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Strip Mining, the West and the Nation

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With the anticipated development of western coal lands, much attention has been directed at the existing patterns of strip mining regulation. Focusing upon the particular problem of reclamation, Professor Binder analyzes the sufficiency of applicable state and federal regulations. It is the author's thesis that federal regulation of strip mining, applicable to all coal lands, is needed for adequate regulation.

STRIP MINING, THE WEST AND THE NATION

*Denis Binder**

> "Briefly put, a region best known for its abundant wildlife and fish, and for its beautiful scenery, a region isolated from urban America, sparsely populated and virtually unindustrialized, will be converted into a major industrial complex."
>
> *Sierra Club v. Morton*, 514 F.2d 856,880 (D.C. Cir. 1975)

The 1973-74 Arab Oil Embargo dramatically brought to the nation's attention our developing energy shortfalls. As a result President Nixon promulgated Project Independence, which is designed to make this country self-sufficient in its energy needs by 1980. Whether or not this goal is attainable is uncertain, and remains the subject of widespread doubt.[1]

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1. Schorr, *Our Blurred Energy Blueprint*, Wall Street J., Nov. 8, 1974, at 10, col. 3.

One of the underpinnings of Project Independence is accelerated development of our coal supplies.[2] Coal is the one fuel which this country possesses in great quantity. An estimated three trillion recoverable tons of coal lie in this country. By way of comparison, we currently mine about 600 million tons a year.[3] Coal would be used not only as a basic fuel source, as in fossil fuel plants, but also as the feedstock in producing synthetic natural gas and oil.[4] Experts have estimated the nation's output of coal could double to 1.2 billion tons by 1980 and triple by 1985. Strip mining could be expanded by 1985 to a billion tons up from 300 million and deep mining to 800 million tons, also up from 300 million.[5]

For a number of reasons much of the increase in strip mining is expected to occur in the Western coal fields,[6] where it is already rapidly expanding.[7] Strict requirements are

2. The estimated coal reserves of the U.S. as of January 1, 1972 equaled 3.224 billion tons, or about 1/5 of the world total. In terms of energy content, these coal reserves exceeded the combined domestic reserves of petroleum, natural gas, shale oil and bituminous sandstone. Averett, *Coal*, in UNITED STATES MINERAL RESOURCES (U.S. Geol. Survey Prof. Paper 820) 133 (1973).
3. Coal production in 1974 totaled 540 million tons. Domestic consumption was 551 million tons, of which 64% was used to generate electricity. The Federal Energy Administration estimates coal consumption will total 692.5 million tons by 1980, of which 88.5% will be for generating electricity. HOUSE COMM. ON INTERIOR AND INSULAR AFFAIRS, 94th Cong., 1st Sess., REPT. OF THE HOUSE COMM. ON INTERIOR AND INSULAR AFFAIRS TO ACCOMPANY H.R. 25, 53 (1975) [hereinafter sited SURFACE MINING REPORT].
4. Major proposals exist for coal-gasification plants in North Dakota. Mercer County is receiving attention by the Michigan-Wisconsin Pipeline Company. Franklin, *What Price Coal?* N.Y. Times magazine, Sept. 29, 1972, at 26, 96.
5. McElheny, *Coal Experts Say Output Could Be Doubled by 1980*, New York Times, Jan. 6, 1974, at 52, col. 3.
6. *See* Bus. Week, May 11, 1974, at 134, 136.
7. The West produced 10% of the nation's coal in 1974. WESTERN STATES NUCLEAR BOARD, WESTERN STATES ENERGY RESOURCE DEVELOPMENT: UPDATE 1976 42 (1976).

   For example, Montana is expected to produce 27 million tons of coal in 1975, up from 14.5 million in 1974. Denver Post, Aug. 1, 1974, at 22, col. 3. About 7 million tons were produced in 1971. Production may reach 41 million tons by 1980. With extensive development Montana, North Dakota and Wyoming could annually produce 960 million tons of coal by the year 2000. Denver Post, May 5, 1974, at 33, col. 4. Wyoming yielded 14.1 million tons in 1973, Montana, 10.4; and New Mexico, 9.0 in 1973. Eight states were above Wyoming. N.Y. Times, Sept. 1, 1974, at § 3, p.5 col. 5. One projection calls for 188,482 acres in the West to be disturbed by strip mining between 1972 and 2000, compared to 20,700 acres disturbed to 1972. *See* Table 3-7 of NATIONAL ACADEMY OF SCIENCES, REHABILITATION POTENTIAL OF WESTERN COAL LANDS (A Report to the Energy Policy Project of the Ford Foundation) 34 (1974) [hereinafter cited as NATIONAL ACADEMY OF SCIENCES REPORT]. Production in Wyoming from the 1980's to the year 2000 could reach 200 million tons per year. MINERAL DIVISION OF THE STATE DEPT. OF ECONOMIC PLANNING & DEVELOPMENT, WYOMING MINERAL YEARBOOK 8 (1975).

being placed on the sulphur intake and emission of power plants to control air pollution. Much of the presently mined eastern coal is high sulphur whereas a substantial percentage of western coal is low sulphur. The coal fields in the Northern Great Plains and the Rocky Mountain Province[8] contain 90 percent of the strippable low sulphur reserves of the United States; 42 percent of the low sulphur coal reserves are in Wyoming.[9] The primary reason for the boom in western coal, though, is economic. Whereas in the East coal companies are willing to strip away 150 feet of overburden to get at a three or four foot thick seam, western strippers can frequently dig down less than 100 feet to recover seams up to 100 feet thick.[10] For example, 30 billion tons of coal are considered economically retrievable in Montana under existing standards of surface extraction technology. The coal lies in seams up to 87 feet thick with overburdens ranging from a few feet to 150 feet deep. The costs of recovery are therefore substantially less than in the East.

It is also much easier to acquire large tracts of land for mineral recovery in the West because of the large holdings of the federal government, railroads and Indians. In addition to land owned completely by the government, it retained

8. Most of the attention today is focused on the coal resources of the Northern Great Plains. Although many seem to refer to this geographic region as the West when discussing coal development, the Northern Great Plains is a major but by no means the sole region in the West where coal development is occurring. The Northern Great Plains covers a region 350 miles North to South, 450 miles East to West in the Dakotas, Montana and Wyoming.

9. The coal fields in the Northern Great Plains and the Rocky Mountains Province contain 90 percent of the strippable low sulphur reserves of the United States. Forty-two percent of the low sulphur coal reserves are in Wyoming. U.S. BUREAU OF MINES, STRIPPABLE RESERVES OF BITUMINOUS COAL AND LIGNITE IN THE UNITED STATES (Info. Circular No. 8531) 21 (1971).

160 billion tons of coal lies within 1,000 feet of the surface in the Northern Great Plains. 80.2 billion tons of these are surface minable; which represents 37% of the nation's surface minable coal. NORTHERN GREAT PLAINS RESOURCE PROGRAM, EFFECTS OF COAL DEVELOPMENT IN THE NORTHERN GREAT PLAINS 1 (1975) [hereinafter referred to as RESOURCES PROGRAM].

Wyoming has an estimated 546 billion tons of coal lying within 6000 feet of the surface. 121.5 billion tons are within 3,000 feet of the surface. U.S. BUREAU OF MINES, STRIPPABLE COAL RESERVES OF WYOMING (Info. Circular No. 8538) 1-2 (1971). 19 billion tons lie within 150 feet of the surface. Glass, *State Reports: Wyoming* in 78 COAL AGE 186, 196 (Western Coal Ed. 1973).

10. For example, the Wyodak mine near Gillette has a 71' thick coal bed lying under only 30' of overburden.

the mineral rights on 60 million acres it homesteaded to settlers.[11] Consequently, long term contracts can be signed with single operators in the West who in turn can mine on vast acreage. On the other hand, land and mineral rights in the East are usually widely dispersed in small parcels.

In addition, mineworkers in the East are usually members of the United Mine Workers, which is considered highly "militant" by coal companies and utilities. Labor tranquility in the mines is non-existent.[12] Furthermore, the UMW receives a royalty of $2.00 per ton mined by its members for its welfare fund. In the West, however, most of the coal miners are either not union members or belong to unions other than the UMW.

Finally, the large seams in the West make the cost of reclamation substantially less than in the East. For example, even at $4,000 per acre, reclamation costs average out to $ .20 per ton[13] versus $ .50 per ton mined in the East at a reclamation cost of $1,000 per acre.

All in all, western coal generally costs 3 to 5 dollars a ton to mine versus 9 to 14 dollars in the East.[14] Even considering the high cost of rail and barge transportation to the East and the low energy content of western coal, it has become not only competitive but highly desirable in many Midwest and Southern markets where it was formerly despised.

The purpose of this article is to evaluate the existing patterns of strip mining regulation, with a critical look at the special reclamation problems of the West. This article

11. In the portions of Montana, North Dakota and Wyoming included in a recent study, the Federal Government controls 29 percent of the total mineral estate acreage. The government reserved mineral rights to those acres with a known coal reserve, and thus controls an estimated 60 percent of the total coal resource in the area, or about 96 billion tons of the coal reserve. RESOURCES PROGRAM, *supra* note 9, at 8.
    For the proper historical and legal perspective of the severed mineral rights controvrsy, see Mall, *Federal Mineral Reservations*, 10 LAND & WATER L. REV. 1 (1975).
12. *See, e.g.*, U.S. Steel Corp. v. United Mine Workers of America, 526 F.2d 377 (5th Cir. 1976).
13. McDowell, *The Shootout Over Western Coal*, supra note 7, at col. 5.
14. Bus. Week, *supra* note 6, at 136.

will first take a socio-ecological look at the problem, dovetailing the known scientific, empirical facts of western mining practices with the legal system that has evolved to minimize these impacts. Proceeding from the identification of the reclamation problems with which an adequate regulatory system must deal, this article will examine the sufficiency of specific regulatory systems of the western states.

It is the thesis of this article that the present regulatory system is inadequate. Given the shortcomings of many state regulatory systems and the national need to preserve the ecological integrity of the western region it is contended that only strong federal regulation of all coal development, either on federal or nonfederal land, will solve the problem. Consequently, we will look at vetoed H.R. 25 which attempted to establish federal regulation of all coal lands and which will most likely serve as a model for future legislation. Also, we will examine the recently promulgated EMARS system which has applied the principles of H.R. 25 to the leasing of federal coal lands.

As a caveat to readers, this writer wishes to make clear that he has long opposed strip mining in situations where reclamation is either impossible or not otherwise contemplated.[15]

STRIP MINING PRACTICES AND RECLAMATION PROBLEMS

General

Coal is mined either in the traditional method of underground shafts, or by stripping away layers of overburden to get at coal seams. The latter is variously referred to as strip mining, surface mining or open cut mining. It currently accounts for about 50 percent of the coal mined.[16] Two hundred fifty acres per day are strip mined in this country. The total area stripped so far is as large as Delaware, and growing fast.

15. Binder, *A Novel Approach to Reasonable Regulation of Strip Mining*, 34 U. PITT. L. REV. 339 (1973).
16. 52% of the 1974 coal production was by strip mining, up from 49% in 1973. SURFACE MINING REPORT, *supra* note 3, at 56.

Strip mining has undergone exhaustive analysis in recent years, perhaps *ad nauseam.*[17] Strip mining in the Midwest and Appalachia has been extensively documented. Only a cursory review is needed here.

There are in fact three forms of strip mining: area mining, contour mining and auger mining. Area mining occurs on relatively flat surfaces. Essentially a series of parallel cuts are made with the spoils matter from each cut being deposited in the proceeding cut. If no reclamation is performed, the surface looks like a giant washboard from the air. Contour mining occurs in mountainous areas where coal seams run along the sides of hills. The overburden above a seam is removed until further cutting is economically impractical. The resulting cut can be viewed as a triangle cut out of a hill. From a distance it looks like a road, (or series of parallel roads if successive cuts have been made) running around the side of a hill. Augers are used to get at any remaining coal that contour mining cannot economically reach. Augers are giant drills that can bore up to 20 feet back in a hill. Occasionally, entire hilltops are removed to get at coal seams.

Strip mining is a comparatively inexpensive method of mining coal. Few workers are needed, and the safety record is better than for deep mining. In addition, surface workers do not contract black lung disease. Strip mining can recover coal from seams otherwise economically unrecoverable.

But strip mining also encompasses tremendous environmental problems. Appalachian soil, especially near coal seams, contains pyritic materials. Sulphuric acid and "yellow boy" (iron sulfate) will form if these materials are exposed to air and water. Unless the toxic materials are buried, acid water can leach out for decades. Acid mine waters pollute waterways, kill fish and vegetation, contaminate potential drinking water, and even prevent recreational uses of

17. *See generally* Binder, *A Novel Approach to Reasonable Regulation of Strip Mining, supra* note 15; Reitze, *Old King Coal and the Merry Rapists of Appalachia,* 22 CASE W. RES. L. REV. 650 (1971); and the U.S. DEPT. OF INTERIOR, SURFACE MINING AND OUR ENVIRONMENT (1967).

waterways in many areas. The problems are heightened by the high precipitation levels in Appalachia, which frequently reach 60 inches a year. Severe sedimentation and erosion problems arise. Farm lands can be rendered unusable and natural reclamation prevented because the topsoil is either buried or washed away. The high walls left by contour mining can cut off animal trails, cause landslides and erosion.

The environmental problems of area mining can be prevented through full and rigorous reclamation techniques in the Midwest and East. Successful efforts are also being made in curbing the problems created by contour and auger mining.[18]

Reclamation Problems

1. Land

Successful reclamation techniques have been developed in much of Appalachia. But in the West new techniques must be developed because of the endemic differences between the western and other coal regions. While the East is a wet, highly fertile area, the western fields lie under semi-arid lands. A fragile ecosystem has developed and gently nourished over centuries. Natural vegetation is so sparse that it may take 20 to 30 acres to sustain a single cow.[19] The least tampering may destroy it. The remains of the Oregon Trail are highly visible evidence of the fragile western ecology. Indeed, no completely successful reclamation has

18. For example, under the box cut method the operator makes his first cut well above the coal outcropping. He temporarily stacks the overburden on a prepared bench above the outcrop while he removes the coal from the cut. When this step is completed, he fills the cut with the original overburden, then he makes another cut to the same slope further down the slope. The overburden from this cut is stacked on top of the first cut. When all the coal exposed by this cut has been removed, the overburden is returned to the trench. The finished effect is a hillside with no overburden on the outslope.

19. Hill, *Environmental Chief Cautions on 'Panic' for 'Short Term Energy Gains,'* N.Y. Times, July 14, 1974 at 20, col. 5; and Kneeland, *To Strip Ranches for Coal Supplies: A Difficult Choice*, N.Y. Times, Feb. 18, 1974, at 27, col. 1, and at 42, col. 1.

yet been performed on western coal lands, aside from certain intensive research efforts.[20]

In the Rocky Mountain Prairie Region, the air, land and water resources are highly intertwined. The top soil, frequently only a few inches thick, is the result of a weathering process spread over a period of thousands of years. It is rich in organic matter and nutrients and has a proper water holding capacity. Without protective vegetation, rain water runs off and erodes the thin topsoil, and wind will scatter it. Erosion rates on western range lands are among the highest in the nation for upland areas not under cultivation due to insufficient moisture for a protective vegetal cover.[21] Because of the difficult conditions, and risks of flash-flooding, natural vegetation cannot be relied upon.

A University of Montana study concluded reclamation is possible in most sections of the state, but that several decades of revegetation would be required before it could be determined whether the attempted reclamation could successfully withstand climatic fluctuations.[22]

A germinal study by the National Academy of Sciences highlights the problems of reclamation in the West. In general, areas receiving 10 inches or more of annual rainfall could easily be rehabilitated, provided evapo-transpiration is not excessive, landscapes are properly shaped, and demonstrably successful techniques are used. Drier areas can probably be reclaimed only with major, sustained inputs of water, fertilizer and management. Success has been limited in these drier areas, and rehabilitation may take decades or even centuries.[23]

Vegetation should be introduced that would sustain the former animal life, and the land transformed into its former

20. Very little if any land in the Northern Great Plains has been revegetated for sufficient time or with a sufficient variety of species to determine potential success in establishing a permanent ecosystem that will sustain grazing or higher uses.
21. NATIONAL ACADEMY OF SCIENCES REPORT, *supra* note 7, at 38.
22. Note, *Section II. Land Quality: The Regulation of Surface Mining Reclamation in Wyoming*, 9 LAND & WATER L. REV. 97, 104-5 (1974).
23. NATIONAL ACADEMY OF SCIENCES REPORT, *supra* note 7, at 2.

image to provide sheltered habitats. Grading the land to a flat topography will not facilitate animal life. Restoring the land to its former contour will also improve aesthetics and aid in erosion control. Current attempts at revegetation incorporate four procedures to hasten sustainable revegetation on mine spoils: spoils segregation, surface manipulation of the graded and shaded spoils, addition of top soil, and seeding.[24]

Precipitation levels in the upper great plains are often low. The average rainfall in western coal areas average less than 16 inches annually—1/3 or 1/4 of that in Appalachia.[25] For example, the average rainfall in western North Dakota is 12-16 inches a year.[26] In eastern Montana the annual precipitation averages 12.5 inches, of which about a quarter is snow.[27] Snowfall is not a reliable source of moisture for revegetation because it can be blown about before melting. If it turns to ice, much of this precipitation will evaporate before the bottom melts.

Even the average precipitation figures are deceptive. Droughts are common in these lands, and annual precipitation is more often below the average than above it.[28] Precipitation frequently comes as high intensity, short duration storms or as snowfall when plants are dormant. Warm dry summers frequently alternate with cold vigorous winters. Only hardy organisms can tolerate the extremes.

In addition, a hard driving wind, unimpeded by dense vegetation, sweeps across the land, driving sand and soil particles into tender plants and drying the soil. Premature grazing will defeat reclamation by destroying plants before sustained growth is achieved.

24. *Id.* at 60.
25. Sterba, *Reclamation Plan for Strip-Mined Lands Stirs Debate*, N.Y. Times, July 3, 1974, at 39, col. 4.
26. *Id.* at 41, col. 7.
27. *Hearing on H.R. 3 Before the Subcomm. on the Env. and the Subcomm. on Mines and Mining of the House Comm. on Interior and Insular Affairs*, 93d Cong., 1st Sess., ser. 93-11, pt. 2, at 1571 (1973).
28. NATIONAL ACADEMY OF SCIENCES REPORT, *supra* note 7, at 42. A 1941 study showed that out of 37 years, one had been humid, one moist subhumid, 25 semiarid, and five arid. RESOURCES PROGRAM, *supra* note 9, at 45.

