	UN190201	Recent Mining	clay	9	1	3	3	2	Ouachita RIver	36.0
WASHINGTON	WS021402	Inactive	Sand and gravel	6	3	3	3	2	Pearl River	36.0
EAST BATON ROUGE	EBR050303	Inactive	Sand and gravel	10	1	1	4	350	Amite River	35.5
LASALLE	LS080206	Pre-77 w/Need	Unspecified	10	1	2	3	Unspecified	Little River	35.5
AVOYELLES	AV010401	Inactive	Sand and gravel	10	0	3	3	10	Lac aux Perles	35.0
EAST BATON ROUGE	EBR060202	Inactive	Clay and Sand	10	0	3	3	100	Comite River	35.0
GRANT	GR060101	Pre-77 w/Need	Unspecified	7	2	4	2	Unspecified	Little River	35.0
IBERVILLE	IV071001	Inactive	Clay	10	0	3	3	10	Intercoastal Waterway	35.0
LIVINGSTON	LV070601	Inactive	Sand and gravel	10	0	3	3	2	Tickfaw River	35.0
ST. TAMMANY	ST051202	Inactive	Sand and gravel	10	0	3	3	30	Bogue Chitto River	35.0

IMPACT/RECLAMATION NEED SCORING
INACTIVE MINING OPERATIONS

PARISH	SITE NO.	STATUS	MINERAL	FUTURE POTENTIAL	RISK ANALYSIS	ENV. IMPACT	WATER IMPACT	AFFECTED ACREAGE	AFFECTED STREAM(S)	SCORE
INACTIVE SITES WITH MODERATELY LOW IMPACT/RECLAMATION NEED (Continued):										
WEBSTER	WB201001	Recent Mining	clay, gravel	10	0	3	3	2	Lake Bistineau	35.0
WASHINGTON	WS011014	Inactive	Sand and gravel	10	0	3	3	20	Bogue Chitto River	35.0
WEBSTER	WB190910	Pre-77 w/Need	Unspecified	7	6	1	0	Unspecified	Lake Bistineau	34.5
WASHINGTON	WS041210	Inactive	Sand and gravel	9	3	3	0	10	Bogue Chitto River	34.5
RED RIVER	RR140809	Pre-77 w/Need	Unspecified	7	5	1	1	Unspecified	Black Lake Bayou	34.0
ST. TAMMANY	ST051101	Inactive	Clay	10	3	1	1	5	Bogue Falaya	34.0
TANGIPAHOA	TA050707	Inactive	Sand and gravel	10	3	1	1	60	Tangipahoa River	34.0
WEBSTER	WB190914	Pre-77 w/Need	Unspecified	10	3	2	0	Unspecified	Lake Bistineau	34.0
GRANT	GR060305	Pre-77 w/Need	Unspecified	6	3	3	2	Unspecified	Bayou Rigolette	33.5
GRANT	GR070207	Pre-77 w/Need	Unspecified	7	3	3	1	Unspecified	Bayou Rigolette	33.0
GRANT	GR080301	Recent Mining	chert, clay, gravel	9	0	3	3	5	Bayou Rigolette	33.0
RAPIDES	RA030202	Inactive	Clay and gravel	9	0	3	3	2	Bayou Boeuf	33.0
WASHINGTON	WS031101	Inactive	Sand and gravel	9	0	3	3	25	Bogue Chitto River	33.0
RAPIDES	RA010111	Inactive	Clay and gravel	9	3	1	1	5	Indian Creek Reservoir	32.0
WASHINGTON	WS011013	Inactive	Sand and gravel	7	1	3	3	Unspecified	Bogue Chitto River	32.0
OUACHITA	OA190502	Pre-77 w/Need	Unspecified	7	0	5	2	Unspecified	Bayou Lafourche	31.5
OUACHITA	OA160304	Pre-77 w/Need	Unspecified	5	2	4	2	Unspecified	Ouachita River	31.0
RAPIDES	RA050107	Inactive	Gravel	7	3	3	0	100	Flagon Bayou	30.5
JEFFERSON DAVIS	JD090301	Inactive	Sand, clay and gravel	10	0	1	3	20	Bayou Nezpique	30.0
RAPIDES	RA050103	Inactive	Gravel	10	0	3	1	20	Flagon Bayou	30.0
RED RIVER	RR130815	Pre-77 w/Need	Unspecified	5	0	4	4	Unspecified	Black Lake Bayou	30.0
TANGIPAHOA	TA050806	Inactive	Sand and gravel	10	0	1	3	10	Tangipahoa River	30.0
WEST FELICIANA	WF030202	Inactive	Sand, gravel and clay	10	0	1	3	200	Mississippi River	30.0
RAPIDES	RA010202	Inactive	Gravel	10	3	0	0	240	Cocodrie Lake	29.0
RAPIDES	RA020202*	Inactive	Gravel	10	3	0	0	120	Indian Creek Reservoir	29.0
TANGIPAHOA	TA050703	Inactive	Sand and clay	10	3	0	0	4	Natalbany River	29.0
TANGIPAHOA	TA050709	Inactive	Sand and gravel	10	3	0	0	10	Tangipahoa River	29.0
TANGIPAHOA	TA060705	Inactive	Gravel	10	3	0	0	20	Yellow Water River	29.0
TANGIPAHOA	TA060706	Inactive	Sand and gravel	10	3	0	0	2	Yellow Water River	29.0
TANGIPAHOA	TA060805	Inactive	Unspecified	10	3	0	0	80	Ponchatoula Creek	29.0
LASALLE	LS070201	Pre-77 w/Need	Unspecified	8	0	1	4	Unspecified	Little River	28.5
VERNON	VN010N601	Inactive	Sand and gravel	9	1	3	0	5	West Six Mile Creek	28.5

IMPACT/RECLAMATION NEED SCORING
INACTIVE MINING OPERATIONS

PARISH	SITE NO.	STATUS	MINERAL	FUTURE POTENTIAL	RISK ANALYSIS	ENV. IMPACT	WATER IMPACT	AFFECTED ACREAGE	AFFECTED STREAM(S)	SCORE
INACTIVE SITES WITH MODERATELY LOW IMPACT/RECLAMATION NEED (Continued):										
BEAUREGARD	BE030702	Inactive	Sand, gravel & clay	9	0	3	1	20	Bundick Lake	28.0
CATAHOULA	CH100722	Recent Mining	clay, gravel	10	1	1	1	60	Ouachita River	28.0
CATAHOULA	CH100725	Recent Mining	clay, sand, gravel	10	1	1	1	10	Ouachita River	28.0
SABINE	SB081304	Recent Mining	clay, sand, gravel	10	1	1	1	3	Toledo Bend Reservoir	28.0
ST. HELENA	SH020603	Inactive	Clay	10	1	1	1	3	Tickfaw River	28.0
ST. TAMMANY	ST051103	Inactive	Clay	10	1	1	1	5	Bogue Falaya	28.0
TANGIPAHOA	TA070701	Inactive	Unspecified	10	1	1	1	2	Yellow Water River	28.0
WEBSTER	WB220901	Recent Mining	clay, ironstone	10	1	1	1	50	Bayou Dorcheat	28.0
WEST FELICIANA	WF010201	Inactive	Sand, gravel and clay	10	1	1	1	5	Bayou Sara	28.0
WEST FELICIANA	WF020302*	Inactive	Sand and gravel	10	1	1	1	10	Bayou Sara	28.0
AVOYELLES	AV010301	Inactive	Sand and gravel	10	0	0	3	5	Bayou Dulac	27.5
TANGIPAHOA	TA060801	Inactive	Sand and gravel	10	0	0	3	5	Tangipahoa River	27.5
TANGIPAHOA	TA060802	Inactive	Sand and gravel	10	0	0	3	5	Tangipahoa River	27.5
TANGIPAHOA	TA060803	Inactive	Sand and gravel	10	0	0	3	3	Tangipahoa River	27.5
UNION	UN200405	Pre-77 w/Need	Unspecified	5	5	1	0	Unspecified	Ouachita River	27.5
RED RIVER	RR130825	Pre-77 w/Need	Unspecified	6	0	4	2	Unspecified	Black Lake Bayou	27.0
WASHINGTON	WS041103	Inactive	Sand and gravel	9	3	0	0	50	Bogue Chitto River	27.0
UNION	UN220304	Pre-77 w/Need	Unspecified	7	0	1	4	Unspecified	Ouachita River	26.5
CATAHOULA	CH100706	Pre-77 w/Need	Unspecified	9	1	1	1	Unspecified	Ouachita River	26.0
GRANT	GR070306	Pre-77 w/Need	Unspecified	5	2	2	2	Unspecified	Bayou Rigolette	26.0
OUACHITA	OA200401	Recent Mining	sand	9	1	1	1	50	Ouachita River	26.0
RAPIDES	RA010201	Inactive	Gravel	10	2	0	0	40	Indian Creek Reservoir	26.0
RAPIDES	RA050301	Inactive	Clay	10	2	0	0	5	Red River	26.0
WEBSTER	WB171004	Pre-77 w/Need	Unspecified	8	0	4	0	Unspecified	Lake Bistineau	26.0
WASHINGTON	WS011011	Inactive	Sand and gravel	4	1	3	3	80	Bogue Chitto River	26.0

IMPACT/RECLAMATION NEED SCORING
INACTIVE MINING OPERATIONS

PARISH	SITE NO.	STATUS	MINERAL	FUTURE POTENTIAL	RISK ANALYSIS	ENV. IMPACT	WATER IMPACT	AFFECTED ACREAGE	AFFECTED STREAM(S)	SCORE
INACTIVE SITES WITH MODERATELY LOW IMPACT/RECLAMATION NEED (Continued):										
BEAUREGARD	BE030704	Inactive	Sand, gravel & clay	10	1	1	0	2	Bundick Lake	25.5
EAST BATON ROUGE	EBR060103	Inactive	Sand, clay and gravel	10	1	1	0	20	Comite River	25.5
WINN	WN100505	Pre-77 w/Need	Unspecified	6	2	2	1	Unspecified	Red River	25.5
CALCASIEU	CC071101	Inactive	Sand and gravel	10	0	1	1	5	Buxton Creek	25.0
EAST BATON ROUGE	EBR0601E08	Inactive	Clay and Sand	10	0	1	1	40	Comite River	25.0
JEFFERSON DAVIS	JD070603	Inactive	Clay	10	0	1	1	2	Calcasieu River	25.0
LIVINGSTON	LV050201	Inactive	Sand and gravel	5	0	3	3	20	Amite River	25.0
LIVINGSTON	LV050202	Inactive	Sand and gravel	10	0	1	1	40	Amite River	25.0
RAPIDES	RA010106	Inactive	Clay and gravel	10	0	1	1	2	Bayou Cocodrie	25.0
RAPIDES	RA010204	Inactive	Gravel	10	0	2	0	160	Cocodrie Lake	25.0
RAPIDES	RA010209	Inactive	Clay and gravel	10	0	1	1	10	Cocodrie Lake	25.0
RAPIDES	RA010301	Inactive	Clay and gravel	10	0	1	1	2	Calcasieu River	25.0
RED RIVER	RR120807	Pre-77 w/Need	Unspecified	5	0	4	2	Unspecified	Black Lake	25.0
ST. TAMMANY	ST051207	Inactive	Unspecified	10	0	2	0	5	Bogue Chitto River	25.0
ST. TAMMANY	ST061403	Inactive	Unspecified	10	0	1	1	10	Pearl River Canal	25.0
TANGIPAHOA	TA030702	Inactive	Sand and gravel	10	0	1	1	40	Tangipahoa River	25.0
TANGIPAHOA	TA050705	Inactive	Sand and gravel	10	0	1	1	10	Tangipahoa River	25.0
VERNON	VN021105	Inactive	Sand and gravel	10	0	1	1	10	Bayou Anacoco	25.0
VERNON	VN021108	Inactive	Sand and gravel	10	0	1	1	5	Bayou Anacoco	25.0
WEST FELICIANA	WF010301	Inactive	Clay and gravel	10	0	1	1	2	Bayou Sara	25.0
WEST FELICIANA	WF020307	Inactive	Sand and gravel	10	0	1	1	1	Bayou Sara	25.0
WEST FELICIANA	WF020308	Inactive	Sand and gravel	10	0	1	1	10	Bayou Sara	25.0
WEST FELICIANA	WF030201	Inactive	Sand, gravel and clay	10	0	1	1	400	Mississippi River	25.0
WASHINGTON	WS011007	Inactive	Sand and gravel	10	0	1	1	20	Bogue Chitto River	25.0
WASHINGTON	WS021002	Inactive	Unspecified	10	0	2	0	Unspecified	Bogue Chitto River	25.0
WASHINGTON	WS021005	Inactive	Sand and gravel	10	0	1	1	10	Bogue Chitto River	25.0

COUNT: 118

IMPACT/RECLAMATION NEED SCORING
INACTIVE MINING OPERATIONS

PARISH	SITE NO.	STATUS	MINERAL	FUTURE POTENTIAL	RISK ANALYSIS	ENV. IMPACT	WATER IMPACT	AFFECTED ACREAGE	AFFECTED STREAM(S)	SCORE
INACTIVE SITES WITH MINIMAL TO NO IMPACT/RECLAMATION NEED:										
WEBSTER	WB170907	Pre-77 w/Need	Unspecified	7	1	2	1	Unspecified	Ouachita River	24.5
WEBSTER	WB180936	Pre-77 w/Need	Unspecified	7	1	3	0	Unspecified	Lake Bistineau	24.5
ST. TAMMANY	ST051305	Inactive	Sand and gravel	9	1	1	0	40	Bogue Chitto River	23.5
BEAUREGARD	BE030801	Inactive	Sand, gravel & clay	10	1	0	0	5	Bundick Creek	23.0
DESOTO	DS121214	Recent Mining	clay, ironstone	10	1	0	0	Unspecified	Bayou Pierre	23.0
RAPIDES	RA010102*	Inactive	Gravel	10	1	0	0	200	Indian Creek Reservoir	23.0
ST. TAMMANY	ST041301	Inactive	Sand and gravel	10	1	0	0	10	Bogue Chitto River	23.0
ST. TAMMANY	ST041302	Inactive	Sand and gravel	10	1	0	0	10	Pearl River	23.0
ST. TAMMANY	ST051302	Inactive	Sand and gravel	10	1	0	0	160	Bogue Chitto River	23.0
TANGIPAHOA	TA060701	Inactive	Sand and gravel	10	1	0	0	40	Yellow Water River	23.0
WEST FELICIANA	WF040202	Inactive	Sand and gravel	10	1	0	0	10	Mississippi River	23.0
WASHINGTON	WS011301	Inactive	Sand, gravel and clay	10	1	0	0	2	Pearl River	23.0
GRANT	GR060207	Pre-77 w/Need	Unspecified	10	0	1	0	Unspecified	Bayou Rigolette	22.5
GRANT	GR070204	Pre-77 w/Need	Unspecified	6	1	2	1	Unspecified	Bayou Rigolette	22.5
JACKSON	JA140402	Pre-77 w/Need	Unspecified	6	1	1	2	Unspecified	Dugdemona River	22.5
ST. TAMMANY	ST041101	Inactive	Sand and gravel	10	0	1	0	10	Bogue Chitto River	22.5
ST. TAMMANY	ST041203	Inactive	Sand and gravel	10	0	1	0	50	Bogue Chitto River	22.5
ST. TAMMANY	ST051307	Inactive	Sand and gravel	10	0	0	1	2	Pearl River	22.5
TANGIPAHOA	TA050712	Inactive	Sand and gravel	10	0	0	1	5	Tangipahoa River	22.5
TANGIPAHOA	TA050803	Inactive	Sand and gravel	10	0	0	1	5	Tangipahoa River	22.5
WEST FELICIANA	WF020303	Inactive	Sand and gravel	10	0	0	1	10	Bayou Sara	22.5
WASHINGTON	WS021001	Inactive	Sand, gravel and clay	10	0	1	0	10	Bogue Chitto River	22.5
BIENVILLE	BN160907	Pre-77 w/Need	Unspecified	4	3	1	1	Unspecified	Black Lake Bayou	22.0
GRANT	GR060203	Pre-77 w/Need	Unspecified	7	1	2	0	Unspecified	Little River	22.0
SABINE	SB061001	Recent Mining	clay, iron	7	1	1	1	2	Sabine River	22.0
WEBSTER	WB180934	Pre-77 w/Need	Unspecified	7	1	2	0	Unspecified	Lake Bistineau	22.0
GRANT	GR080402	Pre-77 w/Need	Unspecified	5	2	1	1	Unspecified	Bayou Rigolette	21.0
BIENVILLE	BN151001	Pre-77 w/Need	Unspecified	2	3	2	1	Unspecified	Loggy Bayou	20.5
WEBSTER	WB180903	Pre-77 w/Need	Unspecified	5	1	2	1	Unspecified	Lake Bistineau	20.5
WEBSTER	WB190909	Pre-77 w/Need	Unspecified	5	1	3	0	Unspecified	Lake Bistineau	20.5
AVOYELLES	AV010701	Inactive	Clay	10	0	0	0	2	Belson lake	20.0

IMPACT/RECLAMATION NEED SCORING
INACTIVE MINING OPERATIONS

PARISH	SITE NO.	STATUS	MINERAL	FUTURE POTENTIAL	RISK ANALYSIS	ENV. IMPACT	WATER IMPACT	AFFECTED ACREAGE	AFFECTED STREAM(S)	SCORE
INACTIVE SITES WITH MINIMAL TO NO IMPACT/RECLAMATION NEED (Continued):										
BEAUREGARD	BE020801	Inactive	Sand and gravel	10	0	0	0	2	Bundick Creek	20.0
BEAUREGARD	BE031101	Inactive	Clay	10	0	0	0	5	Trout Creek	20.0
CALCASIEU	CC090901	Inactive	Sand and clay	10	0	0	0	20	Bayou d'Inde	20.0
CALCASIEU	CC090902	Inactive	Sand and clay	10	0	0	0	10	Bayou d'Inde	20.0
CALCASIEU	CC090903	Inactive	Sand and clay	10	0	0	0	40	Bayou d'Inde	20.0
CALCASIEU	CC091002	Inactive	Sand and clay	10	0	0	0	40	Bayou d'Inde	20.0
CATAHOULA	CH090513	Pre-77 w/Need	Unspecified	5	0	3	1	Unspecified	Ouachita River	20.0
EAST BATON ROUGE	EBR040304	Inactive	Sand and gravel	10	0	0	0	300	Amite River	20.0
EAST BATON ROUGE	EBR050202	Inactive	Sand and gravel	10	0	0	0	5	Amite River	20.0
EAST BATON ROUGE	EBR050301	Inactive	Sand and gravel	10	0	0	0	100	Amite River	20.0
EAST BATON ROUGE	EBR060106	Inactive	Clay and Sand	10	0	0	0	20	Comite River	20.0
EAST BATON ROUGE	EBR060107	Inactive	Clay and Sand	10	0	0	0	2	Comite River	20.0
EAST BATON ROUGE	EBR060206	Inactive	Sand and gravel	10	0	0	0	50	Amite River	20.0
EAST FELICIANA	EF020101	Inactive	Clay and gravel	10	0	0	0	20	Thompson Creek	20.0
EAST FELICIANA	EF020102	Inactive	Clay and gravel	10	0	0	0	40	Thompson Creek	20.0
IBERVILLE	IV080101	Inactive	Sand, gravel and clay	10	0	0	0	20	Mississippi River	20.0
IBERVILLE	IV091201	Inactive	Sand	10	0	0	0	40	Mississippi River	20.0
IBERVILLE	IV091202	Inactive	Sand and gravel	10	0	0	0	40	Mississippi River	20.0
LIVINGSTON	LV060201	Inactive	Sand and gravel	10	0	0	0	40	Amite River	20.0
LIVINGSTON	LV070301	Inactive	Clay	10	0	0	0	40	Grays Creek	20.0
LIVINGSTON	LV070501	Inactive	Gravel	10	0	0	0	2	Tickfaw River	20.0
POINTE COUPEE	PC030701	Inactive	Sand and clay	10	0	0	0	5	Atchafalaya River	20.0
POINTE COUPEE	PC030702	Inactive	Sand and clay	10	0	0	0	5	Atchafalaya River	20.0
PLAQUEMINES	PL152401	Inactive	Sand	10	0	0	0	10	Mississippi River	20.0
PLAQUEMINES	PL152403	Inactive	Sand	10	0	0	0	2	Mississippi River	20.0

IMPACT/RECLAMATION NEED SCORING
INACTIVE MINING OPERATIONS

PARISH	SITE NO.	STATUS	MINERAL	FUTURE POTENTIAL	RISK ANALYSIS	ENV. IMPACT	WATER IMPACT	AFFECTED ACREAGE	AFFECTED STREAM(S)	SCORE
INACTIVE SITES WITH MINIMAL TO NO IMPACT/RECLAMATION NEED (Continued):										
RAPIDES	RA010105	Inactive	Clay and gravel	10	0	0	0	2	Cocodrie Lake	20.0
RAPIDES	RA010112	Inactive	Clay and gravel	10	0	0	0	5	Cocodrie Lake	20.0
RAPIDES	RA010205	Inactive	Gravel	10	0	0	0	40	Cocodrie Lake	20.0
RAPIDES	RA010207	Inactive	Clay and gravel	10	0	0	0	2	Spring Creek	20.0
RAPIDES	RA010405	Inactive	Clay and gravel	10	0	0	0	2	Calcasieu River	20.0
RAPIDES	RA020203	Inactive	Clay and gravel	10	0	0	0	100	Bayou Boeuf	20.0
RAPIDES	RA030201	Inactive	Clay and gravel	10	0	0	0	2	Red River	20.0
RAPIDES	RA030301	Inactive	Clay	10	0	0	0	5	Kincaid Reservoir	20.0
RAPIDES	RA050201	Inactive	Gravel	10	0	0	0	30	Flagon Bayou	20.0
RAPIDES	RA050202	Inactive	Gravel	10	0	0	0	5	Flagon Bayou	20.0
RAPIDES	RA050204*	Inactive	Gravel	10	0	0	0	40	Flagon Bayou	20.0
RAPIDES	RA050205	Inactive	Gravel	10	0	0	0	160	Flagon Bayou	20.0
RAPIDES	RA050302	Inactive	Clay	10	0	0	0	20	Red River	20.0
RAPIDES	RA050303	Inactive	Clay	10	0	0	0	5	Catahoula Lake	20.0
RAPIDES	RA050402	Inactive	Clay	10	0	0	0	2	Lake Rodemacher	20.0
RAPIDES	RA050403	Inactive	Clay	10	0	0	0	2	Lake Rodemacher	20.0
RAPIDES	RA050404	Inactive	Clay	10	0	0	0	2	Lake Rodemacher	20.0
RAPIDES	RA060202	Inactive	Gravel	10	0	0	0	2	Flagon Bayou	20.0
ST. HELENA	SH010502	Inactive	Sand and gravel	10	0	0	0	20	Tickfaw River	20.0
ST. HELENA	SH010601	Inactive	Sand and gravel	10	0	0	0	5	Tickfaw River	20.0
ST. HELENA	SH020501	Inactive	Sand, clay, gravel	10	0	0	0	5	Twelve Mile Creek	20.0
ST. HELENA	SH020502	Inactive	Sand and gravel	10	0	0	0	5	Tickfaw River	20.0
ST. HELENA	SH020503	Inactive	Sand, gravel and clay	10	0	0	0	20	Tickfaw River	20.0
ST. HELENA	SH020601	Inactive	Sand and gravel	10	0	0	0	5	Tickfaw River	20.0
ST. HELENA	SH020604	Inactive	Sand and gravel	10	0	0	0	10	Amite River	20.0
ST. HELENA	SH040601	Inactive	Sand, gravel and dirt	10	0	0	0	2	Tickfaw River	20.0
ST. HELENA	SH040602	Inactive	Sand, gravel and clay	10	0	0	0	2	Tickfaw River	20.0
ST. LANDRY	SL050401	Inactive	Clay	10	0	0	0	10	Bayou Courtableau	20.0
ST. MARY	SM171001	Inactive	Salt, Underground	10	0	0	0	Unspecified	Atchafalaya Bay	20.0
ST. TAMMANY	ST051205	Inactive	Gravel	10	0	0	0	20	Bogue Chitto River	20.0
ST. TAMMANY	ST051206	Inactive	Unspecified	10	0	0	0	100	Bogue Chitto River	20.0
ST. TAMMANY	ST081401	Inactive	Fill Dirt	10	0	0	0	5	Bayou Bonfouca	20.0
ST. TAMMANY	ST081403	Inactive	Unspecified	10	0	0	0	20	Bayou Bonfouca	20.0
ST. TAMMANY	ST081501	Inactive	Unspecified	10	0	0	0	30	West Pearl River	20.0

IMPACT/RECLAMATION NEED SCORING
INACTIVE MINING OPERATIONS

PARISH	SITE NO.	STATUS	MINERAL	FUTURE POTENTIAL	RISK ANALYSIS	ENV. IMPACT	WATER IMPACT	AFFECTED ACREAGE	AFFECTED STREAM(S)	SCORE
INACTIVE SITES WITH MINIMAL TO NO IMPACT/RECLAMATION NEED (Continued):										
TANGIPAHOA	TA010703	Inactive	Sand, gravel and clay	10	0	0	0	2	Tangipahoa River	20.0
TANGIPAHOA	TA010707	Inactive	Sand and gravel	10	0	0	0	5	Tangipahoa River	20.0
TANGIPAHOA	TA010709	Inactive	Unspecified	10	0	0	0	2	Tangipahoa River	20.0
TANGIPAHOA	TA010803	Inactive	Sand and gravel	10	0	0	0	Unspecified	Bogue Chitto River	20.0
TANGIPAHOA	TA010804	Inactive	Sand and gravel	10	0	0	0	2	Bogue Chitto River	20.0
TANGIPAHOA	TA020601	Inactive	Gravel and clay	10	0	0	0	2	Tangipahoa River	20.0
TANGIPAHOA	TA020705	Inactive	Sand and gravel	10	0	0	0	10	Tangipahoa River	20.0
TANGIPAHOA	TA020706	Inactive	Sand and gravel	10	0	0	0	5	Tangipahoa River	20.0
TANGIPAHOA	TA040705	Inactive	Sand and gravel	10	0	0	0	60	Tangipahoa River	20.0
TANGIPAHOA	TA050708	Inactive	Sand and gravel	10	0	0	0	2	Tangipahoa River	20.0
TANGIPAHOA	TA050801	Inactive	Sand and gravel	10	0	0	0	5	Skulls Creek	20.0
TANGIPAHOA	TA050802	Inactive	Sand and gravel	10	0	0	0	10	Tangipahoa River	20.0
TANGIPAHOA	TA050804	Inactive	Sand and gravel	10	0	0	0	2	Tangipahoa River	20.0
TANGIPAHOA	TA050807	Inactive	Unspecified	10	0	0	0	Unspecified	Tangipahoa River	20.0
TANGIPAHOA	TA060704	Inactive	Gravel	10	0	0	0	2	Natalbany River	20.0
TANGIPAHOA	TA060806	Inactive	Fill dirt	10	0	0	0	10	Lake Maurepas	20.0
TANGIPAHOA	TA060807	Inactive	Fill dirt	10	0	0	0	5	Lake Maurepas	20.0
TANGIPAHOA	TA060808	Inactive	Fill dirt	10	0	0	0	3	Lake Maurepas	20.0
TANGIPAHOA	TA060809	Inactive	Fill dirt	10	0	0	0	10	Lake Maurepas	20.0
TANGIPAHOA	TA070801	Inactive	Fill dirt	10	0	0	0	5	Lake Maurepas	20.0
VERNON	VN010703	Inactive	Clay, sand and gravel	10	0	0	0	100	Whisky Chitto Creek	20.0
VERNON	VN010903	Inactive	Clay and gravel	10	0	0	0	20	Bundick Creek	20.0
VERNON	VN010904	Inactive	Clay and gravel	10	0	0	0	10	Bundick Creek	20.0
VERNON	VN010905	Inactive	Clay and gravel	10	0	0	0	40	Bundick Creek	20.0
VERNON	VN010906	Inactive	Clay and gravel	10	0	0	0	20	Flat Creek	20.0
VERNON	VN011004	Inactive	Clay and gravel	10	0	0	0	2	Bayou Anacoco	20.0
VERNON	VN011006	Inactive	Clay and gravel	10	0	0	0	2	Bayou Anacoco	20.0
VERNON	VN0180702*	Inactive	Clay, sand and gravel	10	0	0	0	40	Whisky Chitto Creek	20.0
VERNON	VN021007*	Inactive	Sand and gravel	10	0	0	0	5	Bayou Anacoco	20.0
WEST FELICIANA	WF010204	Inactive	Sand, gravel and clay	10	0	0	0	2	Thompson Creek	20.0
WEST FELICIANA	WF020201	Inactive	Sand and gravel	10	0	0	0	10	Thompson Creek	20.0
WEST FELICIANA	WF040204	Inactive	Sand and gravel	10	0	0	0	100	Mississippi River	20.0

IMPACT/RECLAMATION NEED SCORING
INACTIVE MINING OPERATIONS

PARISH	SITE NO.	STATUS	MINERAL	FUTURE POTENTIAL	RISK ANALYSIS	ENV. IMPACT	WATER IMPACT	AFFECTED ACREAGE	AFFECTED STREAM(S)	SCORE
INACTIVE SITES WITH MINIMAL TO NO IMPACT/RECLAMATION NEED (Continued):										
WASHINGTON	WS010902	Inactive	Sand and gravel	10	0	0	0	5	Bogue Chitto River	20.0
WASHINGTON	WS011002	Inactive	Sand and gravel	10	0	0	0	2	Bogue Chitto River	20.0
WASHINGTON	WS011010	Inactive	Sand, gravel and clay	10	0	0	0	Unspecified	Bogue Chitto River	20.0
WASHINGTON	WS011012	Inactive	Sand and gravel	10	0	0	0	10	Bogue Chitto River	20.0
WASHINGTON	WS011201	Inactive	Sand and gravel	10	0	0	0	20	Pearl River	20.0
WASHINGTON	WS011202	Inactive	Sand, clay and gravel	10	0	0	0	30	Pearl River	20.0
WASHINGTON	WS011401	Inactive	Sand and gravel	10	0	0	0	10	Pearl River	20.0
WASHINGTON	WS011404	Inactive	Sand and gravel	10	0	0	0	10	Pearl River	20.0
WASHINGTON	WS021009	Inactive	Sand and gravel	10	0	0	0	2	Bogue Chitto River	20.0
WASHINGTON	WS021010	Inactive	Sand and gravel	10	0	0	0	2	Bogue Chitto River	20.0
WASHINGTON	WS021012	Inactive	Unspecified	10	0	0	0	Unspecified	Calico Branch	20.0
WASHINGTON	WS021013	Inactive	Unspecified	10	0	0	0	Unspecified	Bogue Chitto River	20.0
WASHINGTON	WS021102	Inactive	Sand and gravel	10	0	0	0	Unspecified	Bogue Chitto River	20.0
WASHINGTON	WS021201	Inactive	Sand and gravel	10	0	0	0	10	Pearl River	20.0
WASHINGTON	WS021401	Inactive	Sand and gravel	10	0	0	0	2	Pearl River	20.0
WASHINGTON	WS031003	Inactive	Unspecified	10	0	0	0	2	Bogue Chitto River	20.0
WASHINGTON	WS041102	Inactive	Sand and gravel	10	0	0	0	10	Bogue Chitto River	20.0
WASHINGTON	WS041104	Inactive	Sand and gravel	10	0	0	0	Unspecified	Bogue Chitto River	20.0
WASHINGTON	WS041107	Inactive	Fill dirt	10	0	0	0	Unspecified	Bogue Chitto River	20.0
WASHINGTON	WS041108	Inactive	Unspecified	10	0	0	0	10	Bogue Chitto River	20.0
WASHINGTON	WS031302	Inactive	Sand, gravel and clay	7	1	1	0	2	Coburn Creek	19.5
ST. HELENA	SH010501	Inactive	Sand, clay and gravel	7	0	1	1	100	Tickfaw River	19.0
GRANT	GR080102	Pre-77 w/Need	Unspecified	4	1	2	1	Unspecified	Little River	18.5
OUACHITA	OA160306	Pre-77 w/Need	Unspecified	8	0	1	0	Unspecified	Ouachita River	18.5
ASCENSION	AS111401	Inactive	Sand	9	0	0	0	60	Mississippi River	18.0
BIENVILLE	BN150905	Pre-77 w/Need	Unspecified	5	1	1	1	Unspecified	Black Lake Bayou	18.0
BIENVILLE	BN160904	Pre-77 w/Need	Unspecified	5	1	1	1	Unspecified	Lake Bistineau	18.0
GRANT	GR080207	Pre-77 w/Need	Unspecified	5	1	1	1	Unspecified	Little River	18.0
IBERIA	IB140701	Inactive	Sand	9	0	0	0	2	Plantation Lake - Sandy	18.0
UNION	UN220302	Pre-77 w/Need	Unspecified	5	1	1	1	Unspecified	Ouachita River	18.0
VERNON	VN010602	Inactive	Sand and gravel	9	0	0	0	5	West Six Mile Creek	18.0
VERNON	VN010702	Inactive	Sand and gravel	9	0	0	0	400	Birds Creek	18.0
VERNON	VN0180701	Inactive	Sand and gravel	9	0	0	0	100	Whisky Chitto Creek	18.0
WEST FELICIANA	WF010101	Inactive	Sand and gravel	9	0	0	0	5	Thompson Creek	18.0
WEST FELICIANA	WF040203	Inactive	Sand and gravel	9	0	0	0	40	Mississippi River	18.0

IMPACT/RECLAMATION NEED SCORING

INACTIVE MINING OPERATIONS

PARISH	SITE NO.	STATUS	MINERAL	FUTURE POTENTIAL	RISK ANALYSIS	ENV. IMPACT	WATER IMPACT	AFFECTED ACREAGE	AFFECTED STREAM(S)	SCORE
INACTIVE SITES WITH MINIMAL TO NO IMPACT/RECLAMATION NEED (Continued):										
WINN	WN120501	Pre-77 w/Need	Unspecified	5	1	1	1	Unspecified	Saline Lake	18.0
WINN	WN100402	Pre-77 w/Need	Unspecified	6	1	1	0	Unspecified	Nantachie Lake	17.5
WINN	WN090402	Recent Mining	sand, clay, gravel	1	0	3	3	100	Bayou Bodcau	17.0
WASHINGTON	WS031201	Inactive	Sand, gravel and clay	7	1	0	0	10	Bens Creek	17.0
UNION	UN230304	Pre-77 w/Need	Unspecified	7	0	1	0	Unspecified	Ouachita River	16.5
UNION	UN210405	Pre-77 w/Need	Unspecified	4	0	1	2	Unspecified	Ouachita River	15.5
RED RIVER	RR140907	Pre-77 w/Need	Unspecified	5	0	1	1	Unspecified	Black Lake Bayou	15.0
ALLEN	AL070602	Inactive	Clay	7	0	0	0	3	Calcasieu River	14.0
WASHINGTON	WS010901	Inactive	Sand and gravel	7	0	0	0	2	Bogue Chitto River	14.0
WASHINGTON	WS011102	Inactive	Clay and gravel	7	0	0	0	Unspecified	Lawrence Creek	14.0
WASHINGTON	WS031303	Inactive	Sand, gravel and clay	7	0	0	0	10	Pearl River	14.0
OUACHITA	OA180314	Pre-77 w/Need	Unspecified	5	0	1	0	Unspecified	Ouachita River	12.5
WASHINGTON	WS010904	Inactive	Clay and gravel	6	0	0	0	2	Bogue Chitto River	12.0
BIENVILLE	BN151003	Pre-77 w/Need	Unspecified	1	1	1	1	Unspecified	Loggy Bayou	10.0
BIENVILLE	BN151007	Pre-77 w/Need	Unspecified	1	1	1	1	Unspecified	Loggy Bayou	10.0
CATAHOULA	CH100712	Recent Mining	clay, gravel	1	1	1	1	5	Ouachita River	10.0
CALDWELL	CD130402	Pre-77 w/Need	Unspecified	2	1	1	0	Unspecified	Ouachita River	9.5
CLAIBORNE	CL190602	Pre-77 w/Need	Unspecified	2	0	1	1	Unspecified	Black Lake Bayou	9.0
									COUNT:	175
								TOTAL:		476

Note: In addition to the 175 sites listed here in the Minimal to No Impact/Reclamation Need category, there are an additional 384 sites that have been assigned a score of 25 or less. This brings the total number of inactive sites that have been scored to 860.

MAINE

Task II Inactive/Abandoned Mining Data Summary

prepared for

Interstate Mining Compact Commission

June 15, 1991

Contents

1.0 HISTORY

Maine has been subject to mining for valuable mineral resources throughout its history. For many years the Abanaki Indians used for decoration a red pigment from a river bed which passed through an iron deposit. This deposit later became the Katadin Iron Works which operated from 1846 to 1899. During the period 1873-1883, Maine also experienced a "Mining Boom" in which a multitude of companies were formed and numerous shafts sunk in the coastal region. Commodities of interest were gold, silver, copper, zinc and lead.[1]

Since the 1880s, Maine has experienced very few base metal operations. The most recent metal mines to operate were the Blue Hill and Cape Rosier mines which operated from 1966 to 1977. Since the late 1970's no metal mines have operated, but a number of companies continue to conduct exploration activities throughout the state. At present, three internationally based firms have announced intentions to start-up mining operations in Maine for gold, copper, zinc and nickel.

Construction ores in the State have been a valuable resource since the first settlers began using granite for building foundations. Currently, sand and gravel accounts for the greatest portion of the State's mineral commodity value, followed by cement, dimension stone and crushed stone.[2] Maine has an extensive history of quarrying activities. These mines are famous throughout the world as sources for semi-precious gem minerals including varieties of tourmaline, beryl, topaz and rose quartz.[3] Recently, commercial mining of peat has occurred along with the construction of North America's first peat-fired electric power plant in Eastern Maine.

Maine's mineral resources have enhanced and continue to enhance the State's economy. But the potential for adverse impacts, from past mining operations, on Maine's environment and public health and safety has not been determined.

2.0 IMPACTS OF PAST MINING ON THE ENVIRONMENT AND PUBLIC SAFETY

Whether or not inactive or abandoned mines have adversely affected the State's environment and public safety, and if so, to what degree, is not known. There are, however, a few examples of known impacts that warrant further discussion. For example, abandoned sand and gravel pits have become host to illegal dumpsites throughout the State. Sixteen abandoned pits are currently being investigated by the Maine Department of Environmental Protection (DEP) as illegal dumpsites for industrial waste, hazardous waste and abestos.[4]

The State also has hundreds of abandoned rock quarries which pose potential dangers to public safety. The possibility of falls and drownings as well as the hazard posed by illegal dumping threaten public health. Many abandoned quarries in the State are now flooded and used as recreational areas.

The numerous shafts driven in the 1880 Mining Boom may also pose a threat to the environment and public safety. But the extent of these historic sites is not known.

The only mine site in the State with known contamination has affected 1.4 miles of a stream.[5] This site is located on the coast and possibly may have contaminated the marine environment. Studies performed by the DEP, Army Corp of Engineers and Robert Dow and John Hurst indicate high levels of copper, zinc, lead and cadmium in sediment samples, plants and mussel tissues.[6] This site has been placed on the State's Uncontrolled Sites list and is under investigation.

3.0 LAWS AND REGULATIONS

Since the implementation of the Site Location of Development Act in 1970, all mining activities in Maine are required to include a provision for safety and reclamation of land affected. This statute also regulates borrow pits (sand and gravel) greater than 5 acres. Recently, Public Law Chapter 640, which concerns the siting of borrow pits smaller than 5 acres, was enacted, requiring notification and setback provisions to protect the adjacent property owner. This law also gave the State the authority to establish slope rules to ensure safety at small borrow pits.[7]

The DEP and the Maine Land Use Regulation Commission are now involved in developing a set of regulations that consolidates the permitting requirements for metallic mineral mining. At present, the Department is in the midst of the formal rule-making process.

The State of Maine, unlike some other states, does not have any regulatory programs that deal with abandoned/inactive mines. But these sites can be affected by existing statutes if they become active again.

4.0 DATA ANALYSIS

The following is a summary analysis of the data collected in this Task II effort:

- The literature and data researched do not accurately describe the impacts associated with Maine's inactive/abandoned mines. All records reviewed indicate only location, mineral commodity, and miscellaneous comments noting shafts, pits and trenches. No records of environmental/public safety impacts were noted in the literature researched.

- The State of Maine does not have any programs that address inactive/abandoned sites. Therefore, the researchers had no mechanism available, other than extensive field surveys, to determine if sites listed were active or inactive. This was especially true for sand and gravel pits listed in the Minerals Industry Location System (MILS) database.

- Regarding metallic ores, only the listing of mine sites with comments stating shafts and pits were included in the inventory.[3] The DEP is assuming that all those sites listed are inactive/abandoned. No records researched indicate acreage affected. Where information stated shaft sunk, it was assumed that it meant two and there is an associated waste rock dump. Some records included comments pertaining to smelters, slag dumps and millsites, and these sites were included in the inventory.

- Regarding construction ores, 255 sites for sand and gravel pits were listed in the MILS database. Location coordinates were the only information given. Other pertinent information such as pit size, operational status (active/inactive) was not recorded. Therefore, the DEP has not included any information on sand and gravel pits in this data summary. Field investigation is needed to confirm the operational status of these borrow pits. Also, based upon the knowledge of Department staff, it appears that the number of sand and gravel pits listed is underestimated. The DEP is also assuming that a majority of the granite and other quarries listed are inactive and contain highwalls.[8] The basis for this assumption is the fact that the State currently has very few quarries in actual operation.

- Regarding industrial ores, 203 pegmatite mines (feldspar) were included in the inventory, based upon the assumption that these sites are all inactive.[3] No information was given, other than location, for acreage, pits or shafts.

In summary, it can be assumed that the State of Maine may have a large number of inactive/abandoned mine sites. However, without further investigation, the exact extent of potential problems from these sites may not be known

5.0 SITE RECLAMATION COSTS

Cost estimates for reclamation of the sites listed in the inventory have not been included in this Task II report. As stated earlier, the State does not have a mechanism or program in place to deal with inactive/abandoned mines. The Department, therefore, will have to defer to professionals with experience in the development of these cost estimates.

6.0 DEFINITIONS

Extraction. "Extraction" means the process of mining of metallic mineral deposits, removal of ores, minerals, and overburden; but does not include the injection of leaching solutions, lixiviants, or solutions to solubilize or extract metallic minerals in place (*in situ*) from existing geologic formations.

In-Situ Leaching/Mining. "In-situ leaching/mining" means the leaching or mining of minerals occurring in the situation in which they were originally formed or deposited. In-situ leaching/mining is not considered metallic mineral mining.

Mine Site. "Mine site" means the area and facilities owned, leased, or otherwise subject to the possessory control of a mining company within which mining or activities incidental thereto occur. The mine site includes, without limitation: the excavation, tailings, waste rock or overburden, storage area, mills, conveyors, concentrators, crushers, screens, pipes, canals, dams, ponds, lagoons, ditches, roads, access roads, utility facilities or equipment, pollution control facilities, railroad tracks or sidings, administrative or other buildings, or improvements, structures, rights-or-way, or easements appurtenant or related to any of the foregoing.

Mine Waste. "Mine waste" means all waste materials (solid, semi-solid, or liquid) associated with exploration, advanced exploration, and mining. Such wastes include, but are not limited to rock, tailings, and other process waste such as leachate and wastewater treatment plant residuals. Land clearing debris, woodwaste, wastes from solvent extraction and electrowinning, and materials and wastes regulated under Subtitle C of the Resource Conservation and Recovery Act, 42 U.S.C. 6901, et seq. are not considered mine wastes for purposes of this rule.

