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Legislative Note, Metallic Mining and Reclamation in Michigan: Environmental Management as a Gentler Approach

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LEGISLATIVE NOTES:

METALLIC MINING AND RECLAMATION IN MICHIGAN: ENVIRONMENTAL MANAGEMENT AS A GENTLER APPROACH*

> We shall hardly relinquish the shovel, which after all has many good points, but we are in need of gentler and more objective criteria for its successful use.
>
> Aldo Leopold[1]

The upper Great Lakes region has long been an important source of raw materials for the commercial centers of the country. The boom years, triggered in the nineteenth century by its rich forests and high-grade mineral ores, ended rather abruptly as the supply and quality of these resources declined. Until recently, the region's economy was characterized by high unemployment, continued outmigration, and low income.[2] A sometimes unstable cornerstone of the region's economy has been its mining industry.[3] Proposed or potential mining operations in national forests,[4] state parks,[5] and

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[1] A. LEOPOLD, A SAND COUNTY ALMANAC 263-64 (Ballantine 1966).

[2] Title V of the Public Works and Economic Development Act of 1965 authorized the Secretary of Commerce to designate regional action planning commissions in areas where unemployment, income, and economic growth lagged behind the rest of the country. 42 U.S.C. §§ 3181-3192 (1970). A 119 county area in northern and central Michigan, Wisconsin, and Minnesota was designated as the Upper Great Lake Regional Commission on March 3, 1966. *See* S. REP. NO. 291, 91st Cong., 1st Sess., *reprinted in* [1969] U.S. CODE CONG. & AD. NEWS 1267, 1293.

[3] The Cleveland-Cliffs Iron Co. and The Copper Range Co., which operate a total of six mines, are the two largest employers in the Upper Peninsula. In January 1976, Copper Range Co. laid off 2,100 workers because of depressed international copper prices and an unsuccessful bid to merge with Amax, Inc. *See* United States v. Amax, Inc., 402 F. Supp. 956 (D. Conn. 1975) (court finding that the planned merger would substantially lessen competition in the production of refined copper). *See also* Det. Free Press, Jan. 6, 1976, § D, at 6. *See generally* A. MURDOCK, BOOM COPPER (1964); W. GATES, JR., MICHIGAN COPPER AND BOSTON DOLLARS (1951).

[4] *See* Izaak Walton League of America v. St. Clair, 353 F. Supp. 698 (D. Minn. 1973), *rev'd and remanded*, 497 F.2d 849 (8th Cir. 1974) (mining in the Boundary Waters Canoe Area in Minnesota).

[5] Exploratory drilling for copper by American Metals Co., now Amax, Inc., took place in the late 1950's in Michigan's Porcupine Mountain State Forest. An application to explore for copper in the forest by a subsidiary of Kennecott Copper Corp. was later rejected by the state. Telephone interview with Robert C. Reed, Mining and Economic Geologist, Geological Survey Division, Mich. Dep't of Natural Resources (Jan. 10, 1977).

off the shore of Lake Superior[6] suggest that such operations place increasing pressure on the environment. That pressure is underscored by the protracted *Reserve Mining Co.* litigation[7] involving the large-scale dumping of finely ground waste rock from iron ore processing into Lake Superior.

Michigan's metallic mining industry, which consists of seven active iron and copper mines,[8] is located in the western end of its Upper Peninsula. These mines make Michigan the nation's second largest producer of iron ore and fifth largest producer of copper.[9] This industry has been insulated from a number of state environmental protection statutes,[10] made privy to certain additional privileges,[11] or subjected to legislation whose impact will be mini-

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[6] *See* R. MEYER, J. MOORE & E. NEBVRIJA, UNDERWATER COPPER EXPLORATION IN LAKE SUPERIOR II: SPECIFIC TARGET CHARTER IN 1974 (1975) (Sea Grant College Reprint WS-SG-75-357). *See also* Turkheiner, *Copper Mining from Under Lake Superior: The Legal Aspects,* 7 NAT. RESOURCES L. 137 (1974).

[7] Reserve Mining Co. v. Minnesota Pollution Control Agency, 1 Envir. L. Rep. (ELI) 20073, 2 Envir. Rep. Cas. (BNA) 1135 (D. Minn. 1970), *aff'd in part, rev'd in part,* 294 Minn. 300, 200 N.W.2d 142 (1972); United States v. Reserve Mining Co., 380 F. Supp. 11 (D. Minn. 1974), *injunction stayed,* 498 F.2d 1073 (8th Cir. 1974), *modified & remanded sub nom.,* Reserve Mining Co. v. Environmental Protection Agency, 514 F.2d 492 (8th Cir. 1975); *modified,* 6 E.L.R. 20628 (D. Minn. 1976). *See also* the summary of Reserve Mining Co. v. Minnesota Pollution Control Agency, ENVIR. REP. (BNA) 1541 (D. Minn. Jan. 28, 1977).

The current controversy in the *Reserve* case centers on the location of an on-land disposal system for material now being deposited in Lake Superior. Although several old copper processing operations also dumped finely ground waste rock, or tailings, into several inland lakes in the Upper Peninsula, this problem of lake disposal no longer exists in Michigan.

[8] Four mines are operated by the Cleveland-Cliffs Iron Co. in Marquette County—the Empire, Mather, Republic, and Tilden mines. Inland Steel Co. operates the Sherwood mine in Iron County, and the Hanna Mining Co. operates the Groveland mine in Dickinson County. White Pine Copper Co., a wholly owned subsidiary of the Copper Range Co., operates the state's major copper mine in Ontonogan County. Another copper mine, the Centennial, is being developed. GEOLOGICAL SURVEY DIVISION, MICHIGAN DEP'T OF NATURAL RESOURCES, ANNUAL REPORT NO. 9, MICHIGAN MINERAL PRODUCERS 14, 16 (1975).

[9] U.S. BUREAU OF MINES, DEP'T OF INTERIOR, COMMODITY DATA SUMMARIES 46, 82 (1976) [hereinafter cited as COMMODITY DATA SUMMARIES].

[10] The Water Resources Commission Act, MICH. COMP. LAWS ANN. §§ 323.1-.13 (1975), gives the Department of Natural Resources (DNR) basic authority to establish water pollution standards. It contains an ambiguous provision apparently exempting iron and copper mining operations where they result in the deposit or removal of material on land owned or controlled by the mining companies. MICH. COMP. LAWS ANN. § 323.12 (1975). *But see* [1969] MICH. OP. ATT'Y GEN. NO. 4950, AT 17, 31, which concluded that the interpretation of § 323.12 should be "guided by and in consonance with the other protective provisions of the act." The Soil Erosion and Sedimentation Control Act exempts anyone "engaged in the industry generally referred to as mining." MICH. COMP. LAWS ANN. § 282.116 (Supp. 1976). *See* Lanning, *State Management of the Environment Part One: An Evaluation of the Michigan Experience,* 8 U. MICH. J.L. REF. 286, 314 (1975).

[11] The DNR is authorized to condemn land for iron ore processing if an iron ore company acquires three-fourths of the necessary land, is unable to obtain the remaining land at fair market value, and can demonstrate that the remaining land is necessary for the project to prevent pollution of the state's waters. MICH. COMP. LAWS ANN. §§ 425.171 (Supp. 1976). The Water Resources Commission is also empowered to grant permits for the use or control of water on iron ore mining property. MICH. COMP. LAWS ANN. §§ 323.251-.258 (1975).

A number of similar bills have been defeated. Best known of these is Mich. S. 1003 (1975), which would have insulated any facility directly associated with iron ore mining and processing from the Michigan Environmental Protection Act. MICH. COMP. LAWS ANN. §§ 691.1201-.1207 (Supp. 1976). *See* Haynes, *Michigan's Environmental Protection Act in its*

mal.[12] Michigan's new Mine Reclamation Act is legislation whose impact will be minimal.[13]

A great deal has been said and written about the need for meaningful reclamation requirements for the surface mining of coal.[14] Nonetheless, little attention has been given to the large quantity of land disturbed by mining for other minerals.[15] Thirty-eight states have laws dealing directly with reclamation from a wide variety of mining operations.[16] For purposes of this note, reclamation refers

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Sixth Year: Substantive Environmental Law from Citizen Suits, 53 J. URB. L. 589, 666-72 (1976) [hereinafter cited as Haynes].

[12] MICH. COMP. LAWS ANN. §§ 425.181-.188 (Supp. 1976).

[13] *Id.* The Sand Dune Protection and Management Act provides for the protection and reclamation of sand dunes along the Great Lakes which are mined for the production of glass. Pub. Act No. 222, 1976 Mich. Leg. Serv. 531 (West). The mining of sand is specifically excluded from the Mine Reclamation Act. MICH. COMP. LAWS ANN. § 425.181(h) (Supp. 1976).

[14] The emphasis of the literature is on federal reclamation legislation for strip mining of coal. *See* H.R. 2, 95th Cong., 1st Sess. (1977); S. 7, 95th Cong., 1st Sess. (1977). The support of the Carter Administration makes it likely that some version of these bills will be signed into law in 1977. Other recent Congressional proposals were H.R. 13950, 94th Cong., 2d Sess. (1976); H.R. 9725, 94th Cong., 1st & 2d Sess. (1976). *See* H.R. REP. NO. 896, 94th Cong., 2d Sess. (1976).

H.R. 25, 94th Cong., 1st Sess. (1975) was vetoed by President Ford. *See* VETO MESSAGE FROM THE PRESIDENT OF THE UNITED STATES, H.R. DOC. NO. 160, 94th Cong., 1st Sess. (1975). The House failed to override the veto by a narrow margin. 121 CONG. REC. H5205 (daily ed. June 10, 1975). *See also* H.R. REP. NO. 189, 94th Cong., 1st Sess. (1975).

S. 425, 93d Cong., 2d Sess. (1974) was vetoed by President Ford on Dec. 30, 1974. *See* H.R. NO. 1522, 93d Cong., 2d Sess. (1974); H.R. REP. NO. 1072, 93d Cong., 2d Sess. (1974). *See generally Regulation of Surface Mining Operations: Hearings on S. 425 and S. 923 Before the Senate Comm. on Interior and Insular Affairs*, 93d Cong., 1st Sess. (1973) (Parts I and II); *Regulation of Surface Mining: Joint Hearings on H.R. 3 and Related Bills Before the Subcomm. on the Environment and the Subcomm. on Mines and Mining of the House Comm. on Interior and Insular Affairs*, 93d Cong., 1st Sess. (1973) (Parts I and II); U.S. DEP'T OF THE INTERIOR, SURFACE MINING AND OUR ENVIRONMENT (1967).

The effectiveness of existing state strip mining legislation has been debated in Congressional hearings on federal legislation and elsewhere. *See, e.g.*, Benoit, *Strip Mining: Methods of Control by the Three Levels of Government*, 8 URB. L. ANN. 143, 147-53 (1974); Binder, *A Novel Approach to Reasonable Regulation of Strip Mining*, 34 U. PITT. L. REV. 339 (1971); Cardi, *Strip Mining and the 1971 West Virginia Surface Mining and Reclamation Act*, 75 W. VA. L. REV. 319 (1973); Reitze, *Old King Coal and the Merry Rapists of Appalachia*, 22 CASE W. RES. L. REV. 650 (1971); Schneider, *Strip Mining in Kentucky*, 59 KY. L.J. 652 (1971). *See also*, J. DOYLE, JR., STATE STRIP MINING LAWS (Environmental Policy Center 1977) (an inventory and analysis of key statutory provisions in 28 coal producing states); NATIONAL ACADEMY OF SCIENCES, REHABILITATION POTENTIAL OF WESTERN COAL LANDS (1974).

Coal mining on federal coal lands is presently subjected to limited controls. *See* Comment, *Interior's Flexible Approach to Strip Mining: Energy Self-Sufficiency Through Minimal Environmental Protection*, 6 ENVIR. L. REP. 10198 (1976).

For particularly eloquent discussions of the problems associated with coal mining, *see* H. CAUDILL, NIGHT COMES TO THE CUMBERLANDS (1963); K. TOOLE, THE RAPE OF THE GREAT PLAINS (1976).

[15] Between 1930 and 1971, bituminous coal mining was responsible for 1.47 million of the 3.65 million acres disturbed by all mining operations. U.S. BUREAU OF MINES, DEP'T OF INTERIOR, INFORM. CIRC. NO. 8642, LAND UTILIZATION AND RECLAMATION IN THE MINING INDUSTRY, 1930-1971, at 20 (1974).

[16] ALA. CODE tit. 26, §§ 166(129a) to (129z) (Supp. 1975); ALA. CODE tit. 26, §§ 166(115) to (129) (Cum. Supp. 1973); ARK. STAT. ANN. §§ 52-901 to -916 (Supp. 1975); CAL. PUB. RES. CODE §§ 2710 to 2793 (West Supp. 1976); COLO. REV. STAT. ANN. §§ 34-32-101 to -118 (1973); FLA. STAT. ANN. §§ 211.30 to .34 (1972 & Supp. 1975); GA. CODE ANN. §§ 43-1401 to

to those measures taken concurrently with or after the mining operation to reduce or repair the adverse effects of the operation on disrupted land.[17] Environmental management is a much broader term which encompasses the full range of environmental protection measures involved with the decision to mine, the location and design of the operation, and the performance standards for various environmental impacts of the operation including, but not limited to, the reclamation requirements.[18]

Although little coal is mined in Michigan, the state's mining industry extracts a wide variety of minerals including iron ore,

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1413 (1974); HAWAII REV. STAT. §§ 181-1 to-10 (1968); IDAHO CODE §§ 47-1501 to -1518 (Cum. Supp. 1976); ILL. ANN. STAT. ch. 93, §§ 201 to 216 (Smith-Hurd Supp. 1976); IND. ANN. STAT. §§ 13-4-6-1 to -13 (Burns 1973 & Supp. 1976); IND. ANN. STAT. §§ 14-4-2-1 to -2.1-8 (Burns 1973); IOWA CODE ANN. §§ 83A.1 to .31 (Supp. 1976); KAN. STAT. ANN. §§ 49-401 to -424 (1976); KY. REV. STAT. ANN. §§ 350.010 to .990 (Cum. Supp. 1976); Pub. Act. No. 141, 1976 La. Sess. Law Serv. 291 (West); ME. REV. STAT. ANN. tit. 10, §§ 2201 to 2216 (Supp. 1976); MD. NAT. RES. CODE ANN. §§ 7-501 to -514.5, 7-5A01 to -5A15, 7-6A01 to -6A31 (Supp. 1976); Pub. Act No. 222, 1976 Mich. Leg. Serv. 531 (West 1976); MICH. COMP. LAWS ANN. §§ 425.181 to .188 (Supp. 1976); MINN. STAT. ANN. §§ 93.44 to .51 (Supp. 1976); MO. ANN. STAT. §§ 444.500 to .755, 444.760 to .786 (Vernon Supp. 1976); MONT. REV. CODES ANN. §§ 50-1034 to -1057, 50-1201 to -1226, 50-1501 to -1517 (Supp. 1975); N.M. STAT. ANN. §§ 63-34-1 to -20 (1974); ch. 477, 1976 N.Y. Laws 977 (McKinney); N.C. GEN. STAT. §§ 74-46 to -68 (1975); N.D. CENT. CODE §§ 38-14-01 to -13 (Supp. 1975); OHIO REV. CODE ANN. §§ 1513.01 to .99, §§ 1514.01 to .99 (Supp. 1975); OKLA. STAT. ANN. tit. 45, §§ 721 to 738 (Supp. 1976); ORE. REV. STAT. §§ 517.750 to .990 (1975); PA. STAT. ANN. tit. 52, §§ 1396.1 to .21 (1966 & Supp. 1975); S.C. CODE ANN. §§ 63-711 to -733 (Cum. Supp. 1975); S.D. COMPILED LAWS ANN. §§ 45-6A-1 to -33 (Supp. 1976); TENN. CODE ANN. §§ 58-1540 to -1564 (Supp. 1976); TEX. REV. CIVIL STAT. ANN. art. 5920-10 (Vernon Supp. 1976); UTAH CODE ANN. §§ 40-8-1 to -23 (Supp. 1975); VA. CODE ANN. §§ 45.1-180 to -197.2, -198 to -220 (1974); WASH. REV. CODE ANN. §§ 78.44.010 to .930 (Supp. 1976); W. VA. CODE ANN. §§ 20-6-1 to -32 (1973 & Supp. 1976); WIS. STAT. ANN. §§ 144.80 to .94 (1974 & Supp. 1976); WYO. STAT. ANN. §§ 35-502.1 to .15, .22 to .41, .45 to .56 (Cum. Supp. 1975).

[17] *See* ARGONNE NAT'L LABORATORIES, SURFACE MINED LAND IN THE MIDWEST I-58 (1974) (National Technical Inform. Serv. No. PB-237 830); Thurgood, *Land Reclamation Must Follow Mining*, CANADIAN MINING J., Dec. 1972, at 33.

[18] Environmental management refers to those decisions which, in addition to land, also protect air and water quality affected by mining (*e.g.*, groundwater, air pollution from ore processing plants). It also incorporates the full range of direct social and economic impacts of a mining operation. Many reclamation acts contain elements of environmental management. *See* notes 194-96 and accompanying text *infra*. In addition to its broader scope, environmental management differs from reclamation in that it involves preplanning of a mining operation to reduce its environmental effects. Environmental management also differs because it involves the consideration of alternative sites, processing methods, and design choices to reduce the environmental, social, and economic impact of the mining operation. *See* notes 61-72 and accompanying text *infra*.

