Reserve Data Base

REPORT

OF

THE NATIONAL COAL COUNCIL

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JUNE 1987

THE NATIONAL COAL COUNCIL

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U.S. DEPARTMENT OF ENERGY

John S. Herrington, Secretary

The National Coal Council is a federal advisory committee to the Secretary of Energy.

The sole purpose of the National Coal Council is to advise, inform, and make recommendations to the Secretary of Energy on any matter requested by the Secretary relating to coal or the coal industry.

Library of Congress Catalog Card Number: 87-062031

Printed in the United States of America

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June 2, 1987

The Honorable John S. Herrington
Secretary of Energy
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20585

Dear Mr. Secretary:

On behalf of The National Coal Council, I am pleased to submit the attached report on the Reserve Data Base prepared in response to your authorization of November 26, 1986, and approved by the Council on June 2, 1987.

Pursuant to your request, this report addresses two (2) issues. The first section of this report deals with an analysis of the Demonstrated Coal Reserve Data Base(s) (DRB) of the United States to determine and identify any incomplete areas in such data base. The second and third sections of this report identify those local, state, and federal policies, regulations and laws which could adversely impact the amount of recoverable coal in the DRB and the degree to which the aforementioned laws, policies and regulations reduce the amount of recoverable coal in the DRB.

The intent of the report is not to be judgmental regarding any particular law, policy or regulation but rather to objectively analyze and quantify the impact of such laws, policies and regulations on the recoverable coal in the DRB. The report's conclusions can be summarized as follows:

(1) The actual DRB for recoverable coal is considerably smaller than previously suspected.

(2) Numerous laws, policies and regulations impose economic and physical limitations on the amount of coal that can be recovered in the DRB.

(3) There is no standard, whether regional or national, in use today which can be used to present a true picture of the DRB from either a technical or economic viewpoint.

The Council believes that a number of steps should be taken to clarify the uncertainties and quantify the adverse impact of local, state and federal laws, policies, regulations and actions of regulatory bodies on the amount of recoverable coal in the DRB. These recommendations include but are not limited to:

(1) The Department of Energy, in conjunction with the U.S. coal industry, and other branches of the federal and state governments should develop better standards for categorizing reserves which recognize realistic estimation criteria, mineability and recovery criteria, the effect of changing economic conditions and the impact of competing land uses, so that a single, reliable and accurate data base is developed.

(2) The Secretary of Energy should establish a high level intergovernmental working group to study and make recommendations concerning all current and proposed laws, policies, regulations and actions of regulatory bodies which could adversely impact the amount of recoverable coal in the DRB.

(3) The Secretary of Energy should initiate a comprehensive and detailed survey of all coal producers and individual coal producing properties to obtain an in-depth, quantifiable and thorough analysis of the technical and economic impacts of laws, policies and regulations on the recoverable coal in the DRB.

We are confident that this report will serve to dramatically underscore the need for a more accurate appraisal of this Nation's most abundant energy resource and the need to take stock of the effects government regulations have on the recoverability of coal in the DRB. We trust that this report will prove useful and assist the administration in developing and implementing policies that will take advantage of this most important resource. We stand ready to provide you with any additional information in this matter that you may desire.

Sincerely,

James W. McGlothlin
Chairman

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Executive Summary

Currently several data bases exist which characterize coal resource and reserve estimates in the United States. The Secretary of Energy has requested that The National Coal Council study and make recommendations concerning the accuracy of the coal reserve data bases and the effect of coal related regulations, laws, and policies on such data bases.

Apparently the current data bases, quantifying the amount of recoverable coal in the United States, termed the Demonstrated Reserve Base (DRB) for purposes of this report, have been calculated using methodologies that appear to overstate the amount of recoverable coal. Furthermore, the existing DRB does not seem to consider the impacts of local, state and federal statutes, regulations, policies, and enforcement agency actions on the amount of recoverable coal in the DRB.

The study requested by the Secretary of Energy was divided into three separate tasks:

1. To analyze the existing data bases for gaps and deficiencies which could produce misleading or inaccurate information critical to making policy decisions;
2. To identify and summarize local, state and federal policies, regulations, and laws which could adversely impact the amount of recoverable coal in the DRB;
3. To attempt to quantify the effects of (2) above on the amount of recoverable coal in the DRB.

Analysis of the existing data bases strongly indicates that the DRB is overstated due to a number of factors. These factors include, but are not limited to, inclusion of unmineable, nonmineable or sterilized coal in the DRB; failure to account for losses due to mining and preparation; failure to account for quality differences between coals; failure to account for geologic complications; and lack of consistency between state and federal agencies' estimation techniques. Certain other factors, such as the addition of newly demonstrated reserves to the DRB, may increase the quantities in the DRB at some future date.

Most laws, regulations and policies at all levels of government have a negative effect on the amount of recoverable coal in the DRB. This effect stems from either an economic consideration, i.e. one in which coal reserves cannot be mined economically, or a physical limitation consideration. The most significant laws impacting the availability of recoverable coal in the DRB are the Federal Coal Leasing Amendments Act of 1976 (90 Stat. 1083, as amended), as administered through the Federal Coal Management Program, and the Surface Mining Control and Reclamation Act (30 USC Section 1201 et seq.). Furthermore, some regulations prohibit the exploration for coal which, *de facto*, prevents reserves from being added to the DRB. Finally, there are pending or proposed regulations which could further limit the availability of otherwise recoverable coal in the DRB.

The intent of this report is not to pass judgment on any particular regulation, but rather is an attempt to objectively analyze and quantify the impact of those regulations directly affecting the amount of recoverable coal in the DRB.

A cursory survey of major coal producing companies indicates that the potential effect of these laws, policies, and regulations could result in the removal of five to fifty percent (5-50%) of the recoverable coal in the DRB which falls under the control of these companies.

From The National Coal Council's perspective, the following conclusions apply:

1. *The actual DRB for recoverable coal is considerably smaller than the 488 billion tons purported in the DRB as published by the Department of Energy in 1984.*
2. *Economical and physical limitations are imposed on coal reserves as a result of certain local, state and federal regulations, effectively limiting the availability*

of the coal in the DRB. Chief among these laws are the Surface Mining Control and Reclamation Act of 1977 and the Federal Coal Leasing Amendments Act of 1976.

3. *State and federal laws, policies, and administrative actions, particularly those dealing with land use, tax the ability of exploration to determine accurately the extent and character of reserves and have further cut off substantial amounts of reserves from development. These in turn severely limit our options in meeting our long term energy needs.*

Recommendations based on the work of The National Coal Council include, but are not limited to, the following:

1. **Better standards for categorizing reserves should be developed and implemented which recognize realistic reserve estimation criteria, mineability and recovery criteria, as well as the impacts of competing land uses. This effort should be coordinated by all parties developing and implementing this policy so that a single reliable data base is developed.**
2. **The Secretary of Energy should establish a high level inter-agency working group to study all current and proposed laws, regulations, and policies concerning the coal industry, and their impact on the ability to fully access coal reserves.**
3. **The Secretary of Energy should initiate a comprehensive survey of all coal producers to obtain an in-depth and detailed view concerning the economic and physical impacts of regulations on the recoverable coal in the DRB.**

Chapter 1

Analysis of Deficiencies in Existing Data Base

The Secretary of Energy has asked The National Coal Council to study the Demonstrated Reserve Base (DRB) and identify any gaps that may exist. This study was conducted by reviewing published literature including Department of Energy (DOE) and Department of Interior (DOI) resource and reserve estimates, state data, industry data, and sending a questionnaire to state agencies (Appendix A) and the member companies of the Council (Appendix B) to determine the impact of existing regulations on coal reserves.

Factors Causing Overstatement of Reserves

The Council believes that there are few important gaps in the data base. However, it concludes that the DRB may significantly overstate the amount of *recoverable* coal in the United States.

This overstatement is caused by a number of factors, including:

- Non-mineable coal is often included in the reserve estimate and the DRB; (For example, coal which underlies large portions of suburbanized King County, Washington, is included in the DRB. Current regulations and economic considerations effectively prohibit mining in these areas.)
- The DRB accounts for coal on an in-place basis and does not account for all coal lost during mining or preparation (washing and/or screening); (For example, coal left as "roof" coal for strata control, or "floor" coal to create a competent workbase, or for dilution control.)
- The DRB makes no provision for exclusion of coal which has been or would be rendered unmineable by mining of stratigraphically adjacent seams (above or below). (For example, deep mining of thicker and/or higher quality seams from below other seams can render these upper seams unmineable. Conversely, surface mining of the upper seams can effectively sterilize lower seams from future mining. A coal reserve (or resource) is considered *sterilized* when it cannot be mined because of actions taken which prevent future access or recovery.)
- The DRB makes no provision for categorizing coal seams by quality other than for coal rank. Coal is a rock with extremely variable composition. Consequently, "coal" has no "average" chemical make-up. Coal with exceptionally low Btu, or high ash content, or both, is included in the reserve data, as "tons in place" or "recoverable" with no accounting for quality or heat value. (For example, Wyoming sub-bituminous coal reserves, with an average heat value of between 8000-8900 Btu/lb., are routinely compared to coal reserves in West Virginia that have a heat value well in excess of 11,500 Btu/lb.)
- Although the DRB is a geological accounting of coal reserves, it does not account for coal rendered unextractable due to localized geological complications such as "wash outs," faults, igneous and sedimentary intrusions, and extreme dips, incompetent and closing strata, and other structural complications.
- The DRB seldom discounts reserves sterilized by competing land uses such as oil and gas wells, dwellings, transportation corridors, lakes, rivers, alluvial valley floors, and other categories of land use.
- The DRB is based upon information which is provided by individual state agencies. Estimation procedures and techniques are not consistent among the states. (For example, some current estimates are made by deducting production from an older "reserve" estimate and seldom reflect revisions based upon new data or the impacts of competing land uses on the reserve base.)

Weaknesses in Reserve/Resource Estimation

Many of the weaknesses in the DRB stem from the lack of a coordinated and comprehensive analysis of reserves by federal and state agencies. This results in a "fuzziness" of and inadvertent distortion in the reserve estimate which in turn results in an inadequate basis from which to derive policy decisions.

Clear definition and estimation of the amount of recoverable coal in the United States has plagued geologists and engineers since the need for accurate coal accounting was first identified. This process is further complicated by the use of two similar words which have vastly different meanings, "resources" and "reserves". In the United States, the U.S. Geological Survey (USGS) has the responsibility for developing the Resource Base (identifying the amount of coal in the ground). The Department of Energy's Energy Information Agency (EIA) has been charged with developing the Demonstrated Reserve Base (DRB—or the amount of mineable coal). This DRB number serves as a basis for making long-term federal policy decisions which have significant impacts on coal mining and recovery.

Unfortunately, there is not a clear definition of coals included in or excluded from the Demonstrated Reserve Base. The DRB does not report the amount of recoverable coal available in the United States; it is a compilation of the mineable coal resource of the United States. A more meaningful number would be a recoverable reserve estimate which recognizes existing and projected recoveries and the impacts of competing land uses. These factors are seldom represented in the DRB.

Reserve estimation is inherently imprecise and a great deal of confusion surrounds the use of the terms *"resources"* and *"reserves"* which are frequently confused and used interchangeably. These terms were defined by Paul Averitt of the USGS in 1969, and the Demonstrated Reserve Base as developed by the Department of Energy's Energy Information Administration follows the definition outlined in the USGS Bulletin 1450-B, *Coal Resource Classification System of the U.S. Bureau of Mines & U.S. Geological Survey* (1976).[1]

The latest resource estimate done by the USGS was published in 1975 (USGS Bull. 1412, *Coal Resources in the United States*, January 1, 1974). This resource/reserve characterization rested upon the fundamental, but faulty, assumption that reserve estimates in the various states followed the estimation criteria established by the USGS. In March 1982, Synergic Resources Corporation prepared a report for the Energy Division of Oak Ridge National Laboratory entitled "Documentation of the Demonstrated Reserve Base of Coal in the United States" (SRC Report No. 7098-R1) wherein it outlines various problems encountered by the Department of Energy in establishing the (DRB) estimate. These include:

- Non-standard categories
- Overlapping reserve estimates
- Failure to categorize data

The Department of Energy/Energy Information Administration has attempted to rectify these problems with varying degrees of success but their resolutions ultimately lie with the state agencies which make the initial and revised reserve estimates.

Much of the resource/reserve data is based upon dated information. In the extreme case, for example, the reserve estimate for Virginia is based upon a report published in 1951 and current reserve estimates were made by subtracting the coal mined from 1951 to 1983 to provide a current estimate. There is a danger in following this methodology, because it rarely incorporates new geological information (a factor noted earlier) or accounts for coal lost in mining or sterilized by competing land uses, or changing economic or environmental situations.

In 1979, the EIA held a symposium to discuss coal resource/reserve information. Jim Palmer, of the Illinois State Geological Survey was quoted as saying, ". . . for example, in Illinois for quite a few years we used the figure of twenty-one billion tons of strippable coal. Only recently did we do a study of the strippable coal, eliminating areas where stripping obviously would be impossible: townsites, interstates, lakes, this sort of thing, and we found that we actually only have about 6 billion tons. . . ."[2] This is a 71 percent reduction in reserves.

Another problem with the USGS methodology is that it includes significant amounts of coal that are too thin, too deep, or simply not recoverable because of coal quality or other considerations. The EIA has tried to factor out the most significant disqualifying components to establish the Demonstrated Reserve Base, but a sizeable amount of non-recoverable coal remains in the DRB.

1. An excerpt from *Demonstrated Reserve Base of Coal in the United States on January 1, 1979*, where coal classification terms are defined, is found in Appendix C.

2. EIA Symposium on Coal Resources/Reserves Information, September 17-18, 1979, p. 104.

Deficiencies in Existing Data Bases

Several gaps or deficiencies in the data base have been identified. Hypothetical coal resources in Alaska, Pacific Coastal areas, parts of the Northern Great Plains, the Green River-Hams Fork areas of Colorado and Wyoming, and the Gulf Coast Lignite Belt have not been studied sufficiently to bring them into the USGS Identified Resource categories, and these have not been included in the Department of Energy's DRB. The net impact of the hypothetical resources on the recoverable reserve base probably will be minor because of the potentially high cost of mining and transportation for the Alaskan coals and those of the Green River-Hams Fork areas, and the relatively low quality or rank of coals for the other areas. Although extrapolation from the known to the hypothetical is dangerous, the Council believes that in the context of this report, the conclusion is valid.

At present, several different data bases exist which are used to characterize coal resource and reserve estimates in the United States. The Identified Resources of the USGS are the same as those identified by the USGS in Bulletin 1412 (1975). The Demonstrated Reserve Base is maintained by the Energy Information Agency (EIA) and is based upon the DRB originally established by the U.S. Bureau of Mines and transferred to the Department of Energy's care in 1978.

Subsequent updates have been derived by deducting production and by incorporating more recent reserve information developed by the individual states. (Since 1977, updates incorporating new

TABLE 1

MATRIX: Resources/Demonstrated Reserve Bases (DRB)

Source D.R.B. / State	RESOURCES (Identified) (MM Short Tons)						
	U.S.G.S. 1974	U.S.G.S. 1984	Keystone 1986	1987 State Agency	U.S.B.M. 1974	D.O.E. 1984	D.O.E. 1985
Alabama	15,262	15,262	23,461	23,461	2,982	5,161	5,079
Alaska	130,079	130,079	170,000	6,000	11,645	6,152	6,150
Arizona	21,234	21,234	387	366	350	366	366
Arkansas	2,416	2,416	9,000	15,461	665	418	418
Colorado	128,948	128,948	128,948	128,948	14,870	17,195	17,142
Georgia	24	24	N/E	3	1	4	3
Illinois	146,001	146,001	181,484	181,484	65,665	78,957	78,848
Indiana	32,868	32,868	32,800	16,763	10,623	10,443	10,413
Iowa	6,505	6,505	6,998	6,864	2,885	2,195	2,194
Kansas	18,668	18,668	1,320	939	1,388	988	986
Kentucky	64,346	64,346	95,790	95,761	25,541	39,993	38,655
Maryland	1,152	1,152	1,230	834	1,048	799	792
Michigan	205	205	N/E	126	119	128	128
Missouri	31,184	31,184	N/E	18,124	9,488	6,043	6,035
Montana	291,639	291,639	50,041	50,041	107,727	120,278	120,236
New Mexico	61,391	61,391	182,110	181,545	4,394	4,652	4,625
No. Carolina	110	110	N/E	N/E	31	11	11
No. Dakota	350,602	350,602	350,911	N/E	16,003	9,862	9,835
Ohio	41,166	41,166	17,065	21,330	21,077	18,840	18,781
Oklahoma	7,117	7,117	7,800	7,500	1,294	1,613	1,608
Oregon	334	334	N/E	359	1	18	18
Pennsylvania	82,752	82,752	34,000	81,000	31,000	29,927	29,809
So. Dakota	2,185	2,185	N/E	2,185	428	336	336
Tennessee	2,530	2,530	N/E	1,038	987	929	916
Texas	16,341	16,341	24,164	25,981	3,272	13,764	13,713
Utah	23,359	23,359	24,300	26,087	4,042	6,366	6,342
Virginia	9,551	9,551	N/E	8,774	3,650	3,187	3,113
Washington	6,169	6,169	6,355	6,185	1,954	1,459	1,454
W. Virginia	100,150	100,150	56,264	56,735	39,590	38,897	38,655
Wyoming	135,943	135,943	65,862	65,862	51,228	69,356	69,191
Other States	688	688	1,000	1,791	—	4	4
TOTAL	1,730,919	1,730,919	1,471,290	1,031,547	433,948	488,341	485,856

N/E: No Estimate Available.

data have taken place in Alabama, Arkansas, Colorado, Georgia, Illinois, Michigan, Missouri, New Mexico, North Carolina, Pennsylvania, South Dakota, Tennessee, Texas, Washington, and Wyoming.) These deductions do not in all cases recognize losses incurred in mining, preparation, or sterilization of reserves caused by undermining, overmining or competing land uses. Other resource/reserve estimates were provided in Keystone Coal Buyers Guide (1986) and provided by the individual states at The National Coal Council's request. All of these estimates are shown in Table 1, Matrix of Resource and Reserve Estimates.

In 1979, *Coal Age* published a book entitled *Coal in America* by Richard A. Schmidt. Many of the impacts to reserves noted in this report were similarly identified in Schmidt's book which attempted a more realistic portrayal of the nation's coal reserves. Schmidt developed a methodology which, when applied to the DRB, estimated that only 30 percent of the underground "mineable" reserves and 45 percent of the surface "mineable" reserves were recoverable. Although The National Coal Council does not endorse the recovery factors of the resulting reserve estimates, Schmidt's study illustrates the impact that the issue of recoverability has on available coal reserves. Table 2 shows the impact that these recovery factors have on the DRB for each state and the nation as a whole, using the *Coal Age* estimates. Clearly, better characterization of these recovery factors by state or region would greatly help to define the amount of recoverable coal, because the DRB states coal reserves on an in-place

TABLE 2

Conversion of DRB from In Situ to Recoverable Coal (MM Tons)

Assume mining recoveries of 45% for Surface, 30% for Deep.[1]

State	UG Rec.	Factor	UG Res.	Sur. Res.	Factor	Sur. Rec.	TOTAL
Alabama	1,696	.3	509	3,427	.45	1,542	2,051
Alaska	5,423	.3	1,627	728	.45	328	1,955
Arizona	102	.3	31	251	.45	113	144
Arkansas	273	.3	82	145	.45	65	147
Colorado	12,248	.3	3,674	4,922	.45	2,215	5,889
Georgia	2	.3	1	1	.45	–	1
Illinois	63,363	.3	19,009	15,594	.45	7,017	26,026
Indiana	8,928	.3	2,678	1,515	.45	682	3,360
Iowa	1,734	.3	520	461	.45	207	727
Kansas	–	–	–	988	.45	445	445
Kentucky	33,820	.3	10,146	6,050	.45	2,722	12,868
Maryland	699	.3	210	100	.45	45	255
Michigan	123	.3	37	5	.45	2	39
Missouri	1,479	.3	444	4,564	.45	2,054	2,498
Montana	70,959	.3	21,288	49,319	.45	22,194	43,482
New Mexico	2,128	.3	638	2,524	.45	1,136	1,774
No. Carolina	11	.3	3	–	–	–	3
No. Dakota	–	–	–	9,862	.45	4,439	4,439
Ohio	12,974	.3	3,892	5,867	.45	2,640	6,532
Oklahoma	1,238	.3	371	375	.45	169	540
Oregon	14	.3	4	3	.45	1	5
Pennsylvania	28,371	.3	8,511	1,557	.45	701	9,212
So. Dakota	–	–	–	336	.45	151	151
Tennessee	619	.3	186	310	.45	140	326
Texas	–	–	–	13,764	.45	6,194	6,194
Utah	6,098	.3	1,829	268	.45	121	1,950
Virginia	2,382	.3	715	805	.45	362	1,077
Washington	1,332	.3	400	132	.45	59	459
W. Virginia	33,820	.3	10,146	5,077	.45	2,295	12,431
Wyoming	42,558	.3	12,767	27,798	.45	12,509	25,276
Other States	4	.3	1	–	–	–	1
TOTALS	332,398		99,719	156,748		70,537	170,256

[1]Recoveries from *Coal in America*—1979

NOTE: Total DRB is 488,289 MMT. Recoverable coal represents 35% average recovery.

basis (theoretically mineable). Coal actually *recoverable* in the United States is considerably less than that stated in the Demonstrated Reserve Base.

Factors Not Accounted For in Existing Data Bases

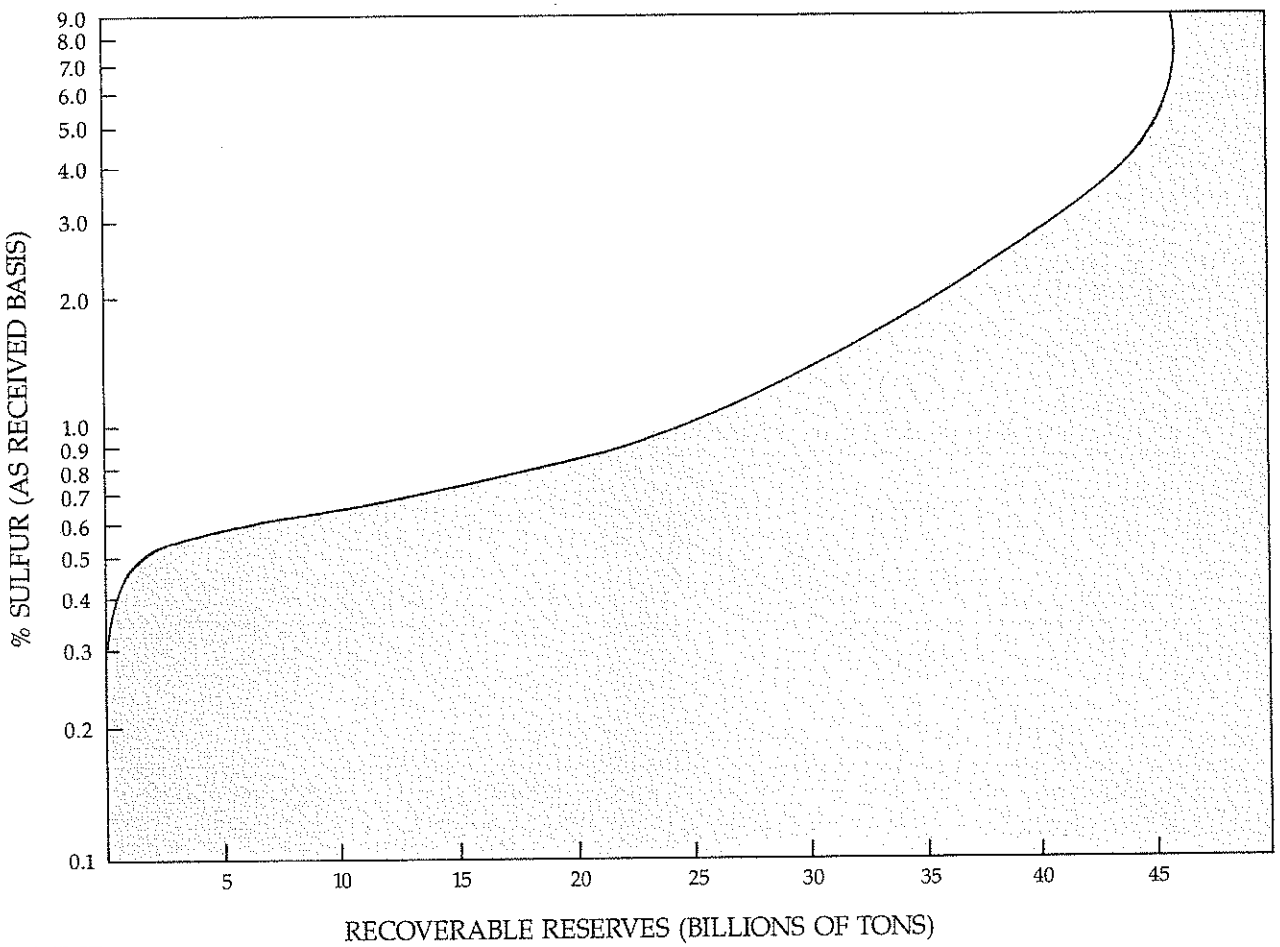
Ownership and other land use issues also have significant impacts on the amount of recoverable coal in the United States. The inability to acquire mining rights frequently results in by-passing and sterilizing reserves that could otherwise be mined. Competing land uses result in leaving a significant percentage of mineable coal in place to either provide subjacent support or provide buffers or barrier pillars at property boundaries. The amount of coal lost to these conditions is highly variable from area to area.

One of the other critical issues not fully addressed in the DRB is that of coal quality. Although coals have been loosely grouped by rank by the Department of Energy/EIA, no attempt to characterize coals by the significant quality parameters such as ash, Btu, or sulfur content has been made. Key policy decisions about resource/reserve recovery issues are currently being debated in Congress without benefit of sufficient data (for example, the pending acid rain legislation).

Nowhere does there exist a consistent comprehensive analysis of coal quality which allows a comparison of coal rank and sulfur content (lbs/SO_2/MM Btu). The nearest approximation to such an analysis currently available is a study of "Uncertainties in Eastern Low-Sulfur Coal Availability" conducted by Resource Dynamics Corporation under contract to DOE (DE-AC01-85FE60711) dated September 1986. Figure 1 is a reproduction of a figure in that report which shows that the amount of available "reserves" in West Virginia drops off severely with decreasing allowable sulfur content. Unfortunately, this graph is not shown in terms of

FIGURE 1

WVGS Preliminary Allocation of Sulfur Content



SOURCE:
West Virginia Geological and Economic Survey: *Spectrum of West Virginia Coal*

pounds of SO_2 per million Btu; however, 1.2 pounds of SO_2 per million Btu is roughly equivalent to approximately .7 percent sulfur for 12,000 Btu coal (average for West Virginia). This means that adoption of a 1.2 pounds per million Btu standard reduces the available coal "reserve" from 46 billion to 13 billion tons—a 71 percent reduction of the reserve base.

The National Coal Council does not endorse this number but suggests that a correlation exists, showing the impact of making resource decisions without a solid underpinning or resource/reserve numbers from which to work.

In a similar vein, there is a widespread misconception about the relative abundance of low sulfur coal in the United States. Table 3 summarizes coal by rank (DRB basis).

When the Btu range shown in Table 3 is compared with the maximum sulfur allowable under different acid rain proposals, it becomes evident that much of the "low sulfur" coals, as mined, cannot meet the standards without *cleaning, blending, or the use of other clean coal technology such as flue-gas desulfurization*. Figure 2 shows graphically the ranges of allowable sulfur by coal rank.

TABLE 3

Demonstrated Reserve Base of Coal in the United States

(million net tons)
(calorific values on moisture mineral matter free basis)

Rank	Btu Range	Tonnage	Percent of Total
Anthracite	15,300	7,331.7	1.5
Bituminous	11,500-15,650	254,666.3	52.2
Sub-bituminous	8,300-11,500	181,213.8	37.1
Lignite	6,300- 8,300	45,007.2	9.2
TOTAL		488,289.0	100.0

Source: DOE/EIA 1984.

FIGURE 2

Ranges of Allowable Sulfur by Coal Rank

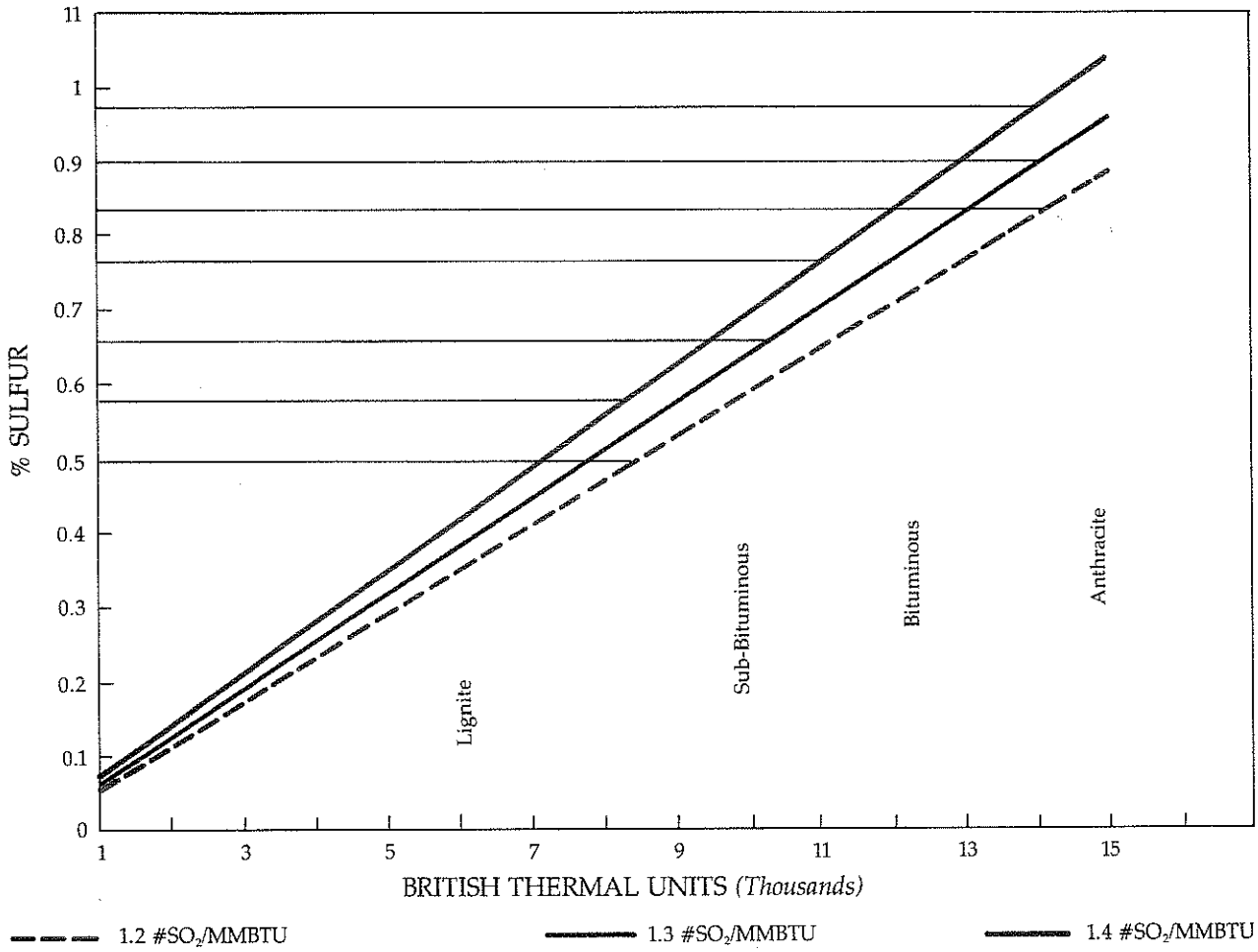


Table 4 summarizes these ranges by rank at three different emissions levels.

Many of the supposedly low sulfur coals therefore cannot meet these standards. This information, coupled with the fact that additional unmineable coals are created by this categorization, would further impede mining. Significant reductions in the amount of recoverable coal in the United States would occur. Development of clean coal technology would greatly help prevent a significant erosion of the U.S. coal reserve base caused by legal constraints on burning higher sulfur coals.

The other key coal quality issue is that of contained energy, or coal rank. The amount of energy contained in the coal to do useful work varies considerably. Two tons of lignite are needed to do roughly the same amount of work as a single ton of either higher rank sub-bituminous or lower rank bituminous coal. This fact is recognized but not quantified in the DRB. Therefore, one ton of lignite has the same relative value as one of bituminous coal in the DRB!

When the following factors are considered:

- inclusion of non-mineable coal (technologically inaccessible),
- inclusion of coal lost to mining/preparation,
- coal sterilized by mining adjacent seams,
- coal rendered non-salable due to coal quality constraints,
- geologically inaccessible coals,
- coal sterilized by land use,

the actual reserve base is considerably smaller than the 488 billion tons stated in the Demonstrated Reserve Base. Recoverable coal estimates are not available but are far smaller than the in-place reserves stated in the DRB. An effort to quantify recoverable reserves should be made so that policy decisions can be more clearly discerned.

Recommendations

Based on this study, The National Coal Council concludes that the DRB is considerably smaller than previously imagined. Based upon this startling information, The National Coal Council makes the following recommendations:

(1) **In order to be more consistent, The National Coal Council recommends that a policy be instituted to ensure that more quantitative standards for categorizing reserves be developed, adopted and implemented which will recognize realistic reserve estimation criteria, mineability and recovery criteria, as well as the impacts of competing land uses.**

(2) **The National Coal Council further recommends that this effort be centrally coordinated and concurrently adopted by all parties developing and implementing this policy so that a *single* reliable data base emerges, as is commonly found among other coal producing nations.**

(3) **Efforts to develop a reliable data base which recognizes coal quality, recovery differences, preparation yield losses, and so forth must be undertaken. Efforts such as the U.S. Geological Survey's National Coal Resource Data System should be encouraged.**

(4) **Clarification of the *"resource"* versus *"reserves"* issue must be made, and reserves must be identified in such a manner as to clearly convey that they are that part of the National Treasury that can be mined and utilized by society. It is suggested that the Demonstrated Reserve Base be redesignated the *Demonstrated Resource Base* and that a new category termed *Recoverable Reserve Base* (RRB) be established as well.**

TABLE 4
Maximum Allowable Sulfur by Rank of Coal

Rank	Maximum Btu	Maximum % Sulfur @ 1.2 #SO_2/MM Btu	Maximum % Sulfur @ 1.4 #SO_2/MM Btu	Maximum % Sulfur @ 1.6 #SO_2/MM Btu
Anthracite	15,300	.92	1.07	1.22
Bituminous	15,640	.92	1.10	1.25
Sub-bituminous	11,500	.69	.81	.92
Lignite	8,000	.50	.58	.66

Chapter 2

Laws and Regulations Affecting the Availability of Coal Reserves

In the United States, virtually all phases of coal production and the consumption cycle—from acquisition to end use—are subject to government regulation at the local, state, or federal level. In general, federal statutes establish minimum standards but states assume primacy in enforcement when state law standards are equal to, or more stringent than, federal statutes. A partial list of major federal laws which affect the coal industry may be found in Appendix D.

While many aspects of coal mining and coal use are regulated by statute, the regulations often have different effects on coal production. Some laws preclude drilling and exploration activity, and therefore, prevent us from accurately determining the amount of coal resources in certain areas of the country. Other laws require that certain lands be designated as unsuitable for mining, and therefore, have a significant effect on actual coal reserve availability. The remainder of the laws and regulations governing the coal industry may not physically remove coal reserves from the mining process, but they do have an economic impact on their recoverability in that they impose additional costs.

Recognizing that different regulations have different effects on coal production, this review of regulatory constraints is divided into four parts. It identifies:

1. regulations that have an economic impact on the coal industry;
2. regulations that have a physical impact on the availability of coal reserves;
3. regulations that prevent accurate determination of the amount of coal resources in certain areas;
4. regulations that have been considered or proposed that may have the same effects as 1, 2, or 3 above.

Laws and Regulations That Have An Economic Impact on the Coal Industry

Virtually all regulation, whether it requires filing for permits or bolting the mine roof, necessarily implies additional cost. Since the coal industry operates within the framework of laws and regulations that govern virtually all phases of coal production, transportation, and consumption, it is apparent that society imposes significant costs on coal production and use.

In terms of the cost of production, the two most significant federal statutes are the Surface Mining Control and Reclamation Act of 1977 (SMCRA) and the Federal Coal Mine Health and Safety Act of 1969, as amended by the Federal Mine Safety and Health Act of 1977. SMCRA was enacted "to protect society and the environment from the adverse effects of surface coal mining" and the Federal Mine Safety and Health Act was enacted "to protect the health and safety of the Nation's coal or other miners."[3]

SMCRA seeks to control the environmental effects of coal mining by requiring that anyone who wishes to engage in surface coal mining must first obtain a permit from the state or federal regulatory authority. The Act specifies detailed design criteria and performance standards that must be incorporated into the permit application. It requires that the mine operator prepare a detailed reclamation plan and file a performance bond to insure adherence to the terms of the operator's permit. In some cases, operators must conduct extensive hydrologic, wildlife, archaeological, and vegetative studies in order to obtain the permit. In some cases, these studies continue through the life of the mine, the mine's reclamation, and reclamation maintenance. In all cases, the land must be returned to its approximate original contour and must be at least

3. 30 USC Sec. 1202; 30 USC Sec. 801.

as productive after reclamation as it was before mining began. Only after the land is judged to be fully reclaimed can the performance bond be released and the studies discontinued.

The Federal Mine Safety and Health Act seeks to reduce fatalities, injuries, and illnesses by establishing mandatory health and safety standards that must be met by each coal mine operation. The health standards are aimed primarily at the control of respirable dust and noise and the promotion of the chest x-ray program for working miners. The safety standards are intended to improve roof control, ventilation, fire protection and protection against electrical hazards.

The Clean Air Act of 1970 has had a negative impact on the production of surface mined coal through enforcement of fugitive dust regulations. Under this Act the "scenic vistas" concept can affect the location of both surface and underground mines.

In addition to the statutes mentioned above, federal and state taxes also have a direct effect on the cost of coal production. Chief among these are black lung taxes, abandoned mine lands reclamation fees, and state severance taxes. The federal black lung tax is imposed on all coal production in the United States (except lignite). The tax currently is $1.10 per ton on coal mined underground and 55 cents per ton on surface mined coal or 4.4 percent of the sales price. The taxes go to the Black Lung Disability Trust Fund, which pays black lung benefits to miners for whom there is no responsible operator. The abandoned mine lands fee is imposed by SMCRA at a rate of 35 cents per ton on surface coal and 15 cents per ton on underground coal. The fees go to the Abandoned Mine Lands Fund, which in turn allocates the money to the states to reclaim abandoned lands. State severance taxes may vary considerably from state to state. Some states impose no severance tax on coal. In states that do, severance taxes are generally levied at specific amounts per ton of coal produced or at a percentage of the gross value of the coal at the mine. These severance taxes, in some cases, represent a *substantial* portion of the production costs. (See Appendix E)

The laws and regulations cited above have a significant effect on the cost and manner of coal mining. These production-related statutory costs, however, are not the only additional costs. Federal laws also govern the transportation and additional consumption of coal. In coal transportation the Staggers Rail Act of 1980 is the most significant statute. The Staggers Act continued many of the regulatory changes that were initiated under the Railroad Revitalization and Regulatory Reform Act of 1976. Among other things, it limited the authority of the Interstate Commerce Commission (ICC) to intervene in rate matters, legalized the use of contract rates, and increased the flexibility of rail carriers in mergers and abandonments. While these issues have been debated intensely among shippers and carriers, there is little question that transportation costs can have a significant impact on the delivered price of coal.

