

5.

Coordinating Mineral and Non mineral Activities

Coordinating Mineral and Non mineral Activities

Federal land contains both important mineral and nonmineral resources. The existing laws treat mineral exploration, development, and production as distinct activities outside the mainstream of the land use planning and management process, although minerals and nonmineral resources are both part of the land, and decisions, policies, and actions affecting each inevitably affect the other.

Historically, mineral uses have been preferred over nonmineral uses of Federal land that is open to mineral activity. Mineral rights, once acquired, override all nonmineral resource values. Neither the mining nor mineral leasing laws contain incentives or other mechanisms adequate to ensure proper balancing of mineral and nonmineral resource values. Many provisions, especially in the Mining Law, result in adverse impacts on nonmineral resources without contributing to efficient or diligent mineral activity.

The lack of adequate nonmineral resource protection requirements has been partially responsible for congressional and executive branch decisions to withdraw increasing amounts of Federal land from the operation of the mining and mineral leasing laws in recent years, thereby precluding even mineral exploration on these lands. On those lands that remain open to mineral activities, administration of the existing broadly worded requirements often creates considerable uncertainty over the acquisition and maintenance of mineral tenure.

A. Mineral and Non mineral Resources on Federal Land

1. The Importance of the Mineral Resources in Federal Land

The importance of Federal onshore land for mineral exploration, development, and production was discussed in section B of chapter 2, where it was noted that Federal onshore land has the potential to continue to be a major source of domestic mineral discoveries. In fact, according to a sampling conducted in 1968, more than **70** percent of the land then controlled by nonfuel mineral producers in the United States that directly overlaid an ore body, or was necessary for mining an ore body, was originally

obtained under the Federal mineral laws. ' All the data support the conclusion of the Public Land Law Review Commission that the public land areas of the West generally hold greater promise for future mineral discoveries than any other region of the country, and that it is in the public interest to acknowledge and recognize the importance of mineral exploration and development in public land legislation. '

2. The Importance of the Nonmineral Resources on Federal Land

Federal onshore land also is a major locus of certain nonmineral resources, including timber, forage, watershed, wilderness, scenic and natural areas, wildlife, and outdoor recreation. Initially, this was the result of historical accident, as the most remote and scenic Federal land areas generally had little commercial value and were passed up by homesteaders. Eventually, as was discussed in chapter 3, many areas of the remaining public domain intentionally were set aside and reserved to protect and preserve such nonmineral resources. The Federal Government came to be recognized as the appropriate trustee of areas containing unique or important nonmineral resources, particularly the noncommercial ones. Areas containing such resources on non-Federal land began to be acquired by the Federal Government through purchase or donation—a process that has continued into the present, and which, together with the public domain areas, make the Government's holdings of such resources among the most significant in the world.

3. Locational Conflicts Between Mineral and Nonmineral Resources

The vast majority of Federal lands, as well as the majority of metal mining districts in the United States, lie west of longitude 100 degrees. Figure 5.1 roughly depicts the location, in 1976, of the mining districts for the six principal base and precious metals (iron, copper, lead, zinc, gold, and silver) and of the principal designated natural, scenic, or recreational areas on Federal onshore land (national parks, national monuments, national seashores, national recreation areas, national preserves, national wildlife refuges, wilderness areas, wilderness study areas, Bureau of Land Management primitive areas, and areas in Alaska withdrawn for possible inclusion in the National Park or Wildlife Refuge Systems). As figure 5.1 shows, the metallic mining districts, which are areas with past or present production or known to contain metallic mineral resources, in many cases are in or adjacent to areas set aside to protect nonmineral resource values. Exploration geologists believe, based on projections from the known areas of mineralization, that mineral belts possibly containing undiscovered mineral deposits exist in the nearby areas set aside or being set aside to protect nonmineral resource values.

This juxtaposition of mineral resources and nonmineral resources on Federal land did not cause much conflict until recently, primarily for two reasons. First, most nonmineral resources, especially the noncommercial ones, were not valued nearly as highly as mineral resources; thus mineral development and production proceeded with

¹University of Arizona, *6 Nonfuel Mineral Resources of the Public Lands: Minerals and the Environment* 694-696 (1970)[prepared

for the Public Land Law Review Commission].
²See ch. 2, sec. B.

Figure 5.1 Base and Precious Metal Mining Districts in Relation to Federal Natural, Scenic and Recreational Areas in 1976



Dots - Metal
Districts

SOURCE: U.S. Geological Survey, Special Maps Branch, 1977.

NOT - Alaska is shown here at a reduced scale.

little or no objection. Second, many of the most significant nonmineral resources, including especially the noncommercial ones, were in geologically complex areas that sometimes were passed over by mineral explorers in favor of more accessible areas containing more easily identifiable mineral deposits. Today, however, nonmineral resources are being valued more highly than before by many citizens (see subsection C(3)), and mineral explorers are turning toward more remote and more complex targets (see chapter 2). Consequently locational conflicts are occurring more frequently between mineral and nonmineral resource activities and uses.

Similar situations exist for the nonmetallic minerals, including the fuel and fertilizer minerals. In places, bedded deposits of these minerals underlie land also valued for its watershed, agricultural, timber, grazing, or recreational uses. Furthermore, the search for these minerals is also moving to more remote and geologically complex targets. A prime example is the major new oil and gas exploration effort in the Overthrust Belt in southeast Idaho, southwest Wyoming, and north-central Utah,] in which areas formally or informally set aside or highly protected because of their nonmineral resource values, including commercial as well as scenic values, are estimated to encompass almost one-half of the area with the greatest oil and gas potential. Conversely, oil and gas leases have been issued for millions of acres in the Overthrust Belt that lie within areas being considered for designation as wilderness or wild and scenic river corridors.⁴

The conflict between mineral and nonmineral resource values is apparent in the current debate over the appropriate classification of vast areas of Federal onshore land in Alaska. On the one hand, Alaskan geology is considered to be favorable for the occurrence of various types of high-grade mineral deposits, but Alaska has not been explored as thoroughly as the lower 48 States because of its remoteness and lack of infrastructure. It therefore represents the last frontier for discovery of major new mineral districts in the United States. On the other hand, the same remoteness, vastness, and lack of infrastructure have resulted in the de facto preservation of extremely significant nonmineral resources not duplicated anywhere else in the United States or, in some instances, in the world, such as entire river valleys and ecosystems that remain in their undisturbed primitive state.

B. The Impact of Mineral Activities on Nonmineral Resources and Their Management

1. Factors Affecting the Extent and Duration of Impact

The impact of mineral activities often can be limited in time and severity through proper precautions and careful reclamation. However, some mining methods, such as mountaintop removal or deep-pit or block-caving mining, will inevitably result in per-

⁴McCaslin, "Thirty Wells Drilling in Overthrust Belt," *Oil & Gas J.*, Aug. 1, 1977, at 123.

⁵U.S. Department of the Interior, *Final Report of the Task Force on the Availability of Federally Owned Mineral Lands* 51,

54-59 (1977) (hereinafter cited as *DOI Task Force Report*); Hamilton, "The Overthrust Belt," 63 *Sierra Club Bull.*, No. 8, at 8 (Oct./Nov./Dec. 1978); see *Oil & Gas J.*, Aug. 2, 1976, at 50.

manent alteration of the surface and, particularly with respect to mountaintop removal and deep-pit mining, major shifts or losses in nonmineral resource values. Some nonmineral resource values, such as critical habitat for endangered species, archeologic sites, and unique and highly esthetic landforms, are not subject to reclamation. Wild, primitive areas can sometimes, depending upon the extent of the impacts, be restored by natural processes to their original state, but it may take up to a century or more to recover the full depth and diversity of the previously existing ecosystem stocks and functions. This is particularly true of the ecosystems of the arid regions and alpine terrain of the West and the tundra of Alaska. There are, however, instances where land can be improved by reclamation after mining,

The extent and duration of the impacts caused by mineral activity vary significantly depending on the stage of the activity. In general, each stage involves more concentrated and intensive work on successively smaller tracts of land (see chapter 2).

During the initial stages of regional appraisal and aerial reconnaissance, very large areas are covered with practically no impact on the land. Regional reconnaissance involving on-the-ground geologic and geochemical techniques also causes very little disturbance if appropriate care is taken in gaining physical access. Regional reconnaissance involving stratigraphic drilling or seismic surveys, however, can result in significant local impacts if new roads or trails are created, particularly in areas containing the more sensitive nonmineral resources. The drill holes required for seismic surveys and stratigraphic drilling may constitute hazards to animals and people and may result in pollution of water tables if not properly sealed and reclaimed. Drilling and roadbuilding activities can upset domestic stock and wildlife, especially during breeding seasons, and may lower an area's recreational values, especially for the nonintensive forms of recreation. However, with proper precautions and reclamation all these effects tend to be temporary, and they are dispersed over a fairly large area rather than concentrated at a particular site,

When exploration focuses on particular target areas, the exploration techniques are applied more intensively in tighter patterns, and techniques such as drilling and the digging of pits and trenches are utilized, but the area of activity is greatly reduced. This intensive exploration is much more likely to require new roads, which, along with cross-country travel, may form a grid as exploration proceeds. The impacts on nonmineral resources are more severe and more prolonged. Some of the more sensitive nonmineral resources may not recover, or may take a long time to recover despite careful exploration and reclamation.

By the time an economic mineral deposit has been confirmed, surface impacts can be quite substantial, although activity is confined to a fairly small area. Development and production of the deposit can either cause substantial and permanent effects, as in the case of an open-pit mine, or can result in impacts no greater or even less than that which occurred during exploration, as in the case of underground mines with minimal onsite surface facilities or oilfields with buried pipelines. Milling and process-

National Academy of Sciences, *Rehabilitation Potential of Western Cool Lands* (1974); Noble, "Healing the Wounded Tundra," *Forestry Research West*, January 1979, at 7; West, "Environmental Problems Associated With Arctic Development Espe-

cially in Alaska," 3 *Environmental Conservation* 218-224 (1976); Waldrop, "Strict Law Challenges Strip Mine Operators," *Chem. & Eng. News*, Aug. 22, 1977, at 18.

ing plants can cause noise, water, and air pollution, Much of this type of pollution has been mitigated in recent years by general environmental laws, Large surface areas, including entire valleys, are often required for disposal of waste rock from mining or waste “tailings” from milling or processing operations.

The impacts of mineral activity on nonmineral resources can be beneficial as well as adverse. In some areas and for some uses, mining and subsequent reclamation can improve the nonmineral resource values of a tract of land. In many areas the same roads that give access to minerals often give access to nonmineral resources, for example, access to outdoor recreation including wilderness. The impacts of roads cannot be generally described, but must be assessed on a site-specific basis, and even then subjective judgments are often called into play. As another example, many of the ancillary land uses connected with mineral activities are for communities and jobs; the tradeoffs among land use, social, and economic impacts are extremely complex, are viewed in different ways by different people, are site-specific, and can vary with time. Thus mineral activities involve both temporary and permanent gains and losses in nonmineral resource values, The mix and extent of these gains and losses depends on the type of nonmineral resources affected, the stage of mineral activity and the type of technology used at that stage, the type of ecosystem, and the care taken in reclamation and mitigation.

2. Total Land Area Affected by Mineral Exploration, Development, and Production

Mineral deposits occur within the crust of the Earth as rare geochemical anomalies concentrated in small portions of the total land areas. For example, the recently discovered deposit of copper and zinc near Crandon, Wis., is one of the largest and richest on Earth (70 million tons of ore indicated to date) and yet lies under a surface area of less than 20 acres.

Data are not available to estimate the total amount or percentage of Federal land affected by mineral activities. A 1974 Bureau of Mines study, based on a survey of the mineral industry, estimated that only 3.65 million acres, or 0.16 percent of the land mass of the United States, including both Federal and non-Federal lands, was utilized by the mining industry in the 42-year period extending from 1930 through 1971, and that 40 percent of this acreage had been reclaimed.⁹ However, the study clearly states that its estimate covers only certain types of mineral activities and impacts, and it does not distinguish between impacts on Federal versus non-Federal lands. The following paragraphs list some of the activities and impacts that were not included in the Bureau's study, without attempting to quantify or evaluate the impacts. It should be kept in mind, as discussed above, that impacts maybe deemed beneficial or adverse by different parties in different situations.

First, the 3.65 million figure estimated by the Bureau of Mines does not include land explored and worked for oil and gas (and possibly other minerals), even though oil and gas activities account for a large proportion of land used for mineral activities.:

⁹Paone, Morning, and Giorgetti, *Land Utilization and Reclamation in the Mining Industry, 1930-1971*. U.S. Bureau of Mines Inf. Circ. 8642, at 10 (1974).

See U.S. Bureau of Land Management, *Public Land Statistics, 1976*, tables 72, 77 & 78 (1977).

Second, the Bureau of Mines' estimate covers only the development and production stages of mineral activity. As was noted above, the impacts of mineral activity are generally much less intense but much more widely dispersed in the exploration stages. For each operating mine, there are exploration pits, drill sites, roads, and other impacts scattered over an area much larger than the mine area, as well as similar impacts from the 10 to 100 unsuccessful exploration projects that occur for each successful project.

Third, the figure does not include much of the area directly affected by mineral activities even at the development and production stages. It includes only the area actually excavated, the area used for disposal of overburden and other wastes, and the area that has subsided (dropped or caved in) as a result of underground mining. It does not include the area occupied by industrial facilities (e. g., processing plants), utilities (e.g., powerlines), residences, and other onsite facilities directly connected with the mine, even though they will usually affect an area much larger than the mine itself. It does not include the downstream areas affected by runoff of water, which may contain sediment or toxic substances. It does not include the area affected by consumption of water from, or even destruction of, an adjacent or underlying aquifer. And it does not include the buffer areas in which wildlife, scenic viewing, and recreation may be affected as a result of the physical, visual, and aural impacts of the mine, its road network, and other facilities and infrastructure.

Even comprehensive estimates of past effects might not be reliable yardsticks for the future. Mineral production has increasingly moved from underground mining to open-pit and surface mining, especially in recent years. As an indication of this trend, the Bureau of Mines' study states that **206,000** acres were affected in 1971, which is over twice the average yearly rate for the period between 1930 and 1971.

Finally, percentage figures for nationwide land disturbance probably underestimate the effect mineral activities have on Federal land and on the Nation's important nonmineral resource values, because mineral activity generally is concentrated in the more remote areas of the country, which contain the most Federal land and the most significant nonmineral resource values.

C. Mineral Resources and Federal Land Management

1. The Federal Land Management and Planning Systems

Two Federal agencies, the Forest Service in the Department of Agriculture and the Bureau of Land Management (BLM) in the Department of the Interior, together controlled over 85 percent of the Federal onshore land in 1976. The Forest Service controlled almost 188 million acres and BLM controlled more than 470 million acres, including the approximately 23 million acres in the National Petroleum Reserve in Alaska.⁸ About 295 million of the BLM acres were in Alaska and subject to the extensive land selection and allocation process initiated under the Alaska Statehood Act

⁸Ibid., tables 9-11

and the Alaska Native Claims Settlement Act, which will eventually result in the transfer of around 105 million acres to the State, 45 million acres to the Natives, and perhaps 100 million acres to the national park, wildlife refuge, and forest systems.⁹ This will leave BLM with only 45 million acres in Alaska and 220 million acres in all. The combined Forest Service and BLM acreage would then drop to about two-thirds of the Federal onshore land.

The Forest Service and BLM have relatively sophisticated planning programs for the management of nonmineral resources on land under their jurisdictions. Both agencies are under explicit congressional directives to inventory periodically the nonmineral resources and to establish plans based on the inventories for multiple use of the land and sustained yield of its renewable resources.¹⁰ (There is some question whether the agencies receive sufficient funding to implement these directives,) The terms "multiple use" and "sustained yield" are defined in the Federal Land Policy and Management Act ("BLM Organic Act") as follows:

The term "multiple use" means the management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; the use of some land for less than all of the resources; a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific, and historical values; and harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output.

The term "sustained yield" means the achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the public lands consistent with multiple use,¹¹

The BLM Organic Act also requires that the Secretary of the Interior, in developing and revising land use plans, "consider the relative scarcity of the values involved and the availability of alternative means (including recycling) and sites for realization of those values" and "weigh long-term benefits to the public against short-term benefits."¹² Similar definitions and requirements are found in the laws governing land management and planning by the Forest Service,]

The Forest Service and BLM differ somewhat in their approaches to land management and planning, but there are more important similarities. Both agencies, faced with wide variations in the types of land under their jurisdictions and in the supply of and demand for the resources on different tracts, place the major responsibility for management and planning at the local level, with guidance and review by State or re-

⁹See app. B, sec. O.

¹⁰Multiple-Use Sustained Yield Act of 1960, 16 U.S.C. §§ 528-531 (1976) (Forest Service); Forest and Rangeland Renewable Resources Planning Act of 1974, as amended, 16 U.S.C. §§ 1600-1614 (1976) (Forest Service); Federal Land Policy and Management Act

of 1976 ("BLM Organic Act"), 43 U.S.C. §§ 1701-1782 (1976).

¹¹BLM Organic Act, § 103(c) & (h), 43 U.S.C. § 1702(c) & (h) (1976).

¹²Ibid., § 202(c), 43 U.S.C. § 1712(c) (1976).