The comprehensive inquiry associated with environmental management is similar to the inquiry involved in the adoption of the coal mining regulations of England and West Germany. *See* Plater, *Coal Law From the Old World: A Perspective on Land Use and Environmental Regulation in the Coal Industries of the United States, Great Britain, and West Germany*, 64 KY. L.J. 473 (1976). Mining proposals in West Germany are subjected to two administrative procedures. These are the initial permission process to mine a particular area under the land use planning laws and the annual authorization procedure for the year's mining plans. Both procedures involve a broad examination of the effects of the operation, which may involve an environmental impact statement. *Id.* at 480-85. The root of the English regulatory system lies in the ability of the National Coal Board, which owns and manages the country's mineral rights, to deny permission for a coal development. The permit procedure necessarily involves broad questions about environmental effects, and the significance of the project may lead to a searching examination of those effects. *Id.* at 486-93.

copper, sand and gravel, gypsum, and sulfur.[19] This note will scrutinize the recently enacted Michigan Mine Reclamation Act as it pertains to metallic mining, the largest of these industries.[20] It will examine the disturbances associated with iron and copper mining, outline the weaknesses of the Mine Reclamation Act, and propose certain changes to improve that Act. This note will also attempt to demonstrate that comprehensive environmental management of land disturbances from metallic mining operations is a desirable approach to problems usually dealt with by reclamation laws.

I. METALLIC MINING—AN INTRODUCTION

The first iron and copper mines in Michigan were small open pit operations begun in the middle of the nineteenth century. Underground operations soon displaced open pits and were, until recently, the predominant method of mining. The iron mines produced a high grade ore which was shipped directly from the site to blast furnaces in major cities along the Great Lakes. Copper mines, which utilized underground operations, yielded an ore which had to be processed at the site before the metal could be shipped. Depletion of high grade iron ores in recent decades, coupled with the development of new processing technology, led to a transition to large open pit mines and a similar procedure for on site processing of iron ore.[21] Nearly all metallic ore mined in Michigan now is processed at or near the mine site.[22] The processing of metallic ore requires a large plant to crush and grind the ore into particles ranging in size from grains of sand to bits of powder. Rock particles with a low ore content known as tailings are pumped as a slurry effluent into low lying areas bordered by large dikes.[23] Particles with a higher concentration of iron ore are made into pellets, which are shipped by rail or freighter for smelting.[24] Copper ore is

[19] *See* GEOLOGICAL SURVEY DIVISION, MICH. DEP'T OF NATURAL RESOURCES, ANNUAL STATISTICAL SUMMARY, MINERAL INDUSTRY OF MICHIGAN, 1973, at 21 (1976).

[20] Iron ore is the state's leading mineral commodity in terms of value, while copper is third. Iron and copper production in 1973 was valued at about $226 million of the state's total mineral production of $789 million. *Id.* at 1. Metallic mining operations also tend to be larger in physical size than other operations.

[21] *See generally* C. BENEDICT, RED METAL (1952); Devaney, *Iron Ore Story of the Upper Great Lakes Past & Future,* SKILLINGS' MINING REV., Mar. 13, 1971, at 1.

[22] Of the iron ore produced in Michigan in 1975, 97.6 percent was processed at or near the mine site. COMMODITY DATA SUMMARIES, *supra* note 9, at 82. All of the copper ore mined in the state is processed and smelted at the mine.

[23] After crushing and grinding, the ore particles are mixed with water to form a slurry, and pumped into tanks where the heavier ore particles are separted by chemical or magnetic means. Most rock particles pumped into a tailings basin settle, and the water is discharged into a nearby stream or recycled to the plant. *See* notes 24 & 90 *infra.*

[24] *See* MINING ENGINEERING HANDBOOK 27-29 to 27-69 (Michigan Technological University 1973); U.S. BUREAU OF MINES, DEP'T OF INTERIOR, INFORM. CIRC. NO. 8574, IRON: A MATERIALS SURVEY 35-52 (1973). *See also* Villar & Dawe, *The Tilden Mine–A New Processing Technique for Iron Ore,* MINING CONG. J., Oct. 1975, at 40.

smelted at the mine site.[25] Open pit mining operations also result in large piles of overburden (material lying over the deposit), low grade ore, and waste rock near the pit.

Since 1970, metallic mining has involved the disturbance of more than 13,000 acres of land in Michigan.[26] The amount of land disturbed by open pit iron mining alone doubled between 1970 and 1975.[27] A continued increase in the amount of land disturbed is likely as a result of the planned or potential development of at least four additional mines as well as the ongoing expansion of two existing mines.[28] Recent increases in proven and indicated reserves, particularly of iron ore, suggest the potential for additional mining operations.[29] Continued increases in demand for iron ore and copper, coupled with a renewed emphasis on domestic production of raw materials, lend further support to the conclusion that more metallic ore will be extracted from Michigan mines in coming years.[30]

These operations present a number of largely uncorrected environmental problems. Inactive and unvegetated tailings basins are the source of substantial amounts of blowing dust.[31] The construc-

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[25] *See* Parks, White Pine Copper Co. 35-51 (June 1974) (unpublished student paper in the possession of Prof. Lawrence Welborn of Michigan Technological University in Houghton, Michigan).

[26] Figures compiled by the Geological Survey Division of the Michigan DNR show 8,900 acres of land have been disturbed by open pit iron mining operations since 1970. The two tailings basins at the White Pine Copper Mine alone cover about 4,300 acres. Personal interview with John Suffron, Director of Environmental Control, Copper Range Co., in White Pine, Michigan (Aug. 17, 1976) [hereinafter cited as Suffron interview].

[27] Figures compiled by the Geological Survey Division of the Michigan DNR show an increase of land disturbed from 4,319 to 8,900 acres between 1970 and 1975.

[28] The capacity of the Tilden and Empire iron mines is being increased by about two-thirds. Det. Free Press, June 18, 1976, § B, at 3, col. 4. At least two additional iron mines are planned in Marquette County, MARQUETTE (MICH). MINING JOURNAL, Sept. 18, 1976, at 1, col. 1. Preparations for two possible copper mines, including the Centennial, are being made on the Keweenaw Peninsula. *See* Kirkby, *Mining Firm Explores for Copper Country's Future,* Milw. J., Aug. 15, 1976, § 2, at 1, col. 1; Skillings, Jr., *Homestake Copper Co. Keweenaw Project,* SKILLINGS' MINING REV., May 10, 1975, at 1; AQUATIC RESEARCH GROUP, MICH. TECH. UNIV., ENVIRONMENTAL IMPACT ASSESSMENT FOR PROJECT 543 SOUTH (1976) [hereinafter cited as PROJECT 543 SOUTH ASSESSMENT].

[29] *Compare, e.g.,* GEOLOGICAL SURVEY, U.S. DEP'T OF INTERIOR, COMPUTER-AIDED ESTIMATES OF CONCENTRATING GRADE IRON RESOURCES IN THE NEGAUNEE IRON FORMATION, MARQUETTE DISTRICT, MICHIGAN (1976) (Open File Report No. 74-426), *with* GREAT LAKES BASIN COMMISSION, GREAT LAKES BASIN FRAMEWORK STUDY, App. 5 (Mineral Resources), at 12 (1974). There is a strong possibility that other metallic minerals, particularly uranium, will be mined in the future. *See* Eckbo, Dean, Austin & Williams, Inc., Seafarer Site Survey, Upper Michigan Region, Book 9 (Mineral Extraction Data) 8-9 (1976).

[30] COMMODITY DATA SUMMARIES, *supra* note 9, at 83. *See also* MINERAL LANDS SUBCOMM., STATE [MICHIGAN] ESSENTIAL & UNIQUE LANDS ADVISORY COMM., RUNNING OUT OF EVERYTHING 13-17 (1974).

[31] Blowing dust is observable from several partially or completely unvegetated tailings basins, including the west basin at Empire (about 900 acres), the south basin at White Pine (1,850 acres), the north basin or emergency spill pond at Republic, and different parts of the Groveland mine. Dust has blown at least two to five miles from the mine site. Personal

tion and use of these basins often interferes with water tables and surface runoff.[32] Waste rock piles are also an existing or potential aesthetic problem.[33] In addition to such problems, a number of questions remain unanswered. The effect of these mining and processing operations on local land use and development has not been fully determined.[34] It is not known whether seepage from tailings ponds has any effect on groundwater supplies.[35] In addition, potential adverse health effects may be caused by the dust blowing from certain tailings basins.[36]

Metallic mine operations in Michigan have engaged in some reclamation work since 1967 or 1968.[37] The efforts, however, have tended to be selective, and where accomplished, aimed at achieving minimal reclamation goals or providing "showcases" of reclamation.[38] In fact, no specific plans exist for the vegetative stabili-

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interview with Stephen G. Shetron, Prof. of Forest Research, Michigan Technological University, in Marquette County, Michigan (Aug. 18 and 19, 1976) [hereinafter cited as Shetron interview].

[32] The author has observed pools of water adjacent to and outside of tailings dikes at the Groveland, Empire, and Centennial mines, indicating that construction of tailings dikes and water inside the dikes has interfered with water tables and surface runoff. This conclusion was supported by the Shetron interview, *supra* note 31.

[33] A 300-foot-high waste rock pile near the Empire mine may someday reach a height of 2,000 feet, making it the tallest point in Michigan. Shetron interview, *supra* note 31. *See also* Posner, *Letter from Ishpeming,* BUSINESS WEEK, Nov. 12, 1976, at 26H. *But see* The Hanna Miner, July 1971, at 8 (caption), referring to certain waste rock piles near a Minnesota iron mine as adding "a new dimension and excitement to the surrounding woodlands."

[34] The location of a major ore mining or processing operation must be considered in the context of land uses in the area. *See* Brief of Minn. Dep't of Natural Resources, In the Matter of Reserve Mining Co., On-Land Disposal Plan, at 84 (D. Minn. Apr. 5, 1976); "No stretch of the imagination can turn such an area . . . into an insignificant extension of an existing far smaller facility, with no ramifications for surrounding land use." Two overlapping land use questions are involved. These are the compatibility of the facility with surrounding land uses and its effect on the development of the area. *See id.,* and Brief of Minnesota Pollution Control Agency, In the Matter of Reserve Mining Co., On-Land Disposal Plan, at 77-84 (D. Minn. Apr. 8, 1976).

[35] Shetron interview, *supra* note 31.

[36] Judge Lord found that the asbestos-like fibers in the cummingtonite-grunerite iron ore processed by Reserve Mining Co. in Minnesota presented a long-range carcinogenic risk whose threshold level is unknown. United States v. Reserve Mining Co., 380 F. Supp. 11, 16 (D. Minn. 1974). He also found the Marquette and Gogebic ranges in Michigan to be two other possible sources of this ore. *Id.* at 34. It is unknown whether there are adverse health effects in Michigan from the inhalation of blowing tailings dust. Posner, *supra* note 33. *Cf.,* Urie v. Thompson, 357 Mo. 738, 210 S.W.2d 98 (1948) (involving an allegation of silicosis resulting from lead and zinc tailings).

[37] Copper Range, Hanna, and Cleveland-Cliffs all began vegetation work in Michigan at that time. Personal interview with Urban Guiliani, Mine Engineer, Groveland Mine, at the mine, Dickinson County, Michigan (Aug. 16, 1976); personal interview with Burton H. Boyum, Director of Administrative Affairs, Cleveland-Cliffs Iron Co., in Ishpeming, Michigan (Aug. 19, 1976) [hereinafter cited as Boyum interview]; Suffron interview, *supa* note 26.

[38] An 80-acre plot at the Humboldt iron mine, for example, has been intensively fertilized and vegetated since 1971 and has received substantial public attention. Aside from several relatively insignificant exceptions, no other disturbed area has received as much reclamation treatment. Most or all of several large tailings basins are unvegetated. A maximum of 350 acres of the 1,850 acre south tailings basin at White Pine, abandoned since 1971, has been

zation of many of these areas.[39]

The fact that there has been reclamation before the effective date of the Reclamation Act generally can be attributed to other legal incentives. The threat of a nuisance action has, in at least one instance, persuaded a company to begin vegetating an old tailings area.[40] The state's Land Exchange Act,[41] which allows private parties to trade land of equal size or value with the state, offers another incentive. Mining companies use this mechanism to obtain lands for processing ore. Their reclamation of land may be one means of demonstrating to the state that they plan to care properly for other land they would like to obtain.[42] While voluntary action has resulted in marginal reclamation, it appears that a greater incentive will be required to bring about needed corrective measures.

Most of the problems associated with metallic mining are also present in the surface mining of coal. However, the techniques employed in metallic mining generate these problems in a somewhat different fashion.[43] Since about three-fourths of the land disturbed by metallic mining is used for tailings basins,[44] the existence of on site ore processing is the basic source of the land disturbance. By contrast, coal mining disturbs land largely through the excavation of material and location of overburden. In addition, the termination date for active disturbance of particular land parcels is subject to change because a tailings basin may be inactive for a period and then used again.[45] While reclamation laws for these different kinds of mining may have the same basic environmental goals, performance standards must necessarily differ because metallic mining presents somewhat of a unique set of environmental issues.

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vegetated. Suffron interview, *supra* note 26. The 900 acre west basin at Empire, inactive but perhaps not abandoned, has received little vegetation or other temporary or permanent stabilizing agent since 1975. The size of tailings basins makes them the largest vegetation problem. *See* note 44 *infra*. Prospects for vegetation occurring naturally on abandoned tailings areas are dim. Shetron interview, *supra* note 31. The basic problem in establishing vegetation is that tailings areas contain no organic materials, contain no major plant nutrients, may be acidic or basic, and are exposed to the wind. *Id. See generally* Nielson & Peterson, *Establishing Vegetation on Mine Tailings Waste,* in 2 ECOLOGY AND RECLAMATION OF DEVASTED LAND 103 (1973).

[39] Suffron interview, *supra* note 26. For a definition of vegetative stabilization, *see* note 86 *infra*.

[40] *See* note 81 and accompanying text *infra*.

[41] MICH. COMP. LAWS ANN. §§ 322.481-.484 (1967).

[42] Telephone interview with R. Thomas Segall, Geologist-in-Charge, Mine Reclamation Geological Survey Division, Michigan DNR (Aug. 12, 1976).

[43] *Compare* notes 23-25 and accompanying text *supra, with* Cardi, *supra* note 14, at 320-25.

[44] According to figures compiled by the Geological Survey Division of the Michigan DNR, 6,449 of the 8,900 acres affected by open pit iron mining in 1975 were used for tailings basins.

[45] This is precisely the problem at the West Empire tailings basin, which has been inactive since 1971, but which Cleveland-Cliffs says may be used again for tailings disposal. Boyum interview, *supra* note 37.

II. APPROACHES TO REGULATION OF METALLIC MINING

A variety of approaches are available to control the land disturbance and other environmental effects of metallic mining.[46] Reclamation must be considered as only one part of a broader set of environmental protection measures which should be applied to metallic mining operations. These measures are, for the most part, regulatory and enacted at the state level.[47]

Control of the environmental problems associated with metallic

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[46] Because mining necessarily involves great land disruption and other environmental difficulties, the temptation exists to ask whether outright prohibition is the answer. That question has been raised about iron mining in Michigan. Hennessy, *UP's Courtship of Industry on Wane,* Det. Free Press, Jan. 12, 1976, § A, at 1, col. 1. The economic importance of mining renders this approach unwise, and probably unlawful. *See generally* McGinley, *Prohibition of Surface Mining in West Virginia,* 78 W. VA. L. REV. 445 (1976). By contrast, the economic impact of regulation on metallic mining operators is likely to be minimal. Metallic mining and processing tends to carry a very high rate of return on investment. *See* Det. News, Nov. 20, 1975, § D, at 15, col. 3. *See also* United States v. Reserve Mining Co., 380 F. Supp. 11, 59-64 (D. Minn. 1974). Moreover, metallic mining generally disturbs less land per unit of metal extracted than coal. Per acre reclamation costs also tend to be somewhat cheaper for metallic operations than for surface coal operations. *Compare* NATIONAL ACADEMY OF SCIENCES, REHABILITATION POTENTIAL OF WESTERN COAL LANDS 87-89 (1974) ($925-$2,750 per acre), *with* L. Jones, Vegetation Establishment on Iron Mine Tailings, Dam Berms and Waste Rock Dumps 50-53 (1972) (unpublished master's thesis, Michigan Technological University) ($61.50-$500 per acre). The difference in reclamation goals of the two studies, however, may account for some of the difference. *See generally* G. Dreese, Economic Impact of Recent Reclamation Laws (paper presented before the annual meeting of the American Academy for the Advancement of Science, Jan. 30, 1975).

[47] It seems logical to deal with mining and environmental disturbances at the state level through existing reclamation laws and mechanisms to affect the location of ore processing facilities. This is not to suggest, however, that federal legislation may not be necessary or desirable. The absence or narrow scope of reclamation laws in many states, coupled with the ability of mining companies to influence state legislatures or administrative agencies, may eventually lead to a federal reclamation act for noncoal minerals.

Reclamation laws which would cover all minerals have been proposed, discussed, and rejected by Congressional Committees, *see* H.R. REP. NO. 1462, 92d Cong., 2d Sess. 19 (1972); H.R. REP. NO. 896, 94th Cong., 2d Sess. 33-34 (1976). If a coal reclamation act is adopted, similar legislation may be adopted for other minerals. The most recent federal proposals would authorize a study of reclamation of noncoal minerals. H.R. 2, 95th Cong., 1st Sess. § 709 (1977); S. 7, 95th Cong., 1st Sess. § 509 (1977). In addition, § 8002(f) of the Resources Conservation and Recovery Act of 1976, Pub. L. No. 94-580, 90 Stat. 2795-2841 (to be codified at 42 U.S.C. §§ 6901-6987), provides for a comprehensive and detailed study by the Environmental Protection Agency on the "adverse effects of solid wastes from active and abandoned surface and underground mines on the environment."

Ideally, reclamation would be placed in the context of comprehensive state land use legislation, *see, e.g.,* HAWAII REV. STAT. §§ 205.1-.16.2 (Supp. 1975); ME. REV. STAT. ANN. tit. 12, §§ 681 to 685-C (1974 & Supp. 1976), or in the context of comprehensive state facility siting legislation, *see* ABA SPECIAL COMMITTEE ON ENVIRONMENTAL LAW, DEVELOPMENT AND THE ENVIRONMENT (1974). The absence of such legislation should not deter the adoption of statutes dealing with the environmental management of metallic mining operations, however.

