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CQ Inc.

Characterization and Evaluation of the Cleanability of Subbituminous Coals from the Powder River Basin

Final Report

to

U.S. Department of Energy
Pittsburgh, Pennsylvania
DE-FC22-90PC89663

Electric Power Research Institute
Palo Alto, California
RP1400-25

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June 23, 1993

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Report No. 90DO101-04

ACKNOWLEDGMENTS

The following individuals and organizations are acknowledged for their cooperation and support for the work detailed in this report:

- Mr. Robert J. Evans, Project Manager, The United States Department of Energy - Pittsburgh Energy Technology Center.
- Mr. David C. O'Connor, Project Manager, The Electric Power Research Institute - Fossil Fuels Power Plants Department.
- Mr. David W. Simpson, Vice President of Operations, Westmoreland Resources, Inc.
- Ms. Kathleen Doran, Senior Mining Engineer, Western Energy Company.
- Mr. Bruce A. Taylor, Manager - Coal Quality, AMAX Coal Company - Western Operations.
- Mr. David Byer, Coal Quality Engineer, Powder River Coal Company.
- Messrs. Thomas Suchomel, Engineering Geologist, and James Kandolin, Technical Manager, Antelope Coal Company.
- Messrs. Joseph N. Brobjorg, Senior Research Engineer, and Dennis F. Wanless, Fuels Operation Specialist, Northern States Power Company.

Mr. John M. McClintock, CQ Inc., is also acknowledged for his assistance in preparing many of the data graphics for this report.

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EXECUTIVE SUMMARY

Under the U. S. Clean Coal Technology Program, the Department of Energy and the Electric Power Research Institute (EPRI) are funding development and demonstration of the Coal Quality Expert (CQE™)--a computer program that will predict the impacts of coal quality on power plant performance and costs, including effects related to emissions control. CQ Inc. (a wholly-owned subsidiary of EPRI) and ABB Combustion Engineering Systems Division are managing this project, which will demonstrate the economic and environmental benefits relative to utility boiler performance and electric power generation that can be realized from cleaning U.S. coals.

Background

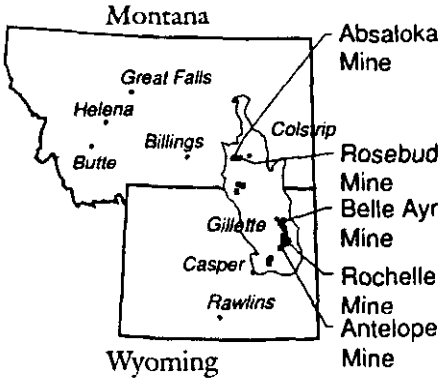
In 1991, in conjunction with combustion field testing at Northern States Power Company's Allen S. King Station in Bayport, Minnesota, CQ Inc. completed characterization studies on five Powder River Basin subbituminous coals. The primary objectives of this work were to:

CQE Field Testing - Site 3. *Coals from Powder River Coal Company and Westmoreland Resources, Inc. were blended with petroleum coke in two different proportions to produce a baseline and an alternate fuel for fireside testing at Northern States Power Company's Allen S. King Station.*

- Characterize the two Powder River Basin coals that were burned at King station during combustion field testing for the CQE project.
- Obtain additional coal quality information on several other low-rank, subbituminous coals in order to expand EPRI's Coal Quality Information System (CQIS™)--a database of specific coal quality information on major U.S. coals that will be used in the CQE.
- Evaluate the potential for improving the quality of Powder River Basin coals through physical coal cleaning, including examination of the extent that cleaning can remove potentially toxic trace elements.

Approach

With assistance from Northern States Power Company (NSP), CQ Inc. identified and contacted candidate mines for coal sampling. It was intended that chosen sites should represent most of the range of coal qualities produced throughout the expanse of the Powder River Basin. Of the candidate mine sites, five were able to participate in CQE coal sampling and characterization efforts:



Mine Locations. *Participating mines in the Powder River Basin.*

- Westmoreland Resources, Inc. - Absaloka Mine
  Big Horn County, Montana
- Western Energy Company - Rosebud Mine
  Rosebud County, Montana
- AMAX Coal Company - Belle Ayr Mine
  Campbell County, Wyoming
- Powder River Coal Company - Rochelle Mine
  Campbell County, Wyoming
- Antelope Coal Company - Antelope Mine
  Converse County, Wyoming

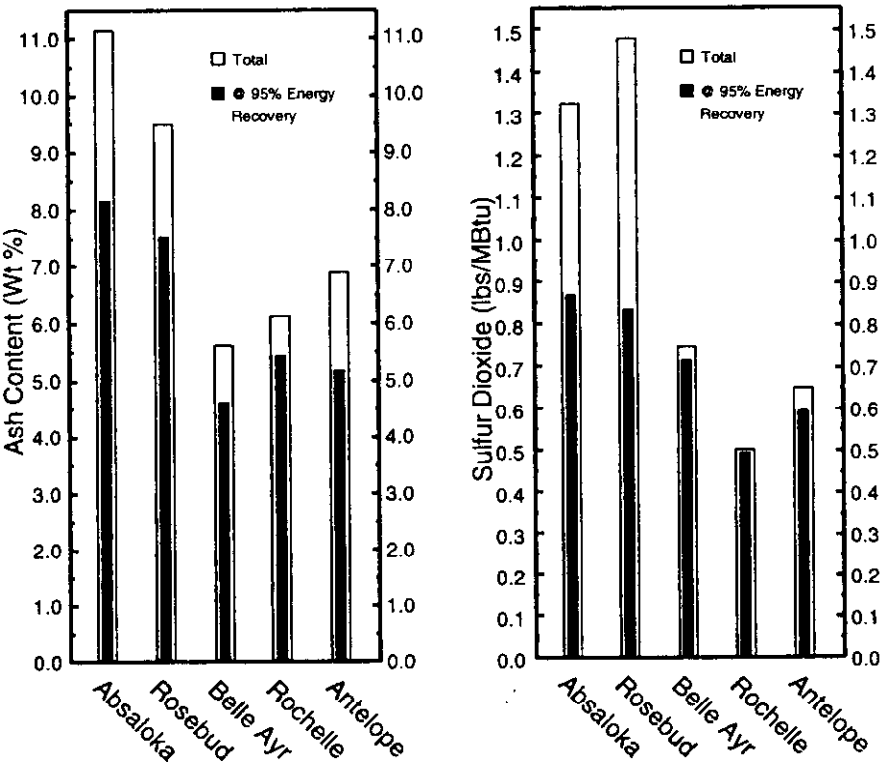
Over periods of three to seven days, CQ Inc. engineers and technicians collected approximately 14 tons of raw coal from each participating mine by manually or mechanically splitting samples from coal streams that had been sampled by in-place, automatic systems. One split was collected for every cycle completed by an automatic system. All samples were purged with dry-ice (solidified carbon dioxide gas) to retard oxidation and reduce moisture loss as much as possible during transport to the laboratory for characterization analyses.

Results

The results of raw coal characterization and liberation potential studies on five Powder River Basin coals indicate that moderate improvements in coal quality can be achieved through physical coal cleaning. As indicated in Figure S-1, between 30 and 40 percent of the potential sulfur dioxide emissions from the Montana coals can be reduced through cleaning, while maintaining 95 percent energy recoveries. If cleaned, these coals would meet the 1990 Clean Air Act Amendments Phase II compliance level of 1.2 lbs SO_2/MBtu for sulfur dioxide emissions. Cleaning would also reduce coal ash levels by about 15 percent. Moreover, crushing to a topsize of 100 mesh and physically cleaning these coals can help improve the rejection of ash-forming and sulfur-bearing minerals by another 10 percent.

Crushing to a topsize of 100 mesh and cleaning Wyodak Seam subbituminous coals from Wyoming can decrease their ash contents by 10 to 20 percent. Crushing and cleaning Wyodak-Anderson Seam coal can theoretically decrease ash

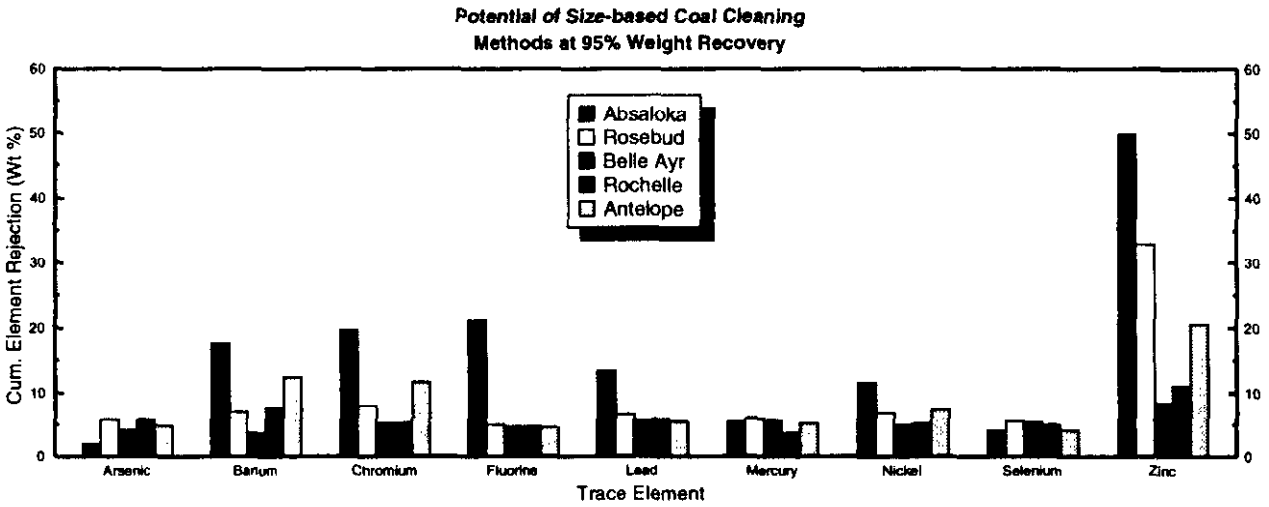
Figure S-1. Potential Ash and Sulfur Dioxide Reduction From Uncrushed Powder River Basin Coals During Coal Cleaning

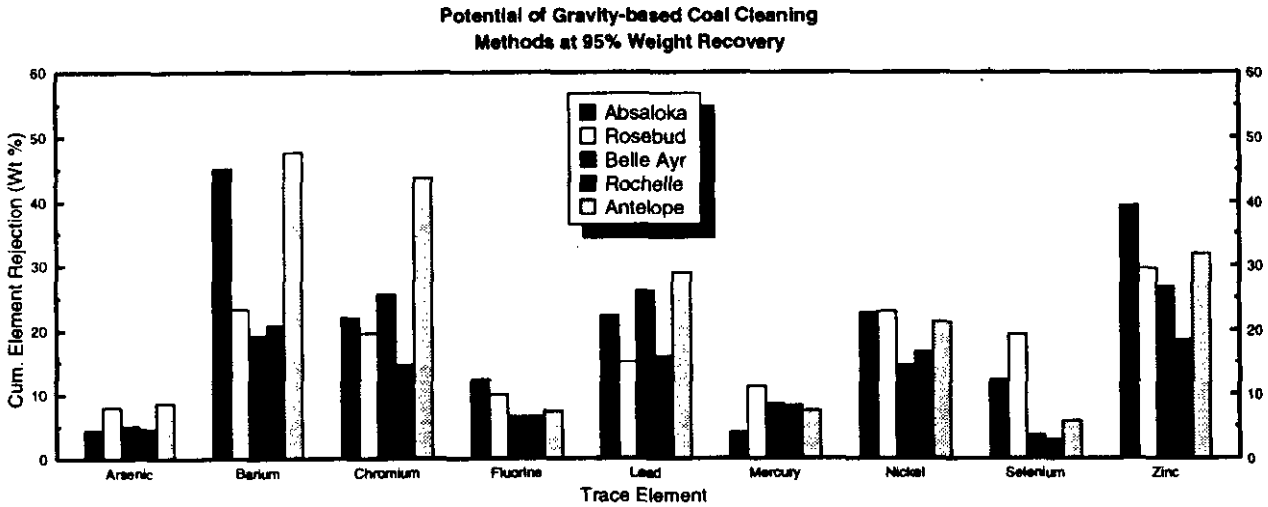


levels over 40 percent and decrease potential sulfur dioxide emissions as much as ten percent. However, all of the Wyoming coals in this study already have potential sulfur dioxide emissions within compliance levels. Crushing and sizing Montana and Wyoming subbituminous coals would probably reduce the clay content of each coal somewhat, thereby reducing their ash and alkali contents.

Evaluation of extensive trace element analyses completed on the five Powder River Basin coals show that coal cleaning may potentially reject anywhere from zero to 50 percent of the amount of each of nine elements of concern in run-of-mine coal. As shown in Figure S-2, sizing the two Montana coals and Antelope Mine coal should effectively reject

Figure S-2. Potential Rejection of Trace Elements During Coal Cleaning





significant amounts of barium, chromium, fluorine, lead, nickel, and zinc without sacrificing more than about five percent coal yield. In all of the samples characterized, using gravity-based coal cleaning techniques to decrease the amounts of barium, chromium, lead, nickel, and zinc while achieving 95 percent coal yield also shows good promise. Crushing run-of-mine coals to minus 100 mesh to improve the rejection of trace elements during coal cleaning can be somewhat effective, but it is probably not worth the extra cost.

In general, mineral matter and trace elements in the coals from the northeastern and southeastern extremes of the Powder River Basin can likely be more easily rejected than those within coals from the interior portions of the basin. The cost of cleaning Powder River Basin coals in a dry-process operation (an air-table plant) or in a simple, wet-process operation (dry screen/jig plant) is around $1.20/raw-ton.

Finally, characterization of a petroleum coke, which is sometimes used in conjunction with low rank coals to fire utility boilers to increase heat rate, shows that physical coal cleaning processes probably cannot be used to reduce the concentrations of either sulfur or trace elements from these inherently low-ash fuels.

INTRODUCTION

As part of the United States Clean Coal Technology Program, CQ Inc. and ABB Combustion Engineering are managing the development and demonstration of the Coal Quality Expert (CQE™)--an expert system capable of predicting the impacts of coal quality on power plant costs, performance, and emissions control. Being developed under the sponsorship of the U.S. Department of Energy and the Electric Power Research Institute (EPRI), this computer program will be a useful tool for the power generation industry in predicting changes in boiler performance resulting from combustion of different coals of different qualities. The CQE will help its users identify cost-effective strategies for future purchasing, transporting, and combusting of suitable coals.

Slagging. *The deposition and accumulation of partially-molten mineral matter (slag) on heat exchange surfaces that are exposed to radiant heat areas in a boiler is referred to as slagging.*

Fouling. *The sintering or chemical deposition of corrosive mineral matter on heat exchange surfaces in the convection pass of a boiler is called fouling.*

The removal of ash- and sulfur-bearing mineral matter from coals is becoming increasingly important to the power generation industry, especially since operating costs and emissions regulations continue to increase. The buildup of ash deposits in a boiler through slagging and fouling can eventually cause derates and even shutdowns. Also, with the 1990 Clean Air Act Amendments mandating more stringent control of carbon dioxide, sulfur dioxide, and nitrogen oxide emissions and with the quality of available coals diminishing, cleaning coal to produce a compliance fuel is becoming imperative. Moreover, residual-ash handling systems and post-combustion desulfurization units are expensive to install and, at times, difficult to operate and maintain efficiently. Fortunately, many studies have shown that substantial improvements in steam generation efficiency and increased savings in capital and operating costs can be realized if the quality of boiler fuels is improved.

Using CQE, utilities will be able to:

- Identify fuel options based on overall plant operations and economics.
- Develop their most economical emissions control strategies.
- Evaluate alternative engineering approaches for power plant operations and designs.

One of 20 integral models to be used in the CQE program is the Coal Quality Information System (CQIS™)--a comprehensive database that contains coal quality information on over 100 raw and clean coals. The CQE project requires expansion of this database to include more information on nationally important coals, including low-rank coals from the Powder River Basin located in southeastern Montana and northeastern Wyoming (see Figure 1).

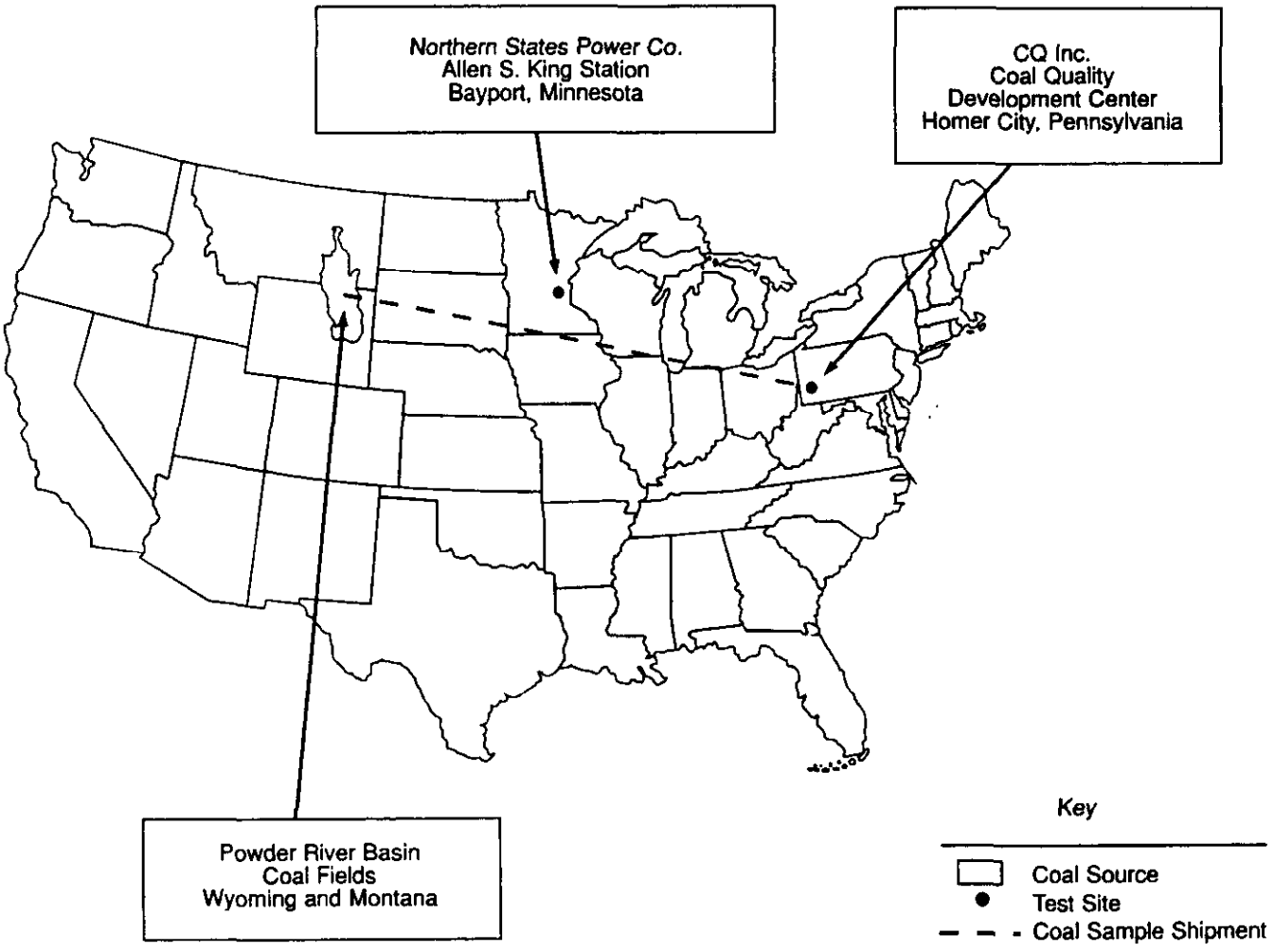
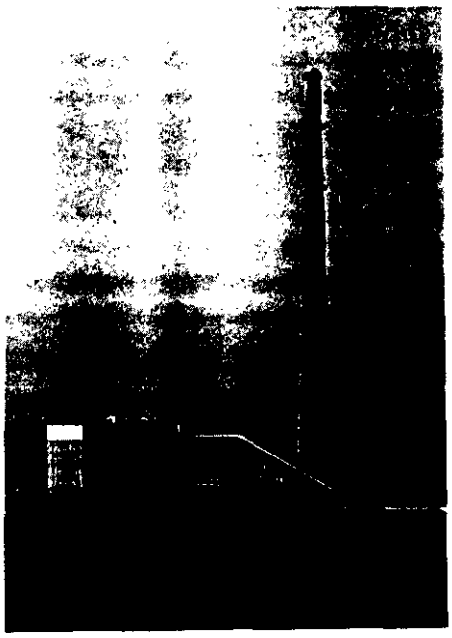


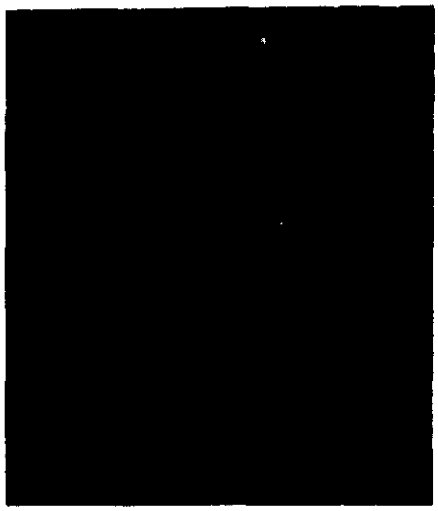
Figure 1. Sites of CQE Testing. *Northern States Power Company's King Station and Powder River Basin Coal Characterizations.*



Northern States Power Company's Allen S. King Station in Bayport, Minnesota. *This is the site of CQE's third field test.*

Coals from the Powder River Basin are currently being burned in many midwestern and southern power plants to reduce emissions of sulfur oxide compounds. At Northern States Power Company's Allen S. King Station--a 560 MW station burning a fuel blend consisting mainly of Powder River Basin subbituminous coals and petroleum coke--fireside testing and analyses are being completed to assess coal quality impacts on its cyclone-fired boiler units and to address specific boiler problems and unit performance. This unit, manufactured by Babcock & Wilcox, was originally designed to burn a midwestern bituminous coal but was converted to burn a subbituminous coal blend to reduce sulfur emissions from the base-loaded boiler.

Since converting to this coal blend, high-temperature fouling of boiler tubes in the convection pass, occasional increases in opacity in stack emissions, and minor increases in ash slagging in the furnace have resulted in derates of the boiler. It is apparent that increased utilization of Powder River Basin coals at King Station and other units may depend on the potential for coal cleaning to remove ash- and sulfur-bearing mineral matter and potentially toxic trace elements such as arsenic, beryllium, cadmium, lead, mercury, nickel, and selenium from these raw coals prior to their combustion.



High-temperature Fouling. *Ash buildup on heat exchange tubes in the convection pass of a typical coal-fired boiler.*

For the CQE project, CQ Inc. (a subsidiary of EPRI) characterized five subbituminous coals from the Powder River Basin to obtain additional information on low-rank coals of various qualities for the CQIS database. Coal samples were collected from:

- Westmoreland Resources, Inc. - Absaloka Mine
  Big Horn County, Montana.
- Western Energy Company - Rosebud Mine
  Rosebud County, Montana.
- AMAX Coal Company - Belle Ayr Mine
  Campbell County, Wyoming.
- Powder River Coal Company - Rochelle Mine
  Campbell County, Wyoming.

- Antelope Coal Company - Antelope Mine
  Converse County, Wyoming.

Previously, CQIS contained only limited amounts of information on low-rank coals, most of which were lignites. Because coal cleaning is not currently performed on Powder River Basin coals and because laboratory analyses can usually provide sufficient information to estimate the potential for removing mineral contaminants, a CQ Inc. Coal Cleanability Characterization including commercial-scale cleaning demonstrations was not deemed necessary. Moreover, the project team judged that in this case raw coal quality information on the five Powder River Basin coals was more valuable to the CQE than commercial-scale testing of only one or two coals.

This report details the results of raw coal characterizations and impurity liberation assessments for each of the five coals and examines the general theoretical cleanability of Powder River Basin coals relative to removal of mineral matter and selected trace elements.

INFORMATION ON COALS OF THE POWDER RIVER BASIN

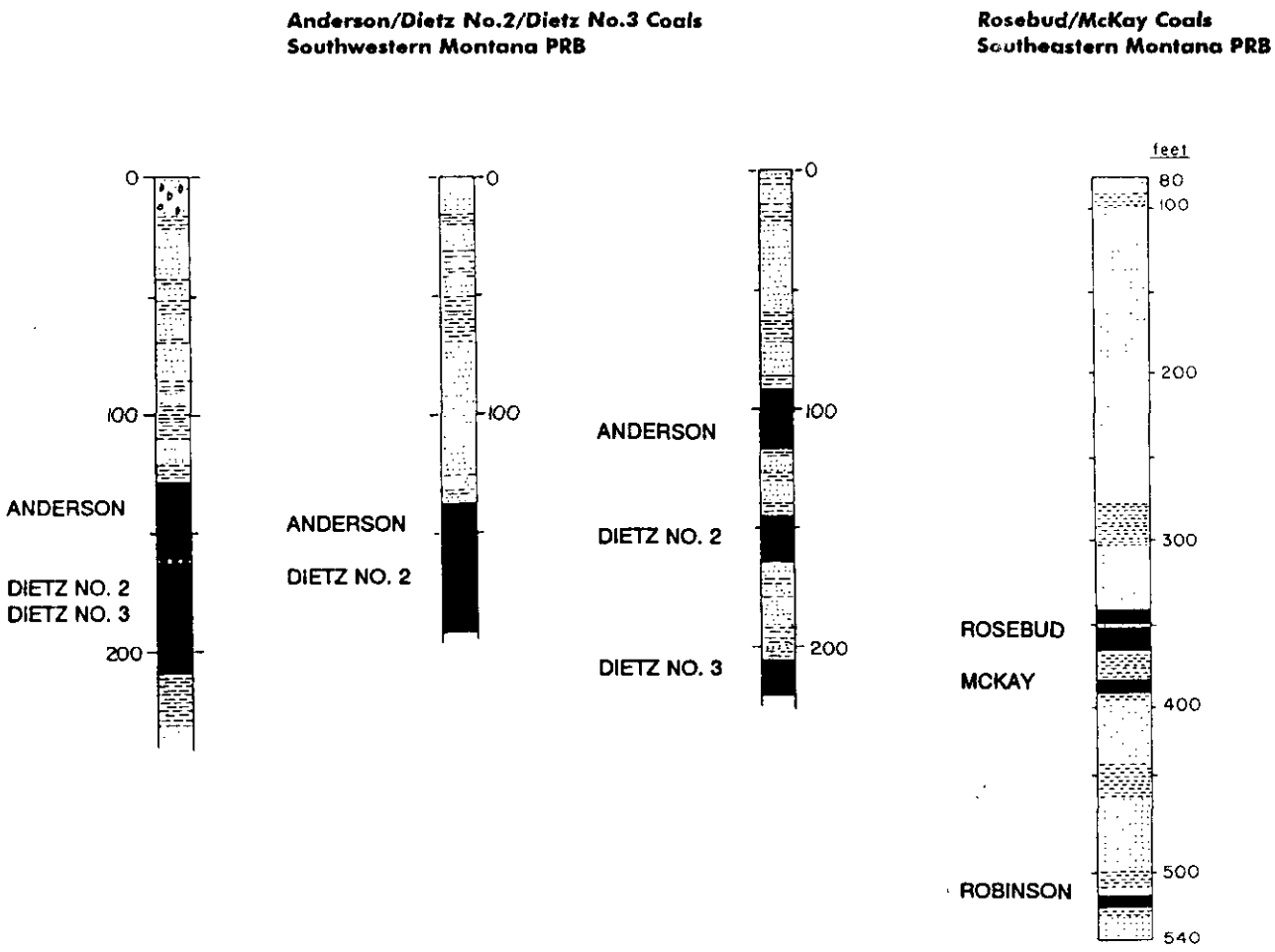
According to the U. S. Geological Survey, the Powder River Basin is located in the Northern Great Plains Coal Province in the Western Coal-Producing Region of the United States (U.S. Bureau of Mines District 19). This coal basin extends about 16,000 square miles (nearly 10,000 square miles in Wyoming and 6,000 square miles in Montana) and is comprised of over 40 minable coal fields. Coal-bearing rock formations in this basin are part of Wasatch and Fort Union strata and consist primarily of interbedded sandstones, siltstones, claystones, shale, and coal. They were deposited between 38 and 66 million years ago during the Eocene and Paleocene epochs of the Tertiary period. Estimated at 1.46 trillion tons, this coal basin has the largest amount of in-place coal resources in the continental United States.

Large-scale mining in the Powder River Basin began in the early 1920s. However, not until the early 1970s did production levels increase dramatically. This was in response to increased energy demands in the United States created by the oil embargo and increased concerns with post-combustion emittants and their effects on the environment. At the end of 1990, there were more than 20 operating mines in the Powder River Basin. Total production from these surface mines exceeded 195 million tons, representing nearly 20 percent of the total coal mined in the U.S. for the year. Over 150 million tons of the coal mined from this basin were produced from the Wyodak Seam in Wyoming alone. The largest amount of coal produced in Montana from one seam (Rosebud) was about 20 million tons. However, the Powder River Basin contains many important coal seams, only some of which correlate with the aforementioned seams.

Montana Coal Seams

Nearly 37.5 million tons of coal were produced in the Powder River Basin in Montana in 1989, while an estimated 44 million tons were produced in 1990. These tonnages were mined from only five seams: Anderson, Dietz No.2, Dietz No.3, Rosebud, and McKay, all of which are subbituminous B or C in apparent coal rank. Figure 2 shows examples of local strata sections for these coals.

The Anderson and Dietz seams have a confusing history of correlation and nomenclature, especially towards the southwestern side of the basin in Montana. The Anderson



Source: Montana Coal - Special Publication 83, Montana Bureau of Mines and Geology, 1980.

Figure 2. Strata Sections for Montana Powder River Basin Coals

Seam (USBM Code 699) has been called the Anderson-Dietz No. 1 Seam and the Dietz No. 1 Seam. Unfortunately, the Dietz No. 2 Seam (USBM Code 698) has also been known as the Dietz No. 1 Seam, while the Dietz No. 3 Seam (USBM Code 697) is sometimes called the Dietz No. 2 Seam. On the southeastern side of the

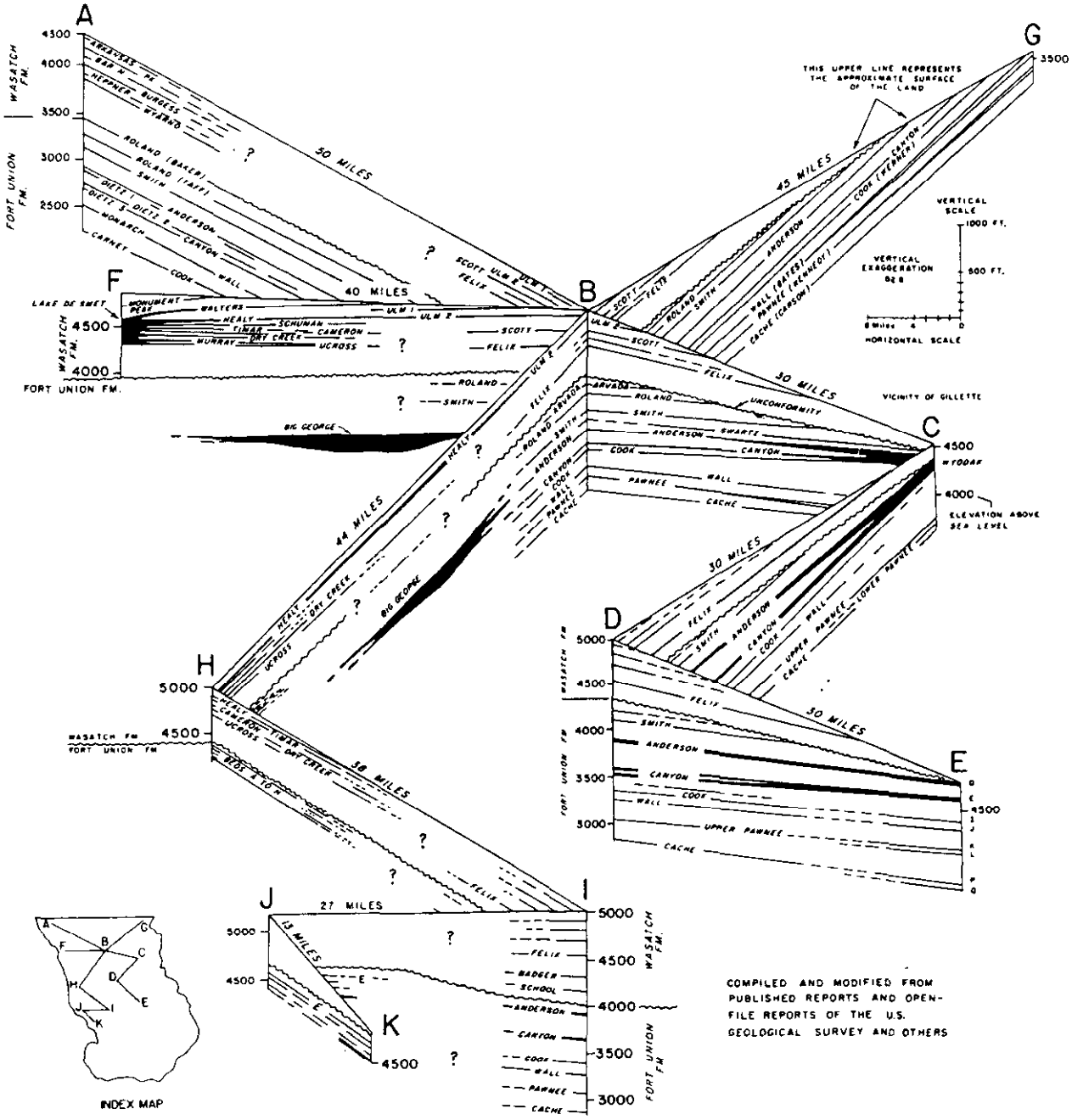
basin in Montana, these coals simply are known as the Anderson and Dietz Seams. Stratigraphically lowest in the strata, the Dietz No. 3 Seam is the oldest coal of the three while Anderson Seam coal is the youngest. All of these coal beds are also found in the Powder River Basin in Wyoming. Composites of Anderson-Dietz No. 2-Dietz No. 3 coal up to 80 feet thick and individual splits of these seams are being mined by both the Spring Creek Coal Company and the Decker Coal Company.

The Rosebud Seam (USBM Code 808), which has also been called the "Q" bed, averages 25 to 30 feet in thickness. The McKay Seam (USBM Code 525) is about 8 feet thick and is located in lower strata. In the area of Sarpy Creek, Westmoreland Resources, Inc. mines a combined Rosebud-McKay bed that is about 30 feet thick. Further to the east, near Colstrip, Western Energy Company and Peabody Coal Company mine the Rosebud Seam coal only.

Wyoming Coal Seams

In 1989, over 142 million tons of coal were mined from the Powder River Basin in Wyoming from the Wyodak and Anderson Seams. Production from these subbituminous C coal rank seams is estimated to exceed 160 million tons in 1990. Lesser amounts of coal are also produced from the Monarch and Dietz No. 3 Seams, and production from the Canyon Seam (also known as the "E" Seam) is planned for as early as 1994.

The Wyodak Seam (USBM Code 699), which is between 25 and 175-feet thick, has been called many names: Wyodak-Anderson, Anderson-Canyon, Anderson, Southern Gillette D, and Roland-Smith. However, it is now known that Wyodak Seam coal does not correlate with the stratigraphically higher Roland Seam. As shown in Figure 3, the Wyodak splits into an Upper and Lower Wyodak Coal north of Gillette, Wyoming. The Upper Wyodak then splits into the Anderson, Swartz, and Smith beds, while the Lower Wyodak splits into the Canyon and Cook Seams. To the south of Gillette, the Wyodak is comprised of splits of the Anderson, Canyon, and Cook Seams. The Wyodak Seam is also correlated with the subbituminous A-ranked coal, Big George Seam, located in the western part of the basin. The demonstrated reserve base of the Wyodak Seam is estimated to be over 19 billion tons at a depth of 200 feet.



Source: Wyoming Description of Seams, Gary B. Glass, 1992 Keystone Coal Industry Manual

Figure 3. Wyoming Powder River Basin Coal Correlations

COAL CHARACTERIZATION METHODOLOGY

CQ Inc. asked Northern States Power Company (NSP) for assistance in identifying and contacting candidate mines for coal sampling. NSP (a large purchaser of subbituminous coal from the region) recommended six mines for sampling. The coals from these mines typify most of the coal qualities produced throughout the expanse of the Powder River Basin. Of the candidate minesites, five were able to participate in CQE coal sampling and characterization efforts. Table 1 provides background summaries and general information about these mines.

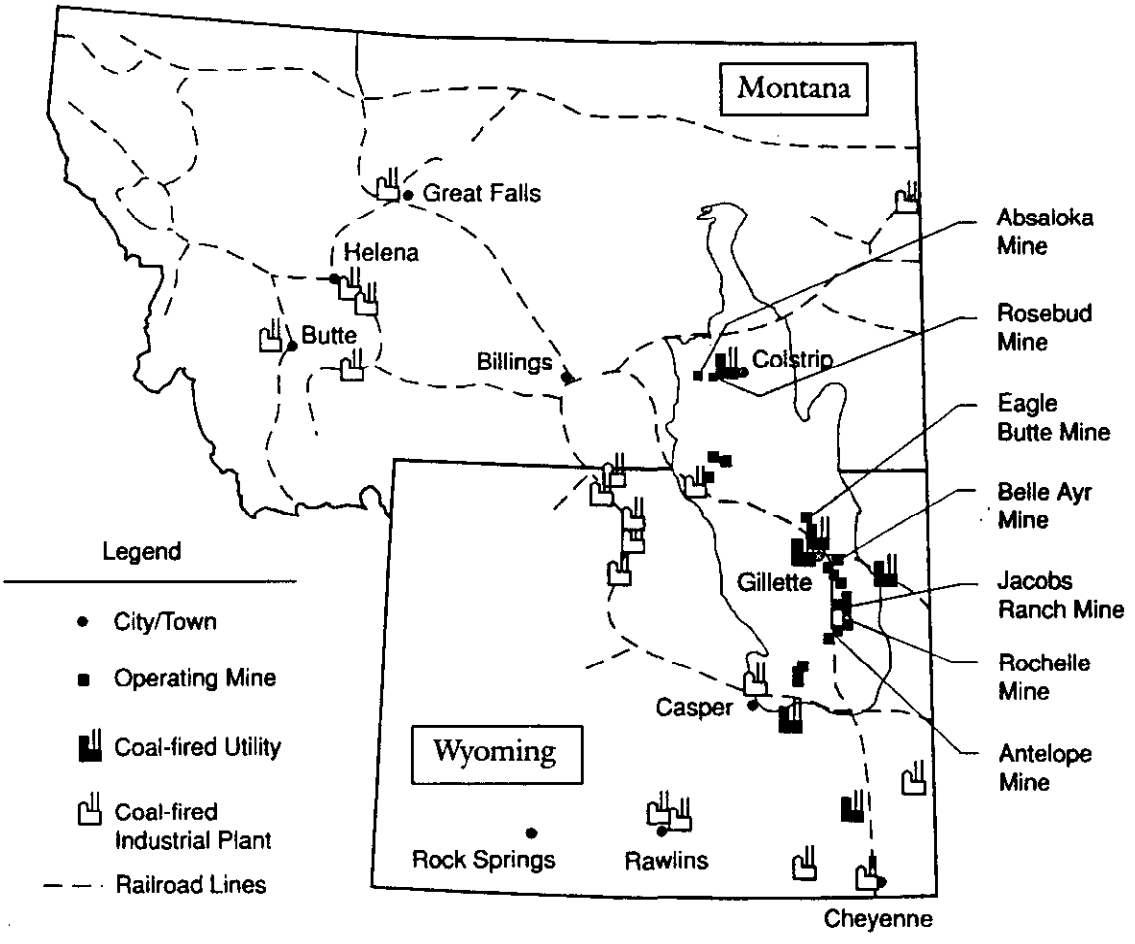
Table 1. Background Summary of Participating Mines

Site	General Information
Absaloka Mine	• Estimated 1990 Recoverable Reserves (Company-wide): 780 Million Tons
Rosebud-McKay Seam	• Total 1990 Production: 4.5 Million Tons
	• Typical Quality: TM = 24%, VM = 29%, FC = 37%, A = 10%, S = 0.7%, B = 8,683
Rosebud Mine	• Estimated 1990 Recoverable Reserves (Company-wide): 850 Million Tons
Rosebud Seam	• Total 1990 Production: 13.0 Million Tons
	• Typical Quality: TM = 25%, VM = 28%, FC = 38%, A = 9%, S = 0.8%, B = 8,600
Belle Ayr Mine	• Estimated 1990 Recoverable Reserves (Company-wide): 2,560 Million Tons
Wyodak Seam	• Total 1990 Production: 15.5 Million Tons
	• Typical Quality: TM = 30%, VM = 33%, FC = 32%, A = 5%, S = 0.3%, B = 8,475
Rochelle Mine	• Estimated 1990 Recoverable Reserves (Company-wide): 700 Million Tons
Wyodak Seam	• Total 1990 Production: 12.4 Million Tons
	• Typical Quality: TM = 26%, VM = 32%, FC = 37%, A = 5%, S = 0.3%, B = 8,800
Antelope Mine	• Estimated 1990 Recoverable Reserves (Company-wide): 291 Million Tons
Wyodak-Anderson Seam	• Total 1990 Production: 4.6 Million Tons
	• Typical Quality: TM = 26%, VM = 31%, FC = 37%, A = 6%, S = 0.3%, B = 8,750

TM = Total Moisture; VM = Volatile Matter (Dry Basis); FC = Fixed Carbon (Dry Basis); A = Ash Content (Dry Basis); S = Total Sulfur Content (Dry Basis); B = Heating Value, Btu/lb (As-Received Basis)

As shown in Figure 4, these mines are located throughout the Powder River Basin and generally represent its current subbituminous coal-producing areas, except for the extreme west-central and southwestern parts of the basin. Published data show that coals in these areas differ markedly in ash mineral and chemical composition from those selected for sampling. Unfortunately, these could not be sampled during the project due to funding limitations. Characterization of

coal from Kerr McGee's Jacobs Ranch Mine was previously completed in 1990 during tests at the Northeastern Station of Public Service Company of Oklahoma. Results from this study are presented in the CQ Inc. report "Coal Cleanability Characterization of Croweburg Seam Coal" (CQ-91R103) written by Robert L. Dospoy and will not be discussed in this report.



Source: After BXG Inc., 1989

Figure 4. Mines and Coal-fired Industries in the Powder River Basin.

Sampling Procedures

CQ Inc. personnel collected 80 55-gallon samples of raw coal from each participating mine. This provided about 14 tons of each coal for laboratory analysis. Although each site required specific sampling methods and had unique sampling points, some procedures were used consistently throughout the campaign. Sampling was accomplished by taking manual or mechanical splits of coal streams that had been sampled by automatic systems. One split was collected for every cycle completed by an automatic system. During sample collection CQ Inc. personnel added dry-ice (solidified carbon dioxide gas) to the drums between individual cuts to help purge air from the coal. Purging air from the samples was intended to retard oxidation and reduce moisture loss as much as possible during transport to the laboratory. Duration of sampling periods for each mine varied from three to seven days.

At Absaloka Mine, a mechanical system actuated periodically by an operator sampled a split from the stream feeding the railcar loadout and discharged minus 2-in. coal down an auxiliary chute into the 55-gallon plastic containers. Minus 2-in. coal from Rosebud Mine was diverted from the collection chute of the primary sampling system into a stand-by chute by using an automated flopgate triggered regularly by an operator. Samples of minus 3-in. coal from Rochelle Mine were collected from the main feed stream to the crushing plant by manually actuating mechanical diverters and allowing the coal to flow into a wheelbarrow, which was used to transport the sample to a dumping station that discharged into the plastic drums. CQ Inc. personnel collected minus 2-in. coal from both Belle Ayr and Antelope mines by manually diverting and splitting samples, respectively, from the discharge flowstreams of the primary sampling systems in the crushing plants.

After filling the sample containers, CQ Inc. sampling technicians packed dry-ice on top of the coal then sealed the plastic drums with an airtight lid anchored by ring clamps. These samples were then immediately shipped to the Warner Laboratories Division of Gould Energy in Cresson, Pennsylvania, for detailed laboratory analysis. (This laboratory is now known as the Gould Energy Division of Standard Laboratories, Inc.)

Laboratory Procedures

Upon receipt of each coal, laboratory personnel weighed, air-dried, and blended the contents of all containers (approximately 14 tons). As shown in Figure 5, seven tons of each of these coal samples were then split by riffling, packed in plastic drums, purged with dry-ice, and archived. The remaining seven tons of as-received raw coal were used for laboratory raw coal characterization and liberation assessment studies. A summary of specified analyses for these coals is shown in Table 2.

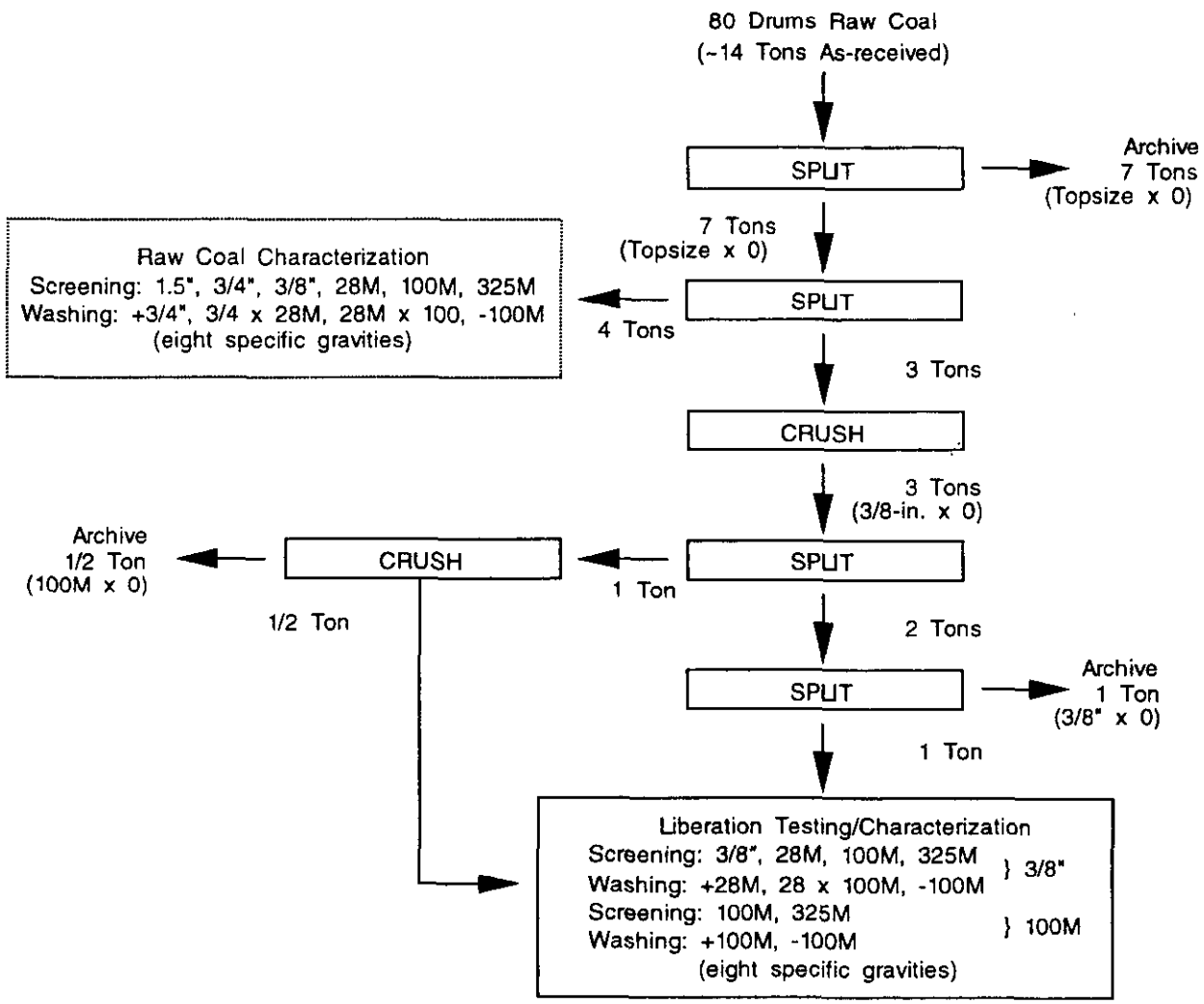


Figure 5. Laboratory Sample Processing Flowsheet

Table 2. Raw Coal Characterization Analytical Specifications

HEAD ANALYSIS

Equilibrium Moisture	Ash Fusion (Reducing and Oxidizing)
Proximate	Ash Composition
Heating Value (Btu/lb)	*Grindability Index (HGI)*
Ultimate	Lithium Oxide in Ash
Sulfur Forms	Manganese Dioxide in Ash
Chlorine	Trace Elements*

SIZE ANALYSIS

As-Received Sample		**Crushed to -3/8" Sample**		**Crushed to -100M Sample**	
Size Fraction	Analysis	Size Fraction	Analysis	Size Fraction	Analysis
+1½-in	W,A,S,B,T**				
1½-in x ¾-in	W,A,S,B,T				
¾-in x 3/8-in	W,A,S,B,T	+3/8-in	W,A,S,B,T		
3/8-in x 28M	W,A,S,B,T	3/8-in x 28M	W,A,S,B,T		
28M x 100M	W,A,S,B,T	28M x 100M	W,A,S,B,T	+100M	W,A,S,B,T
100M x 325M	W,A,S,B,T	100M x 325M	W,A,S,B,T	100M x 325M	W,A,S,B,T
-325M	W,A,S,B,T	-325M	W,A,S,B,T	-325M x 0	W,A,S,B,T

WASHABILITY ANALYSIS Identical matrix applied to the As-Received, Crushed to -3/8", and Crushed to -100M Coals.

Density Fraction	Analysis
Float 1.25	W,A,S,B,T
1.25 x 1.30	W,A,S,B,T
1.30 x 1.35	W,A,S,B,T
1.35 x 1.40	W,A,S,B,T
1.40 x 1.60	W,A,S,B,T
1.60 x 1.80	W,A,S,B,T
1.80 x 2.00	W,A,S,B,T
2.00 x 2.45	W,A,S,B,T
2.45 Sink	W,A,S,B,T

Performed on only the +¾-in, ¾ x 28M, 28 x 100M, and -100M size classes.

* Antimony, Arsenic, Barium, Cadmium, Chromium, Fluorine, Lead, Mercury, Nickel, Selenium, Silver, and Zinc.

** W,A,S,B,T = Weight %, Ash %, Total Sulfur %, Heating Value (Btu/lb), Trace Elements (ppm or ppb)

All coal samples were processed in accordance with laboratory procedures recommended by the Electric Power Research Institute (Report CS-5644, Volume Number 4, Laboratory Guidelines and Procedures: Low-Rank Coal Analysis) and the American Society for Testing and Materials (Volume 05.05, Gaseous Fuels; Coal and Coke). These documents address and detail unique and effective methods for treating and analyzing low-rank coal samples.

Data Reduction Procedures

Recent results from coal washability studies not related to this work have indicated that using heavy organic liquids to separate coal finer than about ¼-in. into progeny gravity fractions to measure the specifc gravity distribution of the sample can often produce distributions that are skewed. Two prevailing theories are that these heavy liquids--commonly known as Certigrav--are being trapped into cracks and crevasses in the coal particles or are being absorbed onto the surfaces of the coal, thereby increasing the apparent specific gravity of the particles. This causes the coal particles to report to the incorrect gravity fraction during separation. This phenomenon appears to be more pronounced in lighter gravity fractions (1.25 to 1.5 specific gravity intervals), i.e. in those fractions where most of the organic material (coal) reports.

Coals from the Powder River Basin typically contain large amounts of particles that report to light gravity fractions. These low-rank coals also tend to be very porous and absorbent. Knowing that these characteristics can ultimately result in inaccurate measurements of specifc gravity distributions, CQ Inc. engineers believed that an alternate washability methodology would be needed to provide more reliable results for laboratory gravity separations of coal samples from the Powder River Basin. Two methods were considered:

- Cesium Chloride Method
- Modified Certigrav Method

Though not yet a standardized gravity separation method, cesium chloride-water solutions can be used to effectively separate coal into gravity classes below a specific gravity level of about 1.8. This limitation on specific gravity level is due to the solubility limit of cesium chloride in cold water: a completely saturated cesium chloride-water solution has a specific gravity around 1.8. Above specific gravities of 1.8--in the density range where little skew in gravity distributions is noted--Certigrav is used to complete the separations. Unfortunately, this method requires expertise not yet widely available and is currently very costly, almost three times the cost of Certigrav washabilities.

As a lower cost alternative, CQ Inc. used a modified heavy liquid method to complete washabilities. For this work, this included coal that was crushed to minus 3/8-in. and minus 100 mesh topsize. The method consisted of four basic steps:

- Step 1. Complete a laboratory size distribution measurement on a sample of as-received coal crushed to the topsize desired. Analyze all products. This represents the size washability of the coal sample.

- Step 2. On another sample lot of as-received coal, use Certigrav washability techniques to separate the coal into two subsamples: one 1.3 specific gravity float product and one 1.3 sink product.

- Step 3. Crush the 1.3 specific gravity sink material to the desired topsize, then use Certigrav washability techniques to separate the coal into the desired gravity classes. Analyze all products.

- Step 4. Mathematically combine the analytical results of the 1.3 specific gravity sink gravity fractions with the corresponding gravity fractions of the 1.3 float product and re-normalize the mass fractions in each gravity interval. This represents the gravity washability of the coal sample crushed to the desired topsize.

Using the modified washability method actually provided two advantages. First, it minimized the probability of obtaining inaccurate measurements of specifc gravity distributions caused by interactions of heavy liquids with fine coal. Second, it precluded crushing of 1.3-float material, which would probably not be crushed in commercial-scale coal cleaning operations anyway because it is almost entirely clean coal. In other words, this material would not be crushed because the amount of mineral matter that can be liberated is likely to be insignificant.

EVALUATION OF COAL QUALITY DATA

In order to evaluate the general theoretical cleanability of Powder River Basin coals relative to removal of mineral matter and selected trace elements, CQ Inc. completed detailed raw coal characterizations and impurity liberation assessments for each of the five coal samples collected.

Raw Coal Characterizations

In a raw coal characterization, comprehensive laboratory analyses such as head analyses and size and gravity washabilities are performed on samples of raw coal to provide detailed information about its quality. Complete results of raw coal characterizations for the five Powder River Basin coals are given in Appendix A.

Tables 3 and 4 summarize important raw coal quality parameters for the Montana and Wyoming coals, respectively. Total moisture content of the coals from Montana ranged from 22.7 to 25.8 percent. The sample of Rosebud-McKay Seam coal from Westmoreland Resources, Inc.'s Absaloka Mine contained 10.7 percent ash and about 0.8 percent total sulfur on a dry basis. Based on a moist, mineral matter free heating value of 9680 Btu/lb, this coal has an apparent rank of subbituminous B. Potential sulfur dioxide emission is about 1.4 lbs/MBtu, slightly over the 1990 Clean Air Act Amendment Phase II mandate level of 1.2 lbs/MBtu. Subbituminous B rank Rosebud Seam coal from Western Energy Company's Rosebud Mine contained over 9.0 percent ash and 0.8 percent total sulfur on a dry basis. This coal also has potential sulfur dioxide emissions of about 1.4 lbs/MBtu. Due to their low ash fusibility temperatures, these lignitic-ash coals are classified as high slagging. With relatively low amounts of sodium oxide, both coals are classified as low fouling.

As shown in Table 5, these samples from Montana exhibit small variances in quality as a function of particle size except in the very coarse and very fine size classes. The cumulative ash content in Rosebud-McKay Seam coal, however, is somewhat higher in coarse size classes than in fine size classes, but increases markedly when minus 325 mesh material is included in the raw coal. This indicates that fine, high-ash clay material is probably present in this raw coal. Rosebud Seam coal quality does not vary distinctly as a function of particle size except that coal coarser than 1 1/2-in. contains less sulfur than any other size fraction.

Table 3. Montana Raw Coal Quality Summary

	Absoloka Mine Rosebud-McKay Seam Big Horn County		Rosebud Mine Rosebud Seam Rosebud County	
	As-Received	Dry Basis	As-Received	Dry Basis
Total Moisture (Wt %)	25.76		22.73	
Fixed Carbon (Wt %)	36.93	49.74	35.49	45.92
Volatile Matter (Wt %)	29.39	39.59	34.69	44.90
Ash (Wt %)	7.92	10.67	7.09	9.18
Heating Value (Btu/lb)	8509	11462	8940	11570
Total Sulfur (Wt %)	0.58	0.78	0.62	0.80
Pyritic Sulfur (Wt %)	0.17	0.22	0.19	0.25
Organic Sulfur (Wt %)	0.40	0.54	0.42	0.54
Lbs SO_2/MBtu		1.36		1.38
Carbon (Wt %)	55.64	74.95	51.45	66.59
Hydrogen (Wt %)	1.10	1.48	3.85	4.98
Nitrogen (Wt %)	0.64	0.86	0.77	0.99
Oxygen (Wt %)	8.36	11.25	13.49	17.46
Chlorine (Wt %)	0.03	0.04	0.04	0.05
Grindability (HGI)	49		50	
Ash Fusibility (°F) (Reducing/Oxidizing)				
Initial Deformation		2180/2215		2150/2225
Softening		2210/2245		2190/2290
Hemispherical		2245/2305		2300/2320
Fluid		2300/2410		2360/2405
Slagging Index (Classification)		2205 (High)		2184 (High)
Fouling Index (Classification)		1.2 (Low)		0.2 (Low)

Analyses reported on an SO_3-free basis.

Table 4. Wyoming Raw Coal Quality Summary

	Belle Ayr Mine Wyodak Seam Campbell County		Rochelle Mine Wyodak Seam Campbell County		Antelope Mine Wyodak-Anderson Seam Converse County	
	As-Received	Dry Basis	As-Received	Dry Basis	As-Received	Dry Basis
Total Moisture (Wt %)	29.20		27.15		26.01	
Fixed Carbon (Wt %)	34.41	48.60	35.12	48.20	36.92	49.90
Volatile Matter (Wt %)	32.38	45.74	33.23	45.62	31.66	42.79
Ash (Wt %)	4.01	5.66	4.50	6.18	5.41	7.31
Heating Value (Btu/lb)	8529	12045	8801	12080	8733	11803
Total Sulfur (Wt %)	0.34	0.47	0.22	0.30	0.28	0.38
Pyritic Sulfur (Wt %)	0.06	0.09	0.01	0.01	0.07	0.09
Organic Sulfur (Wt %)	0.26	0.37	0.20	0.28	0.21	0.29
Lbs SO_2/MBtu		0.78		0.50		0.64
Carbon (Wt %)	48.56	68.58	51.11	70.15	50.49	68.23
Hydrogen (Wt %)	3.52	4.98	3.46	4.75	3.37	4.55
Nitrogen (Wt %)	0.67	0.95	0.66	0.91	0.79	1.07
Oxygen (Wt %)	13.70	19.36	12.90	17.72	13.65	18.44
Chlorine (Wt %)	0.08	0.11	0.05	0.07	0.04	0.06
Grindability (HGI)	63		53		47	
Ash Fusibility (°F) (Reducing/Oxidizing)						
Initial Deformation		2030/2160		2125/2160		2085/2135
Softening		2080/2205		2130/2175		2120/2170
Hemispherical		2120/2315		2145/2200		2145/2200
Fluid		2160/2410		2165/2240		2200/2245
Slagging Index (Class.)		2087 (Severe)		2140 (High)		2108 (High)
Fouling Index (Class.)		0.9 (Low)		1.2 (Low)		2.0 (Low)

Analyses reported on an SO_3-free basis.

Table 5. Coal Quality Summary of Size Fractions of Montana Powder River Basin Coals.
As-received Samples *(Dry Basis)*.

	Absoloka Mine Rosebud-McKay Seam Big Horn County			Rosebud Mine Rosebud Seam Rosebud County		
Retained	Cum. Wt %	Cum. % Ash	Cum. % Sulfur	Cum. Wt %	Cum. % Ash	Cum. % Sulfur
+1-1/2 in.	2.51	13.96	1.03	4.33	9.42	0.50
1-1/2 x 3/4 in.	23.69	11.39	0.75	36.72	10.02	0.88
3/4 x 3/8 in.	49.01	10.39	0.76	62.86	9.65	0.91
3/8 in. x 28M	90.89	9.64	0.80	94.82	9.28	0.88
28 x 100M	95.94	9.70	0.81	98.26	9.28	0.88
100 x 325M	97.36	9.76	0.82	99.11	9.30	0.89
+0	100.00	10.48	0.81	100.00	9.39	0.88

Analyses reported on a SO_3-free basis.
Cum. = Cumulative

Coal samples from Wyoming ranged from about 26 to 29 percent in total moisture content. Wyodak Seam coal samples from Powder River Coal Company's Rochelle Mine and AMAX Coal Company's Belle Ayr Mine contained 5.5 and 5.3 percent dry basis ash, respectively. Both coal samples also contained low total sulfur contents: 0.3 and 0.5 percent on a dry basis, respectively. These Wyodak Seam coals have potential sulfur dioxide emissions less than 0.8 lbs/MBtu. Based on moist, mineral matter free heating values, these coals have an apparent rank of subbituminous C.

The coal sample from Antelope Coal Company's Antelope Mine is from the Anderson or Wyodak-Anderson Seam and is also subbituminous C in apparent rank. This coal sample contained about 7.3 percent ash and 0.4 percent total sulfur. As with the other two Wyoming coals, this sample has potential sulfur dioxide emissions much less than mandated compliance level of 1.2 lbs/MBtu.

Based on ash fusibility temperatures, the coal samples from Rochelle and Antelope mines are classified as high slagging, while the Belle Ayr coal sample is classified as a severe slagging coal. All of these lignitic-ash Wyoming coals contain little enough sodium oxide to be classified as low fouling.

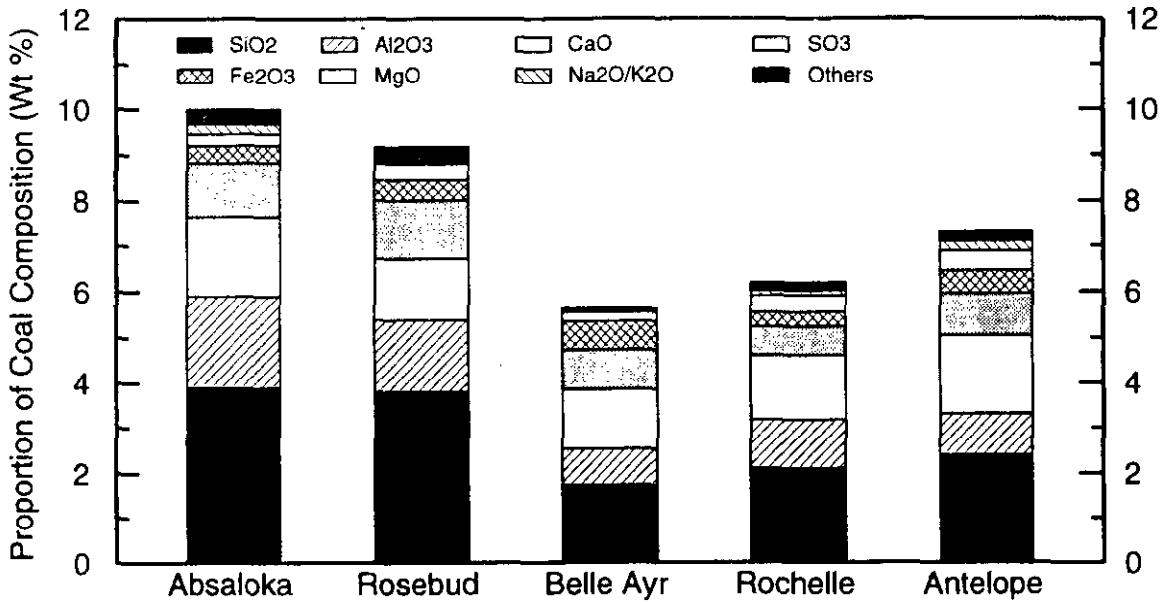
Table 6 shows that the coal samples from Wyoming do not vary appreciably in quality as a function of particle size. However, Figure 6 shows that like the two coals from Montana, fine high-ash clay material is also present in these raw coals.

Table 6. Coal Quality Summary of Size Fractions of Wyoming Powder River Basin Coals.
As-received Samples *(Dry Basis)*.

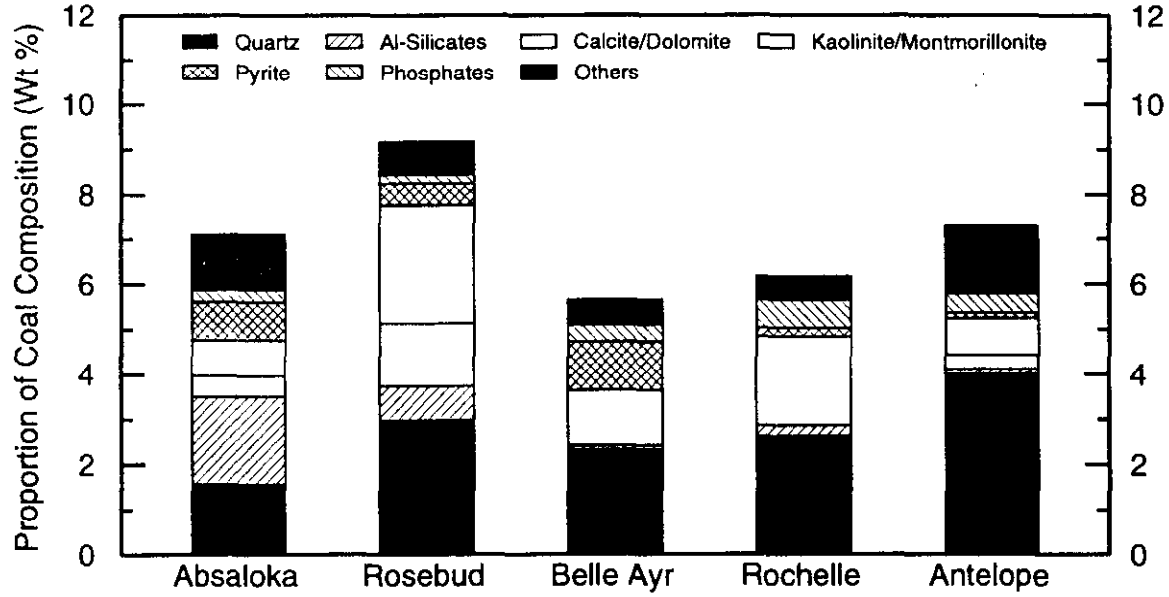
	Belle Ayr Mine Wyodak Seam Campbell County			**Rochelle Mine** Wyodak Seam Campbell County			**Antelope Mine** Wyodak-Anderson Seam Converse County		
Retained	Cum. Wt %	Cum. % Ash	Cum. % Sulfur	Cum. Wt %	Cum. % Ash	Cum. % Sulfur	Cum. Wt %	Cum. % Ash	Cum. % Sulfur
+1-1/2 in.	6.44	5.29	0.46	23.15	5.50	0.30	8.79	7.26	0.40
1-1/2 x 3/4 in.	37.92	5.39	0.44	51.13	5.89	0.30	39.42	6.74	0.38
3/4 x 3/8 in.	62.29	5.39	0.43	72.61	5.94	0.30	62.57	6.87	0.37
3/8 in. x 28M	99.02	5.43	0.44	99.06	6.05	0.30	96.14	7.01	0.38
28 x 100M	99.74	5.43	0.44	99.75	6.06	0.30	98.87	7.02	0.39
100 x 325M	99.89	5.43	0.44	99.91	6.06	0.30	99.55	7.03	0.39
+0	100.00	5.44	0.44	100.00	6.07	0.30	100.00	7.08	0.39

Analyses reported on an SO_3-free basis.
Cum. = Cumulative

Examination of ash mineral compositions measured by chemical analyses and by computer-controlled scanning electron microscope (CCSEM) analyses by the University of North Dakota (detailed in Figure 6) show that the five coal samples from the Powder River Basin contain significant amounts of silicon and aluminum oxides, some of which are ostensibly sheet-structure aluminosilicates (kaolinite and montmorillonite clays). As would be expected from



Ash Mineral Composition Given by Chemical Analysis. (Whole-coal Basis)



Ash Mineral Composition Given by CCSEM Analysis. (Whole-coal Basis)

Figure 6. Ash Composition of Powder River Basin Coal Samples. *Chemical and CCSEM Analyses.*

sandstone and siltstone overburdens, the primary constituents of ash from these coals are silicas and clays. It can also be inferred from the raw coal characterization data on the five Powder River Basin coals that during physical coal cleaning, heating value (energy) recoveries over 95 percent should be easily attainable. Moreover, since minus 28 mesh material in four of the five coals is lower in quality than in coarser size fractions, size- and gravity-based cleaning techniques would be the most effective means to remove moderate amounts of mineral matter from these coals.

Impurities Liberation Assessments

A liberation assessment involves crushing samples of raw coal to various sizes and separating each sample into discrete size or gravity fractions to determine how much mineral matter can be potentially liberated from raw coal. It also includes studying energy recovery-quality relationships for the various new size and gravity fractions to determine if the potential cleanability of the raw coal can be improved through comminution (crushing or grinding).

For the Rosebud-McKay and Rosebud Seam coals from Montana, 95 percent energy recoveries can be attained during coal cleaning if separations are effected at a specific gravity of about 1.6. As shown in figures 7 and 8, cleaning as-received Absaloka Mine coal can theoretically produce a coal having almost 8.0 percent ash and potential sulfur dioxide emissions less than 0.9 lbs/MBtu, while recovering 95 percent of its heating value. These levels represent a theoretical reduction of ash and sulfur dioxide levels in as-received coal of about 30 percent. Crushing this coal to a 3/8-in. topsize improves the potential for removing sulfur dioxide only slightly. However, if this coal is crushed to 100 mesh and then cleaned, the theoretical reduction of ash- and sulfur-bearing minerals from the raw coal can be increased by an additional ten percent.

Similarly, figures 9 and 10 show that the quality of Rosebud Mine coal can be improved significantly by physical coal cleaning. Cleaning this coal can potentially reduce ash and sulfur dioxide levels 25 and 45 percent, respectively, at 95 percent energy recovery of the as-received coal. By crushing to a 3/8-in. or 100 mesh topsize and then cleaning, the ash and sulfur dioxide reduction may be increased by about another 15 percent.