¹³See the first two statutes cited in note 10.

gional offices and the National headquarters. For BLM, the local level is the district office, which receives limited guidance and review from the State and National offices. For the Forest Service, the local level is the forest office, which receives more specific guidance in terms of overall resource allocation goals from the regional and National offices. Each local-level office subdivides the land under its jurisdiction for management and planning purposes. Each national forest is divided into management areas, and each BLM district is divided into resource areas,

An inventory is made of the resources, including known mineral resources, and ecological characteristics of each management or resource area. Major land types are identified on the basis of significant differences in the ecological characteristics that may affect the land's ability to support or survive various uses. The elements that define a land type include land form, slope, aspect (exposure to Sun or prevailing winds), elevation, soils, wildlife habitat or cover, vegetation, and hydrologic characteristics,

These land types are the basis for estimating land use capabilities and sensitivities. The land use capabilities are combined with an assessment of the demands for the various resources in the area to produce a land use plan for the area. Both the Forest Service and BLM follow a well-defined planning process with considerable public input. " In most cases, public input is used to critique plans, assumptions, and alternatives developed by the agency's professional staff. In some cases, however, public input is sought earlier to assist in framing issues and identifying alternative solutions.

The land use plans incorporate decisions on permissible resource uses and restrictions on uses. They are often followed by more detailed activity plans for individual resource activities such as timber harvesting or grazing allocations. The activity plans, however, conform to the guidelines and restrictions established in the land use plans. The Forest Service therefore treats the preparation of land use plans as the major decision point in the land management and planning process. Each plan is accompanied by a full environmental impact statement (EIS), complete with examination of alternatives, under the National Environmental Policy Act (NEPA). BLM, on the other hand, has waited until later in the process to prepare an EIS on individual resource activity plans. Its reason is that the land use plans are merely guidelines and that no environmental impact will occur until specific activities are undertaken. For BLM as well as the Forest Service, however, the decisions made in the land use plan on alternative resource uses and restrictions define the bounds of the subsequent specific resource activities. The range of alternatives with respect to a specific resource activity or program is constrained by the decisions made in the land use plan, and consideration is narrowed to alternatives that are primarily concerned with only the specific individual resource. From a policy perspective, the land use plan is thus the major action affecting alternatives or options. From a practical perspective, it seems also the most logical and efficient place to consider alternatives and impacts through an EIS. To the extent that later actions flow naturally from the land use plan, one EIS prepared for the land use plan can dispense with the necessity of preparing a complete separate EIS for each such subsequent action. (At most, a supplemental EIS might have to be pre-

⁴Forest Service Manual, pt. 8200; Bureau of Land Management Manual, §§ 1601-1609

pared for subsequent actions that could result in impacts of a type or magnitude not considered in the land use plan EIS.)

Other major Federal land management agencies include the National Park Service, with more than 25 million acres in 1975 and a possible addition of over 40 million acres in Alaska; the Fish and Wildlife Service, with more than 30 million acres in 1975 and a possible addition of more than 50 million acres in Alaska; the Department of Defense, with over 30 million acres in 1975, split among the Army (11 million), the Air Force (8 million), the Navy (4 million), and the Corps of Engineers (8 million); the Bureau of Reclamation, with more than 7 million acres; the Department of Energy, with more than 2 million acres; and the Tennessee Valley Authority, with almost 1 million acres. 15

Unlike the Forest Service and BLM, each of these other agencies has a legislatively mandated primary use for the land under its jurisdiction. Although much of this land is managed for multiple use, the management and planning process is constrained by the mandated primary use. For example, rules issued by the Secretary of the Army require inventory, classification, and multiple-use management of the renewable natural resources on Army land, but designated uses must be consistent with the military mission.¹⁶

2. Minerals in the Land Management and Planning Process

With rare exceptions, the Federal land management and planning systems discussed immediately above treat minerals as a distinct category outside the mainstream of the land use planning process.¹⁷ There are two principal reasons for this separation of mineral resource management and nonmineral resource management, one historical and the other practical.

First, throughout history, mineral development generally has been considered the highest use of land. Thus, as was indicated in chapter 3, mineral activities historically have been treated, from a policy and management standpoint, as independent of and preferred to activities related to nonmineral resources on Federal land. The mining and mineral leasing laws make mineral activity the preferred use on any Federal land that is open to such activity. They contain no explicit procedures for coordinating mineral and nonmineral activities. This is true even for those Federal land systems that are managed by agencies other than the Forest Service or BLM and are subject to legislatively mandated primary nonmineral uses. If lands in these systems are open to mineral activity, it will override the designated primary nonmineral uses.

Second, as a practical matter, coordinated planning of the use of mineral and nonmineral resources on any land is complicated considerably by the difficulties of identifying and valuing these resources.

It is usually easier to identify nonmineral resources than mineral resources, as nonmineral resources are usually visible while mineral resources are generally hidden beneath the surface and can be found only through costly and risky exploration. Conse-

¹⁵ U.S. Bureau of Land Management, *Public Land Statistics, 1976*, table 9 (1977).

¹⁶ 36 CFR pt. 642, 59 F.R. 16385 (1977).

¹⁷ E.g., 36 CFR § 642.49, 59 F.R. 16389 (1977) (Department of the Army).

quently, Federal land use planning and land management tend to concentrate, at least until a mineral discovery is made, on the nonmineral resource potential of the land. Mineral resource potential ordinarily is taken into consideration only for known occurrences (as in the case of coal).

On the other hand, it is usually easier to value known mineral resources than certain important types of nonmineral resources, such as scenic beauty, endangered wildlife and plant species, air and water quality, ecosystem functions, wilderness, and quality of life. Our understanding of the range and functions of nonmineral resources is very incomplete, and our ability to value even the better understood ones is quite limited. Thus, land management decisions involving known mineral resources often either slight nonmineral resources or give them an essentially infinite value.

Nevertheless, unless mineral activities are always to be preferred to nonmineral resource uses, or vice versa, decisions by Congress or the Federal land management agencies on the proper use of a particular tract of Federal land will always involve an explicit or implicit balancing of the values of the mineral and nonmineral resources on the tract. This balancing is now being made, in many cases, with inadequate information and analysis.

3. The Relative Availability and Value of Mineral and Nonmineral Resources

The independent and preferred position historically afforded to mineral activities on Federal land has been based largely on two premises: 1) that economic concentrations of minerals, **unlike other resources**, are “where you find them,” and 2) that these mineral concentrations are **always** the most valuable resource **wherever** they are found. As will be demonstrated below, neither premise is valid today. However, they continue to be the starting point for major studies on Federal mineral land management. Both were substantially adopted by the Public Land Law Review Commission in its 1970 report to the President¹⁹ and by the Department of the Interior’s Task Force on the Availability of Federally Owned Mineral Lands in its 1977 report to the Secretary of the Interior,¹⁹ although the Commission hedged on the first premise and the Task Force on the second. The Commission explicitly and the Task Force implicitly drew the conclusion that “[mineral] exploration and development should have a preference over some or all other uses on much of our public lands.” An examination of the two premises follows:

a. Availability

Physically the Earth’s crust consists entirely of mineral elements, with each element constituting varying percentages in the rock and soil. Considering only physical crustal occurrence, minerals are among the most abundant and widely dispersed of all resources.

However, all minerals have different values and economic concentrations of the more valuable minerals are rare and occur in specific identifiable geologic environ-

¹⁹Public Land Law Review Commission, *One Third of the Nation’s Land* (1970).

¹⁹DOI Task Force Report, note 4, at 14, 16, 17.

ments.²⁰ Generally, these economic mineral resources (called “reserves” when discovered and delineated) represent mineral concentrations that are much higher than the crustal average, although for some minerals the lowest grades (degrees of concentration) currently considered economically workable approach the average crustal concentration.²¹ Extremely high capital, energy, and environmental costs make it highly unlikely, barring a revolutionary technological breakthrough, that common crustal rock will be mined for its mineral content in the foreseeable future.

Nevertheless, a large supply of mineral resources is physically available in concentrations substantially greater than the crustal average, which, although not currently economical, could conceivably become so with possible increases in price or advances in technology, or both. In the past, such developments have been responsible for the conversion of substantial quantities of previously uneconomic mineral resources into reserves for production. For example, most of the current domestic production of iron and copper comes from previously known low-grade resources that were uneconomical to produce until new mining, processing, and transport technologies were developed.²² Extensive subeconomic resources of hydrocarbons and aluminum are known to exist in oil shale and clays, respectively, that could be developed given the appropriate economic, technological, and political conditions.

Similarly, increases in price or technological advances could lead to the development of synthetic minerals, the use of less expensive substitute minerals, exploration for deeper hidden deposits, or the mining of mine waste piles or garbage dumps (nonfuel minerals are never destroyed, but rather are recycled or disposed of after use, or dispersed as trace elements in the air, land, or water).

Thus, the location of economic mineral deposits is determined by prices, markets, technology, and time in addition to geologic factors. For society as a whole, the development and production decisions for a particular mineral deposit are not simply “this deposit or none” but rather “this depositor (eventually) a (possibly) more expensive 1) lower grade, more deeply buried, or more geographically remote mineral deposit, 2) synthetic mineral, or 3) substitute mineral.”

The situation for nonmineral resources is in some respects similar to the situation for mineral resources, and in some respects dissimilar. In contrast to the nonfuel minerals, which theoretically at least can be recovered and reused, some (but by no means all) nonmineral resources are subject to permanent loss. Examples include endangered plant and animal species, scenic landforms, and historical and archeological sites and objects. Others, such as wilderness, may take so long to recover, once disturbed, that their destruction is, in a practical sense, irreversible. Still other nonmineral resources recover or can be restored within a reasonable period of time at acceptable cost, analogous to the recovery and reuse of some mineral resources.

Many nonmineral resources are at least as limited in physical supply as most mineral resources, and subject to the same economics of more expensive, lower quality

²⁰H.J. Barnett and C. Morse, *Scarcity and Growth: the Economics of Natural Resource Availability* (1963); J.F. McDivitt and G. Manners, *Minerals and Men* 10-12, 72-78 (rev'd ed. 1974); J. Tilton, *The Future of Nonfuel Minerals* 4-23 (1977); Cook, “Limits to Exploitation of Nonrenewable Resources,” 191 *Science* 677

(1976).

²¹Cook, note 20, at 678; *DOI Task Force Report*, note 4, at 14-16.

²²McDivitt and Manners, note 20, at 39-48, 72-78; see *ibid.*, at 128 (sulfur), 148 (nickel).

alternatives. Examples include watersheds and aquifers, potential hydroelectric power sites, old-growth hardwood timber, prime agricultural land, and white-water rivers.

Thus, many nonmineral resources, like currently economic mineral deposits, are “where you find them only in the sense that alternative sites, although physically available, are of generally lower quality and higher price. Some nonmineral resources, because of uniqueness, are, unlike mineral resources, strictly “where you find them, ” in the sense that alternative sites are not available at any cost. However, no generally accepted formula exists to identify uniqueness.

b. Value

The long-standing premise that mineral activity is **always** the most valuable use of a tract of land is no longer widely accepted. It was based originally on the high net value of high-grade surface or near-surface mineral deposits in relation to the generally low or minimal commercial land values of the arid, remote, and unpopulated western regions. Today, however, two sets of factors undermine this premise.

First, many, if not most, mineral deposits being discovered today are of much lower grade and are located at greater depth than mineral deposits discovered in the past. They are thus more expensive to find and mine than the high-grade surface deposits formerly developed. As a result, the net value of many deposits being discovered today is lower than the net value of deposits worked in the past.

Second, major changes have occurred on the nonmineral side of the balance sheet. For example, today almost all the consumable nonmineral resource stocks (such as timber, forage, game, and water) are scarce as a result of the increase in demand for such resources and the decrease in the land base from which they are obtained, brought on largely by growth in population and the economy.

Furthermore, increased understanding of ecological processes, together with shifts in private and social values, has led to recognition and appreciation of a host of nonconsumable resource uses and values. There is a large and growing demand for various types of outdoor recreation. To illustrate, in 1976, there were close to 10 million visits to the Great Smoky Mountains National Park. Well over 2 million people a year visit Yosemite Valley in Yosemite National Park. These and other national parks clearly have a very high recreational and esthetic value.

Besides recreational and esthetic values, a natural ecosystem provides stocks of fish, animals, and plants for scientific study and research. It was estimated in 1967 that approximately half of the new drugs currently being developed are obtained from botanical specimens.²³ For example, very recently, a wonder drug for viral diseases was developed from the nucleosides of a Caribbean sponge.²⁴ The genetic diversity provided by ecosystems thus has immediate substantial practical benefits as well as longer range evolutionary importance.

An ecosystem also provides functions or services that produce tangible benefits without any necessity for direct intervention or use:

²³Krutilla, “Conservation Reconsidered,” 57 *Am. Econ. Rev.* 777, 780 [1967].

²⁴Cohn, “Drug Treatment for a Virus is Hailed as ‘Major Advance,’” *Washington Post*, Aug. 11, 1977, at A1, A25.

[These functions] include the absorption and breakdown of pollutants, the cycling of nutrients, the binding of soil, the degradation of organic waste, the maintenance of a balance of gases in the air, the regulation of radiation balance and climate, and the fixation of solar energy—the functions, in short, that maintain clean air, pure water, a green earth, and a balance of creatures; the functions that enable humans to obtain the food, fiber, energy, and other material needs for survival.’)

Estimates of the value of just a portion of these functions include \$83,000 per acre for the water purification and fisheries functions of a wetland (not taking account of other functions such as sulfate reduction, carbon dioxide fixation, oxygen release, and waterflow support) and a minimum of \$784 per acre for the ground water storage, soil binding, water purification, and streamside fertilization functions of a Georgian river-swamp-forest.²⁶

Finally, apart from any direct use or tangible benefit, many persons attach a value to the preservation of an option, for themselves or others, to view or use a unique resource in the future, or just to know that it is there. The existence of such an “option demand” value is demonstrated by their willingness to give money to nature preservation and conservation organizations, which use the money to protect resources most contributors never expect to see themselves.²⁷

When all the mutually consistent consumable and nonconsumable nonmineral resource uses, scientific and evolutionary values, ecological functions, and option preservation values of a tract of land are considered, the value of the mineral resources in the tract may be outweighed by the temporary and permanent losses in nonmineral resource uses and values that would result from developing the mineral resources, even when the social value of a secure domestic mineral supply is added to the private value of the deposit to a mineral producer. An obvious example is a low-grade surface deposit of coal under a skyscraper. A more controversial example is an actual calculation made for a low-grade molybdenum deposit in a highly scenic mountain range.²⁸ The automatic assumption, in every case, of a higher value for the mineral resource can lead to inefficient resource use, even though a rich mineral resource may outweigh the nonmineral resource values in most areas.

The difficulty of balancing mineral and nonmineral values should not be underestimated. No general formulas can be given. Each case, each site is different. The methodologies for valuing nonmineral resources vary widely in the acceptance they command. Some nonmineral resource values are calculated by established methods with wide acceptance—e.g., those for the commercial value of agricultural and grazing lands and timber resources. Others are valued by methods still being developed but having reasonable scientific and economic bases—e.g., those used to calculate the \$83,000-per-acre valuation placed on the water purification and fisheries function of a certain wetland. (See footnote 25.)

The valuation becomes more difficult and more subjective when the nonmineral value is based more upon recreational use and especially so when esthetic and wilderness considerations are taken into account. Great Smoky Mountain National Park, for

²⁶Westman, “How Much Are Nature’s Services Worth?” 197 *Science* 960, 961 (1977).

²⁷*Ibid.*

²⁸Krutilla, note 23, at 780-781.

²⁹Krutilla and Fisher, *The Economics of Natural Environments* 151 [1975].

example, would clearly command a very high value, but the value of a remote scenic area, an area of unconventional beauty, or the preservation of an option cannot, at present, be quantified in a way that wins agreement. Indeed, it is likely that such valuations will remain highly subjective and rooted in much larger value systems.

Nevertheless, it is clear that the values of many people in the United States have been changing in favor of nonmineral resource uses as opposed to particular mineral activities. These changing values are partially responsible for increased withdrawals of Federal land from mineral activity that, together with other restrictions, are making it increasingly difficult to explore for and develop minerals on Federal land (see section G). This trend may have serious adverse consequences on the domestic mineral industry and, after a deceptive lag of 10 to 20 years (during which time currently known and available mineral deposits are brought into production but few new deposits are discovered and developed for eventual production), on the U.S. mineral posture in an increasingly tight international minerals environment.

4. The Land Management Dilemma

Land management and planning must proceed on the basis of existing information. This will almost always be deficient with respect to the mineral resources of a tract, as most mineral deposits, unlike almost all nonmineral resources, are hidden beneath the surface. One of the principal goals of Federal land management, therefore, should be to improve such management by obtaining better mineral resource information.

But mineral resource information can be obtained only through exploration, which is both costly and risky. A single mineral exploration project involving the search for only one mineral occurrence type can cost several tens of millions of dollars and yet stand an 80 percent or greater chance of failure to discover significant mineralization (see chapter 2). Clearly, neither Federal land management agencies nor private industry can afford to obtain mineral information that would be adequate for each once-and-for-all, mineral-versus-nonmineral land use decision.²⁹ Unless practically every cubic foot of land in a particular tract has been excavated and analyzed, we can never be entirely sure of its mineral content. Land in Arizona once classified by the U.S. Geological Survey as not known to be mineralized was later found by drilling through the overburden to be underlain by major copper deposits, and many ore bodies have been discovered in areas previously explored and rejected by others.’{’

An obvious alternative to possible once-and-for-all, mineral-versus-nonmineral land use decisions based on inadequate knowledge of the mineral resources is to leave the land open to mineral exploration so that the existing land use designations can be constantly reappraised in the light of whatever mineral information is produced. But, given the risks and costs of exploration, private firms will invest in exploration only if they are given reasonable assurance that they will be allowed to develop any mineral deposit they discover. If such assurance is provided, the land use decision has been

²⁹See O. C. Herfindahl, *Natural Resource Information for Economic Development* (1969).

