

REPORT TO THE CONGRESS



BY THE COMPTROLLER GENERAL
OF THE UNITED STATES



Role Of Federal Coal Resources In Meeting National Energy Goals Needs To Be Determined And The Leasing Process Improved

Department of the Interior

The Department of the Interior has not established goals of how much land with coal resources to lease and when to lease to meet national coal production goals.

Some fundamental attempts should be made to (1) better identify the amount of coal under lease and prospecting permit and (2) relate the amount of Federal coal required to meet national goals to any program of renewed leasing. Interior does not presently contemplate providing the Nation with this data.

Also, the effectiveness of the leasing process is weakened by the deficiencies in

- Interior's coal resource mapping program;
- drilling programs, designed to obtain data for mineral classification and environmental protection; and
- the land management planning system.



COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

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To the President of the Senate and the
Speaker of the House of Representatives

Our report concerns the need to consider Federal coal leasing in the light of national coal production goals and to improve the leasing process.

We made our review because of the critical role Federal coal reserves could play in meeting U.S. energy needs. Our review was made pursuant to the Budget and Accounting Act, 1921 (31 U.S.C. 53), and the Accounting and Auditing Act of 1950 (31 U.S.C. 67).

We are sending copies of this report to the Director, Office of Management and Budget, and to the Secretary of the Interior.

A handwritten signature in cursive script that reads "Thomas A. Steitz".

Comptroller General
of the United States

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ABBREVIATIONS

DCF	discount cash flow
EMRIA	energy mineral rehabilitation inventory and analysis
GAO	General Accounting Office
LMU	logical mining unit
PRLAs	preference right lease applications



D I G E S T

Most energy consumed in the U.S. is provided by oil and natural gas--about 78 percent. Coal supplies about 17 percent and has the potential for increased use in producing electricity and steel and as an alternative source of synthetic gas, liquid fuels, and lubricants.

The Administration's goal is to double present national yearly coal production by 1985. This would bring annual production to about 1.2 billion tons.

Because of its large holdings of low-sulfur coal, the Federal Government is in a key position to shape future patterns of coal development. Most of the coal lands are administered by the Department of the Interior and may be leased to mine coal. (See p. 2.)

In 1971 Interior halted the issuance of coal leases and prospecting permits because growing amounts of coal resources were being placed under lease at a time when production was falling off. Overall, production has been poor.

About 70 percent of the 536 leases, conservatively estimated to contain 16 billion tons of coal, have yet to produce. About 60 percent of the leases are 10 years or older, and production is not expected on about half of the existing leases before 1990. (See p. 12.)

An issue which has never been adequately addressed in the 55-year history of the coal-leasing program is that of timely development.

The ease of obtaining leases and the low costs associated with holding them have not increased production, contrary to the intent of the law. In fact, these conditions, coupled with Interior's failure to enforce production clauses in the leases, provided a strong incentive for speculation. (See p. 6.)

The Secretary of the Interior announced a new coal-leasing policy on January 26, 1976. But lifting of the 1971 moratorium does not mean that leasing will resume automatically in the immediate future, according to Interior. (See p. 7.)

RELATIONSHIP OF FEDERAL LANDS TO COAL PRODUCTION GOALS

Interior has decided to lift the moratorium without having reasonable goals of how much coal to lease or when to lease, based on the best possible estimates of how much coal to expect from development of the leases.

The Department intends to rely on the leasing process itself to indicate the need for new leasing.

Under that process, the level of lease offerings would be determined by bidding results in competitive lease sales. Lease sales, if environmentally acceptable, would be offered as long as bids were sufficiently high.

However, reliance on this process places Interior in the position of reacting rather than providing leadership needed to develop sound national energy strategy. (See p. 11.)

COAL-LEASING PROCESS

The new leasing process appears to be much improved over the previous system. Much remains to be done before it can be applied effectively on a large scale. (See p. 50.)

To prepare for eventual selection of tracts for leasing, Interior had several data-gathering projects designed to provide maps

and other information for use in the proposed leasing program. The effectiveness of the system will depend on the integration of such information as the potential for reclamation and revegetation of mined areas, coal reserve estimates, and conflicting land uses. (See pp. 30 to 33.)

There are weaknesses in the system which will undermine seriously the effectiveness of the leasing process. Weaknesses exist in Interior's coal resource mapping program, in drilling programs to obtain data for mineral classification and environmental protection, and in the land management planning system. (See pp. 40 to 50.)

TRACT VALUATION

In the past, Interior gave little attention to adequately valuing coal lands and leased coal under conditions of great uncertainty about the quantity and quality of the resources. Interior is now attempting to change this but finds that it lacks the information to make reasonably sound valuations. (See p. 53.)

COAL-LEASING REGULATIONS

Several changes are needed in present and proposed coal-leasing regulations for effective administration of the leasing program. Improvements needed concern

- production standards for leases,
- adjustment of lease terms,
- assignment of leases, and
- coal exploration.

Improvements are needed also in Interior's preparation for and administration of a coal-leasing program. (See pp. 19 to 25.)

ACTION BY THE CONGRESS

The Congress should enact legislation that would

--Permit adjusting terms of future leases more frequently than after a 20-year primary term. (See 29.)

--Amend the law to provide for (1) the award of leases only on a competitive basis and (2) issuance of prospecting permits under which persons could explore for coal for commercial purposes but have no exclusive rights to leases. (See pp. 29 and 52.)

Information in this report should assist the Congress in considering the coal-leasing proposals now before it.

RECOMMENDATIONS

Interior should:

--Specify what demands will be placed on Federal coal resources in meeting the President's goal of doubling coal production by 1985.

--Establish a leasing schedule to indicate the timing and magnitude of lease sales. (See p. 51.)

--Develop a systematic coal-drilling program to provide data for appraising coal resources and provide planned and coordinated drilling through federally financed activities. Such data should be made available to the public. (See p. 52.)

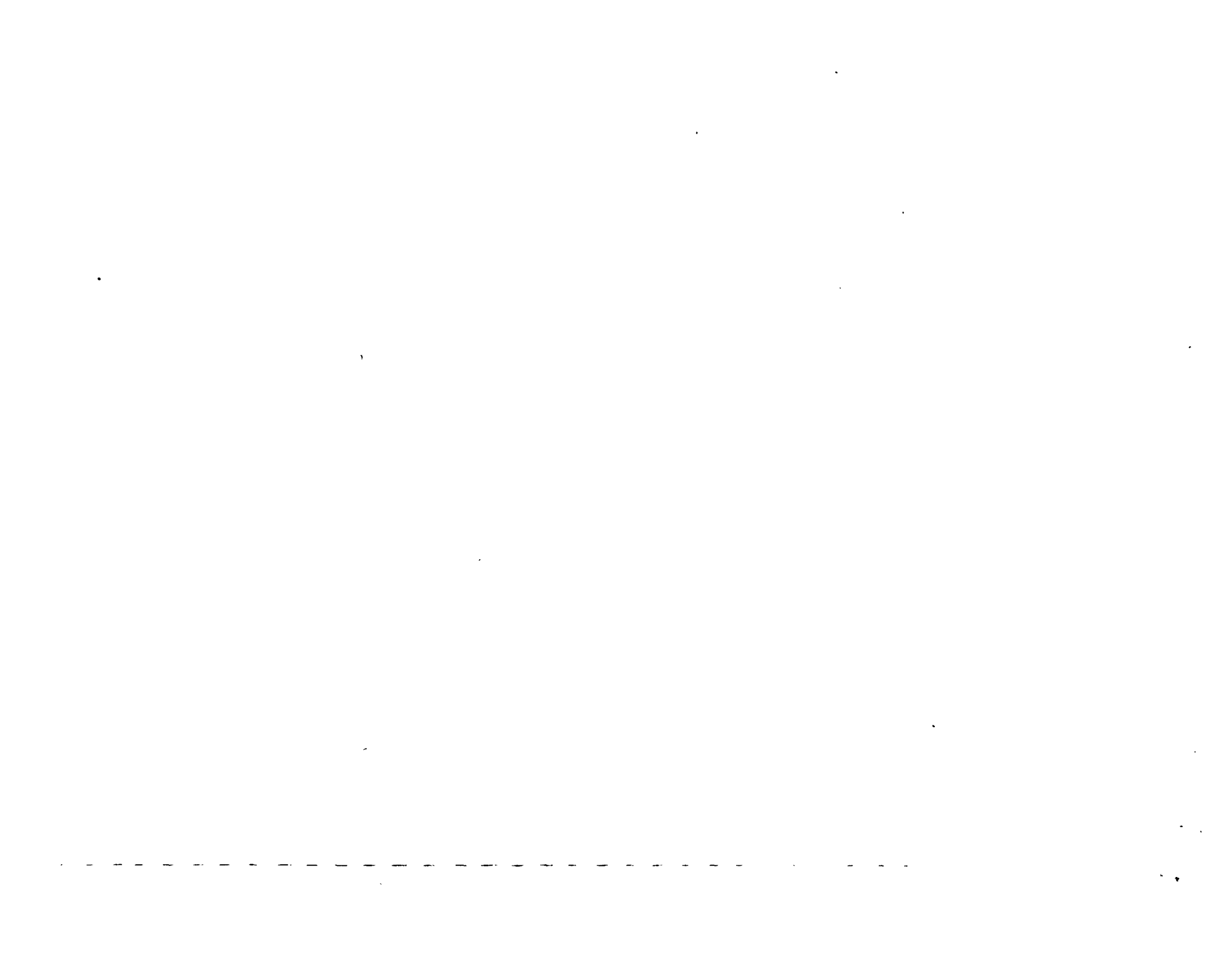
--Require existing and potential lessees and permittees to furnish information on (1) reserve holdings, (2) production plans, (3) reasons and justifications for nonproduction, and (4) the need, if any, for additional Federal coal reserves. (See p. 28.)

--Award leases only on a competitive basis.

Additional recommendations are included in the report designed to improve Interior's preparation for and administration of a coal-leasing program.

AGENCY ACTIONS

Formal agency comments by Interior were received on March 9, 1976. Interior concurred that actions to develop the Nation's coal resources should be undertaken only with adequate knowledge and appreciation of the need and consequences for such development and believed that major initiatives now underway adequately addressed most of the valid points raised. While Interior's actions are a step in the right direction, they do not address several of the program weaknesses or go far enough to remedy other matters detailed in the report. (See pp. 11 and 21.)



CHAPTER 1

INTRODUCTION

The United States is the largest energy-consuming nation in the world. Since the mid-1960s this consumption has grown at a rate of over 4 percent annually.

U.S. energy consumption has changed significantly over the years. Whereas, at the turn of the century, coal supplied 90 percent of the total energy, it now represents only about 17 percent. Most of the energy now consumed in the United States--about 78 percent--is provided by oil and natural gas. Along with this change in consumption, the United States tends to rely on imported petroleum to meet needs not met by domestic energy production. As of July 1975, about 38 percent of the 16 million barrels of oil consumed each day was imported.

The October 1973 oil embargo by the Organization of Petroleum Exporting Countries called vivid attention to our Nation's growing reliance on foreign oil imports as a source of domestic energy and its consequences. Interruptions of oil imports and higher prices have focused attention on developing a national energy program and alternatives to meeting domestic energy needs.

INCREASING ROLE FOR COAL

President Ford's energy policy announcement in January 1975 called for an increasing role for coal. As outlined, the national goal would involve doubling the Nation's annual coal production by 1985--from the present 600 million tons to at least 1.2 billion tons. Coal has the potential for increased use in producing electricity and steel and as an alternative source of synthetic gas, liquid fuels, and lubricants. The electric utility industry is the major consumer of coal--consuming 70 percent of the bituminous coal and lignite in 1973.

The Department of the Interior's latest estimates (January 1974) place U.S. coal resources at about 4 trillion tons, based on both identified and hypothetical ^{1/} deposits. Interior estimates that 434 billion tons is in coal beds thick enough and near enough to the surface to be mined by conventional methods. But on the basis of the average recoverability in past U.S. coal mining, Interior believes only 217 to 258 billion tons would be recovered. Coal fields in the continental United States are shown on page 3.

Compared with estimates of remaining recoverable resources of other U.S. fossil fuels, Interior estimates that coal represents 80 percent of the total heat value of all the fossil fuels. Petroleum, natural gas liquids, and natural gas represent only 8 percent. Oil from oil shale accounts for the remaining 12 percent.

A principal target for future coal development is the States west of the Mississippi River which account for 53 percent of the demonstrated coal reserves (434 billion tons) and where the Federal Government owns about 60 percent of the coal lands and can influence the development of another 20 percent bordering on Federal land.