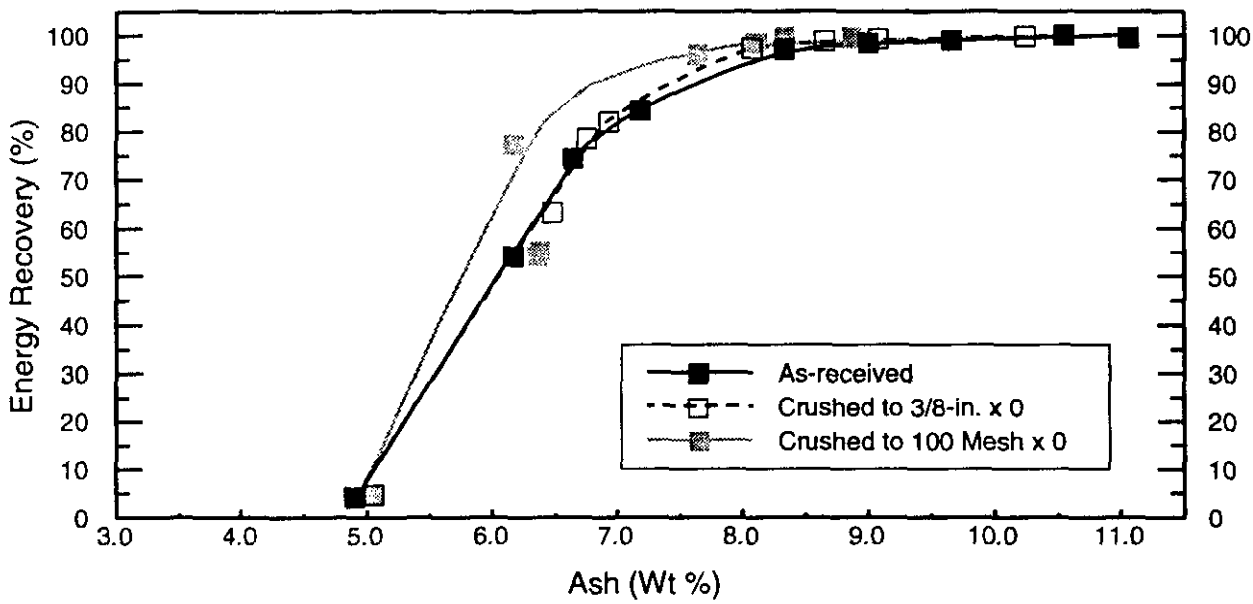


Figure 7. Absaloka Mine Coal's Ash Liberation and Cleaning Potential

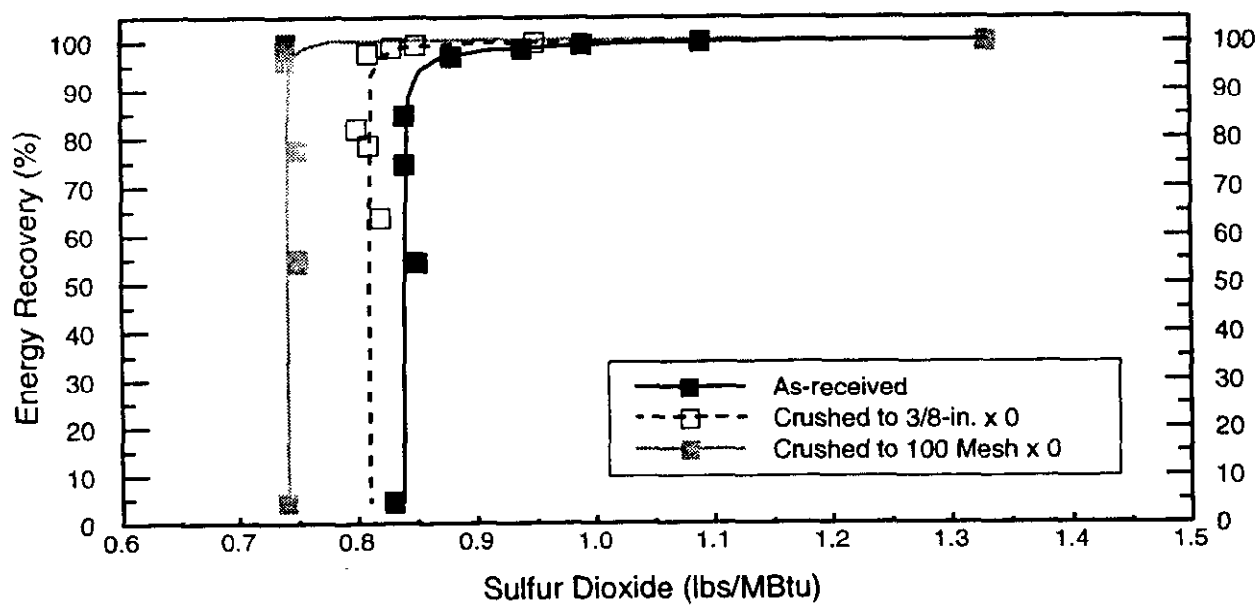


Figure 8. Absaloka Mine Coal's Sulfur Dioxide Liberation and Cleaning Potential

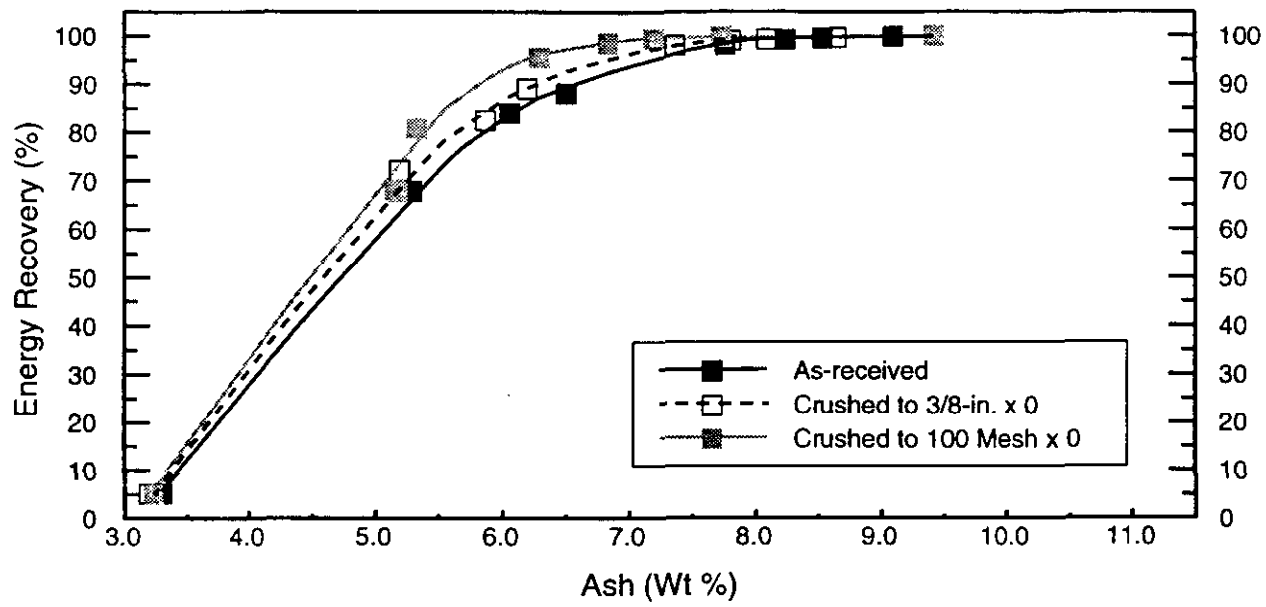


Figure 9. Rosebud Mine Coal's Ash Liberation and Cleaning Potential

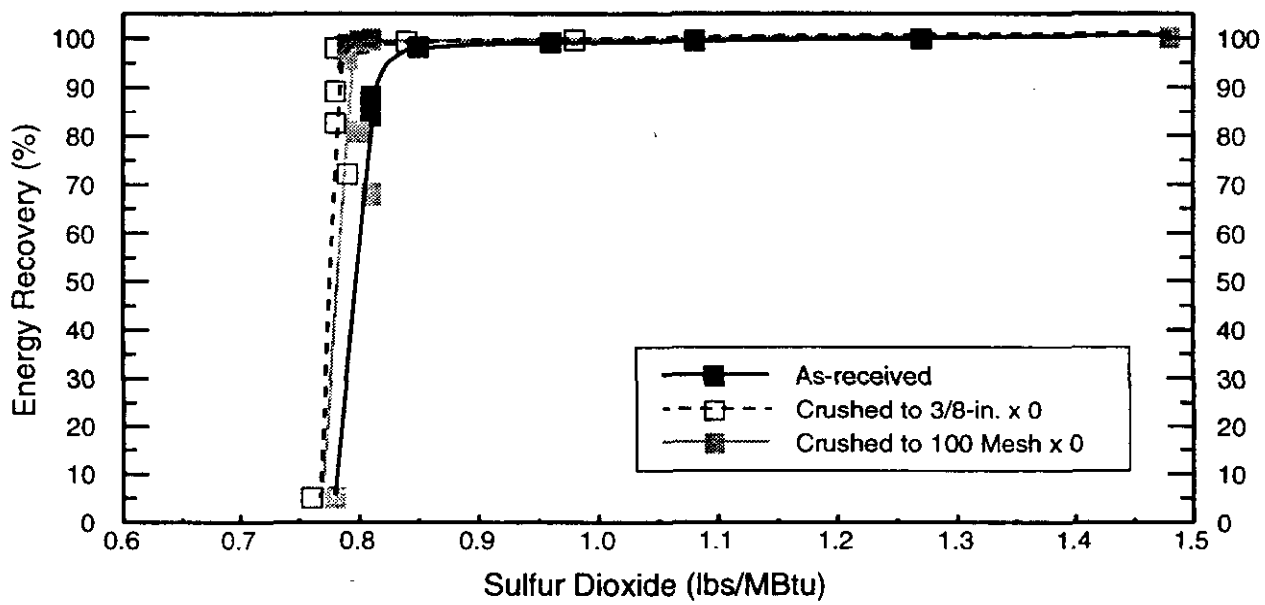


Figure 10. Rosebud Mine Coal's Sulfur Dioxide Liberation and Cleaning Potential

Heating value recoveries of 95 percent can also be easily attained when cleaning Belle Ayr Mine, Rochelle Mine, and Antelope Mine coals from Wyoming if separations are effected at specific gravities of about 1.45 to 1.5. Figures 11 and 12 show that, in theory, cleaning coal from Belle Ayr Mine can reduce its ash level about 20 percent and sulfur dioxide level by about five percent. However, crushing to a topsize as fine as 100 mesh does not improve the potential for removing ash-bearing minerals and improves the potential for reducing sulfur dioxide only by about five percent.

Data for Rochelle Mine coal (see figures 13 and 14) show that cleaning can theoretically reduce the ash content of as-received coal about ten percent, but cannot reduce potential sulfur dioxide levels without severe penalties in energy recovery. Crushing this coal does not improve the potential for removing mineral matter, particularly since the overall contents of these contaminants vary less than about 0.05 lbs/MBtu units.

In figures 15 and 16, the potential for coal cleaning to improve the quality of Antelope coal is apparent. At 95 percent energy recovery, ash levels in an as-received coal sample can be potentially decreased over 40 percent by coal cleaning. And theoretically, potential sulfur dioxide levels can be decreased by ten percent by physical coal cleaning. If crushed to a 100 mesh topsize, cleaning can decrease the ash and potential sulfur dioxide levels ten percent further.

Crushing and sizing Montana and Wyoming subbituminous coals would probably also reduce the clay content of each coal somewhat, thereby reducing their ash and alkali content.

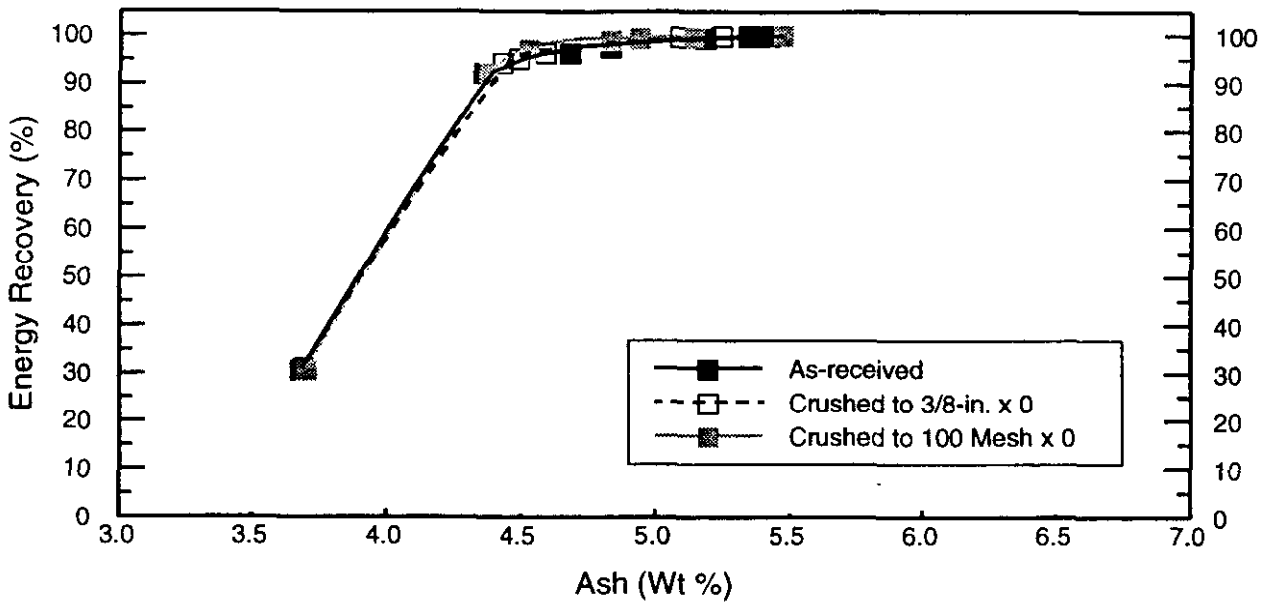


Figure 11. Belle Ayr Mine Coal's Ash Liberation and Cleaning Potential

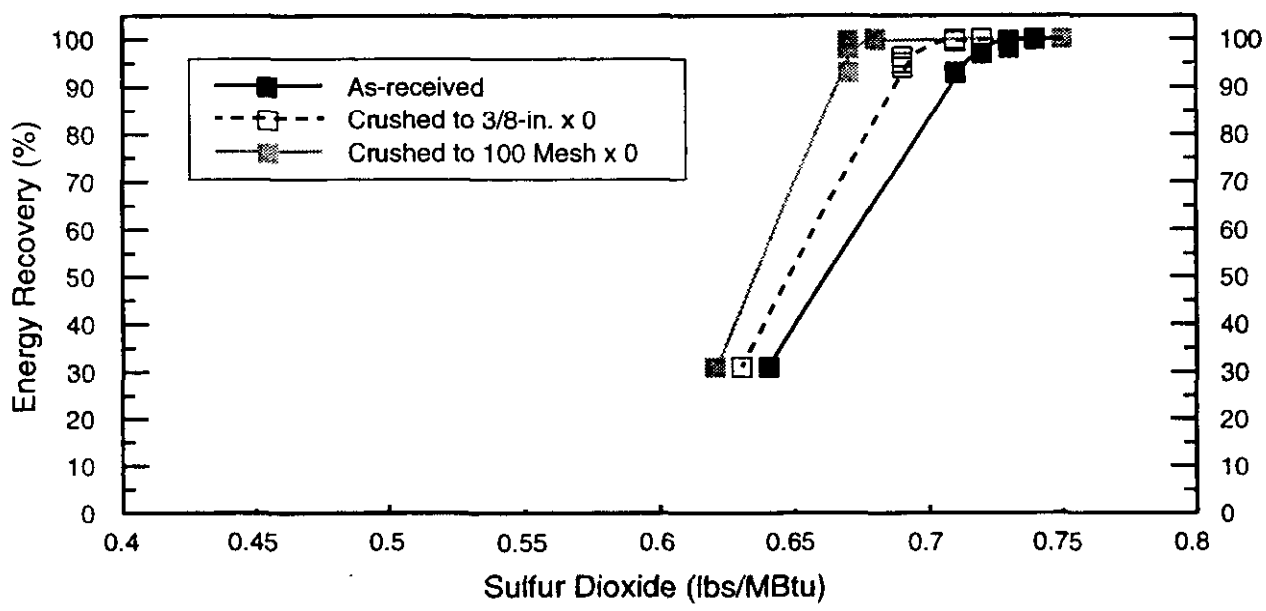


Figure 12. Belle Ayr Mine Coal's Sulfur Dioxide Liberation and Cleaning Potential Coal

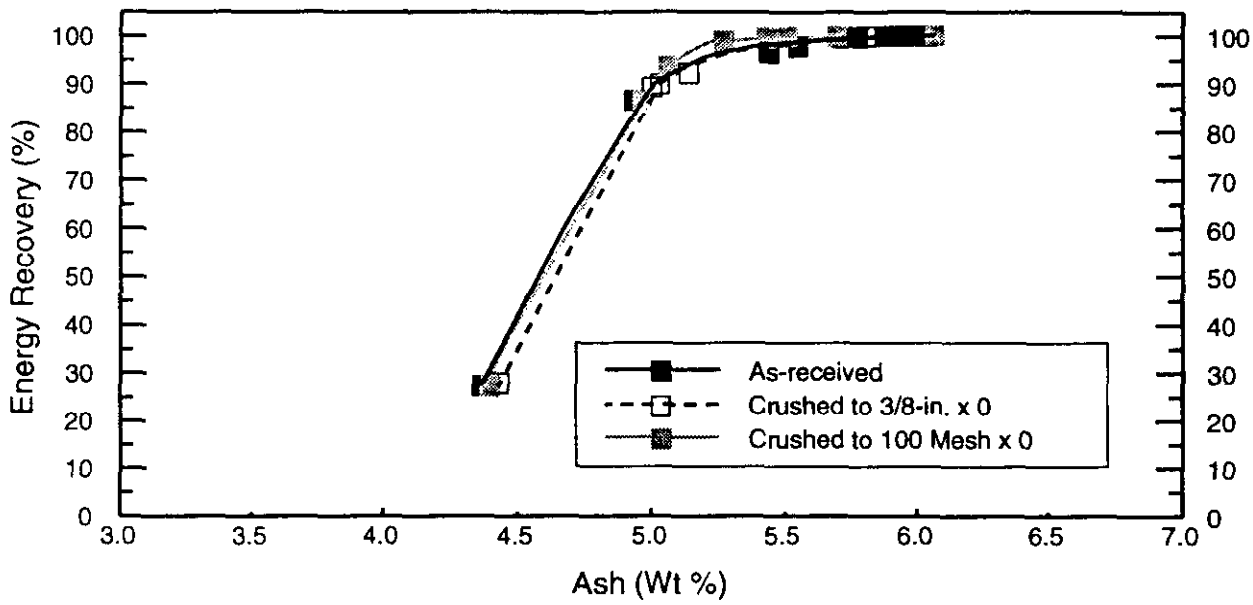


Figure 13. Rochelle Mine Coal's Ash Liberation and Cleaning Potential

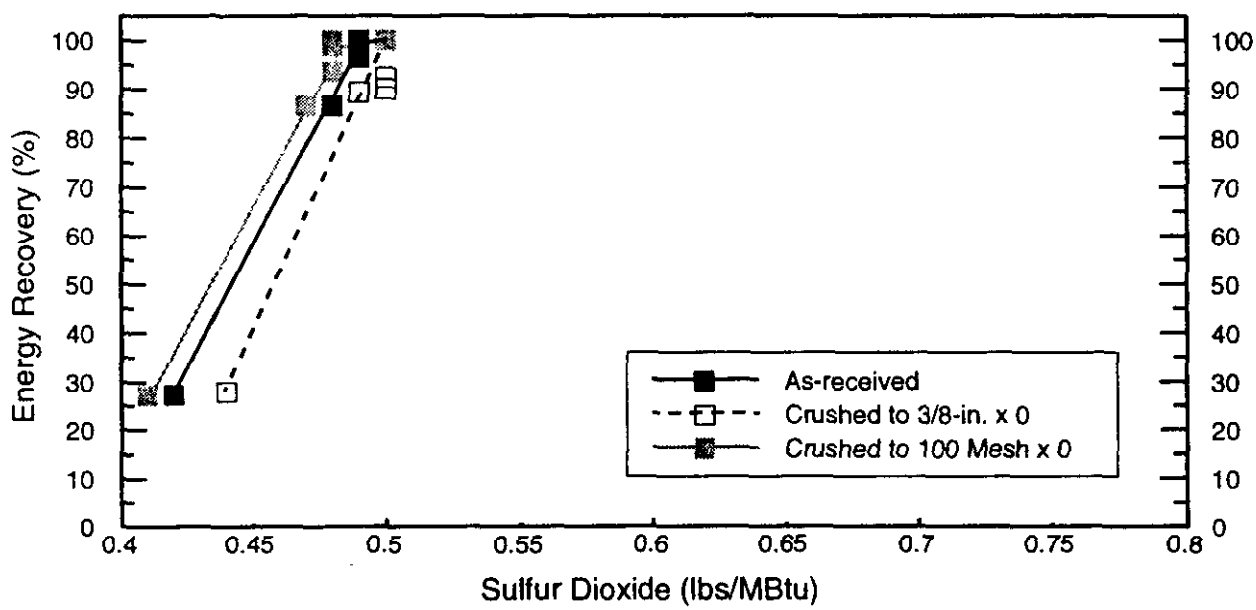


Figure 14. Rochelle Mine Coal's Sulfur Dioxide Liberation and Cleaning Potential

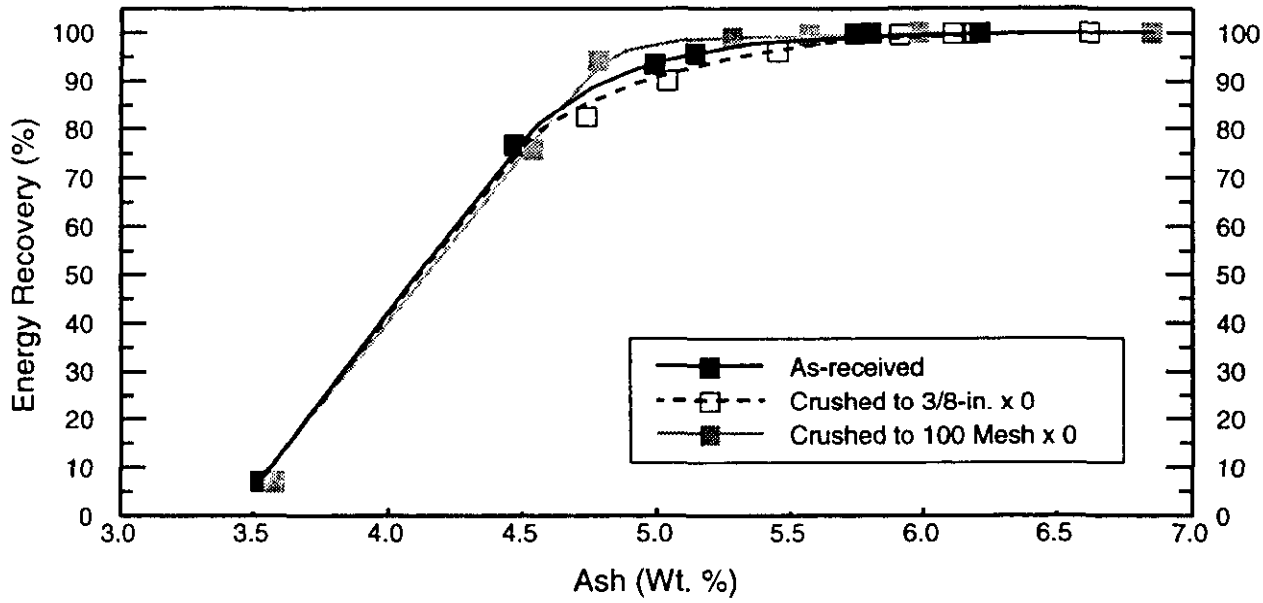


Figure 15. Antelope Mine Coal's Ash Liberation and Cleaning Potential

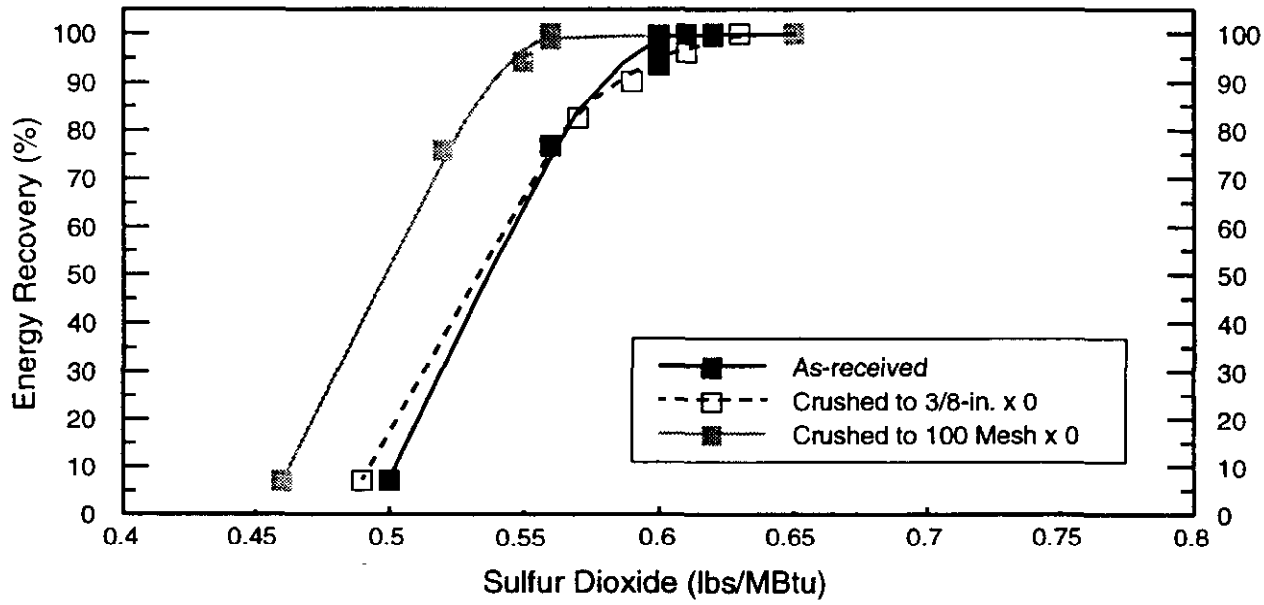


Figure 16. Antelope Mine Coal's Sulfur Dioxide Liberation and Cleaning Potential

EVALUATION OF THE POTENTIAL FOR REMOVING TRACE ELEMENTS USING PHYSICAL COAL CLEANING

Although the Clean Air Act Amendments of 1990 do not impose limits on air toxics emissions from power plants that fire fossil fuels containing trace amounts of metal elements, future regulations are expected to be implemented at the conclusion of a federally-mandated emissions study that is now in progress. Because of the uncertainty of the full effects of any such new laws, the coal characterization work in this study was also directed at determining whether trace elements that may be targeted for control can be removed from Powder River Basin subbituminous coals using physical coal cleaning techniques.

TARGETED TRACE ELEMENTS

- Antimony
- Beryllium
- Chlorine
- Cobalt
- Manganese
- Nickel
- Arsenic
- Cadmium
- Chromium
- Lead
- Mercury
- Selenium

In many cases, trace elements are associated with the mineral matter found with raw coal. For example, arsenic, mercury, and selenium are often associated with pyrite and other sulfide minerals, cadmium is found with sphalerite, and chromium, nickel, and a myriad of heavy metal elements are generally associated with siliceous and calcareous minerals (EPRI Report GS-6575, 1989). There are also other cases where trace elements are associated with the organic coal structure almost entirely. For these reasons, considerable research by the Electric Power Research Institute and other organizations has focused on characterizing the mobilization of elements in coal, its combustion gases, and ash residues. A better understanding of the mobility of trace elements in coal and combustion residue streams will help determine whether it is feasibly or environmentally advantageous to remove trace elements before combustion.

Since many of the trace elements found within coal are usually associated with unwanted mineral matter, using conventional coal cleaning techniques to remove mineral matter will effectively decrease the content of trace elements in the coal and reduce air toxics emissions resulting from its combustion. To evaluate this premise, the products from each of the size and gravity fractions from the coal/mineral matter cleanability characterizations were analyzed for many of the trace elements targeted for control:

- Arsenic
- Chromium
- Lead
- Nickel
- Zinc
- Barium
- Fluorine
- Mercury
- Selenium

Other elements which were also measured in each of the subbituminous coals included antimony, cadmium, and silver. However, in every sample fraction, the measured concentration of each of these elements was less than the minimum ASTM detection limit.

In addition to these elements, the concentrations of fluorine and zinc were also determined for each coal sample. These analyses were completed in lieu of measuring the amounts of beryllium and cobalt, both of which are listed as elements of concern in Title III of the 1990 Clean Air Act Amendments, for several reasons. First, though not expressly mentioned in Title III as elements of concern, many compounds containing these elements are targeted. Second, previous studies by CQ Inc., EPRI, and the U.S. Geological Survey indicate that the beryllium contained in many coals usually occurs in association with the organic coal structure and is therefore not easily removed using physical coal cleaning methods. These studies also indicate that the amount of cobalt contained in coal is typically very low and is, at times, not easily measurable. Last, if the reduction of fluorine and zinc emissions becomes important, these elements will likely be removed easily using coal cleaning since they tend to occur in association with gangue minerals such as clay and pyrite.

The contents of chlorine and manganese--currently targeted for emissions regulation--were also determined since utilities correlate their presence with influences on high-temperature corrosion in boilers. However, due to project limitations, only head samples of the five coals were analyzed for these elements.

All trace element analyses completed in this work were measured using flame-, cold vapor-, and graphite furnace-atomic absorption spectroscopy techniques or ion selective electrode methods. These procedures are described in detail in the 1990 EPRI report, "Laboratory Guidelines and Procedures: Trace Elements in Coal," Vol. 5, (EPRI Report CS-5644).

Trace Elements in Run-of-Mine Powder River Basin Coal Samples

Analysis of run-of-mine coal samples from the Absaloka, Rosebud, Belle Ayr, Rochelle, and Antelope mines shows that the occurrence and content of trace elements in Powder River Basin (PRB) coals vary markedly throughout the

region. For example, the data in Table 7 show that the coal samples from Montana (Absaloka Mine-Rosebud/McKay Seam and Rosebud Mine-Rosebud Seam) generally contained more arsenic, lead, manganese, nickel, and zinc than did those from Wyoming (Belle Ayr and Rochelle mines-Wyodak Seam and Antelope Mine-Wyodak/Anderson Seam), while the Wyoming coal samples contained more chlorine, fluorine, and mercury. Furthermore, the coal sample from Antelope Mine contained higher levels of chromium, lead, nickel, and zinc than did its two Wyoming counterparts.

Table 7. Raw Coal Trace Element Summary. *SO_3-free, Dry Basis Analyses in ppm.*

Trace Element	Absaloka	Rosebud	Belle Ayr	Rochelle	Antelope
Antimony	<0.5	<0.5	<0.5	<0.5	<0.5
Arsenic	4.0	3.6	2.5	1.5	2.3
Cadmium	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorine	400	500	1100	700	600
Chromium	3.9	3.5	2.7	2.7	4.6
Fluorine	34.1	37.7	57.2	48.5	45.5
Lead	4.9	5.0	2.4	1.8	3.2
Lithium	24.1	8.9	2.1	12.6	4.8
Manganese	78.1	110.0	48.1	10.0	15.3
Mercury	0.19	0.16	0.29	0.23	0.24
Nickel	6.3	5.3	3.5	2.5	4.6
Selenium	1.8	1.4	1.2	1.7	1.8
Silver	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc	16.7	9.0	8.2	5.7	10.6

Values given are averages of all available head, size composite, and gravity composite analyses.

The samples from the Montana mines and the Antelope Mine in Wyoming contained more metallic elements (chromium, lead, nickel, and zinc) than did the two other samples, probably because the coals at these sites have more in-seam dilution with rock partings. Minerals containing these heavy elements comprise many types of

sandstones,siltstones, and conglomerates--common rocks tı are formed and often deposited above, below, or within cc beds. Interbedded rock partings in the coal seams ranging in size from a few inches to over one foot thick are typical in coals located near the periphery of the Powder River Basin (G.B. Glass, Keystone Coal Industry Manual, 1992).

In all of the samples analyzed, the levels of antimony, cadmium, and silver were lower than that which can be detected and measured accurately for each of these elements.

The Potential of Sizing-based Coal Cleaning

In physical coal cleaning, unwanted ash-forming and sulfur-bearing mineral matter (commonly referred to as gangue) containing various trace elements can often be removed by identifying and exploiting differences in physical characteristics such as particle size and density. The advantages in using sizing techniques (sieving, screening, cycloning, or pneumatic transport) instead of density separation methods to separate gangue minerals from coal include generally lower cleaning costs and easier processing.

By examining individual size fractions of samples of run-of-mine or crushed coal for specific distributions of trace elements, investigators can determine whether sizing separations can prove useful in reducing the overall trace element content of PRB coals. Tables 8 and 9 show the concentration of nine trace elements of concern by size fraction in the five coal samples from the PRB. More detailed trace element-size fraction are in Appendix B.

Percent Rejection: *The weight percentage of an impurity in a feed that is removed as refuse by the cleaning process. Calculated by:*

$$\%R = 100 - \frac{(\%I \text{ in Product} \times \text{Product Wt})}{(\%I \text{ in Feed} \times \text{Feed Wt})}$$

where: %R = Percent Rejection
%I = Weight Percent of Impurity
Wt = Weight

These data show that the actual cumulative concentrations of some of the trace elements in these samples vary markedly as a function of particle size, while others vary only slightly. More importantly, though, the weight distribution (and, therefore, the potential rejection) of some of these trace elements can be very significant, as figures 17 through 20 show. For example, when sizing at about 28 mesh (0.6 mm), the amount of each of the nine trace elements that can be rejected from Belle Ayr and Rochelle Wyodak Seam coal samples while recovering oversize (plus 28 mesh) coal is well below five percent. However, for the Absaloka Mine-Rosebud/M'Kay Seam, Rosebud Mine-Rosebud Seam, and Antelope Mine-Wyodak/Anderson Seam coal samples, sizing at 28 mesh can result in the rejection of anywhere from 5 to over 50 percent of the trace elements.

Table 8. Cumulative Trace Element Content of Size Fractions of Montana PRB Coals.
Uncrushed (Dry Basis, SO_3-free Analysis).

Absaloka Mine. *Rosebud-McKay Seam (Big Horn County)*

Retained Size	Wt % Recovery	Btu Recovery (%)	Element Concentration (ppm)								
			As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
+1½"	2.5	2.3	0.73	17.20	5.90	23.40	6.30	0.19	7.42	1.95	13.20
1½"x¾"	23.7	23.3	3.14	5.85	3.45	39.76	3.56	0.18	6.05	2.28	7.98
¾"x3/8"	49.0	49.0	4.18	4.90	3.52	30.07	3.72	0.19	5.22	1.91	6.89
3/8"x28M	90.9	91.9	4.33	23.52	3.33	28.65	3.64	0.17	5.90	1.86	8.65
28x100M	95.9	96.9	4.31	27.17	3.35	28.83	3.77	0.17	5.82	1.81	9.19
100x325M	97.4	98.3	4.27	27.75	3.46	28.79	3.82	0.17	5.86	1.81	10.30
+0	100.0	100.0	4.18	30.59	3.95	34.69	4.10	0.17	6.27	1.80	17.22
Head Sample			4.37	30.40	3.59	35.18	5.43	0.19	6.05	2.24	13.50

Rosebud Mine. *Rosebud Seam (Rosebud County)*

Retained Size	Wt % Recovery	Btu Recovery (%)	Element Concentration (ppm)								
			As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
+1½"	4.3	4.3	1.73	44.00	3.53	43.20	4.94	0.10	4.94	0.91	8.16
1½"x¾"	36.7	36.4	4.75	42.24	3.49	40.73	4.83	0.10	5.06	1.93	6.09
¾"x3/8"	62.9	62.7	4.64	41.31	3.13	40.76	4.79	0.13	4.92	2.05	7.37
3/8"x28M	94.8	95.0	3.27	42.32	3.14	39.46	4.65	0.15	4.83	1.49	6.42
28x100M	98.3	98.4	3.30	42.81	3.17	39.11	4.66	0.15	4.85	1.49	6.64
100x325M	99.1	99.2	3.31	42.70	3.19	39.01	4.68	0.15	4.85	1.50	6.84
+0	100.0	100.0	3.29	43.11	3.24	39.37	4.72	0.15	4.90	1.49	9.07
Head Sample			4.75	40.80	3.56	37.10	4.98	0.17	5.21	1.56	9.11

Table 9. Cumulative Trace Element Content of Size Fractions of Wyoming PRB Coals.
Uncrushed Samples (Dry Basis, SO_3-Free Analysis).

Belle Ayr Mine. *Wyodak Seam (Campbell County)*

Retained Size	Wt % Recovery	Btu Recovery (%)	Element Concentration (ppm)								
			As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
+1½"	6.4	6.4	5.49	15.17	2.50	47.20	1.88	0.33	4.38	1.71	6.26
½"x¾"	37.9	37.9	4.01	25.32	2.47	57.49	2.24	0.27	3.56	1.22	7.07
¾"x3/8"	62.3	62.3	2.89	19.40	2.50	58.44	2.24	0.27	3.45	1.15	7.25
3/8"x28M	99.0	99.0	2.50	16.43	2.47	56.16	2.20	0.29	3.18	1.17	8.31
28x100M	99.7	99.7	2.50	16.41	2.48	56.15	2.21	0.29	3.19	1.17	8.46
100x325M	99.9	99.9	2.50	16.40	2.48	56.14	2.22	0.29	3.20	1.17	8.51
+0	100.0	100.0	2.51	16.41	2.48	56.13	2.22	0.29	3.20	1.18	8.54
Head Sample			2.71	18.80	2.91	59.30	2.43	0.28	3.88	1.20	8.04

Rochelle Mine. *Wyodak Seam (Campbell County)*

Retained Size	Wt % Recovery	Btu Recovery (%)	Element Concentration (ppm)								
			As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
+1½"	23.2	23.2	0.48	8.68	2.66	52.30	1.62	0.23	3.01	1.54	3.36
1½"x¾"	51.1	50.9	1.21	11.59	2.52	52.25	1.76	0.18	2.68	1.68	3.56
¾"x3/8"	72.6	72.6	1.37	23.99	2.59	51.58	1.64	0.25	2.77	1.73	4.13
3/8"x28M	99.0	99.0	1.48	32.88	2.58	50.14	1.69	0.22	2.79	1.70	5.27
28x100M	99.7	99.7	1.47	32.80	2.59	50.10	1.69	0.22	2.79	1.70	5.36
100x325M	99.9	99.9	1.48	32.77	2.59	50.10	1.69	0.22	2.79	1.70	5.44
+0	100.0	100.0	1.47	32.75	2.59	50.11	1.70	0.22	2.79	1.70	5.49
Head Sample			1.50	28.00	2.79	47.20	1.78	0.23	2.29	2.50	6.48

Antelope Mine. *Wyodak-Anderson Seam (Converse County)*

Retained Size	Wt % Recovery	Btu Recovery (%)	Element Concentration (ppm)								
			As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
+1½"	8.8	8.6	4.85	9.62	4.44	58.90	4.63	0.12	4.44	2.32	7.03
1½"x¾"	39.4	39.5	2.36	6.15	3.76	48.02	3.30	0.25	4.35	1.93	10.04
¾"x3/8"	62.6	62.8	2.57	5.72	3.44	46.94	3.49	0.21	4.04	1.77	9.19
3/8"x28M	96.1	96.2	2.23	7.16	4.41	42.81	3.28	0.22	4.57	1.73	8.56
28x100M	98.9	99.0	2.22	7.29	4.57	42.54	3.26	0.22	4.62	1.72	9.16
100x325M	99.5	99.6	2.24	7.31	4.64	42.58	3.27	0.22	4.64	1.72	9.42
+0	100.0	100.0	2.24	7.73	4.72	42.70	3.30	0.22	4.68	1.71	10.25
Head Sample			2.49	6.38	4.20	49.00	3.21	0.27	4.54	1.95	10.60

Figure 17. Cumulative Potential Removal of Arsenic and Selenium from Powder River Basin Subbituminous Coals Using Size-based Coal Cleaning Methods

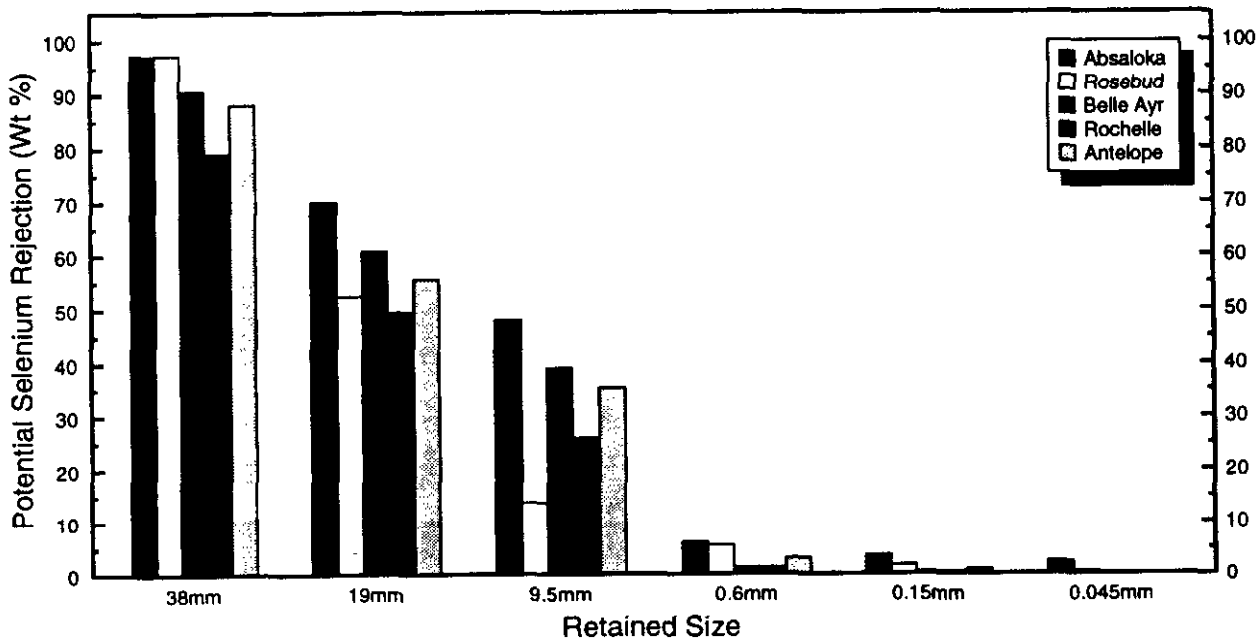


Figure 18. Cumulative Potential Removal of Barium, Fluorine, and Mercury from Powder River Basin Subbituminous Coals Using Size-based Coal Cleaning Methods

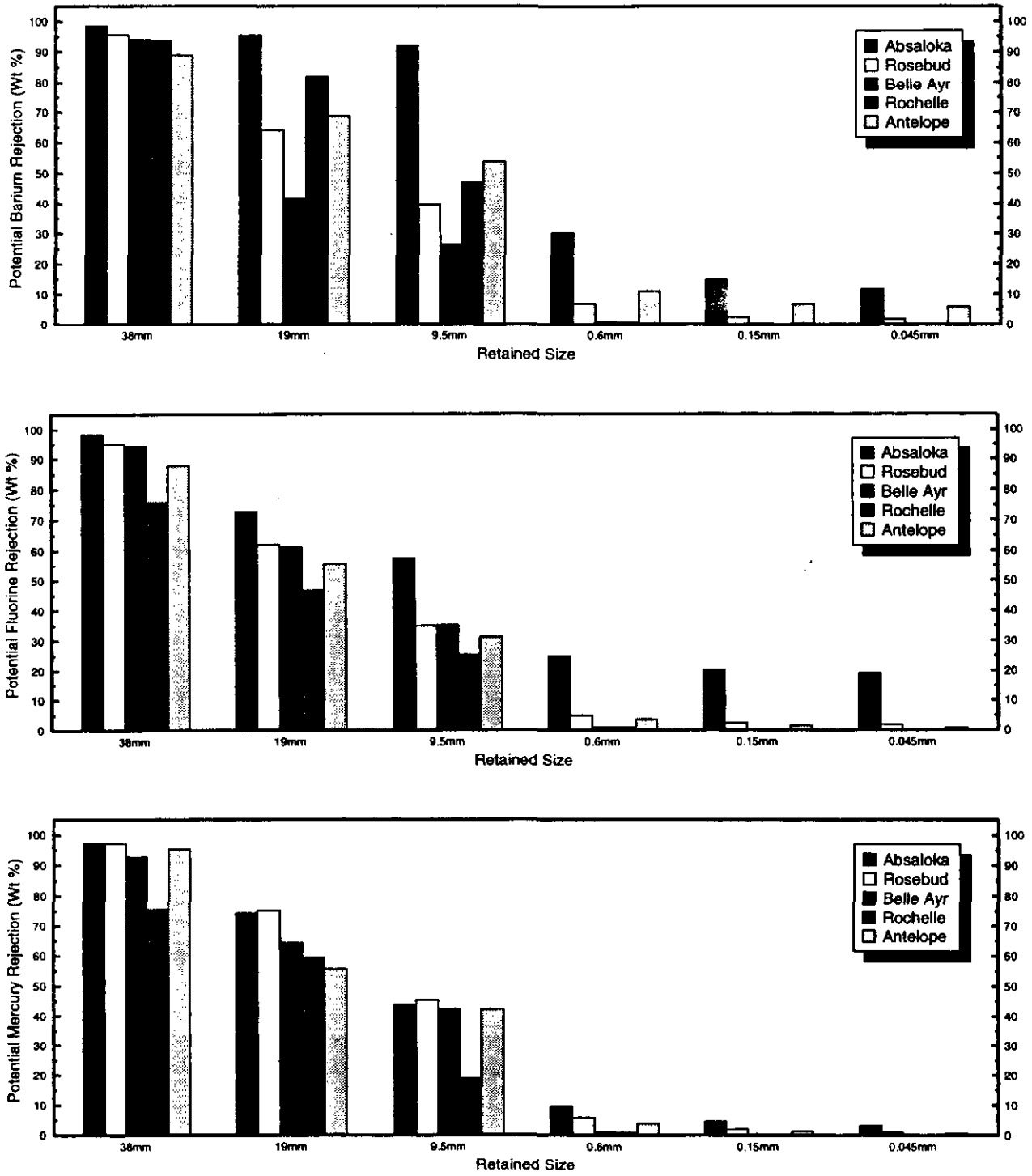
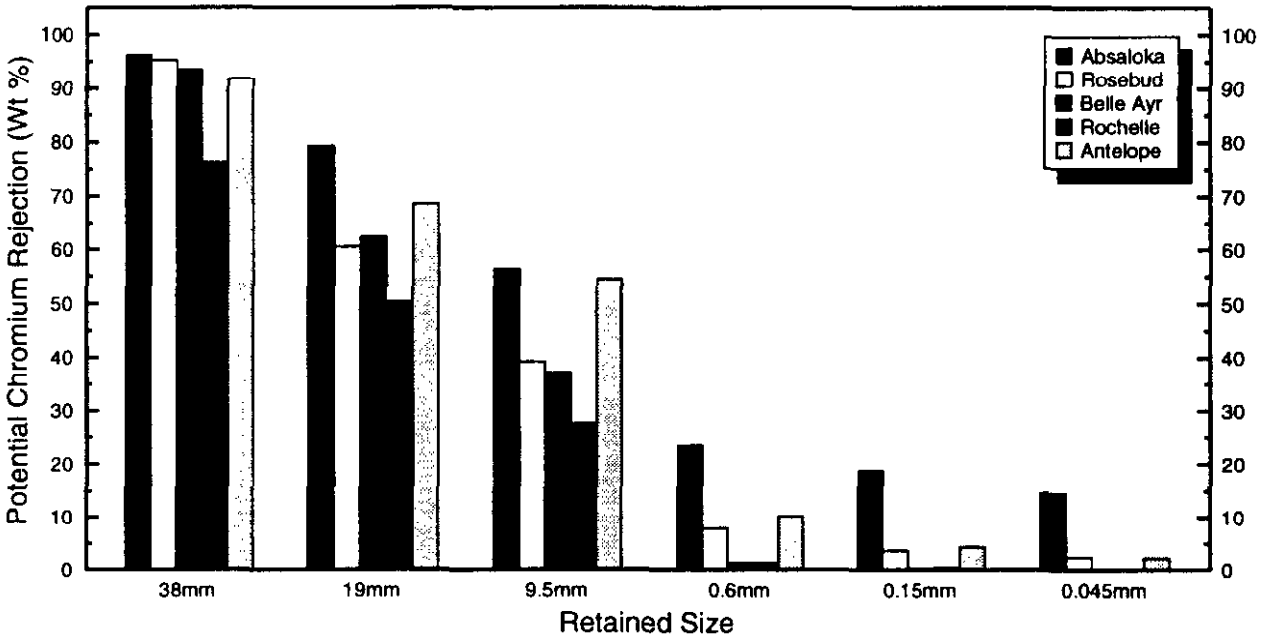


Figure 19. Cumulative Potential Removal of Chromium and Nickel from Powder River Basin Subbituminous Coals Using Size-based Coal Cleaning Methods



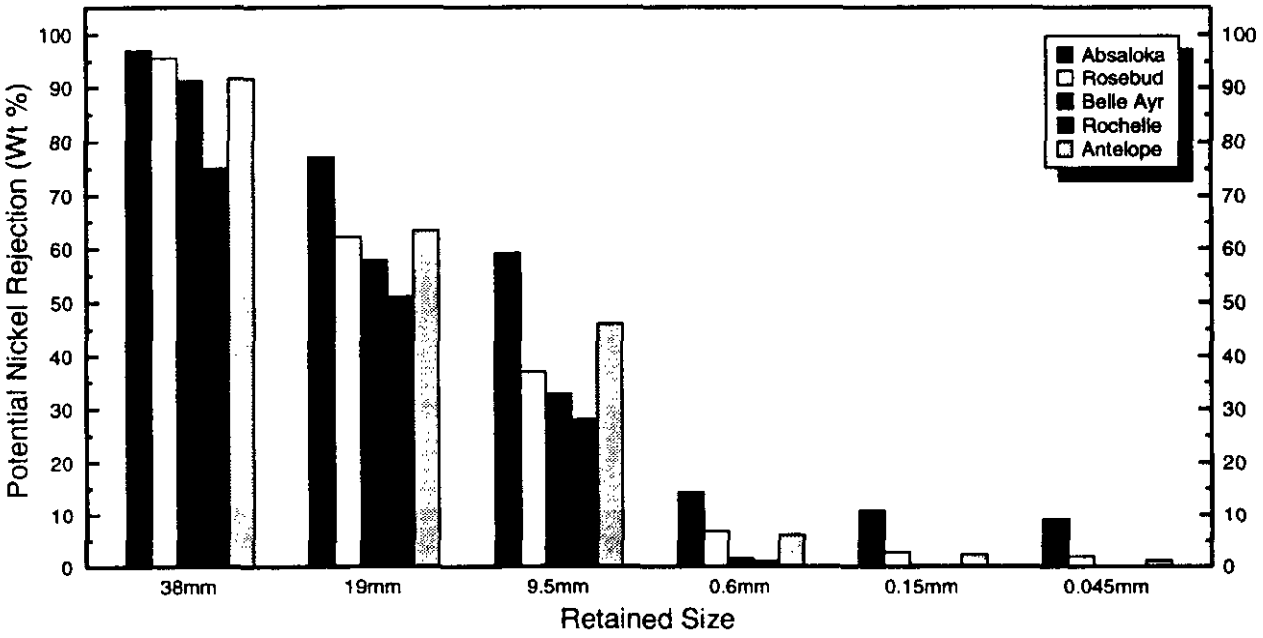
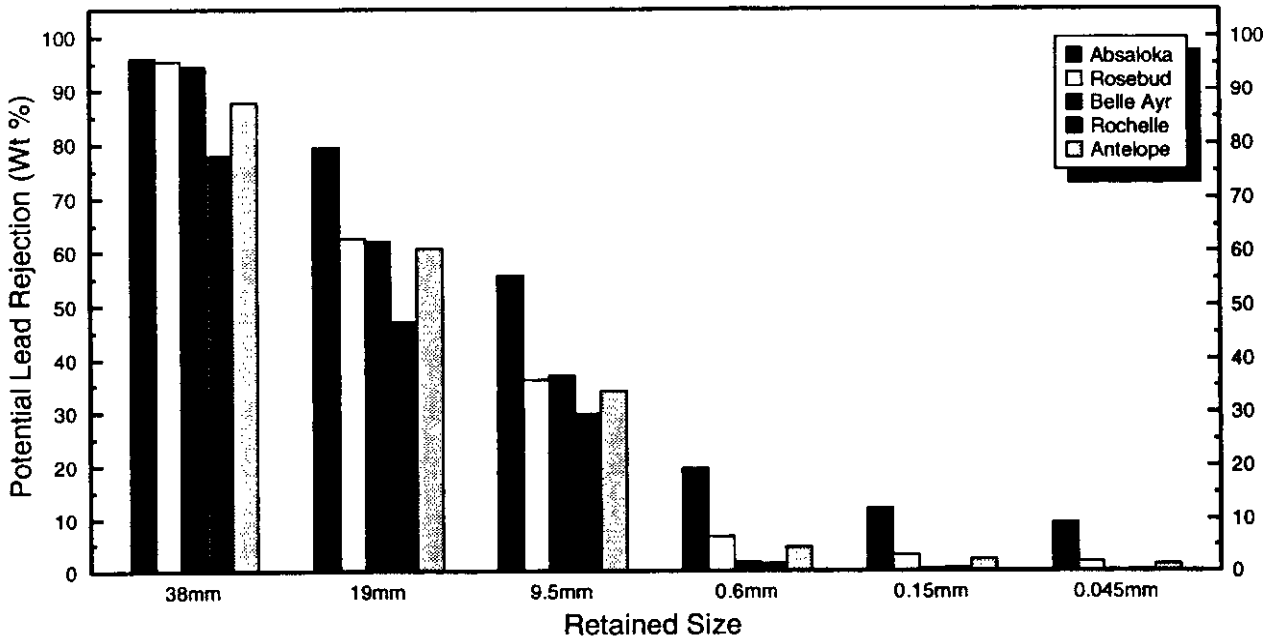
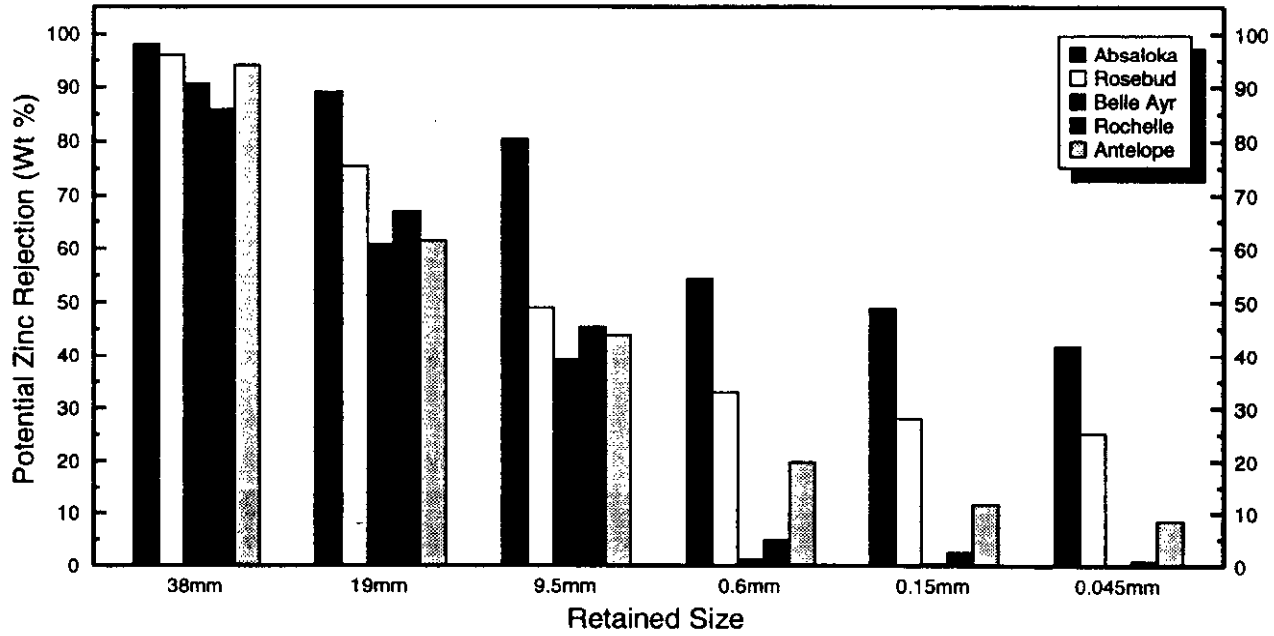


Figure 20. Cumulative Potential Removal of Lead and Zinc from Powder River Basin Subbituminous Coals Using Size-based Coal Cleaning Methods





Moreover, these figures indicate that sizing will give higher rejections of heavy metal trace elements (barium, chromium, nickel, lead, and zinc) than those expected for the other elements. This is probably because these heavy metal elements are likely to be associated with heavy minerals found in the rock partings within the coal seams and in the overburden. However, sizing these three PRB coals at 28 mesh will also decrease coal yield by five to ten percent and heating value recovery by about ten percent (see tables 8 and 9).

Figures 17 through 19 further show that sizing Absaloka Mine coal to reject trace elements is more promising than sizing any of the other coals. This is especially true in the removal of barium, fluorine and zinc, where rejections exceeding 55 percent can possibly be attained, probably by removing barite and pyrite particles. Computer-controlled scanning electron microscope (CCSEM) analyses show that appreciable amounts of barite (barium sulfate) and pyrite particles are present in run-of-mine Absaloka coal. These particles can often have elemental substitutions of fluorine for barium in the barite crystalline structure and zinc for iron in the pyrite structure.

The Potential of Gravity-based Coal Cleaning

Using coal cleaning methods that manipulate differences in particle density (typically measured as a specific gravity) to separate mineral matter from coal is more common than the use of sizing techniques. Gravity-based separations can be made with equipment such as heavy-media vessels and cyclones, jigs, water-only cyclones, shaking tables, and spirals. In order to evaluate the theoretical capability of using gravity-based separations to reduce the trace element concentration of PRB coals by removing relatively light coal from heavy gangue minerals, samples of run-of-mine or crushed coal were fractionated into specific gravity classes and analyzed for trace elements. Complete trace element data for all coal samples are given in Appendix B.

Laboratory washability data--summarized in tables 10 through 14 and figures 21 through 24--show that good potential exists for removing some trace elements using gravity-based separations. As shown in tables 10 through 14, if coal and mineral matter were separated at a 1.6-float specific gravity, the clean coal yield (weight recovery) for all five coals should theoretically be greater than about 93 percent.

Cleaning at this separating gravity would also result in the rejection of anywhere from none to as much as 50 percent of a particular trace element. Even for the cases where a high level of rejection is not always possible for a particular element, cleaning can still reduce the total trace element content of the coal. For example, the cumulative rejection of any of the nine targeted trace elements in the coals from Belle Ayr and Rochelle by separating coal and mineral at 1.6-float mean specific gravity will likely be less than about ten percent (tables 12 and 13). Nonetheless, the overall reduction of the total concentration of these trace elements will still be significantly decreased.

Cleaning Absaloka, Rosebud, and Antelope coals at a mean 1.6-float specific gravity, though, should significantly reduce the trace element content of some of the targeted elements: barium, chromium, lead, nickel, and zinc. Figures 21 through 24 show that, based on the results of analyses of these run-of-mine samples, the potential rejection of these elements from Absaloka and Antelope coals can range from 25 to 30 percent. The coal yield resulting from cleaning at this gravity may well exceed 90 percent (tables 10 through 14). These figures also show that cleaning Absaloka coal will likely give greater overall trace element rejections than those obtained when cleaning Antelope or Rosebud coals. This is probably because Absaloka coal has higher amounts of ash-forming and sulfur-bearing mineral matter containing these trace elements than does either the Rosebud or Antelope coal.

The potential for rejecting barium, chromium, and zinc by using gravity-based cleaning is especially high for the Absaloka and Antelope coals. Again, this probably indicates that some of the trace elements are associated with the rocks and minerals found with the overburden and partings in these raw coals. CCSEM analyses show that discrete particles of rutile and chromite are found in these coals and are probably associated with the sandstone overburden. Elemental crystalline substitution of chromium and nickel in the structure of rutile and substitution of nickel in the lattice structure of chromite minerals is fairly common. In addition, small amounts of barite particles, which might also contain trace amounts of fluorine, are also present in some of these coals and are likely associated with calcite partings and seam intrusions.

Table 10. Trace Element Analyses of Washability Products of Rosebud-M'Kay Seam Subbituminous Coal. *Absaloka Mine, Big Horn County, Montana (Uncrushed, SO_3-free Dry Basis).*

Cumulative Composite

				Element Concentration (ppm)								
Sink	Float	Wt (%) Recovery	Heating Value (Btu/lb)	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
	1.25	4.1	12,312	1.14	6.70	1.10	38.21	4.22	0.10	3.40	0.66	6.08
1.25	1.30	50.9	12,217	2.91	15.72	2.21	25.76	2.87	0.25	3.65	1.39	5.05
1.30	1.35	70.4	12,142	3.47	16.43	2.48	25.71	3.22	0.21	3.95	1.40	5.30
1.35	1.40	80.2	12,082	3.55	15.49	2.60	26.35	3.45	0.19	4.29	1.33	6.17
1.40	1.60	93.2	11,911	3.57	15.17	3.29	29.81	4.02	0.19	5.09	1.35	10.21
1.60	1.80	95.5	11,804	3.58	16.77	3.59	32.20	4.25	0.19	5.53	1.37	12.97
1.80	2.00	97.3	11,689	3.56	17.62	3.81	33.61	4.48	0.19	5.85	1.42	14.61
2.00	2.45	99.1	11,534	3.56	20.94	4.13	34.43	4.93	0.19	6.28	1.47	16.13
2.45		100.0	11,450	3.56	28.49	4.30	34.35	5.13	0.19	6.27	1.48	19.42

Cumulative Distribution

				Element Rejection (Wt %)								
Sink	Float	Wt (%) Recovery	Heating Value Recovery (%)	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
	1.25	4.1	4.4	98.7	99.1	99.0	95.5	96.7	97.8	97.9	98.2	98.7
1.25	1.30	50.9	54.3	58.4	71.9	73.9	61.8	71.6	31.8	72.2	52.2	86.8
1.30	1.35	70.4	74.6	31.4	59.4	59.3	47.3	55.8	21.3	58.4	33.5	80.8
1.35	1.40	80.2	84.6	20.2	56.4	51.5	38.5	46.0	17.4	48.5	27.8	74.5
1.40	1.60	93.2	96.9	6.5	50.4	28.6	19.1	26.9	5.7	29.0	15.0	51.0
1.60	1.80	95.5	98.5	3.9	43.8	20.1	10.5	20.9	3.6	20.9	11.4	36.2
1.80	2.00	97.3	99.4	2.6	39.8	13.7	4.7	15.1	1.9	14.8	6.5	26.8
2.00	2.45	99.2	99.9	1.0	27.1	4.9	0.6	4.6	0.6	6.8	1.6	17.7
2.45		100.0	100.0	0	0	0	0	0	0	0	0	0

Table 11. Trace Element Analyses of Washability Products of Rosebud Seam Subbituminous Coal.
Rosebud Mine, Rosebud County, Montana (Uncrushed, SO_3-free Dry Basis).

Cumulative Composite

				Element Concentration (ppm)								
Sink	Float	Wt (%) Recovery	Heating Value (Btu/lb)	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
	1.25	4.6	12,760	0.62	29.31	1.81	48.81	3.26	0.29	2.27	0.74	5.32
1.25	1.30	64.4	12,345	3.00	30.28	2.53	32.38	3.80	0.15	3.22	1.17	4.13
1.30	1.35	80.6	12,234	3.03	35.65	2.69	32.92	3.85	0.15	3.88	1.18	4.24
1.35	1.40	84.9	12,175	3.01	38.05	2.82	33.17	4.11	0.16	4.07	1.14	4.27
1.40	1.60	95.9	12,005	2.89	39.17	3.17	34.83	4.69	0.16	4.72	1.12	6.63
1.60	1.80	97.4	11,934	2.87	40.80	3.33	35.81	4.81	0.16	4.97	1.13	7.16
1.80	2.00	98.3	11,881	2.87	43.31	3.42	36.13	4.91	0.17	5.18	1.17	7.43
2.00	2.45	99.4	11,786	2.96	45.95	3.58	36.59	5.07	0.17	5.48	1.30	7.73
2.45		100.0	11,733	2.99	48.40	3.71	36.63	5.20	0.17	5.76	1.32	8.71

Cumulative Distribution

				Element Rejection (Wt %)								
Sink	Float	Wt (%) Recovery	Heating Value Recovery (%)	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
	1.25	4.6	5.1	99.0	97.2	97.7	93.8	97.1	92.1	98.2	97.4	97.2
1.25	1.30	64.4	67.8	35.2	59.7	56.1	43.0	52.9	42.7	64.0	42.9	69.4
1.30	1.35	80.6	84.0	18.4	40.6	41.5	27.6	40.2	28.2	45.7	28.0	60.7
1.35	1.40	84.9	88.1	14.6	33.3	35.6	23.1	32.9	23.0	40.0	26.5	58.4
1.40	1.60	95.9	98.1	7.4	22.4	18.2	8.8	13.5	10.1	21.4	18.7	27.0
1.60	1.80	97.4	99.1	6.5	17.9	12.4	4.7	9.8	7.5	16.0	16.7	19.8
1.80	2.00	98.3	99.5	5.7	12.1	9.5	3.1	7.1	5.6	11.7	13.0	16.2
2.00	2.45	99.4	99.9	1.6	5.6	4.1	0.7	3.0	3.0	5.4	2.4	11.8
2.45		100.0	100.0	0	0	0	0	0	0	0	0	0

Table 12. Trace Element Analyses of Washability Products of Wyodak Seam Subbituminous Coal.
Belle Ayr Mine, Campbell County, Wyoming (Uncrushed, SO_3-free Dry Basis).

Cumulative Composite

				Element Concentration (ppm)								
Sink	Float	Wt (%) Recovery	Heating Value (Btu/lb)	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
	1.25	30.5	12,331	2.47	9.94	1.41	78.01	1.24	0.36	2.69	0.97	4.51
1.25	1.30	91.9	12,273	2.24	14.69	1.90	54.15	1.74	0.28	2.86	1.25	5.56
1.30	1.35	96.1	12,235	2.21	14.44	2.13	55.48	1.95	0.29	3.00	1.23	6.26
1.35	1.40	97.4	12,217	2.21	14.50	2.22	55.48	2.03	0.29	3.03	1.23	6.80
1.40	1.60	99.3	12,169	2.21	15.91	2.45	55.82	2.33	0.29	3.12	1.22	7.17
1.60	1.80	99.8	12,148	2.21	16.73	2.53	55.97	2.38	0.29	3.18	1.22	7.32
1.80	2.00	99.9	12,141	2.22	16.87	2.56	56.01	2.40	0.30	3.21	1.22	7.44
2.00	2.45	99.9	12,136	2.22	16.91	2.58	56.06	2.42	0.30	3.24	1.22	7.58
2.45		100.0	12,130	2.22	17.06	2.64	56.08	2.44	0.30	3.29	1.22	7.89

Cumulative Distribution

				Element Rejection (Wt %)								
Sink	Float	Wt (%) Recovery	Heating Value Recovery (%)	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
	1.25	30.5	31.0	66.1	82.2	83.8	57.6	84.5	62.6	75.1	75.9	82.6
1.25	1.30	91.9	93.0	7.5	20.9	33.8	11.3	34.3	13.4	20.3	5.8	35.2
1.30	1.35	96.1	96.9	4.3	18.6	22.7	4.9	23.2	6.8	12.4	3.0	23.7
1.35	1.40	97.4	98.1	3.3	17.2	18.2	3.6	18.7	5.0	10.3	2.3	16.0
1.40	1.60	99.3	99.6	1.2	7.4	8.0	1.1	5.0	1.4	5.8	0.8	9.7
1.60	1.80	99.8	99.9	0.6	2.2	4.6	0.4	2.7	0.5	3.6	0.4	7.4
1.80	2.00	99.9	100.0	0.4	1.3	3.3	0.2	1.6	0.3	2.5	0.3	5.7
2.00	2.45	99.9	100.0	0.3	1.0	2.5	0.1	0.9	0.1	1.7	0.1	3.9
2.45		100.0	100.0	0	0	0	0	0	0	0	0	0

Table 13. Trace Element Analyses of Washability Products of Wyodak Seam Subbituminous Coal.
Rochelle Mine, Campbell County, Wyoming (Uncrushed, SO_3-free Dry Basis).