²⁹Bailly, "The Problems of Converting Resources to Reserves," *Mining Eng.*, January 1976, at 1, 3-4.

made prior to the acquisition of the mineral information, and it has been made in favor of mineral development, even though the mineral deposit (if one is found) may be worth less than the nonmineral resources on the tract. If a deposit were discovered, the Federal land management agency could mitigate the impacts, but it could not prevent the development and production of the deposit. Even if no discovery were made, land use planning might be inhibited by the possibility of a discovery, since an actual discovery could lead to preemption of the planned nonmineral uses.

The land management agency therefore faces a fundamental dilemma in deciding whether to leave an area open to mineral exploration. If the agency wishes to retain control over the later decision on whether mineral development should be allowed, it can do so only by refusing to allow exploration in the first place (e. g., by refusing to issue an exploration permit or by withdrawing the land from the pool of lands available for exploration), in which case it is making a decision without adequate mineral information and precluding the possibility of obtaining such information except through Government exploration. On the other hand, if it wishes to obtain the mineral information through exploration by private industry, it can do so only by turning the later development decision over to the industry, which generally will not fully consider the nonmineral resources values of the tract in deciding whether to proceed to development.

Although the dilemma is persistent and troublesome, it maybe mitigated by establishing, in advance of exploration, conditions and payments applicable to exploration and development that will ensure more complete consideration of nonmineral resource values by private industry. In some areas, the nonmineral resource values may be so low as to make the dilemma of little practical significance.

As we shall see in the following sections, the current Federal mineral laws do little to resolve this dilemma.

D. Coordination of Mineral and Nonmineral Activities Under the Mining Law

1. Relevant Provisions of the Mining Law³¹

During the 19th century, settlement of the public domain was encouraged by enactment of laws providing for free, or almost free, disposal of the public domain to individuals and firms for mining, logging, farming, ranching, irrigation, railroad, and other purposes. The Mining Law of 1872 was enacted during this period.

It authorizes free entry onto and occupation of public domain land for the purposes of exploring for, developing, and producing minerals other than the fossil fuels, certain fertilizer and chemical minerals, and common-variety minerals. There is no requirement for obtaining approval from or paying fees to the Federal landowner.

³¹See ch.3, subsec. B(3), for a more complete discussion

Entry is made by “locating” a mining claim. The claim must be distinctly marked on the ground so that its boundaries can be readily traced. No notice need be given to the Federal land management agency, or to the private or State surface owner if the surface is in non-Federal ownership, before entering on the land. Beginning in 1976, a notice of location, accompanied by a general map and description sufficient to enable someone to find the claim on the ground, must be filed with the appropriate BLM State office within 90 days after making the location, and affidavits of assessment work or notices of intent to maintain the claim must be filed annually.

There is no legal limit to the number of claims anyone can file. However, a discovery (physical exposure) of a valuable mineral deposit must be made on each claim in order to acquire a possessor right valid against the Government.

If it is shown that a valuable mineral deposit has been discovered, complete fee title to the surface and subsurface can be obtained by paying \$2.50 or \$5.00 per acre, depending on the type of claim, for a title document known as a “patent.” In addition, at least \$500 worth of mineral development work must have been done. Before issuance of a patent, use of the surface and surface resources is limited to those uses required for the mining claimant’s prospecting, mining, or processing operations or uses reasonably incident thereto. After issuance of a patent, any use can be made of the surface. No patent is needed to mine.

2. Unnecessary Adverse Impacts on Nonmineral Resource Values

a. Unnecessary Impacts Due to Federal and State Work and Claim Requirements

Various requirements imposed by or under the Mining Law in an attempt to ensure good-faith mineral activity result in adverse impacts on nonmineral resources without an offsetting furtherance of actual mineral discovery. The requirements and impacts vary from State to State.

The Mining Law allows each State to specify the method of locating claims. Almost all the States have enacted location provisions that include a requirement for sinking a discovery shaft or pit of specified minimum dimensions on each claim within a certain period (at most 120 days) after the initial posting of the location notice on the claimed area. Originally, this requirement made sense as a method of ensuring physical exposure of the mineral deposit for which the claim was located, since almost all claims were based on showings of commercial-grade mineralization at or just below the surface. Today, however, as was discussed in chapter 2, many claims are located for buried deposits, and the shaft dimensions specified in the State discovery work requirements (e.g., 10 feet deep) usually will not expose the mineral deposit. The only outcome of the requirement is surface damage. An example is the situation in a remote wildlife area in northern Washington, described by the Secretary of the Interior in 1969:

¹Twitty, Sievright, and Mills, *Nonfuel Mineral Resources of the Public Lands: Legal Study* 476-482, 518-539 (1970) (prepared

for the Public Land Law Review Commission) (hereinafter cited as *PLLRCC Nonfuel Legal Study*).

The land covered by the mining claims is rough and mountainous. . . . To dig [the required] pits, which are entirely unrelated to the exposing of mineral deposits which are usually well below the surface, the scrapers and bulldozers cross the country in the most economical way possible for the company, This results in one pit on each claim and roads bulldozed without respect to contours, slopes, water courses, or other resource considerations. The sum total is hundreds of pits and miles of cuts and scars.

Some States have amended their discovery work requirements to permit drilling instead of the sinking of shafts, or to allow one shaft or drill hole to suffice for several contiguous claims, substantially reducing but not eliminating the damage. Only a few States require the work to continue until exposure of commercial-grade mineralization is accomplished, and the time allowed for exposure is so short (at most 120 days after initial location of the claim) that actual exposure becomes improbable—thus the discovery work is unlikely to accomplish its purpose, and the surface is disturbed for no purpose and at expense and trouble to the mineral explorer. Some States, for example, Alaska and Utah, have no discovery work requirements. Colorado has provided for filing of a map of a field survey of the claim as an alternative to the discovery work.³⁴

The Mining Law itself requires \$100 worth of labor to be performed or improvements made each year from the time a claim is located until a patent is issued conveying title to the claimant. This \$100 worth of work, usually referred to as “assessment work,” is also meant to demonstrate good faith in developing the claim. The law permits work on one claim to be applied to a group of claims held in common, and most work that would tend to facilitate the development of the claim, including on-the-ground geological, geophysical, or geochemical surveys for a limited number of years, will satisfy the requirement.³⁵ Nevertheless, the requirement may lead to unnecessary surface damage (including unnecessary use of bulldozers or dynamite³⁶) by those unable or unwilling to conduct genuine mineral development activities during 1 or more years. This sort of damage is especially unfortunate because it results from a legal requirement that is administratively unenforceable.³⁷

The *pedis possessio* doctrine created by the courts to protect good faith, diligent exploration prior to actual discovery also leads to unnecessary adverse surface impacts. The damage, however, is in more acute form, since this doctrine requires *continued actual occupancy* and persistent and diligent prosecution of work looking to mineral discovery on *each* claim, and perhaps even over the entire claim. The requirement is not satisfied merely by performance of the annual assessment work, which only maintains a claim on which there has been an actual discovery of a valuable mineral deposit.³⁸ Thus, the explorer who has a target encompassing many claims must maintain “show” work on all the claims even though he expects to discover the underlying ore body by drilling on only one of the claims.³⁹ The amount of unnecessary surface damage can be substantial.

³⁴U.S. Department of the Interior, *The Mining Law—An Antique in Need of Repeal* 9 (1969) (hereinafter cited as *DOI Mining Law Report*).

³⁵PLLRC *Nonfuel Legal Study*, note 32, at 522-539.

³⁶*Ibid.*, at 578-595.

³⁷U.S. General Accounting Office, *Modernization of 1872 Mining Law Needed to Encourage Domestic Mineral Production, Protect the Environment, and Improve Public Land Management*,

B-118678, at 26 (1974) (hereinafter cited as *GAO Mining Law Study*); see *DOI Mining Law Report*, note 33, at 10.

³⁸See ch. 4, subsec. D(2)(b).

³⁹PLLRC *Nonfuel Legal Study*, note 32, at 351-352, 356-357.

³⁹MacDonnell, “Public Policy for Hard-Rock Minerals Access on Federal Lands: A Legal-Economic Analysis,” 71 *Q. Colo. Sch. Mines*, no. 2, at 18 (1976).

Finally, the claim marking and posting requirements in the Mining Law and the supplementary State laws also produce unnecessary surface impacts. The Mining Law requires that each claim “be distinctly marked on the ground so that its boundaries can be readily traced.” The supplementary State laws all require placing of substantial posts or mounds of stone at least 3 feet high on at least each corner of the claim. Trees may be used for monuments in at least some of the States if they, for example, are “so hewn as to readily attract attention” (Idaho) or have had their tops removed leaving stumps at least 3 feet high (Nevada).⁴⁰ Such claim marking activity has obvious detrimental impacts on plant life and scenery.⁴¹ More extensive surface impacts can result from roads or trails constructed across the countryside in the process of marking a group of claims. All these impacts are unnecessary for placer claims on surveyed land, which must be located according to the subdivisions of the public survey. Yet only California and Oregon dispense with all physical marking requirements for such placer claims.⁴² These impacts would also be unnecessary for lode claims if the Mining Law required them to be located according to the subdivisions of the public survey. On unsurveyed land, the impacts could be avoided or minimized by requiring location through a field survey tied to a substantial natural monument and depicted on a map to be filed in the recording office.⁴³

All the legal requirements described in this subsection are either outmoded or lack appropriate and adequate criteria for acceptable mineral activities that can be administratively enforced. They therefore result in “practices which often destroy nonmineral values without making a comparable or any real contribution to the discovery or development of mineral deposits.”⁴⁴

b. Unnecessary Impacts Due to Inadequate Government Controls Over Surface Impacts of Mineral Activities

The Mining Law itself contains no provisions for the protection of nonmineral resource values. In 1974, relying on the language in its 1897 Organic Act that requires prospectors and miners in the national forests to “comply with the rules and regulations covering such national forests,”⁴⁵ the Forest Service issued regulations designed to minimize the surface impacts of mineral activities on unpatented claims in the national forests. BLM has had under consideration issuance of similar regulations based on language in the Mining Law that makes activities under the law subject to “regulations prescribed by law”⁴⁷ and on inherent executive authority to protect Federal land from despoliation or improper use.⁴⁸ In 1976, following passage of its own Organic Act that, among other things, directed the Secretary of the Interior “by regulation or otherwise, [to] take any action necessary to prevent unnecessary or undue degradation of the [public] lands,”⁴⁹ BLM proposed regulations similar to those issued

⁴⁰ PLLRC *Nantuel Legal Study*, note 32, at 509-513.

⁴¹ See also Sumner, “Wilderness and the Mining Law,” *The Living Wilderness*, spring 1973, at 11.

⁴² PLLRC *Nantuel Legal Study*, note 32, at 509-513.

⁴³ It is doubtful that the costs of such a survey would be any greater than those now incurred in locating a typical group of claims. See ch. 4, subsec. C(2)(c).

⁴⁴ I. Senzel, *Revision of the Mining Law of 1872*, Senate Comm. on

Energy & Nat. Res. Pub. No. 95-11, 95th Cong., 1st sess. 21 (Comm. Print 1977) (hereinafter cited as Senzel).

⁴⁵ 16 U.S.C. § 478 (1976).

⁴⁶ 36 CFR pt. 252 (1977).

⁴⁷ 30 U.S.C. § 22 (1976). But see Senzel, note 44, at 13.

⁴⁸ Senzel, note 44, at 6 n.8.

⁴⁹ 43 U.S.C. § 1732(b) (1976).

by the Forest Service, but covering all public domain land.⁵⁰ So far, however, the proposed BLM regulations have not been finally adopted.

In the absence of any regulations,⁵¹ BLM is unable to prevent unnecessary surface impacts on the public domain caused by mineral activities under the Mining Law. The activities include dumping waste rock from mines down steep slopes to valley floors, leaving behind abandoned mine equipment, draining possibly toxic or carcinogenic mine water runoff into streams, failing to control soil erosion, drilling in streambeds, constructing duplicative roads and trails, destroying fences and irrigation ditches, failing to plug or fence shafts or drill holes (which constitute safety hazards as well as pollution sources), failing to locate and construct roads and trails so as to minimize surface damage, and failing to reclaim or rehabilitate land affected by mineral activities.⁵² From 1930 to 1971, counting only acreage actually excavated for mines or used for disposal of mine wastes (that is, excluding roads and similar ancillary surface uses), only 8 percent of the area in the United States disturbed by metal mining and 26 percent of the area disturbed by nonmetal mining was reclaimed. By 1971, the annual reclamation rate had risen to 35 percent for metal mines and 56 percent for nonmetal mines.⁵³ Data for more recent years is not available, and there are no mechanisms for gathering such data.

Unnecessary surface impacts also occur, although to a much smaller degree, on national forest land, often as a result of activities undertaken without filing the notice of intent or plan of operations required by the Forest Service's surface use mining regulations.⁵⁴ The regulations require that a notice of intent be filed by any person proposing to engage in mineral activities under the Mining Law that might disturb surface resources. They also state that a notice of intent need not be filed for activities for which no plan of operations would be required. Since plans of operations are required only for activities that will cause significant surface resource disturbance, a miner apparently must file a notice of intent only if significant surface resource disturbance is anticipated.

A plan of operations must include information adequate to describe the proposed activities and their location, the size and location of areas where surface resources will be disturbed, existing and proposed roads or access routes, the time period during which the proposed activities will take place, and measures to be taken to meet certain broad requirements for environmental protection. The environmental protection requirements refer to applicable Federal and State air quality, water quality, and solid waste disposal laws. They require, to the extent practicable, elimination or minimization of impacts on the environment and surface resources, including scenic values, fisheries, and wildlife habitats. The surface, including roads, must be reclaimed. Upon

⁵⁰43 CFR pt. 3800 (proposed), 41 F.R. 53428 (1976). Although the language from the BLM Organic Act quoted in the text is clearly applicable to activities under the Mining Law (see the entire paragraph from which the language is quoted), a question has been raised whether the language would support rehabilitation requirements. Senzel, note 44, at 21. See also 43 CFR subpt. 3802 (proposed), 44 F.R. 2623 (1979) (Mining Law activities in wilderness study areas).

⁵¹Or of any delegation of the Secretary's authority to act "by regulation or otherwise." See text at note 49.

⁵²D. Sheridan, *Hard Rock Mining on the Public Land* 14-15 (1977) (report prepared for the U.S. President's Council on Environmental Quality) (hereinafter cited as *CEQ Study*); *DOI Mining Law Report*, note 33, at 9-13; *GAO Mining Law Study*, note 36, at 24-28.

⁵³U.S. Bureau of Mines Inf. Circ. 8642, note 6, table 10, at 54.

⁵⁴*CEQ Study*, note 52, at 15-19; letter from John R. McGuire, Chief, Forest Service, to John A. McComb, Southwest Representative, Sierra Club, Mar. 18, 1977, at 5; McGuire, "Forest Service Mining Regulations," remarks at the AMC Mining Convention, Sept. 28, 1976.

cessation of mineral operations, hazards must be marked or fenced and all structures and equipment must be removed. Bonds may be required to ensure reclamation.⁵⁵

In its enforcement of the regulations, the Forest Service makes a particular effort to avoid infringing the miner's (prospector's) absolute right of entry. The Forest Service Manual emphasizes the limited nature of control the regulations afford:⁵⁶

The prospector and miner have a statutory right . . . to enter upon the National Forests for prospecting and mining. Their rights to do this cannot be unreasonably restricted or made excessively burdensome.

The objectives in administering the . . . regulations are to . . . [a]void materially endangering or interfering with prospecting, exploration, mining and mineral processing operations, as well as uses reasonably incident to such uses . . .

[T]he economics of operations will be considered in determining what are reasonable environmental protection requirements in operating plans and in special-use permits for road construction, reconstruction or restoration.

No fines or penalties are assessed for failure to comply with the regulations. The Forest Service seeks to negotiate compliance before issuing a notice of noncompliance. In one case it wrote the entire plan of operations for a recalcitrant prospector who still refused to file the plan.⁵⁷ In such cases, the Forest Service Manual advises that, "Where reasonable, continued failure to comply should be followed by additional personal contacts. Legal action to force compliance should be a last resort" (In the case mentioned, a lawsuit was finally filed.)⁵⁹

In sum, the Forest Service is cautious about pressing very hard for major mitigating measures, given the prospector's or miner's absolute legal right to proceed under the Mining Law. The Forest Service has been quite strict in insisting on environmental controls in certain areas, but this strictness occurs against a background of uncertainty over exactly how much authority can be exercised.⁶⁰ Moreover, the workload involved in trying to track down and keep on top of all the mineral projects in a national forest can preclude detailed attention to all but a few projects. In one ranger district on the Beaverhead National Forest in southwest Montana, notices of intent had been filed for only half of the estimated 80 active projects, and plans of operations had been filed and approved for only 6 or 7. Although there is no requirement to file notices or plans for projects that will not involve significant surface disturbance, it is not clear that half the projects did not involve such disturbance, which includes any disturbance for which natural recovery would not be expected to take place within a reasonable period of time.⁶¹ Nationwide, operating plans have been required for only one out of three notices of intent that are filed.⁶²

The absence in the Forest Service and proposed BLM surface use regulations of a requirement that everyone file a notice of intent, rather than only those who believe

⁵⁵36 CFR pt. 252 (1977).

⁵⁶*Forest Service Manual* pt. 2850, Interim Directive No. 5 (1977); cf. *United States v. Bennowitz*, 72 F.D. 183, 187-188 (1965). For two limited categories of Federal land, entry under the Mining Law can be conditioned or regulated to whatever extent is deemed desirable by the Secretary of the Interior. See 30 U.S.C. §§ 621, 622 (1976) (certain powersite withdrawals and reservations) and *ibid.* § 1281 (Supp. I 1977) (urban or suburban residential areas).