Mine Waste Unit. "Mine waste unit" means any land area, structure, location, equipment, or combination thereof on or in which mine wastes are managed. A land area or structure shall not become a mine waste unit solely because it is used to store (for 90 days or less) hazardous wastes generated on the same site.

Mining or Mining Activity. "Mining" or "mining activity" means any activity or process that is for the purpose of extraction or removal of metallic minerals, and includes processes used in the separation or extraction of minerals or minerals from other material including, but not limited to: crushing, grinding, beneficiation by concentration (gravity, floatation, amalgamation, electrostatic, or magnetic); cyanidation; leaching; crystallization; or precipation or processes substantially equivalent, necessary, or incidental to any of the foregoing. Mining or mining activity does not include exploration, advanced exploration, roasting, or thermal or electric smelting.

Ore Leaching. "Ore leaching" means the intentional separation, selective removal, dissolving-out, or extraction of soluble metals, salts, or other constituents form an ore by the action of percolating water or other percolating solution. Ore leaching may include, but is not limited to, heap leaching, vat leaching, agitation leaching, dump leaching and bioleaching.

Pollutant. "Pollutant" means dredged spoil, solid water, junk, incinerator residue, sewage, refuse, effluent, garbage, sewage sludge, munitions, chemicals, biological or radiological materials, oil, petroleum products or by-products, heat, wrecked or discarded equipment, rock, sand, dirt and industrial, municipal, domestic, commercial or agricultural wastes of any kind.

Reclamation. "Reclamation" means the rehabilitation and continued maintenance of the area of land affected by mining under a plan which includes, but is not limited to, grading and land shaping, the creation of lakes or ponds, the planting of forests, the seeding of grasses and legumes, the planting of crops for harvest, and the enhancement of wildlife and aquatic resources, but does not include the filling in of pits, shafts, and/or underground workings with solid materials.

Surface Impoundment. "Surface impoundment" or "impoundment" means a mine waste unit or part of such a unit that is a natural topographic depression, man-made excavation, or diked area formed of earthen or other materials that is designed to hold an accumulation of liquid and solid wastes.

Tailings. "Tailings" means those portions of a metallic mineral deposit remaining after extraction of minerals by physical or chemical means.

Unstable Area. "Unstable area" means any area where mass movement of earth materials such as landslides, rockfalls, mudslides, slumps, earth flows, subsidence, or debris flows are likely to occur.

Waste Rock. "Waste rock" means rock which has been removed during mining or advanced exploration but does not contain sufficient metallic minerals to constitute ore.

7.0 MAINE REFERENCE GUIDE TO DATA SUMMARY TABLE

1. Maine Metal Mines and Prospects, Mineral Resources Index No. 3, Maine Geological Survey 1958.

2. Maine Minerals Yearbook 1988, P. K. Harrison, W. Anderson, M. Foley, Bureau of Mines, U.S. Department of Interior.

3. Maine Pegmatile Mines & Prospects, Mineral Resources Index No. 1, Maine Geological Survey 1958.

4. Uncontrolled Sites Listing, Maine Department of Environmental Protection, Bureau of Oil & Hazardous Material Control, 1991.

5. State of Maine 1990 Water Quality Assessment Section 305(b) Report to Congress.

6. Renewable Resource Problems of Heavy Metal Mining in Coastal Maine, Robert L. Dow and John W. Hurst, Jr., Research Bulletin #35, National Fisherman, 1972.

7. 30 M.R.S.A. § 3556 An Act to Ensure the Safe Siting of Gravel Excavation.

8. Maine Granite Quarries & Prospects, Mineral Resources Index No. 2, Maine Geological Survey 1958.

9. Minerals Industry Location System, Bureau of Mines, U.S. Department of Interior.

10. Mineral Resource Data System, U.S. Geological Survey.

NON-COAL INVENTORY
INACTIVE/ABANDONED MINES[1]

State of MAINE

DATA SUMMARY[2,3]

	MINERAL TYPE (acres)[4]	MINING TYPE (acres)		OWNERSHIP (acres)		FEATURES	(acres)	(cost)
Location on 423	Metallic Ores	Mines	163	Federal		Highwalls[8]	*	(cost)[16] *
	Copper	Millsites	10	Private	X	Mine Openings[9]	326	*
	Zinc	Smelters	5	State		Disturbed Land[10]	*	*
	Lead	Other[5]		Other[6]		Polluted Water[11]	(miles) 1.4	*
	Nickel					Mine Dumps[12]	163	*
	Gold					Subsidence Prone[13]	*	*
	Silver					Hazardous Structures[14]	(number) *	*
	Iron					Other[15]	(units) *	*
	Tin							
	Manganese							
Location on 606	Construction Ores	Mines	176	Federal	X	Highwalls	*	*
	Granite	Millsites		Private	X	Mine Openings	176	*
	Slate	Smelters		State	X	Disturbed Land	*	*
	Limestone	Other		Other		Polluted Water	(miles) *	*
	Sand & Gravel					Mine Dumps	*	*
						Subsidence Prone	*	*
						Hazardous Structures	(number) *	*
						Other	(units) *	*
Location on 306	Industrial Ores	Mines	203	Federal		Highwalls	*	*
	Peat	Millsites		Private	X	Mine Openings	203	*
	Clay	Smelters		State		Disturbed Land	*	*
	Feldspar	Other		Other		Polluted Water	(miles) *	*
	Garnet					Mine Dumps	*	*
	Kyanite					Subsidence Prone	*	*
						Hazardous Structures	(number) *	*
						Other	(units) *	*
	SUBTOTAL	Mines	542	Federal	X	Highwalls	*	*
		Millsites	10	Private	X	Mine Openings	705	*
		Smelters	5	State	X	Disturbed Land	*	*
		Other		Other		Polluted Water	(miles) 1.4	*
						Mine Dumps	163	*
						Subsidence Prone	*	*
						Hazardous Structures	(number) *	*
						Other	(units) *	*

* Not Enough Information Available

DATA SUMMARY[2,3] - Page 2

MINERAL TYPE (acres)*	MINING TYPE (acres)		OWNERSHIP (acres)		FEATURES	(acres)	(cost)
Phosphate Rock	Mines		Federal		Highwalls[8]		(cost)[16]
	Millsites		Private		Mine Openings[9]	(number)	
	Smelters		State		Disturbed Land[10]		
N/A	Other[3]		Other[4]		Polluted Water[11]	(miles)	
					Mine Dumps[12]		
					Subsidence Prone[13]		
					Hazardous Structures[14]	(number)	
					Other[15]	(units)	
Uranium Overburden	Mines		Federal		Highwalls		
	Millsites		Private		Mine Openings	(number)	
	Smelters		State		Disturbed Land		
N/A	Other		Other		Polluted Water	(miles)	
					Mine Dumps		
					Subsidence Prone		
					Hazardous Structures	(number)	
					Other	(units)	
Oil Shale	Mines		Federal		Highwalls		
	Millsites		Private		Mine Openings	(number)	
	Smelters		State		Disturbed Land		
N/A	Other		Other		Polluted Water	(miles)	
					Mine Dumps		
					Subsidence Prone		
					Hazardous Structures	(number)	
					Other	(units)	
Other (acres)[7]	Mines		Federal		Highwalls		
N/A	Millsites		Private		Mine Openings	(number)	
	Smelters		State		Disturbed Land		
	Other		Other		Polluted Water	(miles)	
					Mine Dumps		
					Subsidence Prone		
					Hazardous Structures	(number)	
					Other		
TOTAL	Mines	542	Federal		Highwalls		
	Millsites	10	Private		Mine Openings	(number) 705	
	Smelters	5	State		Disturbed Land		
	Other		Other		Polluted Water	(miles) 1.4	
					Mine Dumps	163	
					Subsidence Prone		
					Hazardous Structures	(number)	
					Other	(units)	

MARYLAND

STATE OF MARYLAND

TASK II FINAL REPORT

INACTIVE AND ABANDONED MINE LANDS

State of Maryland

Task II Final Report

INACTIVE AND ABANDONED MINE LANDS

Introduction and Historical Background

A great variety of mineral products have been produced in Maryland at one time or another. The present output mainly consists of sand and gravel, stone, clays and some other non-metallic minerals. Coal is produced in Maryland, but is not the subject of this report. There are four basic geologic areas in Maryland. They are the costal plain, piedmont, valley and ridge and the Allegany Plateau. At one time Maryland was an important iron-producing State, the leading chrome producer in the world, and ranked high in copper production. These industries eventually succumbed to the discovery of richer deposits in other parts of the world and changes in technologies in other areas.

The western part of Maryland and the Piedmont region have yielded the most varied type of mineral products.

Although Maryland at one time produced a wide variety of minerals that variety is significantly reduced today. Iron ore has not been mined since about 1916. Placer type mining of gold continued until about 1940. Copper production in Maryland ceased about 1918. There have been some exploratory drilling programs in the Linganore copper district of Frederick County. The results of these explorations have not been significant enough to warrant any further activity by the companies involved. Chromium production continued until about 1920, although the latter remnants were small placer operations.

As you will note the variety of minerals once produced has dropped considerably and now is concentrated on production oriented aggregates. The metallic minerals are no longer produced. The size of the original mines and the passage of time has allowed these areas to heal and to conceal any previous scars from mining. No known water quality effects are being produced by old metallic mineral mines.

Aggregate mining is now regulated under the Maryland Surface Mine Law and will be discussed in more detail later.

Mining Methods

There are basically two mining methods in Maryland to extract non-coal minerals. Some placer mining has been done historically but no longer occurs. All mining in Maryland now is done underground or by surface mining.

All but two of the mining operations in Maryland are surface mines. The basic procedure for surface mining in the coastal plain area is to strip the topsoil, remove the overburden, mine the mineral, replace the overburden and topsoil and stabilize the area. In the piedmont, valley and ridge and plateau areas, the rock must be drilled and blasted. Waste rock may be deposited with the overburden or used to reduce final highwalls.

There are two active non-coal underground mines in Maryland. Both mines produce limestone and consume all of their product in the process. Both of the mines discharge water from the pit which is regulated by a N.P.D.E.S. permit. Turbidity is the main parameter of concern since no toxic or minerals of concern are encountered.

Health and Safety Impacts

Non-coal mining methods have created some safety hazards in Maryland. Physical hazards include highwalls, flooded excavation areas, unsafe structures, subsidence or sink hole areas, and overburden areas. There are no known health related impacts from abandoned mines in Maryland.

Highwalls have many times been left in vertical formation with no warning or safety features built in. Highwalls in rock areas may be in excess of 100 feet with vertical drops into water or onto solid rock. A hazardous highwall is not totally a function of height. A unconsolidated material, or overhang may also be hazardous to public safety. Visibility to highwalls from the top have led to accidents. A hazardous highwall may therefore be defined as any unconsolidated material left in a vertical (1:1 or less) state that exceed 15 feet in height. Sand and gravel highwalls are not as high but may be prone to slumping and cave ins. Areas in the coastal plain and piedmont areas are particularly prone to having impounded water. Safety features such as walk out areas, shallow water areas or underwater slopes were not required in the past. Maryland has experienced at least 10 deaths in the past 5 years from drowning at abandoned surface mines.

There is no information available to suggest that there is a problem with hazardous mine openings in Maryland for non-coal mining. Any unsafe structures such as buildings, machinery and abandoned roadways may be a safety hazard in abandoned pits.

Sink holes and subsidence areas are common to the limestone producing piedmont areas. Legislation passed in the 1991 session deals directly with subsidence and water loss from mining. The areas of Karst limestone topography are the only areas that will be affected by subsidence in non-fuel mining. These problems may be more related to active operations however where dewatering is required.

Abandoned overburden and waste rock are a danger to trespassers and explorers. Hazardous structures such as wash plant conveyors and stacking equipment may be dangerous for unknowing trespassers.

Environmental Impacts

Abandoned mines in Maryland have impacted thousands of acres of land and water resources. Although there are no leachates or point source discharges of metals or contaminants there is a significant discharge of sediment from many abandoned sites. A typical abandoned site (assuming disturbed land surface and in proximity to a stream) may be expected to discharge in excess of 100 tons of sediment per acre per year. There are no known discharges of leachate from underground mines. Although some of the copper mines have flooded there is no documentation to suggest a discharge or leachate problem. As previously mentioned there has been no metallic mineral mining in Maryland since the early 1900's.

There have been instances of glauconite being uncovered in the overburden of some coastal plain areas. In the presence of air and water glauconite can form a sulphuric acid resulting in a very low ph. This is routinely neutralized by covering the galuconite as soon as possible. Currently the Administration is undertaking the reclamation of an abandoned glauconite mine in Calvert County.

In as much as Maryland does not produce the minerals referred to in Strawmann II nor has it produced metallic minerals in the recent past there are no effects from fugitive dust or wind blown tailings.

Laws and Regulations

In 1975 Maryland passed a surface mine law for all non-coal mining. That statute requires a permit for all mining exceeding one acre in size. A critical component of all surface mining permits is a Mining and Reclamation Plan. This plan requires the permittee to develop and implement a plan to reclaim all land affected by the mining operation. There are no more abandoned mine lands being created with the implementation of the present mining law. In December of 1989 Maryland adopted regulations to give more regulatory authority to mining enforcement.

An abandoned surface mine is defined as those sites mined and unreclaimed prior to January 1, 1977. Sites dug prior to that time had no statewide responsibility to reclaim disturbed areas.

The state surface mine law also establishes a Surface Mined Land Reclamation Fund. The fund was established to assist in the reclamation of pre-law surface mines. The state matches that contribution annually. Reclamation fees may only be used for the reclamation of pre-law surface mines.

Reclamation Program

Non-coal reclamation in Maryland is administered by the Department of Natural Resources (DNR), within the Minerals, Oil & Gas Division of the Water Resources Administration. The Division is responsible for the reclamation of pre-law surface mines and bond forfeiture sites. Pre-law surface mines were mined and unreclaimed prior to enactment of the surface mining statute, on January 1, 1977. Bond forfeiture sites are permitted surface mines that have submitted to an absolute forfeiture of a performance bond for failure of the permittee to perform in the manner set forth in the approved Permit.

The reclamation program is funded from license fees, permit fees, special reclamation fees, bond forfeitures, and fines collected by the Department. Additional funding has been obtained through grants from the Environmental Protection Agency (for Chesapeake Bay Implementation Projects), and the National Oceanic and Atmospheric Administration. To extend the Division's reclamation fund, a private landowner may be required to assume a portion of the cost associated with construction activities. The Division may also initiate partnerships with other agencies or individuals required to mitigate for non-tidal wetlands, and reforestation projects thereby engineering the project and reducing cost.

Since 1988 DNR has administrated over $11,015,783 in funds to reclaim 303 acres of land affected by pre-law and bond forfeiture surface mines. Post reclamation land use include: park land; open space; sports complexes; deep water ponds; non-tidal wetlands; reforestation; wildlife habitats and environmental study areas with trails and interpretive displays.

The Division has identified, inspected, ranked, and prepared a statewide inventory of approximately 195 pre-law sites ranging in size from one-half acre to over 350 acres. Providing for reclamation of areas of land affected by surface mining will: aid in the protection of wildlife, decrease soil erosion, prevent pollution of rivers and streams, eliminate hazards to health and safety, assure the use of these lands for productive purposes, provide areas for education and environmental studies and provide for the continued use and enjoyment of these lands.

Cost of Remediation

The cost estimates are based upon actual costs incurred by the State of Maryland in our non-fuel abandoned mine program. The average cost in Maryland at non-stone sites is approximately $5,000.00 per acre. Revegetation alone will cost between $1,500.00 and $2,000.00 per acre. Creative reclamation such as non-tidal wetland creation or reforestation could easily approach $10,000.00 per acre. This amount does not include engineering or survey costs which will run approximately $1,000.00 per acre for an average site presenting no significant problems such as major highwalls or waste product storage. The cost of reclaiming the sites on Maryland's abandoned mine inventory will exceed $25 million. That cost could easily double if an exhaustive study is undertaken to locate all former mining sites. To date we have spent more than $11 million in reclaiming 303 acres of abandoned surface mines. We anticipate spending $17.8 million to reclaim sand and gravel sites and $8.2 million on abandoned quarries.

In 1990 Maryland reclaimed a 10 acre abandoned mine site. The site was a former sand and gravel pit that was mined in the mid 1960's. The site was sparsely vegetated with very little topsoil available. Scrub pines were the dominant plant species with some undergrowth of vines and sedges. There was also a 2+ acre pond that was surrounded by 15 foot highwalls. There were 15-25 foot highwalls in other areas of the site. Several tons of sediment per year was leaving the site and being deposited in the Patuxent River.

There were obvious safety problems because of the standing water and highwalls. The pollution problems, although not severe, were documented. The site was also becoming an attractive nuisance for trash and debris.

The base cost of the project for grading, sediment control and traditional planting of grass was $150,000. In order to create wildlife habitat, do some reforestation and create wetlands the cost of the project escalated to $372,000. The project was paid for with money from the abandoned surface mine fund, grants from the Environmental Protection Agency and participation from the Maryland State Highway Administration.

At the beginning of FY 92 there will be approximately $52,000 in Marylands abandoned mine program. Without outside fund enhancements and grants very little reclamation could be accomplished. We are aware of more than 800 acres of abandoned surface mines in Maryland. We also realize that we do not have all the sites inventoried.

NON-COAL INVENTORY - ABANDONED MINE LAND
REFERENCE GUIDE FOR DATA SUMMARY
State of Maryland

DEPARTMENT OF NATURAL RESOURCES
MINERALS OIL & GAS DIVISION
Attn: C. Edmon Larrimore
Telephone (301) 974-3874

REFERENCE GUIDE							
Mineral Type	Mining Type (acres)		Ownership (acres)		Features	(units)	(cost)
Metallic Ores	Mines	0	Federal	0	Polluted Water	(miles)	0
	Millsites	0	Private	0	Mine Dumps	(acres)	0
	Smelters	0	State	0	Disturbed Land	(acres)	0
	Other	0	Other	0	Highwalls	(miles)	0
					Mine Openings	(number)	0
					Subsidence Prone	(acres)	0
					Hazardous Structures	(number)	0
					Other	(units)	0
Metallic	Mines	10	Federal	0	Sediment Pollution	Tons/Acre/Year 165,850	Unknown
Non-Metallic Minerals	Wash Plants	40	Private	844			
	Sand and Gravel	638	Public	24	Highwalls = > 15 Feet	Linear Feet 70,675	Unknown
	Quarries	180			Safety Hazard	(miles)	
					Mine Openings	(number) 12 ±	Unknown
					Subsidence Prone	(acres)	
					Total Cost		25 Million
Industrial Ores	Mines	0	Federal	0	Polluted Water	(miles)	0
	Millsites	0	Private	0	Mine Dumps	(acres)	0
	Smelters	0	State	0	Disturbed Land	(acres)	0
	Other	0	Other	0	Highwalls	(miles)	0
					Mine Openings	(number)	0
					Subsidence Prone	(acres)	0
					Hazardous Structures	(number)	0
					Other	(units)	0

Phosphate Rock	Mines	0	Federal	0	Polluted Water	(miles)	0
	Millsites	0	Private	0	Mine Dumps	(acres)	0
	Smelters	0	State	0	Disturbed Land	(acres)	0
	Other	0	Other	0	Highwalls	(miles)	0
					Mine Openings	(number)	0
					Subsidence Prone	(acres)	0
					Hazardous Structures	(number)	0
					Other	(units)	0
Uranium Overburden	Mines	0	Federal	0	Polluted Water	(miles)	0
	Millsites	0	Private	0	Mine Dumps	(acres)	0
	Smelters	0	State	0	Disturbed Land	(acres)	0
	Other	0	Other	0	Highwalls	(miles)	0
					Mine Openings	(number)	0
					Subsidence Prone	(acres)	0
					Hazardous Structures	(number)	0
					Other	(units)	0
Oil Shale	Mines	0	Federal	0	Polluted Water	(miles)	0
	Millsites	0	Private	0	Mine Dumps	(acres)	0
	Smelters	0	State	0	Disturbed Land	(acres)	0
	Other	0	Other	0	Highwalls	(miles)	0
					Mine Openings	(number)	0
					Subsidence Prone	(acres)	0
					Hazardous Structures	(number)	0
					Other	(units)	0
Other (acres)	Mines	0	Federal	0	Polluted Water	(miles)	0
	Millsites	0	Private	0	Mine Dumps	(acres)	0
	Smelters	0	State	0	Disturbed Land	(acres)	0
	Other	0	Other	0	Highwalls	(miles)	0
					Mine Openings	(number)	0
					Subsidence Prone	(acres)	0
					Hazardous Structures	(number)	0
					Other	(units)	0

TOTAL	Mines	0	Federal	0	Polluted Water	(miles)	0
	Millsites	0	Private	0	Mine Dumps	(acres)	0
	Smelters	0	State	0	Disturbed Land	(acres)	0
	Other	0	Other	0	Highwalls	(miles)	0
					Mine Openings	(number)	0
					Subsidence Prone	(acres)	0
					Hazardous Structures	(number)	0
					Other	(units)	0

1. Information was obtained from an abandoned mine survey complied by staff based upon a 1979 field survey updated in 1988.

2. Sediment loading were estimated based upon the standard soil loss equation.

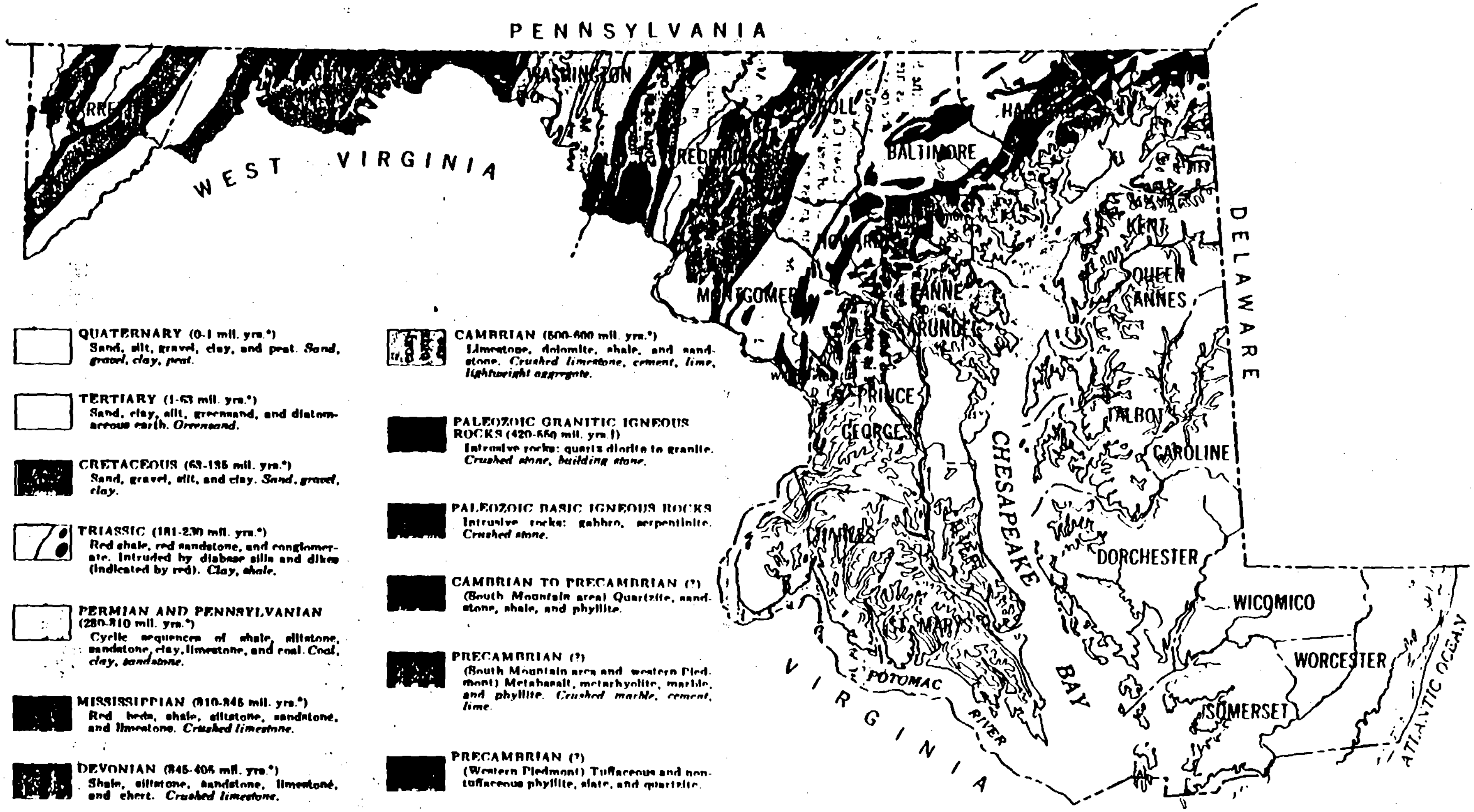
3. All land ownership is private property except for two sites owned by the State of Maryland totalling 24 acres.

4. Polluted water is defined as not able to sustain life forms natural to its native environment.

5. Abandoned mine is defined as those lands mined and not reclaimed prior to July 1, 1977.

6. Disturbed land is effected by mining or incidental to mining including roads, spoil piles, refuse piles, tailings and land excavations.

Historical data obtained from Geography and Geology of Maryland by Harold E. Vokes and Jonath Edwards, Jr. 1957.



QUATERNARY (0-1 mil. yrs.*)
Sand, silt, gravel, clay, and peat. *Sand, gravel, clay, peat.*

TERTIARY (1-63 mil. yrs.*)
Sand, clay, silt, greensand, and diatomaceous earth. *Greensand.*

CRETACEOUS (63-135 mil. yrs.*)
Sand, gravel, silt, and clay. *Sand, gravel, clay.*

TRIASSIC (181-230 mil. yrs.*)
Red shale, red sandstone, and conglomerate. Intruded by diabase sills and dikes (indicated by red). *Clay, shale.*

PERMIAN AND PENNSYLVANIAN (280-310 mil. yrs.*)
Cyclic sequences of shale, siltstone, sandstone, clay, limestone, and coal. *Coal, clay, sandstone.*

MISSISSIPPIAN (310-345 mil. yrs.*)
Red beds, shale, siltstone, sandstone, and limestone. *Crushed limestone.*

DEVONIAN (345-405 mil. yrs.*)
Shale, siltstone, sandstone, limestone, and chert. *Crushed limestone.*

SILURIAN (405-425 mil. yrs.*)
Shale, mudstone, sandstone, and limestone. *Glass sand, crushed limestone.*

ORDOVICIAN (425-500 mil. yrs.*)
Limestone, dolomite, shale, siltstone, and red beds. Slate and conglomerate in northern Harford County. *Crushed limestone, cement, clay, lime.*

CAMBRIAN (500-600 mil. yrs.*)
Limestone, dolomite, shale, and sandstone. *Crushed limestone, cement, lime, lightweight aggregate.*

PALEOZOIC GRANITIC IGNEOUS ROCKS (420-550 mil. yrs.†)
Intrusive rocks: quartz diorite to granite. *Crushed stone, building stone.*

PALEOZOIC BASIC IGNEOUS ROCKS
Intrusive rocks: gabbro, serpentinite. *Crushed stone.*

CAMBRIAN TO PRECAMBRIAN (?)
(South Mountain area) Quartzite, sandstone, shale, and phyllite.

PRECAMBRIAN (?)
(South Mountain area and western Piedmont) Metabasalt, metarhyolite, marble, and phyllite. *Crushed marble, cement, lime.*

PRECAMBRIAN (?)
(Western Piedmont) Tuffaceous and nontuffaceous phyllite, slate, and quartzite.

PRECAMBRIAN (?)
(Eastern Piedmont) Schist, metagraywacke, quartzite, marble, and metavolcanic rocks. *Crushed stone, crushed marble, building stone.*

PRECAMBRIAN BASEMENT COMPLEX (1100 mil yrs.†)
Gneiss, migmatite, and augen gneiss

Most important mineral products in italics.
* Age ranges from Kulp, J. L., 1961, Geologic time scale: Science, v. 133, no. 3459, p. 1105-1114.
† Radiometric dates made on Maryland rocks.

MARYLAND GEOLOGICAL SURVEY
Kenneth N. Weaver, Director

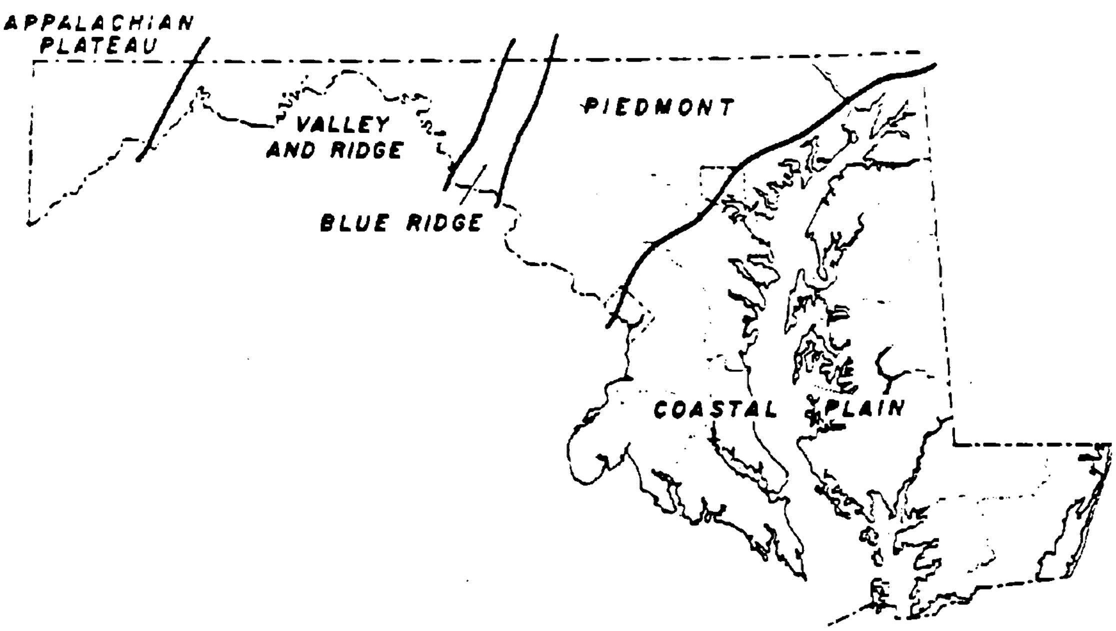
GENERALIZED GEOLOGIC MAP OF MARYLAND‡

1967

10 0 10 20 30 40
1 inch equals 25 miles

‡ A detailed Geologic Map of Maryland, 1968 at a scale of 1 inch equals 4 miles, is also available.

A BRIEF DESCRIPTION OF THE GEOLOGY OF MARYLAND



Maryland is part of three distinct physiographic regions: (1) the Coastal Plain Province, (2) the Piedmont Province, and (3) the Blue Ridge, Valley and Ridge, and Appalachian Plateau Provinces. These extend in belts of varying width along the eastern edge of the North American continent from Newfoundland to the Gulf of Mexico.

The Coastal Plain Province is underlain by a wedge of unconsolidated sediments including gravel, sand, silt, and clay, which overlaps the rocks of the eastern Piedmont along an irregular line of contact known as the Fall Zone. Eastward, this wedge of sediments thickens to more than 8,000 feet at the Atlantic coast line. Beyond this line is the Continental Shelf, the submerged continuation of the Coastal Plain, which extends eastward for at least another 75 miles where the sediments attain a maximum thickness of about 40,000 feet.

The sediments of the Coastal Plain dip eastward at a low angle, generally less than one degree, and range in age from Triassic to Quaternary. The younger formations crop out successively to the southeast across Southern Maryland and the Eastern Shore. A thin layer of Quaternary gravel and sand covers the older formations throughout much of the area.

Mineral resources of the Coastal Plain are chiefly sand and gravel, and are used as aggregate materials by the construction industry. Clay for brick and other ceramic uses is also important. Small deposits of iron ore are of historical interest. Plentiful supplies of ground water are available from a number of aquifers throughout much of the region.

The Piedmont Province is composed of hard, crystalline igneous and metamorphic rocks and extends from the inner edge of the Coastal Plain westward to Catoctin Mountain, the eastern boundary of the Blue Ridge Province. Bedrock in the eastern part of the Piedmont consists of schist, gneiss, gabbro, and other highly metamorphosed sedimentary and igneous rocks of probable volcanic origin. In several places these rocks have been intruded by granitic plutons and pegmatites. Deep drilling has revealed that similar metamorphic and igneous rocks underlie the sedimentary rocks of the Coastal Plain. Several domal uplifts of Precambrian gneiss mantled with quartzite, marble, and schist are present in Baltimore County and in parts of adjacent counties. Differential erosion of these contrasting rock types has produced a distinctive topography in this part of the Piedmont.

The rocks of the western part of the Piedmont are diverse and include phyllite, slate, marble, and moderately to slightly metamorphosed volcanic rocks. In central Frederick County the relatively flat Frederick Valley is developed on Cambrian and Ordovician limestone and dolomite. Gently undulating plains underlain by unmetamorphosed bedrock of Triassic red shale, siltstone, and sandstone occur in three areas in the western Piedmont.

The Piedmont Province contains a variety of mineral resources. Formerly, building stone, slate, and small deposits of non-metallic minerals, base-metal sulfides, gold, chromite, and iron ore were mined. Currently, crushed stone is important for aggregate, cement, and lime. Small to moderate supplies of ground water are available throughout the region, but favorable geological conditions locally may provide larger amounts.

Unlike the Coastal Plain and Piedmont Provinces, the Blue Ridge, Valley and Ridge, and Appalachian Plateau Provinces are underlain mainly by folded and faulted sedimentary rocks. The rocks of the Blue Ridge Province in western Frederick County are exposed in a large anticlinal fold whose limbs are represented by Catoctin Mountain and South Mountain. These two ridges are formed by Lower Cambrian quartzite, a rock which is very resistant to the attack of weathering and erosion. A broad valley floored by Precambrian gneiss and volcanic rock lies in the core of the anticline between the two ridges.

The Valley and Ridge Province between South Mountain in Washington County and Dans Mountain in western Allegany County contains strongly folded and faulted sedimentary rocks. In the eastern part of the region, a wide, open valley called the Great Valley, or in Maryland, the Hagerstown Valley, is formed on Cambrian and Ordovician limestone and dolomite. West of Powell Mountain, a more rugged terrain has developed upon shale and sandstone bedrock which ranges in age from Silurian to Mississippian. Some of the valleys in this region are underlain by Silurian and Devonian limestones.

For many years the limestone formations have been used as local sources of agricultural lime and building stone. Modern uses include crushed stone for aggregate and cement. A pure, white sandstone in the western region of the province is suitable for glass manufacturing.

The Appalachian Plateau Province includes that part of Allegany County west of Dans Mountain and all of Garrett County, the westernmost county in Maryland. The bedrock of this region consists principally of gently folded shale, siltstone, and sandstone. Folding has produced elongated arches across the region which expose Devonian rocks at the surface. Most of the natural gas fields in Maryland are associated with these anticlinal folds in the Appalachian Plateau. In the intervening synclinal basins, coal-bearing strata of Pennsylvanian and Permian ages are preserved.

The sedimentary rocks of the Blue Ridge, Valley and Ridge, and Appalachian Plateau Provinces yield small to moderate supplies of ground water. Under favorable conditions large amounts may occur.

Jonathan Edwards, Jr.
Geologist

1981

STATE OF MARYLAND
DEPARTMENT OF NATURAL RESOURCES

Prepared by the
MARYLAND GEOLOGICAL SURVEY

Johns Hopkins University
Baltimore, Maryland 21218

MISSISSIPPI

TASK II

Inactive and Abandoned Mine Lands

A Review and Summary

Prepared for the Interstate Mining Compact

by

The Surface Mining and Reclamation Division

Office of Geology

Department of Environmental Quality

State of Mississippi

INACTIVE AND ABANDONED MINE DATA SUMMARY

STATE OF MISSISSIPPI

Introduction

Mining in Mississippi began prior to the Civil War when a few families mined lignite for their own use. Most of these small sites have naturally reclaimed themselves and can no longer be found.

Non-coal mining began with the use of some sandstone for building purposes on a localized scale with very little acreage affected. All these small quarries were abandoned prior to the Civil War.

Around the turn of the century, mining of sand and gravel for road construction began and showed a rapid increase around 1910. As paved roads became common, use of sand and gravel increased and the search for local cement sources began. No cement plant was established until 1950. At that time, and again in 1959, plants were established to use raw materials from the limestones of the Vicksburg Group in central Mississippi.

Mining and crushing of limestone and chalk for agricultural purposes began in 1945 and continues today. Limestone from the Vicksburg Group and chalk from the Upper Cretaceous furnish the agricultural lime.

The search for metallic minerals in Mississippi has been for the most part futile. Early settlers of course looked for precious metals but found none. Some iron ore is present and a number of small operators have mined this ore. Problems of transportation and marketing caused the last of the mines to close around 1960. A few hundred tons of ore were smelted on the site and some ore was shipped to Birmingham. There was little or no impact on the environment although no reclamation was done.

Local potteries mined small amounts of clay prior to and after 1900. Brick plants began production around the turn of the century. In 1939 bentonite mines were opened in Smith County in central Mississippi and later in Itawamba and Monroe Counties in northeast Mississippi. These mines are still in operation. Ball clay has been mined in north central Mississippi since 1952. Some of the clay pits operated by the bentonite companies were reclaimed but many of the clay pits have been only naturally reclaimed.

The only underground mine in the state is a small silica mine in the northeast corner of the state. It was abandoned shortly after World War I.

Health and Safety Impacts

There has been little impact on health by non-coal mining in Mississippi. Flooded excavations have been a safety hazard with quite a number of drownings having occurred in abandoned gravel and clay pits and highway borrow pits. There may have been slight health problems caused by sand and gravel and clay and limestone mining operations. There was one unsubstantiated report of silicosis from one worker at a silica mine.

As in all mining operations there have been instances of vehicles falling into pits while mining, and a few wall collapses have been reported but only one death has been attributed to mining.

There has been no mining which has caused toxic wastes or chemically dangerous runoff.

Environmental Impact

Impact on the environment from surface mining has not been as great in Mississippi as in states which have toxic waste or chemical runoff. Surface mining operations have changed drainage flows and increased sediment load in some streams. Removal of vegetation has also occurred on a rather wide scale. No doubt there has been damage to flora and fauna. There is minor damage from fugitive dust.

Almost all damage to the environment and to health and safety took place prior to the enactment of laws regulating mining. Existing laws have reduced damage to the environment to a minimum. There are some problems in revegetation in some clay mining operations and still problems from exempt and "Grandfathered" mines.

Mining Laws in Mississippi

Prior to 1977, there were no laws regulating mining in Mississippi unless some public nuisance had been created or if the air and water were polluted.

The Mississippi Air and Water Pollution Control Commission was created in 1967 and now operates in the Department of Environmental Quality.

Laws controlling this agency are from the Mississippi Code, 1972, Sections 49-17-1 through 49-17-43, and the laws creating the Department of Natural Resources (later, Department of Environmental Quality) from the Mississippi Code, 1972, Sections 49-2-1 through 49-2-21.

Additional regulations have been promulgated by the Pollution Control Commission to meet all Federal and State requirements.

The Pollution Control Commission did not have sufficient staff to inspect mining operations and exercised little control of these operations. Action was taken on rare occasions when citizen complaints called attention to a violation.

Under the Antiquities Law of Mississippi, 1970, Mississippi Code, 1972, Section 3-9-7, the State Archives and History Division of Historic Preservation stopped one mining operation on the grounds that the operations endangered an historical site.

The Mississippi Surface Mining and Reclamation Act of 1977, Mississippi Code, 1972, Section 33-7-1 et seq., gave the State its first control of mining. This law is administered by the Department of Environmental Quality, Office of Geology, Division of Surface Mining.

The Office of Geology promulgated rules and regulations to implement the act and also made certain changes to complement the passage of the Mississippi Surface Coal Mining and Reclamation Act of 1979, Mississippi Code, 1972, Section 53-9-1 et seq.

Permits are required for the mining of sand, gravel, limestone, fill material and all other materials. The materials are divided into two groups: Class I includes bentonite, dolomite and phosphate (the last two have not been mined in Mississippi). Class II includes sand, gravel, soil, clay, limestone, chalk and stone.

Certain operations are exempt from the permit and other requirements of the statute and regulations. These operations include:

(1) Mining for any materials prior to April 15, 1978;

(2) Mining for Class II materials affecting less than four acres and more than 1,320 feet from an existing mine. The Office of Geology requires notification of these exempt operations;

(3) Excavations made by a landowner for his own use, if excavations do not exceed 1,000 cubic yards per year and one acre of land or less is affected.

Reclamation Efforts

Since the passage of the Surface Mining and Reclamation Act of 1977, reclamation of mined lands requiring a permit has been in force. The reclamation is affected by the posting of an appropriate per acre bond for mined acres. The bond is from $500 per acre to $2,500 per acre depending on site conditions. The bond is usually set at $500 per acre. The operator is responsible for the reclamation unless the bond is forfeited, at which time the State would use the bond to effect reclamation.

Since 1977 considerable acreage has been reclaimed with the reclamation bond being forfeited only one time. There has been no reclamation of exempt mined land or mined land existing prior to April 15, 1978, the date the act went into effect.

There are no Federal or State programs working in Mississippi that could be used for reclamation. Due to the rapid affects of erosion and natural revegetation, it would probably not be feasible to reclaim much of the abandoned mined land. Some areas of the State and some types of abandoned mines are amenable to reclamation, should funds become available. In the tables to follow, all lands not formally reclaimed are considered to be naturally reclaimed in lands mined prior to April 15, 1978, with a few exceptions, such as limestone pits which are still much as they were when abandoned.

Inventory Tables

Lands Mined Prior to April 15, 1978 — *Some acreage still unreclaimed by any means

Mineral Type	Number of Sites	Area Affected Acres	Formally Reclaimed Acres	Naturally Reclaimed Acres
Metallic Ores	4	200	0	200
Limestone (Cement)	3	500	20	200*
Limestone (Agricultural)	4	500	0	300*
Soil	4,000	20,000	0	20,000
Stone	5	100	0	50
Sand and Gravel	20,000	100,000	20	98,980**
Clay	250	4,000	0	4,000
Bentonite	12	5,000	80	4,400*

Polluted Water (sediment fill) approximately 5 miles

Reclamation Costs $44,000

**Includes pits filled with water

Lands Mined After April 15, 1978. Includes only abandoned lands.

Mineral Type	Number of Sites	Area Affected Acres	Formally Reclaimed Acres	Naturally Reclaimed Acres	Cost of Reclamation (Dollars)
Metallic Ores	0	0	0	0	0
Limestone (Cement)	2	50	50	0	50,000
Limestone (Agricultural)	3	40	20	0	40,000
Soil	500	25,000	10,000	5,000	5,000,000
Stone	0	0	0	0	0
Sand and Gravel	1,532	21,600	9,600	0	5,860,000
Clay	10	720	150	0	75,000
Bentonite	4	110	90	0	50,000

Polluted Water (sediment fill) approximately 10 miles

There are no dangerous underground mine openings and no dangerous structures. There are very few high walls left standing.

NEW YORK

NEW YORK SUMMARY TABLE

Participating State: New York

Representing Agency: Department of Environmental Conservation, Division of Mineral Resources

Agency Contact: Steven M. Potter, (518)457-0100

Address: 50 Wolf Road, Room 202, Albany, New York 12233-6500

PRIMARY MINERALS MINED: Leading mineral commodities in terms of value are crushed stone, salt, cement, sand and gravel, zinc and wollastonite. Other minerals mined include clay, garnet, gypsum, peat, lead, silver and talc. The majority of mining is accomplished using surface mining or open quarry methods. Processing methods include crushing, screening, washing, gravity separation (wollastonite) and other chemical methods associated with the processing of lead and zinc.