Cumulative Composite

				Element Concentration (ppm)								
Sink	Float	Wt (%) Recovery	Heating Value (Btu/lb)	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
	1.25	26.8	12,281	2.33	11.56	1.45	42.39	1.28	0.17	1.79	1.58	3.68
1.25	1.30	85.6	12,234	1.38	23.31	2.10	46.92	1.54	0.22	2.04	1.73	4.34
1.30	1.35	95.8	12,172	1.44	23.77	2.36	47.50	1.58	0.22	2.21	1.75	4.29
1.35	1.40	97.2	12,161	1.43	24.17	2.40	47.59	1.60	0.23	2.23	1.73	4.37
1.40	1.60	99.4	12,129	1.43	25.28	2.46	47.85	1.68	0.23	2.34	1.71	4.62
1.60	1.80	99.7	12,113	1.43	27.68	2.50	48.06	1.72	0.23	2.40	1.71	4.73
1.80	2.00	99.8	12,105	1.43	28.06	2.51	48.14	1.74	0.23	2.43	1.71	4.78
2.00	2.45	99.9	12,093	1.43	28.37	2.56	48.24	1.76	0.23	2.48	1.71	4.88
2.45		100.0	12,088	1.43	28.47	2.60	48.26	1.78	0.23	2.51	1.71	5.01

Cumulative Distribution

				Element Rejection (Wt %)								
Sink	Float	Wt (%) Recovery	Heating Value Recovery (%)	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
	1.25	26.8	27.3	56.4	89.1	85.0	76.4	80.8	80.4	80.8	75.1	80.3
1.25	1.30	85.6	86.6	17.6	29.9	31.0	16.8	26.3	18.4	30.3	13.5	25.9
1.30	1.35	95.8	96.5	3.5	20.0	13.1	5.7	15.1	7.3	15.5	2.1	17.9
1.35	1.40	97.2	97.8	2.7	17.5	10.3	4.1	12.9	5.2	13.4	1.7	15.2
1.40	1.60	99.4	99.7	0.9	11.7	5.8	1.5	6.5	1.8	7.1	0.4	8.4
1.60	1.80	99.7	99.9	0.7	3.0	4.2	0.7	4.0	0.9	4.6	0.3	6.1
1.80	2.00	99.8	100.0	0.6	1.6	3.6	0.4	2.8	0.6	3.3	0.2	4.9
2.00	2.45	99.9	100.0	0.3	0.4	1.5	0.1	1.2	0.4	1.3	0.1	2.8
2.45		100.0	100.0	0	0	0	0	0	0	0	0	0

Table 14. Trace Element Analyses of Washability Products of Wyodak-Anderson Seam Subbituminous Coal. *Antelope Mine, Converse County, Wyoming (Uncrushed, SO_3-free Dry Basis).*

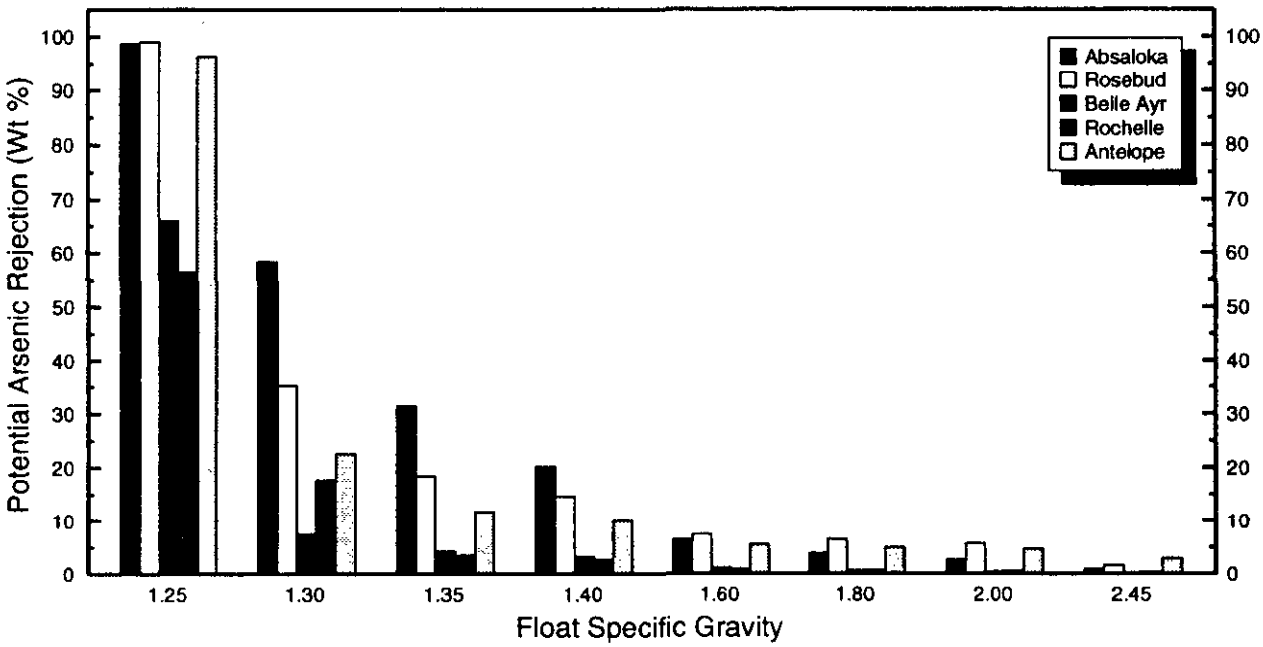
Cumulative Composite

				Element Concentration (ppm)								
Sink	Float	Wt (%) Recovery	Heating Value (Btu/lb)	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
	1.25	6.9	12,105	1.17	3.15	1.84	35.04	1.56	0.13	2.12	1.38	4.95
1.25	1.30	74.7	12,040	2.27	4.32	2.05	43.33	2.19	0.22	3.57	1.71	7.34
1.30	1.35	91.5	11,976	2.11	4.03	2.54	43.69	2.30	0.21	3.72	1.64	7.04
1.35	1.40	93.7	11,956	2.10	4.05	2.73	43.64	2.32	0.21	3.80	1.62	7.55
1.40	1.60	98.1	11,893	2.11	4.64	3.11	43.73	2.47	0.21	3.94	1.60	8.58
1.60	1.80	98.6	11,871	2.11	4.98	3.32	44.09	2.56	0.21	4.04	1.60	8.87
1.80	2.00	98.7	11,862	2.11	5.08	3.40	44.20	2.60	0.21	4.07	1.60	9.02
2.00	2.45	99.2	11,804	2.14	6.30	3.88	44.45	2.83	0.21	4.27	1.61	9.64
2.45		100.0	11,716	2.19	7.69	4.81	44.80	3.17	0.22	4.64	1.63	10.97

Cumulative Distribution

				Element Rejection (Wt %)								
Sink	Float	Wt (%) Recovery	Heating Value Recovery (%)	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
	1.25	6.9	7.1	96.3	97.2	97.4	94.6	96.6	95.7	96.9	94.2	96.9
1.25	1.30	74.7	76.7	22.5	58.1	68.2	27.8	48.2	24.3	42.5	21.8	50.0
1.30	1.35	91.5	93.5	11.8	52.1	51.4	10.8	33.7	10.7	26.6	8.4	41.2
1.35	1.40	93.7	95.6	10.0	50.7	46.9	8.7	31.2	8.5	23.3	6.8	35.5
1.40	1.60	98.1	99.6	5.5	40.8	36.5	4.2	23.5	5.0	16.7	3.7	23.3
1.60	1.80	98.6	99.9	4.9	36.7	32.4	3.0	20.4	4.5	14.6	3.3	20.8
1.80	2.00	98.7	99.9	4.7	35.2	30.5	2.6	19.1	4.3	13.7	3.2	19.2
2.00	2.45	99.2	100.0	3.0	18.9	20.1	1.6	11.5	3.4	8.9	2.2	13.0
2.45		100.0	100.0	0	0	0	0	0	0	0	0	0

Figure 21. Cumulative Potential Removal of Arsenic and Selenium from Powder River Basin Subbituminous Coals Using Gravity-based Coal Cleaning Methods



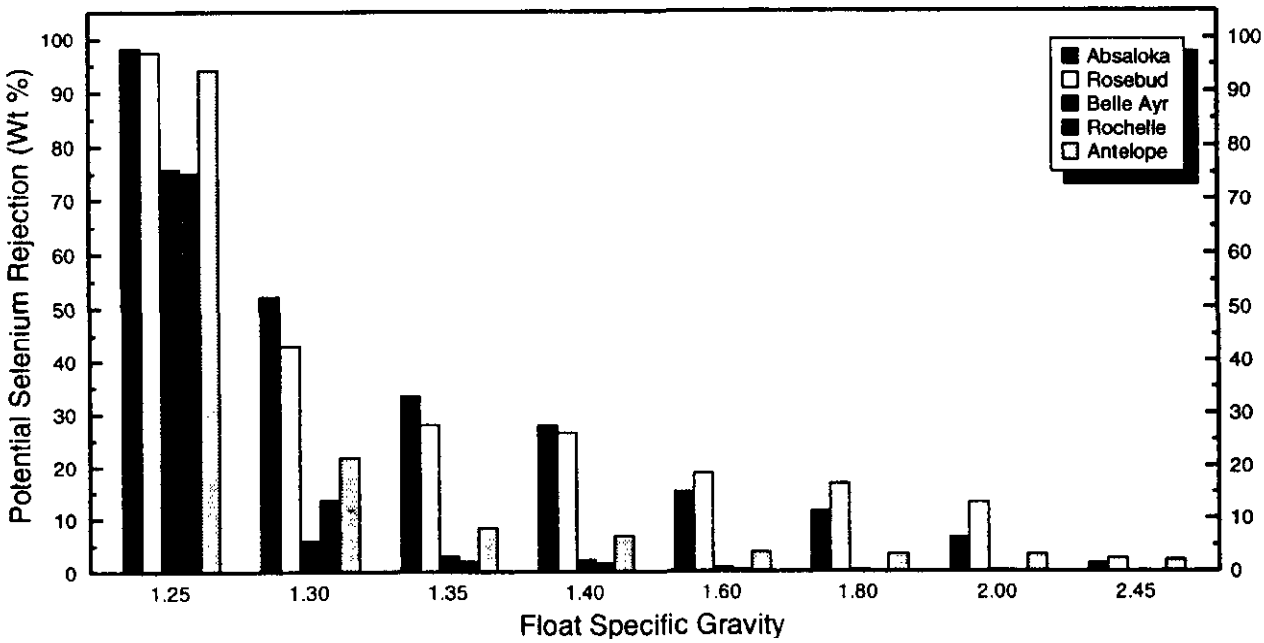


Figure 22. Cumulative Potential Removal of Barium, Fluorine, and Mercury from Powder River Basin Subbituminous Coals Using Gravity-based Coal Cleaning Methods

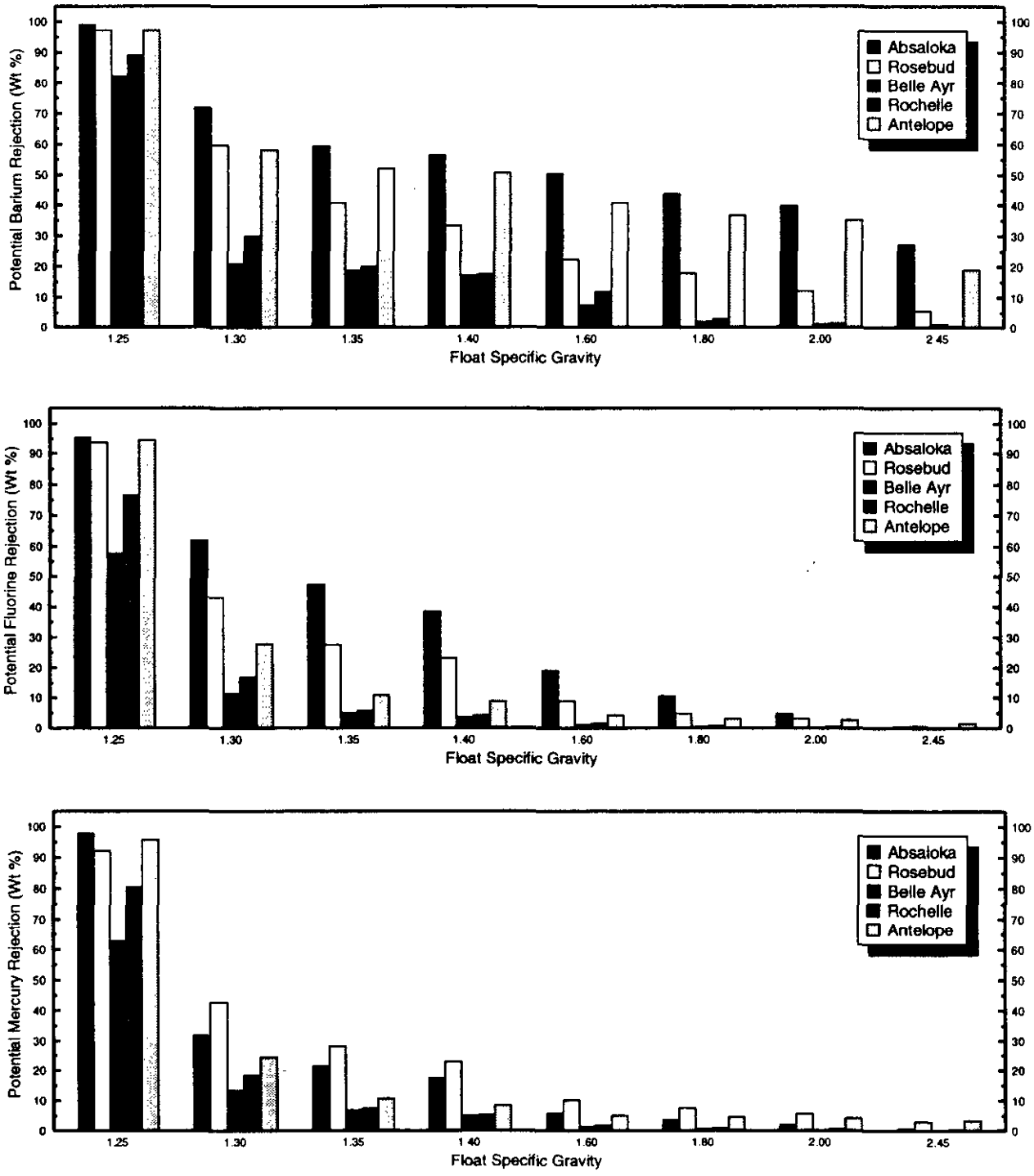
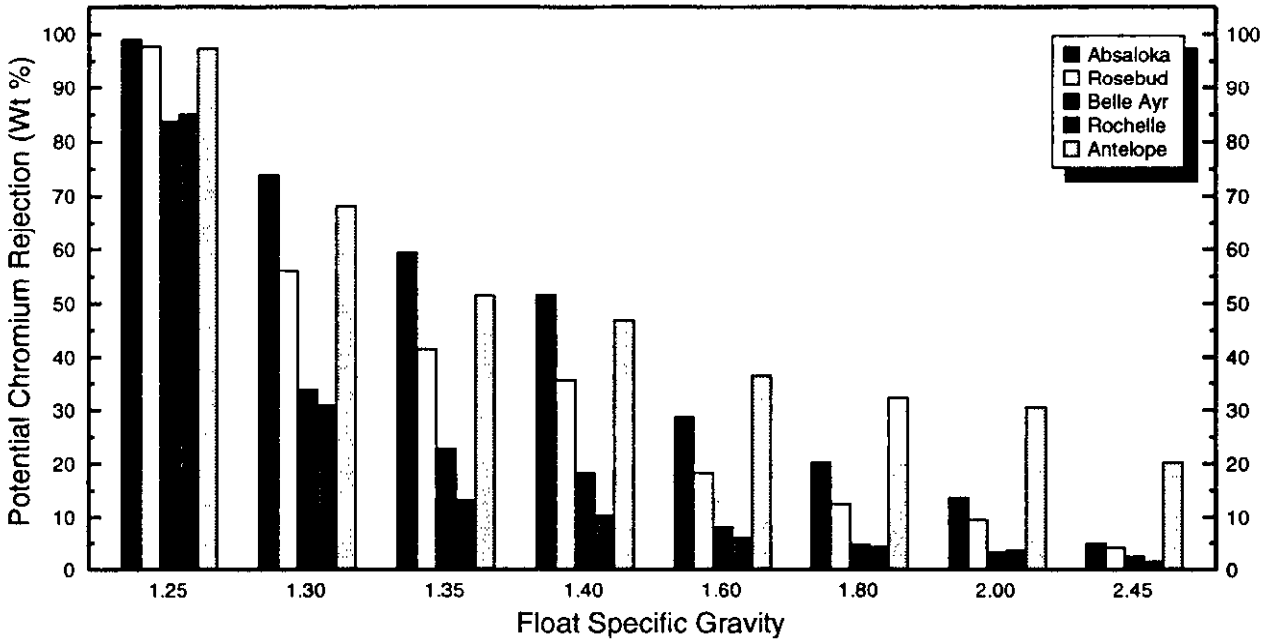


Figure 23. Cumulative Potential Removal of Chromium and Nickel from Powder River Basin Subbituminous Coals Using Gravity-based Coal Cleaning Methods



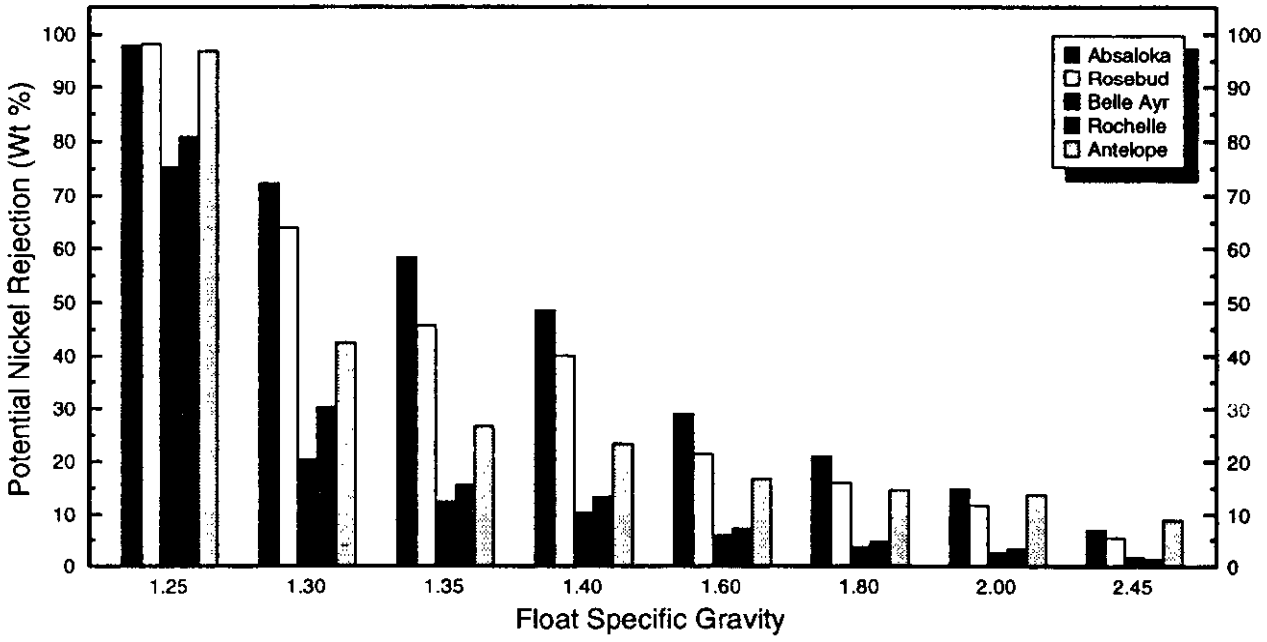
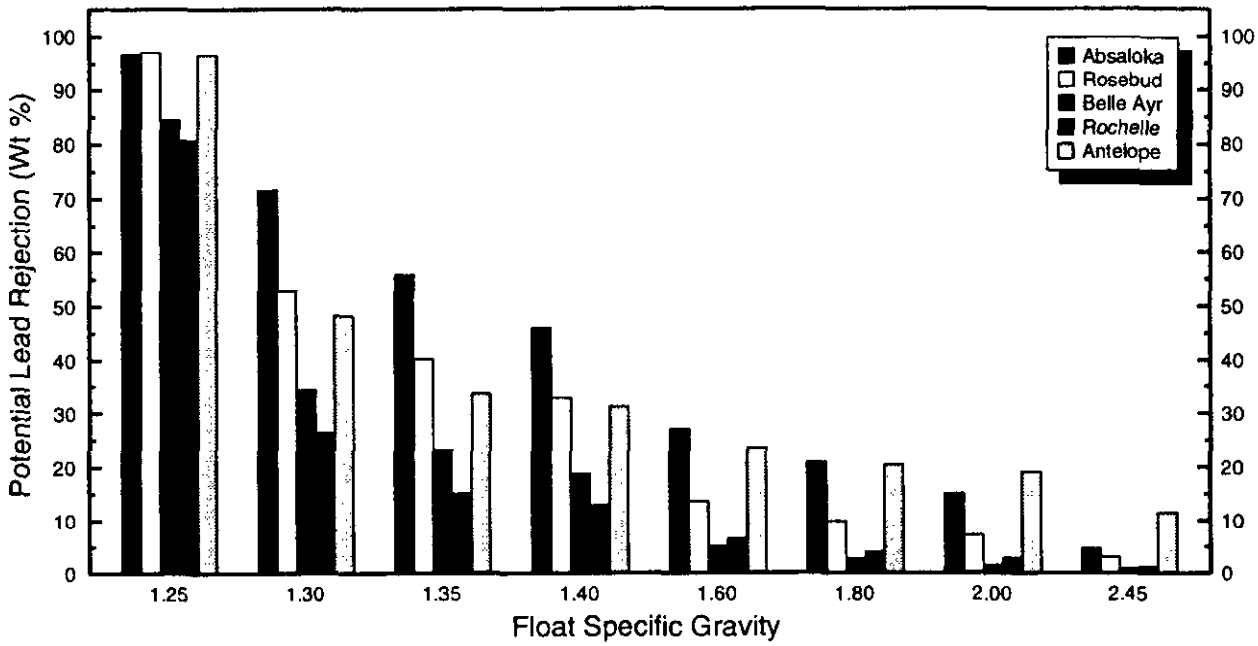
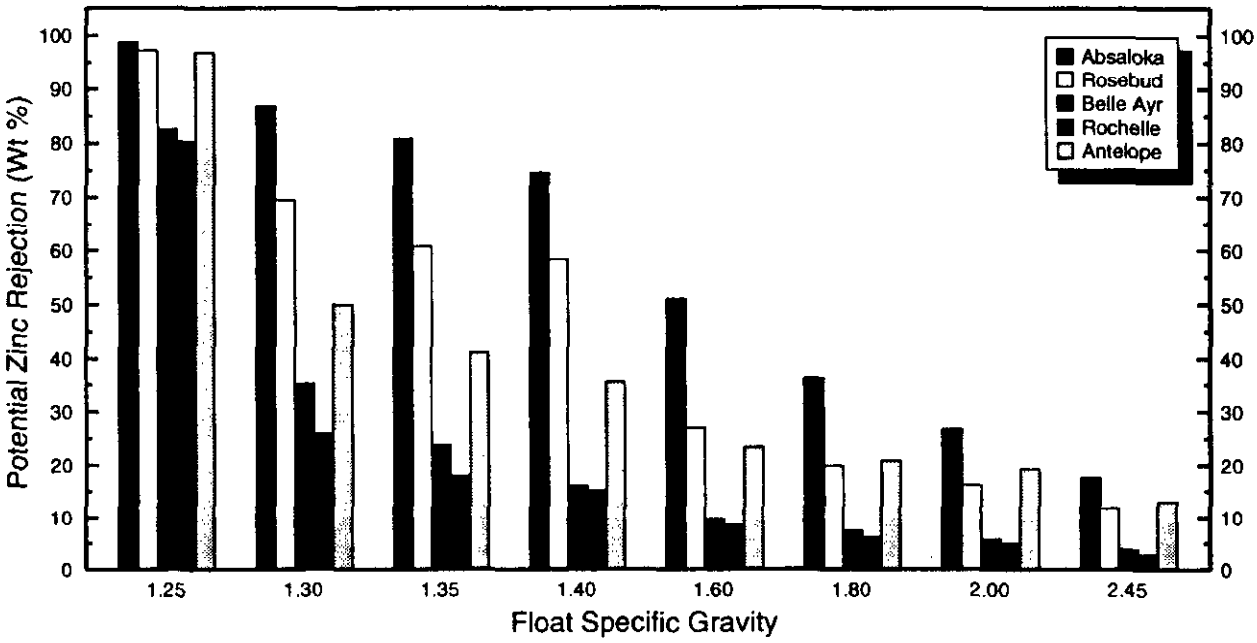


Figure 24. Cumulative Potential Removal of Lead and Zinc from Powder River Basin Subbituminous Coals Using Gravity-based Coal Cleaning Methods





Finally, in all of these cases, the theoretical removal of trace elements and, unfortunately, the losses of coal yield resulting from cleaning will be somewhat higher than that indicated. This is because, for convenience of discussion, the projections of the cleanability of these coal samples were extrapolated from composited analyses of the entire coal sample and not on those of specific size fractions. In practice, gravity-based processes can usually treat only certain sizes of particles in an effective manner and are generally very ineffective on particles finer than about 100 mesh.

The Potential for Improving Trace Element Removal through Mineral Matter Liberation

Trace element analyses were also completed on washability products of samples of all five PRB coals that were crushed to minus 100 mesh to increase the degree of liberation of ash-forming and sulfur-bearing minerals (Appendix B). As with the uncrushed coal washability studies, by examining the trace element content of individual density fractions of the progeny distributions, potential improvements in the removal of mineral matter and trace elements during coal cleaning can be predicted and evaluated.

Improved mineral matter liberation should be characterized by increases in the distribution of material in relatively light and heavy gravity fractions and accompanying decreases in the weight distribution of locked coal-mineral matter particles in intermediate gravity fractions--this is most easily tracked by examining increases in the amount of heavy (2.0-sink) material. Decreases in the distribution of very light or very heavy material in uncrushed versus crushed coals cannot occur, in reality, since the original amount of material in these end-member gravity fractions cannot migrate to lighter or heavier fractions.

As the data in Table 15 show, the potential rejection of heavy minerals containing chromium, nickel, lead, and zinc might be increased by as much as 20 percent for Absaloka, Rosebud, and Antelope coals if the run-of-mine coals are first crushed to minus 100 mesh and then cleaned using a gravity-based method. In general, these same trends can be noted for the other coals and for other elements in the coals, but the increases in the trace element distribution in the 2.0-sink gravity fraction are not usually as significant.

Table 15. Potential Improvements in the Removal of Trace Elements Through Increased Mineral Matter Liberation. *Cumulative Fractional Distribution of 2.0-Sink Material in Uncrushed and Crushed to 100 Mesh Powder River Basin Coals (Wt %).*

	Arsenic		Selenium		Barium		Fluorine		Mercury	
Mines	Uncrushed	-100M	Uncrushed	-100M	Uncrushed	-100M	Uncrushed	-100M	Uncrushed	-100M
Absaloka	3.8	3.9	11.5	9.0	43.8	42.0	10.4	12.7	3.6	3.4
Rosebud	6.5	7.1	16.7	5.5	17.9	11.4	4.8	9.6	7.5	7.1
Belle Ayr	0.7	2.8	0.4	1.7	2.2	8.3	0.5	2.2	0.5	2.9
Rochelle	0.7	1.4	0.2	0.5	3.0	1.6	0.7	7.1	1.0	1.4
Antelope	4.9	6.7	3.3	4.5	36.7	41.6	3.0	5.3	4.6	6.4

	Chromium		Nickel		Lead		Zinc	
Mines	Uncrushed	-100M	Uncrushed	-100M	Uncrushed	-100M	Uncrushed	-100M
Absaloka	20.2	9.4	21.0	7.2	21.0	29.8	35.3	45.8
Rosebud	12.5	13.8	16.0	23.0	9.8	18.4	19.9	31.6
Belle Ayr	4.7	7.7	3.6	9.5	2.8	13.8	7.3	13.0
Rochelle	4.2	7.2	4.6	4.6	4.0	6.6	6.1	9.4
Antelope	32.3	39.8	14.6	30.7	20.4	28.3	20.7	40.7

In some cases, though, the changes in these distributions do not appear to follow accepted trends (less material of 2.0-sink density is reported to be in the crushed coal than was in the uncrushed coal). Concluding that crushing is actually effective in these instances is, therefore, arguable.

Large improvements in rejection should not be totally expected, however, because these subbituminous coal samples typically have fairly low amounts of mineral matter and pyrite to be liberated. Thus, although crushing appears to be effective for improving the liberation and subsequent removal of trace elements from these coals, it is probably not cost justified in most cases.

CHARACTERIZATION OF PETROLEUM COKE

Another material that Northern States Power Company's King Station and many other utilities often use as a boiler fuel is petroleum coke; unfortunately, it often contains relatively high amounts of total sulfur and appreciable amounts of many metal elements.

Petroleum coke, either delayed or fluid type, is a solid residue product of the distillation and carbonization of crude and refined petroleum. It primarily consists of low volatile carbon and hydrocarbon compounds and various amounts of sulfur and metal trace elements that were originally found in the form of complex salts within the crude. Petroleum coke is also naturally low in ash-forming minerals.

To learn more about the types and distribution of the contaminants in petroleum coke, and to ascertain whether this fuel can be cleaned to reduce the sulfur and trace element contents, a sample of petroleum coke from Koch Carbon's Pine Bend Plant in Minnesota was submitted for various analyses: proximate, ultimate, particle size distribution, and trace elements (see Appendix C). Washability analyses were not performed because several other characterizations of petroleum coke completed by CQ Inc. have shown that it usually contains very little ash-forming minerals and, as a result, does not vary much in gravity distribution.

Table 16 shows that this sample of petroleum coke has an extremely high as-received basis heating value (15,140 Btu/lb), a very low total moisture content (less than 0.5 Wt %), and measures over 8.0 lbs SO_2/MBtu. Since the ash content of the petroleum coke is well below one percent, gravity-based cleaning of petroleum coke will probably not be very effective in increasing the heating value of the petroleum coke enough to mask its large sulfur content. The potential for cleaning petroleum coke using sizing methods is not much better. As shown in the size-sulfur distribution data in Table 16, the variation of sulfur as a function of particle size is not significant. The amounts of trace elements in this sample of petroleum coke are also fairly low, with the exceptions of chlorine, nickel, and vanadium. Based on these results, cleaning petroleum coke to improve its quality for firing in utility boilers will probably need to be accomplished using chemical cleaning methods.

Table 16. Petroleum Coke Quality Summary. *(SO_3-free, Dry Basis).*

Proximate Analyses (Wt %)		**Ultimate Analyses (Wt %)**		**Trace Elements**	
Total Moisture	0.27	Carbon	87.20	Arsenic	<2.0 ppb
Fixed Carbon	90.43	Hydrogen	3.67	Barium	1.21 ppm
Volatile Matter	9.19	Nitrogen	1.58	Chlorine	300 ppm
Ash	0.38	Oxygen	1.09	Chromium	1.68 ppm
		Sulfur	6.08	Fluorine	14.9 ppm
Heating Value (Btu/lb)	15,141			Lead	0.26 ppm
Lbs SO_2/MBtu	8.02			Lithium	0.07 ppm
				Mercury	66.1 ppb
Grindability (HGI)	28			Nickel	182.8 ppm
				Selenium	<2.0 ppb
				Thallium	<0.5 ppm
				Tin	1.13 ppm
				Titanium	19.3 ppm
				Vanadium	360.0 ppm
				Zinc	0.88 ppm

Incremental Size Analyses

Retained Size	Wt (%) Recovery	Ash Content (Wt %)	Sulfur Content (Wt %)	Heating Value (Btu/lb)	lbs SO_2/MBtu
+¼-in.	50.9	0.36	5.91	15,142	7.80
¼ x 28M	44.0	0.30	5.95	15,141	7.85
28 x 100M	3.6	0.56	5.86	15,123	7.74
100 x 325M	1.0	1.19	5.79	14,976	7.83
-325M	0.5	4.55	5.65	14,366	7.86

THE COST OF CLEANING POWDER RIVER BASIN COALS

Coal cleaning is not currently conducted on PRB subbituminous coals, since the coals being mined are sufficiently low in ash and sulfur content to meet the present quality demands of the steam coal market. However, concerns with air toxic emissions resulting from the combustion of coals containing high amounts of metallic trace elements may eventually make cleaning necessary. Based on coal characterizations completed on PRB samples, the potential for reducing these contaminants using physical coal cleaning is technically feasible. However, this does not ensure that the economics of coal cleaning operations are feasible.

To examine the economics of the cleaning PRB coals, CQ Inc. engineers completed a preliminary cost estimate for two types of cleaning plants:

- Air-table Plant
- Dry Screen/Jig Plant

A 1,000-tph air-table plant with support equipment was designed and costed to model installations where a lack of processing water is likely--this condition is expected for most sites located in the Powder River Basin. A 1,000-tph dry screening/jig plant with minimal ancillary equipment was also costed to represent those systems where more intensive coal cleaning will be required and where a sufficient water supply may be available. Table 17 summarizes the cost breakdown for each of these designs. Complete cost model information and assumptions are provided in Appendix D.

Table 17. Estimated Costs of Coal Cleaning PRB Coals.
1991 Dollars.

	Air-table Plant	Jig Plant
Operating Costs (in Thousands)		
• Labor	$917	$1,272
• Supplies & Expenses	$2,466	$2,178
• Other (Insurances, Taxes)	$338	$345
Capital Costs (in Thousands)		
• Equipment	$5,881	$4,467
• Installation	$3,214	$4,605
Total	$1.20/raw ton	$1.27 raw ton

The estimated cleaning costs (in 1991 dollars) of $1.20/raw ton for an air-table plant and $1.27/raw ton for a dry screen/jig plant that are shown in Table 17 represent only preliminary estimates of the economics for cleaning PRB coals. These estimates are not meant to be complete cost analyses for the implementation of coal cleaning, but are given for relative comparison to current cleaning operations in other coal fields.

These costs compare favorably with respect to those for existing coal cleaning operations in the U.S. and indicate that cost-effective process flowsheets can be designed for the cleaning of PRB coals if the need develops.

SUMMARY

The results of raw coal characterization and liberation potential studies on five Powder River Basin coals indicate that moderate improvements in coal quality can be achieved through physical coal cleaning. While obtaining 95 percent energy recovery, potential sulfur dioxide emissions from the Montana coals can be reduced at least 30 percent through cleaning, allowing these coals to meet the future compliance level of 1.2 lbs/MBtu for sulfur dioxide emissions. By cleaning these coals after crushing to a topsize of 100 mesh, the ash and sulfur content of the clean coals may be decreased by an additional 10 to 15 percent.

Crushing to a topsize of 100 mesh and cleaning Wyodak Seam subbituminous coals from Wyoming can potentially decrease their ash contents by 10 to 20 percent. Crushing and cleaning Wyodak-Anderson Seam coal can theoretically decrease ash levels over 40 percent and reduce sulfur dioxide emissions as much as ten percent. However, all of the Wyoming coals in this study already have potential sulfur dioxide emissions less than 0.8 lbs/MBtu, well below Phase II compliance levels.

The trace element content of the clean coals can also be reduced by way of physical coal cleaning techniques, but rejections will vary from coal to coal. By sizing run-of-mine coal at about 28 mesh, the rejection of nine elements of concern should range from 5 to 50 percent, while coal yields over 90 percent are attained. Sizing of Rosebud, Antelope, and, especially, Absaloka mine coals will likely give higher rejections of barium, chromium, fluorine, lead, nickel, and zinc than sizing of Belle Ayr and Rochelle mine coals. Similarly, cleaning these subbituminous coals using gravity-based processes can potentially give 90 percent coal yields, while rejecting anywhere from zero to 50 percent of the trace element contaminants.

Crushing followed by gravity-based cleaning may increase the rejection of trace elements by as much as 20 percent, but only for those coals where most of their mineral matter is associated with rock partings within the coal bed.

In conclusion, mineral matter and trace elements will likely be rejected more easily from coals from the northeastern and southeastern extremes of the PRB during physical coal cleaning than those from the interior portions of the basin.

APPENDIX A

Raw and Reduced Coal Data

DEVELOPMENT OF THE COAL QUALITY EXPERT
COAL QUALITY INFORMATION - COAL CHARACTERIZATIONS

A Summary of Specialized Data Analysis and Data Reduction Methods Used to Characterize Sub-Bituminous Coal Samples from the Powder River Basin

All coal samples were processed in accordance with laboratory procedures recommended by the Electric Power Research Institute (Report Number CS-5644, Volume Number 4, Laboratory Guidelines and Procedures: Low-Rank Coal Analysis) and the American Society for Testing and Materials (Volume Number 05.05, Gaseous Fuels; Coal and Coke). These documents address and detail unique and effective methods for treating and analyzing low-rank coal samples.

The following sections briefly explain data analysis and reduction methods for each topsize of coal generated and studied.

As-Received Coal

No special data analysis or data reduction methods were used to generate the data shown for these coal samples.

As-Received Coal Crushed to 3/8 inch Topsize

Based on recent results from coal washability studies not related to this work, there has been strong evidence to suggest that the use of heavy organic liquids to separate coal finer than about ¼ inch into progeny gravity fractions actually results in measurements of gravity distributions that are skewed. Two prevailing theories are that these heavy liquids--commonly known as Certigrav--are being trapped into cracks and crevasses in the coal particles or are being absorbed onto the surfaces of the coal, thereby increasing the apparent specific gravity of the particles. This causes the coal particles to report to the incorrect gravity fraction during separation. This phenomenon appears to be more pronounced in lighter gravity fractions (1.25 to 1.5 specific gravity intervals), i.e. in those fractions where coal that would contain little mineral matter reports.

Knowing that this phenomenon appears to be more marked in fine coal washabilities and in light gravity classes, CQ Inc. believed that an alternative washability methodology was needed to provide more reliable results for laboratory gravity separations of coal samples containing large amounts of fine particles. Two methods were considered:

- Cesium Chloride Method
- Alternate Certigrav Method

As-Received Coal Crushed to 100 mesh Topsize

Data analysis and data reduction methods for run-of-mine coals crushed to minus 100 mesh topsize are similar to those used for coal crushed to minus 3/8 inch topsize.

CQ Inc. used the same procedure to mathematically re-combine the gravity washabilities of the 1.3-float and 1.3-sink material except that since only one size class interval was used in the washability analysis (-100 M), only the weight fractions and quality analyses for one size class were re-combined and re-normalized.

Westinghouse Electric Inc.
Electric Boat

GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE: 5-22-92
MASTER SAMPLE NO. 123126

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: ABSALOKA SECONDARY CRUSHER REJECT SPLIT RAW COAL

OPERATING CO.: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
MINE:
LOCATION:

DATE SAMPLED:
WEATHER:
GROSS WEIGHT: 1796.7

DATE RECEIVED: 08/28/91

OTHER ID: POWDER RIVER BASIN COAL TOP X 0 AS-RECEIVED COAL NOMINAL 6 TONS RAW COAL CHARACTERIZATION ALL WT PERCENTS REPORTED ON A DRY BASIS; ALL ASH PERCENTS ON AN SO3-FREE BASIS

CERTIFICATE OF ANALYSIS

			AS RECEIVED	DRY BASIS
MOISTURE	D2961 D3302	D3173	25.76%	XXX
VOLATILE MATTER	D3175		29.39%	39.59%
FIXED CARBON	D3172		36.93%	49.74%
ASH	D3174		7.92%	10.67%
SULFUR	D4239	METHOD 3.3	.58%	.78%
CARBON	D3178		55.64%	74.95%
HYDROGEN	D3178		1.10%	1.48%
NITROGEN	D3179		.64%	.86%
OXYGEN	D3176		8.36%	11.25%
BTU/LB	D2015	D1989	8509	11462
MAF BTU/LB				12831
LBS OF SO2 PER MILLION BTU				1.36
LBS OF SULFUR PER MILLION BTU				.681
HARDGROVE GRINDABILITY INDEX	D409		49	
FORMS OF SULFUR	D2492			
PYRITIC SULFUR			.17%	.22%
SULFATE SULFUR			.01%	.02%
ORGANIC SULFUR			.40%	.54%
CHLORINE	D4208		.03%	.04%
EQUILIBRIUM MOISTURE	D1412		23.02%	

PAGE 1 OF 2

BLACK SEAL ANALYSIS

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Thomas A. Rifkin

STANDARD LABORATORIES, INC.

DATE: 5-22-92
WARNER NO. 123126

CERTIFICATE OF ANALYSIS (CONT.)

	AS RECEIVED	DRY BASIS
ASH FUSION TEMPERATURE(S)		
D1857 - ELECTRIC METHOD	REDUCING ATMOSPHERE	
INITIAL DEFORMATION TEMPERATURE	2180	
SOFTENING TEMPERATURE	2210	
HEMISPHERICAL TEMPERATURE	2245	
FLUID TEMPERATURE	2300	
D1857	OXIDIZING ATMOSPHERE	
INITIAL DEFORMATION TEMPERATURE	2215	
SOFTENING TEMPERATURE	2245	
HEMISPHERICAL TEMPERATURE	2305	
FLUID TEMPERATURE	2410	
ASH MINERAL COMPOSITION		
D2795 D3682		
SILICON DIOXIDE	38.88	
ALUMINIUM OXIDE	20.03	
FERRIC OXIDE	3.77	
TITANIUM DIOXIDE	.80	
PHOSPHORUS PENTOXIDE	.34	
CALCIUM OXIDE	17.49	
MAGNESIUM OXIDE	2.49	
SODIUM OXIDE	1.25	
POTASSIUM OXIDE	.93	
SULFUR TRIOXIDE	11.77	
PERCENT SOLIDS		74.24%

LITHIUM OXIDE	226.0 ppm
MANGANESE DIOXIDE	731.9 ppm

APPROVED BY Thomas A. Right

APPROVED BY R. E. Kelly

BLACK SEAL ANALYSIS

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GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

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C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

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DATE SAMPLED:

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CERTIFICATE OF ANALYSIS

FRACTION	WT%	MOISTURE	ASH	SULFUR	BTU	LBS SO2 PER MBTU	MAF BTU
1 1/2"SQ	2.51	23.40	13.96	1.03	10569	1.95	14842
1/2"SQ X 3/4"SQ	21.18	24.66	11.09	.71	11370	1.25	12788
/4"SQ X 3/8"SQ	25.32	25.25	9.45	.77	11658	1.32	12874
/8"SQ X 28M	41.88	16.86	8.77	.84	11730	1.43	12857
8M X 100M	5.05	18.35	10.77	1.08	11451	1.88	15717
00M X 325M	1.42	14.87	13.58	1.14	10792	2.11	12487
25M X 0	2.64	8.00	37.03	.46	7571	1.21	12024

CUMULATIVE RETAINED - DOWN

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
1 1/2"SQ	2.51	13.96	1.03	10569	1.95
1 1/2"SQ X 3/4"SQ	23.69	11.39	.75	11285	1.33
1 1/2"SQ X 3/8"SQ	49.01	10.39	.76	11478	1.32
1 1/2"SQ X 28M	90.89	9.64	.80	11594	1.38
1 1/2"SQ X 100M	95.94	9.70	.81	11586	1.40
1 1/2"SQ X 325M	97.36	9.76	.82	11575	1.42
1 1/2"SQ X 0	100.00	10.48	.81	11469	1.41

CUMULATIVE RETAINED - UP

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
1 1/2"SQ X 0	100.00	10.48	.81	11469	1.41
1/2"SQ X 0	97.49	10.39	.80	11492	1.39
/4"SQ X 0	76.31	10.19	.83	11526	1.44
/8"SQ X 0	50.99	10.56	.85	11461	1.48
8M X 0	9.11	18.81	.91	10225	1.78
00M X 0	4.06	28.82	.70	8699	1.61
25M X 0	2.64	37.03	.46	7571	1.21

NALYTICAL RESULTS ARE STATED ON A DRY BASIS

AGE 1

APPROVED BY Thomas A. Right
APPROVED BY

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GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE : 5-22-92
MASTER SAMPLE NO. 123134

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: ABSALOKA SECONDARY CRUSHER REJECT SPLIT RAW COAL

OPERATING CO.: PROJECT 90D0101 TASK 2.4
MINE:
SAMPLED BY: CUSTOMER PROVIDED
GROSS WEIGHT: 1796.7

DATE SAMPLED:

DATE RECEIVED: 08/28/91

OTHER ID: POWDER RIVER BASIN COAL TOP X 0 AS-RECEIVED COAL NOMINAL 6 TONS RAW COAL CHARACTERIZATION ALL WT PERCENTS REPORTED ON A DRY BASIS; ALL ASH PERCENTS ON AN SO3-FREE BASIS

FEED FOR SIZE +3/4"SQ

RAVITY	% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25	2.08	3.83	.57	12437	0.00	0.00
1.30	46.84	5.41	.54	12300	0.00	0.00
1.35	30.67	8.76	.47	11796	0.00	0.00
1.40	5.42	16.11	.53	10862	0.00	0.00
1.60	7.61	27.94	.97	9190	0.00	0.00
1.80	2.27	42.11	2.33	6089	0.00	0.00
2.00	3.06	46.21	1.28	3941	0.00	0.00
2.45	1.96	54.44	2.23	2479	0.00	0.00
2.45 SINK	.08	63.89	24.60	3313	0.00	0.00

CUMULATIVE RESULTS FOR SIZE +3/4"SQ

CUMULATIVE DOWN

RAVITY	% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25	2.08	3.83	.57	12437	0.00	0.00
1.30	48.92	5.34	.54	12306	0.00	0.00
1.35	79.60	6.66	.51	12109	0.00	0.00
1.40	85.02	7.26	.51	12030	0.00	0.00
1.60	92.63	8.96	.55	11796	0.00	0.00
1.80	94.90	9.76	.59	11660	0.00	0.00
2.00	97.96	10.90	.62	11419	0.00	0.00
2.45	99.92	11.75	.65	11243	0.00	0.00
2.45 SINK	100.00	11.79	.67	11237	0.00	0.00

CUMULATIVE UP

RAVITY	% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25	100.00	11.79	.67	11237	0.00	0.00
1.30	97.92	11.96	.67	11211	0.00	0.00
1.35	51.08	17.97	.79	10213	0.00	0.00
1.40	20.40	31.80	1.26	7834	0.00	0.00
1.60	14.98	37.48	1.53	6738	0.00	0.00
1.80	7.37	47.33	2.11	4207	0.00	0.00
2.00	5.10	49.65	2.01	3369	0.00	0.00
2.45	2.04	54.81	3.11	2512	0.00	0.00
2.45 SINK	.08	63.89	24.60	3313	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

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Thomas A. Wright

GOULD ENERGY DIVISION
P. O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

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C. Q. , INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

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FEED FOR SIZE 3/4"SQ X 28M

AVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
.25		5.30	5.06	.50	12295	0.00	0.00
.30		52.98	6.56	.51	12178	0.00	0.00
.35		18.16	7.36	.52	12039	0.00	0.00
.40		12.25	10.49	.45	11735	0.00	0.00
.60		7.69	19.04	.77	10313	0.00	0.00
.80		1.18	40.18	2.90	6922	0.00	0.00
.00		.62	49.49	4.63	5126	0.00	0.00
.45		1.26	61.06	6.04	3075	0.00	0.00
.45	SINK	.56	66.56	23.47	2672	0.00	0.00

CUMULATIVE RESULTS FOR SIZE 3/4"SQ X 28M

CUMULATIVE DOWN

AVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
.25		5.30	5.06	.50	12295	0.00	0.00
.30		58.28	6.42	.51	12189	0.00	0.00
.35		76.44	6.65	.51	12153	0.00	0.00
.40		88.69	7.18	.50	12095	0.00	0.00
.60		96.38	8.12	.52	11953	0.00	0.00
.80		97.56	8.51	.55	11892	0.00	0.00
.00		98.18	8.77	.58	11850	0.00	0.00
.45		99.44	9.43	.65	11738	0.00	0.00
.45	SINK	100.00	9.75	.77	11688	0.00	0.00

CUMULATIVE UP

AVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
.25		100.00	9.75	.77	11688	0.00	0.00
.30		94.70	10.02	.79	11654	0.00	0.00
.35		41.72	14.40	1.15	10988	0.00	0.00
.40		23.56	19.83	1.63	10177	0.00	0.00
.60		11.31	29.95	2.91	8490	0.00	0.00
.80		3.62	53.13	7.47	4618	0.00	0.00
.00		2.44	59.39	9.68	3504	0.00	0.00
.45		1.82	62.76	11.40	2951	0.00	0.00
.45	SINK	.56	66.56	23.47	2672	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

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Thomas A. Light
RECK

GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE : 5-22-92
MASTER SAMPLE NO. 123134

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

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FEED FOR SIZE 28M X 100

RAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		0.00	0.00	0.00	0	0.00	0.00
1.30		2.53	5.18	.53	12753	0.00	0.00
1.35		0.00	0.00	0.00	0	0.00	0.00
1.40		1.52	5.54	.51	12554	0.00	0.00
1.60		88.46	7.76	.47	12101	0.00	0.00
1.80		1.15	34.04	.71	8166	0.00	0.00
2.00		.97	46.72	1.16	6100	0.00	0.00
2.45		1.70	59.45	1.78	3148	0.00	0.00
2.45	SINK	3.67	68.37	15.61	1070	0.00	0.00

CUMULATIVE RESULTS FOR SIZE 28M X 100

CUMULATIVE DOWN

RAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		0.00	0.00	0.00	0	0.00	0.00
1.30		2.53	5.18	.53	12753	0.00	0.00
1.35		2.53	5.18	.53	12753	0.00	0.00
1.40		4.05	5.31	.52	12678	0.00	0.00
1.60		92.51	7.66	.47	12126	0.00	0.00
1.80		93.66	7.98	.47	12078	0.00	0.00
2.00		94.63	8.38	.48	12016	0.00	0.00
2.45		96.33	9.28	.50	11860	0.00	0.00
2.45	SINK	100.00	11.45	1.06	11464	0.00	0.00

CUMULATIVE UP

RAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		100.00	11.45	1.06	11464	0.00	0.00
1.30		100.00	11.45	1.06	11464	0.00	0.00
1.35		97.47	11.61	1.07	11430	0.00	0.00
1.40		97.47	11.61	1.07	11430	0.00	0.00
1.60		95.95	11.71	1.08	11413	0.00	0.00
1.80		7.49	58.27	8.31	3283	0.00	0.00
2.00		6.34	62.66	9.69	2397	0.00	0.00
2.45		5.37	65.54	11.23	1728	0.00	0.00
2.45	SINK	3.67	68.37	15.61	1070	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

Thomas A. Light
ROOKS

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GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

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FEED FOR SIZE 100M X 0

AVITY	% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
.25	0.00	0.00	0.00	0	0.00	0.00
.30	0.00	0.00	0.00	0	0.00	0.00
.35	0.00	0.00	0.00	0	0.00	0.00
.40	6.46	5.12	.48	12600	0.00	0.00
.60	37.82	10.58	.39	10978	0.00	0.00
.80	23.13	28.95	.33	8808	0.00	0.00
.00	15.54	36.20	.32	8055	0.00	0.00
.45	10.36	59.50	.33	4212	0.00	0.00
.45 SINK	6.69	74.87	5.60	719	0.00	0.00

CUMULATIVE RESULTS FOR SIZE 100M X 0

CUMULATIVE DOWN

AVITY	% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
.25	0.00	0.00	0.00	0	0.00	0.00
.30	0.00	0.00	0.00	0	0.00	0.00
.35	0.00	0.00	0.00	0	0.00	0.00
.40	6.46	5.12	.48	12600	0.00	0.00
.60	44.28	9.79	.40	11214	0.00	0.00
.80	67.41	16.36	.38	10389	0.00	0.00
.00	82.95	20.08	.37	9952	0.00	0.00
.45	93.31	24.46	.36	9314	0.00	0.00
.45 SINK	100.00	27.83	.71	8739	0.00	0.00

CUMULATIVE UP

AVITY	% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
.25	100.00	27.83	.71	8739	0.00	0.00
.30	100.00	27.83	.71	8739	0.00	0.00
.35	100.00	27.83	.71	8739	0.00	0.00
.40	100.00	27.83	.71	8739	0.00	0.00
.60	93.54	29.40	.73	8473	0.00	0.00
.80	55.72	42.17	.96	6772	0.00	0.00
.00	32.59	51.55	1.41	5328	0.00	0.00
.45	17.05	65.53	2.40	2842	0.00	0.00
.45 SINK	6.69	74.87	5.60	719	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

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Thomas A. Richter

GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE : 5-22-92
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C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

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MINE:
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GROSS WEIGHT: 1796.7

DATE SAMPLED:

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FEED FOR COMPOSITE +3/4" SQ X 0

RAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		4.05	4.91	.51	12312	0.00	0.00
1.30		46.83	6.29	.51	12208	0.00	0.00
1.35		19.47	7.88	.50	11948	0.00	0.00
1.40		9.86	11.04	.46	11651	0.00	0.00
1.60		12.97	15.39	.65	10851	0.00	0.00
1.80		2.33	35.94	1.68	7521	0.00	0.00
2.00		1.82	43.51	1.71	5695	0.00	0.00
2.45		1.82	58.93	3.54	3189	0.00	0.00
2.45	SINK	.85	69.54	16.09	1716	0.00	0.00

CUMULATIVE RESULTS FOR COMPOSITE +3/4" SQ X 0

CUMULATIVE DOWN

RAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		4.05	4.91	.51	12312	0.00	0.00
1.30		50.88	6.18	.51	12217	0.00	0.00
1.35		70.35	6.65	.51	12142	0.00	0.00
1.40		80.21	7.19	.51	12082	0.00	0.00
1.60		93.18	8.33	.53	11911	0.00	0.00
1.80		95.51	9.00	.55	11804	0.00	0.00
2.00		97.33	9.65	.57	11689	0.00	0.00
2.45		99.15	10.55	.63	11534	0.00	0.00
2.45	SINK	100.00	11.06	.76	11450	0.00	0.00

CUMULATIVE UP

RAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		100.00	11.06	.76	11450	0.00	0.00
1.30		95.95	11.32	.77	11413	0.00	0.00
1.35		49.12	16.11	1.02	10656	0.00	0.00
1.40		29.65	21.51	1.35	9806	0.00	0.00
1.60		19.79	26.73	1.80	8888	0.00	0.00
1.80		6.82	48.29	3.99	5153	0.00	0.00
2.00		4.49	54.69	5.18	3926	0.00	0.00
2.45		2.67	62.32	7.55	2719	0.00	0.00
2.45	SINK	.85	69.54	16.09	1716	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Thomas A. Right

GOULD ENERGY DIVISION
P. O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE: 5-22-92
MASTER SAMPLE NO. 152408

C. Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: ABSALOKA RAW COAL CRUSHED TO 3/8" TOPSIZE

PERATING CO.: PROJECT 90D0101 TASK 2.4
AMPLED BY: CUSTOMER PROVIDED
IINE:
OCATION:

ATE SAMPLED:
EATHER:
ROSS WEIGHT: 160.7 KG

DATE RECEIVED: 8/28/91

THER ID: POWDER RIVER BASIN SPLIT OF AS-REC'D RAW COAL AS REQ'D BY ASTM FOR SAMPLE TOPSIZE CHANGE IN RAW COAL SIZE DIST. WITH CRUSHING ALL WT %'S ON A DRY BASIS ALL ASH %'S SO3 FREE

CERTIFICATE OF ANALYSIS

		AS RECEIVED	DRY BASIS
MOISTURE	D2961 D3302 D3173	25.24%	XXX
ASH	D3174	8.12%	10.86%
SULFUR	D4239 METHOD 3.3	.58%	.78%
BTU/LB	D2015 D1989	8656	11579
MAF BTU/LB			12989
LBS OF SO2 PER MILLION BTU			1.35
LBS OF SULFUR PER MILLION BTU			.674
PERCENT SOLIDS			74.76%

APPROVED BY Thomas A. Wright

APPROVED BY R.E. Kelly

PAGE 1 OF 1
1776

BLACK SEAL ANALYSIS

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GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE : 5-22-92
MASTER SAMPLE NO. 152408

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: ABSALOKA RAW COAL CRUSHED TO 3/8" TOPSIZE

OPERATING CO.: PROJECT 90D0101 TASK 2.4
MINE:
SAMPLED BY: CUSTOMER PROVIDED
GROSS WEIGHT: 160.7 KG

DATE SAMPLED:

DATE RECEIVED: 8/28/91

OTHER ID: POWDER RIVER BASIN SPLIT OF AS-REC'D RAW COAL AS REQ'D BY ASTM FOR SAMPLE TOPSIZE CHANGE IN RAW COAL SIZE DIST. WITH CRUSHING ALL WT %'S ON A DRY BASIS ALL ASH %'S SO3 FREE

CERTIFICATE OF ANALYSIS

FRACTION	WT%	MOISTURE	ASH	SULFUR	BTU	LBS SO2 PER MBTU	MAF BTU
+3/8"SQ	3.76	24.18	10.42	.73	11589	1.26	17062
3/8"SQ X 28M	81.59	12.59	10.12	.80	11690	1.37	14880
28M X 100M	8.61	18.19	12.20	1.06	11451	1.85	15941
100M X 325M	2.20	11.78	13.85	.96	11209	1.71	14748
325M X 0	3.84	10.77	24.74	.53	9371	1.13	13954

CUMULATIVE RETAINED - DOWN

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
+3/8"SQ	3.76	10.42	.73	11589	1.26
+3/8"SQ X 28M	85.35	10.14	.80	11686	1.37
+3/8"SQ X 100M	93.96	10.33	.82	11664	1.40
+3/8"SQ X 325M	96.16	10.41	.83	11654	1.42
+3/8"SQ X 0	100.00	10.96	.81	11566	1.40

CUMULATIVE RETAINED - UP

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
+3/8"SQ X 0	100.00	10.96	.81	11566	1.40
3/8"SQ X 0	96.24	10.98	.82	11565	1.42
28M X 0	14.65	15.73	.91	10869	1.67
100M X 0	6.04	20.77	.69	10040	1.37
325M X 0	3.84	24.74	.53	9371	1.13

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY Thomas A. Right
APPROVED BY [illegible]

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GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE: 5-22-92
MASTER SAMPLE NO. 123181

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: ABSALOKA RAW COAL 1.30 SINK
CRUSHED TO 3/8" X 0

PERATING CO.: PROJECT 90D0101 TASK 2.4
AMPLED BY: CUSTOMER PROVIDED
INE:
OCATION:

ATE SAMPLED:
EATHER:
ROSS WEIGHT:

DATE RECEIVED: 8/28/91

THER ID: POWDER RIVER BASIN SPLIT OF THE 1.30 SINK FRACTION OF THE AS R EC'D SAMPLE AS REQ'D BY ASTM FOR SAMPLE TOPSIZE RAW COAL LIBERATION AL L WT %'S ON A DRY BASIS ALL ASH %'S SO3 FREE

CERTIFICATE OF ANALYSIS

			AS RECEIVED	DRY BASIS
MOISTURE	D2961	D3302 D3173	16.68%	XXX
ASH		D3174	12.66%	15.20%
SULFUR		D4239 METHOD 3.3	.92%	1.10%
BTU/LB		D2015 D1989	8871	10647
MAF BTU/LB				12555
LBS OF SO2 PER MILLION BTU				2.06
LBS OF SULFUR PER MILLION BTU				1.033
PERCENT SOLIDS				83.32%

APPROVED BY Thomas A Light

APPROVED BY RCKL

PAGE 1 OF 1
1540

BLACK SEAL ANALYSIS

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GOULD ENERGY DIVISION
P.O.BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES,INC.

DATE : 5-22-92
MASTER SAMPLE NO. 123181

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: ABSALOKA RAW COAL 1.30 SINK CRUSHED TO 3/8" X 0

PERATING CO.: PROJECT 90D0101 TASK 2.4
INE:
AMPLED BY: CUSTOMER PROVIDED
ROSS WEIGHT:

DATE SAMPLED:

DATE RECEIVED: 8/28/91

THER ID: POWDER RIVER BASIN SPLIT OF THE 1.30 SINK FRACTION OF THE AS REC'D SAMPLE AS REQ'D BY ASTM FOR SAMPLE TOPSIZE RAW COAL LIBERATION ALL WT %'S ON A DRY BASIS ALL ASH %'S SO3 FREE

CERTIFICATE OF ANALYSIS

FRACTION	WT%	MOISTURE	ASH	SULFUR	BTU	LBS SO2 PER MBTU	MAF BTU
28M	80.16	17.07	14.87	1.07	10775	1.98	15262
8M X 100M	12.39	13.22	12.21	1.29	11387	2.26	14948
00M X 0	7.45	12.65	24.46	.82	9488	1.73	12559

CUMULATIVE RETAINED - DOWN

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
28M	80.16	14.87	1.07	10775	1.98
28M X 100M	92.55	14.51	1.10	10857	2.02
28M X 0	100.00	15.25	1.08	10755	2.01

CUMULATIVE RETAINED - UP

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
28M X 0	100.00	15.25	1.08	10755	2.01
8M X 0	19.84	16.81	1.12	10674	2.10
00M X 0	7.45	24.46	.82	9488	1.73

NALYTICAL RESULTS ARE STATED ON A DRY BASIS

AGE 1

APPROVED BY Thomas A. Right

APPROVED BY

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GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE : 5-22-92
MASTER SAMPLE NO. 123185

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: ABSALOKA RAW COAL 1.30 SINK CRUSHED TO 3/8" X 0

OPERATING CO.: PROJECT 90D0101 TASK 2.4
MINE:
SAMPLED BY: CUSTOMER PROVIDED
GROSS WEIGHT:

DATE SAMPLED:

DATE RECEIVED: 8/28/91

OTHER ID: POWDER RIVER BASIN SPLIT OF THE 1.30 SINK FRACTION OF THE AS REC'D SAMPLE AS REQ'D BY ASTM FOR SAMPLE TOPSIZE RAW COAL LIBERATION ALL WT %'S ON A DRY BASIS ALL ASH %'S SO3 FREE

FEED FOR SIZE +28M

RAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		.86	4.70	.67	12664	0.00	0.00
1.30		22.15	6.79	.50	12479	0.00	0.00
1.35		35.94	7.77	.45	11910	0.00	0.00
1.40		7.51	11.50	.43	11538	0.00	0.00
1.60		22.63	16.95	.50	10493	0.00	0.00
1.80		3.39	42.25	1.26	6983	0.00	0.00
2.00		1.38	49.18	2.60	5063	0.00	0.00
2.45		4.33	61.91	3.05	2649	0.00	0.00
2.45	SINK	1.81	67.51	23.54	2823	0.00	0.00

CUMULATIVE RESULTS FOR SIZE +28M

CUMULATIVE DOWN

RAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		.86	4.70	.67	12664	0.00	0.00
1.30		23.01	6.71	.51	12486	0.00	0.00
1.35		58.95	7.36	.47	12135	0.00	0.00
1.40		66.46	7.83	.47	12067	0.00	0.00
1.60		89.09	10.14	.48	11667	0.00	0.00
1.80		92.49	11.32	.51	11495	0.00	0.00
2.00		93.86	11.88	.54	11401	0.00	0.00
2.45		98.19	14.08	.65	11015	0.00	0.00
2.45	SINK	100.00	15.05	1.06	10867	0.00	0.00

CUMULATIVE UP

RAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		100.00	15.05	1.06	10867	0.00	0.00
1.30		99.14	15.14	1.06	10851	0.00	0.00
1.35		76.99	17.54	1.23	10383	0.00	0.00
1.40		41.05	26.09	1.91	9047	0.00	0.00
1.60		33.54	29.36	2.24	8489	0.00	0.00
1.80		10.91	55.12	5.84	4330	0.00	0.00
2.00		7.51	60.93	7.90	3133	0.00	0.00
2.45		6.14	63.56	9.09	2700	0.00	0.00
2.45	SINK	1.81	67.51	23.54	2823	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

Thomas A. Right
RCRG

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GOULD ENERGY DIVISION
P. O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE : 5-22-92
MASTER SAMPLE NO. 123185

C. Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: ABSALOKA RAW COAL 1.30 SINK CRUSHED TO 3/8" X 0

OPERATING CO.: PROJECT 90D0101 TASK 2.4
MINE:
SAMPLED BY: CUSTOMER PROVIDED
GROSS WEIGHT:

DATE SAMPLED:

DATE RECEIVED: 8/28/91

OTHER ID: POWDER RIVER BASIN SPLIT OF THE 1.30 SINK FRACTION OF THE AS REC'D SAMPLE AS REQ'D BY ASTM FOR SAMPLE TOPSIZE RAW COAL LIBERATION ALL WT %'S ON A DRY BASIS ALL ASH %'S SO3 FREE

FEED FOR SIZE 28M X 100M

GRAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		0.00	0.00	0.00	0	0.00	0.00
1.30		0.00	0.00	0.00	0	0.00	0.00
1.35		0.00	0.00	0.00	0	0.00	0.00
1.40		5.58	4.05	.51	12497	0.00	0.00
1.60		84.16	6.81	.44	12348	0.00	0.00
1.80		2.27	30.87	.72	8316	0.00	0.00
2.00		.94	47.50	1.10	5954	0.00	0.00
2.45		1.97	57.48	1.76	2925	0.00	0.00
2.45	SINK	5.06	73.47	16.47	1224	0.00	0.00

CUMULATIVE RESULTS FOR SIZE 28M X 100M

CUMULATIVE DOWN

GRAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		0.00	0.00	0.00	0	0.00	0.00
1.30		0.00	0.00	0.00	0	0.00	0.00
1.35		0.00	0.00	0.00	0	0.00	0.00
1.40		5.58	4.05	.51	12497	0.00	0.00
1.60		89.75	6.63	.44	12357	0.00	0.00
1.80		92.02	7.23	.45	12257	0.00	0.00
2.00		92.96	7.64	.46	12194	0.00	0.00
2.45		94.94	8.68	.48	12001	0.00	0.00
2.45	SINK	100.00	11.96	1.29	11455	0.00	0.00

CUMULATIVE UP

GRAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		100.00	11.96	1.29	11455	0.00	0.00
1.30		100.00	11.96	1.29	11455	0.00	0.00
1.35		100.00	11.96	1.29	11455	0.00	0.00
1.40		100.00	11.96	1.29	11455	0.00	0.00
1.60		94.42	12.42	1.34	11394	0.00	0.00
1.80		10.25	58.56	8.74	3559	0.00	0.00
2.00		7.98	66.46	11.02	2202	0.00	0.00
2.45		7.04	68.99	12.35	1701	0.00	0.00
2.45	SINK	5.06	73.47	16.47	1224	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

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GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE : 5-22-92
MASTER SAMPLE NO. 123185

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: ABSALOKA RAW COAL 1.30 SINK CRUSHED TO 3/8" X 0

OPERATING CO.: PROJECT 90D0101 TASK 2.4
MINE:
SAMPLED BY: CUSTOMER PROVIDED
GROSS WEIGHT:

DATE SAMPLED:

DATE RECEIVED: 8/28/91

OTHER ID: POWDER RIVER BASIN SPLIT OF THE 1.30 SINK FRACTION OF THE AS REC'D SAMPLE AS REQ'D BY ASTM FOR SAMPLE TOPSIZE RAW COAL LIBERATION ALL WT %'S ON A DRY BASIS ALL ASH %'S SO3 FREE

FEED FOR SIZE 100M X 0

GRAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		0.00	0.00	0.00	0	0.00	0.00
1.30		0.00	0.00	0.00	0	0.00	0.00
1.35		7.08	3.73	.49	13133	0.00	0.00
1.40		1.44	5.67	.54	11888	0.00	0.00
1.60		56.40	11.72	.39	11423	0.00	0.00
1.80		8.78	23.21	.38	9638	0.00	0.00
2.00		11.62	45.78	.37	6819	0.00	0.00
2.45		7.12	63.49	.56	3548	0.00	0.00
2.45	SINK	7.55	72.96	4.31	773	0.00	0.00

CUMULATIVE RESULTS FOR SIZE 100M X 0

CUMULATIVE DOWN

GRAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		0.00	0.00	0.00	0	0.00	0.00
1.30		0.00	0.00	0.00	0	0.00	0.00
1.35		7.08	3.73	.49	13133	0.00	0.00
1.40		8.52	4.06	.50	12923	0.00	0.00
1.60		64.93	10.72	.40	11620	0.00	0.00
1.80		73.71	12.21	.40	11384	0.00	0.00
2.00		85.33	16.78	.40	10762	0.00	0.00
2.45		92.45	20.38	.41	10206	0.00	0.00
2.45	SINK	100.00	24.35	.70	9494	0.00	0.00

CUMULATIVE UP

GRAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		100.00	24.35	.70	9494	0.00	0.00
1.30		100.00	24.35	.70	9494	0.00	0.00
1.35		100.00	24.35	.70	9494	0.00	0.00
1.40		92.92	25.92	.72	9217	0.00	0.00
1.60		91.48	26.24	.72	9175	0.00	0.00
1.80		35.07	49.58	1.26	5559	0.00	0.00
2.00		26.29	58.38	1.55	4197	0.00	0.00
2.45		14.67	68.36	2.49	2120	0.00	0.00
2.45	SINK	7.55	72.96	4.31	773	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

Thomas A. Light
PCRK

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GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE : 5-22-92
MASTER SAMPLE NO. 123185

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: ABSALOKA RAW COAL 1.30 SINK
CRUSHED TO 3/8" X 0

PERATING CO.: PROJECT 90D0101 TASK 2.4
INE:
AMPLED BY: CUSTOMER PROVIDED
ROSS WEIGHT:

DATE SAMPLED:

DATE RECEIVED: 8/28/91

THER ID: POWDER RIVER BASIN SPLIT OF THE 1.30 SINK FRACTION OF THE AS REC'D S AMPLE AS REQ'D BY ASTM FOR SAMPLE TOPSIZE RAW COAL LIBERATION ALL WT %'S ON A DRY BASIS ALL ASH %'S SO3 FREE

FEED FOR COMPOSITE +28M X 0

AVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
.25		.69	4.70	.67	12664	0.00	0.00
.30		17.76	6.79	.50	12479	0.00	0.00
.35		29.34	7.70	.45	11932	0.00	0.00
.40		6.82	10.65	.44	11641	0.00	0.00
.60		32.77	13.05	.47	11202	0.00	0.00
.80		3.65	37.97	1.06	7561	0.00	0.00
.00		2.09	47.67	1.59	5842	0.00	0.00
.45		4.24	61.85	2.67	2777	0.00	0.00
.45	SINK	2.64	70.09	17.77	2006	0.00	0.00

CUMULATIVE RESULTS FOR COMPOSITE +28M X 0

CUMULATIVE DOWN

AVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
.25		.69	4.70	.67	12664	0.00	0.00
.30		18.44	6.71	.51	12486	0.00	0.00
.35		47.78	7.32	.47	12146	0.00	0.00
.40		54.60	7.73	.47	12082	0.00	0.00
.60		87.37	9.73	.47	11752	0.00	0.00
.80		91.03	10.86	.49	11584	0.00	0.00
.00		93.12	11.69	.52	11455	0.00	0.00
.45		97.36	13.87	.61	11077	0.00	0.00
.45	SINK	100.00	15.36	1.06	10838	0.00	0.00

CUMULATIVE UP

AVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
.25		100.00	15.36	1.06	10838	0.00	0.00
.30		99.31	15.43	1.07	10825	0.00	0.00
.35		81.56	17.31	1.19	10465	0.00	0.00
.40		52.22	22.72	1.60	9641	0.00	0.00
.60		45.40	24.53	1.78	9340	0.00	0.00
.80		12.63	54.32	5.18	4507	0.00	0.00
.00		8.97	60.98	6.86	3263	0.00	0.00
.45		6.88	65.01	8.46	2482	0.00	0.00
.45	SINK	2.64	70.09	17.77	2006	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

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Thomas A. Light
RCK

GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE: 5-22-92
MASTER SAMPLE NO. 152579

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: ABSALOKA RAW COAL CRUSHED TO 100M TOPSIZE

OPERATING CO.: PROJECT #90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
MINE:
LOCATION:

DATE SAMPLED:
WEATHER:
GROSS WEIGHT: 160.1 KG

DATE RECEIVED: 8/28/91

OTHER ID: POWDER RIVER BASIN SPLIT AS REC'D SAMPLE AS REQ'D BY ASTM FOR SAMPLE TOP SIZE CHANGE IN RAW COAL DIST. WITH CRUSHING ALL WT %'S ON A DRY BASIS ALL ASH %'S SO3 FREE BASIS

CERTIFICATE OF ANALYSIS

			AS RECEIVED	DRY BASIS
MOISTURE	D2961	D3302 D3173	23.80%	XXX
ASH		D3174	7.93%	10.41%
SULFUR		D4239 METHOD 3.3	.67%	.88%
BTU/LB		D2015 D1989	8778	11519
MAF BTU/LB				12857
LBS OF SO2 PER MILLION BTU				1.53
LBS OF SULFUR PER MILLION BTU				.764
PERCENT SOLIDS				76.20%

APPROVED BY Thomas A. Rightnour

APPROVED BY

BLACK SEAL ANALYSIS

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GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE : 5-22-92
MASTER SAMPLE NO. 152579

C.G., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: ABSALOKA RAW COAL CRUSHED TO 100M TOPSIZE

PERATING CO.: PROJECT #90D0101 TASK 2.4
INE:
AMPLED BY: CUSTOMER PROVIDED
ROSS WEIGHT: 160.1 KG

DATE SAMPLED:

DATE RECEIVED: 8/28/91

THER ID: POWDER RIVER BASIN SPLIT AS REC'D SAMPLE AS REQ'D BY ASTM FOR SAMPLE TOP SIZE CHANGE IN RAW COAL DIST. WITH CRUSHING ALL WT %'S ON A DRY BASIS A LL ASH %'S SO3 FREE BASIS

CERTIFICATE OF ANALYSIS

FRACTION	WT%	MOISTURE	ASH	SULFUR	BTU	LBS SO2 PER MBTU	MAF BTU
100M	4.56	10.13	6.59	.76	11958	1.27	14244
00M X 325M	74.04	14.62	9.76	.89	11683	1.52	15162
25M X 0	21.40	8.91	15.56	.90	10545	1.71	13709

CUMULATIVE RETAINED - DOWN

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
100M	4.56	6.59	.76	11958	1.27
100M X 325M	78.60	9.57	.88	11699	1.50
100M X 0	100.00	10.85	.89	11452	1.55

CUMULATIVE RETAINED - UP

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
100M X 0	100.00	10.85	.89	11452	1.55
00M X 0	95.44	11.06	.89	11428	1.56
25M X 0	21.40	15.56	.90	10545	1.71

NALYTICAL RESULTS ARE STATED ON A DRY BASIS

AGE 1

APPROVED BY Thomas A. Rafter

APPROVED BY

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Westmoreland Resources, Inc. (Absaloka or Sarpy Creek Mine) **As-Received**

Size Interval: -100 mesh % Amount This Size: 4.06

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	0.00				0.00	0.00	0.00	0	0.00
1.25	1.30	0.00				0.00	0.00	0.00	0	0.00
1.30	1.35	0.00				0.00	0.00	0.00	0	0.00
1.35	1.40	6.46	5.12	0.48	12600	6.46	5.12	0.48	12600	0.76
1.40	1.60	37.82	10.58	0.39	10978	44.28	9.78	0.40	11215	0.72
1.60	1.80	23.13	28.95	0.33	8808	67.41	16.36	0.38	10389	0.73
1.80	2.00	15.54	36.20	0.32	8055	82.95	20.08	0.37	9952	0.74
2.00	2.45	10.36	59.50	0.33	4212	93.31	24.45	0.36	9314	0.78
2.45		6.69	74.87	5.60	719	100.00	27.83	0.71	8739	1.63
		100.00								
						Size Analysis Heads:	28.83	0.70	8698	1.61

Total: Top Size x 0 % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	4.05	4.91	0.51	12312	4.05	4.91	0.51	12312	0.83
1.25	1.30	46.83	6.28	0.52	12208	50.88	6.17	0.52	12217	0.85
1.30	1.35	19.47	7.88	0.50	11948	70.35	6.65	0.51	12142	0.84
1.35	1.40	9.86	11.04	0.46	11651	80.21	7.19	0.51	12082	0.84
1.40	1.60	12.97	15.39	0.65	10851	93.18	8.33	0.53	11911	0.88
1.60	1.80	2.33	35.94	1.68	7521	95.51	9.00	0.55	11804	0.94
1.80	2.00	1.82	43.51	1.71	5695	97.33	9.65	0.58	11689	0.99
2.00	2.45	1.82	58.93	3.54	3189	99.15	10.55	0.63	11534	1.09
2.45		0.85	69.54	16.09	1715	100.00	11.05	0.76	11450	1.33
						Size Analysis Heads:	10.48	0.81	11469	1.41
						Head Sample Analyses:	10.67	0.78	11462	1.36

COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

Westmoreland Resources, Inc. (Absaloka or Sarpy Creek Mine) **Crushed to -3/8"**

		DIRECT				CUMULATIVE (BY SIZE GROUP)				
Passing	Retained	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	+3/8 in.	3.76	10.42	0.73	11589	3.76	10.42	0.73	11589	1.26
3/8 in.	28 M	81.59	10.12	0.80	11690	85.35	10.13	0.80	11686	1.36
		85.35								
28 M	100 M	8.61	12.20	1.06	11451	8.61	12.20	1.06	11451	1.85
100 M	325 M	2.20	13.85	0.96	11209	2.20	13.85	0.96	11209	1.71
325 M	+0	3.84	24.74	0.53	9371	6.04	20.77	0.69	10040	1.37
		6.04								
	Total	100.00								

COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

Westmoreland Resources, Inc. (Absaloka or Sarpy Creek Mine) **Crushed to -3/8 in.**

1.30 Sink Fraction of As-Received Sample Crushed to -3/8 inch (49.12% of Total)

Size nterval: +28 mesh % Amount This Size: 80.16

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	0.86	4.70	0.67	12664	0.86	4.70	0.67	12664	1.06
1.25	1.30	22.15	6.79	0.50	12479	23.01	6.71	0.51	12486	0.81
1.30	1.35	35.94	7.77	0.45	11910	58.95	7.36	0.47	12135	0.78
1.35	1.40	7.51	11.50	0.43	11538	66.46	7.83	0.47	12067	0.77
1.40	1.60	22.63	16.95	0.50	10493	89.09	10.14	0.48	11667	0.82
1.60	1.80	3.39	42.25	1.26	6983	92.48	11.32	0.50	11496	0.88
1.80	2.00	1.38	49.18	2.60	5063	93.86	11.88	0.54	11401	0.94
2.00	2.45	4.33	61.91	3.05	2649	98.19	14.08	0.65	11015	1.17
2.45		1.81	67.51	23.54	2823	100.00	15.05	1.06	10867	1.95
		100.00								
						1.3-Sink Size Heads:	14.87	1.07	10775	1.99

Size nterval: 28 x 100 mesh % Amount This Size: 12.39

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	0.00				0.00	0.00	0.00	0	0.00
1.25	1.30	0.00				0.00	0.00	0.00	0	0.00
1.30	1.35	0.00				0.00	0.00	0.00	0	0.00
1.35	1.40	5.58	4.05	0.51	12497	5.58	4.05	0.51	12497	0.82
1.40	1.60	84.16	6.81	0.44	12348	89.74	6.64	0.44	12357	0.72
1.60	1.80	2.27	30.87	0.72	8316	92.01	7.24	0.45	12258	0.74
1.80	2.00	0.94	47.50	1.10	5954	92.95	7.64	0.46	12194	0.75
2.00	2.45	1.97	57.48	1.76	2925	94.92	8.68	0.48	12001	0.81
2.45		5.06	73.47	16.47	1224	99.98	11.96	1.29	11456	2.26
		99.98								
						1.3-Sink Size Heads:	12.21	1.29	11387	2.27

Size Interval: -100 mesh % Amount This Size: 7.45

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	0.00				0.00	0.00	0.00	0	0.00
1.25	1.30	0.00				0.00	0.00	0.00	0	0.00
1.30	1.35	7.08	3.73	0.49	13133	7.08	3.73	0.49	13133	0.75
1.35	1.40	1.44	5.67	0.54	11888	8.52	4.06	0.50	12923	0.77
1.40	1.60	56.40	11.72	0.39	11423	64.92	10.71	0.40	11620	0.70
1.60	1.80	8.78	23.21	0.38	9638	73.70	12.20	0.40	11384	0.71
1.80	2.00	11.62	45.78	0.37	6819	85.32	16.78	0.40	10762	0.74
2.00	2.45	7.12	63.49	0.56	3548	92.44	20.37	0.41	10206	0.80
2.45		7.55	72.96	4.31	774	99.99	24.34	0.70	9494	1.48
		99.99								
						1.3-Sink Size Heads:	24.45	0.82	9488	1.73

COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

Westmoreland Resources, Inc. (Absaloka or Sarpy Creek Mine) **Crushed to -3/8 in.**

1.30 Sink Fraction of As-Received Sample Crushed to -3/8 inch (49.12% of Total)

Total: Top Size x 0 % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	0.69	4.70	0.67	12664	0.69	4.70	0.67	12664	1.06
1.25	1.30	17.76	6.79	0.50	12479	18.44	6.71	0.51	12486	0.81
1.30	1.35	29.34	7.70	0.45	11932	47.78	7.32	0.47	12146	0.78
1.35	1.40	6.82	10.65	0.44	11641	54.60	7.73	0.47	12083	0.77
1.40	1.60	32.77	13.05	0.47	11203	87.37	9.73	0.47	11753	0.80
1.60	1.80	3.65	37.96	1.06	7561	91.02	10.86	0.49	11584	0.85
1.80	2.00	2.09	47.68	1.59	5841	93.11	11.69	0.52	11456	0.90
2.00	2.45	4.25	61.85	2.66	2777	97.36	13.88	0.61	11077	1.10
2.45		2.64	70.09	17.76	2007	100.00	15.36	1.06	10838	1.96
		100.00								
						1.3-Sink Size Heads:	15.25	1.08	10755	2.01
						1.3-Sink Head Analysis:	15.20	1.10	10647	2.07

1.30 Float Fraction of As-Received Sample (50.88% of Total)

Size Interval: Top Size x 0 % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	7.96	4.91	0.51	12312	7.96	4.91	0.51	12312	0.83
1.25	1.30	92.04	6.28	0.52	12208	100.00	6.17	0.52	12216	0.85
		100.00								

Calculated Size/Gravity Washability of Crushed to -3/8 inch Sample

Total: Top Size x 0 % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	4.39	4.89	0.52	12339	4.39	4.89	0.52	12339	0.85
1.25	1.30	55.55	6.36	0.52	12251	59.94	6.25	0.52	12257	0.84
1.30	1.35	14.41	7.70	0.45	11932	74.35	6.53	0.50	12194	0.83
1.35	1.40	3.35	10.65	0.44	11641	77.70	6.71	0.50	12170	0.82
1.40	1.60	16.10	13.05	0.47	11203	93.80	7.80	0.50	12004	0.83
1.60	1.80	1.79	37.96	1.06	7561	95.59	8.36	0.51	11921	0.85
1.80	2.00	1.03	47.68	1.59	5841	96.62	8.78	0.52	11856	0.87
2.00	2.45	2.09	61.85	2.66	2777	98.70	9.90	0.56	11664	0.97
2.45		1.30	70.09	17.76	2007	100.00	10.68	0.79	11539	1.36
		100.00								
						Size Analysis Heads:	10.96	0.81	11566	1.40
						Head Sample Analyses:	10.86	0.78	11579	1.35

COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

Westmoreland Resources, Inc. (Absaloka or Sarpy Creek Mine) **Crushed to -100M**

		DIRECT				CUMULATIVE (BY SIZE GROUP)				
Passing	Retained	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	+100 M	4.56	6.59	0.76	11958	4.56	6.59	0.76	11958	1.27
100 M	325 M	74.04	9.76	0.89	11683	74.04	9.76	0.89	11683	1.52
325 M	+0	21.40	15.56	0.90	10545	95.44	11.06	0.89	11428	1.56
		95.44								
	Total	100.00								

COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

Westmoreland Resources, Inc. (Absaloka or Sarpy Creek Mine) **Crushed to -100 Mesh**

1.30 Sink Fraction of As-Received Sample Crushed to -100 Mesh (49.12% of Total)

Size Interval: Top Size x 0 — % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	0.00				0.00				0.00
1.25	1.30	0.00				0.00				0.00
1.30	1.35	1.19	4.47	0.57	12693	1.19	4.47	0.57	12693	0.90
1.35	1.40	42.80	5.52	0.51	12315	43.99	5.49	0.51	12325	0.83
1.40	1.60	39.62	12.75	0.41	10872	83.61	8.93	0.46	11637	0.80
1.60	1.80	6.72	20.22	0.43	9830	90.33	9.77	0.46	11502	0.80
1.80	2.00	1.65	36.17	0.45	8116	91.98	10.24	0.46	11441	0.81
2.00	2.45	1.73	66.77	0.64	2963	93.71	11.29	0.46	11285	0.82
2.45		6.30	76.53	12.16	937	100.01	15.40	1.20	10633	2.26
		100.01								
						1.3-Sink Head Sample:	15.41	1.07	10590	2.02

1.30 Float Fraction of As-Received Sample (50.88% of Total)

Size Interval: Top Size x 0 — % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	7.96	4.91	0.51	12311	7.96	4.91	0.51	12311	0.83
1.25	1.30	92.04	6.28	0.52	12144	100.00	6.17	0.52	12157	0.85
		100.00								

Calculated Size/Gravity Washability of Crushed to -100 Mesh Sample

Total: Top Size x 0 — % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	4.05	4.91	0.51	12311	4.05	4.91	0.51	12311	0.83
1.25	1.30	46.83	6.28	0.52	12144	50.88	6.17	0.52	12157	0.85
1.30	1.35	0.58	4.47	0.57	12693	51.46	6.15	0.52	12163	0.85
1.35	1.40	21.02	5.52	0.51	12315	72.49	5.97	0.52	12207	0.85
1.40	1.60	19.46	12.75	0.41	10872	91.95	7.40	0.49	11925	0.83
1.60	1.80	3.30	20.22	0.43	9830	95.25	7.85	0.49	11852	0.83
1.80	2.00	0.81	36.17	0.45	8116	96.06	8.09	0.49	11821	0.83
2.00	2.45	0.85	66.77	0.64	2963	96.91	8.60	0.49	11743	0.84
2.45		3.09	76.53	12.16	937	100.00	10.70	0.85	11409	1.50
		100.00								
						Size Analysis Heads:	10.85	0.89	11452	1.55
						Head Analyses Sample:	10.41	0.88	11519	1.53

Western Energy Co.
Rosebud Mine

GOULD ENERGY DIVISION
P. O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE: 7- 9-92
MASTER SAMPLE NO. 125583

C. Q., INC
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748 SAMPLE ID: RUN 91082001 WESTERN ENERGY

OPERATING CO.: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
MINE: SECONDARY CRUSHER REJECT SPLIT
LOCATION:

DATE SAMPLED: DATE RECEIVED: 9/13/91
WEATHER:
GROSS WEIGHT: 1735.9 KG

OTHER ID: POWDER RIVER BASIN RAW COAL CHARACTERIZATION AS RECD SAMPLE TO P X O AS RECD COAL NOMINAL 6 TONS ALL WT % REPORTED ON A DRY BASIS, AL L ASH % ON AN SO3-FREE BASIS

CERTIFICATE OF ANALYSIS

		AS RECEIVED	DRY BASIS
MOISTURE D2961	D3302 D3173	22.73%	XXX
VOLATILE MATTER	D3175	34.69%	44.90%
FIXED CARBON	D3172	35.49%	45.92%
ASH	D3174	7.09%	9.18%
SULFUR	D4239 METHOD 3.3	.62%	.80%
CARBON	D3178	51.45%	66.59%
HYDROGEN	D3178	3.85%	4.98%
NITROGEN	D3179	.77%	.99%
OXYGEN	D3176	13.49%	17.46%
BTU/LB	D2015 D1989	8940	11570
MAF BTU/LB			12739
LBS OF SO2 PER MILLION BTU			1.38
LBS OF SULFUR PER MILLION BTU			.691
HARDGROVE GRINDABILITY INDEX	D409	50	
FORMS OF SULFUR	D2492		
PYRITIC SULFUR		.19%	.25%
SULFATE SULFUR		.01%	.01%
ORGANIC SULFUR		.42%	.54%
CHLORINE	D4208	.04%	.05%
EQUILIBRIUM MOISTURE	D1412	21.96%	

PAGE 1 OF 2

CORRECTED COPY THIS REPORT SUPERCEDES ALL PRIOR REPORTS WITH THE SAME LABORATORY NUMBER

BLACK SEAL ANALYSIS

Thomas A. Light
Tom Lathey

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STANDARD LABORATORIES, INC.