Local involvement in reclamation often emerges through zoning or land use controls. *See* note 171 and accompanying test *infra*. *See also* Benoit, *supra* note 14, at 153-61.

mining can occur before, during, and after the mining operation.[48] Most laws offer an incomplete or partial approach to these problems. The most basic approach involves state reclamation statutes, which rarely include any clear definition of the nature or extent of desirable reclamation. Most states treat reclamation simply as a vaguely conceived land improvement technique.[49] A number of laws set forth a balancing test which weighs environmental improvements to disturbed land against perceived or actual costs to the operator.[50] The experience of many states is that the balance is struck in favor of the economic interests of the operator.[51] Reclamation laws should be designed to prevent the mine site from becoming a source of environmental pollution and to insure that post-mining land uses are at least as productive as those preceding the operation. Ideally, these goals would be furthered by complete restoration of the original contours and values of the site within the shortest time possible after cessation of mining.[52]

Restoration is difficult to achieve, however, because metallic mining operators cause major changes in the contours of disturbed land.[53] Restoration is limited by the technological problem of the developing state of reclamation techniques. It has only recently become possible to successfully vegetate inactive tailings basins at the Upper Peninsula mines.[54] Many uncertainties and limitations

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[48] *See* note 18 and accompanying text *supra*.

[49] *See* note 103 and accompanying text *infra*. The reclamation laws are based on the intuitive and reasonable notion that it is improper to allow lands disturbed by mining to remain hostile to the propagation of plant and animal life and unusable for any productive purpose. *See, e.g.*, COLO. REV. STAT. ANN. § 34-32-103(9) (1973); WIS. STAT. ANN. § 144.81(15) (1974). Mining operations are unlike most activities which affect the land. The land disturbance is severe, and the operation is inherently temporary because of the finite quantity of available ore at the site, and severe nature of the land disturbances involved.

[50] *See* note 103 and accompanying text *infra*.

[51] *See* CENTER FOR SCIENCE IN THE PUBLIC INTEREST, ENFORCEMENT OF STRIP MINING LAWS (1975) (CSPI Energy Series VIII).

[52] NATIONAL ACADEMY OF SCIENCES, REHABILITATION POTENTIAL OF WESTERN COAL LAND 11, 86 (1974). Parts of recently proposed federal surface mining and reclamation laws approach these goals. *See* H.R. REP. No. 896, 94th Cong., 2d Sess. 49-56 (1976). H.R. 2, 95th Cong., 1st Sess. (1977), and S. 7, 95th Cong., 1st Sess. (1977), both require restoration of mined land to "approximate original contours." The term refers to a surface configuration achieved by backfilling and grading of the mined area so that it closely resembles the surface configuration of the land prior to mining and blends into and complements the drainage pattern of the surrounding terrain, with all highwalls and spoil piles eliminated. H.R. 2, § 701(23); S. 7, § 501(23).

[53] An open pit mine leaves a large hole several hundred feet deep and often several hundred acres in size, which then fills with water. In several decades, the processing operation will transform a low-lying swampy area into a sandy plain as much as one hundred feet above the original elevation. Rock stockpiles left at the mine site are even higher although they can be shaped more easily than other alterations. Such alterations make it practically impossible to restore the surface to even an approximation of its original contour. The problem stands in stark contrast to surface coal mining, where properly reclaimed land may only be somewhat lower in elevation, reflecting the absence of the mined coal seam.

[54] *Compare* FORESTRY DIVISION, MICHIGAN DEP'T OF NATURAL RESOURCES, ENVIRONMENTAL IMPACT STATEMENT (PRELIMINARY), GROVELAND LAND EXCHANGE PROPOSAL 34

remain, including the durability and quality of the vegetation which can be achieved.[55] Related to these difficulties are the ecological limitations on restoration; fragile natural systems are not replaced in a day.[56] In addition, if some stringent level of environmental requirements was imposed, the costs of mining could become prohibitive. This problem is often exaggerated with it being far from clear that significant economic difficulties would result from most regulations.[57] These suggested limitations, however, are less relevant to whether the goal of restoration is desirable than to whether its achievement is feasible. The distinction is important because it indicates that certain land simply should not be subjected to mining, and also because it requires that another reclamation goal—an achievable one—be defined.

A number of existing or proposed reclamation laws have provided for the designation of some lands as unsuitable for mining. These provisions take three basic approaches. One group of statutes looks to special historical, ecological, and social characteristics of the land, prohibiting mining which would subsequently impair the land's value.[58] A second possible approach conditions the initiation of a coal mining operation on the operator's ability to show that there will be no material injury to the environment, that the productivity of the land will be restored if not improved, and that the land will be returned to its original contours.[59] The third approach involves the balancing of environmental values against those economic values which a mining operation would advance.[60]

(Mar. 27, 1973) [hereinafter cited as GROVELAND ENVIRONMENTAL STATEMENT]: "There is no certainty that vegetation can be made to succeed and continue on the hostile (tailings) surface," *with* note 38 *supra*. *See also* L. Jones, *supra* note 46; J. Prather, Vegetative Stabilization of Reclaimed Copper Stamp-Sands (1973) (unpublished M.S. thesis in Michigan Technological University Library). *See generally* Young, *The Use of Vegetation to Stabilize Mine Tailing Areas at Copper Cliff*, CANADA MINING J., June 1969, at 43.

[55] Shetron interview, *supra* note 31.

[56] A mining company may greatly facilitate the ecological restoration of land by, for example, planting vegetation in two feet of topsoil placed on an inactive tailings basin instead of planting directly on the tailings. Two to three feet of topsoil over the proposed on-land tailings disposal area of the Reserve Mining Co. could reduce restoration time of existing vegetation from between two and six hundred years to eighty or ninety years. Brief of Minnesota Dep't of Natural Resources, In the matter of Reserve Mining Co., On-Land Disposal Plan at 53-56 (Apr. 5, 1976).

[57] *See* note 46 *supra*.

[58] *See, e.g.*, IOWA CODE ANN. § 83A.13(3) (Supp. 1976); KY. REV. STAT. ANN. § 350.085 (Cum. Supp. 1976); MD. NAT. RES. CODE ANN. § 7-505(i)(2) (Supp. 1976); MONT. REV. CODES ANN. §§ 50-1601 to -1617, -1042 (Supp. 1975); N.D. CENT. CODE § 38-14-05.1(2) to (6) (Supp. 1975); S.D. COMPILED LAWS ANN. § 45-6A-9.1 (Supp. 1976); TEX. REV. CIVIL STAT. art. 5920-10, § 13 (Vernon Supp. 1976); VA. CODE ANN. § 45.1-205 (1974); W. VA. CODE ANN. § 20-6-11 (1973). *See also* W. VA. CODE ANN. § 20-6A-1 (Supp. 1976). *But see* CAL. PUB. RES. CODE § 2790 (West Supp. 1976).

[59] *See* Binder, *supra* note 14, at 371.

[60] *See* MD. NAT. RES. CODE ANN. § 7-5A05(g) (Supp. 1976), which provides that a permit may not be issued for mining in an underground abandoned mine unless a detailed project mining plan in the form of cost-benefit analysis is approved.

Such an approach, similar to that in the National Environmental Policy Act of 1969 (NEPA)[61] and its state counterparts,[62] would require a detailed examination of the direct and indirect environmental, social, and economic effects of the operation as well as consideration of alternative design, location, and other options. Properly designed and administered, this alternative would incorporate and refine the basic elements of the first two approaches.[63]

NEPA requires that all federal agencies make detailed statements of the consequences of any major proposed action.[64] This statement generally contains an examination of the environmental impact and a statement of alternatives to the proposal.[65] Environmental impact statements have been required by a number of Interior Department decisions to lease tracts of federal land for coal[66] mining or uranium[67] mining. A number of state laws patterned after NEPA implicitly or explicitly require an environmental impact statement as a precondition to mining in certain circumstances.[68]

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[61] 42 U.S.C. §§ 4321-4327 (1970).

[62] *See generally* Yost, *NEPA's Progeny: State Environmental Policy Acts*, 3 ENVIR. L. REP. 50090 (1973). *See also* COUNCIL ON ENVIRONMENTAL QUALITY, FIFTH ANNUAL REPORT 401-09 (1974); OFFICE OF RESEARCH AND DEVELOPMENT, ENVIRONMENTAL PROTECTION AGENCY, ENVIRONMENTAL IMPACT REQUIREMENTS IN THE STATES (1974).

[63] Where the environmental values involved are great, for example, where the proposed mine is in a state park, that in itself generally should mandate a decision not to mine. Where those values are somewhat less significant, an operator should not be able to mine unless he demonstrates that his interference will be minimal and that he will rehabilitate what he has destroyed. The process is more meaningful than the other two approaches in that a detailed examination of the alternatives and effects of the operation is required and because its scope is much broader than provisions for the designation of unsuitable lands. Because the environmental impact statement process is not always sensitive to the protection of such areas, procedures should be established for the designation of lands with certain carefully identified characteristics as unsuitable for mining. These characteristics have been identified for Michigan as including wetlands and inland lakes with certain characteristics, fish and wildlife habitat critical to the continuation of a species, and areas of unusual scenic beauty. See [MICHIGAN] SPECIAL ENVIRONMENTS (UNIQUE LANDS) SUBCOMMITTEE, REPORT ON SPECIAL ENVIRONMENTS (1974).

[64] 42 U.S.C. § 4332 (1970).

[65] 42 U.S.C. § 4332(2)(C) (1970).

[66] See Cady v. Morton, 527 F.2d 786 (9th Cir. 1975). *See also* Kleppe v. Sierra Club, 44 U.S.L.W. 5104 (1976), where the Court held that the Interior Department was not required to prepare an environmental impact statement for the entire Northern Great Plains region because there was no formal proposal for development of its coal reserves. *See generally* Note, *Program Environmental Impact Statements: Review and Remedies*, 75 MICH. L. REV. 107 (1976).

[67] *See, e.g.*, U.S. BUREAU OF INDIAN AFFAIRS, DEP'T OF THE INTERIOR, DRAFT ENVIRONMENTAL IMPACT STATEMENT, URANIUM EXPLORATION, MINING AND MILLING PROPOSAL, NAVAJO INDIAN RESERVATION, NEW MEXICO (June 23, 1976).

[68] *E.g.*, MINN. STAT. ANN. § 105.64 (1964) and MINN. STAT. ANN. §§ 116D.01-.04 (Supp. 1976); N.Y. ENVIR. CONSERV. LAW §§ 8-0101 to -0117 (McKinney 1976) and 6 N.Y. Code of Rules & Regs. § 420.4 (pertaining to 1976 N.Y. Laws ch. 477 (McKinney)); WIS. STAT. ANN. § 1.11 (1974), *See also* Reserve Mining Co. Draft Environmental Impact Statement On-Land Tailings Disposal Plan (1976) [hereinafter cited as Reserve EIS]; Wisconsin Dep't of Natural Resources, Environmental Impact Statement for the Flambeau Mining Corp. Proposed Copper Mine, Rusk County, Wisconsin (1976) [hereinafter cited as Rusk County EIS].

Michigan's version of NEPA, a 1974 Executive Order, establishes an environmental impact assessment procedure for the review of all state agency actions having a "significant possible impact on the environment or on human life."[69] This requirement, patterned after NEPA, has significant potential for the examination of alternative ore processing sites and mitigation choices at the designated site. The statement is to include a description of the probable effects of the project, modifications which would eliminate or minimize adverse effects, and alternatives to the project.[70] This basic procedure has resulted in three completed or ongoing environmental impact statements for metallic mining operations.[71] The information in these statements is intended to enable regulatory agencies to make enlightened decisions as to whether projects should proceed as well as to provide adequate baseline and forecasting data for the benefit of interested parties.[72]

These decision-making and disclosure goals parallel the purposes of the detailed information many states require of an operator in a permit application before allowing mining operations to commence.[73] In one sense, the greater the detail required in the permit application, the more closely it approaches an environmental impact statement. Both procedures ascertain various environmental effects of a proposed action, but they differ in several respects. Unlike the permit procedure, the environmental impact statement requires an examination of alternatives to the proposed action.[74] The latter tends to assume that the project will be more or less permanent, and thus tends to more closely examine the initial

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[69] Mich. Exec. Order 1974-4 (May 3, 1974). The order superseded Exec. Orders 1971-10 and 1973-9, orders which had somewhat similar goals.

[70] *Id.* The Sand Dune Protection and Management Act, Pub. Act. No. 222, § 4, 1976 Mich. Legis. Serv. (West), requires both an environmental impact statement and a mining and reclamation plan before an operator can obtain a mining permit. The environmental impact statement is to include information as to the compatibility of the operation with existing land uses and the impact of the operation on flora, fauna, wildlife, ground water, and adjacent surface resources. The statement is also to discuss the economic impact of the operation and alternatives to the proposed site. *Id.* at § 5.

[71] GROVELAND ENVIRONMENTAL STATEMENT, *supra* note 54; PROJECT 543 SOUTH ASSESSMENT, *supra* note 28; CLEVELAND-CLIFFS IRON CO., ENVIRONMENTAL IMPACT STATEMENT FOR LANDS EXCHANGE APPLICATION TO DEP'T OF NATURAL RESOURCES (June 30, 1976) [hereinafter cited as CLIFFS ENVIRONMENTAL STATEMENT].

[72] *See* Calvert Cliffs' Coordinating Comm. v. Atomic Energy Comm'n, 449 F.2d 1109 (D.C. Cir. 1976); Environmental Defense Fund v. Corps of Eng'rs, 325 F. Supp. 749 (E.D. Ark., 1971), *dismissed*, 342 F. Supp. 1211 (E.D. Ark. 1972), *aff'd*, 470 F.2d 289 (8th Cir. 1972). Since the state acts are similar to the NEPA, the federal case law as to the purpose of the federal act is generally persuasive regarding the interpretation of the state acts. *E.g.*, City of Davis v. Coleman, 521 F.2d 661, 672 (9th Cir. 1975), Eastlake Community Council v. Roanoke Ass'n, 82 Wash. 2d 475, 513 P.2d 36, (1973); Wisconsin's Environmental Decade, Inc. v. Public Serv. Comm'n of Wis., 69 Wis. 2d 1, 230 N.W.2d 243 (1975).

[73] *See* notes 172-83 and accompanying text *infra*.

[74] *See* 42 U.S.C. § 4332(2)(c)(iii) (1970). *See also* MINN. STAT. ANN. § 116D.04(1)(c) (West Supp. 1976); WIS. STAT. ANN. § 1.11(2)(c)(3) (West 1974).

impact.[75] They also differ in that the value of an environmental impact statement is for the most part procedural,[76] while a permit application has substantive requirements that the operator must meet.[77] It is not enough that the operator merely fill out a permit application; the application must show that his conduct will conform to certain standards.

Apart from the absence of substantive criteria, the Michigan procedure for examination of environmental effects of metallic mining operations suffers from several other shortcomings. It is not clear whether there is a foolproof triggering mechanism requiring an environmental impact statement for the expansion or development of metallic mining operations.[78] In addition, it appears that

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[75] Because permit procedures assume that mines are temporary intrusions, use of them may result in tolerance of the initial disturbance while at the same time requiring that the area be reclaimed. A substantial amount of controversy surrounds the attempt to force the Reserve Mining Co. to use an on-land tailings disposal system, and the proposal by the Kennecott Copper Co. to develop a mine in Rusk County, Wisconsin, both of which involve state-required environmental impact statements. *See* Born, *Wisconsin Gets Ready for New Diggings,* WIS. NATURAL RESOURCES, Mar./Apr. 1977, at 6; Schilling & May, *Case Study of Environmental Impact–Flambeau Project,* MINING CONGRESS J., Jan. 1977, at 39; Rebuffoni, *Reserve Fighting 4 Court Battles,* Minneapolis Tribune, Oct. 11, 1976, § A, at 1. The use of an environmental impact statement does not necessarily cause delays. The environmental impact statement which accompanied the proposed expansion of the Groveland Mine in 1973 caused no substantial delay. Personal Interview with T.R. Tucker, Acquisition Supervisor, Lands Division, Michigan Dep't of Natural Resources (Jan. 19, 1977). It is more likely that delays in the former instances are due to the size of the Reserve Co. operation and the Kennecott Co. mine's potential interference with northern Wisconsin's more developed tourist industry.

Application of the Michigan Environmental Protection Act, which also requires examination of alternatives to a permit procedure, might tend to minimize this difference. *See* notes 148-52 and accompanying text *infra*.

[76] The scope of substantive review under NEPA generally has been confined to whether the action of the agency in proceeding with a project after completion of an environmental impact statement was arbitrary or capricious. *See, e.g.,* Sierra Club v. Froehlke, 486 F.2d 946 (7th Cir. 1973); Jicarilla Apache Tribe v. Morton, 471 F.2d 1275 (9th Cir. 1973). "The court is not empowered to substitute its judgment for that of the agency." Citizens to Preserve Overton Park v. Volpe, 401 U.S. 402, 416 (1971). *But see* Note, *Substantive Review under the National Environmental Policy Act of 1969: E.D.F. v. Corps of Engineers,* 3 ECOLOGY L.Q. 173 (1973); Note, *National Environmental Policy Act of 1969: Toward a Substantive Standard of Review,* 4 N.Y.U. REV. L. & SOC. CHANGE 153 (1974).

[77] *See* notes 172-83 and accompanying text *infra*.