⁵⁷Interview with Buster LaMoure, U.S. Forest Service, Septem-

ber 1976.

⁵⁸*Forest Service Manual* § 2851.2, Interim Directive No. 5 (1977).

⁵⁹Letter to John A. McComb, note 54, at 6.

⁶⁰*CEQ Study*, note 52, at 18, 29.

⁶¹*Forest Service Manual* § 2851.05a, Interim Directive No. 5 (1977).

⁶²McGuire, note 54.

they will cause significant surface disturbance, means that the local agency staff must try to discover and keep track of all those who do not file to make sure there is no significant disturbance. This is, in a practical sense, impossible. Each ranger district or BLM district can encompass millions of acres, and only one or a few persons, if any, will be available and qualified to administer and enforce the regulations, whereas any number of prospectors and miners can come and go at will under the Mining Law and the regulations.

Moreover, the uncertainty of precovery tenure under the Mining Law can act as an incentive to ignore the surface use regulations. Because the limited protection afforded by the *pedis possessio* doctrine applies only to explorers in actual occupation and diligently working, explorers may decide not to wait for approval of operating plans or even to take time to file notices of intent in a competitive situation, especially since failure to comply will not void their claims and will most likely result simply in an admonishment by the Forest Service.⁶³

Finally, it should be noted that the Forest Service (or proposed BLM) surface use regulations apply only to unpatented claims. Once a claim is patented, it becomes private land, and the Federal land management agencies lose control over the surface as well as the subsurface except in a few special areas. They are not empowered to prevent even the most adverse surface impacts on the patented claim, regardless of any indirect impact on nonmineral resource values on the surrounding Federal land.

3. Preemption of Nonmineral Resource Values

As explained in the preceding subsection, mineral activities legally always take precedence over nonmineral resource uses on land subject to the Mining Law, regardless of the relative values. In particular, the surface use regulations under the Mining Law emphasize that the environmental mitigation measures they authorize cannot materially interfere with the mineral activities. The most that can be done for nonmineral values, under the regulations, is to eliminate unnecessary adverse impacts—i.e., those impacts that can be eliminated without seriously affecting the economics of the mineral activity—and to mitigate, insofar as practicable, necessary adverse impacts.

Activities under the Mining Law are subject to Federal and State air quality, water quality, toxic substances control, and other environmental laws of a general nature. But, as is discussed in section F, these laws provide only for mitigation of impacts resulting from the mineral activity. They do not reach the central issues of land resource allocation and use.

Because the Forest Service cannot through its regulations materially interfere with the rights of the prospector or miner under the Mining Law, and therefore sees itself as having little real control over the basic mining activities, it rarely prepares an EIS for proposed operating plans filed under the regulations. Only four had been, or

⁶³See U.S. Department of Agriculture, Forest Service, *Anatomy of a Mine From Prospect to Production*, Gen. Tech. Rep. INT-35, at

14 (1977) [hereinafter cited as *Anatomy of a Mine*]

were being, prepared by early 1977.⁶⁴ A similar “lack of discretion” rationale for declining to prepare an EIS has been adopted by the Department of the Interior’s Board of Land Appeals for patent applications under the Mining Law.⁶⁵

4. Unpredictable Nonmineral Resource Protection Requirements

The surface use and protection requirements that apply to some mineral activities under the Mining Law are applied in an ad hoc and unpredictable manner that sometimes creates great uncertainty for mineral explorers and developers. For example, the Forest Service surface use regulations, discussed in subsection D(2)(b), are written in very general terms that provide little guidance on what controls may be imposed in particular situations. Specific controls are negotiated at the time a plan of operations is submitted or revised, and they can vary in scope or severity depending upon the local forest ranger. At times the controls may be unduly restrictive; at other times they may be unduly permissive. Both the public and the miner might benefit from more specific, predictable controls based on land types and uses in an area.

5. The Valuable Mineral Deposit Criterion

The right to a mineral patent, which conveys ownership of a claim from the Government to the claimant, and the right to exclusive possession of an unpatented claim depend on the discovery of a valuable mineral deposit within the bounds of the claim. The “valuable mineral deposit” criterion is the linchpin of the Mining Law. It is the indispensable element for acquiring and maintaining tenure. It is the element in the law that prevents (but, as will be shown below, not entirely successfully) the acquisition of land under the law for nonmineral purposes. And it is the flexible term that determines, according to the prevailing interpretation, the governing tradeoff between mineral and nonmineral resource values, by making it easier or harder to gain mineral rights on Federal land.

This subsection concentrates on the last aspect of the criterion—its role in the tradeoff between mineral and nonmineral resource values under the Mining Law. Recent interpretations that tighten the requirements under the criterion have been severely criticized by persons in the mineral industry, who quote the following statement by a former BLM official:

There can be no gainsaying that the Mining Law of 1872 is not administered as it was originally written and intended. There has been a definite trend in decisions toward more stringent requirements to establish the validity of a claim. The requirements are innovations which have been superimposed on the basic law by the need for standards which can serve to prevent the subversion of the law for nonmineral purposes. Examples of these may be found in the narrowing application of the rule of discovery, the employment of the rule of marketability, the definitions of “common varieties, and the concern for economic values”⁶⁶

⁶⁴Letter to John A. McComb, note 54, at 3; letter from John R. McGuire to John A. McComb, May 17, 1977.

⁶⁵*United States v. Pittsburgh Pacific Co.*, 84 I.D. 282 (1977); *United States v. Kosanke Sand Corp.*, 12 I.B.L.A. 282 (1973).

⁶⁶Hochmuth, “Governmental Administration and Attitudes in Contest and Patent Proceedings,” 10 *Rocky Mt. Mineral Law Inst.* 467 (1965).

However, a longer run view of the history of administration of the Mining Law and a closer attention to its literal language reveal a different picture—a liberalization of the law’s administration in favor of the miner as it became apparent that the historical conditions on which the law was based no longer applied.

The Mining Law as originally written, and as it still exists in the literal language of the statute, was based on a perceived situation in which high-grade gold, silver, and other metal deposits were discovered at or near the surface of the land, shortly after entry upon the land, and were immediately worked and produced. Thus, the statute literally requires discovery prior to location of the claim, and it requires annual labor to be performed or improvements to be made on each claim. Each of these requirements has been liberalized by the courts and the Department of the Interior to accommodate the realities of exploring for and developing buried deposits.

Similarly, the assumption of high-grade surface deposits that could immediately be worked and produced led to initial decisions under the law requiring that the mineral character of the land be shown as a present fact, based on actual production or proof that profitable production could be undertaken, as well as proof that the land was more valuable for mineral production than for nonmineral purposes.” Subsequently, responding to the realities of lower grade or buried deposits, the decisions have shifted back and forth from the strict present, comparative value test to a prospective (and sometimes merely hopeful) “prudent miner” test for mineral value, relying on the latter test particularly when the dispute involves rival mineral claimants rather than a mineral claimant versus the United States. ⁶⁹ During the early part of the 20th century, when there was a generally lax attitude toward administration and enforcement of the mineral laws (see chapter 3), the “prudent man” test received fairly widespread application, although it never completely displaced the present value and comparative value tests, which continued to crop up in judicial and administrative decisions. With the current heightened concern over nonmineral resource values, the present value test has returned to prominence in the form of the marketability test, which requires proof that a deposit can be presently mined and marketed at a profit.⁶⁹

The comparative value test is generally dormant, but it also could be revived. In 1973, the Department of the Interior’s Board of Land Appeals, over the dissent of three of its members who felt the issue was not ripe for decision, rejected the comparative value test on the basis of a 1914 administrative decision. ⁷⁰ However, the Board apparently was unaware of (a) a line of judicial and administrative decisions since 1914 that have cited the comparative value test,⁷¹ (b) evidence of congressional approval of the test, ⁷² and (c) court decisions that have mandated inclusion of nonmineral values in

⁶⁹ PLLRC *Nonfuel Legal Study*, note 32, at 243-267, 393-394, 398-401; Brice, “Law of Discovery: Prudent Man and Marketability,” in University of Arizona, College of Mines, *Symposium on American Mineral Law Relating to Public Land Use* 19, 21-23 (J.C. Dotson ed., 1966).

⁷⁰ PLLRC *Nonfuel Legal Study*, note 32, at 379-389; Brice, note 67, at 23-24.

⁷¹ *Coleman v. United States*, 390 U.S. 599 (1968).

⁷² *United States v. Kosonke Sand Corp.*, 12 I.B.L.A. 282, 299-302, 314-315 (1973).

⁷³ PLLRC *Nonfuel Legal Study*, note 32, at 394-438; Brice, note 67, at 23-29; G.O. Smith *et al.*, *The Classification of the Public*

Lands, U.S.G.S. Bull. 537, at 25-26 (1913); *Dunbar Lime Co. v. Utah-Idaho Sugar Co.*, 17 F.2d 351, 354 (8th Cir. 1926); *Webb v. American Asphaltum Mining Co.*, 157 F. 203, 205 (8th Cir. 1907); *United States v. Lillibridge*, 4 F. Supp. 204 (S.D. Cal. 1932); *United States v. Lavenson*, 206 F. 755, 763 (W.D. Wash. 1913); *Loney v. Scott*, 57 Ore. 378, 112 P. 174 (1910); *Bay v. Oklahoma Southern Gas, Oil and Mining Co.*, 13 Okla. 425, 73 P. 936 (1903); *United States v. Gray*, A-28710 (Supp.), [1964] Gower Federal Service (Mining) SO-1964-25 (May 7, 1964); *United States v. Dawson*, 58 I.D. 670, 679 (1944); *Layman v. Ellis*, 52 I.D. 714, 718-719 (1929); *John McFayden*, 51 I.D. 436, 442 (1926).

⁷⁴ See, e.g., H.R. Rep. No. 1203, 52d Cong., 1st sess. 1-2 (1892).

agency decisionmaking processes.⁷³ Two recent court decisions suggest that a return to the comparative value test may be required by NEPA.⁷⁴

Nevertheless, at the present time nonmineral values are not balanced directly against mineral values in order to decide whether to issue a mineral patent to Federal land. They are, however, considered indirectly to the extent that requirements for protecting nonmineral values exist. The costs of complying with those requirements are included in an increasingly comprehensive definition of the considerations a prudent miner would take into account, and they are factored into profitability calculations under the marketability version of the “valuable mineral deposit” criterion.⁷⁵ This indirect approach fails to take into account a fairly large range of nonmineral values, but even so, it can create substantial uncertainty over whether the discovery of a valuable mineral deposit necessary for acquiring and maintaining tenure has been made.

Thus, the valuable mineral deposit criterion is unsatisfactory to both miners and nonmineral resource users. Miners point to the extreme uncertainty over tenure created by the marketability interpretation and its increasingly strict scrutiny of costs and financing. In effect, a mine must be well into the development stage before BLM will concede marketability. Prior to such a determination, which amounts to second-guessing of the miner’s profitability calculations, the miner is liable to be dispossessed at any time despite the substantial investment made in exploration and initial development.

Nonmineral resource users, on the other hand, note that the valuable mineral deposit criterion is the only element of the Mining Law that limits the disposal of Federal land and the appropriation or destruction of its nonmineral resource values, by requiring a showing that minerals exist that can be mined at a profit. But, they point out, the criterion provides only minimal protection of nonmineral resources, because, as now interpreted, it considers only the miner’s costs of complying with general environmental laws. It does not consider the value per se of the nonmineral resources. Moreover, the criterion is usually invoked only if a patent (title to the land) is sought by the miner. It is rarely applied during the early stages of exploration and development, and even production can occur under the law without a patent. Although discovery of a valuable mineral deposit is technically required to obtain possessor rights valid against the Government, and the Government can bring contest proceedings alleging failure to make such a discovery, the contest route is almost useless in practice, as is shown in subsection 7,

6. Lack of Payments for Damage to or Appropriation of the Land and Its Nonmineral Resources

There are not only no regulatory mechanisms under the Mining Law for balancing mineral and nonmineral resource values (rather, regulations require mitigating, to the

⁷³See, e.g., *Ely v. Velde*, 451 F.2d 1130 (4th Cir. 1971); *Calvert Cliffs Coordinating Committee v. AEC*, 449 F.2d 1109 (D.C. Cir. 1971); *Zabel v. Tabb*, 430 F.2d 199 (5th Cir. 1970), cert. denied, 401 U.S. 910 (1971).

⁷⁴*Global Exploration & Development Corp. v. Andrus*, Civ. No.

78-0642, slip opinion at 8-9 (D.D.C. Aug. 14, 1978); *Natural Resources Defense Council, Inc. v. Berkland*, Civ. No. 75-0313, slip opinion at 16-17 (D.D.C. June 30, 1978).

⁷⁵*United States v. Pittsburgh Pacific Co.*, 84 I.D. 282 (1977).

extent practicable, impacts on nonmineral resources resulting from some mineral activities), but also no payment incentives.

If the mineral explorer or developer were required to pay for the adverse impacts imposed on nonmineral resources (that is, the impacts not mitigated by regulatory requirements), and if the values of all nonmineral resources could be assessed adequately (which is difficult to do completely and to the satisfaction of all concerned), then mineral activities would not occur unless the net mineral value (the sale price of the mineral minus the cost of finding and producing it) exceeded the value of the nonmineral resources that would be lost. Moreover, there would be a continuing incentive to reduce the damage to nonmineral resources even when mineral activity proceeded: the less damage, the lower the required payments,

The mineral industry pays for such damages, or at least those that directly impact the owner, when it buys mineral rights for private land. An implicit or explicit part of the purchase or lease price covers the expected losses in nonmineral resource uses or values by the private landowner. If the private owner is not offered enough money (in a lump sum or as a royalty on mineral production) to compensate him for such losses, he will not permit mineral activity on his land. Similarly, the private landowner will not himself engage in mineral activities on his land if such activities would preclude nonmineral resource uses that are more valuable to him.

Because a mineral patentee under the Mining Law generally owns the surface as well as the minerals in the patented land, it could be argued that the availability of patents under the law assures balanced consideration of nonmineral values by mining claimants. But there are several major objections to this argument.

First, the purpose of the Mining Law is to promote mineral development. That purpose is not served when a patentee devotes the patented land to nonmineral uses. If there will be no mineral development, why grant a patent in the first place? The same objection would hold even if value were paid for the land. The expressed general policy for Federal nonmineral land is retention and management, not disposal. Furthermore, if value were paid, it would be "fair market value" and would exclude the various public values discussed below.

Second, the individual patentee (or other private landowner) usually does not consider the full range of nonmineral resource values attributable to the tract, but rather ordinarily weighs only those (generally commercial) values from which he derives benefit. Excluded from the accounting are the public or multiple-use values that flow from the tract's being a part of the surrounding ecosystem: overall scenic view, wildlife habitat and range, access route, primitive status, and all of the ecosystem functions described in subsection C(3)(b). Decisions made by the patentee or other private landowner usually omit these types of values.

Third, in order to obtain a patent under the Mining Law, a valuable mineral deposit must first be discovered. A mining claimant exploring for such a deposit faces a high risk of failure. Out of the thousands of claims explored every year, only a few result in discoveries. Given the high risk of failure, the possibility of eventually obtaining a patent affords little incentive to protect surface resources during exploration.

Moreover, claims can be, and sometimes are, developed and mined without a patent. Finally, a patent does not include the surface in wilderness areas, homestead lands, and certain other areas.

The only payments required under the Mining Law are \$2.50 or \$5 per acre for a patent (if one is desired), bonds to insure reclamation of national forest land [if feasible), and payments to private surface owners of homestead land (with reserved Federal mineral ownership) for damages to crops, agricultural (only) improvements, and the value of the land for grazing (only). These payments clearly are not sufficient to ensure proper balancing of all mineral and nonmineral resource values, even on homestead land.

The absence in the Mining Law of required compensation payments at least comparable to those implicitly required on private land (which, as was discussed above, themselves do not cover public or multiple-use values) means that mineral resources on Federal land are underpriced in comparison with mineral resources on private land and in relation to the real total social costs of their discovery, development, and production. The under pricing of mineral resources on Federal land may tend to encourage their wasteful use. And this underpricing refers only to the lack of adequate payments for damage to or appropriation of the land and its nonmineral resources: it does not include the possible additional underpricing resulting from the lack of payments for the minerals themselves (see chapter 4, section E).

7. Abuse of Law to Obtain Land for Nonmineral Purposes

In the past, when the valuable mineral deposit criterion was interpreted more loosely and administered much more laxly than now, much Federal acreage was patented (passed into private ownership) under the Mining Law that had little mineral value but was quite valuable for one or more of its nonmineral resource uses—for example, timber, grazing, residential, commercial, or agricultural use. A patented claim may be used for any purpose. A 1974 General Accounting Office survey of 93 randomly selected mineral patents issued during fiscal years 1950 to 1972 in 10 western counties found no evidence that mineral extraction had ever taken place on land covered by 74 of the 93 patents. Seven were being mined, 66 were not being used for any apparent purpose, and **20** were being used for nonmining purposes, primarily residences or grazing.⁷⁶

The recent stricter enforcement of the valuable mineral deposit criterion has served to limit such abuses of the Mining Law, which were paralleled in the late 19th and early 20th centuries by similar abuses of the nonmineral Federal land laws.⁷⁷ However, as was discussed in subsection D(5), the current interpretation of the criterion still allows people to obtain title to Federal land for which the nonmineral values may exceed the mineral value. Since the Mining Law is the last of the 19th-century Federal land disposal laws, there is a great temptation to abuse it to obtain title to land for nonmineral purposes.” The temptation will persist as long as the law allows title to the

⁷⁶GAO Mining Law Study, note 36, at 11-12. See ch. 3, secs. B and C.