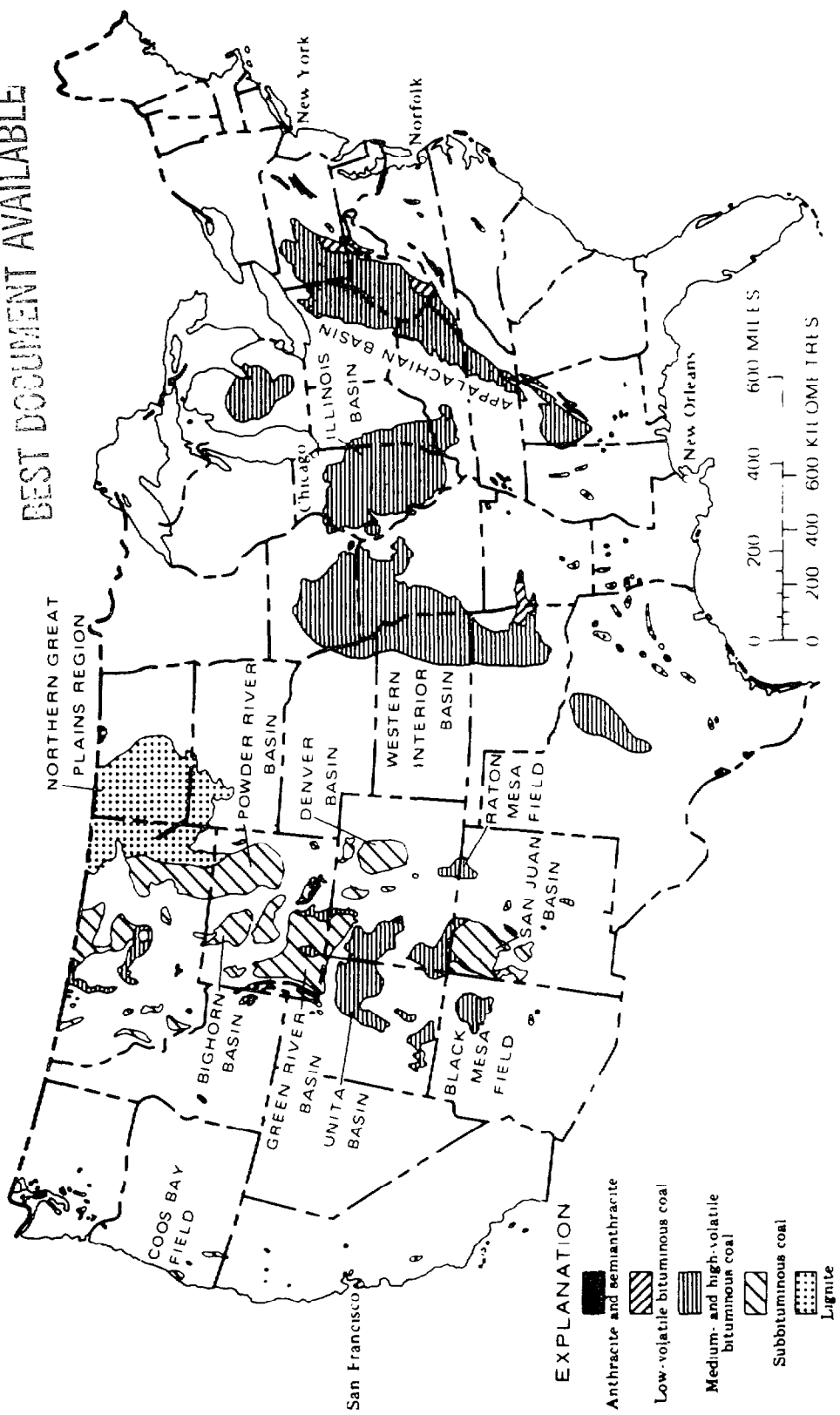
Western coal is important because (1) it is generally easier and more economical to produce because it is strip minable, (2) western lands are usually easier to obtain in large tracts than eastern lands and therefore can be more efficiently mined, and (3) western lands are rich in deposits of low-sulphur coal--a factor critically important in coal use because of the sulfur emission limits called for under the Clean Air Act (42 U.S.C. 1857), as amended on December 31, 1970, by Public Law 91-604. States west of the Mississippi hold an estimated 84 percent of the demonstrated coal reserves with a sulfur content of less than 1 percent.

However, there are disadvantages associated with western coal development. Much of the western coal is of a lower quality than eastern coal and yields less heat for each unit of weight. This means that, on the average, more western coal must be used to produce the same amount of energy. Other constraints to western coal production

^{1/}Hypothetical resources are estimated tonnages of coal in the ground in unmapped and unexplored parts of known coal basins to an overburden depth of 6,000 feet and are determined by extrapolation from nearest areas of identified resources.

COAL FIELDS IN THE CONTINENTAL UNITED STATES

BEST DOCUMENT AVAILABLE



Source: Coal resources of the United States, January 1, 1974. Geological Survey Bulletin 1412.

include the distance from market and difficult ownership patterns caused, in part, by separate ownership of the surface and mineral resources. Also, much of the western coal is in arid or semiarid areas. The scarcity of water could constrain coal use or production in these areas.

Furthermore, western coal cannot be produced without certain social and environmental costs. Increased demands for coal production will be placed on a few western States which historically have produced a relatively small percentage of domestic coal. (See chart on p. 5.)

ADMINISTRATION OF COAL-LEASING PROGRAM

Under the Mineral Lands Leasing Act (30 U.S.C. 181), also known as the Mineral Leasing Act, and under the Mineral Leasing Act for Acquired Lands (30 U.S.C. 351), Federal lands containing coal deposits, except certain specifically excluded lands, such as those in some national parks, may be leased for mining coal.

The Bureau of Land Management and the Geological Survey in the Department of the Interior are the agencies most concerned with the management and disposition of Federal coal resources.

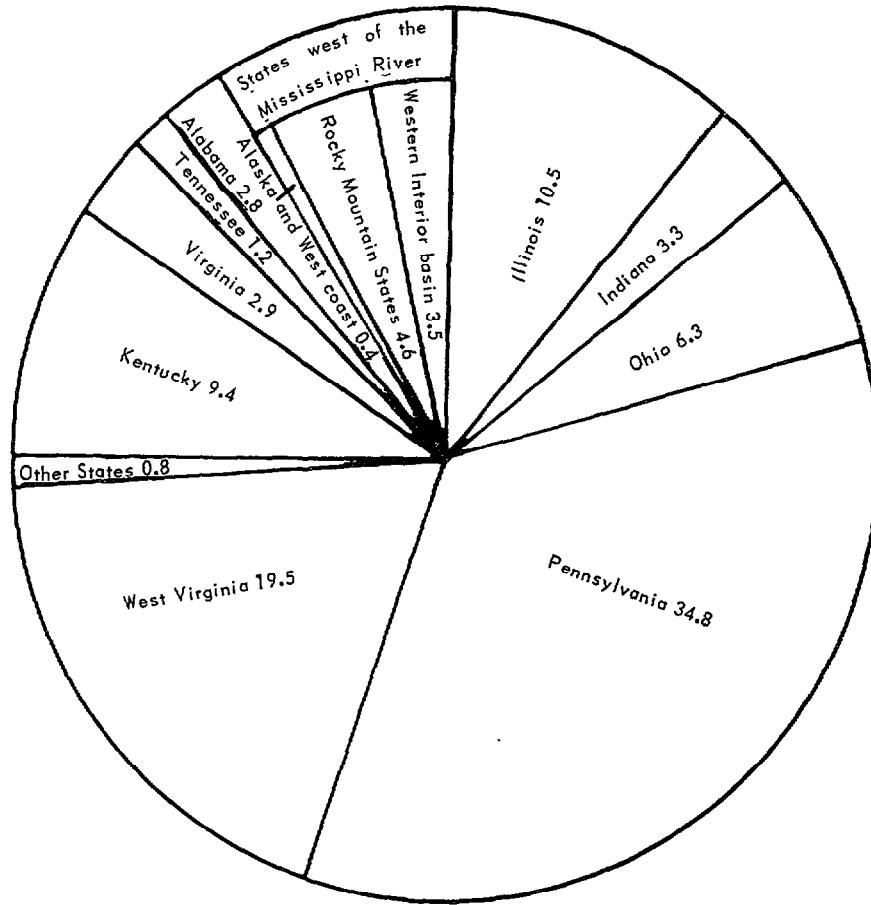
The Bureau, through its offices in the various States, processes applications for (1) permits to explore Federal lands for coal resources and (2) leases of Federal lands for mining coal.

Secretarial Order No. 2948 issued on October 6, 1972, sets out the division of responsibility between the Bureau and the Survey for administering the onshore mineral leasing laws. This order provides that the Bureau exercise the Secretary's discretionary authority to determine whether licenses, permits, or leases should be issued. Specifically, the Bureau issues mineral leases, permits, and licenses and is the office of record in mineral-leasing matters. The Survey provides scientific and technical advice to the Bureau to assist in making decisions on applications to explore for coal or to lease land to mine coal.

Before action is taken on applications for prospecting permits and leases, the Bureau is required to obtain reports from the Survey. The reports include recommendations on (1) whether a permit should be issued or a lease should be entered into, (2) the acreage to be covered by the permit or lease, (3) the royalty rate, (4) the rental rate, and (5) the bonus bid--a one-time payment to the Federal Government for the privilege of obtaining a lease.

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PERCENTAGE DISTRIBUTION, BY STATES, OF CUMULATIVE COAL PRODUCTION
IN THE UNITED STATES TO JANUARY 1, 1974



Source: Coal resources of the United States, January 1, 1974. Geological Survey Bulletin 1412.

Also, the Survey supervises leasing activities for compliance with the terms and conditions of exploratory permits and leases, operating regulations and statutes, and collects royalties.

Under the law Interior issues coal leases for indeterminate terms, subject at 20-year intervals to adjustment of terms and conditions by the Secretary of the Interior. (30 U.S.C. 207).

WEAKNESSES OF PAST LEASING PROGRAMS AND NEED FOR IMPROVEMENT

Historically, Interior assumed a reactive role in leasing Federal coal land, responding to the industry which applied for coal leases and prospecting permits without first knowing when and if coal would be produced. Leasing occurred in an unplanned manner, entirely in response to requests from the private sector and many times from only a single interested party. Competitive interest was not a prerequisite for holding a lease sale, and often nominal or no presale values were placed on the resources.

The ease of obtaining both competitive and noncompetitive leases and the low costs associated with holding leases have not fostered production, contrary to the intent of the law. In fact, such conditions, in addition to Interior's nonenforcement of production clauses in the leases, provided a strong incentive for speculation.

After the Bureau made a coal-lease study in November 1970, the Department of the Interior halted issuing coal leases and prospecting permits to reassess coal-leasing policies.

The study showed that the acreage of coal under lease was increasing while production was decreasing. Acreage under lease had increased from about 80,000 acres in 1945 to about 778,000 acres in 1970. Production during this period had declined from about 10 million tons in 1945 to 7.4 million tons in 1970. Over 90 percent of acreage under lease was within nonproductive leases. Also the study showed that 761,000 acres of Federal lands were included within outstanding coal-prospecting permits and were held principally by coal brokers--not coal producers.

From May 1971 to February 1973, Interior issued no coal leases or permits. On February 17, 1973, the Secretary announced a new coal-leasing policy providing for both short-term and long-range actions.

Interior's short-term coal-leasing policy is intended to be temporary. It provides that coal leases can be issued when coal is needed by the applicant to maintain an existing mining operation or as a reserve for production in the near future. It also requires the applicant to demonstrate a need for the resources by showing that mine development will begin within 3 years.

The short-term coal-leasing policy also requires that all coal leases, renewals, and modifications include provisions for advance royalties. Such provisions provide for the payment of an annual advance royalty beginning in the sixth year of the lease, regardless of whether coal is produced. As of February 1976, 10 leases had been issued under the short-term policy; several others are pending Interior approval.

The long-range coal-leasing policy announced in February 1973 provided for Interior to develop

- an environmental impact statement on the Federal coal leasing program and
- a planning system to determine the size, timing, and location of future coal leases.

The final environmental impact statement was issued on September 19, 1975. The purpose of the impact statement is to consider the broad environmental impact of coal leasing under the proposed leasing system and alternatives to leasing. The impact statement is to be used as a decisionmaking tool. It was not intended to deal with the issues of how much coal should be leased or what specific areas should be leased. Interior's specific environmental analyses will supplement the broad statement. The final impact statement was issued about a year after the draft statement was made available for public comment. Comments ranged from support of the impact statement to requests for a complete revision.

The Secretary of the Interior announced a new Federal coal-leasing policy on January 26, 1976. The Secretary said that the new policy--based primarily on the proposal outlined in the environmental impact statement--would include:

- Adopting the Energy Minerals Activity Recommendation System which requires careful analysis to determine need for coal and to minimize environmental impacts.

- Adopting a totally competitive leasing system under which no new coal prospecting permits will be granted.
- Developing final regulations governing conditions under which mining operations and postmining reclamation must take place.
- Preparing regional environmental impact statements, in which groups of coal and coal-related actions are proposed for a defined geographical area.
- Continuing, until the new coal-leasing system has been implemented, the short-term leasing criteria that has been in effect since February, 1973 to allow leasing for ongoing mining operations or to meet near-term reserve requirements.
- Promulgating effective, diligent development standards.
- Establishing a firm definition for commercial quantities to determine whether leases will be issued to preference right lease^{1/} applicants under the Mineral Leasing Act.
- Removing, under controlled conditions, the Federal coal-leasing moratorium that has been in effect since early in 1971.

Lifting the moratorium does not automatically mean that leasing will resume in the immediate future, according to Interior.

Under the Energy Minerals Activity Recommendation System, a nomination process would determine the need for coal leasing. Industry and the public would indicate areas they would like to have coal leases offered and areas which should not be offered. Nominations would be evaluated for environmental and other land use conflicts through the Bureau's multiple-use, land-planning system and would result in tentative selections of tracts for competitive lease sale.