STATE RECLAMATION LAWS: Mined Land Reclamation Law of 1975, amended 1991. It is the policy of the State of New York to foster and encourage the development of domestic mineral resources and reserves necessary to assure satisfaction of economic needs compatible with sound environmental management practices. The legislature further declares it to be the policy of the state to provide for the wise and efficient uses of the resources available for mining and to provide, in conjunction with such mining operations, for reclamation of affected lands.

Abandoned as used in this title, means the cessation of mining and reclamation activities on land affected by mining without prior notification to the department of such cessation of activities or without describing such cessation in a Mined Land Use Plan approved by the Department, and after opportunity to be heard.

INACTIVE AND ABANDONED MINE (IAM) RECLAMATION TO DATE: The Mined Land Reclamation Law provides for the forfeiture of an operator's reclamation bond for failure to reclaim a site. At the present time, no special account exists for this purpose. The majority of IAM's would have been before 1975. To date, no reclamation of pre law (1975) abandoned lands has been accomplished.

IAM INVENTORY ACREAGE: Not yet available as total figures. An inventory of pre-1975 mines is now being tabulated and summarized. Currently, there are approximately 30,040 acres of land affected by mining under permit in New York State. Total value of reclamation financial security on record is $48,121,801.05.

IAM REMEDIATION COST ESTIMATE: Not yet available.

INVENTORY CONFIDENCE LEVEL: N/A

NORTH CAROLINA

NORTH CAROLINA INACTIVE AND ABANDONED MINED LANDS

A Preliminary Assessment
Prepared For the Interstate Mining Compact Commission
In Conjunction With The Environmental Protection Agency's
Investigation Of Mine Wastes

April, 1991

Submitted by Charles H. Gardner, State Geologist and Director
Division Of Land Resources
North Carolina Department of Environment, Health, and Natural Resources
With Assistance From
Stephen G. Conrad, Former State Geologist and Director

Contents

NORTH CAROLINA

STATE MINE WASTE PROGRAM

TASK II

INACTIVE AND ABANDONED MINED LANDS (IAM)

Introduction

The discovery of gold in Cabarrus County, North Carolina in 1799, is generally credited with ushering in mining as an important industry in the United States. Prior to that time, mineral resources were utilized primarily locally for limited purposes.

North Carolina contains a wide variety of rocks and minerals and between forty and fifty varieties have been produced at one time or another (Stuckey, 1965). Metallic ores, industrial minerals and construction aggregates all occur in North Carolina in a wide range of occurrences and economic importance.

Although metallic ores such as iron, copper, lead, zinc, tungsten and precious metals have been mined in the past, North Carolina has never been an important producer of metals. No metallic mines have operated during the past twenty years, although there is potential for renewed gold production and titanium (heavy minerals).

North Carolina has been and continues to be an important producer of industrial minerals and construction aggregates (noncoal minerals). In 1989, the last year in which statistics are available, before value added noncoal mineral production totalled $584 million and the state ranked 19th nationally in the output of all minerals and 11th in industrial mineral sales (White, 1989). Mineral commodities produced, included clay (common and koalin), feldspar gemstones, lithium minerals, mica, olivine, peat, phosphate rock, pyrophyllite, sand and gravel (construction and industrial) and stone (crushed and dimension). Clay, construction sand, gravel, and crushed stone accounted for about 60 percent of the mineral output in 1989 (White, 1989). North Carolina ranked second to Florida in the production of phosphate rock and continued to lead the nation in the production of feldspar, mica and pyrophyllite.

According to mining statistics compiled by the Land Quality Section of the Division of Land Resources, North Carolina Department of Environment, Health and Natural Resources in 1989, there were 653 active mining operations in North Carolina and 123 inactive, but permitted mines. Total acres permitted were estimated to be 77,419 of which 25,383 are affected but unreclaimed.

Mining and Milling Methods

The three basic mining methods that have been employed to extract minerals in North Carolina are underground, surface and placer mining.

Underground mining has been used mainly at metallic and precious metal mines and to a limited extent at talc, pyrophyllite, feldspar and sheet mica mines. Waste rock generated by underground mines was dumped at the most convenient location adjacent to the mine, most often on side slopes, but also in valley bottoms and heads of drainage.

Open pit surface mining has been the most widely used mining method in North Carolina. This method consists of drilling and blasting the rock, or simply excavating unconsolidated material, and hauling waste material to a waste dump area and the ore to processing facilities.

Placer mining has been the least utilized mining method in North Carolina. It was used extensively in the early days of gold mining and in the recovery of monozite in some western Piedmont stream valleys. Placer operations involve the use of floating dredges, hydraulic giants and small washer plants. Presently, small floating dredges are limited to sand mining operations.

Processing of metallic ores, precious metals and noncoal minerals has involved a variety of methods. Early milling methods to recover gold used chillian mills and stamp mills to crush and grind the ores. Advances in the technology of crushing and grinding equipment resulted in the development of rod and ball mills, jaw crushers and cyclone crushers. Finely crushed ores were further concentrated by gravity separation, mercury amalgamation, cyanidation and flotation.

Tailings and waste materials from mineral processing have been disposed of in several ways. In earlier times, it was common practice to discharge tailings and waste material directly to nearby streams or other low points below the mill facility. This practice was discontinued many years ago and tailings and waste materials are most commonly stored in tailings impoundments or in some cases, hauled off-site to disposal areas.

Smelting is the final beneficiation process for metallic ores. As North Carolina has never been a large producer of metallic ores, smelting facilities have not been constructed in the state. There may be instances in the early days of copper mining where local roasting facilities were used. However, in all cases in recent times metallic ore concentrates were shipped to out-of-state smelters.

Health and Safety Impacts

The extent to which noncoal mining may have adversely affected the health and safety of the public in North Carolina is not well documented.

Physical hazards from inactive and abandoned mines include unprotected mine openings (shafts), highwalls and water-filled excavations. There have been a few isolated instances in which animals have fallen into abandoned open mine shafts and one instance in which a murder victims body was disposed of in an abandoned mine shaft. There are also recorded, but not tabulated cases of drownings at abandoned and inactive sand and gravel pits and hard rock quarries.

Since 1986 there have been two fatalities related to mine accidents. One was attributed to the collapse of a trench wall on mine property and the other caused by the misfire of black powder at a dimension stone quarry. The North Carolina Department of Labor reports that the incident rate for accidents related to mining is below the majority of other industries in North Carolina (personal communication). There is no documentation of health hazards caused by ingestation, inhalation or absorption of toxic metals or ores from abandoned or inactive mines in North Carolina.

Environmental Impacts

Environmental impacts from abandoned and inactive mines can include surface and groundwater degradation and increased erosion and sedimentation resulting from waste rock and tailings material discharging into receiving waters. Environmental problems created by abandoned and inactive mines in North Carolina are not well documented. However, the Division of Environmental Management, Department of Environment, Health and Natural Resources has made a limited investigation into abandoned gold and copper mines that may be causing water quality problems. This report is attached as Appendix A.

In the western counties of Avery, Mitchell and Yancey, North Carolina, the Tennessee Valley Authority (TVA) has cited erosion from abandoned mica, feldspar and clay surface mines and associated tailings disposal sites as a major contributor to one of the ten most critical water quality problems in the Tennessee Valley (Muncy and Bollinger, 1984). Problems cited include the destruction by sediment of fish and aquatic life in over 100 miles of stream, reduction of the original storage capacity of the TVA Nolichucky Reservoir supplies in Tennessee, and polluting the upper reaches of Douglas Reservoir.

Laws and Regulations

Beginning in the mid-to-late 1960's, the State of North Carolina, as well as other states and the Federal government, began to enact and implement various laws and regulations to protect and enhance the quality of the State's water, air and land resources. The North Carolina Mining Act of 1971, was enacted to ensure that adverse impacts created by the extraction of vital mineral resources were minimized and the land returned to a useful purpose after mining is completed. The Mining Act of 1971, requires that any mining operation that disturbs more than one acre, must first obtain a permit that is predicated on filing an approvable post-mining reclamation plan and posting a predetermined reclamation bond. Other environmental laws that directly affect mining include Article 21. Water and Air Resources, G.S. 143-215.1 and G.S. 143-215.108, and G.S. 130A-290 to G.S. 130A-310.22, Solid Waste Management.

Inactive and abandoned mines (IAMs) are considered to be those sites where there is no continuing reclamation responsibility by an owner or operator. However, the North Carolina Mining Act of 1971, as amended, defines these terms somewhat differently. Prior to 1971, there was no obligation on the part of mine owners or operators to reclaim mine disturbances. Abandoned mine land that existed at the time of the enactment of the Mining Act of 1971, is exempt from the requirements of the law and considered to be abandoned, or are sometimes referred to as orphaned mine land. Abandoned is also used to denote operations in which the operator has defaulted or forfeited the bond and walked away from the site without reclaiming it. Inactive means a permitted operation that is not extracting or processing materials on site in any given year. It may become active at some time during the permit period.

Reclamation Efforts

A survey by the Soil Conservation Service in 1977, showed that about 16,700 acres in 80 counties in North Carolina were considered abandoned or orphaned mined lands in need of reclamation.

As there is no established state funding program for the reclamation of abandoned or orphaned mined lands (IAM), most of the reclamation that has been accomplished on these lands has been by natural processes. This has been quite successful in many instances.

The most notable reclamation of abandoned mine lands in North Carolina, was carried out in Avery, Mitchell and Yancey Counties by TVA in cooperation with several state agencies, local government and mine operators. Between 1980 and 1985, about 590 acres of highly erosive materials from abandoned mines and tailings disposal sites were successfully reclaimed. Total costs and in-kind services, amounted to $487,000 at an average cost of $825 per acre (Muncy, 1985).

Water quality problems created by acid mine drainage from an abandoned copper mine in Ashe County, North Carolina, is being addressed by the Division of Environmental Management, Department of Environment, Health and Natural Resources. Section 319 of the Clean Water Act authorizes states to use federal funds to conduct nonpoint source demonstration projects. The Water Quality Section, of the Division of Environmental Management has received approval from the US EPA, for a demonstration project located at the Ore Knob mine, Ashe County (McGee, personal communication). A low-cost, long-term technology developed by the State of Tennessee to treat acid mine drainage will be used. The technology involves intercepting acid drainage (typically with low levels of dissolved oxygen) as it exits the tailings area, routing it through limestone-filled trenches (capped with clay to maintain anoxic conditions) to raise the pH, and then using a wetland system as a retention area for oxidized and precipitated metals. The configuration of the Ore Knob tailings area is suitable for this type treatment system (McGee personal communication).

Some abandoned mine lands in North Carolina have been reclaimed by private landowners and mining companies to develop recreational, residential and commercial properties. There is no documentation to indicate the amount of land reclaimed in this manner, but it is believed to be relatively small.

DEFINITIONS

Water Pollution- Means the man-made or man-induced alteration of the chemical, physical, biological, or radiological integrity of the waters of the State, including, but specifically not limited to, alterations resulting from the concentration or increase of natural pollutants caused by man-made activities. GS 143-213(19)

Mine Dumps (Refuse)- Means all waste soil, rock, mineral scrap, tailings, slimes, and other material directly connected with the mining, cleaning, and preparation of substances mined and shall include all waste materials deposited on or in the permit area from other sources. GS 74-49(14)

Disturbed Land (Affected Land)- Means the surface area of land that is mined, the surface area of land on which overburden and waste is deposited, and the surface area of land used for processing or treatment plant, stockpiles, and settling ponds. GS 74-49(1)

Highwalls(1)- Means any abandoned mine-related land unprotected and dangerous vertical or near vertical rock wall created by previous mining activities.

Mine Openings(1)- Means any abandoned mine-related surface entrance to a drift, tunnel, adit, or shaft, that is large enough for a child to fall through, and is not adequately sealed or barricaded.

Subsidence Prone(1)- Means any abandoned mine land surface expression related to subsidence such as tension cracks, potholes, throughs, or cavings.

Hazardous Structures(1)- Means any abandoned mine land related structure, portion of a structure or facility that has the potential to pose a physical hazard.

(1) Terms not defined in the North Carolina General Statutes or Administrative Code. Definitions adopted informally for this report only.

Explanation of Data Summary Sheet

Data Sources

Data sources reviewed in preparing the Data Summary Sheet included the Mineral Resources Data System (MRDS) furnished by the U.S. Geological Survey; the Mineral Industry Location System (MILS) furnished by the U.S. Bureau of Mines; and Erosion and Sediment Inventory for North Carolina, a report prepared by the federal Soil Conservation Service.

Although the MRDS and MILS printouts contained numerous records of active and abandoned mines and prospects in North Carolina, neither data system contained any information on acreage. The Erosion and Sediment Inventory for North Carolina was the only source of data that included a county listing of acres of abandoned surface mines needing reclamation. Therefore, it was the single source of data used in compiling the Data Summary Sheet for North Carolina.

Cost Analysis

The federal Soil Conservation Service data only included land disturbed by surface mining. It did not include distinguishment by mineral type or reference to health and safety problems or environmental effects, other than to establish an erosion rate attributable to surface mining on a state-wide bases.

The report listed 16,700 acres of abandoned surface mines in need of reclamation and 7,000 acres of abandoned surface mines not in need of reclamation. As the report did not distinguish mineral type, the writer attempted to establish acreage attributable to metallic ores, construction ores and industrial ores subjectively based on personal knowledge of the mineral resources and mining industry in North Carolina. This breakdown resulted in 834 acres(5 percent) attributed to metallic ores, 12,342 acres(74 percent) attributed to construction ores, and 3,524 acres (21 percent) attributed to industrial ores.

In 1987, the Land Quality Section of the Division of Land Resource (NCNR&CD) conducted a state-wide study to establish an estimated reclamation cost per acre of the several categories and types of mining in North Carolina (see Appendix E). This study was conducted to assist the North Carolina Mining Commission in establishing a revised bonding schedule for permitted mining operations.

Based on this information an average cost of $1,500 per acre was chosen for reclaiming metallic ore mines, $1,200 per acre for reclaiming construction ore mines, and $1,850 per acre for reclaiming industrial ore mines.

Deficiencies of Data

The source of abandoned mine land data used in this report was compiled in 1977 and may be out-of-date. Furthermore, it was part of a much broader study to establish erosion rates for a wide range of land uses and was not a single focus study. The writer has applied subjective interpretations to the data and therefore the resulting cost analysis may be in substantial error.

NON-COAL INVENTORY
INACTIVE/ABANDONED MINES[1]

State of North Carolina

Agency Contact Land Resources

Telephone (919) 733-3833

DATA SUMMARY[2,3]

MINERAL TYPE (acres)[4]	MINING TYPE (acres)		OWNERSHIP (acres)		FEATURES	(units)	(cost)
Metallic Ores Gold Copper Iron Others	Mines	834	Federal		Polluted Water[8]	(miles)	(cost)[16]
	Millsites		Private	834	Mine Dumps[9]	(acres)	
	Smelters		State		Disturbed Land[10]	(acres) 834	1,251,000
	Other[5]		Other[6]		Highwalls[11]	(miles)	
					Mine Openings[12]	(number)	
					Subsidence Prone[13]	(acres)	
					Hazardous Structures[14]	(number)	
					Other[15]	(units)	
Construction Ores Crushed Stone Sand & Gravel Dimensions Stone Others	Mines	12342	Federal		Polluted Water	(miles)	
	Millsites		Private	12342	Mine Dumps	(acres)	
	Smelters		State		Disturbed Land	(acres) 12342	14,810,400
	Other		Other		Highwalls	(miles)	
					Mine Openings	(number)	
					Subsidence Prone	(acres)	
					Hazardous Structures	(number)	
					Other	(units)	
Industrial Ores Clays Feldspar Mica Pyrophyllite Others	Mines	3524	Federal		Polluted Water	(miles)	
	Millsites		Private	3524	Mine Dumps	(acres)	
	Smelters		State		Disturbed Land	(acres) 3524	6,519,400
	Other		Other		Highwalls	(miles)	
					Mine Openings	(number)	
					Subsidence Prone	(acres)	
					Hazardous Structures	(number)	
					Other	(units)	

(1) Enough data was not available to differentiate types of features.
All AML lands included under "Disturbed Land".

DATA SUMMARY[2,3] - Page 2

MINERAL TYPE (acres)[4]	MINING TYPE (acres)		OWNERSHIP (acres)		FEATURES	(unit)	(cost)
Phosphate Rock	Mines		Federal		Polluted Water[8]	(miles)	(cost)[16]
	Millsites		Private		Mine Dumps[9]	(acres)	
	Smelters		State		Disturbed Land[10]	(acres)	
	Other[5]		Other[6]		Highwalls[11]	(miles)	
					Mine Openings[12]	(number)	
					Subsidence Prone[13]	(acres)	
					Hazardous Structures[14]	(number)	
					Other[15]	(units)	
Uranium Overburden	Mines		Federal		Polluted Water	(miles)	
	Millsites		Private		Mine Dumps	(acres)	
	Smelters		State		Disturbed Land	(acres)	
	Other		Other		Highwalls	(miles)	
					Mine Openings	(number)	
					Subsidence Prone	(acres)	
					Hazardous Structures	(number)	
					Other	(units)	
Oil Shale	Mines		Federal		Polluted Water	(miles)	
	Millsites		Private		Mine Dumps	(acres)	
	Smelters		State		Disturbed Land	(acres)	
	Other		Other		Highwalls	(miles)	
					Mine Openings	(number)	
					Subsidence Prone	(acres)	
					Hazardous Structures	(number)	
					Other	(units)	
Other (acres)[7]	Mines		Federal		Polluted Water	(miles)	
	Millsites		Private		Mine Dumps	(acres)	
	Smelters		State		Disturbed Land	(acres)	
	Other		Other		Highwalls	(miles)	
					Mine Openings	(number)	
					Subsidence Prone	(acres)	
					Hazardous Structures	(number)	
					Other	(units)	
TOTAL	Mines	16700	Federal		Polluted Water	(miles)	
	Millsites		Private	16700	Mine Dumps	(acres)	
	Smelters		State		Disturbed Land	(acres) 16700	22,580,800
	Other		Other		Highwalls	(miles)	
					Mine Openings	(number)	
					Subsidence Prone	(acres)	
					Hazardous Structures	(number)	
					Other	(units)	

References Cited

McGee, Beth, 1991, Summary of the Ore Knob mines project, personal communication, Department of Environment, Health, and Natural Resources, Raleigh.

Muncy, Jack A., and Bollinger, Roger W., 1984, "Orphans of the Valley," a status report on abandoned surface mines in the Tennessee Valley, Vol. 1, Knoxville, P. 9-10.

_______________, 1985, Reclamation of abandoned mica, feldspar, and kaolin mines and associated tailings disposal sites in western North Carolina, a paper presented at the second annual meeting of the American Society for Surface Mining and Reclamation, Denver, Colorado, Oct 8-10, 1985.

Soil Conservation Service, 1977, Erosion and sediment inventory for North Carolina, Raleigh, Table 9.

Stuckey, Jasper L., 1965, North Carolina: It's geology and mineral resources, N. C. Department of Conservation and Development, Raleigh, p. 273.

White, Doss H., Jr., 1989. The mineral industry in North Carolina in 1989, Mineral industry surveys, Bureau of Mines, Washington.

APPENDIX A

NONPOINT SOURCE ASSESSMENT
REPORT

APRIL 1989
FINAL REPORT

NORTH CAROLINA DEPARTMENT OF ENVIRONMENT, HEALTH,
AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL MANAGEMENT
WATER QUALITY SECTION

REVISED DECEMBER 1989

This report has been approved for release:
R. Paul Wilms,
Director

James G. Martin
Governor

William W. Cobey, Jr.
Secretary

heavy industrial development where availability of municipal sewer systems is limited.

From the 795 systems inventoried, five facilities were chosen for detailed study of their impact on groundwater. Selection of these facilities was based on geographic region, type of facility, age, and agreement to cooperate in the research project. The chosen facilities are a good cross-section of the different types of facilities inventoried.

In conjunction with Water Quality staff, plans are being developed to monitor the effects of golf courses on groundwater quality. Monitoring wells will be installed at four courses to monitor pesticides and nutrients. An environmental fate model (PRZM) will be used to predict the behavior of pesticides used on golf courses.

A plan to monitor the impact of agricultural pesticide use on groundwater quality is being developed in cooperation with an interdepartmental coordinating committee. Completion of the plan in 1989 will assist in providing information on the impact of pesticide application on groundwater and lead to improved pesticide application practices where problems are identified.

ABANDONED GOLD AND COPPER MINES

Of the several types of abandoned mines in North Carolina, orphan gold mines may present a significant toxicant problem. Former gold mining practices involved using mercury as an amalgamation substance. Mercury combines with and adheres to gold fragments, increasing the weight of those fragments and thus facilitating separation from other particles. The use of liquid mercury in past mining methods often led to its being lost to the stream in formidable quantities. The areal extent of residual mercury in stream beds of the old gold districts is unknown but thought to be considerable. Several of the Land Quality personnel know of mercury existing in stream beds of previously worked deposits. In fact, amalgamated mercury can actually be found when panning for gold today.

Recently members of the Water Quality Section located several abandoned gold mines to investigate impacts on streams in the area from sediment, tailing piles, and former mining practices. Most of these sites have naturally revegetated. Water quality samples were collected and analyzed for mercury and other metals from several streams flowing through North Carolina's abandoned gold mining districts. Fish tissue samples were also taken from the same streams. Table 32 lists water quality data collected from grab samples at several streams near abandoned gold mines and an abandoned copper-zinc mine. Additional samples have been taken at other sites and a complete report will be prepared once these samples have been analyzed.

The copper-zinc mine (Ore Knob, Gentry Creek, New River basin, Ashe County) has low pH (2.8 to 2.9), and high levels copper (up to 770 ug/l compared to a water quality standard ug/l) and zinc (up to 850 ug/l compared to a standard of [illegible] ug/l). The tailings pond has low pH and high zinc and coppe well. Low pH is also suspected from two other mines (Table In addition, areas of abandoned pyrophyllite mines may have pH runoff but have not been thoroughly investigated.

Streams from two abandoned gold mine areas, Moore County McDowell County areas, show no evidence of mercury and littl evidence of other heavy metal pollution from a total of 12 samples. Iron, aluminum, and manganese are the only element consistently above detection. These compounds are ubiquitou streams, but the levels are low.

In samples of sediment and water from South Muddy Creek aluminum, iron, and manganese levels are higher (as expected which reflects levels of these elements in the stream sedim In addition, low levels of chromium, copper, zinc, and lead also present in the stirred samples from the lowest station the watershed. In the holding pond (no discharge, complete recycle) at the Imperial Gravel Co. site where gold and mer are recovered from stream gravels and other ores, low level chromium, copper, and zinc were detected but not mercury. appears that heavy metal pollution of the water is not a pr in these McDowell County abandoned gold mine areas.

Samples from the Second French Broad River below Vein Mountain Church, South Fork of Muddy Creek, Bear Creek, and Creek revealed that low levels (or none in the case of Cabi Creek) of mercury were present in fish tissue. All samples less than the FDA action level for mercury (1.0 mg/kg). Ho mercury levels were somewhat higher than statewide averages indicates that mercury entered these watersheds in the past is persisting in the fish. Additional work is planned at a site to confirm these conclusions.

Table 33 lists mines thought likely to be causing water quality problems. Several of these were site-visited and w quality problems are noted. The most obvious problem (pend results of the mercury work discussed above) is sediment (tailings and/or larger stones) which have filled in portic these streams making them unsuitable for aquatic life. Sir these mines were abandoned well before enactment of the Mir Act in North Carolina (1971), they are orphaned and not sub to the Act. There is no abandoned mine reclamation fund ir Carolina.

Table 32

Water Quality Sampling (grab) from Selected Abandoned Mine Streams

Element	Ore Knob mine (copper-zinc mine)			Moore County area (gold mines)			Mc Dowell County area (gold mines)								
										South Muddy Creek					
										lowest station		middle station		upper station	
	Pond	Discharg	Gentry Creek	Simlin Creek	Cabin Ck nr Dry Ck	UT Cabin Creek	Second Broad Rv up gravel co.	Gravel co Settling pond	Second Broad Rv dw gravel co	Clear	Stirred	Clear	Stirred	Clear	Stirred
Date sampled	9/29/87	9/29/87	9/29/87	6/7/88	6/7/88	5/27/88	6/8/88	6/8/88	6/8/88	6/8/88	6/8/88	6/8/88	6/8/88	6/8/88	6/8/88
pH	2.8	2.9	-	7.0	7.1	-	7.5	-	7.3	7.35	7.35	7.2	7.2	7.2	7.[illegible]
Cadmium ug/l	<10	<10	<10	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	<2.0	<2.0
Chromium ug/l	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	-	<25	<2[illegible]
Copper ug/l	770	530	330	<10	<10	<10	<10	59	<10	<10	13	<10	-	<10	<10
Nickel ug/l	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	-	<50	<50
Lead ug/l	<50	<50	<50	<10	<10	<10	<10	<10	<10	<10	14	<10	-	<10	<10
Zinc ug/l	740	850	850	<10	<10	18	<10	59	<10	<10	30	<10	-	<10	<10
Silver ug/l	-	-	-	<25	<25	<25	<25	<25	<25	<25	<25	<25	-	<25	<25
Aluminum ug/l	-	-	-	50	100	50	230	230	150	100	15,000	100	-	50	4,100
Beryllium ug/l	-	-	-	<25	<25	<25	<25	<25	<25	<25	<25	<25	-	<25	<25
Cobalt ug/l	-	-	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	-	<50	<50
Iron ug/l	-	-	-	1,100	720	160	410	410	340	500	38,000	440	270	6,100	
Lithium ug/l	-	-	-	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
Manganese ug/l	-	-	-	130	45	1,100	<25	<25	<25	<25	370	<25	-	<25	
Arsenic ug/l	-	-	-	<10	<10	-	<10	<10	<10	<10	<10	<10	-	<10	<10
Selenium ug/l	-	-	-	<5	<5	-	<5	<5	<5	<5	<5	<5	-	<5	
Mercury ug/l	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	<0.2

Table 33

Abandoned Mines Likely Causing Water Quality Problems

Mine Name	River Basin	County	Receiving Stream	Index #	Comments	Citation
unknown	Watauga	Watauga	Laurel Fork Creek	8-10	active and abandoned	Hickey, 1988
unknown	Watauga	Avery	Cranberry Creek	8-22-16	magnetite mine, sediment	Dr. Callahan ASU
Henry Knob	Catawba	Gaston	UT S. Fork Crowders Creek	11-135-10-0.5	in S.C., acidic	DLQ
Ore Knob	New	Ashe	Little Peak and Gentry Creeks	10-1-35-4	acidic, Zn, Cu	DLQ, DEM
Elk Knob	New		Little Creek	10-1-10-1	acidic, Cu	Kinkel, 1967
unknown	New	Ashe	Three Top Creek	10-2-13		Hickey, 1988
Howie	Catawba	Union	E. Fork Twelve Mile Creek	11-138-2		Pardee & Park, 1948
various mines (n=9)	Cape Fear	Moore	Cabin, Dry, Wet Creeks	17-26-5-1	Hg, sediment	Pardee & Park, 1948
Gardner Hill	Cape Fear	Guilford	Reddicks Creek	17-8		Pardee & Park, 1948
Cotton	Cape Fear	Moore	Deep River	17-(31)		Pardee & Park, 1948
Thompson	Yadkin-Pee Dee	Stanley	Mountain Creek	13-28		Carpenter, 1976
Silver Hill	Yadkin-Pee Dee	Davidson	Battle Brook	12-121		Pardee & Park, 1948
Conrad Hill - Dodge Hill	Yadkin-Pee Dee	Davidson	Fourmile Creek	12-124		Carpenter, 1976
Sawyer	Yadkin-Pee Dee	Randolph	Caraway Creek	13-2-3-(1) and (4)		Pardee & Park, 1948
Parker	Yadkin-Pee Dee	Stanley	Uwharrie River	13-2-(1.5)		Pardee & Park, 1948
Ida	Yadkin-Pee Dee	Davidson	Duncombe Creek	13-2-17		Pardee & Park, 1948
Crayton	Yadkin-Pee Dee	Cabarrus	Little Meadow Creek	13-17-14		Pardee & Park, 1948
Union copper	Yadkin-Pee Dee	Rowan	Little Bear Creek	13-17-31-5-1		Carpenter, 1976
Nash	Yadkin-Pee Dee	Cabarrus	UT Dutch Buffalo Creek	13-17-11-(5)-.5		Pardee & Park, 1948
Dixie Queen	Yadkin-Pee Dee	Cabarrus	UT Anderson Creek	13-17-13-1		Pardee & Park, 1948
Clegg	Cape Fear	Lee				Carpenter, 1976
Blue Wing		Granville				Carpenter, 1976
Cross Cut		Person				Carpenter, 1976
Russell	Yadkin-Pee Dee	Montgomery			Hg?, sediment	Pardee & Park, 1948
Sally Coggins	Yadkin-Pee Dee	Montgomery			Hg?	Pardee & Park, 1948
Palmer	Yadkin-Pee Dee	Montgomery			Hg?, sediment	Pardee & Park, 1948
various mine	Broad	McDowell	South Muddy Creek		Hg?	DEM, DLQ
various mine	Broad	McDowell	Second Broad River		Hg?	DEM, DLQ

XI. REFERENCES

Callahan, J.E. 1988. Personal communication. Appalachian State University. Boone, N.C.

Carpenter, A.P.,III. 1976. Metallic Mineral Deposits of the Carolina Slate Belt. North Carolina Bulletin #84. NCDNRCD, DLR, Geologic Survey Division.

Doucette, W.H. and J.A. Phillips. 1978. Overview: Coastal Land Drainage for Agriculture and Forestry in the North Carolina Coastal Zone. Report No. 8. Center for Rural Development, NCSU. Raleigh, N.C.

Hefner, John M. and James D. Brown. 1984. Wetland Trends in the Southeastern United States. USFWS, Atlanta. Wetlands, Vol 4:1-11.

Kinkel, Arthur R. Jr. 1967. The Ore Knob Copper Deposit, North Carolina, and other Massive Sulfide Deposits of the Appalachians. Geologic Survey PP#558.

Mickey, J.H. 1988. Personal communication. Inland Fisheries, North Carolina Wildlife Resources Commission. Winston-Salem.

Moorhead, K.K. 1988. The National Wetlands Inventory in North Carolina. Proceedings of the Symposium on Coastal Water Resources. American Water Resources Association. Wilmington, N.C.

NCDNRCD Division of Environmental Management, Water Quality Section. 1985. Assessment of Surface Water Quality in North Carolina. Report No. 85-01. Raleigh, N.C.

NCDNRCD Division of Environmental, Water Quality Section. 1986. Water Quality Progress in North Carolina, 1984-1985 305-b Report. Raleigh, N.C.

NCDNRCD Division of Environmental Management, Water Quality Section. 1988. Water Quality Progress in North Carolina, 1986-1987 305-b Report. Report No. 88-02 Raleigh, N.C.

NCDNRCD Division of Environmental Management, Water Quality Section. 1989. North Carolina Nonpoint Source Management Program. Raleigh, N.C.

Omernik, J.M. and A.L. Gallant. 1986. Ecoregions of the Pacific Northwest. EPA/600/3-86/033.

Pardee, J.T. and C.F. Park, Jr. 1948. Gold Deposits of the Southern Piedmont. United States Geologic Survey. PP213.

U.S. Department of Commerce, National Oceanic and Atmospheric Administration, 1985. [illegible]. Washington, D.C.

U.S. Environmental Protection Agency. 1987. Nonpoint Source Guidan Office of Water, U.S. Environmental Protection Agency. Washington D.C.

Summary of Ore Knob Mine Project

Section 319 of the Clean Water Act authorized states to use federal funds to [illegible] projects. The Division of Environmental Management (DEM), Water Quality Section, has received approval from US EPA for a demonstration project located at Ore Knob Mine in Ashe County.

This demonstration project will address acid drainage from an abandoned metal mine in Ashe County. Abandoned in the 1960's, the mine has been unaffected by reclamation requirements of the N.C. Mining Act of 1971. There has been much public concern over the acid drainage from this site.

The State of Tennessee has been involved in the development of a low-cost, long-term technology to treat acid mine drainage. Using this method, called anoxic alkaline drains, they have successfully treated acid mine drainage from coal mines and documented biological recovery in receiving surface waters. The technology involves intercepting acid seepage (typically with low levels of dissolved oxygen) as it exits the tailings area, routing it through limestone-filled trenches (capped with clay to maintain anoxic conditions) to raise pH, and then using a wetland system as a retention area for oxidized and precipitated metals. Tennessee estimates that a high grade limestone will remain effective for greater than 20 years. The configuration of the Ore Knob tailings area is suitable for this type treatment system.

LAND DISTURBED BY SURFACE MINING

Table 9
Page 1 of

North Carolina

County	1/ Active Mining Under Permit	2/ Abandoned Surface Mines Needing Reclamation	Total Surface Mines Needing Reclamation	2/ Abandoned Surface Mines Not Needing Reclamation	Total Distur Surfac
	Acres	Acres	Acres	Acres	Acr
Alamance	124	2	126	15	14
Alexander	5	10	15	5	2
Alleghany	16	0	16	0	1
Anson	283	2,514	2,797	300	3,09
Ashe	9	10	19	8	2
Avery	147	78	225	0	22
Beaufort	1,121	5	1,126	60	1,18
Bertie	50	100	150	50	17
Bladen	66	0	66	10	7
Brunswick	12	27	39	90	12
Buncombe	184	113	297	4	30
Burke	58	50	108	488	59
Cabarrus	159	285	444	15	45
Caldwell	22	0	22	250	27
Camden	4	10	14	20	3
Carteret	0	0	0	0	
Caswell	47	0	47	25	7
Catawba	74	45	119	3	12
Chatham	179	110	289	200	48
Cherokee	74	25	99	17	11
Chowan	0	48	48	51	9
Clay	12	17	29	4	3
Cleveland	51	6	57	78	13
Columbus	16	150	166	150	31
Craven	231	50	281	50	33
Cumberland	219	615	834	54	88
Currituck	37	30	67	60	12
Dare	14	3	17	6	2
Davidson	370	60	430	82	51
Davie	36	0	36	0	3
Duplin	46	5	51	0	5
Durham	140	40	180	0	18
Edgecombe	187	80	267	408	67
Forsyth	128	0	128	20	14
Franklin	39	10	49	0	4
Gaston	157	30	187	0	18
Gates	2	1	3	0	
Graham	0	2	2	3	
Granville	43	10	53	30	8
Greene	0	68	68	100	16
Guilford	321	96	417	58	47
Halifax	38	475	513	0	51
Harnett	1,377	1,210	2,587	125	2,71
Haywood	16	31	47	31	[illegible]

1/ Active surface mines under permit required by N.C. Mining Act of 1971. Data suppl Land Quality Section, N.C. Department of Natural Resources & Community Development March 18, 1977.

2/ Data obtained by individual county survey by Soil Conservation Service field perso January 1974.

[illegible]

North Carolina

County	1/ Active Mining Under Permit Acres	2/ Abandoned Surface Mines Needing Reclamation Acres	Total Surface Mines Needing Reclamation Acres	2/ Abandoned Surface Mines Not Needing Reclamation Acres	Total Land Disturbed By Surface Mining Acres
Henderson	175	90	265	50	315
Hertford	55	6	61	12	73
Hoke	0	15	15	12	27
Hyde	0	0	0	1	1
Iredell	83	100	183	0	183
Jackson	43	20	63	0	63
Johnston	164	3,500	3,664	100	3,764
Jones	26	0	26	10	36
Lee	261	1	262	0	262
Lenoir	73	26	99	0	99
Lincoln	0	0	0	45	45
McDowell	132	70	202	408	610
Macon	91	133	224	74	298
Madison	29	0	29	0	29
Martin	0	50	50	0	50
Mecklenburg	238	40	278	40	318
Mitchell	180	1,312	1,492	80	1,572
Montgomery	128	225	353	150	503
Moore	286	944	1,230	235	1,465
Nash	81	67	148	45	193
New Hanover	521	100	621	50	671
Northampton	29	510	539	350	889
Onslow	60	0	60	9	69
Orange	51	5	56	7	63
Pamlico	0	0	0	0	0
Pasquotank	4	15	19	45	64
Pender	11	15	26	10	36
Perquimans	0	3	3	7	10
Person	0	3	3	3	6
Pitt	122	25	147	125	272
Polk	9	0	9	0	9
Randolph	58	35	93	332	425
Richmond	119	16	135	2	137
Robeson	6	0	6	0	6
Rockingham	229	0	229	15	244
Rowan	205	450	655	100	755
Rutherford	16	28	44	28	72
Sampson	67	40	107	50	157
Scotland	18	100	118	100	218
Stanly	168	2	170	65	235
Stokes	32	0	32	3	35
Surry	156	110	266	110	376
Swain	0	15	15	0	15
Transylvania	13	3	16	0	16

1/ Active surface mines under permit required by N.C. Mining Act of 1971. Data supplied by Land Quality Section, N.C. Department of Natural Resources & Community Development, March 18, 1977.

2/ Data obtained by individual county survey by Soil Conservation Service field personnel, January 1974.

LAND DISTURBED BY SURFACE MINING

North Carolina

County	1/ Active Mining Under Permit Acres	2/ Abandoned Surface Mines Needing Reclamation Acres	Total Surface Mines Needing Reclamation Acres	2/ Abandoned Surface Mines Not Needing Reclamation Acres	Total Disburbed Surface Acres
Tyrrell	0	1	1	1	2
Union	106	154	260	134	39
Vance	89	0	89	0	8
Wake	231	113	344	449	79
Warren	0	0	0	0	[illegible]
Washington	0	3	3	7	1
Watauga	19	40	59	200	25
Wayne	108	500	608	488	1,09
Wilkes	38	125	163	125	28
Wilson	220	150	370	50	42
Yadkin	26	5	31	3	3
Yancey	136	1,114	1,250	0	1,25
TOTAL FOR NORTH CAROLINA	11,005	16,700	27,705	7,000	34,70

1/ Active surface mines under permit required by N.C. Mining Act of 1971. Data suppli Land Quality Section, N.C. Department of Natural Resources & Community Development, March 18, 1977.

2/ Data obtained by individual county survey by Soil Conservation Service field person January 1974.

[illegible] NORTH CAROLINA

[illegible]

FOR ACTIVE AND INACTIVE MINES*

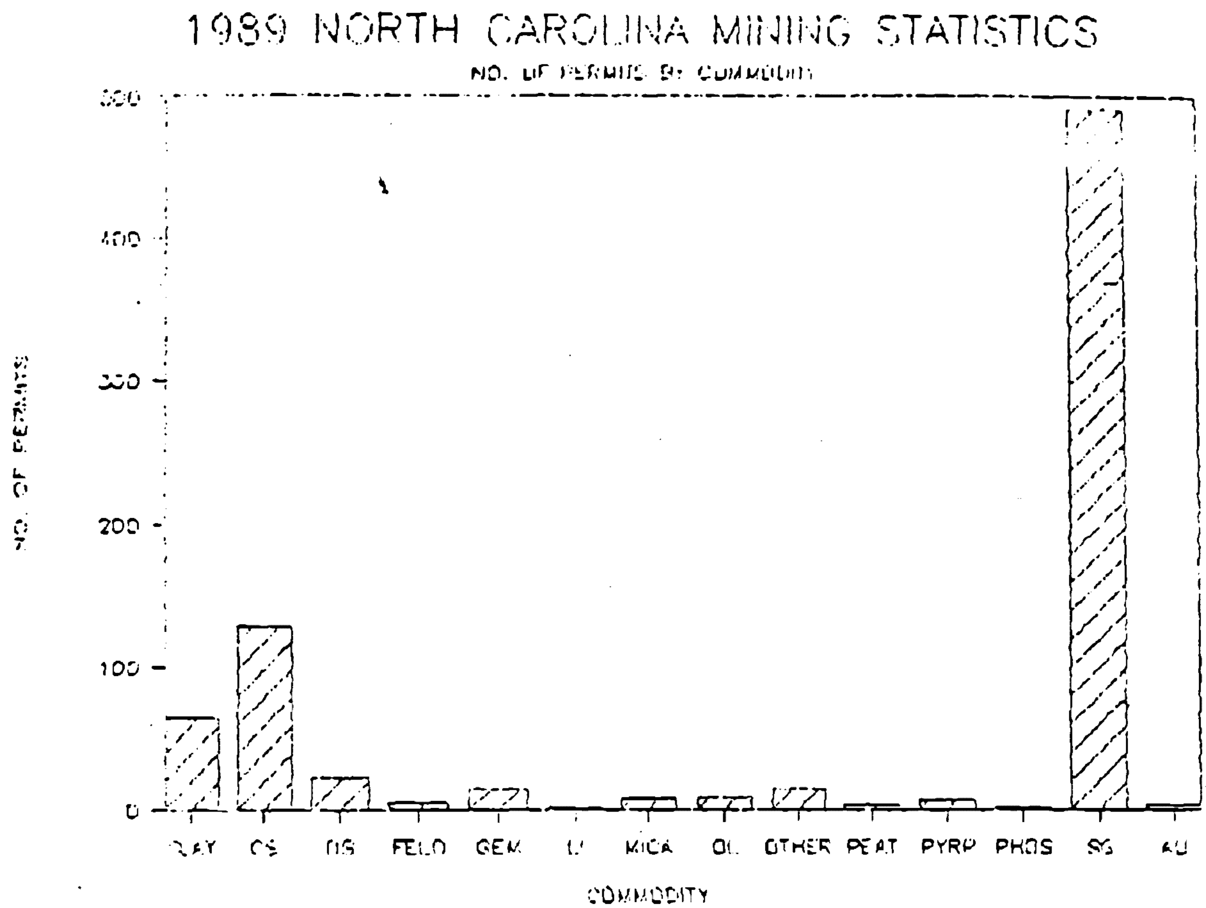
COMMODITY	NO. OF PERMITS	NET ACRES DISTURBED IN 1989	TOT. ACRES RECL./REL. IN 1989**	TOT. ACRES AFFECTED & UNRECLAIMED	EST. OF TOT. ACRES PERMITTED
Clay/Shale(CLAY)	64	5	51	1780	9504
Crushed Stone(CS)	129	120	457	7320	26792
Dimension Stone(DS)	23	0	6	231	1377
Feldspar(FELD)	5	0	11	189	487
Gemstone(GEM)	15	0	5	62	233
Lithium(LI)	2	0	22	622	988
Mica(MICA)	6	0	6	349	948
Olivine(OL)	9	0	9	92	523
Other(OTHER)	15	3	19	125	499
Peat(PEAT)	3	0	7949	197	3745
Pyrophyllite(PYRP)	7	1	3	119	649
Phosphate(PHOS)	2	140	0	8400	13420
Sand/Gravel(SG)	491	167	399	5846	18051
Gold(AU)	3	31	0	51	173
TOTALS	776	467	8937	25383	77419

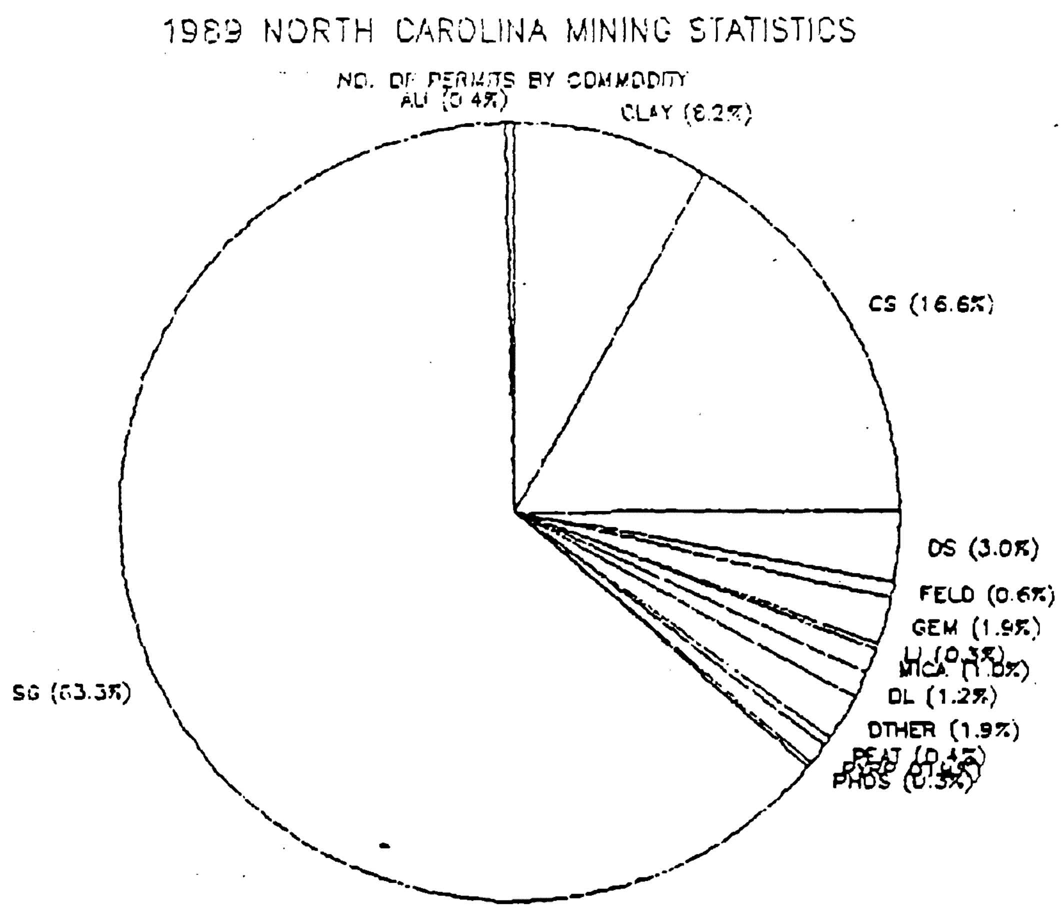
* Statistics are based upon Annual Reclamation Reports submitted by each mine operator and validated by our regional office field staff. As validations are still in the process of being inputed into our statewide computer database from which these statistics are derived, these figures should be considered approximate.

