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

B-125067 January 11, 1978

The Honorable Leo J. Ryan
Chairman, Subcommittee on
Environment, Energy, and
Natural Resources
Committee on Government Operations
House of Representatives

Dear Mr. Chairman:

A letter from the previous Chairman requested us to determine the accuracy, reliability, and consistency of the coal reserve estimates that are prepared and disseminated by the Department of the Interior (Interior). He was also interested in whether the Department's procedures for developing and reporting this coal data were essentially the same as those for the four minerals--bauxite, copper, fluorspar, nickel--which were the subject of a previous report.

The procedures used to prepare coal estimates and mineral estimates are not appreciably different and the limitations of the coal estimates are similar to those previously found in the minerals area.

Enclosure I discusses the problems associated with existing coal resource and reserve estimates that have been prepared by Interior.

At the time of our review of Interior's coal reserve estimates, Interior had the responsibility for developing coal resource and reserve estimates. Within Interior, the responsibility for resource and reserve was divided between the U.S. Geological Survey (Survey) and the Bureau of Mines (BOM). The Survey was responsible for developing coal resource estimates, and BOM was responsible for developing coal reserve estimates. As discussed in Enclosure I, the BOM activities for reserve estimates have subsequently been transferred to the Department of Energy (DOE).

EMD-78-23
(14432)

Our review indicated that current available data on coal resources and reserves are extremely spotty and outdated. The current "best estimate" says we have 3.9 trillion tons of coal resources and a demonstrated reserve base of 438 billion tons of coal. Although it is readily recognized that Federal coal lands account for a large share of the Nation's coal resources, we found that these estimates are equally deficient, even for coal lands under lease.

To enhance coordination of Department of Energy and Interior efforts to improve coal data and policy decisionmaking, we are recommending that the Secretaries of Energy and the Interior continue to work closely during the next few months to

--systematically plan a comprehensive and interagency coordinated coal data program, and

--develop and implement measures for obtaining the additional geological and economic data required to assess the amount of coal under lease and relate it to national energy needs and to any program of renewed leasing.

To improve the reliability and usefulness of coal reserve estimates for specific policy decisionmaking purposes, we are recommending that the Secretary of Energy have the Administrator, Energy Information Administration:

--Develop and implement a plan for obtaining from coal producers estimates of recoverable domestic coal reserves using appropriate verification techniques and develop plans to update the results of this effort on a regular and recurring basis, including the effects of economic, technological, and legal conditions on recoverability.

This report has been discussed with responsible officials at the Department of Energy and Department of the Interior. They agreed that the report is factually correct and expressed general agreement with our conclusions and recommendations.

B-125067

Unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from the date of the report. At that time, we will send copies to interested parties and make copies available to others upon request.

Sincerely yours,

Comptroller General
of the United States

Enclosure

Enclosure I

SUMMARY OF PROBLEMS ASSOCIATED WITH COAL RESERVE ESTIMATES

COAL RESOURCE AND RESERVE CONCEPTS: DEFINITION AND MEASUREMENT

The system of measuring and estimating coal deposits includes two commonly used categories--resources and reserves. Resources include all known coal, plus coal deposits not yet discovered but believed to exist; reserves are portions of identified coal resources that can be extracted under current economic, technological, and legal conditions.

In line with the original request, we have structured most of our analysis around coal reserve estimates that are prepared and disseminated by the Department of the Interior (Interior). However, during our review of published data, we became aware that there is another critical issue in the coal data area--unpublished reserve data which Interior gathers from Federal leases for management purposes. We have therefore devoted a portion of this report to presenting an analysis of the problems of unpublished reserve data.

Coal resources

The U.S. Geological Survey (Survey) has prepared coal resource estimates from data supplied by State geological surveys, maps and drill records from mining companies and others, private records of individuals, and the Survey's own studies of coal-bearing areas.

Within the framework of resources, coal deposits are estimated by the Survey and classified as identified resources and undiscovered resources (also referred to as hypothetical resources). Identified resources refer to deposits of coal whose location, quality (sulfur, ash, moisture, BTU content, etc.), and quantity have been mapped and are known to exist from geologic evidence supported by engineering and measurements of geologic reliability. The concept of undiscovered resources recognizes deposits of coal surmised to exist in unmapped and unexplored areas on the basis of braod geologic knowledge and theory. Resources include coal deposits in beds of minimum thickness (14 and 30 inches, depending on coal rank) occurring at depths down to 6,000 feet.