DATE: 7- 9-92
WARNER NO. 125583

CERTIFICATE OF ANALYSIS (CONT.)

	AS RECEIVED	DRY BASIS
ASH FUSION TEMPERATURE(S)		
D1857 - GAS METHOD	REDUCING ATMOSPHERE	
INITIAL DEFORMATION TEMPERATURE	2150	
SOFTENING TEMPERATURE	2190	
HEMISPHERICAL TEMPERATURE	2300	
FLUID TEMPERATURE	2360	
D1857	OXIDIZING ATMOSPHERE	
INITIAL DEFORMATION TEMPERATURE	2225	
SOFTENING TEMPERATURE	2290	
HEMISPHERICAL TEMPERATURE	2320	
FLUID TEMPERATURE	2405	
ASH MINERAL COMPOSITION		
D2795 D3682		
SILICON DIOXIDE	41.40	
ALUMINIUM OXIDE	17.19	
FERRIC OXIDE	4.94	
TITANIUM DIOXIDE	1.00	
PHOSPHORUS PENTOXIDE	.29	
CALCIUM OXIDE	14.46	
MAGNESIUM OXIDE	3.83	
SODIUM OXIDE	.18	
POTASSIUM OXIDE	.50	
SULFUR TRIOXIDE	14.14	
PERCENT SOLIDS		77.27%

APPROVED BY Thomas A. Light

APPROVED BY Don Petrey

1663

BLACK SEAL ANALYSIS

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STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/01/92
SAMPLE NO: 125583

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
MINE: SECONDARY CRUSHER REJECT SPLIT
SAMPLE I.D.: RUN 91082001 WESTERN ENERGY
DATE SAMPLED:
DATE RECEIVED: 9/13/91
GROSS WEIGHT: 1735.9 KG

OTHER I.D.: POWDER RIVER BASIN RAW COAL CHARACTERIZATION AS RECD. SAMPLE TOP X 0 AS RECD. COAL NOMINAL 6 TONS ALL WT. % REPORTED ON A DRY BASIS, ALL ASH % ON AN SO3-FREE BASIS

CERTIFICATE OF ANALYSIS

FRACTION	WT%	MOISTURE	ASH	SULFUR	BTU	LBS PER	SO2 MBTU	MAF BTU
+1 1/2" SQ	4.33	23.46	9.42	.50	11680		.86	12894
1 1/2" SQ X 3/4" SQ	32.40	23.56	10.10	.93	11563		1.61	12862
3/4" SQ X 3/8" SQ	26.14	24.19	9.13	.95	11702		1.62	12878
3/8" SQ X 28M	31.96	24.64	8.55	.84	11784		1.42	15437
28M X 100M	3.43	15.57	9.34	.90	11545		1.56	12733
100M X 325M	.85	12.66	11.80	1.11	11124		1.99	14440
325 X 0	.89	7.97	18.59	.59	10216		1.15	12549

CUMULATIVE RETAINED - DOWN

FRACTION	WT%	ASH	SULFUR	BTU	LBS PER	SO2 MBTU
+1 1/2" SQ	4.33	9.42	.50	11680		.86
+1 1/2" SQ X 3/4" SQ	36.72	10.02	.88	11577		1.52
+1 1/2" SQ X 3/8" SQ	62.86	9.65	.91	11629		1.56
+1 1/2" SQ X 28M	94.82	9.28	.88	11681		1.51
+1 1/2" SQ X 100M	98.26	9.28	.88	11677		1.51
+1 1/2" SQ X 325M	99.11	9.30	.89	11672		1.52
+1 1/2" SQ X 0	100.00	9.39	.88	11659		1.51

CUMULATIVE RETAINED - UP

FRACTION	WT%	ASH	SULFUR	BTU	LBS PER	SO2 MBTU
+1 1/2" SQ X 0	100.00	9.39	.88	11659		1.51
1 1/2" SQ X 0	95.67	9.39	.90	11658		1.54
3/4" SQ X 0	63.28	9.02	.89	11706		1.52
3/8" SQ X 0	37.14	8.94	.84	11709		1.43
28M X 0	5.18	11.34	.88	11246		1.56
100M X 0	1.74	15.27	.84	10660		1.57
325M X 0	.89	18.59	.59	10216		1.15

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY Thomas A. Ryder

APPROVED BY R.E. Lay

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STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/01/92
SAMPLE NO: 125591

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
MINE: SECONDARY CRUSHER REJECT SPLIT
SAMPLE I.D.: RUN 91082001 WESTERN ENERGY
DATE SAMPLED:
DATE RECEIVED: 9/13/91
GROSS WEIGHT: 1735.9 KG

OTHER I.D.: POWDER RIVER BASIN RAW COAL CHARACTERIZATION AS RECD. SAMPLE TOP X 0 AS RECD. COAL NOMINAL 6 TONS ALL WT. % REPORTED ON A DRY BASIS, ALL ASH % ON AN SO3-FREE BASIS

FEED FOR SIZE +3/4" SQM

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	2.76	3.25	.50	12694	0.00	0.00
1.30	66.53	6.07	.52	12240	0.00	0.00
1.35	15.72	9.79	.54	11693	0.00	0.00
1.40	4.29	17.07	.52	10789	0.00	0.00
1.60	6.08	28.79	1.16	9117	0.00	0.00
1.80	1.95	39.87	5.71	7123	0.00	0.00
2.00	1.21	42.09	9.95	5387	0.00	0.00
2.45	1.30	53.92	8.71	3500	0.00	0.00
2.45 SINK	.16	55.57	22.75	4161	0.00	0.00

CUMULATIVE RESULTS FOR SIZE +3/4" SQM

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	2.76	3.25	.50	12694	0.00	0.00
1.30	69.29	5.96	.52	12258	0.00	0.00
1.35	85.01	6.66	.52	12153	0.00	0.00
1.40	89.30	7.16	.52	12088	0.00	0.00
1.60	95.38	8.54	.57	11898	0.00	0.00
1.80	97.33	9.17	.67	11803	0.00	0.00
2.00	98.54	9.57	.78	11724	0.00	0.00
2.45	99.84	10.15	.89	11617	0.00	0.00
2.45 SINK	100.00	10.22	.92	11605	0.00	0.00

CUMULATIVE UP

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	100.00	10.22	.92	11605	0.00	0.00
1.30	97.24	10.42	.93	11574	0.00	0.00
1.35	30.71	19.86	1.82	10132	0.00	0.00
1.40	14.99	30.42	3.16	8495	0.00	0.00
1.60	10.70	35.77	4.22	7575	0.00	0.00
1.80	4.62	44.95	8.25	5546	0.00	0.00
2.00	2.67	48.66	10.11	4395	0.00	0.00
2.45	1.46	54.10	10.25	3573	0.00	0.00
2.45 SINK	.16	55.57	22.75	4161	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

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STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/01/92
SAMPLE NO: 125591

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
MINE: SECONDARY CRUSHER REJECT SPLIT
SAMPLE I.D.: RUN 91082001 WESTERN ENERGY
DATE SAMPLED: DATE RECEIVED: 9/13/91
GROSS WEIGHT: 1735.9 KG

OTHER I.D.: POWDER RIVER BASIN RAW COAL CHARACTERIZATION AS RECD. SAMPLE TOP X 0 AS RECD. COAL NOMINAL 6 TONS ALL WT. % REPORTED ON A DRY BASIS, ALL ASH % ON AN SO3-FREE BASIS

FEED FOR SIZE +3/4" SQ X 28M

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	6.25	3.31	.50	12778	0.00	0.00
1.30	60.85	5.01	.49	12363	0.00	0.00
1.35	17.85	8.78	.44	11844	0.00	0.00
1.40	4.69	13.76	.45	11248	0.00	0.00
1.60	7.24	23.13	.63	9996	0.00	0.00
1.80	1.03	41.66	4.31	6958	0.00	0.00
2.00	.52	46.73	8.64	5565	0.00	0.00
2.45	1.05	58.24	11.81	3881	0.00	0.00
2.45 SINK	.52	60.34	29.79	3611	0.00	0.00

CUMULATIVE RESULTS FOR SIZE 3/4" SQ X 28M

CUMULATIVE DOWN

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	6.25	3.31	.50	12778	0.00	0.00
1.30	67.10	4.85	.49	12402	0.00	0.00
1.35	84.95	5.68	.48	12285	0.00	0.00
1.40	89.64	6.10	.48	12230	0.00	0.00
1.60	96.88	7.37	.49	12063	0.00	0.00
1.80	97.91	7.73	.53	12010	0.00	0.00
2.00	98.43	7.94	.57	11976	0.00	0.00
2.45	99.48	8.47	.69	11890	0.00	0.00
2.45 SINK	100.00	8.74	.84	11847	0.00	0.00

CUMULATIVE UP

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	100.00	8.74	.84	11847	0.00	0.00
1.30	93.75	9.10	.87	11785	0.00	0.00
1.35	32.90	16.67	1.56	10716	0.00	0.00
1.40	15.05	26.03	2.89	9378	0.00	0.00
1.60	10.36	31.58	3.99	8531	0.00	0.00
1.80	3.12	51.20	11.80	5132	0.00	0.00
2.00	2.09	55.90	15.50	4233	0.00	0.00
2.45	1.57	58.93	17.77	3791	0.00	0.00
2.45 SINK	.52	60.34	29.79	3611	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

Thomas A. Pugh
Reilly

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STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/01/92
SAMPLE NO: 125591

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SAMPLED BY: CUSTOMER PROVIDED
MINE: SECONDARY CRUSHER REJECT SPLIT
SAMPLE I.D.: RUN 91082001 WESTERN ENERGY
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GROSS WEIGHT: 1735.9 KG

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FEED FOR SIZE 28M X 100M

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	0.00	0.00	0.00	0	0.00	0.00
1.30	0.00	0.00	0.00	0	0.00	0.00
1.35	0.00	0.00	0.00	0	0.00	0.00
1.40	.71	5.13	.50	12611	0.00	0.00
1.60	91.97	6.45	.40	12158	0.00	0.00
1.80	2.53	27.54	.39	8945	0.00	0.00
2.00	1.20	43.87	.64	6455	0.00	0.00
2.45	.54	65.16	.64	3015	0.00	0.00
2.45 SINK	3.05	76.17	13.76	825	0.00	0.00

CUMULATIVE RESULTS FOR SIZE 28M X 100M

CUMULATIVE DOWN

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	0.00	0.00	0.00	0	0.00	0.00
1.30	0.00	0.00	0.00	0	0.00	0.00
1.35	0.00	0.00	0.00	0	0.00	0.00
1.40	.71	5.13	.50	12611	0.00	0.00
1.60	92.68	6.44	.40	12161	0.00	0.00
1.80	95.21	7.00	.40	12076	0.00	0.00
2.00	96.41	7.46	.40	12006	0.00	0.00
2.45	96.95	7.78	.40	11956	0.00	0.00
2.45 SINK	100.00	9.87	.81	11616	0.00	0.00

CUMULATIVE UP

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	100.00	9.87	.81	11616	0.00	0.00
1.30	100.00	9.87	.81	11616	0.00	0.00
1.35	100.00	9.87	.81	11616	0.00	0.00
1.40	100.00	9.87	.81	11616	0.00	0.00
1.60	99.29	9.90	.81	11609	0.00	0.00
1.80	7.32	53.26	6.02	4716	0.00	0.00
2.00	4.79	66.84	9.00	2482	0.00	0.00
2.45	3.59	74.52	11.79	1154	0.00	0.00
2.45 SINK	3.05	76.17	13.76	825	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

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C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/01/92
SAMPLE NO: 125591

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
MINE: SECONDARY CRUSHER REJECT SPLIT
SAMPLE I.D.: RUN 91082001 WESTERN ENERGY
DATE SAMPLED:
DATE RECEIVED: 9/13/91
GROSS WEIGHT: 1735.9 KG

OTHER I.D.: POWDER RIVER BASIN RAW COAL CHARACTERIZATION AS RECD. SAMPLE TOP X 0 AS RECD. COAL NOMINAL 6 TONS ALL WT. % REPORTED ON A DRY BASIS, ALL ASH % ON AN S03-FREE BASIS

FEED FOR SIZE 100M X 0

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	0.00	0.00	0.00	0	0.00	0.00
1.30	0.00	0.00	0.00	0	0.00	0.00
1.35	0.00	0.00	0.00	0	0.00	0.00
1.40	0.00	0.00	0.00	0	0.00	0.00
1.60	80.38	7.11	.40	11989	0.00	0.00
1.80	7.90	16.15	.41	10707	0.00	0.00
2.00	2.71	29.94	.49	8585	0.00	0.00
2.45	2.68	66.73	.56	3296	0.00	0.00
2.45 SINK	6.34	81.90	6.99	899	0.00	0.00

CUMULATIVE RESULTS FOR SIZE 100M X 0
CUMULATIVE DOWN

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	0.00	0.00	0.00	0	0.00	0.00
1.30	0.00	0.00	0.00	0	0.00	0.00
1.35	0.00	0.00	0.00	0	0.00	0.00
1.40	0.00	0.00	0.00	0	0.00	0.00
1.60	80.38	7.11	.40	11989	0.00	0.00
1.80	88.28	7.92	.40	11874	0.00	0.00
2.00	90.98	8.57	.40	11776	0.00	0.00
2.45	93.66	10.24	.41	11534	0.00	0.00
2.45 SINK	100.00	14.78	.83	10860	0.00	0.00

CUMULATIVE UP

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	100.00	14.78	.83	10860	0.00	0.00
1.30	100.00	14.78	.83	10860	0.00	0.00
1.35	100.00	14.78	.83	10860	0.00	0.00
1.40	100.00	14.78	.83	10860	0.00	0.00
1.60	100.00	14.78	.83	10860	0.00	0.00
1.80	19.62	46.20	2.57	6235	0.00	0.00
2.00	11.72	66.43	4.02	3223	0.00	0.00
2.45	9.02	77.39	5.08	1612	0.00	0.00
2.45 SINK	6.34	81.90	6.99	899	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

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STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/01/92
SAMPLE NO: 125591

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
MINE: SECONDARY CRUSHER REJECT SPLIT
SAMPLE I.D.: RUN 91082001 WESTERN ENERGY
DATE SAMPLED:
DATE RECEIVED: 9/13/91
GROSS WEIGHT: 1735.9 KG

OTHER I.D.: POWDER RIVER BASIN RAW COAL CHARACTERIZATION AS RECD. SAMPLE TOP X 0 AS RECD. COAL NOMINAL 6 TONS ALL WT. % REPORTED ON A DRY BASIS, ALL ASH % ON AN SO3-FREE BASIS

FEED FOR COMPOSITE +3/4" SQ X 0

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	4.65	3.30	.50	12759	0.00	0.00
1.30	59.79	5.44	.50	12313	0.00	0.00
1.35	16.14	9.14	.48	11790	0.00	0.00
1.40	4.32	14.92	.48	11088	0.00	0.00
1.60	10.99	17.46	.64	10692	0.00	0.00
1.80	1.54	37.75	4.39	7482	0.00	0.00
2.00	.83	43.17	8.48	5685	0.00	0.00
2.45	1.15	56.91	9.89	3686	0.00	0.00
2.45 SINK	.58	66.86	21.79	2642	0.00	0.00

CUMULATIVE RESULTS FOR COMPOSITE +3/4" SQ X 0

CUMULATIVE DOWN

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	4.65	3.30	.50	12759	0.00	0.00
1.30	64.43	5.29	.50	12345	0.00	0.00
1.35	80.58	6.06	.50	12234	0.00	0.00
1.40	84.90	6.51	.50	12175	0.00	0.00
1.60	95.90	7.77	.51	12005	0.00	0.00
1.80	97.44	8.24	.58	11934	0.00	0.00
2.00	98.27	8.54	.64	11881	0.00	0.00
2.45	99.42	9.10	.75	11786	0.00	0.00
2.45 SINK	100.00	9.43	.87	11733	0.00	0.00

CUMULATIVE UP

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	100.00	9.43	.87	11733	0.00	0.00
1.30	95.35	9.73	.89	11683	0.00	0.00
1.35	35.57	16.93	1.53	10625	0.00	0.00
1.40	19.42	23.41	2.41	9656	0.00	0.00
1.60	15.10	25.84	2.97	9246	0.00	0.00
1.80	4.10	48.32	9.21	5370	0.00	0.00
2.00	2.56	54.67	12.11	4102	0.00	0.00
2.45	1.73	60.22	13.86	3338	0.00	0.00
2.45 SINK	.58	66.86	21.79	2642	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

Thomas A. Pight
P.E. Kelly

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STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/01/92
SAMPLE NO: 125628

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
MINE: RAW COAL CR TO 3/8" TOP SIZE
SAMPLE I.D.: RUN 91082001 WESTERN ENERGY
DATE SAMPLED:
DATE RECEIVED: 9/13/91
GROSS WEIGHT: 1735.9 KG

OTHER I.D.: POWDER RIVER BASIN CHANGE IN RAW COAL SIZE DIST WITH CRUSHING LAB SPLIT AS RECD RAW COAL CR TO 3/8" X 0 WT AS REQD ASTM TOP SIZE WT % REPORTED ON DRY BASIS ASH % ON SO3 FREE BASIS

CERTIFICATE OF ANALYSIS

		AS RECEIVED	DRY BASIS
MOISTURE	D2961 D3302 D3173	24.62 %	XXX
ASH	D3174	7.00 %	9.28 %
SULFUR	D4239 METHOD 3.3	.68 %	.90 %
BTU/LB	D2015	8837	11722
MAF BTU/LB			12922
LBS OF SO2 PER MILLION BTU			1.53
PERCENT SOLIDS			75.38%

APPROVED BY Thomas A. Rafter
APPROVED BY RCK

PAGE 1 OF 1
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BLACK SEAL ANALYSIS

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STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/01/92
SAMPLE NO: 125628

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
MINE: RAW COAL CR TO 3/8" TOP SIZE
SAMPLE I.D.: RUN 91082001 WESTERN ENERGY
DATE SAMPLED:
DATE RECEIVED: 9/13/91
GROSS WEIGHT: 1735.9 KG

OTHER I.D.: POWDER RIVER BASIN CHANGE IN RAW COAL SIZE DIST. WITH CRUSHING LAB SPLIT AS RECD RAW COAL CR TO 3/8" X 0 WT AS REQD ASTM TOP SIZE WT % REPORTED ON DRY BASIS ASH % ON AN S03 FREE BASIS

CERTIFICATE OF ANALYSIS

FRACTION	WT%	MOISTURE	ASH	SULFUR	BTU	LBS SO2 PER MBTU	MAF BTU
+3/8" SQ	1.23	23.13	9.60	.86	11686	1.47	12926
3/8" SQ X 28M	89.47	24.53	9.26	.86	11716	1.47	12911
28M X 100M	6.44	10.20	9.29	1.02	11498	1.77	12674
100M X 325M	1.61	8.15	11.42	1.24	11232	2.21	12679
325 X 0	1.25	12.72	18.41	.81	10202	1.59	12504

CUMULATIVE RETAINED - DOWN

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
+3/8" SQ	1.23	9.60	.86	11686	1.47
+3/8" SQ X 28M	90.70	9.26	.86	11716	1.47
+3/8" SQ X 100M	97.14	9.26	.87	11701	1.49
+3/8" SQ X 325M	98.75	9.30	.88	11693	1.50
+3/8" SQ X 0	100.00	9.41	.88	11675	1.51

CUMULATIVE RETAINED - UP

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
+3/8" SQ X 0	100.00	9.41	.88	11675	1.51
3/8" SQ X 0	98.77	9.41	.88	11675	1.51
28M X 0	9.30	10.88	1.03	11278	1.82
100M X 0	2.86	14.47	1.05	10783	1.95
325 X 0	1.25	18.41	.81	10202	1.59

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY Thomas A. Rifft

APPROVED BY

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STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/01/92
SAMPLE NO: 125638

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
MINE: RAW COAL 1.30 SK CR TO 3/8" X 0
SAMPLE I.D.: RUN 91082001 WESTERN ENERGY
DATE SAMPLED:
GROSS WEIGHT: 1735.9 KG
DATE RECEIVED: 9/13/91

OTHER I.D.: POWDER RIVER BASIN RAW COAL LIBERATION LAB SPLIT OF 1.30 SK OF AS RECD SAMPLE CR TO 3/8" X 0 WT AS REQD ASTM TOP SIZE WT % REPORTED ON A DRY BASIS ASH % ON AN SO3-FREE BASIS

CERTIFICATE OF ANALYSIS

		AS RECEIVED	DRY BASIS
MOISTURE	D2961 D3302 D3173	16.49 %	XXX
ASH	D3174	14.73 %	17.64 %
SULFUR	D4239 METHOD 3.3	1.37 %	1.64 %
BTU/LB	D2015 D1989	8768	10500
MAF BTU/LB			12749
LBS OF SO2 PER MILLION BTU			3.12
LBS OF SULFUR PER MILLION BTU			1.562
PERCENT SOLIDS			83.51%

APPROVED BY Thomas A. Rizzetta

APPROVED BY R.E. Kelly

BLACK SEAL ANALYSIS

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE : 7-29-92
MASTER SAMPLE NO. 125638

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: RUN 91082001 WESTERN ENERGY

)PERATING CO.: PROJECT 90D0101 TASK 2.4
1INE: RAW COAL 1.30 SK CR TO 3/8"XO
DATE SAMPLED:
SAMPLED BY: CUSTOMER PROVIDED
>ROSS WEIGHT: 1735.9 GR
DATE RECEIVED: 9/13/91

)THER ID: POWER RIVER BASIN RAW COAL LIBERATION LAB SPLIT OF 1.30 SK OF AS REC D SAMPLE CR TO 3/8"XO W1 AS REQD ASTM TOP SIZE WT % REPORTED ON A DRY BASIS ASH % ON AN SO3-FREE BASIS

CORRECTED REPORT SUPERCEDES ALL PRIOR REPORTS WITH THE SAME LABORATORY NUMBER

CERTIFICATE OF ANALYSIS

FRACTION	WT%	MOISTURE	ASH	SULFUR	BTU	LBS SO2 PER MBTU	MAF BTU
-28M	80.99	16.94	17.93	1.70	10404	3.26	14378
28M X 100M	11.45	10.69	14.74	1.50	10752	2.79	13596
.OOM X O	7.56	14.87	17.64	1.59	10573	3.00	12838

CUMULATIVE RETAINED - DOWN

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
-28M	80.99	17.93	1.70	10404	3.26
-28M X 100M	92.44	17.54	1.68	10447	3.21
-28M X O	100.00	17.54	1.67	10457	3.19

CUMULATIVE RETAINED - UP

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
-28M X O	100.00	17.54	1.67	10457	3.19
28M X O	19.01	15.89	1.53	10681	2.86
.OOM X O	7.56	17.64	1.59	10573	3.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

PAGE 1

APPROVED BY Thomas A. Right
APPROVED BY [illegible]

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STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/01/92
SAMPLE NO: 125642

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
MINE: RAW COAL 1.30 SK CR TO 3/8" X 0
SAMPLE I.D.: RUN 91082001 WESTERN ENERGY
DATE SAMPLED:
DATE RECEIVED: 9/13/91
GROSS WEIGHT: 1735.9 KG

OTHER I.D.: POWDER RIVER BASIN RAW COAL LIBERATION LAB SPLIT OF 1.30 SK OF AS RECD SAMPLE CR TO 3/8" X 0 WT AS REQD ASTM TOP SIZE WT % REPORTED ON A DRY BASIS ASH % ON AN SO3-FREE BASIS

FEED FOR SIZE +28M

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	0.00	0.00	0.00	0	0.00	0.00
1.30	13.11	6.81	.52	12401	0.00	0.00
1.35	36.03	10.69	.44	11741	0.00	0.00
1.40	15.61	12.99	.40	11175	0.00	0.00
1.60	23.05	22.82	.47	9669	0.00	0.00
1.80	3.75	42.56	1.18	6716	0.00	0.00
2.00	1.79	50.83	4.68	4928	0.00	0.00
2.45	3.57	55.83	8.05	3507	0.00	0.00
2.45 SINK	3.08	58.52	26.64	4083	0.00	0.00

CUMULATIVE RESULTS FOR SIZE +28M
CUMULATIVE DOWN

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	0.00	0.00	0.00	0	0.00	0.00
1.30	13.11	6.81	.52	12401	0.00	0.00
1.35	49.14	9.65	.46	11917	0.00	0.00
1.40	64.75	10.46	.45	11738	0.00	0.00
1.60	87.81	13.70	.45	11195	0.00	0.00
1.80	91.56	14.89	.48	11011	0.00	0.00
2.00	93.35	15.58	.56	10895	0.00	0.00
2.45	96.92	17.06	.84	10622	0.00	0.00
2.45 SINK	100.00	18.34	1.63	10421	0.00	0.00

CUMULATIVE UP

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	100.00	18.34	1.63	10421	0.00	0.00
1.30	100.00	18.34	1.63	10421	0.00	0.00
1.35	86.89	20.08	1.80	10122	0.00	0.00
1.40	50.86	26.72	2.77	8976	0.00	0.00
1.60	35.25	32.81	3.81	8002	0.00	0.00
1.80	12.19	51.69	10.14	4848	0.00	0.00
2.00	8.44	55.75	14.12	4018	0.00	0.00
2.45	6.65	57.08	16.66	3774	0.00	0.00
2.45 SINK	3.08	58.52	26.64	4083	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

Thomas A. Right
RAV

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STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/01/92
SAMPLE NO: 125642

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
MINE: RAW COAL 1.30 SK CR TO 3/8" X 0
SAMPLE I.D.: RUN 91082001 WESTERN ENERGY
DATE SAMPLED: DATE RECEIVED: 9/13/91
GROSS WEIGHT: 1735.9 KG

OTHER I.D.: POWDER RIVER BASIN RAW COAL LIBERATION LAB SPLIT OF 1.30 SK OF AS RECD SAMPLE CR TO 3/8" X 0 WT AS REQD ASTM TOP SIZE WT % REPORTED ON A DRY BASIS ASH % ON AN SO3-FREE BASIS

FEED FOR SIZE 28M X 100M

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	0.00	0.00	0.00	0	0.00	0.00
1.30	0.00	0.00	0.00	0	0.00	0.00
1.35	0.00	0.00	0.00	0	0.00	0.00
1.40	26.03	4.17	.49	12521	0.00	0.00
1.60	59.01	8.45	.41	11655	0.00	0.00
1.80	5.23	29.49	.48	8803	0.00	0.00
2.00	1.97	45.53	.97	6298	0.00	0.00
2.45	2.15	62.49	2.26	3060	0.00	0.00
2.45 SINK	5.61	77.68	17.57	1284	0.00	0.00

CUMULATIVE RESULTS FOR SIZE 28M X 100M

CUMULATIVE DOWN

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	0.00	0.00	0.00	0	0.00	0.00
1.30	0.00	0.00	0.00	0	0.00	0.00
1.35	0.00	0.00	0.00	0	0.00	0.00
1.40	26.03	4.17	.49	12521	0.00	0.00
1.60	85.04	7.14	.44	11920	0.00	0.00
1.80	90.27	8.43	.44	11739	0.00	0.00
2.00	92.24	9.23	.45	11623	0.00	0.00
2.45	94.39	10.44	.49	11428	0.00	0.00
2.45 SINK	100.00	14.21	1.45	10859	0.00	0.00

CUMULATIVE UP

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	100.00	14.21	1.45	10859	0.00	0.00
1.30	100.00	14.21	1.45	10859	0.00	0.00
1.35	100.00	14.21	1.45	10859	0.00	0.00
1.40	100.00	14.21	1.45	10859	0.00	0.00
1.60	73.97	17.74	1.79	10274	0.00	0.00
1.80	14.96	54.42	7.21	4828	0.00	0.00
2.00	9.73	67.81	10.82	2692	0.00	0.00
2.45	7.76	73.47	13.33	1776	0.00	0.00
2.45 SINK	5.61	77.68	17.57	1284	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

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Thomas A. Right
DSVO

STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/01/92
SAMPLE NO: 125642

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
MINE: RAW COAL 1.30 SK CR TO 3/8" X 0
SAMPLE I.D.: RUN 91082001 WESTERN ENERGY
DATE SAMPLED: DATE RECEIVED: 9/13/91
GROSS WEIGHT: 1735.9 KG

OTHER I.D.: POWDER RIVER BASIN RAW COAL LIBERATION LAB SPLIT OF 1.30 SK OF AS RECD SAMPLE CR TO 3/8" X 0 WT AS REQD ASTM TOP SIZE WT % REPORTED ON A DRY BASIS ASH % ON AN S03-FREE BASIS

FEED FOR SIZE 100M X 0

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	0.00	0.00	0.00	0	0.00	0.00
1.30	0.00	0.00	0.00	0	0.00	0.00
1.35	.45	3.99	.83	13750	0.00	0.00
1.40	37.41	5.42	.48	12868	0.00	0.00
1.60	38.50	8.35	.37	11917	0.00	0.00
1.80	7.76	17.03	.36	10858	0.00	0.00
2.00	2.14	36.40	.49	7580	0.00	0.00
2.45	2.88	64.15	.74	3438	0.00	0.00
2.45 SINK	10.86	81.80	9.41	643	0.00	0.00

CUMULATIVE RESULTS FOR SIZE 100M X 0

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	0.00	0.00	0.00	0	0.00	0.00
1.30	0.00	0.00	0.00	0	0.00	0.00
1.35	.45	3.99	.83	13750	0.00	0.00
1.40	37.86	5.41	.49	12878	0.00	0.00
1.60	76.36	6.89	.43	12394	0.00	0.00
1.80	84.12	7.83	.42	12252	0.00	0.00
2.00	86.26	8.53	.43	12136	0.00	0.00
2.45	89.14	10.33	.44	11855	0.00	0.00
2.45 SINK	100.00	18.09	1.41	10638	0.00	0.00

CUMULATIVE UP

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	100.00	18.09	1.41	10638	0.00	0.00
1.30	100.00	18.09	1.41	10638	0.00	0.00
1.35	100.00	18.09	1.41	10638	0.00	0.00
1.40	99.55	18.16	1.41	10623	0.00	0.00
1.60	62.14	25.82	1.97	9272	0.00	0.00
1.80	23.64	54.28	4.57	4964	0.00	0.00
2.00	15.88	72.48	6.63	2084	0.00	0.00
2.45	13.74	78.10	7.59	1228	0.00	0.00
2.45 SINK	10.86	81.80	9.41	643	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

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STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/01/92
SAMPLE NO: 125642

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
MINE: RAW COAL 1.30 SK CR TO 3/8" X 0
SAMPLE I.D.: RUN 91082001 WESTERN ENERGY
DATE SAMPLED: DATE RECEIVED: 9/13/91
GROSS WEIGHT: 1735.9 KG

OTHER I.D.: POWDER RIVER BASIN RAW COAL LIBERATION LAB SPLIT OF 1.30 SK OF AS RECD SAMPLE CR TO 3/8" X 0 WT AS REQD ASTM TOP SIZE WT % REPORTED ON A DRY BASIS ASH % ON AN SO3-FREE BASIS.

FEED FOR COMPOSITE +28M X 0

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	0.00	**********			**********	
1.30	10.62	6.81	.52	12401	0.00	0.00
1.35	29.21	10.68	.44	11743	0.00	0.00
1.40	18.45	10.41	.43	11652	0.00	0.00
1.60	28.34	17.91	.44	10374	0.00	0.00
1.80	4.22	37.16	.97	7587	0.00	0.00
2.00	1.84	48.91	3.86	5329	0.00	0.00
2.45	3.36	56.86	7.15	3470	0.00	0.00
2.45 SINK	3.96	66.46	21.59	2915	0.00	0.00

CUMULATIVE RESULTS FOR COMPOSITE +28M X 0

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	0.00	**********			**********	
1.30	10.62	6.81	.52	12401	0.00	0.00
1.35	39.83	9.65	.46	11918	0.00	0.00
1.40	58.29	9.89	.45	11834	0.00	0.00
1.60	86.63	12.51	.45	11356	0.00	0.00
1.80	90.85	13.66	.47	11181	0.00	0.00
2.00	92.69	14.36	.54	11065	0.00	0.00
2.45	96.04	15.84	.77	10800	0.00	0.00
2.45 SINK	100.00	17.85	1.59	10488	0.00	0.00

CUMULATIVE UP

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	100.00	17.85	1.59	10488	0.00	0.00
1.30	100.00	17.85	1.59	10488	0.00	0.00
1.35	89.38	19.16	1.72	10260	0.00	0.00
1.40	60.17	23.27	2.35	9540	0.00	0.00
1.60	41.71	28.96	3.19	8606	0.00	0.00
1.80	13.37	52.39	9.02	4861	0.00	0.00
2.00	9.15	59.42	12.74	3603	0.00	0.00
2.45	7.31	62.05	14.97	3170	0.00	0.00
2.45 SINK	3.96	66.46	21.59	2915	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

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Thomas A. Rafter

STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/01/92
SAMPLE NO: 152551

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
MINE: RAW COAL CR TO 100 TOP SIZE
SAMPLE I.D.: RUN 91082001 WESTERN ENERGY
DATE SAMPLED:
DATE RECEIVED: 9/13/91
GROSS WEIGHT: 1735.9 KG

OTHER I.D.: POWDER RIVER BASIN CHANGE IN RAW COAL SIZE DIST. WITH CRUSHING LAB SPLIT AS RECD CR TO 100M X 0 WT AS REQD ASTM TOP SIZE WT % REPORTED ON A DRY BASIS ASH % ON AN S03 FREE BASIS

CERTIFICATE OF ANALYSIS

		AS RECEIVED	DRY BASIS
MOISTURE	D2961 D3302 D3173	24.79 %	XXX
ASH	D3174	7.31 %	9.72 %
SULFUR	D4239 METHOD 3.3	.67 %	.89 %
BTU/LB	D2015 D1989	8745	11627
MAF BTU/LB			12878
LBS OF S02 PER MILLION BTU			1.53
LBS OF SULFUR PER MILLION BTU			.765
PERCENT SOLIDS			75.21%

APPROVED BY Thomas A. Rafter
APPROVED BY R.E. Kelly

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STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/01/92
SAMPLE NO: 152551

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
MINE: RAW COAL CR TO 100 TOP SIZE
SAMPLE I.D.: RUN 91082001 WESTERN ENERGY
DATE SAMPLED:
DATE RECEIVED: 9/13/91
GROSS WEIGHT: 1735.9 KG

OTHER I.D.: POWDER RIVER BASIN CHANGE IN RAW COAL SIZE DIST. WITH CRUSHING LAB SPLIT AS RECD CR TO 100M X 0 WT AS REQD ASTM TOP SIZE WT % REPORTED ON A DRY BASIS ASH % ON AN S03 FREE BASIS

CERTIFICATE OF ANALYSIS

FRACTION	WT%	MOISTURE	ASH	SULFUR	BTU	LBS SO2 PER MBTU	MAF BTU
+100M	3.47	9.75	7.12	.69	12122	1.14	14461
100M X 325M	71.08	12.46	8.37	.98	11880	1.65	14811
325M X 0	25.45	16.10	14.84	.95	10887	1.74	15237

CUMULATIVE RETAINED - DOWN

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
+100M	3.47	7.12	.69	12122	1.14
+100M X 325M	74.55	8.32	.97	11891	1.63
+100M X 0	100.00	9.98	.96	11636	1.65

CUMULATIVE RETAINED - UP

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
+100 X 0	100.00	9.98	.96	11636	1.65
100M X 0	96.53	10.08	.97	11618	1.67
325M X 0	25.45	14.84	.95	10887	1.74

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY Thomas A. Right

APPROVED BY RCEK

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STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/01/92
SAMPLE NO: 125670

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
MINE: RAW COAL 1.30 SK CR TO 100M X 0
SAMPLE I.D.: RUN 91082001 WESTERN ENERGY
DATE SAMPLED:
DATE RECEIVED: 9/13/91
GROSS WEIGHT: 1735.9 KG

OTHER I.D.: POWDER RIVER BASIN RAW COAL LIBERATION LAB SPLIT OF 1.30 SK OF AS RECD SAMPLE CR TO 100M X 0 WT AS REQD ASTM TOP SIZE WT % REPORTED ON A DRY BASIS ASH % ON AN SO3-FREE BASIS

CERTIFICATE OF ANALYSIS

		AS RECEIVED	DRY BASIS
MOISTURE	D2961 D3302 D3173	21.91 %	XXX
ASH	D3174	13.48 %	17.27 %
SULFUR	D4239 METHOD 3.3	1.33 %	1.70 %
BTU/LB	D2015 D1989	8281	10604
MAF BTU/LB			12818
LBS OF SO2 PER MILLION BTU			3.20
PERCENT SOLIDS			78.09%

APPROVED BY _____

APPROVED BY _____

BLACK SEAL ANALYSIS

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/01/92
SAMPLE NO: 125670

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
MINE: RAW COAL 1.30 SK CR TO 100M X 0
SAMPLE I.D.: RUN 91082001 WESTERN ENERGY
DATE SAMPLED: DATE RECEIVED: 9/13/91
GROSS WEIGHT: 1735.9 KG

OTHER I.D.: POWDER RIVER BASIN RAW COAL LIBERATION LAB SPLIT OF 1.30 SK OF AS RECD SAMPLE CR TO 100M X 0 WT AS REQD ASTM TOP SIZE WT % REPORTED ON A DRY BASIS ASH % ON AN SO3-FREE BASIS

GRAVITY	%WT	%MOIST.	%ASH	%SULFUR	BTU	%VOL	%FIX. CAR.
1.25	0.00	0.00	0.00	0		0.00	0.00
1.30	0.00	0.00	0.00	0		0.00	0.00
1.35	1.22	3.63	.88	13610		0.00	0.00
1.40	32.86	6.35	.48	12688		0.00	0.00
1.60	43.09	11.37	.40	11328		0.00	0.00
1.80	10.03	21.14	.43	10211		0.00	0.00
2.00	3.53	35.25	.50	8014		0.00	0.00
2.45	2.51	68.42	1.04	3006		0.00	0.00
2.45 SINK	6.76	79.75	16.36	1472		0.00	0.00

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STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/01/92
SAMPLE NO: 125591

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
MINE: RAW COAL 1.30 SK CR TO 100M X 0
SAMPLE I.D.: RUN 91082001 WESTERN ENERGY
DATE SAMPLED: DATE RECEIVED: 9/13/91
GROSS WEIGHT: 1735.9 KG

OTHER I.D.: POWDER RIVER BASIN RAW COAL LIBERATION LAB SPLIT OF 1.30 SK OF AS RECD SAMPLE CR TO 100M X 0 WT AS REQD ASTM TOP SIZE WT % REPORTED ON A DRY BASIS ASH % ON AN SO3-FREE BASIS

CUMULATIVE RESULTS FOR RAW

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	0.00	0.00	0.00	0	0.00	0.00
1.30	0.00	0.00	0.00	0	0.00	0.00
1.35	1.22	3.63	.88	13610	0.00	0.00
1.40	34.08	6.26	.49	12721	0.00	0.00
1.60	77.17	9.11	.44	11943	0.00	0.00
1.80	87.20	10.50	.44	11744	0.00	0.00
2.00	90.73	11.46	.44	11599	0.00	0.00
2.45	93.24	12.99	.46	11368	0.00	0.00
2.45 SINK	100.00	17.51	1.53	10698	0.00	0.00

CUMULATIVE UP

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	100.00	17.51	1.53	10698	0.00	0.00
1.30	100.00	17.51	1.53	10698	0.00	0.00
1.35	100.00	17.51	1.53	10698	0.00	0.00
1.40	98.78	17.68	1.54	10663	0.00	0.00
1.60	65.92	23.32	2.07	9653	0.00	0.00
1.80	22.83	45.87	5.23	6492	0.00	0.00
2.00	12.80	65.25	8.98	3578	0.00	0.00
2.45	9.27	76.68	12.22	1887	0.00	0.00
2.45 SINK	6.76	79.75	16.36	1472	0.00	0.00

ANALYTICAL RESULTS ARE STSTED ON A DRY BASIS

Thomas A. Right
R.E. Kelly

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COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

Western Energy Co. (Rosebud or Colstrip Mine) **As-Received**

		DIRECT				CUMULATIVE (BY SIZE-GROUP)				
Passing	Retained	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
+	1-1/2 in.	4.33	9.42	0.50	11680	4.33	9.42	0.50	11680	0.86
1-1/2 in.	3/4 in.	32.40	10.10	0.93	11563	36.73	10.02	0.88	11577	1.52
		36.73								
3/4 in.	3/8 in.	26.14	9.13	0.95	11702	26.14	9.13	0.95	11702	1.62
3/8 in.	28 M	31.96	8.55	0.84	11784	58.10	8.81	0.89	11747	1.51
		58.10								
28 M	100 M	3.43	9.34	0.90	11545	3.43	9.34	0.90	11545	1.56
100 M	325 M	0.85	11.80	1.11	11124	0.85	11.80	1.11	11124	2.00
325 M	+0	0.89	18.59	0.59	10216	1.74	15.27	0.84	10660	1.58
		1.74								
	Total	100.00								

COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

Western Energy Co. (Rosebud or Colstrip Mine) **As-Received**

Size Interval: + 3/4-in % Amount This Size: 36.73

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	2.76	3.25	0.50	12694	2.76	3.25	0.50	12694	0.79
1.25	1.30	66.53	6.07	0.52	12240	69.29	5.96	0.52	12258	0.85
1.30	1.35	15.72	9.79	0.54	11693	85.01	6.67	0.52	12154	0.86
1.35	1.40	4.29	17.07	0.52	10789	89.30	7.17	0.52	12088	0.87
1.40	1.60	6.08	28.79	1.16	9117	95.38	8.54	0.56	11899	0.95
1.60	1.80	1.95	39.87	5.71	7123	97.33	9.17	0.67	11803	1.13
1.80	2.00	1.21	42.09	9.95	5387	98.54	9.58	0.78	11724	1.33
2.00	2.45	1.30	53.92	8.71	3500	99.84	10.15	0.88	11617	1.52
2.45		0.16	55.57	22.75	3397	100.00	10.23	0.92	11604	1.58
		100.00								
						Size Analysis Heads:	10.02	0.88	11577	1.52

Size Interval: 3/4-in x 28 mesh % Amount This Size: 58.10

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	6.25	3.31	0.50	12778	6.25	3.31	0.50	12778	0.78
1.25	1.30	60.85	5.01	0.49	12363	67.10	4.85	0.49	12402	0.79
1.30	1.35	17.85	8.78	0.44	11844	84.95	5.68	0.48	12284	0.78
1.35	1.40	4.69	13.76	0.45	11248	89.64	6.10	0.48	12230	0.78
1.40	1.60	7.24	23.13	0.63	9996	96.88	7.37	0.49	12063	0.81
1.60	1.80	1.03	41.66	4.31	6958	97.91	7.73	0.53	12010	0.88
1.80	2.00	0.52	46.73	8.64	5565	98.43	7.94	0.57	11976	0.96
2.00	2.45	1.05	58.24	11.81	3881	99.48	8.47	0.69	11890	1.16
2.45		0.52	60.34	29.79	3611	100.00	8.74	0.84	11847	1.42
		100.00								
						Size Analysis Heads:	8.81	0.89	11747	1.52

Size Interval: 28 x 100 mesh % Amount This Size: 3.43

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	0.00				0.00				0.00
1.25	1.30	0.00				0.00				0.00
1.30	1.35	0.00				0.00				0.00
1.35	1.40	0.71	5.13	0.50	12611	0.71	5.13	0.50	12611	0.79
1.40	1.60	91.97	6.45	0.40	12158	92.68	6.44	0.40	12161	0.66
1.60	1.80	2.53	27.54	0.39	8945	95.21	7.00	0.40	12076	0.66
1.80	2.00	1.20	43.87	0.64	6455	96.41	7.46	0.40	12006	0.67
2.00	2.45	0.54	65.16	0.64	3015	96.95	7.78	0.40	11956	0.68
2.45		3.05	76.17	13.76	825	100.00	9.87	0.81	11616	1.40
		100.00								
						Size Analysis Heads:	9.34	0.90	11545	1.56

Vestern Energy Co. (Rosebud or C

ize % Amou
nterval: -100 mesh This Size:

Sink	Float	DIRECT Wt.%	% Ash
	1.25	0.00	
1.25	1.30	0.00	
1.30	1.35	0.00	
1.35	1.40	0.00	
1.40	1.60	80.38	7.11

COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

Western Energy Co. (Rosebud or Colstrip Mine) **Crushed to -3/8"**

		DIRECT				CUMULATIVE (BY SIZE GROUP)				
Passing	Retained	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	+3/8 in.	1.23	9.60	0.86	11686	1.23	9.60	0.86	11686	1.47
3/8 in.	28 M	89.47	9.26	0.86	11716	90.70	9.26	0.86	11716	1.47
		90.70								
28 M	100 M	6.44	9.29	1.02	11498	6.44	9.29	1.02	11498	1.77
100 M	325 M	1.61	11.42	1.24	11232	1.61	11.42	1.24	11232	2.21
325 M	+0	1.25	18.41	0.81	10202	2.86	14.48	1.05	10782	1.95
		2.86								
	Total	100.00								

COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

Western Energy Co. (Rosebud or Colstrip Mine) **Crushed to -3/8 in.**

1.30 Sink Fraction of As-Received Sample Crushed to -3/8 inch (35.56% of Total)

Size Interval: +28 mesh — % Amount This Size: 80.99

		DIRECT					CUMULATIVE			
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	0.00				0.00	0.00	0.00	0	ERR
1.25	1.30	13.11	6.81	0.52	12401	13.11	6.81	0.52	12401	0.84
1.30	1.35	36.03	10.69	0.44	11741	49.14	9.65	0.46	11917	0.77
1.35	1.40	15.61	12.99	0.40	11175	64.75	10.46	0.45	11738	0.76
1.40	1.60	23.05	22.82	0.47	9669	87.80	13.70	0.45	11195	0.81
1.60	1.80	3.75	42.56	1.18	6716	91.55	14.89	0.48	11011	0.88
1.80	2.00	1.79	50.83	4.68	4928	93.34	15.58	0.56	10895	1.03
2.00	2.45	3.57	55.83	8.05	3507	96.91	17.06	0.84	10623	1.58
2.45		3.08	58.52	26.64	4083	99.99	18.34	1.63	10421	3.14
		99.99								
						1.3-Sink Size Heads:	17.93	1.70	10404	3.27

Size Interval: 28 x 100 mesh — % Amount This Size: 11.45

		DIRECT					CUMULATIVE			
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	0.00				0.00	0.00	0.00	0	0.00
1.25	1.30	0.00				0.00	0.00	0.00	0	0.00
1.30	1.35	0.00				0.00	0.00	0.00	0	0.00
1.35	1.40	26.03	4.17	0.49	12521	26.03	4.17	0.49	12521	0.78
1.40	1.60	59.01	8.45	0.41	11655	85.04	7.14	0.43	11920	0.73
1.60	1.80	5.23	29.49	0.48	8803	90.27	8.43	0.44	11739	0.74
1.80	2.00	1.97	45.53	0.97	6298	92.24	9.23	0.45	11623	0.77
2.00	2.45	2.15	62.49	2.26	3060	94.39	10.44	0.49	11428	0.86
2.45		5.61	77.68	17.57	1284	100.00	14.21	1.45	10859	2.67
		100.00								
						1.3-Sink Size Heads:	14.74	1.50	10752	2.79

Size Interval: -100 mesh — % Amount This Size: 7.56

		DIRECT					CUMULATIVE			
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	0.00				0.00	0.00	0.00	0	0.00
1.25	1.30	0.00				0.00	0.00	0.00	0	0.00
1.30	1.35	0.45	3.99	0.83	13750	0.45	3.99	0.83	13750	1.21
1.35	1.40	37.41	5.42	0.48	12868	37.86	5.40	0.48	12878	0.75
1.40	1.60	38.50	8.35	0.37	11917	76.36	6.89	0.43	12394	0.69
1.60	1.80	7.76	17.03	0.36	10858	84.12	7.82	0.42	12252	0.69
1.80	2.00	2.14	36.40	0.49	7580	86.26	8.53	0.42	12136	0.70
2.00	2.45	2.88	64.15	0.74	3438	89.14	10.33	0.43	11855	0.73
2.45		10.86	81.80	9.41	643	100.00	18.09	1.41	10637	2.65
		100.00								
						1.3-Sink Size Heads:	17.64	1.59	10573	3.01

COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

Western Energy Co. (Rosebud or Colstrip Mine) **Crushed to -3/8 in.**

1.30 Sink Fraction of As-Received Sample Crushed to -3/8 inch (35.56% of Total)

Total: Top Size x 0 % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00
1.25	1.30	10.62	6.81	0.52	12401	10.62	6.81	0.52	12401	0.84
1.30	1.35	29.21	10.68	0.44	11743	39.83	9.65	0.46	11919	0.77
1.35	1.40	18.45	10.40	0.43	11652	58.28	9.89	0.45	11834	0.76
1.40	1.60	28.34	17.91	0.45	10373	86.62	12.51	0.45	11356	0.79
1.60	1.80	4.22	37.16	0.97	7587	90.84	13.66	0.47	11181	0.85
1.80	2.00	1.84	48.91	3.86	5330	92.68	14.36	0.54	11065	0.98
2.00	2.45	3.36	56.86	7.15	3470	96.03	15.84	0.77	10800	1.43
2.45		3.96	66.46	21.59	2915	99.99	17.84	1.60	10488	3.04
		99.99								
						1.3-Sink Size Heads:	17.54	1.67	10559	3.16
						1.3-Sink Head Analysis:	17.64	1.64	10500	3.12

1.30 Float Fraction of As-Received Sample (64.44% of Total)

Size Interval: Top Size x 0 % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	7.20	3.30	0.50	12760	7.20	3.30	0.50	12760	0.78
1.25	1.30	92.80	5.44	0.50	12313	100.00	5.29	0.50	12345	0.81
		100.00								

Calculated Size/Gravity Washability of Crushed to -3/8 inch Sample

Total: Top Size x 0 % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	4.64	3.30	0.50	12760	4.64	3.30	0.50	12760	0.78
1.25	1.30	63.58	5.52	0.50	12318	68.22	5.37	0.50	12348	0.81
1.30	1.35	10.39	10.68	0.44	11743	78.60	6.07	0.49	12268	0.80
1.35	1.40	6.56	10.40	0.43	11652	85.17	6.41	0.49	12221	0.80
1.40	1.60	10.08	17.91	0.45	10373	95.24	7.62	0.48	12025	0.80
1.60	1.80	1.50	37.16	0.97	7587	96.74	8.08	0.49	11957	0.82
1.80	2.00	0.65	48.91	3.86	5330	97.40	8.36	0.51	11912	0.86
2.00	2.45	1.19	56.86	7.15	3470	98.59	8.94	0.59	11810	1.01
2.45		1.41	66.46	21.59	2915	100.00	9.75	0.89	11685	1.52
		100.00								
						Size Analysis Heads:	9.41	0.88	11675	1.51
						Head Sample Analyses:	9.28	0.90	11722	1.54

COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

Western Energy Co. (Rosebud or Colstrip Mine) **Crushed to -100M**

		DIRECT				CUMULATIVE (BY SIZE GROUP)				
Passing	Retained	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	+100 M	3.47	7.12	0.69	12122	3.47	7.12	0.69	12122	1.14
100 M	325 M	71.08	8.37	0.98	11880	71.08	8.37	0.98	11880	1.65
325 M	+0	25.45	14.84	0.95	10887	96.53	10.08	0.97	11618	1.67
		96.53								
	Total	100.00								

COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

Western Energy Co. (Rosebud or Colstrip Mine) **Crushed to -100 Mesh**

1.30 Sink Fraction of As-Received Sample Crushed to -100 Mesh (35.56% of Total)

Size Interval: Top Size x 0 % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	0.00				0.00				0.00
1.25	1.30	0.00				0.00				0.00
1.30	1.35	1.22	3.63	0.88	13610	1.22	3.63	0.88	13610	1.29
1.35	1.40	32.86	6.35	0.48	12688	34.08	6.25	0.49	12721	0.78
1.40	1.60	43.09	11.37	0.40	11328	77.17	9.11	0.44	11943	0.74
1.60	1.80	10.03	21.14	0.43	10211	87.20	10.49	0.44	11744	0.75
1.80	2.00	3.53	35.25	0.50	8014	90.73	11.46	0.44	11599	0.76
2.00	2.45	2.51	68.42	1.04	3006	93.24	12.99	0.46	11368	0.81
2.45		6.76	79.75	16.36	1472	100.00	17.50	1.53	10699	2.87
		100.00								
						1.3-Sink Head Sample:	17.27	1.70	10604	3.21

1.30 Float Fraction of As-Received Sample (64.44% of Total)

Size Interval: Top Size x 0 % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	7.20	3.30	0.50	12760	7.20	3.30	0.50	12760	0.78
1.25	1.30	92.80	5.44	0.50	12313	100.00	5.29	0.50	12345	0.81
		100.00								

Calculated Size/Gravity Washability of Crushed to -100 Mesh Sample

Total: Top Size x 0 % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	4.64	3.30	0.50	12760	4.64	3.30	0.50	12760	0.78
1.25	1.30	59.80	5.44	0.50	12313	64.44	5.29	0.50	12345	0.81
1.30	1.35	0.43	3.63	0.88	13610	64.87	5.27	0.50	12354	0.81
1.35	1.40	11.69	6.35	0.48	12688	76.56	5.44	0.50	12405	0.80
1.40	1.60	15.32	11.37	0.40	11328	91.88	6.43	0.48	12225	0.79
1.60	1.80	3.57	21.14	0.43	10211	95.45	6.98	0.48	12150	0.79
1.80	2.00	1.26	35.25	0.50	8014	96.70	7.34	0.48	12096	0.80
2.00	2.45	0.89	68.42	1.04	3006	97.60	7.90	0.49	12013	0.81
2.45		2.40	79.75	16.36	1472	100.00	9.63	0.87	11760	1.48
		100.00								
						Size Analysis Heads:	9.98	0.96	11636	1.65
						Head Analyses Sample:	9.72	0.89	11627	1.53

AMAX Coal Co.
Belle Ayr Mine

GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE: 5- 6-92
MASTER SAMPLE NO. 134038

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: RUN #91102301 POWDER RIVER BASIN COAL BELLEAYR

PERATING CO.: PROJECT 90D0101 TASK 2.4
AMPLED BY: CQ
INE:
OCATION:

ATE SAMPLED:
EATHER:
ROSS WEIGHT: 95.4 KG

DATE RECEIVED: 11/6/91

THER ID: AS RECEIVED RAW COAL SINK 1.30 CRUSHED TO 3/8" TOPSIZE WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS ON AN SO3-FREE BASIS

CERTIFICATE OF ANALYSIS

			AS RECEIVED	DRY BASIS
MOISTURE	D2961	D3302 D3173	17.53%	XXX
ASH		D3174	14.77%	17.91%
SULFUR		D4239 METHOD 3.3	.71%	.86%
BTU/LB		D2015 D1989	8662	10503
MAF BTU/LB				12795
LBS OF SO2 PER MILLION BTU				1.64
LBS OF SULFUR PER MILLION BTU				.819
PERCENT SOLIDS				82.47%

APPROVED BY Thomas A. Rightmire

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BLACK SEAL ANALYSIS

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GOULD ENERGY DIVISION
P. O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE : 5- 6-92
MASTER SAMPLE NO. 134038

C. Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: RUN #91102301 POWDER RIVER BASIN COAL BELLEAYR

OPERATING CO.: PROJECT 90D0101 TASK 2.4
MINE:
SAMPLED BY: CQ
GROSS WEIGHT: 95.4 KG

DATE SAMPLED:

DATE RECEIVED: 11/6/91

OTHER ID: AS RECEIVED RAW COAL SINK 1.30 CRUSHED TO 3/8" TOPSIZE WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS ON AN SO3-FREE BASIS

CERTIFICATE OF ANALYSIS

FRACTION	WT%	MOISTURE	ASH	SULFUR	BTU	LBS SO2 PER MBTU	MAF BTU
+28M	87.21	17.13	17.66	.64	10509	1.22	14533
28M X 100M	8.39	11.45	17.91	2.59	10211	5.07	12438
100M X 0	4.40	11.06	18.43	1.39	10258	2.71	12575

CUMULATIVE RETAINED - DOWN

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
+28M	87.21	17.66	.64	10509	1.22
+28M X 100M	95.60	17.68	.81	10483	1.54
+28M X 0	100.00	17.71	.83	10473	1.58

CUMULATIVE RETAINED - UP

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
+28M X 0	100.00	17.71	.83	10473	1.58
28M X 0	12.79	18.09	2.18	10227	4.26
100M X 0	4.40	18.43	1.39	10258	2.71

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

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P.O. BOX 214
CRESSON, PA 16630
STANDARD LABORATORIES, INC.

DATE : 5- 6-92
MASTER SAMPLE NO. 134042

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: RUN #91102301 POWDER RIVER BASIN COAL BELLEAYR

PERATING CO.: PROJECT 90D0101 TASK 2.4
INE:
AMPLED BY: CQ
ROSS WEIGHT: 95.4 KG

DATE SAMPLED:

DATE RECEIVED: 11/6/91

THER ID: AS RECEIVED RAW COAL SINK 1.30 CRUSHED TO 3/8" TOPSIZE WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS ON AN SO3-FREE BASIS

FEED FOR SIZE +28M

AVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
.25		.68	5.66	.64	12298	0.00	0.00
.30		15.79	8.19	.57	12044	0.00	0.00
.35		13.57	10.80	.57	11834	0.00	0.00
.40		18.17	11.59	.53	11567	0.00	0.00
.60		43.75	19.93	.60	10156	0.00	0.00
.80		4.54	42.28	.54	6945	0.00	0.00
.00		2.16	56.18	.68	5060	0.00	0.00
.45		1.04	67.85	2.13	3363	0.00	0.00
.45	SINK	.30	70.56	15.99	2687	0.00	0.00

CUMULATIVE RESULTS FOR SIZE +28M

CUMULATIVE DOWN

AVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
.25		.68	5.66	.64	12298	0.00	0.00
.30		16.47	8.08	.58	12055	0.00	0.00
.35		30.04	9.31	.57	11955	0.00	0.00
.40		48.21	10.17	.56	11809	0.00	0.00
.60		91.96	14.81	.58	11023	0.00	0.00
.80		96.50	16.11	.58	10831	0.00	0.00
.00		98.66	16.98	.58	10704	0.00	0.00
.45		99.70	17.51	.59	10628	0.00	0.00
.45	SINK	100.00	17.67	.64	10604	0.00	0.00

CUMULATIVE UP

AVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
.25		100.00	17.67	.64	10604	0.00	0.00
.30		99.32	17.76	.64	10592	0.00	0.00
.35		83.53	19.56	.65	10318	0.00	0.00
.40		69.96	21.27	.67	10024	0.00	0.00
.60		51.79	24.66	.72	9483	0.00	0.00
.80		8.04	50.38	1.36	5816	0.00	0.00
.00		3.50	60.88	2.43	4352	0.00	0.00
.45		1.34	68.46	5.23	3211	0.00	0.00
.45	SINK	.30	70.56	15.99	2687	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

Thomas A. Rightmire
RCM

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GOULD ENERGY DIVISION
P. O. BOX 214
CRESSON, PA 16630
STANDARD LABORATORIES, INC.

DATE : 5- 6-92
MASTER SAMPLE NO. 134042

C. Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: RUN #91102301 POWDER RIVER BASIN COAL BELLEAYR

OPERATING CO.: PROJECT 90D0101 TASK 2.4
MINE:
SAMPLED BY: CQ
GROSS WEIGHT: 95.4 KG

DATE SAMPLED:

DATE RECEIVED: 11/6/91

OTHER ID: AS RECEIVED RAW COAL SINK 1.30 CRUSHED TO 3/8" TOPSIZE WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS ON AN SO3-FREE BASIS

FEED FOR SIZE 28M X 100M

GRAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		0.00	0.00	0.00	0	0.00	0.00
1.30		0.00	0.00	0.00	0	0.00	0.00
1.35		0.00	0.00	0.00	0	0.00	0.00
1.40		1.15	4.30	.60	13175	0.00	0.00
1.60		65.57	7.81	.48	11803	0.00	0.00
1.80		17.15	23.04	.78	9806	0.00	0.00
2.00		5.85	43.73	1.89	6974	0.00	0.00
2.45		4.65	55.03	8.75	4861	0.00	0.00
2.45	SINK	5.63	60.82	26.05	3648	0.00	0.00

CUMULATIVE RESULTS FOR SIZE 28M X 100M

CUMULATIVE DOWN

GRAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		0.00	0.00	0.00	0	0.00	0.00
1.30		0.00	0.00	0.00	0	0.00	0.00
1.35		0.00	0.00	0.00	0	0.00	0.00
1.40		1.15	4.30	.60	13175	0.00	0.00
1.60		66.72	7.75	.48	11827	0.00	0.00
1.80		83.87	10.88	.54	11413	0.00	0.00
2.00		89.72	13.02	.63	11124	0.00	0.00
2.45		94.37	15.09	1.03	10815	0.00	0.00
2.45	SINK	100.00	17.66	2.44	10412	0.00	0.00

CUMULATIVE UP

GRAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		100.00	17.66	2.44	10412	0.00	0.00
1.30		100.00	17.66	2.44	10412	0.00	0.00
1.35		100.00	17.66	2.44	10412	0.00	0.00
1.40		100.00	17.66	2.44	10412	0.00	0.00
1.60		98.85	17.82	2.46	10380	0.00	0.00
1.80		33.28	37.54	6.37	7575	0.00	0.00
2.00		16.13	52.95	12.30	5204	0.00	0.00
2.45		10.28	58.20	18.23	4196	0.00	0.00
2.45	SINK	5.63	60.82	26.05	3648	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

Thomas A. Right
SGAD

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GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630
STANDARD LABORATORIES, INC.

DATE : 5- 6-92
MASTER SAMPLE NO. 134042

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: RUN #91102301 POWDER RIVER BASIN COAL BELLEAYR

PERATING CO.: PROJECT 90D0101 TASK 2.4
INE:
AMPLED BY: CQ
ROSS WEIGHT: 95.4 KG

DATE SAMPLED:

DATE RECEIVED: 11/6/91

THER ID: AS RECEIVED RAW COAL SINK 1.30 CRUSHED TO 3/8" TOPSIZE WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS ON AN SO3-FREE BASIS

FEED FOR SIZE 100M X 0

AVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
.25		0.00	0.00	0.00	0	0.00	0.00
.30		0.00	0.00	0.00	0	0.00	0.00
.35		0.00	0.00	0.00	0	0.00	0.00
.40		0.00	0.00	0.00	0	0.00	0.00
.60		64.88	5.39	.37	11913	0.00	0.00
.80		16.12	16.60	.47	10736	0.00	0.00
.00		6.82	40.57	.66	7333	0.00	0.00
.45		5.35	67.18	1.69	3381	0.00	0.00
.45	SINK	6.82	80.14	13.39	1671	0.00	0.00

CUMULATIVE RESULTS FOR SIZE 100M X 0

CUMULATIVE DOWN

AVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
.25		0.00	0.00	0.00	0	0.00	0.00
.30		0.00	0.00	0.00	0	0.00	0.00
.35		0.00	0.00	0.00	0	0.00	0.00
.40		0.00	0.00	0.00	0	0.00	0.00
.60		64.88	5.39	.37	11913	0.00	0.00
.80		81.01	7.62	.39	11679	0.00	0.00
.00		87.82	10.18	.41	11342	0.00	0.00
.45		93.18	13.46	.49	10884	0.00	0.00
.45	SINK	100.00	18.01	1.37	10255	0.00	0.00

CUMULATIVE UP

AVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
.25		100.00	18.01	1.37	10255	0.00	0.00
.30		100.00	18.01	1.37	10255	0.00	0.00
.35		100.00	18.01	1.37	10255	0.00	0.00
.40		100.00	18.01	1.37	10255	0.00	0.00
.60		100.00	18.01	1.37	10255	0.00	0.00
.80		35.12	41.31	3.20	7193	0.00	0.00
.00		18.99	62.29	5.52	4185	0.00	0.00
.45		12.18	74.44	8.25	2423	0.00	0.00
.45	SINK	6.82	80.14	13.39	1671	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

Thomas A. Rightmire
RCKly

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GOULD ENERGY DIVISI
P.O. BOX 214
CRESSON, PA 16630
STANDARD LABORATORIES, IN

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

OPERATING CO.: PROJECT 90D0101 TASK 2.4
MINE:
SAMPLED BY: CQ
GROSS WEIGHT: 95.4 KG
OTHER ID: AS RECEIVED RAW COAL SINK 1.30 CRUSHED TO 3/8" TOPSIZE WEIGHT PERCEN
TS REPORTED ON A DRY BASIS ASH PERCENTS ON AN SO3-FREE BASIS

SAMPLE ID: RUN #91102301 POWDER RIVER BASIN COAL BELLEAYR
DATE SAMPLED:
DATE RECEIVED: 11/6/91

MASTER SAMPLE NO. 134
DATE: 5-6-9

FEED FOR COMPOSITE +28M X 0

RAVITY	% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25	.59	5.66	.64	12298	0.00	0.00
1.30	13.77	8.19	.57	12044	0.00	0.00
1.35	11.83	10.80	.57	11834	0.00	0.00
1.40	15.94	11.55	.53	11577	0.00	0.00
1.60	46.51	17.61	.57	10459	0.00	0.00
1.80	6.11	34.77	.59	8059	0.00	0.00
2.00	2.67	52.15	.90	5666	0.00	0.00
2.45	1.53	64.49	3.75	3747	0.00	0.00
2.45 SINK	1.03	68.89	19.83	2831	0.00	0.00

CUMULATIVE RESULTS FOR COMPOSITE +28M X 0
CUMULATIVE DOWN

RAVITY	% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25	.59	5.66	.64	12298	0.00	0.00
1.30	14.36	8.08	.58	12055	0.00	0.00
1.35	26.20	9.31	.57	11955	0.00	0.00
1.40	42.14	10.15	.56	11812	0.00	0.00
1.60	88.65	14.06	.56	11102	0.00	0.00
1.80	94.76	15.40	.57	10906	0.00	0.00
2.00	97.43	16.41	.57	10762	0.00	0.00
2.45	98.97	17.15	.62	10653	0.00	0.00
2.45 SINK	100.00	17.69	.82	10573	0.00	0.00

CUMULATIVE UP

AVITY	% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
.25	100.00	17.69	.82	10573	0.00	0.00
30	99.41	17.76	.82	10562	0.00	0.00
35	85.64	19.30	.86	10324	0.00	0.00
40	73.80	20.66	.91	10082	0.00	0.00
60	57.86	23.17	1.02	9670	0.00	0.00
80	11.35	45.99	2.85	6436	0.00	0.00
00	5.24	59.06	5.47	4545	0.00	0.00
5	2.57	66.26	10.23	3378	0.00	0.00
5 SINK	1.03	68.89	19.83	2831	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

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Thomas A. Raft

GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630
STANDARD LABORATORIES, INC.

DATE: 5- 6-92
MASTER SAMPLE NO. 134034

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: RUN #91102301 POWDER RIVER BASIN COAL BELLEAYR

.PERATING CO.: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CQ
MINE:
OCATION:

DATE SAMPLED:
WEATHER:
ROSS WEIGHT: 142.6 KG

DATE RECEIVED: 11/6/91

OTHER ID: AS RECEIVED RAW COAL CRUSHED TO 1COM TOPSIZE WEIGHT PERCENTS R EPORTED ON A DRY BASIS ASH PERCENTS ON AN SO3-FREE BASIS

CERTIFICATE OF ANALYSIS

		AS RECEIVED	DRY BASIS
MOISTURE	D2961 D3302 D3173	28.78%	XXX
ASH	D3174	4.21%	5.91%
SULFUR	D4239 METHOD 3.3	.41%	.58%
BTU/LB	D2015 D1989	8549	12005
MAF BTU/LB			12759
LBS OF SO2 PER MILLION BTU			.97
LBS OF SULFUR PER MILLION BTU			.483
PERCENT SOLIDS			71.22%

APPROVED BY Thomas A. Right

APPROVED BY

PAGE 1 OF 1
2036

BLACK SEAL ANALYSIS

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GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630
STANDARD LABORATORIES, INC.

DATE : 5- 6-92
MASTER SAMPLE NO. 134034

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: RUN #91102301 POWDER RIVER BASIN COAL BELLEAYR

OPERATING CO.: PROJECT 90D0101 TASK 2.4
MINE:
SAMPLED BY: CQ
GROSS WEIGHT: 142.6 KG

DATE SAMPLED:
DATE RECEIVED: 11/6/91

OTHER ID: AS RECEIVED RAW COAL CRUSHED TO 100M TOPSIZE WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS ON AN SO3-FREE BASIS

CERTIFICATE OF ANALYSIS

FRACTION	WT%	MOISTURE	ASH	SULFUR	BTU	LBS SO2 PER MBTU	MAF BTU
+100M	4.89	7.74	6.53	.61	11910	1.02	13811
100M X 325M	63.42	10.20	5.21	.57	11993	.95	12651
325M X 0	31.69	7.23	7.54	.58	11846	.98	12812

CUMULATIVE RETAINED - DOWN

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
+100M	4.89	6.53	.61	11910	1.02
+100M X 325M	68.31	5.30	.57	11987	.95
+100M X 0	100.00	6.01	.57	11943	.95

CUMULATIVE RETAINED - UP

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
+100M X 0	100.00	6.01	.57	11943	.95
100M X 0	95.11	5.98	.57	11944	.95
325M X 0	31.69	7.54	.58	11846	.98

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

PAGE 1

APPROVED BY Thomas A. Pugh
APPROVED BY R.A. Pugh

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GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE: 5- 6-92
MASTER SAMPLE NO. 134070

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: RUN #91102301 POWDER RIVER BASIN COAL BELLEAYR

OPERATING CO.: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CQ
MINE:
LOCATION:

DATE SAMPLED:
DATE RECEIVED: 11/6/91
WEATHER:
GROSS WEIGHT: 31.8 KG

OTHER ID: AS RECEIVED RAW COAL SINK 1.30 CRUSHED 100M TOPSIZE WEIGHT PER CENTS REPORTED ON A DRY BASIS ASH PERCENTS ON AN SO3-FREE BASIS

CERTIFICATE OF ANALYSIS

SCREEN TEST		CUMULATIVE DOWN	CUMULATIVE UP
+100M	4.46 %	4.46 %	100.00 %
100M X 0	95.54 %	100.00 %	95.54 %
	100.00 %		

BLACK SEAL ANALYSIS

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Thomas A. Rightmire
REKG

STANDARD LABORATORIES, INC.

