TECHNICAL SUPPORT DOCUMENT

THE COAL SECTORS

PROPOSED RULE FOR MANDATORY REPORTING OF GREENHOUSE GASES

Office of Air and Radiation
U.S. Environmental Protection Agency

January 28, 2009

Table of Contents

List of Exhibits

1.0 Introduction

1.1 Purpose

This is one of three in a series of reports to identify the current federal reporting requirements of the fuel suppliers, namely petroleum products, coal and natural gas with respect to the production, imports and throughput of fuels. The analysis here is part of a larger effort to develop guidelines for mandatory reporting requirements for greenhouse gases (GHGs). In December 2007, Congress enacted an omnibus appropriations bill that directs EPA to develop and publish a rule requiring measurement and reporting of GHG emissions above appropriate thresholds in all sectors of the economy. The bill mandates that EPA publish a proposed rule within nine months and a final rule within 18 months. Understanding what information about volumes that fuel suppliers already generate and report is a first step in developing mandatory GHG reporting requirements.

This report focuses on companies and facilities in the coal industry, particularly coal mines, coal imports, coal exports and waste coal reclaimers. The emphasis is on: (1) Current levels of coal production, imports, and exports, (2) Threshold analysis, (3) Correlation analysis between coal higher heat value and carbon content, (4) Coal sampling, testing and weighing standards. The report also addresses questions of granularity of data, facility definitions and boundaries, frequency of reporting, validation of reported data, and how data gaps are managed. Finally, the report develops conclusions about the coverage of the data that are reported, key gaps in the data, and questions about data verification and quality assurance and control.

1.2 Organization of this Report

To provide context for the reporting requirements of the coal sectors, in section 2, we first provide an overview of the coal industry. We begin that with a statistical summary of coal production, imports, exports and consumption. We follow this with a discussion of the coal industry participants, with brief discussions of each, focusing on the types of information generated in both the natural course of business as well as information reported to federal government agencies. We also identify the kinds of information typically reported to state government agencies. Finally, we discuss the regulatory framework for the industry's participants.

Section 3 is where we describe the current federal reporting requirements of the industry. It is divided into three subsections addressing coal mines, imports, and exports.

In Section 4, we present our conclusions about overall gaps in the reporting requirements, as well as other issues relevant to data coverage. We also present our findings on the quality control and reliability of the data reported.

2.0 Overview of the Coal Industry

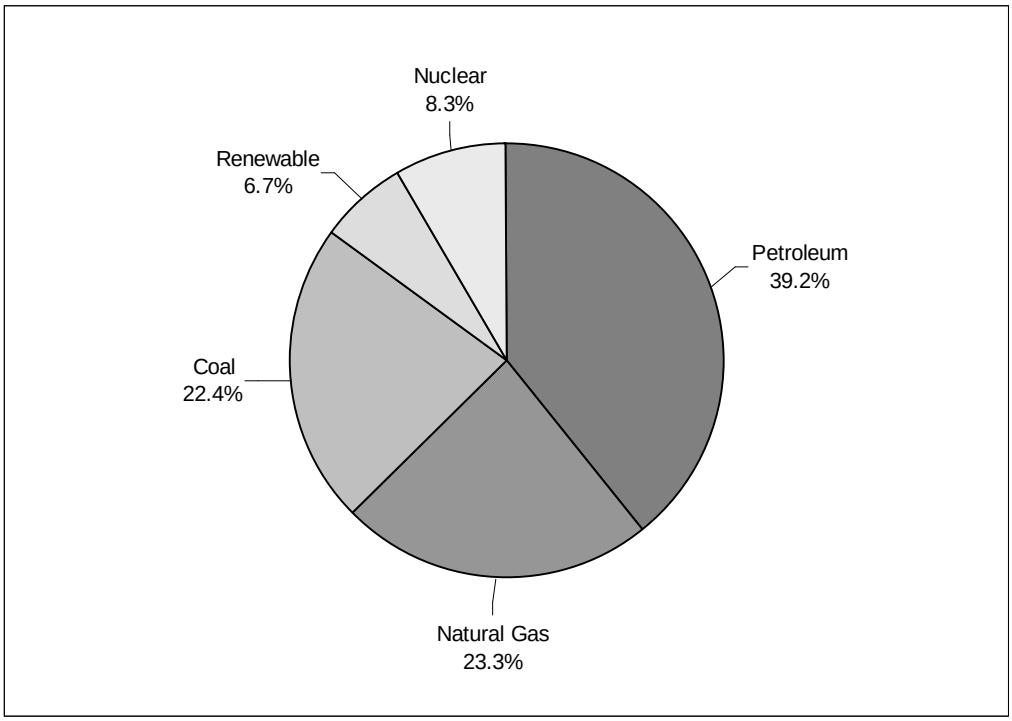
2.1 The Role of Coal in the Economy

Coal consumption in the U.S. totaled 22.8 quadrillion Btu (1,129 million short tons) in 2007, accounting for 22.4 percent of total energy consumption in the U.S. (see Exhibit 1). More coal energy is used in the US than any other form except petroleum, though natural gas is a very close second. Coal energy usage is especially large when one considers that coal is not used for transportation, and very little is used in the residential and commercial sectors i.e. the non industrial sectors.

The electric utility sector is the largest coal consuming sector by a very wide margin. Approximately 93 percent of coal consumed domestically in 2007 or over 1 billion tons of coal was by electric utilities (see Exhibit 2). Coal-fired electric generation accounted for 50 percent of total power generation in the same year. Coal generation has actually modestly increased in share of generation over time even as consumption of electricity has more the doubled. Between 1971, and 2007, the share of coal generation from 45 percent to 50 percent, while the oil share fell from 12 percent to less than 1 percent. Thus, even though over the past fifty to hundred years, coal has been replaced in nearly all space heating and transportation applications, total coal usage has greatly increased as a result of its leading role in the strongly growing electric power sector.

Non-power coal users include coke plants and other industrial facilities which consumed 23 million tons and 56 million tons in 2007, respectively. Coke is used to produce steel.

Exhibit 1. Coal Share of Primary Energy Consumption



Source: Energy Information Administration (EIA), *Annual Energy Review 2007 – U.S. Primary Energy Consumption by Source and Sector, 2007*

Exhibit 2. Coal Consumption by End Use (Million Tons)

	2004	2005	2006	2007
Total Consumption	1,107.3	1,126.0	1,112.3	1,128.8
Electric Power	1,016.3	1,037.5	1,026.6	1,046.4
Coke Plants	23.7	23.4	23.0	22.7
Other Industrial	62.2	60.3	59.5	56.4
Residential and Commercial	5.1	4.7	3.2	3.2

Source: Energy Information Administration, *Annual Coal Reports and 2007 Quarterly Coal Reports.*

2.2 Emission Thresholds and the Coal Industry

The EPA is considering rules for monitoring requirements on facilities and companies in the coal industry. One element of the rules will be establishing thresholds or minimum size requirements for reporting entities tied to the annual emissions derived from the volume of the facilities and companies. The thresholds being considered are 1,000, 10,000, 25,000 and 100,000 metric tonnes per year of CO_2. For coal suppliers, these thresholds would be applied to the CO_2 emissions that would result from complete combustion or oxidation of the coal produced or supplied into the U.S. economy, rather than the actual GHG emissions for the individual facilities or companies. Converting these thresholds into the equivalent of coal tonnages[1] yield the following values:

1,000 metric tones = 532 short tons of coal
10,000 metric tonnes = 5,321 short tons of coal
25,000 metric tonnes = 13,303 short tons of coal
100,000 metric tones = 53,211 short tons of coal

These thresholds would not result in a significant reduction in the number of coal facilities and companies that would be subject to monitoring, considering the following:

- According to the MSHA, there were 1,346 coal mines producing more than 532 tons in 2007. This covered 99 percent of U.S. active coal mines. There were 867 mines or 64 percent of all active mines producing at or above the 53,211 tons annual production level.
- Thus, we can expect that about 64 percent of all active coal mines would be covered by a 100,000 metric tones threshold. At the lower threshold 99 percent of all active coal mines would be covered by the rule. See Exhibit 3.

[1] Carbon content is found using the weighted average of CO_2 (lbs/MMBtu) from EIA Table FE4 along with the heat content (MMBtu/ton) and production (tons) from the 2007 MSHA database. The molecular mass ratio of carbon to CO_2 (12/44) is then used to find carbon content from the derived CO_2 content (4,143 lbs/short ton).

Exhibit 3. Threshold Analysis for Coal Mines

Threshold Level $mtCO_2e/yr$	Total 2007 National Emissions (million $mtCO_2e/yr$)[1]	Total 2007 Number of Facilities in the United States	Emissions Covered		Facilities Covered	
			Million $mtCO_2e/Yr$[2]	Percent	Number of Facilitie[3]	Percent of Facilities
1,000	2,153	1,365	2,146	99.7%	1,346	99%
10,000	2,153	1,365	2,146	99.7%	1,237	91%
25,000	2,153	1,365	2,144	99.6%	1,117	82%
100,000	2,153	1,365	2,130	98.9%	867	64%

Source: EIA Table FE4 and 2007 MSHA database.

Notes:

(1) 2007 National Emissions ($mtCO_2e$) = 2007 Production x US Weighted Average CO_2 content (4,143 lbs/short ton) / (2204.6 lbs/mt).

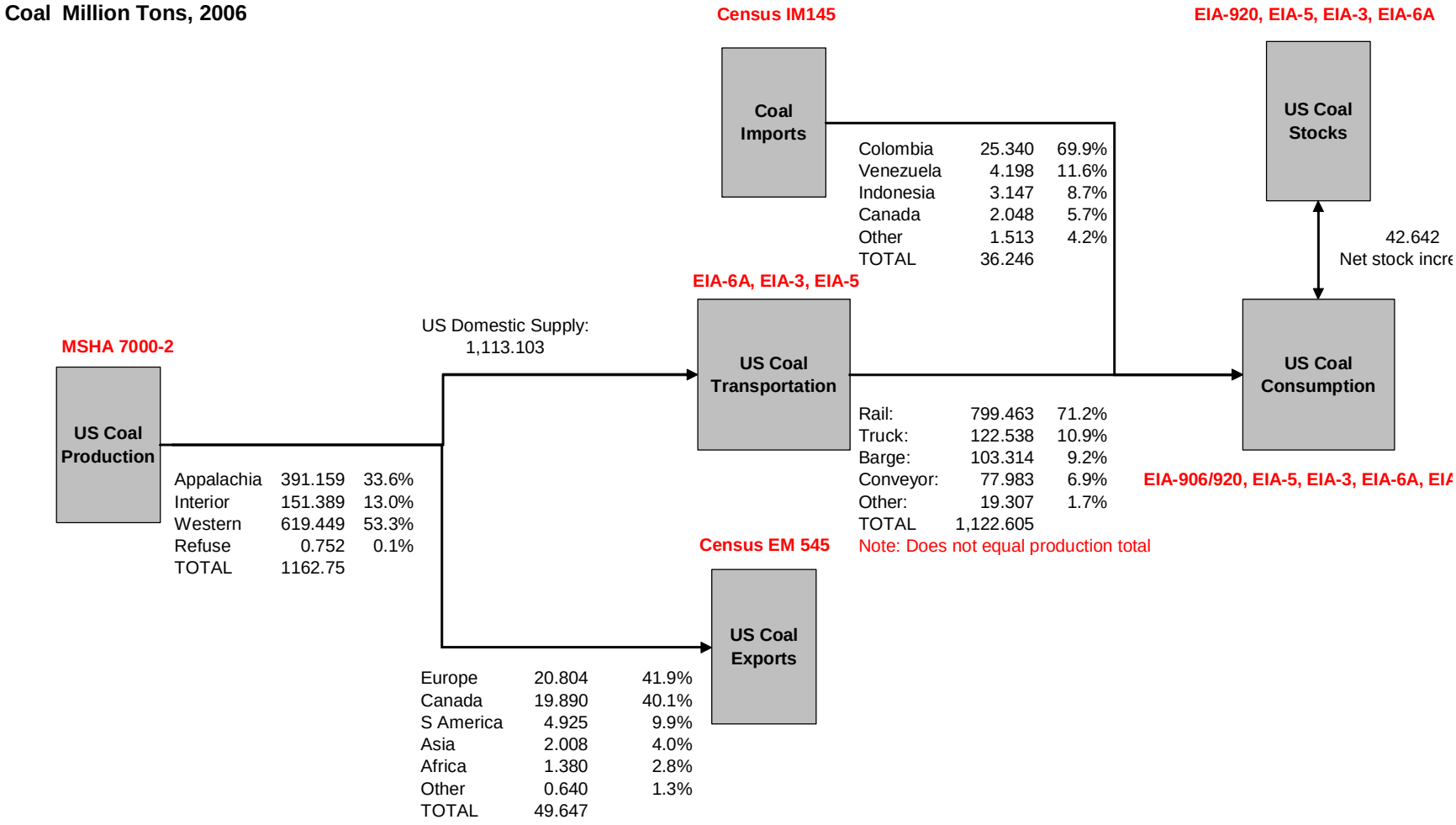
(2) Emissions covered ($mtCO_2e$) = sum of coal CO_2 emissions for all facilities with $mtCO_2e$ production greater than the threshold.

(3) Facilities covered = total number of facilities with $mtCO_2e$ production greater than the threshold.

No threshold analysis is performed for coal exporters, importers and waste coal reclaimers because we could not find facility-specific data on coal volumes. The number of facilities and companies engaging in these activities is relatively small (see discussions in Section 2.0). In 2007, the 14 companies that reported coal exports in 2007 all owned coal mines that will be required to report under the proposed rule. Furthermore, coal importers are typically electric utilities, steel companies, and industrial plants that are also required to report under the rules for Stationary Source. A total of 14 companies or 16 facilities reported the reclamation of coal in 2007.

Exhibit 4 presents the flow of coal through the U.S.