[78] The Executive Order provides for a statement only in the event of a significant *agency* action. According to the guidelines, such actions would include approval of projects for land acquisition, disposition or leasing, authorization of changes in land utilization through exchange or use permits, or agency approval and authorization for disposition of materials that would result in significant environmental degradation. State of Michigan, Guidelines for the Preparation and Review of Environmental Impact Statements under Executive Order 1974-4, Part 5(A)(2). The basic triggering mechanisms for such a statement are the use of the Land Exchange Act, MICH. COMP. LAWS ANN. §§ 322.481-.484 (1967), the permit requirement for the Inland Lakes and Streams Act, MICH. COMP. LAWS ANN. §§ 281.951-.965 (Supp. 1976), and the permit requirements of the Dam Act, MICH. COMP. LAWS ANN. §§ 281.131-.135 (1967). If an operator already owns the land and does not require a permit for development, he may avoid the environmental impact statement altogether. That is apparently what happened when construction of the Gribben tailings basin for the Tilden Mine began in 1972. Significantly, the guidelines also provide for an environmental impact statement where there is sufficient public controversy about a proposal. Because there is great room for administrative discretion, however, a strong agency commitment to an environ-

there is a lack of coordination between the divisions within the Department of Natural Resources responsible for the environmental impact statement and those responsible for various permits which an operator must be granted before being allowed to mine.[79] More fundamentally, the legal validity of the state executive order creating the requirement of an environmental impact assessment is far from certain.[80]

The substantive requirements of the permit procedure should be designed to effect some achievable level of reclamation. While restoration may be the maximum level of desirable reclamation, a large number of intermediate levels are possible. Nuisance or trespass law would require sufficient reclamation to prevent or end unreasonable or technical interferences with the property of others.[81] Moreover, the Michigan Environmental Protection Act (MEPA) requires all agencies, persons, and corporations to act so as not to pollute, impair, or destroy the environment.[82] These, however, do not necessarily provide the minimum standard of reclamation which must be achieved in the absence of a reclamation standard. Local zoning requirements[83] and special provisions in mineral leases[84] may set higher standards for reclamation.

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mental impact statement on each project might be sufficient to insure such a statement for all metallic mining operations.

[79] Telephone interview with Don Inman, Environmental Specialist, Office of Program Review, Mich. Dep't of Natural Resources, in Lansing, Michigan (Apr. 1, 1977). No mechanism correctly exists to insure interaction between different programs in the print review process.

[80] There appears to be no case or statutory law as to the validity of executive orders in Michigan. Compliance with Executive Order 1974-4 seems largely a function of the governor's stature and the infrequent use of the process to stop projects.

[81] The threat of such an action led in at least one instance to the partial vegetative stabilization of a copper tailings area in an area along a lake near the town of Tamarack in the Upper Peninsula. Shetron interview, *supra* note 31. *See generally* ROCKY MTN. MINERAL LAW FOUNDATION, 4 AMERICAN LAW OF MINING § 21.2 (1974); Dietrich, *Mined Land Reclamation in the Western United States*, 16 ROCKY MTN. MINERAL LAW INST. 143, 158-61 (1971).

[82] MICH. COMP. LAWS ANN. §§ 691.1201-.1207 (Supp. 1976). *See* Haynes, *supra* note 11, at 596-622. The Act establishes this standard by providing standing to sue for any Michigan citizen where another party "has, or is likely to, pollute, impair or destroy the air, water, or other natural resources." MICH. COMP. LAWS ANN. § 691.1203(1) (Supp. 1976). *See also* Ray v. Mason County Drain Comm'r, 393 Mich. 294, 224 N.W.2d 883 (1975); Michigan State Highway Comm'n v. Vanderkloot, 392 Mich. 159, 220 N.W.2d 416 (1974) (Levin, J., concurring).

[83] Marquette County, where the bulk of the state's iron mines are located, has proposed a mineral zoning ordinance which is in some ways more exacting than the Michigan Mine Reclamation Act. It would require the operator, as a precondition to receiving a permit, to furnish, among other things, a description of topsoil removal and replacement for mining. Marquette County, Proposed Mineral Reservation District, Fifth Draft (June 1976). *See generally* Crawford, *Zoning Law and Extractive Industry—The Michigan Experience*, 51 N.D.L. REV. 341 (1974).

[84] Mineral leases with special reclamation clauses substitute for reclamation statutes in some states. The Arizona mineral lease form requires all lessees to submit plans outlining "the measures to be taken reasonably to protect the environment from adverse effects

Nevertheless, mineral leases will apply only to state lands, and zoning ordinances differ by county. Thus, in the absence of a reclamation law, nuisance or trespass law and the MEPA provide some limited guidance for minimum levels for reclamation in Michigan.[85] A reclamation law should refine this minimum requirement so that disturbed land would be rehabilitated—a more practical goal for metallic mining than restoration.[86]

Comprehensive environmental management thus involves elements of three different legal mechanisms. First, although selection of the ore processing site must recognize that the location of the ore body is fixed, choices as to the location of ore processing and auxiliary facilities are possible.[87] Alternative sites should be examined in an environmental impact statement, and the choice of sites should be made on the basis of specified criteria in order to minimize environmental impact.[88] The second process, mitigation

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probable" under the proposed action which, when approved, becomes part of the lease. Arizona State Land Dep't, Mineral Lease (1976). Mineral leases are used most often where an operator seeks to use federal or state land for his mining operation. The government can also use leases to affect the location of an operation by refusing to lease ecologically sensitive land. In addition, the use of leases can obviate the necessity of a statutory permit requirement if closing the lease agreement is conditional on a showing by the operator that the land can be reclaimed.

Michigan's Reclamation Act and rules would implicitly apply to a proposed revision of the standard state "all-minerals" lease, which actually is only an exploration lease for minerals on state lands. Stricter requirements may be integrated into the "all-minerals" lease and the standard state iron and copper mining leases. Tucker interview, *supra* note 75.

[85] The unreasonable interference standard of nuisance law differs conceptually from the substantive standard of the MEPA. The issue in nuisance actions is unreasonable interference with another's right to use and enjoy his property, while MEPA is designed to prevent the pollution, impairment, or destruction of the environment. Nuisance suits and MEPA actions will depend upon the particular facts involved, but the standards under each would appear to be divergent. In either case, a reclamation statute would define performance standards with greater particularity.

[86] Rehabilitation is the achievement of a land condition compatible with surrounding areas which allows future uses similar to or more productive than prior potential uses. Rehabilitation thus differs from restoration, which requires that the same usefulness and contours of the disturbed land be returned. Both terms differ from vegetative stabilization, the kind of reclamation which is done by the metallic operators in Michigan. *See* note 38 *supra*. Vegetative stabilization refers only to the creation of a vegetative cover to prevent wind and water erosion and other ecological damage. Shetron interview, *supra* note 31. Rehabilitation may not involve vegetation at all. For example, the desired future use of the land might involve a light industrial facility. *See generally* REHABILITATION POTENTIAL OF WESTERN COAL LANDS, *supra* note 52, at 10-11.

[87] *See, e.g.*, Reserve EIS, *supra* note 68. South Dakota's Reclamation Act provides for the promulgation of rules "for the proper placement of tailings, spoil piles, and other debris from surface mines and to provide for the incorporation of such materials into the landscape so as to create the least amount of eyesores and unproductive areas from the placement of these materials." S.D. COMPILED LAWS ANN. § 45-6A-17.1 (Supp. 1976). The proposed federal strip mining act provides for the promulgation of "standards and criteria regulating the design, location, construction, operation, maintenance, enlargement, modification, removal and abandonment of new and existing coal waste piles." H.R. 2, 95th Cong., 1st Sess. § 515(e) (1977); S. 7, 95th Cong., 1st Sess. 415(e) (1977).

[88] Brief of Minnesota Pollution Control Agency, In the Matter of Reserve Mining Co., On-Land Disposal Plan, at 18-93 (D. Minn. Apr. 8, 1976). Considerations in site selection include dam safety, air and water quality, hydrology, geology, industrial economics, energy, and land use. *See also* Note, *The Least Adverse Alternative Approach to Substantive Review Under NEPA*, 88 HARV. L. REV. 735 (1975).

choices at the designated site, is related to the first in that the ability to carry out such choices may influence the selection of sites. These kinds of choices involve, for example, technology and design options such as the decision to build a higher tailings dike in order to disturb less land.[89] Again, the administrative agency should be required to ensure that these choices are made according to specific criteria in order to minimize the environmental impact of mining and processing. The final process involves the creation of performance standards for air, water, and land quality. The first two elements will not be treated in detail here.[90] Performance standards for reclamation should insure rehabilitation, and the control of other environmental effects of mining operations.

The environmental impact statement requirement, coupled with a strong rehabilitation act supported by the MEPA, offers the most fruitful combination of legal mechanisms to achieve comprehensive environmental management. The result would be the least possible environmental impact with the greatest degree of reclamation. Notwithstanding the weaknesses in the Michigan environmental impact statement requirement,[91] the most basic flaws in the present design may be found in the Mine Reclamation Act.

III. THE MICHIGAN RECLAMATION ACT

Michigan's Mine Reclamation Act,[92] despite amendment in 1972,[93] remains a law of uncertain scope and limited effectiveness.

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[89] Such a possibility was considered in at least one environmental impact statement. *See* GROVELAND ENVIRONMENTAL IMPACT STATEMENT, *supra* note 28, at 42-44 (1973).

[90] The Groveland, White Pine, Empire, and other Upper Peninsula mining operations, which discharge water into nearby streams, are subject to the National Pollution Discharge Elimination System permit requirements of the 1972 Water Pollution Control Act Amendments, 33 U.S.C. § 1342 (Supp. V 1975). *See* MICH. COMP. LAWS ANN. §§ 323.1-.352 (1967 & Supp. 1976). *See generally* Keppler, *Mining and the Federal Water Pollution Control Act Amendments of 1972*, 20 ROCKY MTN. MINERAL LAW INST. 501 (1975); Note, *Michigan Water Resources Commission Amendments: A Response to the Federal Water Pollution Control Amendments of 1976*, 7 U. MICH. J.L. REF. 455 (1974).

Stack emissions from Cleveland-Cliffs' Pioneer Pellet Plant, which processes ore from the Mather mine, have received much attention from state authorities. There is no apparent reason the state Air Pollution Act, MICH. COMP. LAWS ANN. §§ 336.11-.36 (1975), also cannot be used against blowing dust from tailings basins, known generically as fugitive dust. The Air Pollution Act has been used to force controls of fugitive dust in several instances. Telephone Interview with Roger Conner, Executive Director, West Michigan Environmental Action Council (Apr. 2, 1977). *See also* Clean Air Act Amendments of 1970, 42 U.S.C.A. §§ 1857-1857h-7 (Supp. 1976). If the Act was used against tailings dust, vegetative stabilization of the affected area, a minimal reclamation goal, would be the likely result.

[91] *See* notes 79-80 and accompanying text *supra*.

[92] MICH. COMP. LAWS ANN. §§ 425.181-.188 (Supp. 1976). It was adopted without dissent by both houses of the Michigan legislature in 1970. MICHIGAN HOUSE JOURNAL 1806 (1970); MICHIGAN SENATE JOURNAL 1434 (1970).

[93] Mich. Pub. Act No. 123 (1972) (codified at MICH. COMP. LAWS ANN. §§ 425.181-.188 (Supp. 1976)). The amendments, which will be examined *infra*, were also adopted without

The original Act was greatly influenced by the state's iron mining industry.[94] The official responsible for administering the Act has suggested that it may be so weak as to be "completely meaningless."[95] In partial contrast, the state's metallic mining operators characterize the Act as irrelevant because, in their view, they are or would be taking the actions required by the Act in any case.[96]

Since enforcement of the Act depends upon promulgation of administrative regulations,[97] which finally became effective in November 1976,[98] it is still too early to examine the actual administration of the law. It seems clear, however, that administration of the Act will be influenced by several factors. The legislature has been slow to appropriate money for personnel under the Act and cautious with respect to the sums allocated.[99] Should this attitude

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dissent in either house of the legislature. MICHIGAN HOUSE JOURNAL 1459 (1971); MICHIGAN SENATE JOURNAL 824 (1972).

[94] One industry spokesman has said:

> I would not be completely accomplishing my mission here today if I failed to tell the Committee that the iron mining industry came forward in Michigan and Minnesota with suggestions for legislation covering mined land reclamation and worked with interested state agencies and with the legislators in having such legislation enacted.

Hearings on H.R. 60 and Other Bills Relating to the Regulation of Strip Mining Before the Subcomm. on Mines and Mining of the House Comm. on Interior and Insular Affairs, 92d Cong., 1st Sess., pt. 1, 669 (1971) (statement of Ralph Magnuson, Director of Environmental Affairs, Cleveland-Cliffs Iron Co.). *See also Hearings on S. 77 and Other Pending Surface Mining Legislation Before the Subcomm. on Minerals, Materials and Fuels of the Senate Comm. on Interior and Insular Affairs*, 92d Cong., 1st Sess., pt. 1, 296-97 (1971). As originally adopted in 1969, Minnesota's Reclamation Act, MINN. STAT. ANN. §§ 93.44-.51 (West Supp. 1976), was, word for word, almost identical to the Michigan law adopted in 1970. *Compare* 1969 MINNESOTA LAWS ch. 774, *with* MICH. COMP. LAWS ANN. §§ 425.181-.188 (Supp. 1976) (excepting 1972 amendments). The Minnesota Act was strengthened in 1973 by amendments which, *inter alia*, required operators to obtain a permit before mining and attached certain conditions to receiving the permit. MINN. STAT. ANN. § 93.481(1) & (2) (West Supp. 1976). The Minnesota and Michigan Acts still contain many identical provisions. *Compare, e.g.*, MICH. COMP. LAWS ANN. §§ 425.185 & .186 (Supp. 1976), *with* MINN. STAT. ANN. §§ 93.47(4) & (5) (West Supp. 1976).

[95] R. Thomas Segall (Geologist-in-Charge, Michigan Mine Reclamation), interoffice communication to Arthur E. Slaughter (Chief, Geological Survey Division) (Nov. 17, 1975).

[96] Suffron interview, *supra* note 26; personal interview with George Kotonias, General Superintendent, Groveland Mine, Hanna Mining Co., at the Groveland mine (Aug. 16, 1976) [hereinafter cited as Kotonias interview].

[97] MICH. COMP. LAWS ANN. § 425.183 (Supp. 1976).

[98] Mich. Ad. Code R. 425.01-.49 (1976). The rules were certified by the Secretary of State on Nov. 16, 1976, pursuant to the Administrative Procedures Act of 1969, MICH. COMP. LAWS ANN. §§ 24.201-.313 (Supp. 1976). An earlier attempt to promulgate rules ended with adoption of amendments to the Act in 1972. *See generally* Michigan Dep't of Natural Resources, Geological Survey Division, *Administrative Rules Report, Rules for Mine Reclamation Act (Act No. 92, P.A. 1970, as amended by Act No. 123, P.A. 1972)* (Mar. 1, 1976) [hereinafter referred to as *Admininstrative Rules Report*], and Michigan Dep't of Natural Resources, Geological Survey Division, *Special Mining Industry Task Force, Suggested Changes for Proposed Mine Reclamation Rules Submitted to the Geological Survey Division, May 17, 1976* (June 24, 1976).

[99] Funds for a staff person for mine reclamation were not approved until fiscal year 1973-74, and the position was not filled until December 1973, when Mr. Segall was hired. *Administrative Rules Report, supra* note 98, at 1. He is the only professional staff person in the Michigan state government dealing with reclamation, and he has urged additional funding for a larger staff. The legislature has been somewhat more willing to appropriate funds for reclamation research pursuant to the Act. MICH. COMP. LAWS ANN. § 425.185(c)

continue, administration of the Act could be hamstrung by inadequate staffing and funding.[100] Moreover, some of the administrative rules may extend beyond the scope of the Reclamation Act, making them vulnerable to legal challenge.[101] This possibility, in turn, may lead to more cautious enforcement. The various economic and political pressures applied against the agency will also affect the vigor of enforcement.[102] Nonetheless, the single most important influence on reclamation under the Act will probably be the scope and strength of the Act itself.

A. Purpose

Even if administrative weaknesses do not materialize, it is far from clear that the Act will be able to achieve the goals which it purports to advance, or that those are the most desirable goals that could be achieved. The purpose of the Act, as set forth in the preamble, is to provide for reclamation of mined lands, to encourage future land use planning and orderly mining development, and to recognize the beneficial aspects of mining.[103] Rules are to be promulgated based upon a study which balances the environmental effects of mining against the effect of regulation on mineral development and mining employment.[104] While the economic effect

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(Supp. 1976). About $35,000 has been appropriated annually since 1970. Personal interview with R. Thomas Segall, in Lansing, Michigan (Jan. 19, 1976).

[100] Mr. Segall, who drafted the administrative rules, is currently responsible for administering an Act which covers forty-five open-pit mines across the state.

[101] *See* text accompanying notes 227-30 *infra*.

[102] This point has been extensively documented and debated in the dispute over state regulation of surface mining for coal. For a critique of enforcement of strip mining laws in Kentucky, West Virginia, and Pennsylvania, *see* ENFORCEMENT OF STRIP MINING LAWS, *supra* note 51. *See also* J. DOYLE, JR., *supra* note 14, at 2: "Although 38 states have enacted strip mining laws, there are very serious questions as to whether any of these laws is adequate or effective in the regulation of the surface coal mining industry." *But see* Reed, *Healing the Wounded Earth*, SPORTS ILLUSTRATED, Sept. 20, 1976, at 64.

