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Introduction

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Under the Constitution (article IV, section 3, clause 2), Congress is responsible for regulating and disposing of the Federal lands. In the past several years, Congress has faced a number of difficult issues relating to this responsibility. In particular, there has been considerable concern over the constraints on and effects of mineral exploration, development, and production on onshore Federal lands, which comprise about 30 percent of all the land in the Nation and contain significant mineral and non mineral resources. This report undertakes to analyze these constraints and effects, and through such analysis to develop options for promoting efficient and equitable mineral activities on onshore Federal lands. The report focuses on the Federal laws, policies, and practices for management and disposal of minerals on onshore Federal lands, exclusive of Indian lands.

A. Background

In recent years, Congress has faced a number of complex problems related to its constitutional responsibility over Federal lands. Those lands contain minerals that could contribute substantially to the national supply; but mineral exploration, development, and production on Federal onshore lands are hindered by a complicated system of laws and regulations built up gradually over more than 100 years. Moreover, defects in this system have led to the withdrawal of increasing amounts of Federal land from availability for mineral activities in order to protect mineral and nonmineral resource uses and activities. On the other hand, expansion of mineral production on these lands without legal and administrative reform could result in major social and environmental impacts, because the Federal onshore lands are generally located in sparsely populated areas and contain some of the Nation's most spectacular scenery and fragile ecosystems.

This study was initiated and developed to address these issues, in response to several related requests. Senator Ted Stevens, a member of the Technology Assessment Board, asked the Office of Technology Assessment (OTA) to assess "the crucial factors, including land use, environmental and transportation policies, as they determine the accessibility to domestic mineral resources, " and "the likely economic, social, environmental and other impacts of various policy alternatives designed to increase domestic mineral productivity. " Related broad issues of energy and materials supply and use were raised in a request submitted by the Chairman and the Ranking Minority Member of the House Committee on Science and Technology. Representative Morris Udall, another member of the Technology Assessment Board and (then) Chairman of the Subcommittee on Energy and the Environment of the House Committee on Interior

and Insular Affairs (now Chairman of the full committee), requested a study or studies of various natural resource issues as a beginning on an assessment of national growth policy, Among other things, Representative Udall requested a critical examination and extension of prior analyses of resource management policies for land, water, fuels, and other minerals to 1) develop a broader analytical framework, 2) analyze and identify any shortcomings in existing policies and practices, including those involved in choosing between alternative or conflicting uses of natural resources, particularly mineral and nonmineral land uses, and 3) develop options for improvement and coordination of the policies and practices of Federal, State, and local units of government in these areas. The studies were desired to provide information relevant to legislation and other matters pending before the Interior Committee, including revision of the mining and mineral leasing laws for Federal land and other legislation affecting development, use, and conservation of Federal land. The study plan, as developed in response to the previously described requests, was also supported by a request from the Senate Committee on Interior and Insular Affairs (now the Committee on Energy and Natural Resources).

The study has benefited from continuing communication with congressional staff, especially the staffs of the House Committee on Interior and Insular Affairs and the Senate Committee on Energy and Natural Resources. In turn, Congress and congressional staff have made use of interim results of the assessment which were distributed in March 1976, in several specific areas of congressional concern: for example, legislation on mineral land withdrawals, surface mining of coal, mining in the national parks, mineral law revision, and Alaska land classification.

In July 1976, congressional staff participated in an OTA Workshop on Legislative Strategies for Federal Mineral Land Management attended by representatives of industry, Government agencies, and environmental groups.

At the request of the Senate Committee on Governmental Affairs, in April 1977 OTA prepared a brief analysis of the effects of the proposed Department of Energy Organization Act on Federal land management, based on results of the study then in hand.

B. Objectives

1. The Focus of the Study

This study is one of several studies by the OTA Materials Group aimed at analyzing alternative responses to problems of materials supply and use. Although these studies focus on specific problems or issues, they have been planned to provide a better understanding of the overall materials cycle, from discovery of materials to their eventual reuse or disposal.

The focus of this study is on the discovery and production of minerals (including onsite processing, if any, and removal of the minerals from the mine site), and on the impacts on air, land, and water of such discovery and production. It is further

restricted to a particular source of mineral discoveries: onshore land owned by the U.S. Government. No attempt is made to analyze the appropriate level of mineral production on Federal onshore land in comparison with other sources of mineral supply (for example, imports or recycling) or with methods of decreasing demand (for example, improved product design),

The principal purpose of this study is to analyze the Federal land management and disposal laws, policies, and practices (and selected State and local laws, policies, and practices) that significantly affect mineral exploration, development, and production on Federal onshore land. Above all, the study addresses the problems of establishing an efficient and equitable mineral land management system that will:

- facilitate the identification, development, and production of mineral resources on Federal onshore land,
- do so in an environmentally and socially acceptable manner, and
- take into account demands for nonmineral resource uses on such land through provision, as appropriate, for simultaneous, sequential, or dedicated use.