Another problem is encountered with potential reclamation in the West. Whereas the eastern mine regions frequently contain pyritic materials, there is a high salt content in many western soilbanks, even the topsoil can be slightly to moderately salty. Extensive studies around the Decker Mine in Montana have shown only limited success in revegetation attempts to date because of salty spoils and low annual precipitation. The salts, such as sodium, retard plant growth. Gypsum is frequently used to leach the sodium out of the soil but it may be impossible to do so if less than 10 inches of rain falls annually.

One critical factor in successful reclamation is thus the trapping of precipitation. Research has shown that fertilizer will not help if there is insufficient moisture. Not only is there low vegetation levels, but also the soil frequently has a low capacity for holding moisture. Moisture may be trapped several ways, such as by proper soil drainage design, and the reduction of long, uninterrupted gradients of mine spoils terrain.[29] A porous, absorbent layer of segregated materials can be placed on the surface of the spoils to trap and store precipitation. Mulching with organic mulches will reduce evaporation and erosion and thus increase moisture infiltration. Topsoil must be at least 4 to 6 inches thick and overlay a moisture holding subsoil of at least 18 to 24 inches thick to store water for plant growth during dry periods. Because of precipitation variations, some form of temporary, supplementary irrigation should be planned as "insurance." In areas with little rainfall revegetation is virtually impossible without irrigation.

Because eastern reclamation techniques are inadequate in the West, and large scale mining and reclamation is only beginning in the West, western reclamation research is basically in the germinal stage. One of the major obstacles to successful western reclamation is the lack of empirical knowledge. Not only has little research been undertaken so far, but hy-

29. NATIONAL ACADEMY OF SCIENCES REPORT, *supra* note 7, at 62. *See also,* Hodder, *Surface Mined Land Reclamation Research in Eastern Montana,* in SELECTED PAPERS AND REMARKS FROM THE RESEARCH AND APPLIED TECHNOLOGY SYMPOSIUM ON MINERAL-LAND RECLAMATION 65, 68-9 (1973).

drologic effects are not fully known, and precipitation records are lacking for most existing and proposed mine sites. Consequently, areas meeting the 10 inch rainfall guideline cannot presently be mapped.[30] What is known is that the potential for rehabilitating disturbed western land is extremely site specific.[31]

It should also be noted that the 10 inch guideline is just that. In a subsequent interview, Dean Thaddeus Box of the University of Utah, who headed the National Academy of Sciences study team, emphasized that some areas receiving less than 10 inches are highly reclaimable while others with 20 inches cannot be.[32] Therefore, the amount of rainfall is a highly critical variable, but it is not the only one.

Finally, the study concluded that most state laws in the West do not provide for adequate planning, monitoring, enforcement and financing of rehabilitation. The state agencies involved are generally understaffed.[33] For example, North Dakota first received state funds for a full time inspector in 1973.[34]

2. Cumulative Impact of Development

Although this article concentrates on the legal-reclamation issues of strip mining in the arid West, it must be noted that underlying these issues is the very real concern, so often involved in environmental cases, of the quality of life. Aside from the popularity of Colorado, and especially Denver, in recent years, the Northern Great Plains and Rocky Mountain region is sparsely populated with ranching as the major in-

30. NATIONAL ACADEMY OF SCIENCES REPORT, *supra* note 7, at 29.
31. RESOURCES PROGRAM, *supra* note 9, at 29.
32. Denver Post, July 21, 1974, at 41, col. 2.
33. NATIONAL ACADEMY OF SCIENCES REPORT, *supra* note 7, at 98.
34. *For* an account of the funding dfificulties, *see* Hagen, *North Dakota's Surface Mining and Reclamation Law: Will Our Wealth Make Us Poor?* 50 N.D.L.REV. 437, 441-43 (1974). Harris Sherman, director of Colorado's Department of Natural Resources, has testified that the staff assigned to enforce the state's mine reclamation law is so small and overworked as to make these laws essentially meaningless over most of the state. In addition, virtually no monitoring or enforcement of reclamation plans has been done in the past two years. Denver Post, Nov. 14, 1975, at 2, cols. 3-5.

dustry.[35] For example, in 1970, Wyoming had 332,000 people and 1.4 million cattle.[36] The family farm is the sum total of the stability of South Dakota's economy.

The broad energy development projects proposed for this region threaten to radically change the existing life style.[37] For example, although preliminary plans may never crystalize into concrete proposals, the potential for turning eastern Montana into a major coal-based industrial area exists. The Northern Plains Resources Council has identified at least 18 companies attempting to put together coal-water packages at the present time and 28 other actively seeking either water or coal resources. A report indentifies the various companies whose actions indicate serious interest in building power plants or synthetic fuel plants in Montana.[38]

A recent NEPA Statement best states the anticipated change:

> In sum, the culture and way of life of persons in the impacted areas of the [Northern Great

35. Seventy percent of the land is pasture and range. 26% is cultivated for wheat, barley, flax, rye, oats, corn, alfalfa and sugar beets, within the major agricultural products being wheat and "meat." A little less than one-twelfth of the nation's wheat was produced in the Northern Great Plains in 1971. RESOURCES PROGRAM, *supra* note 9, at 45.

36. The 1970 Census shows the following population figures: Colorado (2,207, 259), Utah (1,059,273), New Mexico (1,016.000), Montana (694,409), South Dakota (666,257), North Dakota (617,761) and Wyoming (332,416). THE OFFICIAL ASSOCIATED PRESS ALMANAC 141 (1973).

37. Time, August 5, 1974, at 62.

38. *See* NORTHERN PLAINS RESOURCE COUNCIL, ENERGY COMPANIES ACTIVE IN MONTANA (1975). Although strip mining is the focus of the present article, large scale shale oil, coal conversion and electric power plants are envisioned for the region. For example, the Interior Department forecasts 36 coal gasification plants will be in operation by 1985. Denver Post, May 19, 1974, at 31, col. 1. One study prepared for the state of Wyoming forecasts that within 50 years, the state will have 10 synthetic petroleum liquid plants, 10 gasification plants, seven carbonization plants, 34 electric power plants and 60 coal mines. Bus. Week, Dec. 11, 1971, at 93.

Precise estimates in predicting socio-ecological impacts are impossible because of all the uncertainties inherent in predicting the future. The Federation of Rocky Mountain States estimates 450 to 600 thousand persons may enter the region over the next ten years as a result of the increased mining activity. About 300,000 would be attracted by expanded coal production and 150,000 by expanded uranium mining. The other 150,000 are dependent upon development of the oil shale industry. FEDERATION OF ROCKY MOUNTAIN STATES, ENERGY DEVELOPMENT IN THE ROCKY MOUNTAIN REGION: GOALS AND CONCERNS 29 (1975). One rule of thumb is that each 3,000 MW power plant will mean a new town of 15,000 people. Wynkoop, *Southwest Energy Drive Accelerates, Centers in Utah,* Denver Post, June 22, 1975, at 24, col. 1.

> Plains] will likely shift from the agrarian-focused way of life which now exists to a larger, more urbanized way of life with all the advantages and disadvantages which that will entail. Some of the changes would likely come about without the energy development activities, but at a very much slower pace—over decades instead of in a few years—while others may not have occurred at all.[39]

The North Central Power Study estimated an additional million people could go to the area, which equals the present combined population of Montana and Wyoming. Some areas, such as Rifle, Colorado,[40] Rock Springs[41] and Gillette,[42] Wyoming and Colstrip,[43] Montana are already feeling the strain.[44]

The Federation of Rocky Mountain States has prepared a scenario for a hypothetical "Resource City" based upon conditions actually existing in the energy boom towns of the West.[45] Resource City's population has more than doubled since 1970. Teachers and classrooms are scarce. Despite good wages and ample job opportunities, job turnover is 15 percent per annum because of poor living conditions. Crime and welfare recipients have quadrupled.

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39. RESOURCES PROGRAM, *supra* note 9, at 150.
40. 82,000 people presently reside in the three county shale oil region surrounding Rifle, including 2,290 in Rifle, which could swell to 20,000 over the next 15 years while the three counties experience an influx of 281,000 people. Sterba, *Oil Shale Rush Altering a Colorado Town*, N.Y. Times, June 14, 1974, at 13, cols. 3-4.
41. Rock Springs is expected to increase dramatically. It has already experienced a boom because of the influx of 5,000 workers to construct the mine-mouth Jim Bridger Power plant and work in a newly discovered oil field. Classrooms are jammed, traffic clogged, mobile home sales booming and crime rising. Time, Aug. 5, 1974, at 62.
42. 2,191 people resided in Gillette in 1950, 3,580 in 1960 and 7,194 in 1970, the peak year of an oil boom. The coal boom is expected to bring in 25,000 new people by 1978. Sterba, *Town Scarred by Oil Boom Waits Apprehensively for Miners*, N.Y. Times, April 11, 1974, at 37, col. 1.
43. Colstrip jumped from 200 people in 1972 to 3,000 today. Denver Post, Nov. 6, 1974 at 20AA, col. 1. Nearby Forsyth grew from 2,000 to 2,700 in two years to accommodate the overflow. The new city-county planner stated: "I'm not sure the industrial impact would be so bad, but it's the people impact." Kneeland, *To Strip Ranch for Coal Supplies: A Difficult Choice*, N.Y. Times, Feb. 18, 1974, at 27, col. 1., and at 42, col. 1.
44. Just by way of illustration, an environmental impact statement for a three-million ton-a-year strip mine in Moffat County, Colorado projects employment of 186 persons, and a 1,500 person increase in the area's population. Denver Post, Sept. 1, 1974, at 59, col. 1.
45. FEDERATION OF ROCKY MOUNTAIN STATES, INC., RESOURCE CITY: ROCKY MOUNTAINS (1974).

Good housing is impossible to find. Over 35 percent of the population live in house trailers and tents are common. Trailer rentals approach $85 per week while some motel rooms are rented in eight hour shifts. Traffic has increased fivefold, jamming streets and parking lots. Local medical facilities are grossly inadequate. The mental-health clinic's caseload has increased 1,000 percent. The air and water have become heavily polluted while hunting and fishing opportunities have decreased. Recreational outlets are few.

One important quantitative factor is that the land disturbed for related needs, such as roads, railroad tracks, transmission lines, housing and public services may far exceed the land actually mined.[46] These disturbances tend to be permanent. In addition, these developments will generally cluster on a carefully selected basis because of the investments required for such needed services as railroad tracks.[47] Consequently, the cumulative effect of these projects is greatly magnified.[48]

The weight already felt by the qualitative impacts is arousing reactions. Local sentiment is mounting against

46. For example, in the NEPA Statement on the prototype oil shale leasing program, the Interior Department estimated that for a 1-million-barrell-per-day level of production, the total surface area to be affected would approximate 50,000 acres without backfilling, or about 35,000 acres if backfilling techniques were employed. An additional 15,000 to 20,000 acres would be required for urban development, and the utility rights-of-way would need probably less than 10,000 acres total. U.S. DEPT. OF THE INTERIOR, I FINAL ENVIRONMENT STATEMENT FOR THE PROTOTYPE OIL SHALE LEASING PROGRAM III-23 (1973).

47. For example, the Burlington Northern and Chicago and North Western railroads have filed a joint plan to construct a 113 mile branch line between Gillette and Douglas, Wyoming. 2,400 acres would be used for the railroad corridor. By 1990 an estimated 2,700 person increase in population will occur because of railroad construction within the Eastern Powder River Coal Basin in Wyoming. "A major secondary impact resulting from railroad construction within the Eastern Powder River Coal Basin is development and mining of the vast coal reserves." U.S. DEPT. OF THE INTERIOR, III FINAL ENVIRONMENTAL IMPACT STATEMENT: EASTERN POWDER RIVER COAL BASIN OF WYOMING II-85 to 86 (1974) [hereinafter cited as EASTERN POWDER RIVER NEPA STATEMENT].

An example of a major development spurred way beyond the mining area is a proposal by Texas Gas Transmission Company to build a second major rail-to-barge coal-transfer facility in the St. Louis area. It would be built on a 70-acre site, and could handle up to 10 million tons of coal annually. Wall Street J., March 12, 1975, at 4, col. 4 (Midwest Ed.).

48. For example, one study estimates that the population in Campbell County, Wyoming could increase 500% or 64,000 people by the year 2000 as opposed to only 14% increase in Niobrara County, its neighbor to the southeast. Impacts will be felt in only a few key locations, and not spread evenly over the area. RESOURCES PROGRAM, *supra* note 9, at 122-23.

further development.[49] The Montana Board of Natural Resources has recommended that the state deny additional permits for mine-mouth power plants, thereby not becoming the boiler-room of the nation. A final decision on the proposed 1400 MW expansion of the Colstrip power facilities is pending.[50]

The Northern Great Plains Resources Program Staff has circulated a study entitled *Effects of Coal Development In The Northern Great Plains*.[51] This report considers the cumulative, societal impacts of coal development in the region,[52] recognizes the displacement that will occur, and that:

> Although each community must assess its own special problems it is doubtful if many of the localities in the . . . [Northern Great Plains] are really prepared or capable of accomplishing the task without planning and legislative assistance.[53]

Another report recognizes the underlying issue at stake in the West.

> Perhaps the deepest concerns are for the possibility of disruption of the stable economic and social patterns of the Northern Great Plains. Both urban and rural residents are worried about the ability of their communities to absorb the anticipated labor force and the new families that will accompany coal development.[54]

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49. *See*, Franklin, *Coal Strip Mining in the West Facing Obstacles*, N.Y. Times, March 24, 1975, at 20, col. 3.
50. In its final environmental impact statement on Colstrip 3 and 4, the Montana Department of Natural Resources noted that the proposed 1400 MW facility operating at 80% annual load, with 99.5% particulate removal and 40% SO_2 removal, would still emit 2,500 tons of particulates and 67,000 tons of SO_2 per year, which levels were unacceptable to the Department. ENERGY PLANNING DIVISION OF THE MONTANA DEPT. OF NATURAL RESOURCES AND CONSERVATION, FINAL ENVIRONMENTAL IMPACT STATEMENT ON COLSTRIP ELECTRIC GENERATING UNITS 3 & 4, 500 KILOVOLT TRANSMISSION LINE AND ASSOCIATED FACILITIES 5 (1975). The Department then stated: "Allowing conversion facilities for all means Montana could become a boiler room for the nation . . . ." *Id.* at 10.
51. RESOURCES PROGRAM, *supra* note 9, at 117.
52. One problem with NEPA statements in the past is that they frequently skimmed over the secondary developmental impacts, such as consequntial population and industrial development. *See, e.g.*, Environmental Defense Fund v. Corp of Engineers, 492 F.2d 1123, 1135-38 (5th Cir. 1974) and Duck River Preservation Ass'n v. TVA, 6 ERC 1789 (E.D. Tenn. 1974).
53. RESOURCES PROGRAM, *supra* note 9.
54. I EASTERN POWDER RIVER NEPA STATEMENT, *supra* note 27, at 3.

Other socio-ecological factors are of critical importance in assessing the long-range desirability of these projects.

One as yet unstudied aspect of energy development in the West, or indeed in general, is the net energy cost of producing energy. It takes energy to produce energy. For example, if coal is to be shipped to the Ohio River from the West, large amounts of energy would be consumed in transporting the coal. The energy cost would be not only the fuel energy used to transport the coal—presumably diesel oil for unit trains—but also the energy needed to construct the trains used to transport the coal, the energy consumed in constructing the power plant and transmission lines, the energy used by the workers to get to their jobs and moving supplies to them, and the energy required for all the required paperwork. In total, this energy cost is substantial, and should be a major factor in any impact assessment of energy development in the West.[55]

We must also concern ourselves with the magnitude of any potential loss of farm and ranch land for energy development. On an individualized approach any loss of farm and ranchland would probably be insignificant compared to the alleged benefits of the large energy project.[56] This balance partially occurs because of the fragmatized nature of our agrarian economy and because of the relatively low farm prices. Yet, in *toto* with food shortages appearing in our economy, and which thereby drives up food prices, we must concern ourselves with the longrun economic consequences of the loss of a substantial acreage of farm and ranchland.[57]

55. For example, the proposed 47,000 bbl/day Colony Development shale oil operation in Colorado would require 100 MW's of electricity and two 230 KV powerlines for the plant and 10 MW's for water pumping facilities. BUREAU OF LAND MANAGEMENT, DRAFT ENVIRONMENTAL IMPACT STATEMENT: PROPOSED DEVELOPMENT OF OIL SHALE RESOURCES BY THE COLONY DEVELOPMENT OPERATION IN COLORADO, V-4, table II-1 (1976).
56. For example, the Interior Department estimates that at the assumed rate of development, the projected cumulative annual loss of livestock forage would be 1,515 animal unit months of grazing (AUM's) in the Eastern Powder River Coal Basin, by 1980, 3,435 AUM's by 1995 and 5,067 AUM's by 1990, or about .6% loss of the annual forage base by 1990. II EASTERN POWDER RIVER NEPA STATEMENT, *supra* note 54, at I-542.
57. In the case of power plants out West, especially in Arizona and Colorado, we should be highly concerned with their pollution and any cumulative development pressures which might result in smog because of the reputation these states have acquired as a haven for sufferers of chronic respiratory ailments due to the dryness of the climates. Denver has become highly polluted because of automobiles.

3. Water

a. The Macro Perspective

We have seen the problems caused by inadequate precipitation in the West, but this is only a small part of the total water picture. A major handicap in developing the West is water, or more particularly, a lack of water. The question of water is critical in the West, which has always been extremely water conscious. Epic legal fights have arisen over water rights.[58] The West adopted the system of prior appropriation instead of the standard riparian rights approach in determining water rights. Farming is frequently accompanied by, indeed needs, large scale irrigation projects.