[103] Preamble, MICH. COMP. LAWS ANN. §§ 425.181-.188 (Supp. 1976). Many state mine reclamation laws contain similar declarations of the economic importance of mining and the necessity of controlling land disturbance resulting from mining. *See, e.g.*, UTAH CODE ANN. § 40-8-2 (Supp. 1975); TEX. REV. CIVIL STAT. ANN. art. 5920-10, § 2 (Vernon Supp. 1976). Others make declarations only as to the importance of providing for land reclamation. *See, e.g.*, IDAHO CODE, § 47-1501 (Cum. Supp. 1976); WIS. STAT. ANN. § 144.80(2) (West 1974). It may be argued that the importance of this distinction is minimal since regulation presupposes the desirability of the activity which is regulated. But in Harren v. Zoning Bd. of Appeals of Kendall County, 4 Ill. App. 3d 342, 280 N.E.2d 463 (1972), where denial of a special use permit prevented a limestone excavation on land zoned for agricultural purposes, the court held that the state's Surface Mine Reclamation Act, which declares a public policy in favor of reclamation and assured productivity of land after mining has taken place, does not state that mining uses are to be encouraged. *But see* 30 U.S.C. 21(a) (Supp. 1976) (declaring mining to be in the national interest); MICH. COMP. LAWS ANN. § 323.251 (1975) (declaring the economic importance of iron ore mining to the state).

[104] MICH. COMP. LAWS ANN. § 425.182 (Supp. 1976):

> The supervisor shall conduct a comprehensive study and survey in order to determine, consistent with the intent of this act, the extent and type of regulation of

of regulation on metallic mining is probably minimal,[105] the explicit balancing requirement sets out a note of caution not found in other Michigan environmental protection laws.[106]

This rather cautious approach is manifest in the limited environmental goals of the Act. The Act is basically concerned with the prevention and control of erosion from, and vegetation or other treatment of, rock stockpiles or tailings basins which are permanently inactive.[107] This operational definition of reclamation as vegetative stabilization[108] fails to consider the desirablility of conditioning land to such valuable future uses as recreation or economic development.[109] Nothing in the Act, of course, prohibits operators from rehabilitating land disturbed by mining. Metallic mine operators argue that present efforts at vegetative stabilization are directed at the creation of wildlife habitats or at achieving recreational benefits,[110] but these are not necessarily the most

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mining areas necessary in the public interest. The supervisor shall consider the effects of mining upon: (a) environment, (b) future use of the land upon completion of mining, and (c) wise use and protection of the natural resources, including but not limited to, the control of erosion, the prevention of land or rock slides and air and water pollution. The supervisor also shall consider (a) future and economic effect of such regulations upon mine operators and landowners, the surrounding communities and this state, (b) effect on employment in this state, (c) effect on the future mining and development of metallic minerals, and (d) practical problems of mine operators and mineral owners.

[105] *See* note 46 *supra*.

[106] *See* MICH. COMP. LAWS ANN. §§ 691.1201-.1207 (Supp. 1976) (Michigan Enviromental Protection Act); MICH. COMP. LAWS ANN. §§ 281.951-.959 (Supp. 1976) (Inland Lakes and Streams Act of 1976).

[107] MICH. COMP. LAWS ANN. § 425.183 (Supp. 1976).

[108] *See* note 86 *supra*. No formal definition of reclamation is set forth in the Act. The rules offer this definition: "reconditioning or rehabilitation of the mining area or portions thereof *for useful purposes* and the protection of natural resources, including the control of erosion and the prevention of land or rock slides and air and water pollution." Mich. Ad. Code R. 425.2(5) (1976) (emphasis supplied). The regulations give little reason to believe that such "useful purposes" will be achieved. The reference to future land use planning in the preamble gives some support to the position that the Act is not limited to vegetative stabilization. This view, however, is not embodied in the administrative rules.

[109] *See* definition of rehabilitation in note 86 *supra*. The utilization of vegetative stabilization will, in all likelihood, severely restrict the range and quality of available land use options. Many reclamation statutes are aimed at conditioning land for future valuable uses. *See, e.g.*, CAL. PUB. RES. CODE § 2733 (West Supp. 1976) ("usable condition which is readily adoptable for alternative land uses"); ILL. ANN. STAT. ch. 93, § 202 (Smith-Hurd Supp. 1976) ("optimum future productive use"); N.D. CENT. CODE § 38-14-01 (Supp. 1975) (restore agricultural lands "to the level of inherent productivity equal to or greater than that which existed prior to mining"); TEX. REV. CIVIL STAT. ANN., art. 5920-10, § 4(8) (Vernon Supp. 1976) ("original or other substantially beneficial condition"); W. VA. CODE ANN. § 20-6-10 (1973) ("desirable purpose and use"). Other situations seem to express more modest goals. *See, e.g.*, KY. REV. STAT. ANN. § 350.020 (Baldwin Cum. Supp. 1976) (minimize or prevent injurious effects of coal strip mining on the people and resources of the state); MO. ANN. STAT. § 444.500 (Vernon Supp. 1976) (same).

[110] The most highly publicized of the wildlife habitat efforts is at the White Pine copper mine in Ontonagon County. There are two large tailings basings at the site. The clay used to construct the dike for a third basin, which was never used, was scooped up from shallow holes or borrow pits inside the basin area. These pits, many of which contain shallow ponds, are being covered with aquatic vegetation and grasses to create a wetland habitat for water

desirable future uses of disturbed lands.[111] Neither is it clear, in the absence of an explicit goal of rehabilitation, whether or to what extent the proposed uses will be achieved. A policy of rehabilitation could be implemented through a procedure requiring examination of alternative, future, valuable uses for disturbed land by the administering agency and rehabilitation by the operator to the designated end use or uses.[112]

B. Scope

Beyond its narrow reclamation goals, the scope of the Mine Reclamation Act is limited in other ways. The Act fails to regulate underground operations involving the extensive use of land for on site ore processing.[113] Underground copper mines with on site ore processing[114] are thus exempted from the Act.

The Act covers those lands from which material is removed or on which material is deposited; lands on which treatment plants, water reservoirs, and auxiliary facilities are located; "and auxiliary

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fowl, particularly Canadian geese. Suffron interview, *supra* note 26; Bingham & Suffron, Tailings Area Reclamation at White Pine Copper Company (Sept. 2, 1976) (paper presented at a meeting of the Society of Mining Engineers of the American Institute of Mining Engineers); Bingham and Suffron, *Half a Dozen Goslings,* MICHIGAN NATURAL RESOURCES, Nov./Dec. 1974, at 22. Although these lands have obviously been disturbed by the mining operation, it is important to note that the wildlife effort is concentrated on lands which have not been covered with tailings. The largest and most difficult reclamation problem at White Pine is receiving little attention. *See* note 38 *supra*. Wildlife benefits from vegetative stabilization have been noted by other metallic mine operators. Kotonias interview, *supra* note 96; Boyum interview, *supra* note 37.

Recreation has been viewed as another possible future land use. As part of the land exchange agreement between the DNR and the Hanna Mining Co. in 1972, the DNR obtained for ten dollars an option to purchase land disturbed by the Groveland mine upon completion of the mining and the stabilization or restoration of the land. The land is to be used for recreation. 44 Liber 652 (Nov. 17, 1975) (Record of Registrar of Deeds of Dickinson County, Michigan). The option can be exercised after the year 2002. 44 Liber at 655. Still, it is not known when and to what extent these lands would be suitable for the general recreational purposes that the DNR envisions. Tucker interview, *supra* note 75.

[111] One consulting firm has suggested that land in and around abandoned open pit mines in northern Minnesota might be used for housing, commercial and industrial development, or tourist and recreation sites. *See* Architectural Resources, Inc., Minnesota Mineland Reclamation (1975).

[112] *See* notes 176-77 and accompanying text *infra*.

[113] MICH. COMP. LAWS ANN. § 425.181(b) & (i) (Supp. 1976).

[114] The White Pines copper mine, which has more than 3,000 acres of tailings basins, is the most obvious example. Any new copper mine operation would probably also be underground and thus also exempt. Two underground iron mines are also excluded. These are the Sherwood, which involves no on site ore processing, and the Mather, whose ore is processed at the Pioneer Pellet Plant in Marquette County. Michigan is not the only state to exclude underground metallic mines. *See, e.g.,* WASH. REV. CODE ANN. § 78.44.030(1) (Supp. 1976). Washington's three underground mines with on site ore processing facilities are not included under the Act. Letter from Donald M. Ford, Washington Department of Natural Resources, to the author (Oct. 4, 1976). *But see* CAL. PUB. RES. CODE § 2735 (West Supp. 1976); IDAHO CODE § 47-1503(5) (Cum. Supp. 1976); ch. 477, 1976 N.Y. LAWS 977, § 23-2705(8) (McKinney); TEX. REV. CIVIL STAT. ANN. art. 5920-10, § 4(2) (Vernon Supp. 1976); UTAH CODE ANN. § 40-8-4(6) (Supp. 1975); W. VA. CODE ANN. § 20-6-2(k) (1973).

lands."[115] The 1970 Act was applicable only to open pit metallic mining.[116] As amended in 1972, the Act covers reclamation where there is surface mining of coal, gypsum, stone, metallic ore or other material, and excludes surface mining of clay, gravel, marl, peat, or sand.[117] Most reclamation laws, even in the primary coal producing states, cover a variety of minerals.[118] Because of the varied types of mining involved, the performance standards established in reclamation statutes are often rather general.[119] The unique characteristics of metallic mining and the subsequent difficulties associated with the reclamation of land metallic mining disturbs indicate that it should be treated in a separate statute.[120]

The most ambiguous, and perhaps most important, aspect of the scope of the Michigan Mine Reclamation Act is its application to existing mines.[121] Many reclamation laws, especially those enacted in the past several years, explicitly state whether they affect existing mining operations, expansions of those mines, or operations

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[115] MICH. COMP. LAWS ANN. § 425.181(b) (Supp. 1976).

[116] P.A. 92, § 1(b) (1970).

[117] MICH. COMP. LAWS ANN. § 425.181(h) (Supp. 1976). Sand and gravel mining operations, excepted from the Act, involved 33,200 of the 99,500 acres of land disturbed by the Michigan mining industry between 1930 and 1971. LAND UTILIZATION AND RECLAMATION IN THE MINING INDUSTRY, 1930-1971, *supra* note 15, at 20.

[118] *See, e.g.*, COLO. REV. STAT. ANN. § 34-32-103(5) (1973); IDAHO CODE § 47-1503(4) (Supp. 1975); MONT. REV. CODES ANN. § 50-1203(7) (Cum. Supp. 1975); PA. STAT. ANN., tit. 52, § 1396.3 (Purdon Supp. 1975); TENN. CODE ANN. § 58-1541(b) (Supp. 1976); UTAH CODE ANN. § 40-8-4(3) (Supp. 1975); W. VA. CODE ANN. § 20-6-2(e) (1973).

[119] Plater, *supra* note 18, at 503-04.

[120] *See* notes 23-25, 37-39 and accompanying texts *supra*. Recognizing that different performance standards will be required for varying types of mining operations, some states have different reclamation laws for different categories of minerals. *Compare, e.g.*, MO. ANN. STAT. §§ 444.500-.755 (Vernon Supp. 1976) (barite and coal), *with* MO. ANN. STAT. §§ 444.760-.786 (Vernon Supp. 1976) (clay, limestone, sand, and gravel); MONT. REV. CODES ANN. §§ 50-1034 to -1057 (Supp. 1975) (coal and uranium) *and* MONT. REV. CODES ANN. §§ 50-1501 to -1517 (Supp. 1975) (bentonite, clay, scoria, phosphate rock, sand, or gravel), *with* MONT. REV. CODES ANN. §§ 50-1201 to -1226 (Supp. 1975) ("any ore, rock or substone, other than oil, gas, bentonite, clay, coal, sand, gravel, phosphate rock or uranium"); OHIO REV. CODE ANN. §§ 1513.01 to .99 (Page 1964 and Supp. 1975) (coal), *with* OHIO REV. CODE ANN. §§ 1514.01 to .99 (Page Supp. 1975) (other minerals). Michigan already treats reclamation from sand dune mining along Lake Michigan in a separate statute. Pub. Act. No. 222, 1976 Mich. Legis. Serv. 531 (West).

[121] The Act does not apply to previously existing or abandoned mines. MICH. COMP. LAWS ANN. §§ 425.181(b), .185 (Supp. 1976). Abandoned iron and copper mines cause subsidence and other problems including wind erosion at inactive copper tailings areas. The scope of these problems is not well known. Shetron interview, *supra* note 31. About 500 of the 1280 acres at the Mather underground mine site have "the potential to subside or otherwise be unstable for an indeterminable period of time." CLIFFS ENVIRONMENTAL STATEMENT, *supra* note 71, at 27. *See* MICH. COMP. LAWS ANN. 425.108 (1967); [1955-56] MICH. OP. ATT'Y GEN., No. 2271.

A number of states provide for reclamation of abandoned lands disturbed by mining or subsidence from mining. *See, e.g.*, ILL. ANN. STAT. ch. 93, §§ 251 to 260 (Smith-Hurd Supp. 1976); MD. NAT. RES. CODE ANN. §§ 7-514.1 to .4 (Cum. Supp. 1976); OHIO REV. CODE ANN. § 1513.20, .21 (Page 1964 & Supp. 1975); PA. STAT. ANN. tit. 52, §§ 1406.1-.19 (Purdon Supp. 1975); VA. CODE ANN. § 45.1-216 to -220 (1974). *See generally* Comment, *Subsidence Regulation*, 6 LAND & WATER L. REV. 543 (1971).

initiated after their enactment date.[122] The Michigan Act refers to existing mines in two separate sections. Section 1(b) defines "mining area" as land from which material is "hereafter" removed, located, or deposited.[123] The apparent implication is that only metallic operations initiated after 1970, when the law was enacted, are to be regulated by the Act. Since the same lands are often used for many consecutive years, however, the definition could also refer to lands which were used continuously through the enactment date.

According to Section 3 of the reclamation law, rules promulgated pursuant to it pertain only to "mining operations conducted subsequent to their effective date."[124] The rules, as previously noted, were promulgated in the fall of 1976. If "conducted" means "initiated," all existing mining operations are excluded from the Act. A broader and somewhat more appropriate interpretation would include operations existing at the time the rules were promulgated. The plain meaning of the language[125] does not clearly support either conclusion, and resort to legislative intent[126] seems equally unavailing. The Michigan constitution, however, declares the protection of the state's natural resources to be of "paramount public concern."[127] Given the broad public interest in natural resources legislation,[128] Section 3 should be interpreted to include all new mines and those continuing after the promulgation date of the rules.

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[122] *E.g.*, CAL. PUB. RES. CODE § 2776 (West Supp. 1976); MINN. STAT. ANN. § 93.481(1) (Supp. 1976); UTAH CODE ANN. § 40-8-23 (Supp. 1975); WIS. STAT. ANN. § 144.92 (West 1974).

[123] MICH. COMP. LAWS ANN. § 425.181(b) (Supp. 1976):

> 'Mining area' or 'area subjected to mining' means an area of land from which material is *hereafter* removed in connection with the production or extraction of minerals by open pit mining methods, the lands on which material from such mining is *hereafter* deposited, the lands on which beneficiating or treatment plants and auxiliary facilities are *hereafter* located, the lands on which the water reservoirs used in the mining process are *hereafter* located, and auxiliary lands which are *hereafter* used (emphasis supplied).

[124] MICH. COMP. LAWS ANN. § 425.183 (Supp. 1976).

[125] Determining the plain meaning is an elementary rule of statutory construction. *See* City of Lansing v. Township of Lansing, 356 Mich. 641 (97 N.W.2d 804 (1959); McCann v. Terhune, 12 Mich. App. 364, 162 N.W.2d 906 (1968).

[126] *See* Oakland County v. State Land Office Bd., 296 Mich. 368, 296 N.W. 292 (1949); Commissioner of Ins. v. Nat'l Life Ins. Co., 280 Mich. 344, 273 N.W. 592 (1937).

[127] MICH. CONST. art. 4, § 52. The court in Michigan State Highway Comm'n v. Vanderkloot, 392 Mich. 159, 200 N.W.2d 416 (1974) held that Art. 4, § 52 is to be read in para materia with other statutes and that MEPA's substantive goals are incorporated into all other statutes.

[128] Such statutes are to be construed liberally. 3 C. SANDS, STATUTES AND STATUTORY CONSTRUCTION § 71.14 (4th ed. 1974). *See* Friends of Mammoth v. Board of Supervisors of Mono County, 8 Cal. 3d 247, 502 P.2d 1049, 104 Cal. Rptr. 761 (1972). *Accord,* Insurance Commissioner v. American Life Ins. Co., 290 Mich. 33, 289 N.W. 368 (1939).

A somewhat more difficult question involves reconciling the 1970 referent date in Section 1(b) with the 1976 referent date implied in Section 3. The former defines the mining area to be affected by the law, while the latter defines the time scope of promulgated regulations. The implication of the definition should probably yield to the more explicit time scope of the regulations. This analysis would not exclude any open pit metallic mines from the Act because none have closed since 1970. It does, however, raise a question concerning the absence of a definition of "mining operation."[129] If mining operation refers to the whole system of excavation and processing of minerals for business purposes from a particular site, certain land areas associated with various mining operations which have become inactive between 1970 and 1976 would also be included under the law.[130] While a liberal interpretation would put to rest most of the ambiguity regarding the scope of the Reclamation Act, the Act remains limited in two distinct ways. It applies only to open pit operations, and its reclamation goal is vegetative stabilization.

C. Regulatory Authority

The Act vests administrative authority for reclamation with the chief of the Geological Survey Division of the Department of Natural Resources, who is designated as the supervisor[131] with authority to promulgate rules for administration of the Act.[132] In addition, he may consult with other divisions within the Department, inspect mining areas upon "reasonable prior notice to the operator," and conduct research or enter contracts to further the purposes of the law.[133]

The regulatory structure for reclamation varies greatly among the states.[134] A more appropriate model for reclamation in Michi-

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[129] MICH. COMP. LAWS ANN. § 425.183 (Supp. 1976). It is not clear that the phrases, "mining area" and "area subject to mining," as defined in MICH. COMP. LAWS ANN. § 425.181(b) (Supp. 1976), are equivalent to the phrase, "mining operation."

[130] These include, for example, the west tailings basin at the Empire mine (700 acres), parts of the east and west basins at the Humboldt Mine, and North Basin No. 1 at the White Pine Mine (1850 acres).