Enclosure I

These restrictions are used so that only coal which is believed to be potentially recoverable is included in the resource estimate. For example, bituminous coal existing in beds less than 14 inches thick, subbituminous less than 30 inches thick, and all coal existing more than 6,000 feet below the surface is not included in the resource estimate.

As of January 1, 1974, the Survey's "best estimate" for total coal resources was 3.9 trillion tons. Of this total, 1.7 trillion tons are classified as identified resources and 2.2 trillion tons are classified as hypothetical or undiscovered resources.

Coal reserves

The term reserves refers to the portions of identified coal resources which can be mined under current economic, technological, and legal conditions. Estimates are referred to either as the demonstrated reserve base or recoverable reserves.

The demonstrated reserve base relates to coal deposits at depths and seam thicknesses similar to those from which coal is currently being mined at depths to 1,000 feet--generally having a seam thickness of 28 inches or more for bituminous coal and 60 inches or more for subbituminous and lignitic coal. The Bureau of Mines (BOM) estimates the demonstrated reserve base of domestic coal by reclassifying coal resource estimates. The demonstrated reserve base reflects the quantity in relatively thick beds near enough to the surface to be mined by conventional surface or underground methods. That portion of the demonstrated reserve base which can actually be mined given present technological, economic, and legal constraints is termed reserves.

According to Interior, the proportion of coal that can be recovered from a mining operation ranges from about 35 to 90 percent, depending on the characteristics of the coalbed, the mining method, legal restraints, and the restrictions placed on mining because of natural and manmade features. As of January 1, 1976, BOM's "best estimate" for the total demonstrated reserve base was 438 billion tons. Mining experience in the United States, according to BOM, has indicated that, on a national basis, at least one-half of the mineable coals may be recoverable under current conditions. Application of this criterion

to the demonstrated reserve base would mean that the BOM estimate for recoverable reserves is about 219 billion tons.

PUBLISHED DOMESTIC COAL RESERVE DATA

There are two main problems associated with existing coal reserve estimates that have been published by Interior

--lack of consistent and reliable data, and

--lack of analysis of economic, technologic, and legal conditions on a site-specific basis to determine which reserves may or may not be mined.

Lack of consistent and reliable data

There is concern about the validity of the data sources used to derive coal reserve estimates. The methodology used by the Survey and BOM relies heavily upon secondary sources. Examples of secondary data sources include publications by State geological surveys, drilling records of coal mining companies, petroleum exploration firms, and/or water-well drilling companies, information in the files of State coal mine inspectors, and private records obtained from individuals. Much of the secondary data used by the Survey was accumulated in the early 1900s and has not been refined since then, and the reliability of the estimates has not been verified. Also, some of these coal reserve estimates obtained from coal companies and other proprietary sources are possibly understated due to incentives to avoid property taxes levied on mineral deposits. Although the tax incentive may bias reserve estimates, the exact magnitude of the underestimation is not known.

Although a uniform set of criteria has been adopted by the Survey and BOM for measuring resources and reserves, 1/ the application of such criteria to unreliable

---

1/United States Bureau of Mines and United States Geological Society, "Coal Resources Classification System of the U.S. Bureau of Mines and U.S. Geological Survey," USGS Bulletin 1450-B (Washington: Government Printing Office, 1976).

secondary data sources, without proper verification, may result in adding together dissimilar data bases.

In addition, we found calculation errors in the demonstrated reserve base estimates prepared by BOM. We believe that these could have been avoided by adequate preparation and review procedures.

The BOM document entitled the "Demonstrated Coal Reserve Base of the United States by Sulfur Category on January 1, 1974" contained coal reserve estimates prepared by the Bureau's Eastern Field Operations Center in Pittsburgh, Pennsylvania, and the Intermountain Field Operation Center in Denver, Colorado.

We performed a limited review of the estimates included in the summary for five of the Eastern and three of the Western coal producing States. We found the following errors and omissions in the reported demonstrated reserve base estimates.

--Alabama. Two counties were reviewed. One county had been completely omitted from the estimate, although it had reserves of over 13 million tons. BOM could not explain the omission. The other county was producing over 1 million tons annually from seams less than 28 inches. These seams were not included in the demonstrated reserve base because the estimator believed the parameters precluded their inclusion.

--Virginia. Seven county estimates were reviewed and found to contain errors. For example, the publication contained figures that differed from the source documents. BOM officials could not explain why the errors occurred. In addition, one mine was producing over 1 million tons annually from seams less than 28 inches. These seams were not included in the demonstrated reserve base because they were deeper than 1,000 feet.