The level of lease offerings would be determined by nominations and by bidding results in competitive lease

^{1/} Lease may be issued to a permittee after filing an application showing that coal was discovered in commercial quantities while operating under a valid prospecting permit.

sales. Lease sales, if environmentally acceptable, would be offered as long as bids remain high enough to indicate the desirability of further leasing.

The Energy Minerals Activity Recommendation System was at one time identified as the Energy Minerals Allocation System and was originally designed to relate coal-lease sales to regional and national needs through an economic model. Emphasis was placed on an allocation process to be followed by tract selection, valuation, and leasing. In the model regional demands for Federal coal resources would be allocated to specific inventoried coal resource areas. The amount of coal which should be leased would be identified and coal allocation targets would be distributed to coal-leasing States. Allocation recommendations were then to be incorporated into site specific 1-year leasing schedules and a tentative 5-year schedule. Presale evaluations, preparation of environmental impact statements, lease sales, postsale evaluations, and lease issuance would follow. For reasons we could not fully determine, the Bureau abandoned this concept. Bureau officials told us that the lack of adequate resource data would have hindered its implementation.

CHAPTER 2

NEED TO DEFINE FEDERAL COAL-LEASING GOALS AND

IMPROVE PROGRAM REQUIREMENTS AND ADMINISTRATION

Presently the national coal production goal is 1.2 billion tons a year by 1985 which was set by the President in his energy message of January 1975. It should be clear (1) what portion of the projected 1.2 billion tons will have to come from federally owned coal lands and (2) whether Federal coal reserves now under lease or committed to preference right leaseholders can satisfy this need. As of February 1976, Interior did not have answers to these questions. Consequently, Interior does not have an adequate basis for determining whether additional coal leasing is needed and, if so, how much coal should be leased to meet national coal production goals.

NEED TO DEFINE ROLE OF FEDERAL COAL RESOURCES IN MEETING NATIONAL GOAL

The Administration's national coal production goal is to double our yearly production by 1985. This would result in annual production of about 1.2 billion tons. As indicated in chapter 1, the Federal role in meeting this goal is important because the Federal Government owns 60 percent of the coal lands west of the Mississippi and can influence coal development on another 20 percent bordering on Federal land.

We believe that Interior should have as clear a conception as possible of the potential contribution of Federal lands toward meeting the national coal production goal.

An interagency coal task force report ^{1/} projected that Federal coal resources would supply 131 to 207 million tons by 1985. The National Academy of Engineering has estimated ^{2/} that to double production by 1985 will require 140 new eastern underground mines, each producing 2 million tons a year; 30 new eastern surface mines of that capacity; 100 new surface mines in the West, each yielding 5 million tons

^{1/}Interagency Coal Task Force Report, U.S. Department of the Interior, 1974.

^{2/}"U.S. Energy Prospects An Engineering Viewpoint," the National Academy of Engineering, May 1974.

a year; 140 new 100-cubic-yard shovels and draglines; and 2,400 continuous-mining machines. The Academy estimates that capital costs for such growth will require the coal industry to attract \$20 to \$25 billion in 1985--three or four times the present capital investment. Additionally, if the coal industry is to expand as expected, the Academy foresees a need for 125,000 new miners by 1985--80,000 in the East and 45,000 in the West. Moreover, transportation must be improved to handle twice its present coal traffic.

There is no apparent relationship between such projections and Interior's new coal-leasing policy. Interior indicates that specifying exact demands on Federal coal is impossible beyond saying that greater amounts of coal are anticipated to come from Federal lands. While exact long-term demands might not be measurable, we believe that Interior should have reasonable goals of how much to lease and when to lease, based on the best possible estimates of how much coal to expect from developing the leases.

Interior intends to rely on the leasing process itself to indicate the need for new leasing. Under that process, (see ch. 1) the level of lease offerings would be determined by industry nominations and by bidding results in competitive lease sales. Lease sales, if environmentally acceptable, would be offered as long as bids were sufficiently high. Reliance on such a process places Interior in the position of reacting rather than providing the leadership needed to develop a sound national energy strategy.

IMPORTANCE OF EXISTING LEASES TO FUTURE LEASING PROGRAM

Coal reserves under existing leases are an important factor in formulating a new coal-leasing program. How much coal will be produced from these holdings? Will it be sufficient to satisfy 1985 coal requirements for Federal coal resources? What can be done to encourage production from Federal leases? If existing holdings are not adequate to meet forecasted needs, how much additional leasing is needed? Is Interior ready to lease suitable acreage?

Interior believes that much of the Federal coal resources contributing to fiscal year 1985 production will come from the six western States of Colorado, Montana, New Mexico, North Dakota, Utah, and Wyoming, where an estimated 16.2 billion tons of recoverable coal is already under lease. A 9.3 billion additional tons are covered by preference right lease applications.

Geological Survey field officials indicate that the estimates should be considered only as a rough and conservative approximation of actual resources. In computing the reserves the Survey used data based largely on information on hand in November 1973 and the judgment of the mining supervisors at that time. Although the Survey prepares a quarterly update of the information, Survey field officials update the information only when they become aware of new data on the lease, and they make no attempt to solicit more current information.

In estimating recoverable reserves, the mining supervisors discounted identified reserves by 50 percent for those recoverable by underground mining and by 10 percent for those recoverable by strip mining. Survey field officials told us that although no specific prices were used in the computations, the amount of coal deemed recoverable in 1973, when coal prices were much lower, would make the estimates conservative. According to the latest Bureau of Mines statistics, the price of coal (f.o.b. mines) has increased from \$8.53 a ton in 1973 to an estimated \$18.75 a ton in 1975.

Overall production for Federal coal leases has been poor. About 68 percent of the 467 leases located in the six-State area had not produced any coal as of December 1975. Although similar statistics were not available for the 69 leases in the other States, an Interior official estimated that only about 7 leases had ever produced. Therefore, about 70 percent of the existing leases have yet to produce.

Although production for Federal leases has increased in the past couple years, it still represents only a small percentage of total domestic production. For example, in calendar year 1974, coal production for all Federal leases amounted to about 21 million tons, or about 4 percent of the 603 million tons produced in the United States during that year.

Production not expected before 1990
for about half of the leases

As of December 1975 there were 536 coal leases for about 783,000 acres of Federal land in 15 States. (See app. I.) The 536 leases were held by 167 lessees. The top 20 lessees owned about 65 percent of the total federally leased acreage and 52 percent of the total leases. (See app. II.)

To determine the past, present, and future production plans of lessees, Interior analyzed the 467 leases in a

six-State area--Colorado, Montana, New Mexico, North Dakota, Utah, and Wyoming. According to Survey officials, the information on reserve estimates (past, present, and future production) was obtained from the lease files, and in some instances from the lessees. But they could not recall the exact number of contacts. When future production plans were not know, they assumed that there would be no production before 1990.

Interior's December 1975 analysis showed the following characteristics for the 467 leases.

<u>Production category</u>	<u>No. of leases</u>	<u>No. of lessees</u>	<u>Total acreage</u>	<u>Total reserve (tons)</u>	<u>Average age of lease (years)</u>	<u>Average size of lease (acres)</u>
			(000 omitted)	(000,000 omitted)		
Produced in past only	65	50	28	382	31	435
Producing in 1974	53	39	85	1,606	23	1,665
Produced in past and will in future	31	24	29	349	30	947
No past production but will in future	79	29	129	4,148	12	1,622
Never produced and no plans to	<u>239</u>	<u>66</u>	<u>411</u>	<u>9,681</u>	<u>11</u>	<u>1,734</u>
Total or average	<u>467</u>	<u>a/208</u>	<u>682</u>	<u>16,166</u>	16	1,460

Source: Bureau of Land Management, Department of the Interior, unpublished data.

a/Total includes 128 individual lessees which is equivalent to the sum of 208 lessees because an individual may hold leases in more than one category.

Among other things, the findings of the Interior study were:

- Over 50 percent (239) of the 467 leases have never produced, and lessees have not indicated any plans for development before 1990. These leases are held by 66 lessees and account for 60 percent of the total lease acreage and coal reserves. Most of the coal reserves are in Wyoming, and the coal is surface recoverable.
- Over 60 percent (141) of the lessees that have no plans for production obtained leases through the preference right method; whereas, the past and currently producing leases were obtained primarily through competitive bidding. This would seem to indicate that production has been better with competitive leasing than with preference right leasing. However, Interior's analysis concludes that further study is needed to determine to what extent this is true.
- The major coal production from Federal lands during the next 15 years will come from surface deposits in Wyoming.
- Of the 467 leases, 65 produced over 23 million tons of coal in the past but they are not included in plans for future production. Another 53 leases produced over 21.5 million tons of coal in 1974, with cumulative production of 129 million tons, and lessees plan to more than double annual output before 1980. Nearly all of these leases are over 10 years old and most are over 20 years old.

Interior's analysis only speculates why over 50 percent of the lessees may not be planning any production before 1990. According to Interior, the lessees without production plans hold large quantities of underground reserves, nearly all in Utah, which are not currently competitive with surface-recoverable coal. The newer lessees which do not plan any production have huge surface coal reserves in Wyoming. However, no reason was given why the reserves in Wyoming were not planned for production.

Reasons why GAO-sampled leases
are not producing

To better understand why leases are not producing, we sampled 32 leases in Utah and Wyoming covering about 57,000 acres of Federal land and containing an estimated 1.7 billion

Two lessees (identified as D and F in the table on p. 15) involved principally in oil and gas development and distribution, acquired eight leases in anticipation of a technological breakthrough which would permit the gasification and liquification of coal. Also, one coal company (B) was holding in reserve 299 million tons of coal which it claims was of a higher sulfur content than other western deposits and will not likely have an immediate market.

Uncertain status of preference
right lease applications

An estimated 9.3 billion tons of recoverable coal exists under the 192 preference right lease applications (PRLAs) currently on hand in six western States. These potential coal reserves represent 57 percent of the coal already under Federal lease.

Under the Mineral Leasing Act, a preference right lease may be issued to a permittee after it files an application showing that coal was discovered in commercial quantities while operating under a valid prospecting permit.

The preference right lease applications were filed on land located in six western States and as of July 1975 covered 490,000 acres.

<u>State</u>	<u>Applicants</u>	<u>Applications</u>	<u>Acres</u> (000 omitted)	<u>Estimated reserves</u> (tons) (000,000 omitted)
Colorado	12	41	94	2,300
Montana	3	8	26	500
New Mexico	6	28	78	800
Oklahoma	3	5	9	60
Utah	9	38	113	1,400
Wyoming	<u>12</u>	<u>72</u>	<u>170</u>	<u>4,300</u>
	<u>45</u>	<u>192</u>	<u>490</u>	<u>9,360</u>

Source: Bureau of Land Management, Department of the Interior, unpublished data.

The 192 PRLAs are held by only 45 applicants, 20 of which already own existing Federal coal leases.

Many of the PRLAs have been pending longer than 6 years, but Interior has not yet decided the role of these potential coal reserves and the impact on future coal-leasing plans. According to Bureau officials, the PRLAs are still at various levels of analysis in the Bureau's planning system. The Bureau's analysis indicates that even if all preference right leases were granted, only a small number of potential leases could come into production by 1980 because of the process and development lead time required.

On January 19, 1976, Interior published proposed regulations to define commercial quantities and to state what information the permittees must submit to demonstrate the existence of coal in commercial quantities (41 F.R. 2648). The proposed regulations require the permittee to demonstrate (1) the quantity and quality of the mineral deposit, (2) expected revenues, and (3) the estimated costs that a prudent person would consider before deciding to operate a mine. The regulations, if adopted, will apply to all pending and future applications for leases by prospecting permittees.

Although the proposed regulations set forth the general types of relevant information, they are vague as to the specific information to be submitted, the documentation and detail required, and criteria to be used by lessees in computing the data. For example, the proposal does not specify what factors must be used in computing revenue and reserve estimates or what may be construed to be sufficient evidence. Without specific criteria and requirements, we do not see how the proposed regulations could be effectively administered and with any consistency. Consequently, we believe that Interior should more clearly define the standards for complying with the proposed regulations and disposing of the preference right lease applications.

Furthermore, we believe that the proposed regulations should be revised to require that permittees furnish evidence that a need exists for additional coal reserves and that production is planned to begin within a reasonable time from the date of the lease. Such a requirement would be consistent with Interior's short-term leasing policy. Interior has indicated that, in disposing of preference

right lease applications, it would give priority to those which satisfy this criteria. It makes good sense to us that this criteria be mandated as a condition for issuing all pending preference right leases and not used merely in establishing administrative priorities.

With regard to future Federal coal leasing, we believe that the law should be amended to provide for the award of leases only on a competitive basis. While free access and rights to coal lands at one time may have encouraged coal development, experience has shown that it has not done so.

The Secretary of the Interior's coal-leasing-policy announcement of January 26, 1976, calls for adopting a fully competitive leasing system. Interior's statistics show that rights to an estimated 9.3 billion tons of coal are held under preference right lease applications, of which about 55 million tons have been produced through calendar year 1974. As indicated before, according to Interior's analysis of existing leases, 141 of the 217 preference right leases have not produced in the past, and lessees have no future production plans. Moreover, because these leases are not awarded under competitive bidding, the public is not assured of a fair return.

NEED TO ENCOURAGE DEVELOPMENT OF COAL LEASES

Historically, Interior paid little attention to developing coal leases. Leases were available for the asking. For various reasons, including speculation, production which could be expected from these leases has not occurred and may not be forthcoming.