[131] MICH. COMP. LAWS ANN. §§ 425.181(f), 425.185 (Supp. 1976). The Act is actually administered by a staff member of the division, R. Thomas Segall.

[132] MICH. COMP. LAWS ANN. § 425.183 (Supp. 1976).

[133] MICH. COMP. LAWS ANN. § 425.185 (Supp. 1976). The State Administrative Procedure Act adds nothing to that regulatory authority. *See* notes 143-47 and accompanying text *infra*.

[134] In Idaho, the state Board of Land Commissioners serves a policymaking role while the Department of Lands administers those policies. IDAHO CODE §§ 47-1504, 1505 (Cum. Supp. 1976). *See also* UTAH CODE ANN. §§ 40-8-4(1), (2) & -5, -6 (Supp. 1975); W. VA. CODE ANN. § 20-6-1, -6 (1973). The Texas Railroad Commission, which has regulatory authority over transportation and utilities, admininisters that state's reclamation law. TEX. REV. CIVIL STAT. ANN. art. 5920-10, §§ 4(12), 6 (Vernon Supp. 1976). In Minnesota, reclamation is assigned to the Commissioner of Natural Resources. MINN. STAT. ANN. §§ 93.46(8), 93.47 (West Supp. 1976). Kansas created a regulatory authority within the state's Corporation

gan might be found in the state's Oil and Gas Act,[135] which is designated to protect against unnecessary waste in the drilling for oil and gas and against unnecessary damage or destruction to environmental values.[136] The Oil and Gas Act provides a more precise and comprehensive regulatory scheme than the Reclamation Act.[137] The director of the Department of Natural Resources acts as the Supervisor of Wells with authority to designate assistants to carry out the Act. The Supervisor of Wells is authorized to make and enforce rules, issue orders, and generally enforce the Act subject to the approval of the Natural Resources Commission. The Commission also acts as an appeal board for operators objecting to any rule or action of the supervisor.[138]

Similar provisions for the Mine Reclamation Act would place the reclamation supervisor in a regulatory structure focusing greater attention on the Act and substantially expanding the supervisor's authority to accomplish the Act's purposes. The Oil and Gas Act, like many state reclamation laws, gives the administrative agency broad authority to make investigations and inspections, encourage research and disseminate information, hold hearings, compel witnesses to appear and testify, and make findings of fact on determinations concerning permit applications or violations of the Act.[139] These statutes generally provide that the agency must evaluate the operator's permit application and reclamation plan, and allow the agency to issue, suspend, and revoke permits.[140] The agency typi-

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Commission, KAN. STAT. ANN. (1976), while Alabama placed regulatory machinery for reclamation of noncoal lands within the Department of Industrial Relations, ALA. CODE tit. 26, §§ 166(117)(E), (119) (Cum. Supp. 1973). Some states created advisory boards or councils, with mine operators often serving as members. *See* ILL. ANN. STAT. ch. 93, § 204.1 (Smith-Hurd Supp. 1976); IOWA CODE ANN. § 83A.3-.6 (SUPP. 1976); [1976] N.Y. Laws ch. 477, § 23-2707 (McKinney); WIS. STAT. ANN. § 144.815 (West. 1974).

[135] MICH. COMP. LAWS ANN. §§ 319.1-.27 (1967 & Supp. 1976).

[136] MICH. COMP. LAWS ANN. § 319.2(1) (Supp. 1976).

[137] *See generally* Michigan Oil Co. v. Natural Resources Comm'n, 71 Mich. App. 667, ___ N.W.2d ___ (1976).

[138] MICH. COMP. LAWS ANN. § 319.3 (Supp. 1976). He is also allowed to make inspections and studies, to require the submission of maps and reports, to require that wells be operated so as to prevent waste and environmental contamination, to suspend an operation in violation of the Act, to require the filing of an adequate bond, and to provide for its release. MICH. COMP. LAWS ANN. § 319.6 (Supp. 1976).

[139] *Compare* MICH. COMP. LAWS ANN. § 319.6 (Supp. 1976), *with, e.g.*, GA. CODE ANN. § 43-1405 (1974); KAN. STAT. ANN. § 49-405 (1976); KY. REV. STAT. ANN. § 350.050 (Baldwin Supp. 1976); MO. ANN. STAT. § 444.767(4) to (7) (Vernon Supp. 1976); MONT. REV. CODES ANN. §§ 50-1037, -1038 (Supp. 1975); OHIO REV. CODE ANN. §§ 1513.02, .13 (Page 1964 & Supp. 1975); S.D. COMPILED LAWS ANN. § 45-6A-25 (Supp. 1976); W. VA. CODE ANN. § 20-6-6 (1973). Louisiana's reclamation law gives the administrative agency particularly broad investigative authority, allowing it to subpoena witnesses and take depositions in conducting investigations of any facts or matters necessary to determine whether a person has violated the Act, to aid in enforcement, or to obtain information to make recommendations to the legislature. Pub. Act. No. 141, § 909, 1976 La. Sess. Laws Serv. 291 (West).

[140] *See* notes 194-202 and accompanying text *infra*.

evaluates the plan for its consistency with the goals of the Act.[156] Compliance by an operator with an approved plan fulfills the Act's requirements.

A permit procedure is essential to full and timely compliance with reclamation requirements and the preplanning of mining operations to minimize the need for reclamation. Michigan, with one exception,[157] is the only state which has a reclamation act without a permit provision.[158] The environment plan provisions in the administrative rules arguably could be construed as creating a permit system because the Act states that an operator is one who is "engaged in or *preparing to engage*" in mining.[159] Nonetheless, the word "permit" does not appear in the Act. Importantly, the Act provides that the rules are not to interfere with any rights or authorizations granted by a governmental entity.[160] This provision implies that the grant of a zoning variance or any kind of permit may prevent the state from interfering with the operation.

Assuming that a quasi-permit system would not extend beyond the reach of the Act,[161] it would still fall far short of the more comprehensive permit procedure established by other states. Mining operations in these states are prohibited prior to the receipt of a permit, which is not issued by the regulatory authority until certain

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[156] *Id.* at 425.9(1).

[157] Compliance with Florida's Reclamation Act will reduce the operator's severance tax, but there is no permit requirement. FLA. STAT. ANN. §§ 211.30-.34 (Supp. 1976).

[158] The remaining states have permit requirements. ALA. CODE tit. 26, § 166 (129)(f)) (2) (Supp. 1975); ALA. CODE tit. 26, § 166(118) (Cum. Supp. 1973); ARK. STAT. ANN. § 52-904 (Supp. 1975); CAL. PUB. RES. CODE. § 2770 (West Supp. 1976); COLO. REV. STAT. ANN. § 34-32-110 (1974); GA. CODE ANN. § 43-1406(a) (1974); IDAHO CODE § 47-1506 (Cum. Supp. 1976); ILL. ANN. STAT. ch. 93, § 204 (Smith-Hurd Supp. 1976); IND. ANN. STAT. § 13-4-6-5(a) (Burns Supp. 1976); IND. ANN. STAT. § 14-4-2-4 (Burns Supp. 1973); IOWA CODE ANN. § 83A.7 (Supp. 1976); KAN. STAT. ANN. § 49-406(a) (1976); KY. REV. STAT. ANN. § 350.060(1) (Baldwin Cum. Supp. 1976); Pub. Act No. 141, § 905(c), 1976 La. Sess. Law Serv. 291 (West); ME. REV. STAT. ANN. tit. 10, § 2205(1) (Supp. 1976); MD. NAT. RES. CODE ANN. §§ 7-505(b), 7-5A05(a), 7-6A07(a) (Supp. 1976); Pub. Act. No. 122, § 4(1) 1976 Mich. Legis. Serv. (West); MO. ANN. STAT. §§ 444.540(1), 444.770(1) (Vernon Supp. 1976); MONT. REV. CODES ANN. §§ 50-1039(1), 50-1208(1), 50-1510(1) (Supp. 1975); N.M. STAT. ANN. § 63-34-6 (1974); 1976 N.Y. Laws ch. 477, § 23-2711 (McKinney); N.C. GEN. STAT. § 74-50 (1975); N.D. CENT. CODE § 38-14-03 (Supp. 1975); OHIO REV. CODE ANN. §§ 1513.07(A), 1514.02(A) (Page Supp. 1975); OKLA. STAT. ANN. tit. 45, § 724(a) (Supp. 1976); ORE. REV. STAT. § 517.790(1) (1975); PA. STAT. ANN. tit. 52, § 1396.4(a) (Purdon Supp. 1975); S.C. CODE ANN. § 63-714 (Supp. 1976); S.D. COMPILED LAWS ANN. § 45-6A-7 (Supp. 1976); TENN. CODE ANN. § 58-1544 (Supp. 1976); TEX. REV. CIVIL STAT. ANN. art. 5920-10, § 8(a) (Vernon Supp. 1976); UTAH CODE ANN. § 40-8-13 (Supp. 1975); VA. CODE ANN. §§ 45.1-181, 45.1-202(a) (1974); WASH. REV. CODE ANN. § 78.44.080 (Supp. 1976); W. VA. CODE ANN. § 20-6-8 (1973); WIS. STAT. ANN. § 144.85(1) (West 1974); WYO. STAT. ANN. § 35-502.23 (Cum. Supp. 1975).

[159] MICH. COMP. LAWS ANN. § 425.181(c) (Supp. 1976) (emphasis added). Therefore, an operator could perhaps be required to submit an environment plan before being allowed to mine.

[160] MICH. COMP. LAWS ANN. § 425.183 (Supp. 1976). Mining generally involves obtaining a variety of permits or licenses from various governmental agencies.

[161] *See* notes 225-28 and accompanying text *infra*.

requirements are satisfied.[162] No provision in Michigan's regulations prevents indefinite delay in the submission of a long-range environment plan by the operator. In practice, it may prove impossible to define a time limit for submission for each operation. Moreover, without a permit as an incentive to submit a plan, the number and quality of submitted plans probably will be minimal.

The permit application requirement in most state statutes is aimed at obtaining basic information about the mining operation, detailed reclamation plans, and any other potentially helpful information. Many of the permit requirements are quite detailed.[163] Reclamation plans are central to the permit application process. The operator is often required to designate post-mining land uses and to design his reclamation plan accordingly.[164] The plan typically includes a mining schedule; procedures for avoiding damage to persons, property, and wildlife; reclamation techniques; a reclamation timetable; maps; and supporting documents.[165] These plans are meant to be carried out concurrently with the mining operation and to be completed as soon as possible after the operation in an area ceases.[166] While some states permit this information to be submitted in narrative or summary form, precise scientific

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[162] *See* notes 194-95 and accompanying text *infra*.

[163] In Texas, for example, the operator is required to provide basic data about the kind and quality of the existing environment at the mine site including wildlife, water availability, and aesthetic features. Maps and descriptive information concerning the kind, location, and eventual size of the operation are also required. The operator must detail his plans to control or minimize hydrologic disturbances, erosion and siltation, dust, acid drainage, and disturbance to wildlife. The permit application form is twenty-one pages long. Railroad Comm'n of Texas, Application for Surface Mining Operation Permit (1976). *See* H.R. 9725, 94th Cong., 2d Sess. § 507.8 (1976); TEX. REV. CIVIL STAT. ANN. art. 5920-10, § 11 (b) (Vernon Supp. 1976). *See also* COLO. REV. STAT. ANN. § 34-32-110(2) & (4) (1973); KY. REV. STAT. ANN. § 350.060(2) to (7) (Baldwin Cum. Supp. 1976); WYO. STAT. ANN. § 35-502.24 (Cum. Supp. 1975).

The relationship between this information and that required in an environmental impact statement has already been noted. *See* notes 64-77 and accompanying text *supra*.

[164] *See, e.g.*, ARK. STAT. ANN. § 52-906(h) (Supp. 1975); COLO. REV. STAT. ANN. § 34-32-111(f) to (m) (1974); ILL. ANN. STAT. ch. 93, § 205(e) (14) (Smith-Hurd Supp. 1976); MO. ANN. STAT. § 444.610(8) (Vernon Supp. 1976).

[165] *See* Mich. Admin. Code R. 425.10, .11(2) (1976). *See also* MD. NAT. RES. CODE ANN. § 7-6A19(d) (Supp. 1976) (reclamation "shall be conducted to the extent feasible simultaneously with mining operations and be initiated at the earliest feasible time after completion or termination of mining on any segment of the permit area"); MONT. REV. CODES ANN. § 50-1043 (Supp. 1975) (reclamation to be completed "[a]s rapidly, completely, and effectively as the most modern technology and the most advanced state of the art will allow"); N.M. STAT. ANN. § 63-34-8 (B) (1974) ("reclamation shall be an integral part of the mining operation"). Many statutes provide that reclamation must be completed within a specified period after the end of the mining operation. *See, e.g.*, KY. REV. STAT. ANN. § 350.100(1) (Baldwin Cum. Supp. 1976); ORE. REV. STAT. § 517.820(1) (1975); W. VA. CODE ANN. § 20-6-12 (1973).

[166] *See, e.g.*, COLO. REV.. STAT. § 34-42-110(2) to (4) (1974); KY. REV. STAT. ANN. § 350.060(2) to (7) (Cum. Supp. 1976); 1976 N.Y. Sess. Laws ch. 477, § 23-2715 (McKinney); N.D. CENT. CODE § 38-14-02.1 (Supp. 1975); OKLA. STAT. ANN. tit. 45, § 724(d) (Supp. 1976); PA. STAT. ANN. tit. 52, § 1396.4(a)(2) (Purdon Supp. 1975); WIS. STAT. ANN. § 144.85(3)(b) (West 1974).

data is preferable to enable the administrator to decide whether or not the permit should be granted.[167] Some reclamation laws also obligate the operator to furnish a statement of other surface mining permits he holds or reclamation bonds which he has forfeited.[168]

The quasi-permit procedure in Michigan will probably fail to provide similar information. It seems likely, for example, that the information provided in environment plans submitted by metallic operators will be far less detailed than those in other states.[169] The supervisor may be quite selective in his choice of mines for such plans. This may result in the preparation of highly detailed environment plans, probably for the larger operations, such as metallic mines. Further, local involvement seems doubtful because the law requires only that the supervisor is not to interfere with any permits or other rights granted by local and other governmental entities.[170] The Act fails to specify whether the state can allow mining in an area against the wishes of a local government.[171] In sum, the quasi-permit procedure is highly inadequate.

E. Performance Standards

Permit procedures are designed to assure that all operators adhere to minimum statutory or regulatory requirements. Perform-

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[167] *See* J. DOYLE, JR., STATE STRIP MINING LAWS [IN] ALABAMA, COLORADO, KANSAS, OHIO, TEXAS AND VIRGINIA § 1, at 4-5, § 2, at 1-2 (Environmental Policy Center 1976). This precision necessarily must occur in administrative rules.

[168] *See, e.g.*, COLO. REV. STAT. ANN. § 34-12-110(2)(f) (1974); TEX. REV. CIVIL STAT. ANN. art. 5920-10, § 12(a)(4) (Vernon Supp. 1976); W. VA. CODE ANN. § 20-6-8(8) (1973); WYO. STAT. ANN. § 35-502.27(b)(iii) (Cum. Supp. 1975).

[169] This may be attributed not only to the rather summary nature of the requirements, but also to the absence of a genuine permit procedure. *Compare* Mich. Admin. Code R. 425.8(3), *with* Railroad Comm'n of Texas, Application for Surface Mining Operation Permit (1976). Whatever the vigor of administration of the two laws, the Texas application form clearly seems to offer the operator less opportunity to maneuver. The Michigan operator may submit an environmental plan on his own volition, Mich. Admin. Code R. 425.8(2), but that option probably will be exercised infrequently.

[170] The rules are "subject to the provisions of any rights existing pursuant to any permit, license, lease or other valid existing authorization issued by a governmental entity and subject to applicable mine safety laws or rules. . . ." MICH. COMP. LAWS ANN. § 425.183 (Supp. 1976).

[171] A number of states expressly allow local zoning regulations to require more reclamation from mine operators. *E.g.*, FLA. STAT. ANN. § 211.34 (Supp. 1975); ch. 477, § 23-2703(2) 1976 N.Y. Laws 977 (McKinney); ORE. REV. STAT. § 517.780(1) & (2) (1975); S.C. CODE ANN. § 63-728 (Cum. Supp. 1975); VA. CODE ANN. § 45.1-197 (1974). At least one state expressly preempts local regulation of coal surface mining, ALA. CODE tit. 26, § 166(129y) (Supp. 1975), but requires an applicant for a permit to show that the affected land is or will be properly zoned. ALA. CODE tit. 26, § 166(129h)(12) (Supp. 1975). Others involve local governments in the regulatory process, an approach which, coupled with specific approval to tougher local requirements, does not seem unreasonable. *See* ILL. ANN. STAT. ch. 93, § 205(f) (Smith-Hurd Supp. 1976). *See generally* U.S. GEOLOGICAL SURVEY, DEP'T OF THE INTERIOR, GEOLOGICAL SURVEY CIRCULAR NO. 731, A GUIDE TO STATE PROGRAMS FOR THE RECLAMATION OF SURFACE MINED AREAS 25 (1976).

ance standards are the linchpin for the agency decision-making on permit applications and also serve as a means of evaluating compliance with the Act. The performance standards established by the Michigan Act are intended to prevent and control erosion from stockpiles and tailings basins, vegetate inactive tailings basins and stockpiles, stabilize banks along open pits, and clean up debris from the mining area.[172] The regulations closely follow this four-part standard.