DATE: 5- 6-92
SAMPLE NO. 134070

CERTIFICATE OF ANALYSIS (CONT.)

		AS RECEIVED	DRY BASIS
MOISTURE	D2961 D3302 D3173	17.15%	XXX
ASH	D3174	14.98%	18.08%
SULFUR	D4239 METHOD 3.3	.74%	.89%
BTU/LB	D2015 D1989	8591	10370
MAF BTU/LB			12658
LBS OF SO2 PER MILLION BTU			1.71
LBS OF SULFUR PER MILLION BTU			.858
PERCENT SOLIDS			82.85%

APPROVED BY Thomas A Right

APPROVED BY [illegible]

BLACK SEAL ANALYSIS

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GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE : 5- 6-92
MASTER SAMPLE NO. 134071

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: RUN #91102301 POWDER RIVER BASIN COAL BELLEAYR

OPERATING CO.: PROJECT 90D0101 TASK 2.4
MINE:
SAMPLED BY: CQ
GROSS WEIGHT: 31.8 KG

DATE SAMPLED:

DATE RECEIVED: 11/6/91

OTHER ID: AS RECEIVED RAW COAL SINK 1.30 CRUSHED TO 100M TOPSIZE WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS ON AN SO3-FREE BASIS

	% WT.	% MOIST.	% ASH	%SULFUR	BTU	% VOL.	% FIX. CAR.
RAW	100.00	8.82	16.08	.89	9533	0.00	0.00
			17.64	.97	10455	0.00	0.00
					12693 (MAF)		

GRAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		0.00	0.00	0.00	0	0.00	0.00
1.30		0.00	0.00	0.00	0	0.00	0.00
1.35		0.00	0.00	0.00	0	0.00	0.00
1.40		0.00	0.00	0.00	0	0.00	0.00
1.60		62.10	7.14	.46	11833	0.00	0.00
1.80		23.98	19.60	.51	10295	0.00	0.00
2.00		4.68	33.25	.62	8461	0.00	0.00
2.45		4.04	64.05	1.70	4092	0.00	0.00
2.45	SINK	5.20	83.76	9.07	1475	0.00	0.00

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Thomas A. Right

GOULD ENERGY DIVISION
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CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE : 5- 6-92
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C. Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: RUN #91102301 POWDER RIVER BASIN COAL BELLEAYR

OPERATING CO.: PROJECT 90D0101 TASK 2.4
MINE:
SAMPLED BY: CQ
GROSS WEIGHT: 31.8 KG

DATE SAMPLED:

DATE RECEIVED: 11/6/91

OTHER ID: AS RECEIVED RAW COAL SINK 1.30 CRUSHED TO 100M TOPSIZE WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS ON AN SO3-FREE BASIS

CUMULATIVE RESULTS FOR RAW

CUMULATIVE DOWN

RAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		0.00	0.00	0.00	0	0.00	0.00
1.30		0.00	0.00	0.00	0	0.00	0.00
1.35		0.00	0.00	0.00	0	0.00	0.00
1.40		0.00	0.00	0.00	0	0.00	0.00
1.60		62.10	7.14	.46	11833	0.00	0.00
1.80		86.08	10.61	.47	11405	0.00	0.00
2.00		90.76	11.78	.48	11253	0.00	0.00
2.45		94.80	14.01	.53	10948	0.00	0.00
2.45	SINK	100.00	17.64	.97	10455	0.00	0.00

CUMULATIVE UP

RAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		100.00	17.64	.97	10455	0.00	0.00
1.30		100.00	17.64	.97	10455	0.00	0.00
1.35		100.00	17.64	.97	10455	0.00	0.00
1.40		100.00	17.64	.97	10455	0.00	0.00
1.60		100.00	17.64	.97	10455	0.00	0.00
1.80		37.90	34.83	1.83	8197	0.00	0.00
2.00		13.92	61.06	4.09	4583	0.00	0.00
2.45		9.24	75.14	5.85	2619	0.00	0.00
2.45	SINK	5.20	83.76	9.07	1475	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

Thomas A. Right
RCK

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COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

AMAX Coal Co. (Belle Ayr Mine) **As-Received**

		DIRECT				CUMULATIVE (BY SIZE-GROUP)				
Passing	Retained	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
+	1-1/2 in.	6.44	5.29	0.46	12145	6.44	5.29	0.46	12145	0.76
1-1/2 in.	3/4 in.	31.47	5.41	0.43	12140	37.91	5.39	0.44	12141	0.72
		37.91								
3/4 in.	3/8 in.	24.37	5.39	0.42	12129	24.37	5.39	0.42	12129	0.69
3/8 in.	28 M	36.73	5.49	0.45	12135	61.10	5.45	0.44	12133	0.72
		61.10								
28 M	100 M	0.72	6.10	0.75	11936	0.72	6.10	0.75	11936	1.26
100 M	325 M	0.15	6.86	0.88	11842	0.15	6.86	0.88	11842	1.49
325 M	+0	0.11	9.68	0.58	11437	0.26	8.05	0.75	11671	1.29
		0.26								
	Total	99.99								

COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

AMAX Coal Co. (Belle Ayr Mine) **As-Received**

Size Interval: + 3/4-in % Amount This Size: 37.92

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	30.78	3.62	0.39	12451	30.78	3.62	0.39	12451	0.63
1.25	1.30	62.75	5.04	0.47	12289	93.53	4.57	0.44	12342	0.72
1.30	1.35	4.06	12.85	0.66	11298	97.59	4.92	0.45	12299	0.74
1.35	1.40	0.97	23.14	0.64	9898	98.56	5.10	0.45	12275	0.74
1.40	1.60	1.15	32.52	0.56	8398	99.71	5.41	0.46	12231	0.75
1.60	1.80	0.16	48.19	0.37	6201	99.87	5.48	0.46	12221	0.75
1.80	2.00	0.05	53.66	6.60	5130	99.92	5.51	0.46	12217	0.75
2.00	2.45	0.01	60.58	10.67	4409	99.93	5.51	0.46	12217	0.75
2.45		0.07	86.01	0.33	1002	100.00	5.57	0.46	12209	0.75
		100.00								
						Size Analysis Heads:	5.39	0.44	12141	0.72

Size Interval: 3/4-in x 28 mesh % Amount This Size: 61.10

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	30.73	3.72	0.40	12258	30.73	3.72	0.40	12258	0.65
1.25	1.30	60.12	4.46	0.44	12219	90.85	4.21	0.43	12232	0.70
1.30	1.35	4.42	10.84	0.61	11448	95.27	4.52	0.43	12196	0.71
1.35	1.40	1.59	12.62	0.55	11334	96.86	4.65	0.44	12182	0.72
1.40	1.60	2.35	21.09	0.61	10047	99.21	5.04	0.44	12131	0.73
1.60	1.80	0.53	42.48	0.69	7132	99.74	5.24	0.44	12105	0.73
1.80	2.00	0.13	52.70	0.95	5706	99.87	5.30	0.44	12096	0.73
2.00	2.45	0.09	65.13	3.23	3678	99.96	5.35	0.45	12089	0.74
2.45		0.04	65.72	11.12	3676	100.00	5.38	0.45	12085	0.74
		100.00								
						Size Analysis Heads:	5.45	0.44	12133	0.73

Size Interval: 28 x 100 mesh % Amount This Size: 0.72

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	1.74	3.55	0.45	12960	1.74	3.55	0.45	12960	0.69
1.25	1.30	91.76	5.12	0.41	12173	93.50	5.09	0.41	12188	0.67
1.30	1.35	0.00				93.50	5.09	0.41	12188	0.67
1.35	1.40	0.00				93.50	5.09	0.41	12188	0.67
1.40	1.60	0.00				93.50	5.09	0.41	12188	0.67
1.60	1.80	4.29	17.66	0.77	10183	97.79	5.64	0.43	12100	0.70
1.80	2.00	0.78	42.70	2.63	6758	98.57	5.94	0.44	12057	0.74
2.00	2.45	0.70	54.08	10.46	4810	99.27	6.27	0.51	12006	0.86
2.45		0.73	63.48	25.17	3410	100.00	6.69	0.69	11944	1.16
		100.00								
						Size Analysis Heads:	6.10	0.75	11936	1.26

AMAX Coal Co. (Belle Ayr Mine) **As-Received**

Size Interval: -100 mesh % Amount This Size: 0.26

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	1.60	4.00	0.56	12715	1.60	4.00	0.56	12715	0.88
1.25	1.30	84.69	5.53	0.40	12356	86.29	5.50	0.40	12363	0.65
1.30	1.35	0.00				86.29	5.50	0.40	12363	0.00
1.35	1.40	0.00				86.29	5.50	0.40	12363	0.00
1.40	1.60	0.00				86.29	5.50	0.40	12363	0.00
1.60	1.80	9.40	9.73	0.46	11628	95.69	5.92	0.41	12290	0.66
1.80	2.00	1.41	23.56	0.77	9686	97.10	6.17	0.41	12253	0.68
2.00	2.45	0.94	53.51	2.21	5246	98.04	6.63	0.43	12185	0.71
2.45		1.96	78.34	12.72	1937	100.00	8.03	0.67	11985	1.12
		100.00								
						Size Analysis Heads:	8.05	0.75	11671	1.29

Total: Top Size x 0 % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	30.46	3.68	0.40	12332	30.46	3.68	0.40	12332	0.64
1.25	1.30	61.41	4.70	0.45	12246	91.87	4.36	0.43	12275	0.71
1.30	1.35	4.24	11.57	0.63	11394	96.11	4.68	0.44	12236	0.72
1.35	1.40	1.34	15.51	0.57	10940	97.45	4.83	0.44	12218	0.73
1.40	1.60	1.87	23.75	0.60	9663	99.32	5.18	0.45	12170	0.73
1.60	1.80	0.44	39.70	0.64	7468	99.76	5.34	0.45	12149	0.74
1.80	2.00	0.11	51.36	2.03	5795	99.87	5.38	0.45	12142	0.74
2.00	2.45	0.07	63.60	4.17	3864	99.94	5.42	0.45	12137	0.74
2.45		0.06	75.36	7.79	2352	100.00	5.47	0.46	12131	0.75
						Size Analysis Heads:	5.44	0.44	12133	0.73
						Head Sample Analyses:	5.66	0.47	12045	0.78

COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

AMAX Coal Co. (Belle Ayr Mine) **Crushed to -3/8"**

		DIRECT				CUMULATIVE (BY SIZE GROUP)				
Passing	Retained	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	+3/8 in.	0.64	5.81	0.52	12054	0.64	5.81	0.52	12054	0.86
3/8 in.	28 M	89.26	5.93	0.48	12120	89.90	5.93	0.48	12120	0.79
		89.90								
28 M	100 M	6.52	5.75	0.65	11756	6.52	5.75	0.65	11756	1.11
100 M	325 M	1.84	5.98	0.68	11703	1.84	5.98	0.68	11703	1.16
325 M	+0	1.74	9.02	0.54	11412	3.58	7.46	0.61	11562	1.06
		3.58								
	Total	100.00								

COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

AMAX Coal Co. (Belle Ayr Mine) **Crushed to -3/8 in.**

1.30 Sink Fraction of As-Received Sample Crushed to -3/8 inch (8.13% of Total)

Size Interval: +28 mesh % Amount This Size: 87.21

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	0.68	5.66	0.64	12298	0.68	5.66	0.64	12298	1.04
1.25	1.30	15.79	8.19	0.57	12044	16.47	8.09	0.57	12054	0.95
1.30	1.35	13.57	10.80	0.57	11834	30.04	9.31	0.57	11955	0.96
1.35	1.40	18.17	11.59	0.53	11567	48.21	10.17	0.56	11809	0.94
1.40	1.60	43.75	19.93	0.60	10156	91.96	14.81	0.58	11022	1.05
1.60	1.80	4.54	42.28	0.54	6945	96.50	16.11	0.58	10831	1.06
1.80	2.00	2.16	56.18	0.68	5060	98.66	16.98	0.58	10704	1.08
2.00	2.45	1.04	67.85	2.13	3363	99.70	17.51	0.59	10628	1.12
2.45		0.30	70.56	15.99	2687	100.00	17.67	0.64	10604	1.21
		100.00								
						1.3-Sink Size Heads:	17.66	0.64	10509	1.22

Size Interval: 28 x 100 mesh % Amount This Size: 8.39

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	0.00				0.00	0.00	0.00	0	0.00
1.25	1.30	0.00				0.00	0.00	0.00	0	0.00
1.30	1.35	0.00				0.00	0.00	0.00	0	0.00
1.35	1.40	1.15	4.30	0.60	13175	1.15	4.30	0.60	13175	0.91
1.40	1.60	65.57	7.81	0.48	11803	66.72	7.75	0.48	11827	0.82
1.60	1.80	17.15	23.04	0.78	9806	83.87	10.88	0.54	11413	0.95
1.80	2.00	5.85	43.73	1.89	6974	89.72	13.02	0.63	11124	1.13
2.00	2.45	4.65	55.03	8.75	4861	94.37	15.09	1.03	10815	1.91
2.45		5.63	60.82	26.05	3648	100.00	17.66	2.44	10412	4.69
		100.00								
						1.3-Sink Size Heads:	17.91	2.59	10211	5.07

Size Interval: -100 mesh % Amount This Size: 4.40

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	0.00				0.00	0.00	0.00	0	0.00
1.25	1.30	0.00				0.00	0.00	0.00	0	0.00
1.30	1.35	0.00				0.00	0.00	0.00	0	0.00
1.35	1.40	0.00				0.00	0.00	0.00	0	0.00
1.40	1.60	64.88	5.39	0.37	11913	64.88	5.39	0.37	11913	0.62
1.60	1.80	16.12	16.60	0.47	10736	81.00	7.62	0.39	11679	0.67
1.80	2.00	6.82	40.57	0.66	7333	87.82	10.18	0.41	11341	0.72
2.00	2.45	5.35	67.18	1.69	3381	93.17	13.45	0.48	10884	0.89
2.45		6.82	80.14	13.39	1671	99.99	18.00	1.36	10256	2.66
		99.99								
						1.3-Sink Size Heads:	18.43	1.39	10258	2.71

COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

AMAX Coal Co. (Belle Ayr Mine) **Crushed to -3/8 in.**

1.30 Sink Fraction of As-Received Sample Crushed to -3/8 inch (8.13% of Total)

Total: Top Size x 0 % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	0.59	5.66	0.64	12298	0.59	5.66	0.64	12298	1.04
1.25	1.30	13.77	8.19	0.57	12044	14.36	8.09	0.57	12054	0.95
1.30	1.35	11.83	10.80	0.57	11834	26.20	9.31	0.57	11955	0.96
1.35	1.40	15.94	11.55	0.53	11577	42.14	10.16	0.56	11812	0.94
1.40	1.60	46.51	17.60	0.57	10459	88.65	14.06	0.56	11102	1.02
1.60	1.80	6.11	34.76	0.59	8059	94.76	15.40	0.57	10906	1.04
1.80	2.00	2.67	52.14	0.90	5666	97.43	16.41	0.57	10762	1.07
2.00	2.45	1.53	64.48	3.75	3747	98.97	17.15	0.62	10653	1.17
2.45		1.03	68.89	19.83	2831	100.00	17.69	0.82	10572	1.56
		100.00								
						1.3-Sink Size Heads:	17.71	0.83	10473	1.59
						1.3-Sink Head Analysis:	17.91	0.86	10503	1.64

1.30 Float Fraction of As-Received Sample (91.87% of Total)

Size Interval: Top Size x 0 % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	33.16	3.68	0.40	12332	33.16	3.68	0.40	12332	0.65
1.25	1.30	66.84	4.70	0.45	12246	100.00	4.36	0.43	12275	0.71
		100.00								

Calculated Size/Gravity Washability of Crushed to -3/8 inch Sample

Total: Top Size x 0 % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	30.51	3.68	0.40	12332	30.51	3.68	0.40	12332	0.65
1.25	1.30	62.53	4.76	0.45	12242	93.04	4.41	0.44	12272	0.71
1.30	1.35	0.96	10.80	0.57	11834	94.00	4.47	0.44	12267	0.71
1.35	1.40	1.30	11.55	0.53	11577	95.30	4.57	0.44	12258	0.71
1.40	1.60	3.78	17.60	0.57	10459	99.08	5.07	0.44	12189	0.73
1.60	1.80	0.50	34.76	0.59	8059	99.57	5.22	0.44	12169	0.73
1.80	2.00	0.22	52.14	0.90	5666	99.79	5.32	0.44	12154	0.73
2.00	2.45	0.12	64.48	3.75	3747	99.92	5.39	0.45	12144	0.74
2.45		0.08	68.89	19.83	2831	100.00	5.45	0.47	12136	0.77
		100.00								
						Size Analysis Heads:	5.97	0.49	12075	0.81
						Head Sample Analyses:	5.76	0.46	12087	0.76

COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

AMAX Coal Co. (Belle Ayr Mine) **Crushed to -100M**

		DIRECT				CUMULATIVE (BY SIZE GROUP)				
Passing	Retained	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	+100 M	4.89	6.53	0.61	11910	4.89	6.53	0.61	11910	1.02
100 M	325 M	63.42	5.21	0.57	11993	63.42	5.21	0.57	11993	0.95
325 M	+0	31.69	7.54	0.58	11846	95.11	5.99	0.57	11944	0.96
		95.11								
	Total	100.00								

COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

AMAX Coal Co. (Belle Ayr Mine) **Crushed to -100 Mesh**

1.30 Sink Fraction of As-Received Sample Crushed to -100 Mesh (8.13% of Total)

Size Interval: Top Size x 0 — % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	0.00				0.00				0.00
1.25	1.30	0.00				0.00				0.00
1.30	1.35	0.00				0.00				0.00
1.35	1.40	0.00				0.00				0.00
1.40	1.60	62.10	7.14	0.46	11833	62.10	7.14	0.46	11833	0.78
1.60	1.80	23.98	19.60	0.51	10295	86.08	10.61	0.47	11405	0.83
1.80	2.00	4.68	33.25	0.62	8461	90.76	11.78	0.48	11253	0.86
2.00	2.45	4.04	64.05	1.70	4092	94.80	14.01	0.53	10948	0.97
2.45		5.20	83.76	9.07	1475	100.00	17.63	0.98	10455	1.87
		100.00								
						1.3-Sink Head Sample:	18.08	0.89	10370	1.72

1.30 Float Fraction of As-Received Sample (91.87% of Total)

Size Interval: Top Size x 0 — % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	33.16	3.68	0.40	12332	33.16	3.68	0.40	12332	0.65
1.25	1.30	66.84	4.70	0.45	12246	100.00	4.36	0.43	12275	0.71
		100.00								

Calculated Size/Gravity Washability of Crushed to -100 Mesh Sample

Total: Top Size x 0 — % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	30.46	3.68	0.40	12332	30.46	3.68	0.40	12332	0.65
1.25	1.30	61.41	4.70	0.45	12246	91.87	4.36	0.43	12275	0.71
1.30	1.35	0.00				91.87	4.36	0.43	12275	0.71
1.35	1.40	0.00				91.87	4.36	0.43	12275	0.71
1.40	1.60	5.05	7.14	0.46	11833	96.92	4.51	0.43	12252	0.71
1.60	1.80	1.95	19.60	0.51	10295	98.87	4.80	0.44	12213	0.71
1.80	2.00	0.38	33.25	0.62	8461	99.25	4.91	0.44	12199	0.72
2.00	2.45	0.33	64.05	1.70	4092	99.58	5.11	0.44	12172	0.72
2.45		0.42	83.76	9.07	1475	100.00	5.44	0.48	12127	0.79
		100.00								
						Size Analysis Heads:	6.01	0.57	11943	0.95
						Head Analyses Sample:	5.91	0.58	12005	0.97

Powder River Coal Co.
Rochelle Mine

STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/03/92
SAMPLE NO: 131002

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED

SAMPLE I.D.: RUN 91092301 POWDER RIVER BASIN COAL ROCHELLE

DATE SAMPLED:
DATE RECEIVED: 10/16/91
GROSS WEIGHT: 1736.1 KG

OTHER I.D.: AS RECEIVED RAW COAL WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS REPORTES ON AN SO3-FREE BASIS

CERTIFICATE OF ANALYSIS

		AS RECEIVED	DRY BASIS
MOISTURE	D2961 D3302 D3173	27.15 %	XXX
VOLATILE MATTER	D3175	33.23 %	45.62 %
FIXED CARBON	D3172	35.12 %	48.20 %
ASH	D3174	4.50 %	6.18 %
SULFUR	D4239 METHOD 3.3	.22 %	.30 %
CARBON	D3178	51.11 %	70.15 %
HYDROGEN	D3178	3.46 %	4.75 %
NITROGEN	D3179	.66 %	.91 %
OXYGEN	D3176	12.90 %	17.72 %
BTU/LB	D2015 D1989	8801	12080
MAF BTU/LB			12875
LBS OF SO2 PER MILLION BTU			.50
LBS OF SULFUR PER MILLION BTU			.248
HARDGROVE GRINDABILITY INDEX	D409	53	
FORMS OF SULFUR	D2492		
PYRITIC SULFUR		.01 %	.01 %
SULFATE SULFUR		.00 %	.00 %
ORGANIC SULFUR		.20 %	.28 %
CHLORINE	D4208	.05 %	.07 %
EQUILIBRIUM MOISTURE	D1412	25.73 %	

BLACK SEAL ANALYSIS

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Thomas A. Light

STANDARD LABORATORIES, INC.

DATE: 06/03/92
SAMPLE NO: 131002

CERTIFICATE OF ANALYSIS (CONT.)

	AS RECEIVED	DRY BASIS
ASH FUSION TEMPERATURE (S)		
D1857 - ELECTRIC METHOD	REDUCING ATMOSPHERE	
INITIAL DEFORMATION TEMPERATURE	2125	
SOFTENING TEMPERATURE	2130	
HEMISPHERICAL TEMPERATURE	2145	
FLUID TEMPERATURE	2165	
D1857	OXIDIZING ATMOSPHERE	
INITIAL DEFORMATION TEMPERATURE	2160	
SOFTENING TEMPERATURE	2175	
HEMISPHERICAL TEMPERATURE	2200	
FLUID TEMPERATURE	2240	
ASH MINERAL COMPOSITION		
D2795 D3682		
SILICON DIOXIDE	33.96	
ALUMINIUM OXIDE	17.31	
FERRIC OXIDE	5.21	
TITANIUM DIOXIDE	1.29	
PHOSPHORUS PENTOXIDE	3.30	
CALCIUM OXIDE	23.07	
MAGNESIUM OXIDE	5.60	
SODIUM OXIDE	1.24	
POTASSIUM OXIDE	.46	
SULFUR TRIOXIDE	10.22	
PERCENT SOLIDS		72.85 %

LITHIUM OXIDE 204.5 ppm

MANGANESE DIOXIDE 162.2 ppm

APPROVED BY Thomas A. Right

APPROVED BY R A Kelly

BLACK SEAL ANALYSIS

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE - 7-29-92
MASTER SAMPLE NO. 131002

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: RUN #91092301 POWDER RIVER BASIN COAL ROCHELLE

'ERATING CO.: PROJECT 90D0101 TASK 2.4
'NE:
DATE SAMPLED:
MPLED BY: CUSTOMER PROVIDED
'OSS WEIGHT: 1736.1 KG
DATE RECEIVED: 10/16/91

'HER ID: AS RECEIVED RAW COAL WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PER CENTS REPORTED ON AN SO3 FREE BASIS

RRECTED REPORT SUPERCEDES ALL PRIOR REPORTS WITH THE SAME LABORATORY NUMBER

CERTIFICATE OF ANALYSIS

'RACTION	WT%	MOISTURE	ASH	SULFUR	BTU	LBS SO2 PER MBTU	MAF BTU
1/2"SQ	23.15	27.57	5.50	.30	12110	.49	12815
1/2"SQ X 3/4"SQ	27.98	27.19	6.21	.30	12005	.50	15764
'4"SQ X 3/8"SQ	21.48	27.26	6.06	.29	12171	.48	12955
'8"SQ X 28M	26.44	27.24	6.37	.30	12114	.49	12938
'M X 100M	.69	16.25	6.68	.37	11878	.62	15196
'OM X 325M	.17	9.39	8.00	.45	11752	.77	12774
'5M X 0	.09	7.16	12.96	.43	11007	.78	13620

CUMULATIVE RETAINED - DOWN

'RACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
1/2"SQ	23.15	5.50	.30	12110	.49
1/2"SQ X 3/4"SQ	51.13	5.89	.30	12053	.50
1/2"SQ X 3/8"SQ	72.61	5.94	.30	12088	.50
1/2"SQ X 28M	99.06	6.05	.30	12095	.50
1/2"SQ X 100M	99.75	6.06	.30	12093	.50
1/2"SQ X 325M	99.91	6.06	.30	12093	.50
1/2"SQ X 0	100.00	6.07	.30	12092	.50

CUMULATIVE RETAINED - UP

'RACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
1/2 X 0	100.00	6.07	.30	12092	.50
1/2"SQ X 0	76.85	6.24	.30	12086	.50
'4"SQ X 0	48.87	6.25	.30	12133	.49
'8"SQ X 0	27.39	6.41	.30	12102	.50
'M X 0	.94	7.50	.39	11775	.66
'OM X 0	.25	9.72	.44	11494	.76
'5M X 0	.09	12.96	.43	11007	.78

IALYTICAL RESULTS ARE STATED ON A DRY BASIS

GE 1

APPROVED BY Thomas A. Right
APPROVED BY

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STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/03/92
SAMPLE NO: 131010

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
SAMPLE I.D.: RUN 91092301 POWDER RIVER BASIN COAL ROCHELLE
DATE SAMPLED: DATE RECEIVED: 10/16/91
GROSS WEIGHT: 1736.1 KG

OTHER I.D.: AS RECEIVED RAW COAL WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS REPORTED ON AN SO3-FREE BASIS

FEED FOR SIZE +3/4" SQ

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	28.64	4.23	.27	12186	0.00	0.00
1.30	59.63	5.23	.33	12135	0.00	0.00
1.35	9.73	10.06	.34	11504	0.00	0.00
1.40	.75	17.42	.40	10789	0.00	0.00
1.60	.80	28.78	.31	9081	0.00	0.00
1.80	.30	46.64	.26	6525	0.00	0.00
2.00	.08	56.21	.29	5130	0.00	0.00
2.45	.05	72.94	.51	2785	0.00	0.00
2.45 SINK	.02	65.32	10.15	3568	0.00	0.00

CUMULATIVE RESULTS FOR SIZE +3/4" SQ

CUMULATIVE DOWN

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	28.64	4.23	.27	12186	0.00	0.00
1.30	88.27	4.91	.31	12152	0.00	0.00
1.35	98.00	5.42	.32	12087	0.00	0.00
1.40	98.75	5.51	.32	12078	0.00	0.00
1.60	99.55	5.70	.32	12053	0.00	0.00
1.80	99.85	5.82	.32	12037	0.00	0.00
2.00	99.93	5.86	.32	12031	0.00	0.00
2.45	99.98	5.89	.32	12027	0.00	0.00
2.45 SINK	100.00	5.91	.32	12025	0.00	0.00

CUMULATIVE UP

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	100.00	5.91	.32	12025	0.00	0.00
1.30	71.36	6.58	.34	11961	0.00	0.00
1.35	11.73	13.42	.36	11071	0.00	0.00
1.40	2.00	29.77	.44	8968	0.00	0.00
1.60	1.25	37.17	.46	7875	0.00	0.00
1.80	.45	52.10	.73	5730	0.00	0.00
2.00	.15	63.00	1.68	4140	0.00	0.00
2.45	.07	70.76	3.26	3008	0.00	0.00
2.45 SINK	.02	65.32	10.15	3568	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

Thomas A. Light

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STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/03/92
SAMPLE NO: 131010

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
SAMPLE I.D.: RUN 91092301 POWDER RIVER BASIN COAL ROCHELLE
DATE SAMPLED: DATE RECEIVED: 10/16/91
GROSS WEIGHT: 1736.1 KG

OTHER I.D.: AS RECEIVED RAW COAL WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS REPORTED ON AN SO3-FREE BASIS

FEED FOR SIZE +3/4" SQ X 28M

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	25.45	4.54	.25	12396	0.00	0.00
1.30	58.93	5.14	.29	12297	0.00	0.00
1.35	11.03	9.38	.34	11796	0.00	0.00
1.40	2.06	11.27	.25	11569	0.00	0.00
1.60	1.84	20.74	.24	10121	0.00	0.00
1.80	.29	41.59	.24	7125	0.00	0.00
2.00	.17	53.22	.29	5332	0.00	0.00
2.45	.18	78.26	.42	1819	0.00	0.00
2.45 SINK	.05	77.59	5.41	2145	0.00	0.00

CUMULATIVE RESULTS FOR SIZE +3/4" SQ X 28M

CUMULATIVE DOWN

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	25.45	4.54	.25	12396	0.00	0.00
1.30	84.38	4.96	.28	12327	0.00	0.00
1.35	95.41	5.47	.29	12265	0.00	0.00
1.40	97.47	5.59	.29	12250	0.00	0.00
1.60	99.31	5.87	.29	12211	0.00	0.00
1.80	99.60	5.98	.29	12196	0.00	0.00
2.00	99.77	6.06	.29	12184	0.00	0.00
2.45	99.95	6.19	.29	12166	0.00	0.00
2.45 SINK	100.00	6.22	.29	12161	0.00	0.00

CUMULATIVE UP

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	100.00	6.22	.29	12161	0.00	0.00
1.30	74.55	6.80	.30	12081	0.00	0.00
1.35	15.62	13.06	.33	11266	0.00	0.00
1.40	4.59	21.89	.31	9992	0.00	0.00
1.60	2.53	30.53	.36	8708	0.00	0.00
1.80	.69	56.63	.67	4938	0.00	0.00
2.00	.40	67.53	.99	3353	0.00	0.00
2.45	.23	78.11	1.51	1890	0.00	0.00
2.45 SINK	.05	77.59	5.41	2145	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

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Thomas A. Richter

STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/03/92
SAMPLE NO: 131010

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
SAMPLE I.D.: RUN 91092301 POWDER RIVER BASIN COAL ROCHELLE
DATE SAMPLED:
DATE RECEIVED: 10/16/91
GROSS WEIGHT: 1736.1 KG

OTHER I.D.: AS RECEIVED RAW COAL WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS REPORTED ON AN SO3-FREE BASIS

FEED FOR SIZE 28M X 100M

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	0.00	0.00	0.00	0	0.00	0.00
1.30	0.00	0.00	0.00	0	0.00	0.00
1.35	0.00	0.00	0.00	0	0.00	0.00
1.40	2.48	4.82	.32	12671	0.00	0.00
1.60	94.02	5.43	.26	11975	0.00	0.00
1.80	2.19	11.68	.29	11766	0.00	0.00
2.00	.51	42.29	.77	7081	0.00	0.00
2.45	.41	65.19	3.46	3505	0.00	0.00
2.45 SINK	.39	78.04	16.52	1838	0.00	0.00

CUMULATIVE RESULTS FOR SIZE 28M X 100M

CUMULATIVE DOWN

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	0.00	0.00	0.00	0	0.00	0.00
1.30	0.00	0.00	0.00	0	0.00	0.00
1.35	0.00	0.00	0.00	0	0.00	0.00
1.40	2.48	4.82	.32	12671	0.00	0.00
1.60	96.50	5.42	.26	11993	0.00	0.00
1.80	98.69	5.55	.26	11988	0.00	0.00
2.00	99.20	5.74	.27	11963	0.00	0.00
2.45	99.61	5.99	.28	11928	0.00	0.00
2.45 SINK	100.00	6.27	.34	11888	0.00	0.00

CUMULATIVE UP

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	100.00	6.27	.34	11888	0.00	0.00
1.30	100.00	6.27	.34	11888	0.00	0.00
1.35	100.00	6.27	.34	11888	0.00	0.00
1.40	100.00	6.27	.34	11888	0.00	0.00
1.60	97.52	6.31	.34	11869	0.00	0.00
1.80	3.50	29.80	2.54	9010	0.00	0.00
2.00	1.31	60.10	6.30	4401	0.00	0.00
2.45	.80	71.46	9.83	2692	0.00	0.00
2.45 SINK	.39	78.04	16.52	1838	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Thomas A. Right

GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE : 7-29-92
MASTER SAMPLE NO. 131010

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: RUN #91092301 POWDER RIVER BASIN COAL ROCHELLE

'ERATING CO.: PROJECT 90D0101 TASK 2.4
'NE:
DATE SAMPLED:
MPLED BY: CUSTOMER PROVIDED
OSS WEIGHT: 1736.1 KG
DATE RECEIVED: 10/16/91

'HER ID: AS RECEIVED RAW COAL WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PER CENTS REPORTED ON AN SO3 FREE BASIS

RRECTED REPORT SUPERCEDES ALL PRIOR REPORTS WITH THE SAME LABORATORY NUMBER

FEED FOR SIZE 100M X 0

VITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
25		0.00	0.00	0.00	0	0.00	0.00
30		0.00	0.00	0.00	0	0.00	0.00
35		0.00	0.00	0.00	0	0.00	0.00
40		0.00	0.00	0.00	0	0.00	0.00
60		83.69	4.56	.28	12346	0.00	0.00
80		10.62	12.17	.31	11180	0.00	0.00
00		.99	53.10	.47	5521	0.00	0.00
45		1.03	65.94	.79	3148	0.00	0.00
45	SINK	3.69	87.05	6.59	662	0.00	0.00

CUMULATIVE RESULTS FOR SIZE 100M X 0

CUMULATIVE DOWN

VITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
25		0.00	0.00	0.00	0	0.00	0.00
30		0.00	0.00	0.00	0	0.00	0.00
35		0.00	0.00	0.00	0	0.00	0.00
40		0.00	0.00	0.00	0	0.00	0.00
60		83.69	4.56	.28	12346	0.00	0.00
80		94.30	5.42	.29	12215	0.00	0.00
00		95.29	5.91	.29	12145	0.00	0.00
45		96.31	6.55	.29	12050	0.00	0.00
45	SINK	100.00	9.52	.53	11630	0.00	0.00

CUMULATIVE UP

VITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
25		100.00	9.52	.53	11630	0.00	0.00
30		100.00	9.52	.53	11630	0.00	0.00
35		100.00	9.52	.53	11630	0.00	0.00
40		100.00	9.52	.53	11630	0.00	0.00
60		100.00	9.52	.53	11630	0.00	0.00
80		16.31	34.94	1.77	7957	0.00	0.00
00		5.70	77.38	4.49	1950	0.00	0.00
45		4.71	82.46	5.33	1203	0.00	0.00
45	SINK	3.69	87.05	6.59	662	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Thomas A. Right
RDEKly

STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/03/92
SAMPLE NO: 131010

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
SAMPLE I.D.: RUN 91092301 POWDER RIVER BASIN COAL ROCHELLE
DATE SAMPLED: DATE RECEIVED: 10/16/91
GROSS WEIGHT: 1736.1 KG

OTHER I.D.: AS RECEIVED RAW COAL WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS REPORTED ON AN SO3-FREE BASIS

FEED FOR COMPOSITE +3/4"SQ X 0

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	26.84	4.37	.26	12281	0.00	0.00
1.30	58.73	5.19	.31	12213	0.00	0.00
1.35	10.26	9.71	.34	11654	0.00	0.00
1.40	1.39	12.89	.29	11367	0.00	0.00
1.60	2.15	16.07	.26	10700	0.00	0.00
1.80	.33	40.22	.26	7382	0.00	0.00
2.00	.13	53.87	.30	5319	0.00	0.00
2.45	.12	76.51	.52	2099	0.00	0.00
2.45 SINK	.05	76.79	7.37	2146	0.00	0.00

CUMULATIVE RESULTS FOR COMPOSITE +3/4"SQ X 0

CUMULATIVE DOWN

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	26.84	4.37	.26	12281	0.00	0.00
1.30	85.58	4.93	.30	12234	0.00	0.00
1.35	95.84	5.44	.30	12172	0.00	0.00
1.40	97.23	5.55	.30	12161	0.00	0.00
1.60	99.37	5.78	.30	12129	0.00	0.00
1.80	99.71	5.89	.30	12113	0.00	0.00
2.00	99.84	5.95	.30	12104	0.00	0.00
2.45	99.95	6.04	.30	12093	0.00	0.00
2.45 SINK	100.00	6.07	.30	12088	0.00	0.00

CUMULATIVE UP

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	100.00	6.07	.30	12088	0.00	0.00
1.30	73.16	6.69	.32	12017	0.00	0.00
1.35	14.42	12.82	.35	11221	0.00	0.00
1.40	4.16	20.49	.36	10153	0.00	0.00
1.60	2.77	24.29	.39	9546	0.00	0.00
1.80	.63	52.51	.84	5583	0.00	0.00
2.00	.29	66.59	1.51	3524	0.00	0.00
2.45	.16	76.59	2.46	2113	0.00	0.00
2.45 SINK	.05	76.79	7.37	2146	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Thomas A. Rightt
QCV

STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/03/92
SAMPLE NO: 131047

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
SAMPLE I.D.: RUN 91092301 POWDER RIVER BASIN COAL ROCHELLE --
DATE SAMPLED:
DATE RECEIVED: 10/16/91
GROSS WEIGHT: 145.5 KG

OTHER I.D.: AS RECEIVED RAW COAL CRUSHED TO 3/8" TOP SIZE WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS REPORTED ON AN SO3-FREE BASIS

CERTIFICATE OF ANALYSIS

		AS RECEIVED	DRY BASIS	
MOISTURE	D2961 D3302 D3173	27.21%	XXX	
ASH	D3174	4.44%	6.09%	
SULFUR	D4239 METHOD 3.3	.20%	.28%	
BTU/LB	D2015 D1989	8817	12113	
MAF BTU/LB				12899
LBS OF SO2 PER MILLION BTU			.46	
PERCENT SOLIDS			72.79%	

APPROVED BY Thomas A. Rightl
APPROVED BY

PAGE 1 OF 1
1816

BLACK SEAL ANALYSIS

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STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/03/92
SAMPLE NO: 131047

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
SAMPLE I.D.: RUN 91092301 POWDER RIVER BASIN COAL ROCHELLE
DATE SAMPLED:
DATE RECEIVED: 10/16/91
GROSS WEIGHT: 145.5 KG

OTHER I.D.: AS RECEIVED RAW COAL CRUSHED TO 3/8" TOP SIZE
WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH
PERCENTS REPORTED ON AN SO3-FREE BASIS

CERTIFICATE OF ANALYSIS

FRACTION	WT%	MOISTURE	ASH	SULFUR	BTU	LBS SO2 PER MBTU	MAF BTU
+3/8" SQ	.90	26.35	11.58	.27	11107	.49	14130
3/8" SQ X 28M	89.04	27.17	6.22	.28	12003	.47	15475
28M X 100M	7.14	15.25	5.54	.33	12640	.52	15790
100M X 325M	1.21	6.83	6.63	.36	11852	.61	13623
325 X 0	1.72	8.67	11.36	.43	11117	.77	13731

CUMULATIVE RETAINED - DOWN

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
+3/8" SQ	.90	11.58	.27	11107	.49
+3/8" SQ X 28M	89.94	6.27	.28	11994	.47
+3/8" SQ X 100M	97.07	6.22	.28	12042	.46
+3/8" SQ X 325M	98.28	6.23	.28	12039	.46
+3/8" SQ X 0	100.00	6.31	.29	12023	.48

CUMULATIVE RETAINED - UP

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
+3/8" SQ X 0	100.00	6.31	.29	12023	.48
3/8" SQ X 0	99.10	6.27	.29	12032	.48
28M X 0	10.06	6.67	.35	12285	.57
100M X 0	2.93	9.41	.40	11420	.70
325 X 0	1.72	11.36	.43	11117	.77

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY Thomas A. Right

APPROVED BY R.C. Kelly

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STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/03/92
SAMPLE NO: 131057

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
SAMPLE I.D.: RUN 91092301 POWDER RIVER BASIN COAL ROCHELLE
DATE SAMPLED:
DATE RECEIVED: 10/16/91
GROSS WEIGHT: 161.4 KG

OTHER I.D.: AS RECEIVED RAW COAL SINK 1.30 CRUSHED TO 3/8" TOP SIZE WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS REPORTED ON AN SO3-FREE BASIS

CERTIFICATE OF ANALYSIS

		AS RECEIVED	DRY BASIS	
MOISTURE	D2961 D3302 D3173	19.43 %	XXX	
ASH	D3174	10.25 %	12.73 %	
SULFUR	D4239 METHOD 3.3	.27 %	.33 %	
BTU/LB	D2015 D1989	8881	11023	
MAF BTU/LB				12630
LBS OF SO2 PER MILLION BTU			.60	
PERCENT SOLIDS			80.57%	

APPROVED BY Thomas A. Rufh
APPROVED BY

PAGE 1 OF 1
995

BLACK SEAL ANALYSIS

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STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/03/92
SAMPLE NO: 131057

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
SAMPLE I.D.: RUN 91092301 POWDER RIVER BASIN COAL ROCHELLE
DATE SAMPLED:
DATE RECEIVED: 10/16/91
GROSS WEIGHT: 161.4 KG

OTHER I.D.: AS RECEIVED RAW COAL SINK 1.30 CRUSHED TO 3/8" TOP SIZE WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS REPORTED ON AN SO3-FREE BASIS

CERTIFICATE OF ANALYSIS

FRACTION	WT%	MOISTURE	ASH	SULFUR	BTU	LBS SO2 PER MBTU	MAF BTU
+28M	89.69	19.51	12.94	.31	11023	.56	12661
28M X 100M	8.33	9.06	11.54	.40	11125	.72	12576
100M X 0	1.98	6.40	20.75	.45	9915	.91	12510

CUMULATIVE RETAINED - DOWN

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
+28M	89.69	12.94	.31	11023	.56
+28M X 100M	98.02	12.82	.32	11031	.58
+28M X 0	100.00	12.98	.32	11009	.58

CUMULATIVE RETAINED - UP

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
+28M X 0	100.00	12.98	.32	11009	.58
28M X 0	10.31	13.31	.41	10892	.75
100M X 0	1.98	20.75	.45	9915	.91

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

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APPROVED BY R E Kelly

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STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/03/92
SAMPLE NO: 131061

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
SAMPLE I.D.: RUN 91092301 POWDER RIVER BASIN COAL ROCHELLE
DATE SAMPLED:
DATE RECEIVED: 10/16/91
GROSS WEIGHT: 161.4 KG

OTHER I.D.: AS RECEIVED RAW COAL SINK 1.30 CRUSHED TO 3/8" TOP SIZE WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS REPORTED ON AN S03 FREE BASIS

FEED FOR SIZE +28M

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	4.77	5.76	.34	11919	0.00	0.00
1.30	15.00	6.33	.35	11849	0.00	0.00
1.35	5.37	9.49	.37	11671	0.00	0.00
1.40	18.23	8.95	.31	11709	0.00	0.00
1.60	52.71	12.89	.25	10925	0.00	0.00
1.80	1.40	41.11	.22	7088	0.00	0.00
2.00	1.13	54.22	.24	5248	0.00	0.00
2.45	1.18	79.39	.29	1801	0.00	0.00
2.45 SINK	.21	89.02	2.08	627	0.00	0.00

CUMULATIVE RESULTS FOR SIZE +28M
CUMULATIVE DOWN

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	4.77	5.76	.34	11919	0.00	0.00
1.30	19.77	6.19	.34	11866	0.00	0.00
1.35	25.14	6.90	.35	11824	0.00	0.00
1.40	43.37	7.76	.33	11776	0.00	0.00
1.60	96.08	10.58	.29	11309	0.00	0.00
1.80	97.48	11.01	.29	11248	0.00	0.00
2.00	98.61	11.51	.29	11180	0.00	0.00
2.45	99.79	12.31	.29	11069	0.00	0.00
2.45 SINK	100.00	12.47	.29	11047	0.00	0.00

CUMULATIVE UP

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	100.00	12.47	.29	11047	0.00	0.00
1.30	95.23	12.81	.29	11003	0.00	0.00
1.35	80.23	14.02	.28	10845	0.00	0.00
1.40	74.86	14.35	.27	10786	0.00	0.00
1.60	56.63	16.08	.26	10489	0.00	0.00
1.80	3.92	58.98	.35	4620	0.00	0.00
2.00	2.52	68.90	.42	3249	0.00	0.00
2.45	1.39	80.84	.56	1624	0.00	0.00
2.45 SINK	.21	89.02	2.08	627	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

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Thomas A. Right

STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/03/92
SAMPLE NO: 131061

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
SAMPLE I.D.: RUN 91092301 POWDER RIVER BASIN COAL ROCHELLE
DATE SAMPLED:
DATE RECEIVED: 10/16/91
GROSS WEIGHT: 161.4 KG

OTHER I.D.: AS RECEIVED RAW COAL SINK 1.30 CRUSHED TO 3/8" TOP SIZE WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS REPORTED ON AN S03 FREE BASIS

FEED FOR SIZE 28M X 100M

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	0.00	0.00	0.00	0	0.00	0.00
1.30	0.00	0.00	0.00	0	0.00	0.00
1.35	0.00	0.00	0.00	0	0.00	0.00
1.40	2.22	5.38	.45	12631	0.00	0.00
1.60	87.29	8.22	.26	11626	0.00	0.00
1.80	6.34	28.57	.30	8794	0.00	0.00
2.00	1.94	47.43	.56	6099	0.00	0.00
2.45	1.44	66.02	1.84	3262	0.00	0.00
2.45 SINK	.77	79.91	12.18	1468	0.00	0.00

CUMULATIVE RESULTS FOR SIZE 28M X 100M

CUMULATIVE DOWN

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	0.00	0.00	0.00	0	0.00	0.00
1.30	0.00	0.00	0.00	0	0.00	0.00
1.35	0.00	0.00	0.00	0	0.00	0.00
1.40	2.22	5.38	.45	12631	0.00	0.00
1.60	89.51	8.15	.27	11651	0.00	0.00
1.80	95.85	9.50	.27	11462	0.00	0.00
2.00	97.79	10.25	.28	11356	0.00	0.00
2.45	99.23	11.06	.30	11238	0.00	0.00
2.45 SINK	100.00	11.59	.39	11163	0.00	0.00

CUMULATIVE UP

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	100.00	11.59	.39	11163	0.00	0.00
1.30	100.00	11.59	.39	11163	0.00	0.00
1.35	100.00	11.59	.39	11163	0.00	0.00
1.40	100.00	11.59	.39	11163	0.00	0.00
1.60	97.78	11.73	.39	11130	0.00	0.00
1.80	10.49	40.97	1.43	6999	0.00	0.00
2.00	4.15	59.90	3.16	4256	0.00	0.00
2.45	2.21	70.86	5.44	2637	0.00	0.00
2.45 SINK	.77	79.91	12.18	1468	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

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STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/03/92
SAMPLE NO: 131061

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
SAMPLE I.D.: RUN 91092301 POWDER RIVER BASIN COAL ROCHELLE
DATE SAMPLED: DATE RECEIVED: 10/16/91
GROSS WEIGHT: 161.4 KG

OTHER I.D.: AS RECEIVED RAW COAL SINK 1.30 CRUSHED TO 3/8" TOP SIZE WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS REPORTED ON AN S03 FREE BASIS

FEED FOR SIZE 100M X 0

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	0.00	0.00	0.00	0	0.00	0.00
1.30	0.00	0.00	0.00	0	0.00	0.00
1.35	0.00	0.00	0.00	0	0.00	0.00
1.40	1.53	6.36	.44	13033	0.00	0.00
1.60	57.68	7.55	.25	11739	0.00	0.00
1.80	22.05	20.74	.26	9792	0.00	0.00
2.00	9.43	41.39	.33	6942	0.00	0.00
2.45	3.98	64.71	.48	3577	0.00	0.00
2.45 SINK	5.33	85.72	3.61	601	0.00	0.00

CUMULATIVE RESULTS FOR SIZE 100M X 0

CUMULATIVE DOWN

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	0.00	0.00	0.00	0	0.00	0.00
1.30	0.00	0.00	0.00	0	0.00	0.00
1.35	0.00	0.00	0.00	0	0.00	0.00
1.40	1.53	6.36	.44	13033	0.00	0.00
1.60	59.21	7.52	.26	11772	0.00	0.00
1.80	81.26	11.11	.26	11235	0.00	0.00
2.00	90.69	14.26	.27	10789	0.00	0.00
2.45	94.67	16.38	.27	10485	0.00	0.00
2.45 SINK	100.00	20.07	.45	9959	0.00	0.00

CUMULATIVE UP

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	100.00	20.07	.45	9959	0.00	0.00
1.30	100.00	20.07	.45	9959	0.00	0.00
1.35	100.00	20.07	.45	9959	0.00	0.00
1.40	100.00	20.07	.45	9959	0.00	0.00
1.60	98.47	20.29	.45	9911	0.00	0.00
1.80	40.79	38.30	.73	7326	0.00	0.00
2.00	18.74	58.95	1.29	4424	0.00	0.00
2.45	9.31	76.74	2.27	1873	0.00	0.00
2.45 SINK	5.33	85.72	3.61	601	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

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Thomas A. Reight

STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/03/92
SAMPLE NO: 131061

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
SAMPLE I.D.: RUN 91092301 POWDER RIVER BASIN COAL ROCHELLE
DATE SAMPLED: DATE RECEIVED: 10/16/91
GROSS WEIGHT: 161.4 KG

OTHER I.D.: AS RECEIVED RAW COAL SINK 1.30 CRUSHED TO 3/8" TOP SIZE WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS REPORTED ON AN S03 FREE BASIS

FEED FOR SIZE +28M X 0

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	4.28	5.76	.34	11919	0.00	0.00
1.30	13.45	6.33	.35	11849	0.00	0.00
1.35	4.82	9.49	.37	11671	0.00	0.00
1.40	16.57	8.90	.31	11722	0.00	0.00
1.60	55.69	12.17	.25	11033	0.00	0.00
1.80	2.22	34.12	.24	8026	0.00	0.00
2.00	1.36	51.65	.29	5582	0.00	0.00
2.45	1.26	77.19	.45	2052	0.00	0.00
2.45 SINK	.36	86.42	4.34	770	0.00	0.00

CUMULATIVE RESULTS FOR SIZE +28M X 0

CUMULATIVE DOWN

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	4.28	5.76	.34	11919	0.00	0.00
1.30	17.73	6.19	.34	11866	0.00	0.00
1.35	22.55	6.90	.35	11824	0.00	0.00
1.40	39.11	7.75	.33	11781	0.00	0.00
1.60	94.80	10.35	.29	11342	0.00	0.00
1.80	97.02	10.89	.29	11266	0.00	0.00
2.00	98.38	11.46	.29	11187	0.00	0.00
2.45	99.64	12.28	.29	11072	0.00	0.00
2.45 SINK	100.00	12.55	.30	11035	0.00	0.00

CUMULATIVE UP

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	100.00	12.55	.30	11035	0.00	0.00
1.30	95.72	12.85	.30	10995	0.00	0.00
1.35	82.27	13.92	.29	10856	0.00	0.00
1.40	77.45	14.20	.29	10805	0.00	0.00
1.60	60.89	15.64	.28	10556	0.00	0.00
1.80	5.20	52.74	.59	5440	0.00	0.00
2.00	2.98	66.62	.85	3512	0.00	0.00
2.45	1.62	79.24	1.31	1768	0.00	0.00
2.45 SINK	.36	86.42	4.34	770	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

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Thomas A. Pyatt

STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/03/92
SAMPLE NO: 152583

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
SAMPLE I.D.: RUN 91092301 POWDER RIVER BASIN COAL ROCHELLE
DATE SAMPLED:
DATE RECEIVED: 10/16/91
GROSS WEIGHT: 148.1 KG

OTHER I.D.: AS RECEIVED RAW COAL CRUSHED TO 100M TOP SIZE WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS REPORTED ON AN S03-FREE BASIS

CERTIFICATE OF ANALYSIS

		AS RECEIVED	DRY BASIS	
MOISTURE	D2961 D3302 D3173	27.38%	XXX	
ASH	D3174	4.49%	6.18%	
SULFUR	D4239 METHOD 3.3	.20%	.28%	
BTU/LB	D2015 D1989	8677	11949	
MAF BTU/LB				12736
LBS OF S02 PER MILLION BTU			.47	
LBS OF SULFUR PER MILLION BTU			.234	
PERCENT SOLIDS			72.62%	

APPROVED BY Thomas A. Right
APPROVED BY R.C. Kelly

BLACK SEAL ANALYSIS

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STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/03/92
SAMPLE NO: 152583

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
SAMPLE I.D.: RUN 91092301 POWDER RIVER BASIN COAL ROCHELLE
DATE SAMPLED:
DATE RECEIVED: 10/16/91
GROSS WEIGHT: 148.1 KG

OTHER I.D.: AS RECEIVED RAW COAL CRUSHED TO 100M TOP SIZE WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS REPORTED ON AN SO3-FREE BASIS

CERTIFICATE OF ANALYSIS

FRACTION	WT%	MOISTURE	ASH	SULFUR	BTU	LBS SO2 PER MBTU	MAF BTU
+100M	4.78	19.74	4.87	.31	12114	.51	15866
100M X 325M	55.34	7.65	4.80	.30	12003	.50	13652
325M X 0	39.88	9.57	7.79	.31	11877	.52	14242

CUMULATIVE RETAINED - DOWN

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
+100M	4.78	4.87	.31	12114	.51
+100M X 325M	60.12	4.80	.30	12012	.50
+100M X 0	100.00	5.99	.31	11958	.52

CUMULATIVE RETAINED - UP

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
+100M X 0	100.00	5.99	.31	11958	.52
100M X 0	95.22	6.05	.31	11950	.52
325M X 0	39.88	7.79	.31	11877	.52

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY Thomas A. Right

APPROVED BY R E Kelly

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STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/03/92
SAMPLE NO: 131089

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED

SAMPLE I.D.: RUN 91092301 POWDER RIVER BASIN COAL ROCHELLE

DATE SAMPLED:
DATE RECEIVED: 10/16/91
GROSS WEIGHT: 117.6 KG
OTHER I.D.: AS RECEIVED RAW COAL SINK 1.30 CRUSHED TO 100M TOP SIZE WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS REPORTED ON AN S03-FREE BASIS

CERTIFICATE OF ANALYSIS

SCREEN TEST		CUMULATIVE DOWN	CUMULATIVE UP
+100M	3.68%	3.68%	100.00%
100M X 0	96.32%	100.00%	96.32%
	100.00%		

BLACK SEAL ANALYSIS

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Thomas A. Rafter

STANDARD LABORATORIES, INC.

DATE: 06/03/92
SAMPLE NO: 131089

CERTIFICATE OF ANALYSIS (CONT.)

				AS RECEIVED	DRY BASIS	
MOISTURE	D2961	D3302	D3173	19.59%	XXX	
ASH		D3174		10.22%	12.71%	
SULFUR		D4239	METHOD 3.3	.30%	.37%	
BTU/LB		D2015	D1989	8911	11082	
MAF BTU/LB						12696
LBS OF SO2 PER MILLION BTU					.67	
PERCENT SOLIDS					80.41%	

APPROVED BY Thomas A. Right

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C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/03/92
SAMPLE NO: 131090

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
SAMPLE I.D.: RUN 91092301 POWDER RIVER BASIN COAL ROCHELLE
DATE SAMPLED:
DATE RECEIVED: 10/16/91
GROSS WEIGHT: 117.6 KG

OTHER I.D.: AS RECEIVED RAW COAL SINK 1.30 CRUSHED TO 100M TOP SIZE WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS REPORTED ON AN SO3-FREE BASIS

	%WT	%MOIST	%ASH	%SULFUR	BTU	%VOL.	%FIX. CAR
RAW	100.00	7.60	11.59	.38	10365	0.00	0.00
			12.55	.41	11217	0.00	0.00
					12827 (MAF)		

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	0.00	0.00	0.00	0	0.00	0.00
1.30	0.00	0.00	0.00	0	0.00	0.00
1.35	0.00	0.00	0.00	0	0.00	0.00
1.40	47.60	6.23	.37	12296	0.00	0.00
1.60	38.82	8.70	.24	11522	0.00	0.00
1.80	6.89	20.58	.28	10036	0.00	0.00
2.00	1.61	39.59	.36	7384	0.00	0.00
2.45	2.00	71.14	.49	3012	0.00	0.00
2.45 SINK	3.09	88.46	3.45	699	0.00	0.00

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Thomas A. Right
RECKly

STANDARD LABORATORIES, INC.

C.Q. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/03/92
SAMPLE NO: 131090

OPERATING CO: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
SAMPLE I.D.: RUN 91092301 POWDER RIVER BASIN COAL ROCHELLE
DATE SAMPLED:
DATE RECEIVED: 10/16/91
GROSS WEIGHT: 117.6 KG

OTHER I.D.: AS RECEIVED RAW COAL SINK 1.30 CRUSHED TO 100M TOP SIZE WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS REPORTED ON AN S03-FREE BASIS

CUMULATIVE RESULTS FOR RAW
CUMULATIVE DOWN

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	0.00	0.00	0.00	0	0.00	0.00
1.30	0.00	0.00	0.00	0	0.00	0.00
1.35	0.00	0.00	0.00	0	0.00	0.00
1.40	47.60	6.23	.37	12296	0.00	0.00
1.60	86.42	7.34	.31	11948	0.00	0.00
1.80	93.31	8.32	.31	11807	0.00	0.00
2.00	94.92	8.85	.31	11732	0.00	0.00
2.45	96.91	10.13	.32	11553	0.00	0.00
2.45 SINK	100.00	12.55	.41	11217	0.00	0.00

CUMULATIVE UP

GRAVITY	%WT	%ASH	%S	BTU	VOLATILE	FIXED CARBON
1.25	100.00	12.55	.41	11217	0.00	0.00
1.30	100.00	12.55	.41	11217	0.00	0.00
1.35	100.00	12.55	.41	11217	0.00	0.00
1.40	100.00	12.55	.41	12217	0.00	0.00
1.60	52.40	18.29	.45	10238	0.00	0.00
1.80	13.58	45.69	1.04	6567	0.00	0.00
2.00	6.69	71.54	1.83	2995	0.00	0.00
2.45	5.08	81.66	2.29	1607	0.00	0.00
2.45 SINK	3.09	88.46	3.45	699	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY Thomas A. Wright

APPROVED BY

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COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

Powder River Coal Co. (Rochelle Mine) **As-Received**

		DIRECT				CUMULATIVE (BY SIZE-GROUP)				
Passing	Retained	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
+	1-1/2 in.	23.15	5.50	0.30	12110	23.15	5.50	0.30	12110	0.50
1-1/2 in.	3/4 in.	27.98	6.21	0.30	12005	51.13	5.89	0.30	12053	0.50
		51.13								
3/4 in.	3/8 in.	21.48	6.06	0.29	12171	21.48	6.06	0.29	12171	0.48
3/8 in.	28 M	26.44	6.37	0.30	12114	47.92	6.23	0.30	12140	0.49
		47.92								
28 M	100 M	0.69	6.68	0.37	11878	0.69	6.68	0.37	11878	0.62
100 M	325 M	0.17	8.00	0.45	11752	0.17	8.00	0.45	11752	0.77
325 M	+0	0.09	12.96	0.43	11007	0.26	9.72	0.44	11494	0.77
		0.26								
	Total	100.00								

COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

Powder River Coal Co. (Rochelle Mine) **As-Received**

Size Interval: + 3/4-in % Amount This Size: 51.13

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	28.64	4.23	0.27	12186	28.64	4.23	0.27	12186	0.44
1.25	1.30	59.63	5.23	0.33	12135	88.27	4.91	0.31	12152	0.51
1.30	1.35	9.73	10.06	0.34	11504	98.00	5.42	0.31	12087	0.52
1.35	1.40	0.75	17.42	0.40	10789	98.75	5.51	0.31	12077	0.52
1.40	1.60	0.80	28.78	0.31	9081	99.55	5.70	0.31	12053	0.52
1.60	1.80	0.30	46.64	0.26	6525	99.85	5.82	0.31	12037	0.52
1.80	2.00	0.08	56.21	0.29	5130	99.93	5.86	0.31	12031	0.52
2.00	2.45	0.05	72.94	0.51	2785	99.98	5.89	0.31	12027	0.52
2.45		0.02	65.32	10.15	3568	100.00	5.90	0.32	12025	0.53
		100.00								
						Size Analysis Heads:	5.89	0.30	12053	0.50

Size Interval: 3/4-in x 28 mesh % Amount This Size: 47.92

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	25.45	4.54	0.25	12396	25.45	4.54	0.25	12396	0.40
1.25	1.30	58.93	5.14	0.29	12297	84.38	4.96	0.28	12327	0.45
1.30	1.35	11.03	9.38	0.34	11796	95.41	5.47	0.29	12265	0.46
1.35	1.40	2.06	11.27	0.25	11569	97.47	5.59	0.28	12251	0.46
1.40	1.60	1.84	20.74	0.24	10121	99.31	5.87	0.28	12211	0.46
1.60	1.80	0.29	41.59	0.24	7125	99.60	5.98	0.28	12196	0.46
1.80	2.00	0.17	53.22	0.29	5332	99.77	6.06	0.28	12185	0.47
2.00	2.45	0.18	78.26	0.42	1819	99.95	6.19	0.28	12166	0.47
2.45		0.05	77.59	5.41	2145	100.00	6.22	0.29	12161	0.47
		100.00								
						Size Analysis Heads:	6.23	0.30	12140	0.49

Size Interval: 28 x 100 mesh % Amount This Size: 0.69

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	0.00				0.00	0.00	0.00	0	0.00
1.25	1.30	0.00				0.00	0.00	0.00	0	0.00
1.30	1.35	0.00				0.00	0.00	0.00	0	0.00
1.35	1.40	2.48	4.82	0.32	12671	2.48	4.82	0.32	12671	0.51
1.40	1.60	94.02	5.43	0.26	11975	96.50	5.41	0.26	11993	0.44
1.60	1.80	2.19	11.68	0.29	11766	98.69	5.55	0.26	11988	0.44
1.80	2.00	0.51	42.29	0.77	7081	99.20	5.74	0.26	11963	0.44
2.00	2.45	0.41	65.19	3.46	3505	99.61	5.99	0.28	11928	0.47
2.45		0.39	78.04	16.52	1838	100.00	6.27	0.34	11888	0.57
		100.00								
						Size Analysis Heads:	6.68	0.37	11878	0.62

Powder River Coal Co. (Rochelle Mine) **As-Received**

Size Interval: -100 mesh — % Amount This Size: 0.26

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	0.00				0.00	0.00	0.00	0	0.00
1.25	1.30	0.00				0.00	0.00	0.00	0	0.00
1.30	1.35	0.00				0.00	0.00	0.00	0	0.00
1.35	1.40	0.00				0.00	0.00	0.00	0	0.00
1.40	1.60	83.68	4.56	0.28	12346	83.68	4.56	0.28	12346	0.45
1.60	1.80	10.62	12.17	0.31	11180	94.30	5.42	0.28	12215	0.46
1.80	2.00	0.99	53.10	0.47	5521	95.29	5.91	0.29	12145	0.47
2.00	2.45	1.03	65.94	0.79	3148	96.32	6.55	0.29	12049	0.48
2.45		3.68	87.05	6.59	662	100.00	9.52	0.52	11630	0.90
		100.00								
						Size Analysis Heads:	9.72	0.44	11494	0.77

Total: Top Size x 0 — % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	26.84	4.37	0.26	12281	26.84	4.37	0.26	12281	0.42
1.25	1.30	58.73	5.19	0.31	12213	85.57	4.93	0.30	12234	0.48
1.30	1.35	10.26	9.71	0.34	11654	95.83	5.44	0.30	12172	0.49
1.35	1.40	1.39	12.89	0.29	11367	97.22	5.55	0.30	12161	0.49
1.40	1.60	2.16	16.03	0.26	10706	99.37	5.78	0.30	12129	0.49
1.60	1.80	0.34	40.13	0.26	7394	99.71	5.89	0.30	12113	0.49
1.80	2.00	0.13	53.87	0.31	5319	99.84	5.95	0.30	12105	0.49
2.00	2.45	0.12	76.50	0.52	2100	99.95	6.04	0.30	12093	0.49
2.45		0.05	76.86	7.34	2135	100.00	6.07	0.30	12088	0.50
						Size Analysis Heads:	6.07	0.30	12092	0.50
						Head Sample Analyses:	6.18	0.30	12080	0.50

COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

Powder River Coal Co. (Rochelle Mine) **Crushed to -3/8"**

		DIRECT				CUMULATIVE (BY SIZE GROUP)				
Passing	Retained	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	+3/8 in.	0.90	11.58	0.27	11107	0.90	11.58	0.27	11107	0.49
3/8 in.	28 M	89.04	6.22	0.28	12003	89.94	6.27	0.28	11994	0.47
		89.94								
28 M	100 M	7.13	5.54	0.33	12640	7.13	5.54	0.33	12640	0.52
100 M	325 M	1.21	6.63	0.36	11852	1.21	6.63	0.36	11852	0.61
325 M	+0	1.72	11.36	0.43	11117	2.93	9.41	0.40	11421	0.70
		2.93								
	Total	100.00								

COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

Powder River Coal Co. (Rochelle Mine) **Crushed to -3/8 in.**

1.30 Sink Fraction of As-Received Sample Crushed to -3/8 inch (14.43% of Total)

Size Interval: +28 mesh % Amount This Size: 89.69

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	4.77	5.76	0.34	11919	4.77	5.76	0.34	11919	0.57
1.25	1.30	15.00	6.33	0.35	11849	19.77	6.19	0.35	11866	0.59
1.30	1.35	5.37	9.49	0.37	11671	25.14	6.90	0.35	11824	0.60
1.35	1.40	18.23	8.95	0.31	11709	43.37	7.76	0.33	11776	0.57
1.40	1.60	52.71	12.89	0.25	10925	96.08	10.57	0.29	11309	0.51
1.60	1.80	1.40	41.11	0.22	7088	97.48	11.01	0.29	11248	0.51
1.80	2.00	1.13	54.22	0.24	5248	98.61	11.51	0.29	11180	0.51
2.00	2.45	1.18	79.39	0.29	1801	99.79	12.31	0.29	11069	0.52
2.45		0.21	89.02	2.08	627	100.00	12.47	0.29	11047	0.53
		100.00								
						1.3-Sink Size Heads:	12.94	0.31	11023	0.56

Size Interval: 28 x 100 mesh % Amount This Size: 8.33

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	0.00				0.00	0.00	0.00	0	0.00
1.25	1.30	0.00				0.00	0.00	0.00	0	0.00
1.30	1.35	0.00				0.00	0.00	0.00	0	0.00
1.35	1.40	2.22	5.38	0.45	12631	2.22	5.38	0.45	12631	0.71
1.40	1.60	87.29	8.22	0.26	11626	89.51	8.15	0.26	11651	0.45
1.60	1.80	6.34	28.57	0.30	8794	95.85	9.50	0.27	11462	0.47
1.80	2.00	1.94	47.43	0.56	6099	97.79	10.25	0.27	11356	0.48
2.00	2.45	1.44	66.02	1.84	3262	99.23	11.06	0.30	11238	0.53
2.45		0.77	79.91	12.18	1468	100.00	11.59	0.39	11163	0.69
		100.00								
						1.3-Sink Size Heads:	11.54	0.40	11125	0.72

Size Interval: -100 mesh % Amount This Size: 1.98

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	0.00				0.00	0.00	0.00	0	0.00
1.25	1.30	0.00				0.00	0.00	0.00	0	0.00
1.30	1.35	0.00				0.00	0.00	0.00	0	0.00
1.35	1.40	1.53	6.36	0.44	13033	1.53	6.36	0.44	13033	0.68
1.40	1.60	57.68	7.55	0.25	11739	59.21	7.52	0.25	11772	0.43
1.60	1.80	22.05	20.74	0.26	9792	81.26	11.11	0.26	11235	0.46
1.80	2.00	9.43	41.39	0.33	6942	90.69	14.26	0.26	10789	0.49
2.00	2.45	3.98	64.71	0.48	3577	94.67	16.38	0.27	10485	0.52
2.45		5.33	85.72	3.61	601	100.00	20.07	0.45	9959	0.91
		100.00								
						1.3-Sink Size Heads:	20.75	0.45	9915	0.91

COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

Powder River Coal Co. (Rochelle Mine) **Crushed to -3/8 in.**

1.30 Sink Fraction of As-Received Sample Crushed to -3/8 inch (14.43% of Total)

Total: Top Size x 0 % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	4.28	5.76	0.34	11919	4.28	5.76	0.34	11919	0.57
1.25	1.30	13.45	6.33	0.35	11849	17.73	6.19	0.35	11866	0.59
1.30	1.35	4.82	9.49	0.37	11671	22.55	6.90	0.35	11824	0.60
1.35	1.40	16.57	8.91	0.31	11722	39.11	7.75	0.34	11781	0.57
1.40	1.60	55.69	12.17	0.25	11033	94.80	10.35	0.29	11342	0.50
1.60	1.80	2.22	34.12	0.25	8025	97.02	10.89	0.29	11266	0.51
1.80	2.00	1.36	51.66	0.29	5581	98.38	11.45	0.29	11187	0.51
2.00	2.45	1.26	77.19	0.45	2052	99.64	12.28	0.29	11072	0.52
2.45		0.36	86.42	4.34	770	100.00	12.55	0.30	11035	0.55
		100.00								
						1.3-Sink Size Heads:	12.98	0.32	11009	0.58
						1.3-Sink Head Analysis:	12.73	0.33	11023	0.60

1.30 Float Fraction of As-Received Sample (85.57% of Total)

Size Interval: Top Size x 0 % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	31.37	4.37	0.26	12281	31.37	4.37	0.26	12281	0.42
1.25	1.30	68.63	5.19	0.31	12213	100.00	4.93	0.29	12234	0.48
		100.00								

Calculated Size/Gravity Washability of Crushed to -3/8 inch Sample

Total: Top Size x 0 % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	27.46	4.40	0.26	12273	27.46	4.40	0.26	12273	0.43
1.25	1.30	60.67	5.23	0.31	12201	88.13	4.97	0.30	12224	0.48
1.30	1.35	0.69	9.49	0.37	11671	88.82	5.00	0.30	12219	0.49
1.35	1.40	2.39	8.91	0.31	11722	91.21	5.11	0.30	12206	0.49
1.40	1.60	8.04	12.17	0.25	11033	99.25	5.68	0.29	12111	0.48
1.60	1.80	0.32	34.12	0.25	8025	99.57	5.77	0.29	12098	0.48
1.80	2.00	0.20	51.66	0.29	5581	99.77	5.86	0.29	12085	0.48
2.00	2.45	0.18	77.19	0.45	2052	99.95	5.99	0.29	12067	0.49
2.45		0.05	86.42	4.34	770	100.00	6.03	0.30	12061	0.49
		100.00								
						Size Analysis Heads:	6.31	0.29	12023	0.48
						Head Sample Analyses:	6.09	0.28	12113	0.46

COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

Powder River Coal Co. (Rochelle Mine) **Crushed to -100M**

		DIRECT				CUMULATIVE (BY SIZE GROUP)				
Passing	Retained	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	+100 M	4.78	4.87	0.31	12114	4.78	4.87	0.31	12114	0.51
100 M	325 M	55.34	4.80	0.30	12003	55.34	4.80	0.30	12003	0.50
325 M	+0	39.88	7.79	0.31	11877	95.22	6.05	0.30	11950	0.51
		95.22								
	Total	100.00								

COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

Powder River Coal Co. (Rochelle Mine) **Crushed to -100 Mesh**

1.30 Sink Fraction of As-Received Sample Crushed to -100 Mesh (14.43% of Total)

Size Interval: Top Size x 0 — % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	0.00				0.00				0.00
1.25	1.30	0.00				0.00				0.00
1.30	1.35	0.00				0.00				0.00
1.35	1.40	47.60	6.23	0.37	12296	47.60	6.23	0.37	12296	0.60
1.40	1.60	38.82	8.70	0.24	11522	86.42	7.34	0.31	11948	0.52
1.60	1.80	6.89	20.58	0.28	10036	93.31	8.32	0.31	11807	0.52
1.80	2.00	1.61	39.59	0.36	7384	94.92	8.85	0.31	11732	0.53
2.00	2.45	2.00	71.14	0.49	3012	96.92	10.13	0.31	11552	0.54
2.45		3.09	88.46	3.45	699	100.01	12.55	0.41	11217	0.73
		100.01								
						1.3-Sink Head Sample:	12.71	0.37	11082	0.67

1.30 Float Fraction of As-Received Sample (85.57% of Total)

Size Interval: Top Size x 0 — % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	31.37	4.37	0.26	12281	31.37	4.37	0.26	12281	0.42
1.25	1.30	68.63	5.19	0.31	12213	100.00	4.93	0.29	12234	0.48
		100.00								

Calculated Size/Gravity Washability of Crushed to -100 Mesh Sample

Total: Top Size x 0 — % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	26.84	4.37	0.26	12281	26.84	4.37	0.26	12281	0.42
1.25	1.30	58.73	5.19	0.31	12213	85.57	4.93	0.29	12234	0.48
1.30	1.35	0.00				85.57	4.93	0.29	12234	0.48
1.35	1.40	6.87	6.23	0.37	12296	92.44	5.03	0.30	12239	0.49
1.40	1.60	5.60	8.70	0.24	11522	98.04	5.24	0.30	12198	0.49
1.60	1.80	0.99	20.58	0.28	10036	99.03	5.39	0.30	12176	0.49
1.80	2.00	0.23	39.59	0.36	7384	99.27	5.47	0.30	12165	0.49
2.00	2.45	0.29	71.14	0.49	3012	99.56	5.66	0.30	12138	0.49
2.45		0.45	88.46	3.45	699	100.00	6.03	0.31	12087	0.51
		100.00								
						Size Analysis Heads:	5.99	0.31	11958	0.52
						Head Analyses Sample:	6.18	0.28	11949	0.47

Antelope Coal Co. (NERCO)
Antelope Mine

GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE: 5- 6-92
MASTER SAMPLE NO. 138734

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: POWDER RIVER BASIN COAL - ANTELOPE

PERATING CO.: PROJECT 90D0101 TASK 2.4
AMPLED BY: CUSTOMER PROVIDED
INE:
OCATION:

ATE SAMPLED:
DATE RECEIVED: 12/10/91
EATHER:
ROSS WEIGHT: 12269.6 KG

THER ID: RAW COAL AS RECEIVED SAMPLE WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS REPORTED ON AN SO3 FREE BASIS

CERTIFICATE OF ANALYSIS

			AS RECEIVED	DRY BASIS
MOISTURE	D2961	D3302 D3173	26.01%	XXX
VOLATILE MATTER		D3175	31.66%	42.79%
FIXED CARBON		D3172	36.92%	49.90%
ASH		D3174	5.41%	7.31%
SULFUR		D4239 METHOD 3.3	.28%	.38%
CARBON		D3178	50.49%	68.23%
HYDROGEN		D3178	3.37%	4.55%
NITROGEN		D3179	.79%	1.07%
OXYGEN		D3176	13.65%	18.44%
BTU/LB		D2015 D1989	8733	11803
MAF BTU/LB				12734
LBS OF SO2 PER MILLION BTU				.64
LBS OF SULFUR PER MILLION BTU				.322
HARDGROVE GRINDABILITY INDEX		D409	47	
ORMS OF SULFUR		D2492		
PYRITIC SULFUR			.07%	.09%
SULFATE SULFUR			.00%	.00%
ORGANIC SULFUR			.21%	.29%
CHLORINE		D4208	.04%	.06%
EQUILIBRIUM MOISTURE		D1412	25.27%	

PAGE 1 OF 2

BLACK SEAL ANALYSIS

Thomas A. Rightler
RACKey

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STANDARD LABORATORIES, INC.