Exhibit 4. Flow of Coal Through the U.S. (Million Tons)



2.3 Structure of the Coal Industry

2.3.1 Coal Production

The U.S. is the world's second largest coal producing and consumption country, only next to China. Several key features of this industry include:

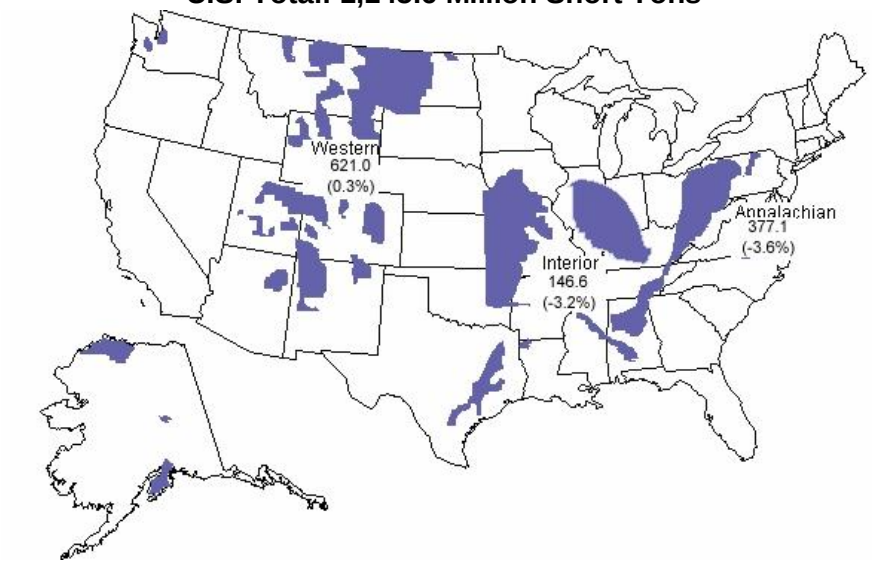
- In 2006, U.S. coal mines produced about 1.2 billion tons of coal of which 49 percent was bituminous, 44 percent was sub-bituminous and the rest was lignite and anthracite.

- Of the total coal produced, 69 percent was mined from surface mines and the remaining 31 percent from underground mines.

- Although 90 percent of the U.S. coal reserves are concentrated in 10 states, coal is mined in 27 states. Nearly 60 percent of the total coal produced in the U.S. came from west of the Mississippi (See Exhibits 5 through 8). Specifically, one-third of the total production came from the Appalachian region (primarily Eastern Kentucky, West Virginia and Southern Appalachian coals, but also from northern Appalachia), over one-half of the production came from the Western region (nearly three-fourths of which was exclusively from Wyoming), and the remaining 13 percent came from the Interior region (primarily from Texas, Indiana, Illinois and Western Kentucky).

- On state-by-state basis, Wyoming is the single largest coal producer and accounted for nearly 40 percent of the U.S. total coal production in 2007.

Exhibit 5.
2007 Coal Production by Coal-Producing Region
U.S. Total: 1,145.6 Million Short Tons



Source: Energy Information Administration

Exhibit 6. U.S. Coal Production by Coal Production Regions (Million Tons)

Year	U.S. Coal Production[1]	Appalachia	Interior	Western	Refuse Recovery
2002	1,094.3	396.2	146.6	550.4	1.0
2003	1,071.8	376.1	146.0	548.7	1.0
2004	1,112.1	389.9	146.0	575.2	1.0
2005	1,131.5	396.7	149.2	585.0	0.7
2006	1,162.7	391.2	151.4	619.4	0.8
2007	1,145.6	377.1	146.6	621.0	0.8

Source: Energy Information Administration, *Annual Coal Reports.*

Exhibit 7. U.S. Coal Production by Type of Mining (Million Tons)

Year	U.S. Coal[1] Production	Underground Mining	Surface Mining[1]
2002	1,094.3	357.4	736.9
2003	1,071.8	352.8	719.0
2004	1,112.1	367.6	743.6
2005	1,131.5	368.6	762.1
2006	1,162.7	359.0	803.0
2007	1,145.6	351.8	793.7

[1]Includes a small amount of refuse coal recovery.
Source: Energy Information Administration, *Annual Coal Reports.*

Exhibit 8. U.S. Coal Production by Coal Rank (Million Tons)

Year	U.S. Coal Production[1]	Bituminous[1]	Sub-bituminous	Lignite	Anthracite
2002	1,094.3	571.3	438.4	82.5	1.2
2003	1,071.8	540.9	442.6	86.4	1.2
2004	1,112.1	561.5	465.4	83.5	1.7
2005	1,131.5	571.2	474.7	83.9	1.7
2006	1,162.7	561.6	515.3	84.2	1.5
2007	1,145.6	542.8	523.7	78.6	1.6

[1]Includes a small amount of refuse coal recovery.
Source: Energy Information Administration, *Annual Coal Reports*

Major coal fields include Central Appalachia (CAPP), Northern Appalachia (NAPP), Illinois Basin (ILB) and Powder River Basin (PRB). The great majority of coal production from PRB is from Wyoming mines (WPRB).

Coal quality varies among major coal regions. For example, the energy content for CAPP is between 12,000 Btu/Lb and 12,500 Btu/lb while WPRB's energy content is lower at between 8,400 Btu/Lb and 8,800 Btu/Lb. The sulfur content of WPRB coal is lower at 0.35% than 0.6%-1.0% for CAPP. WPRB coal also has a very high moisture content of 30% compared to about 10% for CAPP coal. Exhibit 9 presents a summary comparison of major coal fields.

WPRB coal mining began in the 1970's when coal-fired power plants were required to meet increasingly stringent air quality standards. This has caused the coal production pattern to shift from the eastern coal fields to the west during the past 30 years.

Exhibit 9. Summary Comparison of Major Coal Fields

Coal Fields	WPRB	CAPP	ILB
Coal Rank	Sub-bituminous	Bituminous	Bituminous
Type of Mining	Surface	Surface and Underground	Surface and Underground
Number of Mines Operating	13	807	76
2006 Production (MM Tons)	431.3[1]	236.1	95.1
Productivity (Tons per Hour)	36.24	2.89	4.07
Coal Qualify:			
Btu/Lb	8,400 – 8,800	12,000 – 12,500	10,500 – 11,500
% Sulfur	0.35%	0.6% - 1%	1.5% - 3.5%
Ash	10%	8%	8%
Moisture	30%	10%	10%

[1] *Source: Gillette News Record, Casper Star Tribune, and State Mine Inspector of Wyoming*

2.3.2 Coal Producers

According to the Mine Safety and Health Administration (MSHA), a total of 1,365 coal mines are producing in the U.S. in 2007. Of which 1,049 mines are located in Appalachia. Surface mines account for 57% of the number of mines operating. However, some of these mines are huge. There are only a total of 13 surface mines operating in WPRB with annual production of 436.5 million tons. The two largest mines in WPRB, Black Thunder (Arch Coal) and North Antelope/Rochelle (Peabody Coal) produce about 90 million tons each annually. The annual WPRB coal production per mine averages about 33 million tons or more than 100 times the average annual production at Appalachian coal mines of 300,000 tons.

Although the cost of transporting PRB coal is high because of long distance to its targeted utility customers, the mining cost is extremely low compared to mines in the East. Productivity at PRB mines averaged 36.24 tons per man-hour in 2006 as compared to an average of 3.13 per man-hour in Appalachia mines. The ability to compete economically has allowed PRB coal to penetrate into markets as far as the state of Georgia where traditionally CAPP coal has been consumed at electric utilities.

According to EIA, 2007 coal production shows a slight decrease to 1.145 billion tons from 1.16 billion produced in 2006. There is some discrepancy between coal production data reported by EIA and that by MSHA (Mine Safety and Health Administration). For example, 2007 U.S. coal production reported by MSHA is 1.142 billion tons or 3.42 million tons less than EIA.

According to coal production reports submitted to MSHA, the top 20 coal holding companies produced a total of 897.6 million tons in 2007 or nearly 80 percent of the U.S. coal production. Peabody Coal Company is the largest coal producer in the U.S. with nearly 200 million tons production or 17.4 percent of the U.S. total in 2007 (see Exhibit 10). A complete list of 2007 coal production by holding company is provided in Appendix 1. This list is compiled based on the mine ownership list available from MSHA production reports.

Exhibit 10. Top 20 U.S. Coal Producers, 2007

Company	Production (Million Tons)	% of Total U.S. Production
Peabody Energy	198.7	17.4%
Rio Tinto	134.4	11.8%
Arch Coal Inc	116.6	10.2%
Foundation Coal Corporation	71.8	6.3%
CONSOL	61.3	5.4%
A.T. Massey Coal	38.3	3.4%
North American Coal	34.1	3.0%
Peter Kiewit Sons	30.8	2.7%
Westmoreland Coal	30.4	2.7%
Robert E Murray	27.6	2.4%
Alliance Coal	23.9	2.1%
TXU	23.9	2.1%
Alpha Natural Resources	19.9	1.7%
International Coal Group	18.7	1.6%
BHP Billiton	15.4	1.4%
Magnum Coal	13.7	1.2%
Chevron	12.0	1.0%
James River Coal	10.8	0.9%
Ashland	10.5	0.9%
Jeffery A Hoops	8.4	0.7%
Total Top 20	897.6	79%
U.S Total Production	1,142.2	100.0%

Source: MSHA

A total of 611 holding companies reported coal production to MSHA in 2007. The average 2007 coal production per holding company is 1.87 million tons while the median is only about 61,000 tons. This is because 46 percent of the total number of companies reported production less than 50,000 tons. Most of these small companies are located in Appalachia. Exhibits 11 and 12 present a distribution of number of holding companies by production range.

Exhibit 11. Coal Production Distribution by Number of Holding Companies

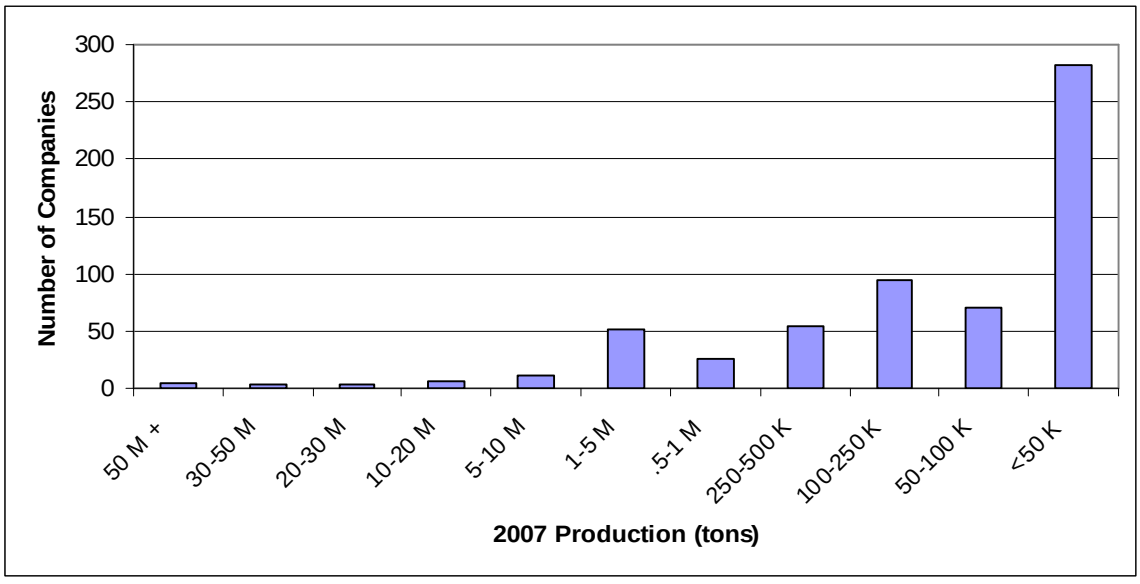


Exhibit 12. Coal Production Distribution by Number of Holding Companies

Annual Tonnage	Number of Companies	Number of Companies as a Percentage of the Total
> 50 Million	5	0.8%
30 to 50 Million	3	0.5%
20 to 30 Million	4	0.7%
10 to 20 Million	7	1.1%
5 to 10 Million	12	2.0%
1 to 5 Million	52	8.5%
500 Thousand to 1 Million	26	4.3%
250 to 500 Thousand	55	9.0%
100 to 250 Thousand	94	15.4%
50 to 100 Thousand	70	11.5%
< 50 Thousand	283	46.3%
Total	**611**	

Source: MSHA

According to 2007 MSHA data, a total of 1,333 mines or 98 percent of all active coal mines produced more than 1,000 tons per year. The combined total coal production from these mines accounted for 99.7 percent of all U.S. coal production. More than half of all U.S. coal mines produced more than 100,000 tons in 2007, accounting for 97.9 percent of all U.S. production. These mines are designated as large mines in the rule. It is assumed that coal resources in large mines may come from multiple coal seams and that quality of these coals may vary. Furthermore, It is assumed that coal sampling and testing are performed on a daily basis at large mines, sometimes at a laboratory on site. Therefore, we require in the rule daily coal sampling and testing. On the other hand, it is assumed that smaller mines with annual production of less than 100,000 tons have limited resources to conduct coal sampling and testing on a daily basis. Therefore, we provide a testing and sampling alternative to smaller mines.

Exhibit 13. 2007 Coal Mine Production

Tons/year	Total U.S. Production (000's Short Tons)	Total Number of U.S. Mines	Production		Mines	
			Thousands of Short Tons	percent	Number of Mines	Percent of Total US
1,000	1,145,567	1,365	1,142,135	99.7%	1333	98%
10,000	1,145,567	1,365	1,141,230	99.6%	1156	85%
25,000	1,145,567	1,365	1,138,677	99.4%	1004	74%
100,000	1,145,567	1,365	1,121,552	97.9%	706	52%

Source: EIA, MSHA.

On a regional basis, the coal industry also exhibits a similar concentration pattern. There is a greater number of mines operating in Appalachia and Interior regions than in PRB and the mine size is also much smaller on average than PRB mines. There are only 13 mines operating in WPRB and therefore, the concentration is greater. Wyoming Powder River Basin 2007 mine production available from MSHA shows the level of concentration. As shown in Exhibit 14, the top 4 companies produced approximately 400 million tons in WPRB, accounting for more than 90% of the region's total production in 2007. WPRB production was 38.2 percent of the 2007 U.S. coal production.

Exhibit 14. Coal Producers - WPRB

Company	2007 Production (Million Tons)	% of Total U.S. Production
Peabody Energy	139.8	32%
RTZ-CRA Group	113.0	26%
Arch Coal Inc	96.4	22%
Foundation Coal Corporation	51.6	12%
Kiewit Peter Sons' Inc	25.3	6%
Western Fuels Association	5.3	1%
Black Hills Corp	5.0	1%
Total WPRB Production	436.5	100%

Source: MSHA

CAPP produced a total of 217.4 million tons in 2007 or 19 percent of total U.S. production. The top 20 companies accounted for 70 percent of this region's total production (see Exhibit 15). Many of the top 20 companies are also major coal producers of other coal regions.