** This does not reflect reclamation in progress.

TOTAL NUMBER OF MINES ON INVENTORY

YEAR	ACTIVE	INACTIVE	RELEASED	TOTAL
1988	603	126	365	1094
1989	653	123	373	1149


1989 NORTH CAROLINA MINING STATISTICS
NO. OF PERMITS BY COMMODITY
400
300
200
100
0
CS
DS
FELD
GEM
MICA
OTHER
PEAT
PYRP
PHOS
SG
COMMODITY

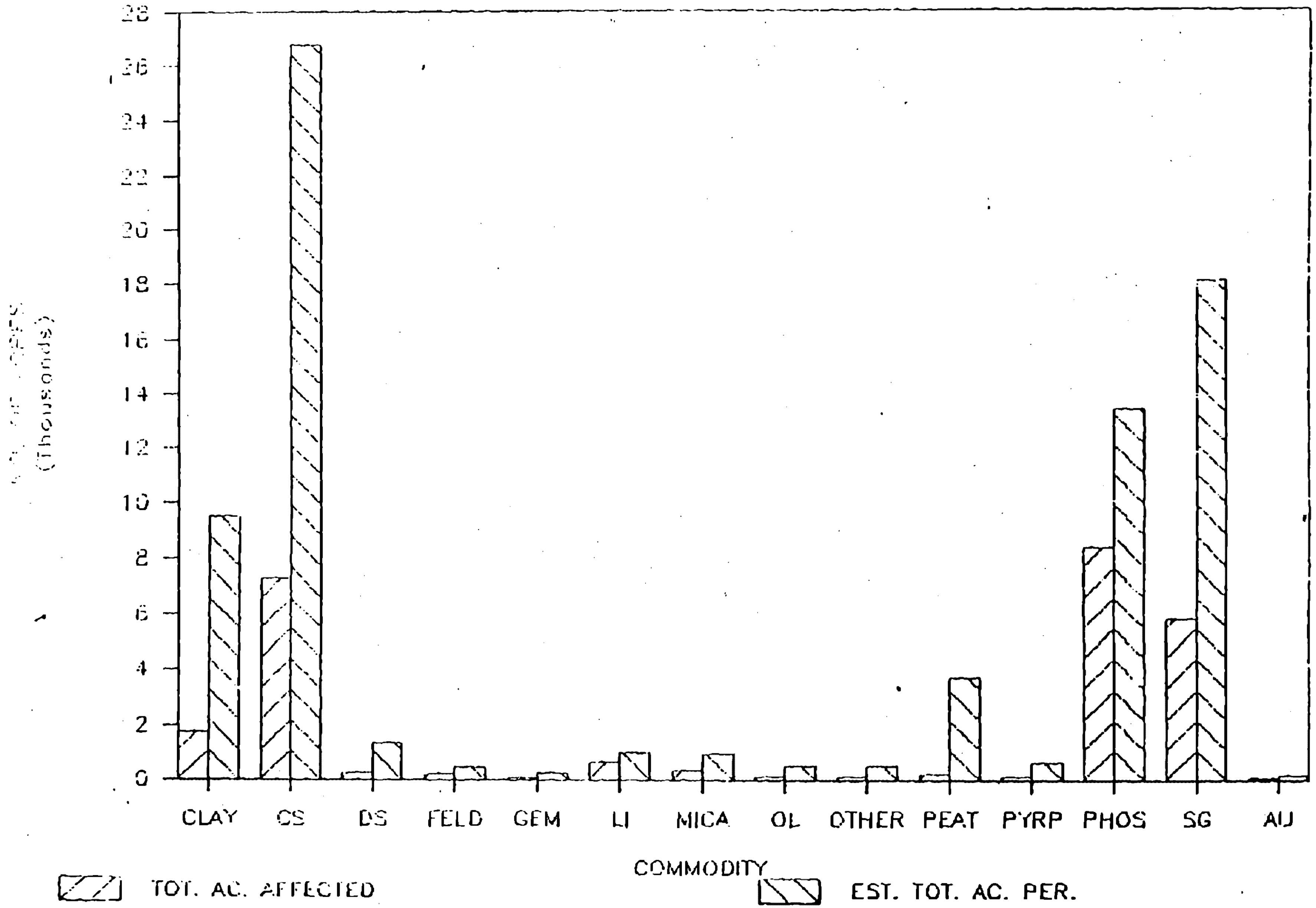

1989 NORTH CAROLINA MINING STATISTICS
NO. OF PERMITS BY COMMODITY
CS (16.6%)
DS (3.0%)
FELD (0.6%)
GEM (1.9%)
DL (1.2%)
OTHER (1.9%)
PHOS (0.3%)

CATEGORIES OF NORTH CAROLINA MINES

CATEGORY & TYPE	MINING CHARACTERISTIC RELATIVE TO BONDING	ESTIMATED RECLAMATION COST/ACRE
I. Quarry	Deep excavation in rock, slow lateral expansion; generally, separate overburden pile (often extensive); processing plant; stockpile, haulage, and plant area are well compacted requiring subsoiling before revegetation but useful for commercial/industrial use.	
A. Crushed Stone		A. $1,500.00 - $2,500.00
B. Industrial		B. $1,500.00 - $2,500.00
C. Dimension Stone	Lateral expansion for dimension stone quarries is even slower. Minimum of waste.	C. $1,500.00 - $2,500.00
II. Clay Mines		
A. Triassic Sedimentary Rock Orgin	Processing confined to separate industrial site Generally little overburden waste; sediment basins often required; usually relatively shallow excavation relative to size of disturbance; nature of operation often requires large areas to remain active to provide various blends of ore or to weather to a usuable form.	A. $1,500.00 - $2,000.00
B. Weathered from underlying metamorphic origneous rock		B. $1,500.00 - $2,000.00
III. Sand & Gravel		
A. Borrow Pits (Sandrock)	Often steep-sided and near residential areas; maximum depth approximately 40 feet. Little waste; differential weathering of material forces operator to leave mound-like islands of rock scattered within pit.	A. $1,500.00 - $2,000.00
B. "Eastern Sand Pits	Located east of the "fall line," usually less than 10 acres, and less than 25 feet deep; internal drainage; usually pit becomes pond but may be very shallow if clay pan encountered.	B. $1,000.00 - $1,500.00
C. Piedmont River Sand Operations	Mostly dragline but sometimes dredge operating intermittenly; little onsite processing other than screening; river bank vegetation removed; some river bank erosion; disturbed areas generally revegetate naturally within two years.	C. $800.00 - $1,200.00

1989 NORTH CAROLINA MINING STATISTICS

TOT.AC. AFFECTED VS. TOT.AC. PERMITTED



	D. Piedmont Sand & Gravel Pits	Located in the vicinity of "fall line." Often large scale operations with large processing plants and settling ponds. Rapid lateral expansion.	$1,200.00 - $2,000.00
	E. Western Alluvian Sand & Gravel	Located in floodplain of high velocity streams; highly flood-prone.	$1,200.00 - $2,000.00
IV.	Gemstone	Small scale tourist mines; sufficient waste and overburden to completely backfill mine excavation.	$800.00 - $1,200.00
V.	Peat	Large Scale-shallow excavations in low-lying coastal areas requiring extensive site drainage for mining and reclamation for agriculture; nature of mining leaves relatively level areas which will readily revegetate naturally; typical reclamation plan calls for agricultural (row crops) use to follow mining.	Unknown-but relatively low cost per acre. Drainage cost may also be included.
VI.	Phosphate	Large scale deep excavation in coastal area requiring large plant and settling ponds and extensive ground-water pumping; nature of operation economically permits only large operations to mine.	Unknown-backfilling of old pit associated with stripping of new mine areas.

OHIO

Inactive & Abandoned Mine Data
State of Ohio Narrative Summary

Introduction

Minerals mining in the State of Ohio began by aboriginal peoples with the excavation of flints & clays and the production of salt from brine seeps in areas now designated as Licking, Jackson, and Washington Counties. With the migration of European settlers into Ohio, many mineral industries came into being starting in 1788 with brick making in Washington County. Although flint production today is used mostly in the creation of jewelry, the salt industry has developed to over 3.5 million tons in 1988.

Non-coal mining in Ohio has produced a variety of mineral commodities including metallic, construction, and industrial ores. Although iron ore production in Ohio lead the country during the Civil War, this industry no longer exists. Construction ores include limestone, sandstone, and sand & gravel. Industrial ores include limestone sand, clay, shale, gypsum, and silica. Almost 98.5 million tons of minerals were producted in 1989. Limestone was the leading producer in Ohio and in the nation in 1990.

Mining

Three basic mining methods have been employed in Ohio to extract noncoal minerals. They include underground, surface, and dredging. Underground mines for salt, gypsum, and limestone involves the development of shafts, adits, and tunnels to access the mineral. Waste rock generated from these mines is either spoiled within the underground portion of the mine or hauled and dumped at the ~~most~~ convenient location adjacent to the mine. These dumps are located on a variety of terrain including both flat land and hillside. Open pit surface mining has been utilized in the production of both metallic deposits and most construction and industrial ores. This method of mineral extraction consists of drilling and blasting the ore, excavating an open pit or cut, and hauling waste ore to a waste dump or using it as backfill in the reclamation process and taking the ore to the processing area. Dredging operations involve the use of floating dredges, dragline, hydraulic back hoe, and slackline cableway.

Processing of iron ore through the use of furnaces ceased sometime after the civil war and the furnaces today are only of historic value. Processing of construction and industrial ores have not changed much in the process although equipment today is much more refined.

Tailings and waste materials which resulted from mineral processing were disposed of in a variety of ways. The majority were disposed of in the most convienent manner without any thought to reclamation. Typically, waste materials ended up in stream channels or other low points down slope from the processing area. If water was necessary to the process, then some operations constructed impoundments in order that water would be recycled in the process, but these operations were in the minority.

Health and Safty Impacts

Non-coal mining methods have created some of the most severe safety hazards in Ohio. Physical hazards including unprotected mine openings, highwalls, flooded excavation, hazardous structures, and subsidence features which threaten public safety across the state. Health hazards are relatively minimal although inhalation of blowing dust from unreclaimed fines piles could have some effect.

Inactive/abandoned mine areas in Ohio have multiple use such as residential hunting or all terrain vehicles. The public is exposed to unprotected mine openings and subsidence features. Abandon mine structures often appear structurally intact but rotten wood, rusty metal, and deteriorated foundations have weakened many of the structures. Cave-ins, collapse of unstable slopes, drowning at flooded excavations and careless people have claimed numerous lives.

Health hazards are minimal as the majority of old mining areas have established volunteer vegetation and are not contributing heavily to air pollution.

Environmental Impacts

Abandoned mines in Ohio have impacted thousands of acres of residential, commercial, recreational and agricultural land in two ways. First, because of the lack of reclamation, these areas have not been returned to land uses which existed prior to mining, and secondly they have had an effect on lands adjacent to their location. Contaminants are transported in the environment through air, ground water, and surface water pathways. Sources of this environmental pollution include acid mine drainage, air borne particulates, and sediments.

Surface and groundwater at inactive/abandoned mines are impacted by leaching and increased sedimentation resulting from waste materials discharging into receiving streams. Rain and snow melt percolating through and eroding waste materials transport dissolved metals to receiving groundwater and surface waters. Elevated metal concentrations in receiving streams have impacted fisheries populations and aquatic ecosystems in many drainages in the eastern and southeastern parts of the State.

Acid mine drainage from underground workings and surface excavations located in the coal bearing counties in Ohio has had a major impact on surface water courses in those areas. Oxidation of sulfide bearing ores causes the formation of sulfuric acid which in turn solubilize high concentrations of metals. This condition has a severe effect on all aquatic life in receiving streams. To a much lesser extent there have been some high pH impact on aquatic life in the area of limestone quarries in the northwestern part of Ohio, especially where agricultural lime was manufactured.

Air resources in the vicinity of unvegetated waste dumps have been impacted from fugitive dust emissions. Wind blown deposits, such as sand, and fugitive dust from elevated dumps can affect offsite flora and fauna as well as contribute foreign particulate of respirable size for human inhalation. The affects of fugitive dust is seasonally dependent and does not represent a continual source for impact to air quality.

Another impact which occurs in Ohio is the deposition of sediments on lands and in streams which are adjacent to abandoned mine areas. The movement of surface material, due to water transport, affects drainages and adjacent flood plain areas by clogging streams and turning useable (agricultural) lands into wetlands. Land surfaces adjacent to waste piles can also be impacted by the downward migration of materials. Except for processing areas, most sand & gravel operations as well as limestone quarries have inward drainage thus minimizing environmental impact.

Laws and Regulations

The unrestricted mineral development on Ohio prior to 1974 led to significant safety and environmental hazards at and adjacent to mining areas in general across the state. Today Ohio does not have an inventory of how much inactive and abandoned mineral operations there are in the state. Prior to 1974, except of some coal mining laws, there were no environmental statutes which regulated the industrial minerals industry. The mining laws promulgated in 1974 did not apply to previously mined areas except for those lands which were affected or reaffected by mining after 1974. Processing plants were not included in the 1974 legislation, thus benefication or processing of such ores are still not regulated under the mining laws.

In the past 18 years, various laws and regulations have been enacted to ensure impacts from resources extraction, beneficiation, and processing are minimized and the quality of State air and water are maintained. (Ohio Surace Mine Law; 1514ORC, Ohio Water Pollution Law or Clean Water Act; 6111 ORC, Federal Clean Water Act; PL52-500, Ohio Air Pollution Law; 3704 ORC, Federal Clean Air Act; PL101-549).

Inactive mines are defined as those areas affected by mining which are located adjacent to active mines that have not been reclaimed or would require some additional work to be returned to a useable land form and do not fall under current regulations. Abandoned mine lands are defined as lands where mining has occurred, reclamation has not been completed, and where there is no continuing reclamation responsibility by an owner or operator. These sites, both inactive and abandoned, primarily include disturbances created prior to 1975 when the Surace Mine Law (Chapter 1514 Ohio Revised Code) was implemented. This reclamation act requires operators to develop a reclamation plan and secure reclamation bonding before the State will issue a mining permit. There are exceptions to chapter 1514 which allow for unregulated operation where:1-test or exploration is occurring; 2-underground mining; 3-extraction by a landowner for his own noncommercial use in an unprocessed form on the same tract of land; 4-borrow pits for highway construction where reclamation requirements are substantially the same as 1514 ORC; 5-removal of minerals incidental to construction where a valid building permit is held; and 6-removal of minerals to a depth of not more than 5 feet where not more than 1 acre of land is disturbed within a twelve month period. These exempted areas do not contribute significantly to the IAM problem.

The Ohio Environmental Protection Agency has determined a number of hazardous waste sites which are located in abandoned mine sites. The designation of hazardous was not given because of the mineral that was mined but because of the materials brought into the site and deposited there. Portions of these areas will be reclaimed by the OEPA through the use of it's own funds and monies received the federal Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA).

Many of the States IAM problems consist of physical hazards which threaten public safety. There is an extensive program to address these hazards under Chapter 1513 Ohio Revised Code in conjunction with PL 95-87, Federal Surface Mine Law under SMCRA in the coal regions of Ohio but to date there are no mining statutes which address abandoned non-coal mines. Road authorities do have some backing if these safety hazards exist within an unsafe distance to a public road or private citizens can pursue civil suits against adjacent property owners if a hazard threatens their wellbeing.

Reclamation Efforts

Non-coal reclamation in Ohio has been performed by the Division of Reclamation (DOR) of the Ohio Department of Natural Resources in cases where an operator has forfeited his bond on an existing permit. This work has been minimal and accounts for only about four sites since 1975. Approximately $100,000.00 have been expended in these efforts. There are another fifty-five (55) sites which fall in the forfeiture category. Although these areas could be identified as IAM sites, the responsibility for the reclamation falls under the jurisdiction of the State and have had a reclamation requirement under a state statute.

The most reclamation of IAM sites fall under the category of active mining. Numerous operations now exist in old abandoned mine areas where for whatever reason, previous operators stopped mining and left the ground unreclaimed. Since the resource still existed, new operators moved in and commenced reaffecting old works. These operators are now regulated, thus the mining has "reclaimed" many old abandoned areas.

There is no organized program within the State of Ohio to address the reclamation of inactive and abandoned sites which were mined prior to 1975. No sets of cost figures have been developed which would reflect the cost of non-coal sites, although some inferences could be made by reviewing the cost per acre figures developed by the coal AML section.

NON-COAL INVENTORY
INACTIVE/ABANDONED MINES[1]

State of Ohio

DATA SUMMARY[2]

MINERAL TYPE	MINING TYPE[6]		OWNERSHIP		FEATURES	ACRES[3]	COST
Metallic	Mines	3	Federal		Mine Openings(#)	3	
Ores	Millsites		Private	3	Disturbed Land		
Iron*	Smelters		State				
	Other[4]	3	Other				
Construction							
Ores	Mines	247	Federal		Mine Openings(#)	9	
	Other[4]	9	Private	256	Disturbed Lands	5400+	
Limestone			Other				
Sandstone							
Sand & Gravel							
Industrial							
Ores	Mines	39	Federal	3	Mine Openings(#)	231	
	Other[4]	231	Private	31	Disturbed Lands	300+	
Salt*			State	5			
Clay			Other	231			
Shale*			"	F-10			
Conglomerate*			"	P-215			
Coal & Clay*			"	S-6			
Coal & Lime*							
Gypsum							
Silica							
Other[5]							
Processing Plants	Millsites	14+	Private	14	Disturbed Lands	75+	
Total							
Surface & Underground	Mines	286	Federal	13	Mine Openings(#)	243	
	Millsites	14	Private	519	Disturbed Lands	5775	
	Other[4]	243	Other	11			

Inactive & Abandoned Mine Data Summary
Ohio Reference Guide

1. **ODNR-Division of Reclamation (DOR), Industrial Minerals Sec.**

   Mining permits are issued by this agency for industrial and construction minerals commodities mined using surface mining methods. Chapter 1514 of the Ohio Revised Code (1974) requires mining operations to post reclamation bonds to cover the cost of restoring the land after mining has ceased. Pre-law estimated by DOR staff are the source of estimates presented in the data summary. The following persons have used professional judgement and report this data with a 10% confidence level.

   Patricia Fagan - Supervisor/Inspector
   Juanita Farley - Inspector
   Craig Simonson - Supervisor/Inspector
   Richard Pennington - Inspector
   William Boyle - Supervisor/Inspector
   James Williamson - Inspector
   Dave Clark - Supervisor/Inspector
   Wayne Schalk - Inspector

2. **ODNR-Division of Reclamation, Abandoned Mine Lands Section**

   This section has the responsibility of reclaiming coal abandoned mine lands on the state level as well as in conjunction with the Department of Interior, Office of Surface Mines. This section also administers the state bond forfeiture program which sees to the reclamation of lands affected after 1975 (industrial minerals) and 1972 (coal). The following persons contributed to data sited in this report:

   Robert Baker - Nat'l Resources Administrator
   David Stroh - Nat'l Resources Administrator

3. **ODNR -Geological Survey-**

   The Division of Geological Survey provides the public with maps and technical data on geology and mineral resources in Ohio. Information from this Division was obtained from records of abandoned underground minerals mines and from the annual minerals reports. Persons contrbuting to the data were:

   Doug Crowell - Coordinator
   Sherry Lopez - Geologist

4. **US Forest Service, Wayne National Forest**

The Forest Service has the responsibility of administering the Wayne National Forest, located in south and southestern Ohio, for multi-use purposes. One area is the inventory of different types of land uses established on the Wayne. Presently they have an inventory which includes inactive and abandoned mine lands. The following persons contributed information for the data cited in this report.

Don Coulter - Civil Engineer - Wayne Nat'l Forest
Robert Moss - Hydrologist - Wayne Hoosier Nat'l Forest

5. **U.S. Bureau of Mines-Intermountain Field Operation Center Denver.**

This office provided information from the Bureau's Minerals Availability System database. This information was concerning past producers and format 5 of the ONELINER program was used. Person contributing to this report was:

Michael B. Sawyer - Physical Scientist

6. **Ohio Environmental Protection Agency-Water Pollution Control Section.**

This agencies has the responsibility for administering air and water pollution laws in Ohio. The range of activity starts with investigation through permitting to enforcement. It also has the responsibility to deal with circumstances which create an imminent and substantial endangerment to human health and the environment as a result of actual or potential exposure to hazardous substances, contaminants, and pollutants. The following person was contracted for information which could be applicable to this report:

John Morrison - Unit Supervisor, Industrial Permitting

Inactive & Abandoned Mine Inventory Summary
State of Ohio
Footnotes

1. Inactive/abandoned mines (IAM's) have been defined as properties where there is no continuing reclamation responsibility of the owner or claimant/lessee to remediate the impact of past noncoal mining. Sites reported in this data summary are not covered by any mining permits, reclamation bonds, state or federal licenses or any reclamation contracts.

2. Included with this report package is a Reference Guide which consists of the Data Summary Table and accompanying text.

3. The acreage listed for each mineral type included the disturbed or impacted land resulting from mining/milling/smeltering activities within the IAM noncoal site. The acreage total listed is only a very loose estimate of what exists as there are very few recorded figures available. These totals are reported with a 2% confidence level.

4. The "other" mining type reported in <u>each category</u> refers to underground mining operations. An asterick (*) also highlighted the ores which were produced underground.

5. The OTHER category listed under Mineral Type refers strictly to processing plants which stand alone and are not physically connected to a mining operation.

6. Millsites and smelters - The Division has never regulated these type operations and therefore has no data on them. Locating other agencies who may have had control or gathering information about these areas is beyond the scope of what DOR can accomplish at this time.

7. No cost figures are available as no program has been instituted to deal with this type reclamation.

Mineral Resources Data System

Record Tvoe	X1M	Info Source	4
Reoort Date	73 00		
Reoorter	COX. DENNIS P.		
Reoorter	USGS		
Site Name	MANGUM PROSPECT		

-- Location Information --

Countrv	UNITED STATES	Countrv Code	US
State	OKLAHOMA	State Code	OK
Countv	GREER		
Phvsioaraohic	07 GREAT PLAINS		
Drainaoe Area	11 ARKANSAS-WHITE-RED		
Ouadranole	LAWTON	Scale	250000
Latitude	34-50- N	Decimal Lat	34.83333
Lonaitude	099-32- W	Decimal Lono	-99.53333
Accuracv	UNKNOWN PRECISION		

-- Commoditv Information --

Commodities	CU AG		
		Occurrina	CU AG
Non-Prod Main	CU	Non-Prod Minor	AG
Ore Materials	SECONDARY SULFIDE AND SECONDARY OXIDE		

-- Exoloration and Develoomont --

Production	No	Status	Prosoect. Active
		Nature of Disc	Ill Defined

-- Deoosit Descriotion --

Deoosit Tvoe	SEDIMENTARY
Deoosit Size	Medium

-- Workinas Descriotion --

-- Geoloav --

-- Reserves Onlv --

Item	Acc	Amount	Thous	Year	Grade
ORE CU	EST	40500.	ST	1973	
CU	EST	450.000	ST	1973	
AG	EST	5.00000	ST	1973	

Resv Comments ORE (1 AG OZ/TON. 1 % CU. 90 % RECOVERY)

Mineral Resources Data System

		File Link ID	TI
Record Tvpe	X1M	Info Source	1
Report Date	73 01		
Reporter	FORCE. ERIC R.		
Reporter	USGS		
Site Name	LAKE LAWTONKA PLACER		

-- Location Information --

Countrv	UNITED STATES	Countrv Code	US
State	OKLAHOMA	State Code	OK
Countv	COMANCHE		
Phvsioaraphic	05 INTERIOR LOWLANDS		
Drainaoe Area	11 ARKANSAS-WHITE-RED		
Quadranale	LAWTON	Scale	250000
Latitude	34-45- N	Decimal Lat	34.75
Lonoitude	098-30- W	Decimal Lona	-98.5
Accuracv	UNKNOWN PRECISION		

-- Commoditv Information --

Commodities	TI FE
Potential	TI
Ore Materials	ILMENITE

-- Exploration and Develoament --

Production	No	Status	Occurrence

-- Deposit Description --

Deposit Tvpe	FOSSIL FLUVIAL PLACER
Deposit Size	Small

-- Workinas Description --

-- Geoloav --

Host Rock Aoe	TERRACE SANDS
Reference	CHASE 1952 OKLA GEOL SURV CIRC. 30

-- Reserves and Resources --

Item	Acc	Amount	Thous	Year	Grade
SDG TI	EST	8000.	TONS		4%

Mineral Resources Data System

Report Title	Mineral Resources Data System site records for Oklahoma		*Numbe*	in Set of 8
Record Number D002860	Friday March 1 1991	17:45:10	*Printe*5	of 8

		File Link ID	OME 6707
Record Type	X1M	*Info Source*	4
Report Date	77 08		
Reporter	HASLER. J. WILLIAM		
Reporter	USGS		
Site Name	WOLFRIDGE MINERALS		

-- Location Information --

District Name	PAOLI		
Country	UNITED STATES	*Country Code*	US
State	OKLAHOMA	*State Code*	OK
County	GARVIN		
Physiographic	05 INTERIOR LOWLANDS		
Drainage Area	11 ARKANSAS-WHITE-RED		
Quadrangle	ARDMORE	*Scale*	250000
Quadrangle 2	PAOLI	*Scale*	24000
		Elevation	1000 FT
Latitude	34-52- N	*Decimal Lat*	34.86666
Longitude	097-14- W	*Decimal Long*	-97.23333
Accuracy	UNKNOWN PRECISION		
Township	004N		
Section	07 13 18 19		
Range	001E		
Meridian	INDIAN		

-- Commodity Information --

Commodities	CU AG
Ore Materials	CHALCOCITE. BORNITE

-- Exploration and Development --

Production	No	*Status*	Occurrence

-- Deposit Description --

Deposit Type	RED BED COPPER. CONCRETIONS. LENSES
Deposit Size	N

-- Workings Description --

-- Geology --

Host Rock Age	PERM
Host Rock Type	WELLINGTON AND STRATFORD SANDSTONES

Mineral Resources Data System

Report Title	Mineral Resources Data System site records for Oklahoma	Numbe in Set of	8
Record Number	W001347 Friday, March 1, 1991 17:44:07	Printed of	8

		File Link ID	TI
Record Type	X1M	Info Source	1
Report Date	73 01		
Reporter	FORCE, ERIC R.		
Reporter	USGS		
Site Name	OTTER CREEK PLACER		

-- Location Information --

Country	UNITED STATES	Country Code	US
State	OKLAHOMA	State Code	OK
County	KIOWA, TILLMAN		
Physiographic	05 INTERIOR LOWLANDS		
Drainage Area	11 ARKANSAS-WHITE-RED		
Quadrangle	LAWTON	Scale	250000
Latitude	34-38- N	Decimal Lat	34.63333
Longitude	099-00- W	Decimal Long	-99
Accuracy	UNKNOWN PRECISION		

-- Commodity Information --

Commodities	TI
Potential	TI
Ore Materials	ILMENITE

-- Exploration and Development --

Production	No	Status	Occurrence

-- Deposit Description --

Deposit Type	MODERN FLUVIAL PLACER
Deposit Size	N

-- Workings Description --

-- Geology --

Host Rock Age	CLAYEY SAND
Reference	HAHN 1960 U. S. BU MI R. I. 5577

-- Reserves and Resources --

Item	Acc	Amount	Thous	Year	Grade
SDG TI	EST	370000.	TONS		1.24%

Mineral Resources Data System

Report Title	Mineral Resources Data System site records for Oklahoma	*Numbe in Set of 8*	
Record Number	W001347 Fridav. March 1. 1991 17:44:07	*Printed 4 of 8*	
		File Link ID	TI
Record Tvoe	X1M	*Info Source*	1
Reoort Date	73 01		
Reoorter	FORCE. ERIC R.		
Reoorter	USGS		
Site Name	OTTER CREEK PLACER		

-- Location Information --

Countrv	UNITED STATES	*Countrv Code*	US
State	OKLAHOMA	*State Code*	OK
Countv	KIOWA. TILLMAN		
Phvsioeraphic	05 INTERIOR LOWLANDS		
Drainaoe Area	11 ARKANSAS-WHITE-RED		
Ouadranole	LAWTON	*Scale*	250000
Latitude	34-38- N	*Decimal Lat*	34.63333
Lonoitude	099-00- W	*Decimal Lono*	-99
Accuracv	UNKNOWN PRECISION		

-- Commoditv Information --

Commodities	TI
Potential	TI
Ore Materials	ILMENITE

-- Exoloration and Develooment --

Production	No	*Status*	Occurrence

-- Deoosit Descriotion --

Deoosit Tvoe	MODERN FLUVIAL PLACER
Deoosit Size	N

-- Workinos Descriotion --

-- Geoloav --

Host Rock Aoe	CLAYEY SAND
Reference	HAHN 1960 U. S. BU MI R. I. 5577

-- Reserves and Resources --

Item	Acc	Amount	Thous	Year	Grade
SDG TI	EST	370000.	TONS	1.24%	

Mineral Resources Data System

		File Link ID	OME 6707
Record Type	X1M	Info Source	4
Report Date	77 08		
Reporter	HASLER, J. WILLIAM		
Reporter	USGS		
Site Name	WOLFRIDGE MINERALS		

-- Location Information --

District Name	PAOLI		
Country	UNITED STATES	Country Code	US
State	OKLAHOMA	State Code	OK
County	GARVIN		
Physiographic	05 INTERIOR LOWLANDS		
Drainage Area	11 ARKANSAS-WHITE-RED		
Quadrangle	ARDMORE	Scale	250000
Quadrangle 2	PAOLI	Scale	24000
		Elevation	1000 FT
Latitude	34-52- N	Decimal Lat	34.86666
Longitude	097-14- W	Decimal Long	-97.23333
Accuracy	UNKNOWN PRECISION		
Township	004N		
Section	07 13 18 19		
Range	001E		
Meridian	INDIAN		

-- Commodity Information --

Commodities	CU AG
Ore Materials	CHALCOCITE, BORNITE

-- Exploration and Development --

Production	No	Status	Occurrence

-- Deposit Description --

Deposit Type	RED BED COPPER, CONCRETIONS, LENSES
Deposit Size	N

-- Workings Description --

-- Geology --

Host Rock Age	PERM
Host Rock Type	WELLINGTON AND STRATFORD SANDSTONES

Mineral Resources Data System

Report Title Mineral Resources Data System site records for Oklahoma *Numbe in Set of 8*

Record Number W001348 Fridav. March 1. 1991 17:46:15 *Printe6 of 8*

		File Link ID	TI
Record Tvoe	X1M	*Info Source*	1
Reoort Date	73 01		
Reoorter	FORCE. ERIC R.		
Reoorter	USGS		
Site Name	LAKE LAWTONKA PLACER		

-- Location Information --

Countrv	UNITED STATES	*Countrv Code*	US
State	OKLAHOMA	*State Code*	OK
Countv	COMANCHE		
Phvsioaraphic	05 INTERIOR LOWLANDS		
Drainaoe Area	11 ARKANSAS-WHITE-RED		
Quadranole	LAWTON	*Scale*	250000
Latitude	34-45- N	*Decimal Lat*	34.75
Lonaitude	098-30- W	*Decimal Lono*	-98.5
Accuracv	UNKNOWN PRECISION		

-- Commoditv Information --

Commodities	TI FE
Potential	TI
Ore Materials	ILMENITE

-- Exoloration and Develooment --

Production	No	*Status*	Occurrence

-- Deposit Descriotion --

Deposit Tvoe	FOSSIL FLUVIAL PLACER
Deposit Size	Small

-- Workinos Descriotion --

-- Geoloav --

Host Rock Aoe	TERRACE SANDS
Reference	CHASE 1952 OKLA GEOL SURV CIRC. 30

-- Reserves and Resources --

Item	Acc	Amount	Thous	Year	Grade
SDG TI	EST	8000.	TONS	4%	

Mineral Resources Data System

Report Title	Mineral Resources Data System site records for Oklahoma	*Numbe in Set of*	8
Record Number	W002698 Fridav. March 1. 1991 17:47:22	*Printe7 of*	8

Record Tvoe	X1M	*Info Source*	4
Report Date	73 00		
Reporter	COX. DENNIS P.		
Reporter	USGS		
Site Name	MANGUM PROSPECT		

-- **Location Information** --

Countrv	UNITED STATES	*Countrv Code*	US
State	OKLAHOMA	*State Code*	OK
Countv	GREER		
Phvsiograohic	07 GREAT PLAINS		
Drainage Area	11 ARKANSAS-WHITE-RED		
Quadrangle	LAWTON	*Scale*	250000
Latitude	34-50- N	*Decimal Lat*	34.83333
Longitude	099-32- W	*Decimal Long*	-99.53333
Accuracv	UNKNOWN PRECISION		

-- **Commodity Information** --

Commodities	CU AG		
		Occurring	CU AG
Non-Prod Main	CU	*Non-Prod Minor*	AG
Ore Materials	SECONDARY SULFIDE AND SECONDARY OXIDE		

-- **Exploration and Development** --

Production	No	*Status*	Prospect. Active
		Nature of Disc	Ill Defined

-- **Deposit Description** --

Deposit Tvoe	SEDIMENTARY
Deposit Size	Medium

-- **Workings Description** --

-- **Geology** --

-- **Reserves Only** --

Item	Acc	Amount	Thous	Year	Grade
ORE CU	EST	40500.	ST	1973	
CU	EST	450.000	ST	1973	
AG	EST	5.00000	ST	1973	

Resv Comments ORE (1 AG OZ/TON. 1 % CU. 90 % RECOVERY)

Mineral Resources Data System

Report Title	Mineral Resources Data System site records for Oklahoma	*Numbe in Set of*	8
Record Number	K002902 Fridav. March 1 1991 17:48:31	*Printe8 of*	8

Record Type	X1M	*Info Source*	14
Report Date	75 04		
Reporter	WEDOW. HELMUTH		
Reporter	USGS		
Site Name	PICHER FIELD		

-- Location Information --

District Name	PICHER FIELD		
Country	UNITED STATES	*Country Code*	US
State	OKLAHOMA	*State Code*	OK
County	OTTAWA		
Physiographic	05 INTERIOR LOWLANDS		
Drainage Area	11 ARKANSAS-WHITE-RED		
Quadrangle	TULSA	*Scale*	250000
Latitude	36-59- N	*Decimal Lat*	36.98333
Longitude	394-50- W	*Decimal Long*	-94.83333
Accuracy	UNKNOWN PRECISION		

-- Commodity Information --

Commodities PB ZN

Major ZN

Ore Materials SPHALERITE. GALENA. MARCASITE. A LITTLE PYRITE AND CHALCOPYRITE. SPARSE ENARGITE.

Commod ONE OF THE MAJOR ZINC AND LEAD DISTRICTS OF THE WORLD. BUT IS NOW APPROACHING EXHAUSTION. THIS. THE LATEST DISCOVERED SUBDISTRICT IN THE GREAT TRI-STATE DISTRICT. WAS DISCOVERED EARLY IN THE PRESENT CENTURY. BEGAN PRODUCING IN 1904. REACHED ITS PEAK 1917-1930. AND HAS GRADUALLY DECLINED WITH PROGRESSIVE DEPLETION SINCE THEN. THOUGH THE DETAILS OF PRODUCTION HAVE FOLLOWED ECONOMIC CONDITIONS VERY CLOSELY. THERE WAS A SAG IN PRODUCTION IN THE EARLY 1930'S. FOLLOWED BY A RESURGENCE IN THE LATE 1930'S AND 1940'S. THROUGH 1947. IN SPITE OF WORLD WAR II STIMULATION. THE RESURGENCE PEAK WAS REACHED IN 1941 AND PRODUCTION DECLINED PROGRESSIVELY TO 1947. LEVELED OFF THROUGH 1952. AFTER WHICH IT DROPPED PRECIPITATELY. THE 1957 PRODUCTION. THOUGH STILL RANKING HIGH AMONG ZINC-LEAD DISTRICTS. IS THE LOWEST SINCE 1915. (MCKNIGHT. 1960?. UNPUBLISHED DATA.)