⁷⁷E.g., DOI Mining Law Report, note 33, at 15 [“salting” of mining claims with gold].

surface to be transferred along with the mining rights, and it will be reduced only to the extent that the valuable mineral deposit criterion is strictly interpreted and enforced.”

The potential for abuse would be lessened but not eliminated if a patent conveyed surface title that would revert to the Government if the surface were used for nonmining purposes. As is shown immediately below with respect to unpatented mining claims, such a limitation is difficult to enforce. Moreover, it would create a situation in which no one (neither the Federal Government, the public, nor the mineral patentee) could use the nonmineral resources on the land—hardly an efficient result. And it would continue to propagate the patchwork landownership pattern that, as will be discussed in the next subsection, is so detrimental to proper use and management of Federal land. The patchwork problem would exist until the reverter took effect, which could well be many decades. The reverter might never take effect, even after mining were completed, if the miner did nothing with the land thereafter, and thus did not use the land for nonmining purposes, which is required to trigger the reverter.

Prior to the time a claim is patented, use of the surface is limited to those uses necessary for or reasonably incident to mineral activities. However, since (a) no permission need be obtained from the Federal land management agency before entering on Federal land and staking a claim, (b) it is difficult to prove that a claimant is not engaged in mineral exploration or development as long as some activity (e.g., sampling or digging) is taking place, and (c) there are no fees for occupancy and only minimal (\$100 worth per year) work requirements, thousands of persons have abused the free right of entry under the Mining Law in order to occupy and use Federal land for nonmineral purposes under the pretense of engaging in mineral activities. Such abuse of the Mining Law, in many instances, hinders the efforts of persons and firms seeking in good faith to explore and develop the mineral potential of the public domain.

One of the major unauthorized uses of mining claims is their use as permanent or vacation residences by those with little or no interest in mining. Housing can be built legally on claims and associated millsites for those actually engaged in mineral activities on the claims. It is difficult to distinguish between such good faith mineral explorers and those who simply want to make free use of the surface of Federal land, since anyone sampling or scratching around on the surface can claim to be exploring for or developing a mineral deposit. The law does not require claimants to file proof of discovery of a valuable mineral deposit unless a patent is sought. Consequently, the Government bears the burden of proving that claims are being held for nonmineral rather than legitimate mineral purposes.⁸¹

Technically, discovery of a valuable mineral deposit is a prerequisite to location of a mining claim, and actual occupation and diligent exploration prior to such discovery protect the claimant only against adverse claims by third parties (under the judicially created *pedis possessio* doctrine), not against the Government. But strict en-

⁸¹See Senzel, note 44, at 12 n.5.

⁸²McGuire, “Forest Service Mining Regulations,” Remarks at the AMC Mining Convention, Sept. 28, 1976; *DOI Mining Law Report*, note 33, at 14-16.

⁸³Letter to Senator Hatfield from R. Max Peterson, Deputy

Chief, U.S. Forest Service, June 18, 1976, enclosing memoranda by Gould, Regional Mining Engineer, “Analysis of Unauthorized Occupancy of Mining Claims,” June 1, 1976, and Lawrence, Office of the General Counsel, “Mining-Claim Abuses,” May 18, 1976. See also *DOI Mining Law Report*, note 33, at 14.

forcement of the discovery requirement as a prerequisite to occupation would stymie good faith mineral occupants. Moreover, under current procedures, the Government can terminate unauthorized occupancies only by initiating and successfully prosecuting contest actions, which are expensive and time consuming, particularly if the occupant appeals all the way through the various levels of the Department of the Interior and the courts. The claimant can remain on the land until the claim is finally declared void and all appeals are exhausted. Even then, the claimant can resist eviction simply by locating a new claim on the same land, which starts the process all over again. Given the high cost, duration, and ineffectiveness of the contest mechanism, BLM can do little but attempt to correct the most flagrant abuses.⁸²

The problems caused by unauthorized occupancy of mining claims for nonmineral purposes have been described as follows by a Forest Service Regional Mining Engineer with nearly 20 years' experience of such abuse of the Mining Law:

Unauthorized occupancy is more than just a trespass which is of interest only to the land managing agency. To the would-be users of the public land it is an unavailable recreation site, an area where hunting or fishing are prevented: a route of access to other public land which is blocked by inappropriate signing, ("Private Proper [y-Keep Out—Survivors Will Be Prosecuted"); an invitation to initiate their own unauthorized occupancy. ('If they can do it, why not I?").

To the potential mineral developer it is effectively a withdrawal of public land from good-faith mineral search and development, and thus antithetic to the basic purpose of the mining laws: to promote the development of the mineral resources of the public lands.

To local government it is services that must be provided (e.g., schools, law enforcement, welfare payments, food stamps, unemployment benefits, aid to families with dependent children, etc.) far in excess of the modest taxes on the buildings (in the order of \$100 annually), and without other contribution to the local economy; it is buildings constructed without regard to building and sanitation codes; because of the isolation of many it is game and fish laws disregarded.

But to the land managing agency, too, it is more than just a case of trespass: It is a campground site that cannot be developed for public use: it is an impediment to a timber-sale, or to the routing of a needed road: it is an invitation to additional trespass which must be countered; it is the expenditure of hundreds of thousands of dollars annually (if not millions) that must be diverted from productive aspects of National Forest management: it is a land use for which, if authorized by a special use permit, a fee would be charged but under the circumstances is not paid: it is still another potential source of wildfire: in the case of a community of organized occupants it can be and sometimes is a barrier to administration of large tracts of land, and a threat of physical harm, even death, to Forest Officers.⁸³

8. Impacts on Surface Management

Mineral activities are compatible in principle with multiple-use management of Federal lands, but some legitimate occupancies under the Mining Law cause substantial problems for multiple-use management. Clearly, an actual mine will interrupt sur-

⁸²Gould memorandum, note 81; DOI Mining Law Report, note 33, at 11, 20; GAO Mining Law Study, note 36, at 20, 34-41; Senzel,

note 44, at 22 & n.18.

⁸³Gould memorandum, note 81

face uses in the mined area and impact to some degree surface uses in adjacent areas. This is a necessary consequence of mineral activities and an example of reasonable sequential multiple use, given appropriate mitigation and reclamation measures based on proper weighing of the mineral and nonmineral values. Certain elements of the Mining Law, however, create problems for multiple-use land management that are not necessary incidents of mineral activity.

The right to acquire title to the surface of a mining claim causes gaps in the surface area being administered by the Federal land management agency. These gaps can affect efficient land management by, for example, blocking desirable public access routes, impeding wildlife migration and movement of grazing stock, preventing public recreational use, or permitting nonmineral uses (after mining is completed) that are not consistent with but rather detract from the desired public use of the surrounding Federal land.

The procedures specified by the Mining Law for laying out claims on the ground add to the problem caused by these private inholdings. Lode claims must be staked along the length of the vein, with a maximum length of 1,500 feet and a maximum width of 600 feet. The resulting irregularly shaped and overlapping claims form a complex pattern of landownership that creates confusion in the land records and serious problems for land managers,”

Neither surface title nor irregularly shaped claims are necessary for mineral exploration or development. The outcropping high-grade veins developed in the 19th century, which motivated the irregularly shaped lode claiming procedures, have now been largely replaced as targets of exploration by buried or disseminated ore bodies underlying larger tracts more suitable to claiming in accordance with the rectangular subdivisions of the public land surveys. Moreover, hardrock minerals are developed under lease on Federal acquired land (for example, the Missouri lead belt) and on practically all State land (for example, Arizona copper). All fossil fuel and fertilizer minerals are developed under lease. A properly drafted lease can provide tenure as secure as full fee title.

Federal land management is also substantially affected before claims are patented and transferred into private ownership under the Mining Law. Since each claim that contains a valuable mineral deposit may be patented at the option of the mineral claimant, or worked or held indefinitely without obtaining a patent, there is a disincentive to plan or develop nonmineral resource activities in areas containing a significant number of active (or even inactive) mining claims. The plans or activities might be preempted at any time, into the indefinite future, by the mineral claimant, who could either destroy the nonmineral improvements or take them over (if a patent were obtained) without paying any compensation.

A similar disincentive to planning may occur even in areas not yet claimed but believed to be favorable for the occurrence of economic mineral deposits. Unless the area is totally withdrawn from the location of claims under the Mining Law, any nonmineral resource activity or plan may be completely preempted, without payment of

⁴DOI Mining Law Report, note 33, at 21

compensation and with little or no advance notice, by the initiation of mineral activities and the associated acquisition of surface rights or title under the Mining Law.

Short-term public use of the nonmineral resources on a claim, or access across the claim, may also be prevented by claimants who erect barriers or otherwise seek to exclude the public, even when public use would not interfere with mining activities. This is particularly a problem with nonmineral occupants of mining claims, as discussed in the previous subsection. Sometimes mineral occupants also seek to exclude the public, despite the reservation of surface rights by the Government affirmed by the Surface Resources Act of 1955. ”-) The mineral occupants often may be motivated by the fear of permitting peaceful entry by adverse claimants and thereby losing the pre-discovery tenure afforded by the *pedis possessio* doctrine.⁸⁶

An unpatented mining claim is presumed to be valid unless it has been declared invalid through appropriate agency proceedings. Thus, every unpatented claim is a “cloud” on the Federal title to the land and may prevent or hinder Federal disposal or use of the surface or any underlying minerals. The Department of the Interior estimated in 1969 that there were more than 6 million unpatented claims on Federal land, not including unpatented claims on national forest land, and that it would cost hundreds of millions of dollars to clear the Federal title of all the abandoned or invalid claims.⁸⁷ This problem was greatly reduced by the passage in 1976 of the BLM Organic Act, which requires the annual recordation of active interest in each unpatented mining claim and makes failure to record the required documents a legal abandonment of the claim.⁸⁸ However, hundreds of thousands of “active” unpatented claims will continue to exist: an average of almost 500,000 claims per year were being located in the Western States between 1961 and 1966, according to one estimate,⁸⁹ and affidavits of annual assessment work were being filed on some 160,000 claims, according to another⁹⁰ (the filing of such affidavits is not mandatory—see chapter 4, subsection D(2)(b)).

Many of these claims are being worked diligently and in good faith in serious attempts to discover and develop valuable mineral deposits. Many more, however, are being held for speculative mineral purposes by individual prospectors,⁹¹ for unauthorized nonmineral occupancy purposes,⁹² or for their nuisance value in hopes of being bought off by a private individual or Government agency wishing to make use of the land.⁹³ These unnecessary and costly clouds on the Government’s title are made possible by the minimal expense of maintaining a claim indefinitely without any requirement for mineral production, and by the free and absolute right of entry under the Mining Law.

The miner’s right, under the Mining Law, to enter, without advance notice or permission, onto land containing Federal minerals leaves the surface owner or manager with no voice in the timing of mineral activities, and with little or no chance to mitigate surface impacts resulting from the initial entry. This creates tensions, especially when

⁸⁶ *Anatomy of a Mine*, note 63, at 17; see ch. 3, subsec. E(1); *United States v. Curtis-Nevada Mines, Inc.*, 415 F. Supp. 1373 (E.D. Cal. 1976).

⁸⁷ *Anatomy of a Mine*, note 63, at 8-9.

⁸⁸ DOI Mining Law Report, note 33, at 12, 19-20.

⁸⁹ 43 U.S.C. § 1744 (1976).

⁹⁰ *University of Arizona PLLBC Study*, note 1, at 731, table 27.

⁹¹ DOI Mining Law Report, note 33, at 20.

⁹² See ch. 2, sec. F.

⁹³ See subsec. D(7).

⁹⁴ DOI Mining Law Report, note 33, at 15-16; Senzel, note 44, at 23.

the surface of the land being entered is in private ownership as a result of, for example, homesteading under the Federal nonmineral land disposal laws, The Federal Government reserved the mineral rights in millions of acres of western land now used for urban as well as rural purposes. Homeowners and ranchers do not like to find mineral exploration crews staking claims and drilling holes across their land, but such unannounced activity is permitted by the homestead laws and necessitated by the location requirements under the Mining Law. Violent conflicts sometimes result.⁹⁴ For land under the surface jurisdiction of the Forest Service, regulations require a notice of intent prior to any significant surface disturbance. Claim location activities, however, are excepted from this requirement, and it may be ignored in a race-to-discovery situation (see subsection D(2)(b)). Tensions could be greatly reduced if tenure were acquired by filing a claim for the desired land in the appropriate land office, rather than having to physically locate the claim on the ground, and if compensation were paid for any unavoidable damage to surface resources and improvements.

E. Coordination of Mineral and Nonmineral Activities Under the Mineral Leasing Laws

1. Relevant Provisions of the Mineral Leasing Laws

The main elements of the various mineral leasing acts, which generally apply to the fossil fuel and fertilizer minerals on public domain land and to all (except common-variety) minerals on acquired land, are discussed in sections C through E of chapter 3. The primary elements of the mineral leasing laws that distinguish them from the Mining Law with respect to coordinated mineral and nonmineral resource activities are (a) retention of surface title by the Federal Government, (b) discretionary authority to refuse to permit mineral entry on any or all tracts, (c) acquisition of tenure rights through applications filed in the agency offices according to the public land subdivisions, rather than through physical location and makework activity on the ground, (d) the absence of annual work requirements, (e) explicit authorization and direction to issue regulations and insert conditions in leases to prevent waste, safeguard the public welfare, and protect the public interest, and (f) authorization and direction to charge rentals and royalties, and to distribute 50 percent or more of the lease revenues and make loans against future revenues to the States impacted by mineral activity on Federal leases.

2. Unlimited Discretion to Issue or Refuse Permits or Leases

One of the most significant aspects of the mineral leasing laws is the complete discretion granted to the Secretary of the Interior to issue or refuse permits or leases on

⁹⁴“Mineral Development on Federal Lands,” hearings before the Subcomm. on Minerals, Materials, and Fuels of the Senate Comm. on Int. & Ins. Affairs, 93d Cong., 2d sess. 148-163 (1974); “Federally Owned Locatable Minerals,” hearing before the Sub-

comm. on Public Lands of the Senate Comm. on Int. & Ins. Affairs, 91st Cong., 1st sess., Casper, Wyo. (1969); see Senzel, note 44, at 22 n.23; *Anatomy of a Mine*, note 63, at 26.

any or all tracts of Federal land. This discretion is limited only by the requirement to obtain the consent of the head of the surface management agency prior to issuing leases on acquired land, on land withdrawn or reserved for military purposes, or for coal or geothermal steam.⁹⁵

As was noted in chapter 3, the discretion given to the Secretary is a two-edged sword. Until very recently, permits and leases were issued routinely to anyone who applied, with little attention given to the potential impact on nonmineral resources. But in the last few years concern over environmental degradation, natural area preservation, and possible excess leasing has led to an almost complete reversal in policy and practice, so that the discretion formerly exercised routinely in favor of the mineral industry is now often used to block mineral activity or to delay it pending lengthy re-assessment of resource values and options. The issuance of permits and leases has practically ceased for many of the leasable minerals.

Such unlimited discretion, which can swing widely back and forth between the extremes of no consideration of surface resource values and absolute protection of such values, is unsatisfactory to both mineral resource users and nonmineral resource users. Specific guidelines that would place some limits on the Secretary's discretion could establish a sounder basis for mineral industry planning and a more secure protection of nonmineral resource values.

The requirement of consent by the surface management agency to the issuance of a mineral lease provides some check on the possible failure of the Secretary of the interior to consider surface values. But consent is now required only for leases on acquired or military land or for coal or geothermal steam leases. Moreover, there are no specific criteria for granting or withholding consent, so that the discretion is in one sense compounded rather than limited, particularly from the standpoint of the mineral industry.

The recently enacted Federal Coal Leasing Amendments Act of 1976 prohibits coal lease sales "unless the lands containing the coal deposits have been included in a comprehensive land use plan and such sale is compatible with such plan."⁹⁶ This prohibition would seem to require that coal mining be explicitly mentioned as a permissible use in the land use plan, since coal mining, especially surface coal mining, will almost always be in conflict with any nonmineral use in the plan. While such explicit designation of mining zones may be appropriate for minerals such as coal and oil shale, for which the location of large quantities of the mineral resource is already known, it does not seem practical for other minerals for which the location of the resource is generally not known prior to issuance of the permit or lease. Moreover, even for coal, the restriction on the Secretary's discretion is somewhat illusory since no criteria are specified for establishing coal leasing zones in land use plans, and the Secretary can always modify a land use plan to permit or prohibit coal leasing.

The guidelines issued by the Secretary of the Interior for recommendations on withholding Federal land from leasing for surface coal mine development require the local land management officer to base any such recommendation on a finding that:

⁹⁵ E.g., 30 U.S.C. §§ 201(a)(3)(A)(iii) (coal), 352 (acquired land) and 1014(b) (geothermal steam) (1976); 43 U.S.C. § 158 (military land) (1976).
⁹⁶ 30 U.S.C. § 201(a)(3)(A) (1976).