An issue which has never been adequately addressed in the 55-year history of the coal-leasing program is that of timely development. Also, Interior has permitted lessees to defer coal mining by issuing leases for indeterminate periods having no requirement that coal be mined if lessees make minimum royalty payments. The low cost of acquiring and holding leases and the ability to assign or transfer leaseholds has permitted a climate for leaseholders to obtain and hold coal resources for speculative purposes.

What production should Interior expect from leases and how soon? What requirements need to be established to stimulate development and discourage abuses of the coal leasing program?

NEED TO IMPROVE DEVELOPMENT AND PRODUCTION REQUIREMENTS

Past Interior policy and practices emphasized and relied on escalating rental payments and minimum production royalties as incentive to promote more timely lease development and coal production. But the costs of rentals and royalties were low. For example, cumulative royalties received on 314 million tons of Federal coal as of March 1975 totaled only about \$39 million or an average royalty of about 12 cents a ton. Mine development was not required and suspension of mine operations was permitted. The legislative requirements for diligent development and continued operations of a mine as conditions for retaining the leases, as provided for by the Mineral Leasing Act of 1920, were negated by another provision of the same act which permitted retaining the nonproducing mines by paying

--a low annual rental--which was credited against royalties as they accrued and

--a minimum royalty for 1 year in advance--which generally was equal to the annual rental.

Lessees have been able to hold public lands, generally at \$1 an acre a year, without having to develop or even show intent to develop the lands.

In two earlier reports 1/ we pointed out weaknesses in Interior's reliance on financial inducements to force production. In 1972 and 1975 we recommended to the Secretary of the Interior that he discontinue issuing coal leases that permitted lessees to defer or suspend mining

1/ "Improvements Needed in Administration of Federal Coal-Leasing Program" (B-169124, March 29, 1972).

"Further Action Needed on Recommendations for Improving the Administration of Federal Coal-Leasing Program" (RED-75-346, April 28, 1975).

operations on Federal lands unless lessees can justify that development or operations should be deferred or suspended. Interior, in commenting on our recommendation in 1975, said that advance royalty provisions and proposed coal-leasing regulations published in December 1974 will encourage timely development and production on existing and future Federal coal leases and will generally prevent lessees from indefinitely deferring or suspending mining operations on Federal lands.

Leases issued since April 1973 contain provisions for payment of advance cumulative royalties beginning in the sixth lease year. Unlike the minimum production requirements in most existing leases, advance cumulative royalties are based on a predetermined rate of coal extraction and the provisions cannot be waived by administrative decision. While the provisions increase the cost of holding leases after the first 5 years, they do not necessarily mean that the financial burden will force lessees into production. Because advanced cumulative royalties can be offset against royalties due when production begins, speculative delay in production can occur because the profit from delay may be greater than the cost in interest on advance royalties. Consequently, we continue to believe that Interior should not rely only on financial inducements to force production.

The December 1974 proposed coal-leasing regulations were substantially revised and were published as new proposals in December 1975. While the new proposals are a positive move by Interior to administratively encourage production and reduce the opportunity for speculative holding, they do not go far enough. We believe the proposals have two major weaknesses which if not corrected will seriously impede their effectiveness. First, the regulations proposed would allow lessees to tie up public coal resources for 10 years without having to show any evidence of progress toward development. Second, compliance with diligent development and continuous operation requirements would be judged on a logical mining unit (LMU) rather than an individual lease basis. Unless more specific definitions and criteria are provided, the concept could become a vehicle for retaining Federal leases without good reason and for negating the requirement for minimum production within 10 years.

Need to strengthen proposed regulations for diligent development and continuous operations

Under the proposed regulations a lessee must have mined at least one-fortieth, or 2-1/2 percent of the

reserves associated with the logical mining unit within the first 10 years of the lease. To retain the lease after that time the lessee must mine 1 percent of the LMU reserves each year.

According to the proposed regulations for diligent development and continuous operations, published in December 1975, (40 F.R. 60070) diligent development is defined as timely preparation for an initiation of production so that one-fortieth of the reserves associated with the logical mining unit is extracted within 10 years of the lease date. Continuous operations is defined as mining 1 percent of the LMU reserves each year thereafter. Interior's rationale in tying production standards to an LMU is based on the premise that an efficient and economic coal development operation requires the accumulation of large lease areas and reserves for development over a long time period and that the operators efforts should be judged on a unit basis.

The proposed regulations are unclear as to what constitutes timely preparation for production. No milestones have been established to determine by which time period activities leading to production would have to be completed. Unlike an earlier proposal (published in December 1974), the lessee is not required to report diligent development on a periodic basis.

We believe that adequate management of the Nation's resources and energy planning needs dictate that Interior concern itself early in the lease term as to whether the lease will produce by the end of 10 years.

Specifically, we believe that as part of diligent development requirements, lessees should be required to furnish detailed exploration and development plans setting forth a schedule for diligent development operations within a specified time after the lease award and to report periodically on development. Under Interior's oil shale prototype leasing program, the lessee is required to furnish a detailed development plan within the first 3 years of the lease.

Interior believes that it is unlikely the lessees would tie up public coal resources for 10 years without producing coal. Interior reasons that if lessees do not produce coal within that time, they would lose the lease rights and investment in the lease--including the advance cumulative royalties.

While we agree these conditions would logically have some influence on production, the argument does not deal with the fact that the lessee has no external incentive to (1) produce before the sixth year or (2) produce at levels greater than are necessary to satisfy the diligent development requirement.

Another principal weakness in the proposed regulations concerns the establishment of logical mining units. The provision would permit almost any combination of Federal and non-Federal land to be combined into an LMU. However, more specific definitions and criteria are necessary to insure that the concept does not become a means for retaining Federal leases without good reason.

The proposed regulations provide that an LMU may consist of one or more Federal leaseholds and may include intervening non-Federal (State or private) lands of a single operator that can be developed and operated as a unified mine. Under the provision almost any combination of Federal and non-Federal land could be combined into an LMU.

The mining supervisor would approve and establish LMUs. No size or other limitations would be in force. The proposal provides that each Federal lease would become an LMU at the time the regulations take effect. The proposal lists three conditions under which the boundaries of an LMU could be reduced or made larger.

- When the lessee or operator applies with the approval of the mining supervisor and concurrence of the authorized officer. (The authorized officer is a Bureau official who has the authority to approve the lease).
- At the discretion of the mining supervisor with the concurrence of the authorized officer.
- At the request of the authorized officer with the approval of the mining supervisor.

While conditions have been set forth under which the boundaries of an LMU can be changed, no guidance is provided on how the mining supervisor can insure that an LMU can be developed and mined in an efficient, economical, and orderly manner with due regard to conserving coal reserves and other resources. Conceivably, at the request of a lessee, an LMU could be established which included only a small unit of Federal land. If it is in the lessee's interest, the Federal

land can be developed years after the State or private parts of the unit are developed or not be developed at all.

Furthermore, guidance as to the permanency of LMUs has not been established. Thus, with the approval of the mining supervisor and the authorized officer, the lessee would be permitted to increase or decrease the size of an LMU through the assignment or purchase of Federal or non-Federal leases to suit its needs. This raises questions as to how production requirements for diligent development and the computation of advance cumulative royalties will be affected by changes to the reserve base.

In the absence of more specific criteria in the proposed regulations, it is unclear how the mining supervisor and authorized officer could assess establishing the logical mining unit, such as justification of need, demonstration or reasonableness, or the appropriateness of size of the unit being established.

We believe that the concept of establishing efficient and economical mining units has merit and could, if implemented properly, promote the timely development of Federal leases. However, more specific definitions, criteria, and limitations will be necessary to establish effective LMUs and insure that the most efficient and economical units are developed.

Need to shorten lease adjustment periods

We analyzed the 533 coal leases which were outstanding as of December 31, 1974, to determine the number of years the leases had to go before Interior could adjust the lease terms. As shown below, Interior will have to wait many years before it can adjust lease terms on the vast majority of leases.

<u>Number of years until adjustment</u>	<u>Number of leases</u>	<u>Percent</u>
None	14	3
1 to 5	64	12
6 to 10	160	30
11 to 15	237	44
16 and over	<u>58</u>	<u>11</u>
Total	<u>533</u>	<u>100</u>

The shortcomings in having to wait until 20-year adjustment periods are reached are obvious. Interior

will not have the necessary flexibility in program administration--a need of special importance in rapidly changing situations, such as those now facing national energy goals and programs.

In both March 1972 and April 1975, we recommended to the Secretary of the Interior that he seek a change in the law that would, for future leases, permit adjusting lease terms more frequently than at 20-year intervals. Interior believes that a 20-year lease period provides the lessee some security of investment and aids in acquiring venture capital.

We agree that a degree of certainty or stability in lease terms is needed by lessees to permit them to properly plan their operations, but Interior has not been able to present evidence to support a 20-year period because it has never studied the matter. On the other hand, we observed that the terms of coal leases on some non-Federal lands did contain shorter adjustment periods. For example, regulations governing coal leases on Indian lands (also administered by Interior) stipulate that leases may be made for specified terms not to exceed 10 years unless coal is produced in paying quantities. Likewise, coal leases on State lands in Wyoming provide for an initial term of 10 years and preference rights to renew the leases for successive periods of 10 years each. Survey personnel also said that coal leases on private lands generally were for 10-year terms and provided for readjustment of royalty rates at frequent intervals.

Therefore, we continue to believe that actions we recommend are warranted. Accordingly, we believe that the Congress should enact legislation that would, for future leases, permit adjusting lease terms more frequently than after a 20-year primary term.

Need to discourage speculation through assignments

Interior's regulations permit leaseholders to assign, transfer, or sublease their leases to other individuals or corporations either with royalty compensations or other financial settlements. Application for approval of assignments is made to the Bureau, and approval is generally automatic. The Bureau does not question the assignees' ability to develop the lands nor impose any diligent development or production requirements. Lease terms are not amended at the time of assignment or transfer.

The right of assignment could encourage speculation. Speculators could obtain leases to sublease or sell them at substantial profits. For example, a leaseholder which acquired a lease with a low bonus payment might be induced to hold its lease as coal becomes more valuable and then sell the lease to another company at a profit.

The ability to assign coal leases, combined with the indeterminate lease term for which Federal coal leases are issued, permitted leaseholders to use the right to mine public lands as if they were private property. For example, in our sample we noted one lease which was assigned as payment of a gambling debt. Of the 32 leases we sampled, 25 had been assigned in whole or in part. Some had been assigned as often as three times since lease issuance. Only 2 of the 25 assigned leases were in production at the time of our review.

According to Survey personnel, the ability to assign leases enables legitimate developers to acquire leaseholds to consolidate areas into mining units for efficient and economical coal extraction. We agree that there may be instances where the ability to assign or transfer leases can encourage or even stimulate development. Such actions should, however, be only granted to bona fide developers. Rather than granting automatic approval of lease assignments, the Bureau should question the assignees' ability to develop and produce coal. To curtail speculation of public coal lands, the Secretary should issue regulations which provide for full disclosure of financial dealings regarding the assignment or transfer, submission by the assignee of a development plan within a specified time after reassignment, and readjustment of lease terms and conditions where warranted by conditions existing at the time of assignment.

CONCLUSIONS

The Administration's national coal production goal is to double our yearly production by 1985. This would result in annual production of about 1.2 billion tons. The Federal role in meeting this goal is important because the Federal Government owns 60 percent of the coal lands west of the Mississippi and can influence coal development on another 20 percent bordering on Federal land.

We believe that Interior should have as clear a conception as possible of the potential contribution of Federal lands toward meeting the national coal production

take appropriate action on the problems hindering timely development and require lessees to begin coal production in paying commercial quantities within specified time periods or relinquish the leases.

--Issue leases on pending preference right lease applications only after (1) commercial quantities have been clearly defined, (2) the permittee has furnished evidence to the satisfaction of the Survey that coal exists in commercial quantities on each of the permit sites, and (3) the permittee has furnished evidence that a need exists for additional coal reserves and that production is planned to begin within a reasonable time from the date of the lease.

--To help discourage speculation of public coal lands, issue regulations to prevent abuses of the rights to assign leases. These regulations should provide for full disclosure by the assigner of financial dealings regarding the assignment, submission by the assignee of a development plan to Interior, and readjustment of lease terms and conditions where warranted by conditions existing at the time of assignment.

MATTERS FOR CONSIDERATION
BY THE CONGRESS

We recommend that the Congress (1) enact legislation that will, for future leases, permit adjusting lease terms more frequently than after a 20-year primary term and (2) amend section 201a of the Mineral Leasing Act of 1920 to provide for the award of leases only on a competitive basis.

CHAPTER 3

INTERIOR NOT PREPARED TO SELECT COAL-LEASING SITES

The Department of the Interior is not prepared to resume large-scale coal leasing with sound judgments based on the location and size of coal tracts suitable for leasing. The information and preparatory work necessary to implement Interior's proposed leasing program is inadequate. Procedures for selecting specific coal tracts have not yet been developed. Efforts to prepare for an anticipated leasing program have been hindered by the lack of timely departmental direction, leasing goals, data gaps, and limited manpower and funding.

PROJECTS TO PROVIDE DATA INPUTS TO TRACT SELECTION DECISIONS

Under the proposed coal-leasing program the Bureau of Land Management, in conjunction with the Conservation Division of Geological Survey, would select those tracts for lease sales with high development and rehabilitation potential after considering land use plans and analyzing industry interest and public concern with these lease areas. The emphasis in tract selection will center around strong industry interest areas in which conflicts with other resources as a result of coal leasing are minimal or in which they have been overridden because coal is more valuable. Consequently, the effectiveness of the tract selection process will depend heavily on adequate information to define resource potential, resolve resource conflicts, minimize environmental degradation, and derive a land use plan.