--Published estimates for eastern Kentucky, Maryland, and Tennessee differ by several hundred million tons from the estimates in the source material. BOM officials were not able to resolve the differences or explain how the estimates were derived.

Enclosure I

--North Dakota. As a source, BOM listed a Survey estimate based on a State extrapolation from a 1953 Survey study. However, the Survey misinterpreted the State study, resulting in a BOM overstatement of strippable coal by 10 billion tons.

--Iowa and California. BOM estimated the strippable demonstrated reserve base for both States in 1971; however, they were eliminated from the 1974 estimate because they were not apportioned among counties. This understated the demonstrated reserve base in the two States by 205 million tons.

Subsequent to our review of these published reports, BOM published a brief report 1/ on their current efforts to update and address some of the problems discussed above. The report notes that demonstrated reserves in several States are presently being reevaluated and that adjustments of the demonstrated reserve base will be made as additional data is developed. The report presents little convincing evidence, however, that significant efforts have been made to update coal estimates.

Lack of analysis of economic, technological, and legal conditions on a site-specific basis

The existing coal reserve estimates provide, in broad terms, a rough idea of the size of the Nation's coal inventories which can be used to project present and future production potential. In specific terms, the reserve estimates are of crucial importance when assessing coal as an alternative energy source. That is, given current and expected future coal prices, accurate reserve estimates should tell decisionmakers how much coal could be made available. However, in terms of their use for specific public policy decisions on what kind of coal to mine, and where and when existing coal reserve estimates are not reliable or useful. Furthermore, since coal must

---

1/U.S. Bureau of Mines, Mineral Industry Surveys, "Demonstrated Coal Reserve Base of the United States on January 1, 1976," prepared in the Office of Assistant Director--Fuels, Division of Coal (Washington: Bureau of Mines, August 1977).

Enclosure I

compete with other energy sources, a decisionmaker must know the total cost of converting site-specific coal to usable energy in order to make a choice.

To account for a lack of specific knowledge of the geologic or economic conditions, some estimators employ reserve recovery rates of 50 percent of the underground demonstrated reserve base and 80 percent of the surface mineable demonstrated reserve base. Debate surrounds the appropriateness of these recovery rates. Interior indicates that the amount of coal that can be recovered from the demonstrated reserve base generally ranges from about 35 percent to 90 percent. It all depends upon the geologic and economic conditions.

In addition to the above geologic factors, price-cost relations play a major role in determining which reserves will actually be recovered. For example, the greater the depth at which reserves are recovered, the more costly the operation. Reserves mineable by underground methods are influenced by more factors affecting costs than reserves mineable by surface mining techniques. Among the important factors, other than the depth of the coal in underground mining, are the thickness and consistency of coal seams, roof conditions, water deposits, and other mining conditions. Such factors increase the hazards of mining, reduce mine productivity, and increase mining costs.

Surface reserves, on the other hand, are influenced by fewer cost factors, with amount of overburden being the primary one. Generally, surface mining is economical when the amount of overburden to be removed is of a certain relation to the seam thickness of the coal to be recovered. This relation is normally expressed in terms of feet of overburden removed per foot of coal recovered, referred to as the stripping ratio. What is considered to be an economical stripping ratio is determined largely by technology in the form of earthmoving equipment, although terrain and reclamation costs also influence whether certain coal can be mined under current mining technology and economics.

Available data gives some indication of economic stripping ratios but, as currently compiled, the data does not present calculations of stripping ratios at specific coal deposits, making it difficult to identify and delineate specific surface mineable reserves on a cost basis.

There are also several legal considerations which preclude some reserves from being mined at specific locations. Such considerations are not adequately dealt with in existing published data. For example, seams of coal under populated areas, Federal- and State-owned forests, parks, reservations, roads, airports, navigable rivers, and streams, etc., which may not legally be mineable, are generally included in the demonstrated reserve base. The land surrounding oil and gas wells is often not mineable as large blocks of coal have to be left standing to prevent the hazard of oil and gas seepage, but it, too, is included in the demonstrated reserve base and must be excluded from the "reserve" figures.

In addition, the Surface Mining Control and Reclamation Act of 1977 (P.L. 95-87, dated August 3, 1977) prohibits mining of certain coal reserves because of the potential adverse environmental effects during and after mining operations. Among the restrictions are

--alluvial valley floors,

--steep slopes, and

--Federal lands where surface owner's rights are protected.