Exhibit 15. Top 20 CAPP Coal Producers, 2007

Company	Production (Million Tons)	% of Total U.S. Production
A. T. Massey	34.6	15.9%
Magnum Coal	13.7	6.3%
Alpha Natural Resources	13.7	6.3%
Jeffery A Hoops	8.4	3.8%
International Coal Group	7.8	3.6%
CONSOL	7.6	3.5%
James River Coal	7.5	3.4%
Arch Coal	7.0	3.2%
Foundation Coal	6.9	3.2%
Richard Gilliam	6.8	3.1%
James H. Booth	5.1	2.4%
TECO Energy	5.1	2.3%
Clearwater Natural Resources	4.2	1.9%
Wexford Capital	4.0	1.9%
United Company	3.7	1.7%
Ashland	3.6	1.6%
Energy Coal Resources	3.5	1.6%
James C. Justice	3.4	1.6%
James O. Bunn	3.4	1.5%
Alliance Resources partners	3.2	1.5%
Total Top 20	152.9	70.3%
CAPP Total Production	217.4	100.0%

Source: MSHA

The average company size in CAPP is small compared to the WPRB average. CAPP coal companies produced an average of 768,300 tons in 2007 versus 62.4 million tons in WPRB. More than 38 percent of the companies or 108 coal holding companies in CAPP produced less than 50,000 tons in 2007 (see Exhibits 16-17). A. T. Massey alone produced more than 30 million tons and Magnum Coal and Alpha Natural Resources each produced more than 10 million tons in 2007.

Exhibit 16. Production Distribution of CAPP Coal Producers, 2007

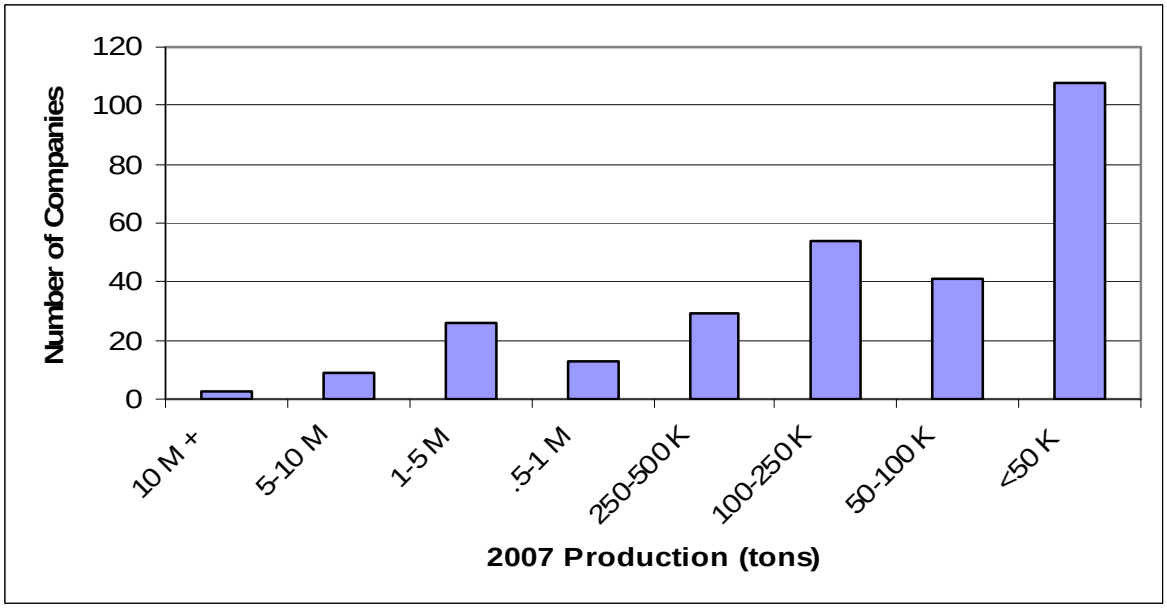


Exhibit 17. CAPP Production Distribution by Number of Holding Companies

Annual Tonnage	Number of Companies	Number of Companies as a Percentage of the Total
> 10 Million	3	1.1%
5 to 10 Million	9	3.2%
1 to 5 Million	26	9.2%
500 Thousand to 1 Million	13	4.6%
250 to 500 Thousand	29	10.2%
100 to 250 Thousand	54	19.1%
50 to 100 Thousand	41	14.5%
< 50 Thousand	108	38.2%
Total	283	100.0%

Source: MSHA

2.3.3 Waste Coal Production

Waste coal is a byproduct of previous coal processing operations. It is usually composed of mixed coal, soil, and rock (mine waste). Waste coal piles are located near mines that have been abandoned for years. Some waste coal piles may have been accumulated since as early as 1900. Examples of waste coal include fine coal, coal obtained from a refuse bank or slurry dam, anthracite culm, bituminous gob, and lignite waste.

Waste coal can be burned for power generation, either as-is in unconventional fluidized-bed combustors or partially cleaned by removing some extraneous noncombustible constituents.

Waste coal has very low energy content averaging only about half as much as newly produced coal. Therefore, waste coal is generally consumed at power plants located in close vicinity of

the waste coal facility so that transportation cost is kept at a minimum. High transportation cost from long distance travel would render waste coal uneconomic. Most waste coal is transported to end users by truck. It is assumed that sampling of coal is performed for each truck shipment.

According to EIA, waste coal production made up only 0.1% of total coal production in the U.S. in 2007. However there has been increased interest in the use of waste coal for power generation projects. Waste coal production has increased by 17% from 2004 to 2007, and the total for the first three quarters of 2008 has already surpassed the total from 2007.

In 2007 more than half (60%) of waste coal is produced in Appalachia, specifically Pennsylvania, East Kentucky, Alabama, Virginia, and Ohio. Two facilities in Missouri owned by James O Bunn et al make up another 36% of all waste coal produced. EIA reported a total of 14 entities or 16 facilities engaging in waste coal reclamation in 2007 (see Exhibit 18).

Exhibit 18. All Waste Coal Producers, 2007

Company	Production (Million Tons)	% of Total U.S. Waste Coal Production
James O Bunn et al	0.41	35.6%
TECO Energy Inc	0.19	16.3%
Alpha Natural Resources LLC	0.12	10.0%
John P Matey	0.10	8.7%
Five J's LLC et al	0.08	6.7%
Drummond Company Inc	0.06	5.3%
Phoenix Coal Corporation	0.06	4.8%
Headwaters Inc	0.05	4.7%
Beard Company	0.04	3.7%
John A Kosky	0.04	3.1%
Jeff Kinser	0.01	0.5%
Richard M Oley	[1]	0.4%
Eugene F Morton	[1]	0.2%
Jim Hall et al	[1]	0.0%
Total	1.16	100.0%

Source: MSHA, EIA
[1]Less than 10,000 tons.

2.3.4 Coal Imports

Coal imports into the U.S. have increased 33% in 2006 over 2004, but the level of imports remains low. The U.S. imported 36.3 million tons of coal in 2006. The great majority of this imported coal or 82 percent came from South America. Colombia alone supplied 70 percent of the coal imported into the U.S. in 2006 (see Exhibit 19). It followed by Venezuela, Indonesia and Canada.

Exhibit 19. U.S. Coal Imports by Country of Origin (Million Tons)

Country of Origin	2004	2005	2006	2007
Colombia	16.7	21.2	25.3	26.9
Venezuela	4.4	3.7	4.2	3.4
Indonesia	2.2	2.5	3.1	3.7
Canada	2.9	2.0	2.0	2.0
Russia	0.3	0.4	0.9	0.1
Australia	0.3	0.2	0.2	0.07
South Africa	0.03	0.1	0.1	-
Other	0.2	0.4	0.5	0.2
Total	27.3	30.5	36.3	36.3

Source: Energy Information Administration, *Quarterly Coal Reports*

Imports of coal from Colombia come from the country's largest mining operation, El Cerrejon which is jointly owned by the Colombian state enterprise, Carbocol and Intercor, a subsidiary of Exxon/Mobil Corp. The mine capacity since 2006 is 28 million metric tons per year with plans to expand to 32 million metric tons by 2008. Coal is mined by surface mining method. More than 90 percent of El Cerrejon mine production is under long term contracts. Coal is transported via a dedicated rail line to the Puerto Bolivar terminal for exports. The port is capable of handling vessels up to 150,000 dwt (dead weight tons). El Cerrejon coal is marketed through a third party company.

Most of the U.S. coal imports are steam coals for power generation. In 2007, electric utilities reported coal imports of 30.7 million tons. Southern Company alone accounted for 44 percent of the total (Note: Southern Company is the holding company for five operating companies: Alabama Power, Georgia Power, Gulf Power, Mississippi Power and Savannah Electric & Power.). As shown in Exhibit 20, eight investors-owned utilities (IOUs) and independent power producers (IPPs) used a combined total of almost 27 million tons or 88 percent of the total imported coal by electric utilities in 2007. Only the Independent Power Producers (IPPs) reported the country of origin to EIA while the Investor Owned Utilities (IOUs) did not report this information. According to EIA data, thirty seven entities reported imports of coal for the generation of electricity.

Exhibit 20. U.S. Coal Imports by Electric Utilities (Million Tons)

Utility Name	2007 Imports	% of Total Utility Imports
Southern Company	13.4	43.7%
Dominion Energy	3.3	10.6%
Jacksonville Electric Authority	3.1	10.0%
Progress Energy	2.4	7.9%
PSEG	1.6	5.3%
Virginia Electric and Power	1.3	4.2%
Dynegy	1.0	3.2%
Public Service Co of New Hampshire	0.8	3.0%
Sub-Total	26.9	88%
Other	3.8	12%
Total Utility Imports	30.7	100%

Source: FERC Form 423, EIA Form 423, and EIA 906

About a third of the total coal imports are moved through the Mobile port. In 2007, coal imports were reported from 23 customs districts (see Exhibit 21). Eight customs districts reported coal imports in volume greater than 1 million tons each.

In addition, the U.S. also imported 2.5 million tons of coke in 2007. China was the largest supplier of coke imports (see Exhibit 22).

Similar to domestic coal sales, international coal sales transactions are executed according to a coal supply contract between the seller and the purchaser. In addition to contract terms and coal prices, the contract specifies source of coal supply (specific mine of origin), coal quantity, coal specification requirement (i.e., heat content, sulfur, ash, moisture, ash fusion temperature, etc.), loading and unloading points, coal weighing, sampling and testing procedures. It also spells out premiums and penalties when coal quality delivered is above or below coal specification requirements. Coal is shipped by ocean vessels, and coal weighing and sampling are performed at port of discharge for each shipment. In general, each coal sample is divided into three parts and put into sealed containers with part one to the seller for testing. Part two of the sample will go to the purchaser for testing by an independent laboratory and part three or the referee sample would be retained for 90 days in case there is a disagreement between the purchaser and seller testing results.

Exhibit 21. U.S. Coal Imports by Customs District (Million Tons)

Customs District	2004	2005	2006	2007
Mobile	8.5	10.0	12.3	12.6
Boston	4.4	4.9	5.3	5.3
Tampa	2.5	2.3	2.7	3.6
New Orleans	1.3	1.0	2.3	2.3
San Juan, PR	1.6	1.7	1.9	1.9
Charleston	0.7	1.4	1.9	1.4
New York	1.1	1.1	1.5	1.1
Pembina, ND	1.4	1.4	1.2	1.1
Portland, ME	0.8	1.1	1.1	0.9
Savannah	0.5	0.9	1.1	0.6
Philadelphia	0.5	0.8	1.0	0.7
Baltimore	0.7	0.7	0.9	0.1
Other	3.2	3.2	3.1	4.6
Total	27.1	30.5	36.3	36.3

Source: Energy Information Administration, *Quarterly Coal Reports*

Exhibit 22. U.S. Coke Imports by Country of Origin (Million Tons)

Country of Origin	2004	2005	2006	2007
China	4.1	1.7	2.7	1.1
Japan	0.9	0.7	0.8	0.8
Colombia	0.1	0.1	0.1	0.2
Canada	0.1	0.3	0.1	0.2
Porland	0.6	0.3	0.4	-
Ukraine	0.6	0.3	0.0	-
Other	0.4	0.2	0.1	0.2
Total	6.9	3.5	4.1	2.5

Source: Energy Information Administration, *Quarterly Coal Reports*

2.3.5 Coal Exports

The U.S. also exported 59 million tons of coal to overseas destinations in 2007 (see Exhibit 23). Of the total, 46 percent was steam coal and 54 percent metallurgical – i.e., used to produce coke. Canada is the largest coal importer of U.S. coal, accounting for 31 percent of the total U.S. exports. More than a third of U.S. coal exports were shipped through Norfolk terminals in 2007 (Exhibit 24).

Exhibit 23. U.S. Coal Exports (Million tons)

Destination	2004	2005	2006	2007
North America	18.8	20.6	20.5	19.1
South America	4.8	4.6	4.9	7.2
Europe	15.2	18.8	20.8	27.1
Asia	7.5	5.1	2.0	1.2
Oceania	0.0	0.0	0.0	0.0
Africa	1.7	0.9	1.4	4.5
Total	48.0	49.9	49.6	59.2

Source: Energy Information Administration, *Quarterly Coal Reports*

Exhibit 24. U.S. Coal Exports by Customs District (Million tons)

Customs District	2004	2005	2006	2007
Norfolk	14.4	15.1	15.0	21.6
Detroit	6.3	8.6	13.7	13.2
Mobile	6.5	7.3	7.4	7.4
Baltimore	4.7	5.0	5.9	7.9
Cleveland	3.4	3.2	3.2	2.3
New Orleans	3.0	1.9	2.2	3.9
Buffalo	1.9	2.1	1.4	1.4
Other	7.7	6.7	3.4	1.5
Total	48.0	49.9	49.6	59.2

Source: Energy Information Administration, *Quarterly Coal Reports*

As we can see in Exhibit 25, the Appalachian region produces about 83% of US exports, the bulk of that being from the Central Appalachian region. Coal exports from the western region are primarily from Wyoming. A total of 14 companies has been engaging in coal exporting business in 2007 (Exhibit 26). When the list of coal exporters is compared with the top 20 producers in the Central Appalachian (CAPP) region (Exhibit 15) 9 out of those top 20 CAPP producers are also coal exporters.

Exhibit 25. 2006 Exports of US Coal by Origin

Region	Tons (000's)	% of Total U.S.
Northern Appalachia	10,597	23%
Central Appalachia	22,201	47%
Southern Appalachia	6,024	13%
West	7,356	16%
Other	568	1%
Total U.S.	46,746	100%

Source: 2006 EIA Coal Distribution Report
Note: Total exports from this source did not match other EIA sources.

Exhibit 26. List of U.S. Coal Exporters

Alliance Resource Partners, L.P.
Alpha Natural Resources
Arch Coal
Chevron Corporation
CONSOL Energy
Foundation Coal
International Coal Group Inc (ICG)
Jim Walter Resources Inc
Kinder Morgan
Massey Energy
Patriot Coal
Peabody
Rio Tinto
TECO Coal

2.3.6. Coal Industry Regulation

Coal mining industry is regulated by federal, state and local authorities with respect to matters such as permitting and licensing requirements, air quality standards, water pollution, the reclamation and restoration of mining properties after mining has been completed, the discharge of materials into the environment, surface subsidence from underground mining, the effects of mining on groundwater quality and availability, plant and wildlife protection, and employee health and safety. A list of federal regulations applicable to the coal industry and with reporting requirements is provided below.