In coal consumption, the law that has the greatest effect on the coal industry is the Clean Air Act of 1970. The Clean Air Act regulates pollution from stationary and mobile sources. Several pollutants from coal-fired power plants are controlled under the Act but the most important, in terms of coal production, is sulfur dioxide (SO_2). Under the Clean Air Act, there are three distinct types of power plants. Generally, plants built before 1971 are regulated under State Implementation Plans (SIPs) that set allowable emission rates. Plants built after 1971 and licensed before September 1978 are subject to the original New Source Performance Standard (NSPS), which requires plants to meet an emission limit of 1.2 pounds of sulfur dioxide per million Btu of heat input. Power plants built after September 1978 are subject to the revised NSPS, which requires that they not only meet the 1.2 pound standard but must also meet a percentage reduction from uncontrolled levels using the best available control technology (BACT). Efforts to reduce emissions of sulfur dioxide have a direct effect on the cost of coal consumption and, therefore, the overall size and distribution of the coal market.

Laws and Regulations That Have A Physical Impact on the Availability of Coal Reserves

Some of the laws that govern the coal industry not only have an economic impact on mining, but they also have an actual physical impact on coal reserve availability. The most notable laws affecting coal reserve availability are the Mineral Leasing Act of 1920, as amended by the Federal Coal Leasing Amendments Act of 1976 and implemented by the Federal Coal Management Program, and the Surface Mining Control and Reclamation Act of 1977. Major provisions in those statutes preclude future leasing and mining on certain lands and establish a procedure to designate other lands as unsuitable for mining. In addition, the royalty provisions of the Federal Coal Leasing Amendments Act have a dramatic impact on the cost of production, thereby affecting the recoverable amount of coal reserves.

The Federal Coal Leasing Laws and Coal Management Program

The federal government is the nation's largest owner of coal lands, holding about fifty (50) percent of in-place reserves in the United States. Nearly all of the federal coal reserves are located west of the Mississippi River. The federal government retained the mineral rights when public domain lands in the West were disposed of in various settlement laws (such as the Homestead Act and the Desert Land Act) which were enacted at the turn of the century. Thus, much of the federally-owned coal lies under private lands.

The government manages its coal resources through the Federal Coal Management Program, which coordinates coal leasing in conjunction with state and local authorities. Under the federal coal leasing program, certain areas of the country are designated as unsuitable for all or certain types of coal mining. These unsuitable areas are removed from the planning process altogether and not leased or are left in the planning process, but only for certain stipulated methods of mining.

Under the current regulations, the following lands are considered unsuitable for leasing:

1. Lands in the federal land preservation system;
2. Lands within rights-of-way or easements;
3. Lands within 100 feet of cemeteries and public roads and within 300 feet of public and residential buildings;
4. Wilderness study areas under review;
5. Class 1 scenic areas;
6. Lands used for scientific study involving food, natural resources or technology demonstrations;
7. Publicly owned places included in the National Register of Historic Sites;
8. Lands designated as National Landmarks;
9. Lands designated as essential habitats for threatened or endangered species of plants and animals (federal or state designation);
10. Nesting sites and buffer zones for bald and golden eagles and roosting sites for migration and wintering;
11. Falcon nesting sites and appropriate buffers;
12. High priority habitats for migratory birds of high federal interest;
13. Essential habitats for resident fish and wildlife species of high interest to a state;
14. Lands in riverine, coastal or special flood plains;
15. Lands committed for use as municipal watersheds;
16. National resource waters identified in State water quality management plans;
17. Certain alluvial valley floors;
18. Lands deemed unsuitable under criteria proposed by a state and adopted by the Secretary of Interior.

Because these lands are considered unsuitable for leasing, the coal reserves that are contained within their boundaries should be excluded from the DRB. The laws and regulations administered through the Federal Coal Management Program can prevent a significant portion of federal reserves from ever being mined.

The new royalty levels imposed by the Federal Government which have increased royalty rates (to 8 percent on coal mined underground and 12½ percent on coal mined at the surface) from previous levels could prevent significant reserves from ever reaching production. The increases from previous royalty levels have been in some cases as much as 2000 percent or more. These laws, therefore, have a significant economic effect on actual coal reserve availability. Federal coal which is by-passed as a result of high royalty levels can become sterilized, removing these reserves from the DRB forever.

Surface Mining Control and Reclamation Act

The Surface Mining Control and Reclamation Act (SMCRA) was enacted by Congress in 1977 to establish a nationwide program to protect society and the environment from the adverse effects of surface coal mining. Among other objectives, SMCRA was enacted to prohibit mining activity in certain areas and to assure that mining would not occur where reclamation is not feasible.

For purposes of coal reserve availability, the most important provisions of SMCRA are those that designate certain lands as unsuitable for mining. The unsuitability provisions are contained in Section 522 of the Act and are divided into three major categories: lands on which there is an express statutory prohibition on surface mining, lands that are subject to mandatory unsuitability designation by the state authority and lands that are subject to discretionary designation of unsuitability by the state regulatory authority.

SMCRA specifically prohibits surface mining in the following circumstances:

1. On lands within the boundaries of the National

Park System, the National Wildlife Refuge System, the National System of Trails, the National Wilderness Preservation System, the Wild and Scenic Rivers System, and National Recreation Areas designated by Congress;

2. On federal lands within the boundaries of a national forest (with specified exemptions);
3. On lands where mining would adversely affect publicly owned parks or places included in the National Register of Historic Sites;
4. On lands within 100 feet of public roads or cemeteries;
5. On lands within 300 feet of an occupied dwelling, unless waived by the owner.

In addition to those lands specifically precluded from mining by statute, lands must be designated as unsuitable for surface mining, upon petition by an interested party, if the state regulatory authority determines that reclamation, as required by the Act, is not technologically or economically feasible. The state also has discretionary authority under SMCRA to designate certain other lands as unsuitable for surface mining. Upon petition by an interested party, lands may be designated as unsuitable if the mining operation would:

- Be incompatible with existing state or local land use plans;
- Result in significant damage to important historic, cultural, scientific, and aesthetic values on fragile or historic lands;
- Affect renewable resource lands, including water supplies, food and fiber production and aquifiers;
- Affect natural hazard lands such as flood plains and areas of unstable geology.

While SMCRA permits mineral exploration on lands designated by a state as unsuitable for certain types of mining, new surface mines on those lands are prohibited. The coal underlying such lands, therefore, should be removed from the U.S. coal reserve estimates.

In addition to designating certain lands as unsuitable for new surface mining operations, SMCRA also regulates surface effects of underground mines (Section 516). In terms of coal reserve availability, the most pertinent provision is that which requires the state regulatory authority to suspend underground mining operations under populated areas and adjacent to industrial or commercial buildings, major impoundments or permanent streams if it finds an imminent danger to the inhabitants of those areas.

Recognizing that underground mining can adversely affect surface areas, SMCRA stipulates that each mining permit shall require, among other things, that the operator:

- Prevent subsidence that causes material damage to the extent technologically feasible, maximize mine stability and maintain the value and reasonably foreseeable use of such surface lands;
- Protect off-site areas from damage;
- Eliminate conditions that constitute a hazard to the health and safety of the public;
- Minimize disturbances to the prevailing hydrologic balance in off-site areas and to the quantity of water in surface ground water systems;
- Minimize disturbance and adverse impacts on fish, wildlife and related environmental values.

There is reason to believe that the provisions of Section 516 of SMCRA may constrain coal production in mines that utilize longwall panels and, therefore, may affect the availability of coal reserves. In order to assess the potential for such disruption, a brief survey was conducted of regulatory handling of longwall subsidence issues in major longwall mining states. The states surveyed include: Alabama, Colorado, Illinois, Ohio, Pennsylvania, Utah, Virginia, and West Virginia. In general, the surveyed states reported similar regulatory handling of surface effects of underground mining. Most of them stress detailed planning to control subsidence and prevent surface damage. They also provide for restoration, rehabilitation, or compensation at fair market value for damage to property. Pennsylvania appeared to have the most restrictive regulation of longwalls, requiring that half of the coal beneath homes, public buildings and cemeteries be left unmined. The other surveyed sites do not have similar percentage limits on extraction. Colorado prohibits longwall mining in "critical" areas, which generally are areas that have the potential to damage water supplies. Utah has the authority to limit mining to one seam in a multiple-seam deposit. Other than these restrictions, most states report that they generally follow the regulatory scheme outlined in the SMCRA regulations.

Although regulations to mitigate surface effects of underground mining generally require significant planning and compensation for property damage, such regulations do not appear to limit the availability of coal reserves to the same extent as

the unsuitability criteria of SMCRA or those established under the Federal Coal Management Program. However, as a result of regulations pursuant to Section 516, significant portions of coal reserves could be precluded from mining and recovery.

Laws and Regulations Preventing Accurate Determination of the Amount of Coal Reserves/Resources in Certain Areas

Some laws preclude any mining activity, including exploration and drilling activities to determine the extent of coal resources. Chief among these is the Wilderness Preservation Act. This prohibition may preclude complete and accurate determination of coal quality and suitability for mining and other factors determining the recoverability of these coal reserves.

The National Park Service exercises discretionary authority over which lands can be considered for incorporation into the National Park, Monument and Landmark inventories. Once lands are targeted by the Park Service for such designation, mining can be prohibited in the discretion of the Secretary of the Interior, as a result of "Scenic Vista" provisions until final determination is made by Congress as to whether or not these should be awarded National Park, Monument, Landmark, etc., status.

Proposed Laws and Regulations Potentially Affecting Coal Reserve Availability and Production

In addition to existing laws and regulations that increase the cost of coal production and consumption or constrain availability of coal reserves, future regulations may exacerbate those effects. Targeted in the proposed laws and regulations are:

- fugitive dust emissions from surface coal mines;
- acid rain;
- application of 300 foot buffer zones to underground mining;
- new bases for valuation of coal produced for royalty determination purposes.

These legislative and regulatory initiatives may prove to be highly disruptive to the coal industry. Control of fugitive dust emissions may significantly limit the size of surface mines, thereby increasing the cost of mining. Acid rain legislation may cause a substantial disruption of current coal production patterns. Proposed subsidence regulations could result in wholesale elimination of coal reserve blocks. Increased federal royalties may severely limit production in the short term and effectively sterilize some reserves for future recovery. Application of 300 foot buffer zones to underground mines would increase the cost of mining and would render certain coal reserves unmineable. These proposed regulations could result in significant increased costs which may materially affect the long term availability of coal reserves and force current reserves to be abandoned—never to be mined again.

Recommendations

The National Coal Council concludes that many of the local, state and federal laws, policies and regulations adversely impact the amount of coal that can be recovered from the DRB. In light of the above conclusions, the following recommendations are offered by The National Coal Council:

1. **The Secretary of Energy should undertake a major examination of all current local, state, and federal laws and policies, regulations, and decisions of regulatory bodies to determine which of these adversely impact the amount of mineable coal reserves in the United States.**
2. **The Secretary of Energy should establish a high level inter-agency working group within the Federal Government to study, address and analyze any and all proposed laws, policies, regulations, statutes and actions of regulatory bodies which pertain to the mining of and exploration for coal. Such a working group might include the Secretaries of the Department of Energy, the Department of the Interior, the Department of Transportation, and the Department of Labor, as well as the Administrators of the Environmental Protection Agency, Federal Energy Regulatory Commission, and other appropriate officials.**
3. **The Secretary of Energy should consider a major high-level meeting of governors and key legislators from coal-producing states to identify the laws, policies, regulations and decisions that could significantly reduce the amount of recoverable coal.**

Chapter 3

The Effect of Regulations on the Coal Reserve Base

One of the charges of the Reserve Data Work Group was to assess the impacts on the recoverable reserves from government regulation on the federal, state, and local level. A detailed quantification of these impacts is a task which, while essential for decision making, is beyond the resources available for this report. However, the relative severity of the impacts from regulations has been estimated from the responses to a questionnaire sent out to major coal producers in the United States. Recommendations for essential future study to better quantify these effects are put forth in the final portion of this chapter.

Regulations affect recoverable reserves in two basic ways. The most obvious impacts are from regulations which make certain reserves inaccessible to mining such as those reserves that lie within the boundaries of the National Parks. Less obvious, but of great significance, are those regulations which affect the economics of coal extraction and therefore, the recoverable reserves. Both these areas are discussed here. In addition, the potential impacts of proposed regulations are discussed in this section in a more general manner. These impacts reinforce the necessity of better information both on the reserve base itself and on the impacts of present and proposed regulation.

The method used here in determining the regulations which impact reserves and the severity of the impacts was to sample the industry. Letters were sent out to many of the coal producers in the United States asking for their assessment of the regulations affecting the reserve base as well as their estimation of the degree of impact. In all, ten responses were received from which this assessment was constructed (Appendix B). It should be noted that this is not necessarily a representative cross-section of the industry, but rather more of a random sampling to provide a basis for discussion. Because of limited time and resources, a detailed and in-depth basis for quantifying the impacts of regulations could not be derived. The Council feels this issue may be best undertaken by the Secretary of Energy, as stated in the recommendations at the end of this section.

Direct Effects of Regulations on Recoverable Reserves

The most obvious impacts to recoverable reserves stem from regulations which eliminate certain areas from consideration for mining altogether. While these impacts are the most straightforward to quantify, several difficulties in this assessment appear. The primary difficulty lies in determining whether the coal in these areas can be classified as recoverable reserves. A second difficulty is posed by certain regulations which prevent exploration in these areas. Consequently, there may be reserves which have not been included in the reserve base which are affected by this group of regulations.

FEDERAL COAL LEASING LAWS

Coal mining is prohibited in certain designated lands containing federally owned coal. Among these lands are: national parks, historic sites, national forests, and alluvial valley floors. Many of these areas are protected from exploration activities also, which prevents full knowledge of potential reserves. The total impact of these regulations on the recoverable reserve base is not known, but is likely to be significant enough to merit further investigation.

The National Park Service can effectively remove coal reserves from the DRB by merely designating an area under consideration for national park, monument or landmark status. While this action does not physically eliminate coal reserves, it can tie up those reserves, prevent exploration, and create a "scenic vista buffer zone" around such areas for years while Congress is making a final determination. If the reserves are by-passed and become sterilized or go unrecognized, then there would be

potential for 100 percent of those coal reserves to be lost forever.

SURFACE MINING CONTROL AND RECLAMATION ACT

The provisions of SMCRA have very significant direct impacts on recoverable reserves. Three main areas of regulation under this Act limit coal mining activities on lands on which reclamation cannot be performed in an acceptable manner, lands which are deemed unsuitable for mining, and lands where the surface effects of underground mining are closely controlled.

Among all the regulations which directly impact recoverable reserves, the regulations under SMCRA which designate lands where acceptable reclamation cannot be performed, appear to have the most severe impact. The protection of alluvial valley floors (AVF) and or prime farmland has the greatest effect. Respondents to the questionnaire provided estimates of lost reserves ranging from fifteen to twenty-five percent on lands where these regulations are applicable.[4]

The second major impact of SMCRA stems from the regulations dealing with lands designated unsuitable for mining. As in the case of the designation of lands as unsuitable for federal coal leasing, these lands include: national parks, national forests, sensitive areas for wildlife, historic and archaeological sites. However, these regulations prohibit mining regardless of ownership rather than prohibiting leasing. While quantifying the impact of these regulations is difficult, the effects do not appear to be as severe as the impact of those regulations governing reclamation. Respondents to the questionnaire indicate that, in local areas, these impacts can be quite severe.[5]

Control of the surface effects of underground mining is the third major area of regulation under SMCRA which directly impacts recoverable reserves. Respondents indicate a wide range of impacts: from two to thirty-five percent of recoverable reserves are lost due to these regulations.[6] The primary area of concern appears to lie in the barriers/buffer zones mandated from occupied dwellings, streams, public roads and other infrastructure. In this area, the limitations on longwall mining appear particularly severe.

FEDERAL MINE SAFETY AND HEALTH ACT (MSHA) REGULATIONS

The regulations dealing with the necessity of leaving "bleeder" around pillar areas (30 CFR Section 75.3176-2) have a direct impact on recoverable reserves. Several respondents estimate losses to total reserves in the neighborhood of one-to-two percent.[7]

STATE AND LOCAL REGULATIONS

Included in this area are those regulations of the U.S. Army Corps of Engineers which directly affect recoverable reserves. In many states, environmental and tax laws are such as to both physically and economically limit the mining or the accessing of reserves. In addition, the regulatory practices of some local and state public service commissions discourage mining activity. The state and local regulations which directly impact recoverable reserves include buffer zones for navigable waterways, for landowners, city limits, oil and gas wells, petroleum pipelines, for electrical transmission lines, and for public highways. While most of the buffers deal with protection from subsidence, highwall benching requirements for surface mining are designed to protect landowners. The estimates from respondents of losses from these regulations are between two-to-five percent.[8]

Indirect or Economic Impacts On Recoverable Reserves

All regulations which impose limitations on operations or requirements for reporting, permitting, or bonding affect the economics of coal recovery by generating additional costs. Within the context of a competitive coal and energy market, these additional costs have the effect of reducing recoverable reserves. The additional costs from regulation cause the producers to drop those reserves with the highest incremental mining costs in order to remain competitive. While some of these reserves will remain accessible to future mining if economics

4. Information provided to William Greenough by William Karis of Consolidation Coal (Consolidation) at the March 20 meeting of the Reserve Data Base Work Group in Denver, CO. (Appendix B). Based on replies to the February 26, 1987, letter of Stuart B. Ehrenreich, Chairman, Reserve Data Base Work Group, The National Coal Council, (hereinafter Ehrenreich). Island Creek Coal to Ehrenreich, March 16, 1987. North American Coal Corporation to Ehrenreich, March 27, 1987.
5. Consolidation. Island Creek Coal to Ehrenreich, March 16, 1987.
6. Consolidation. Island Creek Coal to Ehrenreich, March 16, 1987. North American Coal Corp. to Ehrenreich, March 27, 1987. Jim Walter Resources, Inc. to Ehrenreich, March 26, 1987.
7. South Atlantic Coal Company, Inc. to Ehrenreich, March 16, 1987. AMAX to Ehrenreich, March 13, 1987.
8. Consolidation Coal to Ehrenreich, March 20, 1987. Island Creek Coal to Ehrenreich, March 16, 1987. AMAX to Ehrenreich, March 13, 1987.

allow, other reserves will be effectively sterilized when by-passed due to economies of scale and backfilling requirements.

Arrival at an accurate assessment of the impacts in this area is difficult and will vary from region to region, due to the complexities of competition in the energy market. However, the impacts appear to be quite significant, particularly for near-term planning.

An ensuing discussion of taxes, federal leasing laws as administered under the Federal Coal Management Program, SMCRA, MSHA, Clean Air Act regulations, and state and local laws and regulations illustrates the economic impact on recoverable reserves.

TAXES

Taxation from state and federal agencies adds directly to the cost of coal production, which in turn, affects the amount of economically recoverable coal. This may result in the sterilization of reserves which are by-passed due to economic considerations.

Current federal taxes pertaining to coal mining are the Black Lung tax and the Abandoned Mine Lands Reclamation fee. Taxation on the state level affecting economics of coal recovery is in the form of severance taxes (Appendix E). The federal taxes amount to as much as $1.25 per ton for underground coal or $0.90 per ton for surface coal. In most cases this represents a significant percentage of the total costs of mining. State severance taxes vary widely from state to state. While many states impose no severance tax, other states impose severance taxes which have a substantial impact on recoverable reserves.

FEDERAL COAL LEASING LAWS

Three requirements within the federal coal leasing regulations were identified as causing loss of reserves due to economic impacts to the producers. These requirements deal with the formation of Logical Mining Units (LMU), with demonstrating due diligence in developing a federal lease, and with the royalties imposed for recovery of federal coal. In the case of formation of LMUs, limitations on the total size of each unit, production and royalty requirements, and ramifications in relation with other lessors all affect the economics of mining. One respondent noted the potential need to relinquish federal leases at one mine amounting to forty percent of the total reserves.[9]

The due diligence regulations of the Federal Coal Leasing Amendments Act require a lessee to be producing "commercial quantities" of coal from that lease within ten years. If this requirement is not met, the lessee is barred from bidding on any other leases involving energy producing minerals. In the case of many producers, this is making it uneconomic to hold these leases, even if slated for development. One respondent noted the relinquishment of a large block of reserves even after development had begun.[10]

Royalties set for recovery of federal coal have direct impact on the economics of mining within a competitive energy market. Federal royalties for new federal leases and renewals of older leases have been set at twelve and one-half percent for surface coal and eight percent for underground coal. This has a two-fold impact on recoverable reserves. First, the royalty paid directly affects the cost to the end consumer. In a competitive market, this has the effect of requiring the producer to limit production costs accordingly, which eliminates some higher-cost reserves from mining consideration.

The regulated federal royalty also has the effect of raising the royalty level in the private sector as well. Lessors are naturally unwilling to receive less than the federal government for coal extracted from their properties. This places additional economic constraints on those producers with mixed ownerships. The severity of the impact to recoverable reserves has not been estimated, but it may be quite significant.

While much of the reserves relinquished due to federal leasing regulations may remain recoverable in the long term, the economics of extraction in the short term have been affected negatively in many cases. Some of these reserves will have become sterilized due to the economies of scale and by-passing.

SURFACE MINING CONTROL AND RECLAMATION ACT

The major areas of the SMCRA which indirectly impact recoverable reserves are permitting requirements, requirements for reclamation to approximate the original surface topography, and controls on the surface effects of underground mining. Direct permitting costs are generally not of major consequence when compared to the overall costs of a medium-to-large coal mine. For smaller mines and mines with many small ownership parcels, however, the direct costs can be significant. A more

9. Kaiser Coal Corp. to Ehrenreich, March 11, 1987.

10. Island Creek Coal to Ehrenreich, March 16, 1987.

important component in the cost of permitting lies in the time required for the permitting process. Within the competitive energy framework, the costs from this factor are generally much more significant than the direct costs. Estimation of loss of reserves due to permitting from one respondent was approximately one percent of total reserves.[11] Another respondent estimated a three-to-four percent loss due to permitting, bonding and reclamation regulations.[12]

Regulations requiring the producer to reclaim sites to a close approximation of the original topography have a significant impact on the recoverable reserves. One respondent estimates that up to forty percent of its surface mineable reserves are lost due to these regulations.[13] This area should be noted for further investigation.

The limitations posed by regulations on the surface effects of underground mining have a significant impact on the economics of mining. These regulations generally eliminate any longwall mining from specified buffer zones around infrastructure. The direct loss of this coal also affects the economics and the rest of the reserve in any given mine. One respondent estimated that twenty percent of its deep reserves are lost due to these regulations.[14]

FEDERAL MINE SAFETY AND HEALTH ACT

MSHA regulations governing mine ventilation, steep slope mining, pillar recovery and opening size all indirectly impact recoverable reserves. Estimations of reserve losses from the regulations by several respondents range from less than two percent to six percent.[15]

CLEAN AIR ACT

Current federal, state and local regulations governing sulfur dioxide (SO_2) emissions have a very significant impact on economically recoverable reserves. If the demand is lacking, the coal found in high sulfur regions may never be produced. An accurate assessment of this impact is not possible at this time because of the lack of coal quality information in our current DRB. It is safe to say, however, that with current technology there are large amounts of coal which cannot be mined and marketed. One respondent estimates that thirty-five percent of its reserves are not marketable because of these regulations. An additional thirty-five percent of its reserves are becoming unmarketable for the same reasons.[16] This condition is generally true for all producers with higher sulfur coal reserves.

STATE AND LOCAL LAWS AND REGULATIONS

In certain areas, particularly where the ownership is broken into a large number of small parcels, state and local permitting costs can be prohibitive. One respondent has estimated that it loses up to thirty (30) percent of its reserves in such areas.[17]

Additionally, many coal producing states have both pro-mining and anti-mining groups which significantly impact regulation. In many cases this has resulted in increased cost of permitting, monitoring, and operating coal mines.

IMPACTS DUE TO NUMBERS OF AGENCIES

A significant area which impacts the recoverable reserves is the number of different local, state and federal agencies with which a producer must deal. There is a cost associated with every permitting and reporting requirement which must translate into a loss of otherwise recoverable reserves. The number of agencies with which any producer must interact has been increasing which has resulted in a correspondingly increasing impact on recoverable coal reserves.

In the case of one producer a study indicated that in conducting their business today they must deal with over 100 local, state and federal entities as compared with over sixty in 1980. This, they have shown, has added notably to their production costs.[18]

The way in which these various agencies interact also affects mining costs. As the number of agencies increases, there is an increase in the duplication and confusion of jurisdiction. In many cases, several different agencies control the same aspect of mining, each from a slightly different perspective. The resulting confusion costs the producer time and money in satisfying each of the separate agencies.

This is an area which most likely has significant impact on recoverable reserves and should therefore merit further study.

11. Consolidation.
12. South Atlantic Coal Co., Inc. to Ehrenreich, March 16, 1987.
13. The United Company to Ehrenreich, April 3, 1987.
14. Ibid.
15. South Atlantic Company to Ehrenreich, March 16, 1987. AMAX to Ehrenreich, March 16, 1987. Kaiser Coal Corp. to Ehrenreich, March 11, 1987.
16. Marietta Coal Company to Ehrenreich, March 11, 1987.
17. Ibid.
18. Usibelli Coal Co.

Overall Impacts

It is interesting to note the range of the estimates from the respondents as to the overall impacts on recoverable reserves from all regulations. The range of estimates of reserve loss was from five percent up to fifty percent.[19] The differences between the endpoints can probably be explained by the differences in operations, reserve holdings, and geographical locations. One respondent estimates its total reserve loss as due to loss in productivity that it ascribed to regulation. This estimate amounted to a reserve loss of approximately thirty-three percent.[20]

Potential Effects of Proposed Regulations

There are two areas of proposed regulation in which very significant impacts on recoverable reserves may be anticipated. Because of the multitude of proposed regulations, and the limited understanding of the reserve base, only these two areas will be discussed. They are: clean air regulations and subsidence regulations. While current SO_2 limitations appear to have a significant impact on reserves, future regulations are certain to be even more restrictive. Many producers will simply have to shut down due to lack of demand under the proposed 1.2 pounds of SO_2 per million Btu limitation. The impacts of these regulations alone should justify the effort for a better understanding of the reserve base (including quality information.) The ability of technology to assist in overcoming some of these limitations also needs to be addressed.

Fugitive dust control regulation is another area in which proposed regulations may have a significant impact on the costs of surface mining operations. Some of the proposed rules would effectively limit the size of surface mines to a maximum production of one million tons per year. If this rule were promulgated, it would result in the closure of over ninety percent of the mines in the Powder River Basin. This would remove over 100 million tons of production and cause massive reserve losses due to sterilization. Regulations on the control of surface effects of underground mining which recently have been upheld by the U.S. Supreme Court also appear to have significant impact on reserves. These regulations which further control the buffer zones around infrastructure have been estimated by one respondent to cause the potential loss of thirty-five percent of all underground reserves. This is especially true if those reserves could otherwise have been mined using longwall technology.[21]

Recommendations

The National Coal Council concludes that many local, state and federal laws, policies, and regulations measurably reduce the amount of recoverable coal in the DRB and prevent exploration, identification, and exploitation of future coal reserves. Based on this conclusion, the following recommendations are made by The National Coal Council:

1. **The Secretary of Energy should institute a comprehensive, highly detailed survey of U.S. coal producers in order to obtain a more in-depth and complete view of the quantifiable impacts that laws, policies, regulations, and decisions of regulatory bodies have on the recoverable coal in the DRB.**
2. **The Secretary of Energy should initiate a study addressing the long- and short-term impacts to recoverable coal in the DRB due to increased costs needed to comply with laws, policies, regulations, and so forth. This study would help to clarify whether some or all reserves thus affected and removed from potential production in the short-term should still be considered recoverable reserves in the future.**
3. **The Secretary of Energy should develop a framework which will readily allow quantification of the impacts to the recoverable coal in the DRB stemming from changes in or from newly proposed laws, policies, regulations, and decisions of regulatory bodies.**
4. **In order to facilitate the implementation of recommendation Number 3 (above), the Secretary of Energy should develop and propose legislation that would impose an *"Energy Impact Statement"* (similar to the Environmental Impact Statement). Such a procedure would force legislative, administrative, and regulatory bodies to consider the impact of new or proposed laws, policies, and regulations on current and future energy supply and security as well as the economic impact that such laws, policies and regulations may have.**

19. Island Creek Coal, North American Coal Corp., South Atlantic Coal Co., AMAX, The United Companies, Marietta Coal Co. to Ehrenreich.
20. Jim Walter Resources, Inc. to Ehrenreich, March 26, 1987.
21. Consolidation.

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   General Industries & Blasts Furnaces (Instructions)
3. Weekly Coal Monitoring Report
   Coke Plants
4. Weekly Telephone Surveys of Coal Burning Utilities
5. Coal Production Report
6. Quarterly Coal Consumption Report
   Manufacturing Plants
7. Coke Plant Report (Quarterly)
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Appendices

Appendix A

State Geological Survey Information

The following letters and information were received by The National Coal Council in response to the January 8, 1987, inquiry by William M. Kelce, a member of the Reserve Data Base Work Group, concerning state geological surveys' estimates of the coal reserve base in their respective states. The National Coal Council gratefully acknowledges their contributions to this report.

GEOLOGICAL SURVEY OF ALABAMA

420 Hackberry Lane
P. O. Box O, University Station
Tuscaloosa, Alabama 35486
(205) 349-2852

ERNEST A. MANCINI
State Geologist
and
Oil and Gas Supervisor

DIRECTORS
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Geocartographic Laboratory, T. V. Stone

January 15, 1987

Mr. William M. Kelce
President
Alabama Coal Association
244 Goodwin Crest Drive
Suite 110
Birmingham, AL 35209

Dear Bill:

This is in response to your letter of January 8 requesting information on Alabama's coal reserves. I am enclosing a copy of Geological Survey of Alabama Circular 118 which provides the most up-to-date and comprehensive information available on Alabama's coal resources and reserve base. The text of this report details the data-related problems encountered during its preparation but I will summarize them briefly here for your convenience.

Because the resource tonnages were to be generated at the coalbed level, it was necessary to obtain historical production data by coalbed which, we discovered, was not available. Production tonnages by bed were eventually derived but the accuracy of the figures was not high. Also, coal thickness data were not available in all areas in sufficient density to allow adequate evaluation of the resource potential of those areas. These two factors could cause significant local variation in the distribution of the published resource figures but probably would not excessively alter the state resource picture.

Another potentially important gap in Alabama's coal resource estimates is the absence of tonnage estimates for various coal quality parameters (e.g. sulfur, ash, etc.). For example, resource tonnages of coal with a sulfur content of 1% or less could provide valuable data for resource planners and the Survey is presently developing the capability to produce such data.

In response to the second part of your inquiry, workable reserves in Alabama would be impacted to some extent by regulatory restrictions but we have no figures that define the magnitude of that impact.

If we can be of further assistance in this matter, please do not hesitate to call.

Sincerely,

Tom

Thomas W. Daniel, Jr.
Chief Geologist

FROM THE DESK OF: Louis Hunter

Alabama Coal Association
Attn: William M. Kelce
244 Goodwin Crest Drive, Suite 110
Birmingham, AL 35209

Dear Bill:

Enclosed is the information you requested of our association.

I hope 1987 is good to you.

Sincerely,

Louis

January 21, 1987

AVERAGE RAW COAL ANALYSIS

SEAM	COUNTY	NO.	% VOLATILE	FIXED % CARBON	% ASH	% SULFUR	BTU/LB MF*	BTU/LB MFF**	ASH SOFT TEMP F°
Taggart	Lee	(1)	37.3	58.0	4.8	0.6	14000	15540	2647
High	Wise	(2)	34.7	54.4	4.8	0.8	13400	15000	2637
		(3)	35.2	58.4	6.3	0.6	14100	15040	2733
		(3)	34.6	54.3	11.1	1.0	13430	15100	2746
		(2)	37.0	55.3	7.6	0.6	14130	15300	2800
		(6)	34.2	59.4	6.3	0.7	14240	15190	2701
		(1)	36.2	60.5	3.2	0.6	14800	15300	2539
		(2)	34.2	58.4	7.5	1.4	14140	15280	2600
		(2)	34.4	57.7	7.9	0.7	13940	15140	2700
		(11)	34.2	78.4	8.6	0.8	13900	15200	2528
		(2)	34.2	57.3	8.5	0.8	13970	15280	2515
		(4)	32.9	61.7	5.6	0.6	14050	15430	2697
		(5)	34.7	57.5	7.7	2.5	14050	15230	2170
		(6)	32.4	58.5	8.8	1.2	13600	15270	2695
		(1)	38.3	55.9	5.8	1.6	14240	15120	2179
		(1)	35.8	59.0	5.2	0.5	14660	15460	2787
		(1)	34.4	57.2	8.5	0.7	13850	15130	2566
		(3)	32.4	57.1	13.5	1.1	13860	15110	2491
		(1)	32.7	60.2	7.1	0.7	14460	15570	2692
		(4)	29.1	53.1	17.7	0.6	12470	15160	2528
		(2)	31.1	59.7	9.3	0.6	14050	15480	2300
		(4)	33.2	60.3	6.6	1.0	14260	15280	2670
		(2)	34.1	62.0	4.2	1.9	14680	15300	2265
		(1)	31.2	57.5	11.3	2.9	13490	15210	2359
		(1)	29.6	54.4	16.0	0.6	12840	15290	2000
		(1)	32.1	59.2	8.7	1.0	13990	15320	2170
		(6)	34.4	53.0	12.6	1.5	13380	15310	2457
		(7)	31.0	57.1	11.8	0.8	13590	15410	2462
		(6)	33.1	56.8	10.2	0.9	13930	15470	2410
		(2)	23.7	56.5	19.9	0.7	12410	15470	2670
		(1)	23.4	51.5	25.1	0.5	11490	15340	2665
		(3)	22.0	54.3	23.7	0.7	11660	15270	2800
		(1)	34.2	59.7	6.1	1.3	14440	15360	2494
		(3)	29.4	55.4	15.2	1.3	13030	15360	2668

e
Ash Free
Dickenson; Buch = Buchanan; Dor = Dorchester; Russ = Russell.

1986 VIRGINIA COAL RESERVES BY SEAM
(MILLIONS OF TONS)

	LEE	WISE	RUSS	DICK	TAZE	BUCH	TOTAL	PERCENT
	0.00	111.22	124.91	433.43	6.78	721.51	1399.85	15.96
	0.00	146.01	238.45	469.07	72.32	314.96	1240.81	14.14
	0.00	129.12	95.61	308.50	29.93	586.83	1149.99	13.11
	0.00	7.97	8.19	298.03	0.00	637.57	952.56	10.85
	0.00	113.22	41.49	313.49	0.32	270.68	739.40	8.42
	0.00	80.52	11.41	276.25	0.00	0.54	368.72	4.20
Dorchester	1.56	170.18	0.04	91.85	0.00	91.76	355.39	4.05
Clintwood	84.35	141.11	0.00	63.95	0.00	60.80	350.21	3.99
Hagy	0.00	8.94	0.00	50.57	0.00	260.40	319.91	3.65
Tiller	0.00	5.09	126.79	4.28	42.05	62.50	240.71	2.74
Eagle	0.00	0.00	0.00	13.72	0.00	187.94	201.66	2.30
Imbodon	53.68	137.46	0.00	0.41	0.00	0.00	191.55	2.18
Blair	9.12	142.67	0.00	12.96	0.00	23.01	187.76	2.14
Norton	0.00	157.59	0.00	1.26	0.00	0.00	158.85	1.81
Kelly	15.95	125.96	0.00	0.00	0.00	0.00	141.91	1.62
Pocahontas # 3	0.00	0.00	0.00	0.00	81.41	54.16	137.53	1.57
Lyons	5.73	124.34	0.00	8.65	0.00	0.00	138.72	1.58
Taggart	34.76	76.78	0.00	0.00	0.00	0.47	112.01	1.28
Low Splint	18.97	93.09	0.00	0.00	0.00	0.00	112.06	1.28
Taggart Harker	28.43	77.41	0.00	0.00	0.00	0.82	106.66	1.22
Upper Standiford	0.00	63.43	0.00	0.00	0.00	0.00	63.43	0.72
Pardee	1.85	57.60	0.00	0.00	0.00	0.00	59.45	0.68
Morris	1.98	25.12	0.00	0.00	0.00	0.00	27.10	0.31
High Splint	0.00	17.34	0.00	0.00	0.00	0.00	17.34	0.20
TOTAL	256.48	2012.17	646.09	2427.23	236.81	3194.15	8773.72	100.00

Source: Virginia Division of Mines and Quarries.

Resource Development Council
for Alaska, Inc.

807 "G" Street, Suite 200, Anchorage, Alaska 99501-3440
Box 100516, Anchorage, Alaska 99510-0516 – 907/276-0700

January 19, 1987

Mr. William M. Kelce
Alabama Coal Association
244 Goodwin Crest Drive, Suite 110
Birmingham, Al. 35209

Dear Mr. Kelce:

As per your request of January 8, 1987, here is some basic information detailing Alaska's coal reserves and potential. I hope this material will help you in your project with the National Coal Council.

Sincerely,

RESOURCE DEVELOPMENT COUNCIL
for Alaska, Inc.,

Carl Portman

Carl Portman
Public Relations Director

THE ALASKA COAL ASSOCIATION

C.O.A.L.

COAL OPERATORS AND ALASKA LEASEHOLDERS

2173 University Avenue South, Suite 101
Fairbanks, Alaska 99709
(907) 479-2630

January 19, 1986

Mr. William M. Kelce
President
Alabama Coal Association
244 Goodwin Crest Dr., Suite 110
Birmingham, Alabama 35209

Dear Mr. Kelce:

Thank you for your letter of January 8th requesting all information concerning coal resources in the State of Alaska.

While the total resource base of coal in Alaska is enormous (Alaska has been described as having the potential to be the "Saudi Arabia of coal"), drilled and proven reserves are relatively modest totalling perhaps 2.5 billion tons (Usibelli Coal Mine, Placer U.S., Diamond Alaska, Mobil, Rocky Mountain Energy and Bering Development Co.).

The enclosed map is a very recent compilation of coal resource data for Alaska produced by the Alaska Department of Natural Resources with the collaboration of the Alaska Coal Association. It represents the best reference for your current task.

The Alaska Department of Natural Resources which includes the Division of Mining and Geology has proposed developing a comprehensive coal data base for Alaska but thus far this project has not been initiated. Alaska remains one of the few coal states lacking such a resource. I would encourage any direct questions you may have in this regard be directed to either Mr. Stu Rawlinson or Roy Merritt (Telephone: 907-474-7147) who are with the Alaska Division of Mining and Geology.

Usibelli Coal Mine is currently the only coal producer in the state and regulating constraints and hurdles abound both for us as a producer and for new potential producers. One major problem is that although Alaska assumed primacy with its own approved program for SMCRA the Federal oversight has been so inflexible that legitimate concerns relating to specific Alaska conditions are not heeded. These are many and relate to effects of permafrost, reclamation requirements, standard operating procedures, etc.

Mr. Charles Boddy, Regulatory Compliance Director for Usibelli Coal Mine (Telephone: 907-683-2226) has been appraised of your interest and I have asked him to contact you directly with his input.

I trust that the enclosure and the steps I have taken to provide you with source information will satisfy your needs.