The precision of the performance standards in any reclamation law depends, in large part, upon the different minerals affected by the Act. There are at least two possible methods of achieving precise performance standards. The comprehensive environmental management procedure used for coal mining in England and West Germany establishes individual sets of performance requirements for each mining operation.[173] The procedure, however, relies on a legal and administrative environment which, for the most part, does not exist in this country. The alternative is to establish reasonably precise standards for a particular kind of mining which can be tailored within the intelligent discretion of the administrator to apply to individual sites.[174] Metallic mining operations in Michigan are sufficiently uniform to be controlled by a series of more precise performance standards.[175]

Additional standards for metallic mining should be adopted to achieve rehabilitation of disturbed land. The new standards would

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[172] MICH. COMP. LAWS ANN. § 425.183 (Supp. 1976):

> [T]he supervisor may promulgate rules . . . for the following purposes:
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> (a) The sloping, terracing or other practical treatment of stockpiles and tailings basins where erosion is occurring or is likely to occur which results in or may result in injury or damage to fish and wildlife, the pollution of public waters, or which is causing or might cause injury to the property or person of others.
>
> (b) The vegetation or other practical treatment of tailings basins and stockpiles upon becoming permanently inactive where substantial natural vegetation is not expected within 5 years and where research reveals that vegetation can reasonably be accomplished within practical limitations.
>
> (c) The stabilization of the surface overburden banks of open pits in rock and the entire bank of open pits in unconsolidated materials upon their abandonment.
>
> (d) The cleanup of plantsite and mining areas and the removal of debris therefrom on termination of the mining operation.

The administrative rules transform these guidelines into performance standards. Mich. Admin. Code R. 425.9 (1976).

[173] *See generally* Plater, *supra* note 18. The administrative procedure is nonadversary, partly because the government in each country owns the minerals or mineral rights. The cultural differences between the civil services and the divergent values attached to land also account for part of the difference. *Id.*, at 480, 487, 499-501.

[174] The Minnesota and Wisconsin Reclamation Acts are oriented specifically to metallic mining. MINN. STAT. ANN. § 93.46(2) (Supp. 1976); WIS. STAT. ANN. § 144.81(4) (West 1974).

[175] Despite technical differences in reclamation needs, the basic techniques and knowledge can be carried over from the disturbed land at one mine site to another. Shetron interview, *supra* note 31. *See generally* notes 23-25 and accompanying text *supra*.

assume that as part of the permit application process the operator would select a postmining land condition which his reclamation effort would achieve.[176] The standards would also assume that the mining operation be designed to minimize environmental damage and the need for reclamation to the greatest possible extent.[177] A number of these types of standards should be required.

If the selected land condition involves a vegetative cover, the operator should be required to manage the area over a period of years bringing it into conformity with native vegetation, where desirable, and maintaining a proper soil nutrient balance until substantially certain that the vegetation would be permanent.[178]

Vegetation of a disturbed area should be initiated for the complete area as soon as possible after the disturbed area becomes permanently inactive, and should be completed as soon as technically feasible.[179] Topsoil should be used as a tailings basin cover when it would enhance the speed, quality, and permanence of the vegetation to be achieved.[180] Moreover, waste rock and overbur-

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[176] *See* note 164 and accompanying text *supra*.

[177] *See, e.g.*, KAN. STAT. ANN. § 49-412 (1976). *See also* R. Hutnik, Revegetation—An Important Part of Reclaiming Mined Land (paper presented at the Annual Meeting of the American Academy for the Advancement of Science, Jan. 30, 1977).

[178] *See, e.g.*, COLO. REV. STAT. ANN. § 34-32-111(1)(II), (g), (j), (l) (1973); IDAHO CODE § 47-1510 (Supp. 1976); IOWA CODE ANN. § 83A.31(2) (Supp. 1976); TEX. REV. CIVIL STAT. ANN. art. 5920-10, § 11(b)(17); WYO. STAT. ANN. § 35-502.32(b)(vii), (viii) (Cum. Supp. 1975). The focus of the present Act is the present vegetative stabilization of the area, while the proposed standard would place the focus on the long term productive use of disturbed land. The bond release provisions in the administrative rules are not capable of achieving this standard. *See* notes 204-19 and accompanying text *infra*. A number of states, however, do not require planting of vegetation when the soil is toxic, deficient in nutrients, or otherwise incapable of supporting vegetation. *See, e.g.*, COLO. REV. STAT. ANN. § 34-32-111(1)(m)(II) (1974); IDAHO CODE § 47-1510(b) (Cum. Supp. 1976); KAN. STAT. ANN. § 49-411 (1976); OKLA. STAT. ANN. tit. 45, § 725(g) (Supp. 1976).

[179] *See* note 166 and accompanying text *supra*. The rules define abandonment as "termination of mining operations, or cessation of use of the mining area or any portion thereof, with intent not to resume." Mich. Admin. Code R. 425.2(1) (1976). *See* N.C. GEN. STAT. § 74-49(17) (1975), and S.C. CODE ANN. § 63-713(g) (Supp. 1976), which utilize the same "intent not to resume" standard. A less ambiguous standard would provide for notification of the operator when a parcel of land has not been used for any mining purpose for more than six months. The operator then would have thirty days to show cause why the land should not be considered abandoned. *See, e.g.*, WASH. REV. CODE ANN. § 78.44.030(3) (Supp. 1976). *See also* IDAHO CODE § 47-1511(b) (Supp. 1976); MD. NAT. RES. CODE ANN. § 7-6A26(a) (Supp. 1976). The rules make provision for temporary stabilization of an area. Mich. Admin. Code R. 425.44(2) (1976).

[180] Although topsoil segregation and replacement is a desirable and fairly common practice for coal mining, it has not been used for vegetation or tailings basins and rock stockpiles for metallic mining in Michigan. Some use of wood chips and straw mulch has been made. Shetron interview, *supra* note 31. In Minnesota, the Hanna Mining Co., which operates the Groveland mine in Michigan, segregates topsoil for use in covering overburden. Architectural Resources, Inc., Minnesota Mine Land and Reclamation 21 (1975). Topsoil can greatly improve the quality of vegetation which can be achieved. *See* note 56 and accompanying text *supra*. The plant species involved will depend upon the selected end use. The use of sewage sludge as a substitute for topsoil should be considered. *But see* IDAHO CODE § 47-1509(a)(9) (Supp. 1976); ILL. ANN. STAT. ch. 93, § 206(d) (Smith-Hurd Supp. 1976).

den piles should be limited to a reasonable height to prevent them from becoming visible over long distances.[181]

Tailings dikes, waste rockpiles, and other disturbed lands ought to be graded and contoured to facilitate proper surface run-off and to fit the designated postmining condition of the land.[182] The land immediately surrounding open pits should be treated in a manner suitable to the designated use of these pits as lakes.

These proposed standards, in addition to those already in effect, should be understood as minimum requirements which may be tailored by the administrator for a particular mine site. The administrator also needs authority to impose additional conditions or standards on the operator in order to achieve the desired postmining condition.[183]

F. Permit Approval or Denial

The present quasi-permit procedure provides that the supervisor may reject any proposed environment plan if it does not conform to the Act or rules or if the supervisor believes it is "not feasible or is otherwise undesirable" because it would not conform to the four-part standard set forth in the Act.[184] Whether the supervisor accepts or rejects the plan, he must justify his decision to the operator in a written statement.[185] The approved environment plan is called a reclamation plan with compliance by the operator fulfilling the requirements of the Act for the affected land.[186] A rejected environment plan may be revised and submitted again.[187] The reclamation plan thereafter may be modified, where necessary, to conform to the Act, changing technology, or other changed conditions.[188]

The permit approval or denial standard is incomplete and ambiguous. First, there is no requirement that the operator effectively

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[181] The present Act requires only that rockpiles must be vegetated to prevent erosion and does not restrict the height or visibility of waste rock and overburden piles. MICH. COMP. LAWS ANN. § 425.183(a), (b) (Supp. 1976). *See* note 33 and accompanying text *supra*.

[182] Only rock stockpiles, rocks along open pits, and tailings need be contoured under the present Act. Mich. Admin. Code R. 425.22, .24, .32(1) (1976). This suggestion would incorporate all lands disturbed by mining, and change the focus of land contouring to the future use of the land. *See, e.g.*, WYO. STAT. ANN. § 35-502(b)(V) (Cum. Supp. 1975).

[183] *See, e.g.*, MD. NAT. RES. CODE ANN. § 7-6A10(a) (Supp. 1976); TENN. CODE ANN. § 58-1547(a)(A)(11) (Supp. 1975); TEX. REV. CIVIL STAT. ANN. art. 5920, § 11(b)(20) (Vernon Supp. 1975). *See also* H.R. 2, 95th Cong., 1st Sess. § 515 (1977); S. 7, 95th Cong., 1st Sess. § 415 (1977).

[184] Mich. Admin. Code R. 425.9(1).

[185] *Id.* at .9(1), (3) (1976).

[186] *Id.* at .9(3).

[187] *Id.* at .9(2).

[188] *Id.* at .9(4).

demonstrate that his plan will meet the prescribed standard. The rules are not clear as to which side bears the burden of persuasion.[189] Second, it is not clear whether there are one or two standards. Apparently, the operator's environment plan must not only conform to the Act and regulations, but it must also be feasible and desirable "in the opinion of the supervisor" according to the performance standards of the Act.[190] The former seems to incorporate the latter, but reference to the supervisor's opinion makes the latter standard subjective, while the conformity standard is objective. Third, reference in the evaluation procedure to such disparate terms as "conform," "feasible," and "undesirable" assures difficulty in uniform administration.[191] Fourth, considerable uncertainty exists with regard to the applicable standard required for rejection of an environment plan by the supervisor. The supervisor can reject a plan if erosion "is likely to occur," if banks along open pits "will not be stabilized," and if vegetation "is not satisfactory."[192] The first of these standards requires probability, the second requires certainty, and the third is ambiguous. The federal strip mining bills, in contrast, require a determination that the proposed reclamation plan can actually be accomplished.[193]

Most states provide for rejection of the operator's reclamation plan if the mining operation will violate the act or administrative rules, or if the plan cannot be accomplished. In some states, rejection of a permit application can occur if at least part of the affected land has been designated as unsuitable for mining.[194] A permit might also be denied if the operation will adversely affect air, surface water, or groundwater quality; will endanger public health or safety; will adversely affect a public park, forest, or

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[189] *Compare id.* at .9(3): "If an environment plan is satisfactory, the supervisor shall approve it. . . .," *with* H.R. 2, 95th Cong., 1st Sess. § 510(a) (1977), which places the burden on the operator. Many states place the burden of demonstrating deficiencies in the operator's plan on the administrator, rather than requiring the operator to submit evidence of compliance. *See, e.g.*, KAN. STAT. ANN. § 49-407 (1976); ME. REV. STAT. ANN. tit. 10, § 2206(1) (Supp. 1976); MONT. REV. CODES ANN. 50-1042(i) (Supp. 1975); TEX. REV. CIVIL STAT. ANN. art. 5920-10, § 12(a) (Vernon Supp. 1976). Others provide for automatic issuance of the permit upon receipt of the application, fee, and bond. OKLA. STAT. ANN. tit. 45, § 724(f) (Supp. 1976).

[190] Mich. Admin. Code R. 425.9(1) (1976): "The supervisor may reject a plan or any part thereof . . . if the reclamation specified by a plan does not conform to the requirements of the act and these rules, or if, in the opinion of the supervisor, it is not feasible or is otherwise undesirable" because the performance standards will not be satisfied.

[191] This inadequacy underscores the need for the greatest possible precision in the development of performance standards as detailed by admininistrative rules.

[192] Mich. Admin. Code R. 425.9(1) (1976).

[193] The Act would require rejection of the permit application unless, among other things, the required reclamation "can be accomplished under the reclamation plan contained in the permit application." H.R. 2, 95th Cong., 1st Sess., § 510(b)(2) (1977). Approval of the permit therefore depends in part upon whether reclamation is technically possible and whether the proposed reclamation is consistent with the requirements of the reclamation law.

[194] *See* note 58 and accompanying text *supra*.

recreation area; or is only a short distance away from a highway or building.[195] This expanded scope of inquiry and administrative authority is much needed. A requirement that mining operations minimize or prevent disturbances to air and water quality would help to resolve other anticipated problems.[196] In addition, there should be a requirement for written concurrence from other state or federal agencies concerning evidence of the operator's ability to comply with an act.[197] Periodic permit renewal should be required, utilizing the same procedure as used for the initial application.[198]

Permit hearings are mandatory in a number of states.[199] The operator may be required to publish a notice that he is seeking a permit in newspapers located in the area of the proposed operation.[200] The permit determination should be in writing with all supportive findings of fact contained therein.[201] Generally, an appeals procedure is provided for an operator to challenge a permit

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[195] *See, e.g.*, ILL. ANN. STAT. ch. 93, § 205(g) (Smith-Hurd Supp. 1976); KAN. STAT. ANN. § 49-406(e) (1976); MD. NAT. RES. CODE ANN. § 7-6A09(b) (Supp. 1976); MONT. REV. CODES ANN. § 50-1214 (Supp. 1975); N.C. GEN. STAT. § 74-51 (1975); OHIO REV. CODE ANN. § 1513.07(B) (Supp. 1975); S.C. CODE ANN. § 63-715 (Supp. 1976); TEX. REV. CIVIL STAT. ANN. art. 5920-10, § 12(a) (Vernon Supp. 1975); WYO. STAT. ANN. § 35-502-20(g) (Supp. 1975).

Some states deny permits if any operator has previously forfeited a bond under the act and not corrected the conditions which led to the forfeiture or has otherwise been in violation of the act. *E.g.*, TEX. REV. CIVIL STAT. ANN. art. 5920-10, § 12(a)(4) (Vernon Supp. 1975). *See also* note 168 and accompanying text *infra*.

[196] For example, the impact of tailings pond seepage on groundwater is not known. *See* notes 31-36 and accompanying text *supra*. The operator should monitor and test for such effects, and use that knowledge to lessen adverse environmental consequences of the operation. One result of this requirement would be preplanning of mine sites to reduce adverse environmental effects.

[197] *See* J. Doyle, Jr., *supra* note 167, § 1, at 5, § 5, at 13. *See* N.D. CENT. CODE § 38-14-05(8) (Supp. 1975); VA. CODE ANN. § 45.1-205(b) (1974). This provision also may be found in the National Environmental Policy Act of 1969, which requires consultation with and response to appropriate federal, state, and local agencies in environmental impact statement preparation. 42 U.S.C, § 4332(2)(c) (1970).

[198] Permits are valid for varying periods. *See, e.g.*, ARK STAT. ANN. § 52-903(m) (Supp. 1975) (five years); ILL. ANN. STAT. ch. 93, § 205(h) (Smith-Hurd Supp. 1976) (about three years); MD. NAT. RES. CODE ANN. § 7-505(a) (1974) (until operation completed, abandoned or suspended). Although permit renewal procedures vary greatly, some statutes provide basically the same procedure as a permit application. *See, e.g.*, COLO. REV. STAT. ANN. § 34-32-110(6) (1974); MD. NAT. RES. CODE ANN. § 7-6A13(a) (Supp. 1976); N.C. GEN. STAT. § 74-52 (1975).

The administrative agency should be able to require modification of the permit or reclamation plan to prevent conflict with existing laws when significant environmental problems are occurring at the mine site or if the operator can show that an alternative post-mining land use would be at least as productive as that previously designed. MONT. REV. CODES ANN. § 50-1210 (Supp. 1975); WASH. REV. CODE ANN. § 78-44-100 (Supp. 1976); WIS. STAT. ANN. § 144.87(1), (3) (West 1974).

[199] *See, e.g.*, MD. NAT. RES. CODE ANN. § 7-5A05(c), (d) (Supp. 1976); TEX. REV. CIVIL STAT. ANN. art. 5920-10, § 16(c) (Vernon Supp. 1975). Others provide for hearings on request of the applicant, *e.g.*, IDAHO CODE § 47-1507(d) (Supp. 1976). *See generally* notes 143-47 and accompanying text *supra*.

[200] *See, e.g.*, N.D. CENT. CODE § 38-14-04.1 (Supp. 1975); TENN. CODE ANN. § 58-1544(h) (Supp. 1975); UTAH CODE ANN. § 40-8-13(4) (Supp. 1975).

[201] *See, e.g.*, OHIO REV. CODE § 1513.11 (Page Supp. 1975).

denial.[202] These provisions attempt to insure public participation in the decision-making process as well as to provide the operator with a forum to challenge an administrative decision. Not only are these provisions unavailable under the Michigan Act and regulations, but they are also unavailable under the Michigan Administrative Procedure Act.[203] A clearly defined permit approval or denial standard should be established along with an administrative appeal procedure from the agency's determination.

G. Bonds

Bonding provisions provide the mine operator with a financial incentive to comply with the reclamation requirements, and also provide a source of funds for state-conducted reclamation if an operator fails to comply with the Act and forfeits the bond. The Mine Reclamation Act provides that a bond, security, or other assurance must be posted if the supervisor "has reasonable doubts as to an operator's financial ability to comply with the rules."[204] Postponement of the bond is allowed "depending upon the life of the mining operation."[205]

The rules expand these provisions in several ways. The operator is required to demonstrate that he has the financial ability to comply with the rules in order to avoid the bonding requirement.[206] The amount of the bond is to be determined by the kind of land to be reclaimed, future suitable uses of the land, and the cost of reclamation.[207] Liability on the bond is conditioned on compliance with the Act and regulations. The operator is to notify the supervisor when reclamation work is completed, and the supervisor then decides whether to approve the work.

Many of these requirements offer little substantive guidance. Although the "financial ability" standard of the Act would appear to be directed at those operators least likely to reclaim land, there is little reason to suspect that a more profitable operator would have any more incentive to reclaim land.[208] In addition, the amount of the required bond is to be established according to an imprecise

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[202] *See* notes 143-47 and accompanying text *supra*.

[203] *Id.*

[204] MICH. COMP. LAWS ANN. § 425.187 (Supp. 1976).

[205] *Id.*

[206] Mich. Admin. Code R. 425.15(4) (1976).

[207] *Id.* at 425.15(2). The supervisor is not to approve of vegetative cover until it "has survived two seasons and there is reasonable assurance that it will sustain itself." *Id.* at 425.14(2), .14(3), .16(1).