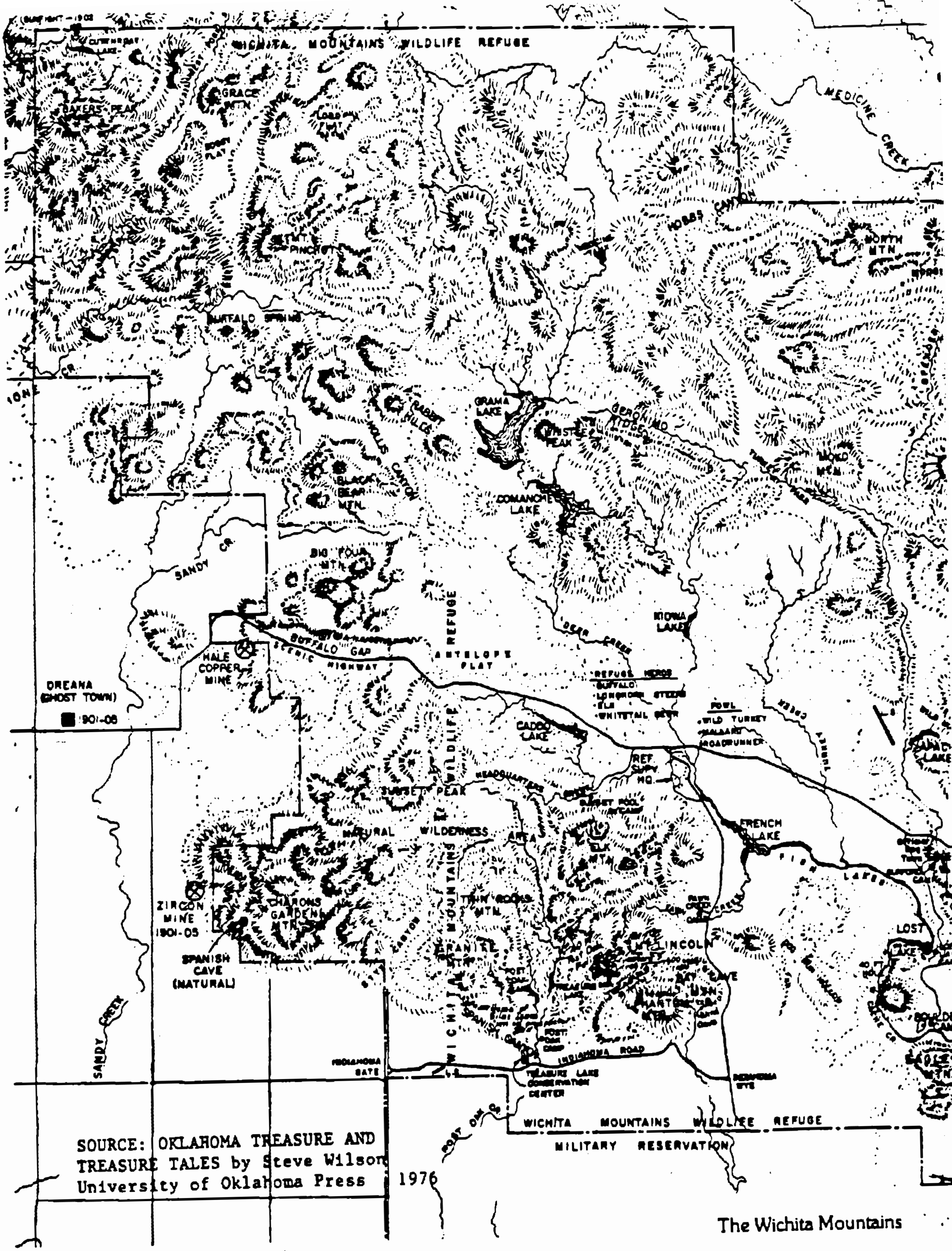
-- Exploration and Development --

		Status	*Occurrence*
Year 1st	1904		

-- Deposit Description --

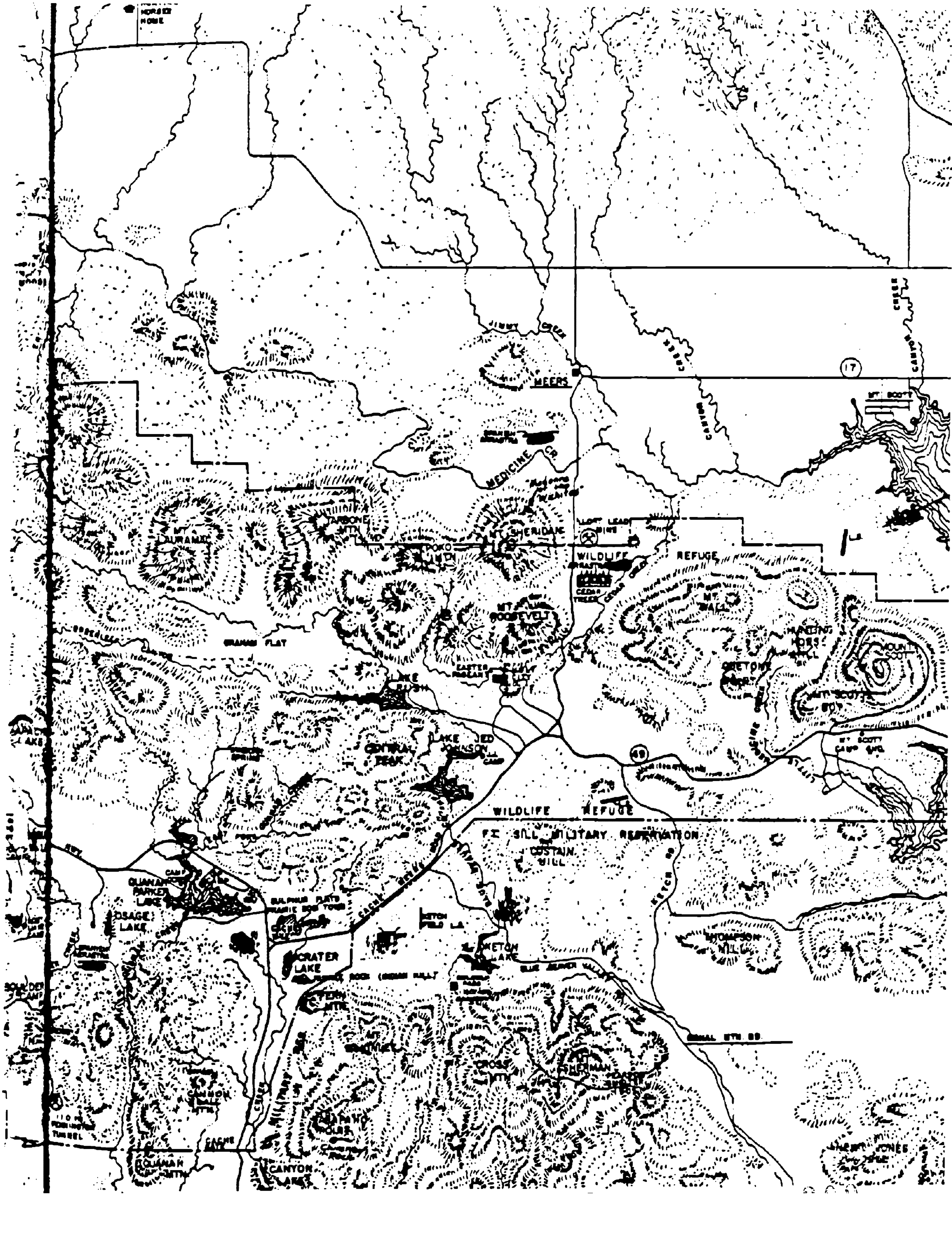
Deposit Type REPLACEMENT AND SHEET GROUND

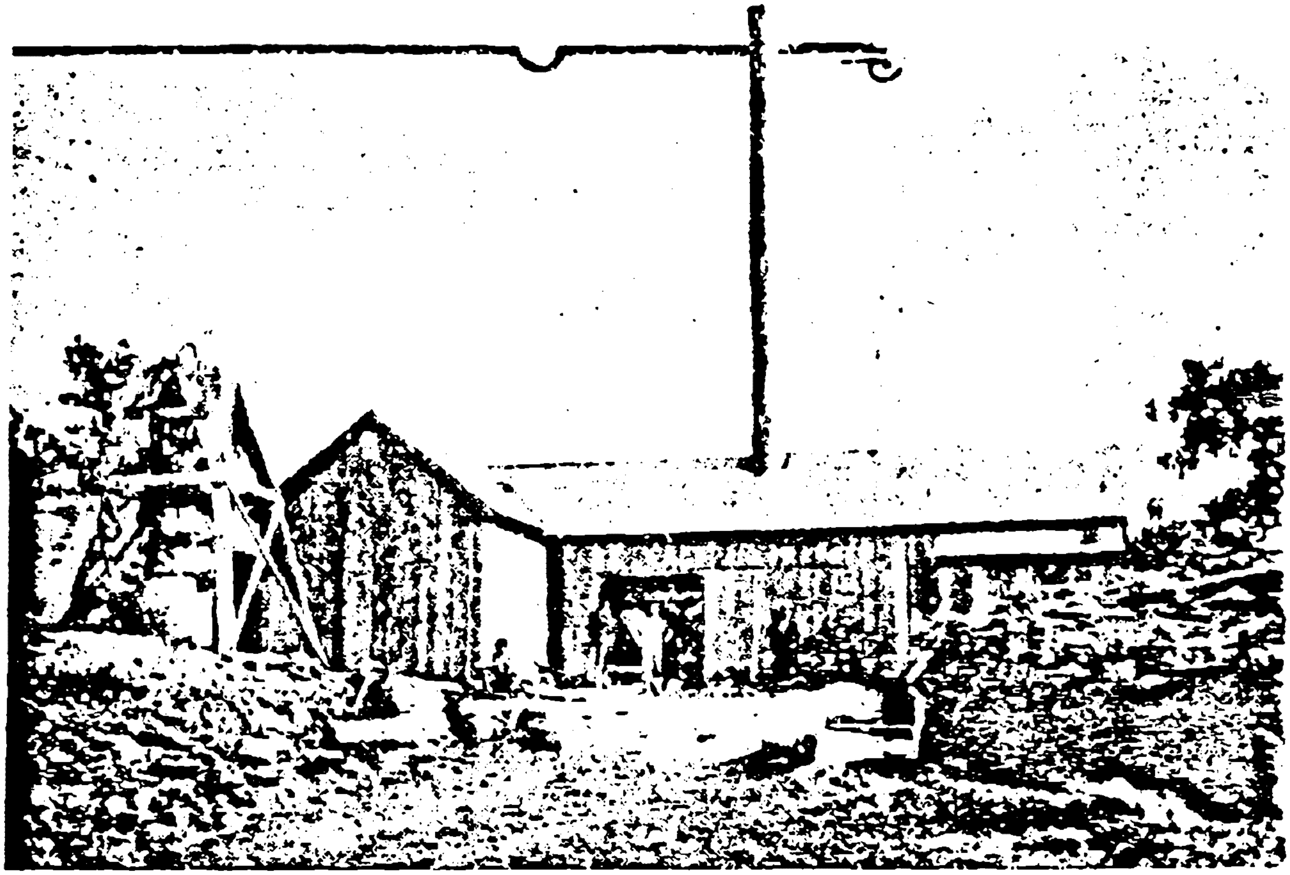
Appendix 5 Photographs



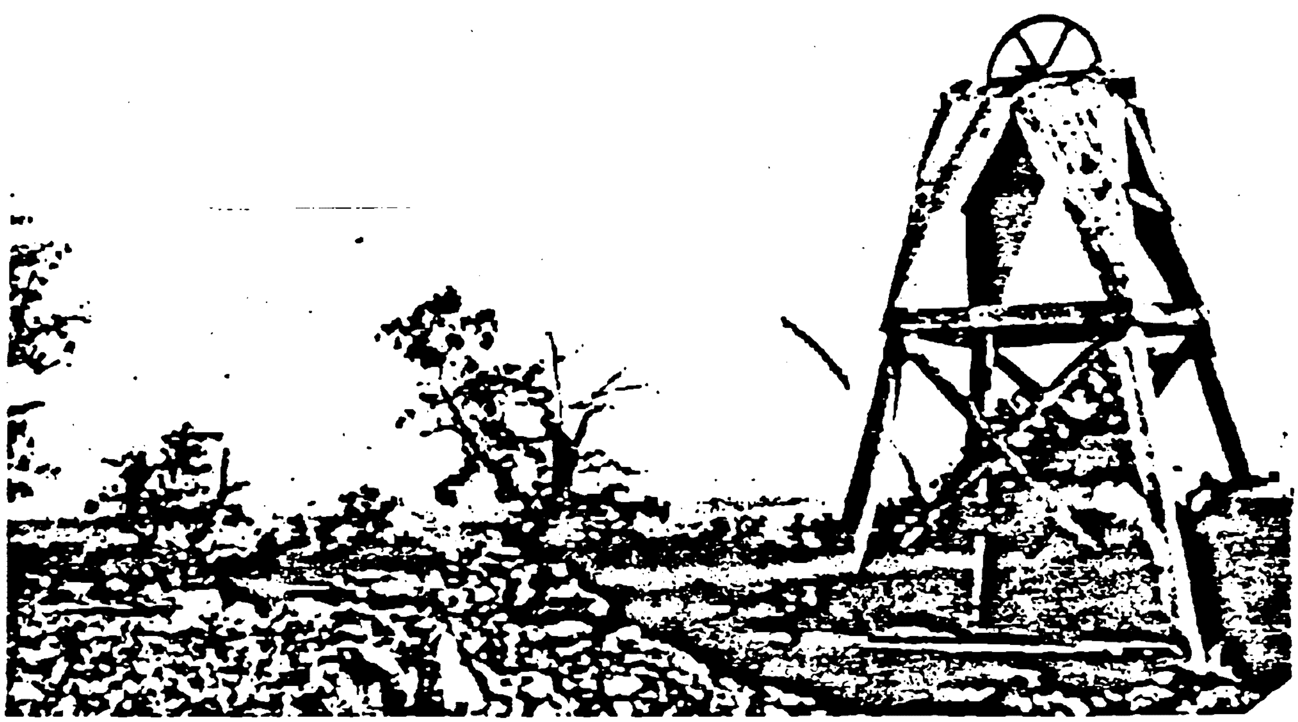
SOURCE: OKLAHOMA TREASURE AND TREASURE TALES by Steve Wilson University of Oklahoma Press 1976

The Wichita Mountains


JIMMY CREEK
MEERS
17
MT. SCOTT
MEDICINE CR
MT. SHERIDAN
WILDLIFE REFUGE
REFUGE
MT. ROOSEVELT
HUNTING HORSE HILL
MOUNT SCOTT
GRAHAM FLAT
CENTRAL PEAK
LAKE JED JOHNSON
49
WILDLIFE REFUGE
FT. SILL MILITARY RESERVATION
COSTAIN HILL
QUANAH PARKER LAKE
OSAGE LAKE
CRATER LAKE
THOMPSON HILL
SIGNAL STN. RD.
MT. SHERMAN
CANYON LAKE



In 1903, Dr. S. J. Hardin, of the Shawnee Mining Company, erected this eight-thousand-dollar smelting plant at his Lost Lead Mine, a mile east of Mount Sheridan, near Meers. The mine, left, reached a depth of 108 feet, and was cased with square-sawed timbers. From Joe B. Baker, *Souvenir of Lawton, Oklahoma*, 1907.



Between 1903 and 1909, Hardin spent more than $19,500 at his Lost Lead Mine. A steam-engine-powered windlass lowered miner and ore bucket more than one hundred feet into the solid-granite shaft. Courtesy Western History Collections, University of Oklahoma Library.

Mount Sheridan looms above the seven-foot-square shaft of the Lost Lead Mine. Today nothing remains but a gaping hole and a mound of tailings—testimony to the gold seekers who lived and worked there during the Wichita gold rush.

Craterville, just north of Cache, at the entrance to the Wichita Mountains, was one of several gold camps established when the Comanche-Kiowa-Apache Reservation was opened to settlement in 1901.

LAWTON NEWS-REPUBLICAN.

BOOM IS NOW ON

Eighteen Tons of Ore Shipped to Colorado Smelters by Lawton People Sells For $11.60 Per Ton.

PEOPLE ARE EXCITED

Hundreds of Assays are Being Made That Outclass the Ore Shipped.

SWARM TO MOUNTAINS

The Gold Fever Has Struck the People and Hundreds of Prospectors Have Joined the Already Large Number of "Pioneer" Miners—Gold is There.

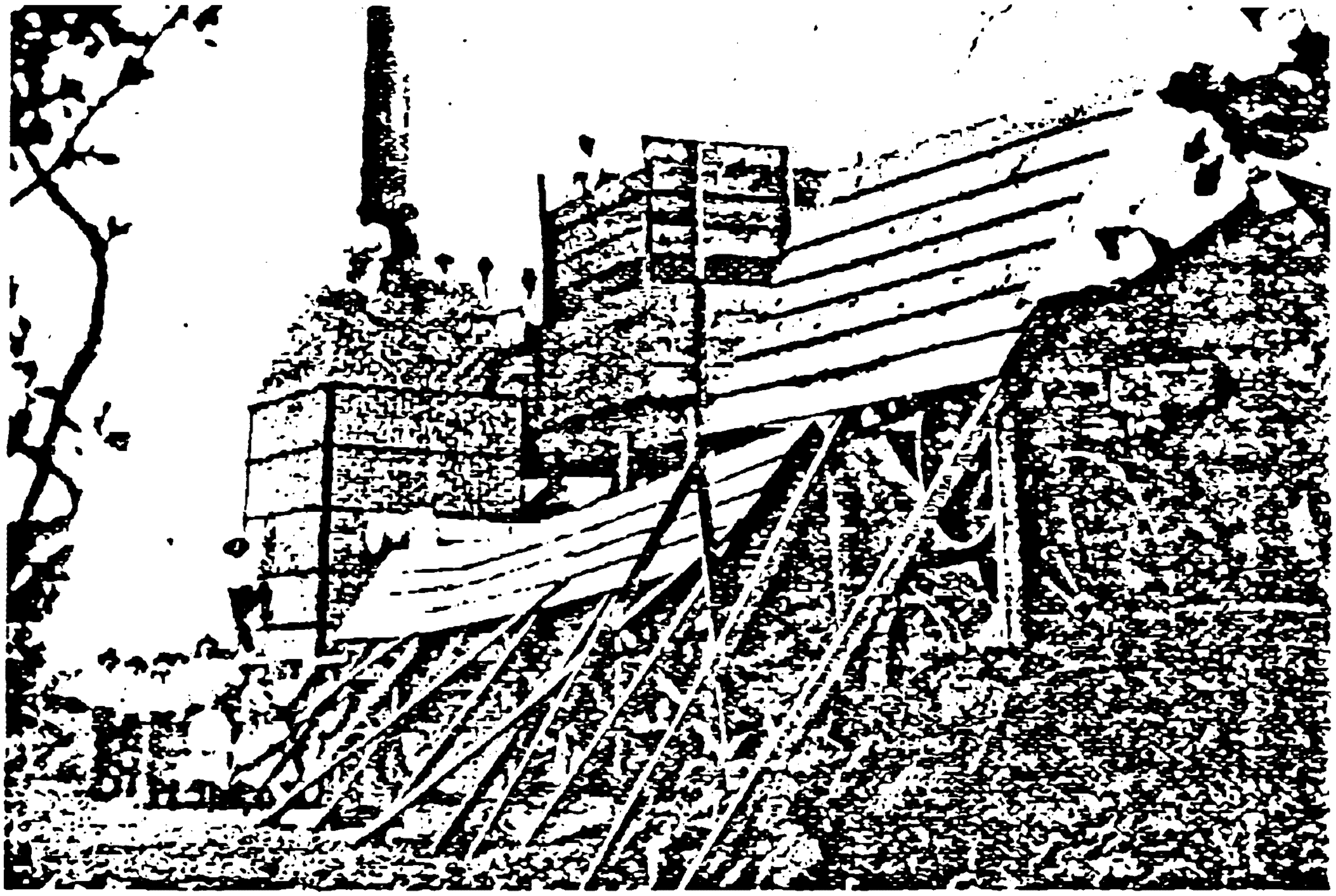
DID THEMSELVES PROUD.

After the Lumber Trusts

SIMPSON'S BIG STORE.

COUNCIL WRANGLES.

"The Boom Is Now On," announced the *Lawton News-Republican* on September 24, 1903



In 1905, after nine months and thirty-five hundred dollars, John Pearson completed this twenty-five-ton firebrick smelter at Camp Homestead, at the foot of Mount Sherman, near Golden Pass. From his mine came enough ore to yield several bars of copper and silver. From *Mineral Kingdom*, October 12, 1905.

News of the Wichita gold camps drew front-page coverage over Oklahoma Territory. Excitement ran high when the Pearson smelter yielded bricks of bullion.

Mt Sheridan Daily Miner

VOL. 1. MEERS, OKLAHOMA, THURSDAY, AUGUST 25, 1904. No. 3

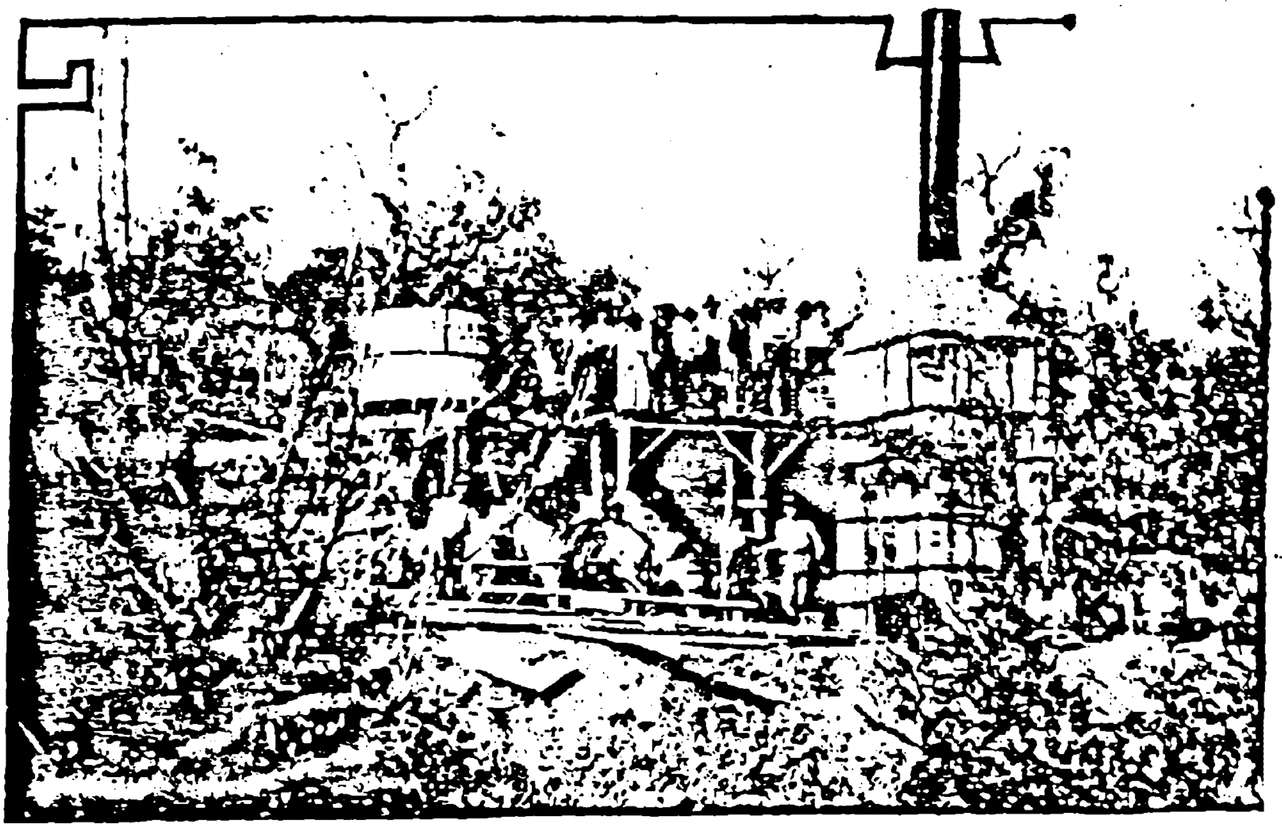
AN EXPERT IN NAME ONLY.

A Political "Pull" and Big Salary His Only Qualification.

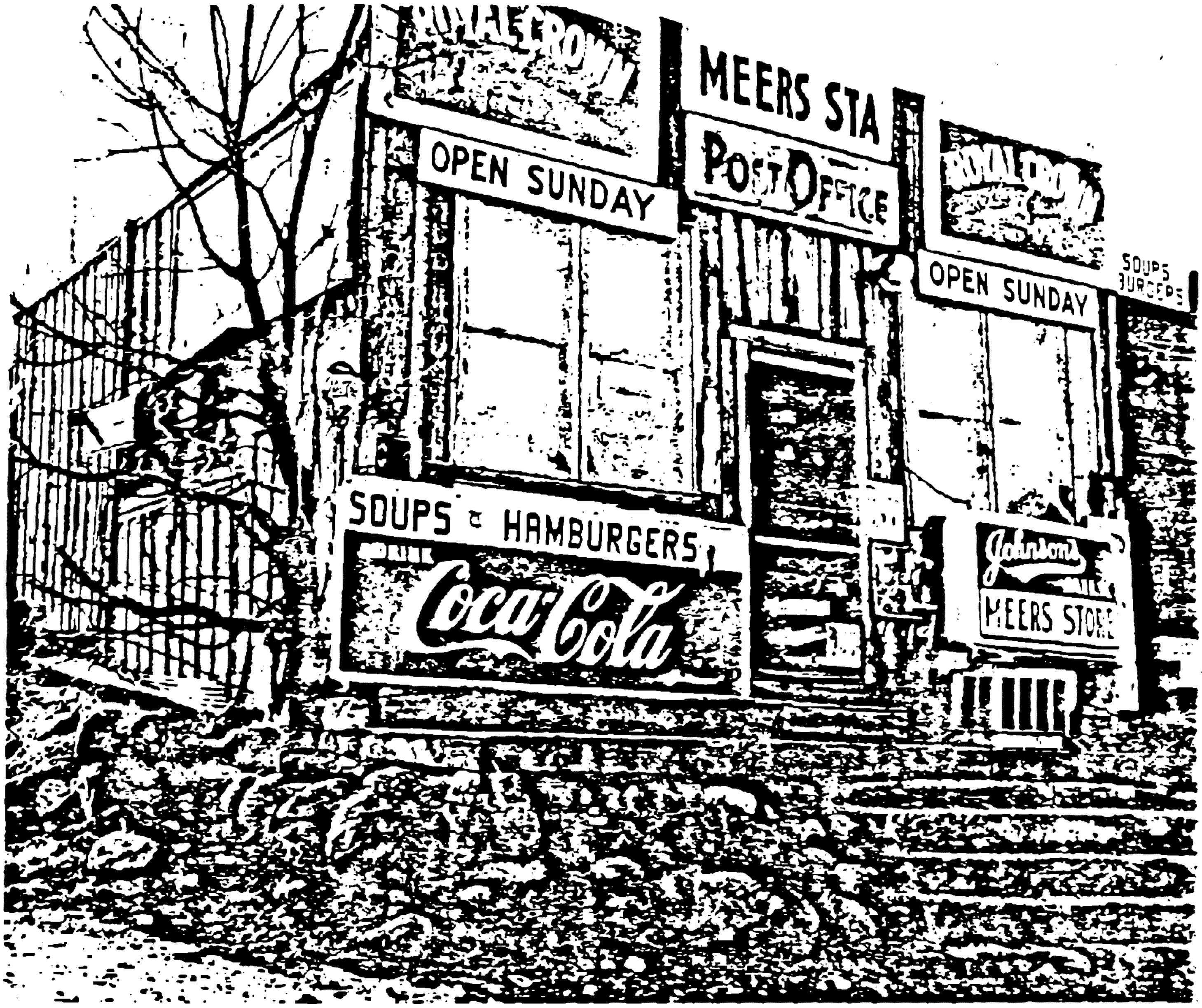
We clip the following "roast" from the columns of the Sterling Star. The editor of that enterprising paper seems to recognize a fraud when he sees it:

"At this particular time there is much comment, both in the press and out of it, relative to the official report of one J. F. Bain as to the mineral bearing of the Wichita Mountains. As is well known, this man Bain is the Government expert (?) geologist who was sent to the mountains for the purpose of making investigations and report- delved in the bowels of the earth as a business and knows nothing else, having followed it as his life's work, knowing the soils, rocks, stratas, etc., by actual and continued observation and experience, is the man that should be recognized as the one who knows what he is talking about—the very man who obtained his information and knowledge with a pick, hammer and drill, at his side: while the so-called expert obtained his knowledge by reading what some other fellow has written, while smoking a ten-cent cigar, and the smallest portion of his anatomy projecting above a three-inch linnen collar, and the largest portion adorned with a pair of patent-leather shoes their experience and knowledge, are the men whose judgement is to be relied upon, in nearly every case; and when this great army, augmented by the number of assayers who corroberate their opinion, agree that there is mineral beneath the jagged ridges of our mountains, then we believe the report, it matters not what may be said to the contrary by our fashionable high-collared "expert" from Washington. We are not from Missouri, but we know enough to be from that grand old state, and that being the case, the Missouri rule inversely applies in our case, that is if there is no mineral in the Wichitas we will insist on being shown that fact, for we have seen too much already to

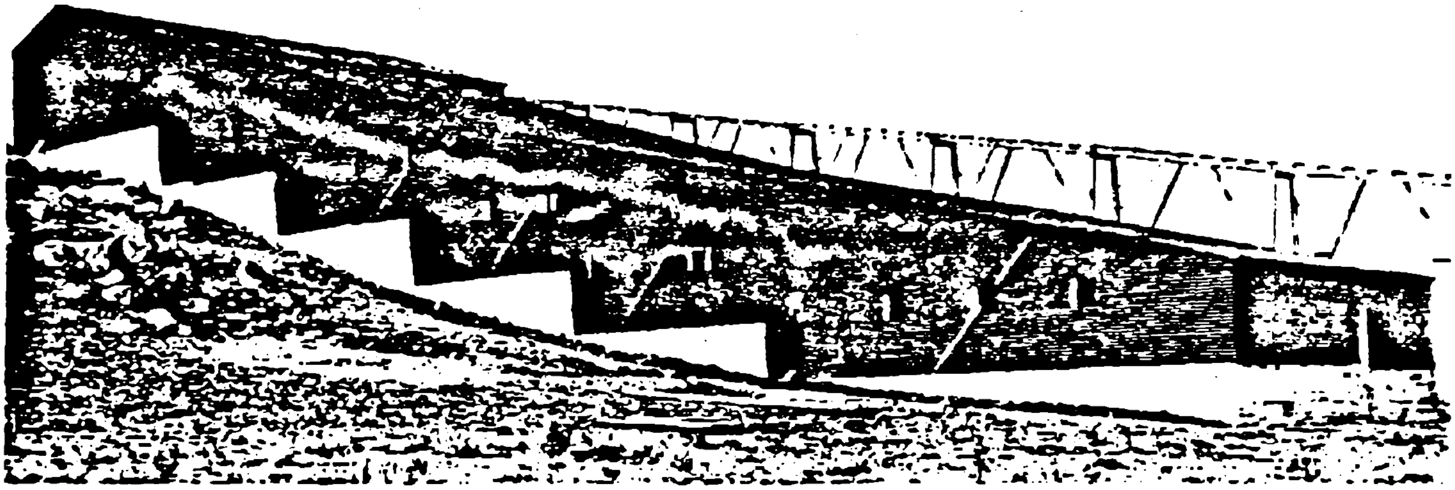
For a time, Meers even boasted a daily, published by twenty-one-year-old Frank C. Davis (also the town druggist, an assayer, a charter member of Aurum Mining Company, and president of the Chandler Mining District and Protective Association).



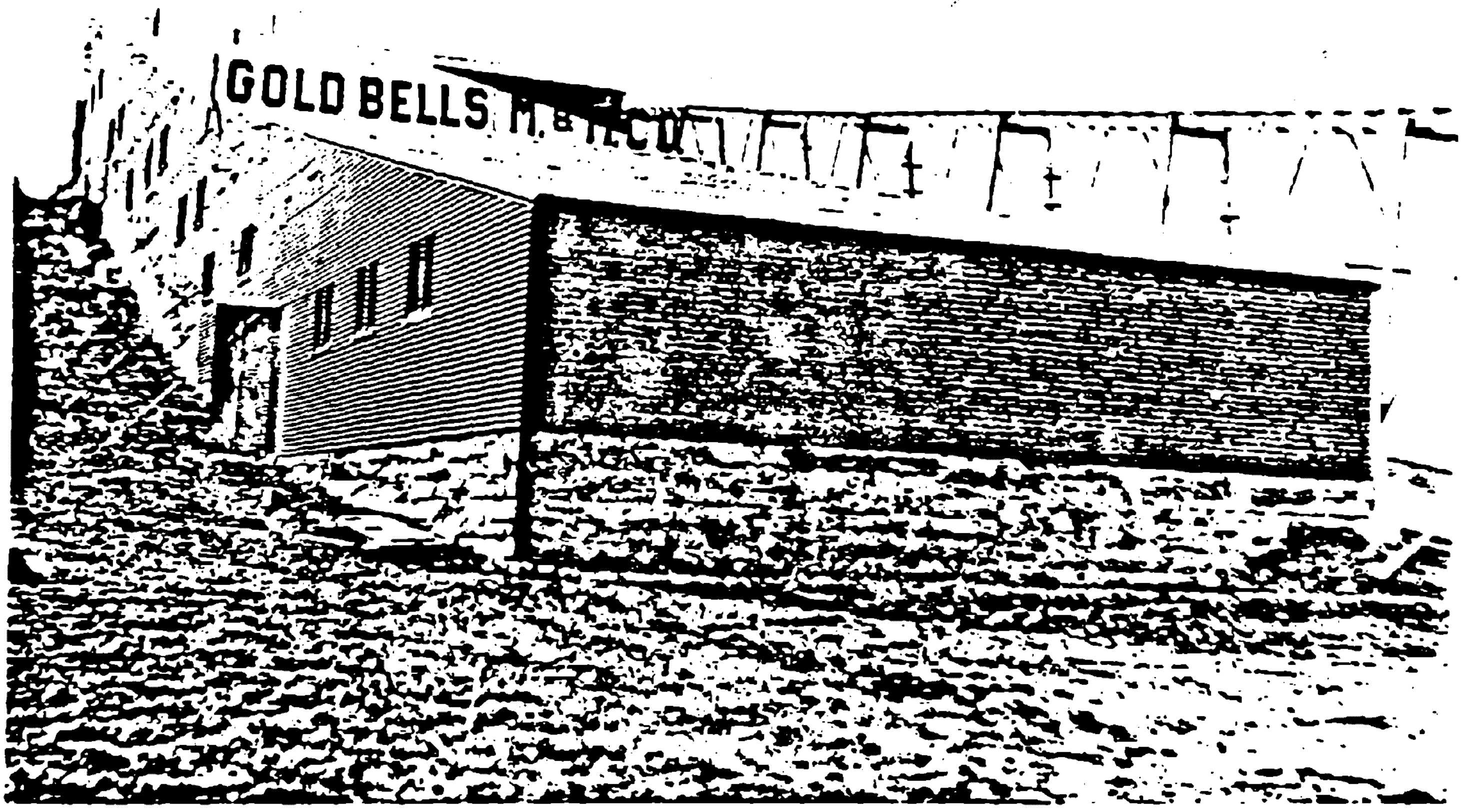
In 1904, Sam Remer built his massive smelter southwest of Mount Sheridan on Blue Beaver Creek to refine ore from his nearby Snake Mine. From *Mineral Kingdom*, January 12, 1905.



Of all the Wichita gold camps only this lone store at Meers survives. From its back rooms once rolled the weekly *Mt. Sheridan Miner.*



Begun in 1904, this fifty-ton cyanide processing plant one mile south of Wildman was erected by Wildman's founder, E. A. Williams, at a cost of seventeen thousand dollars. The tramway led from the ore mill to the Gold Bell Mine, a quarter of a mile away. Courtesy Hugh Corwin.

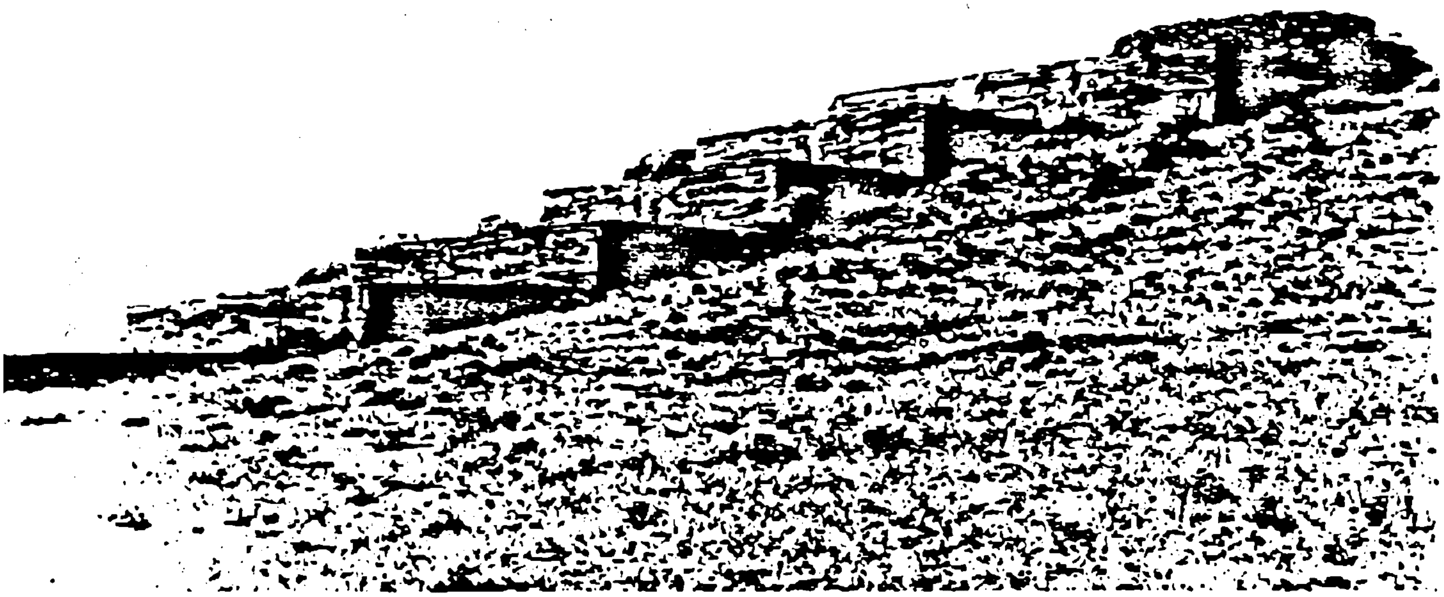


The miners of Wildman founded the first post office on the Comanche-Kiowa-Apache Reservation several months before the land was opened to white settlement. The town's founder, E. A. Williams, stands at the right of the door. Courtesy Mrs. Frank R. Wildman.

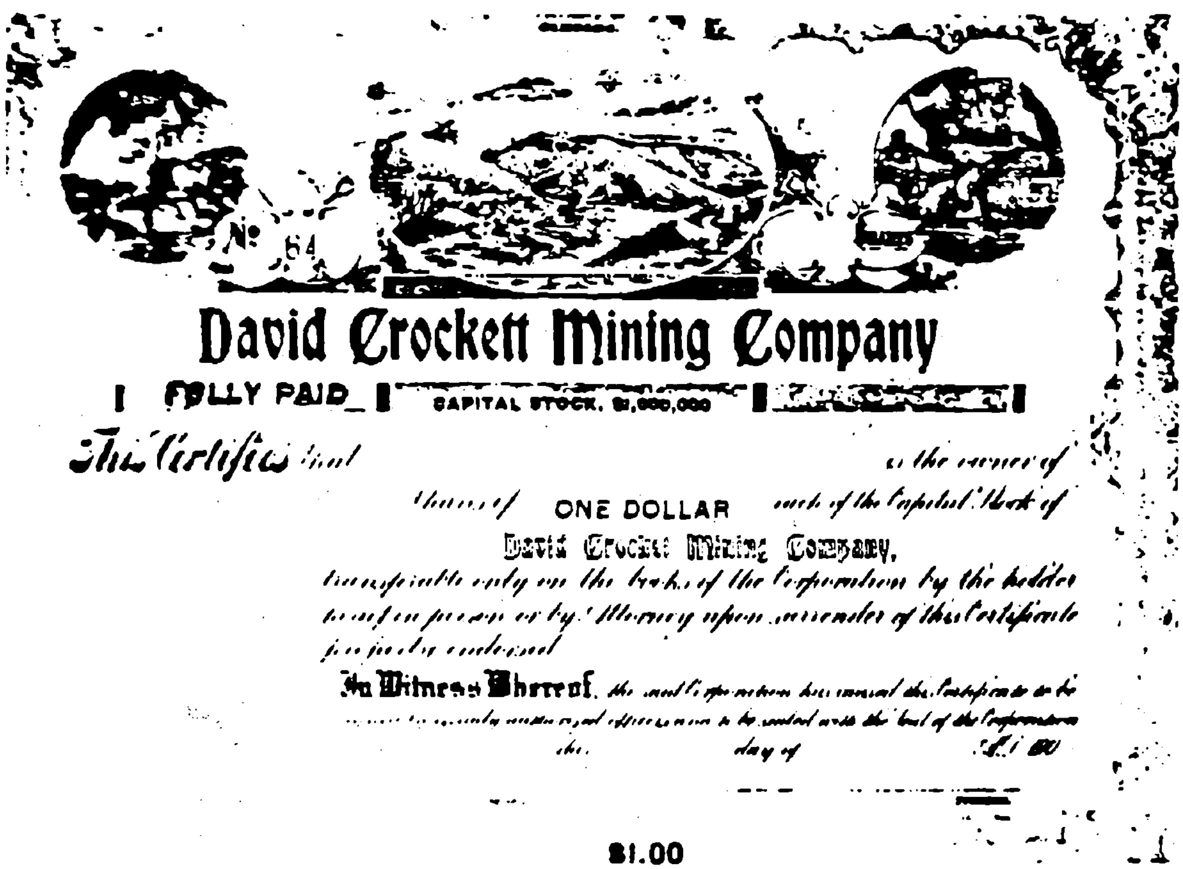
The Lyon Lode was sunk within the townsite of Wildman. While digging the shaft, the miners discovered still older diggings from previous gold seekers. Williams stands in front of the boiler in the background. Courtesy Mrs. Frank R. Wildman.

Mounds of mine tailings and a deep shaft remain of Wildman's Gold Bell Mine, abandoned in 1910

Nest Egg Mountain looms behind the foundation ruins of Wildman, a once-bustling gold camp boasting a two-story hotel and saloon and a population of about three hundred.



Today only massive concrete steps and a deep circular trough remain of Wildman's cyanide mill.



№ 64

David Crockett Mining Company

FULLY PAID

ONE DOLLAR

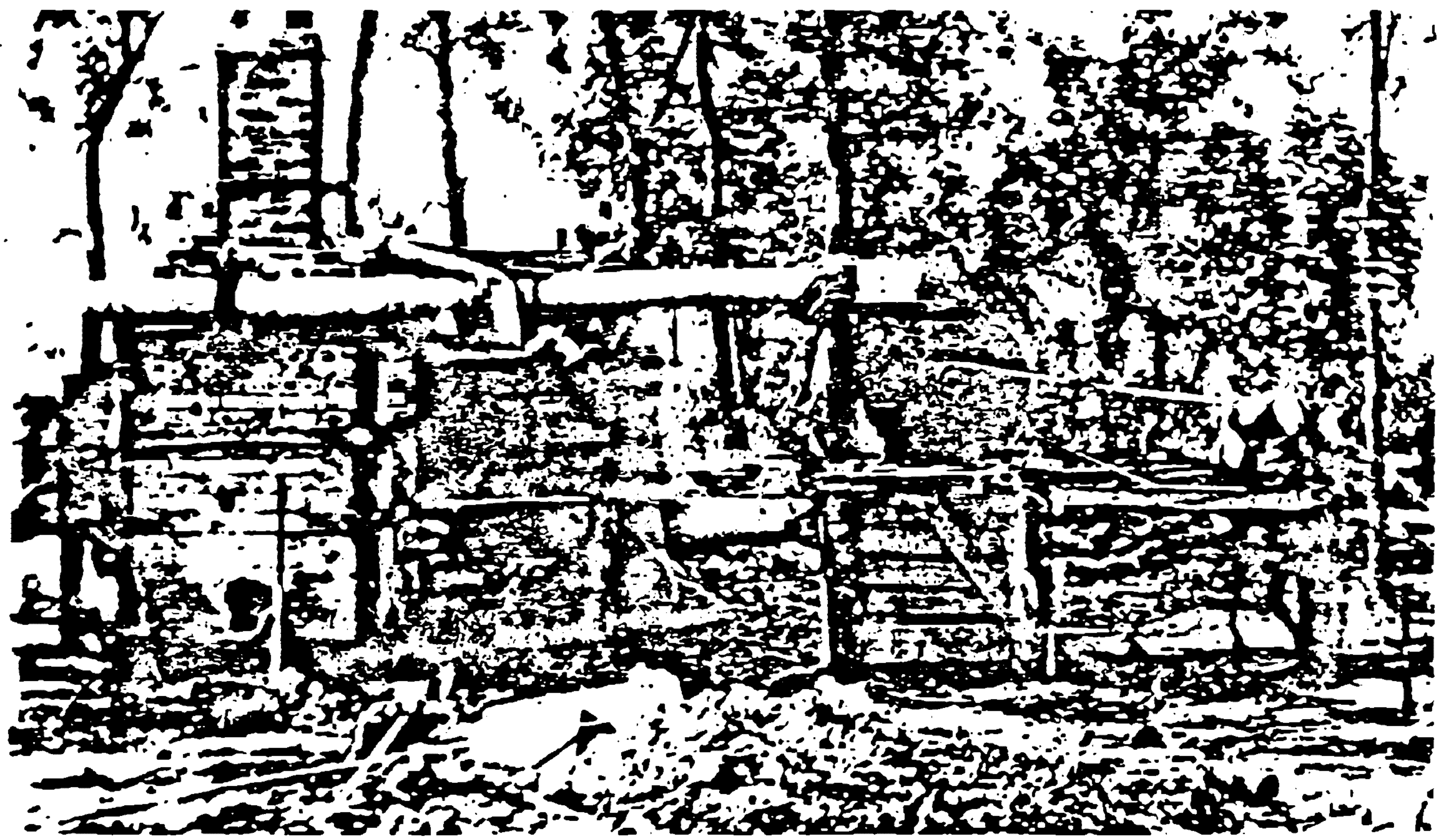
David Crockett Mining Company,

In Witness Whereof,

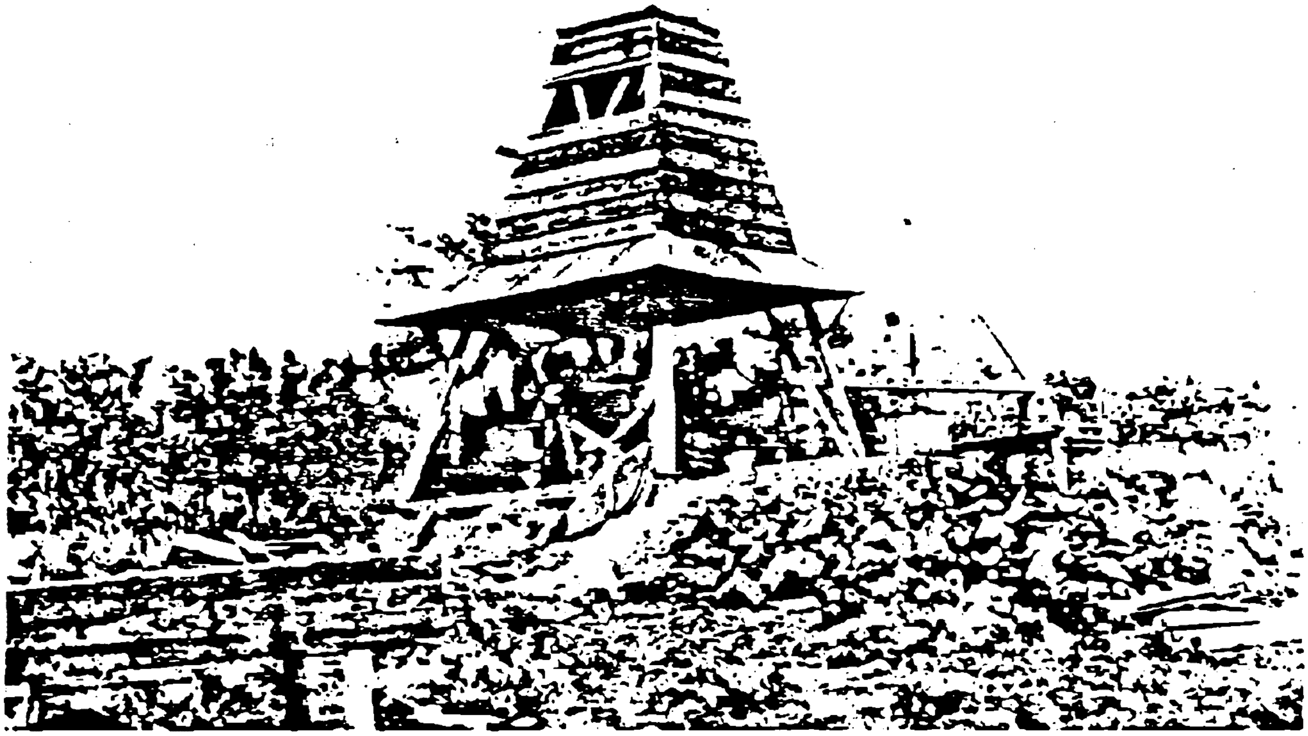
$1.00

Mining companies selling shares of stock were plentiful throughout the Wichita Mountains even though gold was scarce. Pages 168. 169. 171.