Sincerely,

John Sims
PRESIDENT

encl.

cc: Charles Boddy, UCM
Stu Rawlinson/Roy Merrit, DMG

THE UNIVERSITY OF ARIZONA
TUCSON, ARIZONA 85721

COLLEGE OF ENGINEERING AND MINES
DEPARTMENT OF MINING AND GEOLOGICAL ENGINEERING

April 29, 1987

Mr. William M. Kelce
President, Alabama Coal Association
244 Goodwin Crest Drive, Suite 110
Birmingham, AL 35209

Dear Mr. Kelce:

I have just completed for the State of Arizona Department of Commerce a review of the mineral and energy endowment and sector statistics including coal. We are, therefore, able to make a comprehensive reply to your inquiry earlier this year into the Secretary of Energy's concerns over gaps in the demonstrated coal reserve data base maintained by his department.

The State Bureau of Geology has an extensive file on potential coals indicating substantial regional coal reserves and resources exist and including chemical analyses. These give indications of extensive high Btu and low sulfur coals in the base. However, no demonstrated reserves are on state, federal or private lands. All belong to the Hopi and Navajo Indian nations. In consequence, the only demonstrated reserve information on file is for lands currently under lease to the tenants of those tribes, principally Black Mesa pits 1 and 2, and this is but a small proportion of the indicated reserves. It is this data, if any, which are reported to the Department of Energy.

We are not aware that state and federal statutes, regulations or enforcement agencies impact workable reserves identified in this base, except to the extent that the Peabody Coal Company is required to comply with such as part of its current lease agreements.

The Bureau of Indian Affairs has advocated the continual transfer of authority to the Indian Councils during this Administration and greater tribal autonomy in the leasing and demonstrating of coal reserves. If the National Coal Council considers the present state of information as substantially incomplete I would appreciate having your comments.

Please let me know if we can be of any further assistance.

Respectfully yours,

Richard T. Newcomb
Professor of Mineral Economics

RTN/ay
cc: R. Svalin

STATE OF ARIZONA
DEPARTMENT OF MINES AND MINERAL RESOURCES

January 13, 1987

am M. Kelce
ident
na Coal Association
odwin Crest Drive Suite 110
ngham, AL 35209

Mr. Kelce:

tunately we have no figures available on coal reserves in Arizona.
is a 1969 publication by the then Arizona Bureau of Mines titled
, Oil and Natural Gas Helium and Uranium in Arizona" that does
on reserves. However, they are given as indicated and/or inferred
ay not be dependable.

in Arizona is found on Indian Reservations. It is quite likely the
would have data on the reserves or you might contact the only producer
al in Arizona which is Peabody Coal Company.

Very truly yours,

John H. Jett
Director

t

ARIZONA
MINING ASSOCIATION

JACK PURSLEY
Executive Secretary

January 19, 1987

Mr. William M. Kelce
President
Alabama Coal Association
244 Goodwin Crest Drive
Suite 110
Birmingham, AL 35209

Dear Mr. Kelce:

Your request for coal reserve information has been referred to the Arizona Bureau of Geology and Mineral Technology located at the University of Arizona in Tucson.

The Arizona Mining Association represents copper producers only and our library is rather sketchy regarding coal reserve information in Arizona.

I'm sure Dr. Larry Fellows, the State Geologist, will furnish you with the information you have requested. His telephone number is (602) 621-7906.

Thank you for contacting the Arizona Mining Association.

Sincerely,

R. J. Pursley

RJP/jc

2702 N. Third Street · Suite 2015 · Phoenix Arizona 85004 · (602) 266-4416

Arkansas GEOLOGICAL COMMISSION
VARDELLE PARHAM GEOLOGY CENTER • 3815 WEST ROOSEVELT ROAD • LITTLE ROCK, ARKANSAS 72204

NORMAN F. WILLIAMS
STATE GEOLOGIST

501-371-1488

January 22, 1987

Mr. William M. Kelce
Alabama Coal Association
244 Goodwin Crest Drive/ Suite 110
Birmingham, AL 35209

Dear Mr. Kelce:

I believe that most data bases fail to recognize the extent of the lignite resource in Arkansas. It is estimated to comprise at least 9 billion tons under less than ~~100~~ 150 feet of overburden. This estimate is based for the most part on drilling carried on by this agency. Three companies have laid claim to 2.8 billion tons (1978) in a number of deposits in Arkansas, each containing in excess of 100 million workable tons.

As to data relating to higher ranked coal, U. S. Geological Survey Bulletin 1072-P is believed to quite accurately put a measure to the reserves of bituminous and semi-anthracite coal in the state.

If I can be of further assistance to you, please let me know.

Yours very truly,

Norman F. Williams

NFW:kh

CALIFORNIA MINING ASSOCIATION

1010 11th Street, Suite 213/Sacramento Ca. 95814/(916) 447-1977

January 14, 1987

Mr. William M. Kelce
President
Alabama Coal Association
244 Goodwin Crest Drive
Suite 110
Birmingham, AL 35209

Dear Mr. Kelce:

This is in response to your letter of January 8, 1987 regarding the Demonstrated Coal Reserve Data Base.

At present there is no coal mined in California for energy purposes. However, two firms are in the permitting process to mine lignite. They state their reserves are approximately 20 million tons.

To my knowledge all other coal deposits in California are not available for mining. These are not very large.

I hope this is of assistance to you.

Sincerely,

Ray B. Hunter
Executive Director

RBH/bb

STATE OF CALIFORNIA—THE RESOURCES AGENCY — GEORGE DEUKMEJIAN, Governor

DEPARTMENT OF CONSERVATION
DIVISION OF MINES AND GEOLOGY
DIVISION HEADQUARTERS
1416 NINTH STREET, ROOM 1341
SACRAMENTO, CA 95814
(Phone 916—445-1825)

February 5, 1987

Mr. William M. Kelce, President
Alabama Coal Association
244 Goodwin Crest Drive, Suite 110
Birmingham, AL 35209

Dear Mr. Kelce:

This is in response to your recent letter requesting information on the coal reserves in the State of California. The most recent Division of Mines and Geology publication on Coal in California appeared in the December 1978 issue of California Geology. The article is entitled, Coal Deposits of California, a selected annotated bibliography, compiled by Ricky T. Hildebrand, U.S. Geological Survey. A copy of this paper is attached.

The known coal resources of California are estimated to be 90.7 million metric tons (Averitt, Paul, 1975, Coal resources of the United States--January 1, 1974: USGS Bull. 1412, p. 42-43). Of this amount, 9.1 million metric tons is bituminous coal from the Stone Canyon field in Monterey County, 36.2 million metric tons is subbituminous coal from the Mount Diablo field in Contra costa County, and 45.4 million metric tons is lignite from Amador County.

Sincerely,

James F. Davis
State Geologist

Attachment:

STATE OF COLORADO

RICHARD D. LAMM
GOVERNOR

JOHN W. ROLD
DIRECTOR

COLORADO GEOLOGICAL SURVEY
DEPARTMENT OF NATURAL RESOURCES
715 STATE CENTENNIAL BUILDING — 1313 SHERMAN STREET
DENVER, COLORADO 80203 PHONE (303) 866-2611

January 21, 1987

Mr. William M. Kelce
Alabama Coal Association
244 Goodwin Crest Drive, Suite 110
Birmingham, AL 35209

Dear Mr. Kelce:

Enclosed is our Special Publication 23, Summary of Coal Resources in Colorado. This publication, along with Coal Resources of Colorado: U.S. Geological Survey Bulletin 1071-C, p. 131-232, by Landis, E.R., 1959, covers all information available to the Colorado Geological Survey as to coal resource. This should cover item (a) in your letter.

As to item (b), current regulations have had little or no impact on the amount of workable reserves.

If you have any questions, please call.

Sincerely,

L. R. Ladwig, Chief
Minerals Fuels Section

Enclosures

bcr:LRL-87-121
3334/17

GEOLOGY
STORY OF THE PAST . . . KEY TO THE FUTURE

FOR YOUR
INFORMATION
Colorado Mining Association

1985 COLORADO COAL MINE PRODUCTION

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MINE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
ARCHULETA COUNTY													
Chimney Rock Strip	21,223	20,329	19,506	26,409	27,682	22,706	19,312	19,315	17,203	0	0	0	193,885
DELTA COUNTY													
Orchard Valley	96,980	81,864	45,792	11,877	19,425	21,643	27,126	27,367	27,100	39,537	55,772	72,842	533,135
FREMONT COUNTY													
Rex Carbon	6,684	5,958	8,161	5,947	6,660	7,319	984	4,776	3,802	4,299	4,777	3,159	62,486
Southfield No. 1	25,659	21,623	15,680	20,809	28,796	77,576	29,454	15,560	29,125	34,659	28,481	35,677	313,099
Twin Pines No. 2	0	0	0	0	0	1,309	1,456	1,792	2,234	2,424	2,430	2,882	14,527
GARFIELD COUNTY													
Eastside	0	1,511	2,104	0	15	0	0	0	173	137	146	2,377	6,263
McClane Canyon	0	0	0	0	0	0	0	0	0	0	0	0	0
Hunger Canyon	0	0	0	0	0	0	0	0	0	0	0	0	0
GUNNISON COUNTY													
Bear No. 3	22,138	26,832	20,614	26,501	23,599	23,358	13,315	24,740	23,185	28,198	25,026	16,235	273,741
Mt. Gunnison	21,173	21,142	37,011	25,556	50,684	37,310	59,329	70,391	72,901	87,224	62,721	71,107	596,549
O.C. Mine No. 2	758	7	366	465	450	227	219	253	636	767	740	624	5,692
Somerset	71,183	77,952	84,833	88,196	90,667	84,545	47,834	81,220	78,527	77,579	67,551	54,633	904,682
JACKSON COUNTY													
Bourg Strip	21,530	9,005	9,636	10,648	11,008	12,319	12,480	5,310	7,319	13,454	7,148	2,654	120,509
Marr Strip	6,594	6,600	6,370	6,645	0	0	0	494	8,452	10,531	8,678	17,948	72,392
LA PLATA COUNTY													
Carbon Junction Strip	0	0	0	5,456	567	149	756	0	2,916	0	0	0	7,844
Coal Gulch Strip	0	0	0	0	0	0	0	0	0	0	0	1,231	1,231
King	7,375	7,450	3,857	4,410	7,718	7,468	7,457	8,705	8,804	8,738	6,755	7,262	80,979
LAS ANIMAS COUNTY													
Animas	0	0	0	0	0	0	0	0	0	0	0	0	0
Golden Eagle	45,125	31,140	38,080	39,515	0	0	0	0	0	0	0	0	153,860
Helen	0	0	0	0	0	0	0	0	0	0	0	0	0
MESA COUNTY													
Roadside	68,350	77,410	74,110	66,120	69,380	69,070	38,610	76,250	58,990	70,660	63,860	47,116	779,926

1985 COLORADO COAL MINE PRODUCTION

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MINE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
MOFFAT COUNTY													
Colowyo Strip	224,789	291,823	275,820	273,923	273,786	271,004	128,329	282,784	266,296	273,673	283,316	283,834	3,129,527
Eagle No. 5	51,941	54,000	59,824	56,718	93,651	132,590	86,607	146,678	138,554	117,048	99,331	151,189	1,190,132
Trapper Strip	133,705	152,769	244,202	194,393	204,475	249,297	105,421	213,375	253,105	189,331	207,786	194,159	2,356,514
PITKIN COUNTY													
Bear Creek	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Basin	0	0	0	0	0	0	0	0	0	0	0	0	0
Dutch Creek No. 1	25,172	16,446	23,855	21,433	30,898	24,464	24,880	35,312	28,960	30,672	26,256	27,696	316,044
Dutch Creek No. 2	68,358	37,222	17,903	60,399	87,179	49,440	60,140	61,620	77,020	81,760	52,100	63,560	696,901
L.S. Wood	10,332	3,610	5,237	1,613	8,515	9,184	5,440	4,704	3,488	6,048	6,432	0	64,601
Thompson Creek No. 1	0	0	0	2,947	0	0	0	0	0	0	0	0	2,947
Thompson Creek No. 2	0	0	0	0	0	0	0	0	0	0	0	0	0
RIO BLANCO COUNTY													
Deserado	14,220	15,080	11,456	13,920	11,093	7,606	7,802	19,134	13,631	14,280	31,190	85,050	246,942
Rienau No. 2	174	328	365	0	127	0	0	0	328	492	328	400	2,622
ROUTT COUNTY													
Apex No. 2	3,493	3,858	1,768	0	0	0	0	0	0	0	0	0	9,119
Edna Strip	51,956	27,097	48,728	41,229	44,724	51,370	11,100	43,700	61,226	50,052	31,228	50,272	512,682
Colorado Yampa Strip	183,937	159,312	219,526	196,062	237,325	177,896	41,509	155,637	146,972	161,636	138,964	112,421	1,931,195
Foidel Creek	22,088	23,006	28,169	25,715	30,657	24,799	16,353	25,167	24,000	23,794	27,625	36,494	309,865
Grassy Gap Strip	0	0	0	0	0	0	0	0	0	0	0	0	0
Hayden Gulch Strip	44,146	0	3,029	56,125	57,856	48,893	48,222	48,684	58,703	58,080	48,869	48,625	521,236
Seneca Strip	126,902	111,255	124,990	109,842	134,600	173,614	82,113	143,912	146,746	132,470	126,146	137,659	1,550,249
WELD COUNTY													
Keenesburg Strip	34,838	25,779	35,617	29,092	30,269	15,561	32,575	35,407	35,642	33,510	29,551	26,717	364,558
TOTAL TONS FOR STATE	1,409,029	1,307,266	1,487,111	1,421,923	1,563,782	1,556,517	909,025	1,550,285	1,596,042	1,550,803	1,417,687	1,554,265	17,303,733

TOTAL TONS FOR 1984 17,660,145

SOURCE: Colorado Department of Natural Resources, Division of Mines, Monthly Reports

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FOR YOUR
INFORMATION
Colorado Mining Association

1986 COLORADO COAL MINE PRODUCTION

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MINE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
DELTA COUNTY													
Orchard Valley	69,764	68,916	67,573	73,744	67,520	1,520	1,755	2,590	0	0	0	0	353,292
FREMONT COUNTY													
Rex Carbon	0	3,319	3,636	0	0	0	0	0	0	0	0	0	6,955
Southfield No. 1	42,177	37,836	33,836	24,652	4,852	11,877	13,406	21,291	31,990	36,406	30,507	0	292,030
Twin Pines No. 2	2,196	2,664	1,898	1,357	1,906	1,973	1,756	2,552	2,149	2,509	2,349	0	23,809
GARFIELD COUNTY													
Eastside	784	35	16	11	4	1	0	0	45	76	108	0	1,085
McClane Canyon	0	0	0	0	0	0	0	0	0	0	0	0	0
Hunger Canyon	0	0	0	0	0	0	0	0	0	0	0	0	0
GUNNISON COUNTY													
Bear No. 3	28,016	33,570	24,451	26,476	28,607	21,129	16,182	24,016	54,744	30,664	23,812	0	291,747
Mt. Gunnison	95,585	73,008	42,495	56,560	56,808	59,971	71,059	71,066	28,720	0	23,514	0	580,746
O.C. Mine No. 2	862	415	421	410	325	111	0	306	0	566	602	0	4,568
JACKSON COUNTY													
Bourg Strip	715	135	104	63	4,206	4,931	750	606	805	505	529	0	13,347
Marr Strip	3,748	227	10,294	256	13,537	20,459	19,160	13,590	30,108	21,175	21,766	0	154,320
LA PLATA COUNTY													
Carbon Junction Strip	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Gulch Strip	1,950	19	0	0	0	0	0	0	0	0	0	0	1,969
King	8,962	8,126	7,820	8,459	6,673	10,344	9,591	9,013	3,898	8,070	6,641	0	92,777
LAS ANIMAS COUNTY													
Animas	0	0	0	0	0	0	0	0	0	0	0	0	0
Golden Eagle	0	0	0	0	6,565	9,505	9,552	5,405	5,660	9,255	0	0	45,942
Helen	0	0	0	0	0	0	0	0	0	0	0	0	0
MESA COUNTY													
Roadside	73,950	68,780	74,580	78,810	73,820	73,340	37,048	66,610	55,560	9,442	0	0	631,740
MOFFAT COUNTY													
Colowyo Strip	232,751	277,903	261,255	300,956	236,659	247,574	125,708	330,180	285,376	289,908	306,998	0	2,899,145
Eagle No. 5	96,471	25,460	106,588	105,603	54,608	126,259	90,652	117,463	114,020	79,205	85,250	0	1,001,561
Trapper Strip	168,775	206,417	225,180	193,464	202,642	196,617	155,664	166,192	221,365	177,881	196,727	0	2,100,852

1986 COLORADO COAL MINE PRODUCTION

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MINE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
PITKIN COUNTY													
Bear Creek	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Basin	0	0	0	0	0	0	0	0	0	0	0	0	0
Dutch Creek No. 1	31,498	24,048	18,592	9,041	12,305	6,280	5,494	3,951	0	1,404	0	0	112,573
Dutch Creek No. 2	84,120	66,000	74,560	87,712	79,593	79,395	45,411	25,715	55,169	25,874	0	0	603,547
L.S. Wood	0	0	0	0	0	0	0	0	0	0	0	0	0
Thompson Creek No. 1	0	0	0	0	0	0	0	0	0	0	0	0	0
Thompson Creek No. 2	0	0	0	0	0	0	0	0	0	0	0	0	0
RIO BLANCO COUNTY													
Deserado	67,306	82,050	60,877	65,511	73,244	81,064	40,650	72,666	66,398	70,044	54,085	0	741,501
ROUTT COUNTY													
Apex No. 2	0	0	0	0	0	0	0	0	0	0	0	0	0
Colorado Yampa Strip	146,642	91,511	100,449	89,782	125,028	135,641	59,503	90,433	110,727	92,870	93,502	0	1,145,196
Edna Strip	68,505	67,679	54,320	63,473	67,632	60,480	39,601	62,226	60,935	50,658	46,513	0	645,000
Foidel Creek	41,059	35,249	32,370	33,837	34,532	34,847	23,852	32,998	45,716	46,504	26,988	0	387,512
Grassy Gap Strip	0	0	0	0	0	0	0	0	0	0	0	0	0
Hayden Gulch Strip	9,725	57,782	48,866	58,313	39,079	68,351	48,898	59,138	38,954	29,764	29,340	0	467,910
Seneca Strip	134,772	91,207	96,666	159,126	147,052	135,199	77,151	133,016	164,928	140,603	104,188	0	1,563,908
WELD COUNTY													
Keenesburg Strip	29,719	29,295	35,016	24,495	24,374	35,464	40,785	30,775	34,290	25,348	29,081	0	332,242
TOTAL TONS FOR STATE	1,440,497	1,352,710	1,381,593	1,446,391	1,340,991	1,428,243	932,666	1,336,718	1,372,935	1,145,221	1,083,267	0	14,261,232

TOTAL TONS FOR 1985 17,303,733

SOURCE: Colorado Department of Natural Resources, Division of Mines, Monthly Reports

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FOR YOUR
INFORMATION
Colorado Mining Association

1985 COLORADO COAL MINE EMPLOYMENT

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MINE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
ARCHULETA COUNTY												
Chimney Rock Strip	25	25	26	26	27	26	0	0	0	0	0	0
DELTA COUNTY												
King Tipple	0	0	0	0	0	0	0	0	0	0	0	0
Orchard Valley	210	211	65	61	65	62	62	65	69	75	91	96
Terror Creek Loadout	4	4	4	4	4	5	5	5	4	4	4	4
FREMONT COUNTY												
Rex Carbon	27	29	29	29	27	27	27	21	21	20	21	17
Southfield No. 1	49	49	48	50	59	61	63	60	65	69	69	69
Southfield Loadout	10	10	10	10	11	11	11	10	11	11	11	11
Twin Pines No. 2	0	0	0	0	0	8	9	11	12	12	12	12
GARFIELD COUNTY												
Eastside	6	6	5	5	5	1	1	2	5	5	5	5
McClane Canyon	7	7	7	5	7	7	6	6	6	4	4	4
Hunger Canyon	0	0	0	7	1	0	1	1	1	0	2	2
GUNNISON COUNTY												
Bear No. 3	45	46	45	46	46	45	44	44	47	47	46	47
Mt. Gunnison	145	145	152	154	154	159	172	169	167	166	166	164
O.C. Mine No. 2	7	7	9	4	4	4	3	5	5	5	7	6
Somerset	209	208	205	210	215	214	217	205	205	204	208	209
JACKSON COUNTY												
Bourg Strip	15	12	13	11	11	12	22	8	11	10	9	11
Herr Strip	20	20	20	19	19	19	19	6	8	18*	18	19
LA PLATA COUNTY												
Carbon Junction Strip	11	11	11	14	13	13	12	12	12	11	4	4
Coal Gulch Strip	0	0	0	0	0	0	0	0	0	0	0	1
King	22	23	12	16	19	19	21	22	23	23	25	24
LAS ANIMAS COUNTY												
Animas	5	5	5	5	4	4	5	4	3	0	0	2
Golden Eagle	120	126	129	135	2	14	0	0	0	0	0	0
Helen	0	0	0	0	0	0	0	0	0	0	0	0
MESA COUNTY												
Roadside	206	206	206	206	205	205	205	209	204	201	200	200
Roadside Loadout	1	1	1	1	1	1	1	1	1	1	1	1

1985 COLORADO COAL MINE EMPLOYMENT

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MINE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
MOFFAT COUNTY												
Colowyo Strip	391	282	280	278	277	279	277	278	277	278	277	275
Eagle No. 5	189	190	189	190	184	182	115	131	133	135	152	129
Trapper Strip	225	225	227	224	224	225	224	224	225	217	218	218
PITKIN COUNTY												
Bear Creek	0	0	0	0	0	0	0	0	0	0	0	0
Coal Basin	0	0	0	0	0	0	0	0	0	0	0	0
Dutch Creek No. 1	201	198	205	206	212	215	211	214	194	221	214	188
Dutch Creek No. 2	257	244	249	276	274	274	275	295	296	302	296	289	209
L.S. Wood	73	70	70	72	70	69	71	74	70	70	69	0
Thompson Creek No. 1	16	14	14	10	10	9	9	8	8	7	7	7
Thompson Creek No. 3	0	0	0	0	0	0	0	0	0	0	0	0
RIO BLANCO COUNTY												
Deserado	83	79	80	82	81	85	86	86	84	92	154	170
Rineau No. 2	6	6	6	6	6	6	6	6	6	6	6	6
ROUTT COUNTY												
Apex No. 2	11	11	11	4	2	2	2	2	2	2	1	1
Edna Strip	67	67	67	67	83	83	83	83	83	83	80	80
Colorado Yampa Strip	255	232	251	251	257	243	204	172	174	175	176	174
Foidel Creek	48	48	49	49	53	53	53	50	45	53	54	55
Grassy Gap Strip	11	11	2	3	4	2	1	2	2	2	0	1
Hayden Gulch Strip	60	0	60	58	63	63	63	65	65	63	53	53
Seneca Strip	94	94	94	94	94	95	93	94	95	94	96	96
WELD COUNTY												
Keenesburg Strip	39	39	36	36	36	37	37	36	38	38	38	38
TOTAL STATE EMPLOYMENT	3,112	2,856	2,835	2,899	2,648	2,657	2,125	2,607	2,659	2,694	2,767	2,606
AVERAGE NUMBER OF DAYS WORKED AT PRODUCING MINES	20.54	20.71	21.10	22.11	21.18	20.60	18.50	21.74	21.06	22.91	21.45	21.80

SOURCE: Colorado Department of Natural Resources, Division of Mines, Monthly Reports

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1986 COLORADO COAL MINE EMPLOYMENT

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MINE	MEN (DAYS) JAN		FEB		MAR		APR		MAY		JUN		JUL		AUG		SEP		OCT		NOV		DEC	
DELTA COUNTY																								
King Tipple	0		0		0		0		0		0		0		0		0		0		0		0	
Orchard Valley	99	(22)	98	(19)	96	(20)	98	(22)	86	(21)	69	(21)	27	(22)	20	(23)	25	(21)	45	(22)	55	(16)	0	
Terror Creek Loadout	4	(22)	4	(20)	4	(20)	5	(22)	6	(21)	6	(21)	6	(22)	6	(21)	5	(21)	5	(23)	5	(10)	0	
FREMONT COUNTY																								
Rex Carbon	0	NR	0	NR	13	(25)	0	NR	0	NR	3	(25)	0	I	0	I	0	I	0	I	0	I	0	
Southfield No. 1	70	(22)	70	(20)	78	(22)	71	(22)	70	(21)	57	(21)	58	(22)	62	(21)	67	(21)	67	(23)	66	(18)	0	
Southfield Loadout	11	(22)	11	(20)	13	(22)	11	(22)	11	(21)	6	(21)	5	(22)	6	(21)	12	(21)	12	(23)	12	(10)	0	
Twin Pines No. 2	13	(26)	15	(21)	15	(20)	5	(19)	12	(19)	12	(21)	6	(22)	11	(20)	11	(21)	12	(23)	15	(19)	0	
GARFIELD COUNTY																								
Eastside	3	(22)	3	(19)	1	(20)	5	(22)	1	(3)	0	I	0	I	0	I	0	I	3	(22)	3	(19)	0	
McClane Canyon	4	(22)	5	(20)	5	(20)	5	(22)	2	(22)	2	(21)	2	(22)	5	(3)	2	(21)	2	(23)	0	NR	0	
Hunger Canyon	0	(0)	1	(9)	1	(20)	1	(14)	1	(7)	1	(0)	1	(22)	1	(2)	1	(21)	1	(21)	0	NR	0	
GUNNISON COUNTY																								
Bear No. 3	46	(21)	439	(20)	47	(19)	47	(19)	47	(21)	48	(20)	46	(11)	47	(20)	46	(20)	46	(22)	47	(17)	0	
Mt. Gunnison	165	(23)	163	(20)	122	(21)	122	(22)	120	(23)	118	(21)	120	(21)	120	(21)	120	(15)	47	(23)	42	(18)	0	
O.C. Mine No. 2	6	(18)	5	(15)	5	(15)	5	(19)	5	(17)	5	(12)	0	I	5	(20)	0	NR	6	(22)	6	(20)	0	
JACKSON COUNTY																								
Bourg Strip	9	(20)	6	(20)	7	(25)	5	(20)	6	(25)	6	(21)	6	(20)	6	(23)	5	(20)	0	NR	3	(26)	0	
Herr Strip	19	(22)	19	(19)	19	(19)	19	(22)	23	(21)	23	(21)	22	(22)	24	(21)	21	(21)	32	(23)	32	(19)	0	
LA PLATA COUNTY																								
Carbon Junction Strip	3	(22)	1	(20)	0	NR	0	NR	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	
Coal Gulch Strip	3	(22)	2	(20)	0	NR	0	NR	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	
King	25	(22)	25	(20)	24	(21)	24	(22)	25	(21)	24	(21)	24	(23)	26	(21)	27	(22)	25	(22)	26	(17)	0	
LAS ANIMAS COUNTY																								
Animas	2	(33)	2	(26)	2	(26)	0	I	0	I	0		0		0		0		0		0	I	0	
Golden Eagle	0		0		0		0		17	(15)	17	(20)	17	(21)	17	(9)	17	(16)	17	(23)	0	NR	0	
Helen	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	
MESA COUNTY																								
Cameo	0		0		0		0		0		0		9	(22)	9	(23)	9	(23)	0	NR	0	NR	0	
Roadside	207	(22)	206	(20)	206	(20)	206	(22)	206	(21)	205	(21)	197	(22)	192	(21)	195	(21)	0	NR	0	NR	0	
Roadside Loadout	1	(22)	1	(20)	1	(20)	1	(22)	1	(23)	1	(21)	1	(22)	1	(24)	1	(23)	0	NR	0	NR	0	

1986 COLORADO COAL MINE EMPLOYMENT

Page 2

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MINE	MEN (DAYS) JAN		FEB		MAR		APR		MAY		JUN		JUL		AUG		SEP		OCT		NOV		DEC	
MOFFAT COUNTY																								
Colowyo Strip	274	(31)	271	(28)	270	(23)	278	(26)	270	(29)	270	(28)	270	(15)	270	(30)	270	(29)	268	(33)	267	(26)	0	
Eagle No. 5	130	(22)	130	(20)	130	(20)	127	(21)	126	(21)	124	(21)	124	(14)	127	(23)	128	(21)	131	(22)	130	(17)	0	
Trapper Strip	217	(22)	217	(19)	215	(20)	215	(22)	216	(21)	216	(21)	214	(22)	213	(21)	214	(21)	207	(25)	207	(10)	0	
PITKIN COUNTY																								
Bear Creek	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	
Coal Basin	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	
Dutch Creek No. 1	186	(22)	197	(20)	206	(21)	223	(20)	0	NR	233	(20)	0	NR	0	NR	0	NR	0	NR	0	NR	0	
Dutch Creek No. 2	217	(22)	231	(22)	245	(21)	255	(20)	0	NR	257	(20)	0	NR	0	NR	0	NR	0	NR	0	NR	0	
L.S. Wood	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	
Thompson Creek No. 1	5	(22)	6	(20)	5	(23)	5	(22)	5	(21)	5	(21)	5	(22)	0	I	0	I	0	I	0	I	0	
Thompson Creek No. 3	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	
RIO BLANCO COUNTY																								
Deserado	227	(22)	238	(20)	260	(21)	250	(22)	256	(21)	256	(21)	262	(12)	262	(21)	259	(21)	257	(22)	260	(18)	0	
ROUTT COUNTY																								
Apex No. 2	1	(21)	1	(16)	1	(16)	1	(22)	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	
Colorado Yampa Strip	172	(30)	172	(20)	92	(21)	80	(21)	156	(21)	0	NR	102	(22)	93	(21)	98	(21)	98	(22)	98	(18)	0	
Edna Strip	80	(26)	80	(20)	80	(20)	151	(21)	80	(21)	80	(21)	80	(22)	80	(21)	80	(21)	80	(22)	80	(20)	0	
Foidel Creek	55	(22)	58	(20)	58	(20)	57	(22)	56	(21)	56	(21)	56	(21)	56	(22)	51	(21)	52	(23)	51	(18)	0	
Grassy Gap Strip	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	I	0	
Hayden Gulch Strip	53	(10)	53	(20)	53	(22)	51	(22)	52	(22)	52	(22)	56	(25)	56	(20)	56	(22)	47	(22)	21	(20)	20	(18)
Seneca Strip	96	(25)	96	(18)	93	(20)	93	(23)	95	(21)	95	(23)	96	(12)	99	(22)	102	(23)	100	(25)	98	(17)	0	
WELD COUNTY																								
Keenesburg Strip	38	(24)	38	(20)	38	(21)	38	(23)	38	(23)	38	(20)	38	(24)	38	(23)	35	(22)	33	(23)	33	(18)	0	
TOTAL STATE EMPLOYMENT	2,442		2,493		2,506		2,648		1,999		2,259		1,852		1,861		1,650		1,564		1,583		0	
AVERAGE NUMBER OF DAYS WORKED AT PRODUCING MINES	22.77		19.87		20.83		22.04		18.93		21.00		20.11		19.61		20.92		22.75		18.95			

I = Idle
NR = NO REPORT
SOURCE: Colorado Department of Natural Resources, Division of Mines, Monthly Reports

c/p-6

Georgia Department of Natural Resources
205 Butler Street, S.E., Floyd Towers East, Atlanta, Georgia 30334
J. Leonard Ledbetter, Commissioner
Harold F. Reheis, Assistant Director
Environmental Protection Division
(404) 656-3214

Reply To:
Room 400
19 Martin Luther King, Jr., Dr., S.W.
Atlanta, Georgia 30334

January 14, 1987

Mr. William M. Keice, President
Alabama Coal Association
244 Goodwin Crest Drive
Suite 110
Birmingham, Alabama 35209

Dear Mr. Keice,

The State of Georgia has just recently published two technical papers providing information on the coal resources of northwest Georgia. These documents were done in cooperation with the U.S. Geological Survey and provide more current information than the other publications which had been done on this commodity. To our knowledge, this data fills any gaps that may have existed regarding the quality of and the location of the coal deposits in Georgia.

Accompanying this letter are the two documents mentioned as well as other publications of the Geologic Survey and the U.S. Geological Survey which we have available through our publication sales office.

Should you have any further questions or need additional information please feel free to contact our Information Geologist, Edwin L. Williams, or our Economic Geologist, Bruce O'Connor.

Sincerely,

William H. McLemore
State Geologist

Enclosures

cc: Edwin L. Williams
Bruce O'Connor

State Geological Survey Division

ENR
Illinois Department of
Energy and Natural Resources

Natural Resources Building
615 East Peabody Drive
Champaign, IL 61820
217/344-1481

January 27, 1987

William Kelce, President
Alabama Coal Association
244 Goodwin Crest Drive, Suite 110
Birmingham, AL 35209

Dear Mr. Kelce:

This letter is in response to your letter to Dr. Leighton in which you requ
information on coal reserves in Illinois. Enclosed is a list of our public
tions related to coal. As you can see, a substantial amount of data has be
compiled on Illinois coal, much of it far more detailed than you are probat
interested in at this point in your investigation. Also enclosed is a copy
Illinois Energy Plan Volume IV - An Inventory of the Coal Resources of Illi
This document summarizes information available on Illinois coal.

Regarding the completeness of our data base, we believe that we have relati
good information on the total amount of in-place coal (resources) for the m
minable coals in the state. We are lacking data on the minor seams, some c
which may be high-quality coals (high Btu, low sulfur). Of most significan
however, is our lack of sufficient data on the actual amount of minable coa
available - the amount that could be economically recovered after factors s
as coal quality, mining conditions, landcover, infrastructure, and market c
are considered. We have several research projects underway that address th
data needs. What we would consider preliminary assessments of both surface
deep minable coal reserves have been completed in recent years (our Circula
504 and 527).

We also lack data on the other topic you mentioned in your letter, the impa
of government regulations on the amount of minable reserves in the state.
is an area that we hope to address at some point in the future.

I hope this information is of use to your study. Please feel free to conta
should you require further information. Ask for either myself or for Colin
Treworgy who is in charge of our coal resource/reserve assessment. Call 21
333-5115 or 217-344-1481.

Sincerely,

Heinz H. Damberger
Geologist and Head
Coal Section

HHD:blh

Enclosure

STATE OF ILLINOIS
DEPARTMENT OF MINES AND MINERALS
SPRINGFIELD 62706

BRAD EVILSIZER
Director

January 29, 1987

Alabama Coal Association
Attn: Mr. William M. Kelce, President
244 Goodwin Crest Drive
Suite 110
Birmingham, AL 35209

Dear Mr. Kelce:

Director Evilsizer has forwarded your letter to my attention for response.

The Department of Mines & Minerals being a regulatory agency is concerned with the mine safety and the permittin of Illinois coal mines. We, therefore, do not have data relative to Illinois coal reserves.

In a telephone conversation with Heinz Damberger, of the Coal Section with The Illinois State Geological Survey, his office had also received a letter and were to forward the necessary information.

ite cover, a copy of the

nce in the future, feel free

Sincerely,

C. Arthur Rice,
Administrative Assistant

ILLINOIS COAL ASSOCIATION

212 South Second Street
Springfield, Illinois 62701
Area Code 217 • Telephone 525-2092

FOUNDED 1978

January 20, 1987

Mr. William M. Kelce, President
Alabama Coal Association
244 Goodwin Crest Drive, Suite 110
Birmingham, Alabama 35209

Dear Bill:

In response to your January 8 letter requesting information pertaining to the coal reserve data base, I would offer the following information as it pertains exclusively to the state of Illinois.

The Illinois Geological Survey has a fairly accurate estimate of 183 billion tons of Illinois coal reserves. Of that total reserve, it is estimated that 35 billion tons would be recoverable by present mining technologies. And of that minable reserve tonnage there is approximately 2.8 billion tons held in reserve by coal mining companies or energy interests.

In response to your second question, it is indeed more difficult to be precise. While it is without question the state and federal laws do have an impact on our workable reserve areas, the degree of complete ban is very, very limited. In only one small instance have we had an area that was proclaimed to be lands unsuitable. So I would say that even though the regulations have a major impact, there has been little or no impact with respect to prohibiting mining.

Bill, I sincerely appreciate you giving me the opportunity to make comments on this subject. However, I know they are quite sketchy and you need it in a timely fashion.

I hope this is a very good year for you.

My very best regards.

Sincerely,

Joseph S. Spivey
President

JSS/pmr

STATE OF INDIANA

DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY
611 NORTH WALNUT GROVE
BLOOMINGTON, INDIANA 47405

AREA CODE: 812
TELEPHONE: 335-7785

Jan. 23, 1987

Mr. William M. Kelce
Alabama Coal Association
244 Goodwin Crest Drive, Suite 110
Birmingham, AL 35209

Dear Mr. Kelce:

Dr. Hester forwarded your letter that said you had been charged by the Secretary of Energy to conduct certain studies, and he requested that I reply. I assume the organization that is requesting the study is the U.S. Department of Energy, and I also assume the Demonstrated Reserve Base of Coal in the United States refers to the one prepared by the Energy Information Administration on January 1, 1979. If my assumptions are not correct, the remarks that follow may be misleading.

The report on "Demonstrated Reserve Base of Coal in the United States on January 1, 1979," prepared by the U.S. Energy Information Administration (DOE/EIA-0280 (79); May 1981) lists Indiana's demonstrated reserve base as 10,621.08 million tons. This figure is essentially correct according to the information available at the time the demonstrated reserve base was calculated, but we feel the figure does not adequately represent the amount of coal resources in Indiana. The Indiana Geological Survey considers that the amount of recoverable coal resources is 16,763.00 million tons (see attached sheet). We feel that if the demonstrated reserve base were recalculated using information now available, the U.S. Department of Energy figure would come close to the Indiana figure.

Since 1982 the Indiana Geological Survey has been working on a cooperative project with the U.S. Geological Survey to enter coal data into the National Coal Resources Data System (NCRDS). We are hoping in the coming year to begin recalculation of resources, but the NCRDS program has been cut back considerably and is even in jeopardy of extinction. It is, of course, disappointing to us to see this program eliminated now that we are reaching the point of being able to calculate resources.

In regard to your second question, "the degree to which State and Federal statutes, regulations, enforcement agencies, and regulators impact the amount of workable reserves identified in such data base," I think the answer is very little, but perhaps you should seek advice from other sources on that point. Possible people you could contact would be Mr. Richard McNabb, Indiana Division of Reclamation, 309 West Washington Street, Indianapolis, IN 46204; Mr. Nathan Nolan, Indiana Coal Council, 701 Harrison Bldg., 143 W. Market Street, Indianapolis, IN 46204; and Mr. William Beeman, Indiana Coal Association, 632 Cherry Street, Terre Haute, IN 47808. Indiana has little federal land containing coal resources, and so that aspect of impact on workable reserves is not a problem.

In summary, we feel the "demonstrated reserve base" of coal in Indiana, as defined by the U.S. Department of Energy, is not correct based on information we now have avilable. We are working to update our figures, but based on our current level of funding the project may take several years. If we could find a source of additional funding the project could be completed in a much shorter time.

Please call on me if you see ways I could help further.