The current concern is that the Western areas may lack sufficient water resources to supply the project energy developments.[59] Although the West has sufficient water overall to support the energy development plans, the water is poorly distributed. In general, the shale oil and coal rich areas lack adequate water resources. The primary water supply is the Colorado River, but every drop taken from it increases its salinity, which has already complicated relations with Mexico.[60]

Several proposals have been advanced for mine mouth power plants, synthetic crude oil plants,[61] synthetic natural gas plants and shale oil processing facilities. These projects will all require large amounts of water. For example, a 1,000 MW power plant with cooling towers will use about 20,000 acre-feet of water a year; a 100,000 barrel per day synthetic crude plant would use about 65,000 acre-feet a year and a 250,000 cubic feet per day SNG plant would require 20,000-300,000 acre-feet a year.[62] In addition several proposals have been advanced to build coal surry pipelines from west-

58. *See, e.g.*, Arizona v. California, 373 U.S. 546 (1963).
59. Gapay, *Liquidity Problem: Far West's Shortage of Water May Block Many Energy Schemes*, Wall Street J., Dec. 16, 1974, at 1, col. 6. In general, *see* Lobel & Lobel, *The Rocky Road to Water for Energy*, 52 N. DAK. L. REV. 529 (1976).
60. In general, *see International Symposium on Salinity of the Colorado River*, 15 NAT. RES. J. 1 (1975).
61. *See* Bus. Week, Aug. 17, 1974, at 74.
62. NATIONAL ACADEMY OF SCIENCES REPORT, *supra* note 7, at 101.

ern mines to eastern or southern power plants.[63] These pipelines offer substantial cost savings over rail transport, but they will need large amounts of water.[64]

The Western States Water Council estimates anticipated energy demands in eleven Western States could use an additional 2.3 million acre-feet of water annually by 1990.[65]

The Interior Department's first inventory of Upper Colorado River Basin water needs show that of the five basin states only Wyoming has sufficient water to meet authorized, planning or projected energy development.[66] Almost all of the 12 million acre feet per year runoff of the Upper Colorado River has been allocated. The National Academy of Sciences study noted the shortage of water for large scale energy development projects.[67] It must also be noted that the use of water for energy in Wyoming, Montana and North Dakota can affect downstream runoff and availability, such as along the Missouri River.

A critical factor in Western Water supply and utilization is the very wide fluctuation in flows from season to sea-

63. *See* Bus. Week, July 27, 1974, at 36.

64. A proposed coal slurry pipeline from Wyoming to Arkansas and Louisiana would use 15,000 acre-feet of underground Wyoming water a year from a basin that is replenished by 100,000 acre-feet a year. *Id.* at 37. In general, *see* Comment, *An Analysis of Technical and Legal Issues Raised by the Development of Coal Slurry Pipelines*, 13 HOUSTON L. REV. 528 (1976).

65. Increased water requirements for coal-fired power plants would be 717,000 acre-feet, and nuclear plants would need 620,000 acre-feet. Oil-shale processing would require 320,000 acre-feet annually, revegetation of coal strip mines 195,000 acre-feet, coal gasification 193,000 acre-feet, coal slurry lines 200,000 acre-feet and other processes about 59,000 acre-feet. State figures show Colorado up 90,000 acre-feet, Montana 124,000, Wyoming 118,000 and Utah 120,000. Denver Post, March 2, 1975, at 2, cols. 1-2.

Another figure worthy of note reveals that energy industries in the Upper Colorado, Yellowstone and Upper Missouri River Basins have firmly contracted for, or expressed interest in, over 4,200,000 acre-feet per year. The Bureau of Reclamation cannot meet this level of industrial demand as well as its more traditional commitments without undertaking new storage construction. Pring & Edelman, *Reclamation Law Constraints on Energy (Industrial Uses of Western Water)*, 8 NAT. RES. LAWYER 297, 298 (1975).

66. Denver Post, June 4, 1974, at 19, col. 1.

67. NATIONAL ACADEMY OF SCIENCES REPORT, *supra* note 7, at 101-3. By way of illustration, New Mexico has allotted 72,000 acre-feet per year to 7 synthetic natural gas plants, but refused to allocate more, since to do so would cut into the amount available for irrigation, Consequently, only 7 synthetic plants will be built in New Mexico. Arnold, *Energy Alternative: Gas and Oil From Coal Can Help Overcome U.S. Fuel Shortage*, Wall Street J., May 3, 1974, at 1, col. 6.

son and from wet year to dry. Many significant rivers dry up for long stretches during drought years. Even in normal years, a high percentage of the total flow occurs during late spring.[68]

The water problem is well illustrated by the situation in Montana. Throughout Montana and the West, companies, cities, developers and agricultural interests are vying for steadily decreasing amounts of uncommitted water. The Yellowstone River Basin in Montana has an average annual water flow of about 9 million acre feet, of which farmers use 2.3 million acre feet. About 1.25 million acres are irrigated in the Basin. Current industrial use in eastern Montana is slight—less than 10,000 acre feet a year. Coal and utility companies have requested 3.3 million additional acre feet. Critical shortages could arise in about one out of four years when the Basin flow drops to below 2.6 million acre-feet—barely enough for farmers.[69] In March, 1974, Montana enacted a three year moratorium on the taking of additional water from eastern Montana to study how much water is left, and how it should be allocated.[70]

The water problem is especially critical in terms of the probable economic displacement of the agricultural sector. If an economic weighing of agricultural versus energy needs is made, agriculture would lose because of disparate economic productivity and, perhaps, the market's inability to accurately assess the impact such displacement would have upon the consumer's food dollar.[71] Energy concerns have already bought farms to acquire water rights, and suspicions

68. RESOURCES PROGRAM *supra* note 9, at 64.

69. Sterba, *Montana Acts to Guard Its Water Supply*, N.Y. Times, March 22, 1974, at 42, cols. 1-3.

70. MONT. REV. CODES ANN. §§ 89-9-103 to 89-8-111 (Supp. 1975). The Northern Great Plains Resources Program believes there will be adequate total water flowing through the region to satisfy the needs of maximum projected coal development as well as increasing agricultural use by the year 2000 if new storage facilities and possible aqueduct systems are constructed in the Yellowstone Basin, and with the realization it may become water short depending on local conditions. RESOURCES PROGRAM, *supra* note 9, at 85.

71. To the extent that reclamation of otherwise productive agricultural land is uncertain, the market may simply fail to assess the future cost agriculturally should the land become unproductive. *See*, in general, the text accompanying footnote 56.

exist that future water plans of the federal government are to give first priority to energy.[72] In addition, farmers cannot match the offers energy companies are making for water rights.[73]

b. The Micro Perspective

Looking at the water situation from a micro rather than macro approach presents several other problems caused by the mining of coal in the West. The development of these coal resources could radically change water distribution patterns throughout the area. The water, be it surface, subsurface or ground, is an integral flow system developed and delicately balanced over thousands of years. It is frequently impossible to separate surface water from ground water because of this interflow. Consequently, a strip mine will affect the hydrologic balance of the area.

Some of the conspicuous hydrologic impacts of surface mining that occur away from the site of the mine include changes in volume of surface flow, loss of groundwater, deterioration of water quality, channel changes caused by an increase in sediment load, changes in runoff patterns, destruction of aquatic habits and increases in endemic diseases among users of water that has been contaminated by mining.[74]

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72. The Interior Department denies that any priorities for energy have been set up with respect to distribution of water in the West. *Hearing on Federal Coal Leasing Bef. the Subcomm. on Mines Mining of the House Comm. on Interior and Insular Affairs*, 94-6, 94th Cong., 1st Sess. (1975). To a certain extent though the shift away from the use of water for new irrigation is partly the result of new standards for federally funded water projects for which discount rates are no 25-78%, making it difficult to justify many federal water projects for irrigation purpose under the mandatory cost-benefit analysis. RESOURCES PROGRAM, *supra* note 9, at 70.

73. For example, the Rio Blanco Oil Shale Corporation has offered a minimum of $4.5 million for 45,000 acre-feet of White River water in Northwest Colorado. Denver Post, April 17, 1975, at 29, col. 4.

74. NATIONAL ACADEMY OF SCIENCES REPORT, *supra* note 7, at 44. It must also be noted that the water needs for the people coming into the area will accelerate, and generally be greater than the actual needs of the mining operation.

Inadequately treated runoff from disturbed areas will contain sediment, dissolved solids, trace elements and possibly nutrients. Data from the Colstrip and Decker areas show relatively high concentrations of calcium, magnesium, sulfate and total dissolved colids in waters draining from spoils banks. Manganese and lead concentrations exceeded U.S. Public Health Service drinking water standards. RESOURCES PROGRAM, *supra* note 9, at 72.

A coal seam may act as an impermeable layer which prevents the percolation of water through it. The rupture of the seam by mining results in a loss of water to lower strata. Mining may drain trapped underground watercourses and alter surface streams. An entire aquifer may be lost if there is subsidence of overlying strata into underground coal mines containing an aquifer. Interference with an aquifer can disrupt flow channels, and thus well levels.[75]

Although the uncertainty surrounding the present ability to actually reclaim the strip mined land might lead cautious observers to advocate a moratorium on strip mining, this article necessarily assumes coal development will continue in the western states. However, it is with the same cautious appreciation of these uncertainties that this article proceeds upon the premise that any strip mining must be accompanied by effective reclamation laws. The establishment of a standard of effectiveness and the relative inadequacies of present regulatory systems are left to the analysis in the following sections.

Another study found that the most significant water pollution potential of the coal strip mine spoils investigated resulted from the soluble salt content of the overburden materials. The study found the major constituents in surface and subsurface runoffs from spoils to be sodium, calcium, magnesium, sulfate and bicarbonate. These problems are expected to exist, in varying degrees, with the majority of strip mine spoils in the Rocky Mountain and Northern Great Plains regions because almost all the surface mineable coal reserves reside in formations of the Upper Cretaceous and Early Tertiary Age, formed under generally similar geologic conditions. MCWHARTER, SKOGERBOE & SKOGERBOE, WATER QUALITY CONTROL IN MINE SPOILS: UPPER COLORADO RIVER BASIN 1 (1975).

75. One Western strip mine which has received extensive study since 1970 is the Decker Mine in Southeastern Montana. The final size of the mined area upon completion between 1990 and the year 2000 will be about three square miles. The area's residents are heavily dependent on ground water for stock and domestic purposes. Significant changes have been detected in well levels after a year of operation. Water levels in observation wells declined. The greatest declines occurred closest to the mine in wells that were cut off from the recharge area. Northwest of the mining area the well levels declined ten feet or more within a three quarter mile radius. In the southwest it declined ten feet or more within a one and one half mile radius, and twenty feet or more within a quarter mile radius. The highest drop recorded was 25.52 feet. About 350,000-400,000 gallons of water are pumped from the mine every day. VAN VOAST, HYDROLOGIC EFFECTS OF STRIP COAL MINING IN SOUTHEASTERN MONTANA—EMPHASIS: ONE YEAR OF MINING NEAR DECKER 1w, Table 2 and 14 (Mont. Bur. of Mines and Geology Bull. 93) (1974).

CRITICAL PROVISIONS NECESSARY FOR VIABLE STATE REGULATION

With this general background in mind, we should now look at provisions which are essential for a strong regulatory act. Statutes frequently proved inadequate because they prescribed specific reclamatory steps. Sometimes they only provided for grading the land to a gently rolling topography. If these acts were performed, such as backfilling, grading and seeding, the operator had fulfilled all his statutory duties. If these statutes were weak, then actual reclamation would not occur. All too often we were left with the anomaly of legal, but not factual, reclamation. For example, of 224,300 acres affected from 1948 to 1970 in Ohio, 82.4 per cent were legally reclaimed, which frequently meant two reseedings.[76] Ohio taxpayers are now confronted with a bill of $730 million to properly reclaim 370,000 acres ravaged by strip mining and to correct water pollution problems caused by acid mine drainings.[77] Consequently, any effective statute must be geared to reclamation in fact.

Provisions must be designed to ensure that reclamation exists on a sustained basis. Where acid drainage is a problem, the statute should require the covering of all acid-forming materials on an ongoing, immediate basis.[78] In the West the bond should not be released until it is certain revegetation will survive the severe droughts and storms that ravage the region. Similarly, the act must ensure reclamation will continue after the first application of fertilizer is used up. Anything short of sustainable reclamation will leave us with the continued anomaly of legal but not practical reclamation.

The bond must be set high enough to ensure reclamation, either by the operator or insurance company, or upon forfeiture by the state using the bond funds. Leaving the amount solely in the hands of the agency, which is all too frequently understaffed, does not ensure reclamation. Furthermore, in the West it will frequently be necessary to re-

76. Reitze, *supra* note 17, at 715-17.
77. OHIO BOARD ON UNCLAIMED STRIP MINED LANDS & OHIO DEPT. OF NATURAL RESOURCES, LAND REBORN VI (1974).
78. *See, e.g.*, OHIO REV. CODE ANN. §§ 1513.16 (1975).

tain the bond for long periods of time before the release because of the difficulties of reclamation.

In addition, certain areas must be barred to strip miners for a number of reasons, be it unique value, aesthetic, environmental, historical or otherwise. By way of illustration, it is highly unlikely society would allow a major strip mine operation to proceed in the Grand Canyon or on the site of Custer's Last Stand. While these examples may seem farfetched, park lands have in fact been strip mined in Ohio and Appalachia.[79] Similarly, lands which cannot be reclaimed should not be strip mined.

As we have seen the teeth of a strong act is in the power to disqualify operators from future permits upon violations of the act. Certain other safeguards are needed. Provisions calling for annual inspections and renewals are essential to insure that reclamation proceeds according to plan and as an ongoing basis during the course of a major operation, which may continue for three or four decades. In such an operation, reclamation must be contemporaneously and energetically performed; else it may be too late at the end to go back and reclaim.

Staff inspection and high performance bond requirements are intended to insure that the land is reclaimed to its highest prior use, either by the operator or by the state if he forfeits. Proposed mining and reclamation plans should be reviewed in advance of the mining operations to maximize reclamation success. Approved plans set forth the performance standards for reclaiming the area. Consequently, the approved plans must provide for strong reclamation goals. It is known that reclamation is likely if thoroughly planned in advance and undertaken as an integral part of the mining operation. In an area as ecologically fragile as the West, in-

79. For example, one operator continued strip mining in Wayne National Forest in Ohio after losing his federal permit. Cleveland Plain Dealer, June 28, 1973, at 6-G, col. 1. Frequently, mineral rights were reserved when lands were deeded to governmental bodies for park or forest purposes. *See, e.g.*, Dept. of Forests and Parks v. George's Creek Coal & Land Co., 250 Md. 125, 242 A.2d 165 (Ct. App. 1968). These problems generally exist because some lands within the park confines are still privately owned, or if deeded to the public, mineral rights were reserved on the conveyance.

tensive pre-planning studies must be thoroughly performed. These studies must include establishment of specified ecological baselines, such as ground water characteristics, surface water flow patterns, meteorological characteristics, soil characteristics such as detailed analysis of overburden cores, timber and forage quality and quantity, wildlife population, air quality, chemical concentrations in animal and plant tissues, archeological values and watershed values.[80]

In addition, as we have seen, much of the impact occurs on adjoining lands and elsewhere through the necessary construction of ancillary facilities. A strong statute should also cover these disturbances, which promise to be everlasting regardless of whatever reclamatory measures are performed on the land actually mined. Finally, in an area such as the West, the statute must both protect scarce water resources and other citizens' water rights.

Several lessons should be learned from the environmental movement. One of the most important is the need for citizen participation in environmental matters, both on an administrative and judicial level. Indeed, most of the substantial environmental decisions have been in cases brought by citizen or environmental groups against private parties and governmental agencies supposedly sworn to uphold the environmental measures they are now being called to task for violating. Consequently, private citizens must be granted standing to intervene in these cases as many state strip mining statutes currently provide.

Thus, insuring effective reclamation might be summarized as necessitating an adequate evaluative process, a coordinated enforcement mechanism and meaningful public participation. As has been seen, the evaluative process, to be adequate, must first establish criteria for the withdrawal of lands from possible strip mining. Secondly, evaluation of the reclamation requirements for lands not otherwise withdrawn must proceed through a preplanning phase which

80. *For* an example, *see* STEWART AND STEWART, A MULTIPLE LAND USE STUDY FOR A NINE COUNTY AREA OF SOUTHWESTERN NORTH DAKOTA (Little Missouri Nat'l Grasslands Study) (1973).

culminates in the adoption of appropriate ecological criteria for reclamation. As an integral part of any reclamation requirements established, a "sustainable standard" must be quantified which allows the continuance of the reclaimed land's prior use in period's of climatic adversity. Finally, the evaluative process should not overlook the need to restore that portion of the environment which is disturbed by the secondary effects of strip mining such as roads, power lines, etc.

With regard to the enforcement mechanism, the previous discussion illustrates the need to have adequate bonds, realistically ascertained and retained for a period of time which insures reclamation in fact. Supplementing the bond and meshed with adequate inspection must be operating sanctions, which include disqualification from current or future mining permits. These guarantees coupled with a provision for meaningful participation by the public are the quintessence of an effective regulatory scheme.

STATE REGULATORY SYSTEM

General Pattern

Most states currently have statutes regulating strip mining.[81] In the absence of federal legislation such as that proposed in H.R. 25, these state statutes constitute the sole authority with respect to reclamation on nonfederal coal lands. The general pattern of state regulation is fairly well

81. ALA. CODE tit. 26 § 166 (115) (Supp. 1973); ARK. STAT. ANN. §§ 52-901 to 916 (Supp. 1973); COLO. REV. STAT. §§ 34-32-101 to 118 (Supp. 1969); GA. CODE ANN. §§ 43-1401 to 1413 (1974); HAWAII REV. STAT. §§ 181-1 to 10 (1968); IDAHO CODE §§ 47-1501 to 1517 (Supp. 1973); ILL. ANN. STAT. ch. 93, §§ 201-16 (Smith-Hurd Supp. 1974); IND. CODE §§ 13-4-6-1 to 13, 14-4-2-1 to 14 (1971); IOWA CODE §§ 83 A. 1-30 (1971); KAN. STAT. ANN. §§ 49-401 to 424 (Supp. 1973); KY. REV. STAT. ANN. §§ 350.010 to 990 (1972); ME. REV. STAT. ANN. tit. 10 §§ 2201 to 2216 (Supp. 1975); MD. ANN. CODE art. 66c, §§ 657 to 674 (Supp. 1973); MICH. COMP. LAWS ANN. §§ 425.181 to .188 (Supp. 1974-75); MINN. STAT. ANN. §§ 93.44 to .51 (Supp. 1974); MO. ANN. STAT. §§ 444.010 to 786 (Supp. 1976); MONT. REV. CODES ANN. §§ 50-1034 to 1057, 50-1401 to 1409, 50-1601-1617 (Supp. 1974); N.M. STAT. ANN. §§ 64-45-1 to 20 (Supp. 1973); N.Y. ENVIRONMENTAL CONSERV. LAW §§ 23-2701 to 2727 (McKinney Supp. 1974-1975); N.C. GEN. STAT. §§ 74-46 to 68 (Supp. 1973); N.D. CENT. CODE §§ 28-14-01 to 13 (Supp. 1973); OHIO REV. CODE ANN. §§ 1513.01 to .99 (Supp. 1973); OKLA. STAT. ANN. tit. 45 §§ 721.738, 721.801 to 816, 721.851 to 853 (Supp. 1974); ORE. REV. STAT.

defined, and has survived constitutional attacks,[82] although there are numerous variations between states. The statutes may cover all forms of surface mining or just coal. Generally, a strip mine operator must acquire a permit and post a bond to operate. The application must set forth the prescribed information, including identification and details of the land to be mined and a proposed reclamation program. The permit is frequently either reviewable or renewable annually.