1. Reclamation in accordance with the [required] standards ., . cannot be attained by the application of known technology; or
2. Mining by such methods would create hazardous conditions that would involve significant risk to public health and safety, including, but not limited to, destruction of public or private property from rock or land slides, geological instability, significant adverse changes in natural flood patterns or conditions, or unavoidable deterioration of water quality or quantity in contravention of applicable law; or
3. Mining by such methods would be incompatible with, and would prevent, other recognized land uses of a higher value. In determining that such a higher value exists, the authorized officer shall take into account—

The productivity and natural resource potential of the lands involved, including, but not limited to, significant and intensive irrigated or subirrigated agricultural or ranching uses;

The presence of unique key wildlife habitats;

Characteristics of exceptional fragility or of unique historic, cultural, scientific, or esthetic value; and

Action by regional, State, or local governmental bodies to designate or recommend the designation of such lands, or adjacent lands which are geologically, hydrologically, or biologically related, as unsuitable for mining based upon criteria substantially similar to those set forth herein. q'

The report containing such recommendations must set forth "with reasonable specificity the facts on which such recommendation is based." ⁹⁸

These guidelines refer to physical land type or land use characteristics that can be readily identified during the land use planning process, and that perhaps could be used with respect to minerals other than coal. Together with the requirement for a written finding based on specified facts, they could serve as a basis for judicial review of a decision to grant or deny a lease. They therefore suggest one possible avenue for limiting the Secretary's current broad discretion without hampering sound land management. Now, however, they apply only to coal, are still rather general and not explicitly tied into the land use planning process, and are not binding on the Secretary, who can refuse to issue a lease for reasons other than those listed in the guidelines, or issue a lease despite the guidelines (which are guidelines for recommendations only).⁹⁹

3. Preemption of Nonmineral Resource Values Once a Lease Has Been Issued

Although the Secretary of the Interior has practically unlimited discretion to issue or refuse permits or leases under the various mineral leasing acts, his control over mineral activities is greatly reduced once a permit or lease has actually been issued. At that point, the explorer or miner has legal rights under the leasing laws, which can be restricted only in accordance with provisions in the particular permit or lease or applicable regulations. The applicable regulations, according to the lease forms cur-

⁹⁸ "Coal Resources Regs. Guideline No. 1." 41 F.R. 43722 (1976).

⁹⁹ 43 CFR § 3041.2-1(b) (1976).

⁹⁹ Sec. 522 of the Surface Mining Control and Reclamation Act of 1977, 30 U.S.C. § 1272 (Supp. I 1977), requires the Secretary to withdraw or condition mineral leases so as to limit surface coal mining operations on Federal land determined to be unsuitable for all or certain types of such operations. An area must be designated unsuitable if reclamation as required by the Act is not tech-

nologically and economically feasible; it may be designated unsuitable if surface coal mining operations would be incompatible with state or local land use plans or could adversely affect important values on ecologically fragile or historic lands, renewable resource lands, or natural hazard lands. Draft unsuitability criteria have been published in U.S. Department of the Interior, *Federal Coal Management Report, Fiscal Year 1978*, app. A (1979).

rently in use,¹⁰⁰ include all regulations “now or hereafter in force.” But there is an explicit or implicit condition in each form that regulations issued in the future will be applicable to a preexisting lease only if they are “reasonable” and “not inconsistent with any express and specific provision” in the lease. The most basic provision of each lease is the one granting the lessee the right to mine and dispose of the leased deposits and to construct and maintain on the lease tract “all works, buildings, plants, structures, and appliances necessary to the mining, processing, and removal of the deposits.” Thus, as is the case with the Forest Service surface use regulations under the Mining Law, any regulations promulgated after the issuance of the lease cannot be used to restrict the basic legal right to explore for, develop, and produce the leased mineral deposits. The right to explore or mine will outweigh all nonmineral resource uses and values, even nonmineral uses authorized prior to the mineral lease, no matter how valuable they might be or how unexpected the damage,¹⁰¹ unless otherwise specifically provided in the mineral permit or lease or in the regulations existing at the time the lease was issued.

The mineral leasing laws, unlike the Mining Law, expressly authorize the Secretary of the Interior to issue regulations and direct him to insert provisions in mineral leases that he deems necessary to prevent waste, safeguard the public welfare, and protect the interests of the United States.¹⁰² This authorization seems broad enough to support regulations or lease provisions that might render mineral exploration or production uneconomic in certain areas or under certain circumstances,¹⁰³ as long as such regulations or lease provisions are reasonably necessary to protect important nonmineral resources.¹⁰⁴

However, almost all of the provisions in the mineral leasing regulations and lease forms relating to surface resources are couched in broad language which, similar to the Forest Service surface use mining regulations under the Mining Law, simply requires “reasonable steps” to prevent “unnecessary” soil erosion, water pollution, safety hazards, degradation of air quality, and damage to surface resources and, “so far as can reasonably be done,” restoration of the surface to its former condition.¹⁰⁵ These provisions are not specific enough to prevent mining in unsuitable portions of a leased tract, nor to support restrictions on ongoing exploration and mining operations, even though such restrictions might be necessary to maximize the total resource value of the tract. Thus, there is pressure to withdraw tracts rather than leave them open to mineral activities.

There are a few specific provisions for certain leasable minerals. The lease form for hardrock minerals on acquired land requires approval by the authorized Federal officer for strip or open-pit mining; reduction or smelting of ores; operations or surface disturbance within 200 feet of any building; or damage to improvements, timber, crops,

¹⁰⁰ E.g., BLM Lease Forms 3120-7 (1977) (competitive public domain oil and gas), 3110-1 (1977) (noncompetitive public domain oil and gas), 3110-3 (1973) (noncompetitive acquired land oil and gas), 3520-2 (1971) (potassium), 3520-3 (1977) (sodium), 3520-6 (1972) (acquired land hardrock minerals). See also 38 F.R. 33189 (1973) (oil shale); Coal Lease W-6266, Mar. 23, 1976.

¹⁰¹ See, e.g., *Gulf Oil Corp. v. Morton*, 493 F.2d 141, 149 (9th Cir. 1974). But see, for coal, Surface Mining Control and Reclamation Act of 1977, § 523(b), 30 U.S.C. § 1273(b) (Supp. I 1977).

¹⁰² E.g., 30 U.S.C. §§ 187, 189 (1976).

¹⁰³ See *DOI Task Force Report*, note 4, at 64; *Natural Resources Defense Council, Inc. v. Berkland*, Civ. No. 75-0313, slip opinion at 18-19 (D.D.C. June 30, 1978).

¹⁰⁴ *Richard P. Cullen*, 18 *LBLA*, 414 (1975); *A.A. McGregor*, 18 *LBLA*, 74 (1974).

¹⁰⁵ See 30 CFR pts. 211 (coal), 221 (oil and gas), 270 (geothermal), and 241 (all other minerals) (1977); 43 CFR subpts. 3109 (oil and gas) and 3204 (geothermal), pts. 3040 (coal) and 43 (all other minerals) (1976); and the BLM lease forms cited in note 100.

or other cover on the leased tract, It also requires payment for cut or destroyed timber, “any and all damage to or destruction of property” on federally owned surface, and damage or injury to livestock, crops, trees, pipelines, buildings, and other improvements on privately owned surface. ¹⁰⁷ The recently enacted Surface Mining Control and Reclamation Act of 1977 provides detailed requirements for reclamation of land disturbed by surface coal mining operations, and prohibits such operations where the reclamation requirements cannot be met; within specified distances from occupied dwellings or public roads, buildings, parks, or similar facilities; within national parks, wildlife refuges, national trails, wild and scenic rivers, wilderness areas, and most national forests; or on fragile, historic, renewable resource, or natural hazard lands designated unsuitable for surface coal mining operations. ¹⁰⁷

Even under these provisions, however, mining operations once authorized will ordinarily preempt nonmineral resource values. For example, the Surface Mining Control and Reclamation Act focuses on reclamation requirements rather than provisions to balance mineral and nonmineral values during exploration or mining, except for a few provisions related to water supply and quality and soil storage. Outside of those areas declared unsuitable for surface mining (an all-or-nothing sort of determination), the coal lessee is required only to preserve soil for reclamation, protect of offsite water supply and quality, and “to the extent possible using the best technology currently available, minimize disturbances and adverse impacts of the operation on fish, wildlife, and related environmental values, and achieve enhancement of such resources where practicable.” ¹⁰⁸

4. Unpredictable Nonmineral Resource Protection Requirements

Mineral explorers and developers under the leasing laws face substantial uncertainty as a result of the vague and general wording of almost all the current lease provisions and regulations concerning nonmineral resource protection. Like the similarly worded Forest Service surface use regulations under the Mining Law, they are subject to ad hoc and unpredictable interpretation and implementation.

Specific controls on particular mining operations are negotiated through the process of submission and approval of exploration or mining plans. Although technically the controls imposed through this process cannot go beyond the restrictions expressed or implied in the particular lease or governing regulations, the general wording of the lease provisions and regulations (together with the lessee’s desire to avoid the delays involved in administrative or judicial appeals) give the responsible Federal officer considerable leverage.

Additional uncertainty with respect to nonmineral resource protection requirements is created for the nonfuel leasable minerals by the fact that production leases (and hence lease provisions) for such minerals are issued for land not previously known to be valuable for such minerals only after exploration has been successfully

¹⁰⁷BLM Lease Form 3520-6 (1972). Similar requirements are imposed for any mineral permit or lease on land under the jurisdiction of the Department of Agriculture by a special stipulation in BLM Form 3103-2 (1964).

¹⁰⁸30 U.S.C. §§ 1201-1328, especially §§ 1260 & 1272 (Supp. I 1977). There are also special provisions to protect agricultural land in alluvial valleys. See note 99.

¹⁰⁹30 U.S.C. §§ 1265(b)(24), 1266(b)(11) (Supp. I 1977).

completed under a prospecting permit. Apparently, the Secretary of the Interior is free to insert any lease provision reasonably required to protect the nonmineral resources, even though the provision might render production uneconomic, and even though considerable time and effort may already have been spent on exploration.¹⁰⁹ However, nonmineral resource protection requirements in such “preference-right” production leases have until now been as vague and general as those in other leases, even though the availability of the exploration data should make it possible to formulate much more specific requirements.

In sum, nonmineral resource protection requirements in the mineral leasing regulations and lease forms are usually quite general and provide considerable latitude for interpretation. Recently, however, there have been some attempts to reduce uncertainty concerning how the requirements will be applied in particular cases. For example, the Department of the Interior in 1977 issued a booklet, *Surface Operating Standards for Oil & Gas Exploration and Development*, which provides guidelines for siting, construction, use, and rehabilitation of access roads, pipelines, wells, and other facilities. The guidelines are intended to aid oil and gas operators in drawing up surface use plans required to be submitted by the 1976 Notice to Lessees on Approval of Operations (NTL-6). Even this booklet is fairly general, since it is national in scope. But it notes that supplemental guidelines and methods that reflect local site and geographic conditions may be available from the local Federal land office. In particular, it advises that:

Exploration, drilling or other development activity may be prohibited during certain times of the year. For example, development activity during certain spring months may be curtailed when in close proximity to significant breeding grounds. This applies as well to critical wildlife areas during certain winter months. New operations may be temporarily prohibited or restricted when the ground is wet and muddy and significant damage could result from use. Buffer areas near streams and recreation areas may be withheld from surface disturbing activities.

These and other sorts of specific restrictions, such as restrictions on activities on steep slopes, are beginning to find their way into individual leases. They are based on analysis of the land types and uses in particular areas. They represent a balancing approach toward the conflict between mineral and nonmineral resource activities on a tract of land, as opposed to the all-or-nothing, open-or-closed withdrawal approach traditionally used,

The Bureau of Land Management has gone a step further with these area-specific restrictions in certain districts by developing and promulgating them as part of its land use planning process. Thus, both mineral and nonmineral resource users can comment on and influence the development of the restrictions through the public participation procedures of the land use planning process. Moreover, the restrictions are published as part of the land use plan for the area, and therefore reduce uncertainty by providing advance notice of some of the major nonmineral resource protection requirements that will be imposed on mineral leases in the area.

¹⁰⁹See *Montana Eastern Pipeline Co.*, 55 L.D. 189 (1935), and the sources cited in notes 103 and 104.

So far, the restrictions adopted in these land use plans, although more specific than the usual “mitigate if possible” language in the leasing regulations and lease forms and more flexible than the open-or-closed withdrawal approach, have been fairly broad-gauged themselves—for example, seasonal restrictions on operations or limitations on surface disturbance within specified distances of certain sites. However, they represent an interesting indication of an approach that could improve nonmineral resource protection while leaving land substantially open to mineral activity, through implicit or explicit designation of land types or categories that can be fitted with appropriate protective stipulations.¹¹⁰

5. The Valuable Mineral Deposit Criterion and Preference-Right Leases

The valuable mineral deposit criterion, discussed in subsection D(5), which has been the source of so much conflict and uncertainty under the Mining Law, was incorporated into the leasing acts to serve as the basis for determining whether exploration activity under a prospecting permit had been successful enough to development into a “preference-right” production lease.

Almost immediately, however, the criterion was weakened in practice to require only a showing that a mineral deposit had been found that the explorer was willing to try to produce. This application of the criterion did not cause much objection, since a lease did not convey title to the surface or the minerals (unlike the situation under the Mining Law), and since there was initially no great concern over possible damage to nonmineral resources as a result of operations under a lease.

Recent concern over the environmental impacts of mining operations has led to stricter interpretation and enforcement of the valuable deposit criterion under the mineral leasing acts as well as the Mining Law. In the first formal definition of the criterion under the leasing acts, the Secretary of the Interior has affirmed that the criterion is the same as that used under the Mining Law, and he has ruled that the cost of complying with lease provisions must be included in determining whether a valuable mineral deposit has been discovered.” Thus, not only does the marketability test with its strict scrutiny of costs and financing apply to applications for preference-right leases, but the Secretary can also affect the costs being considered by inserting weak or tough nonmineral resource protection provisions in proposed leases.

The availability of a preference-right production lease is made even more uncertain by two additional factors. First, the leasing laws require that an applicant for a preference-right lease for sodium, sulfur, or potassium show that the land is “chiefly valuable” for the development of the mineral involved.¹¹² This requirement apparently expressly incorporates the comparative (mineral versus nonmineral] value test, discussed in subsection D(5), for granting mineral production rights. To date, however, it does not seem to have been enforced. Second, as discussed in subsection D(3)(b) of chapter 4, the issuance of a preference-right lease may be discretionary with the Sec-

¹¹⁰E.g., BLM Rawlins District, *Proposed Decisions, Management Framework Plan, Overland Unit, Wyoming* (Apr. 8, 1977); BLM Billings District, *Land Use Recommendations and Land Use Deci-*

sions, Buffalo Creek Unit, Montana [June 30, 1973]

¹¹¹43 CFR §§ 3520.1-1, 3521.1-1 (1976).

¹¹²*Ibid.*

retary of the Interior: discovery of a valuable mineral deposit under a prospecting permit may only entitle the permittee to a preference right to a lease, that is, a right of first refusal if the Secretary should decide to issue a lease,

6. Lack of Payments for Damage to Nonmineral Resources

One of the major purposes of the Mineral Leasing Act of 1920, reiterated in the debates and committee reports leading to its passage, was to assure that those Federal lands containing fossil fuel or fertilizer minerals would be conserved and developed as prudent men would conserve and develop their private properties. As was discussed in subsection D(5), prudent men would not allow mineral development on their private property unless they were reimbursed in some fashion for the value of the nonmineral uses of the property that were lost or diminished as a result of the mineral development.

Partially in recognition of this fact, and partially to ensure diligent development, the authors of the Mineral Leasing Act established minimum rentals to be paid by mineral lessees under the Act. The minimum rentals were tied to the nonmineral value of the land, which was at the time considered to be fairly low, since only commercial nonmineral uses were valued.¹¹³ Thus, the rentals generally were set at a minimum of \$0.25 per acre for the first year of the lease and rose to a minimum of \$1 per acre after 5 years. Some of the rental rates were fixed rather than being specified as minimums,

Even for the rentals specified as minimums, few have been raised over the years since 1920, and those have been raised only slightly, despite enormous increases in the valuation of commercial and noncommercial nonmineral resources on Federal land. The rentals, therefore, do not serve as payments for damage to nonmineral resources caused by mineral activities under a lease.

Royalty payments on production have also stayed fairly low, and it is sometimes doubtful whether they cover even the Government's "fair share" of the mineral value, let alone the damage to nonmineral resources. Moreover, royalties are not appropriate instruments for ensuring payment for damages to nonmineral resources, since royalties are paid only when production occurs, and substantial damage to nonmineral resources may occur without production as a result of exploration and development activities.

Finally, neither rental nor royalty payments under the Mineral Leasing Act are used to reimburse the Federal Government for damages to nonmineral resources on the leased land. As will be discussed in subsection E(3) of chapter 6, mineral revenues under the Act are almost all turned over to the Western States or used to finance irrigation projects in those States. Thus, the land management agencies receive little or no compensation for damages to Federal nonmineral resources caused by mineral activities under the Mineral Leasing Act. This lack of compensation tends to promote an unfavorable attitude toward mineral leasing on the part of the land management agencies.

¹¹³ See, e.g., 58 Cong. Rec. 4540, 4541 (daily ed. Aug. 25, 1919) (remarks of Senator Fall).

As with miners under the Mining Law, mineral lessees under the mineral leasing laws must pay private surface owners of homestead land (with reserved Federal mineral ownership) for damages to crops, agricultural improvements, and the value of the land for grazing. In addition, certain private surface owners (those who, for at least 3 years, have resided on the land, personally conducted farming or ranching operations thereon, or received directly a significant portion of their income from such operations) can negotiate for a more substantial payment from potential coal lessees, since no coal lease can be issued without the surface owner's written consent.¹¹⁴ Even for coal leases, however, these required payments to surface owners are usually insufficient to ensure proper balancing of all mineral and nonmineral resource values by the mineral lessee.

Some lease forms and regulations require mineral lessees to pay for damages to certain nonmineral resources, but there are very few such provisions, and they are generally limited to only a few nonmineral resources, such as timber.¹¹⁵

7. Impacts on Surface Use and Management

Generally, unnecessary disruption of surface use and management is much less of a problem under the mineral leasing laws than it is under the Mining Law. This is primarily because the Federal Government retains title to the surface and approves and supervises operations under the mineral leasing laws, and also because tenure rights under the mineral leasing laws generally expire after a certain time in the absence of active mineral development. But, given the lack of adequate diligence requirements (or in some cases enforcement of those requirements) discussed in chapter 4, management and planning of surface use can be unnecessarily disrupted for the full primary period (ordinarily 20 years) of even an "inactive" lease, since, until the expiration of the primary period, there is always the possibility that mining will be begun with consequent damage to surface improvements. Moreover, for some minerals the primary period extends or can be renewed indefinitely, even in the absence of production. In such cases, long-range land planning is precluded.