Very truly yours,

Donald D. Carr

Donald D. Carr, Head
Mineral Resources Group

DDC:ks

Enclosure

cc: Norman C. Hester

INDIANA GEOLOGICAL SURVEY

INDIANA COAL RESOURCES

BY COUNTY

(Thousand Short Tons)

	TOTAL REMAINING RESOURCES			RECOVERABLE RESOURCES*		
COUNTY	SURFACE	UNDERGROUND	TOTAL	SURFACE	UNDERGROUND	TOTAL
CLAY	378281	504731	883012	302625	252366	554991
DAVIESS	150594	239004	389598	120475	119502	239977
DUBOIS	1050	6581	7631	840	3291	4131
FOUNTAIN AND WARREN	40046	7204	47250	32037	3602	35639
GIBSON	329189	5963818	6293007	263351	2981909	3245260
GREENE	237673	454957	691630	190138	227479	417617
KNOX	163117	4481144	4644261	130494	2240572	2371066
MARTIN	101878	22	101900	81502	11	81513
OWEN	62333	--------	62333	49866	--------	49866
PARKE	11878	59004	70882	9502	29502	39004
PERRY	52457	--------	52457	41966	--------	41966
PIKE	206839	739604	946443	165471	369802	535273
POSEY	--------	5740781	5740781	--------	2870391	2870391
SPENCER	51544	3	51547	41235	2	41237
SULLIVAN	332714	6972909	7305623	266171	3486455	3752626
VANDERBURGH	--------	2166906	2166906	--------	1083453	1083453
VERMILLION	26312	588689	615001	21050	294345	315395
VIGO	304361	2897639	3202000	243489	1448820	1692309
WARRICK	224412	1031935	1256347	179530	515968	695498
TOTAL	2674678	31854931	34528608	2139742	14623470	16763212

*Based on 80% recoverability for surface mines and 50% recoverability for underground mines

April 1986

STATE OF IOWA

TERRY E. BRANSTAD, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
LARRY J. WILSON, DIRECTOR

January 16, 1987

Mr. William M. Kelce
244 Goodwin Crest Drive
Suite 110
Birmingham, AL 35209

Dear Mr. Kelce:

Your letter of January 8, 1987 requesting information on coal resources in Iowa was referred to me by Don Koch for reply. I am sending you several Geological Survey Bureau publications which give details of what is known about coal resources in Iowa. I have also attempted to summarize this information and comment on current coal resource related activities at the Survey and on the effects of regulation on coal resources in Iowa.

The bulk of coal resources in Iowa are located in the southcentral, central, and southeastern areas of the state. Logically, this is where most of the mining has occurred. Nearly all Iowa coal is classed as high volatile C Bituminous, although a few samples test as subbituminous or high volatile B bituminous. sulfur and ash contents are typically high.

Total original coal reserves in 44 Iowa counties were estimated at 7,236.54 million ons in a 1965 publication (Tech. Pap. 4, enclosed). This estimate covers nearly all the area of coal-bearing rocks in Iowa with coals 1.2 ft. or greater in thickness, regardless of depth. It also estimated reserves by coal bed. Strippable original reserves in 12 counties in southeastern and southcentral Iowa were estimated in 1975 and 1976 at 2,025.46 million tons (Open File Reports, enclosed). Reserves were not estimated by individual coal beds in these studies. The 1976 study also estimated remaining reserves in seven of the twelve counties at 654.15 million tons and recoverable reserves at 327.07 million tons. The twelve counties included in these two studies encompass a large portion of the area wher most of the historic mingin occurred in Iowa.

Coal production in Iowa between 1840 and 1985 totalled 372.25 million tons. Peak production was in 1917. In 1985 Iowa coal production totalled 585,000 tons. Curremlty, there are four operating coal mines in Iowa. Three of these are surface mines and one is an underground mine. Iowa mines currently supply approximately 5% of the coal consumed in Iowa. Planned construction of fluidized bed combustion units at several locations should provide a larger market for Iowa coal by reducing the impact of the high sulfur content on the marketibility of the coal.

The Geological Survey Bureau (then Iowa Geological Survey) published a revised stratigraphic nomenclature for the Pennsylvanian System in Iowa (Tech. Inf. Ser. 12, enclosed) in 1984 based on work done by IGS Coal Resource Program. Work

WALLACE STATE OFFICE BUILDING / DES MOINES, IOWA 50319 / 515-281-5145

ıary 16, 1987
William M. Kelce
-2-

e as part of that project showed that many of the previously used coal bed
ıs were based on incorrect correlations with coal beds from surrounding
:es, that some names were inappropriate, or that different names have been
ied to coal seams which could be correlated biostratigraphically from one
to another. Part of the goal on an on-going cooperative agreement with the
Geological Survey-National Coal Resources Data System has been to reassign
bed names to bring the stratigraphic designations into agreement with the
sed nomenclature.

current NCRDS cooperative agreement is intended to begin collection of
itized mapped data (e.g. outcrop limits, mined out areas). Collection and
y of geologic data is virtually completed for the state. Digitized boundary
will allow us to use the NCRDS software to evaluate resources. We will be
ing at resources assessments in Wapello and Davis Counties in southeastern
as part of another project, funded through the Department of Energy, to
ıblish procedures for using the NCRDS system and demonstate its capabilities
continuing this type of work.

distribution of geologic data which has been used to demonstrate coal
reserves is very uneven in Iowa. This is probably the most important factor which impacts the base of coal reserve related data in the state and is probably impossible to evaluate. The bulk of the data which is available to us is from coal test drilling in areas which have been extensively mined in the past. More scattered data from other areas within the Pennsylvanian outcrop area in Iowa suggest the presence of mineable coal, but can't be used to accurately evaluate coal reserves. This has had the effect of weighting the reserve estimates in favor of areas which have been extensively explored and mined and of concentrating any current or near-term exploration in these same areas.

As in other states with "high sulfur" coals, air quality regulations ahv affected the mineable reserve base of Iowa coal. The report quoted above gave an average sulfur content of 6.6% and an average ash content of 17.2% for Iowa coal. THese numbers are somewhat high than the coals which are typically mined in Iowa. The average sulfur content of these coals is in the range of 2.5 to 4%. In addition, all the coal produced at present is "washed". Here, again, the available data are unevenly distributed and too sparse to allow an accurate evaluation of the coal impact of air quality controls on the reserve base of Iowa coal.

Reclamation requirements have also effected mineable reserves. Interest in underground mining has increased recently as means of avoiding stringent requirements for reclamation of surface mines in areas which contain tracts of "prime" farm land. The concern with reclamation is understandable and justified in a heavily agricultural state such as Iowa, but it also undoubtedly effects the reserve base of coal in Iowa.

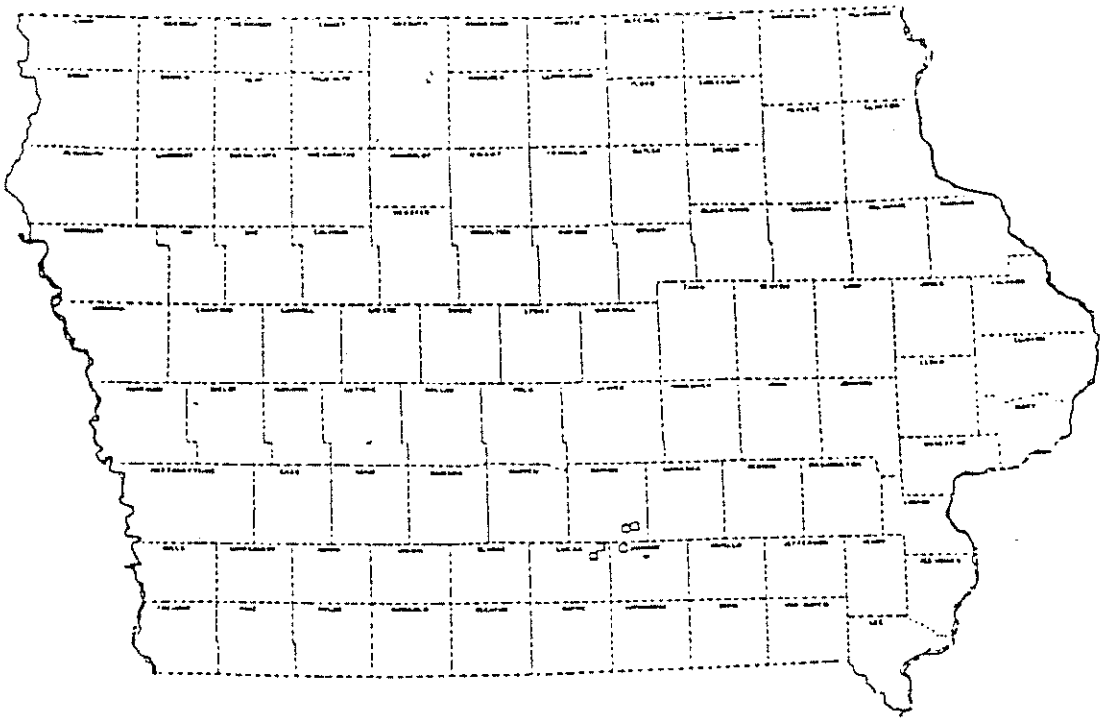
Admittedly, Iowa is a small coal producer. However, as the discussion above shows, it still has a large coal reserve base. Participation in the NCRDS and DOE projects (both are small-scale) has allowed us to maintain, update, and add to a database of coal-related information for Iowa. This is important in a state which has not yet produced any economically recoverable petroleum--coal is Iowa's only fossil fuel source. I would like to urge you to support continuation of this type of project and database.

This letter is rather long, but I hope that it provides you with the information that you need for your report. Please feel free to contact me at 319/335-4021 if I can provide further assistance.

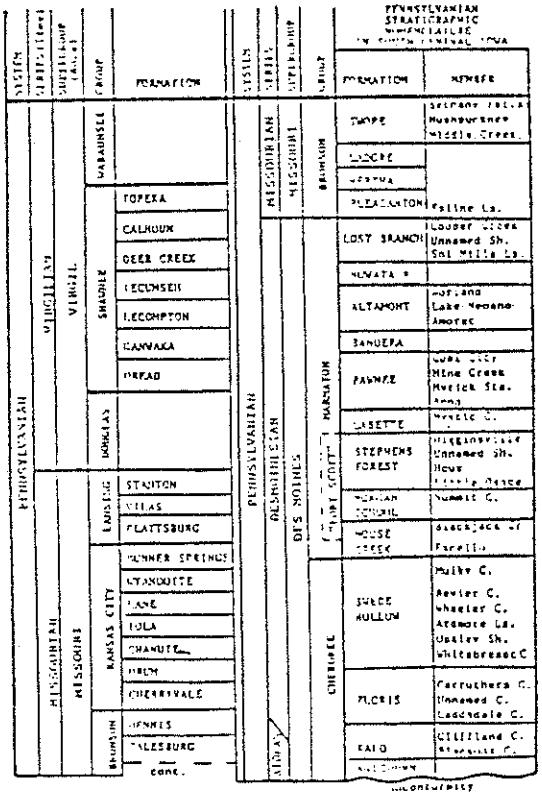
Sincerely,

Mary R. Howes
Research Geologist

MRH/mph
Enclosure



Coal Mines Operating in Iowa - 1986



Pennsylvanian Stratigraphy of Iowa (Ravn, et al., 1984)

KANSAS GEOLOGICAL SURVEY

1930 Constant Ave., Campus West
The University of Kansas
Lawrence, Kansas 66046-2598
913-864-3965

January 22, 1987

Mr. William M. Kelce
President, Alabama Coal Association
244 Goodwin Crest Drive, Suite 110
Birmingham, Alabama 35209

Dear Mr. Kelce:

Your letter concerning coal reserves in Kansas was referred to me by Bill Hambleton for possible reply.

I have enclosed a copy of our coal report on Kansas coal reserves and resources. This publication is the basis of the Department of Energy Demonstrated Coal Reserve Base estimate for Kansas. They have used my Demonstrated Coal Reserves figures for coal beds with less than 100 feet of cover. They have subtracted the amount of coal production for Kansas since 1976 to determine the Demonstrated Reserve Base figures they publish in their coal production publications [i.e., DOE/EIA-0118(84) Coal Production 1984]. These figures are now rather dated, but we do not have good numbers to replace those figures with at this time.

A large amount of data and detailed work has gone into a large new study on shallow and deep coal resources in Kansas in cooperation with the U.S. Geological Survey. This study is still a couple of years off before we will have some good resource/reserve figures. We have considerable data entered into the USGS computer at the present time, but a large detailed analysis of that data is necessary to get the final figures. Funding has been cut considerably on this National Coal Resources Data System (NCRDS) study and the result is taking longer than originally planned.

Preliminary results of this NCRDS study indicate over 900 million tons of coal that could be in the Demonstrated Reserve Base as deep coal (28" or thicker). Deep coals were not considered for Kansas in the earlier coal reserve study and are not listed in the DOE coal reserve base. When results are completed on the strippable coals, I would expect much larger strippable coal figures because of more data available and more accurate analysis of the data.

I hope this information helps you to better understand the coal reserve picture in Kansas. Contact me if you need additional information.

Sincerely,

Lawrence L. Brady

Lawrence L. Brady
Geologist

Enclosure

IMMR
University of Kentucky
Institute for Mining and Minerals Research

Mr. William M. Kelce, President
Alabama Coal Association
244 Goodwin Crest Drive, Suite 110
Birmingham, AL 35209

Dear Mr. Kelce:

The books on Kentucky coal resources recently sent to you by Dr. Lyle Sendlein, Director of IMMR, came back to us today because of a problem with the packaging. I am mailing these to you again today at Book Rate. We're sorry for the delay and hope that you will receive the books soon.

Sincerely,

Susan Wilson
Publications Editor

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IMMR
University of Kentucky
Institute for Mining and Minerals Research

14 January 1987

Mr. William M. Kelce, President
Alabama Coal Association
244 Goodwin Crest Drive, Suite 110
Birmingham, AL 35209

Dear Mr. Kelce:

With reference to your request to data base information for Kentucky coal resources, I can furnish you with a set of reports (sent under separate cover) that describe the resource from a geological perspective and refer you to a publication by the Kentucky Energy Cabinet which lists, among other things, coal seam quantity and quality information. I have attached a copy of the Table of Contents for the latter publication so you can determine if a copy is required for your study. If you would like a copy, you should contact J. Dan Guffey who is the project director.

Kentucky is very fortunate in that the whole state has been geologicaly mapped at the quadrangle scale. This information allowed the resource data base to be determined and resulted in the publications which are being sent to you. The director of that project has retired and I refer you to Dr. James Cobb, Head of the Coal Program for the Kentucky Geological Survey should you have any further questions relative to that data base.

To determine the "degree to which State and Federal statutes, regulations, enforcement agencies, and regulators impact the amount of workable reserves identified in the data base" is a more difficult task to address. I do not know of any studies that have been conducted in Kentucky that would shed some light on how the resource is diminished by these constraints. The physical properties, such as location, depth, and thickness and chemical composition of the coal, reduce the recoverable reserves considerably. How the statutes and enforcement of regulations reduce the reserve further in Kentucky is an unknown.

We were very fortunate in having the chairman of the National Coal Council, James McGlothlin, as our keynote speaker at an energy conference held in Lexington last September. He provided a rational assessment of the coal industry future in a very energetic manner and was well received by the audience. You are fortunate in having an opportunity to work with him.

If I can be of further assistance in helping you with any other aspects of your task, please do not hesitate to let me know. Good luck with your project.

Attachment

LVAS/ds

4495S

cc: James Cobb
J. Dan Guffey
W. Royster

Sincerely,

Lyle V. A. Sendlein
Director

Kentucky Center for Energy Research Laboratory

John K. Hiett
Geologist/Manager, Mine Map Program

ENT OF MINES AND MINERALS
P.O. BOX 680
EXINGTON, KENTUCKY 40586
57-8819 (502) 564-3019

WILLARD STANLEY
COMMISSIONER

1-19-87

TO: W. M. Kelce

FROM: John Hiett

SUBJECT: coal reserve info

Enclosed you will find a list of the KDMM information systems. At the Kentucky Energy Cabinet they also have a system called the KCMIS, (Kentucky Coal Market Information System) for information call Dan Guffey at 606-252-5535. For information on coal quality and reserves at the Kentucky Geological Survey (KGS) and their information systems contact Rick Sargent at 606-257-5863.

The Dept. of Natural Resources has additional systems that pertain to surface mining: they are the Kentucky Natural Resources Information System ,(KNRIS) see Myles Powers at 502-564-5174 , also the Surface Mine Information System (SMIS).

Signed, John K. Hiett

An Equal Opportunity Employer M/F/H

KENTUCKY DEPT OF MINES & MINERALS AND K.E.C.L.

MINE MAP MICROFILM PROJECT-
The Kentucky Energy Center Laboratory and the Kentucky Department for Mines and Minerals are jointly working on the MINE MAP INFORMATION SYSTEM for the state of Kentucky. This computer index of information is an integral part of the coal MINE MAP MICROFILM PROJECT; it will be used to index the microfilmed documents, original documents, digitized mined out areas, and other digitized data pertaining to the individual coal mine. It will contain all data that relates directly to the 60,000 mine maps on file at the KDMM as well as the information that is available for 40,000 maps that were destroyed by fire in 1948. The records will begin with 1884 KDMM Annual Report data and will cover all mine years of information up to the present. Over 100,000 mine years of information are available. The storage and retrieval capabilities of the system will make management of the data a possibility. All mine maps and mine map microfilm can be indexed readily in this manner utilizing VAX-DATATRIEVE. The records can be queried using any possible combination of fields pertaining to the coal mines. Topographic maps (7.5 minute) with sketches of the mined out areas accompany this data where possible. As the result of a joint KGS-IMMR project for the USGS the topo maps for west Kentucky are essentially complete and the mined out areas are digitized and ready for plotting.

ANNUAL REPORTING SYSTEM-
In 1983 the KDMM began entering active mine license data in the ANNUAL REPORTING SYSTEM. Information regarding licensed mines includes details on the mine, operator, license, mine map, and annual report statistics. Over 9250 licenses have been entered using IMS and reports and queries may be made easily using the key field of State File Number. This system keeps track of active licenses, and provides a means of preparing the KDMM Annual Report from magnetic tape. The information within the system ranges from 1982 to the present.

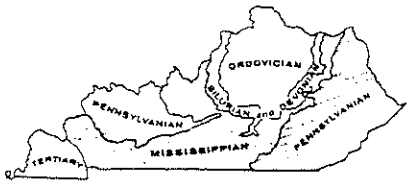
MINER INFORMATION, TRAINING, EDUCATION, and CERTIFICATION SYSTEM-
The KDMM Division of Training and Education utilizes the MITEC system to keep track of all the 42917 certified miners within the state as well as the approximately 15000 temporarily certified miners. The system uses IMS to store and retrieve data on miner training, certification, specialties, classes, tests, retraining, biographies, and other related fields.

FOR MORE INFORMATION-
For more information or help involving coal mines contact Margaret Cawnod, Assistant to the Commissioner at the KDMM. For information on miner training contact Bill Clayton, Director of Miner Training and Certification at the KDMM. For information about coal mine maps contact John Hiatt, Geologist at KDMM or IMMR.

KENTUCKY GEOLOGICAL SURVEY
UNIVERSITY OF KENTUCKY
311 Breckinridge Hall
Lexington, Kentucky 40506-0056

Director and State Geologist
DONALD C. HANEY

Assistant State Geologist
JOHN D. KIEFER



Phone (606) 257-5863

January 15, 1987

Mr. William M. Kelce, President
Alabama Coal Association
244 Goodwin Crest Drive
Suite 110
Birmingham, AL 35209

Dear Mr. Kelce:

I have forwarded your letter of inquiry about Kentucky's coal data base relative to the National Coal Council's study of the DOE "Demonstrated Coal Reserve Data Base" to Dr. James Cobb, Head of the Kentucky Geological Survey's Coal Section. Our data base is very extensive, so it will take Jim a while to sort out what you need. However, he will address the task immediately and get the information to you as soon as possible.

In reference to the DOE Demonstrated Coal Reserve Data Base, I would suggest to you that DOE officials often confuse coal reserves with coal resources. Most of our data fall in the area of coal resources which we define as known coal in the ground. Reserve data would be defined as mineable coal using present day recovery technology. It is the amounts of coal reserves that concern us, and for this the DRB and other Federal data bases are inadaquate.

I wish you success in this most difficult task.

Sincerely,

Donald C. Haney

Donald C. Haney
State Geologist and Director

DCH/mww

KENTUCKY GEOLOGICAL SURVEY
UNIVERSITY OF KENTUCKY
311 Breckinridge Hall
Lexington, Kentucky 40506-0056

Director and State Geologist
DONALD C. HANEY

Assistant State Geologist
JOHN D. KIEFER

Phone (606) 257-5863

February 13, 1987

William M. Kelce
244 Goodwin Crest Drive
Suite 110
Birmingham, AL 35209

Dear Mr. Kelce:

Your letter was given to me by Donald C. Haney to write a response to your request for comments on the DOE Demonstrated Reserve Base (DRB) of Coal in the United States. I have a very strong interest in coal resource estimates, methods, and objectives. I am very familiar with the DRB as well as other coal resource programs of federal and state agencies. I am very happy to give my opinion about the DRB. I would also look forward to discussing these matters with you personally if there is a need to do so.

There is no easy way to answer your question about the DRB. There is a long history of government coal resource investigations. These investigations require complicated methods, sometimes arbitrary, for doing this type of work. There is no agreement that the methods used are either adequate to do the job or provide useable results. Worst of all, there is no known relationship between coal resources as given in the DRB and "economically mineable" coal in the ground. The technical aspects of the DRB and coal resource estimates are too involved to be covered in a letter.

The DRB has served an important role by providing a gross inventory of resources by state. In times of national emergency, such as the energy crisis of the early 70's, the DRB fulfilled a need to reassure the industry and the nation that the U.S. does indeed have sufficient domestic energy supplies for the near term and beyond. We must avoid the panic brought on by artificial and temporary crises and the resulting price fly-up and disruptions in our public energy utilities that can occur from insufficient information. The DRB helps a great deal in this regard.

The United States has very immediate needs as well as long-term needs for coal resource information. Coal resource information is used by government and industry to plan for the future and to justify legislative and administrative actions. Government programs such as clean coal technology, acid rain legislation, the construction of seaport loading facilities, waterways and transportation systems, and other programs require an indepth knowledge of the quality, quantity, location, and mineability of coal reserves. Utilities use

econometric models to predict coal price and supply and need detailed resource information. Unfortunately, the DRB does not provide the level of detail needed by most users of coal resource information.

On the other hand, the huge numbers for remaining coal resources in the DRB of 475 billion tons when divided by the annual production of 850 million tons gives more than 550 years of coal supply. Almost no one believes this to be true because the amount of economically mineable coal is only a very small fraction of the DRB. No one knows what that fraction is but new research could provide some of the answers. The 500 year coal supply is a myth and terribly misleads energy planners with a false sense of security. It is perceived by many decision makers as less harmful to pass rigid legislation about a resource that is apparently so plentiful. Therefore, DRB estimates can be harmful to our energy needs.

I believe the U. S. needs a DRB, but I also believe that the next generation (fourth generation) of reserve studies should be undertaken now. All coal states compile resource figures, mine maps, and legal obstacles to mining. Therefore, the components of a third generation reserve study are available in each state, some much more developed than others, but nonetheless available for coal reserve investigation. As the new generation of reserve estimates are completed the results could be incorporated into the DRB.

In response to your second question about the impacts of government regulations on reserves, there is no firm estimate or data to estimate these impacts. The Kentucky Geological Survey together with the U.S. Geological Survey has a pilot study to determine such impacts in a small area of eastern Kentucky. The pilot study is scheduled to be completed in June.

Only a small fraction of the total coal resource will ever be extracted because of naturally occurring obstacles to mining such as thin coal, split coal, poor top, bad quality, vants, faults, and other geological problems. Regulations promulgated by government further divide the resource into mineable and unmineable categories. The combined impacts of past mining, natural obstacles, and man-made obstacles including government regulations combine to render much of our resources unmineable.

Thank you for this opportunity to express my views of coal resource estimates and the DRB. If you need anything else from me please let me know.

Sincerely,

James C. Cobb

James C. Cobb
Geologist and Head,
Coal Section

cc: Donald C. Haney

JCC/blw

GEORGE E. EVANS, JR.
SECRETARY

MARTHA LAYNE COLLINS
GOVERNOR

KENTUCKY ENERGY CABINET
February 17, 1987

William M. Kelce, President
Alabama Coal Association
244 Goodwin Crest Dr., Ste. 110
Birmingham, Alabama 35209

Dear Mr. Kelce:

Tom Duncan, President of the Kentucky Coal Association, sent me a copy of your letter requesting recommendations on the nation's coal reserve data base. EIA's Demonstrated Reserve Data Base served as a useful inventory of known information when it was prepared but more details are now required for effective planning. I believe that a complete understanding of the United States' coal resources is mandatory if we are to properly exploit this country's most plentiful energy source and hydrocarbon feedstock.

Extensive information is already available on Kentucky's coal resources. Enclosed are copies of seven evaluations, prepared by the Kentucky Geological Survey for the Kentucky Energy Cabinet. Also, enclosed is a copy of the Blue Book of Kentucky coal, the first chapter of which summarizes the quantity and quality of the state's coal resources. These reports, while very detailed, should be updated in light of new and more complete data.

In addition to updating the coal resource quantity estimates, more work needs to be done on quality of the Commonwealth's coal resources. This information is crucial to determining future markets. I should point out that the Cabinet and its Laboratory are now evaluating the available coal quality data for Kentucky. Furthermore, while it is clear that statutes, regulations, etc., significantly influence the resources available both directly and indirectly, little substantive data is available regarding the problem. Therefore, the issue needs to be addressed soon. Finally, in addition to tables, new data must be made available on maps wherever possible.

Dr. James C. Cobb, Head of the Coal Section for the Kentucky Geological Survey should also be contacted for your report. Please call Dr. Thomas B. Griswold of my staff if you need more information on our activities.

Sincerely,

William H. Bowker, Commissioner
Department of Production & Utilization

WHB:TBG:mm
Enclosures

KENTUCKY CENTER FOR ENERGY RESEARCH
P.O. BOX 11888
LEXINGTON, KENTUCKY 40578-1918
(606) 252-5535

State of Louisiana

B. JIM PORTER
SECRETARY

DEPARTMENT OF NATURAL RESOURCES
LOUISIANA GEOLOGICAL SURVEY

CHARLES G. GROAT
DIRECTOR

January 15, 1987

William M. Kelce
President
Alabama Coal Association
244 Goodwin Crest Drive
Suite 110
Birmingham, AL 35209

Dear Mr. Kelce,

The State Geologist, Dr. Groat, has asked me to reply to your letter regarding coal reserve data. The LGS is currently actively involved in National Coal Resources Data System research in cooperation with the United States Geological Survey. We expect to complete this research by December 1987. At that time we will have well log data (including location, depth and lithology) from approximately 8,000 shallow density logs available which the USGS and the LGS will use to arrive jointly at a new estimate of the coal reserves of Louisiana.

Our current Louisiana reserve estimate is approximately 1.7 billion tons of lignite. This is based on the analysis of isopach and isopleth maps prepared from data from approximately 2,000 shallow density logs.

If I can be of any further help to you on this or any other matter, please write me or call me at 504/342-6757.

Sincerely,

John E. Johnston, III
Chief
Energy and Mineral Resources

P.O. BOX G . BATON ROUGE, LA. 70893 . PHONE 504/342-6754
LSU GEOLOGY BUILDING

STATE OF MICHIGAN

JAMES J. BLANCHARD, Governor

DEPARTMENT OF NATURAL RESOURCES

STEVENS T. MASON BUILDING
BOX 30028
LANSING, MI 48909

Gordon E. Guyer, Director

February 10, 1987

Mr. William M. Kelce, President
Alabama Coal Association
244 Goodwin Crest Drive
Suite 110
Birmingham, Alabama 35209

Dear Mr. Kelce:

Mr. R. Thomas Segall has asked me to respond to your letter of January 8, 1987, requesting information on the coal reserves in Michigan. I am enclosing a copy of the 1976 report "Magnitude and Quality of Michigan's Coal Reserves" by J. Kalliokoski and E. J. Welch. Although this report is now eleven years old, it is still the only report we have on our coal reserves. However, I would like to point out the reserve data on this report has taken the liberty to put two very significant qualifiers on the reserve estimates. It has only included coal seams which are greater than 28 inches thick and have less than 100' of overburden. With current surface mining techniques, I believe the majority of the coal seams less than 28" thick would be recovered along with the thickest seam of coal, if a mining operation were to be conducted in our state. As a result, the estimate of coal reserves in this report represents a somewhat lower value than what is actually available.

I hope this information will be of assistance in your study. If we can provide additional information, feel free to call me at 517-334-6976.

Sincerely,

Rodger Whitener

Rodger Whitener, Acting Supervisor
Policies, Procedures & Special
Services Unit
Geological Survey Division
517-334-6976

rw:jh

cc: Mr. R. Thomas Segall, Chief, Geological Survey Division

R1026

Mining Industry Council of Missouri

Tel: (314) 635-7308 - Box 725 - 225 E. Capitol - Jefferson City, Mo. 65102

January 13, 1987

Mr. Jerry Vineyard
Department of Natural Resources
Missouri Geological Survey & Water Resources
P. O. Box 250
Rolla, Missouri 65401

Dear Jerry:

Enclosed is the letter from Bill Kelce about which I spoke to you yesterday. I appreciate your willingness to help by providing the requested information.

Sincerely,

W. E. Marbaker II
Executive Secretary

rms

cc: William M. Kelce
President, ACA

JOHN ASHCROFT
Governor

FREDERICK A. BRUNNER
Director

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES

DIVISION OF GEOLOGY & LAND SURVEY
P.O. Box 250, 111 Fairgrounds Road
Rolla, MO 65401
314-364-1752

Division of Energy
Division of Environmental Quality
Division of Geology and Land Survey
Division of Management Services
Division of Parks and Historic Preservation

January 21, 1987

Mr. William M. Kelce, President
Alabama Coal Association
244 Goodwin Crest Drive
Suite 110
Birmingham, AL 35209

Dear Mr. Kelce:

Your request for information on Missouri coal resources and reserves has been referred to me by Dr. Williams.

I am sending under separate cover a few of our publications which contain the most recent, comprehensive information on the state's coal reserves. "Coal Availability in Missouri" discusses the quantity and quality of coal reserves, production potential and possible coal markets for nine coal-bearing regions in Missouri. Some of the problems associated with mining and marketing Missouri coal are presented in "Policy Options for Missouri Coal".

"Coal Resources and Reserves of Missouri" by Robertson and Smith, contains the latest, most detailed estimate of the state's coal resources and reserves. We are in the process of updating our estimate using the computerized National Coal Resources Data System maintained by the USGS, Branch of Coal Geology.

I am also sending you a complete list of publications available from our office, as well as a condensed list of coal-related publications.

If I can be of any further assistance in this matter, please call or write.

Sincerely,

ECONOMIC GEOLOGY

Joy L. Bostic
Geologist, Coal Resources

JLB:rcb

Under Separate Cover:
Missouri Coal (Brochure)
Policy Options for Missouri Coal
OFR-79-4-ER - Coal Availability in Missouri
RI-63 - Chemical Composition of Missouri Coals
RI-66 - Coal Resources are Reserves of Missouri
List of publications
List of coal publications
DGLS Testimony

cc: Dr. James H. Williams
Director and State Geologist

cc: William E. Marbaker
Executive Secretary
Mining Industry Council of Missouri

MISSOURI COAL RESOURCES, PRODUCTION, CONSUMPTION & TRENDS

Missouri Department of Natural Resources
Geological Survey Program
September 22, 1986

RESOURCES vs. CONSUMPTION

Missouri has measured recoverable coal reserves adequate to support a potential annual production of 29 million tons for 30 years, but current annual production is about 5 million tons, and declining. Coal consumption in Missouri is currently about 23 million tons per year, which is being supplied primarily by coal shipped in from Illinois, Wyoming, and other states. Coal consumption continues to increase, while coal production in Missouri is on the decline.

The primary use of coal in Missouri is for power production by electric utilities, which generate 94 percent of the State's electricity needs by burning coal. Nationally, the figure is 85 percent; Missouri coal consumption for power production rose from 6.9 million tons in 1967 to over 22 million tons in 1985 (illustration 1). However, while total coal consumption has more than tripled, Missouri's coal production has increased by only a third; the lion's share of the Missouri energy dollar has gone to other states.

MISSOURI COAL PRODUCTION AND TRENDS

Missouri coal production increased steadily from 1967 through 1977, reflecting the rising demand for electricity and the construction of three mine-mouth, coal-fired power plants: Thomas Hill in Randolph County; LaCygne in Linn County, Kansas (using Missouri coal); and Asbury in Jasper County. Production peaked in 1977 and 1979 (illustration 2), coinciding with the energy crisis and resulting shortages of oil and natural gas.

For the past five years, Missouri coal production has averaged about 5.5 million tons, except for 1984, when an all-time high of nearly seven million tons per year was reached. However, much of the record production has been attributed to stockpiling by electric utilities anticipating a major labor strike which did not materialize. Since then, production has declined from 5.5 million tons in 1985 to a projected 5 million tons in 1986.

In 1985, the most recent year for which full production figures are available, 15 companies produced 5,458,589 tons of coal (see table 1). Three of these producers closed in 1985; production in 1986 is expected to be about 500,000 tons lower than 1985. In addition, Central West Coal Company in Vernon County has filed Chapter 11 bankruptcy and has greatly curtailed production.

CONSIDERATIONS ON THE USE OF MISSOURI COAL

Using Missouri coal in Missouri power plants has both advantages and disadvantages:

Advantages:

* Mine-mouth power plants minimize transportation
* Btu content is relatively high (10,000-12,500 Btu/lb)
* Production costs stimulate local economies
* Mining jobs are available to Missouri workers

Disadvantages:

* High sulfur content (4.5%) causes emissions problems; wet scrubbers may be required
* Thin coal seams require greater disturbed areas during mining, causing higher reclamation costs

Missouri's principal competitors for the State's coal market are Illinois, which supplies major power plants in the St. Louis area for a 61% share of the market in 1985, and Wyoming, which now has 16% of the 22 million ton Missouri market and seems ready to increase its market share at the expense of Missouri coal (Illustration 3).

The primary reasons why Wyoming coal is gaining in the utility-coal market is its low (less than one percent) sulfur content. It can be burned without the need for expensive flue-gas scrubbers, which may add 40% to the cost of a power plant, and thereafter are extremely expensive to operate and maintain. These "wet scrubbers" also require a supply of crushed limestone that reacts with the sulfur in the stack gases to form a waste product called calcium sulfate, which must be stored on-site in waste-retention ponds.

WHO USES MISSOURI COAL?

Of the 5.4 million tons of coal produced in the state in 1985, approximately 90% was consumed by four mine-mouth power plants. The remaining part of Missouri's coal production was consumed on the electric utility spot-market and at smaller municipal and state-owned power plants in north-central and western Missouri. The future demand for Missouri coal will depend on the demand for electric power at these utilities.

HOW MUCH COAL DOES MISSOURI HAVE?

Coal occurs in layers or "seams" in the bedrock of western and northern Missouri (see Mineral Resources Map, illustration 4). The Geological Survey has mapped coal-bed outcrops, measured the thickness of seams encountered in drillholes, and conducted analyses to determine coal quality in all of the coal-producing areas of the state. The data thus acquired have been published in numerous reports and shown on maps, for public use. In recent years, coal data have been computerized through development of the National Coal Resources Data System, in which DNR has been a leading participant.

In measuring coal remaining in the ground, geologists use terminology that defines and separates the limited amount of coal that is economically mineable from the vast resource base that is too thin and/or in discontinuous seams, to be mined (Illustration 5).

* Resource base: All coal in seams 14 or more inches thick, regardless of mineability — 47 billion tons
* Recoverable reserves: All coal in seams 28 inches or more thick, explored by drilling or mapping, and suitable for mining by current methods — 5 billion tons
* Measured recoverable reserves: Coal measured by detailed mapping using closely-spaced control points (usually drillholes), mine workings, and outcrops — 875 million tons

The 875 million ton Measured Recoverable Reserves figure means that DNR's Geological Survey Program has reliable information on coal deposits that could sustain a 29 million tons per year production rate for 30 years, enough to sustain much more than the total annual coal consumption in Missouri.

OIL
COAL VS. ~~COAL~~

The price of oil on the world market has a direct effect on the attractiveness of coal as a fuel. When oil prices are high, coal becomes a more economical alternative fuel. Conversely, when oil prices are low there is less incentive to develop technology for clean-burning coal. Illustration 6 shows the relationship between oil and coal prices since 1966.

Currently oil prices are about $14/bbl for western Missouri oil; coal prices have held relatively steady.

SOURCES

Coal resource and reserve data from Missouri Department of Natural Resources Geological Survey, in cooperation with the National Coal Resources Data System. Computer applications by Geological Survey staff.

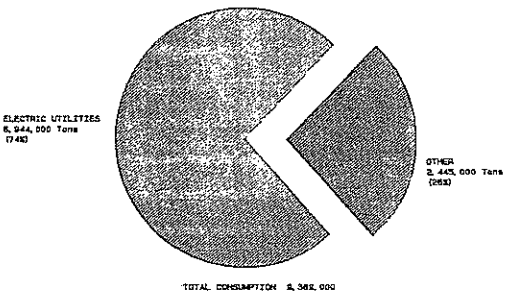
Coal production data from U. S. Department of Energy, and from personal communications with industry representatives.

Hearing testimony presented by Jerry D. Vineyard, Program Director, Geological Survey.

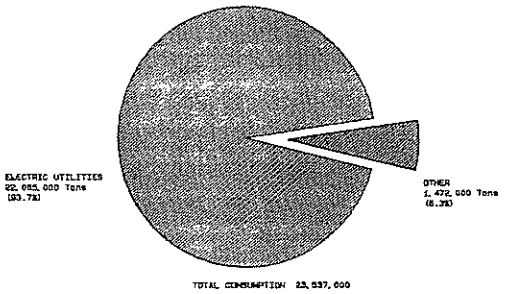
Staff contributions by Joy Bostic, Geologist, Coal Resources; Kurt Hildebrandt and Bruce Netzler, professonal staff, Economic Geology.