The alluvial valley floor restriction will eliminate some reserves from being mined. Alluvial valley floors consist of unconsolidated deposits formed by streams or channels where ground water levels are high enough to permit irrigation which is vital to farming and ranching operations. As defined in the act, the restriction would affect parts of Montana, Wyoming, North Dakota, Utah, and Colorado. A recent study indicates that the amounts of surface areas and coal reserves affected by the restriction in these regions would be small--only about 3 percent of the surface-mineable reserves may be restricted in order to protect alluvial valley floors in agriculturally developed areas. 1/

1/ICF Incorporated, Energy and Economic Impacts of H.R. 13950 ("Surface Mining Control and Reclamation Act of 1976," 94th Congress), draft final report submitted to the Council on Environmental Quality and Environmental Protection Agency, contract no. EQ6AC016 (Washington: U.S. Environmental Protection Agency, February 1, 1977), p. 12.

Surface mining restrictions based on the angle of the slope overlying coal reserves are also provided for in the act. For all practical purposes, the Eastern region areas of southern West Virginia, eastern Kentucky, Virginia, and eastern Tennessee would be affected most by steep slope reserve restrictions. However, accurate estimates of economically recoverable reserves lost to mining by the steep slope restrictions are not available.

The act also provides protection to owners of surface rights overlying Federally-owned coal. Written consent from surface owners must be obtained by the Secretary of the Interior before such land can be leased for surface mining. No accurate estimate exists as to the amount of Federal coal mineral rights that is overlain by non-Federal surface rights. One study 1/ indicates that as much as 14 billion tons of coal could be prohibited from surface mining under this provision in the 7-state region of Colorado, Montana, New Mexico, North Dakota, Oklahoma, Utah, and Wyoming. This highly uncertain estimate indicates the need for more reliable and accurate reserve data on Federal coal lands.

Recoverability of coal reserves at some locations may also be reduced because of the incremental mining costs associated with reclamation and restoration requirements in the act. Some States already impose reclamation and restoration requirements similar to the Federal regulations. The major cost element for most surface mining reclamation operations is the cost of handling overburden. Because cost variations can range widely, it is difficult to determine with accuracy the magnitude of surface mineable reserves affected by the act at various levels of coal demand and prices. However, the impact will vary from one location to the next as terrain and technological, geologic, and economic conditions differ.

The application or use of the above economic and legal factors for determining specific coal reserves is not systematically described in current Government publications. Cost conditions are handled vaguely. Common to most Survey and BOM publications is the reference to current costs without any definition of cost levels or the distribution of costs for underground reserves at specific locations.

1/ Ibid., p. 15.

As presented in Survey and BOM analyses, cost conditions are assumed to be uniformly distributed on the basis of the criteria employed for delineating underground reserves by geological assurance, minimum seam thickness, and maximum depth of 1,000 feet, with a few exceptions at specific locations.

Government publications, therefore, do not permit a useful delineation of reserves on the basis of economic costs at various depths nor on other conditions affecting productivity and costs at specific locations.

PUBLISHED INTERNATIONAL COAL RESERVE DATA

Available international coal estimates used by Interior rely upon numerous secondary sources which are regarded at best as gross approximations rather than accurate estimates based on sound geological, economic, and engineering measurement.

Currently, the most widely recognized source of world coal estimates is the 1976 "World Energy Conference Survey of Energy Resources", published in 1977 by the World Energy Conference. The survey provides estimates of economically recoverable reserves on a country and worldwide basis. World economically recoverable reserves are estimated to be about 785 billion tons and total world coal resources are placed at 12.6 trillion tons. 1/

In addition to the World Energy Conference coal estimates, the U.S. Geological Survey published world-identified and total-coal-resource estimates in USGS Bulletin 1412 (1975), "Coal Resources of the United States, January 1, 1974." As estimated by the Survey, identified coal resources of the world are placed at 6,390 billion tons. Hypothetical resources of the world were estimated to be 10,230 billion tons, to give a combined total of 16,620 billion tons. The world distribution

---

1/The "World Energy Conference Survey of Energy Resources" estimates are reported in International System (metric) units of megatonnes. We converted to the approximate U.S. equivalent by multiplying estimates of world recoverable reserves (712,806 megatonnes) and total world resources (11,504,885 megatonnes) by the factor 1.102.

of these resource estimates are published by Survey on a 5-continent basis. The estimates are at best gross approximations and were made by analysis and extrapolation of estimates from 50 countries and opinions of competent observers.