The statute sets forth a minimum bond amount—frequently $2,000, and a flexible amount per acre mined, such as 100 to 500 dollars. The actual amount of the bond will be determined by the appropriate state agency upon due consideration of the reclamation problems involved. If the operator fails to perform the prescribed reclamation steps, such as backfilling, revegetation and soil stabilization, the bond will be forfeited and the permit suspended. In addition, the operator may be liable to the state for any additional costs of reclamation not covered by the bond.

The real teeth of many statutes is a provision disqualifying an operator from future permits, and suspending present permits, if he wilfully fails to perform the prescribed reclamation procedure or otherwise breaches the statute. The state agencies are empowered to delete areas sought in the permit application. They are further empowered to promulgate rules and regulations governing strip mine activities. In Appalachia where reclamation has proved difficult on steep slopes, statutes or regulatory agencies frequently limit the width of the bench or degree of the slope. Some statutes provide that permit fees, bond forfeitures, and perhaps a special reclamation fee will go into a special fund designated to reclaim past stripped lands.

§§ 517.750.990 (1974); PA. STAT. ANN. tit. 52 §§ 681.1 to .22, 1396.1 to .21, 1471-1476 (Supp. 1975); S.C. CODE ANN. §§ 63-711 to 732 (Supp. 1973); S.D. COMPILED LAWS ANN. §§ 45-6A-1 to 33 (Supp. 1974); TENN. CODE ANN. §§ 58-1501 to 1564 (Supp. 1974); TEX. REV. CIV. STAT. ANN. art. 5928-10 (Supp. 1976); VA. CODE ANN. §§ 45.1-180 to 220 (Supp. 1974); WASH. REV. CODE ANN. §§ 78.44.010 to 930 (Supp. 1973); W. VA. CODE ANN. §§ 20-6-1 to 6-32 (1970); WYO. STAT. § 35-502.1 to 502.56 (Supp. 1975).

82. *See, e.g.*, Bureau of Mines of Maryland v. George's Creek Coal and Land Co., 272 Md. 143, 321 A.2d 748 (Ct. App. 1974); Dufour v. Maizw, 385 Pa. 309, 56 A.2d 675 (1948).

The overall history of state regulation has been one of successively stronger regulations. Initial attempts proved inadequate, but no state wanted to cripple the industry. Consequently, the goal was to pass the least restrictive measures that would maximize reclamation success. Inadequate regulation met with strengthening amendments as weaknesses became evident. For example, the Kentucky statute has been amended six times since its initial passage in 1954.[83] Colorado[84] and North Dakota [85] amended their statutes in 1973 while Montana[86] and Wyoming[87] enacted totally new statutes.

Western Statutes

Let us now take a detailed look at the strengths and weaknesses of the Western acts. It should initially be pointed out that Arizona presently lacks strip mine reclamation statutes.

1. North Dakota

In North Dakota a permit must be acquired for any surface mining operation.[88] The Commission shall publish notice of the permit application in the official county newspaper of the county where the proposed mining operation is located.[89] In addition notice must be given to the surface owner[90] whose consent to the mining must be obtained before the Commission may grant a permit.[91] The applicant must file a reclamation plan together with geologic, topographic and soil maps.[92]

The Commission is duty bound to designate certain areas as unminable. The statute provides:

83. KY. REV. STAT. §§ 350.010 to .990 (1972).
84. COLO. REV. STAT. §§ 34-32-101 to -118 (1973).
85. N. DAK. CENT. CODE §§ 38-14-02 to 13 (Supp. 1975) *amending* N.D. CENT. CODE §§ 38-14-01 to 13 (1960).
86. MONT. REV. CODES ANN. §§ 50-1034 to 1057 (Supp. 1975) *repealing* MONT. REV. CODES ANN. §§ 50-1001 to 1017 (1969).
87. WYO. STAT. ANN. §§ 35-502.1 to .56 (Supp. 1975).
88. N. DAK. CENT. CODE §§ 38-14-02(3) and 38-14-03 (Supp. 1975).
89. N. DAK. CENT. CODE § 38-14-02.1 (Supp. 1975).
90. N. DAK. CENT. CODE § 38-14-02.1 and 38-18-06(1) (Supp. 1975).
91. N. DAK. CENT. CODE § 38-18-06(2) and (3) (Supp. 1975).
92. N. DAK. CENT. CODE § 38-14-05(8) (Supp. 1975).

> The legislature finds that there may be certain areas in the state of North Dakota which are impossible to reclaim either by natural growth or by technological activity, and that if surface mining is conducted in these certain areas, such operations may naturally cause stream pollution, landslides, flooding, the permanent destruction of land for agricultural purposes without approved rehabilitation for other uses, the permanent destruction of consequential aesthetic values, the permanent destruction of consequential recreational areas and the future use of the area and surrounding areas, thereby destroying or impairing the health and property rights of others, and, in general, creating hazards dangerous to life and property so as to constitute an imminent and inordinate peril to the welfare of the state, and that such areas shall not be mined by the surface mining process.[93]

The Commission is thereby empowered, and indeed obligated, to deny a permit if the operation cannot be carried out consistent with the act's purpose, and must delete areas from a permit application if the operation constitutes a hazard to specified buildings or public lands.[94] No approval can be given if the operation will adversely affect a state, national or interstate park unless adequate screening and other approved measures are provided.[95] The Commission may delete areas where problems with the overburden will create substantial sedimentation, landslides, water pollution or permanent destruction of land for agricultural purposes without approved rehabilitation for other purposes.[96] Finally, if the Commission finds that ongoing surface mining operations are causing or will cause the conditions set forth in the citation above, it may order immediate cessation and take other action or make changes in the permit as it deems necessary.[97]

The bond shall equal $1,500 per acre, or more, if costs are determined to exceed $1,500 per acre. A forfeiture shall

93. N. DAK. CENT. CODE § 38-14-05.1 (Supp. 1975).
94. N. DAK. CENT. CODE § 38-14-05.1(4) (Supp. 1975). These include dwelling houses, public buildings, schools, churches, cemeteries, commercial or institutional buildings, public roads, streams, lakes or other public property.
95. N. DAK. CENT. CODE § 38-14-05.1(5) (Supp. 1975).
96. N. DAK. CENT. CODE § 38-14-05.1(3) (Supp. 1975).
97. N. DAK. CENT. CODE § 38-14-05.1(6) (Supp. 1975).

satisfy in full all obligations of the operator to reclaim the land.[98] While the amount may often seem low, any operator refusing or willfully failing to comply with the statute is ineligible for future permits and must cease all mining operations within 30 days.[99]

The statute sets forth specific reclamation steps, including regrading the area to approximately original contour or rolling topography unless a different topography shall be required for an intended higher use; spreading of topsoil or approved surface material within the permit area over the regraded area to a depth of five feet if available; the impounding, drainage control or treatment of runoff water to reduce erosion, damage to agricultural lands and pollution; final cuts and endwalls must be backsloped to an angle not exceeding 35 per cent from the horizontal; refuse shall be buried or removed; and annual filings of maps showing affected areas are required during the permit period.[100]

The reclamation plan and Commission's approval of it shall be based upon the advice and technical assistance of various state environmental agencies.[101] Significantly, the operator and Commission shall have the landowner designate his preference for a reclamation plan covering his affected land.[102] While three years is set forth as the target guideline for successful completion of reclamation, extensions of time may be granted.[103] At the end of five years the Commission may extend the bond or order its forfeiture.[104] Any fees

98. N. DAK. CENT. CODE § 38-14-07 (Supp. 1975). One qualification to the general statement must be noted. In the case of inadequately reclaimed land, if the mineral developer does not own the surface estate, the recently enacted Surface Owner Protection Act would appear to make the mineral developer liable for all reclamation costs even if they exceed the bond. N. DAK. CENT. CODE § 34-18-08 (Supp. 1975). Additionally, when the mineral developer does own the surface estate, the bond may be partially returned upon forfeiture if certain statutorily prescribed requirements have been met. N. DAK. CENT. CODE § 38-14-07 (Supp. 1975).

99. N. DAK. CENT. CODE § 38-14-07 (Supp. 1975).

100. N. DAK. CENT. CODE § 38-14-05 (Supp. 1975).

101. These include the state soil conservation committee, game and fish department, state forester and other agencies or individuals. N. DAK. CENT. CODE § 38-14-05(8) (Supp. 1975).

102. N. DAK. CENT. CODE § 38-14-05(8) (Supp. 1975).

103. N. DAK. CENT. CODE § 38-14-05(10) (Supp. 1975).

104. N. DAK. CENT. CODE § 38-14-05(10) (Supp. 1975).

and forfeited bonds go into a special strip-mine reclamation fund.[105]

The Commission is empowered to seek injunctive relief, without bond or other undertaking, against any operator mining without a permit or otherwise in violation of the act or rules and regulations promulgated thereunder.[106] Before requesting forfeiture of the bond, the Commission must give written notice to the operator of violations. Ninety days are then provided the operator to institute approved corrective measures or reach agreement with the Commission. Failure to do so entitles the Commission to commence proceedings to forfeit the bond.[107] The statute grants standing to private citizens.[108] However, it does not cover adjoining surface disruptions or exploratory activities. One major weakness of the act is its inadequate protection of water rights. The Commission has the power to delete areas where water pollution or sedimentation occurs, but it is not obligated to take such action against ongoing activities.[109]

2. South Dakota

By way of comparison with the moderately tough North Dakota act, the South Dakota statute is exceedingly weak. Although a bond must be posted sufficient to cover reclamation costs as determined by the Commission, no minimum or maximum amount is specified.[110] Nor is a time period provided for its duration. No explicit power is granted the administrative agency to delete areas for which an application for a permit to mine is made. No protection is afforded water rights, and no standing is granted private citizens.

Prior to commencement of strip mining, the operator has to submit to the State Conservation Commission a plan which, in the Commission's discretion, may include the depth and direction of the proposed operation, the proposed disposition

105. N. DAK. CENT. CODE § 38-14-08 (Supp. 1975).
106. N. DAK. CENT. CODE § 38-14-12 (Supp. 1975).
107. N. DAK. CENT. CODE § 38-14-07 (Supp. 1975).
108. N. DAK. CENT. CODE § 38-14-08.1 (Supp. 1975).
109. N. DAK. CENT. CODE § 38-14-05.1 (Supp. 1975).
110. S. DAK. COMPILED LAWS ANN. § 45-6A-12 (Supp. 1976).

of boulders and tailings, and provisions for the stripping, storage, and, if required, the replacement of the overburden and topsoil. Thus, the state does not require any detailed baseline studies in advance.[111] In addition, this section is the only statutory provision covering the "duties" of the operator to reclaim the land.

In 1975 the Legislature amended the act by adding a new section, which grants authority to the Commission to promulgate rules for designating lands as unsuitable for strip mining. The governing criteria are quite specific,[112] and go a long ways toward protecting the physical environment of South Dakota.

Provision was also made in 1975 for the regulation of mineral exploration involving the use of heavy equipment.[113] The act covers adjacent areas,[114] and the agency is empowered to require replacement of overburden and topsoil.[115] An on-site investigation is required by the agency prior to issuance of a permit and the determination of the amount of the bond. The permit is renewable annually,[116] and may be suspended or revoked for violation of the act.[117] Finally, fees and other funds collected are placed in a special reclamation fund.[118]

3. Colorado

Colorado has acquired a reputation in recent years for environmental awareness, but its strip mining statute does

111. S. DAK. COMPILED LAWS ANN. § 45-6A-17 (Supp. 1976).
112. The criteria for designating lands as unsuitable for surface mining are:
(1) Reclamation is not "physically or economically feasible";
(2) The operation is "reasonably certain to create a hazard to a dwelling house, public building, school, church, cemetery, commercial or institutional building, public road, stream, lake or other public property;"
(3) The overburden is reasonably certain to create a sedimentation, landslide or water pollution problem;
(4) Rare species of wildlife would be jeopardized by loss of the land;
(5) The operation could cause an adverse reaction of unpredictable scope to the total ecosystem;
(6) The land posssses unique characteristics;
(7) The operation would be incompatible with public plans for land development; or
(8) It is reasonably certain to result in the loss or reduction of long-range productivity of watershed lands, aquifer recharge areas, and significant agricultural areas. S. DAK. COMPILED LAWS ANN. § 45-6A-9.1 (Supp. 1976).
113. S. DAK. COMPILED LAWS ANN. §§ 45-6A-6.1 to 6.4 (Supp. 1976).
114. S. DAK. COMPILED LAWS ANN. § 45-6A-2(1) (Supp. 1976).
115. S. DAK. COMPILED LAWS ANN. § 45-6A-17 (Supp. 1976).
116. S. DAK. COMPILED LAWS ANN. § 45-6A-8 (Supp. 1976).
117. S. DAK. COMPILED LAWS ANN. § 45-6A-23 (Supp. 1976).
118. S. DAK. COMPILED LAWS ANN. § 45-6A-28 (Supp. 1976).

not live up to this reputation. The 1973 Colorado Open Mining Land Reclamation Act[119] regulates limestone, sand, gravel and quarry mines as well as coal operations.[120] It sets out the standard permit—bond—reclamation plan format.

A Land Reclamation Board is created as a part of the Division of Mines in the Department of Natural Resources.[121] Among its duties are a continuing review of the problem of open mining and land reclamation in the state, and the development of standards for land reclamation plans.[122]

The permit application must include baseline studies, including topography, soil distribution and vegetation,[123] but does not protect water rights. However, the applicant must show that the operation will not adversely affect the stability of any man-made structure on the area of the affected land and within 200 feet of all boundaries of the area, thereby protecting subjacent and lateral support.[124]

A reclamation plan must be filed annually.[125] Grading is required, the major objective of which will be "an even or gently undulating skyline".[126] The operator makes the initial determination, subject to the Board's approval, of the post-mining land use. Before making a decision, the Board must consult with local officials. The statute sets forth standards if the choice is either forest planting, range land or agricultural or hortcultural crops.[127]

Where reclamation cannot be completed in ten years, the operator may be discharged from liability by undertaking to reclaim an equal number of acres of past mined land.[128] Acid forming materials in the exposed face of a mineral seam that has been mined must be covered to a depth

119. COLO. REV. CODE § 34-43-101 *et. seq.* (1973).
120. COLO. REV. CODE § 34-32-103(5) (1973).
121. COLO. REV. CODE § 34-32-105 (1973).
122. COLO. REV. CODE § 34-32-106 (1973).
123. COLO. REV. CODE § 34-32-110(3)(g)-(i) (1973).
124. COLO. REV. CODE § 34-32-110(5)(b) (1973).
125. COLO. REV. CODE § 34-32-111(1)(a) (1973).
126. COLO. REV. CODE § 34-32-111(1)(b) (1973).
127. COLO. REV. CODE § 34-32-111(1)(f)-(k) (1973).
128. COLO. REV. CODE § 34-32-111(1)(m) (II) (1973).

which will protect the drainage system from pollution, unless covered with water to a depth of not less than four feet.[129]

The Colorado Act bars the Department of Natural Resources from issuing a permit which would violate city, town, county, or city and county zoning or subdivision regulations. In other respects, the Act preempts other state or local jurisdiction.[130] An operator who is in violation of the statute's provisions is ineligible for a new permit.[131] The amount of the bond is discretionary with the Land Reclamation Board, being in such amount

> . . . as the board deems necessary to insure the performance of the duties of the operator under this article with respect to the affected land.[132]

Several major weaknesses are present with the Colorado Act. First, it makes no attempt to protect water resources, aside from acid drainage and sedimentation control. Secondly, the Act's provisions are generally vague and highly discretionary. However the main weakness is that it sets forth no standards for deleting areas sought to be mined, such as land which cannot be reclaimed. Indeed, the standard set forth is that the Board shall issue a permit if:

> The method of operation, physical appearance, and time-table are reasonable in view of the public interest in physically attractive surroundings and completion of the operation as soon as practicable.[133]

4. New Mexico and Idaho

New Mexico and Idaho also have permit systems, but their bonding requirements are weak. A bond in New Mexico is discretionary, being required "Whenever the commission finds it necessary to ensure compliance with the . . . [Act] or any regulation or mining plan requirement."[134]

129. COLO. REV. CODE § 34-32-111(1)(d) (1973).
130. COLO. REV. CODE § 34-32-109(1) (Supp. 1975).
131. COLO. REV. CODE § 34-32-115 (1973).
132. COLO. REV. CODE § 34-32-112(1) (1973).
133. COLO. REV. CODE § 34-32-110(5)(a) (1973).
134. N. MEX. STAT. ANN. § 63-45-18(A) (1974).

The bond should be in an amount sufficient to ensure compliance, and would extend for the life of the operation unless suspended or revoked. The Idaho bond cannot exceed $500 per acre and forfeiture of it shall satisfy all obligations of the operator to reclaim the land.[135] Neither statute contains a ban against future permits upon forfeiture or noncompliance.

Under the New Mexico statute, a mining plan must be submitted with the application. This plan must include a detailed proposal and schedule for grading and revegetation, an estimate of any water to be used, and any resulting pollution to water.[136] The Idaho permit application requires detailed maps of the site and affected area, including waterways, roads and drainage. A reclamation plan must be filed for approval.[137] A map must be filed annually in New Mexico throughout the life of the operation.[138] Both statutes fall short of requiring the detailed baseline studies that are needed.

Reclamation is an integral part of the mining operation in New Mexico, and should be completed within reasonably prescribed time limit.[139] The New Mexico Coal Surface Mining Commission regulations shall govern regrading and revegetation. Its rules regulating productive reclamation must cover grading, revegetation, time schedules and other mining plan provisions.[140]

The Idaho Board of Land Commissioners' power to set reasonable regulations cannot be exercised to set standards which exceed those specified in the Idaho statute.[141] The Idaho statute sets forth detailed reclamation steps, including the leveling of ridges and peaks, revegetation, and the treatment of overburden piles to control erosion.[142] Vegetation must be comparable to that growing on the area prior to the

135. IDAHO CODE § 47-1512(a) (Supp. 1975).
136. N. MEX. STAT. ANN. § 64-45-9(6)-(8) (1974).
137. IDAHO CODE § 47-1506(a) and (b) (Supp. 1975).
138. N. MEX. STAT. ANN. § 63-34-16 (1974).
139. N. MEX. STAT. ANN. § 64-45-8(B) (1974).
140. N. MEX. STAT. ANN. § 64-45-10 (1974).
141. IDAHO CODE § 47-1606(a)(3) (Supp. 1975).
142. IDAHO CODE § 47-1509 to 1510 (Supp. 1975).

exploration or surface mining.[143] However, planting is not required where it would not be practicable or reasonable because the soil is composed of sand, gravel, shale, stones or other materials that would prohibit plant growth.[144] Reclamation is to commence within one year after cessation of mining operations, or one year after termination of a pit or mine panel.[145]

In acting upon proposed mining plans in New Mexico, and in adopting regulations, the state Commission must consider the pre-mining conditions of the land, the future productivity of the affected area, the peculiar condition of the geographical area where the mine is located and the technical and economic practicability of each particular revegetation and grading requirement.[146] The last requirement may detract from the possibility of full reclamation, especially in areas where reclamation is impossible or extremely difficult. Neither the New Mexico nor Idaho statutes ban strip mining in areas where reclamation is impossible or elsewhere, such as parks. Neither Colorado, New Mexico nor Idaho require soil stratification, or at least, preservation of the topsoil.