To prepare for eventual tract selection, the Survey has special data-gathering projects designed to provide maps and other information for use in implementing the proposed coal-leasing program.

The Survey's present efforts to satisfy the Bureau's needs for tract selection involves preparing four resource maps including:

- Leasable mineral classification maps. These maps show broad land areas and indicate where coal is thought or known to be located.
- Known coal-leasing area maps. Maps identifying boundaries of lands known to contain sufficient

coal to be commercially workable for competitive leasing.

- Coal resource occurrence maps. Basically these are geologic maps which emphasize the thickness and continuity of coal, the attitude and depth of burial, and the quality of coal within the defined known coal-leasing boundaries.
- Coal development potential overlays. Overlays to the resource occurrence maps delineate areas where specific types of resource exploitation is expected and show the relative geologic and engineering potential for development. The overlays classify the development potential of coal areas and outline (1) strippable, (2) deep mining, and (3) in situ sites. Development potential of areas are further classified as (1) high, (2) moderate, (3) low, and (4) insufficient data.

The Survey is concentrating on areas which the Bureau had identified as having the best potential for future leasing. These priority areas, as of February 10, 1976, included 67 townships and 7 counties in 7 States (Colorado, New Mexico, North Dakota, Montana, Wyoming, Utah, and Oklahoma) covering approximately 55,000 square miles. Approximately 1,000 areas for Survey mapping are included in the priority areas assigned by the Bureau. The priorities were not fixed; several changes have been made to date. For example, of the eight priority areas in southern Wyoming, four were later deleted, one was added, and the order of priority was changed for the three others.

The Bureau will use the results of the Survey's efforts in developing coal "unit resource analysis." These analyses will be used in preparing "management framework plans."

The following steps are used in preparing the management framework plans.

- Preparing program objectives and recommendations for each of the seven resource activities (minerals, wildlife habitat, livestock forage, watershed, timber, recreation, and intensive land use) without concern for overlap or conflict between activities. These become alternatives or options for later consideration. The coal development potential maps become the basis for recommendations for the first step of the management framework plan.

--Identifying and analyzing interactions between the recommendations prepared for the seven resource activities with alternative solutions for major competitive situations. The Bureau does not have a single objective or absolute policy guide for resolving conflicts. Rather, an attempt will be made for a multiple-use compromise. The high development potential coal areas are recommended as one segment of the overall minerals program recommendation.

--Reviewing all data by Bureau State directors and district managers and selecting and approving specific alternatives resulting in a clear planning decision.

The planning decision for coal leasing identified through the management framework plan program is expected to consider all the resource management programs and resolve the resource use conflicts or find them to be of minimum impact. The Bureau's objective is that leasing in the recommended areas planned for coal development should be desirable from both resource and environmental aspects. There is no time frame specified for development or priority established between areas.

The management framework plans are being prepared by the 65 Bureau District Offices for 1 or more of about 650 planning units in 12 western States. Bureau officials indicated that about 500 plans would be prepared, of which about 350 had been completed.

Also as input to the planning system, the Bureau has undertaken two data collection projects. One of the projects--the energy mineral rehabilitation inventory and analysis (EMRIA)--recognizes the need for data and the potential use of data to minimize environmental impacts from mineral leasing. The other--the minerals management mapping program--involves preparing maps showing graphic representations of surface and mineral ownership patterns.

EMRIA is a Bureau-coordinated project to obtain drill data and determine specific reclamation and rehabilitation requirements needed for potential coal-leasing areas. Data obtained should provide guidance in preparing mining and reclamation stipulations for coal, oil shale, and other natural resource lands. Drill sites were selected on the basis of requests for information from Bureau State offices. Drill data will be collected, and soil, water, overburden, and mineral content will be analyzed and evaluated. Interior's Bureau of Reclamation is drilling. The results of each drilling project, including recommendations, will

by the Bureau as priority areas for work to be done before tract selection and eventual lease sales.

The initial delineation of known coal-leasing areas and accompanying maps for the Basin were completed in 1973. The maps, however, were based on brief reconnaissance of the area, and according to the area geologist, the maps should be updated to more precisely define the eastern extent of the known coal-leasing areas.

The Survey has completed revisions for only 4 of the 55 quads 1/ in the Basin priority areas. The remaining revisions cannot be made until the necessary fieldwork is completed. The Survey estimates that fieldwork will be completed in the summer of 1978 and appropriate revisions should be made early in 1979.

Occurrence maps and potential overlays have been completed for only 1 of the 55 quads in the Basin priority areas. The Survey forwarded the completed maps to the Bureau on February 6, 1976. The maps were based on available drill data and projections extrapolated from available oil and gas drill logs. Oil and gas drill logs are not available for many of the other priority areas. The Survey has completed the fieldwork for 35 of 55 quads in the Basin priority areas. The Survey estimates that the fieldwork for the remaining 20 quads will be completed by the summer of 1978.

The area geologist for the Northern Rocky Mountain Area estimated that 12 to 15 maps would be completed by about June 1976. For the remaining 39 maps and overlays, he estimated that it would take about 3 staff-months to complete the maps and overlays for each quad where the fieldwork had been completed. For each quad where the fieldwork has not been completed, it will take about 6 staff-months to complete. Since fieldwork is not expected to be completed until the summer of 1978, all the maps and overlays are not expected to be completed until sometime after 1978.

Delay in establishing priorities for resource mapping

It was not until March 1975 that the Bureau gave the Survey written guidance on the extent of its data needs for future leasing and geographical priorities. A chronic

1/ Standard mapping area used by Survey, approximately 220 square miles.

complaint of Survey field personnel we talked with was that they worked for months without guidance concerning when to complete analyses, for what areas, or how much work was required to satisfy the Bureau's planning needs.

Until March 1975, Survey coal-mapping programs were concentrated on identifying known coal and other mineral leasing areas, as called for by the Chief of Survey's Conservation Division in June 1973. But field personnel were not working towards specific work goals or target dates. Also, given the responsibility of inventorying and classifying various resources on thousands of acres of Federal lands, Survey field personnel found their time and program funding spread thinly and dictated by day-to-day management needs. As a result, when in March 1975 the Chief of the Conservation Division directed the field staffs to accelerate their mapping program by concentrating on Bureau-established high-priority coal areas, field personnel found that they lacked much of the data needed to satisfy the Bureau's needs.

Staffing affecting effectiveness of other field office functions

The Survey's central region is responsible for mineral classification and lease management for the six western States which contain most of the Federal coal resources and where Federal coal leasing would have the greatest impact. Officials in the Survey's central region told us that despite the fact that staffing levels had about doubled during the past 2 years, they lacked the staff needed to satisfy their normal work demands, which included other minerals in addition to coal.

The central region's mineral evaluation and lease management support responsibilities for all leasable minerals in the six State area are carried out by personnel in four area offices. The evaluation personnel are predominately geologists whose main responsibilities with respect to coal activities are recommending leasing areas, preparing coal resource maps, geologic input to coal development potential maps, and tract selection and evaluation in the event of a lease sale. Mining operations personnel are mostly mining engineers whose main responsibilities with respect to coal activities include approving mining plans, environmental analysis, and making lease inspections.

The Chief of the Survey's Conservation Division, in a March 24, 1975, memorandum, directed all area geologists to defer systematic formal mineral land classification

fieldwork so that priority could be given to the coal evaluation and other high-priority work. The Chief requested that

- all ongoing projects not specifically related to coal evaluation and other high-priority work be deferred as expeditiously as possible,
- resource evaluation personnel be instructed and trained as appropriate to meet the coal-mapping requirements, and
- all future field projects be specifically oriented toward the coal and other priority work.

Survey field officials said that, because of the workload created by the priority coal work and increased numbers of environmental analyses and impact statements, they could spend only a bare minimum of time on other evaluation and operation work. Field officials were concerned that the staffing demands would be even greater with the resumption of coal leasing.

As shown in the following table, in fiscal year 1976 about 70 percent of the Office's staff years devoted to mineral resource and mining lease management activities was solely for coal.

Staff Years--Geological Survey
Central Region Conservation Division

	1976		
	<u>Total staff</u>	<u>Evaluations</u>	<u>Operations</u>
Coal	75.8	59.3	16.5
Oil and gas	9.1	9.1	-
Other minerals	13.5	7.6	5.9
Geothermal	4.6	4.6	-
Oil shale	2.0	2.0	-
Waterpower	0.2	0.2	-
Accounting	1.5	-	1.5
Clerical	1.4	-	1.4
Evaluation	<u>0.8</u>	-	<u>0.8</u>
Total	<u>108.9</u>	<u>82.8</u>	<u>26.1</u>
Percent of coal to total	69.6	71.6	63.4

According to Survey field officials, most of the following work has been suspended until the coal mapping has been completed.

- Mines classification mapping for minerals other than coal, such as oil and gas, unless the mapping would be incidental to the needs of coal classification mapping.
- Geologic studies and subsurface mapping for oil and gas fields and known leasing areas.
- Program to analyze and evaluate all existing oil and gas well logs for indications of other minerals, such as sodium and phosphate.
- The assignment of at least one geologist or engineer as a specialist for each leasable mineral.
- The major work of identification and delineation of known leasing areas for minerals other than coal, such as oil and gas.
- The resolution of conflicts which occur through multiple mineral development on existing leases, especially where coal is being developed on a valid oil and gas lease.

As specific examples of staffing constraints, the area geologist responsible for Montana, Northern Wyoming, and North and South Dakota has had only two staff members to administer oil and gas activities. And, on occasion, they have been assigned to help in the coal mapping. According to another area geologist, the Survey has practically no data available to determine (1) the extent of onshore oil field reservoirs, (2) maximum efficiency recovery rates, and (3) the location and extent of drainage tracts--all of which are necessary if the Survey is to control or influence the management of the onshore oil- and gas-leasing program.

Lease management activities are similarly affected. Survey field officials cited the following examples to illustrate impacts on lease management activities.

- Reclamation and supervisory inspection on coal leases are made too infrequently to adequately determine if proper reclamation standards are being followed for revegetation, contouring, fertilization, and watering of reclaimed land. Also, adequate consideration is not given to the water table, wildlife, and air quality.

--Monitoring of exploration and development is inadequate to insure that plans are being followed and that test drill holes are properly plugged and abandoned.

--A Conservation Division field office, as of October 1975, had a 2-month backlog of unprocessed unitization agreements (essentially a method for combining leases under central management which may result in extending oil and gas lease periods). One area geologist told us that because of a heavy workload they were forced to merely rubber stamp approvals of unitization agreements.

According to one area mining supervisor, his staff of mining engineers is only able to respond to pressure and crisis situations. He said that in 1970 and 1971, his staff spent about 75 percent of their time making site inspections of mineral leases. At present, however, the engineers are primarily involved with writing environment reports so that the site inspections are only about 20 percent of their work. He said that, because of the volume of plans now being submitted for approval plus other environmental tasks which require area mining supervisor staff coordination or participation, the staff is only able to spend minimal time reviewing such plans and mining and exploration plans are not being independently evaluated.

The Survey's fiscal year 1977 budget provides for staffing increases of 201 positions at a cost of \$7.2 million for regulating Federal and Indian energy minerals (oil, gas, coal, and oil shale). In commenting on this report, the Survey indicated that future planning for fiscal year 1978 would include sufficient personnel to alleviate strains in mineral programs other than coal but did not indicate what these needs would be. With regard to implementing the new coal-leasing program announced January 1976, the Survey indicated that additional staffing and funding would be required. The levels specified included (1) a minimum increase of \$1,275,000 and 30 positions for coal drilling and (2) an increase in funding of about \$9.5 million and in excess of 250 positions to provide adequate capability to handle all presently identified priority areas. (See p. 33.)

We believe that the Survey should fully assess its staffing and funding requirements in the light of the new coal-leasing program and, where warranted, request budget amendments for additional funding or reprogramming of existing Survey activities.

Improvements needed in data used for resources mapping

The precision and accuracy of the coal resources mapping program is jeopardized by the lack of adequate subsurface geologic data. The problem is especially acute for unleased areas. The Survey believes that some of the needed data is being collected by companies and individuals when drilling for minerals which are not now subject to Government resource data reporting requirements. The Government's program to collect the needed data has been minimal.

Essentially, most of the data used in preparing the maps is already known to the Survey. The Survey has some reserve and geologic data about coal on existing Federal leases because this data is required and obtained from lessees as the result of their exploratory and operational drilling. This data is maintained in case files and individual well records and township files and includes core samples, laboratory analysis of core samples, results of test drill logs, and operational drill logs. Other data sources include maps and drill reports published by technical societies and State agencies and data purchased from private data service companies.

Although the Survey readily admits there are gaps in their inventory of resource data, they do not know how much data is missing because a complete inventory has never been made. Also, criteria for determining the adequacy of data have not been established for use by the geologist. The geologists simply try to make their best judgment using available information. For reserve estimates, Survey headquarters has instructed field geologists to use all information available to them in calculating coal reserves and then discount their estimates by a factor which is considered the degree of uncertainty for unavailable data.