- Coal Mine Health and Safety Act of 1969
- Energy Policy Act of 2005
- Federal Mine Safety and Health Act of 1977
- Mine Improvement and New Emergency Response Act of 2006 (The Miner Act)
- Mining and Minerals Policy Act of 1970
- Surface Mining Control and Reclamation Act of 1977 (SMCRA)
- Tax Relief and Health Care Act of 2006

3.0 Coal Sampling and Testing

ASTM standards are the most widely used test methods and are accepted both nationally and internationally. ASTM International (American Society for Testing and Materials) is one of the largest voluntary standards development organizations in the world. Developed in 1898, ASTM was created by a group of engineers and scientist in order to improve railroad safety for the public by addressing frequent rail breaks through the creation of standardization on the steel used in rail construction. With the quick advancement of industrialization new standardization requirements evolved and were immediately addressed by ASTM through the creation of consensus standards.

The term, volume and coal quality of coal requirements are specified in the coal supply/purchase agreements. Coal quality is tested and certified by third party independent laboratories. ASTM (American Society for Testing and Materials) standards are the industry-

wide acceptable standards for coal testing. The test results are provided on a dry basis (moisture free). General coal analysis and testing include the following:

1. Proximate analysis: moisture content, ash content, volatile matter, fixed carbon
2. Ultimate analysis: Carbon, Hydrogen, Oxygen, Nitrogen, sulfur
3. Ash analysis – SiO_2, Al_2O_3, Fe_2O_3, MgO, CaO, Na_2O, Mn_2O_3, TiO_2, P_2O_5, SO_3
4. Calorific value or specific energy

In addition, special coal analysis may also be performed on trace element, coal hardness, ash fusion temperature, chlorine, fluorine, boron, arsenic, mercury, selenium, phosphorus, size analysis, washability testing/float and zinc test.

Chemical analyses are generally done off-site in a lab. Coal quality/content testing is performed for both the buyer and the seller; whoever is requesting the analysis. Analysis reports are provided to the party paying for the service and any other party that the paying client instructs. Quality assurance/quality control measures are considered necessary by most reputable labs who participate in a program such as the Round Robin program for Coal, Met Coke and Coal Ash.

3.1 ASTM Coal Testing Standards

There are three ASTM certified testing methods that are frequently used by coal producers and coal consumers in the determination of coal quality:

- Proximate Analysis:
  - *ASTM D3172 – A Standard Practice for Proximate Analysis of Coal and Coke* - This practice covers the determination of moisture, volatile matter, and ash and the calculation of fixed carbon on coals and cokes sampled and prepared by prescribed methods and analyzed according to ASTM established procedures.
  - *ASTM D5142 – Test Methods for Proximate Analysis of the Analysis Sample of Coal and Coke by Instrumental Procedures* – Proximate analysis is most frequently used as an analysis for characterizing coals in connection with their utilization because it separates the products obtained when heated into four groups: (1) moisture, (2) volatile matter, (3) fixed carbon, and (4) ash. The amount of carbon residue remaining after the volatile matter test is measured by subtracting the sum of percentages of the remaining three products (moisture, volatile matter, and ash) from 100. This value represents fixed carbon. The fixed carbon value is used in determining the efficiency of coal burning equipment and as an indication of the yield of coke in a coking process. It does not take into account the amount of carbon that is lost in hydrocarbons with the volatiles during pyrolysis and therefore may not give an accurate measurement of the carbon content in coal. Fixed carbon can also contain appreciable amounts of sulfur, hydrogen, nitrogen and oxygen.
- Ultimate Analysis:

- ASTM D3176 – *A Standard Practice for Ultimate Analysis of Coal and Coke* – Involves the determination of carbon and hydrogen content as found in the gaseous products of the complete combustion of the coal, the determination of total sulfur, nitrogen, and ash content in the material as a whole, and the estimation of oxygen content by difference. These five elements comprise the organic fraction of coal. The ultimate analysis of coal and coke represents the elemental composition of these organic materials in coal in terms of carbon, hydrogen, nitrogen, sulfur and oxygen as weighted percentages. The carbon determination includes that which is present in the organic coal substance and any originally present as mineral carbonate.

- ASTM D5373 – *Test Methods for Instrumental Determination of Carbon Hydrogen and Nitrogen in Laboratory Samples of Coal and Coke* – This test method was created to simultaneously determine the amount of carbon, hydrogen and nitrogen in coal using computer controlled instrumentation. These instruments must provide for complete conversion of carbon to carbon dioxide, hydrogen to water vapor and nitrogen to elemental nitrogen in a coal sample. This test must then provide a quantitative determination of these gases in an appropriate gas stream. Depending upon the detection scheme employed by each instrument, there can be up to three configurations available for use.

§ Testing the heat content of coal and coke:

- ASTM D5865 – *A Standard Test Method for Gross Calorific Value of Coal and Coke* – Utilized to determine the amount of heat produced by complete combustion of a substance at constant volume with all water formed condensed to a liquid.

The test most frequently performed is the Proximate Analysis (ASTM D5142) which, for quality purposes, analyzes the characteristics of coal: (1) moisture, (2) volatile matter, (3) fixed carbon and (4) ash. For total carbon content evaluation of a coal sample, ASTM D5373 is utilized. As of June 2007 ASTM D3178 Standard Test Methods for Carbon and Hydrogen in the Analysis Sample of Coal and Coke was withdrawn and replaced by ASTM D5373. Of the three ASTM standards listed, ASTM D5373 is the recommended method to use for determining the carbon content of a coal sample.

ASTM D5373 may not be as readily used as ASTM D5142 (Proximate Analysis). Depending on sampling procedures, requiring the use of ASTM D5373 may involve an entirely new collection of coal samples to be taken separate from the samples used for Proximate Analysis. On the other hand, if no new samples/sampling techniques are required by ASTM, then it may be possible to develop a correlation between the Proximate Analysis and ASTM D5373 in order to avoid disruption to mining operations and standard testing practices.

3.2. Coal Sampling

The purpose of collecting and preparing a sample of coal is to provide a test sample which, when analyzed, will provide test results representative of the lot sampled. This helps ensure an accurate characterization of the coal from which it is taken.

Samples are extracted from the coal throughout the whole coal mining/handling process: from exploration to shipment for sale. How samples are gathered is dependent on the aspect of mining and the purpose for which the coal is being tested. Samples may be required for technical evaluation, process control, quality control, and/or for commercial transactions. Generally, most coal is sampled for quality assurance and is drawn from in-situ coal seams as rectangular blocks or pillars cut from full seam height, from seam channels or from borehole cores.

The sampling procedure will depend mainly on the nature of sample collection, i.e., by mechanical or manual means, from moving belt or from stationary lots like wagons, stockpiles, etc. These different sampling techniques commonly follow a relevant national or international standard. At times, upon mutual agreement, modifications are made in the method of sampling due to technical, cost and time constraints. Statistically, 80% of the total variances involved at the different stages of sample collection, preparation and analysis comes from errors during its collection.

For commercial transactions, several samples are taken to ensure accuracy and to mitigate any discrepancies that may occur. In general, samples are taken and distributed to the purchaser and the seller with one kept in the storage. Should any inconsistencies arise in the testing results between the seller's and purchaser's samples the storage samples can be used to verify any differences.

It is a general practice for coal samples to be taken and tested throughout the whole mining process. During the washing procedure samples are gathered every hour on the hour as coal composition will change. These tests are performed on site at the mines. Not all mines contain a preparation plant and not all coal undergoes a washing treatment; however, it is common practice for all coal to be tested prior to loading onto carriers.

Coal washing takes place in the preparation plant. Not all mines have a preparation plant. Coal is washed to lessen impurities and enhance the quality of its composition. Washing reduces the ash and sulfur content thereby increasing the relative carbon content and calorific value. It is not certain if there are any significant changes in the moisture content of coal during the washing procedure or from transport, but should be considered in sampling, preparing and storing samples.

For purposes of EPA rulemaking it is recommended the sampling of coal be taken when coal is loaded onto railcars, trucks or barges. This is to minimize the potential distortion of moisture and other chemical components of coal after coal is processed at the preparation plant. For mines that do not have coal preparation plants samples are recommended to be taken from the conveyor belts.

3.2.1 General Principles of Sampling

The fundamental requirements of sampling include:

- All particles of coal in the lot to be sampled are accessible to the sampling equipment and each individual particle shall have an equal probability of being selected and included in the sample.
- The dimension of the sampling device used should be sufficient to allow the largest particle to pass freely into it.

- The first stage of sampling known as primary increments is the collection of an adequate number of coal portions from positions distributed over the entire lot to take care of the variability of the coal. The primary increments are then combined into a sample, as taken or after reducing the mass of the sample to a manageable size. From this gross sample, the required number and types of test samples are prepared by a series of processes jointly known as sample preparation.
- The minimum mass of the gross sample should be sufficient to enable particles to be present in the same proportions as in the lot of coal from which it is taken.

3.2.2. General Procedure for Establishing a Sampling Scheme

1. Decide for what purpose the samples are taken, e.g., plant performance evaluation, process control, commercial transactions, etc.
2. Identify the quality parameters to be determined, i.e., general analysis, total moisture, size analysis, carbon content
3. Define the lot
4. Define the precision required
5. Decided whether continuous or intermittent sampling is required
6. Determine the number of sub-lots and the number of increments per sub-lot to achieve the required precision
7. Determine or estimate the nominal top size of the coal
8. Determine the minimum mass per increment and the minimum mass of the total sample
9. Decide on the method of combining the different increments to produce the gross sample
10. Decide on drawing common or separate samples for general analysis and moisture

3.2.3. Moisture

Moisture is an important property of coal, as all coals are mined wet. Groundwater and other extraneous moisture are known as *adventitious moisture* and are readily evaporated. Moisture held within the coal itself is known as *inherent moisture* and is analyzed. Moisture may occur in four possible forms within coal:

- *Surface moisture*: water held on the surface of coal particles
- *Hydroscopic moisture*: water held by capillary action within the microfractures of the coal
- *Decomposition moisture*: water held within the coal's decomposed organic compounds
- *Mineral moisture*: water which comprises part of the crystal structure of hydrous silicates such as clays

Total moisture is analyzed by loss of mass between an untreated sample and the sample once analyzed. This is achieved by any of the following methods:

1. Heating the coal with toluene
2. Drying in a minimum free-space oven at 150 °C (300 °F) within a nitrogen atmosphere
3. Drying in air at 100 to 105 °C (210 to 220 °F) and relative loss of mass determined

Methods 1 and 2 are suitable with low-rank coals but method 3 is only suitable for high-rank coals as free air drying low-rank coals may promote oxidation. Inherent moisture is analyzed similarly, though it may be done in a vacuum.

Coal is susceptible to oxidation at room temperature. Like moisture changes, such oxidation has to be considered in sampling, preparing, and storing samples. Comparison of moisture and ash-free (MAF) Btu values is often useful for evaluating suspected oxidation problems. All these operations should be done rapidly and in as few steps as possible to minimize oxidation of the coal. The sample containers used should have airtight lids to minimize moisture loss and exposure of the coal to air. Containers should be selected that will hold only the required amount of sample and leave a minimum of air space. Even when such precautions are taken, the samples change very quickly, so the analysis of a sample should be carried out as soon as possible after it is received.

3.2.4 ASTM Coal Collection Standards

It seems that in order to provide unbiased, representative coal samples for lab analysis either the mining company or the buyer unloading the coal from a barge, railcar or truck will use some sort of bulk sampling and/or mechanical sampling. There are ASTM sampling practices that specify how the samples are to be collected and the QA/QC measures that should be taken when collecting samples.

The two following practices are intended to provide a representative coal sample of the source that they are collected from. In addition the samples from both procedures are to be crushed and prepared for further analysis by Method D2013 so that the samples may be analyzed for a variety of different parameters. These parameters may define the lot's value, its ability to meet specifications, its environmental impact, as well as other properties.

ASTM D2234/2234M Standard Practice for Collection of a Gross Sample of Coal
This practice provides procedures for the collection of a sample under various sampling conditions. Practice D2234/D2234 M allows for one division of the gross sample before crushing. The mass and top size of the gross or divided sample collected by using these guides and practices are usually too large for chemical or physical testing. This procedure explains how to divide large samples before they are crushed and prepared for further analysis according to Method D2013.

ASTM D7430-08 Standard Practice for Mechanical Sampling of Coal
This practice provides the guidelines for sample separation and crushing before it is followed by Method D2013. For easier use the ASTM D7430-08 is the compilation of 4 previous standards D7256/D 7256M, D4916, D4702, and D6518 that govern the mechanical sampling of coal.

There are four main parts of the practice. Part A: Mechanical Collection and Within-System Preparation of a Gross Sample of Coal from Moving Streams. This section covers procedures for the mechanical collection of a sample under Classification I-B-1 and I-B-2 (Practice

D2234/D2234M) and the within-system preparation (reduction and division) of gross samples utilizing various components of the mechanical sampling system.

Part B: Mechanical Auger Sampling describes procedures for the collection of an increment, partial sample, or gross sample of material using mechanical augers. Reduction and division of the material by mechanical equipment at the auger is also covered.

Part C: Quality Management of Mechanical Coal Sampling Systems is applicable to the quality management of cross-belt, falling stream, and auger sampling systems. Part C also includes the Spacing of Increments for Cross-Belt and Falling Stream Samplers. This section covers the cross-belt and falling stream type mechanical sampling systems that take increments during a fixed time strata either randomly or at fixed time intervals.

Part D: Bias Testing of a Mechanical Coal Sampling System presents sample collection and statistical evaluation procedures for testing mechanical sampling systems, subsystems, and individual system components for bias. It is the responsibility of the user of this practice to select the appropriate procedure for a specific sampling situation.

ASTM 2013

The ASTM 2013 practice would follow the two previous ASTM methods and provides instructions for reducing and dividing the gross or divided sample, by on-line or off-line processes, or both, to a top size and mass suitable to the performance of testing.

Division and reduction of a sample may occur at more than one location. Most often, the sample is collected, reduced, and divided (one or more times) by use of a mechanical sampling system. The remaining sample may be further divided on-site to facilitate transporting it to the laboratory where further reduction and division likely occurs before analysis. In places, this practice requires air drying the sample before subsequent reduction. Procedures for air drying and air-dry loss determination are provided in Test Method D3302.

This practice specifies how to prepare composite samples, if required. This practice divides the procedures for the reduction and division for two groups of coal. Group A consists of cleaned coals of all sizes and Group B consists of all other unknown coals.