Survey and BOM officials informed us that each country has its own way of measuring and reporting coal estimates. The purpose for which estimates are made also vary by country, which influences the accuracy and reliability of estimates. One BOM official told us that political and national economic security motives sometimes influence the estimation and, therefore, the reliability of many coal estimates is questionable.

A Coal Resources Branch, Survey, official informed us that major efforts are currently underway to improve the accuracy and reliability of world coal estimates. The mechanism for carrying this out is the World Coal Resources and Reserves Data Bank System of the International Energy Agency (IEA). The program is in its early stages of development and is being financed by the six participating IEA countries: United States, Great Britain, Canada, West Germany, Belgium, and Italy. In addition, several non-IEA member countries having coal deposits are participating in the effort.

The world data bank system is collecting and verifying world coal resource and reserve data by country. Phase one of the program consists of collecting and compiling available coal estimate data and storing it on Survey headquarter computers. Phase two will consist of collecting and compiling site-specific data by country and storing it on Survey computers. This data includes drill hole and other proprietary geological and geophysical data, engineering measurements, and chemical analysis. When integrated with phase one data, the data will serve to improve world coal estimate accuracy and reliability. All data collected and compiled will be standardized in terms of a comprehensive international terminology.

An eventual product of this program will be a summary of world coal resource and reserve data. This will be made available through the National Coal Resource Data System, Coal Resource Branch, Survey. Because of proprietary data submitted by participating countries, country-specific information will not be available to the general

public. The summary data is expected to be available in about two years.

UNPUBLISHED FEDERAL COAL LEASE DATA

Interior, in addition to published data on domestic and international coal reserves, accumulates information on the amount of coal reserves on public lands leased under the Federal Coal Leasing Program.

In an April 1976 report 1/ and related testimony 2/ on the Federal Coal Leasing Program, we pointed out that there were serious deficiencies in the quantity and quality of the resource, reserve, and economic data available for Government use in valuing coal areas. Our recent work done in 1977 indicates that the situation has not changed; data needed to make credible valuations is still inadequate. We are currently completing a report to the Congress which will contain several additional recommendations to the Secretaries of Energy and Interior to improve the management of the Federal Coal Leasing Program. We testified again in October 1977 3/ that neither Interior nor the individual leaseholders' estimates of recoverable coal reserves can be considered accurate. As the estimates now stand, neither should be relied on in managing the Coal Leasing Program.

In our work, we selected the top 20 Federal leaseholders based on estimates of recoverable reserves. These leaseholders controlled about 75 percent of the total estimated recoverable reserves on leases as of September 1976

1/"Role of Federal Coal Resources in Meeting National Energy Goals Needs to be Determined and the Leasing Process Improved," RED-76-79, April, 1, 1976.

2/Statement of Phillip S. Hughes, Assistant Comptroller General of the United States, before the Subcommittee on Materials and Fuels of the Committee on Interior and Insular Affairs, United States Senate, February 16, 1976.

3/Statement of Monte Canfield, Jr., Director, Energy and Minerals Division before the Subcommittee on Energy Production and Supply of the Committee on Energy and Natural Resources, United States Senate, October 25, 1977.

and included 219 of the 537 outstanding Federal leases. We analyzed Interior's estimates by comparing them with those made by the 20 leaseholders and by examining the leaseholders' supporting documentation and estimating methodologies. With the assistance of a geologist consultant, we also independently computed inplace and recoverable reserve estimates on four leases and compared our estimate with both Interior's and the leaseholders'.

In the aggregate, the amount of recoverable coal computed by Interior was 22 percent, or about 2 billion tons, more than the recoverable coal computed by the leaseholders for the 219 leases. However, on 21 leases, Interior's estimates were more than 40 percent higher. These wide variations existed between Interior and leaseholder estimates because of differences in estimation methodology and because Interior generally considered some underground coal in its estimates, whereas leaseholders generally only included surface mineable coal. Our analysis of the four showed the existence of greater inplace and recoverable reserves than estimated by either Interior or the leaseholders.

We identified several additional underground seams, but no additional surface seams. The additional underground seams are located 400 to 1,000 feet below the surface and contain an estimated 82 million tons of coal which could be classified as recoverable. In the interest of completing our work as rapidly as possible, we made no attempt to exclude underground seams based on economics or safety, both of which could reduce recoverable tonnage. We recognize that both of these factors should be considered in classifying coal as recoverable; however, our point is that a significant amount of underground coal exists which neither the leaseholders nor Interior carried in their records.