DATE: 5- 6-92
WARNER NO. 138734

CERTIFICATE OF ANALYSIS (CONT.)

	AS RECEIVED	DRY BASIS

ASH FUSION TEMPERATURE(S)

D1857 - ELECTRIC METHOD	REDUCING ATMOSPHERE
INITIAL DEFORMATION TEMPERATURE	2085
SOFTENING TEMPERATURE	2120
HEMISPHERICAL TEMPERATURE	2145
FLUID TEMPERATURE	2200
D1857	OXIDIZING ATMOSPHERE
INITIAL DEFORMATION TEMPERATURE	2135
SOFTENING TEMPERATURE	2170
HEMISPHERICAL TEMPERATURE	2200
FLUID TEMPERATURE	2245

ASH MINERAL COMPOSITION
D2795 D3682

SILICON DIOXIDE	32.78	
ALUMINIUM OXIDE	12.51	
FERRIC OXIDE	6.77	
TITANIUM DIOXIDE	1.08	
PHOSPHORUS PENTOXIDE	.12	
CALCIUM OXIDE	23.58	
MAGNESIUM OXIDE	5.93	
SODIUM OXIDE	2.05	
POTASSIUM OXIDE	.75	
SULFUR TRIOXIDE	12.44	
PERCENT SOLIDS		73.99%

LITHIUM OXIDE	66.2 ppm
MANGANESE DIOXIDE	209.7 ppm

APPROVED BY Thomas A. Rifkin

APPROVED BY R. Ackly

BLACK SEAL ANALYSIS

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ASH PERCENTS REPORTED ON AN SO3-FREE BASIS

CERTIFICATE OF ANALYSIS

FRACTION	WT%	MOISTURE	ASH	SULFUR	BTU	LBS SO2 PER MBTU	MAF BTU
1 1/2"SQ	8.79	24.91	7.26	.40	11530	.69	12432
1/2"SQ X 3/4"SQ	30.63	25.25	6.59	.38	11892	.64	12730
/4"SQ X 3/8"SQ	23.15	25.43	7.11	.36	11830	.61	12734
/8"SQ X 28M	33.57	25.27	7.28	.40	11743	.68	15633
8M X 100M	2.73	10.44	7.10	.55	11630	.94	12519
00M X 325M	.68	12.94	8.70	.98	11343	1.73	12424
25M X 0	.45	6.23	18.83	.81	9960	1.62	12270

CUMULATIVE RETAINED - DOWN

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
1 1/2"SQ	8.79	7.26	.40	11530	.69
1 1/2"SQ X 3/4"SQ	39.42	6.74	.38	11811	.64
1 1/2"SQ X 3/8"SQ	62.57	6.87	.37	11818	.63
1 1/2"SQ X 28M	96.14	7.01	.38	11792	.64
1 1/2"SQ X 100M	98.87	7.02	.39	11787	.66
1 1/2"SQ X 325M	99.55	7.03	.39	11784	.66
1 1/2"SQ X 0	100.00	7.08	.39	11776	.66

CUMULATIVE RETAINED - UP

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
1 1/2"SQ X 0	100.00	7.08	.39	11776	.66
1/2"SQ X 0	91.21	7.07	.39	11800	.66
/4"SQ X 0	60.58	7.31	.40	11753	.68
/8"SQ X 0	37.43	7.43	.42	11706	.72
8M X 0	3.86	8.75	.65	11385	1.14
00M X 0	1.13	12.74	.91	10792	1.68
25M X 0	.45	18.83	.81	9960	1.62

NALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY Thomas A. Pugh
APPROVED BY [illegible]

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GOULD ENERGY DIVISION
P. O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE : 5- 6-92
MASTER SAMPLE NO. 138742

C. Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: POWDER RIVER BASIN COAL - ANTELOPE

OPERATING CO.: PROJECT 90D0101 TASK 2.4
MINE:
SAMPLED BY: CUSTOMER PROVIDED
GROSS WEIGHT: 12269.6 KG

DATE SAMPLED:

DATE RECEIVED: 12/10/91

OTHER ID: RAW COAL AS RECEIVED SAMPLE WEIGHT PERCENTS REPORTED ON A DRY BASIS
ASH PERCENTS REPORTED ON AN SO3-FREE BASIS

FEED FOR SIZE +3/4"SQ

RAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		11.80	3.49	.31	12102	0.00	0.00
1.30		69.29	4.38	.35	12061	0.00	0.00
1.35		14.77	7.30	.50	11851	0.00	0.00
1.40		1.43	12.16	.42	11200	0.00	0.00
1.60		1.41	31.01	.29	8574	0.00	0.00
1.80		.31	53.58	.25	5864	0.00	0.00
2.00		.03	65.32	.46	3790	0.00	0.00
2.45		.49	79.36	1.37	988	0.00	0.00
2.45	SINK	.47	92.27	.05	310	0.00	0.00

CUMULATIVE RESULTS FOR SIZE +3/4"SQ

CUMULATIVE DOWN

RAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		11.80	3.49	.31	12102	0.00	0.00
1.30		81.09	4.25	.34	12067	0.00	0.00
1.35		95.86	4.72	.37	12034	0.00	0.00
1.40		97.29	4.83	.37	12021	0.00	0.00
1.60		98.70	5.21	.37	11972	0.00	0.00
1.80		99.01	5.36	.37	11952	0.00	0.00
2.00		99.04	5.38	.37	11950	0.00	0.00
2.45		99.53	5.74	.37	11896	0.00	0.00
2.45	SINK	100.00	6.15	.37	11842	0.00	0.00

CUMULATIVE UP

RAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		100.00	6.15	.37	11842	0.00	0.00
1.30		88.20	6.50	.38	11807	0.00	0.00
1.35		18.91	14.26	.49	10875	0.00	0.00
1.40		4.14	39.12	.44	7392	0.00	0.00
1.60		2.71	53.34	.44	5383	0.00	0.00
1.80		1.30	77.55	.61	1923	0.00	0.00
2.00		.99	85.06	.72	751	0.00	0.00
2.45		.96	85.68	.73	656	0.00	0.00
2.45	SINK	.47	92.27	.05	310	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

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Thomas A. Light

GOULD ENERGY DIVISION
P. O. BOX 214
CRESSON, PA 16630

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1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

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FEED FOR SIZE 3/4"SQ X 28M

GRAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		3.90	3.60	.29	12111	0.00	0.00
1.30		71.41	4.69	.33	12014	0.00	0.00
1.35		19.07	7.33	.45	11607	0.00	0.00
1.40		1.76	15.38	.52	10583	0.00	0.00
1.60		1.96	28.52	.44	8839	0.00	0.00
1.80		.34	48.46	.51	6132	0.00	0.00
2.00		.12	58.60	1.07	4609	0.00	0.00
2.45		.52	85.35	2.05	650	0.00	0.00
2.45	SINK	.93	87.75	.74	571	0.00	0.00

CUMULATIVE RESULTS FOR SIZE 3/4"SQ X 28M

CUMULATIVE DOWN

GRAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		3.90	3.60	.29	12111	0.00	0.00
1.30		75.31	4.63	.33	12019	0.00	0.00
1.35		94.37	5.17	.35	11936	0.00	0.00
1.40		96.13	5.36	.35	11911	0.00	0.00
1.60		98.08	5.82	.36	11850	0.00	0.00
1.80		98.43	5.97	.36	11830	0.00	0.00
2.00		98.55	6.03	.36	11821	0.00	0.00
2.45		99.07	6.45	.37	11762	0.00	0.00
2.45	SINK	100.00	7.21	.37	11658	0.00	0.00

CUMULATIVE UP

GRAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		100.00	7.21	.37	11658	0.00	0.00
1.30		96.10	7.36	.37	11640	0.00	0.00
1.35		24.69	15.08	.51	10557	0.00	0.00
1.40		5.63	41.36	.68	6999	0.00	0.00
1.60		3.87	53.14	.76	5374	0.00	0.00
1.80		1.92	78.27	1.08	1836	0.00	0.00
2.00		1.57	84.73	1.20	906	0.00	0.00
2.45		1.45	86.89	1.21	599	0.00	0.00
2.45	SINK	.93	87.75	.74	571	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

Thomas A. Right

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FEED FOR SIZE 28M X 100M

RAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		0.00	0.00	0.00	0	0.00	0.00
1.30		0.00	0.00	0.00	0	0.00	0.00
1.35		5.22	4.59	.35	11817	0.00	0.00
1.40		7.37	5.02	.35	11743	0.00	0.00
1.60		82.25	5.63	.28	11726	0.00	0.00
1.80		2.80	23.85	.58	8996	0.00	0.00
2.00		.60	44.94	1.22	6223	0.00	0.00
2.45		.68	59.08	3.50	3614	0.00	0.00
2.45	SINK	1.08	73.37	15.55	1881	0.00	0.00

CUMULATIVE RESULTS FOR SIZE 28M X 100M

CUMULATIVE DOWN

RAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		0.00	0.00	0.00	0	0.00	0.00
1.30		0.00	0.00	0.00	0	0.00	0.00
1.35		5.22	4.59	.35	11817	0.00	0.00
1.40		12.59	4.84	.35	11774	0.00	0.00
1.60		94.84	5.53	.29	11732	0.00	0.00
1.80		97.64	6.05	.30	11654	0.00	0.00
2.00		98.24	6.29	.30	11621	0.00	0.00
2.45		98.92	6.65	.32	11566	0.00	0.00
2.45	SINK	100.00	7.37	.49	11461	0.00	0.00

CUMULATIVE UP

RAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		100.00	7.37	.49	11461	0.00	0.00
1.30		100.00	7.37	.49	11461	0.00	0.00
1.35		100.00	7.37	.49	11461	0.00	0.00
1.40		94.78	7.53	.50	11441	0.00	0.00
1.60		87.41	7.74	.51	11416	0.00	0.00
1.80		5.16	41.31	4.17	6475	0.00	0.00
2.00		2.36	62.02	8.44	3484	0.00	0.00
2.45		1.76	67.85	10.90	2550	0.00	0.00
2.45	SINK	1.08	73.37	15.55	1881	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

Thomas A Right
RCK

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CRESSON, PA 16630

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DATE : 5- 6-92
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1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

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ROSS WEIGHT: 12269.6 KG

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ASH PERCENTS REPORTED ON AN SO3-FREE BASIS

FEED FOR SIZE 100M X 0

AVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
.25		0.00	0.00	0.00	0	0.00	0.00
.30		0.00	0.00	0.00	0	0.00	0.00
.35		0.00	0.00	0.00	0	0.00	0.00
.40		40.94	4.95	.36	11879	0.00	0.00
.60		43.47	6.90	.34	11427	0.00	0.00
.80		6.29	18.19	.50	10267	0.00	0.00
.00		2.62	41.35	.79	7325	0.00	0.00
.45		2.81	67.95	1.17	2852	0.00	0.00
.45	SINK	3.88	82.31	10.95	1124	0.00	0.00

CUMULATIVE RESULTS FOR SIZE 100M X 0

CUMULATIVE DOWN

AVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
.25		0.00	0.00	0.00	0	0.00	0.00
.30		0.00	0.00	0.00	0	0.00	0.00
.35		0.00	0.00	0.00	0	0.00	0.00
.40		40.94	4.95	.36	11879	0.00	0.00
.60		84.41	5.95	.35	11646	0.00	0.00
.80		90.70	6.80	.36	11551	0.00	0.00
.00		93.31	7.77	.37	11432	0.00	0.00
.45		96.12	9.53	.39	11182	0.00	0.00
.45	SINK	100.00	12.35	.80	10791	0.00	0.00

CUMULATIVE UP

AVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
.25		100.00	12.35	.80	10791	0.00	0.00
.30		100.00	12.35	.80	10791	0.00	0.00
.35		100.00	12.35	.80	10791	0.00	0.00
.40		100.00	12.35	.80	10791	0.00	0.00
.60		59.06	17.48	1.11	10038	0.00	0.00
.80		15.59	47.00	3.27	6162	0.00	0.00
.00		9.30	66.46	5.14	3389	0.00	0.00
.45		6.69	76.28	6.84	1849	0.00	0.00
.45	SINK	3.88	82.31	10.95	1124	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

Thomas A. Kight
PE/KL

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1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

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OPERATING CO.: PROJECT 90D0101 TASK 2.4
MINE:
SAMPLED BY: CUSTOMER PROVIDED
GROSS WEIGHT: 12269.6 KG

DATE SAMPLED:
DATE RECEIVED: 12/10/91

OTHER ID: RAW COAL AS RECEIVED SAMPLE WEIGHT PERCENTS REPORTED ON A DRY BASIS
ASH PERCENTS REPORTED ON AN SO3-FREE BASIS

FEED FOR COMPOSITE +3/4" SQ X 0

RAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		6.86	3.53	.31	12105	0.00	0.00
1.30		67.72	4.56	.34	12033	0.00	0.00
1.35		16.76	7.29	.47	11694	0.00	0.00
1.40		2.24	11.39	.44	11121	0.00	0.00
1.60		4.49	14.55	.33	10592	0.00	0.00
1.80		.47	40.90	.45	7140	0.00	0.00
2.00		.13	53.29	.96	5396	0.00	0.00
2.45		.54	81.22	1.81	1009	0.00	0.00
2.45	SINK	.79	87.95	1.74	592	0.00	0.00

CUMULATIVE RESULTS FOR COMPOSITE +3/4" SQ X 0

CUMULATIVE DOWN

RAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		6.86	3.53	.31	12105	0.00	0.00
1.30		74.59	4.47	.33	12040	0.00	0.00
1.35		91.34	4.99	.36	11976	0.00	0.00
1.40		93.58	5.14	.36	11956	0.00	0.00
1.60		98.08	5.57	.36	11893	0.00	0.00
1.80		98.54	5.74	.36	11871	0.00	0.00
2.00		98.67	5.80	.36	11862	0.00	0.00
2.45		99.21	6.21	.37	11803	0.00	0.00
2.45	SINK	100.00	6.85	.38	11715	0.00	0.00

CUMULATIVE UP

RAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		100.00	6.85	.38	11715	0.00	0.00
1.30		93.14	7.10	.38	11686	0.00	0.00
1.35		25.41	13.86	.51	10762	0.00	0.00
1.40		8.66	26.57	.60	8958	0.00	0.00
1.60		6.42	31.86	.65	8202	0.00	0.00
1.80		1.92	72.33	1.39	2618	0.00	0.00
2.00		1.46	82.42	1.70	1167	0.00	0.00
2.45		1.33	85.21	1.77	762	0.00	0.00
2.45	SINK	.79	87.95	1.74	592	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

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Thomas A. Ruptak

GOULD ENERGY DIVISION
P. O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE: 5- 6-92
MASTER SAMPLE NO. 138779

C. Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: POWDER RIVER BASIN COAL - ANTELOPE

OPERATING CO.: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
MINE:
LOCATION:

DATE SAMPLED:
WEATHER:
GROSS WEIGHT: 1931.3 KG

DATE RECEIVED: 12/10/91

OTHER ID: RAW COAL CRUSHED TO 3/8" TOPSIZE WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS REPORTED ON AN SO3-FREE BASIS

CERTIFICATE OF ANALYSIS

			AS RECEIVED	DRY BASIS
MOISTURE	D2961	D3302 D3173	26.13%	XXX
ASH		D3174	5.38%	7.29%
SULFUR		D4239 METHOD 3.3	.27%	.36%
BTU/LB		D2015 D1989	8743	11836
MAF BTU/LB				12766
LBS OF SO2 PER MILLION BTU				.61
LBS OF SULFUR PER MILLION BTU				.304
PERCENT SOLIDS				73.87%

APPROVED BY Thomas A. Rightmire

APPROVED BY [illegible]

BLACK SEAL ANALYSIS

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GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE : 5- 6-92
MASTER SAMPLE NO. 138779

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: POWDER RIVER BASIN COAL - ANTELOPE

OPERATING CO.: PROJECT 90D0101 TASK 2.4
MINE:
SAMPLED BY: CUSTOMER PROVIDED
GROSS WEIGHT: 1931.3 KG

DATE SAMPLED:

DATE RECEIVED: 12/10/91

OTHER ID: RAW COAL CRUSHED TO 3/8" TOPSIZE WEIGHT PERCENTS REPORTED ON A DRY B ASIS ASH PERCENTS REPORTED ON AN SO3-FREE BASIS

CERTIFICATE OF ANALYSIS

FRACTION	WT%	MOISTURE	ASH	SULFUR	BTU	LBS SO2 PER MBTU	MAF BTU
+3/8"SQ	3.24	24.65	6.40	.38	11806	.64	12612
3/8"SQ X 28M	87.06	26.28	7.20	.37	11845	.62	12764
28M X 100M	7.15	9.83	6.75	.44	11711	.75	12558
100M X 325M	1.63	6.73	9.78	.64	11495	1.11	12740
325M X 0	.92	7.82	12.61	.56	10986	1.02	12571

CUMULATIVE RETAINED - DOWN

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
+3/8"SQ	3.24	6.40	.38	11806	.64
+3/8"SQ X 28M	90.30	7.17	.37	11844	.62
+3/8"SQ X 100M	97.45	7.14	.38	11834	.64
+3/8"SQ X 325M	99.08	7.19	.38	11828	.64
+3/8"SQ X 0	100.00	7.24	.38	11821	.64

CUMULATIVE RETAINED - UP

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
+3/8"SQ X 0	100.00	7.24	.38	11821	.64
3/8"SQ X 0	96.76	7.26	.38	11821	.64
28M X 0	9.70	7.81	.49	11606	.84
100M X 0	2.55	10.80	.61	11312	1.08
325M X 0	.92	12.61	.56	10986	1.02

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

PAGE 1

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APPROVED BY [illegible]

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GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE: 5-6-92
MASTER SAMPLE NO. 138789

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: POWDER RIVER BASIN COAL - ANTELOPE

OPERATING CO.: PROJECT 90D0101 TASK 2.4
SAMPLED BY: CUSTOMER PROVIDED
MINE:
LOCATION:

DATE SAMPLED:
DATE RECEIVED: 12/10/91
WEATHER:
GROSS WEIGHT: 2231.6 KG

OTHER ID: RAW COAL LIBERATION 1.30 SK CRUSHED TO 3/8" X 0 WEIGHT PERCENT S REPORTED ON A DRY BASIS ASH PERCENTS REPORTED ON AN SO3-FREE BASIS

CERTIFICATE OF ANALYSIS

		AS RECEIVED	DRY BASIS
MOISTURE	D2961 D3302 D3173	16.08%	XXX
ASH	D3174	11.81%	14.07%
SULFUR	D4239 METHOD 3.3	.47%	.56%
BTU/LB	D2015 D1989	9163	10919
MAF BTU/LB			12707
LBS OF SO2 PER MILLION BTU			1.02
LBS OF SULFUR PER MILLION BTU			.513

APPROVED BY Thomas A. Right

APPROVED BY R.E. Kelly

1608

BLACK SEAL ANALYSIS

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GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE : 5- 6-92
MASTER SAMPLE NO. 138789

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: POWDER RIVER BASIN COAL - ANTELOPE

OPERATING CO.: PROJECT 90D0101 TASK 2.4
MINE:
SAMPLED BY: CUSTOMER PROVIDED
GROSS WEIGHT: 2231.6 KG

DATE SAMPLED:

DATE RECEIVED: 12/10/91

OTHER ID: RAW COAL LIBERATION 1.30 SK CRUSHED TO 3/8" X 0 WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS REPORTED ON AN SO3-FREE BASIS

CERTIFICATE OF ANALYSIS

FRACTION	WT%	MOISTURE	ASH	SULFUR	BTU	LBS SO2 PER MBTU	MAF BTU
+28M	91.25	15.59	13.16	.51	11068	.92	12745
28M X 100M	7.46	8.96	13.32	.98	10844	1.81	12510
100M X 0	1.29	3.31	41.51	1.34	6931	3.86	11849

CUMULATIVE RETAINED - DOWN

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
+28M	91.25	13.16	.51	11068	.92
+28M X 100M	98.71	13.17	.54	11052	.98
+28M X 0	100.00	13.53	.56	10998	1.02

CUMULATIVE RETAINED - UP

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
+28M X 0	100.00	13.53	.56	10998	1.02
28M X 0	8.75	17.47	1.03	10268	2.00
100M X 0	1.29	41.51	1.34	6931	3.86

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

PAGE 1

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APPROVED BY [illegible]

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GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE : 5-12-92
MASTER SAMPLE NO. 138793

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: POWDER RIVER BASIN COAL - ANTELOPE

PERATING CO.: PROJECT 90D0101 TASK 2.4
INE:
AMPLED BY: CUSTOMER PROVIDED
ROSS WEIGHT: 387.1 KG

DATE SAMPLED:
DATE RECEIVED: 12/10/91

THER ID: RAW COAL LIBERATION 1.30 SK CRUSHED TO 3/8" X 0 WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS REPORTED ON AN SO3-FREE BASIS

FEED FOR SIZE +28M

AVITY	% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
.25	.05	5.47	.56	12222	0.00	0.00
.30	26.81	6.99	.51	11919	0.00	0.00
.35	32.76	8.25	.50	11877	0.00	0.00
.40	26.32	11.11	.48	11470	0.00	0.00
.60	9.50	23.59	.49	9641	0.00	0.00
.80	1.61	52.01	.40	5803	0.00	0.00
.00	.47	62.95	.65	4265	0.00	0.00
.45	1.81	88.16	.39	537	0.00	0.00
.45 SINK	.66	88.65	1.82	338	0.00	0.00

CUMULATIVE RESULTS FOR SIZE +28M

CUMULATIVE DOWN

AVITY	% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
.25	.05	5.47	.56	12222	0.00	0.00
.30	26.86	6.99	.51	11920	0.00	0.00
.35	59.63	7.68	.50	11896	0.00	0.00
.40	85.95	8.73	.49	11766	0.00	0.00
.60	95.45	10.25	.49	11564	0.00	0.00
.80	97.06	10.94	.49	11459	0.00	0.00
.00	97.53	11.19	.49	11424	0.00	0.00
.45	99.34	12.59	.49	11226	0.00	0.00
.45 SINK	100.00	13.10	.50	11154	0.00	0.00

CUMULATIVE UP

AVITY	% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
.25	100.00	13.10	.50	11154	0.00	0.00
.30	99.95	13.10	.50	11153	0.00	0.00
.35	73.14	15.34	.50	10872	0.00	0.00
.40	40.37	21.09	.50	10058	0.00	0.00
.60	14.05	39.81	.53	7411	0.00	0.00
.80	4.55	72.89	.63	2756	0.00	0.00
.00	2.94	84.24	.75	1088	0.00	0.00
.45	2.47	88.29	.77	484	0.00	0.00
.45 SINK	.66	88.65	1.82	308	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

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Thomas A. Right

GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE : 5-12-92
MASTER SAMPLE NO. 138793

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: POWDER RIVER BASIN COAL - ANTELOPE

OPERATING CO.: PROJECT 90D0101 TASK 2.4
MINE:
SAMPLED BY: CUSTOMER PROVIDED
GROSS WEIGHT: 387.1 KG

DATE SAMPLED:
DATE RECEIVED: 12/10/91

OTHER ID: RAW COAL LIBERATION 1.30 SK CRUSHED TO 3/8" X 0 WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS REPORTED ON AN SO3-FREE BASIS

FEED FOR SIZE 28M X 100M

RAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		0.00	0.00	0.00	0	0.00	0.00
1.30		0.00	0.00	0.00	0	0.00	0.00
1.35		1.54	5.76	.49	12382	0.00	0.00
1.40		2.01	5.83	.53	11930	0.00	0.00
1.60		80.68	7.66	.44	11459	0.00	0.00
1.80		7.83	18.40	.64	10094	0.00	0.00
2.00		2.16	45.22	1.31	6506	0.00	0.00
2.45		1.86	65.74	3.26	3213	0.00	0.00
2.45	SINK	3.92	81.70	9.49	1170	0.00	0.00

CUMULATIVE RESULTS FOR SIZE 28M X 100M

CUMULATIVE DOWN

RAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		0.00	0.00	0.00	0	0.00	0.00
1.30		0.00	0.00	0.00	0	0.00	0.00
1.35		1.54	5.76	.49	12382	0.00	0.00
1.40		3.55	5.80	.51	12138	0.00	0.00
1.60		84.23	7.58	.45	11488	0.00	0.00
1.80		92.06	8.50	.46	11369	0.00	0.00
2.00		94.22	9.35	.48	11258	0.00	0.00
2.45		96.08	10.44	.54	11102	0.00	0.00
2.45	SINK	100.00	13.23	.89	10713	0.00	0.00

CUMULATIVE UP

RAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		100.00	13.23	.89	10713	0.00	0.00
1.30		100.00	13.23	.89	10713	0.00	0.00
1.35		100.00	13.23	.89	10713	0.00	0.00
1.40		98.46	13.35	.89	10687	0.00	0.00
1.60		96.45	13.50	.90	10661	0.00	0.00
1.80		15.77	43.39	3.24	6973	0.00	0.00
2.00		7.94	68.04	5.80	3101	0.00	0.00
2.45		5.78	76.56	7.48	1828	0.00	0.00
2.45	SINK	3.92	81.70	9.49	1170	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

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Thomas A. Pitt

GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE : 5-12-92
MASTER SAMPLE NO. 138793

C. Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: POWDER RIVER BASIN COAL - ANTELOPE

PERATING CO.: PROJECT 90D0101 TASK 2.4
INE:
AMPLED BY: CUSTOMER PROVIDED
ROSS WEIGHT: 387.1 KG

DATE SAMPLED:
DATE RECEIVED: 12/10/91

THER ID: RAW COAL LIBERATION 1.30 SK CRUSHED TO 3/8" X 0 WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS REPORTED ON AN SO3-FREE BASIS

FEED FOR SIZE 100M X 0

AVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
.25		0.00	0.00	0.00	0	0.00	0.00
.30		0.00	0.00	0.00	0	0.00	0.00
.35		0.00	0.00	0.00	0	0.00	0.00
.40		0.00	0.00	0.00	0	0.00	0.00
.60		42.66	6.61	.47	11339	0.00	0.00
.80		10.24	13.84	.46	10889	0.00	0.00
.00		3.51	33.65	.65	8231	0.00	0.00
.45		25.50	75.19	.73	2132	0.00	0.00
.45	SINK	18.08	89.31	4.47	723	0.00	0.00

CUMULATIVE RESULTS FOR SIZE 100M X 0

CUMULATIVE DOWN

AVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
.25		0.00	0.00	0.00	0	0.00	0.00
.30		0.00	0.00	0.00	0	0.00	0.00
.35		0.00	0.00	0.00	0	0.00	0.00
.40		0.00	0.00	0.00	0	0.00	0.00
.60		42.66	6.61	.47	11339	0.00	0.00
.80		52.91	8.01	.46	11352	0.00	0.00
.00		56.42	9.60	.48	11064	0.00	0.00
.45		81.92	30.02	.55	8283	0.00	0.00
.45	SINK	100.00	40.74	1.26	6916	0.00	0.00

CUMULATIVE UP

AVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
.25		100.00	40.74	1.26	6916	0.00	0.00
.30		100.00	40.74	1.26	6916	0.00	0.00
.35		100.00	40.74	1.26	6916	0.00	0.00
.40		100.00	40.74	1.26	6916	0.00	0.00
.60		100.00	40.74	1.26	6916	0.00	0.00
.80		57.34	66.14	1.83	3685	0.00	0.00
.00		47.09	77.52	2.16	2046	0.00	0.00
.45		43.58	81.05	2.28	1547	0.00	0.00
.45	SINK	18.08	89.31	4.47	723	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

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GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE : 5-12-92
MASTER SAMPLE NO 138793

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: POWDER RIVER BASIN COAL - ANTELOPE

OPERATING CO.: PROJECT 90D0101 TASK 2.4
MINE:
SAMPLED BY: CUSTOMER PROVIDED
GROSS WEIGHT: 387.1 KG

DATE SAMPLED:

DATE RECEIVED: 12/10/91

OTHER ID: RAW COAL LIBERATION 1 30 SK CRUSHED TO 3/8" X 0 WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS REPORTED ON AN SO3-FREE BASIS

FEED FOR COMPOSITE +28M X 0

RAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		.05	5.47	.56	12222	0.00	0.00
1.30		24.47	6.99	.51	11919	0.00	0.00
1.35		30.01	8.24	.50	11878	0.00	0.00
1.40		24.17	11.07	.48	11473	0.00	0.00
1.60		15.24	16.91	.47	10420	0.00	0.00
1.80		2.19	40.72	.46	7257	0.00	0.00
2.00		.64	56.36	.82	5116	0.00	0.00
2.45		2.12	84.68	.68	960	0.00	0.00
2.45	SINK	1.13	86.98	4.35	633	0.00	0.00

CUMULATIVE RESULTS FOR COMPOSITE +28M X 0

CUMULATIVE DOWN

RAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		.05	5.47	.56	12222	0.00	0.00
1.30		24.51	6.99	.51	11920	0.00	0.00
1.35		54.52	7.67	.50	11897	0.00	0.00
1.40		78.69	8.72	.50	11767	0.00	0.00
1.60		93.93	10.05	.49	11548	0.00	0.00
1.80		96.12	10.75	.49	11451	0.00	0.00
2.00		96.75	11.04	.49	11407	0.00	0.00
2.45		98.87	12.62	.50	11185	0.00	0.00
2.45	SINK	100.00	13.46	.54	11066	0.00	0.00

CUMULATIVE UP

RAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		100.00	13.46	.54	11066	0.00	0.00
1.30		99.95	13.47	.54	11066	0.00	0.00
1.35		75.49	15.56	.55	10789	0.00	0.00
1.40		45.48	20.40	.58	10070	0.00	0.00
1.60		21.31	30.98	.70	8478	0.00	0.00
1.80		6.07	66.31	1.28	3602	0.00	0.00
2.00		3.88	80.72	1.74	1549	0.00	0.00
2.45		3.25	85.48	1.92	846	0.00	0.00
2.45	SINK	1.13	86.98	4.35	633	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

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Thomas A. Pugh

GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE: 5- 6-92
MASTER SAMPLE NO. 138785

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: POWDER RIVER BASIN COAL - ANTELOPE

PERATING CO.: PROJECT 90D0101 TASK 2.4
AMPLED BY: CUSTOMER PROVIDED
IINE:
OCATION:

ATE SAMPLED:
EATHER:
ROSS WEIGHT: 150.4 KG

DATE RECEIVED: 12/10/91

THER ID: RAW COAL CRUSHED TO 100M TOPSIZE WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS REPORTED ON AN SO3-FREE BASIS

CERTIFICATE OF ANALYSIS

		AS RECEIVED	DRY BASIS
MOISTURE	D2961 D3302 D3173	25.89%	XXX
ASH	D3174	5.33%	7.20%
SULFUR	D4239 METHOD 3.3	.29%	.40%
BTU/LB	D2015 D1989	8738	11791
MAF BTU/LB			12705
LBS OF SO2 PER MILLION BTU			.68
LBS OF SULFUR PER MILLION BTU			.339
PERCENT SOLIDS			74.11%

APPROVED BY Thomas A. Right

APPROVED BY

PAGE 1 OF 1
1697

BLACK SEAL ANALYSIS

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GOULD ENERGY DIVISION
P. O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE : 5- 6-92
MASTER SAMPLE NO. 138785

C. Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: POWDER RIVER BASIN COAL - ANTELOPE

OPERATING CO.: PROJECT 90D0101 TASK 2.4
MINE:
SAMPLED BY: CUSTOMER PROVIDED
GROSS WEIGHT: 150.4 KG

DATE SAMPLED:

DATE RECEIVED: 12/10/91

OTHER ID: RAW COAL CRUSHED TO 100M TOPSIZE WEIGHT PERCENTS REPORTED ON A DRY B ASIS ASH PERCENTS REPORTED ON AN SO3-FREE BASIS

CERTIFICATE OF ANALYSIS

FRACTION	WT%	MOISTURE	ASH	SULFUR	BTU	LBS SO2 PER MBTU	MAF BTU
+100M	4.06	11.68	7.93	.41	11778	.70	12792
100M X 325M	73.52	6.12	6.85	.39	11803	.66	12671
325M X 0	22.42	2.98	8.81	.37	11609	.64	12730

CUMULATIVE RETAINED - DOWN

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
+100M	4.06	7.93	.41	11778	.70
+100M X 325M	77.58	6.90	.39	11802	.66
+100M X 0	100.00	7.33	.39	11759	.66

CUMULATIVE RETAINED - UP

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
+100M X 0	100.00	7.33	.39	11759	.66
100M X 0	95.94	7.31	.39	11758	.66
325M X 0	22.42	8.81	.37	11609	.64

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

PAGE 1

APPROVED BY Thomas A. Light

APPROVED BY [illegible]

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GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE: 5- 6-92
MASTER SAMPLE NO. 138821

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: POWDER RIVER BASIN COAL - ANTELOPE

PERATING CO.: PROJECT 90D0101 TASK 2.4
AMPLED BY: CUSTOMER PROVIDED
INE:
OCATION:

ATE SAMPLED:
EATHER:
ROSS WEIGHT: 150.5 KG

DATE RECEIVED: 12/10/91

THER ID: RAW COAL LIBERATION 1.30 SK CRUSHED TO 100M X 0 WEIGHT PERCENT S REPORTED ON A DRY BASIS ASH PERCENTS REPORTED ON AN SO3-FREE BASIS

CERTIFICATE OF ANALYSIS

SCREEN TEST		CUMULATIVE DOWN	CUMULATIVE UP
+100M	4.94 %	4.94 %	100.00 %
100M X 0	95.06 %	100.00 %	95.06 %
	100.00 %		

BLACK SEAL ANALYSIS

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STANDARD LABORATORIES, INC.

DATE: 5- 6-92
SAMPLE NO. 138821

CERTIFICATE OF ANALYSIS (CONT.)

			AS RECEIVED	DRY BASIS
MOISTURE	D2961	D3302 D3173	16.47%	XXX
ASH		D3174	11.10%	13.28%
SULFUR		D4239 METHOD 3.3	.51%	.61%
BTU/LB		D2015 D1989	9142	10945
MAF BTU/LB				12622
LBS OF SO2 PER MILLION BTU				1.11
LBS OF SULFUR PER MILLION BTU				.557
PERCENT SOLIDS				83.53%

APPROVED BY Thomas A. Pighton

APPROVED BY RCK

BLACK SEAL ANALYSIS

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GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE : 5- 6-92
MASTER SAMPLE NO. 138822

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: POWDER RIVER BASIN COAL - ANTELOPE

OPERATING CO.: PROJECT 90D0101 TASK 2.4
MINE:
SAMPLED BY: CUSTOMER PROVIDED
GROSS WEIGHT: 150.5 KG

DATE SAMPLED:

DATE RECEIVED: 12/10/91

OTHER ID: RAW COAL LIBERATION 1.30 SK CRUSHED TO 100M X 0 WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS REPORTED ON AN SO3-FREE BASIS

	% WT.	% MOIST.	% ASH	%SULFUR	BTU	% VOL.	% FIX. CAR.
RAW	100.00	9.06	12.24	.59	9952	0.00	0.00
			13.46	.64	10943	0.00	0.00
					12646 (MAF)		

GRAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		0.00	0.00	0.00	0	0.00	0.00
1.30		0.00	0.00	0.00	0	0.00	0.00
1.35		0.00	0.00	0.00	0	0.00	0.00
1.40		0.00	0.00	0.00	0	0.00	0.00
1.60		71.55	5.69	.44	11913	0.00	0.00
1.80		18.42	15.00	.37	11081	0.00	0.00
2.00		3.49	37.45	.39	7951	0.00	0.00
2.45		2.30	72.42	.67	2779	0.00	0.00
2.45	SINK	4.24	86.09	5.44	882	0.00	0.00

Thomas A. Rightmire

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GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE : 5- 6-92
MASTER SAMPLE NO. 138822

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: POWDER RIVER BASIN COAL - ANTELOPE

OPERATING CO.: PROJECT 90D0101 TASK 2.4
MINE:
SAMPLED BY: CUSTOMER PROVIDED
GROSS WEIGHT: 150.5 KG

DATE SAMPLED:

DATE RECEIVED: 12/10/91

OTHER ID: RAW COAL LIBERATION 1.30 SK CRUSHED TO 100M X 0 WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS REPORTED ON AN SO3-FREE BASIS

CUMULATIVE RESULTS FOR RAW

CUMULATIVE DOWN

RAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		0.00	0.00	0.00	0	0.00	0.00
1.30		0.00	0.00	0.00	0	0.00	0.00
1.35		0.00	0.00	0.00	0	0.00	0.00
1.40		0.00	0.00	0.00	0	0.00	0.00
1.60		71.55	5.69	.44	11913	0.00	0.00
1.80		89.97	7.60	.43	11743	0.00	0.00
2.00		93.46	8.71	.43	11601	0.00	0.00
2.45		95.76	10.24	.43	11389	0.00	0.00
2.45	SINK	100.00	13.46	.64	10943	0.00	0.00

CUMULATIVE UP

RAVITY		% WT	% ASH	% S	BTU	VOLATILE	FIXED CARBON
1.25		100.00	13.46	.64	10943	0.00	0.00
1.30		100.00	13.46	.64	10943	0.00	0.00
1.35		100.00	13.46	.64	10943	0.00	0.00
1.40		100.00	13.46	.64	10943	0.00	0.00
1.60		100.00	13.46	.64	10943	0.00	0.00
1.80		28.45	33.00	1.15	8505	0.00	0.00
2.00		10.03	66.04	2.59	3775	0.00	0.00
2.45		6.54	81.28	3.76	1549	0.00	0.00
2.45	SINK	4.24	86.09	5.44	882	0.00	0.00

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

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Thomas A. Right

COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

Antelope Coal Co. - NERCO (Antelope Mine) **As-Received**

		DIRECT				CUMULATIVE (BY SIZE-GROUP)				
Passing	Retained	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
+	1-1/2 in.	8.79	7.26	0.40	11530	8.79	7.26	0.40	11530	0.69
1-1/2 in.	3/4 in.	30.63	6.59	0.38	11892	39.42	6.74	0.38	11811	0.65
		39.42								
3/4 in.	3/8 in.	23.15	7.11	0.36	11830	23.15	7.11	0.36	11830	0.61
3/8 in.	28 M	33.57	7.28	0.40	11743	56.72	7.21	0.38	11779	0.65
		56.72								
28 M	100 M	2.73	7.10	0.55	11630	2.73	7.10	0.55	11630	0.95
100 M	325 M	0.68	8.70	0.98	11343	0.68	8.70	0.98	11343	1.73
325 M	+0	0.45	18.83	0.81	9960	1.13	12.73	0.91	10792	1.69
		1.13								
	Total	100.00								

COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

Antelope Coal Co. - NERCO (Antelope Mine) **As-Received**

Size Interval: + 3/4-in % Amount This Size: 39.42

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	11.80	3.49	0.31	12102	11.80	3.49	0.31	12102	0.51
1.25	1.30	69.29	4.38	0.35	12061	81.09	4.25	0.34	12067	0.57
1.30	1.35	14.77	7.30	0.50	11851	95.86	4.72	0.37	12034	0.61
1.35	1.40	1.43	12.16	0.42	11200	97.29	4.83	0.37	12021	0.61
1.40	1.60	1.41	31.01	0.29	8574	98.70	5.20	0.37	11972	0.61
1.60	1.80	0.31	53.58	0.25	5664	99.01	5.36	0.37	11952	0.61
1.80	2.00	0.03	65.32	0.46	3790	99.04	5.37	0.37	11950	0.62
2.00	2.45	0.49	79.36	1.37	988	99.53	5.74	0.37	11896	0.63
2.45		0.47	92.27	0.05	310	100.00	6.14	0.37	11842	0.63
		100.00								
						Size Analysis Heads:	6.74	0.38	11811	0.64

Size Interval: 3/4-in x 28 mesh % Amount This Size: 56.72

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	3.90	3.60	0.29	12111	3.90	3.60	0.29	12111	0.48
1.25	1.30	71.41	4.69	0.33	12014	75.31	4.63	0.33	12019	0.55
1.30	1.35	19.07	7.33	0.45	11607	94.38	5.18	0.35	11936	0.59
1.35	1.40	1.76	15.38	0.52	10583	96.14	5.37	0.36	11911	0.60
1.40	1.60	1.96	28.52	0.44	8839	98.10	5.83	0.36	11850	0.60
1.60	1.80	0.34	48.46	0.51	6132	98.44	5.98	0.36	11830	0.61
1.80	2.00	0.12	58.60	1.07	4609	98.56	6.04	0.36	11821	0.61
2.00	2.45	0.52	85.35	2.05	650	99.08	6.46	0.37	11762	0.63
2.45		0.93	87.75	0.74	571	100.01	7.21	0.37	11658	0.64
		100.01								
						Size Analysis Heads:	7.21	0.38	11779	0.65

Size Interval: 28 x 100 mesh % Amount This Size: 2.73

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	0.00				0.00	0.00	0.00	0	0.00
1.25	1.30	0.00				0.00	0.00	0.00	0	0.00
1.30	1.35	5.22	4.59	0.35	11817	5.22	4.59	0.35	11817	0.59
1.35	1.40	7.37	5.02	0.35	11743	12.59	4.84	0.35	11774	0.59
1.40	1.60	82.25	5.63	0.28	11726	94.84	5.53	0.29	11732	0.49
1.60	1.80	2.80	23.85	0.58	8996	97.64	6.05	0.30	11654	0.51
1.80	2.00	0.60	44.94	1.22	6223	98.24	6.29	0.30	11621	0.52
2.00	2.45	0.68	59.08	3.50	3614	98.92	6.65	0.33	11566	0.56
2.45		1.08	73.37	15.55	1881	100.00	7.37	0.49	11461	0.85
		100.00								
						Size Analysis Heads:	7.10	0.55	11630	0.95

Antelope Coal Co. - NERCO (Antelope Mine) **As-Received**

Size Interval: -100 mesh % Amount This Size: 1.13

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	0.00				0.00	0.00	0.00	0	0.00
1.25	1.30	0.00				0.00	0.00	0.00	0	0.00
1.30	1.35	0.00				0.00	0.00	0.00	0	0.00
1.35	1.40	40.94	4.95	0.36	11879	40.94	4.95	0.36	11879	0.61
1.40	1.60	43.47	6.90	0.34	11427	84.41	5.95	0.35	11646	0.60
1.60	1.80	6.29	18.19	0.50	10267	90.70	6.80	0.36	11551	0.62
1.80	2.00	2.62	41.35	0.79	7325	93.32	7.77	0.37	11432	0.65
2.00	2.45	2.81	67.95	1.17	2852	96.13	9.53	0.40	11181	0.71
2.45		3.88	82.31	10.95	1124	100.01	12.36	0.80	10791	1.49
		100.01								
						Size Analysis Heads:	12.73	0.91	10792	1.69

Total: Top Size x 0 % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	6.86	3.53	0.30	12105	6.86	3.53	0.30	12105	0.50
1.25	1.30	67.82	4.57	0.34	12033	74.68	4.47	0.33	12040	0.56
1.30	1.35	16.78	7.30	0.47	11693	91.46	4.99	0.36	11976	0.60
1.35	1.40	2.23	11.46	0.45	11113	93.69	5.14	0.36	11956	0.60
1.40	1.60	4.40	14.75	0.33	10566	98.09	5.57	0.36	11893	0.60
1.60	1.80	0.46	41.09	0.45	7117	98.56	5.74	0.36	11871	0.61
1.80	2.00	0.13	53.40	0.97	5381	98.68	5.80	0.36	11862	0.61
2.00	2.45	0.54	81.27	1.80	1003	99.22	6.21	0.37	11804	0.62
2.45		0.79	87.97	1.70	589	100.01	6.85	0.38	11715	0.65
						Size Analysis Heads:	7.08	0.39	11776	0.66
						Head Sample Analyses:	7.31	0.38	11803	0.64

COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

Antelope Coal Co. - NERCO (Antelope Mine) **Crushed to -3/8"**

		DIRECT				CUMULATIVE (BY SIZE GROUP)				
Passing	Retained	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	+3/8 in.	3.24	6.40	0.38	11806	3.24	6.40	0.38	11806	0.64
3/8 in.	28 M	87.06	7.20	0.37	11845	90.30	7.17	0.37	11844	0.63
		90.30								
28 M	100 M	7.15	6.75	0.44	11711	7.15	6.75	0.44	11711	0.75
100 M	325 M	1.63	9.78	0.64	11495	1.63	9.78	0.64	11495	1.11
325 M	+0	0.92	12.61	0.56	10986	2.55	10.80	0.61	11311	1.08
		2.55								
	Total	100.00								

COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

Antelope Coal Co. - NERCO (Antelope Mine) **Crushed to -3/8 in.**

1.30 Sink Fraction of As-Received Sample Crushed to -3/8 inch (25.32% of Total)

Size Interval: +28 mesh % Amount This Size: 91.25

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	0.05	5.47	0.56	12222	0.05	5.47	0.56	12222	0.92
1.25	1.30	26.81	6.99	0.51	11919	26.86	6.99	0.51	11920	0.86
1.30	1.35	32.76	8.25	0.50	11877	59.62	7.68	0.50	11896	0.85
1.35	1.40	26.32	11.11	0.48	11470	85.94	8.73	0.50	11766	0.84
1.40	1.60	9.50	23.99	0.49	9641	95.44	10.25	0.50	11554	0.86
1.60	1.80	1.61	52.01	0.40	5803	97.05	10.94	0.49	11459	0.86
1.80	2.00	0.47	62.95	0.65	4265	97.52	11.19	0.50	11424	0.87
2.00	2.45	1.81	88.16	0.39	537	99.33	12.60	0.49	11226	0.88
2.45		0.66	88.65	1.82	338	99.99	13.10	0.50	11154	0.90
		99.99								
						1.3-Sink Size Heads:	13.16	0.51	11068	0.92

Size Interval: 28 x 100 mesh % Amount This Size: 7.46

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	0.00				0.00	0.00	0.00	0	0.00
1.25	1.30	0.00				0.00	0.00	0.00	0	0.00
1.30	1.35	1.54	5.76	0.49	12382	1.54	5.76	0.49	12382	0.79
1.35	1.40	2.01	5.83	0.53	11950	3.55	5.80	0.51	12137	0.84
1.40	1.60	80.68	7.66	0.44	11459	84.23	7.58	0.44	11488	0.77
1.60	1.80	7.83	18.40	0.64	10094	92.06	8.50	0.46	11369	0.81
1.80	2.00	2.16	45.22	1.31	6506	94.22	9.34	0.48	11258	0.85
2.00	2.45	1.86	65.74	3.26	3213	96.08	10.44	0.53	11102	0.96
2.45		3.92	81.70	9.49	1170	100.00	13.23	0.88	10713	1.65
		100.00								
						1.3-Sink Size Heads:	13.32	0.98	10844	1.81

Size Interval: -100 mesh % Amount This Size: 1.29

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	0.00				0.00	0.00	0.00	0	0.00
1.25	1.30	0.00				0.00	0.00	0.00	0	0.00
1.30	1.35	0.00				0.00	0.00	0.00	0	0.00
1.35	1.40	0.00				0.00	0.00	0.00	0	0.00
1.40	1.60	42.66	6.61	0.47	11339	42.66	6.61	0.47	11339	0.83
1.60	1.80	10.24	13.84	0.46	10889	52.90	8.01	0.47	11252	0.83
1.80	2.00	3.51	33.65	0.65	8231	56.41	9.60	0.48	11064	0.87
2.00	2.45	25.50	75.19	0.73	2132	81.91	30.02	0.56	8283	1.35
2.45		18.08	89.31	4.47	723	99.99	40.74	1.26	6916	3.66
		99.99								
						1.3-Sink Size Heads:	41.51	1.34	6931	3.87

COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

Antelope Coal Co. - NERCO (Antelope Mine) **Crushed to -3/8 in.**

1.30 Sink Fraction of As-Received Sample Crushed to -3/8 inch (25.32% of Total)

Total: Top Size x 0 % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	0.05	5.47	0.56	12222	0.05	5.47	0.56	12222	0.92
1.25	1.30	24.46	6.99	0.51	11919	24.51	6.99	0.51	11920	0.86
1.30	1.35	30.01	8.24	0.50	11879	54.52	7.68	0.50	11897	0.85
1.35	1.40	24.17	11.08	0.48	11473	78.69	8.72	0.50	11767	0.84
1.40	1.60	15.24	16.91	0.47	10420	93.92	10.05	0.49	11548	0.85
1.60	1.80	2.19	40.72	0.47	7257	96.11	10.75	0.49	11451	0.86
1.80	2.00	0.64	56.36	0.82	5116	96.74	11.05	0.49	11409	0.87
2.00	2.45	2.12	84.68	0.63	960	98.86	12.63	0.50	11185	0.89
2.45		1.13	86.98	4.36	633	99.99	13.46	0.54	11066	0.98
		99.99								
						1.3-Sink Size Heads:	13.53	0.56	10998	1.02
						1.3-Sink Head Analysis:	14.07	0.56	10919	1.03

1.30 Float Fraction of As-Received Sample (74.68% of Total)

Size Interval: Top Size x 0 % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	9.19	3.53	0.30	12105	9.19	3.53	0.30	12105	0.50
1.25	1.30	90.81	4.57	0.34	12033	100.00	4.47	0.34	12040	0.56
		100.00								

Calculated Size/Gravity Washability of Crushed to -3/8 inch Sample

Total: Top Size x 0 % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	6.87	3.53	0.30	12105	6.87	3.53	0.30	12105	0.50
1.25	1.30	74.01	4.77	0.35	12023	80.89	4.67	0.35	12030	0.58
1.30	1.35	7.60	8.24	0.50	11879	88.48	4.97	0.36	12017	0.60
1.35	1.40	6.12	11.08	0.48	11473	94.60	5.37	0.37	11982	0.62
1.40	1.60	3.86	16.91	0.47	10420	98.46	5.82	0.37	11921	0.63
1.60	1.80	0.55	40.72	0.47	7257	99.01	6.02	0.37	11895	0.63
1.80	2.00	0.16	56.36	0.82	5116	99.18	6.10	0.38	11884	0.63
2.00	2.45	0.54	84.68	0.63	960	99.71	6.52	0.38	11825	0.64
2.45		0.29	86.98	4.36	633	100.00	6.75	0.39	11793	0.66
		100.00								
						Size Analysis Heads:	7.24	0.38	11806	0.64
						Head Sample Analyses:	7.29	0.36	11836	0.61

COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

Antelope Coal Co. - NERCO (Antelope Mine) **Crushed to -100M**

		DIRECT				CUMULATIVE (BY SIZE GROUP)				
Passing	Retained	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	+100 M	4.06	7.93	0.41	11778	4.06	7.93	0.41	11778	0.70
100 M	325 M	73.52	6.85	0.39	11803	73.52	6.85	0.39	11803	0.66
325 M	+0	22.42	8.81	0.37	11609	95.94	7.31	0.39	11758	0.66
		95.94								
	Total	100.00								

COAL QUALITY EXPERT PROJECT: POWDER RIVER BASIN COAL CHARACTERIZATIONS

Antelope Coal Co. - NERCO (Antelope Mine) **Crushed to -100 Mesh**

1.30 Sink Fraction of As-Received Sample Crushed to -100 Mesh (25.68% of Total)

Size Interval: Top Size x 0 % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	0.00				0.00				0.00
1.25	1.30	0.00				0.00				0.00
1.30	1.35	0.00				0.00				0.00
1.35	1.40	0.00				0.00				0.00
1.40	1.60	71.55	5.69	0.44	11913	71.55	5.69	0.44	11913	0.74
1.60	1.80	18.42	15.00	0.37	11081	89.97	7.60	0.43	11743	0.72
1.80	2.00	3.49	37.45	0.39	7951	93.46	8.71	0.42	11601	0.73
2.00	2.45	2.30	72.42	0.67	2779	95.76	10.24	0.43	11389	0.76
2.45		4.24	86.09	5.44	882	100.00	13.46	0.64	10944	1.17
		100.00								
						1.3-Sink Head Sample:	13.28	0.61	10945	1.11

1.30 Float Fraction of As-Received Sample (74.68% of Total)

Size Interval: Top Size x 0 % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	9.19	3.53	0.30	12105	9.19	3.53	0.30	12105	0.50
1.25	1.30	90.81	4.57	0.34	12033	100.00	4.47	0.34	12040	0.56
		100.00								

Calculated Size/Gravity Washability of Crushed to -100 Mesh Sample

Total: Top Size x 0 % Amount This Size: 100.00

		DIRECT				CUMULATIVE				
Sink	Float	Wt.%	% Ash	% Sulfur	Btu/lb	Wt.%	% Ash	% Sulfur	Btu/lb	#SO2/MBtu
	1.25	6.86	3.53	0.30	12105	6.86	3.53	0.30	12105	0.50
1.25	1.30	67.82	4.57	0.34	12033	74.68	4.47	0.34	12040	0.56
1.30	1.35	0.00				74.68	4.47	0.34	12040	0.56
1.35	1.40	0.00				74.68	4.47	0.34	12040	0.56
1.40	1.60	18.12	5.69	0.44	11913	92.80	4.71	0.36	12015	0.59
1.60	1.80	4.66	15.00	0.37	11081	97.46	5.20	0.36	11970	0.60
1.80	2.00	0.88	37.45	0.39	7951	98.34	5.49	0.36	11934	0.60
2.00	2.45	0.58	72.42	0.67	2779	98.93	5.89	0.36	11880	0.60
2.45		1.07	86.09	5.44	882	100.00	6.75	0.41	11762	0.70
		100.00								
						Size Analysis Heads:	7.33	0.39	11759	0.66
						Head Analyses Sample:	7.20	0.40	11791	0.68

APPENDIX B

Raw and Reduced Coal Trace Element Data

Westmoreland Resources, Inc.
Absaloka Mine

GOULD ENERGY DIVISION
PO BOX 214
CRESSON, PA 16630
STANDARD LABORATORIES, INC.

CQ, INC.
ONE QUALITY CENTER
HOMER CITY, PA 15748

DATE: 06/10/93
SAMPLE NO: 123126

SAMPLE ID: ABSALOKA SECONDARY CRUSHER REJECT SPLIT RAW COAL

SAMPLED BY:

DATE SAMPLED:

DATE RECEIVED: 8/28/91

OTHER ID: POWDER RIVER BASIN COAL TOP X 0 AS-RECEIVED COAL

CORRECTED REPORT - THIS REPORT SUPERSEDES ALL PRIOR REPORTS IDENTIFIED WITH THE SAME LABORATORY NUMBER.

CERTIFICATE OF ANALYSIS

TRACE ELEMENTS	
ARSENIC	4.37 ppm
BARIUM	30.4 ppm
CADMIUM	< 0.10 ppm
CHROMIUM	3.59 ppm
FLUORINE	32.9 ppm
LEAD	5.43 ppm
MERCURY	191.0 ppb
NICKEL	6.05 ppm
SELENIUM	2.24 ppm
SILVER	< 0.10 ppm
ZINC	13.5 ppm
ANTIMONY	< 0.50 ppm

APPROVED BY Thomas A. Rufft

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STANDARD LABORATORIES, INC.

., INC.
UALITY CENTER BOX 280
ER CITY, PA 15748

DATE: 06/09/92
MASTER WARNER NO. 123126

SAMPLE ID: ABSALOKA SECONDARY CRUSHER REJECT SPLIT RAW COAL

RATING CO: PROJECT 90D0101 TASK 2.4
PLED BY: CUSTOMER PROVIDED
E SAMPLED:

GROSS WEIGHT: 1796.7
DATE RECEIVED: 08/28/91

ER ID: POWDER RIVER BASIN COAL TOP X 0 AS-RECEIVED COAL NOMINAL 6 TONS RAW COAL CHARACTERIZATION
ALL WEIGHT PERCENTS REPORTED ON A DRY BASIS
*CORRECTED REPORT THIS REPORT SUPERSEDES ALL PRIOR REPORTS

CERTIFICATE OF ANALYSIS

EEN SIZE GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
1/2" SQ	2.51	0.73	17.20	< 0.10	5.90	23.40	6.30	190.20	7.42	1.95	< 0.10	13.20	< 0.50
/2" X 3/4"SQ	21.18	3.43	4.51	< 0.10	3.16	41.70	3.24	182.40	5.89	2.32	< 0.10	1.36	< 0.50
" X 3/8" SQ	25.32	5.14	4.01	< 0.10	3.58	21.00	3.86	205.80	4.45	1.57	< 0.10	5.88	< 0.50
" SQ X 28M	41.88	4.51	45.30	< 0.10	3.10	27.00	3.54	139.10	6.70	1.80	< 0.10	10.70	< 0.50
X 100M	5.05	4.05	92.90	< 0.10	3.72	31.90	6.11	168.30	4.32	0.89	< 0.10	18.90	< 0.50
M X 325M	1.42	1.56	69.30	< 0.10	11.50	26.40	7.70	164.40	8.40	1.57	< 0.10	85.40	< 0.50
M X 0	2.64	0.86	135.30	< 0.10	21.90	252.40	14.50	206.90	21.30	1.63	< 0.10	272.60	< 0.50

CUMULATIVE RESULTS

EEN SIZE GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
1/2" SQ	2.51	0.73	17.20	< 0.10	5.90	23.40	6.30	190.20	7.42	1.95	< 0.10	13.20	< 0.50
/2" X 3/4"SQ	23.69	3.14	5.85	< 0.10	3.45	39.76	3.56	183.23	6.05	2.28	< 0.10	7.98	< 0.50
" X 3/8" SQ	49.01	4.18	4.90	< 0.10	3.52	30.07	3.72	194.89	5.22	1.91	< 0.10	6.89	< 0.50
" SQ X 28M	90.89	4.33	23.52	< 0.10	3.33	28.65	3.64	169.18	5.90	1.86	< 0.10	8.65	< 0.50
X 100M	95.94	4.31	27.17	< 0.10	3.35	28.83	3.77	169.14	5.82	1.81	< 0.10	9.19	< 0.50
M X 325M	97.36	4.27	27.78	< 0.10	3.46	28.79	3.82	169.07	5.86	1.81	< 0.10	10.30	< 0.50
M X 0	100.00	4.18	30.62	< 0.10	3.95	34.69	4.10	170.07	6.27	1.80	< 0.10	17.22	< 0.50

ALL TRACE ELEMENTS RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY _____

APPROVED BY _____

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STANDARD LABORATORIES, INC.

INC.
LITY CENTER BOX 280
CITY, PA 15748

DATE: 06/10/92
MASTER WARNER NO. 123126

SAMPLE ID: ABSALOKA SECONDARY CRUSHER REJECT SPLIT RAW COAL

TING CO: PROJECT 90D0101 TASK 2.4
ED BY: CUSTOMER PROVIDED
SAMPLED:

GROSS WEIGHT: 1796.7
DATE RECEIVED: 08/28/91

ID: POWDER RIVER BASIN COAL TOP X 0 AS-RECEIVED COAL NOMINAL 6 TONS RAW COAL CHARACTERIZATION
ALL WEIGHTS REPORTED ON A DRY BASIS
*CORRECTED REPORT-THIS REPORT SUPERSEDES ALL PRIOR REPORTS
CERTIFICATE OF ANALYSIS

FEED FOR SIZE +3/4" SQ

SIZE VITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
	2.08	0.75	< 0.20	< 0.10	< 0.10	53.50	2.59	168.00	2.35	0.96	< 0.10	5.90	< 0.50
	46.84	2.03	5.16	< 0.10	2.02	28.50	1.97	194.10	3.10	2.05	< 0.10	4.35	< 0.50
	30.68	3.87	15.30	< 0.10	2.64	25.90	2.95	150.00	2.57	1.54	< 0.10	4.06	< 0.50
	5.42	3.70	< 0.20	< 0.10	6.90	43.80	8.10	110.20	9.95	1.25	< 0.10	28.40	< 0.50
	7.61	1.51	< 0.20	< 0.10	7.25	76.50	10.40	220.50	15.30	1.72	< 0.10	16.40	< 0.50
	2.27	4.70	< 0.20	< 0.10	12.70	45.60	12.30	176.70	28.70	3.76	< 0.10	45.60	< 0.50
	3.06	0.93	< 0.20	< 0.10	6.28	54.90	16.30	110.70	33.20	6.91	< 0.10	7.10	< 0.50
	1.96	0.00	< 0.20	< 0.10	7.71	71.70	21.60	184.00	39.20	5.82	< 0.10	17.30	< 0.50
INK	0.08	12.30	172.20	< 0.10	397.00	52.70	34.50	885.60	578.80	2.19	< 0.10	453.30	< 0.50

CUMULATIVE RESULTS

SIZE VITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
	2.08	0.75	0.20	< 0.10	0.10	53.50	2.59	168.00	2.35	0.96	< 0.10	5.90	< 0.50
	48.92	1.98	4.95	< 0.10	1.94	29.56	2.00	192.99	3.07	2.00	< 0.10	4.42	< 0.50
	79.60	2.71	8.94	< 0.10	2.21	28.15	2.36	176.42	2.88	1.82	< 0.10	4.28	< 0.50
	85.02	2.77	8.38	< 0.10	2.51	29.15	2.73	172.20	3.33	1.79	< 0.10	5.82	< 0.50
	92.63	2.67	7.71	< 0.10	2.90	33.04	3.36	176.17	4.31	1.78	< 0.10	6.69	< 0.50
	94.90	2.71	7.53	< 0.10	3.13	33.34	3.57	176.18	4.89	1.83	< 0.10	7.62	< 0.50
	97.96	2.66	7.30	< 0.10	3.23	34.01	3.97	174.13	5.78	1.99	< 0.10	7.60	< 0.50
	99.92	2.61	7.16	< 0.10	3.32	34.75	4.32	174.33	6.43	2.06	< 0.10	7.79	< 0.50
INK	100.00	2.61	7.29	< 0.10	3.63	34.77	4.34	174.90	6.89	2.06	< 0.10	8.15	< 0.50

ALL TRACE ELEMENT RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY Don Petrey

APPROVED BY ROEKG

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STANDARD LABORATORIES, INC.

ℓ., INC.
QUALITY CENTER BOX 280
IER CITY, PA 15748

DATE: 06/10/93
MASTER WARNER NO. 123126

SAMPLE ID: ABSALOKA SECONDARY CRUSHER REJECT SPLIT RAW COAL

ERATING CO: PROJECT 90D0101 TASK 2.4
IPLED BY: CUSTOMER PROVIDED
TE SAMPLED:

GROSS WEIGHT: 1796.7
DATE RECEIVED: 08/28/91

IER ID: POWDER RIVER BASIN COAL TOP X 0 AS-RECEIVED COAL NOMINAL 6 TONS RAW COAL CHARACTERIZATION
ALL WEIGHTS REPORTED ON A DRY BASIS
*CORRECTED REPORT-THIS REPORT SUPERSEDES ALL PRIOR REPORTS

CERTIFICATE OF ANALYSIS

FEED FOR SIZE 3/4" SQ X 28M

EEN SIZE GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
5	5.30	1.19	7.60	< 0.10	1.24	36.10	4.44	91.20	3.54	0.62	< 0.10	6.10	< 0.50
0	52.98	3.40	20.07	< 0.10	2.39	23.40	2.99	284.90	3.85	1.27	< 0.10	5.00	< 0.50
5	18.16	5.57	20.10	< 0.10	3.55	25.40	4.87	70.30	6.05	1.36	< 0.10	7.10	< 0.50
0	12.25	4.25	9.92	< 0.10	2.90	28.60	4.66	67.60	6.25	0.82	< 0.10	6.35	< 0.50
0	7.69	5.22	15.40	< 0.10	11.50	52.90	9.25	135.40	14.80	1.63	< 0.10	30.30	< 0.50
0	1.18	6.37	< 0.20	< 0.10	11.40	90.10	12.30	157.80	22.30	2.24	< 0.10	47.50	< 0.50
0	0.62	5.81	< 0.20	< 0.10	15.10	< 0.10	14.40	174.80	20.05	4.06	< 0.10	40.80	< 0.50
5	1.26	5.42	< 0.20	< 0.10	19.40	< 0.10	36.00	101.80	29.20	4.25	< 0.10	42.90	< 0.50
5 SINK	0.56	2.99	1350.00	< 0.10	22.40	< 0.10	28.70	93.90	66.20	2.07	< 0.10	221.90	< 0.50

CUMULATIVE RESULTS

EEN SIZE GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
5	5.30	1.19	7.60	< 0.10	1.24	36.10	4.44	91.20	3.54	0.62	< 0.10	6.10	< 0.50
0	58.28	3.20	18.94	< 0.10	2.29	24.55	3.12	267.28	3.82	1.21	< 0.10	5.10	< 0.50
5	76.44	3.76	19.21	< 0.10	2.59	24.76	3.54	220.49	4.35	1.25	< 0.10	5.58	< 0.50
0	88.69	3.83	17.93	< 0.10	2.63	25.29	3.69	199.37	4.61	1.19	< 0.10	5.68	< 0.50
0	96.38	3.94	17.73	< 0.10	3.34	27.49	4.14	194.27	5.43	1.22	< 0.10	7.65	< 0.50
0	97.56	3.97	17.52	< 0.10	3.43	28.25	4.23	193.82	5.63	1.24	< 0.10	8.13	< 0.50
0	98.18	3.98	17.41	< 0.10	3.51	28.07	4.30	193.70	5.72	1.25	< 0.10	8.33	< 0.50
5	99.44	4.00	17.19	< 0.10	3.71	27.72	4.70	192.54	6.02	1.29	< 0.10	8.77	< 0.50
5 SINK	100.00	3.99	24.65	< 0.10	3.81	27.56	4.83	191.99	6.36	1.30	< 0.10	9.97	< 0.50

ALL TRACE ELEMENT RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY Timothy

APPROVED BY Thomas A. Right

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STANDARD LABORATORIES, INC.

, INC.
ALITY CENTER BOX 280
CITY, PA 15748

DATE: 06/10/93
MASTER WARNER NO. 123126

SAMPLE ID: ABSALOKA SECONDARY CRUSHER REJECT SPLIT RAW COAL

TING CO: PROJECT 90D0101 TASK 2.4
ED BY: CUSTOMER PROVIDED
SAMPLED:

GROSS WEIGHT: 1796.7
DATE RECEIVED: 08/28/91

ID: POWDER RIVER BASIN COAL TOP X 0 AS-RECEIVED COAL NOMINAL 6 TONS RAW COAL CHARACTERIZATION
ALL WEIGHTS REPORTED ON A DRY BASIS INSUFFICIENT MATERIAL FOR 1.25 AND 1.35 FRACTIONS
*CORRECTED REPORT-THIS REPORT SUPERSEDES ALL PRIOR REPORTS

CERTIFICATE OF ANALYSIS

FEED FOR SIZE 28M X 100M

N SIZE AVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.53	0.67	5.15	< 0.10	2.48	50.90	3.40	102.90	3.06	1.14	< 0.10	45.90	< 0.50
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.52	0.66	8.40	< 0.10	4.11	50.60	4.42	110.60	10.40	0.85	< 0.10	45.00	< 0.50
	88.46	3.57	14.20	< 0.10	3.02	35.30	4.34	180.50	1.65	1.08	< 0.10	10.20	< 0.50
	1.15	5.08	141.10	< 0.10	13.80	169.40	13.20	242.90	27.60	1.60	< 0.10	92.40	< 0.50
	0.97	9.13	61.40	< 0.10	24.10	134.80	18.90	139.10	-31.70	1.66	< 0.10	286.00	< 0.50
	1.70	4.54	2152.00	< 0.10	22.00	60.00	27.10	137.00	42.55	4.65	< 0.10	92.60	< 0.50
SINK	3.67	3.10	866.40	< 0.10	0.10	0.10	25.40	201.60	53.30	2.27	< 0.10	150.60	< 0.50

CUMULATIVE RESULTS

N SIZE AVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.53	0.67	5.15	< 0.10	2.48	50.90	3.40	102.90	3.06	1.14	< 0.10	45.90	< 0.50
	2.53	0.67	5.15	< 0.10	2.48	50.90	3.40	102.90	3.06	1.14	< 0.10	45.90	< 0.50
	4.05	0.67	6.37	< 0.10	3.09	50.79	3.78	105.79	5.81	1.03	< 0.10	45.56	< 0.50
	92.51	3.44	13.86	< 0.10	3.02	35.98	4.32	177.23	1.83	1.08	< 0.10	11.75	< 0.50
	93.66	3.46	15.42	< 0.10	3.16	37.62	4.42	178.04	2.15	1.08	< 0.10	12.74	< 0.50
	94.63	3.52	15.89	< 0.10	3.37	38.61	4.57	177.64	2.45	1.09	< 0.10	15.54	< 0.50
	96.33	3.54	53.59	< 0.10	3.70	38.99	4.97	176.92	3.16	1.15	< 0.10	16.90	< 0.50
SINK	100.00	3.52	83.42	< 0.10	3.57	37.56	5.72	177.83	5.00	1.19	< 0.10	21.81	< 0.50

ALL TRACE ELEMENT RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY [signature]

APPROVED BY Thomas A. Right

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STANDARD LABORATORIES, INC.

, INC.
ALITY CENTER BOX 280
R CITY, PA 15748

DATE: 06/10/92
MASTER WARNER NO. 123126

SAMPLE ID: ABSALOKA SECONDARY CRUSHER REJECT SPLIT RAW COAL

ATING CO: PROJECT 90D0101 TASK 2.4
LED BY: CUSTOMER PROVIDED
SAMPLED:

GROSS WEIGHT: 1796.7
DATE RECEIVED: 08/28/91

R ID: POWDER RIVER BASIN COAL TOP X 0 AS-RECEIVED COAL NOMINAL 6 TONS RAW COAL CHARACTERIZATION
ALL WEIGHTS REPORTED ON A DRY BASIS INSUFFICIENT MATERIAL FOR 1.25, 1.30, AND 1.35 FRACTIONS
*CORRECTED REPORT-THIS REPORT SUPERSEDES ALL PRIOR REPORTS

CERTIFICATE OF ANALYSIS

FEED FOR SIZE 100M X 0

EN SIZE RAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6.46	0.83	12.90	< 0.10	1.93	32.70	4.15	87.20	3.05	0.00	< 0.10	113.50	< 0.50
	37.82	1.92	18.60	< 0.10	8.14	62.20	7.75	174.50	12.50	1.63	< 0.10	146.20	< 0.50
	23.13	1.62	190.90	< 0.10	21.10	204.50	14.60	169.80	20.00	1.54	< 0.10	234.50	< 0.50
	15.54	1.44	174.20	< 0.10	25.10	237.40	18.00	258.70	11.70	0.88	< 0.10	233.70	< 0.50
	10.36	2.26	419.60	< 0.10	37.90	246.00	25.30	114.20	14.90	1.43	< 0.10	295.10	< 0.50
SINK	6.69	5.50	370.10	< 0.10	18.10	93.00	28.00	115.60	< 0.10	4.00	< 0.10	822.20	< 0.50

CUMULATIVE RESULTS

EN SIZE RAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6.46	0.83	12.90	< 0.10	1.93	32.70	4.15	87.20	3.05	0.00	< 0.10	113.50	< 0.50
	44.28	1.76	17.77	< 0.10	7.23	57.90	7.22	161.76	11.12	1.39	< 0.10	141.43	< 0.50
	67.41	1.71	77.17	< 0.10	11.99	108.20	9.76	164.52	14.17	1.44	< 0.10	173.36	< 0.50
	82.95	1.66	95.35	< 0.10	14.45	132.40	11.30	182.16	13.71	1.34	< 0.10	184.67	< 0.50
	93.31	1.73	131.35	< 0.10	17.05	145.02	12.85	174.62	13.84	1.35	< 0.10	196.93	< 0.50
SINK	100.00	1.98	147.32	< 0.10	17.12	140.20	13.87	170.67	12.92	1.53	< 0.10	238.76	< 0.50

ALL TRACE ELEMENT RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY Doris Pathney

APPROVED BY

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GOULD ENERGY DIVISION
PO BOX 214
CRESSON, PA 16630
STANDARD LABORATORIES, INC.

CQ, INC.
ONE QUALITY CENTER
HOMER CITY, PA 15748

DATE: 06/10/93
SAMPLE NO: 123177

SAMPLE ID: ABSALOKA SECONDARY CRUSHER REJECT SPLIT

SAMPLED BY:

DATE SAMPLED:

DATE RECEIVED: 8/28/91

OTHER ID: POWDER RIVER BASIN CRUSHED TO 100M TOPSIZE

CORRECTED REPORT - THIS REPORT SUPERSEDES ALL PRIOR REPORTS IDENTIFIED WITH THE SAME LABORATORY NUMBER.