F. The Role of National and State Environmental Laws

Federal and State air quality, water quality, toxic substances control, and other environmental laws of a general nature usually apply to mineral activities on Federal land. The mining industry has, until recently, unanimously argued that only such general environmental laws should apply to environmental aspects of mining on Federal land, that the Mining Law, at least, should remain a pure property tenure and ownership statute without any environmental provisions, and that the general Federal and State environmental laws adequately protect the environment.¹¹⁶

¹¹⁴Surface Mining Control and Reclamation Act of 1977, § 715, 30 U.S.C. § 1305 (Supp. I 1977).

¹¹⁵See, e.g., BLM Lease Form 3520-6 (1972) [acquired land hard-rock minerals]; U.S. Department of the Interior, *Surface Operating Standards for Oil & Gas Exploration and Development* 35

(1977).

¹¹⁶E.g., Marsh, *A Critique of the General Accounting Office Report on the General Mining Law*, Colorado Mining Ass'n Publication 2-77, at 4 (1977).

However, general environmental laws do not reach the central issues of land resource allocation and use. Minerals are part of the land and, as such, are intimately bound up with the nonmineral resources in and on the land. Mineral activities inevitably impact nonmineral resource uses and values. Therefore many people believe that any mineral disposal statute, and especially one like the Mining Law that disposes of the surface along with the minerals, can never be treated as simply a mineral title statute, but rather must be recognized as a statute that necessarily affects the allocation and use of the tract of land involved and all its mineral and nonmineral resources,

These central issues of land resource allocation and use would not be adequately addressed even by adoption of general Federal or State land use laws. For one thing, it is doubtful that the Federal Government would or should ever leave the protection of nonmineral resources on its land solely in the hands of the States. In 1976, 20 States, including six Western States, did not even have a hardrock reclamation statute.¹¹⁷ Problems with State coal reclamation statutes led to passage of a Federal statute. Moreover, even a Federal land use law would be ineffective given the existing mineral disposal statutes, because mineral activities under those statutes preempt the land use planning process, unless withdrawals from mining are effected, in which case it is the mineral laws that are preempted. Federal land use laws for Federal land already exist—for example, the Federal Land Policy and Management Act of 1976¹¹⁸—but they do not resolve the basic issues of coordinating mineral and nonmineral resource uses. It is not likely that the issues will be resolved as long as mineral tenure is treated as something separate from land tenure and use.

G. The Response to Inadequate Procedures for Coordination of Mineral and Nonmineral Activities Under the Federal Mining and Mineral Leasing Laws: Withdrawals and Similar Restrictions

Current nonmineral resource protection procedures applicable to locatable and leasable minerals generally are limited to ad hoc negotiation of mitigating measures. Thus, Congress and the executive branch have withdrawn large amounts of land from availability under the Federal mineral laws in order to protect nonmineral resources that they believed were inadequately protected by existing laws and regulations. In other cases, administrative delay and public opposition have blocked mining ventures in the absence of a formal withdrawal. Mineral development is thereby completely precluded, even in cases where properly restricted mineral activities might be entirely compatible with protection of nonmineral uses and values. In recent years, increased demands on Federal land for nonmineral resource uses and a heightened concern for the environment have led to a substantial reduction in the amount of Federal land available for mineral development.

Tables 5.1 and 5.2 summarize data compiled in appendix B on the availability for mineral activity of various categories of Federal onshore land in 1975. Table 5.1

¹¹⁷ Imhoff, Friz, and LaFeyers, *A Guide to State Programs for the Reclamation of Surface Mined Areas*, USGS Circ. 731 (1976).

¹¹⁸ 43 U.S.C. §§ 1701-1782 (1976).

Table 5.1.—Availability of Federal Onshore Land for Development of Fossil Fuel and Fertilizer Minerals
The Status in 1975a
(millions of acres)

Designated use	Formally closed		Highly restricted		Moderate or slight restriction	
	Millions of acres	(%)	Millions of acres	(%)	Millions of acres	(%)
Military	22.9	(2.80A)	—	—	—	—
Indian (nonreservation)	0.9	(0.1%)	—	—	—	—
National parks, recreation areas, historic sites	26.0	(3.2% ⁴)	0.2	(0.0% ⁰)	0.4	(0.0% ⁰)
Wildlife protection	1.9	(0.2%)	29.4	(3.60% ⁷)	—	—
Wild and natural areas	0.2	(0.0% ⁴)	29.7	(3.5% ⁰)	65.3	(8.0% ⁰)
Agricultural, stockraising, water supply, flood control	7.8	(0.9% ⁰)	9.1	(1.10% ⁷)	65.8	(8.0% ⁰)
Energy development	7.4	(0.9% ⁰)	16.1 ^b	(1.9%)	—	—
Mineral conservation	23.9	(2.9% ⁴)	4.8	(0.6% ⁰)	0.1	(0.0% ⁰)
Spatial surface occupancy	5.4	(0.7% ⁰)	0.5	(0.1%)	—	—
Other or none	—	—	0.6	(0.1% ⁰)	242.5	(29.4% ⁰)
Subtotal non-ANCSA,	96.4	(11.7%)	81.4	(9.9%)	374.1	(45.4%)
Alaska Native selections	49.2	(6.0% ⁴)	—	—	30.8	(3.7%)
Alaska State selections	39.1	(4.7% ⁴)	—	—	16.4	(2.0% ⁰)
ANCSA d-1	71.4	(8.7%)	—	—	—	—
ANCSA d-2	65.0	(7.9% ⁰)	—	—	—	—
Subtotal ANCSA,	224.7	(27.3%)	—	—	47.2	(5.7%)
Total,	321.1	(39.0% ⁰)	81.4 ^c	(9.9%)	421.3	(51.1%)

^aThe Alaska situation was changed in late 1978 by major new executive withdrawals that resulted in no increase (over prior ANCSA withdrawals noted in this table) in the land formally closed to development of the fossil fuel and fertilizer minerals. See appendix B, section O.

^b0 overlaps stricter ANCSA withdrawals and is not included in totals.

covers the 823.8 million acres of Federal onshore land in which the Government owned the fossil fuel and fertilizer minerals, which are available under the mineral leasing laws.¹¹⁹ Table 5.2 covers the 799.9 million acres in which the Government owned the hardrock minerals (minerals other than the fossil fuel, fertilizer, and common-variety minerals), which are generally locatable under the Mining Law but are leased or otherwise available on over 100 million acres.

Both tables classify land as either formally closed to mineral activity, highly restricted, or subject to moderate or slight restriction. The “formally closed” classification includes land explicitly closed to mineral activities by statute (for example, National Petroleum Reserve No. 4 and almost all national parks in 1975) or by a published Secretarial order (for example, wildlife, military, or oil shale land). The “highly restricted” classification includes land which, while formally open to mineral activities, is restricted by statutory conditions (for example, powersites), statutory and administrative conditions (for example, wilderness areas or certain reclamation projects), or administrative conditions (for example, BLM’s primitive and natural areas) to such an extent that mineral activity is greatly discouraged, although it sometimes occurs. The “moderate or slight restriction” classification includes all other Federal onshore land, which is generally open to mineral activities, although there will usually be some requirement to mitigate the impact of mineral activities on the surface resources

¹¹⁹Except sulfur, which is leasable in New Mexico and Louisiana only.

Table 5.2.—Availability of Federal Onshore Land for Development of Hardrock Minerals
The Status In 1975a
(mill ions of acres)

Designated use	Formally closed		Highly restricted		Moderate or slight restriction	
Military	22.9	(2.9%)				
Indian (non reservation)	0.9	(0.1%)				
National parks, recreation areas, historic sites	189	(2.4%)	7.3b	(0.9%)	0.4%	(0.0%)
Wildlife protection	30.0	(3.7%)	1.3	(0.2%)		
Wild and natural areas	10	(0.1%)	28.9b	(3.6%)	65.3b	(8.2%)
Agricultural, stockraising, water supply, flood control	127	(1.6%)	4.2b	(0.5%)	419	(5.2%)
Energy development	59	(0.7%)	15.2c	(1.9%)	24	(0.3%)
Mineral conservation	28.5	(3.6%)	—	—	0.3	(0.0%)
Spatial surface occupancy	54	(0.7%)	0.5	(0.1%)	—	
Other or none	10	(0.1%)	—	—	242.1b	(30.3%)
Subtotal non-ANCSA	1272	(15.9%)	48.4b	(6.1%)	352.4b	(44.0%)
Alaska Native selections,	492	(6.2%)	—	—	30.8b	(3.9%)
Alaska State selections	—	—	—	—	55.5b	(6.9%)
ANCSA d-1	300	(3.7%)	—	—	414	(5.2%)
ANCSA d-2	650	(8.1%)	—	—	—	—
Subtotal ANCSA	1442	(18.0%)	—	—	127.7b	(16.0%)
Total	271.4	(33.9%)	48.4b	(6.1%)	480.1b	(60.0%)

^a The Alaska situation was changed in late 1978 by major new executive withdrawals that, according to rough estimates provided to OTA by the Bureau of Land Management's Alaska Native Claims Office, resulted in a net increase (over prior ANCSA withdrawals noted in this table) of approximately 13 million acres (1.6%) in the land formally closed to hardrock mineral development. See appendix B, section C.

^b 3.6 (0.5%) of the total highly restricted acreage (0.2 in national parks, etc.), 0.7 in wild and natural, and 2.7 in agricultural, etc.; and 114.1 (14.3%) of the total moderate or slight restriction acreage (0.4 in national parks, etc.), 0.1 in wild and natural, 27.3 in other or none, 30.8 in Alaska Native, and 55.5 in Alaska State) were formally closed to the Mining Law but available through Federal lease, Native lease, or State location or lease.

^c 9.0 overlaps stricter ANCSA withdrawals and is not included in totals.

of the land, or the land may be closed to development of a few minerals (for example, land open to location of metalliferous minerals only is classified as being moderately restricted for hardrock mineral activity).

The “formally closed” column in each table represents formal withdrawals by Congress or the executive branch. The other columns represent land that has not been withdrawn but may be subject to discretionary restrictions or refusals to lease. Thus, the data in the “formally closed” column can be used to gain a rough idea of the scope of and reasons for withdrawals.

Initially, it can be noted that, excluding the temporary but massive land withdrawals in Alaska under the Alaska Native Claims Settlement Act (ANCSA), but including “normal” withdrawals in Alaska, 11.7 percent of the Federal land was closed to mining of the fossil fuel and fertilizer minerals and 15.9 percent was closed to mining of the hardrock minerals in 1975. These figures do not reflect the relative magnitude of withdrawals under the mineral leasing laws and the Mining Law, since (as indicated in note b in table 5.2), some acreage withdrawn from the operation of the Mining Law nevertheless remained available for hardrock mineral activity under various leasing laws. If this acreage (31.4 million non-ANCSA acres) is added to the “formally closed” column in table 5.2, then the figures do reflect the relative magnitude of withdrawals under the two types of laws: 11.7 percent withdrawn under the mineral leasing

ing laws and 19.8 percent, or almost twice as much, withdrawn under the Mining Law, as of 1975.

The ANCSA data in the tables were based on very rough estimates and assumptions (explained in appendix B). Again, however, it should be noted that the data were based on availability under any law, and not just the Mining Law (in the case of table 5.2) or the Federal mineral leasing laws (in the case of table 5. I). Because of ANCSA requirements, all the ANCSA-related acreage was withdrawn from the operation of all the Federal mineral laws, except for approximately 41.4 million acres of d-1 land left open to location of metalliferous minerals only. The ANCSA acreage listed as having been available for mineral activity in the tables was almost all available from the State of Alaska or the Alaskan Natives, as explained in appendix B. The ANCSA data, therefore, are not particularly useful for analyzing normal withdrawal patterns and forces.

The preceding two paragraphs illustrate one major distinction between OTA's analysis of withdrawal statistics and other published analyses:¹²⁰ the OTA analysis recognized that land was available for mineral activity (e. g., hardrock activity) if it was available from any source (e.g., Mining Law, Mineral Leasing Act of 1920, special Federal leasing law, Alaska mineral law, or Native contract), rather than classifying land as unavailable simply because it was not available under the usually applicable law (e.g., Mining Law). In addition, the OTA analysis separated out the effect of the ANCSA-related withdrawals since they are a special and unusual case that is not indicative of normal withdrawal forces or trends. Finally, the OTA analysis was based on a more complete compilation and review of available data (see appendix B) than was undertaken for other analyses,

As was noted above, the tables disclose that almost twice as much land was withdrawn from locations under the Mining Law as from mineral leasing, if only normal (non-ANCSA) withdrawals are taken into account. This is not surprising, since withdrawals are the only means of controlling entries under the Mining Law, whereas entries under the mineral leasing laws can be prevented by refusals to lease or restricted through appropriate lease conditions. Land management officials will often withdraw an area from entry under the Mining Law but leave it open to mineral leasing.¹²¹ In some cases (e. g., wildlife refuges) the land is "open" to leasing in theory only, and leases will very rarely be authorized. In other cases, however, the land is genuinely left open to leasing under protective stipulations.¹²² The amount of land either formally withdrawn or highly restricted (for example, by policies that discourage leasing or issuance of necessary rights-of-way) is approximately the same for the Mining Law and the mineral leasing laws. (There have been moratoria on the issuance of any new leases for certain minerals under the mineral leasing laws in the last few years.) As more experience is gained with recently initiated attempts to devise appropriate protective stipulations (see subsection E(4)), more land may be truly open to leasing, and less reliance may be placed on the traditional all-or-nothing withdrawal approach.

¹²⁰Bennethum and Lee, "Is Our Account Overdrawn?" *Mining Congress J.*, September 1975, at 33-48; U.S. Department of the Interior, *Mining and Minerals Policy*, 1976, at 81-93 (1976).

¹²¹E.g., BLM Carson City District, *Fort Churchill-Clan Alpine*

Land Use Guides, Fort Churchill-Clan Alpine Planning Units, Nevada, at 13 & 16.

¹²²E.g., BLM Las Vegas District, *Virgin Valley Land Use Guide, Virgin Valley Planning Unit, Nevada*, at 18-19.

The “designated use” breakdown in the tables shows that, apart from ANCSA withdrawals, in 1975 only 3.4 percent of the Federal onshore land was closed to mining of the fossil fuel and fertilizer minerals and 6.2 percent to mining of the hardrock minerals for environmental or cultural reasons (parks, recreation areas, historic sites, wildlife protection, and wild and natural areas). About twice as much Federal land was withdrawn for other uses (for example, military use, irrigation projects, and even energy development and mineral conservation). On the other hand, approximately two-thirds of the “highly restricted” category in each table was due to cultural or environmental uses.

The aggregate effect of the withdrawals on mineral exploration, development, and production may be much greater than suggested by the percentages in the tables if, as seems to be the case, the withdrawals often occur in those areas where the geology is most favorable for economic mineralization (see subsection A(3)). On the other hand, the effect of the withdrawals may be less than is indicated because many mineral leases and mining claims exist in the withdrawn areas (having been issued or located prior to the withdrawals). For example, it has been estimated that there are 11,000 uranium mining claims in the Glen Canyon National Recreation Area. In 1975, 82.6 million acres (11.1 percent) of the public domain were under mineral lease, and, estimating very roughly, 80.0 million acres (10.8 percent) were covered by mining claims. It was not possible to determine how much of this acreage was in withdrawn areas.

There is a need for a cumulative State-by-State and nationwide accounting of the use status of Federal land. Such an accounting should permit Federal management of minerals and land to progress beyond its current essentially ad hoc procedures. The land use planning process already underway on Federal land could include a unit-by-unit summary of land status, including withdrawals, which is aggregated at successively higher levels of the relevant agencies and culminates in a comprehensive land status report. Computerization of the land status records at the local level might greatly simplify statistical reporting and increase the accuracy, timeliness, and ease of maintaining those records.

As was indicated above, cultural and environmental protection and preservation motivated only about one-third of the actual closures of Federal land to mining as of 1976. The remaining two-thirds were closed to protect stock driveways, administrative sites, dams, military security, water supplies, physical improvements, opportunities for State and Native selections, and even mineral conservation and development (geothermal resource areas and petroleum and oil shale reserves). The reason for many of these closures was, in essence, a lack of provision in the mineral laws for compensation for nonmineral uses foreclosed by mining. That is, even where mining would be the highest and best use of a tract of land, the Federal Government, like any private landowner, is not willing to permit mining when no compensation would be paid for the destruction of existing valuable improvements (for example, dams, administrative facilities, or substantial recreational facilities) or for the loss, even temporarily, of important nonmineral resources (for example, a watershed that supports a municipal water supply),

Many withdrawals for cultural and environmental reasons would not be necessary if appropriate environmental controls could be agreed on and established to protect various types of cultural and environmental values. Similarly, many withdrawals to protect valuable improvements or economically important nonmineral uses would not be necessary if procedures existed whereby miners would compensate for the loss of such improvements or uses.

The “withdrawal problem” is one of the more visible symptoms of the lack of adequate measures for coordinating mineral and nonmineral resource uses on Federal land. The increased removal of Federal land from availability for mineral activities reflects a belief on the part of Congress, the executive branch, and the general public that mineral activities under existing laws and regulations do not properly take account of nonmineral resource values.