This practice also covers procedures for checking precision of sample preparation and analysis of the various stages. The data obtained from tests using consistent sample preparation and analysis methods are used to estimate the random errors in the various stages of sample division and analysis.

3.2.5 ISO Standards

ASTM standards are more frequently used in the U.S. whereas ISO standards are sometimes used for international trade. ISO standards comparable to ASTM testing standards are:

- ISO 17246:2005 Coal Proximate Analysis
- ISO 17247:2005 Coal Ultimate Analysis

3.3. Coal Weighing

Typically, coal is weighed using automated systems on the conveyor belt or at the loadout facility. In general, the weighing and sampling of coal at coal mines are conducted at about the same time to ensure consistency between quantity and quality of coal. This is because coal is sold based on the unit of weight and within certain quality specifications. There are many types of weighing devices and methods used in the coal industry including belt scales, rail and track scales, and barge drafting. Each of these methods has a varying degree of accuracy and different methods of calibration and certification. The NIST Handbook 44 published by the Weights and Measures Division, National Institute of Standards and Technology is generally used as the industry standard practice for coal weighing. In considering rules for coal weighing requirements on facilities and companies in the coal industry, EPA will adopt the NIST Handbook 44 as the standard for weighing coal.

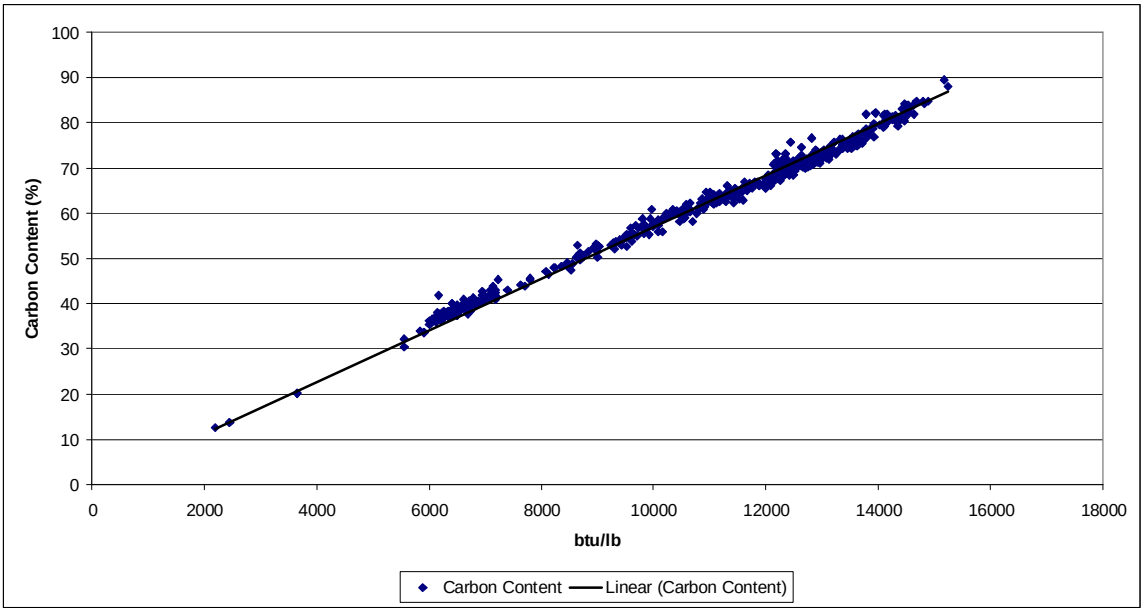
3.4 National Coal Quality Inventory

In 1999, the U.S. Geological Survey (USGS) initiated the National Coal Quality Inventory (NaCQI0) project to create a comprehensive database on the quality of U.S. coals. The project was a cooperative effort between the USGS, various state geological surveys, universities, coal-fired utilities and the coal industry with funding coming from USGS, Electric Power Research Institute and the U.S. Department of Energy. Through this effort, a total of 729 samples were collected. ASTM test standards of proximate and ultimate analyses were formed by independent testing labs. The information is collected on moisture, ash, mercury, selenium, total sulfur, chlorine, and major-minor trace elements.

Based on the USGS National Coal Quality Inventory database, a correlation was found between the energy content and the carbon content of coal sampled throughout the United States. Exhibit 27 shows both the raw data points as well as the representation of the linear regression of the two variables. The data points are from 526 coal samples. A regression/correlation analysis performed on the sample data shows a high correlation between the two with an R-square (R^2) of 0.99. The resulting regression equation is as follows:

Carbon Content (%) = 0.000057 * Coal Energy Content (Btu/lb)

Exhibit 27.
Carbon Content vs. Energy Content



For an illustrative example of carbon content at various levels of coal energy content see Appendix 3. Similar analysis also performed for each of the coal producing state that sample data points are available from USGS. The results are summarized in the table below (Exhibit 28).

Exhibit 28.
Carbon Content versus Energy Content – Individual State Samples

State	R^2	beta
All US	**0.99**	**0.000057**
CO	0.98	0.000057
IL	0.97	0.000056
ND	0.85	0.000060
PA	0.99	0.000058
TN	0.99	0.000057
TX	0.96	0.000058
UT	0.98	0.000056
WV	0.97	0.000056
WY	0.98	0.000058

Reports associated with the National Coal Quality Inventory can be found in the following URL:

http://pubs.usgs.gov/of/2007/1116/
http://pubs.usgs.gov/of/2006/1162/#four
http://pubs.usgs.gov/fs/fs-0120-99/fs-0120-99.pdf
http://pubs.usgs.gov/pp/p1625b/Reports/Chapters/Chapter_G.pdf

http://pubs.usgs.gov/pp/p1625a/Chapters/WQ.pdf
http://pubs.usgs.gov/pp/p1625a/Chapters/PQ.pdf
http://pubs.usgs.gov/pp/p1625a/Chapters/HQ.pdf
http://pubs.usgs.gov/pp/p1625a/Chapters/GQ.pdf
http://pubs.usgs.gov/of/1997/of97-134/

4.0 Industry Federal Reporting Requirements

In this section we focus on the three sectors identified as points of monitoring of coal: coal mines, coal imports and coal exports. The following discussion is based on the information gathered on current reporting requirements and presents an interpretive narrative of the reporting matrix spreadsheets compiled for EPA. We focus our discussion on the reporting requirements most relevant to the determination of an accurate accounting of coal flow through the coal system.

For each sector, we discuss the key reporting obligations by agency and reporting form. We then address the key questions EPA has identified for evaluating the suitability of the reporting requirement as a basis for EPA's mandatory monitoring system. These questions include:

- What is reported? e.g., coal received, coal delivered, etc.
- Is the reporting tied to a facility or entity at a facility?
- What is the threshold for reporting?
- What is the frequency of reporting?
- How is the data developed?
- What are the verification/certification, QA/QC methods?
- How public is the information?
- Where are the gaps in sector coverage that would lead to un-accounted for volumes?

The matrices on federal reporting requirements on coal are included in Appendix 2.

4.1 Coal Production

Energy Information Administration

EIA Form 7A is a comprehensive report of the operating characteristics of all US mines with capacity over 10,000 short tons and stand-alone facilities that record over 5,000 hours of labor. Mine level data is kept confidential, however EIA publishes data aggregated by state and economic sector.

Coal Production Report; Form EIA-7A	
What is reported	Coal production operations, locations, productive capacities, coal beds mined, reserves, and disposition (volumes and revenues received).
Who is reporting	Mine operators (1,542 respondents)
What is the threshold for reporting	Greater than 10,000 short tons
What is the reporting frequency	Annual
How are the reported data developed	Mail, facsimile, or internet submission to EIA.
Are reports mandatory or voluntary	Mandatory
What is the facility level of the reporting	Mine
What are the verification/certification & QA/QC methods	Sanctions against incorrect submission
Is the data public or restricted	Most data remains confidential, but EIA aggregates for state or regional reporting
Where are the gaps in the data reported	Currently no tracking of carbon. Tracks coal quantity and rank.

Mining Safety and Health Administration

MSHA's data collection is primarily focused on accidents and injuries, but it does also collect production, employee numbers and employee hours for its 7000-2 report. This report must be filed for all mining operations that have at least one hour of work performed in them, effectively including all operations. No data on coal quality is collected.

Quarterly Mine Employment and Coal Production Report; MSHA 7000-2	
What is reported	Employees, work hours, coal production.
Who is reporting	Mine operators
What is the threshold for reporting	All
What is the reporting frequency	Quarter
How are the reported data developed	
Are reports mandatory or voluntary	Mandatory
What is the facility level of the reporting	Mine level
What are the verification/certification & QA/QC methods	MSHA may request verification of data. Fines and possible jail time for non-compliance.
Is the data public or restricted	Public
Where are the gaps in the data reported	Data is limited to only production and employee data.

Summary

These reports give a complete picture of the production and operating characteristics of the US coal industry, however neither report gathers data on coal quality other than rank.

4.2 Coal Imports and Exports

Census Bureau Form EM545	
What is reported	Commodity type, country destination, customs district origin, quantity (tons), and value (dollars)
Who is reporting	Coal exporters
What is the threshold for reporting	All coal exports
What is the reporting frequency	Monthly
How are the reported data developed	Not known
Are reports mandatory or voluntary	Mandatory
What is the facility level of the reporting	N/A
What are the verification/certification & QA/QC methods	Not known
Is the data public or restricted	Public
Where are the gaps in the data reported	Fuel characteristics not tracked

Census Bureau Form IM145	
What is reported	Commodity type, country origin, customs district destination, quantity (tons), and value (dollars)
Who is reporting	Coal importers
What is the threshold for reporting	All coal imports
What is the reporting frequency	Monthly
How are the reported data developed	Not known
Are reports mandatory or voluntary	Mandatory
What is the facility level of the reporting	N/A
What are the verification/certification & QA/QC methods	Not known
Is the data public or restricted	Public
Where are the gaps in the data reported	Fuel characteristics not tracked

Summary

Data collected on imports and exports in these forms cover 100% of the shipments, however no descriptive data is available on the shipments other than quantity shipped.

4.3 Coal Distribution and Consumption

Energy Information Administration

EIA Form 3 tracks coal receipts at manufacturing plants in the US that consume greater than 10,000 tons per year. This total also includes synfuel plants that use coal as a feedstock and facilities using coal for gasification or liquefaction. In addition to tracking the quantity of coal consumed and current stock levels, this form also tracks the origin of the coal, the predominant transportation mode used, the coal rank, the heat content, the sulfur content, and the ash content. Form 3 segregates synfuel in a separate schedule.

Quarterly Coal Consumption and Quality Report Manufacturing Plants; Form EIA-3	
What is reported	Origin, quantity, primary transportation mode, quality (i.e., Btu, sulfur, and ash contents), and cost; short tons
Who is reporting	Manufacturing Plants
What is the threshold for reporting	Greater than 1000 short tons
What is the reporting frequency	Quarter
How are the reported data developed	Mail/electronic submission
Are reports mandatory or voluntary	Mandatory
What is the facility level of the reporting	Plant level
What are the verification/certification & QA/QC methods	Not known
Is the data public or restricted	Parts are public others confidential
Where are the gaps in the data reported	Tracks quantity, heat content, sulfur and ash but not carbon

EIA form 5 is nearly identical to Form 3 except that it focuses on coal received at coke plants. One exception is that Form 5 does not request data on the heat content of the coal; instead, it requests the volatile matter percentage, a trait more relevant to the coking industry.

Quarterly Coal Consumption and Quality Report Coke Plants; Form EIA-5	
What is reported	Coal receipts, costs, carbonization, and stocks, as well as coke and breeze production, distribution, and stocks at all U.S. coke plants; short tons
Who is reporting	All operating coke plants
What is the threshold for reporting	All coke plants
What is the reporting frequency	Quarter
How are the reported data developed	Mail/electronic submission
Are reports mandatory or voluntary	Mandatory
What is the facility level of the reporting	Plant level
What are the verification/certification & QA/QC methods	Not known
Is the data public or restricted	Parts are public others confidential
Where are the gaps in the data reported	Tracks quantity, volatile matter, sulfur and ash but not carbon

EIA form 6A collects coal distribution data from US coal mining companies and wholesale and retail coal dealers, including brokers. Companies that owned, purchased, or distributed 50,000 tons of coal during the reporting year must fill out this form. Companies that only distribute, but never own, coal are exempt from this requirement. The coal distribution report tracks coal shipments from US producers to US consumers. No data on coal quality is collected in this form.

Coal Distribution Report; Form EIA-6A	
What is reported	Coal production, purchases, distribution by consumer type, and stocks; short tons
Who is reporting	Coal mining companies, wholesale coal dealers (including brokers), and retail coal dealers

What is the threshold for reporting	Greater than 50,000 short tons
What is the reporting frequency	Annual
How are the reported data developed	Mail/electronic submission
Are reports mandatory or voluntary	Mandatory
What is the facility level of the reporting	Company
What are the verification/certification & QA/QC methods	Data consistency check performed by EIA
Is the data public or restricted	Parts are public others confidential
Where are the gaps in the data reported	Only tracks quantity of coal distributed, no characteristics tracked.

EIA Form 906 collects fuel receipts and generation data from US generators with capacity of 1 MW or more. Approximately 4,400 plants are required to fill out this form. Form 906 only tracks the quantity, rank, and heat content of coal receipts. Due to a consolidation of forms planned for 2008, Form 906 will be discontinued and replaced by EIA Form 923.

Power Plant Report; Form EIA-906	
What is reported	Fuel consumption, heat content, electric generation, and fuel stocks
Who is reporting	Power plants
What is the threshold for reporting	Plants greater than 1 MW capacity
What is the reporting frequency	Month/annual
How are the reported data developed	Mail/electronic submission
Are reports mandatory or voluntary	Mandatory
What is the facility level of the reporting	Plant level
What are the verification/certification & QA/QC methods	Not known
Is the data public or restricted	Public, but "Stocks at End of Reporting Period" will be confidential
Where are the gaps in the data reported	Discontinued in 2008

EIA Form 920 is similar to Form 906 in the data collected, but is required only for CHP plants. Form 920 also tracks the use of electricity generated at the plants and sales. Like Form 906, Form 920 will be discontinued in 2008 and replaced by EIA Form 923.