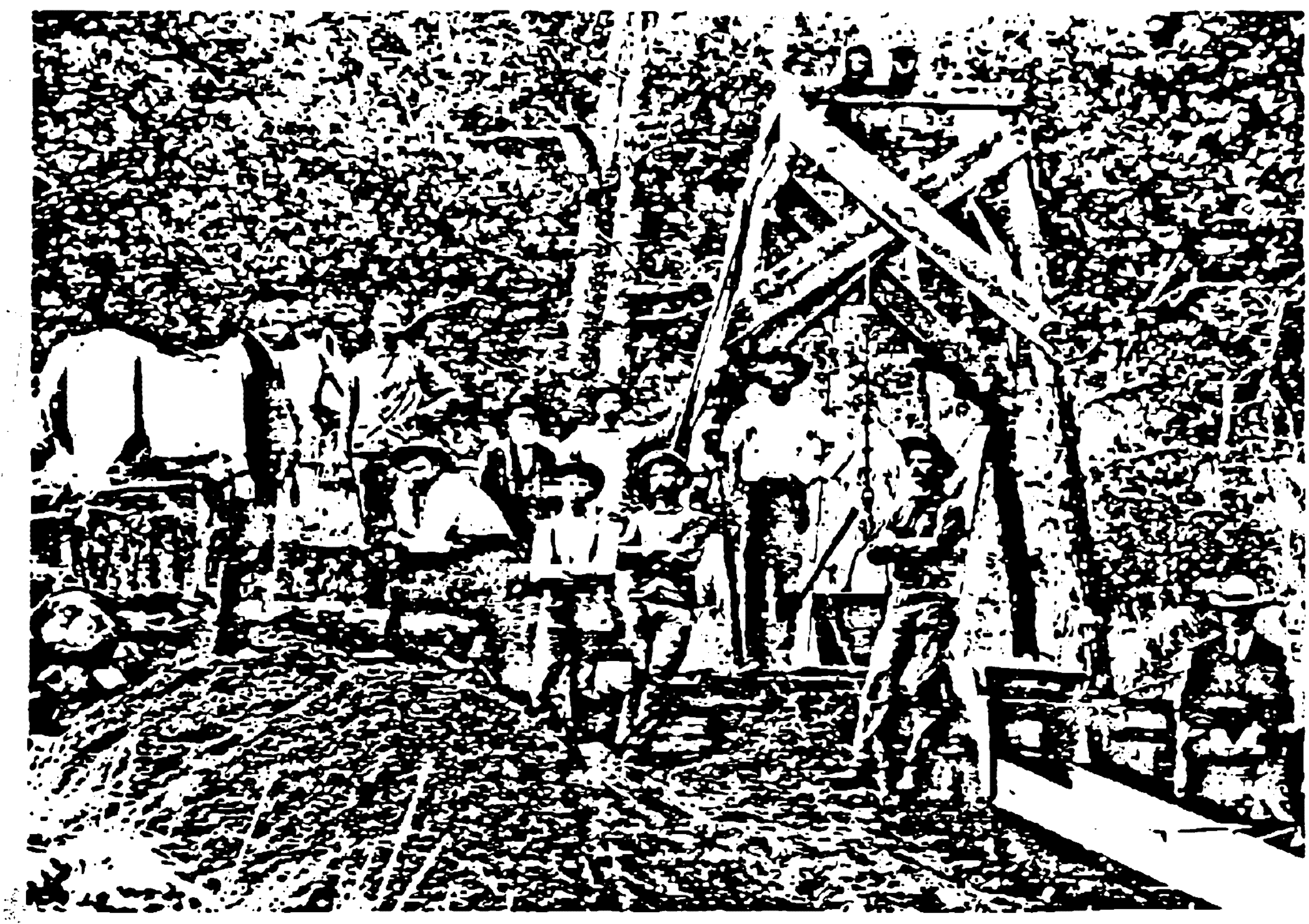
The last smelter erected in the Wichita Mountains was built at the head of Fawn Creek Canyon, near Elk Mountain, in 1906. Miners T. E. Cook and his son, Bert, recovered a slug of gold the size of a .38-caliber bullet from the ore of the Bonanza Mine at the head of the tramway. Courtesy Bert Cook.



Virtually every mining camp in the Wichitas had its own furnace for smelting ore. In 1906, Olive Wells completed this four-ton, nine-foot-high test smelter at Golden Pass, north of Cache. Courtesy Bert Cook.

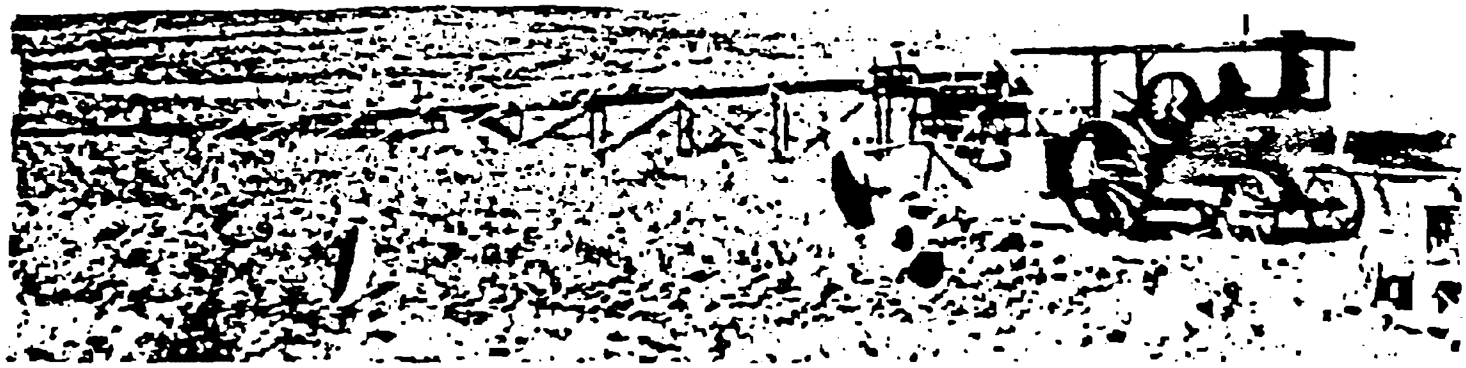


Between 1901 and 1907 more than twenty-five hundred shafts were sunk in the Wichita Mountains. Most were crowned with horse-powered hoists and shaft houses, such as this one near Snyder. Courtesy Western History Collections, University of Oklahoma Library.



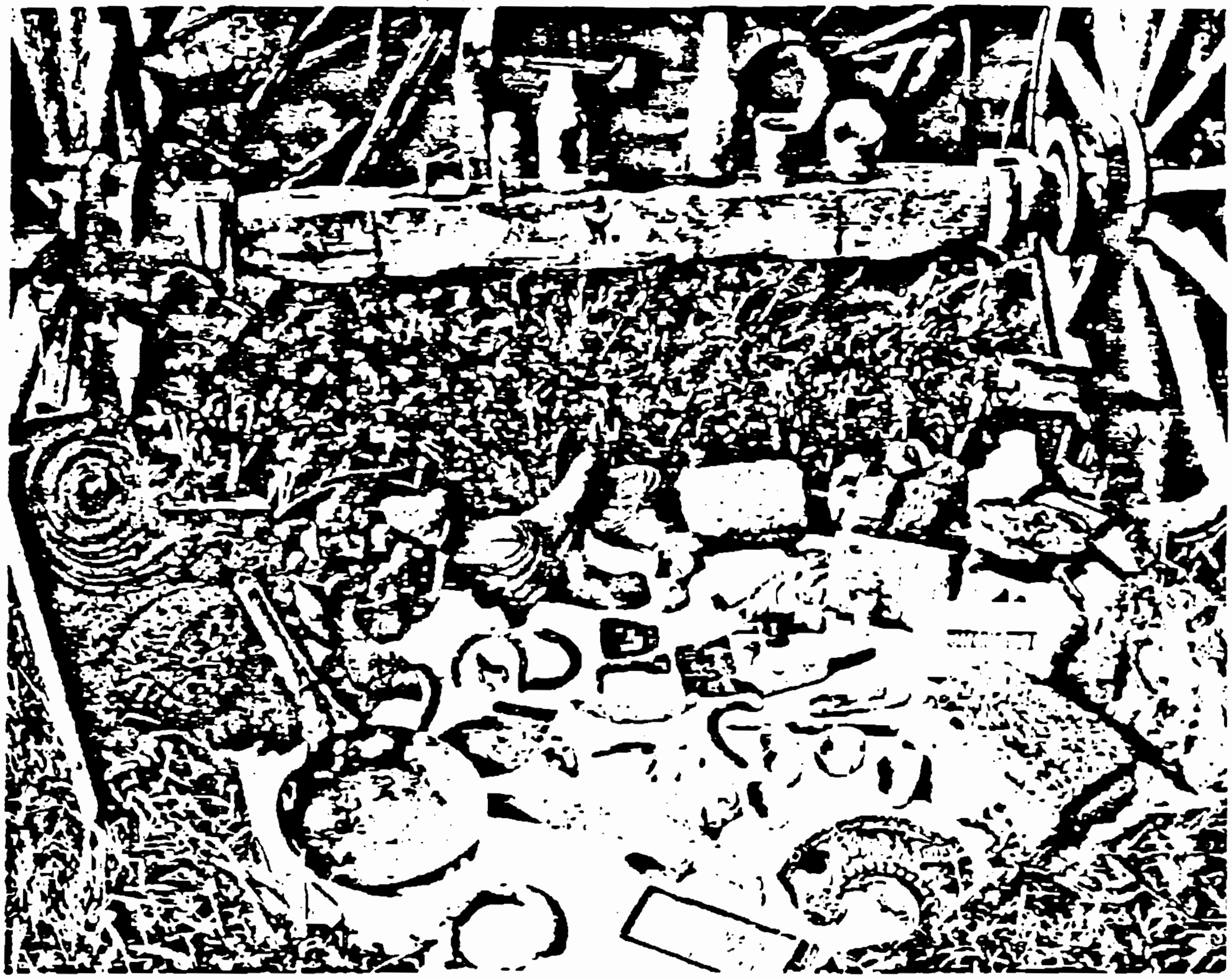
The Gold Blossom, or Campbell, Mine at the north base of Mount Scott in the Wichitas was sunk sixty-five feet deep with a thirty-foot tunnel. Courtesy Oklahoma Historical Society.

The Mount Scott Post Office, just north of the mountain, did a brisk business during the gold-rush activity in the Wichitas. Courtesy Museum of the Great Plains.



As late as 1917 placer gold was dredged from the streams south of Snyder..in Kiowa and Tillman counties, where grains of yellow metal could be panned or trapped i sluice boxes. Courtesy Western History Collections. University of Oklahoma Librar

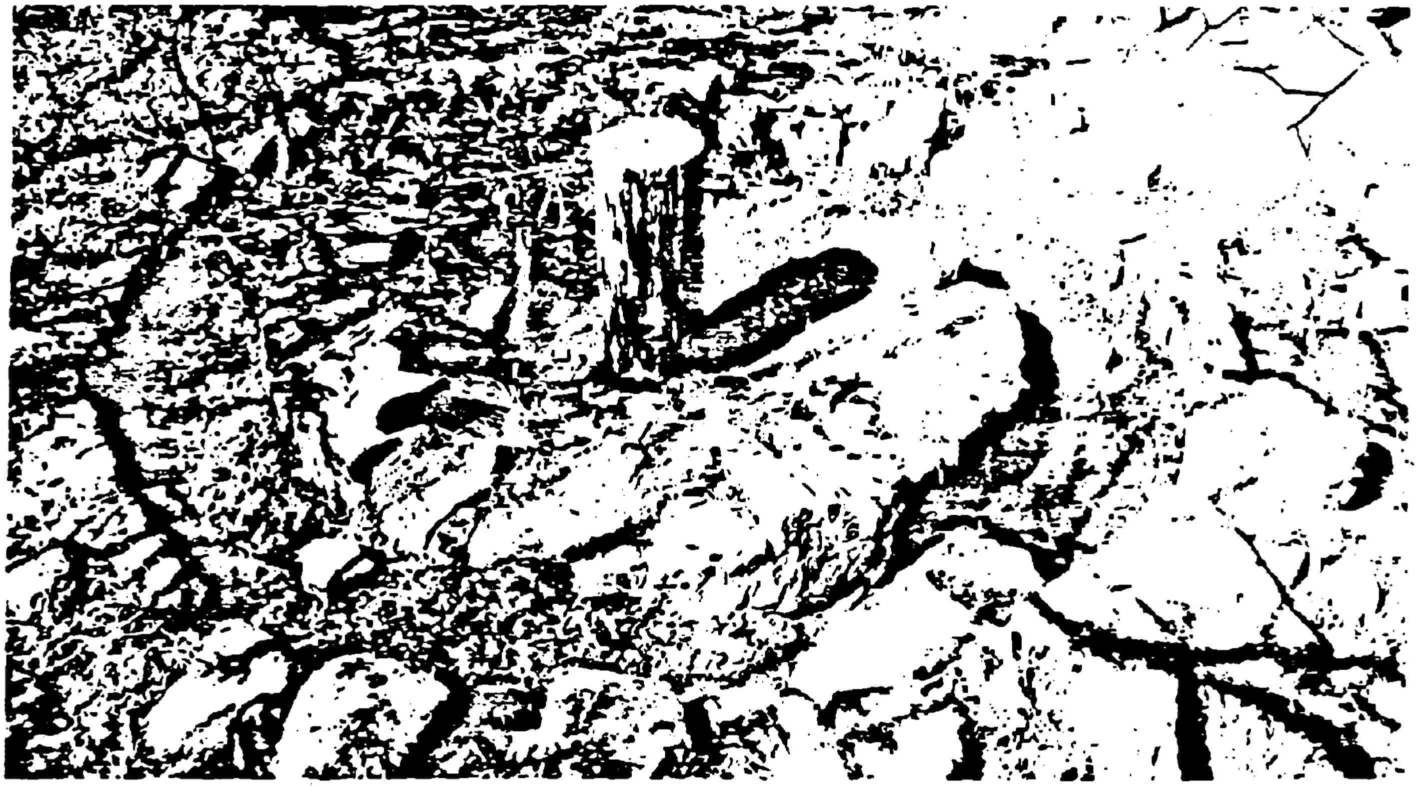
Keith Walker examines the ruins of a miner's log cabin near Treasure Lake in the Wichita Mountains.



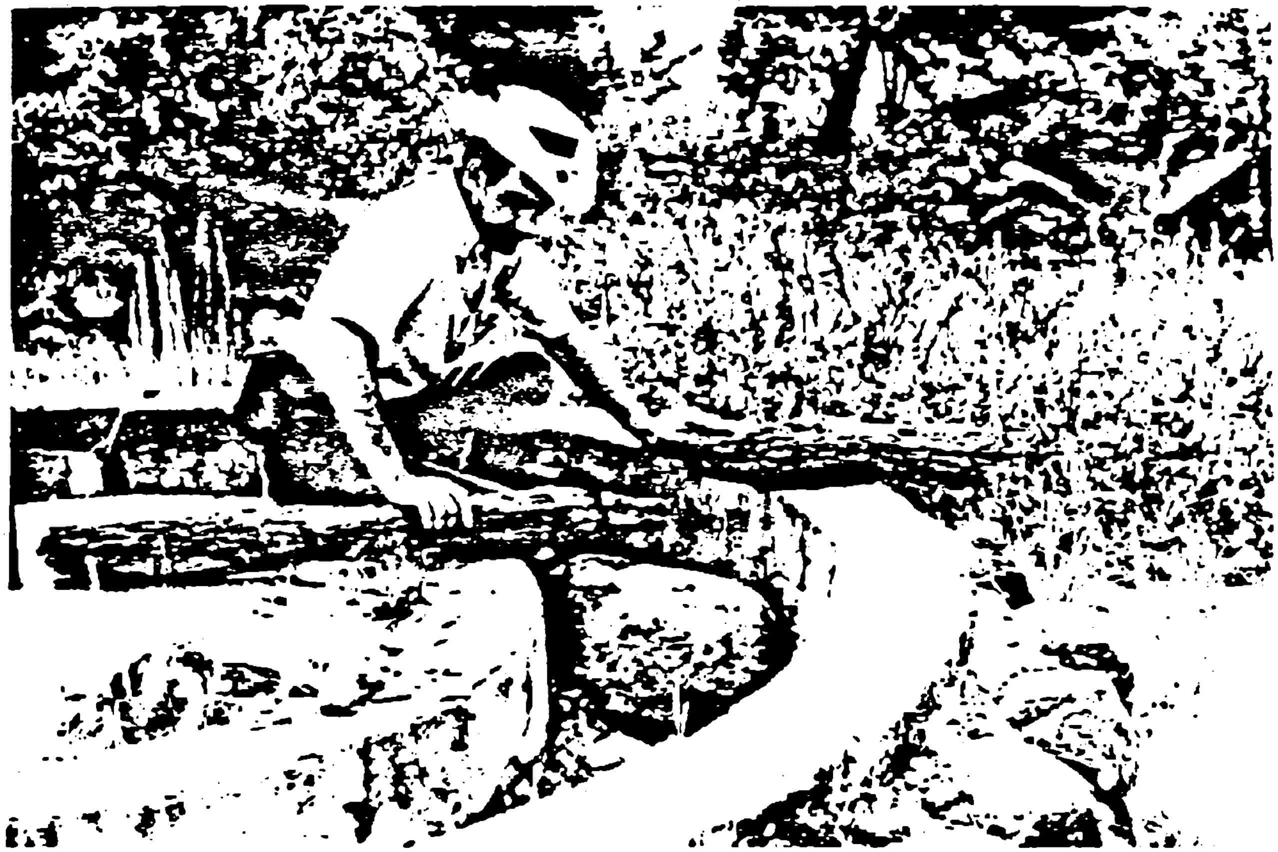
Relics of Oklahoma's gold-rush days are still found scattered among the rocks where prospectors once grubbed for precious metals. These picks, pans, crucibles, bottles, stove parts, and firebricks are among the artifacts picked up in the Wichitas.

The 110-foot-long Pennington tunnel in West Cache Creek Canyon, on the south side of the Wichitas, sold for five thousand dollars a half interest in 1903. The tunnel was dug into solid granite.

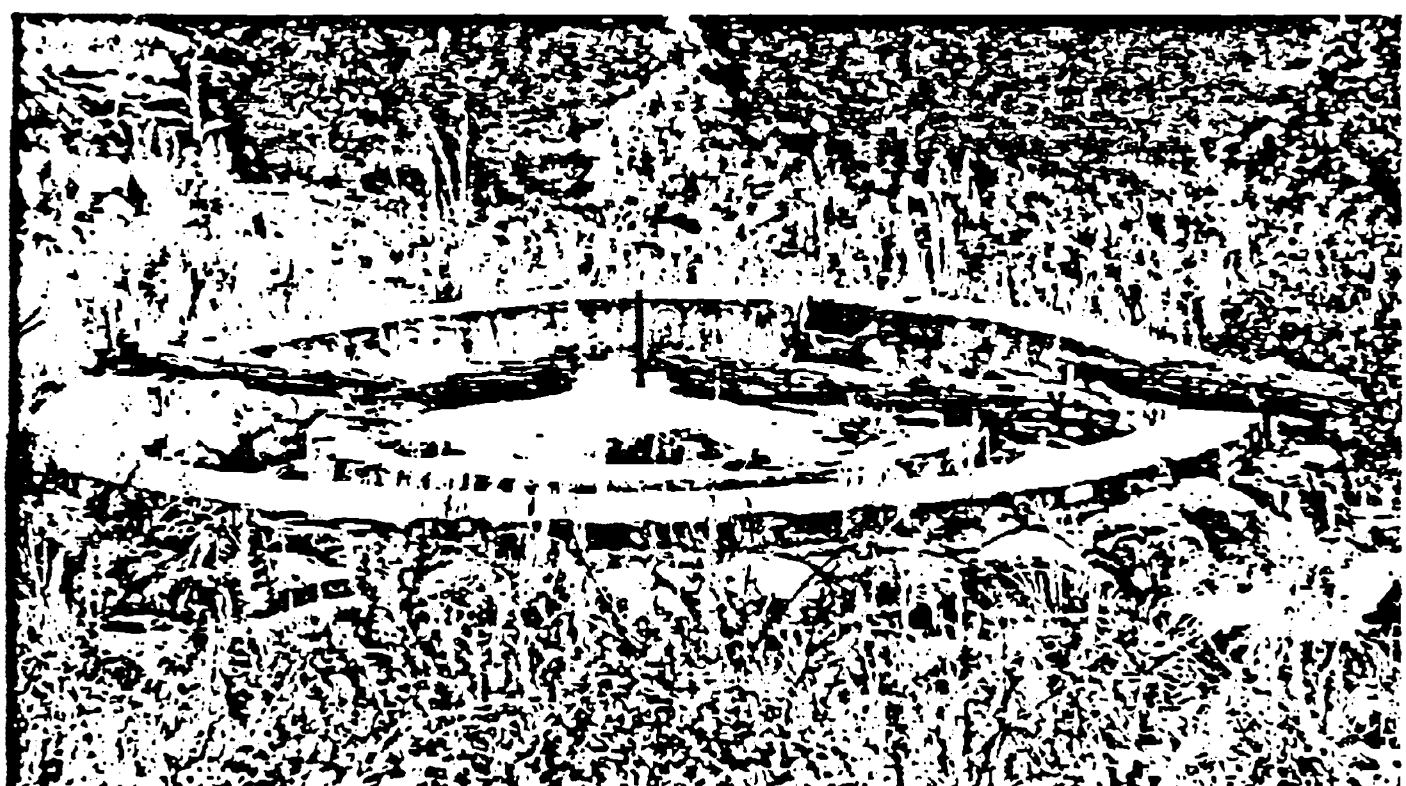
The entrance to Pennington tunnel, which remains an attraction for visitors to the Wichitas. Left to right: Linda Wilson, Ellen Jahnke, Lillian Ewing, and Ken Jahnke



In 1901, William Larve, known as "Dutch Bill," who mined thirty years in the West and Mexico, built this Spanish-type arrastra just east of Mount Sheridan on Cedar Creek. It is typical of many crude ore grinders found over the state. The rock was crushed by drag stones pulled round and round by burros.



Above: The author examines the remains of a Spanish-type arrastra built by gold seekers on Panther Creek in 1905. Below: Another view of the arrastra. Burros harnessed to a cedar crossbeam pulled a drag stone around the trough, crushing ore in preparation for separating gold and silver with mercury. Photographs by Ruth Garland



Salt Creek Canyon (north fork) looking southeast from top of Blaine escarpment in sec. 23, T. 18 N., R. 12 W. The Ferguson Salt Plain is approximately 200-250 feet below the top of the Blaine escarpment. The salt is precipitated from salt water flowing from many salt springs in the Flowerpot Shale about 100 feet below the base of the Blaine Formation. The Shimer Gypsum caps the hill on the left and the prominent Nescatunga Gypsum forms the next lower ledge, 40 feet below the Shimer ledge. The Medicine Lodge Gypsum is barely discernible about 10 feet below the Nescatunga ledge.
Photograph by Myron E. McKinley

OKLAHOMA GEOLOGICAL SURVEY

CARL C. BRANSON, *Director*

BULLETIN 89

GEOLOGY AND MINERAL RESOURCES OF BLAINE COUNTY, OKLAHOMA

PART I.—STRATIGRAPHY AND GENERAL GEOLOGY OF BLAINE COUNTY

by

ROBERT O. FAY

PART II.—ECONOMIC GEOLOGY AND PETROLOGY OF GYPSUM AND ANHYDRITE IN BLAINE COUNTY

by

WILLIAM E. HAM

PART III.—PETROLEUM GEOLOGY OF BLAINE COUNTY

by

JOHN T. BADO AND LOUISE JORDAN

The University of Oklahoma
Norman
September 1962

ginning of the Pleistocene Epoch, the Pleistocene river cutting down another 100 feet and filling in bottom portions of the valley below the escarpment.

One feature of the drainage on the northeastern side of the river is the pattern produced by ephemeral and intermittent streams that do not reach the main rivers. Most of these streams are less than a mile long and end in a small sink or depression with a lake in the middle. Many sand dunes cover the region and account for some of this pattern, but recently formed sinkholes also contributed to the development of this pattern (Fay, 1958, p. 58-64). Many sinkholes have developed in historic time in this region, probably due to solution of the underlying Blaine Formation (fig. 33). The average modern sinkhole is about 20 or 30 feet deep and 50 to 200 feet across. The overlying gravel and sand deposits act as an aquifer, supplying water to the formations below. The water probably dissolves out the gypsum and soluble salts, flowing out eastward in the Blaine escarpment to form gypsum- and salt-water springs at lower elevations (fig. 34).

Figure 33. Recently formed sinkhole on Anna Foley farm, near C SW¼ SW¼ sec. 2, T. 16 N., R. 12 W., in the Pleistocene deposits of the North Canadian River. The hole is about 22 feet deep and 50 feet wide and was probably formed by a cave-in of the Shimer Gypsum, which is about 100 feet below the ground. My wife is standing above and Mrs. Gerald "Cowboy" Curtin, editor of the *Watonga Republican* is standing below.

SOURCE: BULLETIN 89 OGS

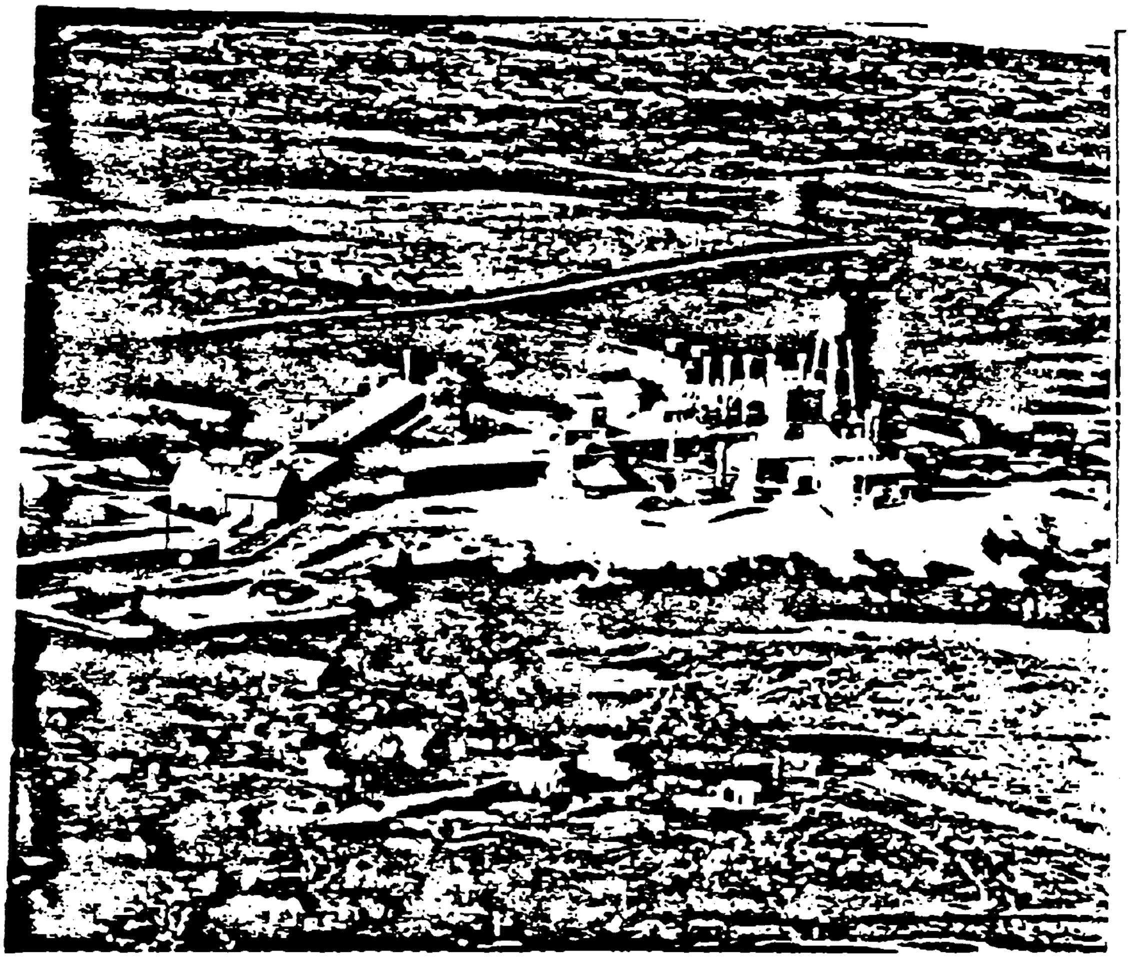


Figure 36. Aerial view of plant of U. S. Gypsum Co., Southard, showing gypsum outcrops and a few worked-out quarties at upper right. (Photograph courtesy of U. S. Gypsum Co.)

Source: Bulletin 89 OKLA. Geol Survey

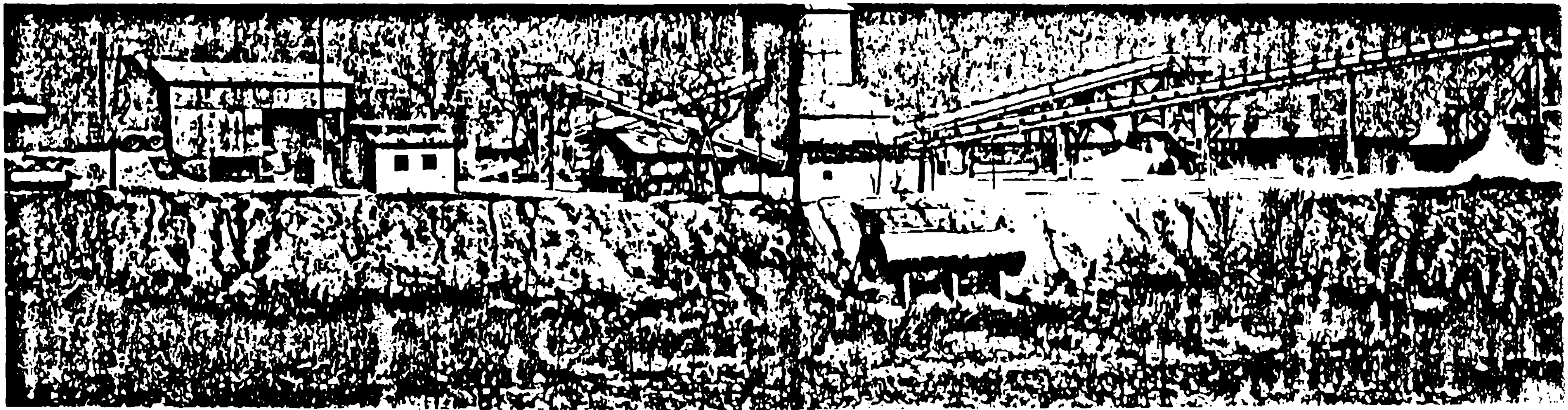


Figure 42. Plant of Universal Atlas Cement Co. at Bucher siding

OGS BULLETIN 89

The gypsum bed lies flat and is worked by open-face methods (fig. 41). After shale overburden is stripped and discarded, the face is shot from vertical blast holes, drilled to a depth one foot above the basal Magpie Dolomite. Broken stone from the face is hauled by dump trucks to the crusher plant where it is reduced to —1½-inch size through two roll crushers and loaded into open gondolas for rail shipment (fig. 42). All the stone is used as retarder in the manufacture of portland cement by 15 Universal Atlas Cement plants in the south-central part of the United States. The small amount of anhydrite locally present is worked with the gypsum as mill-run feed, for it is not sufficiently abundant to be objectionable for use of the gypsum as retarder.

As much as 10 acres of overburden is stripped in advance of the working face (fig. 43), and approximately 100,000 tons of stone is shot at one time. The thickness of shale overlying the gypsum is as much as 38 feet, up to the Southard Dolomite, but in practice not more than 25 feet is removed because here, just as in the Southard area, the percentage of anhydrite increases excessively in the worked ledge where the overburden is thicker. Underground mining was practiced at an early date but was abandoned in 1938.

Gypsum outcrops in the Blaine Formation at Bucher on the Frisco Railway have been worked for 50 years. The Monarch Plaster Company operated a gypsum-products mill at Watonga in 1913 (Snider, 1913, p. 74), shipping stone to the mill from the same deposits in sec. 27, T. 17 N., R. 11 W. that are now worked by Universal Atlas. Production was doubtless small, and the plant did not survive into the 1920's. The property was acquired in 1925 by Universal Atlas and since then has been continuously active, yielding the second largest production in Oklahoma.

S. A. Walton and Son

The partnership of S. A. Walton and Son, 805 N. 8th St., Fairview, Oklahoma, has produced crude gypsum since 1947 from properties in the central part of sec. 35, T. 19 N., R. 12 W. Located two miles northeast of Southard, at Gyp siding of the St. Louis and San Francisco Railway, the plant also is close to State Highway 51 and has excellent transportation facilities for the sale and distribution of crushed gypsum for use as retarder in the manufacture of portland cement and of ground gypsum for soil conditioner. Most of the gypsum for cement retarder is sold to the plant of the Dewey Portland Cement Company, Dewey, Washington County, Oklahoma.

From the opening of the plant in April 1948, through 1956, the Medicine Lodge Gypsum was worked by open-face methods from the bench surrounding a small butte in NW¼ SE¼ sec. 35.

PENNSYLVANIA

COMMONWEALTH OF PENNSYLVANIA

FINAL REPORT
NARRATIVE SUMMARY - NONCOAL MINERAL INVENTORY

INTRODUCTION

The noncoal mining industry in Pennsylvania began in early colonial days. The earliest record of iron ore mining in Pennsylvania was in 1692, while small scale quarries for building stone were started somewhat earlier by the original Swedish and English colonists. A thriving iron industry developed by the mid-seventeen hundreds, based on abundant iron ore, limestone, forests for charcoal, and water power. By this time, the forests and iron mines in England had been greatly depleted and the abundant resources of the colonies could fill that gap. Mines and quarries expanded in number and size to meet the needs of the growing colony. Pennsylvania had produced a wide variety of metallic minerals including iron, copper, zinc, chromium, and lead along with minor production of silver, gold, nickel, cadmium, and molybdenum. Noncoal minerals used for construction or industrial purposes include limestone, dolomite, clay, shale, sandstone, sand, and gravel.

METHODS OF MINING

Both underground and surface mining methods have been used in Pennsylvania for both metallic and nonmetallic mining. Surface mining methods have been used to a far greater extent than underground mining for noncoal minerals in Pennsylvania, especially during the 20th century.

Processing of iron ore in colonial days involved the locating of the furnace in close proximity to the ore. Most iron ore in the state is located near a limestone source, and forests were abundant at the time. This combination resulted in numerous self-sufficient iron production facilities through much of the 1700's and 1800's. When the more abundant and richer Minnesota iron ore became available, along with improved transportation, small scale iron mining in Pennsylvania declined. Most of the overburden was dumped locally, as was the slag. With the expansion of the railroad system, much of the slag was used for ballast. As the rail transportation became available, most ore was shipped to centralized mills in the growing cities. By the 20th century, only a handful of the larger iron mines were working in Pennsylvania. The size and scope of mining of minerals for construction purposes continued to grow along with the population and rapidly expanding industry.

Two additional methods of mining are used in Pennsylvania for noncoal. There is a limited amount of dredging for sand and gravel conducted in the Allegheny River. Sand and gravel is also dredged by the clamshell method along stream terraces.

At the present time, there is no metals-mining in Pennsylvania. The Cornwall magnetite iron mine stopped production in 1972 after 234 years of continuous production. Three mines - Cornwall (iron), Grace (iron), and Freidensville (zinc) had a greater production than all other metals mines in Pennsylvania combined.

NONCOAL LAWS AND RECLAMATION

Noncoal mining in Pennsylvania is regulated under the Noncoal Surface Mining Conservation and Reclamation Act and The Pennsylvania Clean Streams Law. Regulation of noncoal mining began in 1972 when the Surface Mining Conservation and Reclamation Act (SMCRA) was amended to include noncoal surface mining. The Noncoal SMCRA was passed in 1984.

Since 1972, noncoal operations have been required to obtain permits from the Bureau of Mining and Reclamation, provide for reclamation of the mine site, and post bond to ensure reclamation.

Highwalls established above the regional water table prior to 1972 require no reclamation unless they are reaffected for production purposes after that date.

Noncoal mines with sufficient overburden are required to backfill to approximate contour after the extraction of minerals. Noncoal mines with insufficient overburden normally are required to slope the highwall to an average of 35° for areas above the water table. Revegetation of disturbed area is also required. Effluent standards are set for likely pollutional parameters. Any public or private water supply affected by contamination, interruption, or diminution due to noncoal surface mining activities must be restored or replaced with an alternate source of water adequate in quantity and quality for the purposes served by the supply.

The majority of large noncoal mines in Pennsylvania intercept the regional water table and, after mining and reclamation is completed, will result in the creation of a lake with vegetated slopes.

INACTIVE/ABANDONED MINES - ENVIRONMENTAL IMPACTS

Metals Mines

All metals surface mining in Pennsylvania had ceased prior to the effective date of noncoal regulation in the state (1972). The vast majority of the small scale metals mines had ceased operation prior to 1900. In conjunction with this study, the Bureau of Mining and Reclamation looked at impacts of metals mining in three counties (Cumberland, Lehigh, and Northampton), which account for approximately 50% of the past metals mining in the state. The Bureau looked at water quality (surface and groundwater) in those areas to assess the impacts.

Lehigh and Northampton Counties are adjacent to each other and represent the greatest concentration of past metals mining in Pennsylvania. Extensive iron ore mining was conducted in this area from the early 1800's until World War I. None of the iron ore mines have been active since that time. The mines ranged in size from 40 acres to less than 1/4 acre. Many of the mines were small and cannot even be located on aerial photos - many are now merely a shallow area in the center of a cornfield. The larger mines which operated below the water table are now waterfilled impoundments, with some used for recreational purposes. The water is of good quality with wells in the area and the streams draining the area, meeting EPA drinking water standards for iron and manganese. A well, formerly used at the now inactive Freidensville zinc mine, is being used as a public water supply and meets EPA primacy drinking water standards. The old tailing pile at the site is currently being mined for its lime for use in gypsum wallboard, with no adverse affects on the well quality.

In Cumberland County, over twenty old iron ore mines are located in the watershed of the Yellow Breeches Creek, which is one of Pennsylvania's most popular trout streams. The largest of the old iron ore mines in this area is now a recreational lake (swimming, row boating, and fishing) as part of the Pennsylvania State Parks System. Several other old iron ore mines in the area are used for private recreational purposes and are surrounded by cottages. The water quality of the wells and streams in the area are of good quality.

Construction and Industrial Minerals

The major construction type minerals in Pennsylvania are limestone, sand and gravel, argillite, shale and sandstone. Dimension stone (various types), flagstone, and cut slate are also produced. Water quality associated with limestone mining is usually of excellent quality. Water associated with argillite, and sand and gravel is usually of good quality. Water quality associated with shale and sandstone is normally of good quality except those mined in the coal measures and associated with an acid-producing coal seam.

Clay, which is usually mined for industrial purposes, exhibits good water quality unless the clay is mined in association with an acid-producing coal seam.

Air Quality

Air quality does not tend to be a problem at abandoned noncoal mines since most disturbed areas, other than areas of bare rock (which is not prone to producing air pollution, is quickly covered by natural vegetation due to the moist temperate climate and the alkaline nature of the materials.

Inactive/Abandoned Mine Reclamation

Noncoal mines in Pennsylvania which ceased operation prior to 1972 have no reclamation responsibility. The majority of the inactive/abandoned noncoal mines were inactive by 1900. Noncoal mines developed prior to extensive use of modern explosives had the working faces or highwalls developed at the angle of natural repose for the type of material being mined. Noncoal mines mined in more recent times in consolidated rock were developed with high angle highwalls. Slopes developed at the angle of natural repose usually remain stable. Highwalls developed in consolidated rock in most cases remain stable. The highwalls in existence at inactive/abandoned noncoal mines do not compare with the reclamation standards required in Pennsylvania since 1972. However, these highwalls would meet the present reclamation standards required in many states which allow vertical highwalls in most cases if the highwall is stable.

Accidents involving old highwalls have been few. Many inactive highwalls near urban areas have been fenced.

Mills and Plants

The database available during the study contained no data regarding whether the inactive/abandoned mine site had on-site mills or plants. The data does indicate that there are 28 off-site inactive/abandoned mills or plants. In regard to on-site mills and plants, there are numerous abandoned iron ore furnaces throughout the state which have not been active during the 20th century. Many of these are considered to be of historic significance, and some have been restored and included under both state and local park systems.

Bond Forfeiture and Reclamation

Since 1972, noncoal mines have had reclamation responsibilities and reclamation bonds, only five noncoal mines have had bond forfeiture in which Pennsylvania will have to use the forfeited bonds to provide for reclamation. Seven other sites that have been abandoned have been reclaimed by the bonding company or the site has been repermitted by another mining company. The five sites with bond forfeiture are now under study for reclamation under Pennsylvania's abandoned mine land program.

Costs and Acreage - Inactive/Abandoned Noncoal Mines

Pennsylvania has listed most data information on the Data Summary as the number of mine sites, rather than by acreage, since there is insufficient data to list these by acreage. The only acreage data available to us is from the Soil Conservation Service. This data is listed as total acreage of land needing reclamation and which was not required by any law. The data is listed by county and is broken down into three catagories (coal mines, sand and gravel, and other mined areas). The totals for Pennsylvania are:

Coal -	240,000 acres
Sand and Gravel -	11,000 acres
Other Mined Areas -	20,500 acres

These figures would amount to a total of approximately 31,500 acres of land disturbed and abandoned by noncoal mining in Pennsylvania for which reclamation is not required by any law. The information available contained no data identifying acreage on any individual noncoal sites. In addition to the 31,500 acre figure, the available data shows that there are 1309 noncoal sites abandoned prior to the regulation of noncoal mining in Pennsylvania.

The cost to reclaim abandoned noncoal mines in Pennsylvania would depend on the condition of the individual mine site. An average cost figure of approximately \$7000 per acre has been established for reclamation of surface coal sites in Pennsylvania. A similar average cost figure for noncoal in reasonable. Most sand and gravel sites would require a lower figure, while consolidated rock sites may require a higher figure, based on site conditions.

The major site condition affecting reclamation cost of a consolidated rock quarry is the height and slope of the highwall. As noted previously in this report, the majority of the inactive/abandoned noncoal sites in Pennsylvania were inactive prior to 1900. Vertical or high angle highwalls were not developed at that time since modern drilling and explosive equipment and technology were not available. The highwalls were generally developed at a 45° slope in bedrock. After the water pumping at the pit ceased, the water table returned to its normal level and the abandoned pit became a lake with 45° slopes. Over the years, natural revegetation occurred and the slopes were covered by hardwood forest. In the early years of this century, the larger noncoal operations started to develop vertical highwalls. These methods gradually were phased into smaller noncoal sites, although many small local sites continued to develop 45° highwalls into the 1950's. Most of the noncoal surface mines which were developed at 45% and abandoned have been reclaimed through natural processes.