Missouri Department of Natural Resources
Division of Geology and Land Survey
Geological Survey Program
(314)364-1752

COAL CONSUMED IN MISSOURI
BY ELECTRIC UTILITIES

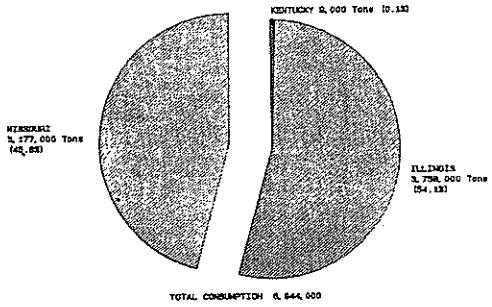


1967



1985

ORIGIN OF COAL CONSUMED BY
ELECTRIC UTILITIES IN MISSOURI



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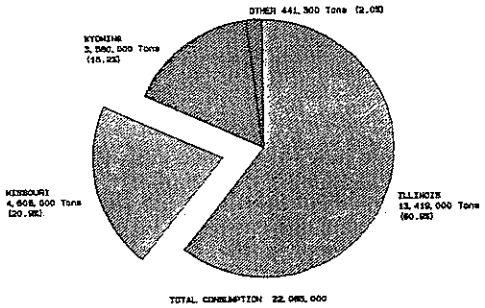
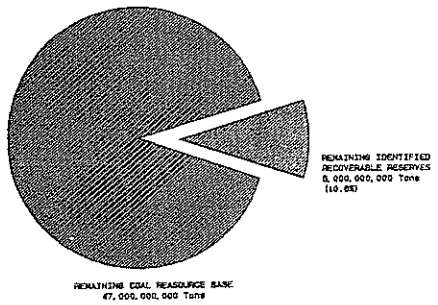
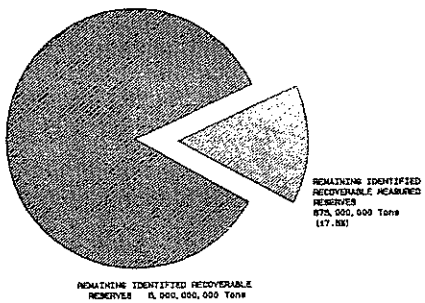


1985

MISSOURI'S COAL RESOURCES
AND RESERVES





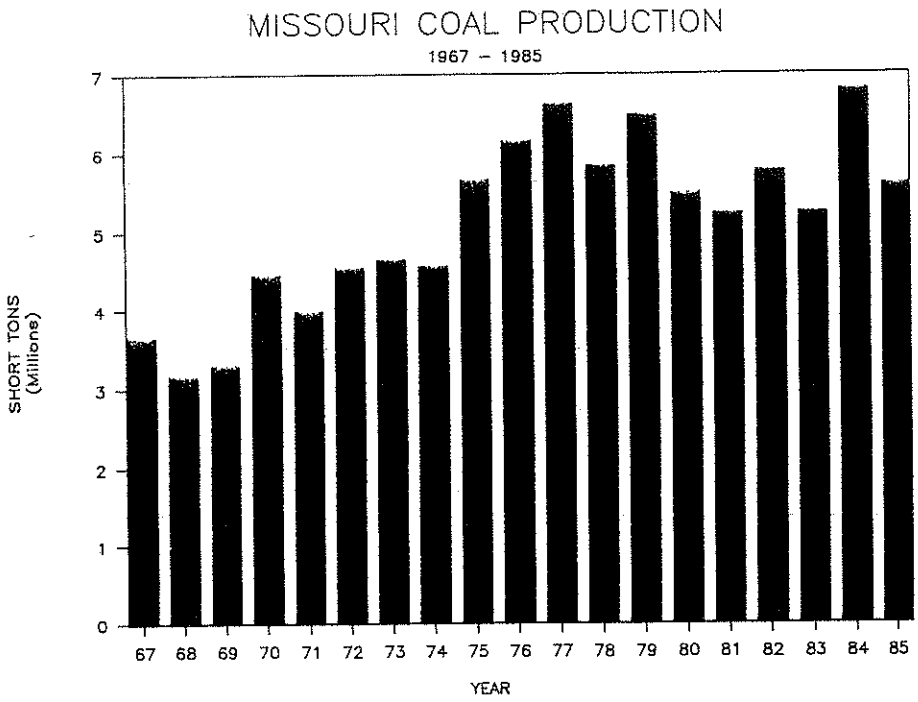
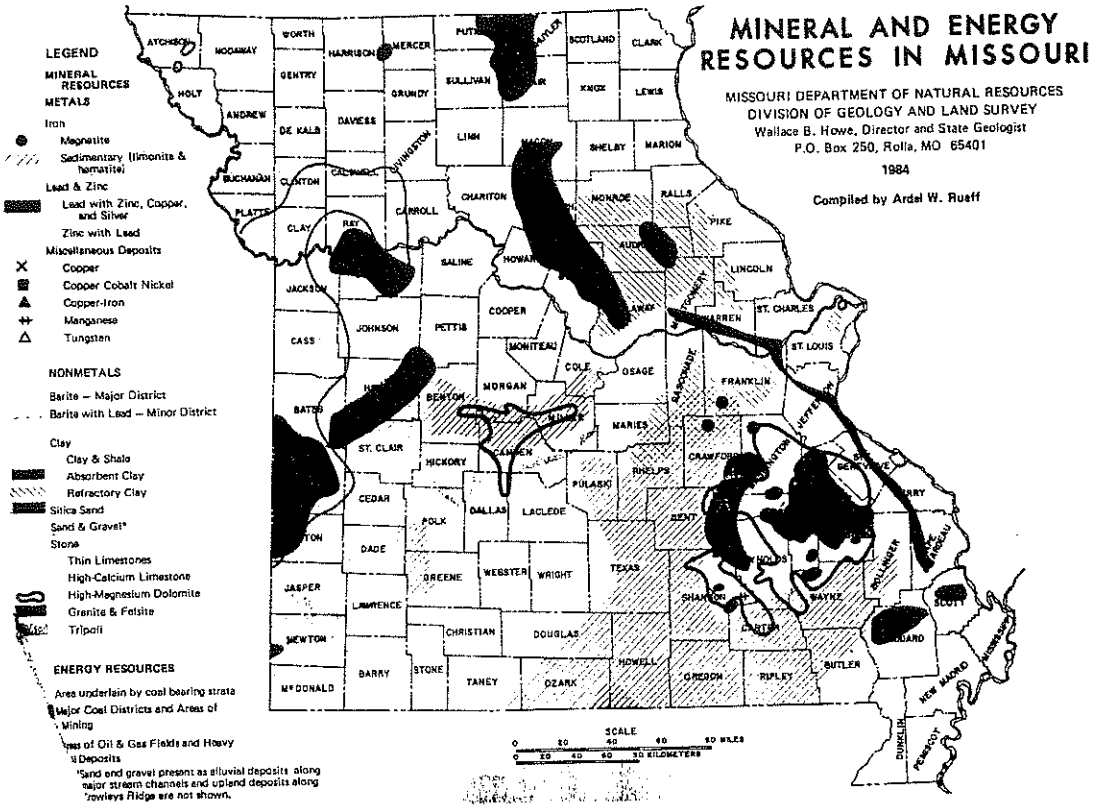


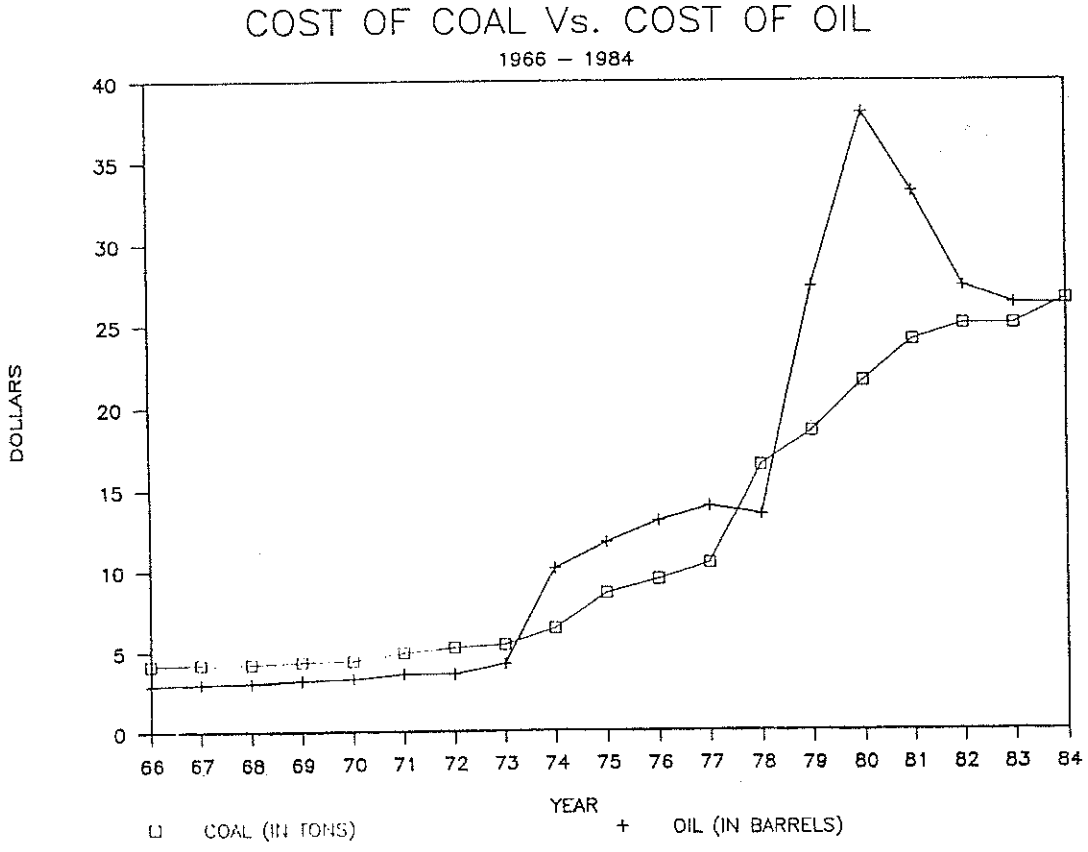
TABLE 1

MISSOURI COAL PRODUCTION 1985

Company	County	Production
Associated Electric Co-op	Randolph	1,718,300
* Bill's Coal Company	Vernon	336,648
Burbridge Coal Company	Monroe	96,275
** Central West Coal Company	Vernon	135,818
Missouri Leasing & Investment Company	Cooper	26,901
Missouri Mining, Inc.	Putnam	38,981
* Moniteau Valley Mine, Inc.	Randolph	4,802
NEMO Coal Company	Randolph	892,670
Peabody Coal Company	Henry	651,232
P & M Coal Mining (Empire Mine)	Barton	494,420
P & M Coal Mining (Midway Mine)	Bates	797,562
Universal Coal & Energy Company	Howard/Randolph	223,870
* Wyoming Fuel Corporation	Monroe	18,086
ACORN System, Inc.	Howard	5,021
Sunrise Coal Company	Bates	18,003
	TOTAL	5,458,589

* Closed in 1985.
** Filed for Chapter 11 bankruptcy


MINERAL AND ENERGY RESOURCES IN MISSOURI
MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGY AND LAND SURVEY
Wallace B. Howe, Director and State Geologist
P.O. Box 250, Rolla, MO 65401
1984
Compiled by Ardel W. Rueff
LEGEND
MINERAL RESOURCES
METALS
Iron
Magnetite
Sedimentary (limonite & hematite)
Lead & Zinc
Lead with Zinc, Copper, and Silver
Zinc with Lead
Miscellaneous Deposits
Copper
Copper Cobalt Nickel
Copper-Iron
Manganese
Tungsten
NONMETALS
Barite – Major District
Barite with Lead – Minor District
Clay
Clay & Shale
Absorbent Clay
Refractory Clay
Silica Sand
Sand & Gravel*
Stone
Thin Limestones
High-Calcium Limestone
High-Magnesium Dolomite
Granite & Felsite
Tripoli
ENERGY RESOURCES
Area underlain by coal bearing strata
Major Coal Districts and Areas of Mining
Areas of Oil & Gas Fields and Heavy Oil Deposits
*Sand and gravel present as alluvial deposits along major stream channels and upland deposits along Crowleys Ridge are not shown.
SCALE
0 20 40 60 80 MILES
0 20 40 60 80 KILOMETERS


COST OF COAL Vs. COST OF OIL
1966 – 1984
DOLLARS
40
35
30
25
20
15
10
5
0
66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84
YEAR
COAL (IN TONS)
OIL (IN BARRELS)

MONTANA BUREAU OF MINES AND GEOLOGY
MONTANA COLLEGE OF MINERAL SCIENCE AND TECHNOLOGY
BUTTE, MONTANA 59701
(406) 496-4180

February 5, 1987

Mr. William M. Kelce
Alabama Coal Association
Suite 111
244 Goodwin Crest Drive
Birmingham, Alabama 35209

Dear Mr. Kelce:

I have been requested by Dr. Ruppel to answer your request for information on coal resources in Montana. Enclosed is a copy of the Montana section from the Keystone Coal Industry Manual. It provides basic resource information. Strippable coals in the Powder River and Fort Union regions and coals in the Bull Mountain Field are also covered in MBMG Bulletin 91. U. S. Geological Survey Open-File Report 85-621 summarizes coal resources on federal lands. Little modern work has been done on other coal fields in Montana.

Please contact me if you need more information.

Yours truly,

Mark A. Sholes
Coal Geologist
(406) 496-4439

MAS:jd

Enclosure

January 12, 1987

Mr. William M. Kelce, President
Alabama Coal Association
244 Goodwin Crest Drive, #110
Birmingham, AL 35209

Dear Mr. Kelce:

Your request of January 8th has been discussed with Dr. Frank Kottlowski, Director of the New Mexico Bureau of Mines and Mineral Resources, who has the best information in the state on coal resources. He will be sending this information to you. Our office has no reserve information at all.

Yours truly,

William F. Darmitzel

William F. Darmitzel
Executive Director

xc: Dr. Kottlowski

New Mexico Bureau of Mines & Mineral Resources
Socorro, NM 87801

A DIVISION OF
NEW MEXICO INSTITUTE OF MINING & TECHNOLOGY

Information 505-835-5420
Publications 505-835-5410

January 23, 1987

Mr. William M. Kelce, President
Alabama Coal Association
244 Goodwin Crest Dr.
Suite 110
Birmingham, AL 35209

Dear Mr. Kelce:

We have attempted to work with the Department of Energy on their Demonstrated Coal Reserve Data Base for New Mexico and have some variance with their treatment of the classification of reserves, resources, and other designations. We have been a long-time cooperator with the U. S. Geological Survey on their NCRDS system; we have provided most of the basic data that have gone into that computerized national coal resources data system for areas in New Mexico.

To obtain the data from the NCRDS system, you would have to contact the U. S. Geological Survey, which I am sure you have already done. The problems with that point-source data base is that it contains a very considerable amount of confidential data which cannot be released except in an aggregated total for large areas. Perhaps another problem is that this data base contains a very considerable amount of excellent information in relatively small areas, i.e., coal mine areas or areas that have been explored by coal companies for possible future production. Data in other areas may be very sparse and may include only outcrop data and information from scattered water wells, oil tests, and so on. The State of New Mexico, in the last two years, in cooperation with six coal companies, has attempted to set-up a relatively uniform data base on the strippable coals in the state by a drilling program of evenly-spaced holes, sited about two miles apart along the outcrop of the minable coals, but down dip a sufficient distance so that strippable coals to 250 or as much as 300 feet are included. This work is in progress and has been funded by approximately $820,000 of state and industry money. It will be released when the final report is available for publication (a year from now?).

In addition, we have several publications that deal with reserve and resource data such as our Memoir 25 on the strippable low-sulfur coal resources of the San Juan Basin, and an update to that report which is available as Open-File Report 84, as well as some reports on some of the smaller coal field areas such as those in west-central New Mexico. Also, we are doing mineral resource assessment for BLM, including coal deposits; some of these county reports are available as our Open-File Reports; others are in progress.

In addition, the USGS Branch of Coal Geology has recently put together a report entitled "Coal in New Mexico, 1985: geology, resources, methodology, and reliability of resource calculation; collected reports." This is in process as a U. S. Geological Survey circular; a draft of it has appeared as a USGS Administrative Report which was approved in April of 1985 and is entitled "Coal in New Mexico: issues in quality and resources."

At the meeting of the Coal Geology Division of the Geological Society of America held in San Antonio last fall, the informal suggestion was made by Hal Gluskotter, who is chief of the Branch of Coal Resources for USGS, that on a state-wide and nation-wide basis, we all seriously need to get together on a relatively detailed program to characterize and evaluate the actual economic coal reserves and resources, based on realistic economic characteristics as to stripping ratio, depth of coal beds, thickness of coal beds, rank of the coal, availability for underground mining, and other factors that will affect actual coal production in the near future and for the next several decades. Perhaps that is what you should recommend to the Secretary of the Department of Energy.

We can provide you with all of our reports related to coal resources in New Mexico; the USGS circular that is in editing at the present time, would have to come from the USGS and also the NCRDS data would have to be cleared through them.

If there are any questions or comments, you may reach me at 505-835-5420. Gretchen Roybal is the coal geologist at NMBM&MR who is in charge of our NCRDS program; she can be reached at 505-835-5640.

Sincerely yours,

Frank E. Kottlowski
Director

FEK/jv

cc: William F. Darmitzel, Executive Director

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
525 Camino de los Marquez
Santa Fe, New Mexico
87501

GARREY CARRUTHERS
GOVERNOR

January 13, 1987

Mr. William M. Kelce, President
Alabama Coal Association
244 Goodwin Crest Drive, Suite 110
Birmingham, AL 35209

Dear Mr. Kelce:

I was asked to respond to your letter of 1-8-87 requesting information on New Mexico's coal reserves. The most recent information I have available is in the coal chapter of our 1986 Annual Resources Report, due off the press within a week. I will mail you a copy as soon as it is available.

If you have any further questions after looking over the article, please write or call me at (505) 827-5868.

Sincerely,

Kay S. Hatton

KAY S. HATTON
Staff Geologist

KSH/vb

OFFICE OF THE SECRETARY (505) 827-5950
ADMINISTRATIVE SERVICES DIVISION (505) 827-5925
RESOURCE DEVELOPMENT & MANAGEMENT DIVISION (505) 827-5900
MINING & MINERALS DIVISION (505) 827-5970
OIL CONSERVATION DIVISION (505) 827-5800
Land Office Building, P.O. Box 2088, Santa Fe, New Mexico 87501

State of North Carolina
Department of Natural Resources and Community Development
Division of Land Resources
512 North Salisbury Street • Raleigh, North Carolina 27611

James G. Martin, Governor
S. Thomas Rhodes, Secretary

Stephen G. Conrad
Director

January 20, 1987

Mr. William M. Kelce, President
Alabama Coal Association
244 Goodwin Crest Drive, Suite 110
Birmingham, Al 35209

Dear Mr. Kelce:

Thank you for your letter of January 8 to Mr. Stephen G. Conrad. Because of the nature of the letter, it was forwarded to me.

The only coal reserve figures for North Carolina are published by the U.S. Bureau of Mines. Mr. Doss H. White, JR. is the liason officer for the southeast; he may be reached in Tuscaloosa at (205)758-0491.

You may wish to refer to United States Geological Survey Prof. Paper 246 by J.A. Reinemund (1955). That professional paper describes the geology and presents reserve figures for the Deep River coal field located in the Triassic Deep River Basin, North Carolina.

If I can be of any further help, please feel free to call upon me.

Jeffrey C. Reid
Chief Geologist
North Carolina Geological Survey

JRC/mjh

cc: Stephen G. Conrad

P.O. Box 27687, Raleigh, North Carolina 27611-7687 Telephone 919-733-3833

THE NORTH DAKOTA LIGNITE COUNCIL

JOHN W. DWYER, PRESIDENT

March 10, 1987

Mr. William Kelce
Alabama Coal Association
244 Goodwin Crest Drive
Suite 110
Birmingham, AL 35209

Dear Mr. Kelce:

Regarding your letter requesting data on North Dakota's coal reserves, there is little information available that is recent or that can be considered accurate. Estimates of the state's total reserves range from 351 billion tons up to 500 billion tons.

Accurate data on the amount of economically recoverable lignite reserves in North Dakota is even more difficult to come by. Department of Energy publications list North Dakota as having 9.9 billion tons of recoverable reserves while other sources estimate the figure at between 15 and 32 billion tons.

As you can see, there are wide discrepancies in data on North Dakota's coal reserves. This is because no recent scientific studies on the state's reserves have been completed. The most widely quoted figures come from a study by R.A. Brant published in 1953 by the U.S. Geological Survey. However, most of Brant's study is based on estimates, not hard data from drill holes.

The North Dakota Mining and Mineral Resources Research Institute (NDMMRRI) at the University of North Dakota has undertaken a project to re-evaluate the state's lignite resources. In the last two years, only about one-sixth of North Dakota's lignite reserves have been mapped under this study. Funding cuts have slowed progress considerably, and at the current level of funding, the study is not expected to be completed for another six years.

Obviously in North Dakota there exists a serious gap in accurate data on coal reserves. Even conservative estimates seem to suggest that DOE's figure of 9.9 billion tons of economically recoverable reserves is probably not correct.

If I can be of further assistance, please let me know.

Sincerely,

John W. Dwyer
President

BOX 2277 • SUITE 410, NORWEST BANK BUILDING • BISMARCK, NORTH DAKOTA 58502 • (701) 258-7117

OHIO MINING AND RECLAMATION ASSOCIATION
50 SOUTH YOUNG STREET, COLUMBUS, OHIO 43215 — PHONE (614) 228-6336
NEAL S. TOSTENSON
PRESIDENT

February 14, 1987

Alabama Coal Association
244 Goodwin Crest Drive
Suite 110
Birmingham, AL 35209

Attention: Mr. William M. Kelce, President

Dear Bill:

The attached letter and materials were put together by the head of the State Geological Survey.

One of the biggest problems relative to reserves in portions of Ohio deal with the number of oil and gas holes that have been drilled to lower stratas, which have a tremendous effect on longwall mining.

The second factor that has not really been estimated are the effects of the regulatory changes that keep coming out, which in the longrun are going to have an effect of taking more undergound coal out of production.

I hope the enclosed materials are what you wanted.

Very truly yours,

Neal S. Tostenson
President

OHIO MINING AND RECLAMATION ASSOCIATION
50 SOUTH YOUNG STREET, COLUMBUS, OHIO 43215 — PHONE (614) 228-6336
NEAL S. TOSTENSON
PRESIDENT

February 5, 1987

Mr. William M. Kelce, President
Alabama Coal Association
244 Goodwin Crest Drive, Suite 110
Birmingham, AL 35209

Dear Mr. Kelce:

This letter will serve as a reply to your letter of January 8, 1986 to b
Mr. Horace R. Collins, Chief of the Division of Geological Survey, and t

The Ohio Division of Geological Survey issued a publication (Bulletin 58
"Coal Resources of Ohio") in 1960 which reports on the original coal
resources of Ohio. This bulletin sets the original coal resources of th
state at 46,488,251,000 tons. This figure was reduced by the tonnage of
mined through 1957 and reduced again by 50 percent to account for the
unrecoverable coal to arrive at an estimate of 21,330,125,500 tons of "r
coal. Although Bulletin 58 uses the term reserve interchangeably with t
erm resources, it is vital to understand these are resource and not rese
data. Furthermore, there are several other shortcomings with this estin
First, as stated, the estimate is for resources and not reserves; resour
being all coal regardless of its potential mineability vs. reserves bein
coal which can be mined under current economic and technological conditi
(see Ohio Division of Geological Survey Open-File Report 85-1). Second
the Bulletin 58 estimate includes coal in all relability and thickness c
gories; that is, coal as thin as 14 inches and coal weakly inferred by
geological conditions. It should be further noted that Bulletin 58 deal
essentially with near-surface coals, as few data were available for coal
deeper than approximately 400 feet.

Mr. Collins, using data from Bulletin 58, subsequently made an estimate
on that coal in the proven and probable reliability categories reduced
tonnage mined to date and by 50 percent estimated unrecoverable coal. U
this method, an estimate was arrived at of 10,785,000,000 tons. As a ch
to this method, using the same data base, an estimate was made using onl
that coal 28 inches thick or thicker reduced by past mining and allowing
50 percent for nonrecovery. By this method the estimate was 10,760,000,0
tons.

The Division of Geological Survey is aware that better reserve data are
needed, and all coal data now being developed by the Division are design
to produce reserve estimates. The method now being used by the Division
described in the enclosed Open-File Report 85-1. The method now being u
allows greater flexibility in describing resources which may be valuable
the future and reserves which have immediate interest. Concerns such as
and gas wells, parks, lakes, cities, and other restrictions to mining ar
now being addressed.

The gap that currently exists for near-furface coals in Ohio is recalculation of our estimates using the more up-to-date method. Some areas have already been reworked, particularly those with continuing importance as mining areas. An example of a more recnt esitmate - Report of Investigations 105, "Resources of the Pittsburgh (No. 8) coal in the Belmont Field, Ohio" - is enclosed. There is as yeat, however, no statewide update to Bulletin 58.

While a minor gap does exist in the near-surface estimates, work in area is not our highest priority for the following reasons. Firstly, a large body of coal data exists for these resources which, although imperfect, is serving present needs. Secondly, additional geologic mapping is being carried out by the Division of Geological Survey which will allow for important refinements in coal estimates when completed. Thirdly, any reworking at this time would not produce drastic changes in the estimates. A quick comparison for the Pittsburgh coal between Bulletin 58 (using Collins' procedure) and RI 105 suggests a decrease in tonnage of only 25 percent for the more recent tabulation. Given the stricter definitions used in Open-File Report 85-1, decreases are to be expected. Considering the magnitude of the estimates, the inherent weakness in any estimate, and the change in procedures between the two estimates, a 25 percent difference is not expecially significant. Lastly, there are more serious gaps needing attention.

Deep-coal reserves for Ohio are inadequately known and do present a serious gap in the reserve data. The Division of Geological Survey has been attempting to carry out a preliminary drilling program to close this gap. Twenty to 25 counties in Ohio are underlain by coal-bearing rocks which exceed the depths to which underground mining has normally been carriec out within the state. Additionally, given the ready availability of strip coal in Ohio even relatively shallow underground coal have not been adequately explored. Drilling to close this data gap has been carried out in four counties. Because of a shortage of operating funds, it is uncertain when this program will be completed. Data gathered to date indicate additional reserves will be found, although they must be subjected to a vigorous analysis as outlined in Open File Report 85-1.

Proximate, ultimate, Btu, ash, and sulfur analyses are available for most coals. More sophisticated data such as trace elements in whole coal and ash along with FSI's, grindability, and washability data are considerably limited. A new coal-characterization program to greatly expand such data is being uncertaken by the Division of Geological Survey (funded in part by the Ohio Coal Development Office). No major gaps should exist for these data at the completion of this work. Although not a gap in the conventional sense, there is a need for the Division of Geological Survey to place all its coal data on a computer system for ease of manipulation and retrieval.

Very truly yours,

Neal S..Tostenson
President

ss

Enclosures

NEIL GOLDSCHMIDT
GOVERNOR

Department of Geology and Mineral Industries
ADMINISTRATIVE OFFICE
910 STATE OFFICE BLDG., 1400 SW 5th AVE., PORTLAND, OR 97201-5528 PHONE (503) 229-5580

January 27, 1987

William M. Kelce
President
Alabama Coal Association
244 Goodwin Crest Drive, Suite 110
Birmingham, AL 35209

Dear Mr. Kelce:

In answer to your question about Oregon's coal resources the following reports are enclosed:

1. Coal Resources of Oregon.
2. Economic Factors Affecting the Mining, Processing, Gasification, and Marketing of Coos Bay Coals.
3. Preliminary Report on Northeastern Oregon Lignite and Coal Resources Union, Wallowa, and Wheeler Counties.
4. Oregon's Coal and its Economic Future.

Sincerely,

Jerry J. Gray

Jerry J. Gray
Economic Geologist

JJG:RM
enclosures

50TH ANNIVERSARY 1937-1987

Western Pennsylvania Coal Operators Association, Inc.

Suite 1480 Two Chatham Center Pittsburgh, PA 15219
Telephone: 412 261-2446 or 261-2447

January 15, 1987

Mr. William M. Kelce
President
Alabama Coal Association
244 Goodwin Crest Drive
Suite 110
Birmingham, AL 35209

Dear Mr. Kelce:

In answer to your inquiry of January 8, 1987 concerning a coal data base, we are an association of small local operators involved in grievance and arbitration cases. We have practically no information available which would be of assistance in your search. We have, however, forwarded your letter to the Keystone Bituminous Coal Association which is a state-wide legislative association and which could possibly aid you.

The National Coal Association is another source of information but, I am certain you have already contacted them.

Sincerely,

Beatrice E. Edwards
Secretary/Treasurer

/bee

DEPARTMENT OF WATER AND NATURAL RESOURCES
SOUTH DAKOTA GEOLOGICAL SURVEY
Science Center, USD
Vermillion, SD 57069-2390
(605) 677-5227

January 26, 1987

William M. Kelce
Alabama Coal Association
244 Goodwin Crest Drive
Suite 110
Birmingham, AL 53209

Dear Mr. Kelce:

This is in reply to your recent letter to Merlin J. Tipton, State Geologist of South Dakota, concerning coal reserves in this State and the degree to which State and Federal regulations and enforcement agencies impact workable reserves. On this latter point we cannot make accurate comment concerning the impact that Federal regulations would have on reservation lands (i.e., Corson, Dewey and Ziebach Counties). Outside of these three Counties, Federal lands account for approximately 11 percent of the total area underlain by coal resources. (See page 168, U.S. Geological Survey, U.S. Bureau of Reclamation, and SD Geological Survey, Mineral and Water Resources of South Dakota, SD Geological Survey Bulletin 16, 1975, by Landis, E. R., and Tipton, M. M., which is enclosed.)

The regulations of the State concerning exploitation of coal reserves are not onerous. A copy of these regulations are enclosed for your perusal.

Sincerely,

Robert A. Schoon

Robert A. Schoon
Geologist

For the State Geologist

RAS:co
Enclosures

well in the SW1/4SE1/4 sec. 6, T. 22 N., R. 5 E., Harding County. The test was in the "C" zone of the formation from 8,939 to 9,022 feet. The well flowed 269 BOPD, 32 MCFPD gas, and ½ barrel of water, and was placed in production November 12, 1973. The first official production recorded for November was 154 BOPD and 19 MCFPD gas. This rate had declined to 102 BOPD and 12 MCFPD gas in December 1973. Cumulative production through December 31, 1973, was 6,855 bbls oil and 830 MCF gas.

The field was designated by the Board of Natural Resource Development in December 1973 with 320-acre spacing. No offset wells have been drilled.

Resources

The possibilities of discovering additional commercial oil and gas in South Dakota have been discussed by Ballard (1942), Agnew and Gries (1960), Sandberg (1962), Wulf and Gries (1963), and Sandberg and Prichard (1964). As of December 31, 1974, the recorded primary recoverable reserves were 2.6 million barrels of oil and 145 million cubic feet of gas.

Though the production record has been modest, a large number of geologic structures throughout the western part of South Dakota remain to be tested with the drill. A listing of all these structures and a description of each would be too lengthy for this article. It is sufficient to point out that the increased demand for petroleum and petroleum products along with higher wellhead prices for "new" oil and gas, brought about by the energy crisis of 1973, will undoubtedly stimulate activity in the region. More oil production can also be expected when secondary techniques are applied to some of the older wells in the State. Evidence that gas will become important is negligible.

The fact should be re-emphasized that through 1973 only 734 oil tests have been drilled in South Dakota. In contrast, 895 oil tests were drilled in Wyoming and 856 in Colorado during the single year 1973. South Dakota cannot become significant as an oil producing State until many more exploratory holes are drilled in intensified efforts to discover new oil fields and to further develop existing fields.

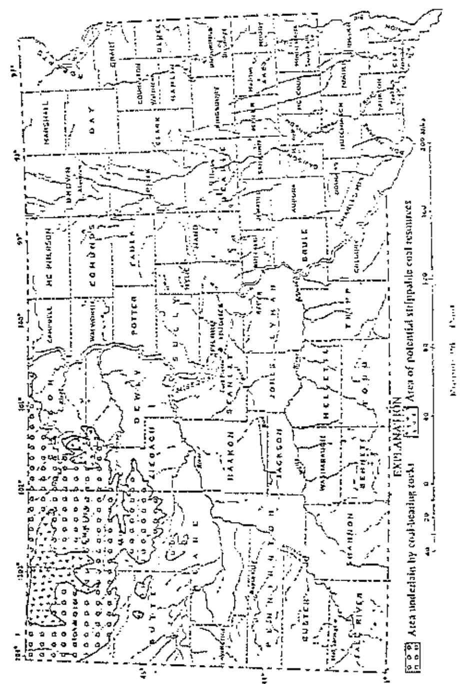
Coal

(By E. R. Landis, U.S. Geological Survey, Denver, Colo., and M. J. Tipton, South Dakota Geological Survey, Vermillion, S. Dak.)

A large area in northwestern South Dakota is underlain by rocks that contain lignite (fig. 26). The southwestern part of the State has small quantities of bituminous coal. Both the lignite and the bituminous coal have been mined to a small extent in the past and used almost solely for domestic heating nearby. Though the amount of bituminous coal is small, the lignite of the State constitutes a resource of considerable magnitude and potential value.

Geology

The coal-bearing rocks of South Dakota are of Cretaceous and Tertiary age. Bituminous coal is in the Lakota Formation of Early Cretaceous age at scattered places in the southwestern part of the



State, but known resources have been delineated only in Fall River County, where the coal was mined. A total of about 11,000 tons of bituminous coal is estimated to have been present before mining began. The bituminous coal is not discussed further in this report because its quantity is insignificant. The main resources consist of lignite in the northwestern part of the State in the Hell Creek Formation of latest Cretaceous age and in the Fort Union Group of earliest Tertiary age.

The Hell Creek Formation underlies a large part of the northwestern quarter of the State and contains lignite through much of this area. Lignite from the Hell Creek has been mined until recently in the Isabel-Firesteel field of Dewey and Ziebach counties, and was formerly mined in central Corson, northern Meade, southern Perkins, and eastern and northern Harding counties.

The Fort Union Group in South Dakota has the Ludlow Formation at its base followed by the Cannonball and Tongue River Formations. The Ludlow and Tongue River are nonmarine and coal-bearing. The Cannonball, which is marine, does not contain coal and is present only in the northern parts of Harding, Perkins, and Corson Counties. The Ludlow Formation "is the most prolific lignite-bearing rock unit in South Dakota" (Brown, 1952, p. 12) and is present over a considerable part of the lignite area. The Tongue River Formation is only in the northern parts of Harding and Perkins Counties. It contains coal beds as much as 9 feet thick in northern Perkins County. Nevertheless, the total amount of coal in the Tongue River in South Dakota is small compared to the amount in the Ludlow and Hell Creek because the areal extent of the Tongue River is small. Uranium associated with some of the Fort Union lignite is discussed in the uranium section of this report.

Production and utilization

The earliest recorded lignite production in South Dakota is for the year 1913, but lignite had been mined by ranchers and settlers for many years prior to that date. Total production is about 1,393,147 tons, which had a total value of about $3,391,846 (table 28). The peak year was 1941, when about 70,000 tons were mined. No production has been reported since 1967.

Most of the lignite has come from strip mines. Strip mining is more economical and more productive than underground mining in places like South Dakota where the coal beds are overlain by a relatively thin overburden composed of soft rocks. All recent recorded production has been from strip mines in Dewey and Corson counties. Though small underground mines may be active periodically, the amount of coal obtained from them is usually too small to be reported.

The lignite mined has in the main been used locally for domestic heating. In other northern Great Plains States lignite is extensively used to generate electric power. Lignite lends itself to processes such as carbonization and gasification, and can furnish a great variety of organic chemical substances (U.S. Bureau of Mines, 1954b and 1963).

TABLE 28.—COAL PRODUCTION, 1895-1973

[From U.S. Bureau of Mines and South Dakota Geological Survey]

Year	Quantity (short tons)	Value	Year	Quantity (short tons)	Value
1895-1912	[1]95,200	[1]$152,100	1942	53,558	$104,000
1913	10,540	20,635	1943	40,554	78,000
1914	11,950	20,456	1944	25,827	55,000
1915	10,593	15,354	1945	24,415	53,000
1916	4,696	19,021	1946	16,946	36,352
1917	5,542	23,346	1947	14,518	32,727
1918	7,942	22,229	1948	29,000	36,000
1919	14,417	45,707	1949	25,000	82,000
1920	12,777	46,500	1950	[1]27,000	[1]95,000
1921	7,553	25,200	1951	28,150	99,008
1922	7,752	22,600	1952	[1]25,000	[1]60,000
1923	10,379	25,000	1953	23,671	82,117
1924	12,033	35,000	1954	[1]20,000	[1]73,000
1925	14,247	42,000	1955	24,192	90,240
1926	14,129	42,000	1956	25,000	90,000
1927	12,501	33,000	1957	21,227	79,000
1928	13,929	39,000	1958	20,000	78,000
1929	12,451	35,000	1959	22,000	88,000
1930	12,340	31,020	1960	20,000	83,000
1931	27,435	54,391	1961	18,000	75,000
1932	49,074	37,500	1962	18,000	72,000
1933	59,375	104,000	1963	16,000	52,000
1934	42,407	75,300	1964	13,000	61,000
1935	13,237	21,000	1965	10,000	49,000
1936	34,331	55,000	1966	10,000	45,000
1937	35,979	67,000	1967	5,000	27,000
1938	48,059	55,000	1968-73	0	0
1939	49,145	59,000			
1940	65,085	91,000	Total, 1895-1967	1,393,147	3,391,846
1941	70,325	103,000			

[1] Estimated.

Resources

As the map (fig. 26) indicates, about 7,700 square miles of South Dakota is underlain by rocks that ordinarily contain lignite. In such a large area, in which the amount of mining has been modest and the search for deposits cannot have been intensive, the known resources may be substantially less than the actual resources. Yet lignite may be very thin or absent in much of the area outlined on the map. For this reason, resource estimates are commonly limited to localities that have been investigated with enough care to provide data from which, following certain standardized procedures, reasonably reliable calculations can be made. Such estimates are of what is known as identified resources, which is the only kind that can be discussed in detail for South Dakota.

Identified coal resources are those for which the location, quality, and quantity are known from geologic evidence supported by engineering measurements. The total was estimated by Brown (1952) at 2,032.01 million short tons in six counties. Reexamination of Brown's results in the light of new data has changed the total only slightly, to the 2,185 million tons shown in table 29.

The estimates were made by the standard methods of the U.S. Geological Survey (Averitt, 1961, p. 14-22). These methods call for dividing the resources into measured, indicated, and inferred cate-

TABLE 29.—IDENTIFIED LIGNITE RESOURCES [1]

[In millions of short tons; overburden 0-1,000 ft]

County	Original resource [2]	Inferred resources and resources in beds less than 5 ft thick	Total
Corson	40	10	50
Dewey	200	50	250
Harding	700	1,000	1,700
Meade		1	1
Perkins	80	100	180
Ziebach	1	5	6
Total	1,021	1,166	2,187
Cummulative production and losses to Jan. 1, 1972 [3]			2
Resources remaining in the ground, Jan. 1, 1972			2,185

[1] From Brown (1952), with modifications to accord with new data on stripping coal resources.
[2] Measured and indicated resources in beds 5 ft or more thick plus lignite in thinner beds suitable for strip mining.
[3] Past losses in mining are assumed to equal past production.

gories according to the reliability of the data, and also for using thickness categories, which for lignite and subbituminous coal are 2.5 to 5 feet, 5 to 10 feet, and more than 10 feet. The thickness of overburden, which is commonly used in classifying coal resources, has been disregarded in South Dakota because all of the known coal is less than 1,000 feet below the surface (Brown, 1952, p. 7).

Because the lignite of the State normally occurs in very lenticular beds and because information points were widely spaced and largely confined to outcrops, less than 10 percent is classed as measured, more than 80 percent is indicated, and about 10 percent is inferred (Brown, 1952, p. 1). Only 3 percent of the lignite is more than 10 feet thick, and 63 percent is between 2.5 and 5 feet thick.

For every ton of coal produced, a certain amount of coal is left unmined in pillars, roof, or floor, discarded as undersize, lost in washing or other preparation, or is unrecoverable because it is too close to other mines, wells, or man-made structures. The ratio of the coal produced to the total amount of coal actually present is expressed in percentage as the recoverability factor. A standard recoverability factor of 50 percent is used by the U.S. Geological Survey in areas, such as South Dakota, where precise information is lacking (Averitt, 1961, p. 23-26). If the 50 percent is in fact correct, the recoverable known lignite resources of South Dakota are about 1,092 million tons. A larger recoverability factor possibly should be used, for as much as 80 percent of the State's known resources may be under less than 500 feet of overburden (Brown, 1952, p. 1) and a large share can be strip mined (table 30). A recoverability factor of 80 percent is commonly used for strip mining and actual recovery is as much as 90 percent under favorable conditions (Averitt, 1961, p. 25). For many years all of the reported coal production of the State has come from strip mines, and most of the coal produced in the next few decades probably will be obtained in the same way.

TABLE 30.—AVAILABILITY OF IDENTIFIED LIGNITE RESOURCES BY MINING METHODS

[In millions of short tons]

County	Original identified resources, 0-1,000 ft overburden [1]	Mining methods: Surface mining: Resource [2]	Surface mining: Potentially recoverable [3]	Surface mining: Economically recoverable [4]	Underground mining: Resource [2]	Underground mining: Potentially recoverable [5]
	(1)	(2)	(3)	(4)	(5)	(6)
Corson	40	30	24		10	5
Dewey	200	130	104		70	35
Harding	700	227	182		473	237
Meade						
Perkins	80	40	32		40	20
Ziebach	1	1	1		0	0
Total	1,021	428	343	206	593	297

[1] Cumulative production and losses are so small that original identified resources are virtually unchanged.
[2] Col. 2 plus col. 5 equals col. 1.
[3] 80 percent of figures in col. 2.
[4] 60 percent of total in col. 3. Not classified by county.
[5] 50 percent of figures in col. 5.