CERTIFICATE OF ANALYSIS

TRACE ELEMENTS

ARSENIC	4.83 ppm
BARIUM	33.8 ppm
CADMIUM	< 0.10 ppm
CHROMIUM	3.03 ppm
FLUORINE	42.20 ppm
LEAD	5.05 ppm
MERCURY	192.8 ppb
NICKEL	7.65 ppm
SELENIUM	2.57 ppm
SILVER	< 0.10 ppm
ZINC	13.8 ppm
ANTIMONY	< 0.50 ppm

APPROVED BY Thomas A. Rystad

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

STANDARD LABORATORIES, INC.

., INC.
UALITY CENTER BOX 280
BR CITY, PA 15748

DATE: 06/10/93
MASTER WARNER NO. 123177

SAMPLE ID: ABSALOKA SECONDARY CRUSHER REJECT SPLIT

RATING CO: PROJECT 90B0101 TASK 2.4
PLED BY: CUSTOMER PROVIDED
E SAMPLED:

GROSS WEIGHT:
DATE RECEIVED: 08/28/91

ER ID: POWDER RIVER BASIN COAL CRUSHED TO 100M TOPSIZE
ALL WEIGHT PERCENTS REPORTED ON A DRY BASIS
*CORRECTED REPORT-THIS REPORT SUPERSEDES ALL PRIOR REPORTS

CERTIFICATE OF ANALYSIS

EEN SIZE GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
)M	4.56	3.20	30.20	< 0.10	2.83	31.10	4.58	105.80	6.70	1.89	< 0.10	18.60	< 0.50
M X 325M	74.04	4.05	38.20	< 0.10	2.76	29.90	3.92	183.20	5.50	2.85	< 0.10	9.20	< 0.50
M X 0	21.40	3.99	43.30	< 0.10	5.09	79.30	8.30	226.80	10.50	2.69	< 0.10	53.40	< 0.50

CUMULATIVE RESULTS

EEN SIZE GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
)M	4.56	3.20	30.20	< 0.10	2.83	31.10	4.58	105.80	6.70	1.89	< 0.10	18.60	< 0.50
M X 325M	78.60	4.00	37.74	< 0.10	2.76	29.97	3.96	178.71	5.57	2.79	< 0.10	9.75	< 0.50
M X 0	100.00	4.00	38.93	< 0.10	3.26	40.53	4.89	189.00	6.62	2.77	< 0.10	19.09	< 0.50

ALL TRACE ELEMENT RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY _____

APPROVED BY _____

FOR YOUR PROTECTION THIS DOCUMENT HAS
BEEN PRINTED ON CONTROLLED PAPER STOCK.
NOT VALID IF ALTERED.

STANDARD LABORATORIES, INC.

GOULD ENERGY DIVISION
PO BOX 214
CRESSON, PA 16630

CQ, INC.
ONE QUALITY CENTER
HOMER CITY, PA 15748

DATE: 06/12/92
SAMPLE NO: 123213

SAMPLE ID: ABSALOKA SECONDARY CRUSHER REJECT SPLIT

SAMPLED BY:

DATE SAMPLED:

DATE RECEIVED: 8/28/91

OTHER ID: POWDER RIVER BASIN AS RECD COAL 1.30 SINK CRUSHED 100M X 0

CERTIFICATE OF ANALYSIS

TRACE ELEMENTS

CORRECTED REPORT - This report supersedes all prior reports

ARSENIC	4.25 ppm
BARIUM	92.40 ppm
CADMIUM	< 0.10 ppm
CHROMIUM	4.66 ppm
FLUORINE	40.50 ppm
LEAD	10.00 ppm
MERCURY	350.0 ppb
NICKEL	4.29 ppm
SELENIUM	1.98 ppm
SILVER	< 0.10 ppm
ZINC	20.6 ppm
ANTIMONY	< 0.50 ppm

APPROVED BY Jon Petrey
Thomas A. Rightch

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

STANDARD LABORATORIES, INC.

, INC.
ALITY CENTER BOX 280
R CITY, PA 15748

DATE: 06/10/92
MASTER WARNER NO. 123213

SAMPLE ID: ABSALOKA SECONDARY CRUSHER REJECT SPLIT

ATING CO: PROJECT 90D0101 TASK 2.4
LED BY: CUSTOMER PROVIDED
SAMPLED:

GROSS WEIGHT:
DATE RECEIVED: 08/28/91

R ID: POWDER RIVER BASIN AS-RECEIVED COAL 1.30 SINK CRUSHED TO 100M X 0
ALL WEIGHT PERCENTS REPORTED ON A DRY BASIS INSUFFICIENT MATERIAL FOR 1.25, 1.30, AND 1.35 FRACTIONS
*CORRECTED REPORT-THIS REPORT SUPERSEDES ALL PRIOR REPORTS

CERTIFICATE OF ANALYSIS

EN SIZE RAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	43.74	3.37	5.83	< 0.10	3.01	25.60	3.24	420.20	2.74	2.43	< 0.10	7.21	< 0.50
	40.48	3.96	105.40	< 0.10	4.52	40.50	7.30	225.30	5.95	1.91	< 0.10	18.75	< 0.50
	6.86	1.27	130.00	< 0.10	6.90	85.60	11.11	240.70	8.10	0.86	< 0.10	7.75	< 0.50
	1.70	0.80	219.50	< 0.10	11.70	173.30	15.00	300.00	13.70	0.66	< 0.10	14.80	< 0.50
	1.76	4.07	388.80	< 0.10	23.60	159.80	45.50	310.00	21.80	4.36	< 0.10	150.00	< 0.50
SINK	5.46	2.67	635.80	< 0.10	< 0.10	48.80	37.60	139.80	< 0.10	3.84	< 0.10	175.00	< 0.50

CUMULATIVE RESULTS

EN SIZE RAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	43.74	3.37	5.83	< 0.10	3.01	25.60	3.24	420.20	2.74	2.43	< 0.10	7.21	< 0.50
	84.22	3.65	53.69	< 0.10	3.74	32.76	5.19	326.52	4.28	2.18	< 0.10	12.76	< 0.50
	91.08	3.47	59.44	< 0.10	3.97	36.74	5.64	320.06	4.57	2.08	< 0.10	12.38	< 0.50
	92.78	3.43	62.37	< 0.10	4.12	39.24	5.81	319.69	4.74	2.05	< 0.10	12.42	< 0.50
	94.54	3.44	68.45	< 0.10	4.48	41.49	6.55	319.51	5.06	2.10	< 0.10	14.99	< 0.50
SINK	100.00	3.40	99.42	< 0.10	4.24	41.89	8.24	309.70	4.78	2.19	< 0.10	23.72	< 0.50

ALL TRACE ELEMENT RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY Lori Fahney

APPROVED BY

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CQE: POWDER RIVER COAL CHARACTERIZATIONS

Westmoreland Resources, Inc. (Absaloka or Sarpy Creek Mine) **As-Received**

INCREMENTAL

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
+	1-1/2 in.	2.51	10569	0.73	17.20	5.90	23.40	6.30	190.20	7.42	1.95	13.20
1-1/2 in.	3/4 in.	21.18	11370	3.43	4.51	3.16	41.70	3.24	182.40	5.89	2.32	7.36
		23.69										

INCREMENTAL

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
3/4 in.	3/8 in.	25.32	11658	5.14	4.01	3.58	21.00	3.86	205.80	4.45	1.57	5.88
3/8 in.	28 M	41.88	11730	4.51	45.30	3.10	27.00	3.54	139.10	6.70	1.80	10.70
		67.20										

INCREMENTAL

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
28 M	100 M	5.05	11451	4.05	92.90	3.72	31.90	6.11	168.30	4.32	0.89	18.90

INCREMENTAL

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
100 M	325 M	1.42	10792	1.56	66.90	11.50	26.40	7.70	164.40	8.40	1.57	85.40
325 M	+0	2.64	7571	0.86	135.30	21.90	252.40	14.50	206.90	21.30	1.63	272.60
		4.06										

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Westmoreland Resources, Inc. (Absaloka or Sarpy Creek Mine) **As-Received**

CUMULATIVE (BY SIZE GROUP)

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
+	1-1/2 in.	2.51	10569	0.73	17.20	5.90	23.40	6.30	190.20	7.42	1.95	13.20
1-1/2 in.	3/4 in.	23.69	11285	3.14	5.85	3.45	39.76	3.56	183.23	6.05	2.28	7.98

CUMULATIVE (BY SIZE GROUP)

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
3/4 in.	3/8 in.	25.32	11658	5.14	4.01	3.58	21.00	3.86	205.80	4.45	1.57	5.88
3/8 in.	28 M	67.20	11703	4.75	29.74	3.28	24.74	3.66	164.23	5.85	1.71	8.88

CUMULATIVE (BY SIZE GROUP)

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
28 M	100 M	5.05	11451	4.05	92.90	3.72	31.90	6.11	168.30	4.32	0.89	18.90

CUMULATIVE (BY SIZE GROUP)

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
100 M	325 M	1.42	10792	1.56	66.90	11.50	26.40	7.70	164.40	8.40	1.57	85.40
325 M	+0	4.06	8698	1.10	111.38	18.26	173.36	12.12	192.04	16.79	1.61	207.13

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Westmoreland Resources, Inc. (Absaloka or Sarpy Creek Mine) **As-Received**

				CUMULATIVE CONCENTRATION (ppm)								
Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
+	1-1/2 in.	2.51	10569	0.73	17.20	5.90	23.40	6.30	0.19	7.42	1.95	13.20
1-1/2 in.	3/4 in.	23.69	11285	3.14	5.85	3.45	39.76	3.56	0.18	6.05	2.28	7.98
3/4 in.	3/8 in.	49.01	11478	4.18	4.90	3.52	30.07	3.72	0.19	5.22	1.91	6.89
3/8 in.	28 M	90.89	11594	4.33	23.52	3.33	28.65	3.64	0.17	5.90	1.86	8.65
28 M	100 M	95.94	11586	4.31	27.17	3.35	28.83	3.77	0.17	5.82	1.81	9.19
100 M	325 M	97.36	11575	4.27	27.75	3.46	28.79	3.82	0.17	5.86	1.81	10.30
325 M	+0	100.00	11469	4.18	30.59	3.95	34.69	4.10	0.17	6.27	1.80	17.22
Head Sample Analysis:			11462	4.37	30.40	3.59	35.18	5.43	0.19	6.05	2.24	13.50

		CUM. REC. (%)		CUMULATIVE ELEMENT REJECTION (Wt.%)								
Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
+	1-1/2 in.	2.51	2.31	99.56	98.59	96.25	98.31	96.15	97.19	97.03	97.28	98.08
1-1/2 in.	3/4 in.	23.69	23.31	82.20	95.47	79.31	72.85	79.43	74.48	77.12	70.01	89.03
3/4 in.	3/8 in.	49.01	49.05	51.10	92.15	56.37	57.52	55.62	43.84	59.14	47.95	80.38
3/8 in.	28 M	90.89	91.88	5.96	30.12	23.52	24.93	19.51	9.58	14.36	6.12	54.36
28 M	100 M	95.94	96.92	1.07	14.78	18.76	20.29	11.99	4.58	10.88	3.63	48.82
100 M	325 M	97.36	98.26	0.54	11.68	14.63	19.21	9.33	3.21	8.97	2.39	41.78
325 M	+0	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Westmoreland Resources, Inc. (Absaloka or Sarpy Creek Mine) **As-Received**

Size Interval: + 3/4-in % Amount This Size: 23.69

INCREMENTAL

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
	1.25	2.08	12437	0.75	0.20	0.10	53.50	2.59	168.00	2.35	0.96	5.90
1.25	1.30	46.84	12300	2.03	5.16	2.02	28.50	1.97	194.10	3.10	2.05	4.35
1.30	1.35	30.68	11796	3.87	15.30	2.64	25.90	2.95	150.00	2.57	1.54	4.06
1.35	1.40	5.42	10862	3.70	0.20	6.90	43.80	8.10	110.20	9.95	1.25	28.40
1.40	1.60	7.61	9190	1.51	0.20	7.25	76.50	10.40	220.50	15.30	1.72	16.40
1.60	1.80	2.27	6089	4.70	0.20	12.70	45.60	12.30	176.70	28.70	3.76	45.60
1.80	2.00	3.06	3941	0.93	0.20	6.28	54.90	16.30	110.70	33.20	6.91	7.10
2.00	2.45	1.96	2479	0.00	0.20	7.71	71.70	21.60	184.00	39.20	5.82	17.30
2.45		0.08	3313	12.30	172.20	397.00	52.70	34.50	885.60	578.80	2.19	453.30
		100.00										

Size Interval: 3/4-in x 28 mesh % Amount This Size: 67.20

INCREMENTAL

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
	1.25	5.30	12295	1.19	7.60	1.24	36.10	4.44	91.20	3.54	0.62	6.10
1.25	1.30	52.98	12178	3.40	20.07	2.39	23.40	2.99	284.90	3.85	1.27	5.00
1.30	1.35	18.16	12039	5.57	20.10	3.55	25.40	4.87	70.30	6.05	1.36	7.10
1.35	1.40	12.25	11735	4.25	9.92	2.90	28.60	4.66	67.60	6.25	0.82	6.35
1.40	1.60	7.69	10313	5.22	15.40	11.50	52.90	9.25	135.40	14.80	1.63	30.30
1.60	1.80	1.18	6922	6.37	0.20	11.40	90.10	12.30	157.80	22.30	2.24	47.50
1.80	2.00	0.62	5126	5.81	0.20	15.10	0.10	14.40	174.80	20.05	4.06	40.80
2.00	2.45	1.26	3075	5.42	0.20	19.40	0.10	36.00	101.80	29.20	4.25	42.90
2.45		0.56	2672	2.99	1350.00	22.40	0.10	28.70	93.90	66.20	2.07	221.90
		100.00										

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Westmoreland Resources, Inc. (Absaloka or Sarpy Creek Mine) **As-Received**

Size Interval: + 3/4-in % Amount This Size: 23.69

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
						CUMULATIVE						
	1.25	2.08	12437	0.75	0.20	0.10	53.50	2.59	168.00	2.35	0.96	5.90
1.25	1.30	48.92	12306	1.98	4.95	1.94	29.56	2.00	192.99	3.07	2.00	4.42
1.30	1.35	79.60	12109	2.71	8.94	2.21	28.15	2.36	176.42	2.88	1.82	4.28
1.35	1.40	85.02	12030	2.77	8.38	2.51	29.15	2.73	172.20	3.33	1.79	5.82
1.40	1.60	92.63	11797	2.67	7.71	2.90	33.04	3.36	176.17	4.31	1.78	6.69
1.60	1.80	94.90	11660	2.71	7.53	3.13	33.34	3.57	176.18	4.89	1.83	7.62
1.80	2.00	97.96	11419	2.66	7.30	3.23	34.01	3.97	174.13	5.78	1.99	7.60
2.00	2.45	99.92	11243	2.61	7.16	3.32	34.75	4.32	174.33	6.43	2.06	7.79
2.45		100.00	11237	2.61	7.29	3.63	34.77	4.34	174.90	6.89	2.06	8.15
	Size Analysis Heads:			3.14	5.85	3.45	39.76	3.56	183.23	6.05	2.28	7.98

Size Interval: 3/4-in x 28 mesh % Amount This Size: 67.20

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
						CUMULATIVE						
	1.25	5.30	12295	1.19	7.60	1.24	36.10	4.44	91.20	3.54	0.62	6.10
1.25	1.30	58.28	12189	3.20	18.94	2.29	24.55	3.12	267.28	3.82	1.21	5.10
1.30	1.35	76.44	12153	3.76	19.21	2.59	24.76	3.54	220.49	4.35	1.25	5.58
1.35	1.40	88.69	12095	3.83	17.93	2.63	25.29	3.69	199.37	4.61	1.19	5.68
1.40	1.60	96.38	11953	3.94	17.73	3.34	27.49	4.14	194.27	5.43	1.22	7.65
1.60	1.80	97.56	11892	3.97	17.52	3.43	28.25	4.23	193.82	5.63	1.24	8.13
1.80	2.00	98.18	11850	3.98	17.41	3.51	28.07	4.30	193.70	5.72	1.25	8.33
2.00	2.45	99.44	11738	4.00	17.19	3.71	27.72	4.70	192.54	6.02	1.29	8.77
2.45		100.00	11688	3.99	24.65	3.81	27.56	4.83	191.99	6.36	1.30	9.97
	Size Analysis Heads:			4.75	29.74	3.28	24.74	3.66	164.23	5.85	1.71	8.88

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Westmoreland Resources, Inc. (Absaloka or Sarpy Creek Mine) **As-Received**

Size Interval: 28 x 100 mesh % Amount This Size: 5.05

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
					INCREMENTAL							
	1.25											
1.25	1.30	2.53	12753	0.67	5.15	2.48	50.90	3.40	102.90	3.06	1.14	45.90
1.30	1.35											
1.35	1.40	1.52	12554	0.66	8.40	4.11	50.60	4.42	110.60	10.40	0.85	45.00
1.40	1.60	88.46	12101	3.57	14.20	3.02	35.30	4.34	180.50	1.65	1.08	10.20
1.60	1.80	1.15	8166	5.08	141.10	13.80	169.40	13.20	242.90	27.60	1.60	92.40
1.80	2.00	0.97	6100	9.13	61.40	24.10	134.80	18.90	139.10	31.70	1.66	286.00
2.00	2.45	1.70	3148	4.54	2152.00	22.00	60.00	27.10	137.00	42.55	4.65	92.60
2.45		3.67	1070	3.10	866.40	0.10	0.10	25.40	201.60	53.30	2.27	150.60
		100.00										

Size Interval: -100 mesh % Amount This Size: 4.06

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
					INCREMENTAL							
	1.25											
1.25	1.30											
1.30	1.35											
1.35	1.40	6.46	12600	0.83	12.90	1.93	32.70	4.15	87.20	3.05	0.10	113.50
1.40	1.60	37.82	10978	1.92	18.60	8.14	62.20	7.75	174.50	12.50	1.63	146.20
1.60	1.80	23.13	8808	1.62	190.90	21.10	204.50	14.60	169.80	20.00	1.54	234.50
1.80	2.00	15.54	8055	1.44	174.20	25.10	237.40	18.00	258.70	11.70	0.88	233.70
2.00	2.45	10.36	4212	2.26	419.60	37.90	246.00	25.30	114.20	14.90	1.43	295.10
2.45		6.69	719	5.50	370.10	18.10	73.00	28.00	115.60	0.10	4.00	822.20
		100.00										

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Westmoreland Resources, Inc. (Absaloka or Sarpy Creek Mine) **As-Received**

Size Interval: 28 x 100 mesh % Amount This Size: 5.05

Sink	Float	Wt.%	Btu/lb	As	Ba	CUMULATIVE Cr	F	Pb	Hg*	Ni	Se	Zn
	1.25											
1.25	1.30	2.53	12753	0.67	5.15	2.48	50.90	3.40	102.90	3.06	1.14	45.90
1.30	1.35	2.53	12753	0.67	5.15	2.48	50.90	3.40	102.90	3.06	1.14	45.90
1.35	1.40	4.05	12678	0.67	6.37	3.09	50.79	3.78	105.79	5.81	1.03	45.56
1.40	1.60	92.51	12126	3.44	13.86	3.02	35.98	4.32	177.23	1.83	1.08	11.75
1.60	1.80	93.66	12078	3.46	15.42	3.16	37.62	4.42	178.04	2.15	1.08	12.74
1.80	2.00	94.63	12016	3.52	15.89	3.37	38.61	4.57	177.64	2.45	1.09	15.54
2.00	2.45	96.33	11860	3.54	53.59	3.70	38.99	4.97	176.92	3.16	1.15	16.90
2.45		100.00	11464	3.52	83.42	3.57	37.56	5.72	177.83	5.00	1.19	21.81
			5732									
	Size Analysis Heads:			4.05	92.90	3.72	31.90	6.11	168.30	4.32	0.89	18.90

Size Interval: -100 mesh % Amount This Size: 4.06

Sink	Float	Wt.%	Btu/lb	As	Ba	CUMULATIVE Cr	F	Pb	Hg*	Ni	Se	Zn
	1.25											
1.25	1.30											
1.30	1.35											
1.35	1.40	6.46	12600	0.83	12.90	1.93	32.70	4.15	87.20	3.05	0.10	113.50
1.40	1.60	44.28	11215	1.76	17.77	7.23	57.90	7.22	161.76	11.12	1.41	141.43
1.60	1.80	67.41	10389	1.71	77.17	11.99	108.20	9.76	164.52	14.17	1.45	173.36
1.80	2.00	82.95	9952	1.66	95.35	14.45	132.40	11.30	182.16	13.71	1.35	184.67
2.00	2.45	93.31	9314	1.73	131.35	17.05	145.02	12.85	174.62	13.84	1.35	196.93
2.45		100.00	8739	1.98	147.32	17.12	140.20	13.87	170.67	12.92	1.53	238.76
	Size Analysis Heads:			1.10	111.38	18.26	173.36	12.12	192.04	16.79	1.61	207.13

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Westmoreland Resources, Inc. (Absaloka or Sarpy Creek Mine) **As-Received**

Total: Top Size x 0 % Amount This Size: 100.00

INCREMENTAL

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
	1.25	4.05	12312	1.14	6.70	1.10	38.21	4.22	100.53	3.40	0.66	6.08
1.25	1.30	46.83	12208	3.07	16.50	2.30	24.68	2.75	262.89	3.67	1.45	4.96
1.30	1.35	19.47	11948	4.94	18.31	3.21	25.59	4.15	100.05	4.75	1.43	5.97
1.35	1.40	9.86	11651	4.06	8.72	3.40	30.86	5.09	74.01	6.68	0.86	12.38
1.40	1.60	12.97	10851	3.75	13.25	7.59	51.22	7.54	167.38	10.07	1.45	35.16
1.60	1.80	2.33	7521	4.04	80.64	15.67	127.95	13.25	169.13	22.98	2.29	123.62
1.80	2.00	1.82	5695	2.44	62.12	15.30	107.73	16.52	177.39	22.70	4.03	100.80
2.00	2.45	1.82	3189	3.26	198.90	20.82	78.13	29.42	127.33	29.08	4.02	97.07
2.45		0.85	1715	4.02	906.33	24.51	24.50	27.89	141.84	53.73	2.73	402.86
		100.00										

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Westmoreland Resources, Inc. (Absaloka or Sarpy Creek Mine) **As-Received**

Total: Top Size x 0 % Amount This Size: 100.00

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
						CUMULATIVE						
	1.25	4.05	12312	1.14	6.70	1.10	38.21	4.22	100.53	3.40	0.66	6.08
1.25	1.30	50.88	12217	2.91	15.72	2.21	25.76	2.87	249.95	3.65	1.39	5.05
1.30	1.35	70.35	12142	3.47	16.43	2.48	25.71	3.22	208.46	3.95	1.40	5.30
1.35	1.40	80.21	12082	3.55	15.49	2.60	26.35	3.45	191.94	4.29	1.33	6.17
1.40	1.60	93.18	11911	3.57	15.17	3.29	29.81	4.02	188.52	5.09	1.35	10.21
1.60	1.80	95.51	11804	3.58	16.77	3.59	32.20	4.25	188.05	5.53	1.37	12.97
1.80	2.00	97.33	11689	3.56	17.62	3.81	33.61	4.48	187.85	5.85	1.42	14.61
2.00	2.45	99.15	11534	3.56	20.94	4.13	34.43	4.93	186.74	6.28	1.47	16.13
2.45		100.00	11450	3.56	28.49	4.30	34.35	5.13	186.36	6.68	1.48	19.42
Size Analysis Heads:				4.19	30.62	3.95	35.18	4.10	170.70	6.27	1.80	17.22
Head Sample Analysis:				4.37	30.40	3.59	32.90	5.43	191.00	6.05	2.24	13.50

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Westmoreland Resources, Inc. (Absaloka or Sarpy Creek Mine) **As-Received**

		CUM. REC. (%)		CUMULATIVE ELEMENT REJECTION (Wt.%)								
Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
	1.25	4.05	4.36	98.71	99.05	98.96	95.49	96.67	97.81	97.94	98.19	98.73
1.25	1.30	50.88	54.29	58.37	71.93	73.88	61.84	71.57	31.76	72.22	52.23	86.78
1.30	1.35	70.35	74.61	31.39	59.42	59.34	47.33	55.80	21.30	58.37	33.47	80.80
1.35	1.40	80.21	84.64	20.16	56.40	51.54	38.47	46.02	17.39	48.52	27.77	74.52
1.40	1.60	93.18	96.93	6.51	50.36	28.63	19.13	26.94	5.74	28.96	15.05	51.03
1.60	1.80	95.51	98.46	3.88	43.77	20.14	10.46	20.93	3.62	20.95	11.45	36.21
1.80	2.00	97.33	99.37	2.63	39.80	13.66	4.74	15.06	1.89	14.76	6.50	26.76
2.00	2.45	99.15	99.87	0.96	27.11	4.86	0.61	4.63	0.65	6.85	1.57	17.68
2.45		100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Westmoreland Resources, Inc. (Absaloka or Sarpy Creek Mine) **Crushed to -100 Mesh**

INCREMENTAL

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
	+100 M	4.56	11958	3.20	30.20	2.83	31.10	4.58	105.80	6.70	1.89	18.60
100 M	325 M	74.04	11683	4.05	38.20	2.76	29.90	3.92	183.20	5.50	2.85	9.20
325 M	+0	21.40	10545	3.99	43.30	5.09	79.30	8.30	226.80	10.50	2.69	53.40
		95.44										

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Westmoreland Resources, Inc. (Absaloka or Sarpy Creek Mine) **Crushed to -100 Mesh**

CUMULATIVE (BY SIZE GROUP)

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
	+100 M	4.56	11958	3.20	30.20	2.83	31.10	4.58	105.80	6.70	1.89	18.60
100 M	325 M	74.04	11683	4.05	38.20	2.76	29.90	3.92	183.20	5.50	2.85	9.20
325 M	+0	95.44	11428	4.04	39.34	3.28	40.98	4.90	192.98	6.62	2.81	19.11

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Westmoreland Resources, Inc. (Absaloka or Sarpy Creek Mine) **Crushed to -100 Mesh**

				CUMULATIVE (ppm)								
Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
	+100 M	4.56	11958	3.20	30.20	2.83	31.10	4.58	0.11	6.70	1.89	18.60
100 M	325 M	78.60	11699	4.00	37.74	2.76	29.97	3.96	0.18	5.57	2.79	9.75
325 M	+0	100.00	11452	4.00	38.93	3.26	40.53	4.89	0.19	6.62	2.77	19.09
Head Sample Analysis:				4.83	33.80	3.03	42.20	5.05	0.19	7.65	2.57	13.80

		CUM. REC. (%)		CUMULATIVE ELEMENT REJECTION (Wt.%)								
Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
	+100 M	4.56	4.76	96.35	96.46	96.04	96.50	95.73	97.45	95.39	96.89	95.56
100 M	325 M	78.60	80.29	21.36	23.80	33.39	41.87	36.34	25.68	33.92	20.77	59.87
325 M	+0	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Westmoreland Resources, Inc. (Absaloka or Sarpy Creek Mine) **Crushed to -100 Mesh**

Size Interval: -100 mesh

% Amount This Size: 100.00

INCREMENTAL

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
	1.25	4.05	12311	1.14	6.70	1.10	38.21	4.22	110.53	3.40	0.66	6.08
1.25	1.30	46.83	12144	3.07	16.50	2.30	24.68	2.75	262.89	3.67	1.45	4.96
1.30	1.35	0.58	12693	3.37	5.83	3.01	25.60	3.24	420.20	2.74	2.43	7.21
1.35	1.40	21.02	12315	3.37	5.83	3.01	25.60	3.24	420.20	2.74	2.43	7.21
1.40	1.60	19.46	10872	3.96	105.40	4.52	40.50	7.30	225.30	5.95	1.91	18.75
1.60	1.80	3.30	9830	1.27	130.00	6.90	85.60	11.11	240.70	8.10	0.86	7.75
1.80	2.00	0.81	8116	0.80	219.50	11.70	173.30	15.00	300.00	13.70	0.66	14.80
2.00	2.45	0.85	2963	4.07	388.80	23.60	159.80	45.50	310.00	21.80	4.36	150.00
2.45		3.09	937	2.67	635.80	0.10	48.80	37.60	139.80	0.10	3.84	175.00
		99.99										

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Westmoreland Resources, Inc. (Absaloka or Sarpy Creek Mine) **Crushed to -100 Mesh**

Size Interval: -100 mesh

% Amount This Size: 100.00

CUMULATIVE

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
	1.25	4.05	12311	1.14	6.70	1.10	38.21	4.22	110.53	3.40	0.66	6.08
1.25	1.30	50.88	12157	2.92	15.72	2.20	25.76	2.87	250.76	3.65	1.39	5.05
1.30	1.35	51.46	12163	2.92	15.61	2.21	25.76	2.87	252.67	3.64	1.40	5.07
1.35	1.40	72.48	12207	3.05	12.77	2.44	25.71	2.98	301.26	3.38	1.70	5.69
1.40	1.60	91.94	11925	3.24	32.38	2.88	28.84	3.89	285.18	3.92	1.74	8.46
1.60	1.80	95.24	11852	3.18	35.76	3.02	30.81	4.14	283.64	4.07	1.71	8.43
1.80	2.00	96.05	11821	3.16	37.31	3.10	32.01	4.23	283.78	4.15	1.70	8.49
2.00	2.45	96.90	11743	3.16	40.39	3.28	33.13	4.60	284.01	4.30	1.73	9.73
2.45		99.99	11409	3.15	58.79	3.18	33.61	5.62	279.55	4.17	1.79	14.83
Size Analysis Heads:				4.00	38.93	2.99	40.44	4.89	189.00	6.62	2.77	14.40
Head Sample Analyses:				4.83	33.80	3.03	42.20	5.05	192.80	7.65	2.57	13.80

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Westmoreland Resources, Inc. (Absaloka or Sarpy Creek Mine) **Crushed to -100 Mesh**

		CUM. REC. (%)		CUMULATIVE ELEMENT REJECTION (Wt.%)								
Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
	1.25	4.05	4.37	98.53	99.54	98.60	95.40	96.96	98.40	96.70	98.51	98.34
1.25	1.30	50.88	54.22	52.86	86.39	64.70	61.01	74.02	54.36	55.51	60.61	82.68
1.30	1.35	51.46	54.87	52.24	86.34	64.15	60.57	73.69	53.48	55.13	59.82	82.40
1.35	1.40	72.48	77.56	29.74	84.25	44.24	44.56	61.56	21.88	41.33	31.32	72.18
1.40	1.60	91.94	96.11	5.26	49.36	16.56	21.11	36.27	6.20	13.58	10.57	47.58
1.60	1.80	95.24	98.95	3.93	42.07	9.39	12.70	29.74	3.36	7.17	8.99	45.86
1.80	2.00	96.05	99.53	3.72	39.04	6.41	8.53	27.58	2.49	4.51	8.69	45.05
2.00	2.45	96.90	99.75	2.62	33.42	0.10	4.49	20.69	1.55	0.07	6.62	36.46
2.45		99.99	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Western Energy Co.
Rosebud Mine

GOULD ENERGY DIVISION
PO BOX 214
CRESSON, PA 16630
STANDARD LABORATORIES, INC.

DATE: 06/10/93
SAMPLE NO: 125583

CQ, INC.
ONE QUALITY CENTER
HOMER CITY, PA 15748

SAMPLE ID: WESTERN ENERGY RUN # 91082001 SECONDARY CRUSHER REJECT SPLIT

SAMPLED BY:

DATE SAMPLED:

DATE RECEIVED: 9/13/91

OTHER ID: POWDER RIVER BASIN COAL TOP X 0 AS-RECEIVED COAL

CORRECTED REPORT - THIS REPORT SUPERSEDES ALL PRIOR REPORTS IDENTIFIED WITH THE SAME LABORATORY NUMBER.

CERTIFICATE OF ANALYSIS

TRACE ELEMENTS

ARSENIC	4.75 ppm
BARIUM	40.80 ppm
CADMIUM	< 0.10 ppm
CHROMIUM	3.56 ppm
FLUORINE	37.10 ppm
LEAD	4.98 ppm
MERCURY	169.9 ppb
NICKEL	5.21 ppm
SELENIUM	1.56 ppm
SILVER	< 0.10 ppm
ZINC	9.11 ppm
ANTIMONY	< 0.50 ppm

APPROVED BY Lori Pathney
Thomas A. Right

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

STANDARD LABORATORIES, INC.

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/10/93
MASTER WARNER NO. 125583

SAMPLE ID: RUN 91082001 WESTERN ENERGY

OPERATING CO: PROJECT 90D0101 TASK 2.4
MINE: SECONDARY CRUSHER REJECT SPLIT
SAMPLED BY: CUSTOMER PROVIDED
DATE SAMPLED:

GROSS WEIGHT: 1735.9 KG
DATE RECEIVED: 09/13/91

OTHER ID: POWDER RIVER BASIN RAW COAL CHARACTERIZATION AS-RECD SAMPLE TOP X 0
*CORRECTED REPORT -THIS REPORT SUPERSEDES ALL PRIOR REPORTS

CERTIFICATE OF ANALYSIS

SCREEN SIZE OR GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
+1 1/2"SQ	4.33	1.73	44.00	< 0.10	3.53	43.20	4.94	102.40	4.94	0.91	< 0.10	8.16	< 0.50
1 1/2" X 3/4"SQ	32.40	5.15	42.00	< 0.10	3.48	40.40	4.82	103.50	5.08	2.07	< 0.10	5.81	< 0.50
3/4" X 3/8" SQ	26.14	4.50	40.00	< 0.10	2.63	40.80	4.73	175.30	4.73	2.21	< 0.10	9.18	< 0.50
3/8" SQ X 28M	31.96	0.58	44.30	< 0.10	3.17	36.90	4.38	190.50	4.63	0.38	< 0.10	4.55	< 0.50
28M X 100M	3.43	3.91	56.40	< 0.10	4.01	29.50	4.82	173.40	5.62	1.66	< 0.10	12.70	< 0.50
100M X 325M	0.85	4.30	30.40	< 0.10	4.82	27.90	6.90	175.30	4.82	2.08	< 0.10	29.90	< 0.50
325M X 0	0.89	2.08	88.60	< 0.10	8.65	78.60	9.42	184.20	10.60	0.90	< 0.10	257.70	< 0.50

CUMULATIVE RESULTS

SCREEN SIZE OR GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
+1 1/2"SQ	4.33	1.73	44.00	< 0.10	3.53	43.20	4.94	102.40	4.94	0.91	< 0.10	8.16	< 0.50
1 1/2" X 3/4"SQ	36.73	4.75	42.24	< 0.10	3.49	40.73	4.83	103.37	5.06	1.93	< 0.10	6.09	< 0.50
3/4" X 3/8" SQ	62.87	4.64	41.31	< 0.10	3.13	40.76	4.79	133.28	4.92	2.05	< 0.10	7.37	< 0.50
3/8" SQ X 28M	94.83	3.27	42.32	< 0.10	3.14	39.46	4.65	152.56	4.83	1.49	< 0.10	6.42	< 0.50
28M X 100M	98.26	3.30	42.81	< 0.10	3.17	39.11	4.66	153.29	4.85	1.49	< 0.10	6.64	< 0.50
100M X 325M	99.11	3.31	42.70	< 0.10	3.19	39.01	4.68	153.48	4.85	1.50	< 0.10	6.84	< 0.50
325M X 0	100.00	3.29	43.11	< 0.10	3.24	39.37	4.72	153.75	4.90	1.49	< 0.10	9.07	< 0.50

ALL TRACE ELEMENTS RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY Lori Pathey
APPROVED BY Thomas R. Right

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

STANDARD LABORATORIES, INC.

., INC.
UALITY CENTER BOX 280
3R CITY, PA 15748

DATE: 06/10/93
MASTER WARNER NO. 125591

SAMPLE ID: RUN 91082001 WESTERN ENERGY

RATING CO: PROJECT 90D0101 TASK 2.4
3: SECONDARY CRUSHER REJECT SPLIT
'LED BY: CUSTOMER PROVIDED
E SAMPLED:

GROSS WEIGHT: 1735.9 KG
DATE RECEIVED: 09/13/91

3R ID: POWDER RIVER BASIN RAW COAL CHARACTERIZATION AS-RECD SAMPLE TOP X 0
*CORRECTED REPORT - THIS REPORT SUPERSEDES ALL PRIOR REPORTS

CERTIFICATE OF ANALYSIS

FEED FOR SIZE +3/4" SQ

3EN SIZE GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
5	2.76	0.89	27.90	< 0.10	1.47	59.60	3.36	158.70	2.00	0.99	< 0.10	2.42	< 0.50
)	66.53	4.91	28.40	< 0.10	2.78	31.10	4.09	101.40	3.93	1.21	< 0.10	3.93	< 0.50
5	15.72	5.24	103.10	< 0.10	3.54	33.50	3.30	116.80	5.19	2.06	< 0.10	2.83	< 0.50
0	4.29	1.29	45.00	< 0.10	5.24	32.00	10.90	67.70	7.43	0.59	< 0.10	9.18	< 0.50
)	6.08	0.57	82.70	< 0.10	11.90	80.90	12.60	212.30	14.70	0.62	< 0.10	16.10	< 0.50
J	1.95	1.89	106.20	< 0.10	16.70	112.20	13.80	299.80	23.60	2.09	< 0.10	16.70	< 0.50
0	1.21	3.07	147.50	< 0.10	13.10	58.90	18.30	402.40	28.70	7.99	< 0.10	14.40	< 0.50
5	1.30	16.00	176.60	< 0.10	17.10	57.10	18.90	276.50	29.10	20.60	< 0.10	20.60	< 0.50
5 SINK	0.16	10.90	108.90	< 0.10	22.10	49.50	17.40	400.00	69.50	5.67	< 0.10	78.90	< 0.50

CUMULATIVE RESULTS

3EN SIZE GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
5	2.76	0.89	27.90	< 0.10	1.47	59.60	3.36	158.70	2.00	0.99	< 0.10	2.42	< 0.50
0	69.29	4.75	28.38	< 0.10	2.73	32.24	4.06	103.68	3.85	1.20	< 0.10	3.87	< 0.50
5	85.01	4.84	42.20	< 0.10	2.88	32.47	3.92	106.11	4.10	1.36	< 0.10	3.68	< 0.50
0	89.30	4.67	42.33	< 0.10	2.99	32.45	4.26	104.26	4.26	1.32	< 0.10	3.94	< 0.50
0	95.38	4.41	44.91	< 0.10	3.56	35.54	4.79	111.15	4.93	1.28	< 0.10	4.72	< 0.50
0	97.33	4.36	46.13	< 0.10	3.82	37.07	4.97	114.93	5.30	1.29	< 0.10	4.96	< 0.50
0	98.54	4.34	47.38	< 0.10	3.94	37.34	5.13	118.46	5.59	1.38	< 0.10	5.07	< 0.50
5	99.84	4.49	49.06	< 0.10	4.11	37.60	5.31	120.62	5.89	1.63	< 0.10	5.28	< 0.50
5 SINK	100.00	4.50	49.16	< 0.10	4.14	37.62	5.33	120.96	6.00	1.63	< 0.10	5.39	< 0.50

ALL TRACE ELEMENT RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY Jim Petrey

APPROVED BY Thomas A. Rifft

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

STANDARD LABORATORIES, INC.

.Q., INC.
QUALITY CENTER BOX 280
OMER CITY, PA 15748

DATE: 06/09/92
MASTER WARNER NO. 125591

SAMPLE ID: RUN 91082001 WESTERN ENERGY

PERATING CO: PROJECT 9000101 TASK 2.4
INE: SECONDARY CRUSHER REJECT SPLIT
AMPLED BY: CUSTOMER PROVIDED
ATE SAMPLED:

GROSS WEIGHT: 1735.9 KG
DATE RECEIVED: 09/13/91

THER ID: POWDER RIVER BASIN RAW COAL CHARACTERIZATION AS-RECD SAMPLE TOP X 0
*CORRECTED REPORT -THIS REPORT SUPERSEDES ALL PRIOR REPORTS

CERTIFICATE OF ANALYSIS

FEED FOR SIZE 3/4"SQ X 28M

CREEN SIZE R GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
.25	6.25	0.55	29.70	< 0.10	1.90	45.80	3.23	329.50	2.34	0.67	< 0.10	6.13	< 0.50
.30	60.85	2.00	31.70	< 0.10	2.45	31.10	3.67	170.90	2.85	1.20	< 0.10	4.11	< 0.50
.35	17.85	1.95	31.50	< 0.10	3.24	36.00	4.50	174.50	7.28	0.75	< 0.10	5.74	< 0.50
.40	4.69	3.36	105.00	< 0.10	5.11	41.00	7.66	292.90	7.65	0.40	< 0.10	2.19	< 0.50
.60	7.24	1.19	69.10	< 0.10	6.11	44.90	12.80	224.20	14.70	0.61	< 0.10	12.20	< 0.50
.80	1.03	1.91	217.40	< 0.10	12.90	82.80	11.80	351.60	17.90	1.69	< 0.10	20.40	< 0.50
.00	0.52	3.04	686.20	< 0.10	13.60	73.70	14.90	447.20	32.60	4.32	< 0.10	28.50	< 0.50
.45	1.05	6.82	357.10	< 0.10	16.60	80.20	18.20	524.10	32.20	6.44	< 0.10	14.90	< 0.50
.45 SINK	0.52	11.50	223.00	< 0.10	24.40	44.60	31.40	1515.00	46.00	4.01	< 0.10	55.70	< 0.50

CUMULATIVE RESULTS

CREEN SIZE R GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
.25	6.25	0.55	29.70	< 0.10	1.90	45.80	3.23	329.50	2.34	0.67	< 0.10	6.13	< 0.50
.30	67.10	1.86	31.51	< 0.10	2.40	32.47	3.63	185.67	2.80	1.15	< 0.10	4.30	< 0.50
.35	84.95	1.88	31.51	< 0.10	2.58	33.21	3.81	183.33	3.74	1.07	< 0.10	4.60	< 0.50
.40	89.64	1.96	35.36	< 0.10	2.71	33.62	4.01	189.06	3.95	1.03	< 0.10	4.47	< 0.50
.60	96.88	1.90	37.88	< 0.10	2.96	34.46	4.67	191.68	4.75	1.00	< 0.10	5.05	< 0.50
.80	97.91	1.90	39.77	< 0.10	3.07	34.97	4.75	193.37	4.89	1.01	< 0.10	5.21	< 0.50
.00	98.43	1.91	43.18	< 0.10	3.12	35.17	4.80	194.71	5.04	1.02	< 0.10	5.34	< 0.50
.45	99.48	1.96	46.49	< 0.10	3.26	35.65	4.94	198.18	5.32	1.08	< 0.10	5.44	< 0.50
.45 SINK	100.00	2.01	47.41	< 0.10	3.37	35.70	5.08	205.03	5.53	1.10	< 0.10	5.70	< 0.50

ALL TRACE ELEMENT RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY Don Pathney

APPROVED BY

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

STANDARD LABORATORIES, INC.

.Q., INC.
QUALITY CENTER BOX 280
MER CITY, PA 15748

DATE: 06/10/93
MASTER WARNER NO. 125591

SAMPLE ID: RUN 91082001 WESTERN ENERGY

PERATING CO: PROJECT 90D0101 TASK 2.4
NE: SECONDARY CRUSHER REJECT SPLIT
MPLED BY: CUSTOMER PROVIDED
ATE SAMPLED:

GROSS WEIGHT: 1735.9 KG
DATE RECEIVED: 09/13/91

HER ID: POWDER RIVER BASIN RAW COAL CHARACTERIZATION AS-RECD SAMPLE TOP X 0
INSUFFICIENT MATERIAL FOR 1.25, 1.30, 1.35 AND 1.40 GRAVITY ANALYSIS
*CORRECTED REPORT -THIS REPORT SUPERSEDES ALL PRIOR REPORTS

CERTIFICATE OF ANALYSIS

FEED FOR SIZE 28M X 100M

REEN SIZE GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	92.68	3.31	8.32	< 0.10	2.46	31.50	3.69	154.50	2.44	1.25	< 0.10	10.00	< 0.50
80	2.53	2.14	45.40	< 0.10	8.52	96.50	12.80	137.30	22.00	0.64	< 0.10	174.00	< 0.50
00	1.20	2.89	126.10	< 0.10	15.60	122.90	15.60	200.00	34.60	1.45	< 0.10	69.20	< 0.50
45	0.54	7.55	95.10	< 0.10	24.70	101.60	12.30	102.70	51.10	5.84	< 0.10	95.10	< 0.50
45 SINK	3.05	3.65	1541.80	< 0.10	22.50	25.90	24.80	115.60	84.60	9.51	< 0.10	110.30	< 0.50

CUMULATIVE RESULTS

REEN SIZE GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	92.68	3.31	8.32	< 0.10	2.46	31.50	3.69	154.50	2.44	1.25	< 0.10	10.00	< 0.50
80	95.21	3.28	9.31	< 0.10	2.62	33.23	3.93	154.04	2.96	1.23	< 0.10	14.36	< 0.50
00	96.41	3.27	10.76	< 0.10	2.78	34.34	4.08	154.61	3.35	1.24	< 0.10	15.04	< 0.50
45	96.95	3.30	11.23	< 0.10	2.90	34.72	4.12	154.33	3.62	1.26	< 0.10	15.49	< 0.50
45 SINK	100.00	3.31	57.91	< 0.10	3.50	34.45	4.75	153.14	6.09	1.51	< 0.10	18.38	< 0.50

ALL TRACE ELEMENT RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY [signature]

APPROVED BY Thomas A. Rafter

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

STANDARD LABORATORIES, INC.

:.Q., INC.
1 QUALITY CENTER BOX 280
IOMER CITY, PA 15748

DATE: 06/10/93
MASTER WARNER NO. 125591

SAMPLE ID: RUN 91082001 WESTERN ENERGY

)PERATING CO: PROJECT 90D0101 TASK 2.4
IINE: SECONDARY CRUSHER REJECT SPLIT
SAMPLED BY: CUSTOMER PROVIDED
GROSS WEIGHT: 1735.9 KG
)ATE SAMPLED:
DATE RECEIVED: 09/13/91

)THER ID: POWDER RIVER BASIN RAW COAL CHARACTERIZATION AS-RECD SAMPLE TOP X 0
INSUFFICIENT MATERIAL FOR 1.25, 1.30, 1.35 AND 1.40 GRAVITY ANALYSIS

*CORRECTED REPORT -THIS REPORT SUPERSEDES ALL PRIOR REPORTS
CERTIFICATE OF ANALYSIS

FEED FOR SIZE 100M X 0

CREEN SIZE R GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
.60	80.37	3.42	17.50	< 0.10	3.05	39.50	5.08	217.40	3.65	1.63	< 0.10	110.40	< 0.50
.80	7.90	0.76	66.80	< 0.10	7.28	81.10	9.00	103.70	11.10	0.75	< 0.10	167.10	< 0.50
.00	2.71	1.12	54.10	< 0.10	9.63	160.80	13.30	150.00	17.80	0.51	< 0.10	299.20	< 0.50
.45	2.68	1.51	180.50	< 0.10	25.80	200.60	18.90	102.60	32.70	0.92	< 0.10	374.70	< 0.50
.45 SINK	6.34	3.72	333.00	< 0.10	38.00	54.20	24.60	142.90	40.20	6.17	< 0.10	630.20	< 0.50

CUMULATIVE RESULTS

CREEN SIZE R GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
.60	80.37	3.42	17.50	< 0.10	3.05	39.50	5.08	217.40	3.65	1.63	< 0.10	110.40	< 0.50
.80	88.27	3.18	21.91	< 0.10	3.43	43.22	5.43	207.22	4.32	1.55	< 0.10	115.47	< 0.50
.00	90.98	3.12	22.87	< 0.10	3.61	46.73	5.67	205.52	4.72	1.52	< 0.10	120.95	< 0.50
.45	93.66	3.07	27.38	< 0.10	4.25	51.13	6.04	202.57	5.52	1.50	< 0.10	128.21	< 0.50
.45 SINK	100.00	3.12	46.76	< 0.10	6.39	51.32	7.22	198.79	7.72	1.80	< 0.10	160.03	< 0.50

ALL TRACE ELEMENT RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY [signature]

APPROVED BY Thomas A. Right

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

GOULD ENERGY DIVISION
PO BOX 214
CRESSON, PA 16630
STANDARD LABORATORIES, INC.

DATE: 06/10/93
SAMPLE NO: 125634

CQ, INC.
ONE QUALITY CENTER
HOMER CITY, PA 15748

SAMPLE ID: WESTERN ENERGY RUN #91082001

SAMPLED BY:

DATE SAMPLED:

DATE RECEIVED: 9/13/91

OTHER ID: POWDER RIVER BASIN CRUSHED TO 100M CHANGE IN RAW COAL SIZE DIST WITH CRUSHING

CORRECTED REPORT - THIS REPORT SUPERSEDES ALL PRIOR REPORTS IDENTIFIED WITH THE SAME LABORATORY NUMBER.

CERTIFICATE OF ANALYSIS

TRACE ELEMENTS

ARSENIC	2.66 ppm
BARIUM	44.10 ppm
CADMIUM	< 0.10 ppm
CHROMIUM	3.52 ppm
FLUORINE	45.30 ppm
LEAD	5.39 ppm
MERCURY	160.2 ppb
NICKEL	7.12 ppm
SELENIUM	1.07 ppm
SILVER	< 0.10 ppm
ZINC	14.1 ppm
ANTIMONY	< 0.50 ppm

APPROVED BY Fran Petney
Thomas A. Right

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STANDARD LABORATORIES, INC.

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/10/93
MASTER WARNER NO. 125634

SAMPLE ID: RUN 91082001 WESTERN ENERGY

OPERATING CO: PROJECT 90D0101 TASK 2.4
MINE:
SAMPLED BY: CUSTOMER PROVIDED
DATE SAMPLED:

GROSS WEIGHT:
DATE RECEIVED: 09/13/91

OTHER ID: POWDER RIVER BASIN CHANGE IN RAW COAL SIZE DIST. WITH CRUSHING.
CRUSHED TO 100M. ALL WEIGHT % ON A DRY BASIS
*CORRECTED REPORT -THIS REPORT SUPERSEDES ALL PRIOR REPORTS

CERTIFICATE OF ANALYSIS

SCREEN SIZE OR GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
+100M	3.47	0.81	229.80	< 0.10	3.27	24.30	4.20	56.50	5.36	0.70	< 0.10	3.50	< 0.50
100M X 325M	71.08	3.34	16.30	< 0.10	2.53	25.20	3.94	172.40	5.44	2.03	< 0.10	7.52	< 0.50
325M X 0	25.45	0.73	62.40	< 0.10	3.91	63.80	6.72	220.50	8.22	0.45	< 0.10	40.30	< 0.50

CUMULATIVE RESULTS

SCREEN SIZE OR GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
+100M	3.47	0.81	229.80	< 0.10	3.27	24.30	4.20	56.50	5.36	0.70	< 0.10	3.50	< 0.50
100M X 325M	74.55	3.22	26.24	< 0.10	2.56	25.16	3.95	167.01	5.44	1.97	< 0.10	7.33	< 0.50
325M X 0	100.00	2.59	35.44	< 0.10	2.91	34.99	4.66	180.62	6.14	1.58	< 0.10	15.72	< 0.50

ALL TRACE ELEMENT RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY Timothy
APPROVED BY Thomas A. Right

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STANDARD LABORATORIES, INC.

GOULD ENERGY DIVISION
PO BOX 214
CRESSON, PA 16630

CQ, INC.
ONE QUALITY CENTER
HOMER CITY, PA 15748

DATE: 06/12/92
SAMPLE NO: 125670

SAMPLE ID: WESTERN ENERGY RUN #91082001 SECONDARY CRUSHER REJECT SPLIT

SAMPLED BY:

DATE SAMPLED:

DATE RECEIVED: 9/13/91

OTHER ID: POWDER RIVER BASIN AS RECD COAL 1.30 SINK CRUSHED 100M

CERTIFICATE OF ANALYSIS

TRACE ELEMENTS

CORRECTED REPORT - This report supersedes all prior reports

ARSENIC	1.67 ppm
BARIUM	32.70 ppm
CADMIUM	< 0.10 ppm
CHROMIUM	4.99 ppm
FLUORINE	73.40 ppm
LEAD	8.89 ppm
MERCURY	284.3 ppb
NICKEL	11.00 ppm
SELENIUM	1.00 ppm
SILVER	< 0.10 ppm
ZINC	42.50 ppm
ANTIMONY	< 0.50 ppm

APPROVED BY Thomas A. Rupert

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STANDARD LABORATORIES, INC.

, INC.
ALITY CENTER BOX 280
R CITY, PA 15748

DATE: 06/10/93
MASTER WARNER NO. 125670

SAMPLE ID: RUN 91082001 WESTERN ENERGY

ATING CO: PROJECT 9000101 TASK 2.4
: SECONDARY CRUSHER REJECT SPLIT
LED BY: CUSTOMER PROVIDED
SAMPLED:

GROSS WEIGHT:
DATE RECEIVED: 09/13/91

R ID: POWDER RIVER BASIN RAW COAL LIBERATION. 1.30 SINK OF AS-RECD SAMPLE CRUSHED TO 100M. ALL WEIGHT % ON A DRY BASIS
INSUFFICIENT MATERIAL FOR 1.25, 1.30 AND 1.35 GRAVITY ANALYSIS
ORRECTED REPORT - THIS REPORT SUPERSEDES ALL PRIOR REPORTS

CERTIFICATE OF ANALYSIS

EN SIZE RAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	34.08	2.34	8.71	< 0.10	3.07	42.00	4.27	290.03	3.07	1.37	< 0.10	52.50	< 0.50
	43.09	0.97	43.00	< 0.10	5.44	55.90	9.07	300.00	8.46	0.54	< 0.10	12.20	< 0.50
	10.03	0.64	28.80	< 0.10	4.42	93.20	5.31	90.00	8.76	0.40	< 0.10	12.00	< 0.50
	3.53	0.84	39.70	< 0.10	9.03	138.60	6.32	235.00	21.70	0.45	< 0.10	86.60	< 0.50
	2.51	3.56	134.90	< 0.10	12.40	101.80	25.30	270.00	37.30	2.30	< 0.10	72.80	< 0.50
SINK	6.76	5.89	80.30	< 0.10	10.60	69.60	30.20	361.20	25.30	1.37	< 0.10	145.10	< 0.50

CUMULATIVE RESULTS

:N SIZE :AVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	34.08	2.34	8.71	< 0.10	3.07	42.00	4.27	290.03	3.07	1.37	< 0.10	52.50	< 0.50
	77.17	1.58	27.86	< 0.10	4.39	49.76	6.95	295.60	6.08	0.91	< 0.10	30.00	< 0.50
	87.20	1.47	27.97	< 0.10	4.40	54.76	6.76	271.95	6.39	0.85	< 0.10	27.93	< 0.50
	90.73	1.44	28.42	< 0.10	4.58	58.02	6.74	270.51	6.98	0.83	< 0.10	30.21	< 0.50
	93.24	1.50	31.29	< 0.10	4.79	59.20	7.24	270.50	7.80	0.87	< 0.10	31.36	< 0.50
SINK	100.00	1.80	34.60	< 0.10	5.18	59.90	8.80	276.63	8.98	0.91	< 0.10	39.05	< 0.50

ALL TRACE ELEMENT RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY Timothy

APPROVED BY Thomas A. Pugh

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CQE: POWDER RIVER COAL CHARACTERIZATIONS

Western Energy Co. (Rosebud or Colstrip Mine) **As-Received**

INCREMENTAL

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
+	1-1/2 in.	4.33	11680	1.73	44.00	3.53	43.20	4.94	102.40	4.94	0.91	8.16
1-1/2 in.	3/4 in.	32.40	11563	5.15	42.00	3.48	40.40	4.82	103.50	5.08	2.07	5.81
		36.73										

INCREMENTAL

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
3/4 in.	3/8 in.	26.14	11702	4.50	40.00	2.63	40.80	4.73	175.30	4.73	2.21	9.18
3/8 in.	28 M	31.96	11784	0.58	44.30	3.17	36.90	4.38	190.50	4.63	0.38	4.55
		58.10										

INCREMENTAL

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
28 M	100 M	3.43	11545	3.91	56.40	4.01	29.50	4.82	173.40	5.62	1.66	12.70

INCREMENTAL

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
100 M	325 M	0.85	11124	4.30	30.40	4.82	27.90	6.90	175.30	4.82	2.08	29.90
325 M	+0	0.89	10216	2.08	88.60	8.65	78.60	9.42	184.20	10.60	0.90	257.70
		1.74										

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Western Energy Co. (Rosebud or Colstrip Mine) **As-Received**

CUMULATIVE (BY SIZE GROUP)

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
+	1-1/2 in.	4.33	11680	1.73	44.00	3.53	43.20	4.94	102.40	4.94	0.91	8.16
1-1/2 in.	3/4 in.	36.73	11577	4.75	42.24	3.49	40.73	4.83	103.37	5.06	1.93	6.09

CUMULATIVE (BY SIZE GROUP)

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
3/4 in.	3/8 in.	26.14	11702	4.50	40.00	2.63	40.80	4.73	175.30	4.73	2.21	9.18
3/8 in.	28 M	58.10	11747	2.34	42.37	2.93	38.65	4.54	183.66	4.67	1.20	6.63

CUMULATIVE (BY SIZE GROUP)

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
28 M	100 M	3.43	11545	3.91	56.40	4.01	29.50	4.82	173.40	5.62	0.89	18.00

CUMULATIVE (BY SIZE GROUP)

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
100 M	325 M	0.85	11124	4.30	30.40	4.82	27.90	6.90	175.30	4.82	2.08	29.90
325 M	+0	1.74	10660	3.16	60.17	6.78	53.83	8.19	179.85	7.78	1.48	146.42

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Western Energy Co. (Rosebud or Colstrip Mine) **As-Received**

				CUMULATIVE (ppm)								
Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
+	1-1/2 in.	4.33	11680	1.73	44.00	3.53	43.20	4.94	0.10	4.94	0.91	8.16
1-1/2 in.	3/4 in.	36.73	11577	4.75	42.24	3.49	40.73	4.83	0.10	5.06	1.93	6.09
3/4 in.	3/8 in.	62.87	11629	4.64	41.31	3.13	40.76	4.79	0.13	4.92	2.05	7.37
3/8 in.	28 M	94.83	11681	3.27	42.32	3.14	39.46	4.65	0.15	4.83	1.49	6.42
28 M	100 M	98.26	11676	3.30	42.81	3.17	39.11	4.66	0.15	4.85	1.49	6.64
100 M	325 M	99.11	11672	3.31	42.70	3.19	39.01	4.68	0.15	4.85	1.50	6.84
325 M	+0	100.00	11659	3.29	43.11	3.24	39.37	4.72	0.15	4.90	1.49	9.07
Head Sample Analysis:			11662	4.75	40.80	3.56	37.10	4.98	0.17	5.21	1.56	9.11

		CUM. REC. (%)		CUMULATIVE ELEMENT REJECTION (Wt.%)								
Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
+	1-1/2 in.	4.33	4.34	97.73	95.58	95.28	95.25	95.47	97.12	95.64	97.36	96.11
1-1/2 in.	3/4 in.	36.73	36.47	47.08	64.01	60.44	62.00	62.38	75.31	62.08	52.40	75.36
3/4 in.	3/8 in.	62.87	62.71	11.37	39.76	39.20	34.91	36.18	45.50	36.86	13.68	48.91
3/8 in.	28 M	94.83	95.01	5.74	6.92	7.89	4.95	6.52	5.90	6.69	5.54	32.88
28 M	100 M	98.26	98.41	1.67	2.43	3.64	2.38	3.02	2.04	2.76	1.72	28.08
100 M	325 M	99.11	99.22	0.56	1.83	2.38	1.78	1.78	1.07	1.92	0.54	25.28
325 M	+0	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Western Energy Co. (Rosebud or Colstrip Mine) **As-Received**

Size Interval: + 3/4-in % Amount This Size: 36.73

INCREMENTAL

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
	1.25	2.76	12694	0.89	27.90	1.47	59.60	3.36	158.70	2.00	0.99	2.42
1.25	1.30	66.53	12240	4.91	28.40	2.78	31.10	4.09	101.40	3.93	1.21	3.93
1.30	1.35	15.72	11693	5.24	103.10	3.54	33.50	3.30	116.80	5.19	2.06	2.83
1.35	1.40	4.29	10789	1.29	45.00	5.24	32.00	10.90	67.70	7.43	0.59	9.18
1.40	1.60	6.08	9117	0.57	82.70	11.90	80.90	12.60	212.30	14.70	0.62	16.10
1.60	1.80	1.95	7123	1.89	106.20	16.70	112.20	13.80	299.80	23.60	2.09	16.70
1.80	2.00	1.21	5387	3.07	147.50	13.10	58.90	18.30	402.40	28.70	7.99	14.40
2.00	2.45	1.30	3500	16.00	176.60	17.10	57.10	18.90	276.50	29.10	20.60	20.60
2.45		0.16	3397	10.90	108.90	22.10	49.50	17.40	400.00	69.50	5.67	78.90
		100.00										

Size Interval: 3/4-in x 28 mesh % Amount This Size: 58.10

INCREMENTAL

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
	1.25	6.25	12778	0.55	29.70	1.90	45.80	3.23	329.50	2.34	0.67	6.13
1.25	1.30	60.85	12363	2.00	31.70	2.45	31.10	3.67	170.90	2.85	1.20	4.11
1.30	1.35	17.85	11844	1.95	31.50	3.24	36.00	4.50	174.50	7.28	0.75	5.74
1.35	1.40	4.69	11248	3.36	105.00	5.11	41.00	7.66	292.90	7.65	0.40	2.19
1.40	1.60	7.24	9996	1.19	69.10	6.11	44.90	12.80	224.20	14.70	0.61	12.20
1.60	1.80	1.03	6958	1.91	217.40	12.90	82.80	11.80	351.60	17.90	1.69	20.40
1.80	2.00	0.52	5565	3.04	686.20	13.60	73.70	14.90	447.20	32.60	4.32	28.50
2.00	2.45	1.05	3881	6.82	357.10	16.60	80.20	18.20	524.10	32.20	6.44	14.90
2.45		0.52	3611	11.50	223.00	24.40	44.60	31.40	1515.00	46.00	4.01	55.70
		100.00										

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Western Energy Co. (Rosebud or Colstrip Mine) **As-Received**

Size Interval: + 3/4-in % Amount This Size: 36.73

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
						CUMULATIVE						
	1.25	2.76	12694	0.89	27.90	1.47	59.60	3.36	158.70	2.00	0.99	2.42
1.25	1.30	69.29	12258	4.75	28.38	2.73	32.24	4.06	103.68	3.85	1.20	3.87
1.30	1.35	85.01	12154	4.84	42.20	2.88	32.47	3.92	106.11	4.10	1.36	3.68
1.35	1.40	89.30	12088	4.67	42.33	2.99	32.45	4.26	104.26	4.26	1.32	3.94
1.40	1.60	95.38	11899	4.41	44.91	3.56	35.54	4.79	111.15	4.93	1.28	4.72
1.60	1.80	97.33	11803	4.36	46.13	3.82	37.07	4.97	114.93	5.30	1.29	4.96
1.80	2.00	98.54	11724	4.34	47.38	3.94	37.34	5.13	118.46	5.59	1.38	5.07
2.00	2.45	99.84	11617	4.49	49.06	4.11	37.60	5.31	120.52	5.89	1.63	5.28
2.45		100.00	11604	4.50	49.16	4.14	37.62	5.33	120.96	6.00	1.63	5.39
Size Analysis Heads:				4.75	42.24	3.49	40.73	4.83	103.37	5.06	1.93	6.09

Size Interval: 3/4-in x 28 mesh % Amount This Size: 58.10

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
						CUMULATIVE						
	1.25	6.25	12778	0.55	29.70	1.90	45.80	3.23	329.50	2.34	0.67	6.13
1.25	1.30	67.10	12402	1.86	31.51	2.40	32.47	3.63	185.67	2.80	1.15	4.30
1.30	1.35	84.95	12284	1.88	31.51	2.58	33.21	3.81	183.33	3.74	1.07	4.60
1.35	1.40	89.64	12230	1.96	35.36	2.71	33.62	4.01	189.06	3.95	1.03	4.47
1.40	1.60	96.88	12063	1.90	37.88	2.96	34.46	4.67	191.68	4.75	1.00	5.05
1.60	1.80	97.91	12010	1.90	39.77	3.07	34.97	4.75	193.37	4.89	1.01	5.21
1.80	2.00	98.43	11976	1.91	43.18	3.12	35.17	4.80	194.71	5.04	1.02	5.34
2.00	2.45	99.48	11890	1.96	46.49	3.26	35.65	4.94	198.18	5.32	1.08	5.44
2.45		100.00	11847	2.01	47.41	3.37	35.70	5.08	205.03	5.53	1.10	5.70
Size Analysis Heads:				2.34	42.37	2.93	38.65	4.54	183.66	4.67	1.20	6.63

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Western Energy Co. (Rosebud or Colstrip Mine) **As-Received**

Size Interval: 28 x 100 mesh

% Amount This Size: 3.43

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
					INCREMENTAL							
	1.25											
1.25	1.30											
1.30	1.35											
1.35	1.40											
1.40	1.60	92.68	12161	3.31	8.32	2.46	31.50	3.69	154.50	2.44	1.25	10.00
1.60	1.80	2.53	8945	2.14	45.40	8.52	96.50	12.80	137.30	22.00	0.64	174.00
1.80	2.00	1.20	6455	2.89	126.10	15.60	122.90	15.60	200.00	34.60	1.45	69.20
2.00	2.45	0.54	3015	7.55	95.10	24.70	101.60	12.30	102.70	51.10	5.84	95.10
2.45		3.05	825	3.65	1541.80	22.50	25.90	24.80	115.60	84.60	9.51	110.30
		100.00										

Size Interval: -100 mesh

% Amount This Size: 1.74

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
					INCREMENTAL							
	1.25											
1.25	1.30											
1.30	1.35											
1.35	1.40											
1.40	1.60	80.37	11989	3.42	17.50	3.05	39.50	5.08	217.40	3.65	1.63	110.40
1.60	1.80	7.90	10707	0.76	66.80	7.28	81.10	9.00	103.70	11.10	0.75	167.10
1.80	2.00	2.71	8585	1.12	54.10	9.63	160.80	13.30	150.00	17.80	0.51	299.20
2.00	2.45	2.68	3296	1.51	180.50	25.80	200.60	18.90	102.60	32.70	0.92	374.70
2.45		6.34	899	3.72	333.00	38.00	54.20	24.60	142.90	40.20	6.17	630.20
		100.00										

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Western Energy Co. (Rosebud or Colstrip Mine) **As-Received**

Size Interval: 28 x 100 mesh % Amount This Size: 3.43

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
						CUMULATIVE						
	1.25											
1.25	1.30											
1.30	1.35											
1.35	1.40											
1.40	1.60	92.68	12161	3.31	8.32	2.46	31.50	3.69	154.50	2.44	1.25	10.00
1.60	1.80	95.21	12076	3.28	9.31	2.62	33.23	3.93	154.04	2.96	1.23	14.36
1.80	2.00	96.41	12006	3.27	10.76	2.78	34.34	4.08	154.61	3.35	1.24	15.04
2.00	2.45	96.95	11956	3.30	11.23	2.90	34.72	4.12	154.33	3.62	1.26	15.49
2.45		100.00	11616	3.31	57.91	3.50	34.45	4.75	153.14	6.09	1.51	18.38
	Size Analysis Heads:			3.91	56.40	4.01	29.50	4.82	173.40	5.62	0.89	18.00

Size Interval: -100 mesh % Amount This Size: 1.74

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
						CUMULATIVE						
	1.25											
1.25	1.30											
1.30	1.35											
1.35	1.40											
1.40	1.60	80.37	11989	3.42	17.50	3.05	39.50	5.08	217.40	3.65	1.63	110.40
1.60	1.80	88.27	11874	3.18	21.91	3.43	43.22	5.43	207.22	4.32	1.55	115.47
1.80	2.00	90.98	11776	3.12	22.87	3.61	46.73	5.67	205.52	4.72	1.52	120.95
2.00	2.45	93.66	11534	3.07	27.38	4.25	51.13	6.04	202.57	5.52	1.50	128.21
2.45		100.00	10859	3.12	46.76	6.39	51.32	7.22	198.79	7.72	1.80	160.03
	Size Analysis Heads:			3.16	60.17	6.78	53.83	8.19	179.85	7.78	1.48	146.42

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Western Energy Co. (Rosebud or Colstrip Mine) **As-Received**

Total: Top Size x 0 % Amount This Size: 100.00

INCREMENTAL

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
	1.25	4.64	12760	0.62	29.31	1.81	48.81	3.26	292.22	2.27	0.74	5.32
1.25	1.30	59.79	12313	3.19	30.35	2.58	31.10	3.84	142.50	3.29	1.20	4.04
1.30	1.35	16.14	11790	3.13	57.11	3.35	35.11	4.07	153.86	6.53	1.22	4.70
1.35	1.40	4.30	11080	2.60	83.02	5.16	37.70	8.85	210.39	7.57	0.47	4.75
1.40	1.60	11.02	10696	1.96	47.77	5.84	47.65	9.15	200.81	9.76	0.93	24.82
1.60	1.80	1.54	7482	1.81	142.49	13.92	97.10	12.54	293.26	20.18	1.73	40.44
1.80	2.00	0.83	5685	2.94	336.11	13.21	73.17	16.65	394.38	29.79	5.92	38.29
2.00	2.45	1.15	3686	10.42	270.98	17.31	75.85	18.42	397.71	31.24	12.07	33.11
2.45		0.58	2563	8.52	472.03	26.43	43.54	27.47	884.09	54.30	5.59	178.05
		100.00										

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Western Energy Co. (Rosebud or Colstrip Mine) **As-Received**

Total: Top Size x 0 % Amount This Size: 100.00

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
						CUMULATIVE						
	1.25	4.64	12760	0.62	29.31	1.81	48.81	3.26	292.22	2.27	0.74	5.32
1.25	1.30	64.44	12345	3.00	30.28	2.53	32.38	3.80	153.29	3.22	1.17	4.13
1.30	1.35	80.58	12234	3.03	35.65	2.69	32.92	3.85	153.40	3.88	1.18	4.24
1.35	1.40	84.88	12175	3.01	38.05	2.82	33.17	4.11	156.29	4.07	1.14	4.27
1.40	1.60	95.90	12005	2.89	39.17	3.17	34.83	4.69	161.41	4.72	1.12	6.63
1.60	1.80	97.44	11934	2.87	40.80	3.33	35.81	4.81	163.49	4.97	1.13	7.16
1.80	2.00	98.27	11881	2.87	43.31	3.42	36.13	4.91	165.45	5.18	1.17	7.43
2.00	2.45	99.42	11786	2.96	45.95	3.58	36.59	5.07	168.14	5.48	1.30	7.73
2.45		100.00	11733	2.99	48.40	3.71	36.63	5.20	172.27	5.76	1.32	8.71
Size Analysis Heads:				3.15	43.11	3.24	39.36	4.72	153.75	4.90	1.46	9.25
Head Sample Analysis:				4.75	40.80	3.56	37.10	4.98	169.90	5.21	1.56	9.11

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Western Energy Co. (Rosebud or Colstrip Mine) **As-Received**

		CUM. REC. (%)		CUMULATIVE ELEMENT REJECTION (Wt.%)								
Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
	1.25	4.64	5.05	99.03	97.19	97.74	93.81	97.09	92.12	98.17	97.40	97.16
1.25	1.30	64.44	67.80	35.25	59.69	56.10	43.05	52.89	42.66	64.01	42.89	69.44
1.30	1.35	80.58	84.02	18.37	40.65	41.54	27.57	40.24	28.24	45.70	27.99	60.73
1.35	1.40	84.88	88.08	14.63	33.27	35.56	23.15	32.92	22.99	40.05	26.46	58.38
1.40	1.60	95.90	98.13	7.41	22.40	18.22	8.82	13.52	10.15	21.39	18.74	26.98
1.60	1.80	97.44	99.11	6.48	17.87	12.45	4.74	9.81	7.53	16.00	16.72	19.83
1.80	2.00	98.27	99.51	5.66	12.07	9.48	3.07	7.13	5.62	11.68	12.98	16.16
2.00	2.45	99.42	99.87	1.64	5.62	4.10	0.68	3.04	2.96	5.43	2.44	11.78
2.45		100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Western Energy Co. (Rosebud or Colstrip Mine) **Crushed to -100 Mesh**

						INCREMENTAL						
Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
	+100 M	3.47	12122	0.81	229.80	3.27	24.30	4.20	56.50	5.36	0.70	3.50
100 M	325 M	71.08	11880	3.34	16.30	2.53	25.20	3.94	172.40	5.44	2.03	7.52
325 M	+0	25.45	10887	0.73	62.40	3.91	63.80	6.72	220.50	8.22	0.45	40.30
		96.53										

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Western Energy Co. (Rosebud or Colstrip Mine) **Crushed to - 100 Mesh**

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
					CUMULATIVE							
	+100 M	3.47	12122	0.81	229.80	3.27	24.30	4.20	56.50	5.36	0.70	3.50
100 M	325 M	71.08	11880	3.34	16.30	2.53	25.20	3.94	172.40	5.44	2.03	7.52
325 M	+0	96.53	11618	2.65	28.45	2.89	35.38	4.67	185.08	6.17	1.61	16.16

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Western Energy Co. (Rosebud or Colstrip Mine) **Crushed to -100 Mesh**

				CUMULATIVE (ppm)								
Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
	+100 M	3.47	12122	0.81	229.80	3.27	24.30	4.20	0.06	5.36	0.70	3.50
100 M	325 M	74.55	11891	3.22	26.24	2.56	25.16	3.95	0.17	5.44	1.97	7.33
325 M	+0	100.00	11636	2.59	35.44	2.91	34.99	4.66	0.18	6.14	1.58	15.72
Head Sample Analysis:			11627	2.66	44.10	3.52	45.30	5.39	0.16	7.12	1.07	14.10

		CUM. REC. (%)		CUMULATIVE ELEMENT REJECTION (Wt.%)								
Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
	+100 M	3.47	3.62	98.91	77.50	96.10	97.59	96.87	98.91	96.97	98.46	99.23
100 M	325 M	74.55	76.19	7.18	44.81	34.23	46.40	36.73	31.07	34.05	7.24	65.23
325 M	+0	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Western Energy Co. (Rosebud or Colstrip Mine) **Crushed to -100 Mesh**

Size Interval: -100 mesh

% Amount This Size: 100.00

INCREMENTAL

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
	1.25	4.64	12760	0.62	29.31	1.81	48.81	3.26	292.22	2.27	0.74	5.32
1.25	1.30	59.80	12313	3.19	30.35	2.58	36.09	3.84	142.50	3.29	1.20	4.04
1.30	1.35	0.43	13610	2.34	8.71	3.07	42.00	4.27	290.03	3.07	1.37	52.50
1.35	1.40	11.69	12688	2.34	8.71	3.07	42.00	4.27	290.03	3.07	1.37	52.50
1.40	1.60	15.32	11328	0.97	43.00	5.44	55.90	9.07	300.00	8.46	0.54	12.20
1.60	1.80	3.57	10211	0.64	28.80	4.42	93.20	5.31	90.00	8.76	0.40	12.00
1.80	2.00	1.26	8014	0.84	39.70	9.03	138.60	6.32	235.00	21.70	0.45	86.60
2.00	2.45	0.89	3006	3.56	134.90	12.40	101.80	25.30	270.00	37.30	2.30	72.80
2.45		2.40	1472	5.89	80.30	10.60	69.60	30.20	361.20	25.30	1.37	145.10
		100.00										

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Western Energy Co. (Rosebud or Colstrip Mine) **Crushed to -100 Mesh**

Size Interval: -100 mesh

% Amount This Size: 100.00

CUMULATIVE

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
	1.25	4.64	12760	0.62	29.31	1.81	48.81	3.26	292.22	2.27	0.74	5.32
1.25	1.30	64.44	12345	3.00	30.28	2.52	37.01	3.80	153.28	3.22	1.17	4.13
1.30	1.35	64.87	12354	3.00	30.13	2.53	37.04	3.80	154.19	3.22	1.17	4.45
1.35	1.40	76.56	12405	2.90	26.86	2.61	37.80	3.87	174.93	3.19	1.20	11.79
1.40	1.60	91.88	12225	2.58	29.55	3.08	40.82	4.74	195.78	4.07	1.09	11.86
1.60	1.80	95.45	12150	2.51	29.52	3.13	42.77	4.76	191.83	4.25	1.06	11.86
1.80	2.00	96.71	12096	2.48	29.66	3.21	44.02	4.78	192.39	4.47	1.06	12.84
2.00	2.45	97.60	12013	2.49	30.62	3.29	44.55	4.97	193.10	4.77	1.07	13.38
2.45		100.00	11760	2.58	31.81	3.47	45.15	5.57	197.13	5.27	1.07	16.54
Size Analysis Heads:				2.59	35.44	2.90	35.38	4.65	181.97	6.17	1.58	15.72
Head Sample Analyses:				2.66	44.10	3.52	45.30	5.39	160.20	7.12	1.07	14.10

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Western Energy Co. (Rosebud or Colstrip Mine)

Crushed to -100 Mesh

		CUM. REC. (%)		CUMULATIVE ELEMENT REJECTION (Wt.%)								
Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
	1.25	4.64	5.03	98.88	95.72	97.58	94.98	97.29	93.12	98.00	96.80	98.51
1.25	1.30	64.44	67.65	24.80	38.67	53.10	47.18	56.09	49.89	60.64	29.99	83.91
1.30	1.35	64.87	68.14	24.41	38.55	52.72	46.78	55.76	49.26	60.39	29.44	82.54
1.35	1.40	76.56	80.76	13.79	35.35	42.37	35.91	46.80	32.06	53.58	14.53	45.45
1.40	1.60	91.88	95.51	8.02	14.64	18.35	16.94	21.87	8.75	28.96	6.82	34.15
1.60	1.80	95.45	98.61	7.13	11.41	13.80	9.57	18.47	7.12	23.03	5.50	31.56
1.80	2.00	96.71	99.47	6.72	9.83	10.52	5.71	17.04	5.62	17.83	4.97	24.96
2.00	2.45	97.60	99.70	5.49	6.06	7.33	3.70	13.00	4.40	11.53	3.06	21.05
2.45		100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

AMAX Coal Co.
Belle Ayr Mine

STANDARD LABORATORIES, INC.