The situation appears similar to that which occurred during the first two decades of this century, when the increasing amounts of land being withdrawn from mineral entry forced a reappraisal of the Federal mining laws that eventually resulted in the adoption of a leasing system for the fuel and fertilizer minerals. (It should be noted that the administration of the leasing system has resulted in substantial uncertainty and confusion for both miners and those interested in nonmineral resource protection. See section E.) The issues then were competition, mineral conservation, and a fair return to the Government for its fuel and fertilizer minerals. The issues now are protection of and compensation for the nonmineral resources affected by mining on Federal land.

This discussion suggests that the solution of the “withdrawal problem” depends not so much on procedural reforms (although such reforms are needed) as on adjustments to the mining and mineral leasing laws that will satisfy the concerns about nonmineral resource values.

H. Summary and Options

This section summarizes the material discussed in the previous sections of this chapter by presenting four major options for consideration. The options are presented in ascending degree of the amount and character of change involved when compared with the existing systems—no changes at all, moderate adjustments to the existing systems, major adjustments to the existing systems, and a shift to integrated mineral and nonmineral resource management. The options, other than the “no change” option, are presented in skeletal form in table 1 at the end of the executive summary. In each option other than the “no change” option, an attempt is made to eliminate unnecessary or duplicative regulation, to address questions of efficiency and equity in other regulations, and, where it seems appropriate, to replace regulatory restrictions with more flexible payment requirements or incentives.

Option 1. The Existing Systems (“No Change” Option)

The existing laws treat mineral exploration, development, and production as distinct activities outside the mainstream of the land use planning and management pro-

ess for Federal onshore land, even though mineral and nonmineral resource uses are unavoidably intertwined. The mineral laws reflect the belief that mineral production is the best use of any tract of land and thus make mineral activity the preferred use on any Federal land that is open to such activity. Except for recent enactments governing coal, the laws contain no explicit procedures for coordinating mineral activities with nonmineral activities.

Regulations have been promulgated under the mining and mineral leasing laws to control the impacts of mineral activities on surface resources. These regulations are couched in broad language and do not contest the miner's preferred right to explore for and develop the minerals in a tract. The regulations are not tailored to varying land characteristics and do not attempt to control the method of development, but rather seek to mitigate its impact on surface resources by relying on negotiated approval of operating plans.

The regulations applicable to activities under the Mining Law do not cover most Federal land. They do not apply to unpatented mining claims outside the national forests or to patented mining claims outside the national parks or wilderness areas. The Forest Service regulations, which were adopted in 1974 against a background of uncertainty about the extent of the Forest Service's authority to control the impacts of Mining Law activities, have minimal sanctions, do not require filing of notices of activity by most mineral explorers, and are sometimes hesitantly enforced. However, the Forest Service has imposed and enforced strict surface protection requirements in certain areas.

Many provisions in the Mining Law result in unnecessary damage to surface resources and disruption of surface use and management. For example, the Federal and State claim marking and work requirements (including State discovery work requirements and Federal pedis possessio and assessment work requirements) require a mineral explorer to disturb the surface without any benefits necessarily being obtained in terms of efficient or diligent mineral activity. The pedis possessio requirements also encourage mineral explorers to attempt to prevent use of the surface by others. The irregular shapes of claims, coupled with the miner's right to acquire title to the surface as well as to the minerals, lead to a jigsaw pattern of surface ownership that can frustrate efficient planning and management of surface use. Federal land use planning and management are further inhibited by the knowledge that any plan or use can be preempted at any time by mineral activities under the Mining Law, unless the land is withdrawn from mineral entry, or even by nonmineral activities on a nearby patented claim. Medium- or long-range land use planning is also inhibited under the mineral leasing laws when leases are issued or can be renewed for indefinite periods without any production.

On the other hand, because the regulatory controls on mineral activities under the existing laws, although generally weak, are broadly worded and applied in an ad hoc manner to specific mineral projects, they can create considerable uncertainty with respect to the requirements that will actually be imposed on a particular project. Technically, the controls cannot go beyond the restrictions expressed or implied in the governing regulations (or lease), and they cannot substantially interfere with the miner's

right to develop the mineral deposit as he sees fit. But the broad wording of the regulations, together with the miner's desire to avoid the delays involved in administrative or judicial appeals, give the responsible Federal officer considerable leverage to delay, or impose substantial restrictions on, mineral activities. Furthermore, strict conditions can be imposed on nonfuel mineral projects under the leasing laws after exploration and before development, even if such conditions would make development and production uneconomic, since a lease is required for development and production after successful exploration under a prospecting permit.

Additional uncertainty with respect to mineral tenure results from the use of the "discovery of a valuable mineral deposit" test for acquiring development and production rights to any mineral under the Mining Law and to nonfuel minerals under the leasing laws. Under the present interpretation of the test, nonmineral values are not balanced directly against mineral values in order to decide whether mineral development and production rights should be granted, although such a comparative value test has been used in the past and could enjoy a resurgence. However, some nonmineral values are considered indirectly to the extent that regulations protecting such values impose costs on the miner. Such costs are included in an increasingly comprehensive definition of the considerations a prudent miner would take into account in deciding whether a mineral deposit is valuable. This indirect approach must necessarily leave out a fairly large range of nonmineral values. Thus it does not go far enough, in the opinion of surface resource users. On the other hand, miners believe that it goes too far in second-guessing their profitability calculations and exposing them to the danger of losing tenure after considerable effort has been spent on exploration,

Activities under the mining and mineral leasing laws are subject to Federal and State air quality, water quality, toxic substances control, and other environmental laws of a general nature that impose stringent requirements for mitigation of certain impacts resulting from mineral activity. However, these general environmental laws do not reach the central issues of land resource allocation and use that are at the core of today's debate over Federal mineral land management.

Existing laws require very few payments for damage to or appropriation of non-mineral resources. Payments of \$2.50 or \$5 per acre are required to obtain title to the surface under the Mining Law, and annual rentals of only \$0.25 to \$2 per acre are required under the leasing laws. In addition, bonds to insure reclamation, if feasible, and payments for damages to privately owned crops, agricultural improvements, and grazing values may be required. These payment requirements are not sufficient to ensure proper balancing of mineral and nonmineral resource values,

The lack of adequate regulatory or payment mechanisms under the existing laws has been partially responsible for the withdrawal of increasing amounts of Federal land from the operation of the mining and mineral leasing laws in recent years. Formal withdrawals of land from the operation of the Mining Law have been almost double those under the leasing laws, if only normal withdrawals are taken into account (that is, omitting the unique situation posed by ANCSA). (See section G for the calculations and analysis.) This is because initial access to land for mineral activities under the Mining Law is a statutory right that can be blocked only by withdrawal, while initial

access under the leasing laws is at the discretion of the Secretary of the Interior, who can block access by refusals to lease as well as by formal withdrawals. The amount of land either formally withdrawn or highly restricted (for example, by policies that discourage leasing or issuance of necessary rights-of-way) is approximately the same for the Mining Law and the mineral leasing laws. Withdrawals and antileasing restrictions continue to be made, and are maintained, to protect mineral and nonmineral resource uses and values that Congress or the executive branch believes are inadequately protected by existing regulations and payment requirements. Mineral activity is thereby completely precluded, even though properly restricted mineral activities might be entirely compatible with protection of such uses and values.

Conversely, mineral activity continues to be the preferred use on nonwithdrawn land under the Mining Law and on leased land under the leasing laws. Mineral rights, once acquired, override all nonmineral resource values, regardless of the relative values of the mineral and nonmineral resources. Mineral rights may be acquired by simply staking out a claim under the Mining Law. Advance notice to or permission from the Federal or private surface owner is not required. The Secretary's discretion to grant access under the leasing laws may be exercised, as it was until very recently, routinely in favor of granting access, with little attention paid to the potential impact on nonmineral resources, except in those few cases where access must also be approved by the Federal agency responsible for management of the surface,

The Mining Law has been abused by persons who are not interested in mineral activity but rather want to make use of or even obtain title to the surface. This abuse has been made possible by the absolute right of entry under the law, the very weak and practically unenforceable controls over diligent activity, and the lack of adequate controls over use of the surface. Even though some actions have been taken to curb this abuse, such as removing common-variety minerals from location under the Mining Law and requiring all claims to be recorded at the Federal land office, some abuse remains because of the underlying difficulties with enforcing provisions of the Mining Law.

Option 2. Moderate Adjustments to the Existing Distinct Systems

Almost all the moderate adjustments discussed in section G of chapter 4, dealing with improved coordination of mineral activities undertaken by different individuals and firms, could also improve coordination of mineral activities with nonmineral activities.

For example, unnecessary surface damage, jigsaw land use patterns, and uncertainty about land status are caused by existing Federal and State claim location and marking requirements under the Mining Law. These problems could be greatly reduced by replacing the physical location procedures with filings in the local Federal land office according to subdivisions of the public land surveys. For unsurveyed land, claims could be required to be rectangular in shape, oriented north-south or east-west, and depicted and described (through reference to permanent physical features) on the best available map of the area. A survey of the claim could be required as a precondition to development. The surface damage attributable to unproductive pedis possessio and assessment work requirements under the Mining Law could be reduced by replac-

ing the maximum size limits on individual claims with generous limits on the size of an area that could be treated as a unit for the purpose of satisfying work requirements, and by allowing payments in lieu of actual work and “banking” of excess work. Payments for mineral value comparable in magnitude to those required by non-Federal landowners could be instituted to avoid possible underpricing and inefficient use of Federal land.

Similar adjustments, also described in section G of chapter 4, could be made to maximum acreage limits, work requirements, and payments for mineral value under the mineral leasing laws,

The remaining adjustments outlined in section G of chapter 4, such as minimum sizes for mining claims and mineral leases, time limits on development tenure, and produce-or-pay conditions on production tenure, would make it easier to keep track of land status and would prevent land from being held indefinitely without any development or production.

Other adjustments could also be made that would improve coordination of mineral and nonmineral activities without making major changes in the existing systems. For example, the existing requirement of consent by the surface management agency to issuance of leases for certain minerals on certain lands could be extended to leases for all minerals on all lands. (The requirement would not apply to mining claims under the Mining Law.) Ad hoc, broadly worded surface use regulations, similar to those now in existence for some mining claims and all leases, could be applied across the board to mineral activities on all lands under all the Federal mineral laws. Such regulations could include a prohibition on any residential use of the surface of a mining claim or mineral lease without permission from the surface management agency or surface owner. No surface-disturbing mineral activity could proceed without first filing a notice of intent with the surface management agency or surface owner,

These adjustments would eliminate or revise many regulations that cause needless and unproductive expense to the miner and unnecessary adverse impacts on nonmineral resources, particularly under the Mining Law. They would also reduce some of the uncertainty over land use management and planning under the existing systems by placing some diligence-related conditions on the duration of mineral tenure and by making all mineral activities subject to Forest Service-type regulations requiring limited mitigation of impacts on surface resources.

However, the adjustments would not resolve the most serious problems involved in coordinating mineral activities with nonmineral activities under the existing systems. On the one hand, they would not reduce miners’ uncertainty about nonmineral resource-related controls over mineral access and tenure. On the other hand, they would not affect any person’s absolute right to locate mining claims on any nonwithdrawn area of the public domain, and to obtain ownership of the surface as well as the minerals on discovery of a valuable mineral deposit. Nor would they affect the absolute preference given to mineral activity on any land covered by a mining claim or mineral lease. Mineral rights, once acquired, would continue to override all nonmineral resource values. Thus, the adjustments would not significantly reduce the pressure for

withdrawals of land from mineral activity in order to protect mineral and nonmineral resource values.

Some additional moderate adjustments could be made to lessen slightly the adverse effect that withdrawals have on mineral availability. Stale withdrawals no longer needed to protect nonmineral resource values could be identified and eliminated through a better withdrawal review program. Or, if such a program would be impractical because of the poor condition of land records, a fresh start could be made by terminating all withdrawals, except those made by Congress, that are not confirmed by the responsible agency within a certain number of years—a sort of re-recording requirement for withdrawals analogous to the recordation requirement for mining claims. But the latter approach would run the risk of inadvertently leaving important nonmineral resources unprotected.

In addition, some continuing mineral appraisal activity on withdrawn lands could be provided through a specific Government program for periodic assessment of the mineral resource potential of such lands. The program might include detailed Government exploration and evaluation needed to decide whether certain withdrawn land should be reopened to private mineral activity,

Option 3. Major Adjustments to the Existing Distinct Systems

Several of the most serious problems involved in coordinating mineral activities with nonmineral activities under the existing systems would be eliminated by the major adjustments described in section G of chapter 4 for improved coordination of mineral activities considered by themselves. These include: replacing *pedis possessio* exploration tenure under the Mining Law with a secure, limited-in-duration exploration right; establishing more realistic, flexible, and enforceable work requirements under the mining and leasing laws; eliminating the “discovery of a valuable mineral deposit” test for acquiring development and production tenure under the laws; limiting patents (fee title) under the Mining Law to the minerals in the claimed land, with a right to use the surface for mining-related purposes upon payment of rentals; and eliminating or restricting overriding royalties.

Two of the above adjustments—the elimination of the “discovery of a valuable mineral deposit” test under the mining and mineral leasing laws and the provision of secure exploration tenure under the Mining Law—would greatly reduce the uncertainty now faced by explorers and miners under the mining and leasing laws. An analogous adjustment would make the “preference right to a lease” for successful prospectors under the leasing laws a clear option exercisable by the prospector, rather than a mere right of first refusal should the Government decide to issue a development-production lease. These adjustments, however, would eliminate some of the most important protections of nonmineral values that now exist (see, e.g., subsection D(5)). To compensate for the loss of these protections, the statutory right of access under the Mining Law could be converted to access at the discretion of the Secretary of the interior or the surface management agency, or both, as is now the case under the leasing and sale laws. (Unlike now, the access under each law, once granted, would be secure for exploration, development, and production.) In addition, the surface use regulations

under each law could be strengthened. The surface management agencies could be given clear authority to control the surface impacts of mineral activity, including the power to prohibit some or all surface impacts when necessary to protect important surface values. Finally, miners could be required to pay for damage to some publicly owned as well as privately owned surface resources and facilities in order to encourage mineral activity that is efficient from the standpoint of total resource use,

These adjustments could provide for better balancing of mineral and nonmineral resource values than occurs under the existing systems. They would substantially reduce the need to rely on the withdrawal power to protect nonmineral resource values. They would also greatly reduce the uncertainty that currently exists with respect to maintaining exploration tenure under the Mining Law and acquiring development and production tenure for the nonfuel minerals under the mining and mineral leasing laws.

However, there still would be considerable uncertainty about the acquisition of exploration tenure and about the specific nonmineral resource protection requirements that would be applied after tenure is acquired in any particular case. Perhaps these uncertainties could be reduced by guidelines limiting the Government's discretion over access and over specification of nonmineral resource protection requirements after access is granted. But excessively restrictive guidelines would not adequately protect nonmineral resource values, given the current broad nature of nonmineral resource protection requirements.

Option 4. A Shift to Integrated Mineral and Nonmineral Resource Management

The adjustments listed in the two preceding options do not resolve the fundamental dilemma of how to provide for open access to and secure tenure on Federal lands for private mineral exploration, development, and production while also assuring proper balancing of mineral and nonmineral resource values during each stage of mineral activity (see subsection C(4)).

One approach that might go a long way toward resolving this fundamental dilemma would build on the emerging practice of basing surface use restrictions under the leasing laws on analysis of the land types and land use characteristics of particular areas. In certain instances, these area-specific restrictions have been developed and promulgated as part of the normal land use planning process.

Surface use restrictions tied to land classifications established by the surface management agencies as part of their normal land use planning process might provide greater assurance of adequate protection of nonmineral resource values on Federal land, since such restrictions could vary for different areas to take account of the vast differences in surface values and their sensitivity to disruption from mining. Because the restrictions would be much more specific and localized and would be published in advance in the land use plan for an area, they should also greatly reduce mineral explorers' and producers' uncertainty about the surface use conditions applicable to the various stages and types of mineral activity in the area,

If specific restrictions tied to land types and values in an area could be devised and promulgated as part of the normal land use planning process, and if such restrictions were adequate to protect the important nonmineral resource values in the area, there should be much less pressure for withdrawal of land from mineral activity. Moreover, there should be much less need for making the acquisition of mineral rights depend on the discretion of the Secretary of the Interior or the surface management agency. Once the new system was firmly in place, access to Federal land under the mineral laws could be made nondiscretionary, and many, if not all, of the existing withdrawals perhaps could be revoked. Access to certain areas might still be very highly restricted in order to protect very important nonmineral resource values, but it would not be completely precluded.

A surface use restriction might be too protective for the less unusual nonmineral resource values, because a restriction could not be violated no matter how valuable or potentially valuable the mineral resources in an area might be. This problem can be overcome, in part, by relaxing the restrictions that protect these less unusual nonmineral resource values as mineral activity successfully progresses from exploration through production. For example, there might be severe limits on or even prohibitions against roadbuilding or other types of surface disturbance in certain areas during exploration, which would be relaxed or eliminated for development and production.

For the easier-to-value nonmineral resources, surface use restrictions might be replaced entirely by compensation requirements. A schedule of payments could be developed along with the surface use restrictions as part of the land use planning process for an area, with some nonmineral resources values being absolutely protected through restrictions and others being conditionally protected through compensation requirements. The individual explorer or miner could decide on his own whether the potential mineral values were worth the cost of paying for damage to the conditionally protected nonmineral resource values, and he could structure his project to minimize such required compensation by minimizing the damage.

In sum, this option would replace the existing open-ended and broadly worded surface use regulations promulgated primarily at the national level with more specific and predictable conditions tied to land types and uses at the local level, substitute flexible charges for absolute restrictions where appropriate, and ensure open access and secure tenure once such conditions and charges were firmly in place.