Reserves are identified by reliability categories--measured, indicated, or inferred. The calculations for the reliability categories are based to a large extent on the distance from points of known information. In general, 1/2 mile is used for projection of measured categories; as much as 1-1/2 additional miles for indicated; and inferred reserves are generally more than 2 miles from the outcrop, mining area, or other point of geologic information. The estimated reserves for each of the reliability categories are discounted by the following percents.

<u>Reliability category</u>	<u>Discount factor range (percent)</u>
Measured	0-20
Indicated	21-50
Inferred	51-99

Prime reliance is placed on geologic judgment in determining the degree of certainty and selecting the discount factor.

While we found common agreement by Survey field personnel on the need for more drill hole data to upgrade the quality of reserve estimates, there was little understanding of how much was needed to fill the data gaps and to adequately meet management needs. The uncertainty stems partially from the fact, as mentioned earlier, that an assessment of the data on hand has never been made; presently, the adequateness of data can only be judged on a site-by-site basis as the ongoing mapping program progresses. Also, since adequateness is subject to varied definition from user to user, it is not clear just how much data is enough. For example, reliable estimates to some might mean measured reserves--the distance from points of known information being 1/2 mile--whereas to others reliable estimates might mean indicated reserves--the distance from points of information being 1-1/2 additional miles.

The Survey's informal comments on this report suggested that tracts offered for lease should ideally only contain measured reserves requiring drilling on half-mile centers or one hole for each 160 acres offered. We believe that the Survey should establish standards of adequateness for use by field personnel in the coal-mapping and leasing programs. These standards should be high enough to protect the public interest in the leasing of coal land for the extraction of coal, and no tract should be offered for leasing unless such standards have been met.

NEED TO IMPROVE RESOURCE DATA REPORTING
AND TO DISCOURAGE UNAUTHORIZED DRILLING
ON FEDERAL LANDS

Given the shortcomings in the Government's knowledge of coal resources in specific areas and the increasing demands placed on limited Federal staffing, there is an apparent need for access to industry-generated data and to encourage more industry participation in coal exploration with Government approval. Our review suggests that better resource data reporting requirements and enforcement coupled with

a system of special use permits for exploratory drilling would help meet that need.

Legislation needed for reporting
drilling results for all minerals

Survey officials believe that industry has more information than the Federal Government on the quantity and quality of some Federal coal resources. Such information is obtained, officials say, by companies when drilling for locatable minerals (such as uranium, copper, iron, and bauxite) which are not subject to Federal resource data reporting requirements. Although little documentation was available, Survey field personnel suspected that a large percentage of this drilling was actually done to supplement coal data, under the guise of drilling for locatable minerals. Some companies, they said, designed uranium drilling projects to supplement known coal data. Companies that drill Federal coal lands in advance of a competitive lease sale will definitely have an unfair advantage over the Federal Government and other prospective bidders in valuing tracts for lease. The problems involved in valuing coal tracts are discussed in chapter 4.

As we recommended to the Congress in July 1974, 1/ mineral leasing legislation should be enacted which would make exploration for and development of locatable minerals subject to Federal approval. We reported that improvements were needed in the procedures for reporting and recording mining activities carried out on public land so that Federal land management agencies can properly monitor and control use of public land. Under a leasing system similar to that now used for such minerals as coal, oil, and gas, mandatory reporting requirements would insure that the results of drilling activities on Federal lands were available for use by the Government.

Legislation which would establish a mineral-leasing system for locatable minerals and provide for reporting drilling results had been introduced on several occasions during the past couple of years but was never enacted. At the present time, such changes are embodied in H.R. 8435, the Mineral Leasing Act of 1975 now before the Congress for consideration.

1/"Modernization of 1872 Mining Law Needed to Encourage Domestic Mineral Production, Protect the Environment, and Improve Public Land Management," B-118678, July 25, 1974.

Unauthorized drilling could be discouraged
through prospecting permits and
better enforcement practices

In addition to legislative changes, it appears that Interior could do more to discourage unauthorized drilling and to deal more firmly with operators which carry out unauthorized drilling on Federal coal lands. The number of trespass actions is unknown. According to Survey officials, instances of unauthorized drilling are documented only when reported by coal operators or others which feel the unauthorized drill hole data will give competitors an unfair advantage when valuing tracts for future lease sales.

We believe that Interior should give attention to the apparent cause of the abuse. It seems obvious from the exploration activities that operators need and are interested in paying for coal resource data. However, under the new coal-leasing policy, they have no opportunity for properly satisfying their need. Even without early resumption of leasing, such resources knowledge has considerable usefulness. For example, a 1974 Bureau proposal for coal exploration in a county in Utah noted:

"The Power Company is basically in a dilemma as to the available coal resources in the area of their proposed * * * Power Generating Station. It has immediate need for information on the North Horn Mountain area so feasibility of a * * * generating plant can be assessed."

Given the inadequacies of present resource knowledge the need for provisions to do informational drilling seems convincing. One approach would involve issuing prospecting permits for a specified period of time to do informational core drilling. A permittee would be required to allow other parties opportunities to participate in the program before the drilling started and to share costs and drilling results. The permits would confer no right to a lease as is the present practice under the preference right provisions of the law. The information developed would be made immediately available to the Government.

This approach is analogous to that used by Interior to permit prelease stratigraphic test drilling for oil and gas on the Outer Continental Shelf. An alternative would be for the Government to conduct a fully financed exploration program of its own before leasing. The Survey agreed that a program which would allow exploratory drilling for coal by industry on Federal lands would be in the public interest and said that the Department was considering such a program.

Another issue which Interior needs to address is how to deal firmly with trespassers. It has not done so to date. At most, the only action the Survey has taken is to inform operators that (1) the Government knows of the drilling, (2) it is unauthorized, and (3) any data developed should be made available to the Government. In one instance we noted that the operator was even encouraged to continue with the unauthorized drilling as long as the information was made available to the Government. The February 19, 1974, Survey letter to the operator read in part:

"I know that you have done some drilling east of the lease to determine the extent and quality of unburned coal that might exist. Upon your determination that certain areas outside the lease do contain marketable Federal-owned coal, delineate these areas on a map and submit, in triplicate, for my consideration and authorization to mine.

"Neither the company nor the Government benefit if any small blocks of merchantable coal adjoining the lease are bypassed by your operation."

The above example also points up the different organizational reactions because of sometimes conflicting interests in public land use. In this instance, because of data needs, a Survey official encouraged trespassing on lands for which the Bureau had management responsibility and was charged with preventing such unauthorized activities.

According to Interior's Solicitor's Office, no legal authority exists for imposing fines on trespassers. Senate Bill 391, a bill to amend the Mineral Leasing Act of 1920, was introduced in July 1975 for consideration by the Congress and provided for a fine up to \$1,000 for each day any person willfully conducted unauthorized coal exploration for commercial purposes. We believe that, in addition to fines, Interior should consider other punitive measures which could be imposed on trespassers, such as forbidding participation in competitive sales of coal lands where they have done unauthorized drilling. Furthermore, the Directors of the Survey and the Bureau should reaffirm existing departmental instructions regarding the prompt communication of instances of unauthorized drilling on Federal lands and insure the proper disposition of such trespassing.

- Preparing environmental reports and impact statements.
- Assessing reclamation potential.
- Determining baseline conditions on soil and water resources.
- Creating guidelines for:
 1. Decisions regarding energy development.
 2. Determining reclamation techniques.
 3. Surface manipulation and vegetation suitable for reclamation.
 4. Sound land use planning.
 5. Preparing stipulations on land disturbing.
- As a source of real time water quality data at locations potentially affected by mining operations.

The Bureau has cooperative agreements with the Survey and the Bureau of Reclamation. Funds are provided for surface and ground water quantity and quality studies where the Bureau identifies areas or stream reaches of specific interest to the development of energy resources. The Survey maintains gages in these areas and participates in interpreting the resulting data.

The Bureau also selects reclamation study sites in areas that are of particular interest as probable mining sites. Six to eight of these sites are selected every year. The Bureau of Reclamation studies soil and overburden materials and suggests reclamation activities. The Bureau of Land Management is also responsible for related management duties, such as preparing environmental reports, obtaining easements and rights of way, coordination between participants in the study, incorporating data into the Bureau planning system, and disseminating information to the public. The combined work of the three agencies in fiscal year 1975 amounted to about 235 staff-months at a cost of \$1.4 million. In fiscal year 1976, the work is expected to reach 950 staff-months and cost \$3.2 million.

The Bureau initially estimated that the area to be evaluated should comprise a total of about 256,000 acres because an area this size would yield statistically

representative data. However, because of funding limitations and the limited resources and capability within the Federal Government to do the work, the Bureau decided that EMRIA sites would be limited to between 2,000 and 3,000 acres each (about 1 percent of the 256,000 acres area recommended).

EMRIA for fiscal years 1975 and 1976 is being done at 11 sites in 9 counties. From three to eight holes were drilled at four sites in fiscal year 1975. From 8 to 10 holes will be drilled at 7 sites in fiscal year 1976.

Interior officials estimated that drilling at 17 to 20 sites each year starting in fiscal year 1977 would be needed to provide new data on new locations, in addition to studying reclamation potential on existing coal leases. The Bureau is considering a coordinated drilling program which has as its objective the development of an approach capable of maximizing the effort of drilling by Interior agencies in relation to location, assessment of evaluation of mineral resources, and associated reclamation needs. The program is intended to do essentially the same type of studies as are now being done in the reclamation study sites within EMRIA.

Survey field officials told us that, in their opinion, the Bureau had not effectively coordinated EMRIA during its collection of environmental data with the Survey's drilling program for acquiring basic coal resource data for evaluation purposes. The Survey believes that the Bureau has not coordinated the selection of site locations and the type and extent of data needs with the Survey's lease management program. Also, the Survey believes that EMRIA site selections for drilling should be consistent with Energy Minerals Activity Recommendation System tracts being considered, because even if favorable information were obtained under EMRIA, the site may never be selected for leasing. The Survey said there was a need for a Department of the Interior-coordinated drilling program. The Survey conveyed these concerns to the Bureau at a meeting held January 21, 1976.

The adequacy of the present EMRIA program to date was contained in an August 20, 1975, Bureau program summary:

"Adequacy depends somewhat on the ideas of the concerned users. The magnitude of the FY 75 effort, \$1,400,000 was not adequate to meet the needs; it was adequate to develop the procedures needed and to point out problems in establishing a larger program. The FY 76

effort at a \$3,200,000 level will come closer to being adequate to meet the needs in BLM. However, since we do not possess the ability to foresee the future and therefore the specific areas to be developed for energy resources, we must try to gather and interpret data on a much broader scale. With this idea, EMRIA is not adequate."

We believe that the Secretary of the Interior should insure that the planning and results of work by the Interior agencies for mineral classification and mapping, drilling programs, and multiple-use planning are coordinated as to priorities, scope, and geographical coverage. Also, we believe that the Secretary should have the Directors of the Survey and the Bureau fully assess their staffing and funding requirements in the light of the new coal leasing program and where warranted, address such needs in budget amendments for additional funding or reprogramming of activities.

NEED TO IMPROVE LAND USE PLANNING PROCESS

In addition to delays in developing needed resource data, the effectiveness of the Bureau's land use planning system and the usefulness of the already completed plans is poor.

According to a Bureau policy statement issued in June 1975, many of the completed management framework plans are not of high enough quality to meet management needs and there is an increasing need for gathering much more specific inventory data and completing major revisions in the planning documents. In August 1975 Interior's internal auditors also noted that the plans developed by district offices contained weaknesses and that very little had been done by the Bureau district offices to update and maintain the plans.

It was also reported that many plans had been completed and approved which did not contain sufficient data, particularly concerning resource inventories. Interior auditors believed this was occurring for two reasons: (1) an undercurrent of pressure from higher levels to complete plans and (2) lack of any specific guidance from the Bureau State officials to the districts on how plans could be developed in the most efficient and effective manner.

Among other areas of concern to the departmental auditors and/or Bureau State Directors were

- a need for training program personnel,
- a lack of expertise in certain discipline areas,
- a need to look at new planning goals and identify priorities, and
- a need for periodic reviews to determine the effectiveness of plans and to determine how they were being used.

The Bureau has addressed these concerns in a general way in a June 1975 policy statement which calls for implementing new procedures for preparing management framework plans, but it is not clear at this time when and how the new procedures will be implemented. Also, it is unclear what the implications are for developing quality plans for use in the new coal-leasing program. For example, according to a Survey field official, the management framework plans prepared by the Bureau for the Eastern Powder River Basin were early attempts to complete planning and were based on incomplete data. He believed that the plans should be revised on the basis of the information to be provided by the Survey in the occurrence maps and potential overlays. As already discussed, maps and overlays have been completed for only 1 of 55 quads in the Basin priority areas, and the mapping for the remaining quads will not be completed until sometime after 1978.

One serious implication we see of the Survey's current effort to accelerate coal-mapping programs to meet the Bureau's need is the impact which deferment of other resource work will have on the overall quality of the Management Framework Plans--especially since gaps in resource inventories already represents a serious deficiency in the plans. The Survey's involvement in the accelerated mapping program has deferred some other Survey work.

We believe that, as part of the management improvements planned for the land use program, the Bureau should give priority to assessing the usefulness of the management framework plans already completed for the coal priority areas and as part of overall program improvements to insure that adequate plans exist before leasing.

CONCLUSIONS

Interior had made some progress toward designing a tract selection system and preparing for its implementation. But much remains to be done before Interior would be ready to proceed with any large-scale leasing.