Uranium

(By R. W. Schnabel, U.S. Geological Survey, Denver, Colo.)

Uranium deposits of economic significance were discovered in 1951 in the Craven Canyon area of Fall River County, South Dakota, in what became known as the Edgemont mining district (Page and Redden, 1952). Prospecting quickly intensified and by 1953 production of uranium ore had increased to a point such that the U.S. Atomic Energy Commission established a buying station in Edgemont. In 1956 a mill for processing the ore was completed in Edgemont.

Commercial uranium deposits were discovered in lignite beds of Harding County in 1954, but occurrences of uranium minerals had been reported as early as 1948 (Wyant and Beroni, 1950).

The locations of the principal deposits are shown on figure 27.

Exploration and development increased rapidly and production of ore reached a peak in 1964. Production declined greatly in the late 1960's, partly because the U.S. Government support price was eliminated and partly because the supply of uranium exceeded demand. The mill at Edgemont stopped producing uranium concentrates in 1972. However, with the energy crisis of 1973 and 1974, and the consequent increase in proposals for the construction of nuclear power generating stations, the prospects for another uranium boom appear bright. Uranium mining in South Dakota probably will be reactivated, and exploration for new deposits will accelerate.

Production, reserves, and resources

Data compiled by the U.S. Atomic Energy Commission show that by the end of 1973, nearly one million tons of uranium ore containing about 3,200,000 pounds of U_3O_8 have been produced from deposits in South Dakota (table 31). This amounts to only about 0.5 percent of the uranium produced in the United States, but at an average price of perhaps $8 per pound, total value has been about $25,000,000.

BUREAU OF ECONOMIC GEOLOGY
THE UNIVERSITY OF TEXAS AT AUSTIN

University Station, Box X · Austin, Texas 78713-7508 · (512) 471-1534 or 471-7721

January 17, 1987

Mr. William M. Kelce
President
Alabama Coal Association
244 Goodwin Crest Drive
Suite 110
Birmingham, AL 35209

Dear Mr. Kelce:

I am writing in response to your request to Dr. William Fisher, Director of the Bureau of Economic Geology, dated January 8, 1987, requesting information on coal resources in Texas.

Enclosed is a memorandum report on Texas coal resources and regulatory impacts prepared as a brief response to your request by Dr. William Kaiser and Ms. Mary McBride. I believe you will find this summary useful in your analysis.

Please call or write if you have additional questions.

Sincerely,

Edward C. Bingler
Deputy Director

ECB:mk
Enclosure

January 16, 1987

To: E. C. Bingler
From: W. R. Kaiser and Mary McBride
RE: Texas Coal Resources and Regulatory Impact

Coal Resources

Texas coal occurs in Tertiary, Cretaceous, and Pennsylvanian strata. The lower Tertiary (mainly Wilcox and Jackson Groups) lignite-bearing strata of the Texas Coastal Plain contain the state's largest coal resources. Small resources of bituminous coal occur in middle and upper Pennsylvanian, upper Cretaceous, and middle Eocene strata. Most bituminous resources are in north-central and South Texas; those of the Trans-Pecos area are of minor significance.

Near-surface resources of lignite and bituminous coal at depths between 20 and 200 ft are 23,377 and 787 million short tons, respectively. Near-surface resources include lignite seams 3 ft or more thick and bituminous seams 14 inches or more thick. Resources of near-surface lignite were conservatively estimated by Kaiser and others in RI 104 and their locations are well known. More recent estimates made for three Wilcox lignite-bearing regions in East Texas, using the U. S. Geological Survey's National Coal Resources Data System (NCRDS), are larger than those of Kaiser and others by about 1.5 times. The NCRDS estimates are larger because of a large inferred category, which constitutes about 64 percent of the NCRDS total. The size of the NCRDS circles of reliability will always cause the majority of coal resources to be inferred. In RI 104 the inferred category was constrained by the geologic models used and constitutes about 36 percent of the total. Shallow bituminous coal resources are less well known and based on regional assessment with limited subsurface data and understanding of the coal-bearing stratigraphic units.

Deep-basin resources of lignite and bituminous coal at depths between 200 and 2,000 ft are 34,819 and 4,700 million tons, respectively. Resources of deep-basin lignite include seams 5 ft or more thick. More recent detailed studies of lignite in two Wilcox regions in East Texas indicate that the 35-billon-ton figure reported in RI 104 is approximately 40 percent too large. Thus, shallow and deep resources may be about the same size. However, little is known about the distribution of deep, thick seams in the Jackson Group in East and South Texas and the Wilcox Group in South Texas. The bituminous coal estimate is a guesstimate at best and calculated in terms of seams 14 inches or more thick. Regardless of the resource base, thinness of seams (3 ft or less) and their limited continuity makes deep bituminous coal an unlikely target for future exploitation.

The demonstrated reserve base (DRB) is that portion of identified coal resources (measured and indicated) from which reserves are calculated. The DRB for lignite as of January 1, 1986 is 19,881 million tons (measured and indicated resources of 20,383 million tons minus depletion of 502 million tons). Data are insufficient to calculate a DRB for bituminous coal.

DOE's Energy Information Agency (EIA) in 1984 carried a smaller DRB of 13,764 million tons. We believe a larger DRB for Texas is warranted. Clearly, its size depends on the method and assumptions used to calcutate it. For example, EIA, by accepting only RI 104's measured resources and not the indicated resources, assumes that the NCRDS methodology is superior to that of RI 104. The NCRDS is highly data dependent and in the absence of close spaced point-source data can make no allowance for resources that can be estimated with moderate certainty using geologic models. RI 104 does that and therefore a DRB based on it will be larger than one using NCRDS.

Using the BEG DRB calculated reserves of 10,829 million tons assume mining to 150 ft, 85 percent recovery factor, and an 11-percent "illegal" fraction, or that fraction of resources under populated areas, highways, pipelines, railroads, rivers, and reserviors that cannot be mined. The recoverable coal reserves (RCR), or the amount of coal that can be recovered (mined) from coal deposits at active mines, are reported by EIA in 1984 to be 877 million tons. Certainly, this reserve is a minimum number for it would sustain current annual production of 45 million tons for only 20 years or approximately two-thirds the life of the power plants fueled by that production. Furthermore, in 1990 installed, lignite generating capacity will be 9,085 net MW requiring a larger RCR. Assuming 5.8 million tons/1,000 MW/yr, 30-year life, and 85 percent recovery yields recoverable reserves of 1,860 million tons.

Regulatory Impact

The regulatory impact on reserves cannot be quantified nor can it be easily qualified. Here, it is addressed in terms of agencies and statutes that may affect RCR, the estimate most sensitive to regulatory action. Agencies and statutes are presented in no particular order of importance.

Railroad Commission of Texas

> Denial of a mining permit application will stop a mine, for example, LCRA's Cummins Creek mine. The review process is lengthy (12 months or more) and with today's dynamic energy economics an applicant may turn to western coal.

Public Utility Commission of Texas

> Refusal to issue a Certificate of Convenience and Necessity (CCN) will stop a power plant; for example, Houston Lighting & Power's proposed Malakoff plant may never receive a CCN. It appears that it is becoming increasingly difficult to get a CCN as the PUC becomes more consumer oriented.

Public Utility Regulatory Policies Act of 1973

> Act mandated purchase of industrially generated electricity, which in Texas is generated by gas-fired cogenerators. Cogeneration has reduced the need for new lignite-fired capacity (RE: Malakoff plant). The PUC interprets and enforces PURPA; its decisions can be appealed to the Federal Energy Regulatory Commission.

Power Plant and Industrial Fuel Use Act of 1978

> Act prohibits use of natural gas in large generating stations. The impact is obvious if it is repealed or amended, especially in Texas where over half of our electricity is generated by gas.

Texas Legislature

> A severance tax on lignite would make it a less cost competitive fuel relative to western coal. At present there is no severance tax.

Texas Air Control Board

> Interprets and enforces the Clean Air Act and its amendments and issues air quality permits. Neither Prevention of Significant Deterioration increments nor National Ambient Air Quality Standards are expected to prevent construction of any future lignite plants.

Staggers Rail Act of 1980

> Rail pricing became more competitive and flexible, making western coal more cost competitive in Texas.

National Pollutant Discharge Elimination System

> Permit granted by EPA and none have been denied to date.

RAILROAD COMMISSION OF TEXAS
P.O. DRAWER 12967
AUSTIN, TEXAS 78711

MACK WALLACE
CHAIRMAN

January 14, 1987

Re: Coal Reserves

Mr. William M. Kelce
President
Alabama Coal Association
244 Goodwin Crest Drive, Suite 110
Birmingham, Alabama 35209

Dear Mr. Kelce:

The most up-to-date studies on coal resources in Texas have been developed and published by the Bureau of Economic Geology at the University of Texas here in Austin. To assist you in compiling data on Texas coal reserves for the National Coal Council, I am enclosing three of that agency's publications.

1. Lignite Resources in Texas, by Kaiser, Ayers, and La Brie
2. Geology and Ground Water Hydrology of Deep Basin Lignite in the Wilcox Group of East Texas, by Kaiser
3. Bituminous Coal in Texas, by Fisher

Two of the publications deal with lignite resources which are by far the state's most abundant. In 1986 over 48 million tons were produced. The third publication examines bituminous resources which are less likely to be developed because of its dispersement and lack of continuity.

I hope this information is helpful to you, and please do not hesitate to contact me again if I can be of further assistance.

Sincerely,

Mack Wallace

MACK WALLACE

MW:sj

Enclosures

STATE OF UTAH
NATURAL RESOURCES
Utah Geological & Mineral Survey

Norman H. Bangerter, Governor
Dee C. Hansen, Executive Director
Genevieve Atwood, State Geologist

606 Black Hawk Way · Salt Lake City, UT 84108-1280 · 801-581-6831

29 January 1987

William M. Kelce, President
Alabama Coal Association
244 Goodwin Crest Drive, Suite 110
Birmingham, Alabama, 35209

Dear Mr Kelce:

Your letter of 8 January 1987 has been forwarded to me by the Director, Division of State Lands and Forestry, for reply. The most comprehensive treatment of Utah's coal reserves is contained in a 1972 Monograph Series by Hellmut H. Doelling published by the Utah Geological and Mineral Survey. I am enclosing a list of publications which contains an order form to facilitate your need.

We have been and are now working within the definition of the National Coal Resource Database System (NCRDS) to computerize verifiable coal data and to upgrade our ability to respond to requests such as yours. In the process of accumulating data for NCRDS, we have canvassed all sources and have gathered what I consider to be a relatively complete data base. Utah has two hundred and two (202) seven and one half minute (7 1/2') quadrangles that are grouped into several coal fields that may or may not be contiguous. We have gathered some data on all of these quadrangles in the way of measured sections and/or drill hole information. Unfortunately, there are only sufficient nonconfidential data to define demonstrated reserves of any significant extent on an estimated fifteen percent (15%) of the quadrangles; then, only over a portion of the quadrangle. Therefore, large gaps exist in our data base which, in my opinion, will not soon be remedied because of the low demand coal market and the present hiatus on coal leasing.

I hope this has been helpful. In the future, we plan to be able to respond to coal inquiries with a complete coal folio containing computer generated text and graphics that depict and delineate the useful parameters such as chemical analyses, reserves, isopachs, overburden, etc.of coal in a particular quadrangle, field, or region.

Sincerely

Archie D. Smith

Archie D. Smith
Senior Geologist
Economic Geology

cc: Director, State Lands and Forestry

O. GENE DISHNER
Director

DIVISIONS
ENERGY
MINED LAND RECLAMATION
MINERAL RESOURCES
MINES

COMMONWEALTH of VIRGINIA

DEPARTMENT OF MINES, MINERALS AND ENERGY

DIVISION OF MINERAL RESOURCES
Natural Resources Building
Alderman & McCormick Roads
Box 3667, Charlottesville, Virginia 22903
(804) 293-5121
ROBERT C. MILICI, Commissioner & State Geologist

January 13, 1987

Mr. William M. Kelce
244 Goodwin Crest Drive, Suite 110
Birmingham, Alabama 35209

Dear Sir:

In reply to your letter requesting information on coal reserves in Virginia, enclosed is a copy of the U.S. Geological Survey's Circular 171, Coal Resources of Virginia and a copy of a report by the Virginia Coal Council. These are the only publications dealing with coal reserves in the state.

The Virginia Division of Mineral Resources, in cooperation with the U.S. Geological Survey, is currently building a data base to reassess the state's coal resources. Within the next two or three months, new coal resource estimates will be published for Lee and Wise counties. The remainder of the Southwest Virginia coalfield will also be revised in the months to come.

The amount of coal resource data in Virginia is quite voluminous and prevents me from sending it to you. If specific data points, measured sectios, drill holes and mining data is required, contact me so that arrangements can be made to provide this information for you.

Sincerely,

G. P. Wilkes
Geologist

A Note From
BENJAMIN C. GREENE, President
West Virginia Mining and
Reclamation Association

1/19/87

Bill,

The West Virginia Geological & Economic Survey has the backup data to support these coal reserves. Should you need additional information, please be in touch.

Regards,
Ben

Mr. William Kelce, President
Alabama Coal Association
244 Goodwin Crest Drive
Suite 110
Birmingham, AL 35209

WEST VIRGINIA COAL RESERVES

	ORIGINAL MINEABLE RESERVES* SHORT TONS	REPORTED PRODUCTION 1883-1985 (INCLUSIVE) SHORT TONS	ESTIMATED LOSS IN MINING** SHORT TONS	ESTIMATED RECOVERABLE RESERVE SHORT TONS
	619,298	193,693,882	193,693,882	1,599,115,767
	--	246	246	----
	970,465	451,784,247	301,594,749	4,433,754,881
	332,633	19,877,178	19,877,178	1,141,789,138
	000,000	99,091,361	99,091,361	80,908,639
	167,156	----	----	22,083,157
	017,114	----	----	251,017,114
	869,854	44,532,277	29,688,184	1,898,189,635
	317,757	2,790	1,860	671,587,864
	505,039	730,587,316	487,058,210	1,921,715,707
	245,455	13,838,988	13,838,988	495,783,739
	014,155	55,579,878	37,053,252	525,828,615
	293,321	82,373,453	54,915,635	649,802,539
Hancock	500,000,000	3,340,986	3,340,986	246,659,014
Harrison	2,172,730,581	494,767,473	494,767,473	591,597,817
Kanawha	5,901,324,612	647,487,313	431,658,208	2,893,307,454
Lewis	2,776,037,160	21,200,151	21,200,151	1,366,818,429
Lincoln	1,770,813,665	5,398,339	3,595,293	1,057,092,019
Logan	8,149,879,105	1,097,643,181	731,762,120	3,792,284,282
Marion	4,317,089,326	655,507,298	655,507,298	1,503,037,365
Marshall	4,448,857,374	170,017,379	170,017,379	2,054,411,308
Mason	339,976,480	17,981,106	17,981,106	152,007,134
McDowell	5,340,598,171	1,437,964,562	958,643,041	1,766,394,340
Mercer	506,829,312	203,933,713	135,955,808	100,163,874
Mineral	809,834,066	39,501,010	39,501,010	365,416,023
Mingo	6,332,263,181	376,755,263	251,170,175	3,442,602,645
Monongalia	3,748,630,971	609,851,118	609,851,118	1,264,464,367
Nicholas	6,172,807,449	219,532,173	146,354,782	3,484,152,296
Ohio	910,000,000	117,375,402	117,375,402	337,624,598
Pleasants	------	87,719	58,478	-----
Pocahontas	508,644,743	5,338,522	3,559,014	299,848,324
Preston	3,212,323,508	159,474,406	159,474,406	1,446,687,348
Putnam	433,090,336	21,620,592	14,399,314	238,233,610
Raleigh	4,283,368,282	747,199,056	498,132,704	1,822,821,913
Randolph	4,183,643,819	79,180,218	52,786,812	2,431,006,073
Roane	674,768,973	----	----	404,861,276
Summers	18,678,528	385,305	256,870	10,821,811
Taylor	1,327,673,239	49,491,653	49,491,653	614,344,966
Tucker	486,964,209	62,226,876	41,484,584	229,951,649
Tyler	948,133,232	----	----	474,066,616
Upshur	3,554,551,754	66,306,773	66,306,773	1,710,969,104
Wayne	1,471,495,778	12,106,699	8,071,132	870,790,768
Webster	6,305,536,510	49,493,800	32,995,866	3,733,828,106
Wetzel	3,321,923,236	93,425	93,425	1,660,868,193
Wirt	22,302,720	----	----	11,151,360
Wyoming	5,061,292,844	460,406,487	306,937,658	2,576,369,219
Small mines	-----	25,028,400	25,028,400	- 50,000,000
TOTALS	116,705,415,231	9,548,058,014	7,284,571,984	56,734,842,781

* Estimated by WV Geological Survey using One Foot as the Minimum Mineable Thickness
** Loss Resulting from the Undermining of a Coal Bed not Included

WEST VIRGINIA
GEOLOGICAL AND ECONOMIC SURVEY

Robert B. Erwin, *Director*
and *State Geologist*

P. O. Box 879
Morgantown, WV 265070879
304/594-2331

Offices at Mont Chateau
Mont Chateau Road
Exit 10 (Cheat Lake) off U.S. 48

IN REPLY REFER TO:
CR/8400/0041/020/87

January 20, 1987

Mr. William M. Kelce
President, Alabama Coal Association
244 Goodwin Crest Drive
Suite 110
Birmingham, Alabama 35209

Dear Mr. Kelce:

Enclosed is an updated version of our popular publication entitled "Spectrum of West Virginia Coal", prepared by the West Virginia Geological and Economic Survey. This publication outlines the extent, quality, availability, and geology of West Virginia's most important natural resource, coal.

The reserve base, FOB mine price map, and publications order form have been added for your information. In addition, the careful inspection of many of the maps and graphs will indicate the available coal reserves for West Virginia based on various quality parameters such as sulfur and ash content. Please see the section on "Coal Resources in West Virginia, and inspect the curve diagrams.

This material should provide you with a detailed statewide summary of coal information that will be useful in your research. Good luck in your effort.

Sincerely,

Thomas R. Jake

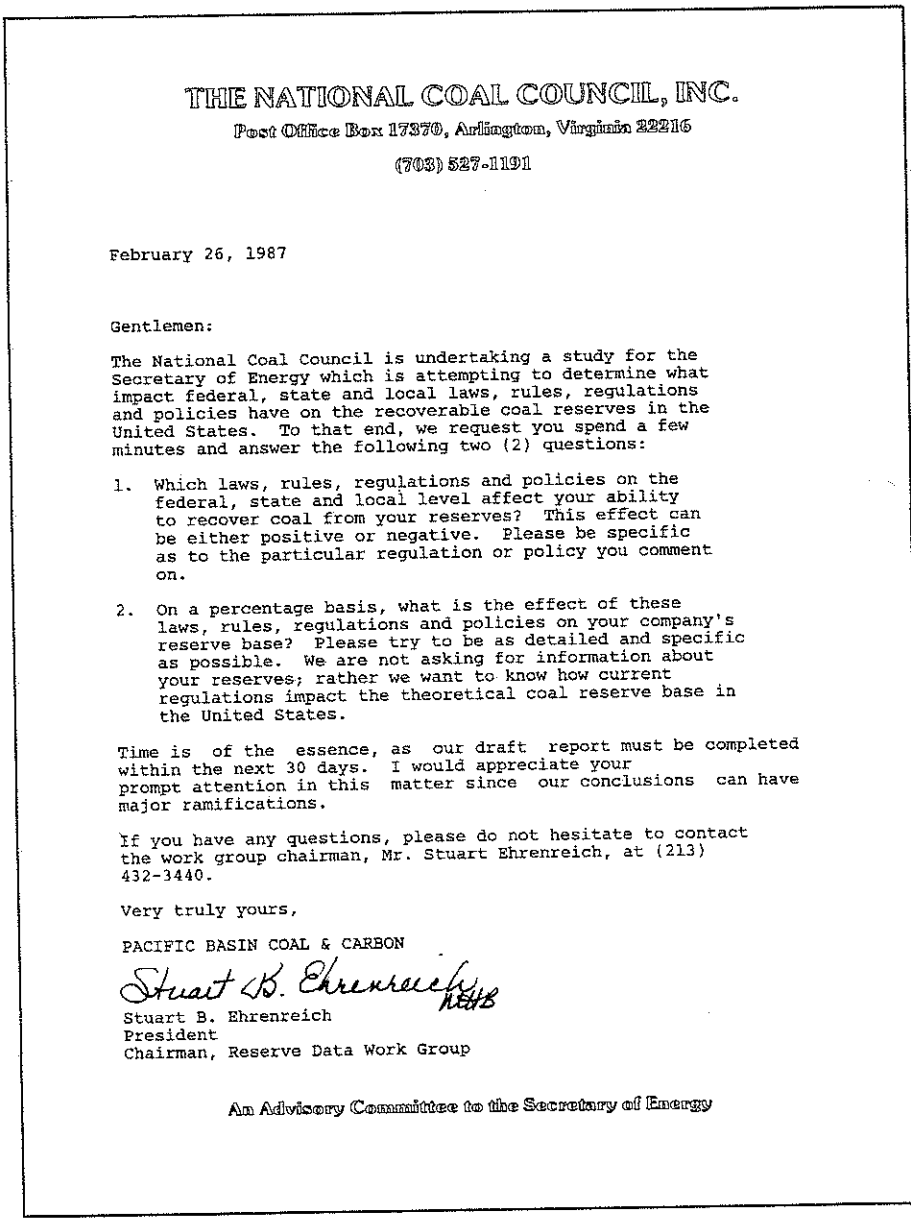
Thomas R. Jake
Supervisory Geologist
CPGS

Appendix B

Responses from Member Companies to Questionnaire

June 26, 1987

For informational purposes, the responses from The National Coal Council's member companies to the Data Reserve Base Work Group's questionnaire concerning the effects of regulations on the recoverability of coal reserves are included in this appendix. We gratefully acknowledge the contributions of these member companies to this report.



THE NATIONAL COAL COUNCIL, INC.

Post Office Box 17370, Arlington, Virginia 22216

(703) 527-1191

February 26, 1987

Gentlemen:

The National Coal Council is undertaking a study for the Secretary of Energy which is attempting to determine what impact federal, state and local laws, rules, regulations and policies have on the recoverable coal reserves in the United States. To that end, we request you spend a few minutes and answer the following two (2) questions:

1. Which laws, rules, regulations and policies on the federal, state and local level affect your ability to recover coal from your reserves? This effect can be either positive or negative. Please be specific as to the particular regulation or policy you comment on.

2. On a percentage basis, what is the effect of these laws, rules, regulations and policies on your company's reserve base? Please try to be as detailed and specific as possible. We are not asking for information about your reserves; rather we want to know how current regulations impact the theoretical coal reserve base in the United States.

Time is of the essence, as our draft report must be completed within the next 30 days. I would appreciate your prompt attention in this matter since our conclusions can have major ramifications.

If you have any questions, please do not hesitate to contact the work group chairman, Mr. Stuart Ehrenreich, at (213) 432-3440.

Very truly yours,

PACIFIC BASIN COAL & CARBON

Stuart B. Ehrenreich

Stuart B. Ehrenreich
President
Chairman, Reserve Data Work Group

An Advisory Committee to the Secretary of Energy

Memorandum
From
Consolidation Coal Corporation
By
William G. Karis

NCC1 RESERVE DATA WORK GROUP 23-Feb-87

DISCUSSION AND CALCULATION OF PERMITTING IMPACT

U.S. Company wide Reserves (MT) = 6593097*

UG = 3832228

SURF = 2760869

Permitting Impact (Company wide)	Reserve Reduction
Underground Mines = 1%	38322
Surface Mines = 1%	27609

Permitting impacts are difficult to quantify relative to coal reserves lost. Delays in processing permit applications as well as costs associated with assembling applications were generally not significant enough to directly account for any measureable coal losses. Nevertheless, the above figures do attempt to represent impacts associated with routine programatic concerns that are addressed during the permitting phase. These concerns include efforts to prevent or minimize impacts to certain sensitive surface and subsurface features, e.g., perennial streams, aquifers, public buildings and fish and wildlife areas.

* Reserves by Consol's definition, is that portion of the demonstrated tonnage that meets Consol's general economic criteria regarding mining height, preparation plant recovery, depth of cover and stripping ratio. Generally, these reserves would be commercially minable at year end price and cost levels using current technology and mining practices.

NCCI RESERVE DATA WORK GROUP 23-Feb-87

DISCUSSION AND CALCULATION OF SUBSIDENCE IMPACT

(PRESENT)

UG Company wide Reserves (MT) = 3,832,228

Impacts of Current Subsidence Regulations

	Region	Reserves	Impact	Reduction (MT)	
I.	Pennsylvania	781,660 MT	5% *	39,083	PA Regs Buffers
II.	Remaining Northern Appalachia (OH, northern WV)	1,352,006 MT	2%	27,040	Bldgs, Streams, Impoundment SMCRA
III.	Southern Appalachia	755,918 MT	1%	7,559	
IV.	Midwestern	911,517 MT	25% **	227,879	Farmland, drainage SMCRA
V.	Western	31,127 MT	5% ***	1,556	Colorado Subsidence Monitoring

* Considers the support requirements mandated by PA subsidence law.

** Based on preventing impacts to floodplain prime farmland and low gradient streams

*** Based on strict subsidence monitoring requirements in Colorado regulations.

NCC1 RESERVE DATA WORK GROUP 23-Feb-87

DISCUSSION AND CALCULATION OF SUBSIDENCE IMPACT

(PROPOSED - Sec. 522(e))

I. Northern Appalachia (PA, OH, Northern WV):
UG Consol reserves (MT) = 2,133,666

Regulation	Impact	Reduction (MT)
Sec. 522(e) buffer zones	30%	640,099

II. Southern Appalachia (VA, KY, Southern WV):
UG Consol reserves (MT) = 166,302

Sec. 522(e) buffer zones	22%	36,586

III. Midwestern (IL, IN): UG Consol reserves (MT) = 911,517

Sec. 522(e) buffer zones	48%	437,528

IV. Western: UG Consol reserves (MT) = 31,127

Sec. 522(e) buffer zones	5%	1,556

These impact percentages are based on preliminary figures developed by Baker Engineers for the Joint NCA/AMC Committee. The study was done in response to a EIS scoping notice released by the Office of Surface Mining. These results assume a worse case application of the SMCRA Sec. 522(e)(4) & (5) requirements.

NCC1 RESERVE DATA WORK GROUP 23-Feb-87

DISCUSSION AND CALCULATION OF ADDITIONAL ENVIRONMENTAL IMPACTS

(PRESENT)

I. Consol Western Surface Reserves - 2,055,340 MT

Regulation	Impact	Reduction
Alluvial Valley Floors	22% *	452,175
Wildlife Protection	26% **	534,388

* Assumes no replacement or exchange coal available.

** Based on a Colorado reserve with a sensitive wildlife habitat. Areawide percentage would be lower.

Background for Regulatory Impacts on
Consol Reserve Base for National Coal Council

Subsidence Impacts

Pennsylvania's Subsidence Law requires that a certain class of structures be protected from subsidence. These include public buildings, cemeteries and dwellings built prior to April, 1966. This requirement is implemented by leaving coal in-place within a specified zone beneath the protected structures. This zone is calculated by measuring 15 feet horizontally out from the structure and then downward at a 15° angle to the coal seam. At least 50 percent of the coal must be left in the calculated support area. However, the use of longwall equipment,which is designed for 100 percent extraction, requires total avoidance of the support zone, i.e., 100 percent of the coal must be left in place, since the equipment can't mine at a reduced extraction rate. Provisions are in the Pennsylvania Law that allow the owner of a protected structure to waive his support right, which is done in a number of cases. If this waiver provisions did not exist the five percent in I would be considerably higher.

The impacts for II and III generally relate to not undermining certain public buildings, perennial streams and large impoundments which are somewhat protected by federal and state regulations under SMCRA.

These regulations require a demonstration of "no material damage" before mining is permitted. The percentage difference between II and III merely represents the reduced number of structures that exist in Southern Appalachia.

The Midwestern impact identified in IV reflects the problems associated with longwall mining beneath flat prime farmland and low gradient perennial streams. The surface trough created by longwalling can seriously disrupt drainage patterns in these areas, thus causing farmland to pond water and streams to overflow their banks. Significant areas can be precluded from mining as the result.

The Western impacts in V relate solely to subsidence monitoring requirements that exist in Colorado. These require the operator to assume a worse case subsidence impact scenario when developing a mining plan. If the projected impacts exceed prescribed limits then mining plans must be modified or the areas avoided.

Section 522(e) Impacts

Section 522(e) of the Surface Mining Control and Reclamation Act of 1977, specifies certain areas where "surface coal mining operations" are prohibited. These areas include: lands within 100' of the outside right-of-way of public roads, unless a waiver is obtained; lands within 300' of public buildings, public parks and occupied dwellings, unless a waiver is obtained; and lands within 100' of any cemetery.

The U.S. Office of Surface Mining (OSM) developed regulations to implement SMCRA. In Part 701.5 of its regulations, OSM established a definition for "surface mining operations" which includes both surface operations and surface impacts incident to underground coal mines. Although Section 522(e) describes areas where "surface coal mining operations are prohibited," the buffer zone restrictions of Section 522(e)(4) and (5) have not been applied to underground mines.

In a challenge to the regulations implementing Section 522(e), the National Wildlife Federation has focused on the ambiguities as to whether SMCRA and the OSM regulations do or do not prohibit underground mining within the buffer zones described. Accordingly, on April 3, 1985, OSM published a notice of intent to conduct rulemaking on the applicability of the prohibitions in Section 522(e)(4) and (5) of SMCRA to underground mining.

The Baker study was conducted in response to OSM's investigation of the applicability of the prohibitions in Section 522(e)(4) and (5) to underground mining. The findings are preliminary in nature and consist of the first phase of a two-phased approach to evaluating and documenting the nature and degree of impacts that could result from imposition of the prohibitions of Section 522(e)(4) and (5) on the underground coal mining industry.

Additional Environment Impacts

Alluvial Valley Floors (AVF's) cannot be mined if farming will be disrupted or precluded due to damage to the hydrologic regime of the AVF. SMCRA considers these to be valuable agricultural resources in the West and therefore affords them a high degree of protection. Federal exchange coal is available in some cases although our impact determination assumed it wasn't available. We based our impact on Consol's experience at the CX Ranch.

The wildlife protection percentage was based on our experience at Meeker which had a significant elk migratory area. A detailed wildlife study of all Consol western reserves would need to be conducted to substantiate this figure.

ISLAND CREEK CORPORATION
2355 HARRODSBURG ROAD P.O. BOX 11430 LEXINGTON, KY 40575 TELEPHONE 606/223-3638

March 16, 1987

Mr. Stuart B. Ehrenreich
Chairman, Reserve Data Work Group
The National Coal Council, Inc.
Post Office Box 17370
Arlington, Virginia 22216

Subject: Effect of Laws and Regulations on Coal Reserves

Dear Mr. Ehrenreich:

Your letter of February 26 was referred to me for reply. We appreciate this opportunity to submit our comments on this very important subject.

In our opinion, there are very few laws which affect coal reserves in a positive manner. The Fuel Use Act (PUFUA) might be one, but here, the law was virtually toothless and probably produced very few measurable positive results in our opinion. Various state "acid rain" bills and EPA regulations controlling SO_2 emissions are, in reality, a "mixed bag" pitting high sulfur producers against low. In either case, our company would be hard pressed to show how such laws have affected our coal reserves in a positive way.

All other laws and regulations, especially those with an environmental flavor have affected us in a negative manner. Some of these are:

Federal Coal Leasing Amendment Act of 1976

- Section 3 provides that the holder of a federal coal lease who has held that lease for ten years and is not producing in "commercial quantities" must relinquish that lease if it hopes to continue to bid on future leases involving other energy producing minerals. As a subsidiary of an international energy producing company, it is in our best interest to relinquish such coal leases. In our case, we had actually begun development of our reserves but could not meet the definition of production in "commercial quantities". Approximately 93 million tons of coal are being returned to the federal government from our reserve base.

Clean Water Act

- Section 404 involves Army COE and USEPA regulations which control those activities which may affect wetlands. A proposed surface mine in central West Virginia has been delayed because of potential impacts on wetlands. The early indications are

ification will be required to leave a large
sturbed. It may turn out to be economically
t in a mine for the remaining reserves.
million tons of coal could be affected.

ntrol and Reclamation Act of 1977

.0) (F) involves regulations promulgated to
alluvial valley floors (AVF) in the West. A
yoming reserves are owned in fee, yet we are
ning because of AVF considerations. We are
ility of an exchange of coal of equal value;
acted procedures involved makes it unlikely
exchange will be accomplished any time soon
million tons of coal are involved here.

2) involves regulations which address the
provisions of the SMCRA. We own a block of
st Virginia which lies partially under the
al Forest. Approximately five million tons
on ton reserve will be lost because of 522

Ivania Bituminous Mine
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Also, the recent (3/9/87) Supreme Court decision in the Pennsylvania subsidence case (Keystone Bituminous Coal vs. Duncan) will have the same effect on longwalls in Pennsylvania. It may be merely a matter of time before other states follow in lock step.

Further, EPA recently published guidelines which address impacts on ground water. The definitions for ground water quality and useable aquifers deserving of protection are so broad that virtually every proposed deep mine may be required to take special precautions to minimize impacts. Again, the effect on longwall operations could be devastating. In some cases, especially out West, the coal seam itself is the only aquifer. These guidelines are new and how these issues will be resolved is anyone's guess. One thing is certain, there will be many more opportunities for significant coal losses in our reserve base.

If there are any questions in this regard, please do not hesitate to contact me.

Sincerely,

J. L. Lombardo
Manager Env. Compliance

JLL/cz

cc: S. O. Ogden

THE NORTH AMERICAN COAL CORPORATION

12800 SHAKER BOULEVARD

CLEVELAND, OHIO 44120-2099

March 27, 1987

Mr. Stuart B. Ehrenreich
Chairman, Reserve Data Work Group
The National Coal Council, Inc.
P. O. Box 17370
Arlington, Virginia 22216

Dear Mr. Ehrenreich:

This is in response to your letter of February 26, 1987, regarding your Committee's efforts to determine what impact federal state and local laws, rules and regulations and policies have on the recoverable coal reserves in the United States.

The North American Coal Corporation has mining operations in Pennsylvania, Ohio, North Dakota and Texas, and each state has its own laws and regulations which vary slightly from state to state. Since most of the states have similar type of laws and regulations, Pennsylvania was selected as typical of the states in which we operate.

Exhibit I, attached, details the specific laws and regulations which regulate mining in Pennsylvania, including specific effects on coal recovery both for surface mining and underground mining operations.

Pending regulations on subsidence and bonding could severely affect the amount of coal reserves that would be recoverable.

I hope this information will be helpful in preparing your draft on the impact of laws and regulations on recovering coal reserves.

Sincerely,

THE NORTH AMERICAN COAL CORPORATION

Louis Kuchinic, Jr.
Executive Assistant to the President

LK/ef

Attachments

EXHIBIT 1
Page 1 of 2

Laws and Regulations
Affecting Recovery of Coal Reserves

Laws and Regulations

1. Federal Surface Mining and Reclamation Act (PL95-87)
2. Pennsylvania Surface Mining Conservation and Reclamation Act (PL1198)
3. Pennsylvania Clean Streams (Act 394) (PL1987)
4. Pennsylvania Department of Environmental Resources (Title 25: 77.012, 86.102, 209.34)
5. Pennsylvania Department of Environmental Resources (Title 25: 89.143)
6. Pennsylvania Bituminous Coal Mine Act 339

Effects on Surface Mining

A. 100' barrier from right of way of any public highway.
B. 300' barrier from any occupied dwelling house, unless consent given by owner.
C. 300' barrier from any public building, school, park etc.
D. 100' barrier around any cemetery.
E. 100' barrier from bank of any stream.
F. 25' barrier from property line in consolidated material or barrier equal to the height of the face in unconsolidated material.
G. 125' radius barrier around any active oil or gas wells.
H. 50' barrier on each side of any gas or oil lines unless the lines are temporarily relocated.
I. Archeological sites must be left undisturbed.

The coal left in place as described above reduces the amount of surface mineable coal by about 15 percent.

EXHIBIT 1
Page 2 of 2

Effects on Underground Mining

All dwellings, schools, churches, cemeteries, gas wells, etc., must be protected from subsidence by mining only 50 percent of the coal from the area designated to support the facility as described in the laws and regulations indicated in 5 and 6 above.

Based on the density of such surface facilities, it could be necessary to leave as much as 35 percent of the mineable reserves to meet these restrictions.

Jim Walter resources, inc.
MINING DIVISION • BROOKWOOD, ALABAMA

March 26, 1987

Mr. Stuart B. Ehrenreich
Chairman, Reserve Data Work Group
The National Coal Council, Inc.
Post Office Box 17370
Arlington, Virginia 22216

RE: Impact of Governmental Restrictions
on Recoverable Coal Reserves

Dear Mr. Ehrenreich:

The Mining Division of Jim Walter Resources, Inc., in response to your letter of February 26, 1987, has assessed the impact of federal, state and local laws, rules, regulations and policies on our recoverable coal reserves. Our first approach was to determine the portion of our active mine's reserves that the regulatory bodies explicitly prohibit us from mining.

The current extent of the mine's workings were planimetered and then the area of coal left in place was calculated. Coal reserves left in place were approximately five percent of our total reserves.

This narrow interpretation of your request, however, does not consider the more pervasive impact of the cost of complying with the numerous other laws and regulations. The greatest challenge in recovering our reserves is not in getting the coal to the stockpile, but in doing so cost competitively. It is important to recognize that most other domestic underground coal mine operators face the same governmental restrictions that we have. Domestic surface miners also experience high compliance costs, and some of these costs, such as land reclamation, may be greater on a per-ton basis than those facing underground operators. We are most disadvantaged in the international market where foreign producers have few if any regulatory restrictions on their operations. Jim Walter Resources' situation is therefore vastly different from the producer limited to domestic markets.

Our cost reporting system does not isolate the expense of complying with governmental laws and regulations. Precise definition of the total expense can result only from an exhaustive study of our operations. The time constraints on this report and the associated cost do not justify such a study. One option to determine this cost would be to rely upon a study commissioned by another major underground coal operator in the mid-1980's. That study estimated nearly 35 percent to be the portion of their total cost associated with safety laws and regulations.

P.O. Box C-79 • Birmingham, Alabama 35283 • Telephone (205) 556-6000

to best estimate our cost involves a review of
ty rates for all underground coal mines before
ine Health and Safety Act. Such an analysis
First, we must accept that the impact of the
fact was, as severe on Jim Walter Resources as
ational average mine. Second, we must recognize
the last decade to be the product of improved
and not the result of lessened governmental
ust assume that supply and electrical costs are
mental actions. This final assumption is very
proximation. Some supply costs, such as rock
re mandated by regulatory agencies, but some
capital costs, caps and canopies, and labor costs, fire bosses, are also.

According to the Department of Energy, the national underground average productivity in 1969 was 15.61 tons per man day, and in 1978 it was 8.38 tons per man day. We isolated our supply and electrical costs and considered the balance to be variable with productivity, which is the best measure of our burden of compliance. Using constant 1987 dollars, we determined that our current total cost would be 33 percent lower but for the impact of governmental laws, rules, regulations and policies. Gross assumptions are used in arriving at this conclusion, but the result is extremely close to 35 percent derived by the other major coal producer.