Combined Heat and Power Plant; Form EIA-920	
What is reported	Fuel consumption, heat content, electric generation, and fuel stocks
Who is reporting	CHP plants
What is the threshold for reporting	Plants greater than 1 MW capacity
What is the reporting frequency	Month/annual
How are the reported data developed	Mail/electronic submission
Are reports mandatory or voluntary	Mandatory
What is the facility level of the reporting	Plant level
What are the verification/certification & QA/QC methods	Not known
Is the data public or restricted	Public, but "Stocks at End of Reporting Period" will be confidential
Where are the gaps in the data reported	Discontinued in 2008

EIA Form 423 reports fuel receipts at non-utility electric generating plants in the US of capacity 50MW or greater. In addition to tracking quantity, Form 423 tracks heat content, sulfur content, ash content, cost, and specifically for coal, the origin of the fuel. Cost information is kept confidential. Form 423 will be discontinued in 2008 and replaced by EIA Form 923.

Monthly Cost and Quality of Fuels for Electricity Plants; Form EIA-423	
What is reported	Fuel quantity received, quality (Btu, sulfur, and ash content), purchase type, cost, contract expiration date, tolling agreements, and supplier of fossil fuels delivered for the generation of electric power. In addition, for coal only, data will include type of mine and the State and county where the mine is located.
Who is reporting	Non-utility power plants
What is the threshold for reporting	Non-utility plants greater than 50 MW capacity
What is the reporting frequency	Month/annual
How are the reported data developed	Mail/electronic submission
Are reports mandatory or voluntary	Mandatory
What is the facility level of the reporting	Plant level
What are the verification/certification & QA/QC methods	Cross-checked with fuel consumption reported on EIA 906 and 920 forms
Is the data public or restricted	Public, but "fuel cost data" will be confidential
Where are the gaps in the data reported	Discontinued in 2008

Federal Energy Regulatory Commission

FERC Form 423 is virtually identical to EIA Form 423, with the exceptions that the FERC form covers all utility power plants and it reports delivered cost information. Form 423 will be discontinued this year and replaced by EIA Form 923.

Cost and Quality of Fuels for Electric Plants; FERC Form-423	
What is reported	Fuel quantity received, quality (Btu, sulfur, and ash content), purchase type, cost, contract expiration date, tolling agreements, and supplier of fossil fuels delivered for the generation of electric power. In addition, for coal only, data will include type of mine and the State and county where the mine is located.
Who is reporting	Utility Power plants
What is the threshold for reporting	All utility plants
What is the reporting frequency	Month/annual
How are the reported data developed	Mail/electronic submission
Are reports mandatory or voluntary	Mandatory
What is the facility level of the reporting	Plant level
What are the verification/certification & QA/QC methods	Not known
Is the data public or restricted	Public
Where are the gaps in the data reported	Discontinued in 2008

Energy Information Administration (Not yet released)

EIA Form 923 was designed to replace EIA forms 906, 920, 423, and FERC form 423. It includes all relevant data elements present on the obsolete forms and also adds data on commodity cost, mercury content of coal, additional detail on transportation modes, and it links coal shipments to specific mines as indicated by the MSHA ID number. Additionally, a coal balancing check was added that requires the reported change in fuel stocks to reconcile with the fuel receipts and fuel consumption reported.

Power Plant Operations Report; Form EIA-923	
What is reported	Electric power generation, fuel consumption, fossil fuel stocks, and delivered fossil fuel cost and quality
Who is reporting	All electric power plants and CHP plants over 1 MW
What is the threshold for reporting	All plants 1 MW or greater that have the ability to draw power from the grid or deliver power to the grid.
What is the reporting frequency	Month/annual
How are the reported data developed	Mail/electronic submission
Are reports mandatory or voluntary	Mandatory
What is the facility level of the reporting	Plant level
What are the verification/certification & QA/QC methods	Requires that changes in reported fuel stocks must reconcile with fuel receipts and fuel consumption reported.
Is the data public or restricted	Public, but non-utility cost data is confidential
Where are the gaps in the data reported	Carbon not reported, but quantity and source of coal reported as well as other fuel characteristics

Summary

Coal quality data is almost exclusively found in these distribution and consumption reports, however carbon is currently not reported in any of them. It will also not be included in the new EIA Form 923. Coverage is fairly comprehensive, especially under the new form where only units under 1 MW are not required to report.

5.0 Data Gaps and Quality

In this section we discuss the observed gaps in the reporting requirements and suggest alternatives for acquiring missing data. Similarly, we discuss quality control of the accuracy of the data that are reported.

In its current form, data collection on the coal industry is redundant, sometimes contradictory, and not consistently checked for errors. Some of these issues are expected to be resolved with the introduction of EIA form 923 in late 2008 / early 2009.

5.1 Reporting Gaps in Industry Coverage

Both EIA and MSHA collect data on production, however MSHA requires reports from all mines while EIA has a reporting threshold. This results in different totals reported from the two forms. EIA collects more descriptive data of mines compared to MSHA, which focuses more on accident reporting than operating characteristics. Neither MSHA nor EIA collect data on coal quality at the producer; instead, that data is located in the various EIA and FERC forms that monitor distribution and consumption.

The distribution and consumption forms are also duplicative in their reporting. EIA forms 906 and 920 collect data on fuel consumed and the heat content of fuel, but contain no other descriptive data. Additionally, the 920 data only applies to CHP units 50MW and above, which would seem to leave a considerable number of CHP units with no reporting requirement. The 423 forms, of which EIA and FERC both report, contain additional descriptive data on fuel use, especially coal in which the source is identified. Fuel use reported for a particular plant does not always match when comparing between the 906/920 forms and the 423 forms. Form 923, when implemented, should resolve the disparities of fuel consumption reporting for the electric power sector. Other sector reporting seems to be accurately covered by EIA forms 3, 5, and 6.

Import and export data, reported by the Census Bureau, covers all imports and exports but does not contain any characteristics of the fuel shipments.

5.2 Quality Assurance and Control

EIA performs some cross-checking between its forms for accuracy, and contacts filers for additional information if discrepancies exist. It is not known what kind of quality control was performed by FERC for the 423 data. While using the data for internal use, ICF has noticed that some of the FERC data is likely off by an order of magnitude (tons reported rather than thousand tons). One of the problems in enforcing quality control with these forms is that the penalties seem to only target missing data, rather than missing and/or incorrect data. The introduction of the 923 form will likely reduce some of these errors as it incorporates automatic balancing calculations which require fuel reporting to equilibrate.

APPENDIX 1
2007 U.S. COAL PRODUCTION BY COAL HOLDING COMPANIES
Source: MSHA

Controller	2007 Production (tons)	2007 Production as a Percentage of U.S. Total
Peabody Energy	198,674,509	17.4%
RTZ-CRA Group	134,352,528	11.8%
Arch Coal Inc	116,564,889	10.2%
Foundation Coal Corporation	71,827,904	6.3%
CONSOL Energy Inc	61,320,542	5.4%
Massey Energy Company	38,302,078	3.4%
NACCO Industries Inc	34,068,714	3.0%
Westmoreland Coal Company	30,392,392	2.7%
Robert E Murray	27,566,697	2.4%
Kiewit Peter Sons' Inc	27,171,022	2.4%
Alliance Resource Partners LP	23,872,215	2.1%
TXU	23,852,935	2.1%
Alpha Natural Resources LLC	19,886,012	1.7%
International Coal Group Inc (ICG)	18,705,641	1.6%
BHP Billiton	15,427,995	1.4%
Magnum Coal Company	13,702,575	1.2%
Chevron Corporation	11,990,796	1.0%
James River Coal Company	10,820,915	0.9%
Ashland Inc et al	10,453,806	0.9%
Jeffery A Hoops	8,351,542	0.7%
Level III Communications et al	6,984,546	0.6%
Richard Gilliam et al	6,798,473	0.6%
Pacific Minerals Inc et al	6,473,810	0.6%
James O Bunn et al	6,116,390	0.5%
Wexford Capital LLC	5,530,387	0.5%
John C Smith Jr	5,480,569	0.5%
Western Fuels Association	5,303,516	0.5%
James H Booth et al	5,112,618	0.4%
J Clifford Forrest III	5,104,054	0.4%
TECO Energy Inc	5,090,818	0.4%
Black Hills Corp	5,049,231	0.4%
Black Beauty Resources Inc & United Minerals	4,966,840	0.4%
Oxbow Carbon & Minerals Inc	4,823,662	0.4%
Walter Industries Inc	4,530,690	0.4%
Charles Ungurean	4,248,029	0.4%
Clearwater Natural Resources LP	4,175,806	0.4%
United Company	4,123,999	0.4%
Allete Inc	3,894,230	0.3%
Pacificorp	3,685,476	0.3%
Kiewit Peter Sons' Inc et al	3,655,146	0.3%
Energy Coal Resources Inc	3,496,083	0.3%
James C Justice II	3,390,202	0.3%
Felson Bowman	3,121,532	0.3%

Jerry W Wharton	3,091,562	0.3%
Thomas R Hamilton et al	2,890,976	0.3%
Chester M Thomas	2,819,284	0.2%
Patriot Coal Corporation	2,779,232	0.2%
Donald Blankenberger	2,623,781	0.2%
American Electric Power Company Inc	2,558,017	0.2%
Tri-State Generation & Transmsn Assoc et al	2,477,549	0.2%
Edward L Clemons Estate	2,281,917	0.2%
John M Potter et al	2,176,315	0.2%
Alcoa Inc	2,138,829	0.2%
Exxon Mobil Corp	2,133,879	0.2%
Citicorp Venture Capital Ltd	2,130,063	0.2%
Phoenix Coal Corporation	2,051,913	0.2%
Amvest Corporation	1,994,956	0.2%
Vigo Coal Company Incorporated	1,988,490	0.2%
Douglas M Epling	1,979,495	0.2%
Timothy Elliott	1,792,172	0.2%
David A Duff	1,742,928	0.2%
Benjamin M Statler et al	1,637,380	0.1%
James L Laurita Jr et al	1,598,542	0.1%
James H Booth	1,588,993	0.1%
General Dynamics Corp	1,531,465	0.1%
Brody Trust	1,514,717	0.1%
Deseret Generation & Transmission Co-operative	1,424,019	0.1%
William D Humphreys et al	1,420,034	0.1%
John M Stilley	1,377,470	0.1%
Everett (Gordon) Justice	1,367,111	0.1%
Drummond Company Inc	1,331,831	0.1%
Joseph E Usibelli	1,323,560	0.1%
Andrew B Jordan	1,282,011	0.1%
Long Branch Energy Corporation	1,257,001	0.1%
James F Graham	1,233,398	0.1%
Harold E Akers et al	1,182,450	0.1%
Cleveland-Cliffs Inc	1,174,985	0.1%
Steven W Haynes et al	1,155,735	0.1%
Five J's LLC et al	1,137,871	0.1%
Thomas J Smith	1,118,706	0.1%
Coalfield Transport Inc	1,075,762	0.1%
John P Garcia et al	1,058,761	0.1%
Ronald E Laswell et al	1,039,232	0.1%
National Coal Corporation	979,575	0.1%
Robert J Reed Sr	946,198	0.1%
Gary Asher	875,523	0.1%
Brian J Veldhuizen et al	823,143	0.1%
Sun Company Inc	818,273	0.1%
Dan Chambers et al	769,286	0.1%
International Industries Inc	764,822	0.1%
Joseph T Bennett et al	755,144	0.1%
Robert R Jeran	739,555	0.1%
Anthony P Cline	738,804	0.1%

David Wells	733,221	0.1%
Frank C Mann	725,236	0.1%
Ben Bennett et al	712,475	0.1%
W Thomas Mackall et al	671,117	0.1%
Cambrian Mining PLC	668,807	0.1%
David D Bundy	667,357	0.1%
A J Taft	639,096	0.1%
William G Skewes	625,868	0.1%
Joseph A Owens	610,705	0.1%
William J Cooper	607,755	0.1%
International Resources LLC	595,712	0.1%
Bill W Stoddard et al	587,784	0.1%
Douglas M Epling et al	537,931	[1]
Alan Arthur et al	515,827	[1]
Aubra P Dean et al	515,305	[1]
Robert A Lewis et al	500,013	[1]
Bobby G Meadows Jr	491,843	[1]
Otis R Robison Jr	488,537	[1]
John W Smith	477,195	[1]
GCC of America	470,099	[1]
Anthony Frederick et al	468,747	[1]
John B Preece	463,708	[1]
Gary E Peyton	463,007	[1]
Robert L Worley	462,021	[1]
Douglas L Sanner et al	458,788	[1]
Carl L Baker Jr	458,281	[1]
Evergreen Energy Inc	450,822	[1]
Robert I Hartley et al	437,921	[1]
David Maynard	426,034	[1]
Jerry Skeens et al	425,703	[1]
Ervin Stiltner	410,414	[1]
Tri-State Generation & Transmission Assn Inc et al	405,864	[1]
Forest Coal Company	405,433	[1]
Geraldine P Turner	404,973	[1]
Mary J Brown	402,462	[1]
Carl Kirk et al	401,013	[1]
Gary L Barker et al	397,321	[1]
Roger W Perry	387,559	[1]
Pat A Jones	383,752	[1]
George R Beener	377,595	[1]
William P Moore III et al	375,970	[1]
Randel L Richmond	375,554	[1]
Donald R Hoffman	375,004	[1]
Franklin S Schall	364,438	[1]
Rhonda Marcum	364,198	[1]
Charles D Lilly	363,800	[1]
Jerry M Gaines	361,929	[1]
Theodore L Darlington	348,956	[1]
Stanley R Ditty	342,762	[1]
F D Justice II et al	342,211	[1]

C Ray Peters et al	326,697	[1]
Chris Patton et al	318,298	[1]
Progress Energy Inc	315,811	[1]
Edward A Asbury	315,350	[1]
Randy Gilkerson et al	311,983	[1]
Keith B Kimble	298,391	[1]
James Brakefield et al	298,221	[1]
Michael R Burns	296,952	[1]
James A Sigmon	281,428	[1]
Thomas Scholl	278,459	[1]
Roger L Kirk et al	276,867	[1]
Paul C Combs et al	274,811	[1]
Charles H Snyder Jr	273,321	[1]
Daris Stump	272,519	[1]
Martha A Bender	267,488	[1]
Wolford Jeffrey	267,413	[1]
Rowland Goble et al	265,721	[1]
David Cline	263,040	[1]
Bill C Smith	261,674	[1]
Willis Ring	256,832	[1]
Kenneth F Smith	254,979	[1]
Richard H Abraham et al	249,886	[1]
John A Blaschak	247,787	[1]
Scarlett Biliter	246,161	[1]
Donn A Chickering	236,737	[1]
William Ridley Elkins Jr	236,169	[1]
Jeffrey A Goldizen	234,102	[1]
Melvin Bailey	233,667	[1]
Cecil Ann Walker	233,105	[1]
Bronco Energy Fund Inc	232,881	[1]
Anthony V Lanham	231,739	[1]
Jem-Coal LLC et al	228,058	[1]
(Harold) Lynn Keene et al	227,326	[1]
Broe Companies Inc	227,232	[1]
Richard (Barry) Hale	225,170	[1]
Wesley D. Burke et al	223,904	[1]
Robert L Clear	222,136	[1]
Keith D Dyke	221,457	[1]
Edward Tincher	220,494	[1]
James Cox et al	220,038	[1]
David Forcey et al	215,402	[1]
Ronnie D Jackson	210,739	[1]
Sean D Taylor	210,245	[1]
Joseph L Waroquier et al	209,650	[1]
Gregory Jessee et al	206,856	[1]
James H Hurley	205,282	[1]
Clarence L Moss III	203,351	[1]
Thomas King Evans	201,320	[1]
INR-I Holdings LLC	197,914	[1]
Henry Chaney Jr	194,378	[1]