Although anyone aggrieved by a decision of the New Mexico Commission may appeal to a court of appeals, the court may reverse only if, in words all too familiar to administrative law students, the decision was arbitrary, capricious or an abuse of discretion, not supported by substantial evidence in the record, or otherwise not in accordance with the law.[147]

5. Utah

Utah is in the perhaps unique role of actively courting large energy development projects. It has passed statutes designed to ameliorate the boom-town syndrome. . It has also recently enacted the Utah Mined Land Reclamation Act of 1975.

143. IDAHO CODE § 47-1510(a) (Supp. 1975).
144. IDAHO CODE § 47-1510(b) (Supp. 1975).
145. IDAHO CODE § 47-1511 (Supp. 1975).
146. N. MEX. STAT. ANN. § 64-34-10(c) (1974).
147. N. MEX. STAT. ANN. § 63-34-12(C) (1974).

Regretfully, this statute must be considered the weakest of the Western statutes.[148] All mining shall include reclamation plans, but reclamation is defined vaguely as actions "to shape, stabilize, revegetate, or otherwise treat the land affected in order to achieve a safe, stable, ecological condition and use which will be consistent with local environmental conditions."[149] The act does cover on-site peripheral development,[150] but excludes off-site operations or transportation.[151]

With an eye to the future, the act allows the state agency to issue rules and regulations which will comply with federal or local laws or regulations.[152] The power to issue rules and regulations is quite broad,[153] but the agency is not granted the power to delete lands. The statute sets forth as objectives the restoration of the land to a stable ecological condition and the prevention or minimization of on-site and off-site environmental degradations to the ecologic and hydrologic regimes.[154]

The act, however, is notable for what it does not do. It does not set aside lands as unsuitable for mining and does not explicitly protect water resources. It does not provide for detailed baseline studies. Indeed, it does not contain quantifiable standards, leaving almost everything to the discretion of the agency. Even the boundary requirement is ambigiously weak. Finally, the agency shall set the bond in a fixed amount as required at any point to complete reclamation to an acceptable standard. In case of default the bond can only be used to reclaim the land with any residual amount being returned to the claimant.[155]

6. Wyoming and Montana

The recent Wyoming and Montana enactments are certainly among the strongest in the nation. Both statutes cover

148. UTAH CODE ANN. § 40-8-3 (Supp. 1975).
149. UTAH CODE ANN. § 42-8-4(7) (Supp. 1975).
150. UTAH CODE ANN. § 40-8-4(4) (Supp. 1975).
151. UTAH CODE ANN. § 50-8-4(4) and (8) (Supp. 1975).
152. UTAH CODE ANN. § 40-8-5(2) (Supp. 1975).
153. UTAH CODE ANN. § 40-8-6 (Supp. 1975).
154. UTAH CODE ANN. § 50-9-12(1) (Supp. 1975).
155. UTAH CODE ANN. § 40-9-14(b) (Supp. 1975).

exploratory acts as well as access roads and railroads.[156] Both ban strip mining on areas of unique value.[157] The Montana statute defines lands as having these characteristics if, *inter alia*, the land is of such unique ecological fragility that it could not return to its former ecological role in the reasonably foreseeable future, or is of such ecological importance in that it has such strong influence on the total ecosystem of which it is a part that even temporary effects felt by it could precipitate a system-wide reaction of unpredictable scope or dimensions.[158] Both require detailed plans, studies and maps to be filed.[159] Both provide compensation for loss of water, thereby protecting water rights.[160] Both require disclosure of the operator's past record in the permit application.[161] They require annual reports from the operator and annual inspections.[162] Both grant standing to private citizens,[163] although Montana's is more explicit in that respect.[164] In Montana the permit must be renewed annually,[165] while the Wyoming permit lasts for the lifetime of the operation conditioned upon compliance with the act, rules and regulations.[166]

The Wyoming Act requires that applications for a mining permit for minerals owned separately from the surface estate be accompanied by the surface owner's consent.[167] If this consent is unobtainable and the surface owner does not

156. MONT. REV. CODES ANN. § 50-1041 and 50-1036(5) (Supp. 1975); WYO. STAT. §§ 35-502.30 to 502.31 and 35-502.24(b)(v) (Supp. 1975).

157. WYO. STAT. § 35-502.24(g)(iv) (Supp. 1975).

158. MONT. REV. CODES ANN. § 50-1042(2) (Supp. 1975).

159. MONT. REV. CODES ANN. § 50-1039 (Supp. 1975); WYO. STAT. §§ 35-502.24 (a)(vii)-(ix) and (b)(1) (Supp. 1975).

160. WYO. STAT. § 35-502.33(b) (Supp. 1975); MONT. REV. CODES ANN. § 50-1055(3) (Supp. 1975).

161. MONT. REV. CODES ANN. § 50-1039(g) (Supp. 1975); WYO. STAT. §§ 35-502.24(a)(iii) (Supp. 1975).

162. MONT. REV. CODES ANN. § 50-1049 (Supp. 1975); WYO. STAT. § 35-502.28 (Supp. 1975).

163. WYO. STAT. § 35-502.24(f) (Supp. 1975). There is talk that the rules and regulations to be issued under Wyoming's act will limit standing to those having an economic interest. Brimmer, *Wyoming Environmental Quality Act*, 7 NAT. RES. L. 33, 34 (1974). However, this would be contrary to the test promulgated in Sierra Club v. Morton, 405 U.S. 727, 731-41 (1972).

164. MONT. REV. CODES ANN. §§ 50-1055 and 50-1043(1) (Supp. 1975).

165. MONT. REV. CODES ANN. § 50-1039(1) (Supp. 1975).

166. WYO. STAT. § 35-502.23 (Supp. 1975).

167. WYO. STAT. § 35-502.24(b)(x) (Supp. 1975).

qualify as a "resident or agricultural landowner",[168] the Environmental Quality Council is empowered to issue the permit if it finds that the mining operations will not "substantially" prohibit the operations of the surface owners.[169] The Montana Act requires the surface owner's consent to nearly all mining activities.[170] Written consent is not required where the operations are expressly authorized in a valid prospecting permit, mineral lease or other agreement.[171] Nor would such consent seem necessary for land where the mineral estate is owned by the federal government.[172]

Montana provides for a flexible bond amount of $200 to $2,500 per acre with a minimum total bond of $2,000.[173] In Montana the bond cannot be less than the estimated cost to the state of rehabilitating the land[174] while in Wyoming it is the amount determined to ensure rehabilitation but, in no case, less than $200 per acre, or $10,000 total bond.[175] It is too early to determine if these standards are merely sementical differences.

In the case of forfeitures and violations of the statute, Wyoming automatically disqualifies the operator from subsequent permits[176] while in Montana denial is based upon the costs incurred by the state in reclaiming the land for which the bond was posted.[177] Montana permits only area stripping,[178] and requires deletion from the permit of those areas if water rights would be affected by the stripping. Such deletions are discretionary in Wyoming.

168. *See* WYO. STAT. § 35-502.24(b)(xi) (Supp. 1975). The relative rights of the "resident or agricultural landowner" and the non-resident or non-agricultural landowner are discussed more adequately elsewhere. *See* the text accompanying footnote 47 of Alfers, *Accommodation or Preemption? State and Federal Control of Private Coal Lands in Wyoming*, 12 LAND & WATER L. REV. 73, 75 (1977).
169. WYO. STAT. § 35-502.24(b)(xii) (Supp. 1975).
170. MONT. REV. CODES ANN. §§ 50-1301 to 1306 (Supp. 1975).
171. MONT. REV. CODES ANN. § 50-1305 (Supp. 1975).
172. *See* MONT. REV. CODES ANN § 50- 1039.1 (Supp. 1975). In this respect, the Montana surface owner's veto would seem more limited than that of his Wyoming counterpart.
173. MONT. REV. CODES ANN. § 50-1039(5) (Supp. 1975).
174. MONT. REV. CODES ANN. § 50-1039(g) (Supp. 1975).
175. WYO. STAT. § 35-502.34(c)(xvi) (Supp. 1975).
176. WYO. STAT. § 35-502.24(g)(vi) (Supp. 1975).
177. MONT. REV. CODES ANN. § 50-1050(2) (Supp. 1975).
178. MONT. REV. CODES ANN. § 50-1044 (Supp. 1975).

Interestingly, the Wyoming Act does not contain specific reclamation provisions, but rather general standards against which the specific performance requirements in the rules and regulations, such as slope bases and minimum vegetative cover, may be tested.[179] In drafting its rules the agency shall consider the potential for adverse environmental impact, the highest previous use of the affected land, the earliest possible reclamation time-table consistent with the orderly and economic development of mining property, and the stockpiling and re-use of topsoil if possible.[180] The operator must obtain either consent from the surface owner, or, in certain cases, an order from the Environmental Quality Council, in lieu of consent. Such an order may be issued only if the surface owner is a non-resident and non-agricultural landowner and the mineral owner's use does not "substantially prohibit the operations of the surface owner," and the operator posts a bond to protect the surface owner.[181]

Wyoming and Montana require newspaper publication of the proposed mining operation.[182] In Montana public notice and an opportunity for a hearing must be provided prior to release of a bond. However, the full bond cannot be released prior to five years after the initial planting.[183] Under the Wyoming Act up to 75 per cent of the bond may be released upon completion of the reclamation plan after cessation of mining,[184] however, at least $10,000 must be held for five years unless the operator obtains a written release from the surface owner, and administrative approval after an on-site inspection shows successful completion of the reclamation project.[185]

The conclusion to be drawn from the analysis is that most western state statutes fail to provide adequate protection of the present environmental quality of the region from

179. WYO. STAT. § 35-502.21 (Supp. 1975).
180. WYO. STAT. §§ 35-502.20(e) and 35.502.21(a)(v) (Supp. 1975).
181. WYO. STAT. § 35-502.33(a) (Supp. 1975).
182. WYO. STAT. § 35-502.24(e) (Supp. 1975); MONT. REV. CODES ANN. § 50-1039(k) (Supp. 1975).
183. MONT. REV. CODES ANN. § 50-1047(3) (Supp. 1975).
184. WYO. STAT. § 35-502.34(d) (Supp. 1975).
185. WYO. STAT. § 35-502.40(b) and (c) (Supp. 1975).

the dangers of careless strip mining and irresponsible reclamation. Although some states do have alternative means of forcing the coal mining industry to internalize the external social costs which are imposed by strip mining,[186] the reclamation standards themselves are unacceptably weak.

With recognition of this situation, the importance of the federal regulatory system becomes apparent.

FEDERAL REGULATION

In light of the present status of federal strip mining regulation, as discussed below, the analysis of the federal regulatory system is of importance in each of two ways. First, the existing regulations and recent Congressional action suggest a foundation for the establishment of federal minimum standards for all strip mining reclamation—a move which this author advocates.

186. Recognizing that regulation by itself will not solve all of the socio-ecological effects of strip mining, Kentucky, Ohio, and Montana have enacted severance taxes on coal. New Mexico has enacted a tax on all electricity sales within the state and has extended its oil and gas conservation tax to all other energy resources "secured from the soil of New Mexico." NEW MEXICO STAT. ANN. § 72-34-1 *et. seq.* (Supp. 1975). Montana has added to its 5% gross proceeds tax a tax of up to 30% (20% for low-grade lignite) on the selling price of strip mined coal valued at the mine. MONT. REV. CODES ANN. §§ 83-1312 to 1417 (Supp. 1975). The revenue collected has been earmarked for a number of specific funds, including a local impact fund, thereby internalizing some of the costs of strip mining. Although Utah has not enacted statutes to internalize these costs, it has enacted measures to economically prepare for the boom-town syndrome by creating special service districts funded through issuance of tax-exempt bonds. UTAH CODE ANN. §§ 11-23-1 to 29 (Supp. 1975). Utah also allows any person involved in development or utilization of natural resources to prepay all or part of anticipated sales and use taxes, the funds thereby collected to be used for financing public improvements.

Some states have indirectly forced consideration of the socio-ecological costs associated with strip mining by means of power plant siting laws. The western states which have enacted power plant siting statutes are Arizona, California, Montana, Nevada, New Mexico, Oregon, Washington, and Wyoming. Those states which have facilitated licensing by providing one-stop, pre-construction licensing prcoedures have insured that clashes between ecological and economic interests will be solved before extensive planning and actual construction of power plants begin. If the appropriate agency denies a permit for a power plant, it is probable that plans for development of the adjoining strippable coal deposits will be abandoned.

These state statutes provide a forum for resolving conflicts. But they also provide a forum for delaying tactics and red-tape. Under the circumstances, utilities contemplating the construction of additional facilities may "forum shop" to states, who are openly hospitable to new energy facilities, and lack these detailed siting statutes and have weak strip mining statutes. If so, federal air quality standards will act as the major restraint on an unhealthy concentration of such facilities in any given geographical area.

Secondly, the federal regulations should be noted for their current significance with respect to federal lands. The main weakness of western efforts to control the land use problems occasioned by rapid energy development is a factor over which they currently have no control; a large amount of the coal to be strip mined in the West comes from federal lands, or lands over which the federal government has preemptive jurisdiction such as Indian lands. The Interior Department estimates that 175.8 million tons of coal must be produced annually from federal leased lands in the West by the year 2000.[187] Existing federal reclamation and enforcement policies were grossly inadequate. A moratorium on additional leasing of federal coal lands has just ended.

Because of the large amount of coal to come from federal lands, and the interaction private energy projects will have with private lands, federal policies are critical.

The Compromise Model: H.R. 25

1. General

After several years of study, and at times acrimonious debate, Congress passed a federal surface mining measure during the final days of the 93rd Congress.[188] The bill, S.425, received a pocket veto by President Ford.[189] One of the first priorities of the new Congress was surface mining. Congress passed H.R. 25,[190] which was vetoed by President Ford. Con-

187. Denver Post, May 29, 1974, at 28, col. 1. The Interior Department estimates for strip mine production from federal coal lands show the following:

State	Year 1975	2000
Colorado	4,300,000	16,000,000
Montana	6,000,000	20,000,000
New Mexico	1,100,000	15,000,000
North Dakota	3,000,000	20,000,000
Utah	3,000,000	30,000,000
Wyoming	18,900,000	70,000,000

Denver Post, May 19, 1974, at 31, col. 1.
Indeed, because of 200 years of mining laws and scattered ownership patterns, it is estimated that the Federal Government influences the development of 80% of all western coal resources. U.S. DEPT. OF INTERIOR, FINAL ENVIRONMENTAL IMPACT STATEMENT: PROPOSED FEDERAL COAL LEASING PROGRAM 1-7 (1975).

188. 212 Cong. Rec. H 11321 (Daily ed. Dec. 5, 1974).

189. Bus. Week, Jan. 13, 1975, at 40.

190. H.R. 25, 94th Cong., 1st Sess., 121 Cong. Rec. S. 7423 (Daily ed. May 5, 1975).

gress failed to override the veto by three votes on June 10, 1975.[191]

Although H.R. 25 has thereby failed enactment, it is currently relevant for several reasons. First, it represents the first major effort by Congress to extend federal control over a critical environmental area hitherto reserved to the states. Secondly, it represents the current consensus of Congress on the shape of federal regulation, and will probably serve as the cornerstone of future Congressional action. Federal surface mining legislation has gained increasing Congressional support in recent years, and momentum has been building for some form of meaningful Congressional action. In the interim, the Interior Department has issued regulations for federal lands. These regulations substantially incorporate provisions of the vetoed act.[192]

2. State Duties

H.R. 25 is dividable into four separate parts: preplanning, mining practices, post-mining reclamation and the protection of water resources. To a large extent the new federal regulatory scheme parallels existing state patterns. A permit must be obtained from the proper regulatory agency,[193] reclamation plan filed[194] and liability bond posted.[195] Primary regulatory and enforcement responsibilities rest with the states, but they must meet minimal standards established by the Act and the Secretary of the Interior. The Secretary was given six months after enactment to issue the necessary regulations.[196] An office of Surface Mining Reclamation and Enforcement would be established in the Department of Interior.[197] The Secretary would act through this office as provided in the Act.[198]

The state law must meet the minimal federal standards, provide sanctions for violations of state laws, regulations or

191. 121 CONG. REC. H. 5205 (daily ed. June 10, 1975).
192. 41 FED. REG. 20252 *et seq.* (1976).
193. H.R. 25, 94th Cong. 1st Sess., at § 506(a) (1975).
194. H.R. 25, 94th Cong. 1st Sess., at §§ 507(d) and 508 (1975).
195. H.R. 25, 94th Cong. 1st Sess., at § 507(c) (1975).
196. H.R. 25, 94th Cong. 1st Sess., at § 501 (1975).
197. H.R. 25, 94th Cong. 1st Sess., § 201(a) (1975).
198. H.R. 25, 94th Cong. 1st Sess., § 201(c) (1975).

permit conditions, including civil and criminal actions, bond forfeitures, suspensions, revocations and withholding of permits and issuance of cease and desist orders.[199] One perhaps critical Congressional restraint was that the states must provide sufficient funding and qualified personnel to regulate coal mining and reclamation in accordance with the Act's requirements.[200] Indeed, the Secretary could not legally approve the state program unless he found that the state possessed the legal authority and qualified personnel necessary for the enforcement of the environmental protection standards.[201]

States were empowered to issue more stringent land use and environmental controls than prescribed under the federal standards.[202] Preemption existed only when the two are in direct conflict.[203] Theoretically, a state could thereby constitutionally ban strip mining altogether.