Sand and gravel mining in Pennsylvania involves both wet and dry sites. The wet sites are usually on a flood plain of a river or large stream and involve the dredging of sand and gravel below the shallow water table. The operations result in the creation or expansion of a lake with slopes at the angle of natural repose for sand. In most cases, affected areas around the pit will become naturally vegetated. The dry sand and gravel site are usually shallow pits on old river terraces or in glacial drifts. The slopes on these were maintained at the angle of natural repose. Most abandoned dry sand and gravel will also be covered by a natural vegetative growth, but at a slower rate than the wet sand and gravel sites.

Many of the abandoned noncoal surface mine sites in Pennsylvania have been reclaimed through the way in which they were developed and the climate and natural fertility of the land. Most of the abandoned consolidated rock noncoal mines developed at 45° would need no further reclamation work. The majority of abandoned sand and gravel sites would also require no further reclamation. There are abandoned noncoal mine sites which were developed with vertical high angle highwalls. Most of these noncoal mine sites are located on private property and were abandoned prior to noncoal mine regulation in Pennsylvania. Although the Bureau of Mining and Reclamation has no jurisdiction over these sites, many of the possible safety problems at these sites have been taken care of through actions of the landowner and/or local government agencies. Many have safety fencing to prevent access to the pit area. Some have been developed for commercial uses - private fishing clubs, skin diving schools, water supply reservoirs, etc.

Due to the mining methods of many of these old abandoned noncoal sites, a large percentage of the affected and abandoned 31,500 acres of noncoal mining would need no further reclamation.

We have included several photographs showing the natural reclamation which has taken place at a number of abandoned noncoal sites. Photographs of abandoned vertical highwalls are also included.

REFERENCE GUIDE

1. Data for mining type was obtained primarily from the following sources:

    a) U.S. Bureau of Mines - Minerals Availability System Domestic Deposit Listing (MAS).

    b) U.S. Geological Survey - Mineral Resource Data System (MRDS).

    c) Pennsylvania Geologic Survey - Mineral Resources Report 50.

    d) U.S. Department of Agriculture (Soil Conservation Service) - The Status of Land Disturbed by Surface Mining in the United States.

    The quality of data listed on the Data Summary Sheet is rated at a 75% accuracy rating. Due to acreage figures not being available for most sites in the data sources, mining type has been listed as site numbers instead of acres.

    The number of millsites and smelters located at abandoned mining sites could not be obtained from the data available.

2. The data sources for ownership are listed in 1. a, b, c, and d.

    The ownership is listed as site numbers rather than by acreage due to lack of acreage data.

    Ownership listed as "other" indicates no ownership was available for the mine site.

3. Under features, the data available was insufficient to provide a listing and was therefore insufficient to provide cost estimate. Both of these items will be addressed further in the narrative.

4. In considering the data for Construction Ores and Industrial Ores, some noncoal minerals are used for both construction and industrial purposes (such as lime- stone). Since there is no data available as to which use such minerals were produced for, we have listed limestone and other multiple use minerals under construction since this is the more frequent use. Sites listed under Industrial Ores are for minerals used only for industrial purposes (i.e. clay).

5. There is no mining of phosphate, uranium, or oil shale in Pennsylvania.

6. Insufficient data available.

7. The totals only include inactive/abandoned noncoal mines which are not covered by permits and reclamation requirements under the Pennsylvania Noncoal Surface Mining Conservation and Reclamation Act. Noncoal mines with permits which are abandoned illegally are addressed in the narrative. A separate reclamation narrative on cost and acreage has been provided for the inactive/abandoned mines.

NON-COAL INVENTORY
INACTIVE/ABANDONED MINES[1]

Commonwealth of Pennsylvania

Agency Contact Ernest Giovannitti

Telephone (717) 787-5103

REFERENCE GUIDE TO DATA SUMMARY[2,3]

MINERAL TYPE (acres)[4]	MINING TYPE	(number)	Ownership	(number)	FEATURES	(units)	(cost)
Metallic Ores	Mines	ref.1	Federal	ref.2	Polluted Water[8]	(miles) ref.3	(cost)[6] ref.3
	Millsites	"	Private	"	Mine Dumps[9]	(acres) "	"
	Smelters	"	State	"	Disturbed Land[10]	(acres) "	"
	Other[5]	"	Other[7]	"	Highwalls[11]	(miles) "	"
					Mine Openings[12]	(number) "	"
					Subsidence Prone[13]	(acres) "	"
					Hazardous Structures[14]	(number) "	"
					Other[15]	(units) "	"
Construction Ores Ref. 4	Mines	ref.1	Federal	ref.2	Polluted Water	(miles) ref.3	ref. 3
	Millsites	"	Private	"	Mine Dumps	(acres) "	"
	Smelters	"	State	"	Disturbed Land	(acres) "	"
	Other	"	Other	"	Highwalls	(miles) "	"
					Mine Openings	(number) "	"
					Subsidence Prone	(acres) "	"
					Hazardous Structures	(number) "	"
					Other	(units) "	"
Industrial Ores Ref. 4	Mines	ref.1	Federal	ref.2	Polluted Water	(miles) ref.3	ref. 3
	Millsites	"	Private	"	Mine Dumps	(acres) "	"
	Smelters	"	State	"	Disturbed Land	(acres) "	"
	Other	"	Other	"	Highwalls	(miles) "	"
					Mine Openings	(number) "	"
					Subsidence Prone	(acres) "	"
					Hazardous Structures	(number) "	"
					Other	(units) "	"

REFERENCE GUIDE ATTACHED

DATA SUMMARY - Page 2

MINERAL TYPE (acres)	MINING TYPE (number)		Ownership (number)		FEATURES	(units)	(cost)
Phosphate Rock Ref. 5 N/A	Mines		Federal		Polluted Water	(miles)	(cost)
	Millsites		Private		Mine Dumps	(acres)	
	Smelters		State		Disturbed Land	(acres)	
	Other		Other		Highwalls	(miles)	
					Mine Openings	(number)	
					Subsidence Prone	(acres)	
					Hazardous Structures	(number)	
					Other	(units)	
Uranium Overburden Ref. 5 N/A	Mines		Federal		Polluted Water	(miles)	
	Millsites		Private		Mine Dumps	(acres)	
	Smelters		State		Disturbed Land	(acres)	
	Other		Other		Highwalls	(miles)	
					Mine Openings	(number)	
					Subsidence Prone	(acres)	
					Hazardous Structures	(number)	
					Other	(units)	
Oil Shale Ref. 5 N/A	Mines		Federal		Polluted Water	(miles)	
	Millsites		Private		Mine Dumps	(acres)	
	Smelters		State		Disturbed Land	(acres)	
	Other		Other		Highwalls	(miles)	
					Mine Openings	(number)	
					Subsidence Prone	(acres)	
					Hazardous Structures	(number)	
					Other	(units)	
Other (acres) Ref. 6	Mines		Federal		Polluted Water	(miles)	
	Millsites		Private		Mine Dumps	(acres)	
	Smelters		State		Disturbed Land	(acres)	
	Other		Other		Highwalls	(miles)	
					Mine Openings	(number)	
					Subsidence Prone	(acres)	
					Hazardous Structures	(number)	
					Other	(units)	
TOTAL Ref. 7	Mines		Federal		Polluted Water	(miles)	
	Millsites		Private		Mine Dumps	(acres)	
	Smelters		State		Disturbed Land	(acres)	
	Other		Other		Highwalls	(miles)	
					Mine Openings	(number)	
					Subsidence Prone	(acres)	
					Hazardous Structures	(number)	
					Other	(units)	

NON-COAL INVENTORY
INACTIVE/ABANDONED MINES[1]

Commonwealth of Pennsylvania

Agency Contact Ernest Giovannitti

Telephone (717) 787-5103

DATA SUMMARY[2,3]

MINERAL TYPE (acres)	MINING TYPE	(number)	Ownership	(number)	FEATURES	(units)	(cost)
Metallic Ores	Mines	622	Federal	1	Polluted Water	(miles) ref.3	(cost) ref.3
	Millsites	ref.1	Private	510	Mine Dumps	(acres) "	"
	Smelters	"	State	2	Disturbed Land	(acres) "	"
	Other	"	Other	22	Highwalls	(miles) "	"
			Munc.	8	Mine Openings	(number) "	"
					Subsidence Prone	(acres) "	"
					Hazardous Structures	(number) "	"
					Other	(miles) "	"
Construction Ores	Mines	580	Federal	3	Polluted Water	(miles) ref.3	ref. 3
	Millsites	ref.1	Private	565	Mine Dumps	(acres) "	"
	Smelters	N/A	State	0	Disturbed Land	(acres) "	"
	Other		Other	12	Highwalls	(miles) "	"
					Mine Openings	(number) "	"
					Subsidence Prone	(acres) "	"
					Hazardous Structures	(number)	"
					Other	(miles)	"
Industrial Ores	Mines	102	Federal	0	Polluted Water	(miles) ref.3	ref. 3
	Millsites	ref.1	Private	101	Mine Dumps	(acres) "	"
	Smelters	N/A	State	1	Disturbed Land	(acres) "	"
	Other		Other	0	Highwalls	(miles) "	"
					Mine Openings	(number) "	"
					Subsidence Prone	(acres) "	"
					Hazardous Structures	(number) "	"
					Other	(miles) "	"

DATA SUMMARY - Page 2

MINERAL TYPE (name)	MINING TYPE	(number)	Ownership	(number)	FEATURES	(units)	(cost)
Phosphate Rock	Mine		Federal		Polluted Water	(miles)	(cost)
	Millsite		Private		Mine Dumps	(acres)	
	Surface		State		Disturbed Land	(acres)	
N / A	Other		Other		Highwalls	(miles)	
					Mine Openings	(number)	
					Subsidence Prone	(acres)	
					Hazardous Structures	(number)	
					Other	(units)	
Uranium Overburden	Mine		Federal		Polluted Water	(miles)	
	Millsite		Private		Mine Dumps	(acres)	
	Surface		State		Disturbed Land	(acres)	
N / A	Other		Other		Highwalls	(miles)	
					Mine Openings	(number)	
					Subsidence Prone	(acres)	
					Hazardous Structures	(number)	
					Other	(units)	
Oil Shale	Mine		Federal		Polluted Water	(miles)	
	Millsite		Private		Mine Dumps	(acres)	
	Surface		State		Disturbed Land	(acres)	
N / A	Other		Other		Highwalls	(miles)	
					Mine Openings	(number)	
					Subsidence Prone	(acres)	
					Hazardous Structures	(number)	
					Other	(units)	
Other (acres)	Mine		Federal		Polluted Water	(miles)	
	Millsite		Private		Mine Dumps	(acres)	
	Surface		State		Disturbed Land	(acres)	
	Other		Other		Highwalls	(miles)	
					Mine Openings	(number)	
					Subsidence Prone	(acres)	
					Hazardous Structures	(number)	
					Other	(units)	
TOTAL	Mine	1309	Federal	4	Polluted Water	(miles)	
	Millsite	ref.1	Private	1181	Mine Dumps	(acres)	
	Surface	ref.1	State	3	Disturbed Land	(acres)	
	Other		Other	35	Highwalls	(miles)	
	Acres	31500	Munc.	8	Mine Openings	(number)	
					Subsidence Prone	(acres)	
					Hazardous Structures	(number)	
					Other	(units)	*

*See narrative on Costs and Acreage

NOTES TO TABLE

Some States have already performed Inactive/Abandoned Mine (IAM) inventories. These States may have different definitions for IAM features. Because this is a small scoping project to gather existing information, we are not attempting to impose a common set of definitions on the States. However, in interpreting the results, it is vital that the reader clearly understand each State's definition.

1. Provide a description of your State's definition of inactive/abandoned mines used in the table, e.g., do you include permitted mines which may be inadequately reclaimed under existing laws?

2. Footnote carefully your sources of data for each topic, e.g., data compiled from State surveys, State employees (listed) and review of federal data bases, Mineral Industry Location System of the Federal Bureau of Mines (MILS) and/or Mineral Resource Data System (MRDS) of the U.S. Geological Survey.

3. Describe the quality of your data. Is it 95% accurate or a different figure? Discuss basis for the estimate.

4. Define the acres listed for each MINERAL TYPE. Does it include entire mine site or just the environmental or health/safety feature?

5. Describe any "other" MINING TYPE.

6. Describe any "other" OWNERSHIP, local government or Tribal.

7. Describe any "other" MINERAL TYPE.

8. Provide your definition of POLLUTED WATER.

9. Provide your definition of MINE DUMPS, e.g., including heap leach pads, ore dumps, waste dumps, and mill tailings.

10. Provide your definition of DISTURBED LAND and associated environmental problems.

11. Provide your definition of hazardous HIGHWALLS.

12. Provide your definition of hazardous MINE OPENINGS.

13. Provide your definition of SUBSIDENCE PRONE areas, e.g., included are areas where subsidence occurrence potential is great.

14. Provide your definition of what constitutes HAZARDOUS STRUCTURES.

15. Describe any "other" FEATURES.

16. List COST factors, e.g., dollar cost per mile of polluted stream or acre of disturbed land. Provide basis for cost factors, e.g., best engineering practice, past practice but not EPA "superfund" cost.

INACTIVE/ABANDONED MINE INVENTORY SUMMARY

Commonwealth of Pennsylvania

Response - Notes to Table

1. Pennsylvania defines inactive/abandoned noncoal mines, for the purposes of this study, as noncoal mines where mining was completed prior to the regulation of such mining under the Pennsylvania Surface Mining Conservation and Reclamation Act (effective January 1, 1972). Prior to this date, noncoal mines had no reclamation responsibility in Pennsylvania. Noncoal mines which have been abandoned illegally since 1972 are included under the category of "other".

2. A reference guide to the Data Summary Sheets has been included in this package compiling the data and references used for this report.

3. The quality of the data (as a % accuracy) is addressed in the reference guide and the text for different data used.

4. The data available on inactive/abandoned noncoal mining for Pennsylvania in most cases contains no listing for acres for individual mine sites. There is, however, data available for total acreage by county. Due to this data being unavailable for individual mine sites, we have listed mining type by number of site rather than by acreage.

5. For the category "other", for the purposes of this study, we are listing permitted noncoal mining which has been illegally abandoned without completion of reclamation, and the reclamation bonds have been forfeited.

6. The term "other", in reference to ownership, will be defined as unknown ownership on the database available.

7. This description is addressed in Number 5 above.

8. "Pollution" shall be construed to mean contamination of any waters of the Commonwealth such as will create or is likely to create a nuisance or to render such waters harmful, detrimental or injurious to public health, safety or welfare, or to domestic, municipal, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or to livestock, wild animals, birds, fish or other aquatic life, including but not limited to such contamination by alteration of the physical, chemical or biological properties of such waters, or change in temperature, taste, color or odor thereof, or the discharge of any liquid, gaseous, radioactive, solid or other substances into such waters. The Department shall determine when a discharge constitutes pollution, as herein defined, and shall establish standards whereby and wherefrom it can be ascertained and determined whether any such discharge does or does not constitute pollution as herein defined.

9. Mine dumps, for the purpose of this study, will include slag piles, waste rock, railings, ponds, waste materials from processing, and overburden stock piles.

10. Disturbed land is defined as any area affected in the process of the mining operation. This includes both the pit and the support areas (haul roads, waste dumps, etc.)

11. A highwall is defined as a high angle face in a pit or open cut which would include both the exposed mineral and overburden.

12. Mine opening is defined as any mine entryway, ventilation shaft, pumping borehole, or any other opening to an underground mine which would permit human entrance to the mine. Abandoned mine openings which have not been sealed or have human access blocked could be hazardous.

13. Subsidence prone areas are defined as areas located over underground mine workings having incompetent roof rock and overburden which may be subject to collapse in the future. This situation is most prevalent in shallow mine workings.

14. Hazardous structures are defined as structures used to support noncoal mining activities (buildings, conveyors, foundations, etc.) which were abandoned and present a safety hazard to the public.

15. Due to the small number of bond forfeitures and the great variation in noncoal sites, an average cost figure is not yet available for noncoal reclamation by Pennsylvania. It can be assumed that the average per acre figure may be similar to that of the coal program which is approximately $7,000 per acre.

Abandoned limestone quarry (circa 1920's). This quarry was developed with 45° or less highwalls and abandoned. The water table returned to normal after pumping ceased, and natural vegetation developed on the sloped highwalls. This area is now used for reclamation by the newly erected adjacent corporate center.

Ironton Iron Mine. The meadow in the background was part of the mine and is now used for grazing cattle.

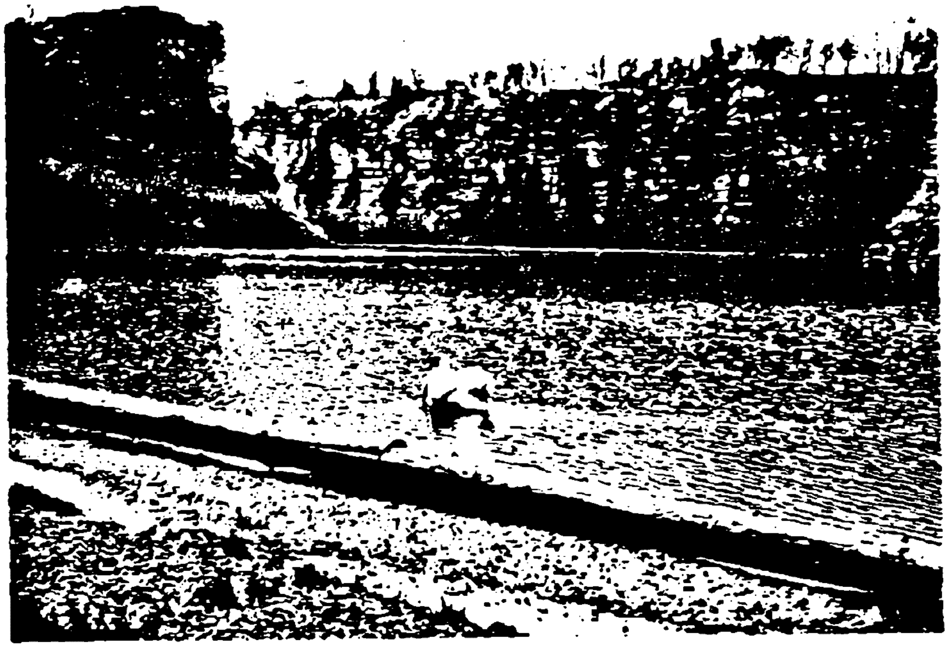
Abandoned Ironton Iron Mine (circa 1860-1890). The mine covered an area of 2200 x 800 feet with highwalls developed at approximately 45°. The water table is now at normal elevation and forested areas have developed on the slopes. A housing development ($250,000 - $400,000 range) has been built just beyond the tree line.

Figure 7-5. Pine Grove iron ore pit circa 1875. The view is to the northwest. (Photograph courtesy of the Cumberland County Historical Society.)

Figure 7-6. The ore pit ' better known as Fuller Lake, a northwest view similar to t Figure 7-5.

Waste pile from old Pine Grove iron ore pit.

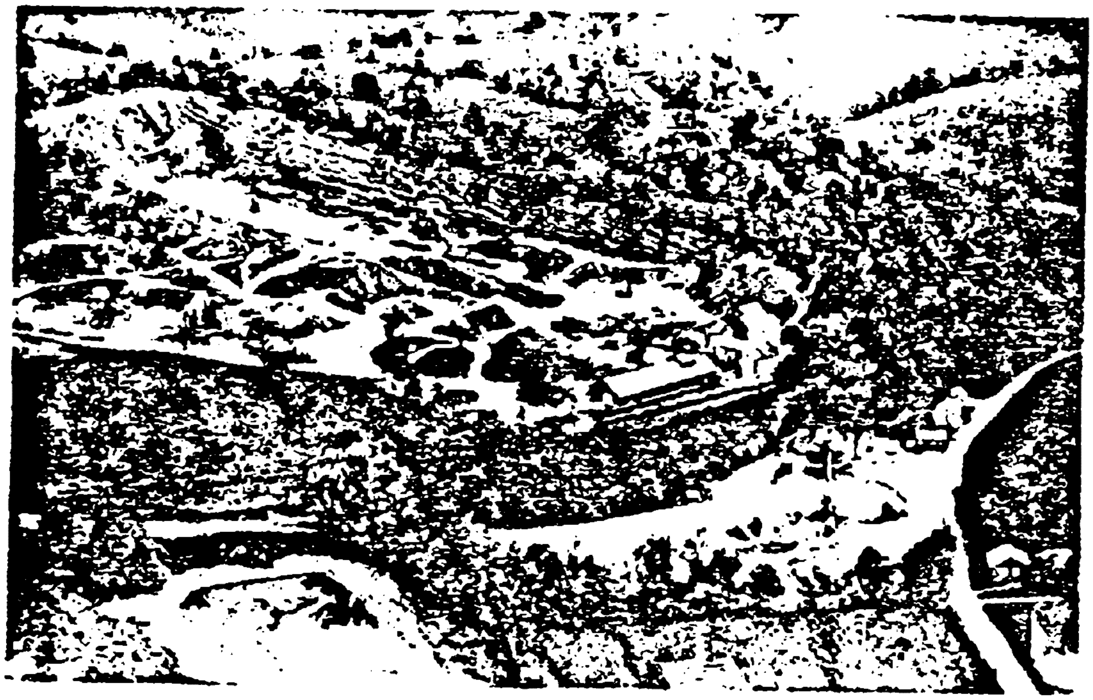
Abandoned iron mine developed with 45° highwalls. This area is presently a state park - Fuller Lake.



Abandoned limestone quarry with vertical highwalls. The area is now used as a fishing and boating lake.

Abandoned sand and gravel operation. This area is now a wetlands area used for duck hunting and fishing (Pike).

Abandoned iron mine. This area is now a private fishing club. This site was active in the 1890's.



Limestone quarry (circa 1950) with highwalls developed at approximately 45°. The highwall slopes shown in this photograph would have developed a natural growth of hardwood trees if abandoned. This quarry is still active, however, and has greatly expanded using vertical highwalls. Under Pennsylvania law, the vertical highwalls will be blasted down to 35° and the slopes will be vegetated.

Figure 3. The top of the southerly dipping diabase sheet at the ore footwall looking west. (Photo courtesy Bethlehem Steel Corp.)

The Cornwall Iron Mine operated for 235 years until it closed in the 1970's. The mine was developed at approximately 45°.

Present photograph of the Cornwall Iron Mine showing natural rise of the water table and growth of vegetation on the slopes.

TEXAS

STATE OF TEXAS
NONCOAL INVENTORY - INACTIVE/ABANDONED MINES

Prepared by
RAILROAD COMMISSION OF TEXAS
SURFACE MINING AND RECLAMATION DIVISION
Melvin B. Hodgkiss, P.E., Director
Telephone (512) 463-6900

June 1991

TABLE OF CONTENTS

NARRATIVE SUMMARY

INTRODUCTION

Texas contains an abundance of noncoal mineral resources. Location and production of these commodities has influenced the settlement and economy of Texas for over 200 years. The Salt Lakes of Trans-Pecos Texas have served the needs of ranchers and miners since the 1750's (Price and others, 1983). Production of, and exploration for, metallic ores including copper, silver, lead, zinc, tin, and tungsten brought people to far West Texas in the late 19th and early 20th centuries. In the Big Bend region the Shafter silver district and Terlingua mercury district created prosperous mining communities until the 1950's. After World War II, it was no longer economically feasible to mine the deposits. Today the Terlingua area is frequented by many tourists passing through enroute to Big Bend National Park and Big Bend Ranch State Natural Area. The mining areas are well known and generate considerable interest among tourists, especially those interested in mining and mineral collecting.

Production of building stone from the Central Texas mineral region continues today as reserves of limestone, granite, marble and sandstone are quarried. Construction ores such as limestone, sand and gravel, caliche and clay are produced all over the state, especially in Central and East Texas near population centers. Other mineral resources from around the state include fluorspar, talc, iron ore, sulfur, barite, gypsum, gold, gem stones, manganese, molybdenum, rhyolite, serpentine, shell, celestite, graphite, and mica.

MINING AND PROCESSING

Both underground and surface mining techniques have been used successfully in Texas. The underground workings associated with mineral development in Trans-Pecos Texas are extensive. Surface mining of construction and industrial ores have left thousands of pits, quarries, and strip mines throughout the state.

Processing of ore has taken place at the mine site as well as in centralized facilities of varying distances from the mines. In several localities abandoned smelting and milling equipment, and tailings from silver, mercury, limestone, and sand and gravel production have been observed. Smelters in El Paso and along the Texas Gulf Coast are still processing both foreign and domestic ores. Currently operating facilities include those processing talc, gypsum, graphite, building stones (marble, granite, sandstone, limestone), uranium, clay, salts, and sand and gravel.

HEALTH AND SAFETY CONSIDERATIONS

Unstable underground workings, unmarked vertical shafts, highwalls, and impoundments at abandoned mine sites in Texas pose serious health and safety hazards to the general public. In Trans-Pecos Texas there are many underground mine sites containing open shafts located on state and federal park lands and in close proximity to other public use areas. Some of the shafts (particularly near Terlingua and Study Butte) are readily accessible to the public and have been responsible for fatalities in the past.

Throughout the state there are abandoned mine lands located in close proximity to public roadways. There are reports of accidents involving motorists who fail to negotiate roadways near abandoned mine sites and suffer serious injuries as a consequence. The abandoned sites commonly contain water resulting in increased risks to individuals that inadvertently end up in the pits.

Recreational use of the impoundments (swimming, diving, and fishing) has resulted in a number of accidental deaths in Texas. Informal interviews with landowners and city/county officials in East and South Texas corroborate many reports of fatal and near-fatal accidents associated with hazardous conditions commonly found in many abandoned mines.

ENVIRONMENTAL IMPACTS

Environmental effects of mining, milling, and smelting activities in Texas persists long after a site is abandoned. Accelerated soil erosion from bare or poorly vegetated areas results in soil loss, stream sedimentation, and air quality degradation. Overburden commonly contains elements that can be highly toxic to fish and wildlife exposed to runoff from the site. Acid mine drainage at some sites causes a decrease in pH, resulting in leaching of metals contained in the spoil. Metal concentrations can accumulate and cause problems with water quality downstream. Processing facilities use additional substances that can be extremely hazardous to fish and wildlife as well as the public. In many cases, sites that pose no significant threat to the environment, in and of themselves, become significant environmental hazards because of waste disposal on the sites. The EPA lists several such sites on their National Priority List.

There are potentially beneficial impacts of mining in Texas as well. Many surface pits and quarries serve as ground water recharge basins. In the South Texas uranium mining district surface water resources are very limited and abandoned uranium mines in the area contain water of sufficient quality to be beneficial to livestock, fish and wildlife. Abandoned sand and gravel mines along streams and rivers in Texas significantly increase the wetland habitat available for fish and wildlife.

LAWS AND REGULATIONS

In 1975, the 64th Texas Legislature approved the Texas Surface Mining and Reclamation Act giving the Texas Railroad Commission responsibility for regulation of coal and uranium mining in the state. The Surface Mining and Reclamation Division was created to regulate the industry and to ensure the proper and timely reclamation of lands impacted by mining activities. In 1983 the Texas Legislature gave the Railroad Commission further jurisdiction over iron ore mining by amending the Texas Surface Mining and Reclamation Act. The passage of the Surface Mining Control and Reclamation Act (SMCRA) in 1977 by the 95th U.S. Congress established a national system of coal mining regulation under the jurisdiction of the Office of Surface Mining Reclamation and Enforcement, U.S. Department of the Interior. The Surface Mining Control and Reclamation Act established a program for the reclamation of mine lands abandoned prior to 1977 through the Abandoned Mine Land Reclamation Fund. There was no legal responsibility for reclamation of mines abandoned prior to the passage of the Act in 1977. Fees are levied on coal mined in the state and a percentage of the funds are available for use by state Abandoned Mine Land (AML) programs through reclamation grants administered by the Federal Office of Surface Mining.

Abandoned coal mine reclamation projects are highest priority as the coal mining industry remains the sole source of funding for the AML Program. The Texas AML Program is currently reclaiming the last eligible abandoned coal mine site at the Sandow Mine in Milam County. Funds are available on an emergency basis for noncoal reclamation if sufficient public health and safety hazards exist on the site and a request is made by the governor of the state. To date, the Texas Abandoned Mine Land Program has reclaimed seven noncoal mine sites in Brewster, El Paso, and Karnes Counties at the request of the Governor. With the completed reclamation of all eligible abandoned coal mine sites, the Texas AML Program will become certified for noncoal reclamation and will no longer require a request from the governor to reclaim noncoal sites. Federal funding for the AML Program was to expire in 1992 but was extended until September of 1995 by the recent passage of the 1991 Federal Budget by the United States Congress.

There have been several attempts in the Texas Legislature to address further regulation of noncoal mining activities. The most recent proposed legislation deals with the erection of safety features (such as berms and barricades) along abandoned sites that are in close proximity to public roadways. A school bus accident in September of 1989 near Alton, Texas resulted in the drowning deaths of several students when the bus in which they were riding collided with a tractor-trailer at an intersection. The bus went over a highwall into an impoundment created by a caliche mining operation. After the bus accident, there was concern in the legislature for additional regulation of the mining industry to insure public health and safety. With the exception of uranium and limited iron ore mining, there is no current regulation of noncoal mining activities in the State of Texas.

The U.S. Environmental Protection Agency (USEPA)is administering the investigation and remediation of hazardous waste disposal sites under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). Several abandoned noncoal mine sites are on the USEPA National Priority List (NPL) because of hazardous waste disposal at the sites.

RECLAMATION EFFORTS

The Texas Abandoned Mine Land Program has reclaimed a total of seven noncoal abandoned mine sites over the eight year period from 1983 to the present. Each noncoal reclamation project has been requested by the Governor of Texas to eliminate public health and safety hazards. A total of 134 mine shafts have been capped or backfilled in the Terlingua mercury district in Brewster County. Two abandoned surface uranium mines have been reclaimed in Karnes County and thirteen tin mine shafts have been reclaimed in El Paso County. As the last eligible abandoned coal mine lands are being reclaimed, environmental assessments, engineering design, and grant applications are being prepared for three high priority abandoned uranium mines in Karnes and Live Oak Counties.

The Abandoned Mine Land Program is presently conducting a mine land inventory of West Texas that will, upon completion, be used in the prioritization of other noncoal abandoned mine land reclamation projects in Texas. The inventory identifies and catalogs all noncoal and non-uranium mine lands as indicated on United States Geological Survey 7.5 minute quadrangle maps, aerial photographs, and field visits. Information for each site greater than two acres includes latitude and longitude, a size estimate, and mined commodity. Interpretation of aerial photographs provides further information regarding size, type of mining, active/abandoned status, presence of a highwall or wetland, and propinquity to a public road. For abandoned, non-reclaimed sites within one-half mile of a residential area, park or school, and with evidence of a highwall and/or a wetland, a site visit is made to verify status of mining and to evaluate the site for health, safety, and environmental features. All information is recorded in the Texas Mine Land Database.

The inventory is complete for the southern and eastern portions of the state. The northern and western areas of the state are currently under investigation. Site data is available for 6221 sites greater than two acres in size from the South and East Texas inventories. To date, only location and size information are available for 3200 sites greater than two acres in West Texas. A total of 11,183 sites less than two acres have been identified statewide. The statewide inventory is expected to be complete by 1992.

DATA SUMMARY TABLE

NON-COAL INVENTORY - INACTIVE/ABANDONED MINES
State of TEXAS

RAILROAD COMMISSION OF TEXAS
SURFACE MINING AND RECLAMATION DIVISION

Melvin B. Hodgkiss, P.E., Director
Telephone (512) 463-6900

DATA SUMMARY

Mineral Type (acres)	MINING TYPE (acres)		OWNERSHIP (acres)		FEATURES	(units)	(cost)
Metallic Ores Copper, Gold, Iron, Lead, Manganese, Mercury, Molybdenum, Silver, Tin, Tungsten, Zinc	Mines	630	Federal	10	Polluted Water	(miles) N/A	N/A
	Millsites		Private	*1	Mine Dumps	(acres) 400	*2
	Smelters	8 sites	State	62	Disturbed Land	(acres) 630	4,095,000
	Other		Other	558	Highwalls	(miles) -0-	-0-
					Mine Openings	(number) 744	5,580,000
					Subsidence Prone	(acres) N/A	N/A
					Hazardous Structures	(number) N/A	N/A
					Other	(units) —	—
Construction Ores Basalt, Caliche, Clay, Dolomite, Granite, Gypsum, Limestone, Marble, Perlite, Rhyolite, Sand and Gravel, Sandstone, Serpentine, Shale, Shell.	Mines	152,046	Federal	70	Polluted Water	(miles) N/A	N/A
	Millsites	53 sites	Private	*1	Mine Dumps	(acres) 7,603	*2
	Smelters		State	60	Disturbed Land	(acres) 152,046	988,300,000
	Other		Other	151,916	Highwalls	(miles) 1,013	*2
					Mine Openings	(number) -0-	-0-
					Subsidence Prone	(acres) -0-	-0-
					Hazardous Structures	(number) 31	N/A
					Other	(units) —	—
Industrial Ores Barite, Celestite, Clay, Fluorspar, Graphite, Mica, Salt, Sulfur, Talc	Mines	806	Federal	-0-	Polluted Water	(miles) N/A	N/A
	Millsites	24 sites	Private	*1	Mine Dumps	(acres) 40	*2
	Smelters		State	-0-	Disturbed Land	(acres) 806	5,239,000
	Other		Other	806	Highwalls	(miles) 8	*2
					Mine Openings	(number) -0-	-0-
					Subsidence Prone	(acres)-0-	-0-
					Hazardous Structures	(number) 1	N/A
					Other	(units) —	—

*1 **Private lands included in other catagory**

*2 **Disturbed land includes mine dumps, highwalls and all land disturbed by mining. Reclamation costs are based on this acreage.**

N/A **Not Available**

DATA SUMMARY - Page 2

Mineral Type (acres)	MINING TYPE (acres)		OWNERSHIP (acres)		FEATURES	(units)	(cost)
Phosphate Rock N/A							
	Millsites		Private		Mine Dumps	(acres)	
	Smelters		State		Disturbed Land	(acres)	
	Other		Other		Highwalls	(miles)	
					Mine Openings	(number)	
					Subsidence Prone	(acres)	
					Hazardous	(number)	
					Other	(units)	
Uranium Overburden	Mines	1,582	Federal	—	Polluted Water	(miles) N/A	N/A
	Millsites	4 sites	Private	1,582	Mine Dumps	(acres) 797	[a]
	Smelters	N/A	State	—	Disturbed Land	(acres) 1,582	23,730,000
	Other	N/A	Other	—	Highwalls	(miles) 15.7	[a]
					Mine Openings	(number) -0-	-0-
					Subsidence Prone	(acres) -0-	-0-
					Hazardous	(number) -0-	-0-
					Other	(units) —	—
Oil Shale N/A	Mines		Federal		Polluted Water	(miles)	
	Millsites		Private		Mine Dumps	(acres)	
	Smelters		State		Disturbed Land	(acres)	
	Other		Other		Highwalls	(miles)	
					Mine Openings	(number)	
					Subsidence Prone	(acres)	
					Hazardous	(number)	
					Other	(units)	
Other (acres) N/A							
	Millsites		Private		Mine Dumps	(acres)	
	Smelters		State		Disturbed Land	(acres)	
	Other		Other		Highwalls	(miles)	
					Mine Openings	(acres)	
					Subsidence Prone	(acres)	
					Hazardous	(number)	
					Other	(units)	
TOTAL							
	Millsites	81 sites	Private	1,582 [a]	Mine Dumps	(acres) 8,840	[a]
	Smelters	8 sites	State	122	Disturbed Land	(acres) 155,064	1,021,364,000
	Other	—	Other	153,280	Highwalls	(miles) 1,037	[a]
					Mine Openings	(number) 744	5,580,000
					Subsidence Prone	(acres) N/A	N/A
					Hazardous	(number) 32	N/A
					Other	(units) —	—

DATA SUMMARY REFERENCE GUIDE

DEFINITIONS

The following definitions should be taken only in the context of this report as they are tailored specifically for this report.

Inactive/Abandoned Mine Lands:

Lands affected by noncoal mining and/or noncoal mining related activities that are not presently being mined and for which no legal responsibility exists for reclamation.

Mine activity was determined by interpretation of aerial photographs for South and East Texas, and during low-altitude flyovers for North and South Texas. If no evidence of recent excavation, milling, or processing was observed, the site was classified as inactive/abandoned.

Polluted Water:

Water resources adversely impacted by mining related activities.

The Texas Water Commission's biennial report to the U.S. Environmental Protection Agency in accordance with Section 305(b) of the federal Clean Water Act fails to distinguish water quality problems related to mining activities from other impacts to water quality.

Mine Dumps:

Overburden, spoil, and other waste material removed during mining and discarded on the surface.

Mine dumps were calculated to be 95% of disturbed area for underground mines and 5% of the disturbed area for surface mines.

Disturbed Land:

All land disturbed by noncoal mining activities including: excavations, roads, mine dumps, spoil, and areas impacted by mine land runoff.

Disturbed land was calculated from general size estimates listed in the Mined Lands Inventory as follows:

Below threshold	1.5 acres
Small	10 acres
Medium	two thirds at 20 acres
	one third at 150 acres
Large	220 acres
Underground	0.5 acres/opening
Prospects	0.5 acres

Reclamation costs of approximately $6500 per acre includes reduction of highwall, regrading, soil amendments, and revegetation/reforestation.

Highwalls:

An excavated face of a mining operation that has a slope greater than 45 degrees

Highwall length was calculated based on Mine Land Inventory commodity and size estimates as follows:

Small sites	2640 linear feet of highwall
Medium sites	6624 linear feet of highwall
Large sites	12380 linear feet of highwall

Highwall height was not included in the calculation due to incomplete data.

Mine Openings:

A shaft or adit in which the depth exceeds the width.

Remediation costs for mine openings are based on three types of closures utilized by the Texas AML Program. The three closure types and their average costs (based on previous mine opening remediation projects) are as follows:

Fence @ $500/opening
Backfill @ $6,500/opening
Cap/Gate/Grate @ $15,000/opening

Total cost of mine opening remediation was estimated assuming each closure type would be used for approximately one-third of the total number of openings.

Subsidence Prone:

Mined lands with underground workings which exhibited evidence of instability.

There were no data available for subsidence prone mine lands as the inventory of underground mines in West Texas is incomplete.

Hazardous Structures:

Abandoned facilities or equipment associated with previous mining activities.

There were a small number of structures noted in the East and South Texas Inventories.

DATA SOURCES

* Mined Lands Inventory
* South Texas Uranium District Abandoned Mine Land Inventory
* Mineral Producers Lists

DATA DEFICIENCIES

The Mined Lands Inventory is not complete for North and West Texas so estimates regarding the total number, sizes and commodities of sites were made from published literature (Kier and others, 1977; McBride and others, 1987; McBride and others, 1988; and Smith, 1974) and county soil surveys. The active/abandoned status of mine sites in South and East Texas are only as current as the aerial photography examined. Photos interpreted included those from the National High-Altitude Aerial Photography Program (scale 1:58,000; 1981, 1983, 1985); Texas State Highways and Public Transportation (scale 1:24,000; 1979-1990); Lower Colorado River Authority (scale 1:12,000; 1982); National Aeronautics and Space Administration (scale 1:60,000; 1987); United States Geological Survey (USGS) Border Color Image Maps (scale 1:25,000; 1982) and National Aerial Photography Program (scale 1:40,000; 1989-90). For North and West Texas, identification of sites is more dependent on the USGS 7.5 minute topographic maps and soil surveys as the cost of purchasing aerial photography for the entire survey area was prohibitive. However, the status of mine sites in North and West Texas will be more accurately determined as all sites will be surveyed by low altitude flyovers. With the recent changes in the Texas economy during the 1980's, it is possible there are many recently abandoned operations.

Calculations of disturbed areas, highwalls, and mine dumps were all made based on the size category of each site in the Mine Lands Inventory. No actual measurements have been made for these features.

The number of mill sites and smelters is underestimated as the only available data is from the mineral producers lists which were not compiled until the late 1970's. No data on the acreages disturbed by ore processing were available.

Cost estimates were based on coal, uranium, mercury, and tin mine reclamation projects completed by the Texas AML program. Construction and administrative costs were combined to approximate the total expenditure for each project. Costs per feature were determined by total acreage and total number of mine openings reclaimed. No specific cost data were available for mine dumps and highwalls. These features were included in the per acre reclamation cost.

REFERENCES

Jackson, M.L.W., R.H. Blodgett, and W.R. Kaiser. 1989. Mined lands inventory, industrial minerals, South Texas. Contract report prepared for the Railroad Commission of Texas under Interagency Cooperation Contract No. IAC (88-89)-0979. University of Texas at Austin. Bureau of Economic Geology. 57 pp. 5 appendices. 9 maps.

Jackson, M.L.W., R.H. Blodgett, and W.R. Kaiser. 1990. Mined lands inventory, industrial minerals, East Texas. Contract report prepared for the Railroad Commission of Texas under Interagency Cooperation Contract No. IAC (90-91)-0492. University of Texas at Austin. Bureau of Economic Geology. 79 pp. 5 appendices. 9 maps.

Kier, R.S., L.E. Garner, and L.F. Brown Jr. 1977. Land resources of Texas. University of Texas at Austin. Bureau of Economic Geology. 42 pp. 4 maps.

McBride, M.W., W.T. Pickens, and B. Stengl. 1987. Computer-generated list of inactive Texas mineral sites (exclusive of oil and gas). University of Texas at Austin. Bureau of Economic Geology.

McBride, M.W., and B. Stengl. 1988. Computer-generated list of Texas mineral producers (exclusive of oil and gas). University of Texas at Austin. Bureau of Economic Geology.

Price, J.G., C.D. Henry, and A.R. Standen. 1983. Annotated bibliography of mineral deposits in Trans-Pecos Texas. University of Texas at Austin. Bureau of Economic Geology. Mineral resource circular No. 73. 108 pp.

Sharpe, R.D. 1980. Development of the mercury mining industry: Trans-Pecos Texas. University of Texas at Austin. Bureau of Economic Geology. Mineral resource circular No. 64. 32 pp.

Smith, G.E. 1974. Depositional systems, San Angelo Formation (Permian), North Texas-facies control of red-bed copper mineralization. University of Texas at Austin. Bureau of Economic Geology. Report of investigations No. 80. 84 pp.

VIRGINIA

Commonwealth of Virginia April 1991

Orphaned Mineral Mine Inventory

Department of Mines, Minerals and Energy

Contents

Commonwealth of Virginia

Orphaned Mineral Mine Inventory

HISTORY

Mining in Virginia has taken place in one form or another since man's initial habitation of the land. Early mining in Virginia began with the retrieval of flint and stone by American Indians for use as tools, and with the mining of bog iron ore near Jamestown in 1609. The first ironworks were set up in 1619 about 66 miles above Jamestown on the James River. The Virginia ironworks were small local operations using local sources of ore for raw material. The only other metal of any importance in colonial America was lead, which was used mostly for bullets. The Austinville Lead/Zinc Mine in Wythe County, Virginia operated in the 1700's and was important in the Revolutionary War.

Salt mines, located in the town of Saltville, were utilized for preservation purposes during the Civil War. In the 1800's numerous gold mines existed in Virginia. Shafts were sunk and drifts driven to explore and mine the deposits of gold, copper, iron, lead, and silver. As the mineral deposits in the western U.S. were discovered and found to be richer, Virginia's metal mines began to close down. The majority of the gold mines in Virginia closed during the Civil War with only minor attempts to reopen them after the war. Other metal mines in Virginia remained viable during this period; the Crimora Mine, the largest producer of manganese in the United States, operated until 1958.