The progress has been slow and has been hindered by the lack of timely departmental direction and leasing goals, data gaps, and limited manpower and funding. Several actions by Interior are necessary to improve its ability to respond to a call for additional leasing of Federal coal resources.

First, Interior must insure that its work to provide key inputs into the leasing decision are coordinated as to priorities, scope, and geographical coverage. The lack of site data for any one of these inputs--reclamation and revegetation potential, reserve estimates, or conflicts with other land uses--could undermine the effectiveness of the leasing system.

Second, Interior should establish an orderly systematic plan for exploring and analyzing coal reserves and specify the limits of geographical coverage and data reliability which should be pursued at this time.

We believe that the private sector should be encouraged to engage in prelease informational drilling. The law should be amended to provide for the issuance of nonexclusive prospecting permits which would confer no exclusive right to a lease as presently provided by law. A permittee should be required to allow other parties opportunities to participate in the program before drilling starts and to share costs and drilling results. All geotechnical data, including interpreted data, should be available to the Government.

Also, we believe that Interior should engage in sufficient Government exploratory activity to insure adequate information to protect the public interest in the leasing of public land for the extraction of coal when private drilling does not satisfy data needs. Data produced through wholly financed Government activities should be made available to the public.

RECOMMENDATIONS TO THE
SECRETARY OF THE INTERIOR

We recommend that Interior defer issuing new leases until it has established a workable and effective administrative mechanism for implementing a Federal coal-leasing program. We recommend that, to accomplish this objective, the Secretary:

- Establish a leasing schedule which would indicate the timing and magnitude of lease sales.

- Insure that the planning and results of work by Interior agencies for mineral classification and mapping, drilling programs, and multiple-use planning are coordinated as to priorities, scope, and geographical coverage.
- Have the Director, Geological Survey, establish standards of data reliability for use in the coal-mapping and leasing programs. The standards should be high enough to protect the public interest in the leasing of public land for the extraction of coal, and no tract should be offered for leasing unless such standards have been satisfied.
- To insure the effectiveness of multiple-use planning, have the Director, Bureau of Land Management, assess the usefulness of those plans already completed for the priority areas and give priority to adequately completing the management framework plans in these areas.
- Direct a coal-drilling program which would provide data for developing and implementing a systematic plan for appraising coal resources and insure implementation of planned and coordinated drilling through federally financed activities. Data produced through wholly financed Government activities should be made available to the public.
- Have the Directors of the Survey and the Bureau assess their staffing and funding requirements in the light of the new coal leasing program and where warranted address such needs in budget amendments for additional funding or reprogramming of activities.

MATTERS FOR CONSIDERATION
BY THE CONGRESS

We recommend that the Congress amend section 201b of the Mineral Leasing Act of 1920 to provide for the issuance of nonexclusive prospecting permits under which persons could explore for coal for commercial purposes but have no exclusive rights to leases.

CHAPTER 4

EFFECTIVENESS OF TRACT VALUATIONS HINDERED BY INADEQUATE DATA

If coal leasing were to resume in the near future, Interior would not be prepared to provide reasonably reliable tract valuations to insure that the public will receive fair value for coal resources leased. Interior has not yet decided which valuation method to use in valuing future coal leases. However, a problem common to all three methods being considered is the lack of reliable data. Also, Interior personnel cannot concentrate on the data needed for specific areas because, as noted earlier, they do not know where or how much coal will be leased.

FAIR VALUE ON PAST SALES NOT INSURED BECAUSE OF INADEQUATE LEASING PRACTICES AND POOR COMPETITIVE ENVIRONMENT

In the past, Interior issued coal leases without adequately insuring payment of fair value for coal resources. Also, competition during most of the leasing period was generally either poor or lacking, although some limited improvement was indicated since 1960.

By the time Interior stopped issuing coal leases in 1971, an estimated 260 million tons of coal had been sold for about \$984 million, plus royalty and rental payments. Over half of the coal went to holders of preference rights lease applications and consequently drew no payment. Payments received from competitive lease sales averaged only \$3.83 an acre.

Receipt of fair value under Interior's coal-leasing program was limited by the lack of a consistent and standardized system for resource evaluation and the fact that Interior did not pay much attention to fair value. It was not until the late 1960s, a few years before the coal lease moratorium and almost 50 years into the program, that Interior started to experiment with ways to insure fair value on coal leases and to direct attention to establishing a standardized system for resource evaluation. Interior attempted in 1968 to use a discount cash flow (DCF) method but stopped because of lack of data. A second attempt in 1971 used an empirical formula (referred to as the k-factor method) to compute a minimum acceptable bid value. But, because of the lack of data, it too was difficult to apply and was based largely on judgment.

Resource evaluations, if made at all, were primarily judgmental. The Survey's mining supervisors recommended minimum acceptable tract values on the basis of their judgment and general knowledge of values of neighboring coal lands of similar characteristics. In some instances tracts were arbitrarily valued at \$1 an acre or not even valued.

Conditions in the marketplace also generally failed to insure fair value since the market was not truly competitive; for example, there were not many bona fide bidders. As shown in the following table, 70 percent of the 262 competitive leases issued between 1920 and September 15, 1975, drew 1 or no bids, about 18 percent drew 2 bids, 4 percent drew 3 bids, and less than 5 percent drew 4 or more bids. In some cases no bids were received on competitive sales, and Interior awarded the lease to the applicant even though no bid was submitted.

Analysis of Competitive Lease Sales
for 1920 to September 15, 1975 (note a)

	<u>Number</u>		<u>Percent</u> <u>of total</u>	<u>Acres</u> <u>leased</u>
	<u>Bidders</u>	<u>Leases</u>		
0		37	14.1	41,360
1		151	57.6	190,867
2		48	18.3	75,530
3		14	5.3	43,448
4		3	1.1	2,451
5		6	2.3	24,753
6		1	.4	5,457
9		1	.4	6,560
23		<u>1</u>	<u>.4</u>	<u>160</u>
Total		<u>262</u>	<u>100</u>	<u>390,586</u>

a/ Only eight leases (short term) were issued between February 1973 and September 1975.

Further analysis of bidding patterns over the past 50 years reveals that the competitive environment has improved some since 1960. For example, from 1960 to 1969 leases receiving two or more bids amounted to 37 percent while from 1970 to 1974 leases receiving two or more bids amounted to 59 percent. Bonus bids an acre have also risen correspondingly during this period--increasing from \$20.31 an acre from 1960 to 1969 to \$250.44 an acre from 1970 to 1975.

INTERIOR UNDECIDED ON TRACT VALUATION
METHOD FOR FUTURE COAL LEASING

Presently the Survey and the Bureau are experimenting with three methods for valuing tracts of coal land but to date one method has not been chosen. Interior officials indicate that valuation of future tracts will be made under all three methods with the hope that actual bid results and/or comparative sales data will show one method as being the most appropriate. Because all three methods rely on varying degrees of information and the data available is inadequate, we doubt that the merits of any single method will be established over the others. According to Survey field officials, the availability of adequate and appropriate data will determine which method will provide the most realistic results.

Although the Survey is responsible for presale tract valuations, the Bureau has the ultimate responsibility to either accept or reject bids. Therefore, the Bureau plans to do tract valuations as an audit function or check on Survey valuations to insure that Survey valuations represent fair value.

The Survey plans to continue using the k-factor method--a method used since just before the moratorium in 1971--and the Bureau is studying the comparative sales methods. In addition, both the Survey and the Bureau are studying the discount cash flow valuation method. A critical problem in testing these methods is the inadequateness of the coal reserve, economic, and other data needed for reliable valuations. The Bureau will depend essentially on Survey data to implement its valuation systems.

Interior's experience with each of the methods for valuing coal tracts is limited. Each of the valuation methods, except comparative sales, incorporates some variable factors classified as either geologic, engineering, environmental, or economic. Each factor affects the computed value of the land being evaluated in varying degrees.

Some factors are common to all three methods, such as resource data involving quantity and quality information, recovery rates, and the selling price of coal. A description of the methods follows.

Empirical k-factor method

In 1971 the Survey's Conservation Division Chief instructed field offices to use an empirical formula referred to as the k-factor method to value tracts and to compute a minimum acceptable bid amount to evaluate competitive bids for coal. Several factors to be included in the formula were resource characteristics, including

- total calculated thickness over lease area of all technologically minable coal beds present,
- average Btu's of the minable beds,
- quality of coal for coking purposes, and
- sulfur content of the coal.

However, the basis for this data as well as the "k" factor were based primarily on the personal knowledge of mining supervisors rather than specific data.

Comparative sales method

Both the Bureau and the Survey plan to test the use of the comparative sales method formulation of future coal leases. The Survey's plans for using the comparative sales method involve a direct presale comparison of bids offered with the recent selling prices of similar tracts in the area of the tracts being offered.

The Bureau does not plan to use the comparative sales method as a primary evaluation procedure for valuing tracts. Rather it plans to use the comparative method, together with its discount cash flow valuations to represent fair value for coal lands offered in the future.

The Bureau has developed a comparative sales computer model which will be used to do multiple regression analyses of past competitive coal lease sales with two or more bidders and numerous variable factors to predict the expected future price of coal. A Bureau official told us that, because important changes in market conditions and coal prices occurred in 1964, coal sales are divided into two periods to reflect the most recent coal price trends--pre-1964 leases and post-1964 leases.

The variables will be used in an attempt to identify possible relationships between changes in selling price and the other variables. The most significant variables in the model are recoverable tonnages of coal and the date that the past leases occurred. Recoverable tonnages of coal and other variable factors such as sulfur and Btu content of coal are similar to data used in DCF valuations.

The Bureau plans to obtain data for the variable factors used in its model from the Survey and continually update the data as future sales occur. The Bureau has not made any comparisons using its comparative sales model, because no major sales have occurred since coal leasing was halted in 1971.

Discount cash flow method

Essentially the DCF method is a computerized model that calculates the possible economic value of coal tracts and is similar to the method used in valuing Outer Continental Shelf oil and gas tracts. On the basis of the laws of probability, the model predicts economic values of coal tracts from the input of recoverable resources, cost, income, and other data provided by the Survey. Discount cash flow calculations or runs are done by the computer to assess the possible outcomes of the resource, cost, and income data to determine the range of possible values for the coal tracts. The range of values generated by DCF are (1) high possible, (2) most probable, and (3) low possible.

In August 1974 the Survey established a task force of specialists to develop standardized DCF procedures and a users' manual for use in evaluating coal tracts offered for sale under the short-term leasing program and for eventual use in the planned long-term program. The present task force includes a mineral economist as the coordinator and a mining engineer, a geologist, and a computer specialist as staff advisors.

Some of the major factors used in the DCF method are as follows:

<u>Type of information</u>	<u>Variable factors</u>	<u>Factor definition</u>
Geologic	resource data	The quantity and quality of coal in place.
Engineering	recovery rate	The quantity of coal reserves expressed in tons which can be recovered from both underground and surface mines.
	production rate	The quantity of coal which can be produced each year over the life of the mine.
	project life	Period to develop and produce total reserves of a mining area.
Environmental	reclamation-restoration costs	Expenditures to reclaim and restore mined areas.
Economic	capital investment costs	Capital expenditures to explore, develop, and operate a producing mine.
	operating costs	Expenditures to sustain mining operations.
	selling price	Price received for each ton of coal produced.
	royalty rate	Percentages or fixed amounts expected to be paid to lessor for coal produced.
	depreciation	Rate at which capital investment is expected to be amortized over life of mine.

<u>Type of information</u>	<u>Variable factors</u>	<u>Factor definition</u>
	income tax rates	Anticipated tax rates charged for realized income.
	depletion rate	Expected rate that coal reserves will be exhausted.
	discount rate	Rate used to express the present worth of future income.

NEED TO IMPROVE DATA USED IN TRACT VALUATIONS

Because few new coal leases have been issued since 1971, Interior has had little opportunity to value leasing sites and to make post sale analyses of the reasonableness of such values. However, the Survey's recent attempts to value tracts using the DCF method have shown serious deficiencies in the quantity and quality of data available for Government use--especially the following data

- coal reserves, production, and recovery rates, including specific data on the quantity and quality of reserves;
- operating and capital investment costs and the costs of reclaiming and restoring mined areas;
- selling price of coal in the area of tracts being offered for sale;
- other economic data, such as depreciation, depletion, and income tax rates.

Because of similarities in data needs, some of these shortcomings would also adversely affect valuations made using the other two methods.

There are no systematic procedures for collecting the needed data or criteria for judging its reliability. For example, the DCF task force uses cost of recovery and other economic data obtained mainly through informal contacts with coal operators in the locality of the tract being offered. The information obtained is based primarily on personal judgment, often incomplete, and not subject to verification.

Resource, reserve, and recovery data

Resource, reserve, and recovery rate data are fundamental factors used in determining a tract's value. The data required for these factors involves all the necessary and specific information about the quantity and quality of coal reserves which can be recovered during the life of the mine. Also, these factors are the most sensitive and will cause the most variations when valuing tracts.

As indicated in chapter 3, specific site information on recoverable coal reserves is inadequate. Both we and the valuation task force believe that more and better information is essential if reasonably sound tract valuations are to be made. Without reliable drilling data, the Survey's present practice is to discount the reserve estimates. It does not have a good idea how much minable coal exists. For example, in-place coal reserve estimates used in a recent valuation of a Wyoming tract were difficult to make because no drill hole data was available to Federal Government to calculate measured reserves. As a result, measured reserves (category of best reliability) could not be determined, and inferred reserves were subject to wide margins of error--up to 70 percent. As shown in the following table, the estimated total tons used in the DCF computation ranged from 4.3 million tons to 12.7 million tons. The best estimate was considered to be 8.5 million tons.