States were granted eighteen months to submit programs to the Secretary for approval.[204] Pending approval, all surface mines were required to comply with an abbreviated list of environmental standards.[205] The Secretary had 4½ months to implement a federal enforcement program which would remain in effect until a state program was approved or federal program implemented.[206] Should a state fail to submit an approved plan, or implement, enforce or maintain it, the Secretary must issue a federal plan for the state. In any event the Secretary was to issue a federal plan covering federal lands in a state. When an approved state plan existed for the state, the federal plan for federal lands in the state had to meet at the minimum the requirements of the state plan. In establishing a federal plan for a State, the

199. H.R. 25, 94th Cong. 1st Sess., § 503(a)(2) (1975).
200. H.R. 25, 94th Cong. 1st Sess., § 503(a)(3) (1975).
201. H.R. 25, 94th Cong. 1st Sess., § 503(b)(4) (1975).
202. H.R. 25, 94th Cong. 1st Sess., § 505(b) (1975).
203. H.R. 25, 94th Cong. 1st Sess., § 505(a) (1975).
204. H.R. 25, 94th Cong. 1st Sess., § 503(a) (1975).
205. These include post-mining land use objectives, regrading to approximately original contours, steep slope requirements including limitations on spoils placements on downslopes, segregation and preservation of topsoil, protection of the hydrologic balance, and revegetation. H.R. 25, 94th Cong. 1st Sess., § 502(c) (1976).
206. H.R. 25, 94th Cong. 1st Sess., § 502(f) (1975).

Secretary must consider the nature of the state's terrain, climate, biological, chemical and other relevant physical conditions.

Within 135 days after enactment, preexisting operations subject to state permits must meet certain requirements under the federal act; if the overburden and coal seams have not yet been removed.[207] All existing operators must apply for a permit within 20 months after enactment to cover those lands to be mined after approval of a State program.[208]

If a state is not enforcing a part of its program,[209] the Secretary may provide for federal enforcement of that part of the program. This provision afforded the Secretary some form of continuing overview of the state's program, the dimensions of which are not only unknown, but will necessarily be discretionary with the Secretary. It does not take much of a crystal ball to forsee litigation arising on this point.

The state plans must establish a process for designating areas as unsuitable for mining.[210] In general, where reclamation pursuant to the act is unfeasible, designation is mandatory[211] but would not be retroactive if substantial legal and financial commitments existed prior to September 1, 1974.[212] The state was granted discretionary authority to declare certain areas unsuitable for surface mining if the mining operation would be incompatible with existing land use plans or programs, affect fragile or historic lands, affect renewable resource lands or natural hazard lands, such as floodplains or areas of unstable geology.[213]

New strip mining operations were banned on lands within the National Park System, National Wildlife Refuge System, National System of Trails, National Wilderness System, National Wild and Scenic River System, National Rec-

207. H.R. 25, 94th Cong. 1st Sess., § 502(c) (1975).
208. H.R. 25, 94th Cong. 1st Sess., § 502(e) (1975).
209. H.R. 25, 94th Cong. 1st Sess., § 504(b) (1975).
210. H.R. 25, 94th Cong. 1st Sess., § 503(a)(5) (1975).
211. In general, *see* H.R. 25, 94th Cong. 1st Sess. § 522(a)(2)(c) (1975).
212. H.R. 25, 94th Cong. 1st Sess., § 522(a)(6) (1975).
213. H.R. 25, 94th Cong. 1st Sess., § 522(a)(3) (1975).

reation Areas and National Forests, but not the national grasslands.[214]

3. Permits and Planning

A permit must be established from the proper authority —be it state or federal.[215] The permit application must disclose several facts,[216] including the applicant's past history, any suspension, revocation or bond forfeiture since 1960 must be disclosed.[217] Permits would also be required for coal exploration operations which substantially disturb the natural land surface.[218]

The application must disclose the anticipated on-site and off-site hydrologic effects of the operation,[219] topographic and geologic data,[220] and test results.[221] The applicant must provide, if requested by the proper regulatory officials, the climatological factors peculiar to the area, including the average seasonal precipitation, average direction and velocity of prevailing winds, and the seasonal temperature ranges.[222] In short, detailed baseline studies of the proposed operation must be filed. A permit could not be issued unless the statute and approved program have been complied with and reclamation could be accomplished.

Permits were not to exceed five years in duration, and were nontransferable.[223] A permit would lapse unless the mining and reclamation operations commenced within three years of issuance.[224] Permits were renewable subject to specified conditions being met, the gist of which amounted to full performance and compliance with the Act's standards.[225]

214. H.R. 25, 94th Cong. 1st Sess., § 522(e)(1) (1975).
215. H.R. 25, 94th Cong. 1st Sess., § 503(a)(4) (1975).
216. In general, *see* H.R. 25, 94th Cong. 1st Sess., § 507(b) (1975).
217. H.R. 25, 94th Cong. 1st Sess., § 507(b)(5) (1975).
218. H.R. 25, 94th Cong. 1st Sess., § 521(a) (1975).
219. H.R. 25, 94th Cong. 1st Sess., § 507(b)(11) (1975).
220. H.R. 25, 94th Cong. 1st Sess., § 507(b)(13)-(14) (1975).
221. H.R. 25, 94th Cong. 1st Sess., § 507(b)(15) (1975).
222. H.R. 25, 94th Cong. 1st Sess., § 507(b)(12) (1975).
223. H.R. 25, 94th Cong. 1st Sess., § 506(b) (1975).
224. However, when coal was to be mined for a synthetic fuel facility, initiation of the facility's construction would constitute the date as of which mining would be considered to have commenced. H.R. 25, 94th Cong. 1st Sess., § 506(c) (1975).
225. H.R. 25, 94th Cong. 1st Sess., § 506(d)(i) (1975).

The applicant had to provide proof of public advertisement in the locality of the proposed operation, and the regulatory agency was to notify concerned governmental agencies and bodies, such as planning agencies.[226] Public hearings had to be held prior to issuance of the permit if written objections were filed and a hearing requested.[227]

Permits would be accompanied by a fee, but unlike most state statutes, the fee was flexible, based nearly as possible upon the actual or anticipated cost of reviewing, administering and enforcing the permit.[228] A bond must be posted, sufficient in amount to assure the completion of the reclamation plan if it has to be performed by a third party, but for not less than $10,000.[229]

4. Mining Operation

Mining operation standards provide that mining methods minimize or obviate damage or injury to public health and safety. Restrictions were included on overburden, blasting, water pollution and waste disposal. The operator must avoid acid or other toxic mine drainage by a number of enumerated methods, including segregation of toxic materials, water treatment and sealing of holes.[230]

5. Reclamation

The third division generally required reclamation and restoration to pre-mining conditions. Reclamation meant restoration to approximately the original contours, and a condition at least fully capable of supporting the uses the land was capable of supporting prior to the mining, but variances were allowed for socially valuable uses of the post-mining site.[231] Operators were required to eliminate vertical cuts in mountainsides, depressions and spoil piles.[232] To further eliminate erosion and sedimentation, downslope

226. H.R. 25, 94th Cong. 1st Sess., § 513(a) (1975).
227. H.R. 25, 94th Cong. 1st Sess., § 513(b) (1975).
228. H.R. 25, 94th Cong. 1st Sess., § 507(a) (1975).
229. H.R. 25, 94th Cong. 1st Sess., § 509(a) (1975).
230. H.R. 25, 94th Cong. 1st Sess., § 515(b)(10)(A) (1975).
231. H.R. 25, 94th Cong. 1st Sess., § 515(b)(2)-(3) and 515(c) (1975).
232. H.R. 25, 94th Cong. 1st Sess., § 515(b)(3)-(4) (1975).

dumping of soil and mined materials in mountainous areas was banned.[233] Segregation and backfilling of topsoil were required.[234] Complete backfilling was required, and the returned spoil material had to maintain stability following mining and reclamation. Thus, many of the past abuses of contour mining were to be eliminated.

Water quality and quantity were to be restored and revegetation to pre-mining conditions was mandated. Reclamation efforts were to proceed in an environmentally sound manner, and as contemporaneously as practical with the mining operation.[235] The operator assumed the responsibility for successful revegetation for five years, except in areas receiving 26 inches or less of annual average precipitation. In these areas, which reflect the needs of the West, the specified period was ten years.

6. Water Rights

One of the major areas of disagreement in Congress over the past couple of years is the treatment to be accorded Western water rights. Both Congressional measures reflected the Western concern, however imperfectly. The major split in Congress developed over the proposed treatment of alluvial valley floors. These valleys are the major fertile areas in much of the West, and are essential for large-scale agricultural and ranching activities; they provide the only natural irrigation for hay and crop lands essential to farming and ranching operations.[236]

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233. H.R. 25, 94th Cong. 1st Sess., § 515(d) (1975). The actual statute applies to steep-slope mining, which is defined as slopes of 20° or more.
234. H.R. 25, 94th Cong. 1st Sess., § 522(e)(1)-(2) (1975). The exemption for national grasslands is interesting. The House version prohibited mining on national grasslands, such as the Thunder Basin National Grasslands in Wyoming. The ban would have hindered planned operations by Atlantic Richfield Co., Peabody Coal Co. and Kerr McGee Corp. The ban disappeared during the Conference Committee meetings reconciling differences on S.425. The grasslands represent some of the last remaining areas of native prairie lands. *See* Denver Post, Aug. 4, 1974, at 19, cols. 4-6.
235. H.R. 25, 94th Cong. 1st Sess., § 515(b)(16) (1975).
236. The alluvial valleys form the lush, sub-irrigated hay meadows where winter feed is produced. The National Academy of Sciences study recognized the value of alluvial valley floors, as follows:

> In the planning of any proposed mining and rehabilitation it is essential to stipulate that alluvial valley floors and stream channels be preserved. The unconsolidated alluvial deposits are highly susceptible to erosion, as evidenced by the erosional history of many

Both House bills originally contained an outright ban on strip mining in alluvial valley floors, but each time the ban disappeared in the Joint Conference Committee meetings. A substitute was passed, which banned surface mining operations which would have a substantial adverse effect on alluvial valley floors underlain by unconsolidated stream land deposits where farming or ranching operations are significantly or economically feasible.[237] The operator was obligated to preserve the essential hydrological functions of alluvial valley floors in the arid and semi-arid areas of the West.[238]

A permit would not be issuable unless the assessment of the probable cumulative impact of all anticipated mining in the area on the hydrologic balance was made, and the proposed operation was designed to prevent significant irreparabel offsite damage to the hydrologic balance.[239]

Other provisions also protected water quality and rights. The operator had to replace the water supply of a property owner who obtained all or part of his water for domestic, agricultural, industrial or other legitimate use from an underground or surface source affected by the mining.[240]

A zero siltation goal was established throughout the nation for run-offs from mining areas to nearby rivers.[241]

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western valleys which record several periods of trenching in the past several thousand years . . . .
Removal of alluvium from the thalweg of the valley not only lowers the water table, but also destroys the protective vegetation cover by draining soil moisture. Rehabilitation of trenched valley floors would be a long and expensive process, and in the interim these highly productive grazing areas would be in disuse.

NATIONAL ACADEMY OF SCIENCES REPORT, *supra* note 7, at 44-45.

237. H.R. 25, 94th Cong. 1st Sess., § 510(b)(5). The House version contained an outright ban on mining on alluvial valley floors.
The Joint Conference report interprets the compromise provision to cover "the inherent properties of alluvial valley floors controlling the availability of water under a wide range of natural conditions. Such properties include for instance: interaction between ground and surface water; varying degrees of permeability throughout the deposit; infiltration rates; flow direction and gradients; capability of accumulating, holding and releasing water through drought and seasonal cycles; stability with respect to storm or flood runoff conditions, and maintaining quality of water available to the agricultural uses." 121 CONG. REC. S.7445 (daily ed. May 5, 1975).
238. H.R. 25, 94th Cong. 1st Sess., § 517(a)(10)(F) (1975).
239. H.R. 25, 94th Cong. 1st Sess., § 510(b)(3) (1975).
240. H.R. 25, 94th Cong. 1st Sess., § 515(b)(10)(D) (1975).
241. H.R. 25, 94th Cong. 1st Sess., § 515(b)(10)(B) (1975).

Finally, the act would not affect any water rights recogoized under state law.[242]

7. Severed Mineral Interests

A highly controversial subject arising in recent years is what to do with the problem of severed mineral interests in the West. The Senate version of S.425 prohibited leasing of federal coal rights on lands not owned by the government.[243] The final version of both statutes contained a moratorium on further leasing without the surface owner's consent until February, 1976.[244] The Secretary was instructed to refrain from leasing the rights thereafter to the maximum extent possible.[245]

Consent of the surface owners would be required prior to leasing of the severed mineral interests,[246] but in such a way as to preclude speculation and unjust enrichment. The surface owner would be entitled to compensation based upon the market value of the land, costs of dislocation and relocation, loss of income and other value damages.[247] The owner was barred from receiving additional compensation to obtain his consent.[248]

It should be noted that this provision does not cover the problem of the broad form deed in eastern states, which is still or critical significance in Kentucky. This problem would still be one of existing common law.[249]

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242. H.R. 25, 94th Cong. 1st Sess., § 505(c) (1975).

243. S. 425, 94th Cong. 1st Cess., at § 612(b), 121 CONG. REC. S. 18901 (daily ed. Oct. 9, 1973).

244. However, this restriction would not apply if the Secretary has in his possession a document which demonstrates the acquiescence prior to February 27, 1975 of the owner of the surface rights to surface mining.

245. H.R. 25, 94th Cong. 1st Sess., § 714(o) (1975).

246. H.R. 25, 94th Cong. 1st Sess., § 714(a) (1975).

247. H.R. 25, 94th Cong. 1st Sess., § 714(d) (1975).

248. H.R. 25, 94th Cong. 1st Sess., § 714(e) (1975). In addition, for their restriction on leasing to be effective, the surface owner must for the preceding three years have to have had his principal place of residence on the land, or personally conduct farming or ranching operations upon a farm or ranch unit to be affected by surface coal mining operations, or receive a significant portion of his income from such farming or ranching operations. H.R. 25, 94th Cong. 1st Sess., § 714(g)(2) (1975).

249. H.R. 25, 94th Cong. 1st Sess., § 714(m) (1975).

8. Miscellaneous

Several other provisions of interest to us were contained in the vetoed act. One of the controversial provisions to which President Ford objected strongly was a liberal granting of standing for citizens suits. Although subject to procedural limits, "any person having an interest which is or may be adversely affected" may commence a civil suit against any person, including the United States or any other governmental body or instrumentality to the extent permitted by the eleventh amendment.[250] However, an operator cannot be sued under this section if he is proceeding in compliance with all regulations, orders and an approved permit. Relief must be obtained against the agency.[251]

The statutory grant of standing basically follows existing judicial decisions expanding the use of citizen suits in environmental matters;[252] and, as we have all too often unfortunately seen over the past decade, is essential if the statute's purposes are to be maintained. The number of injunctions issued against governmental agencies in the environmental and energy fields shows that the government officials involved cannot be trusted to faithfully and fully carry out their assigned duties pursuant to the public interest, as expressed by the public through their representatives in Congress. This distrust is especially acute when large economic interests are at stake, as in the energy field. Judgment could include an award of attorneys fees under the statute.[253]

A controversial area of the bill involves the funding of a trust fund to reclaim abandoned mine lands. The bulk of the funds would accrue through a fee of $ .35 per ton of coal produced through underground, or 10% of the value of the coal, whichever is less, except for lignite coal where the maxi-

250. *See, e.g.*, Martin v. Kentucky Oak Mining Co., 429 S.W.2d 395 (Ky. 1968); Watson v. Kenlick Coal Co., 489 F.2d 1183 (6th Cir. 1974). In general, *see* Note, *Kentucky's Experience With the Board Form Deed*, 63 KY. L.J. 107 (1975).

251. H.R. 25, 94th Cong. 1st Sess., § 520 (1975).

252. H.R. 25, 94th Cong. 1st Sess., § 520(a) (1975).

253. Sierra Club v. Morton, *supra* note 163; U.S. v. Students Challenging Regulatory Agency Procedures, 412 U.S. 669 (1973).

mum is 5% or $ .35.[254] Other sources of revenue are from the sale, lease or rental of land reclaimed pursuant to the title and user charges.

As is common with major measures, exemptions are contained in the Act which recognizes small operations or lobbying pressures. For example, the Act does not cover surface mining operations affecting two acres or less, or extractions by a landowner for his non-commercial use.[255]

The Act mandates the Secretary to issue separate, and lesser, regulations for anthracite mines, which protect the declining anthracite mine industry in Pennsylvania. In addition, separate regulations are to be issued for Western mines producing coal as of January 1, 1972 whose coal seams, inter alia, pitch, or dip at an angle to 15° and the excavation of the specific mine pit takes place on the same relatively limited site for an extended period of time.[256] This exemption benefits the Kemmerer Coal Company of Frontier, Wyoming.[257]

The Secretary may make grants to the states to help them defray the cost of administering the Act.[258] Finally, frequent inspections are mandated by the Act.[259]

9. Effects of H.R. 25

Primary opposition to the bill in the Administration came from the Federal Energy Administration, whose views prevailed on the administration. It is believed that the FEA was the only major federal agency concerned with energy which opposed the bill.[260]

The FEA cited estimates to the effect that H.R. 25 would reduce coal production by 62-162 million tons in the first

254. H.R. 25, 94th Cong. 1st Sess., § 520(f) (1975).
255. H.R. 25, 94th Cong. 1st Sess., § 401(d) (1975).
256. H.R. 25, 94th Cong. 1st Sess., § 528 (1975).
257. H.R. 25, 94th Cong. 1ts Sess., § 527 (1975).
258. In general, *see* Franklin, *Strip Mining Battle: Classic Example of Lobbyist Role*, N.Y. Times, May 8, 1975, at 31, col. 1.
259. H.R. 25, 94th Cong. 1st Sess., § 705(a) (1975).
260. H.R. 25, 94th Cong. 1st Sess., §§ 502(f)(1) and 517 (1975). Denver Post, May 21, 1975, at 14, col. 5.

year of enactment and the Senate version 40-162 million tons. It further quoted figures showing consumer prices or taxes rising $130-204 million on coal, $171 million in increased coal production and reclamation costs, and $100-160 million for Federal and State governmental activities to carry out the statutory duties. The Senate bill would allegedly lock up 12-72 billion tons of coal and the House version 33-72 billion tons. Another commonly accepted figure was that 36,000 workers would lose their jobs because of the bill.[261]

A Bureau of Mines study showed that 45 million tons of the 63 million stripped in the West in 1974 came in areas located in alluvial valley floors.[262]

Unfortunately for the Administration's position and credibility, all these figures have been soundly criticized as based on inadequate information, false assumptions and double counting.[263]

The Administration claimed nine Western mines would be shut down because of the restrictions upon mining in alluvial valley floors. The Denver office of the United States Geological Survey subsequently investigated and found that only four of these mines are located on alluvial valley floors, and of these four only two are significant coal producers. Total output of these four mines is 10 million tons per year.[264]

The job loss estimate was based upon a 1967 study by Professor Miernyk of West Virginia University. He found a 1.8 multiplire factor for jobs lost through a ban on strip mining. In using this study, the administration ignored a subsequent 1971 study by Professor Miernyk in which he found that a clamp-down on strip mining would actually result in a net job increase because of the subsequent need to open more deep mines, which are more labor intensive than strip mines.[265]

261. *See* letter from FEA Administrator Zarb, 121 CONG. REC. S. 7542-3 (daily ed. May 5, 1975).
262. 121 CONG. REC. S. 7453 (daily ed. May 5, 1975).
263. Much of the substantive basis of the dispute over the Administrator's figures comes from an EPA study of H.R. 25, reprinted at 121 CONG. REC. H. 5187-90 (daily ed. June 10, 1975).
264. 121 CONG. REC. H. 3670 (daily ed. May 7, 1975).
265. 121 CONG. REC. H. 5184 (daily ed. June 10, 1975).