David Powers	192,056	[1]
Donald Newsome	188,787	[1]
Terry C Marshall et al	186,364	[1]
Clyde H McComas et al	185,916	[1]
Harry J Hanchar	183,435	[1]
Freddie A Taylor	182,592	[1]
Darrell G Spencer et al	182,505	[1]
Headwaters Inc	182,369	[1]
Johnny H Parton	180,926	[1]
Randall E Crawford et al	180,312	[1]
Paul M Hogg	179,056	[1]
Howard Russell Morris	178,795	[1]
John Lewis	175,444	[1]
G B Hendrickson	170,565	[1]
Prushnok Coal Company Inc	170,482	[1]
Ray Slone Jr	168,788	[1]
Jackie (Mitch) Fannin Et Al	168,315	[1]
John H Wellford	161,409	[1]
Jon K Ingle	159,886	[1]
George Cowfer Jr	155,868	[1]
James L Bevins	154,682	[1]
United American Energy Et Al	153,885	[1]
Alice Hall	151,805	[1]
Anthony K Dotson et al	151,676	[1]
H. Garrison Hill	147,478	[1]
Rodney Bentley et al	145,853	[1]
William F Haley	145,782	[1]
Timothy Schwinabart et al	143,796	[1]
Laird T Orr	143,541	[1]
Ralph L Wingrove	143,363	[1]
Gary Bowen II	143,301	[1]
Susie A Smith et al	141,461	[1]
James Taylor et al	140,080	[1]
Ron D Bowling	139,329	[1]
Michael T McCullough	139,307	[1]
Andrew J Hewitson	138,547	[1]
Michael Puskarich et al	138,013	[1]
Hank K Matney et al	137,251	[1]
John W Rich Sr et al	135,241	[1]
Mark Bowles	133,103	[1]
Greg Damron et al	129,418	[1]
Daniel A Fescemyer	129,239	[1]
Woodman Three Mining Inc	124,267	[1]
Anthony Blaschak et al	122,849	[1]
Ervin Stiltner et al	120,793	[1]
Terry Hovatter	119,606	[1]
Fredrick J Murell	119,036	[1]
Robert D Mc Fall	118,093	[1]
Joseph L Waroquier Jr Et Al	117,619	[1]
Robert L Rosencrans et al	116,255	[1]

Scott E Fieg et al	115,498	[1]
Robert Swisher et al	113,976	[1]
Christopher J Evans	112,537	[1]
Jerry Tackett	109,645	[1]
Lester Sherman et al	109,170	[1]
Jody L Ritchie	108,829	[1]
Linda S Coleman	107,721	[1]
Robert L Johnson	105,113	[1]
Charles B Hall et al	104,455	[1]
Ronald S Bryant et al	102,152	[1]
John A Decker et al	101,814	[1]
Dick J Plaster	101,677	[1]
John P Matey	101,041	[1]
Terry L. Hall	101,022	[1]
Robert M Keen	100,404	[1]
David C Neiswonger	99,848	[1]
Mark E Strishock et al	99,478	[1]
Danny Justice	98,298	[1]
Coal International PLC et al	96,568	[1]
Jimmie R Ryan et al	95,336	[1]
Kenneth L Farley et al	95,079	[1]
Kenneth R Calloway	93,891	[1]
Charles T Clise Jr	93,147	[1]
Josh Osborne	91,340	[1]
Timothy R Dye	90,314	[1]
James M Davidson Jr	90,028	[1]
Jack H Ealy et al	88,717	[1]
Larry D Baumgardner	86,799	[1]
Marvin Shafer et al	86,190	[1]
Benjamin T Elkin	85,247	[1]
Minerva (Ruth) Mead	83,481	[1]
City Trust Of Philadelphia	82,503	[1]
John D North et al	82,106	[1]
Robert George Koval	80,603	[1]
R. Alex Johnson et al	80,280	[1]
Eddie Hurley	80,144	[1]
David D Osikowicz Jr	79,616	[1]
David Stevenson	79,603	[1]
Robert O Roan	79,167	[1]
Howard Covington et al	79,058	[1]
Nancy A Cybulla-Johnson	78,888	[1]
Neil I Atwell	78,635	[1]
Pagnotti Enterprises Inc	75,705	[1]
Joseph Aloe et al	74,825	[1]
Hufford V Williams	74,315	[1]
Noah L Vandyke	73,660	[1]
Barbara Evans et al	73,451	[1]
John M Lee	73,404	[1]
Robin M Lambert et al	73,081	[1]
Pen Carb Incorporated	72,407	[1]

Joseph Kuperavage et al	72,187	[1]
Jim Clark	71,701	[1]
John Harris	69,671	[1]
Robert Caylor	69,630	[1]
James Wayne Estep	67,827	[1]
Clinton L Ramey	67,787	[1]
Curtis Laws	66,259	[1]
Gary Dotson et al	66,137	[1]
William F Adams	65,079	[1]
Elmer Kincaid Jr	64,023	[1]
William R Ward et al	63,586	[1]
Bobby R Elswich et al	63,377	[1]
Consolidated Energy Inc	60,532	[1]
Edward Helfrich et al	60,150	[1]
Billy Wright	59,587	[1]
Kevin Washburn	59,281	[1]
Jerry C Whitt et al	58,266	[1]
Ernest E Varney et al	58,165	[1]
Randall G Vance	58,140	[1]
James Larry Jamieson	57,833	[1]
William D Barnette et al	56,722	[1]
Francis H McCullough et al	56,569	[1]
D Kent Glover	56,530	[1]
William J Paulisick et al	56,405	[1]
Paul D Corbin et al	56,224	[1]
James V Filiaggi Jr	55,432	[1]
Dennis Creg Yonts	55,117	[1]
Clyde Meenach et al	54,771	[1]
Charles J Douglas	54,232	[1]
Leonard Swisher	52,716	[1]
Kevin Hall	52,034	[1]
Barry Runyon et al	51,603	[1]
John R Kellar	51,546	[1]
Mike Newsome	50,906	[1]
Gerald Peacock et al	50,148	[1]
Gerald D Thomas	49,630	[1]
Frank H Ikerd III	49,050	[1]
William E Nesselrotte	48,711	[1]
Perry Allen Whited	48,548	[1]
Robert E Elkin	48,427	[1]
David E Godin	47,541	[1]
John G Rocovich Jr et al	47,024	[1]
Alvin J Roman	46,722	[1]
Ray E Collett et al	46,085	[1]
William Haskins et al	45,525	[1]
James G Shank	44,350	[1]
Edsel H Preece et al	43,470	[1]
Beard Company	42,693	[1]
Charles T Norman	42,594	[1]
Larry Vance	42,404	[1]

Vhonda Dotson	42,401	[1]
Greg Fleenor	42,321	[1]
Connie Bryant	42,119	[1]
Elijah J Helton	41,371	[1]
Randall Wagers et al	41,251	[1]
Elster Mc Clanahan et al	41,104	[1]
James R Gibbs et al	40,276	[1]
Leonard Hendrickson	40,129	[1]
Scott B Kimmel	39,878	[1]
Joseph Teodori et al	39,308	[1]
Michael D Poskas	38,987	[1]
Fred McGlothlin et al	38,621	[1]
Brian K Reichard	38,600	[1]
Harold Sturgill	38,000	[1]
John R Demuth et al	37,729	[1]
Jeremy Lynn Stewart	36,965	[1]
George Begley et al	36,852	[1]
(Charles) Ralph Sutton et al	36,569	[1]
Bernard J Kuperavage Jr et al	36,473	[1]
John A Kosky	36,019	[1]
Bull Mountain Coal Properties Inc	35,111	[1]
Dennis Daniels	35,005	[1]
Thomas H Loughry et al	34,700	[1]
Ricky Blair	34,116	[1]
Robin Belcher	34,112	[1]
David L Huffman	33,560	[1]
Hung Q Nguyen	33,560	[1]
Billy R Daugherty	33,002	[1]
Kelly K Felts	32,996	[1]
Kres B VanDyke	32,923	[1]
David E Hess et al	32,337	[1]
Douglas K Tackett et al	31,355	[1]
David C Gummere	31,177	[1]
Russell Stacy	31,025	[1]
Albert Carapellotti et al	30,131	[1]
Brian K Short et al	29,452	[1]
Johnny Goley et al	29,266	[1]
Randy F Stout	28,475	[1]
John Asher et al	28,459	[1]
Stuart Renfro	28,389	[1]
David D Svonavec et al	28,184	[1]
David L Patterson Jr	27,796	[1]
Carl Ferguson	27,608	[1]
Citore Coal Co Inc et al	27,250	[1]
Jennifer N Szakacs	26,721	[1]
Charles R Sheesley Sr	26,450	[1]
Robert Helton	25,894	[1]
Cliff Bartley	25,452	[1]
Ronald J Kuperavage	25,274	[1]
Thomas Kraynak et al	25,186	[1]

Timothy R Mowry	25,073	[1]
Shad B Spencer	24,856	[1]
Judith Smith et al	24,419	[1]
Richard Maynard	24,180	[1]
Waste Management Inc	24,160	[1]
Gary N Boyd	23,843	[1]
Randy Hensley	23,578	[1]
Joe L Cusick et al	23,270	[1]
Donald Simpson	23,195	[1]
AES Corp	22,445	[1]
Thomas S Hynoski et al	22,378	[1]
Dennis B Hagerman	22,377	[1]
Kenneth M Pollock et al	22,300	[1]
Donald E Kahle Jr et al	21,997	[1]
Rocky Hill	21,980	[1]
Wally T Fetterolf	21,786	[1]
Alon Ballenger	21,450	[1]
Justin L Curry	21,413	[1]
David M. Raynard	20,788	[1]
Harold P Leasure et al	20,187	[1]
Albert F Stiffler	19,911	[1]
Perry Queener et al	19,868	[1]
James W Cooper	19,758	[1]
Andrew J Freno	19,280	[1]
Charlie Sorokach et al	19,166	[1]
Debbie S. Rose	19,073	[1]
Ronald G Goff	19,045	[1]
Rob Mears et al	18,906	[1]
Cory Lee Shawver	18,875	[1]
Jody Puckett	18,662	[1]
Ricky D Kirk et al	18,631	[1]
Warren C Hartman	18,108	[1]
Paul A Cooney et al	17,985	[1]
Benjamin Wurts et al	17,876	[1]
Randy C Rothermel et al	17,418	[1]
Barry C Brocious et al	17,304	[1]
Roger L Miller	17,069	[1]
Jeffrey K Justus et al	17,006	[1]
Donald Miller et al	16,590	[1]
Mark Houser et al	16,412	[1]
Morris G Thompson	15,868	[1]
Mark E Daugherty	15,752	[1]
Daniel J Patterson	15,644	[1]
Kurt E Kerry	15,515	[1]
Noah White Jr	15,460	[1]
Kern Brashear	15,283	[1]
Hugh Slatery et al	15,165	[1]
Ronald L Gray	15,019	[1]
Emanuel A. Paris	14,909	[1]
Leonard Hendrickson et al	14,897	[1]

David A Betscher Et Al	14,782	[1]
Edward Fiala	14,395	[1]
Glen D Pope	14,302	[1]
Joseph W Zaprazny	14,203	[1]
Mark Popple et al	14,200	[1]
David L Cordill	13,810	[1]
William E Konya et al	13,659	[1]
Walter R Lindenmuth	13,545	[1]
Harvey Bumbarger	13,498	[1]
Jimmie D Lester	13,475	[1]
Jeffery S Sisler	13,310	[1]
Alan Larson et al	13,248	[1]
Troy Soberdash et al	13,204	[1]
Lloyd Cole et al	13,089	[1]
Alan D Clark et al	12,978	[1]
Eugene Byrum et al	12,919	[1]
Joseph Balazick et al	12,651	[1]
John Melochick	12,573	[1]
Donald C Bender et al	12,390	[1]
Kevin Gamblin	12,383	[1]
Gary Gioia	12,201	[1]
Timothy A Keck	11,876	[1]
Stephen N Peles	11,654	[1]
Donald Thompson	11,386	[1]
Donald E Stash Jr	11,357	[1]
Matthew J Polenik	11,307	[1]
Michael R Shelton	11,158	[1]
Frank Parks	11,080	[1]
Vincent Kassa	10,798	[1]
Gary R Cruey et al	10,765	[1]
Terry G Loving	10,749	[1]
Paul M Whatley	10,745	[1]
Jerry Volk et al	10,701	[1]
David L Hansen	10,543	[1]
Mark Horton et al	10,009	[1]
Steve Singleton et al	9,912	[1]
Gilbert L Barnes et al	9,708	[1]
Jimmy Wright	9,688	[1]
Jerry M Grant	9,663	[1]
Elmer S Campbell et al	9,657	[1]
Joe B Test	9,589	[1]
John R Yenzi Jr	9,520	[1]
Julian T Hammond	9,439	[1]
Oscar Hatten et al	9,399	[1]
David S Himmelberger	9,231	[1]
Dennis Kasubick et al	9,179	[1]
Arthur (David) Montgomery	8,926	[1]
Anthony J Ripepi	8,894	[1]
Michael L Horn et al	8,874	[1]
Robert W Titus	8,859	[1]