The materials mined in the 1900's included the only arsenic mined east of the Mississippi River, the Brinton Mine, which operated from 1912-1917. Manganese and iron mining continued throughout the state until production ceased for the most part in the 1950's. Barite production began in Fauquier County in 1845 and continued also until the mid-1950's. Titanium ore mining and processing continued from the 1940's to the early 1970's. The mining of construction materials, which was first documented in the late 1800's, continues today and includes sand and gravel, granite, limestone, gneiss, sandstone, etc. for crushed stone, dimension stone, gypsum, clay, and others. At one time or another, over 50 minerals have been mined in Virginia, contributing greatly to the state's economy but also causing adverse impacts on the public's health and safety, and the environment.

IMPACTS OF PAST MINING ON THE ENVIRONMENT AND PUBLIC SAFETY

The impacts of past mining on the environment and the public's health and safety are present in varying degrees throughout the state. These impacts are defined as follows:

- Environmental pollution is defined as any condition which poses existing or potential hazards to the environment. The major environmental problems associated with inactive/abandoned mine sites is stream sedimentation from unvegetated soils, acid drainage, tailings and waste piles, ground water depletion, and trash dumps.

- Hazards to the public health and safety are defined as any conditions which have the potential, now or in the future, of posing a danger to the public. The major public health and safety problems associated with inactive/abandoned mine sites in Virginia are fall hazards from highwalls, shafts and other mine openings, and the unauthorized and unsupervised use of mine sites as recreational areas.

Gold, pyrite, zinc, and copper mines in the eastern, south-central, and southwest portion of the state pose public safety hazards due to hazardous open mine shafts at many of the mines; and environmental hazards from acidic drainage, mine waste, and stream sedimentation. In this same region of the state, inactive/abandoned sand and gravel provide potential sources of non- point and point source pollution of the Chesapeake Bay and its tributaries. The entire state is host to hundreds of acres of denuded landscape resulting from manganese and iron mining prior to 1950. These mines continue to pose threats to state waters through increased stream sedimentation. In the western region of the state, shafts from the mining of zinc, and stream sedimentation from manganese and iron is prevalent. Across the state abandoned quarries pose numerous dangers to public health and safety. Orphaned mine sites were often used as trash dumps and/or for recreational activities. (Over 1000 PCB contaminated capacitors were found inside a plant building on one orphaned mine site). As a result, people have fallen from highwalls at old quarry sites, drowned in bodies of water left by mining operations, and suffered serious injuries while riding ATV's and other off-road vehicles. The actual number of injuries resulting from persons frequenting mine sites is not known due to the age of the old mines, the vast amount of mining throughout the state, and the lack of reporting data.

ORPHANED LAND PROGRAM

Orphaned lands are those areas disturbed by the mining of all minerals, except coal, which were not required by law to be reclaimed or have not been reclaimed. Reclamation laws were enacted by Virginia's General Assembly in 1968 to minimize the adverse effects of mining on the environment. Recognizing that past mining practices had left many orphaned or unreclaimed mine sites, a proposal was made to study the extent of orphaned mines in Virginia.

As a result of a proposal by the mining industry, legislation was enacted in 1978 which established a non-coal orphaned land reclamation program. Funds for the reclamation of orphaned mines are obtained from interest monies earned from a state managed industry self-bonding program. Mine operators participating in the program make payments into the Minerals Reclamation Fund based on the acreage disturbed by their operations. The fund assures that active mines will be reclaimed and participation is mandatory under Virginia's Mineral Surface Mining Law.

Once identified, an orphaned mine site is evaluated for its potential hazards to the environment and the public's health and safety. This evaluation includes soil and water investigations, studies on the feasibility of reclaiming the site, cost analysis, and seeking the landowner's consent to allow reclamation to proceed.

An Orphaned Land Advisory Committee composed of individuals from the Division of Mineral Resources, the mineral mining industry, Virginia Tech Crop & Soil Environmental Sciences Department, Virginia Department of Transportation, U.S. Soil Conservation Service, State Water Control Board, Virginia Aggregates Association, and private citizens assist the Division of Mineral Mining (DMM) in evaluating the sites and prioritizing reclamation.

Following approval for reclamation by the Orphaned Land Advisory Committee, the orphaned land site is surveyed and mapped, further studies are conducted, and a plan for reclamation is developed. Reclamation of the site is then contracted through a competitive bidding process.

The first orphaned land site was reclaimed in 1981. Since then, 49 orphaned land projects have been completed encompassing 392.9 acres at a cost of $1,104,910.20. The average cost of reclamation per acre has been $2,812.19.

In 1987, additional emphasis was placed on developing an inventory of orphaned mine sites. Fifty-four sites are currently on Virginia's Orphaned Land Inventory which does not include the twenty-eight sites reclaimed from 1981-1986.

OLP PROGRAM INSERTS

- Insert A: Orphaned Land Summary by year - A listing of Virginia's Orphaned Land Projects completed to date.
- Insert B: Orphaned Land Inventory Listing - Priority of reclamation is established by the Orphaned Land Advisory Committee. " A" priority is the highest. N/A means reclamation not recommended.
- Insert C: Orphaned Land Cost by Year.
- Insert D: Current Site Investigation Form - This form has been used to inventory projects to date.
- Insert E: Revised January 1991 Site Investigation Form - this form will be used to inventory future orphaned land projects.
- Insert F: Virginia's Orphaned Land Program Brochure
- Insert G: Map - "Mineral Resources of Virginia"

INSERT A

ORPHANED LAND SUMMARY

ORPHANED LAND SUMMARY BY YEAR

	Project No.	Project Name	County	Mineral	Per Acre/Cost	Total	Contractor
1.	OLP-81-01	Red Mill	Rockbridge	limestone	2.5 ac/$6,400.00	$16,000.00	Echols Brothers
2.	OLP-81-02	Sugar Grove	Smyth	sandstone	2.0/ac/$4,938.00	9,875.00	New River Construction
3.	OLP-81-03	Good Luck	Northumberland	sand & gravel	3.3 ac/$5,017.00	16,555.00	Virginia Excavating
4.	OLP-81-04	Jack Mountain	Campbell	limestone	8.0 ac/$2,063.00	16,500.00	Anderson Sand Works
5.	OLP-82-01	Short Mountain	Washington	manganese	7.5 ac/$3,023.00	22,675.00	Sowers Construction Co.
6.	OLP-82-02	Jordan Point	Prince George	sand	3.5 ac/$2,771.00	9,700.00	W. T. Curd Company
7.	OLP-82-03	Milford	Caroline	sand & gravel	13 ac/$1,037.00	13,487.00	John W. Lewis Construction
8.	OLP-83-01	Brays Fork	Essex	sand	2.0 ac/$3,498.00	6,995.00	Rock and Raines
9.	OLP-83-02	Little Fall Creek	Pittsylvania	granite	13 ac/$1,527.00	19,851.44	Sowers Construction Co.
10.	OLP-83-03	New Market	Rockingham	limestone	7.0 ac/$3,357.00	23,500.00	Eavers Brothers Excavating
11.	OLP-83-04	Radford	Montgomery	limestone	6.0 ac/$3,045.00	18,271.31	Sowers Construction Co.
12.	OLP-83-05	Shady Grove	Washington	limestone	3.0 ac/$3,433.00	10,300.00	Simpson Construction Co.
13.	OLP-84-02	Sand Mountain	Wythe	sand	6.0 ac/$2,623.85	15,743.10	Woodyard Brothers, Inc.
14.	OLP-84-03	Mt. Crawford	Rockingham	limestone	23 ac/$1,497.39	34,440.00	J & W Landscaping
15.	OLP-84-04	O. T. Bonner	Pittsylvania	fill dirt	6.0 ac/$1,941.33	11,648.00	H & H Grading
16.	OLP-84-05	Hazelwood Tract	Caroline	sand	16 ac/$2,121.87	33,950.00	J. L. Kent & Sons
17.	OLP-84-06	Bugg's Island	Mecklenburg	limestone	17½ ac/$1,256.45	21,988.00	John W. Lewis Construction
18.	OLP-84-07	Short Mountain II	Washington	manganese	8.5 ac/$1,941.18	16,500.00	Cave Spring Excavating
19.	OLP-85-01	Genite Mills	Powhatan	stone	7.0 ac/$3,375.71	23,630.00	F. W. Vaughn Landscaping
20.	OLP-85-02	New Post	Spotsylvania	sand & gravel	10 ac/$1,960.00	19,600.00	John W. Lewis Construction
21.	OLP-85-03	Barricks Mill	Middlesex	sand	3.5 ac/$1,528.57	5,350.00	Aylett Sand and Gravel
22.	OLP-86-01	Jerry's Creek	Smyth	manganese	5.5 ac/$2,960.00	14,800.00	Woodyard Brothers, Inc.
23.	OLP-86-02	Brown Project	Augusta	manganese	3.6 ac/$4,958.34	17,850.00	Dennis Bays Excavating
24.	OLP-86-03	Hunting Creek	Bedford	feldspar	5.0 ac/$4,037.40	20,187.00	Crews Construction Co.
25.	OLP-86-04	Fall Run	Stafford	borrow pit	15+ ac/$1,941.671	29,125.00	John W. Lewis Construction
26.	OLP-86-05	Cobham Park	Richmond	sand	1.0 ac/$4,850.00	4,850.00	Patrick A. Nawchok
27.	OLP-86-06	Bracey Project	Mecklenburg	granite	5.0 ac/$1,870.00	9,350.00	John W. Lewis Construction
28.	OLP-86-07	Rye Hill	Bedford	fill dirt	4.0 ac/$4,997.75	19,991.00	Joe Detamore Excavating

ORPHANED LAND SUMMARY BY YEAR

	Project No.	Project Name	County	Mineral	Per acre/cost	Total	Contractor
29.	OLP-87-01	Goshen Pass	Rockbridge	silica	20.0/$4,508.10	$ 90,162.00	Woodyard Brothers, Inc.
30.	OLP-87-02	N. Mt. Brick	Augusta	shale	5.5/ 4,545.28	24,999.00	Woodyard Brothers, Inc.
31.	OLP-87-03	Drapers Mountain	Pulaski	iron	3.5/ 3,731.59	13,060.55	Woodyard Brothers, Inc.
32.	OLP-87-04	Sand Pit	Gloucester	sand	2.0/ 4,570.00	9,140.00	Patrick Newchok
33.	OLP-87-05	Cranes Corner	Stafford	fill dirt	18.0 3,244.44	58,400.00	Taylor Development Corp.
34.	OLP-87-06	Hudson Feldspar	Bedford	feldspar	4.0/ 4,819.50	19,278.00	F & B Contractors, Ltd.
35.	OLP-87-07	Valentine Tract	Caroline	borrow pit	2.0/ 2.900.00	5,800.00	Taylor Development Corp.
36.	OLP-87-08	Lester Sand	Northumber.	sand	1.0/ 2,480.00	2,480.00	Taylor Development Corp.
37.	OLP-88-01	Goshen Pass	Rockbridge	silica	13.0/ 3,696.15	48,050.00	Woodyard Brothers, Inc.
38.	OLP-88-02	Reed Creek Sand	Wythe	sand	6.0/ 3,099.86	18,599.16	Simpson Construction Co.
39.	OLP-88-03	Crimora Manganese	Augusta	manganese	6.0/ 4,050.00	24,300.00	Woodyard Brothers, Inc.
40.	OLP-88-04	Pennsylvania Sand	Scott	sand	1.0/ 9,800.00	9,800.00	Hartgrove Construction Con., Inc.
41.	OLP-89-01	Goshen Pass	Rockbridge	silica	10.0/ 4,479.90	44,798.99	Woodyard Brothers, Inc.
42.	OLP-89-02	Vesuvius Mine	Augusta	manganese	30.0/ 3,560.00	106,800.00	Nu-Valley General Contractors
43.	OLP-90-01	Bowman Mine	Scott	zinc	1.0/10,550.00	10,550.00	Woodyard Brothers, Inc.
44.	OLP-90-02	Vesuvius Mine	Augusta	manganese	30.0/ 150.00	4,500.00	Ron Dale t/a Oston Tree
45.	OLP-90-03	Goshen Pass	Rockbridge	silica	18.0/ 3,853.60	69,365.00	Wilkins Construction Co.
46.	OLP-90-04	Wilderness Mine	Orange	gold	00.50/ 175.83	8,791.50	Bruce V. Boxley Construction
47.	OLP-90-05	Vesuvius Mine	Augusta	manganese	6.00/3,134.83	18,809.00	Woodyard Brothers, Inc.
48.	OLP-90-06	Crimora Manganese	Augusta	manganese	8.00/5,556.69	44,453.50	Woodyard Brothers, Inc.
49.	OLP-90-07	Wilderness Mine	Orange	gold	00.50/ 196.33	9,816.65	Bruce V. Boxley Construction

INSERT B

ORPHANED LAND INVENTORY LISTING

NUMBERS	NAME..........................	COUNTY	MINERAL	PRIORITY	PROJECT NO..........	ACRES.....
11	GOSHEN SILICA	RO	SI	A	87/88/89/01-03	100.00
02	NORTH MT BRICK	AG	SH	A	87-02	5.50
8703	DRAPERS MOUNTAIN	PU	FE	A	87-03	3.50
8704	SAND PIT	GL	ST	A	87-04	2.00
8705	CRANES CORNER	ST	FLD	A	87-05	18.00
8706	HUDSON FELDSPAR	BE	FLD	A	87-06	4.00
8707	VALENTINE TRACT	CA	FI	A	87-07	2.00
8708	LESTER SAND	NO	SA	A	87-08	1.00
8709	CRAIGHEAD FELDSPAR	BE	FLD	B		4.00
8710	BLUE RIDGE IRON	BU	FE	B		3.00
8711	RIVERMONT CLAY	CH	CL	A		2.00
8712	BRITON ARSENIC	FL	AS	A		3.00
8713	VESUVIUS MINE	AG	MN	A	89/90-02-05	30.00
8714	REED CREEK	WY	SA	A	88-02	7.00
8715	VILLAGE SAND MINE	NO	SA	N/A		3.00
8716	LYTHES SAND	WE	SA	C		1.00
8717	CRIMORA PROJECT	AG	MN	A	88-03/90-06	20.00
8736	REDBANK GOLD	HA	AU	C		1.00
8818	CHESTNUT MT IRON	AP	FE	B		0.50
8819	RIVERVILLE, #1, 2, 3	AM	CU	C		2.00
8820	STONEWALL CREEK	AP	CU	C		2.00
8821	SIMS FELDSPAR	BE	FLD	A	OLP 91-02	1.00
8822	MASSAPONAX CREEK SAND	SP	SA	C		30.00
8823	STEVENS CITY QUARRY	FR	ST	C		20.00
8824	POWHATAN MICA	PO	MIC	B		1.00
25	NEW JERSEY ZINC	WY	ZI	N/A		0.00
26	CONTRARY CREEK	LO	PYR	A		20.00
8827	GOODWYN MINE	SP	AU	C		1.00
8828	MITCHELL GOLD MINE	SP	AU	A		5.00
8829	VAUCLUSE GOLD MINE	OR	AU	A		10.00
8830	PAGE CO GRAVEL PIT	PA	GR	N/A		10.00
8831	VALZINCO MINE	SP	ZI	A	N/A	20.00
8832	BOWMAN MINE	SC	ZI	A	90-01	2.00
8833	PENNSYLVANIA SAND AND GRAVEL	SC	SI	A	88-04	2.00
8834	MCDONALD MINE	WY	GR	N/A		4.00
8835	NATIONAL CARBIDE	WY	GR	N/A		10.00
8837	NATIONAL PARK SAND	SP	SA	A		1.00
8838	WILDERNESS MINE	OR	AU	A	90-04	1.00
8939	BUCHNER RUN GRANITE	GR	GF	A		0.50
8940	AMERICAN CYANAMID WOOD PIT	AM	TI	C		5.00
8941	CHALK MINE RUN	RO	CH	A	91-01	5.00
8942	ALLEN CREEK MINE	NE	TI	C		20.00
8943	COVINGTON SHALE	AL	SH	A		15.00
8944	GUSLER-AUSTIN MINE	BO	BA	C		1.00
8945	PICO QUARRY	BO	GR	B		5.00
8946	HOLLYBROOK	BL	MN	A	91-03	30.00
8947	MUNDY QUARRY	RO	LI	B		10.00
8948	ROANOKE QUARRY	RO	LI	B		15.00
8949	COFER PROSPECT	LO	ZN	A		10.00
8950	RIVERVILLE SHAFTS	AM	CU	A		3.00
51	ASHLAND GRAVEL	HA	GR	N/A		10.00

NUMBERS	NAME..........................	COUNTY	MINERAL	PRIORITY	PROJECT NO..........	ACRES.....
72	JOHNSON SAND MINE	IS	SA	B		10.00
953	COLES FELDSPAR	BE	FLD	C		10.00
9001	BENNETT MINE	PI	BA			10.00
9002	JEFFERSON N.F. MANGANESE	SM	MN			

55 records listed.

INSERT C

ORPHANED LAND COST by YEAR

DEPARTMENT OF MINES, MINERALS AND ENERGY
DIVISION OF MINERAL MINING

Orphaned Land Summary Costs

Year	Acres	Reclamation Cost	Cost/per acre
1981	15.8	$ 58,930.00	$ 3,730.00
1982	24.0	45,862.00	1,911.00
1983	31.0	78,917.75	2,546.00
1984	77.0	134,269.10	1,743.75
1985	20.5	48,580.00	2,369.76
1986	38.6	96,162.00	2,491.25
1987	56.0	223,319.55	3,987.85
1988	26.0	100,749.16	3,874.97
1989	40.0	151,834.99	3,795.87
1990	64.0	166,285.65	2,598.21
TOTALS	392.9	1,104,910.20	2,812.19

Revised 06/29/90
ses

INSERT D

CURRENT SITE INVESTIGATION FORM

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF MINES, MINERALS AND ENERGY
DIVISION OF MINERAL MINING
P. O. BOX 4499
LYNCHBURG, VIRGINIA 24502
Telephone: (804) 239-0602

ORPHANED MINED LAND SITE INVESTIGATION REPORT

Inventory No.:____________________ Name of Mine:____________________

Mineral Mined:____________________ County:____________________

Quadrangle:____

Latitude: ____________________ Longitude: ____________________

Location: ____

____

____

Name of Property Owner: ____________________

Address: ____________________

Telephone: ____________________

Estimated Acreage Involved: ____________________

Environmental Hazards: ____________________

Erosion:____________________
Highwall: ____________________
Acidic Drainage: ____________________
Acidic Soil Conditions: ____________________
Lack of Vegetation: ____________________
Eyesore: ____________________
Trash Dump: ____________________
Toxic Materials: ____________________
Ground Water Contamination: ____________________
Destruction of Aquatic Habitat: ____________________
Other: ____________________

____

____

____

DMM-121
Rev. 8/88

Receiving stream name: ______________________________

____

Field pH and appearance: ______________________________

Were samples taken? ______________________________

If yes, give results: ______________________________

____

____

If available, give groundwater information and potential hazards to:

____

____

____

Public health and safety hazards: ______________________________

____

____

____

____

____

____

____

____

____

____

____

____

____

____

____

Surrounding site conditions:

How far is mine from main road? ____________ nearest community? __________
Is mine visible from main road? ____________ nearest community? __________
Surrounding topography: ____

Elevation: ____
Any archaeological or historical site(s) nearby? ______________________
Average temperature: __________ Annual rainfall: ______________________
Spring frost free date: ____________ Fall kill frost date: ______________
Land use of surrounding area: ____

Estimated number of homes in general vicinity: ______________________

Soil conditions at site: ____

Field pH: ____

General history of minesite: ____

(Supplement information attached?) Yes No

Is there any hazardous material on-site? ____________________

If yes, describe: ____________________

____

Is there any marketable material on-site? ____________________

If yes, describe: ____________________

____

Other pertinent information:

____

____

____

____

____

____

____

____

General plan of reclamation: ____________________

____

____

____

____

____

____

____

____

____

____

____

____

____

Estimated Cost of Reclamation

Equipment needed: ______________________________

____
____
____
____

Total grading cost: ______________

Seed requirements: ______________________________

____
____
____
____
____
____
____

Total seeding cost: ______________

Other cost: ______________

____
____
____
____

TOTAL ESTIMATED COST: ______________

____

INSERT E

REVISED 01-15-91 SITE INVESTIGATION FORM

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF MINES, MINERALS AND ENERGY
DIVISION OF MINERAL MINING
P. O. BOX 4499
LYNCHBURG, VIRGINIA 24502

ORPHANED MINED LAND SITE INVESTIGATION REPORT

Inventory No.: ____________________

Name of Mine: ____________________

Mineral Mine: ____________ County: ____________

Quadrangle: ____________________

Latitude: ____________ Longitude: ____________

Location: ______ ____________________

____

____

Name of Property Owner: ____________________

Address: ____________________

____

Telephone: ____________________

Estimated Acreage Involved: ____________________

Surrounding Site Conditions:

How far is mine from main road? ______ nearest community? ______
Is mine visible from main road? ______ nearest community: ______
Surrounding topography: ____________________

____
Elevation: ____________________
Any archeological or historical site(s) nearby? ______
Land use of surrounding area: ____________________

____
Estimated number of homes within 1/4 mile: ______
Circle: 0-10 11-100 over 100

Receiving Stream Name: ____________________

Field pH and appearance: ____________________

Environmental Hazards:

Erosion: yes no

if yes, explain: ______________________________

____

Acidic Drainage: yes no P.H.______

Acidic Soil Conditions: yes no P.H.______

Lack of Vegetation: yes no No. of acres ________

Eyesore: yes no

Trash Dump: yes no No. of truckloads ____

Hazardous/Toxic Materials: yes no Type, Quantity ______

____

Ground Water Contamination: yes no Source____________

Surface Water Contamination: yes no Explain __________

____

Other: ______________________________

____

____

Public Health and Safety Hazards:

Highwall: yes no length ft. ______ height ft. ____

Portals/Shaft: yes no #wet_____ # dry ____________
#caved_____ # accessible ________

Dangerous Impoundment: yes no P.H. ____________
Dimensions: ______________________

Recreational water body: yes no P.H. ____________
Dimensions: ______________________

Slides: yes no Dimension__________

Equipment or facilities: yes no If yes, explain:

____

Subsidence: yes no L x W x H __________

Mine dumps: yes no No. & size __________

Is there evidence of site visitation? yes no

Is there a fence around the site? yes no

Is there water in the pit? yes no

Estimated volume? ______________________________

P.H. of water: ________ Appearance? ______________________________

Is the site readily accessible? yes no

Have there been complaints on the site? yes no # ____

If a quarry, how big is pit? ______________________________

Date abandoned: ______________________________

General history of minesite: ______________________________

____

____

____

____

____

____

____

Other pertinent information? ______________________________

____

____

____

____

____

____

____

____

____

Inspector: ______________________________

Date: ______________________________

DMM-121
REV. 1/91

NOTE: Insert F ("Virginia's Orphaned Land Program Brochure) and Insert G (Map - "Mineral Resources of Virginia") are not included in this report but are available from the Interstate Mining Compact or from the Virginia Department of Mines, Minerals and Energy.

EXPLANATION OF DATA SUMMARY SHEET

ELIGIBILITY:

Inactive/abandoned mines for which there are no (federal, state or local government) reclamation responsibility are included in the inventory.

Inactive/abandoned mines existing within the boundaries of active mine permits, unpatented mining claims and EPA Superfund mine sites are included in Virginia's Orphaned Land Program Inventory. EPA Superfund sites are included for tracking purposes only. The cost of reclamation is not included in the cost projections.

Future plans to mine over and reclaim hazardous or environmental problems are not grounds for exclusion from the inventory but will be taken under consideration in the prioritization stage of the program.

All orphaned lands as defined in the definitions are eligible for inclusion in Virginia's Orphaned Land Inventory. Sites reclaimed are not removed from the inventory in order that follow up evaluations will continue.

DEFICIENCIES OF DATA:

The data researched in completing the Data Summary Sheet does not accurately describe the environmental and public health and safety problems associated with Virginia's non-coal inactive/abandoned (orphaned) mines. The data pertained primarily to geologic conditions and although some records noted shafts, pits, dumps, and other surface features still present they did not identify environmental and public health and safety hazards. The records were not written for the purpose of identifying environmental and safety hazards therefore they did not serve that purpose adequately. Records reviewed, where the sites have been inventoried under the Orphaned Land Program, were found to be deficient in that the records did not note the large disturbed areas, hazardous highwalls, severe erosion, acid mine drainage, dangerous shafts or other hazards to the environment and the public health and safety which were present on these sites. Other deficiencies noted were:

- (1) The information provided in this report was derived from existing data and did not involve field work with the exception of the use of the Virginia Department of Mines, Minerals and Energy's Orphaned Land Inventory. Reports on 2,161 of the 3,067 mine sites reviewed (approximately 70%) included information on location only. Others included only information that a number of pits etc. were present without giving size or other pertinent data. Below is a breakdown of the data deficiencies in each category:

  METALLIC ORES – Reports on 466 of the 1,104 sites reviewed included only location information. The data on copper, lead, zinc and gold mines was the most detailed, including descriptions of the workings such as the data mentioned when a shaft was water filled, or that numerous shafts or pits were present, structures were present etc.. Information on environmental and safety hazards was deduced from these descriptions. Where the information stated there were several pits it was assumed this meant three. Where the information stated there were numerous pit, shafts etc. this was assumed to mean four. When water was noted it was assumed to be polluted. Water and mine dumps were listed as occurrences as the miles and acres were not given. There were 498 copper, lead, zinc, and gold sites with descriptive data of the workings. There was no information given on 224 of 282 iron mines, 154 of 234 manganese mines, 16 of 21 titanium, 3 of 10 pyrite, 4 of 4 kyanite, 1 of 2 cobalt, 2 of 2 tin, or 4 of 6 aluminum mines.

- (2) CONSTRUCTION ORES --1,388 of the 797 records researched did not give data other than location coordinates. The only information given on the 101 other records was the number of pits. The size of the pits was not addressed.

- (3) INDUSTRIAL ORES -- 307 of the 415 records researched did not give data other than location coordinates. There was no information given on 38 of 43 feldspar mines, 128 of 133 mica mines, 43 of 149 barite mines, 67 of 67 clay mines, 1 of 3 graphite, nor on any of the other minerals listed. As with the metallic ores, polluted water and mine dumps were listed as occurrences. The most information on an industrial mineral available was on barite and generally listed the number of pits, openings, and a general description of the site workings.

Overall, data collected and reviewed, thus far, provided valuable information on location coordinates. The accuracy of the data given on the number of shafts is 90% accurate due to the assumptions made. All the other information such as polluted waters, etc. is not at all accurate because of the lack of adequate field data. The number of minesites which fit into the definition of an orphaned mine under Virginia's program is presumed to be 90% accurate. There is convincing evidence that more mines exist which have not been noted. This is true in Bedford County where the number of known feldspar mines exceeds the number noted in records reviewed. Also, in the coastal plain province of eastern Virginia, there are numerous unlocated sand and gravel pits which immediately become trash dumps following abandonment.

It can be deduced from the data that Virginia has a large number of inactive/abandoned mine sites which have the potential of being hazards to the environment and the public's health and safety.

COST

Cost estimates on the Data Summary Sheet are based on guidelines for estimating Abandoned Mine Land reclamation costs from the AML Inventory Update Manual, Office of Surface Mining.

- POLLUTED WATER - $10,000 per occurrence.

- REVEGETATION OF MINE DUMPS, PITS, DISTURBED ACREAGE - estimated to cost $5,000/acre. This figure assumes each site is one acre and requires significant grading, conditioning, and ground cover. These assumptions were made to obtain a minimal cost estimate.

- HIGHWALLS - $5.00 per HLP (height, length, product).
- MINE OPENINGS - $5,000/occurrence.
- HAZARDOUS STRUCTURES - $5,000/structure. This figure is not based on the guidelines. This is an estimate based on reclamation to date on orphaned land projects with structures. The structures have historically been small, therefore, the lower estimate.

DATA SOURCES RESEARCHED

(1) MRDS SYSTEM --Mineral Resources Data System, The U. S. Geological

Survey

(2) MILS SYSTEM --Minerals Industry Location System, Bureau of Mines

(3) Department of Mines, Minerals and Energy, Division of Mineral Mining

Orphaned Land Inventory

(4) Virginia Topographic Maps

DEFINITIONS

ORPHANED LANDS:

Orphaned lands are those areas disturbed by the surface mining of minerals, not including coal, which were not required by law to be reclaimed or have not been reclaimed. Virginia's Mineral Mining Reclamation Law was enacted in 1968. Mine sites not adequately reclaimed may be considered under the auspices of Virginia's Orphaned Land Program.

POLLUTED WATER:

All surface or ground waters which do not meet water quality standards (especially acid or alkaline conditions) because of orphaned mine land related impact.

MINE DUMPS:

Refuse, waste, or other unmerchantable material which has been deposited on the land surface.

DISTURBED LAND:

Land impacted by the mining of minerals other than coal (especially land that has not revegetated to a condition where environmental problems no longer exist).

HIGHWALLS:

Any orphaned land related, unprotected, and dangerous highwall. The proximity of the highwall to a populated area, public road, or other public use area is documented.

MINE OPENINGS:

Any orphaned land related surface entrance to a drift, tunnel, adit, or shaft regardless of proximity to populated areas, that is large enough for a child to fall through, and is not adequately sealed or barricaded.

SUBSIDENCE PRONE:

Any surface expression of orphaned land related subsidence such as tension cracks, potholes, troughs, or caving.

HAZARDOUS STRUCTURES:

Any orphaned land related structure, portion of a structure, or facility which has the potential to pose a hazard.

PITS:

Mine workings or excavations open to the surface including quarries, trenches, etc.

DATA SUMMARY SHEETS

- Insert A - Data Summary Sheet.
- Insert B - Orphaned Land Program Summary Sheet: This sheet was completed to identify the data deficiencies in the Data Summary Sheet. This information was collected in the field and, while not all inclusive, the information reflects what exist on Virginia's orphaned land sites.
- Insert C - Combination Data Summary Sheet information extrapolated from the Data Summary Sheet and the Orphaned Land Inventory Summary Sheet.

INSERT A

DATA SUMMARY SHEET

NON-COAL INVENTORY
INACTIVE/ABANDONED MINES[1]

State of VIRGINIA

Agency Contact ALLEN BISHOP

Telephone 804-239-0602

DATA SUMMARY[2,3]

NO INFORMATION EXCEPT LOCATION ON 466

MINERAL TYPE (acres)[4]	MINING TYPE (acres)		OWNERSHIP (acres)		FEATURES		(total)	(cost)
Metallic Ores	Mines	1145	Federal	50	Polluted Water[5] 57 occ	(miles)		(cum)* 570,000
COPPER	Millsites	7	Private	1101	Mine Dumps[9] 534 occ	(acres)		2,670,000
ZINC	Smelters	31	State	1	Disturbed Land[10]	(acres)	42	210,000
GOLD	Other[7]		Other[8]		Highwalls[11]	(miles)	1.5	990,000
IRON					Mine Openings[12]	(number)	913	4,565,000
TITANIUM					Subsidence Prone[13]	(acres)		
PYRITE					Hazardous Structures[14]	(number)	80	400,000
MANGANESE					Other[15]	(units)	1,895	9,475,000
ALUMINUM · LEAD								
TIN COBALT								

INFORMATION EXCEPT LOCATION ON 1,388

MINERAL TYPE (acres)	MINING TYPE (acres)		OWNERSHIP (acres)		FEATURES		(total)	(cost)
Construction Ores	Mines	1489	Federal		Polluted Water	(miles)		
GRANITE	Millsites		Private	1489	Mine Dumps	(acres)		
STONE	Smelters		State		Disturbed Land	(acres)		
SHALE	Other		Other		Highwalls	(miles)		
SLATE					Mine Openings	(number)		
SAND & GRAVEL					Subsidence Prone	(acres)		
LIMESTONE					Hazardous Structures	(number)		
SANDSTONE					Other	(units)	204	1,020,000
GYSUM								

NO INFO EXCEPT LOCATION ON 307

MINERAL TYPE (acres)	MINING TYPE (acres)		OWNERSHIP (acres)		FEATURES		(total)	(cost)
Industrial Ores	Mines	425	Federal	7	Polluted Water 5 occ	(miles)		50,000
BARITE	Millsites	1	Private	419	Mine Dumps 30 occ	(acres)		150,000
CLAY	Smelters		State		Disturbed Land	(acres)		
PIGMENT	Other		Other		Highwalls	(miles)	.75	495,000
FELDSPAR					Mine Openings	(number)	89	445,000
FLURINE GRAPHITE					Subsidence Prone	(acres)		
LITHIUM TALC					Hazardous Structures	(number)		
SULPHUR SILICA					Other	(units)	424	2,120,000
MICA EMERY								
KYANITE ARSENIC								

* = NOT ENOUGH INFO AVAILABLE

occ = OCCURRENCES

DATA SUMMARY[4,5] - Page 2

MINERAL TYPE (acres)[1]	MINING TYPE (acres)		OWNERSHIP (acres)		FEATURES	(units)	(cost)
Phosphate Rock	Western		Federal		Polluted Water[7]	(miles)	
	Midwest		Private		Mine Dumps[8]	(acres)	
	Southern		State		Unreclaimed Land[9]	(acres)	
	Other[2]		Other[3]		Highwalls[11]	(miles)	
					Mine Openings[12]	(number)	
					Subsidence Prone[13]	(acres)	
					Hazardous Structures[14]	(number)	
					Other[15]	(units)	
Uranium Overburden	Western		Federal		Polluted Water	(miles)	
	Midwest		Private		Mine Dumps	(acres)	
	Southern		State		Unreclaimed Land	(acres)	
	Other		Other		Highwalls	(miles)	
					Mine Openings	(number)	
					Subsidence Prone	(acres)	
					Hazardous Structures	(number)	
					Other	(units)	
Oil Shale	Western		Federal		Polluted Water	(miles)	
	Midwest		Private		Mine Dumps	(acres)	
	Southern		State		Unreclaimed Land	(acres)	
	Other		Other		Highwalls	(miles)	
					Mine Openings	(number)	
					Subsidence Prone	(acres)	
					Hazardous Structures	(number)	
					Other	(units)	
Other (acres)[7]	Western		Federal		Polluted Water	(miles)	
	Midwest		Private		Mine Dumps	(acres)	
	Southern		State		Unreclaimed Land	(acres)	
	Other		Other		Highwalls	(miles)	
					Mine Openings	(number)	
					Subsidence Prone	(acres)	
					Hazardous Structures	(number)	
					Other	(units)	
TOTAL	Western	3028	Federal	57	Polluted Water 62	(miles)	620,000
	Midwest	8	Private	3009	Mine Dumps 564	(acres)	2,670,000
	Southern	31	State	1	Unreclaimed Land	(acres) 42	210,000
	Other		Other		Highwalls	(miles) 2.25	1,485,000
					Mine Openings	(number) 1,002	5,010,000
					Subsidence Prone	(acres)	
					Hazardous Structures	(number) 80	400,000
					Other	(units) 2,523	12,615,000

TOTAL 123,010,000

INSERT B

ORPHANED LAND PROGRAM SUMMARY SHEET

NON-COAL INVENTORY
INACTIVE/ABANDONED MINES[1]

State of VIRGINIA

Agency Contact ALLEN BISHOP

Telephone 804-239-0602

ORPHANED LAND INVENTORY ~~DATA~~ SUMMARY[2,3]

MINERAL TYPE (acres)[4]	MINING TYPE (acres)		OWNERSHIP (acres)		FEATURES		(units)		(cost)
Metallic Ores	Mines	26	Federal	3.	Polluted Water[7]		OCC. (miles)	12	(cost)* 120,000
	Millsites		Private	23	Mine Dumps[8]		OCC. (acres)	9	4,500
	Smelters		State		Disturbed Land[10]		(acres)	248.6	1,233,000
	Other[5]		Other[6]		Highwalls[11]	2,160'	(miles)	.46	———
					Mine Openings[12]		(number)	25	125,000
					Subsidence Prone[13]		OCC. (acres)	7	———
					Hazardous Structures[14]		(number)	6	30,000
					Other[15]		(none)	22	110,000
Construction Ores	Mines	45	Federal		Polluted Water		(miles)	13	130,000
	Millsites		Private	45	Mine Dumps		(acres)	—	
	Smelters		State		Disturbed Land		(acres)	364.3	1,821,500
	Other		Other		Highwalls	2,590'	(miles)	.49	———
					Mine Openings		(number)	2	10,000
					Subsidence Prone		(acres)	—	
					Hazardous Structures		(number)	13	65,000
					Other		(none)	58	290,000
Industrial Ores	Mines	12	Federal		Polluted Water		OCC. (miles)	7	70,000
	Millsites		Private	8	Mine Dumps		(acres)	———	
	Smelters		State	4	Disturbed Land		(acres)	102	510,000
	Other		Other		Highwalls	1,630'	(miles)	.30	———
					Mine Openings		(number)	6	30,000
					Subsidence Prone		(acres)		
					Hazardous Structures		(number)	6	30,000
					Other		(none)	7	35,000

INSERT C

COMBINATION DATA SUMMARY SHEET

COMBINATION DATA SUMMARY SHEETS

DATA SUMMARY[4,3] - Page 2

MINERAL TYPE (acres)[5]	MINING TYPE (acres)		OWNERSHIP (acres)		FEATURES	(units)	(cost)
Phosphate Rock	Mines		Federal		Polluted Water[8]	(miles)	(cost)[8]
	Millsites		Private		Mine Dumps[9]	(acres)	
	Smelters		State		Disturbed Land[10]	(acres)	
	Other[7]		Other[7]		Highwalls[11]	(miles)	
					Mine Openings[12]	(number)	
					Subsidence Prone[13]	(acres)	
					Hazardous Structures[14]	(number)	
					Other[15]	(units)	
Uranium Overburden	Mines		Federal		Polluted Water	(miles)	
	Millsites		Private		Mine Dumps	(acres)	
	Smelters		State		Disturbed Land	(acres)	
	Other		Other		Highwalls	(miles)	
					Mine Openings	(number)	
					Subsidence Prone	(acres)	
					Hazardous Structures	(number)	
					Other	(units)	
Oil Shale	Mines		Federal		Polluted Water	(miles)	
	Millsites		Private		Mine Dumps	(acres)	
	Smelters		State		Disturbed Land	(acres)	
	Other		Other		Highwalls	(miles)	
					Mine Openings	(number)	
					Subsidence Prone	(acres)	
					Hazardous Structures	(number)	
					Other	(units)	
Other (acres)[7]	Mines		Federal		Polluted Water	(miles)	
	Millsites		Private		Mine Dumps	(acres)	
	Smelters		State		Disturbed Land	(acres)	
	Other		Other		Highwalls	(miles)	
					Mine Openings	(number)	
					Subsidence Prone	(acres)	
					Hazardous Structures	(number)	
					Other	(units)	
TOTAL	Mines		Federal		Polluted Water	(miles) 1,165 occ	11,650,000
	Millsites		Private		Mine Dumps 564 occ	(acres)	
	Smelters		State		Disturbed Land	(acres) 26,376	131,880,000
	Other		Other		Highwalls	(miles)	
					Mine Openings	(number) 1,002	5,010,000
					Subsidence Prone	(acres)	
					Hazardous Structures	(number) 920	4,600,000
					Other	(units) 2,523	

TOTAL 153,140,000

DATA ANALYSIS

The data inventory indicated there were 3,067 mines. Virginia's Orphaned Land Program has field inventoried 83 mines or 2.7%.

- Polluted Water:

  Data research indicated 62 occurrences of polluted water in 3,067 mines or 2.00%. Field inventory indicated 32 occurrences in 83 mines or 38% of the mines had polluted water. This indicated that 38% or 1,165 occurrences of polluted water may be found on the 3,067 mines.

- Mine Dumps:

  Data research indicated that there were 564 occurrences of mine dumps (24% of the mine sites had mine dumps). The field inventory of 83 random mine sites indicated 10% of the mine sites had mine dumps located on them. This is not a good indicator of what exist as mine dumps have historically been part of the disturbed area on orphaned mine sites and have not been documented to a major extent.

- Disturbed Land:

  Research data showed minimal (42 acres) disturbed land. The field inventory indicated 714.9 acres for the 83 sites or 8.6 acres/mine site. This figure is most indicative of acreage that would, on the average, be disturbed in the reclamation of an orphaned mine site in Virginia. It may be concluded from this that 26,376 acres of disturbed land exist.

- Highwalls:

  Data researched and field data were both deficient in that length of highwalls has seldom been measured on abandoned mine sites.

- Mine Openings:

  Data research indicated 32% or 1,002 of the 3,067 mine sites had mine openings. Field inventory indicated that 39% or 33 mine openings occurred on the 83 mine sites. It is assumed from this data that the mine openings figure is fairly accurate.

- Subsidence Prone:

  Seven incidents of subsidence exist on one mine site in the field inventory.

- Hazardous Structures:

  Data researched indicated 2.6% or 80 hazardous structures on 3,067 mine sites. Field inventory indicated 30% or 25 hazardous structures on 83 mine sites. Foundations were included in this figure. It may be deduced that 920 structures exist on orphaned mines in Virginia.

- Pits:

  The data research indicates 2,523 pits on 3,067 mines. The field inventory revealed 87 pits on 83 mines. The two are consistent. Pits have been included with disturbed acreage on the field inventory.

MINING & MILLING TECHNIQUES

During Virginia's rich and varied mining history, over 50 minerals have been mined using both surface and underground methods and numerous mining and milling techniques. The majority of the metallic ores employed underground mining methods while the construction and industrial mineral mining was predominately surface pit and quarry.

Milling techniques used to produce the primary consumer derivatives included crushing, grinding, pulverizing, sizing, concentrating, washing, drying, sawing and cutting stone, heat expansion, roasting pelletizing, sintering, evaporating, calcining, kiln treatment, retorting (mercury leaching), leaching, and briquetting.

The majority of the milling historically has taken place on the larger mine sites with material from other sites trucked in. With Virginia's varied mining history, every conceivable mining and milling technique applicable to each specific mineral has probably been utilized to some extent.

ADDITIONAL DATA

Using topographic maps of Virginia, 743 additional sites were identified by location. Predominate symbols were for sand and quarries which made designating a category difficult. It is suspected that a portion of the mines designated as construction minerals were in fact barite, feldspar, iron, manganese, titanium ore, and several other more commonly surface mined minerals. Field examination of these additional sites would be the only way to delineate the mineral mined in most cases. These additional sites bring the total number of orphaned (inactive/abandoned) mineral mine sites in Virginia to be 3,067 plus or minus 10%.

The explanation of data summary sheets, the data summary sheets, and data analysis have been changed to reflect this increased number of sites.

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. EPA530-R-92-005R	2.	
4. Title and Subtitle INACTIVE AND ABANDONED NONCOAL MINES - VOLUME III - APPENDIX: STATE REPORTS			5. Report Date AUGUST 1991
			6.
7. Author(s) WGA/OSW			8. Performing Organization Rept. No
9. Performing Organization Name and Address U.S. EPA Office of Solid Waste 401 M. Street SW Washington, DC 20460			10. Project/Task/Work Unit No.
			11. Contract(C) or Grant(G) No. (C) (G) CX-816270-01-0
12. Sponsoring Organization Name and Address WGA			13. Type of Report & Period Covered
			14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

The
This report lists the State reports for the inactive and abandoned noncoal mines for the following states: Alabama, Arkansas, Illinois, Indiana, Iowa, Louisiana, Maine, Maryland, Mississippi, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Texas, and Virginia

17. Document Analysis a. Descriptors

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report)	21. No. of Pages
	UNCLASSIFIED	0
RELEASE UNLIMITED	20. Security Class (This Page)	22. Price
	UNCLASSIFIED	0

(See ANSI-Z39.18)

OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)