Many unions such as the United Mine Workers and the AFL-CIO, which are highly concerned with employment for their workers, supported H.R. 25, which detracts from the loss of jobs argument. A major belief is that H.R. 25 would increase jobs because of the reclamation standards, which would increase the manpower needed for reclamation. An Interior Department estimate is that the Bill would create 2,100-3,100 direct jobs and 4,000-5,000 indirect jobs.[266]

The actual effect on jobs is, of course, unknown and highly speculative. But we do know that in the past doomsday cries were shouted in various states where strip mining restrictions were under consideration by legislatures. Yet these estimates did not live up to the industry's dire prediction. Strip mining is still a profitable, and a growing industry in Kentucky, Ohio and Pennsylvania.[267] It is rapidly expanding in Wyoming and Montana even though these states have strong enactments.

The actual costs imposed by the bill cannot be accurately measured at this time. The only direct figure available is the reclamation tax of $ .35 a ton. Various estimates of the total cost have been made. The figure accepted by the House Interior Committee was $1.20 per ton.[268] One studied estimate is that even if the cost of land reclamation rose to $5,000 per acre, the increase in production costs for mines producing from 20 foot seams would be less than $0.15 per ton.[269] It is estimated that the average total reclamation costs for sur-

266. 121 CONG. REC. H. 5186 (daily ed. June 10, 1975).

267. For example, permit applications have increased every year since Ohio's tough act was enacted in 1972 rising from 190 in 1971 to 349 in 1974. 26.8 million bituminous tons of coal were mined in Pennsylvania in 1971. By 1974 it had risen to 36 million tons. 121 CONG. REC. H. 5200 (daily ed. June 10, 1975).

268. SURFACE MINING REPORT, *supra* note 3, at 138.

269. ASBURY AND COSTELLO, PRICE AND AVAILABILITY OF WESTERN COAL IN THE MIDWESTERN ELECTRIC UTILITY MARKET: 1974-1982 51 (1974) [hereinafter cited as COAL PRICES]. Another estimate is that if reclamation costs $4,000 an acre in Wyoming, it would average out to 6.4 cents a ton. SURFACE MINING REPORT, *supra* note 3, at 74. In 1969 the acreage sold in the U.S. went for $4.99 per ton, exactly the same as in 1948. Average prices jumped 25% in 1970, 36% between 1971 and 1973, and 93.4% in 1974. STAFF REPORT OF THE COUNCIL ON WAGE AND PRICE STABILITY, A STUDY OF COAL PRICES 1 (1969).

face mined lands in Eastern Kentucky is $165 per disturbed acre, or $ .32 per ton.[270]

Contrasted with these figures, and the effect of H.R. 25 on consumer prices, is the reality that coal is no longer selling on a cost-plus basis, but by the economic laws of supply and demand. From the 1940's through 1960's coal was a declining industry because of the loss of key markets, such as steam locomotives and home heating. Air pollution controls and the low cost of alternative fuel, especially natural gas, drove coal out of key utility markets such as New York City.

The market dramatically changed in 1974 with the Arab Oil Embargo and steep increases in gasoline prices. Natural gas was not only rising in price, but supply was increasingly failing to meet demand. Consequently, there was an increasing demand for coal, which resulted in high prices on the spot market.

As it was, bituminous coal prices had risen 112.1% between 1971 and 1974.[271] The Embargo shot the lid off the market. Prices rose to over $60 per ton on the spot market. Escalation clauses and supply pressures caused the renegotiation of long term utility contracts. One price increase on a utility coal contract was $20.00,[272] reflecting pure profit. Current prices for new utility coal contracts are $25 per ton for low sulphur eastern coal and $17.20 for high sulphur Midwestern coal.[273]

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270. A study by Consolidated Coal Company, cited at the same time, estimates that at most, reclamation costs would add only two to three percent to the average residential bill. SURFACE MINING REPORT, *supra* note 3, at 7.
271. *Id.* at 7.
272. One study showed that the price of contract coal delivered to Ohio Edison rose 27% between January and August, 1974 while the utility's coal purchased on the spot market increased 99%. Columbus Dispatch, May 25, 1975, at B5, col. 4.
273. Arnold, *Commodities: Coal Prices Continue to Rise, Promising Costlier Electricity, Pinch at Steel Firms*, Wall Street J., March 24, 1974, at 20, cols. 1-3 (Midwest Ed.).
A spokesman for American Electric Power stated that during 1974 average coal prices from outside suppliers was $20.10 per ton, while the average cost from the company owned mines was $16.25 a ton. Cleveland Plain Dealer, May 30, 1975, at 7E, col. 1-2. Documents filed with the Securities and Exchange Commission indicated that Island Creek Coal Co., one of the nation's largest, received an average of $33.28 per ton through April 30, 1974 compared to $22.92 for 1974 and $11.58 in 1973. Denver Post, May 25, 1975, at 3E, col. 2.

Other factors should be taken into consideration. Transportation costs account for about two-thirds of the price of Western coal delivered to the Midwestern market, and have been increasing in constant dollars at about 3% a year.[274] Greater constraints on strip mine production than costs and H.R. 25 are the shortages, and costs, of large-scale mining equipment, particularly of draglines with bucket capacities greater than 50 cubic yards. The current leadtime is 4-5 years. Thirty percent of the backload comes from the Western mine operators.[275]

A certain irony exists in the FEA's opposition to H.R. 25 on the grounds that it would increase costs to consumers. The FEA is considering ordering utilities to convert certain power plants to coal from natural gas or oil. The purpose is to reduce our dependence on foreign oil. Up to 79 power plants will be involved. In ordering such conversion, the FEA indicated that the possibility of higher costs to consumers would not be taken into consideration. One FEA spokesman stated "Costs are not considered a policy constraint."[276]

The final consideration is the amount of coal production that would be "lost" to production because the provision on severed mineral interests. It was feared that this provision would in effect bar additional federal leases, which would prevent the projected increase in coal production from occurring. Ignoring the limited duration of the ban, and the consent of the surface owner, the fact remains that of the 533 federal coal leases outstanding, only 59 are considered active producers. 681,000 acres of federal coal land are currently under lease in six Western states. These leases contain 16.1 billion recoverable tons of coal, of which the Bureau of Land Management estimates 10.6 billion are recoverable by sur-

274. COAL PRICES, *supra* note 269, at 36.

275. *Id.* at 51. Haul-back trucks cost about $200,000 each, front-end loaders $250,000, and D-9 bulldozers $195,000. 121 CONG. REC. H. 3985 (daily ed. May 13, 1975).

276. N.Y. Times, May 10, 1975, at 22, col. 1. These costs could come about because of the increased demand for coal pushing up prices, or the need for pollution control equipment.

face mining and 5.5 billion through underground mining.[277] What these figures mean is that even with the unlikely prospect of no additional federal coal leasing, a substantial amount has already been committed in addition to whatever private rights or state leases may exist.[278]

Existing Leasing System

Under existing law the Department of the Interior is delegated responsibility over most of the public domain in the West. The basic statutory authority for the leasing of federal lands for mineral development is the Mineral Lands Leasing Act of 1920 pursuant to which the Secretary of the Interior can issue appropriate administrative regulations.[279] Certain lands are exempted from the Act, but these limited exemptions do not concern us.[280]

Pursuant to the Act, each lease shall contain provision for the purpose of assuring the exercise of reasonable diligence, skill and care in the operating of the property. The Secretary is authorized to cancel any prospecting permit, or lease, for failure to exercise due diligence.[281] So far lease protections for the environment have been virtually worthless. Present federal reclamation and enforcement policies are grossly inadequate.

277. COAL LEASING HEARING, *supra* note 72, at 23-24 (Testimony of Asst. Secretary Horton). *Hearings on S. 2538 Bef. the Subcomm. on Mines and Mining of the House Comm. on Interior and Insular Affairs*, 93d Cong. 2d Sess., ser. 93-63 at 17 (1975) (Testimony of Asst. Secretary Horton).

278. It should be pointed out that unused leases are held for speculative purposes. For example, Wyoming has leased 1,862,000 acres, but only one coal mine is operating on state lands. On April 1, 1975 18 state leases totaling 20,000 acres were sold by the Tipperary Corporation of Midland, Texas, to Mobil Oil for $12,506,000. The cost basis of the seller is unknown, but the selling price was 35 times the amount Wyoming received in rents and royalties statewide in 1974. N.Y. Times, May 8, 1975, at 36, col. 3.

70% of the acreage leased is in the hands of 15 leaseholders, including 5 oil companies, 7 of the 15 largest coal producers and 3 electric utilities. 93% of the leases held by these 15 leaseholders are not producing coal. These fifteen companies hold 70% of the land, but produce only 48% of the coal production. COUNCIL ON ECONOMIC PRIORITIES, LEASED AND LENT: A STUDY OF PUBLIC AND NUCLEAR COAL LEASING IN THE WEST 9, 11 (1974).

279. 30 U.S.C. § 181 *et. seq.* (1970).

280. These exclusions include lands acquired under the Appalachian Forest Act, and those incorporated cities, towns, and villages and in national parks and monuments, these acquired under acts subsequent to February 25, 1920 and lands within the naval petroleum and oil shale reserves. 30 U.S.C. § 181 (1970).

281. 30 U.S.C. § 183 (1970).

It should be noted in fairness to the Interior Department that it has a policy of enforcing restoration clauses in coal leases even where the mining operation has been undertaken on privately patented surface lands. In 1965 the Secretary of the Interior denied renewal of a coal lease unless a clause was inserted requiring restoration of the privately owned surface. The opinion stated:

> The undesirable after effects of the single-minded exploration of mineral resources are well known and the [restoration] clause is merely a reasonable attempt to achieve some balance between the competing issues of land now and in the future.
>
> That the land is of relatively low value and used only for grazing and that the cost of restoration might exceed its value do not justify an exception from the Department's general policy . . .[282]

It should also be noted that the Interior Department recognizes the need for orderly regional development. On June 30, 1972 Interior Secretary Morton write his Assistant Secretaries as follows:

> The vast reserves of coal in the Fort Union Region . . . provide an excellent opportunity for this Department to demonstrate how a responsible Federal agency can manage resource development with proper regard for environmental protection. It is important that we not lose this opportunity by engaging in single purpose studies which are incapable of developing comprehensive information or by taking piecemeal actions which restrict our future options.[283]

The Department accordingly created the Northern Great Plains Resources Program to assess the potential social, economic and environmental impacts of coal development on the province.

One other factor should be mentioned under the Mineral Leasing Act. The holder of a valid prospecting permit is en-

282. The Montana River Co., 72 I.D. 518, 521 (1965).
283. Sierra Club v. Morton, 514 F.2d 856, 863 (D.C. Cir. 1975).

titled to preferential leasing if he discovers a commercial quantity of a mineral.[284]

Successive veto actions by President Ford have forestalled legislative attempts to regulate strip mining on a national basis and to reform the Mineral Leasing Act. However, a recognized inadequacies in the federal leasing system have caused the Department of the Interior to reevaluate its existing policies and promulgate new regulations governing the lease of federal coal lands. On February 17, 1973 Secretary of the Interior Morton suspended further leasing of federal coal lands. Pursuant to the goals of Project Independence of accelerating domestic coal production, and after preparation of a NEPA statement, the Interior Department is currently implementing a new Energy Mineral Activity Recommendation System (EMARS). Promulgation of EMARS was accompanied by the issuance of new, tighter leasing regulations.[285]

EMARS[286]

EMARS is designed to feature competitive leasing based upon the principles of multiple-use land management,

284. 30 U.S.C. § 201(b) (1970).

285. *See* 41 FED. REG. 20252 (1976).

286. Congress has been unable to override President Ford's veto of general strip mine legislation. However, it did override the President's veto of the Federal Coal Leasing Amendments Act of 1975, which revised the statutes governing the issuance of federal coal lands. S. 391 (H.R. 6721), CONG. REC. H. 169 (daily ed. Jan. 21, 1976). In general, there is little conflict with EMARS. In effect, the new enactment set floors upon which EMARS can build. Many of the changes correct the financial inadequacies of the existing Mineral Tax Act of 1920 as it relates to coal leases.

The amendment substantially increases the federal royalty rate to 12.5% of the value of the coal. 50% of the royalty revenue will now go to the states, up from 37.5%. S. 391, 96th Cong. 2d Sess., at § 9(a) (1976). The additional 12.5% will be available for use in planning, construction and maintenance of public facilities, with priority given to areas impacted by development of the coal resource. S. 391, 96th Cong. 2d Sess., at § 6 (1976). The goal, obviously, is to partially alleviate the Boom Town problem.

In addition, certain fundamental charges are made in the issuance of federal leases. From now on, leasing will be on a competitive basis. There will be no new preferential rights leases. S. 391, 96th Cong. 2d Sess., at § 2 (1976). Any lands leased must have been included in a comprehensive land use plan. Prior to issuance of any lease, the Secretary of the Interior shall consider the effects the proposed leases would have on impacted communities, including environmental, agricultural and other economic activities, and on public services. As to leases within a national forest, the governor of the state must be notified in advance. If the governor objects, a six month moratorium will be placed on the lease. S. 391, 96th Cong. 2d Sess., at § 3 (1976).

and nominations for or against leasing and development by industry and the public at large. In the past leases were issued on specific application with no overall look being taken at coal leasing. Now, instead of reacting to individual lease applications, EMARS is designed to lease coal sufficient to meet energy needs and environmental standards. In effect, broad study will precede individual leasing. Major constraints on leasing include the objective of not allowing leasing where environmental damage would be unacceptable. To object is to maximize production while minimizing conflicts and adverse effects. The overall interest is to balance three factors: assurance of environmental protection to the maximum extent practicable, orderly and timely resource development, and assurance of a fair return for resources sold.[287]

The key structural elements include conveying multiple leases in one region through a single impact statement, diligent development of new and existing leases and measurement of coal reserves and rehabilitation. The Bureau of Land Management's land use planning and programming system will be utilized to determine the location, size, timing and susceptibility to rehabilitation of future federal coal leases. EMARS will operate through a multiple resource evaluation at field office level, examining and evaluating the relevant data, including rehabilitative potential, the resource base [which includes much more than minerals, i.e., watershed, range, wildlife, forestry, recreation], surface and mineral ownership, socio-economic impacts, of coal development,

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All lessees must submit an operating and reclamation plan within three years. S. 391, 96th Cong. 2d Sess., at § 6 (1976). Leases shall be for 20 years, and as long thereafter as coal is produced annually in commercial quantities. To reduce speculation, any lease not producing in commercial quantities at the end of 10 years shall be terminated. S. 391, 96th Cong. 2d Sess., at § 6 (1976). In addition, a new lease cannot be issued to a party holding such a non-productive lease. S. 391, 96th Cong. 2d Sess., at § 3 (1976). The EMARS diligent development regulations appear to be stricter.

The Secretary can approve consolidation of coal leases into logical mining units, but not to exceed 25,000 acres each. S. 391, 96th Cong. 2d Sess., at § 5 (1976). No one shall possess over 46,080 acres of federal coal leases in one state or over 100,000 in the United States. S. 391, 96th Cong. 2d Sess., at § 11 (1976).

287. U.S. DEPT. OF THE INTERIOR, FINAL ENVIRONMENTAL IMPACT STATEMENT: PROPOSED FEDERAL COAL LEASING PROGRAM, *supra* note 187, at 1-4.

state and local governmental impacts and requirements, and demand for coal.[288]

Leasing will only be in amounts appropriate for plans to produce coal in the near future. The agency's due diligence and advance royalty payments requirements are designed to ensure this objective.

One problem that could arise occurs with preference right leasing, which occurs where a permittee has discovered coal in commercial quantities while operating under a valid prospecting permit. The automatic issuance of a permit and lease would afford little protection to environmental values. Consequently, this system has been revised so that issuance of the original prospecting permit has to meet specified criteria: (1) existence or workability of the coal is not known; (2) rehabilitation is feasible and practicable; (3) other resource uses do not override the possibile extraction of coal; and (4) a need exists. Even with prospecting permits, emphasis will now be on competitive leasing.

1. Implementation of EMARS

EMARS will be implemented by Interior through two of its agencies, the Bureau of Land Management (BLM) and the Geological Survey. The functions at times seem to overlap, so provisions are made for resolving any intra-agency imbroglios.[289]

BLM determines the adequacy of environmental protection and rehabilitation aspects of all mining operations plans. The Geological Survey in conjunction with BLM conducts compliance examinations on leased acres, as well as on prospecting permits or licensed lands beyond operating areas, and consults with BLM on matters concerning surface disturbances, reclamation and other land use considerations prior to approval of mining and development plans for leased

288. *Id.* at 1-13.

289. The responsibilities of the two agencies are found at 41 FED REG. 20253 (1976). Any disputes that cannot be resolved between the two agencies will be referred to the appropriate Assistant Secretaries or to the Under Secretary of the Interior.

acres. BLM, in consultation with the Geological Survey and the surface owner, formulates the requirements to be placed in a lease. BLM exercises discretion on whether or not mineral leases, permits and licenses are to be issued. But much of the basic data which goes into the decision making process is gathered by the Geological Survey.