2. Limitation to Federal Onshore Mineral Land

A complete study of all the factors affecting or affected by domestic mineral activities would be a prohibitively complex task, involving not only issues of physical access to and management of mineral land, but also tax, capital, transportation, energy, employment, import, export, environmental, and other issues. Accordingly, this study focuses on the issues of physical access to and management of Federal onshore mineral land. There are several reasons for this particular focus.

First, Congress is directly responsible under the Constitution for the disposal and management of Federal lands. [1]When this study was initiated, Congress faced a number of difficult issues related to the disposal and management of Federal mineral land-for example, surface mining of coal, Alaska land disposal, coal leasing, oil shale development, mining law revision, public land management authority, and mining in the national parks.

Second, onshore Federal land is a very significant portion (approximately so percent) of the total national onshore land area,

Third, over 93 percent of the onshore Federal land is in the 11 contiguous Western States and Alaska, which contain much of the known domestic resources of metallic, fuel, and other minerals. The Federal acreage amounts to 64 percent of the total land in these States, not including federally reserved mineral rights underlying an additional 5 percent of the State land. There has been an impressive history of mineral production from the Federal onshore land, and the Federal land remains a very important source for future production of many minerals. [2]

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[1]"Congress shall have Power to dispose of and make all needful Rules and Regulations respecting the Territory or other Property belonging to the United States." U.S. Const. Art. IV, § 3, cl. 2. See ch. 6, sec. C.

[2]See app. A.

Fourth, as has been noted, mineral exploration, development, and production on Federal land is subject to a complex, unwieldy system of laws and regulations, built up over more than 100 years, and to a wide variety of restrictions for environmental, national security, water resource, agricultural development, and other purposes. There appears to be substantial room for coordination and improvement of the existing laws and practices, especially if, as seems likely, the Federal land is expected to provide a significant portion of domestic mineral supply.

Fifth, the present laws and practices, combined with evident pressures for large-scale development of Federal energy resources, could result in major social and environmental impacts, since the Federal land is generally located in sparsely populated areas and contains some of the Nation's most spectacular scenery and sensitive ecosystems.

Sixth, the study is limited to onshore Federal land because of the significant differences in the technology and natural environment of onshore and offshore mineral activities. Moreover, OTA already had commenced separate studies related to offshore oil,[8] which is the only significant mineral currently being developed or produced on Federal offshore land,

Although the study does not directly analyze broader issues such as overall tax, transportation, energy, or environmental policy, it does address the general impacts of alternative legal arrangements for physical access to and management of minerals on Federal land, Similarly, although it focuses on alternative Federal legal arrangements, attention is paid also to their interaction with State and local laws, policies, and practices affecting mineral activity on Federal land.

Finally, it should be noted that the term "Federal land, " as used in this study, does not include Indian land.[4]

C. Structure and Contents

This report analyzes the substance and impacts of existing Federal land management and disposal laws, policies, and practices (and related State and local laws, policies, and practices) that significantly affect exploration for and development and production of minerals on Federal onshore land. The report also describes a number of possible options for improving the existing systems.

Chapter 1 (this chapter) describes the purpose and scope of the assessment.

Chapters 2 and 3 provide background data for the analysis. Chapter 2 describes the importance to the Nation's economy of the mineral resources on Federal onshore land. It also presents an overview of the technology, acreages, costs, times, risks, and

[3]See, e.g., Office of Technology Assessment, U.S. Congress, *An Analysis of the Feasibility of Separating Exploration From Production of Oil and Gas on the Outer Continental Shelf* (1975); Office of Technology Assessment, U.S. Congress, *Coastal Effects of Offshore Energy Systems* (1976).

[4]For information on Indian land, see Federal Trade Commission, Bureau of Competition, *Staff Report on Mineral Leasing on Indian Lands* (1975); U.S. General Accounting Office, *Management of Indian Natural Resources*, Senate Comm. on Int. & Ins. Affairs, 94th Cong., 2d sess. (Comm. Print 1976); American Indian Policy Review Commission, Task Force Seven, *Report on Reservation Resource Development and Protection* (1976).

parties involved in the various stages of mineral activity. Chapter 3 outlines the historical development and main elements of the existing Federal onshore mineral land management systems. Additional background on the role of Federal land with respect to production of essential mineral commodities is provided in appendix A.

Chapters 4 through 6 contain the actual analysis. These chapters examine the current status of the Federal onshore mineral land management systems, identify problems related to that status, and present options for improvement in each of three major areas of concern: coordination of mineral activities undertaken by different individuals and firms (chapter 4); coordination of mineral activities with nonmineral activities (chapter 5); and coordination of Federal, State, and local controls and payment requirements (chapter 6).

Appendix B develops statistical data on the availability of Federal onshore land for mineral exploration, development, and production in 1975. Its primary focus is on land classification actions that restrict such availability.

Appendix C contains the results of an OTA survey of the mineral industry. The survey was designed to obtain descriptions of the techniques used and estimates of the parties, costs, acreages, and times involved in exploration for and development and production of various types of mineral occurrences on onshore land in the United States.