Approximately 33 percent of our total cost is a result of compliance with federal, state and local laws, rules, regulations and policies. It is a very general estimate, without specific components definable, but it does provide a reasonable measure of our cost of compliance.

My opinion on the effect of this cost is that without such a burden, we could increase by 50 percent our reserve recovery.

Sincerely yours,

Frederick Carr
Vice President, Mining Engineering

AMAX Coal Company
251 North Illinois Street
P.O. Box 957
Indianapolis, IN 46206-0957
(317) 266-1500

AMAX Minerals+Energy

March 13, 1987

Mr. Stuart B. Ehrenreich
President
Chairman, Reserve Data Work Group
The National Coal Council, Inc.
P.O. Box 17370
Arlington, Virginia 32216

Dear Mr. Ehrenreich:

Before responding to your February 21, 1987, inquiry as to what extent laws, rules, regulations, and policies on the federal, state and local level impact recoverable coal reserves in the United States, one must decide upon a base or norm from which to start. For example, if one goes back thirty years, before any state had a strict reclamation law, he would find included within a company's coal reserves areas that are not even explored or drilled today, e.g., wild and scenic rivers, national parks, rare and endangered species habitat, wetlands, historical and archaeological sites, etc. When one eliminates areas such as these from reserves, he comes up with a reserve figure that is reduced further through compliance with laws or regulations. Our estimated loss figures in this response are based upon coal reserves that have already been reduced early in the planning stage.

Every environmental law regulating air, water, soil, or solid waste has the potential to impact coal mining. Most, however, such as the federal Environmental Protection Act, the Solid Waste Disposal Act, Safe Drinking Water Act, Clean Air Act, Clean Water Act, etc., together with their state counterparts, have effects that are limited to economic disincentives rather than those that actually preclude mining. Exceptions to this are found in some local zoning ordinances (e.g. Vanderburg County, Indiana) where all surface mining is prohibited.

The greatest impact to mining comes from "The Surface Mining Control and Reclamation Act of 1977" (SMCRA) and from state laws and regulations in primacy states designed to be as effective as SMCRA. Some examples where SMCRA can actually prohibit mining are as follows:

1. Section 510(b)(2) - Applicant must demonstrate that reclamation can be accomplished.

2. Section 510(b)(3) - Operation must be designed to prevent material damage to the hydrologic balance outside the permit area.

- Mining must not interrupt, discontinue, or preclude
ors except on undeveloped rangeland insignificant to

- Operator must have technological capability to
equivalent or higher level of yields as non-mined

Operator must prevent subsidence causing material
ogically and economically feasible.

eas are listed as being unsuitable for surface mining
s.

amples from laws other than SMCRA follow.

onmental Quality Act, 35-11-406(b)(xi), requires
landowner's consent to bench out and recover all
Up to 3% of recoverable coal is lost).

art 75.200) requires a roof control plan which limits entry opening size and pillar recovery so that it is sometimes uneconomical to mine. (Loss - up to 2%).

3. MSHA (30 CFR Part 75.200) requires barrier pillars to be left to maintain bleeder entries to ventilate pillared areas. (Loss - up to 2%).

4. Illinois state regulations require barriers to be left to protect gas or oil wells. (Loss - up to 2%).

5. U. S. Army Corps of Engineers rules limit extraction beneath navigable waterways and levees. (Up to 2% of recoverable coal is lost).

There is no end to examples that could be given where coal mining is effected by laws and regulations, but it is difficult to estimate the percentage loss of reserves due to these effects. In fact, it is impossible to give a meaningful number without much study and calculation. If, however, an educated guess is acceptable, we estimate something less than 10% loss of reserves due to the impact of laws and regulations on coal mining.

We hope this helps to answer your two questions even though it was put together hurriedly. Certainly any loss of reserves is important to the coal industry, but the increase cost of mining coal due to laws and regulations is of greater importance. This impacts the consumers as higher energy bills are paid.

Very truly yours,

David B. MacKenzie

David B. MacKenzie
Strategic Planning

DBM/mg

-2-

South Atlantic Coal Company, Inc.

March 16, 1987

The National Coal Council, Inc.
P. O. Box 17370
Arlington, Virginia 22216

Attention: Mr. Stuart B. Ehrenreich
Chairman, Reserve Data Work Group

Gentlemen:

Referring to your letter of February 26, 1987.

There are many sections of State and Federal mining and reclamation laws that cause us to lose coal reserves. The two most notable are the following:

(1) Deep Mining - Section 75.316-2 of Title 30-Code of Federal Regulations requires the leaving of "bleeder" around pillared areas. This "bleeder" consists of a row of coal pillars around the circumference of a pillared area. For non-gassy, above drainage coal seams that we mine, this is most of the time unnecessary. It is estimated that we lose 1 to 2% of our coal reserves because of this requirement; and

(2) Surface Mining/Auger Operations - Section 826.1 of Title 30-Code of Federal Regulations effectively prohibits mining steep slope (slope equal to or greater than 20°) areas since complete highwall elimination is difficult (and costly) to obtain using available technology. It is estimated that this law causes us to lose 4 to 6% of our coal reserves.

Permitting, bonding, mine face up, and reclamation expenses have caused many small blocks of coal to be uneconomical to mine. I would estimate this would amount to another 3 or 4% of our reserves.

In summary, I would estimate that we lose somewhere between 8 and 12% of our reserves due to restrictive regulations.

Sincerely,

SOUTH ATLANTIC COAL COMPANY, INC.

President

REPerkinson:pwc

cc: Mr. Stuart B. Ehrenreich
President
Pacific Basin Coal & Carbon
249 East Ocean Boulevard
Long Beach, California 90802

P. O. Box 1614 / 127 North Street / Bluefield, West Virginia 24701 / Telephone: (304) 325-7[illegible]

KAISER COAL

KAISER COAL CORPORATION
102 SOUTH TEJON STREET, SUITE 800 ▪ P.O. BOX 2679
COLORADO SPRINGS, COLORADO 80901-2679
(303) 475-7005 ▪ TELEX 289 909

March 11, 1987

Mr. Stuart B. Ehrenreich
Chairman, Reserve Data Work Group
The National Coal Council, Inc.
P.O. Box 17370
Arlington, VA 22216

Dear Mr. Ehrenreich:

This is in response to your letter dated February 26, 1987 regarding information on recoverable coal reserves in the United States. Charles McNeil asked me to respond to the two questions you posed, namely what laws, rules or policies affect our ability to recover coal from our reserves, and what percent of our reserves is affected by these restrictions?

First, of course, an argument can be made that any restrictions which impose added costs on a mining operation affect the reserves that can be recovered economically. According to the definitions contained in 43 CFR Section 3480.0-5, the concept of commercial recoverability affects the amount of coal in the "minable reserve base", which in turn affects the "recoverable coal reserves". As a result, the amount of coal that a company includes in its recoverable reserves is influenced by the existing requirements of a variety of federal, state and local laws, rules and regulations. Where these requirements have valid purposes, your report should not comment specifically. In our view, requirements which unnecessarily restrict the amount of coal which is currently recoverable should be the focus of the report. In addition, laws and regulations which change constantly are difficult to comply with, increase costs and restrict recoverable reserves. The industry needs certainty as well as reasonableness.

In our case, the restrictions placed on LMU formation create a significant possibility of reducing our recoverable reserves. Kaiser Coal's Sunnyside Mine in Utah includes a number of undeveloped federal leases, placing Kaiser in violation of Section 3 and disqualifying the company or its affiliates from further leasing under the MLA. Should we desire to resume leasing, formation of a LMU would be our best means to comply. However, the law requires that LMU's contain no more than 25,000

contiguous acres, and that a mine plan showing mineout in 40 years or less be in place. In order to meet those restrictions, Kaiser could be forced to relinquish a substantial amount of federal coal. It's difficult to be specific about percentages, but as much as 40% of the Sunnyside recoverable reserves could be lost in this way.

Another specific area that affects Kaiser Coal is the MSHA ventilation requirement, contained at 30 CFR Section 75.326, that intake and return air courses be separated from belt haulage entries. Kaiser has petitioned for modification of this rule to allow 2-entry mining because of roof conditions at its Cimarron Mine in New Mexico. The burden is on the operator to establish the basis for such a modification, and there are numerous avenues for appeal from a favorable decision by MSHA. Kaiser is currently involved in such an appeal from MSHA's decision to approve the petition.

Although it's difficult to assign a specific reserve loss in 3-entry mines compared to 2-entry mines, we estimate the potential loss of recoverable reserves at Cimarron to be about 4%. Of course, conditions would vary from mine to mine.

Thank you for this opportunity to provide input to the study. If you have any further questions, please don't hesitate to give me a call at 303/578-4347.

Yours very truly,

Jeffrey H. Desautels
Director, External Affairs

JHD:spc

Glenway Avenue
P.O. Box 1280
Bristol, Virginia 24203

The United Company

April 3, 1987

National Coal Council, Inc.
P. O. Box 17370
Arlington, Virginia 22216

Gentlemen:

Re: Impact of Federal, State and Local Laws, Rules, Regulations and Policies on Recoverable Coal Reserves

Pursuant to your request by letter dated February 27, 1987, I requested our Property and Engineering Departments to respond to your request for information concerning the rules, regulations and policies on federal, state and local levels which affect our ability to recover our coal reserves. The following federal laws are detrimental to recovery:

Public Law 95-87, §515: Approximate original contour provisions make it impossible in some situations to recover surface mined coal in steep slope areas. These requirements severely impact on the economic feasibility of recovery.

Public Law 95-87, §516: The subsidence regulations set out in this section make it very difficult to economically maintain our past recovery rate on retreat (pillar) work in underground mines.

Public Law 95-87, §522(e)(5): This section requires waivers prior to mining within 300 feet of an occupied dwelling. This section gives individuals veto power over the permit process. In effect, the owner of the occupied dwelling is in the position of approving or denying the permit, regardless of the mineral owner's rights. There has been some debate over whether to extend this section to apply to underground works also, which would cause a very large problem. Public buildings and cemeteries are also covered under this section and do not make any provisions for waivers.

New regulations under the Clean Water Act requiring that water quality only needs to be improved over the pre-existing conditions will add to our reserve base. This standard will allow re-mining of many areas that would otherwise be reclaimed under the abandoned mine land program. Because our company does

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not control a large number of reserves with acid mine drainage potential, this change would not be of significant benefit to us, perhaps increasing our recoverable reserves by only 1 or 2 percent.

The negative aspects set out above have the potential to cause a loss of approximately 20 percent of our deep mineable reserves, primarily resulting from the subsidence regulations in Public Law 95-87 and its effect on room and pillar mining operations. Because of the approximate original contour requirement and the waivers, we may be facing a loss of as much as 40 percent of our surface mine reserve.

I hope these comments are helpful to you and appreciate the opportunity to participate in your study.

Very truly yours,

James P. Barry
Assistant Corporate Counsel

JPB:jks
cc: Jim McGlothlin
David Wampler
Mark Goff
Don Layne
Ken Evans

MARIETTA COAL CO.
ST. CLAIRSVILLE, OHIO 43950

PHONE 695-2197
AREA CODE
614

67705 FRIENDS CHURCH ROAD

March 11, 1987

Mr. Stuart Ehrenreich
The National Coal Council
Post Office Box 17370
Arlington, VA 22216

Dear Mr. Ehrenreich:

Regarding your letter of February 26, 1987, two major impacts on the recoverability of our coal reserves of current regulations and policies come immediately to mind.

First, the complexity and frequent inaneness of the state permitting process have made it uneconomical to permit small areas of coal. The requests we get for archeological studies, major hydrology studies on normal watersheds, notification lists including hundreds or thousands of names, are expensive. This part of the country's coal fields are broken up by many small farms and plots of ground. Some have been mined, and many haven't. An area of 100 acres or less may contain thousnads of tons of coal, and probably these account for at least one-third of the readily mineable coal in the area. Because of the cost of permitting a great deal of this coal will never be mined.

Secondly, air quality regulations imposed on the utilities in this country have left the #12 coal we have unmineable. It has a high sulfur value relative to its btu. These reserves were the largest remaining reserves in this region, probably 35% of the coal. perhaps another 35% is the #11 coal. While it is still being mined today, (it is what my company mines), it is becoming unmarketable. Average clean analysis is about 11,200 btu/2.75 % sulfur. Our area power companies are switching to out-of-state fuels with similar or better btus, and much lower sulfur, to meet their emmissions requriements. If this situations continues worsening, almpst all of the coal in this area will be non-recoverable.

Generally speaking, the most obivous effect our many federal and state regulations, laws, and policies have had has been to render America's coal non-competitive in world markets, and unprofitable; "non-recoverability" follows. The prices of Australian and South African coals, for example, have followed the price of oil down. American coal has also been forced down in price, but as a domestic industry we are governened by many very demanding rules that keep our costs of permitting, mining, and reclaiming high. Our overseas competitors, not subject to these laws and costs, continue to cut prices. At present, spot coal is selling for less than the fixed cost of meeting the laws and taxes we are subject to.

In this region, about 50% of our reserves are considered non-recoverable, for the reasons mentioned above, and have been written off.

The remainder will become absolutely unmineable should additional air-quality (sulfur emmissions) standards be imposed, or if additional expensive regulatory requirements are levied against us.

Sincerely,

MARIETTA COAL COMPANY

Kiki Nicolozakes
Vice-president of Administration

Cyprus Coal Company
Subsidiary of Cyprus Minerals Company
7200 South Alton Way
Post Office Box 3299
Englewood, Colorado 80155
303-740-5131

D. P. Bellum
President

April 16, 1987

Mr. Stuart B. Ehrenreich
President
Pacific Basin Coal & Carbon
249 E. Ocean Blvd., Suite 300
Long Beach, California 90802

Dear Mr. Ehrenreich:

The following comments are submitted in response to your February 26, 1987, request on the impact of various laws, regulations and policies on recoverable coal reserves.

Cyprus Coal Company operates mines in Pennsylvania, Kentucky, Colorado, and Utah. These mines consist of surface and underground operations in both the eastern and western United States.

In order to most accurately address your request, the following questions were submitted to each of our operations:

1. Which laws, rules, regulations, and policies on the federal, state and local level affect your ability to recover coal...

2. On a percentage basis, what is the effect of these laws, rules, regulations and policies on your company's reserve base...?

As may be expected, the responses expressed different regulatory constraints between eastern and western operations. Regulatory constraints were also different between surface and underground mines. In view of these regional and operational differences, the comments will be summarized by eastern surface, eastern underground, western surface and western underground.

CYPRUS

. Ehrenreich
87

ace

consensus from our eastern operations is that onstraints stem from the 1977 SMCRA which forms the st, if not all, state mining regulations. Most cited ision for stream buffer zones within 100 feet of an or perennial stream. The operations point out that e possible but when such are not granted operational experienced by "skipping" the buffer zone. Also straints were the provisions for additional buffers eries, and within 100 feet of public roads. General re made concerning fish and wildlife constraints ose from threatened or endangered species. From the wever, wildlife constraints have not created major our operations. One operation noted concern for raints due to perceived requirements for detailed istoric and archaeological surveys before permit ncern was also expressed on water quality constraints ining of previously mined areas. However, the recent g provisions are expected to ease this concern.

pacts to otherwise recoverable reserves were not the Eastern Surface responses. The general statement at "it is very, very minor compared to the total The commenter continued, however, that such "have a very high potential to prohibit mining based . When these regulations are combined with others ly or indirectly affect costs (bonding, exploration, s, acid overburden determination, contemporaneous requirements which affect preferred methods of tc.) any given area could easily become uneconomical

rground

ing comment on regulations that affect operations for rground were those that limited or prohibited surface Noted as triggers for such limitations were effects uildings, aquifers serving as a significant water eams, roads, pipelines, railraods and large water . Recent court action in Pennsylvania tends to e expressed concerns.

ern surface, specific reserve losses were not listed nses. The impacts to underground mines in Pennsyl- however, believed to be significant where surface acking.

designation for our western surface min consist of 16.2 million tons comprising 100 base which is otherwise extractable coal.

Western Underground

As noted for eastern underground mines our western properties noted subsidence restrictions as the number one constraint. The difference between east and west came up in subsidence restrictions under alluvial valley floor areas which compounded the regulatory constraint. The only other perceived constraint was reported as "water resource protection" which may require coal to be left in place as a buffer zone against a fault system that may carry water to a public groundwater well field.

The loss of reserve for western underground was reported as 25% to 30% of the approved permit boundary for one of our mines. The other did not report losses but did note a regulatory technicality that "lost" ton otherwise extractable under all laws and regulations. "Coal in a peninsula adjacent to a Federal lease... was lost forever because the BLM would not accept a reasonable bid.... We felt we offered a fair price considering mining conditions.... No one else will ever mine the areas because of its location."

Please let me know if you need any additional information.

Sincerely,

D.P. Bellum
President

GAT/DPB/clr

TEXAS UTILITIES COMPANY
2001 BRYAN TOWER-DALLAS, TEXAS 75201-3050

March 23, 1987

Mr. Stuart B. Ehrenreich
President
Pacific Basin Coal and Carbon
249 East Ocean Blvd., Suite 300
Long Beach, CA 90802

Dear Mr. Ehrenreich:

This is in response to your request of February 26 regarding the impact of federal, state and local laws, rules, regulations and policies on the recoverable coal reserves in the United States:

1. Numerous federal and state regulations affect the economics of surface mining lignite in Texas but we have not experienced a situation where mining was absolutely prohibited. There are provisions in the Federal Surface Mining and Reclamation Act of 1979 and the nearly identical Texas Surface Coal Mining and Reclamation Act that specifies areas where mining is prohibited if certain uses are being made of the surface. When these surface obstructions are encountered mitigation measures are available to resolve the problem. For example, roads may be rerouted, cemeteries relocated, etc.

2. Texas Utilities Mining Company, one of our subsidiaries, has elected not to mine several small areas due to the cost of mitigation. Such losses have been minimal. Currently, there are no statues that prohibit recovery of all of Texas Utilities Company's lignite reserves.

Sincerely,

Perry G. Brittain

PGB/bhm

INTEROFFICE CORRESPONDENCE

SUBJECT: Data Base - Federal Coal Reserves

DATE: December 15, 1986

OFFICE: Cordero Mine - Environmental

FROM: Jim Sutherland

TO: Dwight Knott

Per your request, we have attempted an initial assessment of the degree to which state and federal statutes, regulations, agencies, and regulators impact the amount of workable federal reserves. The items listed below are not all-encompassing by any means. In fact, we merely touch the tip of the iceberg. Most of the items have already caused a delay in development of reserves at one time or another. It should be noted that they may or may not have a long lasting impact on reserve availability.

The most obvious problem areas are:

- Endangered species (plant and animal); e.g., black footed ferret. When an endangered species, either plant or animal, is identified upon a lease area, all activities must cease until the circumstances are fully understood and mitigation plans underway.
- Critical habitat; e.g., ferruginous hawk nest, bald eagle roosting areas, strutting grounds, Red Rim winter antelope range.
- Alluvial Valley Floors (AVF)
- Air quality regulations; Clean Air Act; visibility regulations (integral vistas)
- Archaeological finds - Sites eligible for nomination to the National Register of Historic Places.
- Surface owner consent - Federal coal under private surface.
- Cumulative Hydrologic Impact Assessment (CHIA) - This is going to be one of the primary concerns from an environmental standpoint during the next few years. Concerns mining impact on the total groundwater regime.
- Acid rain legislation - Potential problem.
- Oil and gas conflicts; e.g., we changed mine plan sequencing because an oil well was drilled in front of a proposed pit advance.
- Wilderness areas - No mineral development allowed.

Once you have had a chance to digest these, let's get together and discuss in further detail.

JOS:lh

PEABODY HOLDING COMPANY, INC.

301 North Memorial Drive
P.O. Box 373
St. Louis, Missouri 63166
(314) 342-3400

ROBERT H. QUENON
President

April 9, 1987

Mr. Stuart B. Ehrenreich
Chairman, Reserve Data Work Group
The National Coal Council, Inc.
Post Office Box 17370
Arlington, Virginia 22216

Dear Mr. Ehrenreich:

This is in response to your letter inquiring as to what impact federal, state, and local laws, rules, regulations, and policies have on our recoverable coal reserves. While many of the above governmental actions affect our ability to recover coal from our reserves, we at Peabody feel that, on the federal side, the following have caused or could cause a substantial reduction to our reserve base:

- The Federal Coal Leasing Amendments Act (FCLAA) of 1976 as a cause for surrender or other disposition of federal leases and preference right lease applications due to Sections 3 and 7 diligence requirements.
- The 1977 Amendments to the Clean Air Act of 1970 as it defines Class I areas in Part C.
- The Surface Mining Control and Reclamation Act (SMCRA) of 1975, especially in Section 522(e) with its buffer zone requirements.

With regard to State action, Minnesota's acid rain legislation requires that one whole seam at one of our two seam operations be left in place and, therefore, lost to our reserve base.

We feel that these constraints and others like them can easily affect 20% of our reserve base and that of the United States.

Of course, there are many other instances of federal, state, and local actions which have major negative economic effects on our ability to mine and market our coal, in essence, taking this coal out of the available reserve. Further, the Clean Air Act of 1970 as amended can negatively impact our reserves to the same extent (approximately 45%) that it affects the national reserve base due to high sulfur content. This reduction does not include any high sulfur reserves under present development.

If we can be of further assistance, please let us know. We will look forward to seeing the results of your study.

Sincerely,

Robert H. Quenon

RHQ:br

NERCO INC.
111 S.W. COLUMBIA, SUITE 800
PORTLAND, OR 97201-5813
TELECOPIER 503 · 241 · 2819
TELEPHONE 503 · 796 · 6600

April 1, 1987

Stuart B. Ehrenreich, President
Chairman, Reserve Data Work Group
The National Coal Council, Inc.
PO Box 17370
Arlington, VA 22216

Dear Mr. Ehrenreich:

Thank you for your letter requesting information on laws and regulations affecting coal development in the U.S.

Attached is a list of state and federal policies which we believe most significantly affect our coal marketing and recovery efforts.

Please give me a call at 503/796-6409 if you have any questions.

Sincerely,

Reuben C. Plantico
Director, Government Relations

RCP/cs/0769G
Attachments

cc: Lehmann

Energy Policy

- It is no coincidence that the coal boom in the 1970's coincided with the cutoff of foreign energy supplies and simultaneous concern that the United States maintain a strategic level of energy independence. Since that time the federal government has failed to follow through with serious policy implementation and those initiatives which were put in place are being eroded (i.e., the Fuel Use Act). This has resulted in oversupply and plunging prices in all coal regions of the country. A serious program of energy independence coupled with policies which conserve domestic oil and natural gas reserves would help to restore markets for U.S. coal.

Percentage Reduction Requirement

- This requirement virtually eliminated the low sulfur advantage of western coal in meeting Clean Air Act emissions standards. While the importance of this requirement may be reduced as new clean coal technology is implemented, it remains a significant cost constraint to the use of western coal.

Approximate Original Contour Requirement

- The highwall reduction requirement accounts for an estimated 12 percent of the cost of mining coal. Elimination or modification of this requirement would directly assist coal in meeting interfuel competition.

Transportation Competition

- The cost of transportation for western coal is now commonly two to four times the cost of the coal itself, and sometimes higher. This is due in part to the lack of competition and an unregulated monopoly status for railroads hauling coal in the West. The continued absence of policies which result in either transportation competition or reasonable rate regulation will continue to limit the markets for domestic coal both here and abroad. Current transportation competition policy issues include waterway funding and intermodel monopolization also.

Taxes and Royalties

- Federal tax policies encouraging coal development and use have been dramatically eroded in recent years. Coal states grew dependent on production royalty and severance tax levels barely supportable when coal was the fuel of choice and commanded premium prices. These same tax and royalty levels today are being applied to an industry which is engaged in fierce interfuel competition for new markets and which faces an oversupply situation in its current markets.

Sulfur Dioxide Controls

- Whether in the form of acid rain legislation, increment consumption, revised industrial or utility source performance standards, substitute technology utilization or otherwise, the extent and mechanisms of sulfur dioxide controls have a great influence on the size and type of coal markets. Costly control programs may drive customers to alternate fuels and power supplies.

Particulate Controls

- The EPA is in the process of finalizing regulations under the Clean Air Act for fugitive dust controls from surface coal mines. The potential impacts to operating costs range from very small to very large.

Interfuel Competition

- Particularly with the decline in oil and gas prices, government policies affecting the cost and availability of alternative fuels have a direct market size impact whether or not related to the energy independence issue noted above. These policies include oil and gas use restrictions (Fuel Use Act), Canadian gas and hydropower policies, and government policy toward imported oil and coals.

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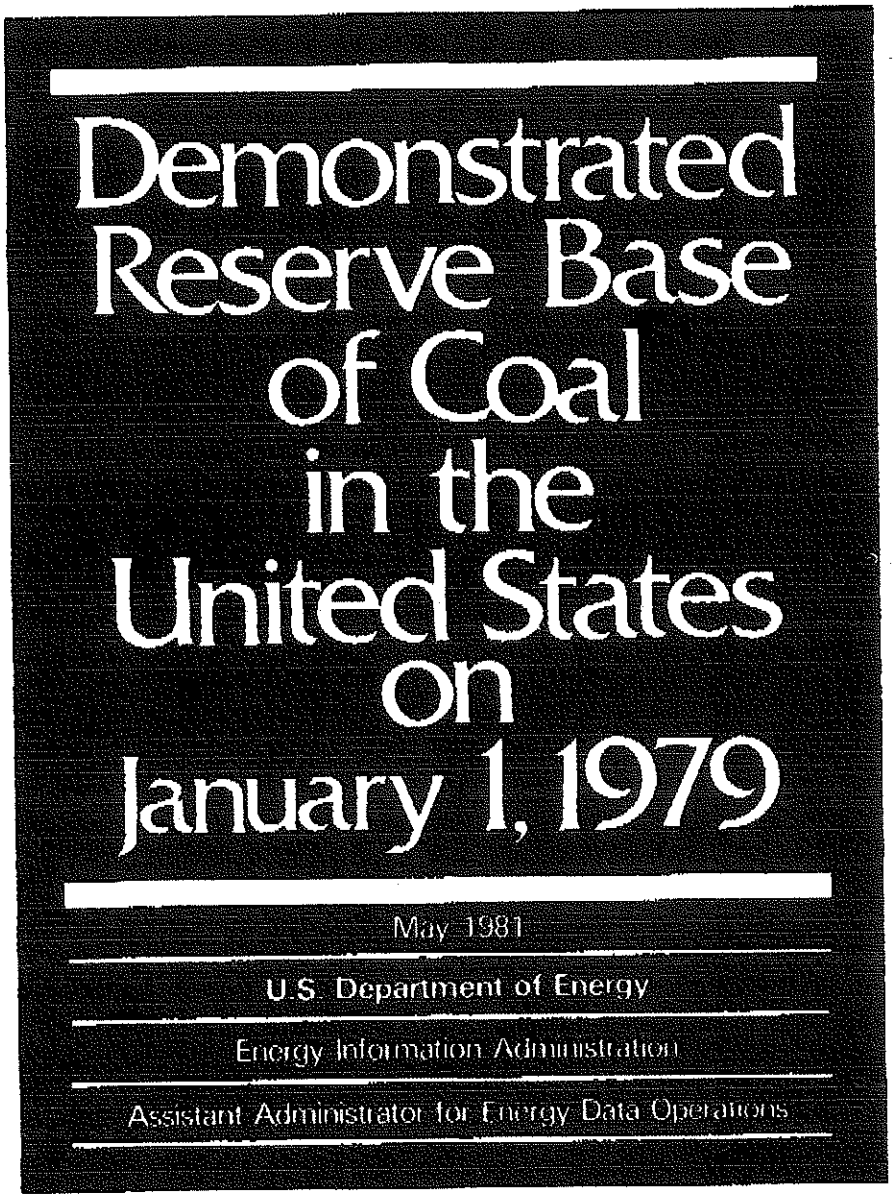
Appendix C

Glossary of Selected Coal Classification Terms



GLOSSARY OF SELECTED COAL CLASSIFICATION TERMS[1]

Demonstrated Reserve Base. - A collective term for the sum of coal in both Measured and Indicated Resource categories of reliability and represents 100 percent of coal in place as of a certain date. Includes beds of bituminous coal and anthracite 28 inches or more thick and beds of subbituminous coal 60 inches or more thick that occur at depths to 1,000 feet. Includes beds of lignite 60 inches or more thick that can be surface mined. Includes also thinner and/or deeper beds that presently are being mined or for which there is evidence that they could be mined commercially at this time. Represents that portion of the Identified Coal Resource from which Reserves are calculated.

Depletion[2]. - The subtraction of both the tonnage produced and the tonnage lost to mining from the Demonstrated Reserve Base and Identified Resources to determine the remaining tonnage as of a certain time.

Depletion Factor[2]. - The multiplier of the tonnage produced that takes into account both the tonnage recovered and the tonnage lost due to mining. The Depletion Factor is the reciprocal of the Recovery Factor in relation to a given quantity of production.

Hypothetical Resources. - Undiscovered Coal Resources in beds that may reasonably be expected to exist in known mining districts under known geologic conditions. In general, Hypothetical Resources are in broad areas of coalfields where points of observation are absent and evidence is from distant outcrops, drill holes, or wells. Exploration that confirms their existence and reveals quantity and quality will permit their reclassification as Identified Resources. Quantitative estimates are based on a broad knowledge of the geologic character of coalbed or region. Measurements of coal thickness are more than 6 miles apart. The assumption of continuity of coalbed is supported only by geologic evidence.

Identified Resources. - Specific bodies of coal whose location, rank, quality, and quantity are known from geologic evidence supported by engineering measurements. Included are beds of bituminous coal and anthracite 14 inches or more thick and beds of subbituminous coal and lignite 30 inches or more thick that occur at depths to 6,000 feet and whose existence and quantity have been delineated within specified degrees of geologic assurance as measured, indicated, or inferred. Also included are thinner and/or deeper beds that presently are being mined or for which there is evidence that they could be mined commercially.

Indicated Resources. - Coal for which estimates of the rank, quality, and quantity have been computed partly from sample analyses and measurements and partly from reasonable geologic projections. Indicated resources are computed partly from specified measurements and partly from projection of visible data for a reasonable distance on the basis of geologic evidence. The points of observation are 1/2 to 1 1/2 miles apart. Indicated coal is projected to extend as a 1/2-mile wide belt that lies more than 1/4 mile from the outcrop or points of observation or measurement.

Inferred Resources. - Coal in unexplored extensions of Demonstrated Resources for which estimates of the quality and size are based on geologic evidence and projection. Quantitative estimates are based largely on broad knowledge of the geologic character of the bed or region and where few measurements of bed thickness are available. The estimates are based primarily on an assumed continuation from Demonstrated coal for which there is geologic evidence. The points of observation are 1 1/2 to 6 miles apart. Inferred coal is projected to extend as a 2 1/4-mile wide belt that lies more than 3/4 mile from the outcrop or points of observation or measurement.

Measured Resources. - Coal for which estimates of the rank, quality, and quantity have been computed, within a margin of error of less than 20 percent, from sample analyses and measurements from closely spaced and geologically well-known sample sites. Measured resources are computed from dimensions revealed in outcrops, trenches, mine workings, and drill holes. The points of observation and measurement are so closely spaced and the thickness and extent of coals are so well defined that the tonnage is judged to be accurate within 20 percent of true tonnage. Although the spacing of the points of observation necessary to demonstrate continuity of the coal differs from region to region according to the character of the coalbeds, the points of observation are no greater than 1/2 mile apart. Measured coal is projected to extend as a 1/4-mile belt from the outcrop or points of observation or measurement.

Quality or Grade. - Refers to individual measurements such as heat value, fixed carbon, moisture, ash, sulfur, phosphorus, major, minor, and trace elements, coking properties, petrologic properties, and particular organic constituents. The individual quality elements may be aggregated in various ways to classify coal for such special purposes as metallurgical, gas, petrochemical, and blending usages.

Rank. - The classification of coal relative to other coals, according to their degree of metamorphism, or progressive alteration, in the natural series from lignite to anthracite (Classification of Coal by Rank, 1938, American Society for Testing Materials, ASTM Designation D-388-38, p. 77-84).

Recovery Factor[2]. - The percentage of total tons of coal estimated to be recoverable from a given area in relation to the total tonnage estimated to be in the Demonstrated Reserve Base. For the purpose of calculating Depletion Factors only, the estimated Recovery Factors for the Demonstrated Reserve Base generally are 50 pecent for underground mining methods and 80 percent for surface mining methods. More precise Recovery Factors can be computed by determining the total coal in place and the total recoverable in any specific locale.

Reserve[2]. - That portion of the Demonstrated Reserve Base that is estimated to be recoverable at the time of determination. The Reserve is derived by applying a Recovery Factor to that component of the Identified Coal Resource designated as the Demonstrated Reserve Base.

Speculative Resources. - Undiscovered coal in beds that may occur either in known types of deposits in a favorable geologic setting where no discoveries have been made, or in deposits that remain to be recognized. Exploration that confirms their existence and reveals quantity and quality will permit their reclassification as Identified Resources.

Undiscovered Resources. - Unspecified bodies of coal surmised to exist on the basis of broad geologic knowledge and theory. Undiscovered Resources include beds of bituminous coal and anthracite 14 inches or more thick and beds of subbituminous coal and lignite 30 inches or more thick that are presumed to occur in unmapped and unexplored areas to depths of 6,000 feet. The Speculative and Hypothetical Resource categories comprise Undiscovered Resources.

[1]Based on Geological Survey Bulletin 1450-B (1976).
[2]Defined by EIA for use in this report.

Appendix D

Major Federal Laws Governing the U.S. Coal Industry

- Federal Mineral Lands Leasing Act of 1920
- Federal Coal Leasing Amendments Act of 1976
- Surface Mining Control and Reclamation Act of 1977
- National Environmental Policy Act of 1969
- Clean Air Act of 1970
- Clean Air Act Amendments of 1977
- Clean Water Act of 1977
- Federal Water Act of 1977
- Federal Water Pollution Control Act Amendments of 1977
- Resource Conservation and Recovery Act of 1976
- Coal Mine Health and Safety Act of 1969
- Federal Mine Safety and Health Act of 1977
- Department of Energy Organization Act
- Antiquities Act of 1906
- Archaeological and Historical Preservation Act of 1974
- Bald Eagle Protection Act of 1969
- Endangered Species Act of 1973
- Fish and Wildlife Coordination Act of 1934
- Historic Preservation Act of 1977
- Mining and Minerals Policy Act of 1970
- Noise Control Act of 1972
- Safe Drinking Water Act of 1972
- Soil and Water Resources Conservation Act of 1977
- Multiple-Use Sustained Yield Act of 1960
- National Forests Management Act of 1976
- Wilderness Preservation Act
- Powerplant and Industrial Fuel Use Act
- Railroad Revitalization and Regulatory Reform Act of 1976
- Staggers Rail Act of 1980
- Federal Rivers and Harbors Act

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March 6, 1987

Mr. Micheal W. Buckner
Research Director
United Mine Workers of America
900 Fifteenth Street, N.W.
Washington, D.C. 20005

Re: The National Coal Council, Inc.
Coal Reserve Data Base and
Regulatory Impact Work Group Project

Dear Micheal:

Stu Ehrenreich, chairman of the above-referenced work group, has requested that I provide you a list of federal laws impacting the development of the coal reserve base delineated by the data base sub-group. Among such laws are the following:

1. Mineral Leasing Act of 1920, as amended by the Federal Coal Leasing Amendments Act of 1976, 30 U.S.C. 201-214.
2. Federal Land Policy and Management Act of 1976, 43 U.S.C. 1701-1782.
3. Surface Mining Control and Reclamation Act of 1977, 30 U.S.C. 1201-1328.
4. Department of Energy Organization Act, 42 U.S.C. 7101-7352.
5. Antiquities Act of 1906, 16 U.S.C. 431.
6. Archaeological and Historical Preservation Act of 1974; Archaeological Salvage Act, 16 U.S.C. 469.

HOLLAND & HART
ATTORNEYS AT LAW

r. Micheal W. Buckner
arch 6, 1987
age 2

7. Bald Eagle Protection Act of 1969, 16 U.S.C. 668.
8. Clean Air Act Amendments of 1977, 42 U.S.C. 7401.
9. Clean Water Act of 1977, 33 U.S.C. 1251.
10. Endangered Species Act of 1973, 16 U.S.C. 1531.
11. Fish and Wildlife Coordination Act of 1934, 16 U.S.C. 661.
12. Historic Preservation Act of 1977, 16 U.S.C. 470.
13. National Environmental Policy Act of 1969, 42 U.S.C. 4321.
14. Mining and Minerals Policy Act of 1970, 43 U.S.C. 21.
15. Noise Control Act of 1972, 42 U.S.C. 4901.
16. Resource Conservation and Recovery Act of 1976, 42 U.S.C. 6901.
17. Safe Drinking Water Act of 1977, 42 U.S.C. 300.
18. Soil and Water Resources Conservation Act of 1977, 16 U.S.C. 2001.
19. Multiple-Use Sustained Yield Act of 1960, 16 U.S.C. 528.
20. National Forests Management Act of 1976, 16 U.S.C. 472a.

he foregoing, although not all-inclusive, is representative of he types of federal laws impacting development of the coal eserve base. I am also enclosing for your use a copy of a unedco Coal Company memorandum provided by Dwight Knott at the ebruary 23, 1987 work group meeting.

Regarding the presentment of the list of laws impacting development of the reserve base, I suggest the following format for your consideration. I have used the Antiquities Act of 1906 as an example of how the format would function:

Name of Act	U.S. Code Citation	Purpo
Antiquities Act of 1906	16 U.S.C. 431	.Regula antiqu excava and co tion, ing fo remains.

tological resources.

.Protects historical values on public land.

I trust that this communication will be of assistance in the preparation of your report concerning this important matter. Should you have any questions, please give me a call next week. I find that I must be in London on business during the week of March 16th and unfortunately will be unable to attend the next meeting of the work group on March 20th. I have, however, made arrangements for the meeting to be held in our offices commencing at 9:30 a.m. on the 20th.

Yours very truly,

Gerald J. Schissler

GJS:klw
Enclosure
cc: Mr. Stuart Ehrenreich
Mr. James McAvoy
Mr. William Greenough
Mr. Gardar Dahl, Jr.

Appendix E

Summary of Coal Severance and Production Taxes

SUMMARY OF COAL SEVERANCE AND PRODUCTION TAXES

NAME	STATE	
Severance Tax	Alabama	33.5¢ per ton - County taxes range from 20¢ to 50¢ per ton
Mining License Tax	Alaska	Net Income (Allows depletion as a deduction) from mining property at following rates: 40,000 to 50,000 - 3% 50,000 to 100,000 - $1,500 plus 5% of excess over $50,000 100,000 or over - $4,000 plus 7% of excess over $100,000
Severance Tax	Arkansas	10¢ per ton
Coal Tonnage Tax	Colorado	60¢ per ton increased or decreased 1% for every three points of change in the Wholesale Price (producer's price effective 1/1/80) Index for all commodities, 50% credit on coal produced from underground mines and 50% credit for lignite coal. No tax on first 8,000 tons produced.
Severance Tax	Idaho	2% of net value (Allows depletion as a deduction) mined.
Severance Tax	Kansas	$1.00 per ton. Exemption on coal from any mine the total annual production from which is 350,000 tons or less in the preceding calendar year. A Mined-Land Conservation and Reclamation Tax ranging from 3¢ to 10¢ per ton of coal extracted is imposed on persons holding surface coal mining and reclamation permits.
Severance Tax	Louisiana	10¢ per ton
Severance Tax	Kentucky	4½% of gross income with a 50¢ per ton floor
Mining Excise Tax	Maine	The excise tax due on each mine site is the greater of (1) a tax on facilities and equipment equal to the value of facilities and equipment multiplied by 0.005; or (2) a tax on gross proceeds equal to gross proceeds multiplied by (a) if net proceeds is greater than zero, the greater of 0.009 or a number determined by subtracting from 0.045 the quotient obtained by dividing gross proceeds by net proceeds multiplied by 100; or if net proceeds is equal to less than zero, then 0.009.