The initial study of individual tracts is designed to provide both detailed baseline studies, and environmental protection. Potential effects on the environment will be evaluated including effects on fish and other aquatic resources, wildlife habitats and populations, and visual, recreational, cultural and other resources in the area.[290] Based upon these studies, a report will be prepared, including recommendations for lands which should be excluded because reclamation is not obtainable or assured, measures required to comply with restoration and performance standards, necessary conditions and amounts of a bond to ensure reclamation for areas disturbed during the initial five year period, and additional, more stringent requirements needed. The permit may include such terms and conditions as may be necessary to protect the environment.[291]

The Geological Survey is responsible for supervision of the leases under terms of the leases issued by BLM. Instances of non-compliance are referred to BLM. The Geological Survey is supposed to inspect the operations quarterly.[292]

The regulatory coverage is quite broad, being modeled after H.R. 25. It covers all affected lands, which extends not only to the lands affected by exploration, development and mining, but also all related surface structures and facilities.[293] This key provision thereby does not duplicate a weakness of many state statutes. Indeed, when no longer necessary, the operator will remove all roads, pipelines, power-

290. 43 C.F.R. § 3041.1(b) (1976), 41 FED. REG. 20255-6 (1976).
291. 43 C.F.R. § 3041.2-1(a) (1976).
292. 30 C.F.R. § 211.3(c)(1) (1976), 41 FED. REG. 20263 (1976).
293. 43 C.F.R. § 3041.0-6(b) (1976).

lines and associated facilities in a manner as to minimize erosion, siltation, dust and pollution.[294]

The reclamation standard is similarly broad, requiring affected lands to be restored to the condition and form consistent with their pre-mining productivity or, in the alternative, to an approved post-mining use.[295] The goal is effective reclamation as soon as possible, but the actual provision is open ended, requiring reclamation:

> as soon after disturbance as possible, without undue physical interference with ongoing operations, leaving a minimum of land unreclaimed, consistent with the objective of environmental protection.[296]

A more stringent deadline would be desirable. As it is, this flexible deadline will depend for its effectiveness upon the enforcement efforts of BLM and the Geological Survey.

With respect to reclamation, the overburden and waste materials shall be backfilled.[297] Top soil is to be segregated.[298] Surface areas shall be stabilized and protected.[299] Thus, the regulations provide for protection of the essential top soil and minimization of erosion. Restoration of approximately the original contours is also prescribed. If they cannot be restored, then the lowest practicable grade is the goal, which in any event should be less than the angle of repose.[300] Water retention facilities, such as dams, must be provided as needed.[301] There should be no acid mine drainage problems. Unless otherwise approved, a diverse vegetative cover native to the area, and capable of regeneration and succession at least equal in density and permanence to the natural vegetation must be provided.[302]

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294. 43 C.F.R. § 3041.2-2(b)(11) (1976).
295. 43 C.F.R. § 3041.0-6(hh) (1976).
296. 43 C.F.R. § 3041.0-6(h) (1976).
297. 43 C.F.R. § 3041.2-2(f)(2) (1976).
298. 43 C.F.R. § 3041.2-2(f)(4) (1976).
299. 43 C.F.R. § 3041.2-2(f)(3) (1976).
300. 43 C.F.R. § 3041.2-2(f)(2) (1976).
301. 43 C.F.R. § 3041.2-2(f)(5) (1976).
302. 43 C.F.R. § 3041.2-2(f)(13)(i) (1976).

The applications are to contain detailed plans, maps and other baseline data such as topography, drainage facilities, geologic, visual, cultural and archeological factors. The topographic or aerial maps must show existing bodies of surface water.[303] The exploration or mining plans shall show that reclamation is an integral part of the proposed operations and will progress as contemporaneously as possible with the mining operations. Information is sought for five years of operation, and a statement of minimizing measures is needed.

One performance standard will be of special importance in the eastern area, where operators frequently successively strip the same area to get at successive seams, and so are reluctant to reclaim between operations. This provision would require that the coal be extracted to the maximum extent possible taking into account existing technology, commercially available equipment and cost of production so that future environmental disturbances through the resumption of mining will be minimized.[304] The application of this provision on a large scale to western areas is questionable because of the thickness of the seams out west.

As with most strip mining acts, a bond must be posted. The amount shall be sufficient to ensure reclamation.[305] If a bond has been previously forfeited, an application for a permit may be denied, but denial for past violations is discretionary.[306] The bond shall extend until it is determined that successful revegetation has occurred, but for not less than five years or over ten.[307]

2. Due Diligence

The 1920 Mineral Leasing Act requires diligent development of federal leased mineral lands. Some of the controversy over federal coal leasing has centered around the Interior Department's past practice of issuing leases upon application, and then not requiring much in the way of "due dili-

303. 43 C.F.R. § 3041.1-2(b) (1976).
304. 43 C.F.R. § 3041.2-2(c) (1976).
305. 43 C.F.R. § 3041.3(b) (1976).
306. 43 C.F.R. § 3041.3(c) (1976).
307. 43 C.F.R. § 3041.2-2(f)(13)(ii)(B) (1976).

gence." Consequently, it is alleged that several applicants obtained large leases in the early 1960's, and have since sold the leases at a substantial profit.[308] Hence, the Department has done little to stop speculation. The profits were made from a public resource. The Department has now issued a separate set of regulations requiring due diligence. Although separately issued from the performance standards, they are part and parcel of an overall package.

The regulations reserve the right to cancel both future and existing leases where lessees have not made a reasonable effort to develop the coal reserves. Coal areas are divided into "logical mining units," which are areas that can be developed and mined in an efficient, economical and orderly manner. In general, each lease will constitute an LMU.[309]

Diligent development is defined to mean that preparation and production of 1/40 of the LMU reserves are extracted in 10 years, subject to specified exceptions.[310] Extraordinary circumstances allowing an extension of not over five years will not include normally foreseeable business risks, which include forseeable costs of compliance with environmental standards.[311]

In addition, a continuous operative regulation requires the production of one percent or more of the LMU reserve on an annual basis.[312] Each new and readjusted lease shall contain an advance royalty clause based on the maximum productible tons determined on a schedule sufficient to exhaust the leased reserves in 40 years.

Each coal lease shall require diligent development, and either continuous operation or an annual advance royalty. All leases not providing for advance royalties, and those

308. In general, *see* COUNCIL ON ECONOMIC PRIORITIES, LEASED AND LOST: A STUDY OF PUBLIC AND INDIAN COAL LEASING IN THE WEST (1974).
309. If a LMU covers more than one lease, all lands in the LMU must be under the effective control of a single operator. 43 C.F.R. § 3500.0-5(d) (1976), 41 FED. REG. 21780 (1976).
310. 43 C.F.R. § 3500.0-5(f) (1976).
311. 43 C.F.R. § 3500.0-5(f)(1) (1976). *See also* 43 C.F.R. § 3523.2-1(b)(ii) (1976), 41 FED. REG. 21781 (1976).
312. 43 C.F.R. § 3500.0-5(q) (1976).

where advance royalties have been paid, are subject to the conditions of continuous operation.[313]

3. Problems

a. Omission of Lands

There are several problems with the regulation, some of which reflect the difficulties experienced by Congress in trying to formulate a bill, and some of which simply reflect Interior's desire to renew coal leasing.

The most significant weakness of the regulations promulgated so far is that they do not contain provisions for excluding federal lands as unsuitable for mining. Even though an ostensible goal is to preclude strip mining in areas where reclamation is not possible, there are no provisions to implement this goal, or to prevent leasing in other areas. Later regulations are promised to fill in this gap, but none have yet been issued.

One provision does exclude from the regulations coal deposits owned by Indians, and thereby subject to the Trust Protection of the United States.[314] Since the Indians in the West control large coal deposits, this exclusion creates a gap which has yet to be filled. Since the Indian lands and the trust are handled through the Bureau of Indian Affairs, which is part of Interior, it would seem that Interior has a duty to issue regulations setting at least minimum standards, such as these newly issued regulations, for the Indian lands. The Indians could issue stricter standards if they wish.

Although Interior has yet to issue regulations for excluding lands from leasing, in its recent call for industry nomination of areas for reserved coal leasing, Interior also requested nominations by concerned citizens and organizations of areas deemed unsuitable for coal leasing.[315] The rationale behind requesting the nominations is to help facilitate the

313. 43 C.F.R. § 3520.2-5 (1976).
314. 43 C.F.R. § 3041.0-5(a) (1976).
315. 41 FED. REG. 22133 (1976).

agency's making process. Factors important to the decisions are identification of endangered species habitat, archeological values, watershed disruption, loss of range land and other indirect socio-economic impacts.[316]

As a matter of policy, Interior does not intend to issue coal leases in National Wildlife Refuges, units of the National Park System, Wildness Areas and primitive areas.[317] It remains to be seen whether Interior will designate areas other than these and those nominated by the public as unsuitable for surface mining. Although reclamation potential is a factor to be considered in opening federal lands to leasing, impossibility of reclamation is not a factor listed to be considered in designating lands as unsuitable for mining.

b. Surface Ownership

One of the major conflicts in Congress concerned the protections to be afforded the owner of the surface estate. These regulations "solve" the problem legally by ignoring it. The regulations provide that they will not affect the rights of the surface owner.

> Nothing in this subpart shall be deemed or construed as increasing or diminishing any right not in conflict with Federal law held by any person, including any surface owner or entryman, arising under the laws of any State and relating to the giving or withholding of consent to, or consultation in connection with, entry to any land for the purpose of conducting operations subject to this subpart.[318]

Seemingly this provision means that state law will determine the rights of the surface owner, unless Congress or the courts find a conflict, in which event federal supremacy, of course, prevails. In short, we still do not know.

The only substantive provision in the regulations applicable to surface owners is one which provides that operations in conjunction with other authorized uses on the same

316. 41 FED. REG. 22133 (1976).
317. 41 FED. REG. 22133 (1976).
318. 43 C.F.R. § 3041.0-5(d) (1976).

land will not unreasonably interfere with or endanger operations pursuant to these regulations, or vice versa.[319]

c. Water Resources

The protections afforded by the regulation to water resources are not the strongest possible, but, if fully implemented, will serve to protect essential water resources. Hydrology is one factor to be considered in issuance of a permit.

The best available practicable, commercially available technology is required to protect existing water quality, including control of acid mine waters, minimization of erosion, siltation structure control,[320] and, in a measure of critical significance to the arid west, preserving water quality, quantity and flow of (alluvial) valley floors, which provide significant quantities of water for other purposes. Measures to implement this last provision include relocating and maintaining stream gradients, avoiding mining aquifers or aquicludes, and replacing soils. This regulation also provides that it will not affect any existing water rights.[321]

Another measure provides that no access road shall be constructed in a stream, nor shall any stream or stream bed be used as an access road. Stream fordings are to be avoided.[322]

However, none of these provisions deal with the problems of interstate allocation of scarce water resources. This type of problem is merely hightened by the checkerboard pattern of state regulation and federal lands. Indeed, we still have not even come close to solving the problems of over-allocations on an intrastate level. The regulations merely provide that they do not affect vested rights.[323] Sooner or later, we will be directly confronted in a highly disruptive battle over allocation of scarce water resources between energy needs, farmers, ranchers, cities, domestic uses, other industrial and

319. 43 C.F.R. § 3041.0-7(b) (1976).
320. In general, *see* 43 C.F.R. § 3041.2-2(f)(7) (1976).
321. 43 C.F.R. § 3041.2-2(f)(7)(IV) (1976).
322. 43 C.F.R. § 3041.2-2(f)(12)(ii) (1976).
323. 43 C.F.R. § 3041.2-2(f)(5)(IV) (1976); 43 C.F.R. § 3041.2-2(f)(7)(IV) (1976).

Indian water rights. By continuing to postpone resolution of issue, we are guaranteed resolutions of it at a crisis level.

d. Variances

One of the potentially serious shortcomings in the regulations concern the possibility of variances. The proposed regulations set opened "maximum extent practicable" reclamation standards. A major concession obtained by the Environmental Protection Agency and the Council on Environmental Quality before issuance of the final regulations was substitution of detailed performance standards with a variance mechanism for the open-ended draft regulations.[324]

The regulations provide for variance under two circumstances. First, if the operator proposes a post-mining land use that is substantially different from the use immediately preceding the exploration and mining, it can be approved if the proposed development is deemed to constitute an equal or better economic or public use of the affected land, and granting of the variance is essential to achieving this proposed land use.[325]

The second possibility of a variance arises during the operation if the operator cannot meet a performance standard. He may request a variance where such would be compatible with the approved post-mining land use.[326]

Although iron-clad rigidity is not always desirable, the problem with affording a mechanism for the granting of variances is the spirit in which such variance will be granted. Environmentalists lack faith in the sincerity of Interior to protect the environment. Consequently, one can be apprehensive about variances. However, even with the possibility of variances, the present regulations are a vast improvement over the proposed "maximum extent practicable" regulations, under which we would have been almost solely dependent on the good faith of Interior.

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324. BNA, ENVIRONMENTAL REPORTER CURRENT DEVELOPMENTS 27-28 (1976).
325. 43 C.F.R. § 3041.8(a)(2) (1976).
326. 43 C.F.R. § 3041.8(a)(1) (1976).

e. State Laws

One major problem so far with strip mine regulations is the wide diversity of state laws governing it. Some are weak, and some are strong. Although the general pattern is the same, the variances from state to state are great. To a certain extent, this is advisable since reclamation and other difficulties vary from state to state. But a disadvantage is that weak laws of some states will leave our land permanently scarred.

The vetoed act partially overcame this by setting minimal standards which state laws would have to meet. Perhaps the strength of the vetoed act is that most state measures fell short.

A provision of these regulations is that Interior will review the state laws, and the ones that "afford general protection of environmental quality and values at least as stringent" as these regulations will be adopted by Interior and applied to federal lands within the state.[327] But there is no requirement that the states bootstrap their regulations upwards. And since the regulations are in general weaker than H.R. 25, the national preservation of environmental quality from strip mining is not as good as would otherwise have existed. We may still end up with a varieted pattern of regulations—this time within a state. The results may be ludicrous if a federal coal lease adjoins an area subject to only state regulations.

f. General Criticism

The major criticism of the regulation is that Interior's real position is that the coal will be mined. True, environmental damage will be minimized, but in the balancing test used, there is no reason to think that environmental factors will outweigh the need for production. It is generally believed by the federal government that the only major ways of decreasing our energy dependence on OPEC is to vastly increase our coal production and build more nuclear power

327. 30 C.F.R. § 211.75 (1976).

plants. The need for increased coal production is the spur to Interior's reopening the federal coal lands in the West when *reclamation in fact* has yet to be achieved on the coal lands of the West.

Perhaps Interior's attitude is best shown by the provision governing applications of state statutes. The regulation allows Interior the option of implementing state strip mining statutes. They will not be utilized by Interior where the Secretary finds that they would unreasonably and unilaterally prevent the mining of federal coal in that state and that it is the overwhelming national interest that the coal be produced.[328]

This rule can best be explained by noting that Secretary of the Interior Kleppe was quoted to the effect that these statutes would be followed if the states were willing to let the coal be mined.[329]

CONCLUSION

The environmental movement should have taught us that progress is not the penultimate goal of mankind. Consequently, we should be hesitant to open an area up for development simply because it is now considered "wasteland." Mineral booms have come and gone, but the ghost towns and spoils have remained. That type of progress has become ecologically undesirable.

Environmental law is the law of resource allocation. No resource is more finite and desirable of protection today than land. Long after the coal has been dug out and the shale oil processed, the land will still be there.[330] Whether or not it will be productive, or truly a wasteland, remains to be seen.[331]

328. 30 C.F.R. § 211.75 (1976).
329. N.Y. Times, May 12, 1976, at 68, col. 1. They apply only "provided the State doesn't sit on its hands and attempt to block or lock up federal coal reserves that can be mined in an environmentally sound manner." Wall Street J., May 12, 1976, at 3, col. 2.
330. *See, e.g.*, PRINE, PARADISE (BMI) (1971).
331. "A casual traveler gains the impression of emptiness or openness—the 'Big Sky Country.' The quality generating this impression is, of course, one of the region's assets. But the area is not empty. The regional resources are being used for an economy based upon agriculture, tourism,

Whether or not we will yet again squander our children's heritage remains to be seen. The legal issue has best been stated by the Court of Appeals for the District of Columbia Circuit:

> Whether or not the spectre of a national power crisis is as real as the Commission apparently believes, it must not be used to create a blackout of environmental consideration in the agency review process.[332]

The humanistic issue is whether the utility-federal policy of encouraging economic growth, and its corrollary, the construction of ever greater power plant complexes must be considered.[333] NEPA affords the thrust to do so. Yet, regardless of what federal agency is involved the NEPA Statement reaches the seemingly inevitable conclusion that the energy development project continue. There has been no independent reassessment of the energy development ethos. As long as the Department of Interior and other agencies favor development in general of the coal resources, other social values and environmental considerations will lose out to the growth ethic. The impacts will hopefully be minimized, but they will occur nevertheless.

By not dealing with this policy issue, a secondary issue will not receive proper consideration. To what extent should the Pacific Southwest be sacrificed on a bed of coal to fuel Southern California and Central Arizona? Potentially air polluting power plants will not receive approval in Southern California because of the already existing pollution problem. Nuclear plants will not fill the supply-demand gap for a number of reasons. By necessity, the affected utilities have turned elsewhere in the Southwest to build their facilities. The result is pollution far away from the baseload in thinly populated regions. The real issue there is whether or not

and oil and gas extraction. The areas' social, economic, and governmental structures have evolved to meet the needs of this economy." NORTHERN GREAT PLAINS RESOURCES PROGRAM STAFF, NORTHERN GREAT PLAINS RESOURCE PROGRAM: DRAFT REPORT I-2 (1974).

332. Calvert Cliffs Coordinating Council, Inc. v. Atomic Energy Commn., 449 F.2d 1109, 1122 (D.C. Cir. 1971).

333. Caldwell, *The Energy Crisis and Environmental Law: Paradox of Conflict and Reinforcement*, 20 N.Y.L.F. 751 (1975).

Los Angeles should internalize the cost of producing electricity or will it be allowed to continue to externalize them upon Arizona, New Mexico and Utah.

Similarly, should the Northern Great Plains have to supply the energy for the Pacific Northwest and Midwest. The Midwest in particular is suffering from air pollution problems which makes low-sulphur Western coal desirable.

But stripping the West will not solve the country's energy problems. Ultimately what is needed is the development of new energy sources and intense action encouraging energy conservation. Present proposals for the West only encourage a false sense of energy security.

Veto of H.R. 25 will postpone federal regulation of strip mining, but it will not open the floodgates to a widespread energy rape of the West. Businessmen are hesitant to act where major uncertainties exist, and such is the legal situation with strip mining in the West. Many are afraid to invest heavily in new mines today until the legal strictures have solidified. Thus, as long as no federal strip mine statute exists, but is expected, major uncertainties exist. Perhaps the real tragedy of H.R. 25's demise is not that it was vetoed, but that only two Western statutes, Montana's and Wyoming's, came close to meeting its requirements, while in the east only Kentucky, Ohio, Pennsylvania and West Virginia come close. The weakness of the other statutes illustrate the need for major federal action in the area.