Estimated coal reserves of Wyoming tract
(Strippable coal in place)

<u>Reliability</u> <u>category</u>	<u>Minimum</u>	<u>Best</u> <u>estimate</u> (tons)	<u>Maximum</u>
Measured	(a)	(a)	(a)
Indicated	2,902,000	3,869,000	4,836,000
Inferred	<u>1,393,000</u>	<u>4,642,000</u>	<u>7,891,000</u>
Total tons used in DCF computations	<u>4,295,000</u>	<u>8,511,000</u>	<u>12,727,000</u>

a/ No calculations made.

Operating and capital cost data

Operating and capital cost data needed to make credible tract valuations is inadequate.

Program regulations (30 CFR part 200) require lessees to report investment, and cost data to the Government, but the Survey has not required lessees to comply with this requirement. Also, up until 1975, standard coal leases contained a similar requirement, but for reasons we were not able to determine this provision was deleted from the lease language.

Most of the data which the Survey uses to estimate the operating and capital costs is adopted from reports prepared by the Bureau of Mines or published in various trade journals. Survey field personnel told us that this published cost data was not in the form and the type of data that could satisfy their tract valuation needs without extensive revisions and updating. For example, use of the Bureau of Mines cost data involves the problem of relating model mines to an actual proposed situation having different physical conditions, resource quantities, and operations under somewhat different conditions.

The DCF task force used the data published by the Bureau of Mines in a recent valuation but noted in its report:

"Thus, the task force accepted and used these data, but cannot vouch for the validity of these data, and therefore, must state the disclaimer of possible error in the evaluations due to possible error in the capital and operating cost data used."

In November 1974 the Survey Conservation Manager, central region, requested permission from the Chief, Conservation Division, to obtain valid cost and production data directly from one leaseholder but Survey headquarters decided that it would not be advisable to request such data because cost data was available elsewhere. Task force members told us that the sources suggested by headquarters were the same unsatisfactory sources that they had used in the past.

We believe that the Survey should require lessees to comply with the program regulations and lease stipulations which provide for the submission of cost data. Also, we believe that the Survey should insure that reasonable effort is made to obtain cost data needed for valuation purposes.

Selling price data

Selling price data is one of the two most sensitive data inputs for tract valuation. The other sensitive input is that for coal reserves. Little reliable selling price data is available for tract valuation, and there is no systematic procedure established to collect such data. The lack of such data will seriously impair the integrity of future valuations.

The lack of such data was indicated by the task force in the recent valuation of a Wyoming tract. The task force reported that little reliable selling price data was available. Therefore, a compromise was reached with prices obtained from various sources, such as personal contacts with coal companies and published prices in a coal journal. The data used was not verified and was considered to be unreliable for the following reasons:

- Coal sales contracts are usually long-term contracts based on negotiations and many with escalation clauses for future production cost increases.
- Prices published in journals are not adequate, because it is not possible to find leases that are the same size and contain the same quantity of coal as the tract being evaluated.
- Published coal prices do not include amounts paid by the buyer before coal contracts are executed--commonly called front-end money.

CONCLUSIONS

Because of inadequate data, Interior cannot reasonably insure that a fair market value is received in coal sales in which competition is not adequate to protect the public interest.

In the past, Interior gave little attention to adequately valuing coal lands and leased coal under conditions of great uncertainty about the quantity and quality of the resources. Interior is now attempting to correct these weaknesses but finds that it lacks the information it needs to make reasonably sound valuations.

What can be done? Interior must act to insure that sufficient reserve data is collected and evaluated before leasing.

A stepped-up coal exploration program through industry participation and, where necessary, Government financing, as we recommended in chapter 3, would help fill a serious gap in coal reserve data. Also, Interior should seek to acquire the economic and cost data it needs for valuing tracts.

RECOMMENDATIONS TO THE
SECRETARY OF THE INTERIOR

We recommend that Interior establish a workable and effective administrative mechanism for valuing coal resources. To carry out this objective, the Secretary should:

- Insure that sufficient reserve data is collected and evaluated by directing a coal-drilling program as recommended in chapter 3.
- Have the Director, Geological Survey, acquire from lessees and other appropriate sources the economic and cost data it needs to value coal areas.

We recommend also that, in the absence of adequate competition, Interior defer issuing new leases until such mechanism is established.

CHAPTER 5

SCOPE OF REVIEW

We made our review at Department of the Interior headquarters in Washington, D.C., at Bureau of Land Management headquarters in Washington, D.C. their State Offices in Salt Lake City, Utah; and Cheyenne, Wyoming; and at the Service Center in Denver, Colorado; at Geological Survey's headquarters in Reston, Virginia; the Regional Conservation Division in Denver, Colorado, and area or district offices in Denver, Colorado; Billings, Montana; Salt Lake City, Utah; and Casper, Wyoming.

We reviewed legislation, regulations, policies, procedures, and practices pertaining to Federal leasing of coal on public and acquired lands. Selected coal leases in Utah and Wyoming were reviewed. We interviewed Department of the Interior, Bureau of Land Management, and Survey officials at headquarters, regional, area, and district offices.

We obtained comments from coal industry officials regarding Federal coal leasing and implications of Federal goals for coal development.

FEDERAL COAL LEASES, LESSEES AND ACRES UNDER LEASE
AS OF DECEMBER 1975

<u>State</u>	<u>Acreage</u>	<u>Number of lessees</u>	<u>Number of leases</u>
Alabama	2,388	2	1
Alaska	2,675	2	4
California	80	1	1
Colorado	121,471	38	113
Kentucky	1,644	2	2
Montana	36,232	12	17
New Mexico	40,958	16	28
North Dakota	16,236	9	18
Ohio	144	1	1
Oklahoma	87,014	10	53
Oregon	5,403	2	3
Pennsylvania	80	1	2
Utah	268,555	41	199
Washington	521	1	2
Wyoming	<u>199,945</u>	<u>29</u>	<u>92</u>
	<u>783,346</u>	<u>167</u>	<u>536</u>

Source: "An Analysis of Existing Federal Coal Leases,"
December 1975, unpublished, Bureau of Land
Management

Concentration of Federal Coal Leaseholds
Top 20 Lessees, U.S. Totals

December 1975

Lessee	(Parent Company)	Total Acreage Under Fed. Coal Lease	Total Federal Leases	% of Total Fed. Coal Lse. Acreage
1. Peabody Coal Co.	(Kennecott Copper Co.)	83,778 acres	49 leases	10.7%
2. Garland Coal & Mining Co.		45,993	27	5.9
3. Consolidation Coal Co.	(Continental Oil Co.)	45,452	26	5.8
4. Resources Co. et al	(Ariz. Pub. Serv. & San Diego Gas & Elec.)	39,355	20	5.0
5. Pacific Power & Light		35,079	19	4.5
Top 5 Total		249,657 acres	141 leases	31.9%
6. El Paso Natural Gas		27,019 acres	15 leases	3.5%
7. Utah International, Inc.		24,228	26	3.1
8. Kemmerer Coal Co.	(Lincoln Corp.)	22,854	16	2.9
9. Richard D. Bass		20,701	1	2.6
10. Atlantic Richfield		19,186	6	2.5
Top 10 Total		363,645 acres	205 leases	46.4%
11. U.S. Steel Corp.		18,959 acres	20 leases	2.4%
12. Consol. Coal & Kemmerer Coal Co.	(Cont. Oil & Lincoln Corp.)	18,746	10	2.4%
13. Carter Oil Co.	(Exxon Corp.)	15,491	3	2.0
14. Industrial Resources, Inc.		14,929	6	1.9
15. Sun Oil Co.		14,680	1	1.9
Top 15 Total		446,450 acres	245 leases	57.0%
16. Kaiser Steel Corp.		14,617 acres	9 leases	1.9%
17. Decker Coal Co.	(Pacific Power & Light)	13,610	3	1.7
18. Kerr McGee Corp.		13,289	7	1.7
19. Evans Coal Co.		12,622	8	1.6
20. Western Coal Co.		12,289	6	1.6
Top 20 Total		512,877 acres	279 leases	65.5%
U.S. Total		781,763 acres	536 leases	100.0%

Source: "An Analysis of Existing Federal Coal Leases," December 1975, unpublished, Bureau of Land Management.



United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

MAR 9 1976

Mr. Henry Eschwege
Director, Resources and
Economic Development Division
U. S. General Accounting Office
Washington, D. C. 20548

Dear Mr. Eschwege:

We have reviewed your proposed report to the Congress entitled "Impact of Federal Coal Resources on Meeting Coal Production Goals Uncertain," and enclose our comments on it. While we concur with the general conclusion of the Draft Report that actions to develop the Nation's coal resources should be undertaken only with adequate knowledge and appreciation of the need and consequences, both economic and environmental, for such development, we feel that major initiatives now underway adequately address most of the valid points raised.

As you know, a new comprehensive Federal coal leasing policy was announced on January 26, 1976, copy enclosed, to promote orderly development of public energy resources. This policy will be implemented on a gradual and logical basis, and is designed to: help keep national energy costs down by permitting timely and efficient development of Federal coal by leasing only when needed; provide a proper balance between the national policy requirement for utilization of the Nation's most abundant fossil fuel and preservation of the environment; discourage private holdings of excessive reserves of Federal coal by implementation of diligent development regulations requiring timely development or relinquishment; provide for issuance of preference right leases under a definition of commercial quantities; return fair market value to the taxpayer through competitive bid sale of coal leases; and obtain public participation in the Federal coal decision process.

The new policy will include these steps:

-- adoption of the Energy Minerals Activity Recommendation System (EMARS), which requires careful analysis to determine need for coal and to minimize environmental impacts;



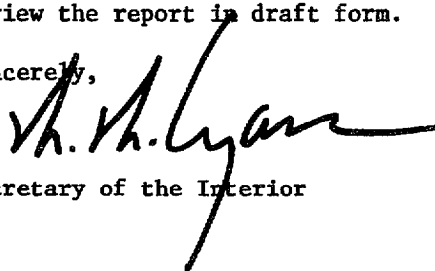
Save Energy and You Serve America!

- adoption of a totally competitive leasing system, under which no new coal prospecting permits will be granted;
- development of final regulations governing conditions under which mining operations and post-mining reclamation must take place;
- preparation of regional environmental impact statements, wherein groups of coal and coal-related actions are proposed in a defined geographical area;
- continuation, until the new coal leasing system has been implemented, of the short-term leasing criteria that has been in effect since February 1973, to allow leasing for ongoing mining operations or to meet near-term reserve requirements;
- promulgation of effective diligent development standards;
- establishment of a firm definition for commercial quantities to determine whether leases will be issued to preference right lease applicants under the Mineral Leasing Act; and,
- removal under controlled conditions of the Federal coal leasing moratorium that has been in effect since early 1971.

These steps address a number of the recommendations made in the Draft GAO Report. Attached are comments on these recommendations, arranged in the order presented in the Draft Report digest. We have separately transmitted editorial comments for consideration in preparing the final audit report.

We appreciate the opportunity to review the report in draft form.

Sincerely,



Deputy Under Secretary of the Interior

Attachments

GAO note: The attachment contained general and technical comments on our draft report which have been incorporated into the final report where appropriate.

PRINCIPAL OFFICIALS
RESPONSIBLE FOR THE ADMINISTRATION OF
ACTIVITIES DISCUSSED IN THIS REPORT

	<u>Tenure of office</u>	
	<u>From</u>	<u>To</u>
<u>DEPARTMENT OF THE INTERIOR</u>		
SECRETARY OF THE INTERIOR:		
Thomas S. Kleppe	Oct. 1975	Present
Kent Frizzell (acting)	July 1975	Oct. 1975
Stanley K. Hathaway	June 1975	July 1975
Kent Frizzell (acting)	May 1975	June 1975
Rogers C.B. Morton	Jan. 1971	May 1975
ASSISTANT SECRETARY OF THE INTERIOR--		
ENERGY AND MINERALS:		
William G. Fischer (acting)	Jan. 1976	Present
Jack W. Carlson	Aug. 1974	Jan. 1976
King Mallory (acting)	May 1974	July 1974
Stephen A. Wakefield	Mar. 1973	Apr. 1974
John B. Rigg (note a)	Jan. 1973	Mar. 1973
Hollis M. Dole	Mar. 1969	Jan. 1973
ASSISTANT SECRETARY OF THE INTERIOR--		
LAND AND WATER RESOURCES:		
Jack O. Horton	Mar. 1973	Present
ASSISTANT SECRETARY OF THE INTERIOR--		
PUBLIC LAND MANAGEMENT (note b)		
Harrison B. Leosch	Apr. 1969	Jan. 1973
DIRECTOR GEOLOGICAL SURVEY:		
Vincent E. McKelvey	Dec. 1971	Present
William A. Radlinski (acting)	May 1971	Dec. 1971
DIRECTOR BUREAU OF LAND MANAGEMENT:		
Curt Berklund	July 1973	Present
Burton W. Silcock	June 1971	July 1973

a/Deputy Assistant Secretary in charge.

b/Became office of Assistant Secretary--Land and Water Resources in March 1973 reorganization.





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