Coal Severance Tax	Maryland (Garrett County)	40¢ per ton - Surface Mined - Tax is in effect until June 30, 1987
Mine Reclamation Surcharge	Maryland	Department of Natural Resources assesses a 9¢/ton surcharge on coal removed by the open-pit or strip method. A county will assess a 6¢/ton surcharge.
Coal Reclamation Tax	Missouri	30¢/ton on first 50,000 tons sold and 20¢/ton on the next 50,000 tons sold. Assessed on all surface coal permit holders
Coal Mine Operators Tax	Montana	Heating quality (BTU per lb. of coal) / Surface / Underground Under 7,000: 12¢ or 20% of value / 5¢ or 3% of value 7,000 - 8,000: 22¢ or 30% of value / 8¢ or 4% of value 8,000 - 9,000: 34¢ or 30% of value / 10¢ or 4% of value Over 9,000: 40¢ or 30% of value / 12¢ or 4% of value First 20,000 tons annually are exempt.
Mineral Mining Tax	Montana	$25 plus ½ of 1% of the gross value of the product in excess of $5,000
Severance Tax	New Mexico	Effective July 1, 1982, tax is 57¢ per ton plus a required surtax of 42.4¢ per ton for a total of 99.4¢ per ton on surface coal and 55¢ per ton plus a required surtax of 40.9¢ per ton for a total of 95.9¢ per ton on underground coal. Surtax will be recomputed by multiplying the dollar amount of the severance tax by a percentage equal to the percentage rise in the Consumer Price Index from the calendar year 1976 to the calendar year just prior to the year in which the surtax rates are computed. The resources excise tax at .75% and conservation tax .18% remain unchanged.
Severance Tax	North Dakota	85¢ per ton, escalating 1¢ per ton for each 4-point increase in the Wholesale Price Index from base Wholesale Price Index figure as of June 30, 1979. In lieu of all other taxes on coal. Cannot be reduced once it increases. Rate for first and second quarters, 1985 is $1.04 per ton. Coal used for space heating of buildings in North Dakota are exempt, effective July 1, 1981.
Severance Tax	Ohio	4¢ per ton and an additional 1¢ per ton during any year in which it is necessary to bring the balance of the reclamation supplemental forfeiture special account to $2 million.
Energy Minerals Severance Tax	South Dakota	4½% of taxable value of any energy minerals severed and saved
Severance Tax	Tennessee	20¢ per ton
Severance Tax	Virginia	Tazewell and Buchanon Counties - 2% of mine mouth value. No state severance tax.
Occupation Tax	West Virginia	3.85% of gross income
Mining Severance Tax	Wyoming	A tax of 8½% is applied against a valuation formula prescribed by statute. The State Tax Commissioner should be consulted as to the manner in which the formula is applied to any individual mining operation. Coal Severance tax based on "gross value mined" is 2% effective until January 1 next following the year in which revenue produced by this tax exceeds $160 million.

Source: National Coal Association

Appendix F

Letters from the Secretary of Energy and Response of the National Coal Council

THE SECRETARY OF ENERGY
WASHINGTON, D.C.

August 21, 1986

Dear Mr. McGlothlin:

Thank you for your letter of June 6, 1986, concerning issues of concern to the National Coal Council.

I appreciate the work the Council has done on various issues outlined in my letter of September 4, 1985. I believe studies of the following two issues would be of benefit to the Department of Energy:

1. Improved International Competitiveness for US Coal and Technologies.

   Evaluate what can be done to make US coal more competitive in international markets. This evaluation should include: consideration of the long-term availability of coal for export from coal producing countries, their long-term reliability, their ability to sustain current coal exports, the impact of new coal-using technologies on international coal trade, and the factors influencing the price of US coal in international trade.

2. Conduct a strenuous critique of the demonstrated coal reserve data base.

   Evaluate how well the national assessment of quantity and quality of coal represented as being practically available for mining can be supported by data on local knowledge of ownership patterns, bypassed reserves, extraction practices, constraints, etc. Special emphasis should be given to coals where there could be a significant future demand by virtue of special characteristics, such as low sulphur, low ash, and ease of cleansing, etc.

Additionally, I understand from Under Secretary Salgado that you will discuss with the Executive Committee the need to do a broad based study of the Surface Mining and Reclamation Act. Please advise me of the results of the discussion.

Best wishes.

Yours truly,

John S. Herrington

John S. Herrington

Mr. James McGlothlin
Chairman
National Coal Council
PO Box 17370
Arlington, VA 22216

THE NATIONAL COAL COUNCIL, INC.
Post Office Box 17370, Arlington, Virginia 22216
(703) 527-1191

November 11, 1986

The Honorable John S. Herrington
Secretary of Energy
1000 Independence Avenue
Washington, D. C.

Dear Mr. Secretary:

On behalf of the members of the National Coal Council, let me express our very deep appreciation for visiting with us during our recently completed meeting in Texas. We were very encouraged by your fine remarks and honored to have had you with us again.

At the meeting of the Full Council, we passed resolutions to request your agreement for us to conduct three important studies. Two of these were in response to your letter to us and the third was generated by the members. Accordingly, I do hereby formally request that you authorize the National Coal Council to conduct a study and make recommendations regarding each of the folowing areas:

1. Improving the International Competitiveness of U.S. Coal and Coal Technologies

2. (a) The Demonstrated Coal Reserve data base of the U.S. and to determine and identify any substantially incomplete areas in such data base, if any exist; and

   (b) The degree to which State and Federal statutes, regulations, enforcement agencies, and regulators impact the amount of workable reserves identifies in such data base.

3. The impact on the U.S. economy of substituting coal for imported energy

Mr. Secretary, we look forward to your early favorable consideration of our requests, and hope to hear from you soon as we are eager to begin our efforts.

Again, our most sincere thanks for taking the time from your most busy schedule to be with us. We look forward to continuing to serve and advise you.

With warmest best wishes and personal regards.

Yours very truly,

James W. McGlothlin

James McGlothlin
Chairman

An Advisory Committee to the Secretary of Energy

THE SECRETARY OF ENERGY
WASHINGTON, D.C.

November 26, 1986

Mr. James McGlothlin
Chairman
National Coal Council
United Coal Company
P.O. Box 1280
Bristol, Virginia 24203

Dear Mr. McGlothlin:

In response to your November 11, 1986, letter, I authorize the National Coal Council (NCC) to conduct a study and make recommendations regarding each of the following areas:

(1) Improving the International Competitiveness of U.S. Coal and Coal Technologies. Specifically, I request the NCC's advice on what barriers prohibit U.S. coal and coal technologies from freely competing in the international marketplace and recommendations for improving the competitiveness of the U.S. in these markets. It is recommended that you build upon studies on the subject that have been completed or are underway.

(2) (a) The Demonstrated Coal Reserve Data Base of the U.S. and to determine and identify any substantially incomplete areas in such data base, if any exist; and

(b) The degree to which State and Federal statutes, regulations, enforcement agencies, and regulators impact the amount of workable reserves identified in such data base.

It is recognized that an extensive coal data base exists. However, it is possible that there are important gaps in the data base(s) which may result in lack of available and necessary data for policy analyses, domestic and international coal marketing and other purposes. Therefore, I am requesting the NCC's advice on the gaps that exist in the data base, if any, and the impacts the U.S. regulatory system is having on workable reserves and recommendations to deal with any shortcomings identified.

(3) The impact on the U.S. economy of substituting coal for imported energy. A complete accounting by the NCC of the value to the U.S. economy of using U.S. coal in lieu of imported energy should be of great value in the development of National energy and economic policies for the U.S.

It was a pleasure meeting with you and the full NCC in Texas. The four reports you provided to me in August were of extremely high quality and of great value. Deputy Secretary Martin advised me of the extensive discussions at the Coal Policy Committee Meeting on the new requested studies. I look forward to receiving future reports that will be of equal or even greater value than those you have already submitted.

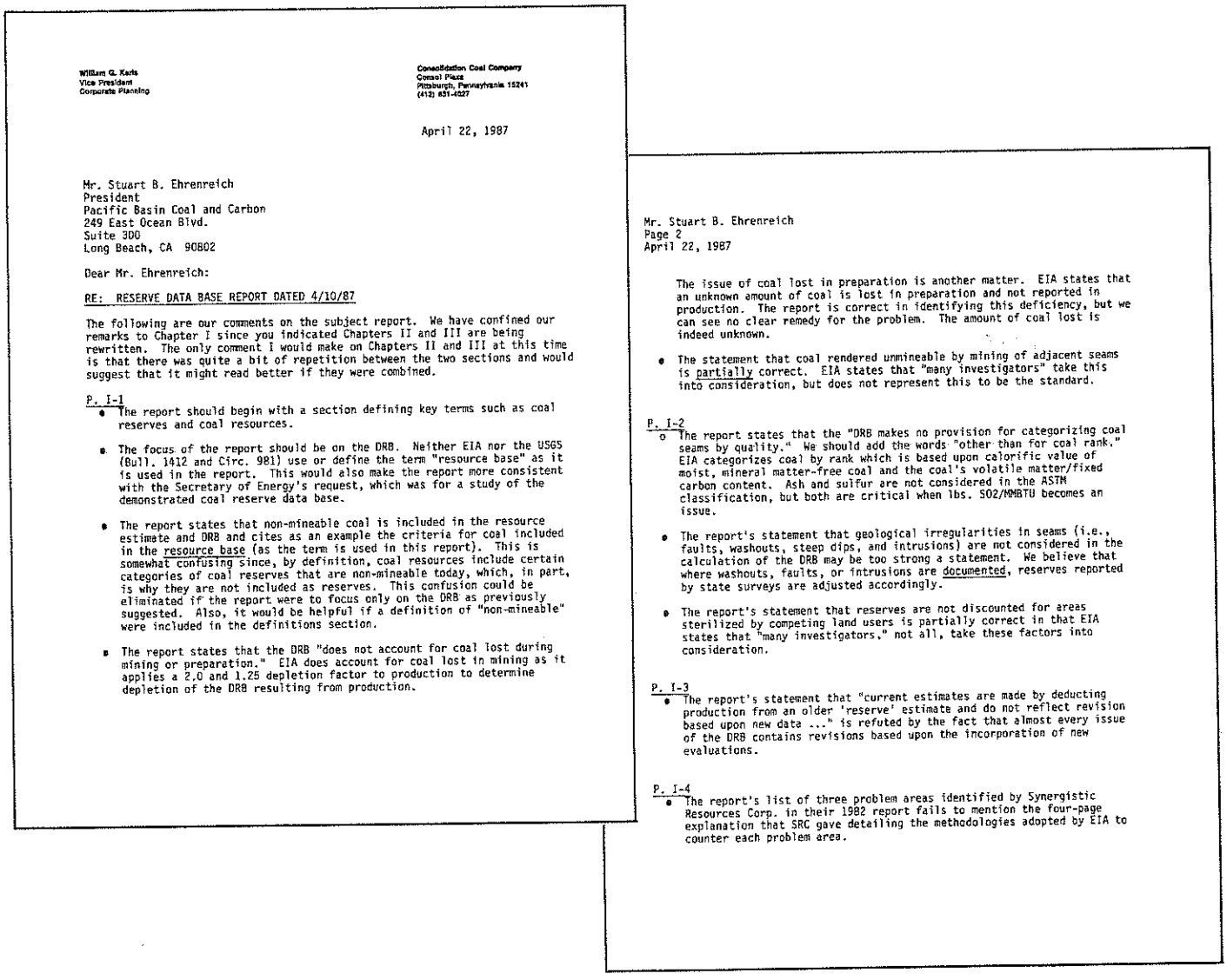
Yours truly,

John S. Herrington

Appendix G

Comments Submitted on Draft Reports

In this Appendix we have included the comments received in response to the various drafts of this report. This is done to show the positions/opinions of the respondents to the report. We believe that showing varying positions should be of value to policy makers. It should be emphasized that comments on drafts do not imply a dissenting position on the report as a whole. The comments received may have been incorporated in subsequent drafts or otherwise discussed. We have not included comments that were purely editorial in nature.



William G. Karis
Vice President
Corporate Planning

Consolidation Coal Company
Consol Plaza
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April 22, 1987

Mr. Stuart B. Ehrenreich
President
Pacific Basin Coal and Carbon
249 East Ocean Blvd.
Suite 300
Long Beach, CA 90802

Dear Mr. Ehrenreich:

RE: RESERVE DATA BASE REPORT DATED 4/10/87

The following are our comments on the subject report. We have confined our remarks to Chapter I since you indicated Chapters II and III are being rewritten. The only comment I would make on Chapters II and III at this time is that there was quite a bit of repetition between the two sections and would suggest that it might read better if they were combined.

P. I-1

- The report should begin with a section defining key terms such as coal reserves and coal resources.
- The focus of the report should be on the DRB. Neither EIA nor the USGS (Bull. 1412 and Circ. 981) use or define the term "resource base" as it is used in the report. This would also make the report more consistent with the Secretary of Energy's request, which was for a study of the demonstrated coal reserve data base.
- The report states that non-mineable coal is included in the resource estimate and DRB and cites as an example the criteria for coal included in the resource base (as the term is used in this report). This is somewhat confusing since, by definition, coal resources include certain categories of coal reserves that are non-mineable today, which, in part, is why they are not included as reserves. This confusion could be eliminated if the report were to focus only on the DRB as previously suggested. Also, it would be helpful if a definition of "non-mineable" were included in the definitions section.
- The report states that the DRB "does not account for coal lost during mining or preparation." EIA does account for coal lost in mining as it applies a 2.0 and 1.25 depletion factor to production to determine depletion of the DRB resulting from production.

The issue of coal lost in preparation is another matter. EIA states that an unknown amount of coal is lost in preparation and not reported in production. The report is correct in identifying this deficiency, but we can see no clear remedy for the problem. The amount of coal lost is indeed unknown.

- The statement that coal rendered unmineable by mining of adjacent seams is partially correct. EIA states that "many investigators" take this into consideration, but does not represent this to be the standard.

P. I-2

- The report states that the "DRB makes no provision for categorizing coal seams by quality." We should add the words "other than for coal rank." EIA categorizes coal by rank which is based upon calorific value of moist, mineral matter-free coal and the coal's volatile matter/fixed carbon content. Ash and sulfur are not considered in the ASTM classification, but both are critical when lbs. SO2/MMBTU becomes an issue.
- The report's statement that geological irregularities in seams (i.e., faults, washouts, steep dips, and intrusions) are not considered in the calculation of the DRB may be too strong a statement. We believe that where washouts, faults, or intrusions are documented, reserves reported by state surveys are adjusted accordingly.
- The report's statement that reserves are not discounted for areas sterilized by competing land users is partially correct in that EIA states that "many investigators," not all, take these factors into consideration.

P. I-3

- The report's statement that "current estimates are made by deducting production from an older 'reserve' estimate and do not reflect revision based upon new data ..." is refuted by the fact that almost every issue of the DRB contains revisions based upon the incorporation of new evaluations.

P. I-4

- The report's list of three problem areas identified by Synergistic Resources Corp. in their 1982 report fails to mention the four-page explanation that SRC gave detailing the methodologies adopted by EIA to counter each problem area.

Mr. Stuart B. Ehrenreich
Page 3
April 22, 1987

- The report cites a 1951 reserve estimate for Virginia that was updated "by merely subtracting the coal production from 1951 to 1983 to provide a current estimate." This gives two false impressions: (1) most state reserve estimates are dated significantly later than this; and (2) depletion due to mining is determined by multiplying production by a depletion factor (either 2.0 for deep or 1.25 for strip production) and then subtracting from the DRB.

- The report cites a statement regarding Illinois strip reserves which indicates that these reserves were reduced from 21 billion to 6 billion tons by eliminating townsites, interstates, lakes, etc., where mining was obviously impossible. This reduction in reserves was reported to be "350 percent." Two points should be made: (1) the DRB has never reported 21 billion tons of strip coal in Illinois (the number was 14.7 billion tons in 1979 and 15.6 billion tons in 1984), and (2) reserves would have been reduced by 71 percent, not 350 percent.

P. I-7
- With respect to Table 1, the 1986 Keystone Manual lists Montana's "remaining resources" as 471,639 million tons (p. 508), not the 50,041 million cited by the report. Other Keystone figures are suspect, including Ohio which appears to report "resources" on a recoverable basis and Illinois which uses more liberal criteria than EIA and the USGS. Also, the units (million tons) of the estimates should be indicated at the top of the table.

P. I-9
- Table 2 column headings are inconsistent (change UG Rec. to UG DRB, UG Res. to UG Rec., and Sur. Res. to Sur. DRB).

P. I-10
- The percentage reduction should read "72 percent" instead of "350 percent."

P. I-12
- Table 3 erroneously uses 14,000 Btu/lb as the maximum for bituminous coal. The maximum calorific value (moist, mineral matter - free basis) is approximately 15,650 Btu. The range of calorific value for anthracite should be 14,000 to 15,300 Btu/lb based upon reported values for Pennsylvania anthracite. Also, the report should indicate that Btu's are on a moist, mineral matter-free basis.

Mr. Stuart B. Ehrenreich
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P. I-14 & 15
- Figure 2 and Table 4 should be changed to reflect the correct ranges in calorific value for bituminous and anthracite coal. Corrected Table 4 would read:

Rank	Maximum Btu	Maximum % Sulfur @ 1.2 # SO2/MM Btu	Maximum % Sulfur @ 1.4 # SO2/MM Btu	Maximum % Sulfur @ 1.6 # SO2/MM Btu
Anthracite	15,300	0.92	1.07	1.22
Bituminous	15,650	0.94	1.10	1.25

P. I-17
- The report should include as one of its recommendations that a number of economic criteria be added to the USGS's existing system (Circ. 981) and that reserves only be reported.

We hope these comments are useful in the redrafting of the report. If we can be of further assistance, please advise.

Sincerely,

William C. Kerr

/dw

cc: B. R. Brown

James F. McAvoy
Executive Director
National Coal Council
P.O. Box 17370
Arlington, VA 22216

Dear Mr. McAvoy:

I am not sure that I will be able to attend the Coal Policy Committee meeting on May 5 as it conflicts with a previous commitment to attend a meeting of the National Academy of Sciences Board on Mineral and Energy Resources, on which I also serve. However, I have reviewed the two draft reports and offer the following comments.

Improving International Competitiveness...

I suggest several editorial changes for the executive summary, a copy of which is enclosed.

Pages E-6 - E-7: I do not believe Black Lung taxes and unspecified regulations "affecting" longwall mining are the best examples of cost components affecting the competitiveness of U.S. coal. Higher relative labor costs due to our higher standard of living are probably much more significant. The Black Lung program and excise taxes to finance it represent a social policy judgment by Congress that is highly unlikely to be changed. The recommendation to exempt exported coal from Black Lung taxes smacks of the subsidies and protectionism criticized elsewhere in the report.

Page R-5 refers to regulations that "discriminate" against longwall mining, but this allegation is nowhere documented in the report (even on page III-19, where cost factors are discussed). Since the two reports apparently are intended to be separate, more than bare assertions are needed.

Page III-18 refers to the 50% increase in productivity during the past decade. I suspect that much of this improvement was due to increased production from large western surface mines. Obviously, one way to increase the competitiveness of U.S. coal is to focus on the coal that can be produced cheaply enough to compete with foreign producers, namely surface-mined coal. In fact, surface mining is "discriminated against" in numerous ways, including higher federal royalty rates and abandoned mine land (AML) fees.

I find the discussion of U.S. rail transportation problems woefully inadequate.

Reserve Data Base Report

At minimum, the title of this report should be changed to more accurately reflect its contents, since more than half of the report deals with laws and regulations affecting coal production and utilization.

The discussion of SMCRA and FCLAA does not indicate exactly what is wrong with these programs, in terms of what is unreasonable or needs to be changed. For example, on page II-31, first full paragraph, does NCC intend to suggest that the regulatory authority should not have the authority to suspend underground mining operations where it finds an "imminent danger to the inhabitants" of those areas? That would really play well in the press!

I believe there are a number of ways in which the cost-effectiveness of regulation can be improved to achieve environmental goals specified by Congress at a lower cost. However, this report appears to suggest that the mere enactment of legislation designed to protect people and the environment from the adverse effects of coal mining, rather than the often inept administration of that legislation, is the major problem.

On page II-32, the report states: "There is reason to believe that the provisions of Section 516 of SMCRA may constrain" longwall production. Other than the Pennsylvania law, it is not at all clear from the discussion why this is so. Most of the regulations discussed sound perfectly reasonable, e.g., to prevent damage to water supplies. However, the discussion does not indicate, even with examples, how much coal might be affected by this type of regulation. Furthermore, the first full paragraph on page II-33 makes no sense; the last sentence is a non sequitur.

Page II-33, section 6: Does the NCC really believe there are significant coal reserves in designated w areas? If so, some documentation or examples shoul provided.

To say that coal mining and exploration is not all wilderness areas is like saying that mining is not in Yellowstone National Park or on the White House course it is not! The whole focus of this report emphasis from the real issues affecting U.S. coal production. Even with substantial environmental re (which the vast majority of Congress and the publi and is therefore unlikely to change), we do not suffer from a lack of coal reserves; we suffer from a lack of demand for coal production because it cannot be utilized economically to provide energy without unacceptable environmental impacts relative to other fuel sources such as natural gas or imported hydropower.

If there are ways in which environmental goals can be achieved in a more efficient or cost-effective manner, then we should identify them. For example, the mandatory scrubber requirement and the percentage sulfur reduction required by the revised NSPS has resulted in less coal utilization and more pollution by coal-fired power plants than a lower emission standard (which would have favored utilization of low-sulfur coal), not to mention the inhibiting effect this regulation has had on the development of new technology to reduce emissions from coal utilization. This report merely suggests that environmental legislation itself is the problem, reflecting the kind of attitude the public has come to expect from the coal industry. With the possible exception of royalty rates and lease provisions for Federal coal, this report does nothing to identify appropriate areas of concern that really need to be addressed by the Department of Energy or by Congress.

I regret that my teaching commitments and lack of travel funds* have precluded me from participating more actively in preparation of these reports, since I have spent considerable time struggling with these issues and feel there is much that can be done to improve the competitiveness of U.S. coal for both domestic and international markets. I hope my comments will be of some value in your deliberations.

Sincerely,

Professor Sandra L. Blackstone

THE NAVAJO NATION
WINDOW ROCK, NAVAJO NATION (ARIZONA) 86515

Peter MacDonald, Sr.
CHAIRMAN, NAVAJO TRIBAL COUNCIL

Johnny R. Thompson
VICE CHAIRMAN, NAVAJO TRIBAL COUNCIL

JUN 9 1987

Mr. James McGlothin, Chairman
The National Coal Council, Inc.
P. O. Box 1730
Arlington, Virginia 22216

Subject: Reserve Data Base, Laws and Regulations and Improving International Competitiveness of U.S. Coal and Coal Technologies

Dear Mr. McGlothin:

We appreciate the opportunity to review the subject draft reports prepared by the National Coal Council. Our comments on the drafts are as follows:

Reserve Data Base

1. While the present Reserve Data Base does not exclude anticipated losses in preparation plants and due to washing, room and pillar mining, etc., the wider acceptance of longwall mining, the introduction of stowing, etc. will substantially decrease such losses. Any study in this area will require certain assumptions regarding the mining methods to be used, which will in turn strongly affect the estimated losses.

2. Regulations can increase mining costs and render some coal reserves unmineable. At the same time, many of the regulations are essential and came about because of the indifference of the operators to miner safety and health and to the environment.

3. It is probable that some of the factors listed, such as geologic factors, will reduce the reserve base by millions of tons. Nonetheless, a detailed geologic study to determine reserves might not be economically feasible.

4. Oil and gas prices affect coal prices as stated. If oil and gas prices increase the demand for coal is likely to increase.

Ltr. Mr. James McGlothin
Page Two

5. The coal reserve data for Arizona (page I-10, Table 1, Columns 4-7) is inaccurate. The Navajo and Hopi Tribes alone have leased more coal than the amount stated.

6. We suggest that the recommendations listed on pages I-19 through I-21, if implemented, be cost effective.

Regulations and Laws affecting the Availability of Coal Reserves:

The Council recommends that the Secretary should undertake a major examination of all current laws which adversely impact mineable coal reserves and analyze similar proposed laws, policies and regulations. However, before this study is undertaken we suggest that the Federal Government develop a comprehensive "Energy Policy". The absence of such a policy has paralyzed the U.S. uranium industry. Coal mining requires tremendous capital investment and investors must be able to predict the demand for coal. Exploration and development activities will be dictated by market stability. Furthermore, efforts to analyze laws and regulations should be limited to the unproductive laws and regulations which do not enhance the quality of life and the environment.

Improving International Competitiveness of U.S. Coal and Coal Technologies

We support the draft report on this subject. Our opinion on this subject has been conveyed to you by our letter of October 22, 1986.

Sincerely,

THE NAVAJO NATION

Peter MacDonald, Chairman
Navajo Tribal Council

PITTSTON

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Joseph C. Farrell
Executive Vice President-Coal

May 5, 1987

Mr. James F. McAvoy
Executive Director
The National Coal Council, Inc.
P. O. Box 17370
Arlington, Virginia 22216

Dear Jim:

I have read the April 22, 1987 draft of the Reserve Data Base Report, and while I am in general agreement with its thrust and conclusions, I am quite concerned with some of the commentary contained in the section (Pages I-9 through I-17) which discusses the available reserves of low sulphur coal in the East. As you are aware, there is considerable controversy within the coal industry as regards the so-called acid rain issue. We surely do not wish to get the National Coal Council embroiled in ths argument as it can only lead to division and ultimate diminution of the NCC.

I would strongly suggest that all the text in the draft starting with the word "Unfortunately" in the fourth from the bottom line on page I-9 through the end of the paragraph be eliminated. This leaves in place the principal thrust that reserves are overstated without implying there is a substantial shortfall in so-called compliance coal.

I am suggesting the elimination of these two sentences because they raise the question of adopting a 1.2 lbs. per million standard for SO_2. There is considerable debate wither this is the appropriate standard and there can be no assurance that if an acid rain bill is adopted that this would be the standard employed. Thus, inadvertently the report seems to switch from a considered recitation of the facts into editorializing on the appropriate standard for an acid rain bill. This can only be a mistake which could adversely impact the reputation of the NCC and ultimately its ability to function effectively.

Sincerely yours,

Joe Farrell

JCF:rp

COLLEGE OF ENGINEERING

UNIVERSITY OF FLORIDA

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DEPARTMENT OF MECHANICAL ENGINEERING

April 22, 1987

Ms. Margaret H. Brown
Director of Administration
National Coal Council
Post Office Box 17370
Arlington, VA 22216

Dear Ms. Brown:

Finally I had the opportunity to read carefully the draft Reserve Data Base Report. Enclosed is a table drawn from an Office of Technology Assessment Report. It would be helpful if some estimates were made as to how the NCC-RDBR study might alter the entries in the OTA table. This would be helpful in Clean Coal Technologies and Acid Rain discussions.

Very sincerely,

Alex E.S. Green

cc: S. B. Ehrenreich

FLORIDA'S CENTER FOR ENGINEERING EDUCATION AND RESEARCH
EQUAL EMPLOYMENT OPPORTUNITY/AFFIRMATIVE ACTION EMPLOYER

Table A-24.—Demonstrated Reserve Base by Sulfur Category
(quantities in millions of tons, sulfur categories in lb SO_2/MMBtu)

State	<0.9	0.9–1.2	1.3–1.5	1.6–2.0	2.1–3.0	3.1–4.0	4.1–5.0	5.1–6.0	>6.0	Total
Alabama	5	1,775	1,712	1,074	1,756	438	0	0	0	6,760
Georgia	0	0	4	0	0	0	0	0	0	4
Illinois	0	0	0	4,359	1,581	3,151	3,107	14,248	41,260	67,705
Indiana	0	212	992	1,304	503	453	2,018	1,976	3,161	10,621
Kentucky	0	10,210	3,846	1,473	410	749	1,556	7,524	8,472	34,240
Maryland	0	1	5	296	65	175	178	107	0	826
Michigan	0	0	0	0	95	0	26	0	7	128
North Carolina	0	0	11	0	0	0	0	0	0	11
Ohio	0	0	0	0	1,119	1,294	6,684	4,429	5,509	19,035
Pennsylvania	16	568	587	1,992	8,581	12,203	3,757	1,684	1,039	30,428
Tennessee	0	189	135	154	154	62	234	31	39	998
Virginia	764	1,469	458	561	148	118	0	0	0	3,538
West Virginia	3,407	13,724	2,932	2,791	6,029	3,084	3,535	355	4,128	39,985
Eastern U.S. total	4,212	28,149	10,681	14,005	20,440	21,725	21,096	30,353	63,615	214,277
Alaska	5,805	18	332	0	0	0	0	0	0	6,155
Arizona	0	0	0	399	25	0	0	0	0	424
Arkansas	0	11	23	250	43	74	0	0	0	411
Colorado	7,800	2,212	4,841	213	1,150	0	0	0	0	16,215
Idaho	0	0	4	0	0	0	0	0	0	4
Iowa	0	0	0	0	0	0	0	71	2,127	2,199
Kansas	0	0	0	0	0	190	123	210	472	995
Missouri	0	0	0	0	0	0	518	0	5,559	6,077
Montana	84,247	32,788	1,410	1	1,527	0	0	0	499	120,469
New Mexico	1,277	508	2,701	7	48	0	0	0	0	4,541
North Dakota	564	165	1,961	2,908	2,244	1,524	604	0	0	9,971
Oklahoma	8	750	280	26	332	144	0	21	83	1,644
Oregon	12	0	0	6	0	0	0	0	0	17
South Dakota	0	0	193	74	0	99	0	0	0	366
Texas	0	0	0	0	12,693	0	0	0	0	12,693
Utah	399	4,733	158	0	178	1,033	0	0	0	6,502
Washington	843	16	0	578	0	143	0	0	0	1,580
Wyoming	33,527	8,560	1,007	24,214	2,806	4	0	0	95	70,014
Western U.S. total	134,482	49,761	12,911	28,685	20,845	3,212	1,246	302	8,835	260,279
United States	138,694	77,909	23,592	42,690	41,285	24,938	22,341	30,655	72,451	474,556

SOURCE: Adapted for Office of Technology Assessment by E. H. Pechan & Associates from U.S. Department of Energy, Demonstrated Reserve Base of Coal in the United States on Jan. 1, 1979, DOE/EIA-0260(79), May, 1981.

Office of Technology Assessment, OTA-O-204, Acid Rain and Transported Air Pollutants: Implications for Public Policy, June 1984.

May 4, 1987

MEMORANDUM FOR: Joan Bok

FROM: Glenn Schleede

SUBJECT: Comments on Draft National Coal Council Reports

I have reviewed the two draft reports you received for comment under a cover letter from Jim McAvoy, Executive Director of the National Coal Council. The drafts have been prepared as a response to requests from the Secretary of Energy and are to be discussed at a May 5th meeting of the Policy Committee of the National Coal Council in Cincinnati. The two reports cover:

- Improving International Competitiveness of U.S. Coal and Coal Technologies; and
- U.S. Coal Reserve Data Base.

U.S. Coal Reserve Data Base.

There appears to be general agreement among persons involved in one way or another with the production, transportation and use of U.S. coal that the data available on U.S. coal resources and reserves is rather poor.

To oversimplify, there are two kinds of problems with available data on U.S. coal resources:

- One kind of problem relates to overall reserves and has potential longer term policy and other implications. For example: Does the U.S. really have some 488 billion tons of coal reserves and what portion of these reserves is and will be economically recoverable. The draft paper does a fairly good job in identifying existing and proposed laws and regulations and other factors which have the effect of reducing the quantities of coal that are economically recoverable. Undoubtedly these issues are important to individual producers because of the potential economic effect.

- The other kind of problem relates to near term questions and near term public policy issues. These questions and issues relate to coal quality, economics, mineability, recovery and marketability. They are "here and now issues" of considerable importance to coal users and to public policy questions such as the potential cost of acid rain and other potential environmentally based restrictions. Answers to these questions are needed in the near term and relatively little work is being done on them. Frankly, the report doesn't deal at all well with these issues.

Most recommendations call for more action by governments to improve the quality of data dealing with the longer term issues described above.

In view of imminent policy issues, a better case could be made for focusing government attention on the nearer term issues described above.

The electric utility industry through its research arm, the Electric Power Research Institute (EPRI), has sponsored some excellent studies and issued reports* which establish quite clearly how uncertain assumptions are about quality, mineability and recovery of coal -- particulary in the eastern part of the U.S.

The weaknesses of data on coal in these areas should be brought to the attention of the Department of Energy because data on coal quality, mineability and recoverability are not adequate for the Government's planning and policy making activities.

It is not clear from the report why the Work Group dealt only with the longer term issues. Ideally, the report would be expanded to deal with the near-term issues or perhaps a separate, shorter report can be developed which could be sent to the Secretary along with the existing draft.

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* Important EPRI sponsored studies either not considered or omitted from the reference list include:

- EPRI EA-673, Coal Resource Information - Volume 3: Case Studies in Evaluating Adequacy of Information, ICF, 1980.
- EPRI EA-3133, Estimation of Uncertainty in Coal Resources, Univ. of Texas, 1983.
- EPRI EA-3733, Effects of Resource Depletion on Future Coal Prices, ICF, 1984.
- EPRI EA-3750, Agenda of Critical Issues: Coal Price and Availability, Temple, Barker & Sloane, 1984.
- EPRI EA-4710, Reserves and Potential Supply of Low-Sulfur Appalachian Coal, Charles River Associates, 1986.

Living Lakes

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April 30, 1987

Mr. James F. McAvoy
Executive Director
The National Coal Council
P.O. Box 17370
Arlington, VA 22216

Dear Mr. McAvoy:

I have received and read thoroughly the draft reports entitled "Improving Competitiveness of U.S. Coal and Coal Technologies" and "Reserve Data Base Report." I believe the reports to be informative and well-written.

In the first report: "Improving Competitiveness of U.S. Coal and Coal Technologies," I either missed, or there is no reference to, the work force which extracts the coal. Is there no loss of competitive edge or U.S. capability because of the difference in pay between exporting countries? Is there no difference in the profit margin between competing exporting countries? These issues did not seem to be explicitly addressed and perhaps can not be, but it seems an omission.

In the second report: "Reserve Data Base Report," Chapter II discusses regulations and laws affecting the availability of coal reserves. Among items recommended is the removal of Black Lung taxes on exported coal. I believe this to be very relevant to human welfare on a global scale and discourage the recommendation. As world citizens, we should be encouraging other countries to adopt such a tax for their own welfare. This could have some input (however minor) on the amount of foreign aid provided to some exporting competitors of the United States.

I offer these comments in good faith and restate that the reports were overall well written and informative.

Sincerely,

Robert W. Brocksen
Executive Director

Appendix H

Description of The National Coal Council and The National Coal Council Membership Roster

Background Information on The National Coal Council

Recognizing the valuable contribution of the industry advice provided over the years to the Executive Branch by the National Petroleum Council and the extremely critical importance of the role of coal to America and the world's energy mix for the future, the idea of a similar advisory group for the coal industry was put forward in 1984 by the White House Conference on Coal. The opportunity for the coal industry to have an objective window into the Executive Branch drew overwhelming support.

In the fall of 1984, The National Coal Council was chartered and in April of 1985, Secretary of Energy John Herrington made the Council fully operational. Secretary Herrington's action was based on his conviction that such an industry advisory council could make a vital contribution to America's energy security by providing him with information that could help shape policies leading to the increased production and use of coal and, in turn, decreased dependence on other, less abundant, more costly and less secure sources of energy.

The Council is chartered by the Secretary of Energy under the Federal Advisory Committee Act. The purpose of The National Coal Council is solely to advise, inform and make recommendations to the Secretary of Energy with respect to any matter relating to coal or the coal industry that he may request.

The National Coal Council does not engage in any of the usual trade association activities. It specifically does not engage in lobbying efforts. The Council does not represent any one segment of the coal or coal related industry nor the views of any one particular part of the country. It is instead to be a broad, objective advisory group whose approach is national in scope. Matters which the Secretary of Energy would like to have considered by the Council are submitted as a request in the form of a letter outlining the nature and scope of the study. The request is then referred to the Coal Policy Committee which makes a recommendation to the Council. The Council reserves the right to decide whether or not it will consider any matter referred to it.

The first major studies undertaken by The National Coal Council at the request of the Secretary of Energy were presented to the Secretary of Energy in the summer of 1986, barely one year after the start up of the Council. These reports covered: Coal Conversion, Clean Coal Technologies, and Interstate Transmission of Electricity.

The Council also can determine topics which it believes significant for study and then seek the approval of the Secretary to proceed, as in the case of the study of New Source Performance Standards for Industrial Boilers, also completed in 1986.

Members of The National Coal Council are appointed by the Secretary of Energy and represent all segments of coal interests and a large geographical dispersement. The National Coal Council is headed by a Chairman and a Vice-Chairman who are elected by the Council. The Council is supported entirely by voluntary contributions from its members.

The National Coal Council Membership Roster 1986-1987

CHAIRMAN

Mr. James McGlothlin
President/CEO
The United Companies

VICE-CHAIRMAN

Mr. A. J. Wittmaier*
President/CEO
Knife River Coal Mining Company

MEMBERS

Dr. Bill L. Atchley
President
University of the Pacific

Mr. Bert Ballengee
Chairman of the Board/CEO
Southwestern Public Service Company

Mr. James E. Barnes
Chairman, President & CEO
MAPCO, Inc.

Mr. Pat Barrett
Executive Vice President for Marketing and Sales
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Mr. John P. Baugues, Sr.
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Mr. Daniel Beam
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Arkansas Mining Board

Mr. Donald P. Bellum
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Cyprus Coal Company

Mr. Thomas J. Belville
President
Belville Mining Company Inc.

Mr. Otes Bennett, Jr.
Chairman, President & CEO
The North American Coal Corporation

Mr. William W. Berry**
Chief Executive Officer
Dominion Resources

Mr. George M. Bigg
Simms Fork Associates, Inc.

Mr. Gerald Blackmore
G. Blackmore, Inc.

Ms. Sandra Blackstone
Professor—College of Law
University of Denver

Mrs. Joan T. Bok
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New England Electric Systems

Mr. Charles H. Bowman**
President
Old Ben Coal Company

Mr. J. Robert Bray
Executive Director
Virginia Port Authority

Mr. William T. Bright
Chairman of the Board
Land Use Corporation

Mr. Perry G. Brittain
Chairman/CEO
Texas Utilities Company

Dr. Robert W. Brocksen
Executive Director
Living Lakes, Inc.

Mr. B. R. Brown
Chairman/CEO
Consolidation Coal Company

Mr. Omar Bunn
President
Southwestern Virginia Coal Corporation

Mr. A. W. Calder
President/CEO
Joy Manufacturing Company

Dr. Donald Carlton
President
Radian Corporation

Mr. William Carr
President
Mining Division
Jim Walter Resources

Ms. Joyce S. Carter*
President
S. J. Carter Associates

Honorable Garrey Carruthers**
Governor of New Mexico

Mr. William Cavanaugh III
President/Chief Executive Officer
Systems Energy Resources Inc.

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Shand Mining Inc.

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K & R Coal Company

*Member until May 31, 1987
**Member as of June 1, 1987

Ms. Barbara Deverick
Administrative Manager
Blueridge Electric Membership Corp.

Mr. Walter Drexel
President/CEO
Burlington Northern Railroad

Mr. Garry Drummond
Chairman of the Board
Drummond Coal Company

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Appendix I

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