Interior's estimating criteria requires that economics be considered in determining recoverable reserves but does not specify the type or source of such information. We found that Interior does not use specific economic factors in making its leaseholder reserves estimates. In fact, most of the estimates were made in 1973 within a 30-day period and were based on the judgment of individual mining supervisors and their staffs rather than on a detailed analysis of all available geologic data. Estimates for only 31 of the 219 leases included in our review have been updated since 1973; these were updated in 1975

and 1976. None of these later estimates were based on specific economic factors. Cost and pricing considerations generally are not readily discernable in the reserve estimates of Interior or the leaseholders.

COORDINATION BETWEEN DEPARTMENTS OF ENERGY AND INTERIOR

In a March 1977 report 1/ entitled "Energy Policy Decisionmaking, Organization, and National Energy Goals," we pointed out that the management and control of Federal energy programs was spread throughout a number of agencies. We felt at that time, and still do, that the Government could deal more effectively with the long-term, complex nature of the Nation's energy problems by consolidating energy functions. In this regard, we favored removing all leasing and coal data gathering functions from Interior.

However, in August 1977, subsequent to the completion of our recent reviews at Interior, the Department of Energy Organization Act created the Department of Energy (DOE) and transferred to this new agency only some responsibilities for Federal coal leasing policy which previously had been performed by Interior. Other responsibilities remain in Interior.

The law also reorganized energy functions within the Federal Government for purposes of securing effective management and assuring a coordinated national energy policy. Also, the law established in DOE an independent Energy Information Administration (EIA). The EIA's responsibility is to carry out a central, comprehensive, and unified energy data and information program. This office now has the responsibility to collect, assemble, analyze, and disseminate data information on energy reserves. The BOM function of collecting, evaluating, assembling, and disseminating coal reserve estimates was transferred to this office. In addition to its data collection and information responsibilities, the EIA is to develop a new system of national reserves to determine the best estimate of fuel reserves.

While it is premature to say what success the EIA will have in correcting the coal data deficiencies

---

1/"Energy Policy Decisionmaking, Organization, and National Energy Goals," EMD-77-31, March 24, 1977.

discussed in this report, we believe that creation of the EIA as an independent office within DOE is a first step in the right direction to effectively address many of the problems. GAO plans to closely monitor the operations of EIA in our future work.

CONCLUSIONS

We believe that there are fundamental and serious shortcomings in the accuracy and reliability of coal reserve estimates prepared and disseminated by Interior. Current available data on reserves is extremely spotty and outdated. Even the information available from both Interior and leaseholders on coal reserves under Federal lease cannot be considered accurate.

Accurate coal reserve data is needed to permit sound public policy decisions on what kind of coal to mine and where and when. Accurate and reliable coal reserve data is also needed to enable Interior to effectively manage the Federal Coal Leasing Program.

GAO has been a strong advocate over the past several years for the improvement of coal reserve data. In several previously isused reports, we made specific recommendations for actions to improve coal reserve estimates. We recognize that the Departments of Energy and Interior have been working together during the past few months. However, we continue to believe that further action is needed on these recommendations to insure that public policy decisons are made on the basis of accurate, reliable data.

The establishment of the EIA within the Department of Energy has given the Department responsibilities in the area of energy data collection and analysis. Therefore, our recommendations require action by both DOE and Interior.

RECOMMENDATIONS

To enhance coordination of Department of Energy and Interior efforts to improve coal data and policy decision-making, we recommend that the Secretaries of Energy and the Interior continue to work closely during the next few months to

--systematically plan a comprehensive and interagency coordinated coal data program, and

Enclosure I

--develop and implement measures for obtaining the additional geological and economic data required to assess the amount of coal under lease and relate it to the national energy needs and to any program of renewed leasing.

To improve the reliability and usefulness of coal reserve estimates for specific policy decisionmaking purposes, we recommend the Secretary of Energy have the Administrator, Energy Information Administration, develop and implement a plan for obtaining from coal producers estimates of recoverable domestic coal reserves using appropriate verification techniques and develop plans to update the results of this effort on a regular and recurring basis, including the effects of economic, technological, and legal conditions on recoverability.

- - - - -

This report has been discussed with Department of Energy and Interior officials. They agreed that the report is factually correct. They also generally agreed with the recommendations and indicated that the Departments will continue to work together to improve coal data.