Ralph T Smith	8,798	1
Albert Michael Capps	8,695	1
Joseph A Robinson	8,616	1
Troy Lee Girdner	8,535	1
Charles C Swenglish	8,370	1
Rickey E Hause	8,331	1
George K Walker	8,318	1
Roger Bressler	8,246	1
Harold Craft	8,223	1
David Job Suender	8,217	1
Daniel J Joy et al	8,179	1
Frank M Neumeister	8,154	1
Steve J Patterson	7,914	1
Steve A Rife	7,878	1
Mark D Bevan	7,775	1
Warren Weaver et al	7,680	1
Kenneth S Bowling et al	7,670	1
Harry E Freed	7,611	1
Jesse L Stephens	7,451	1
Michael S Carcia	7,346	1
Eugene T Sosko	7,180	1
Larry Jordan	7,106	1
Brian Edmonds	7,000	1
William C Vought	6,997	1
David Rayner et al	6,643	1
Mike Fredrick et al	6,486	1
Jay Wallace	6,448	1
Douglas Vaughn	6,268	1
Daniel P Maksimik Jr	6,262	1
Bradley B Hopkins	6,193	1
Eddie Rowe	6,093	1
Chris E Kerstetter et al	5,983	1
Roger A Thomas et al	5,524	1
Rodney A Robinson et al	5,384	1
Jeff Kinser	5,222	1
Gary Berkley	5,212	1
Melvin Schaney	5,097	1
Robert R Stremick et al	5,036	1
Thomas L Hill	4,784	1
Patrick H Cunningham et al	4,651	1
Larry M Fahr	4,547	1
Roger Ohler	4,533	1
Richard M Oley	4,495	1
Clyde D Fields	4,412	1
Paul Ferlitch	4,404	1
Philip Reese	4,203	1
James M Allen	4,175	1
Amy J Johnson	4,056	1
Gabriel J Stewart	3,944	1
Ash English et al	3,596	1

John E Ling	3,543	[1]
Alfred J Brown	3,452	
Mike Ritchie	3,451	[1]
Ricky G Derck et al	3,414	[1]
James Hood et al	3,274	[1]
Darryl Koperna	3,085	[1]
C Dan Burton	3,000	[1]
Kerry Harris	3,000	[1]
Frank A Muscara	2,955	[1]
Vogel Disposal Service Inc	2,769	[1]
Joseph Patrick Fremer Jr	2,740	[1]
Everett Shepherd II	2,690	[1]
Paul Hitchcock	2,619	[1]
Robert Cuomo	2,597	[1]
Dave Finney	2,589	[1]
Darryl W Lucas Sr	2,577	[1]
Darwin Rowe et al	2,490	[1]
Philip M Koury	2,460	[1]
Roy E Collins	2,454	[1]
Pat L Martin et al	2,421	[1]
Henry Comer	2,397	[1]
Chris Davis	2,368	[1]
Darryl M Jacobs	2,208	[1]
Eugene F Morton	2,164	[1]
Amanda Halcomb	2,017	[1]
Gregg Barrett	1,998	[1]
George L Rusnak et al	1,980	[1]
Larry Weaver	1,899	[1]
Jefferson Martin et al	1,880	[1]
Brian J Black	1,869	[1]
Paul Beilchick	1,844	[1]
Joseph P Cromyak	1,838	[1]
Richard Piccolomini	1,800	[1]
D L (Jack) Bowling	1,785	[1]
Rick H Varney	1,580	[1]
Thomas J Lynott	1,573	[1]
Gregory S Showers et al	1,529	[1]
Donald F Mauthe	1,468	[1]
Kenneth K Rishel	1,438	[1]
Lawrence Bender et al	1,385	[1]
Matthew S Postupack et al	1,360	[1]
Steve Bentley et al	1,155	[1]
W Ruskin Dressler	1,141	[1]
Vulcan Coal Partners LP	1,104	[1]
Harold J Rehe	1,099	[1]
Matt Short	1,074	[1]
Michael Supko et al	1,051	[1]
Michael S. Carsia et al	939	[1]
Alan Churchill	693	[1]
Todd Morchesky	657	[1]

Jim Fahr et al	643	[1]
Thomas Klinger et al	625	[1]
Michael A Botner et al	490	[1]
Jerry W Lucas Jr	477	[1]
William Reiner et al	449	[1]
Jim Kummerfeld	443	[1]
Greg Schenck	419	[1]
Paul F Becker	403	[1]
Michael Rothermel et al	384	[1]
Regina A Constantica et al	377	[1]
William A Long et al	333	[1]
Barry Karnes	297	[1]
Jim Hall et al	236	[1]
Robert Bowers et al	183	[1]
Joseph E Shingara	120	[1]
Marvin Hays	86	[1]
Kevin E Thompson	55	[1]
Calvin Hepler	48	[1]

Notes: (1) Production is less than 0.05% of U.S. total.

APPENDIX 2
Matrix of Federal Reporting Requirement on Coal

Coal Production

Agency	Reporting Form Full Official Title	Who must file the report?	What percent of facilities and fuel flow does the report capture? (i.e., what is the coverage of the industry?)	Facility Level of Report (facility name and owner)	What is Reported (product and units?)	How is ownership of the fuel throughput treated in the report form?	What is the threshold for reporting, i.e., minimum level of throughput or facility size?	What is the frequency of Reporting?	How does the facility collect the data reported?	Would the facility need this information without the reporting requirement?	Is the information reported publicly available? Any restrictions?	What are the verification or certification procedures?	What are the Agency's QA/QC requirements?	Summary Comments: How good is this report for gaining an accurate accounting of fuel and carbon?
Energy Information Administration	Coal Production Report; Form EIA-7A	Mine operators	1,542 total respondents to form	Mine	Coal production operations, locations, productive capacities, coal beds mined, reserves, and disposition (volumes and revenues received). For coal preparation, information collected includes operations, locations, productive capacity, disposition, and coal prepared.	Not specified	Greater than 10,000 short tons	Annual	Mail, facsimile, or internet submission to EIA.	Yes	Parts are public others confidential	Sanctions against incorrect submission	Not known	Currently no tracking of carbon. Tracks fuel quantity and other fuel characteristics.
MSHA	Quarterly Mine Employment and Coal Production Report; MSHA 7000-2	Mine operators	All mines	Mine level	Employees, work hours, coal production.	Not specified	All	Quarter		Yes	Parts are public others confidential	MSHA may request verification of data.	Not known	Data is limited to only production and employee data.

Coal Imports and Exports

Agency	Reporting Form Full Official Title	Who must file the report?	What percent of facilities and fuel flow does the report capture? (i.e., what is the coverage of the industry?)	Facility Level of Report (facility name and owner)	What is Reported (product and units?)	How is ownership of the fuel throughput treated in the report form?	What is the threshold for reporting, i.e., minimum level of throughput or facility size?	What is the frequency of Reporting?	How does the facility collect the data reported?	Would the facility need this information without the reporting requirement?	Is the information reported publicly available? Any restrictions?	What are the verification or certification procedures?	What are the Agency's QA/QC requirements?	Summary Comments: How good is this report for gaining an accurate accounting of fuel and carbon?
Census Bureau	EM545	Coal exporters	All exporters	N/A	Commodity type, country destination, customs district origin, quantity (tons), and value (dollars)	Not specified	All coal exports	Monthly	Not known	Yes	Public	Not known	Not known	Fuel characteristics not tracked
Census Bureau	IM145	Coal importers	All importers	N/A	Commodity type, country origin, customs district destination, quantity (tons), and value (dollars)	Not specified	All coal imports	Monthly	Not known	Yes	Public	Not known	Not known	Fuel characteristics not tracked
Energy Information Administration	Power Plant Report; Form EIA-906	Power plants	1400 plants file monthly, 3000 plants file annually	Plant level	Fuel consumption, heat content, electric generation, and fuel stocks	Not specified	Plants greater than 1 MW capacity	Month/annual	Mail/electronic submission	Yes	Public, but "Stocks at End of Reporting Period" will be confidential	Not known	Not known	Discontinued in 2008
Energy Information Administration	Combined Heat and Power Plant; Form EIA-920	CHP plants	300 plants file monthly, 700 plants file yearly	Plant level	Fuel consumption, heat content, electric generation, and fuel stocks	Not specified	Plants greater than 1 MW capacity	Month/annual	Mail/electronic submission	Yes	Public, but "Stocks at End of Reporting Period" will be confidential	Not known	Not known	Discontinued in 2008
Energy Information Administration	Monthly Cost and Quality of Fuels for Electricity Plants; Form EIA-423	Nonutility power plants	740 non-utility power plants	Plant level	Fuel quantity received, quality (Btu, sulfur, and ash content), purchase type, cost, contract expiration date, tolling agreements, and supplier of fossil fuels delivered for the generation of electric power. In addition, for coal only, data will include type of mine and the State and county where the mine is located.	Not specified	Nonutility plants greater than 50 MW capacity	Month/annual	Mail/electronic submission	Yes	Public, but "fuel cost data" will be confidential	Not known	Not known	Discontinued in 2008
FERC	Cost and Quality of Fuels for Electric Plants; FERC From-423	Utility Power plants	All utility plants	Plant level	Fuel quantity received, quality (Btu, sulfur, and ash content), purchase type, cost, contract expiration date, tolling agreements, and supplier of fossil fuels delivered for the generation of electric power. In addition, for coal only, data will include type of mine and the State and county where the mine is located.	Not specified	All utility plants	Month/annual	Mail/electronic submission		Public	Not known	Not known	Discontinued in 2008
Energy Information Administration	Power Plant Operations Report; Form EIA-923	All electric power plants and CHP plants over 1 MW	All utility and nonutility plants	Plant level	Electric power generation, fuel consumption, fossil fuel stocks, and delivered fossil fuel cost and quality	Not specified	All plants 1 MW or greater that have the ability to draw power from the grid or deliver power to the grid.	Month/annual	Mail/electronic submission	Yes	Public, but nonutility cost data is confidential	Not known	Not known	Carbon not reported, but quantity and source of coal reported as well as other fuel characteristics

Coal Distribution and Consumption

Agency	Reporting Form Full Official Title	Who must file the report?	What percent of facilities and fuel flow does the report capture? (i.e., what is the coverage of the industry?)	Facility Level of Report (facility name and owner)	What is Reported (product and units?)	How is ownership of the fuel throughput treated in the report form?	What is the threshold for reporting, i.e., minimum level of throughput or facility size?	What is the frequency of Reporting?	How does the facility collect the data reported?	Would the facility need this information without the reporting requirement?	Is the information reported publicly available? Any restrictions?	What are the verification or certification procedures?	What are the Agency's QA/QC requirements?	Summary Comments: How good is this report for gaining an accurate accounting of fuel and carbon?
Energy Information Administration	Quarterly Coal Consumption and Quality Report Manufacturing Plants; Form EIA-3	Manufacturing Plants	496 total respondents to form	Plant level	Origin, quantity, primary transportation mode, quality (i.e., Btu, sulfur, and ash contents), and cost; short tons	Not specified	Greater than 1000 short tons	Quarter	Mail/electronic submission	Yes	Parts are public others confidential	Not known	Not known	Tracks quantity, heat content, sulfur and ash but not carbon
Energy Information Administration	Quarterly Coal Consumption and Quality Report Coke Plants; Form EIA-5	All operating coke plants	19 total respondents to form	Plant level	Coal receipts, costs, carbonization, and stocks, as well as coke and breeze production, distribution, and stocks at all U.S. coke plants; short tons	Not specified	All coke plants	Quarter	Mail/electronic submission	Yes	Parts are public others confidential	Not known	Not known	Tracks quantity, volatile matter, sulfur and ash but not carbon
Energy Information Administration	Coal Distribution Report; Form EIA-6A	Coal mining companies, wholesale coal dealers (including brokers), and retail coal dealers	934 total respondents to form	Company	Coal production, purchases, d	Not specified	Greater than 50,000 short tons	Annual	Mail/electronic submission	Yes	Parts are public others confidential	Not known	Not known	Only tracks quantity of coal distributed, no characteristics tracked.
Energy Information Administration	Power Plant Report; Form EIA-906	Power plants	1400 plants file monthly, 3000 plants file annually	Plant level	Fuel consumption, heat content, electric generation, and fuel stocks	Not specified	Plants greater than 1 MW capacity	Month/annual	Mail/electronic submission	Yes	Public, but "Stocks at End of Reporting Period" will be confidential	Not known	Not known	Discontinued in 2008
Energy Information Administration	Combined Heat and Power Plant; Form EIA-920	CHP plants	300 plants file monthly, 700 plants file yearly	Plant level	Fuel consumption, heat content, electric generation, and fuel stocks	Not specified	Plants greater than 1 MW capacity	Month/annual	Mail/electronic submission	Yes	Public, but "Stocks at End of Reporting Period" will be confidential	Not known	Not known	Discontinued in 2008
Energy Information Administration	Monthly Cost and Quality of Fuels for Electricity Plants; Form EIA-423	Nonutility power plants	740 non-utility power plants	Plant level	Fuel quantity received, quality (Btu, sulfur, and ash content), purchase type, cost, contract expiration date, tolling agreements, and supplier of fossil fuels delivered for the generation of electric power. In addition, for coal only, data will include type of mine and the State and county where the mine is located.	Not specified	Nonutility plants greater than 50 MW capacity	Month/annual	Mail/electronic submission	Yes	Public, but "fuel cost data" will be confidential	Not known	Not known	Discontinued in 2008
FERC	Cost and Quality of Fuels for Electric Plants; FERC From-423	Utility Power plants	All utility plants	Plant level	Fuel quantity received, quality (Btu, sulfur, and ash content), purchase type, cost, contract expiration date, tolling agreements, and supplier of fossil fuels delivered for the generation of electric power. In addition, for coal only, data will include type of mine and the State and county where the mine is located.	Not specified	All utility plants	Month/annual	Mail/electronic submission		Public	Not known	Not known	Discontinued in 2008
Energy Information Administration	Power Plant Operations Report; Form EIA-923	All electric power plants and CHP plants over 1 MW	All utility and nonutility plants	Plant level	Electric power generation, fuel consumption, fossil fuel stocks, and delivered fossil fuel cost and quality	Not specified	All plants 1 MW or greater that have the ability to draw power from the grid or deliver power to the grid.	Month/annual	Mail/electronic submission	Yes	Public, but nonutility cost data is confidential	Not known	Not known	Carbon not reported, but quantity and source of coal reported as well as other fuel characteristics

APPENDIX 3
Carbon Content at Given Level of Energy Content

Btu/lb	Carbon %
2,000	11.40
2,250	12.83
2,500	14.25
2,750	15.68
3,000	17.10
3,250	18.53
3,500	19.95
3,750	21.38
4,000	22.80
4,250	24.23
4,500	25.65
4,750	27.08
5,000	28.50
5,250	29.93
5,500	31.35
5,750	32.78
6,000	34.20
6,250	35.63
6,500	37.05
6,750	38.48
7,000	39.90
7,250	41.33
7,500	42.75
7,750	44.18
8,000	45.60
8,250	47.03
8,500	48.45
8,750	49.88
9,000	51.30
9,250	52.73
9,500	54.15
9,750	55.58
10,000	57.00
10,250	58.43
10,500	59.85
10,750	61.28
11,000	62.70
11,250	64.13
11,500	65.55
11,750	66.98
12,000	68.40
12,250	69.83
12,500	71.25
12,750	72.68
13,000	74.10
13,250	75.53

13,500	76.95
13,750	78.38
14,000	79.80
14,250	81.23
14,500	82.65
14,750	84.08
15,000	85.50
15,250	86.93
15,500	88.35