[208] Vegetative stabilization work at the White Pine mine, which is undergoing severe financial problems, is not substantially different from that at the state's iron mines. *See* notes 38, 108 and accompanying texts *supra*.

and misleading standard. A consideration of the kind of lands to be reclaimed, reclamation costs, and future use of land provide the supervisor with no real criteria. Equally important, these considerations beg the whole point of bonding. To be effective a bond must be set at a level sufficiently high to insure that the required reclamation will be accomplished.[209] The enumerated considerations are hardly conclusive of that objective. The appropriate bonding level is that cost which a third party would incur to achieve the reclamation goal set forth in the operator's plan on that land which is presently disturbed.[210] Thus, the cost-to-a-third-party method would provide the operator with a greater incentive to complete reclamation.

While postponement of a bond for a long term mining operation may be viewed as a means of preventing unnecessary diversion of the operator's capital, it eviscerates the performance bond requirement. Metallic mines have lifetimes of at least several decades, but most of the land involved is disturbed for a much shorter time before becoming inactive.[211] Moreover, even if the posting of a bond is not delayed indefinitely, postponement reduces the operator's incentive to preplan his operation to minimize costs.[212]

The Michigan bonding procedure is less adequate than other reclamation laws in two ways. Several states condition the grant of a permit, among other things, on the filing of a performance bond by the operator.[213] The supervisor's difficulty in obtaining a bond from an operator in Michigan will mirror the problems involved in assuring the submission of an environment plan. The absence of a permit requirement will likely result in substantial delays.[214] In addition, there is no provision in the Michigan Act or regulations for bond forfeiture where there are substantial violations of the

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[209] COLO. REV. STAT. ANN. § 34-32-112 (1974); IDAHO CODE § 47-1512(a) (Supp. 1976).

[210] *See, e.g.*, IOWA CODE ANN. § 83A.23 (Supp. 1976); Pub. Act 141, 905(H), 1976 La. Sess. Law Serv. 291 (West); MD. NAT. RES. CODE § 7-5A09(c) (Supp. 1976); MONT. REV. CODES ANN. § 50-1039 (Supp. 1975); OHIO REV. CODE ANN. § 1513.08(A) (Page Supp. 1975); S.D. COMPILED LAWS ANN. § 45-6A-12 (Supp. 1976); WASH. REV. CODE ANN. § 78.44.120 (Supp. 1976); WYO. STAT. ANN. § 35-502.34 (Cum. Supp. 1975). Many states provide minimum and maximum per-acre bond levels, and may or may not provide the administrator with any guidance as to the proper bond level. *See, e.g.*, ARK. STAT. ANN. § 52-908(a) (Supp. 1975); ILL. ANN. STAT. ch. 93, § 208 (Smith-Hurd Supp. 1976); IND. ANN. STAT. § 13-4-6-5 (Burns Supp. 1976); KY. REV. STAT. ANN. § 350.060(9) (Baldwin Cum. Supp. 1976); VA. CODE ANN. § 45.1-206 (1974).

[211] Except for the open pit, plant, and auxiliary facilities, a metallic mine generally will not disturb the same land parcels through its lifetime. A tailings basin will become inactive in ten to twenty years, and parts of the basin may have a much shorter lifetime.

[212] *See* note 177 and accompanying text *supra*.

[213] *See, e.g.*, COLO. REV. STAT. ANN. § 34-32-110(5) (1974); ch. 477, § 23-2717, 1976 N.Y. Sess. Laws 977 (McKinney); WYO. STAT. ANN. § 35-502-20(g)(ix) (Cum. Supp. 1975).

[214] *See* text following note 162 *supra*.

law's performance standards.[215] In many states, bond forfeiture funds are used by the administrative agency to reclaim the land for which the bond was forfeited.[216] Whatever the use of the forfeited money, the forfeiture provision provides an additional reclamation incentive for the operators. The administrative rules for the Mine Reclamation Act provide for release from the performance bond when the supervisor is reasonably satisfied that vegetation will sustain itself.[217] The provision, however, is vague and restricted solely to vegetation, ignoring other features such as the size and shape of rock stockpiles. In a broader sense, release of the operator from the performance bond should be conditioned upon full performance of the reclamation according to the standards of the Act.[218] Properly administered, the bonding provisions and rules could provide an economic incentive for active reclamation efforts by mine operators.[219] The narrowness of the bond release criterion, however, coupled with its vagueness, leaves the matter in some doubt.

H. Enforcement and Sanctions

The Michigan Mine Reclamation Act provides that the Attorney General, at the supervisor's request, may sue an operator for a restraining order, injunction, or other appropriate remedy to prevent or preclude a violation of the terms and conditions of any rule in the circuit court of the county where the mining operation is taking place.[220] The regulations do not further discuss enforcement.

The range of available sanctions under the Act is sharply limited. Although it seems probable that the Act may be used against existing and likely violators, it is at least arguable that the Act

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[215] *See, e.g.*, ARK. REV. STAT. ANN. § 52-908(e) (Supp. 1975); IDAHO CODE § 47-1513(a) (Supp. 1975); MD. NAT. RES. CODE ANN. § 7-5A10 (Supp. 1976); PA. STAT. ANN. tit. 52, § 1396.4(h) (Purdon Supp. 1975); TEX REV. CIVIL STAT. ANN. art. 5920-10, § 22 (Vernon Supp. 1976); UTAH CODE ANN. § 40-8-14(6) (Supp. 1975).

[216] *See, e.g.*, KAN. STAT. ANN. § 49-417 (1976); KY. REV. STAT. ANN. § 350.150 (Baldwin Cum. Supp. 1976); MONT. REV. CODES ANN. § 50-1213 (Supp. 1975); ORE. REV. STAT. § 517.860(2) (1975); S.D. COMPILED LAWS ANN. § 45-6A-21 (Supp. 1976); VA. CODE ANN. § 45.1-211 (1974); WASH. REV. CODE ANN. § 78.44.140 (Supp. 1976). As to whether the operator may be liable for expenses in excess of the bond, *compare* OHIO REV. CODE ANN. § 1514.06 (Page Supp. 1975), *with* WIS. STAT. ANN. § 144.91(2) (West 1974).

[217] Mich. Admin. Code R. 425.12(3) (1976).

[218] *See generally* ILL. ANN. STAT. ch. 93, § 208 (Smith-Hurd Supp. 1976); IND. ANN. STAT. § 13-4-6-7(e) (Burns Supp. 1976); KAN. STAT. ANN. § 49-413 (1976); OHIO REV. CODE ANN. § 1513.16(D), (E) (Supp. 1975); VA. CODE ANN. § 45.1-206(b) (1974).

[219] *See* notes 204-09 and accompanying text *supra*.

[220] MICH. COMP. LAWS ANN. § 425.188 (Supp. 1976).

refers only to potential violators.[221] There is no provision for civil fines, criminal penalties, bond forfeiture, or the revocation or suspension of a permit upon violation of the Act.[222] In addition to the limited range of available sanctions, the requirement that an enforcement action be taken in the circuit court of the county where the affected mining operation is located, rather than in Ingham County, the location of the state capital,[223] raises troubling questions about the likely outcome of such actions. While the supervisor can determine the level of performance bonds and the acceptability of environmental plans, the legal status of these determinations is uncertain.[224]

An additional enforcement difficulty is the possibility that some regulations, most notably those dealing with quasi-permits, are unsupported extensions of statutory authority. The regulations transform a single reference to long-range environment plans into detailed requirements for ascertaining reclamation plans, costs, and timetables to be evaluated by the supervisor. Administrative regulations, to be sustained, must be within the subject matter of the enabling statute, comply with its underlying intent, and be neither arbitrary nor capricious.[225] The administrative agency does, however, have substantial discretion. It can, within reason, establish stricter regulations than those found in the statute.[226] Moreover, MEPA requires state agencies to adhere to its substantive environmental requirements.[227] Nonetheless, an agency is not

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[221] An action may be instituted to "prevent or preclude" a violation. *Id.* "Preclude" is used primarily but not exclusively to mean prevent. WEBSTER'S THIRD NEW INT'L DICTIONARY 1785 (1971). In any case, the spirit and purpose of the law is to prevail over its strict letter. *See* People v. McFarlin, 389 Mich. 557, 208 N.W.2d 504 (1973); Aikens v. Department of Conservation, 387 Mich. 495, 198 N.W.2d 304 (1972).

[222] These provisions are typical in other reclamation acts. *See, e.g.*, KY. REV. STAT. ANN. § 350.990 (Baldwin Cum. Supp. 1976); MD. NAT. RES. CODE § 7-516 (1974); OHIO REV. CODE ANN. § 1513.99 (Page Supp. 1975); WASH. REV. CODE ANN. § 78.44.160 (Supp. 1976); WIS. STAT. ANN. § 144.91(1), (2) (West 1974).

[223] The Michigan Oil and Gas Act provides that certain enforcement proceedings will take place in "any court of competent jurisdiction" in Ingham County. MICH COMP. LAWS. ANN. § 319.18a (Supp. 1976). Some states set concurrent jurisdiction in the circuit court in the county of the state capital and the circuit court of the mining operation. *E.g.*, MO. ANN. STAT. § 444.680(1) (Vernon Supp. 1976), and MONT. REV. CODES ANN. § 50-1056(1) (Supp. 1975).

[224] *See* notes 143-47 and accompanying text *supra*.

[225] Chesapeake & Ohio Ry. Co. v. Public Serv. Comm., 59 Mich. App. 88, 228 N.W.2d 843 (1975).

[226] *See* Coffman v. State Bd. of Examiners in Optometry, 331 Mich. 582, 50 N.W.2d 322 (1951), where the court sustained a 4-year course requirement for professional schools teaching optometry, even though the statute creating the board set a minimum standard of a course of two years and six months. *See also* Roberts Tobacco Co. v. Department of Revenue, 332 Mich. 519, 51 N.W.2d 922 (1948); Argo Oil Co. v. Atwood, 274 Mich. 47, 264 N.W. 285 (1935).

[227] MICH. CONST. art. 4, § 52. Generally, the courts are allowed to ascertain legislative intent from the problems which led to enactment. Detroit Common Council v. Engel, 207

permitted under the guise of its rulemaking power to enlarge the authority given to it by its authorizing statute.[228] The quasi-permit procedure can therefore be administered only as an information gathering device, because that is the apparent intent of the "long range environment plans" provision in the Act. To the extent that compliance with the plan means compliance with the Act, or to the extent that the supervisor attempts to condition mining on an acceptable environment plan, it probably cannot be enforced. Other regulations, such as those dealing with performance bonds or exploration for mining, are more clearly within the purview of the Act.[229]

IV. CONCLUSION

Michigan's Reclamation Act is, on paper, the poorest reclamation statute in the country. It contains no permit requirement, no meaningful penalties, no precise performance standards, and no bond forfeiture provisions. Its reclamation goal, vegetative stabilization, is exceedingly modest. The Act will in all likelihood be unable to deal effectively with land disturbances from metallic mining despite the opportunity it affords for the exercise of administrative discretion and the existence of some voluntary reclamation. The 1974 Executive Order presents a more extensive opportunity for environmental management, but the legal basis for the order is questionable. Further, agency decision-making is fragmented by different procedures and among different divisions within the Department of Natural Resources.

Metallic mining should be conditioned on compliance with a three-part, single-permit procedure. A single step permit for metallic mining would provide for comprehensive and convenient evaluation from the standpoint of both the operator and the administrator. All state permits could be consolidated into the same procedure with examination by all relevant local, state, and federal agencies. The procedure should include an evaluation of alternative locations for ore processing facilities, mitigation choices at the designated site, and an evaluation of the operator's plan to reclaim

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Mich. 106, 173 N.W. 547 (1919). *See also* [1971-1972] MICH. OP. ATT'Y GEN. 53; [1968-1969] MICH. OP. ATT'Y GEN. 17. *Accord,* Milford v. People's Community Hosp. Auth., 380 Mich. 49, 155 N.W.2d 835 (1968).

[228] *See, e.g.,* Sterling Secret Serv., Inc., v. Department of State Police, 20 Mich. App. 502, 174 N.W. 2d 298 (1969), where the court invalidated an administrative rule requiring square badges for private security guards when the Act itself required only that such badges be different from police badges.

[229] *See* notes 226-28 and accompanying text *supra.*

disturbed lands. This permit application process should necessarily be accompanied by an environmental impact statement.

In addition, a Metallic Minerals Reclamation Act should be adopted with the explicit purpose of rehabilitation, not merely vegetative stabilization, of disturbed lands.[230] The new act should include all existing and future mines in a regulatory structure patterned after that of the Oil and Gas Act. The initiation or continuation of metallic mining should be conditioned on the receipt of a mining permit. The application process should include a showing by the operator that he can comply with the explicit performance standards of the Act, a proposed reclamation plan, and a timetable for reclamation. The administrative agency should examine alternative sites for ore processing facilities and alternative postmining land uses. When an operator makes the required showing, the level of his performance bond should be set at an amount with which a third party could rehabilitate the disturbed land. Moreover, the supervisor should be empowered to enforce the Act through the use of permit suspension and revocation, bond forfeiture, fines, and injunctions.[231]

It is not difficult to appreciate the desire for economic progress which accompanies the renewed vigor of metallic mining in the Upper Peninsula. Environmental protection and economic progress need not, however, be cast as irreconcilable goals. In one sense, the question is whether the productivity and value of certain lands should be sacrificed permanently for the short term economic benefits which result from metallic mining operations. More broadly, the problem involves the degree of reduction or elimination of the many environmental harms and uncertainties that accompany such operations. The scope and clarity of Michigan's response to these issues thus far has been limited and ambiguous at best. Whether this will change must inevitably depend upon the state legislature as it reflects the wishes of the people it serves. A gentler approach to the area's environment, embodied in environmental management of metallic mining sites, would help prevent a subtler reoccurrence of the insensitivities of the past.

—John C. Dernbach

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[230] All nonmetallic mining currently regulated by the present Mine Reclamation Act would continue to be affected by that Act. Many of the arguments made for changes in the procedures and standards for metallic mineral reclamation, of course, also apply to the mining of other minerals.

[231] The Mine Reclamation Act provides for the institution of an action by the Attorney General at the request of the supervisor. MICH. COMP. LAWS ANN. § 425.188 (Supp. 1976). Legal actions by all state agencies in Michigan are undertaken by the Attorney General's office. However, the supervisor should have authority to suspend, revoke, or deny permits, declare the forfeiture of bonds, and levy civil fines.

ACCIDENT AND MALPRACTICE LIABILITY OF PROFESSIONAL CORPORATION SHAREHOLDERS

Historically, the inability of professionals[1] to incorporate their practices[2] meant that each member of a professional group practice was jointly and severally liable for all tortious harm arising from services rendered by any other member or employee on behalf of the organization.[3] During the past fifteen years, however, special professional corporation legislation has been enacted in every state.[4] Most of these acts exempt all shareholders from liability for tortious harm arising from services rendered by any other shareholder or employee on behalf of the corporation.[5]

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[1] Most state professional corporation acts use the term "professional" broadly to denote services performable only pursuant to a license granted by the state; however, many statutes deny use of their provisions to those who can legally incorporate under any other act. *See, e.g.*, ARIZ. REV. STAT. ANN. §§ 10-902.5, 10-903.A (Supp. 1975); CAL. CORP. CODE §§ 13401, 13402 (West Supp. 1975). Physicians, dentists, lawyers, and accountants are the least likely to be able to incorporate under any other act. *See* cases collected in Willcox, *Hospitals and the Corporate Practice of Medicine*, 45 CORNELL L. REV. 432, 442-43 (1960); Wormser, *Corporations and the Practice of Law*, 5 FORDHAM L. REV. 207, 208-14 (1936). This note limits its discussion to these four professions because they are the prime beneficiaries of professional corporation legislation and because relevant information is lacking concerning other professions. Special account will be taken of physicians. They have utilized the professional corporation form far more than other professionals. *See* Hayes, *Professional Corporations in Iowa — 1970-1972*, 25 DRAKE L. REV. 161, 162 (1975) (Health care professionals utilize 90 percent of Iowa's professional corporations.) Furthermore, pertinent accident data is much more complete and recent for physicians than for any other profession.

[2] Jones, *The Professional Corporation*, 27 FORDHAM L. REV. 353 (1958).

[3] Three forms of business organization were open to professionals wishing to engage in group practice. The only common one, the partnership, is always characterized by full and independent liability of each general partner for torts committed by any partner or employee of the partnership. *See* note 16 *infra*. The rarely used joint stock company is generally characterized by joint and several liability. H. HENN, HANDBOOK OF THE LAW OF CORPORATIONS AND OTHER BUSINESS ENTERPRISES § 54 (1970). Only a minority of the states invariably impose joint and several liability on the occasionally employed business trust; a larger group imposes such liability where, as is likely in business trusts formed to provide professional services, full control is exercised by the beneficiaries. *Id.* at § 64.

[4] Shores, *Professional Corporations*, 10 WAKE FOREST L. REV. 691, 694 (1974).

[5] *See, e.g.*, ALA. CODE tit. 46, §§ 350, 359; tit. 10, § 21(41) (Cum. Supp. 1973). The statement in the text is based upon the author's examination of over forty of the state statutes. As in the Alabama legislation just cited, the most prevalent provision merely states that no change is intended. In such an absence of a positive provision, the incorporation by reference of all nonconflicting business corporation law means that the limited liability characteristic of business corporations also characterizes professional corporations. Although the shareholders are subject to no liability as a legal matter, their corporation is fully liable by virtue of the doctrine of enterprise liability. *See* James, *Vicarious Liability*, 28 TUL. L. REV. 161 (1954). Thus, each shareholder is, in effect, liable to the extent of his or her share in the corporation's assets. This de facto liability is called "limited liability," both in contrast to the broader legal standard of joint and several liability and because it is limited to each shareholder's share in the corporate assets.