GOULD ENERGY DIVISION
PO BOX 214
CRESSON, PA 16630

CQ, INC.
ONE QUALITY CENTER
HOMER CITY, PA 15748

DATE: 06/12/92
SAMPLE NO: 133983

SAMPLE ID: BELLEAYR SECONDARY
CRUSHER REJECT SPLIT MINE SITE

SAMPLED BY:

DATE SAMPLED:

DATE RECEIVED: 11/06/91

OTHER ID: POWDER RIVER BASIN COAL AS-RECEIVED RAW COAL

CERTIFICATE OF ANALYSIS

TRACE ELEMENTS

ARSENIC	2.71 ppm
BARIUM	18.8 ppm
CADMIUM	< 0.10 ppm
CHROMIUM	2.91 ppm
FLUORINE	59.30 ppm
LEAD	2.43 ppm
MERCURY	283.2 ppb
NICKEL	3.88 ppm
SELENIUM	1.20 ppm
SILVER	< 0.10 ppm
ZINC	8.04 ppm
ANTIMONY	< 0.50 ppm

APPROVED BY Doris Pathney
Thomas W. Right

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STANDARD LABORATORIES, INC.

.Q., INC.
QUALITY CENTER BOX 280
OMER CITY, PA 15748

DATE: 06/09/92
MASTER WARNER NO. 133983

SAMPLE ID: RUN 91102301 BELLEAYR

PERATING CO: PROJECT 90D0101 TASK 2.4
INE:
AMPLED BY: CUSTOMER PROVIDED
ATE SAMPLED:

GROSS WEIGHT:
DATE RECEIVED: 11/06/91

THER ID: POWDER RIVER BASIN RAW COAL CHARACTERIZATION AS-RECD SAMPLE TOP X 0
NOMINAL 6 TONS. ALL WEIGHT % ON A DRY BASIS.
*CORRECTED REPORT-THIS REPORT SUPERSEDES ALL PRIOR REPORTS

CERTIFICATE OF ANALYSIS

CREEN SIZE R GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
1 1/2"SQ	6.44	5.49	15.17	< 0.10	2.50	47.20	1.88	327.30	4.38	1.71	< 0.10	6.26	< 0.50
1/2" X 3/4"SQ	31.47	3.71	27.40	< 0.10	2.46	59.60	2.31	262.40	3.39	1.12	< 0.10	7.24	< 0.50
/4" X 3/8" SQ	24.37	1.15	10.18	< 0.10	2.55	59.90	2.25	262.00	3.29	1.04	< 0.10	7.53	< 0.50
/8" SQ X 28M	36.73	1.84	11.40	< 0.10	2.42	52.30	2.14	327.60	2.71	1.21	< 0.10	10.10	< 0.50
8M X 100M	0.72	2.85	13.40	< 0.10	3.35	54.70	3.57	283.10	5.55	1.42	< 0.10	29.80	< 0.50
00M X 325M	0.15	2.70	12.20	< 0.10	2.92	48.80	4.21	593.00	4.63	1.68	< 0.10	40.70	< 0.50
25M X 0	0.11	4.66	21.70	< 0.10	2.75	46.60	5.22	212.30	3.69	1.97	< 0.10	31.00	< 0.50

CUMULATIVE RESULTS

CREEN SIZE R GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
1 1/2"SQ	6.44	5.49	15.17	< 0.10	2.50	47.20	1.88	327.30	4.38	1.71	< 0.10	6.26	< 0.50
1/2" X 3/4"SQ	37.91	4.01	25.32	< 0.10	2.47	57.49	2.24	273.42	3.56	1.22	< 0.10	7.07	< 0.50
/4" X 3/8" SQ	62.28	2.89	19.40	< 0.10	2.50	58.44	2.24	268.95	3.45	1.15	< 0.10	7.25	< 0.50
/8" SQ X 28M	99.01	2.50	16.43	< 0.10	2.47	56.16	2.20	290.71	3.18	1.17	< 0.10	8.31	< 0.50
8M X 100M	99.73	2.50	16.41	< 0.10	2.48	56.15	2.21	290.66	3.19	1.17	< 0.10	8.46	< 0.50
00M X 325M	99.88	2.50	16.40	< 0.10	2.48	56.14	2.22	291.11	3.20	1.17	< 0.10	8.51	< 0.50
25M X 0	99.99	2.51	16.41	< 0.10	2.48	56.13	2.22	291.02	3.20	1.18	< 0.10	8.54	< 0.50

ALL TRACE ELEMENTS RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY _____

APPROVED BY _____

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STANDARD LABORATORIES, INC.

J.Q.. INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/10/93
MASTER WARNER NO. 133983

SAMPLE ID: RUN 91102301 BELLEAYR

OPERATING CO: PROJECT 90D0101 TASK 2.4
MINE:
SAMPLED BY: CUSTOMER PROVIDED
DATE SAMPLED:

GROSS WEIGHT:
DATE RECEIVED: 11/06/91

OTHER ID: POWDER RIVER BASIN RAW COAL CHARACTERIZATION AS-RECD SAMPLE TOP X 0
NOMINAL 6 TONS. ALL WEIGHT % ON A DRY BASIS
*CORRECTED COPY-THIS REPORT SUPERSEDES ALL PRIOR REPORTS

CERTIFICATE OF ANALYSIS

FEED FOR SIZE +3/4" SQ

SCREEN SIZE OR GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
1.25	30.78	3.68	8.09	< 0.10	1.24	124.10	1.16	335.70	2.85	1.43	< 0.10	3.75	< 0.50
.30	62.75	3.42	29.30	< 0.10	2.13	30.00	2.11	284.20	3.14	1.13	< 0.10	5.49	< 0.50
..35	4.06	1.75	16.70	< 0.10	5.66	34.90	5.97	597.20	4.71	0.71	< 0.10	11.60	< 0.50
1.40	0.97	1.34	51.20	< 0.10	16.20	44.80	12.40	369.50	10.20	0.64	< 0.10	104.50	< 0.50
.60	1.15	1.84	334.30	< 0.10	19.60	70.60	28.60	532.90	15.80	0.78	< 0.10	31.60	< 0.50
.80	0.16	2.09	341.30	< 0.10	22.80	90.60	17.10	411.90	17.10	0.84	< 0.10	39.80	< 0.50
2.00	0.05	2.79	269.60	< 0.10	26.70	111.90	36.00	686.60	24.00	1.42	< 0.10	65.40	< 0.50
2.45	0.01	8.87	237.10	< 0.10	125.80	93.70	50.00	1054.10	119.80	1.83	< 0.10	1325.90	< 0.50
..45 SINK	0.07	6.71	498.60	< 0.10	157.90	118.60	24.90	194.20	76.90	3.84	< 0.10	153.70	< 0.50

CUMULATIVE RESULTS

SCREEN SIZE OR GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
.25	30.78	3.68	8.09	< 0.10	1.24	124.10	1.16	335.70	2.85	1.43	< 0.10	3.75	< 0.50
.30	93.53	3.51	22.32	< 0.10	1.84	60.97	1.80	301.15	3.04	1.23	< 0.10	4.92	< 0.50
1.35	97.59	3.43	22.09	< 0.10	2.00	59.88	1.97	313.46	3.11	1.21	< 0.10	5.20	< 0.50
.40	98.56	3.41	22.37	< 0.10	2.14	59.73	2.07	314.02	3.18	1.20	< 0.10	6.17	< 0.50
.60	99.71	3.39	25.97	< 0.10	2.34	59.86	2.38	316.54	3.33	1.20	< 0.10	6.47	< 0.50
.80	99.87	3.39	26.48	< 0.10	2.37	59.91	2.40	316.69	3.35	1.20	< 0.10	6.52	< 0.50
2.00	99.92	3.39	26.60	< 0.10	2.38	59.94	2.42	316.88	3.36	1.20	< 0.10	6.55	< 0.50
..45	99.93	3.39	26.62	< 0.10	2.39	59.94	2.42	316.95	3.37	1.20	< 0.10	6.68	< 0.50
..45 SINK	100.00	3.39	26.95	< 0.10	2.50	59.98	2.44	316.87	3.42	1.20	< 0.10	6.78	< 0.50

ALL TRACE ELEMENT RESULTS ARE STATED IN ppm EXECPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALITICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY Thomas A. Rayston

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STANDARD LABORATORIES, INC.

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/10/92
MASTER WARNER NO. 133983

SAMPLE ID: RUN #91102301 BELLEAYR

OPERATING CO: PROJECT 90D0101 TASK 2.4
MINE:
SAMPLED BY: CUSTOMER PROVIDED
DATE SAMPLED:

GROSS WEIGHT:
DATE RECEIVED: 11/06/91

OTHER ID: POWDER RIVER BASIN RAW COAL CHARACTERIZATION AS-RECD SAMPLE TOP X 0
NOMINAL 6 TONS. ALL WEIGHT % ON A DRY BASIS
*CORRECTED COPY-THIS REPORT SUPERSEDES ALL PRIOR REPORTS

CERTIFICATE OF ANALYSIS

FEED FOR SIZE 3/4"SQ X 28M

SCREEN SIZE OR GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMON
1.25	30.73	1.72	11.10	< 0.10	1.51	49.40	1.29	378.80	2.59	0.68	< 0.10	4.96	< 0.50
1.30	60.12	1.27	9.27	< 0.10	2.17	50.00	1.91	205.10	2.81	1.57	< 0.10	6.00	< 0.50
1.35	4.42	1.69	4.94	< 0.10	7.64	112.40	6.68	376.90	6.97	0.88	< 0.10	27.00	< 0.50
1.40	1.59	1.62	5.72	< 0.10	6.06	59.50	6.39	410.50	3.37	0.66	< 0.10	22.90	< 0.50
1.60	2.35	2.81	15.20	< 0.10	13.00	74.80	14.60	578.40	5.42	1.04	< 0.10	24.90	< 0.50
1.80	0.53	2.59	201.20	< 0.10	21.30	91.40	11.70	588.60	17.00	0.98	< 0.10	42.60	< 0.50
2.00	0.13	4.00	121.60	< 0.10	37.80	82.20	24.30	612.20	39.20	1.24	< 0.10	125.70	< 0.50
2.45	0.09	4.90	71.80	< 0.10	26.10	137.70	22.80	1234.90	35.90	1.87	< 0.10	135.40	< 0.50
2.45 SINK	0.04	15.60	131.00	< 0.10	72.90	84.80	41.40	36.60	114.40	2.40	< 0.10	805.70	< 0.50

CUMULATIVE RESULTS

SCREEN SIZE OR GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMON
1.25	30.73	1.72	11.10	< 0.10	1.51	49.40	1.29	378.80	2.59	0.68	< 0.10	4.96	< 0.50
1.30	90.85	1.42	9.89	< 0.10	1.95	49.80	1.70	263.85	2.74	1.27	< 0.10	5.65	< 0.50
1.35	95.27	1.43	9.66	< 0.10	2.21	52.70	1.93	269.10	2.93	1.25	< 0.10	6.64	< 0.50
1.40	96.86	1.44	9.59	< 0.10	2.27	52.81	2.00	271.42	2.94	1.24	< 0.10	6.91	< 0.50
1.60	99.21	1.47	9.73	< 0.10	2.53	53.33	2.30	278.69	3.00	1.24	< 0.10	7.33	< 0.50
1.80	99.74	1.48	10.74	< 0.10	2.63	53.54	2.35	280.34	3.07	1.24	< 0.10	7.52	< 0.50
2.00	99.87	1.48	10.89	< 0.10	2.67	53.57	2.38	280.77	3.12	1.24	< 0.10	7.67	< 0.50
2.45	99.96	1.48	10.94	< 0.10	2.69	53.65	2.40	281.63	3.15	1.24	< 0.10	7.79	< 0.50
2.45 SINK	100.00	1.49	10.99	< 0.10	2.72	53.66	2.42	281.53	3.19	1.24	< 0.10	8.11	< 0.50

ALL TRACE ELEMENT RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY _____

APPROVED BY _____

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

STANDARD LABORATORIES, INC.

).., INC.
QUALITY CENTER BOX 280
IER CITY, PA 15748

DATE: 06/09/92
MASTER WARNER NO. 133983

SAMPLE ID: RUN #91102301 BELLEAYR

RATING CO: PROJECT 90D0101 TASK 2.4
IE:
IPLED BY: CUSTOMER PROVIDED
E SAMPLED:

GROSS WEIGHT:
DATE RECEIVED: 11/06/91

ER ID: POWDER RIVER BASIN RAW COAL CHARACTERIZATION AS-RECD SAMPLE TOP X 0
NOMINAL 6 TONS. ALL WEIGHT % ON A DRY BASIS
*CORRECTED REPORT-THIS REPORT SUPERSEDES ALL PRIOR REPORTS
INSUFFICIENT MATERIAL FOR 1.35, 1.40, AND 1.60 GRAVITIES.

CERTIFICATE OF ANALYSIS

FEED FOR SIZE 28M X 100M

EEN SIZE GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
5	1.74	1.88	6.62	< 0.10	6.02	52.20	5.87	400.00	4.06	1.08	< 0.10	32.70	< 0.50
0	91.76	2.53	8.80	< 0.10	1.96	56.20	1.96	279.40	2.66	1.20	< 0.10	25.70	< 0.50
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	4.29	2.29	100.20	< 0.10	10.50	76.60	20.40	472.80	12.80	1.39	< 0.10	52.30	< 0.50
0	0.78	3.54	30.90	< 0.10	22.10	134.50	32.00	637.10	23.20	1.34	< 0.10	146.70	< 0.50
5	0.70	5.22	72.90	< 0.10	26.30	81.80	30.60	806.00	32.10	2.28	< 0.10	230.40	< 0.50
5 SINK	0.73	7.50	37.80	< 0.10	92.90	36.10	43.00	624.50	118.70	3.04	< 0.10	884.20	< 0.50

CUMULATIVE RESULTS

EEN SIZE GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
5	1.74	1.88	6.62	< 0.10	6.02	52.20	5.87	400.00	4.06	1.08	< 0.10	32.70	< 0.50
0	93.50	2.52	8.76	< 0.10	2.04	56.13	2.03	281.64	2.69	1.20	< 0.10	25.83	< 0.50
5	93.50	2.52	8.76	< 0.10	2.04	56.13	2.03	281.64	2.69	1.20	< 0.10	25.83	< 0.50
0	93.50	2.52	8.76	< 0.10	2.04	56.13	2.03	281.64	2.69	1.20	< 0.10	25.83	< 0.50
0	93.50	2.52	8.76	< 0.10	2.04	56.13	2.03	281.64	2.69	1.20	< 0.10	25.83	< 0.50
0	97.79	2.51	12.77	< 0.10	2.41	57.02	2.84	290.03	3.13	1.21	< 0.10	26.99	< 0.50
0	98.57	2.52	12.91	< 0.10	2.56	57.64	3.07	292.78	3.29	1.21	< 0.10	27.94	< 0.50
5	99.27	2.54	13.34	< 0.10	2.73	57.81	3.26	296.40	3.49	1.21	< 0.10	29.37	< 0.50
5 SINK	100.00	2.57	13.52	< 0.10	3.39	57.65	3.55	298.79	4.33	1.23	< 0.10	35.61	< 0.50

ALL TRACE ELEMENT RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY Don Fahey

APPROVED BY

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

STANDARD LABORATORIES, INC.

}., INC.
QUALITY CENTER BOX 280
(ER CITY, PA 15748

DATE: 06/10/92
MASTER WARNER NO. 133983

SAMPLE ID: RUN #91102301 BELLEAYR

3RATING CO: PROJECT 90D0101 TASK 2.4
IE:
IPLED BY: CUSTOMER PROVIDED
'E SAMPLED:

GROSS WEIGHT:
DATE RECEIVED: 11/06/91

IER ID: POWDER RIVER BASIN RAW COAL CHARACTERIZATION AS-RECD SAMPLE TOP X 0 NOMINAL 6 TONS. ALL WEIGHT % ON A DRY BASIS
ALL WEIGHT % ON A DRY BASIS
*CORRECTED REPORT-THIS SUPERSEDES ALL PRIOR REPORTS
INSUFFICIENT MATERIAL FOR THE 1.25, 1.35, 1.40, 1.60, AND 2.45 GRAVITIES.

CERTIFICATE OF ANALYSIS

FEED FOR SIZE 100M X 0

:REEN SIZE GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
:5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
:0	86.29	2.95	13.27	< 0.10	1.96	50.60	2.29	340.00	3.43	1.57	< 0.10	24.90	< 0.50
:5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
;0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
:0	9.40	5.35	16.03	< 0.10	6.27	60.40	5.07	798.60	6.51	2.46	< 0.10	38.10	< 0.50
)0	1.41	2.29	3.65	< 0.10	12.20	209.50	12.80	545.10	11.60	1.02	< 0.10	209.30	< 0.50
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5 SINK	2.90	9.93	12.60	< 0.10	16.80	55.90	44.10	1342.00	31.50	2.53	< 0.10	424.40	< 0.50

CUMULATIVE RESULTS

:EEN SIZE GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	86.29	2.95	13.27	< 0.10	1.96	50.60	2.29	340.00	3.43	1.57	< 0.10	24.90	< 0.50
5	86.29	2.95	13.27	< 0.10	1.96	50.60	2.29	340.00	3.43	1.57	< 0.10	24.90	< 0.50
0	86.29	2.95	13.27	< 0.10	1.96	50.60	2.29	340.00	3.43	1.57	< 0.10	24.90	< 0.50
0	86.29	2.95	13.27	< 0.10	1.96	50.60	2.29	340.00	3.43	1.57	< 0.10	24.90	< 0.50
0	95.69	3.19	13.54	< 0.10	2.38	51.56	2.56	385.05	3.73	1.66	< 0.10	26.20	< 0.50
0	97.10	3.17	13.40	< 0.10	2.53	53.86	2.71	387.37	3.85	1.65	< 0.10	28.86	< 0.50
5	97.10	3.17	13.40	< 0.10	2.53	53.86	2.71	387.37	3.85	1.65	< 0.10	28.86	< 0.50
5 SINK	100.00	3.37	13.37	< 0.10	2.94	53.92	3.91	415.06	4.65	1.67	< 0.10	40.33	< 0.50

ALL TRACE ELEMENT RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY _____

APPROVED BY _____

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

GOULD ENERGY DIVISION
PO BOX 214
CRESSON, PA 16630
STANDARD LABORATORIES,INC.
DATE: 06/10/93
SAMPLE NO: 134034

CQ, INC.
ONE QUALITY CENTER
HOMER CITY, PA 15748

SAMPLE ID: BELLEAYR
RUN #91102301

SAMPLED BY:

DATE SAMPLED: DATE RECEIVED: 11/06/91

OTHER ID: POWDER RIVER BASIN CRUSHED TO 100M TOPSIZE

CORRECTED REPORT - THIS REPORT SUPERSEDES ALL PRIOR REPORTS IDENTIFIED WITH THE SAME LABORATORY NUMBER.

CERTIFICATE OF ANALYSIS

TRACE ELEMENTS

ARSENIC	3.00 ppm
BARIUM	20.90 ppm
CADMIUM	< 0.10 ppm
CHROMIUM	3.09 ppm
FLUORINE	44.5 ppm
LEAD	2.40 ppm
MERCURY	333.3 ppb
NICKEL	3.94 ppm
SELENIUM	1.10 ppm
SILVER	< 0.10 ppm
ZINC	9.26 ppm
ANTIMONY	< 0.50 ppm

APPROVED BY Thomas A. Rapp

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

STANDARD LABORATORIES, INC.

Q., INC.
QUALITY CENTER BOX 280
MER CITY, PA 15748

DATE: 06/10/92
MASTER WARNER NO. 134034

SAMPLE ID: RUN #91102301 BELLEAYR

ERATING CO: PROJECT 90D0101 TASK 2.4
VE:
MPLED BY: CUSTOMER PROVIDED
TE SAMPLED:

GROSS WEIGHT:
DATE RECEIVED: 11/06/91

IER ID: POWDER RIVER BASIN CHANGE IN RAW COAL SIZE DIST. WITH CRUSHING.
AS-RECEIVED SAMPLE CRUSHED TO 100M. ALL WEIGHT % ON A DRY BASIS
*CORRECTED REPORT-THIS REPORT SUPERSEDES ALL PRIOR REPORTS

CERTIFICATE OF ANALYSIS

REEN SIZE GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
DOM	4.89	3.01	4.27	< 0.10	2.90	43.60	1.88	405.60	4.44	1.50	< 0.10	10.10	< 0.50
DM X 325M	63.42	2.41	20.40	< 0.10	2.57	42.40	2.40	345.80	3.60	0.89	< 0.10	8.50	< 0.50
5M X 0	31.69	3.79	19.90	< 0.10	4.24	54.20	4.24	295.60	6.48	1.78	< 0.10	13.10	< 0.50

CUMULATIVE RESULTS

REEN SIZE GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
DOM	4.89	3.01	4.27	< 0.10	2.90	43.60	1.88	405.60	4.44	1.50	< 0.10	10.10	< 0.50
DM X 325M	68.31	2.45	19.25	< 0.10	2.59	42.49	2.36	350.08	3.66	0.93	< 0.10	8.61	< 0.50
5M X 0	100.00	2.88	19.45	< 0.10	3.12	46.20	2.96	332.82	4.55	1.20	< 0.10	10.04	< 0.50

ALL TRACE ELEMENT RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY Don Petney

APPROVED BY

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

GOULD ENERGY DIVISION
PO BOX 214
CRESSON, PA 16630
STANDARD LABORATORIES, INC.

CQ, INC.
ONE QUALITY CENTER
HOMER CITY, PA 15748

DATE: 06/10/93
SAMPLE NO: 134070

SAMPLE ID: BELLEAYR
RUN #91102301

SAMPLED BY:

DATE SAMPLED:

DATE RECEIVED: 11/06/91

OTHER ID: POWDER RIVER BASIN AS RECD COAL 1.30 SINK CRUSHED 100M TOPSIZE

CORRECTED REPORT - THIS REPORT SUPERCEDES ALL PRIOR REPORTS IDENTIFIED WITH THE SAME LABORATORY NUMBER.

CERTIFICATE OF ANALYSIS

TRACE ELEMENTS

ARSENIC	2.65 ppm
BARIUM	23.7 ppm
CADMIUM	< 0.10 ppm
CHROMIUM	10.70 ppm
FLUORINE	59.80 ppm
LEAD	10.20 ppm
MERCURY	480.60 ppb
NICKEL	7.28 ppm
SELENIUM	0.90 ppm
SILVER	< 0.10 ppm
ZINC	38.00 ppm
ANTIMONY	< 0.50 ppm

APPROVED BY Thomas A. Right

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STANDARD LABORATORIES, INC.

.Q., INC.
QUALITY CENTER BOX 280
OMER CITY, PA 15748

DATE: 06/09/92
MASTER WARNER NO. 134070

SAMPLE ID: RUN #91102301 BELLEAYR

PERATING CO: PROJECT 90D0101 TASK 2.4
INE:
AMPLED BY: CUSTOMER PROVIDED
ATE SAMPLED:

GROSS WEIGHT:
DATE RECEIVED: 11/06/91

THER ID: POWDER RIVER BASIN RAW COAL LIBERATION. 1.30 SINK OF AS-RECD SAMPLE CRUSHED TO 100M. ALL WEIGHT % ON A DRY BASIS
*CORRECTED REPORT-THIS REPORT SUPERSEDES ALL PRIOR REPORTS
INSUFFIICIENT MATERIAL FOR THE 1.25, 1.30, 1.35, AND 1.40 GRAVITIES.

CERTIFICATE OF ANALYSIS

CREEN SIZE R GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
.60	62.10	2.87	3.63	< 0.10	5.99	35.90	5.34	342.50	3.42	1.00	< 0.10	35.70	< 0.50
.80	23.98	2.38	24.10	< 0.10	13.50	62.10	12.00	473.00	7.71	0.97	< 0.10	21.00	< 0.50
.00	4.68	3.61	37.10	< 0.10	21.90	162.20	17.70	314.00	18.60	1.60	< 0.10	63.30	< 0.50
.45	4.04	3.80	126.30	< 0.10	22.60	123.90	22.60	534.00	35.50	1.63	< 0.10	105.30	< 0.50
.45 SINK	5.20	8.90	170.50	< 0.10	8.70	47.70	45.70	1333.70	28.30	2.25	< 0.10	119.60	< 0.50

CUMULATIVE RESULTS

CREEN SIZE R GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
.40	0.00	0.00	0.00	< 0.00	0.00	0.00	0.00	0.00	0.00	0.00	< 0.00	0.00	< 0.00
.60	62.10	2.87	3.63	< 0.10	5.99	35.90	5.34	342.50	3.42	1.00	< 0.10	35.70	< 0.50
.80	86.08	2.73	9.33	< 0.10	8.08	43.20	7.20	378.85	4.62	0.99	< 0.10	31.60	< 0.50
.00	90.76	2.78	10.76	< 0.10	8.79	49.33	7.74	375.51	5.34	1.02	< 0.10	33.24	< 0.50
.45	94.80	2.82	15.69	< 0.10	9.38	52.51	8.37	382.26	6.62	1.05	< 0.10	36.31	< 0.50
.45 SINK	100.00	3.14	23.74	< 0.10	9.35	52.26	10.31	431.74	7.75	1.11	< 0.10	40.64	< 0.50

ALL TRACE ELEMENT RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY Doris Pathney

APPROVED BY

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

CQE: POWDER RIVER COAL CHARACTERIZATION

AMAX Coal Co. (Belle Ayr Mine) **As-Received**

INCREMENTAL

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
+	1-1/2 in.	6.44	12145	5.49	15.17	2.50	47.20	1.88	327.30	4.38	1.71	6.26
1-1/2 in.	3/4 in.	31.47	12140	3.71	27.40	2.46	59.60	2.31	262.40	3.39	1.12	7.24
		37.91										

INCREMENTAL

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
3/4 in.	3/8 in.	24.37	12129	1.15	10.18	2.55	59.90	2.25	262.00	3.29	1.04	7.53
3/8 in.	28 M	36.73	12135	1.84	11.40	2.42	52.30	2.14	327.60	2.71	1.21	10.10
		61.10										

INCREMENTAL

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
28 M	100 M	0.72	11936	2.85	13.40	3.35	54.70	3.57	283.10	5.55	1.42	29.80

INCREMENTAL

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
100 M	325 M	0.15	11842	2.70	12.20	2.92	48.80	4.21	593.00	4.63	1.68	40.70
325 M	+0	0.11	11437	4.66	21.70	2.75	46.60	5.22	212.30	3.69	1.97	31.00
		0.26										

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATION

AMAX Coal Co. (Belle Ayr Mine) **As-Received**

CUMULATIVE (BY SIZE GROUP)

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
+	1-1/2 in.	6.44	12145	5.49	15.17	2.50	47.20	1.88	327.30	4.38	1.71	6.26
1-1/2 in.	3/4 in.	37.91	12141	4.01	25.32	2.47	57.49	2.24	273.42	3.56	1.22	7.07

CUMULATIVE (BY SIZE GROUP)

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
3/4 in.	3/8 in.	24.37	12129	1.15	10.18	2.55	59.90	2.25	262.00	3.29	1.04	7.53
3/8 in.	28 M	61.10	12133	1.56	10.91	2.47	55.33	2.18	301.44	2.94	1.14	9.07

CUMULATIVE (BY SIZE GROUP)

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
28 M	100 M	0.72	11936	2.85	13.40	3.35	54.70	3.57	283.10	5.55	1.42	29.80

CUMULATIVE (BY SIZE GROUP)

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
100 M	325 M	0.15	11842	2.70	12.20	2.92	48.80	4.21	593.00	4.63	1.68	40.70
325 M	+0	0.26	11671	3.53	16.22	2.85	47.87	4.64	431.93	4.23	1.80	36.60

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATION

AMAX Coal Co. (Belle Ayr Mine) **As-Received**

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
				CUMULATIVE (ppm)								
+	1-1/2 in.	6.44	12145	5.49	15.17	2.50	47.20	1.88	0.33	4.38	1.71	6.26
1-1/2 in.	3/4 in.	37.91	12141	4.01	25.32	2.47	57.49	2.24	0.27	3.56	1.22	7.07
3/4 in.	3/8 in.	62.28	12136	2.89	19.40	2.50	58.44	2.24	0.27	3.45	1.15	7.25
3/8 in.	28 M	99.01	12136	2.50	16.43	2.47	56.16	2.20	0.29	3.18	1.17	8.31
28 M	100 M	99.73	12134	2.50	16.41	2.48	56.15	2.21	0.29	3.19	1.17	8.46
100 M	325 M	99.88	12134	2.50	16.40	2.48	56.14	2.22	0.29	3.20	1.17	8.51
325 M	+0	99.99	12133	2.51	16.41	2.48	56.13	2.22	0.29	3.20	1.18	8.54
Head Sample Analysis:			12045	2.71	18.80	2.91	59.30	2.43	0.28	3.88	1.20	8.04

Passing	Retained	CUM. REC. (%) Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
				CUMULATIVE ELEMENT REJECTION (Wt.%)								
+	1-1/2 in.	6.44	6.45	85.90	94.05	93.50	94.58	94.55	92.76	91.18	90.63	95.28
1-1/2 in.	3/4 in.	37.91	37.94	39.32	41.49	62.25	61.16	61.80	64.38	57.81	60.64	68.59
3/4 in.	3/8 in.	62.28	62.30	28.14	26.37	37.16	35.15	37.11	42.44	32.73	39.08	47.09
3/8 in.	28 M	99.01	99.04	1.18	0.85	1.27	0.92	1.70	1.09	1.59	1.27	3.63
28 M	100 M	99.73	99.75	0.37	0.26	0.30	0.22	0.54	0.39	0.34	0.40	1.11
100 M	325 M	99.88	99.90	0.20	0.15	0.12	0.09	0.26	0.08	0.13	0.18	0.40
325 M	+0	99.99	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CQE: POWDER RIVER COAL CHARACTERIZATIONS

AMAX Coal Co. (Belle Ayr Mine) **As-Received**

Size Interval: + 3/4-in % Amount This Size: 37.91

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
					INCREMENTAL							
	1.25	30.78	12451	3.68	8.09	1.24	124.10	1.16	335.70	2.85	1.43	3.75
1.25	1.30	62.75	12289	3.42	29.30	2.13	30.00	2.11	284.20	3.14	1.13	5.49
1.30	1.35	4.06	11298	1.75	16.70	5.66	34.90	5.97	597.20	4.71	0.71	11.60
1.35	1.40	0.97	9898	1.34	51.20	16.20	44.80	12.40	369.50	10.20	0.64	104.50
1.40	1.60	1.15	8398	1.84	334.30	19.60	70.60	28.60	532.90	15.80	0.78	31.60
1.60	1.80	0.16	6201	2.09	341.30	22.80	90.60	17.10	411.90	17.10	0.84	39.80
1.80	2.00	0.05	5130	2.79	269.60	26.70	111.90	36.00	686.60	24.00	1.42	65.40
2.00	2.45	0.01	4409	8.87	237.10	125.80	93.70	50.00	1054.10	119.10	1.83	1325.90
2.45		0.07	1002	6.71	498.60	157.90	118.60	24.90	194.20	76.90	3.84	153.70
		100.00										

Size Interval: 3/4-in x 28 mesh % Amount This Size: 61.10

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
					INCREMENTAL							
	1.25	30.73	12258	1.72	11.10	1.51	49.40	1.29	378.80	2.59	0.68	4.96
1.25	1.30	60.12	12219	1.27	9.27	2.17	50.00	1.91	205.10	2.81	1.57	6.00
1.30	1.35	4.42	11448	1.69	4.94	7.64	112.40	6.68	376.90	6.97	0.88	27.00
1.35	1.40	1.59	11334	1.62	5.72	6.06	59.50	6.39	410.50	3.37	0.66	22.90
1.40	1.60	2.35	10047	2.81	15.20	13.00	74.80	14.60	578.40	5.42	1.04	24.90
1.60	1.80	0.53	7132	2.59	201.20	21.30	91.40	11.70	588.60	17.00	0.98	42.60
1.80	2.00	0.13	5706	4.00	121.60	37.80	82.20	24.30	612.20	39.20	1.24	125.70
2.00	2.45	0.09	3678	4.90	71.80	26.10	137.70	22.80	1234.90	35.90	1.87	135.40
2.45		0.04	3676	15.60	131.00	72.90	84.80	41.40	36.60	114.40	2.40	805.70
		100.00										

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

AMAX Coal Co. (Belle Ayr Mine) **As-Received**

Size Interval: + 3/4-in % Amount This Size: 37.91

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
						CUMULATIVE						
	1.25	30.78	12451	3.68	8.09	1.24	124.10	1.16	335.70	2.85	1.43	3.75
1.25	1.30	93.53	12342	3.51	22.32	1.84	60.97	1.80	301.15	3.04	1.23	4.92
1.30	1.35	97.59	12299	3.43	22.09	2.00	59.88	1.97	313.46	3.11	1.21	5.20
1.35	1.40	98.56	12275	3.41	22.37	2.14	59.73	2.07	314.02	3.18	1.20	6.17
1.40	1.60	99.71	12231	3.39	25.97	2.34	59.86	2.38	316.54	3.33	1.20	6.47
1.60	1.80	99.87	12221	3.39	26.48	2.37	59.91	2.40	316.69	3.35	1.20	6.52
1.80	2.00	99.92	12217	3.39	26.60	2.38	59.94	2.42	316.88	3.36	1.20	6.55
2.00	2.45	99.93	12217	3.39	26.62	2.39	59.94	2.42	316.95	3.37	1.20	6.68
2.45		100.00	12209	3.39	26.95	2.50	59.98	2.44	316.87	3.42	1.20	6.78
Size Analysis Heads:				4.01	25.32	2.47	57.49	2.24	273.42	3.56	1.22	7.07

Size Interval: 3/4-in x 28 mesh % Amount This Size: 61.10

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
						CUMULATIVE						
	1.25	30.73	12258	1.72	11.10	1.51	49.40	1.29	378.80	2.59	0.68	4.96
1.25	1.30	90.85	12232	1.42	9.89	1.95	49.80	1.70	263.85	2.74	1.27	5.65
1.30	1.35	95.27	12196	1.43	9.66	2.21	52.70	1.93	269.10	2.93	1.25	6.64
1.35	1.40	96.86	12182	1.44	9.59	2.27	52.81	2.00	271.42	2.94	1.24	6.91
1.40	1.60	99.21	12131	1.47	9.73	2.53	53.33	2.30	278.69	3.00	1.24	7.33
1.60	1.80	99.74	12105	1.48	10.74	2.63	53.54	2.35	280.34	3.07	1.24	7.52
1.80	2.00	99.87	12096	1.48	10.89	2.67	53.57	2.38	280.77	3.12	1.24	7.67
2.00	2.45	99.96	12089	1.48	10.94	2.69	53.65	2.40	281.63	3.15	1.24	7.79
2.45		100.00	12085	1.49	10.99	2.72	53.66	2.42	281.53	3.19	1.24	8.11
Size Analysis Heads:				1.56	10.91	2.47	55.33	2.18	301.44	2.94	1.14	9.07

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

AMAX Coal Co. (Belle Ayr Mine) **As-Received**

Size Interval: + 3/4-in % Amount This Size: 37.91

INCREMENTAL

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
	1.25	30.78	12451	3.68	8.09	1.24	124.10	1.16	335.70	2.85	1.43	3.75
1.25	1.30	62.75	12289	3.42	29.30	2.13	30.00	2.11	284.20	3.14	1.13	5.49
1.30	1.35	4.06	11298	1.75	16.70	5.66	34.90	5.97	597.20	4.71	0.71	11.60
1.35	1.40	0.97	9898	1.34	51.20	16.20	44.80	12.40	369.50	10.20	0.64	104.50
1.40	1.60	1.15	8398	1.84	334.30	19.60	70.60	28.60	532.90	15.80	0.78	31.60
1.60	1.80	0.16	6201	2.09	341.30	22.80	90.60	17.10	411.90	17.10	0.84	39.80
1.80	2.00	0.05	5130	2.79	269.60	26.70	111.90	36.00	686.60	24.00	1.42	65.40
2.00	2.45	0.01	4409	8.87	237.10	125.80	93.70	50.00	1054.10	119.10	1.83	1325.90
2.45		0.07	1002	6.71	498.60	157.90	118.60	24.90	194.20	76.90	3.84	153.70
		100.00										

Size Interval: 3/4-in x 28 mesh % Amount This Size: 61.10

INCREMENTAL

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
	1.25	30.73	12258	1.72	11.10	1.51	49.40	1.29	378.80	2.59	0.68	4.96
1.25	1.30	60.12	12219	1.27	9.27	2.17	50.00	1.91	205.10	2.81	1.57	6.00
1.30	1.35	4.42	11448	1.69	4.94	7.64	112.40	6.68	376.90	6.97	0.88	27.00
1.35	1.40	1.59	11334	1.62	5.72	6.06	59.50	6.39	410.50	3.37	0.66	22.90
1.40	1.60	2.35	10047	2.81	15.20	13.00	74.80	14.60	578.40	5.42	1.04	24.90
1.60	1.80	0.53	7132	2.59	201.20	21.30	91.40	11.70	588.60	17.00	0.98	42.60
1.80	2.00	0.13	5706	4.00	121.60	37.80	82.20	24.30	612.20	39.20	1.24	125.70
2.00	2.45	0.09	3678	4.90	71.80	26.10	137.70	22.80	1234.90	35.90	1.87	135.40
2.45		0.04	3676	15.60	131.00	72.90	84.80	41.40	36.60	114.40	2.40	805.70
		100.00										

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

AMAX Coal Co. (Belle Ayr Mine) **As-Received**

Size Interval: + 3/4-in % Amount This Size: 37.91

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
						CUMULATIVE						
	1.25	30.78	12451	3.68	8.09	1.24	124.10	1.16	335.70	2.85	1.43	3.75
1.25	1.30	93.53	12342	3.51	22.32	1.84	60.97	1.80	301.15	3.04	1.23	4.92
1.30	1.35	97.59	12299	3.43	22.09	2.00	59.88	1.97	313.46	3.11	1.21	5.20
1.35	1.40	98.56	12275	3.41	22.37	2.14	59.73	2.07	314.02	3.18	1.20	6.17
1.40	1.60	99.71	12231	3.39	25.97	2.34	59.86	2.38	316.54	3.33	1.20	6.47
1.60	1.80	99.87	12221	3.39	26.48	2.37	59.91	2.40	316.69	3.35	1.20	6.52
1.80	2.00	99.92	12217	3.39	26.60	2.38	59.94	2.42	316.88	3.36	1.20	6.55
2.00	2.45	99.93	12217	3.39	26.62	2.39	59.94	2.42	316.95	3.37	1.20	6.68
2.45		100.00	12209	3.39	26.95	2.50	59.98	2.44	316.87	3.42	1.20	6.78
Size Analysis Heads:				4.01	25.32	2.47	57.49	2.24	273.42	3.56	1.22	7.07

Size Interval: 3/4-in x 28 mesh % Amount This Size: 61.10

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
						CUMULATIVE						
	1.25	30.73	12258	1.72	11.10	1.51	49.40	1.29	378.80	2.59	0.68	4.96
1.25	1.30	90.85	12232	1.42	9.89	1.95	49.80	1.70	263.85	2.74	1.27	5.65
1.30	1.35	95.27	12196	1.43	9.66	2.21	52.70	1.93	269.10	2.93	1.25	6.64
1.35	1.40	96.86	12182	1.44	9.59	2.27	52.81	2.00	271.42	2.94	1.24	6.91
1.40	1.60	99.21	12131	1.47	9.73	2.53	53.33	2.30	278.69	3.00	1.24	7.33
1.60	1.80	99.74	12105	1.48	10.74	2.63	53.54	2.35	280.34	3.07	1.24	7.52
1.80	2.00	99.87	12096	1.48	10.89	2.67	53.57	2.38	280.77	3.12	1.24	7.67
2.00	2.45	99.96	12089	1.48	10.94	2.69	53.65	2.40	281.63	3.15	1.24	7.79
2.45		100.00	12085	1.49	10.99	2.72	53.66	2.42	281.53	3.19	1.24	8.11
Size Analysis Heads:				1.56	10.91	2.47	55.33	2.18	301.44	2.94	1.14	9.07

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

AMAX Coal Co. (Belle Ayr Mine) **As-Received**

Size Interval: 28 x 100 mesh % Amount This Size: 0.72

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
					INCREMENTAL							
	1.25	1.74	12960	1.88	6.62	6.02	52.20	5.87	400.00	4.06	1.08	32.70
1.25	1.30	91.76	12173	2.53	8.80	1.96	56.20	1.96	279.40	2.66	1.20	25.70
1.30	1.35	0.00										
1.35	1.40	0.00										
1.40	1.60	0.00										
1.60	1.80	4.29	10183	2.29	100.20	10.50	76.60	20.40	472.80	12.80	1.39	52.30
1.80	2.00	0.78	6758	3.54	30.90	22.10	134.50	32.00	637.10	23.20	1.34	146.70
2.00	2.45	0.70	4810	5.22	72.90	26.30	81.80	30.60	806.00	32.10	2.28	230.40
2.45		0.73	3410	7.50	37.80	92.90	36.10	43.00	624.50	118.70	3.04	884.20
		100.00										

Size Interval: -100 mesh % Amount This Size: 0.26

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
					INCREMENTAL							
	1.25	1.60	12715	2.95	13.27	1.96	50.60	2.29	340.00	3.43	1.57	24.90
1.25	1.30	84.69	12356	2.95	13.27	1.96	50.60	2.29	340.00	3.43	1.57	24.90
1.30	1.35	0.00										
1.35	1.40	0.00										
1.40	1.60	0.00										
1.60	1.80	9.40	11628	5.35	16.03	6.27	60.40	5.07	798.60	6.51	2.46	38.10
1.80	2.00	1.41	9686	2.29	3.65	12.20	209.50	12.80	545.10	11.60	1.02	209.30
2.00	2.45	0.94	5246	9.93	12.60	16.80	55.90	44.10	1342.00	31.50	2.53	424.40
2.45		1.96	1937	9.93	12.60	16.80	55.90	44.10	1342.00	31.50	2.53	424.40
		100.00										

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

AMAX Coal Co. (Belle Ayr Mine) **As-Received**

Size Interval: 28 x 100 mesh % Amount This Size: 0.72

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
						CUMULATIVE						
	1.25	1.74	12960	1.88	6.62	6.02	52.20	5.87	400.00	4.06	1.08	32.70
1.25	1.30	93.50	12188	2.52	8.76	2.04	56.13	2.03	281.64	2.69	1.20	25.83
1.30	1.35	93.50	12188	2.52	8.76	2.04	56.13	2.03	281.64	2.69	1.20	25.83
1.35	1.40	93.50	12188	2.52	8.76	2.04	56.13	2.03	281.64	2.69	1.20	25.83
1.40	1.60	93.50	12188	2.52	8.76	2.04	56.13	2.03	281.64	2.69	1.20	25.83
1.60	1.80	97.79	12100	2.51	12.77	2.41	57.02	2.84	290.03	3.13	1.21	26.99
1.80	2.00	98.57	12057	2.52	12.91	2.56	57.64	3.07	292.78	3.29	1.21	27.94
2.00	2.45	99.27	12006	2.54	13.34	2.73	57.81	3.26	296.40	3.49	1.21	29.37
2.45		100.00	11944	2.57	13.52	3.39	57.65	3.55	298.79	4.33	1.23	35.61
Size Analysis Heads:				2.85	13.40	3.35	54.70	3.57	283.10	5.55	1.42	29.80

Size Interval: -100 mesh % Amount This Size: 0.26

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
						CUMULATIVE						
	1.25	1.60	12715	2.95	13.27	1.96	50.60	2.29	340.00	3.43	1.57	24.90
1.25	1.30	86.29	12363	2.95	13.27	1.96	50.60	2.29	340.00	3.43	1.57	24.90
1.30	1.35	86.29	12363	2.95	13.27	1.96	50.60	2.29	340.00	3.43	1.57	24.90
1.35	1.40	86.29	12363	2.95	13.27	1.96	50.60	2.29	340.00	3.43	1.57	24.90
1.40	1.60	86.29	12363	2.95	13.27	1.96	50.60	2.29	340.00	3.43	1.57	24.90
1.60	1.80	95.69	12290	3.19	13.54	2.38	51.56	2.56	385.05	3.73	1.66	26.20
1.80	2.00	97.10	12253	3.17	13.40	2.53	53.86	2.71	387.37	3.85	1.65	28.86
2.00	2.45	98.04	12185	3.24	13.39	2.66	53.88	3.11	396.53	4.11	1.66	32.65
2.45		100.00	11985	3.37	13.37	2.94	53.92	3.91	415.06	4.65	1.67	40.33
Size Analysis Heads:				3.53	16.22	2.85	47.87	4.64	431.93	4.23	1.80	36.60

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

AMAX Coal Co. (Belle Ayr Mine) **As-Received**

Total: Top Size x 0 % Amount This Size: 99.99

INCREMENTAL

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
	1.25	30.46	12331	2.47	9.94	1.41	78.01	1.24	362.26	2.69	0.97	4.51
1.25	1.30	61.41	12245	2.12	17.04	2.15	42.32	1.99	237.00	2.94	1.40	6.08
1.30	1.35	4.24	11392	1.71	9.21	6.92	84.26	6.42	456.83	6.15	0.82	21.41
1.35	1.40	1.34	10939	1.54	18.21	8.84	55.46	8.04	399.20	5.24	0.65	45.30
1.40	1.60	1.87	9662	2.58	89.51	14.54	73.81	17.86	567.75	7.84	0.98	26.46
1.60	1.80	0.44	7467	2.65	203.12	19.91	88.52	12.69	567.71	16.13	1.07	42.64
1.80	2.00	0.11	5794	3.70	138.89	34.15	94.48	26.37	624.25	34.75	1.27	119.01
2.00	2.45	0.07	3863	5.34	79.15	31.47	127.90	25.73	1195.77	40.20	1.92	221.37
2.45		0.06	2351	10.59	272.21	106.72	92.84	34.62	263.62	91.64	3.09	498.57
		100.00										

*** Indicates ppb rather than ppm basis**

As-Received

Hg*	Ni	Se	Zn

CQE: POWDER RIVER COAL CHARACTERIZATIONS

AMAX Coal Co. (Belle Ayr Mine) **As-Received**

		CUM. REC. (%)		CUMULATIVE ELEMENT REJECTION (Wt.%)								
Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
	1.25	30.46	30.97	66.14	82.25	83.78	57.62	84.47	62.64	75.11	75.89	82.58
1.25	1.30	91.87	92.96	7.52	20.93	33.83	11.29	34.34	13.36	20.32	5.81	35.22
1.30	1.35	96.11	96.95	4.26	18.65	22.73	4.92	23.17	6.80	12.40	2.97	23.71
1.35	1.40	97.45	98.15	3.33	17.22	18.25	3.59	18.75	4.99	10.26	2.26	16.02
1.40	1.60	99.32	99.64	1.16	7.40	7.97	1.13	5.03	1.40	5.81	0.76	9.74
1.60	1.80	99.76	99.92	0.63	2.16	4.65	0.43	2.74	0.55	3.65	0.37	7.36
1.80	2.00	99.87	99.97	0.45	1.29	3.26	0.25	1.57	0.32	2.52	0.26	5.74
2.00	2.45	99.94	99.99	0.29	0.98	2.47	0.10	0.87	0.05	1.71	0.15	3.88
2.45		100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CQE: POWDER RIVER COAL CHARACTERIZATIONS

AMAX Coal Co. (Belle Ayr Mine) **Crushed to -100 Mesh**

				INCREMENTAL								
Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
	+100 M	4.89	11910	3.01	4.27	2.90	43.60	1.88	405.60	4.44	1.50	10.10
100 M	325 M	63.42	11993	2.41	20.40	2.57	42.40	2.40	345.80	3.60	0.89	8.50
325 M	+0	31.69	11846	3.79	19.90	4.24	54.20	4.24	295.60	6.48	1.78	13.10
		95.11										

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

AMAX Coal Co. (Belle Ayr Mine) **Crushed to - 100 Mesh**

CUMULATIVE (BY SIZE GROUP)

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
	+100 M	4.89	11910	3.01	4.27	2.90	43.60	1.88	405.60	4.44	1.50	10.10
100 M	325 M	63.42	11993	2.41	20.40	2.57	42.40	2.40	345.80	3.60	0.89	8.50
325 M	+0	95.11	11944	2.87	20.23	3.13	46.33	3.01	329.07	4.56	1.19	10.03

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

AMAX Coal Co. (Belle Ayr Mine) **Crushed to -100 Mesh**

				CUMULATIVE (ppm)								
Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
	+100 M	4.89	11910	3.01	4.27	2.90	43.60	1.88	0.41	4.44	1.50	10.10
100 M	325 M	68.31	11987	2.45	19.25	2.59	42.49	2.36	0.35	3.66	0.93	8.61
325 M	+0	100.00	11942	2.88	19.45	3.12	46.20	2.96	0.33	4.55	1.20	10.04
Head Sample Analysis:			12005	3.00	20.90	3.09	44.50	2.40	0.33	3.94	1.10	9.26

		CUM. REC. (%)		CUMULATIVE ELEMENT REJECTION (Wt.%)								
Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
	+100 M	4.89	4.88	94.88	98.93	95.45	95.39	96.89	94.04	95.23	93.90	95.08
100 M	325 M	68.31	68.57	41.75	32.42	43.13	37.18	45.43	28.15	45.09	46.93	41.37
325 M	+0	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CQE: POWDER RIVER COAL CHARACTERIZATIONS

AMAX Coal Co. (Belle Ayr Mine) **Crushed to -100 Mesh**

Total: Top Size x 0 % Amount This Size: 100.00

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
					INCREMENTAL							
	1.25	30.46	12332	2.47	9.94	1.41	78.01	1.24	362.26	2.69	0.97	4.51
1.25	1.30	61.41	12246	2.12	17.04	2.15	42.32	1.99	237.01	2.94	1.40	6.08
1.30	1.35	0.00										
1.35	1.40	0.00										
1.40	1.60	5.05	11833	2.87	3.63	5.99	35.90	5.34	342.50	3.42	1.00	35.70
1.60	1.80	1.95	10295	2.38	24.10	13.50	62.10	12.00	473.00	7.71	0.97	21.00
1.80	2.00	0.38	8461	3.61	37.10	21.90	162.20	17.70	314.00	18.60	1.60	63.30
2.00	2.45	0.33	4092	3.80	126.30	22.60	123.90	22.60	534.00	35.50	1.63	105.30
2.45		0.42	1475	8.90	170.50	8.70	47.70	45.70	1333.70	28.30	2.25	119.60
		100.00										

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

AMAX Coal Co. (Belle Ayr Mine) **Crushed to -100 Mesh**

Total: Top Size x 0 % Amount This Size: 100.00

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
						CUMULATIVE						
	1.25	30.46	12332	2.47	9.94	1.41	78.01	1.24	362.26	2.69	0.97	4.51
1.25	1.30	91.87	12275	2.24	14.69	1.90	54.15	1.74	278.54	2.86	1.26	5.56
1.30	1.35	91.87	12275	2.24	14.69	1.90	54.15	1.74	278.54	2.86	1.26	5.56
1.35	1.40	91.87	12275	2.24	14.69	1.90	54.15	1.74	278.54	2.86	1.26	5.56
1.40	1.60	96.92	12252	2.27	14.11	2.12	53.20	1.93	281.87	2.89	1.24	7.13
1.60	1.80	98.87	12213	2.27	14.31	2.34	53.38	2.13	285.64	2.98	1.24	7.40
1.80	2.00	99.25	12199	2.28	14.39	2.42	53.80	2.19	285.75	3.04	1.24	7.62
2.00	2.45	99.58	12172	2.28	14.76	2.48	54.03	2.25	286.57	3.15	1.24	7.94
2.45		100.00	12127	2.31	15.42	2.51	54.00	2.44	291.00	3.25	1.25	8.41
		Size Analysis Heads:		2.88	19.45	3.12	46.20	2.95	332.81	4.55	1.21	10.03
		Head Sample Analyses:		3.00	20.90	3.09	44.50	2.40	333.30	3.94	1.10	9.26

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

AMAX Coal Co. (Belle Ayr Mine) **Crushed to -100 Mesh**

		CUM. REC. (%)		CUMULATIVE ELEMENT REJECTION (Wt.%)								
Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
	1.25	30.46	30.98	67.42	80.36	82.88	55.99	84.51	62.08	74.82	76.28	83.67
1.25	1.30	91.87	92.99	11.05	12.51	30.28	7.87	34.39	12.06	19.36	7.25	39.28
1.30	1.35	91.87	92.99	11.05	12.51	30.28	7.87	34.39	12.06	19.36	7.25	39.28
1.35	1.40	91.87	92.99	11.05	12.51	30.28	7.87	34.39	12.06	19.36	7.25	39.28
1.40	1.60	96.92	97.92	4.77	11.33	18.23	4.51	23.33	6.12	14.05	3.20	17.85
1.60	1.80	98.87	99.57	2.76	8.28	7.74	2.27	13.73	2.95	9.43	1.68	12.99
1.80	2.00	99.25	99.84	2.17	7.36	4.42	1.13	10.97	2.54	7.26	1.19	10.12
2.00	2.45	99.58	99.95	1.63	4.67	1.47	0.37	7.92	1.94	3.68	0.76	6.01
2.45		100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Powder River Coal Co.
Rochelle Mine

GOULD ENERGY DIVISION
PO BOX 214
CRESSON, PA 16630
STANDARD LABORATORIES, INC.

DATE: 06/10/93
SAMPLE NO: 131002

CQ, INC.
ONE QUALITY CENTER
HOMER CITY, PA 15748

SAMPLE ID: ROCHELLE RUN # 91092301

SAMPLED BY:

DATE SAMPLED:

DATE RECEIVED: 10/16/91

OTHER ID: POWDER RIVER BASIN COAL TOP X 0 AS-RECEIVED COAL

CORRECTED REPORT - THIS REPORT SUPERSEDES ALL PRIOR REPORTS IDENTIFIED WITH THE SAME LABORATORY NUMBER.

CERTIFICATE OF ANALYSIS

TRACE ELEMENTS	
ARSENIC	1.50 ppm
BARIUM	28.00 ppm
CADMIUM	< 0.10 ppm
CHROMIUM	2.79 ppm
FLUORINE	47.20 ppm
LEAD	1.78 ppm
MERCURY	226.3 ppb
NICKEL	2.29 ppm
SELENIUM	2.50 ppm
SILVER	< 0.10 ppm
ZINC	6.48 ppm
ANTIMONY	< 0.50 ppm

APPROVED BY Eric Putney
Thomas A. Pugh

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STANDARD LABORATORIES, INC.

, INC.
ALITY CENTER BOX 280
R CITY, PA 15748

DATE: 06/10/92
MASTER WARNER NO. 131002

SAMPLE ID: RUN 91092301 ROCHELLE COAL

ATING CO: PROJECT 90D0101 TASK 2.4
:

LED BY: CUSTOMER PROVIDED
SAMPLED:

GROSS WEIGHT:
DATE RECEIVED: 10/16/91

R ID: POWDER RIVER BASIN RAW COAL CHARACTERIZATION AS-RECD SAMPLE TOP X 0
NOMINAL 6 TONS, ALL WEIGHT % ON A DRY BASIS.
*CORRECTED REPORT-THIS REPORT SUPERSEDES ALL PRIOR REPORTS

CERTIFICATE OF ANALYSIS

EN SIZE RAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
/2"SQ	23.15	0.48	8.68	< 0.10	2.66	52.30	1.62	233.30	3.01	1.54	< 0.10	3.36	< 0.50
2" X 3/4"SQ	27.98	1.82	14.00	< 0.10	2.40	52.20	1.87	127.20	2.40	1.80	< 0.10	3.73	< 0.50
X 3/8" SQ	21.48	1.74	53.50	< 0.10	2.75	50.00	1.37	416.90	2.99	1.86	< 0.10	5.49	< 0.50
SQ X 28M	26.44	1.77	57.30	< 0.10	2.58	46.20	1.81	150.30	2.84	1.59	< 0.10	8.39	< 0.50
X 100M	0.69	1.13	21.00	< 0.10	3.09	43.50	2.01	184.40	3.09	1.92	< 0.10	18.50	< 0.50
X 325M	0.17	2.61	13.50	< 0.10	2.88	48.00	3.27	238.50	2.31	3.58	< 0.10	53.10	< 0.50
X 0	0.09	0.49	13.70	< 0.10	6.16	65.10	5.81	370.80	3.42	1.32	< 0.10	54.70	< 0.50

CUMULATIVE RESULTS

EN SIZE RAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
/2"SQ	23.15	0.48	8.68	< 0.10	2.66	52.30	1.62	233.30	3.01	1.54	< 0.10	3.36	< 0.50
2" X 3/4"SQ	51.13	1.21	11.59	< 0.10	2.52	52.25	1.76	175.24	2.68	1.68	< 0.10	3.56	< 0.50
X 3/8" SQ	72.61	1.37	23.99	< 0.10	2.59	51.58	1.64	246.73	2.77	1.73	< 0.10	4.13	< 0.50
SQ X 28M	99.05	1.48	32.88	< 0.10	2.58	50.14	1.69	220.99	2.79	1.70	< 0.10	5.27	< 0.50
X 100M	99.74	1.47	32.80	< 0.10	2.59	50.10	1.69	220.74	2.79	1.70	< 0.10	5.36	< 0.50
X 325M	99.91	1.48	32.77	< 0.10	2.59	50.10	1.69	220.77	2.79	1.70	< 0.10	5.44	< 0.50
X 0	100.00	1.47	32.75	< 0.10	2.59	50.11	1.70	220.90	2.79	1.70	< 0.10	5.49	< 0.50

ALL TRACE ELEMENTS RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY _____

APPROVED BY _____

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STANDARD LABORATORIES, INC.

.NC.
ITY CENTER BOX 280
ITY, PA 15748

DATE: 06/10/92
MASTER WARNER NO. 131002

SAMPLE ID: RUN 91092301 ROCHELLE COAL

ING CO: PROJECT 90D0101 TASK 2.4

BY: CUSTOMER PROVIDED
AMPLED:

GROSS WEIGHT:
DATE RECEIVED: 10/16/91

D: POWDER RIVER BASIN RAW COAL CHARACTERIZATION AS-RECD SAMPLE TOP X 0
NOMINAL 6 TONS, ALL WEIGHT % ON A DRY BASIS
*CORRECTED REPORT-THIS REPORT SUPERSEDES ALL PRIOR REPORTS

CERTIFICATE OF ANALYSIS

FEED FOR SIZE +3/4" SQ

SIZE ITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
	28.64	2.03	5.62	< 0.10	1.52	37.30	1.36	131.80	1.69	1.52	< 0.10	2.49	< 0.50
	59.63	0.87	11.80	< 0.10	2.36	51.20	1.62	166.70	2.49	1.62	< 0.10	2.86	< 0.50
	9.73	1.09	21.20	< 0.10	4.23	51.30	2.75	265.60	4.44	1.07	< 0.10	4.44	< 0.50
	0.75	0.73	73.80	< 0.10	5.39	76.80	5.18	543.10	5.39	0.54	< 0.10	15.80	< 0.50
	0.80	< 0.00	230.00	< 0.10	8.62	93.70	8.28	612.10	11.90	0.45	< 0.10	13.90	< 0.50
	0.30	0.97	290.80	< 0.10	13.30	115.90	13.80	545.70	18.80	0.41	< 0.10	35.40	< 0.50
	0.08	0.79	324.50	< 0.10	16.30	109.60	17.00	438.90	29.90	0.52	< 0.10	93.70	< 0.50
	0.05	2.51	386.30	< 0.10	57.20	125.30	28.60	938.10	53.60	2.86	< 0.10	223.50	< 0.50
NK	0.02	15.10	264.30	< 0.10	121.60	114.80	88.10	1133.20	149.80	4.99	< 0.10	121.60	< 0.50

CUMULATIVE RESULTS

SIZE ITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
	28.64	2.03	5.62	< 0.10	1.52	37.30	1.36	131.80	1.69	1.52	< 0.10	2.49	< 0.50
	88.27	1.25	9.79	< 0.10	2.09	46.69	1.54	155.38	2.23	1.59	< 0.10	2.74	< 0.50
	98.00	1.23	10.93	< 0.10	2.30	47.15	1.66	166.32	2.45	1.54	< 0.10	2.91	< 0.50
	98.75	1.23	11.40	< 0.10	2.32	47.37	1.68	169.18	2.47	1.53	< 0.10	3.01	< 0.50
	99.55	1.22	13.16	< 0.10	2.37	47.75	1.74	172.74	2.55	1.52	< 0.10	3.09	< 0.50
	99.85	1.22	14.00	< 0.10	2.41	47.95	1.77	173.86	2.60	1.52	< 0.10	3.19	< 0.50
	99.93	1.22	14.24	< 0.10	2.42	48.00	1.78	174.07	2.62	1.52	< 0.10	3.26	< 0.50
	99.98	1.22	14.43	< 0.10	2.45	48.04	1.80	174.46	2.64	1.52	< 0.10	3.37	< 0.50
NK	100.00	1.22	14.48	< 0.10	2.47	48.05	1.82	174.65	2.67	1.52	< 0.10	3.40	< 0.50

ALL TRACE ELEMENT RESULTS ARE STATED IN ppm EXCEP

ANALITICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY Doris Pitney
ROE Kly

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STANDARD LABORATORIES, INC.

, INC.
ALITY CENTER BOX 280
R CITY, PA 15748

DATE: 06/10/92
MASTER WARNER NO. 131002

SAMPLE ID: RUN 91092301 ROCHELLE COAL

ATING CO: PROJECT 90D0101 TASK 2.4

:

ED BY: CUSTOMER PROVIDED

GROSS WEIGHT:

SAMPLED:

DATE RECEIVED: 10/16/91

ID: POWDER RIVER BASIN RAW COAL CHARACTERIZATION AS-RECD SAMPLE TOP X 0 NOMINAL 6 TONS. ALL WEIGHT % ON A DRY BASIS
*CORRECTED REPORT-THIS REPORT SUPERSEDES ALL PRIOR REPORTS

CERTIFICATE OF ANALYSIS

FEED FOR SIZE 3/4"SQ X 28M

EN SIZE AVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
	25.45	2.68	18.70	< 0.10	1.37	48.50	1.18	215.40	1.91	1.66	< 0.10	5.10	< 0.50
	58.93	1.03	46.90	< 0.10	2.43	46.60	1.69	329.40	1.80	1.98	< 0.10	6.56	< 0.50
	11.03	2.79	33.60	< 0.10	4.79	53.30	1.20	236.50	2.80	2.69	< 0.10	3.42	< 0.50
	2.06	0.85	43.60	< 0.10	5.35	45.40	1.97	286.90	3.38	0.45	< 0.10	7.04	< 0.50
	1.84	1.68	65.20	< 0.10	6.47	56.10	6.22	416.60	10.50	0.49	< 0.10	11.90	< 0.50
	0.29	1.05	1455.40	< 0.10	13.00	107.50	16.10	683.80	20.10	< 0.00	< 0.10	18.10	< 0.50
	0.17	0.75	321.70	< 0.10	10.50	103.60	16.50	791.50	23.70	0.37	< 0.10	21.10	< 0.50
	0.18	3.21	249.10	< 0.10	45.10	135.20	24.50	296.50	41.20	1.37	< 0.10	45.10	< 0.50
SINK	0.05	12.00	310.40	< 0.10	91.70	114.00	43.90	2715.50	89.80	3.97	< 0.10	298.70	< 0.50

CUMULATIVE RESULTS

3N SIZE AVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
	25.45	2.68	18.70	< 0.10	1.37	48.50	1.18	215.40	1.91	1.66	< 0.10	5.10	< 0.50
	84.38	1.53	38.39	< 0.10	2.11	47.17	1.54	295.02	1.83	1.88	< 0.10	6.12	< 0.50
	95.41	1.67	37.84	< 0.10	2.42	47.88	1.50	288.25	1.94	1.98	< 0.10	5.81	< 0.50
	97.47	1.66	37.96	< 0.10	2.48	47.83	1.51	288.22	1.98	1.94	< 0.10	5.83	< 0.50
	99.31	1.66	38.47	< 0.10	2.56	47.98	1.59	290.60	2.13	1.92	< 0.10	5.95	< 0.50
	99.60	1.65	42.59	< 0.10	2.59	48.16	1.64	291.75	2.19	1.91	< 0.10	5.98	< 0.50
	99.77	1.65	43.07	< 0.10	2.60	48.25	1.66	292.60	2.22	1.91	< 0.10	6.01	< 0.50
	99.95	1.66	43.44	< 0.10	2.68	48.41	1.70	292.60	2.29	1.91	< 0.10	6.08	< 0.50
SINK	100.00	1.66	43.57	< 0.10	2.72	48.44	1.72	293.82	2.34	1.91	< 0.10	6.22	< 0.50

ALL TRACE ELEMENT RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY

APPROVED BY

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STANDARD LABORATORIES, INC.

NC.
ITY CENTER BOX 280
CITY, PA 15748

DATE: 06/10/92
MASTER WARNER NO. 131002

SAMPLE ID: RUN 91092301 ROCHELLE COAL

NG CO: PROJECT 90D0101 TASK 2.4

BY: CUSTOMER PROVIDED
MPLED:

GROSS WEIGHT:
DATE RECEIVED: 10/16/91

D: POWDER RIVER BASIN RAW COAL CHARACTERIZATION AS-RECD SAMPLE TOP X 0
NOMINAL 6 TONS. ALL WEIGHT % ON A DRY BASIS
THE 1.40 GRAVITY IS A COMPOSITE OF THE 1.25, 1.30, 1.35, AND 1.40 FRACTIONS
*CORRECTED REPORT-THIS REPORT SUPERSEDES ALL PRIOR REPORTS

CERTIFICATE OF ANALYSIS

FEED FOR SIZE 28M X 100M

SIZE ITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.48	1.64	30.80	< 0.10	4.75	50.10	2.24	355.70	3.92	2.25	< 0.10	38.00	< 0.50
	94.02	1.25	12.40	< 0.10	2.84	43.10	1.98	168.40	1.98	1.57	< 0.10	13.10	< 0.50
	2.19	1.35	93.20	< 0.10	5.14	81.20	5.79	185.70	15.40	1.37	< 0.10	29.60	< 0.50
	0.51	2.37	407.00	< 0.10	26.80	166.90	4.67	574.70	25.70	1.58	< 0.10	70.00	< 0.50
	0.41	2.22	925.10	< 0.10	45.40	279.90	11.80	887.60	48.80	2.93	< 0.10	267.40	< 0.50
INK	0.39	12.20	265.70	< 0.10	139.80	94.40	56.20	1529.30	213.70	6.37	< 0.10	1717.80	< 0.50

CUMULATIVE RESULTS

SIZE VITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.48	1.64	30.80	< 0.10	4.75	50.10	2.24	355.70	3.92	2.25	< 0.10	38.00	< 0.50
	96.50	1.26	12.87	< 0.10	2.89	43.28	1.99	173.21	2.03	1.59	< 0.10	13.74	< 0.50
	98.69	1.26	14.66	< 0.10	2.94	44.12	2.07	173.49	2.33	1.58	< 0.10	14.09	< 0.50
	99.20	1.27	16.67	< 0.10	3.06	44.75	2.08	175.55	2.45	1.58	< 0.10	14.38	< 0.50
	99.61	1.27	20.41	< 0.10	3.24	45.72	2.12	178.48	2.64	1.59	< 0.10	15.42	< 0.50
INK	100.00	1.31	21.37	< 0.10	3.77	45.91	2.34	183.75	3.46	1.61	< 0.10	22.06	< 0.50

ALL TRACE ELEMENT RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

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STANDARD LABORATORIES, INC.

, INC.
ALITY CENTER BOX 280
R CITY, PA 15748

DATE: 06/10/92
MASTER WARNER NO. 131002

SAMPLE ID: RUN 91092301 ROCHELLE COAL

ATING CO: PROJECT 90D0101 TASK 2.4 *CORRECTED REPORT-THIS REPORT SUPERSEDES ALL PRIOR REPORTS
:

LED BY: CUSTOMER PROVIDED
SAMPLED:

GROSS WEIGHT:
DATE RECEIVED: 10/16/91

R ID: POWDER RIVER BASIN RAW COAL CHARACTERIZATION AS-RECD SAMPLE TOP X 0 NOMINAL 6 TONS. ALL WEIGHT % ON A DRY BASIS
INSUFFICIENT MATERIAL FOR 1.25 AND 1.30 GRAVITY ANALYSIS.
THE 1.60 GRAVITY IS A COMPOSITE OF THE 1.35, 1.40, AND 1.60 FRACTIONS
THE 1.80 GRAVITY IS A COMPOSITE OF THE 1.80, 2.00, 2.45, AND 2.45 SINK FRACTIONS

CERTIFICATE OF ANALYSIS

FEED FOR SIZE 100M X 0

EN SIZE RAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	85.32	1.39	13.70	< 0.10	2.38	55.50	5.23	326.30	1.78	2.87	< 0.10	41.90	< 0.50
	14.68	2.17	11.00	< 0.10	7.33	107.20	4.09	278.10	7.33	2.55	< 0.10	108.10	< 0.50
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SINK	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CUMULATIVE RESULTS

EN SIZE RAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	85.32	1.39	13.70	< 0.10	2.38	55.50	5.23	326.30	1.78	2.87	< 0.10	41.90	< 0.50
	100.00	1.50	13.30	< 0.10	3.11	63.09	5.06	319.22	2.59	2.82	< 0.10	51.62	< 0.50
	100.00	1.50	13.30	< 0.10	3.11	63.09	5.06	319.22	2.59	2.82	< 0.10	51.62	< 0.50
	100.00	1.50	13.30	< 0.10	3.11	63.09	5.06	319.22	2.59	2.82	< 0.10	51.62	< 0.50
SINK	100.00	1.50	13.30	< 0.10	3.11	63.09	5.06	319.22	2.59	2.82	< 0.10	51.62	< 0.50

ALL TRACE ELEMENT RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY Lori Pathney

APPROVED BY R. Ally

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CQ, INC.
ONE QUALITY CENTER
HOMER CITY, PA 15748

SAMPLED BY:

STANDARD LABORATORIES, INC.

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 06/10/93
MASTER WARNER NO. 131053

SAMPLE ID: RUN 91092301 ROCHELLE COAL

OPERATING CO: PROJECT 90D0101 TASK 2.4
MINE:
SAMPLED BY: CUSTOMER PROVIDED
DATE SAMPLED:

GROSS WEIGHT:
DATE RECEIVED: 10/16/91

OTHER ID: POWDER RIVER BASIN CHANGE IN RAW COAL SIZE DIST. WITH CRUSHING.
AS-RECEIVED SAMPLE CRUSHED TO 100M. ALL WEIGHT % ON A DRY BASIS
*CORRECTED REPORT-THIS REPORT SUPERSEDES ALL PRIOR REPORTS

CERTIFICATE OF ANALYSIS

SCREEN SIZE OR GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
+100M	4.78	1.16	11.50	< 0.10	1.84	45.20	1.44	125.00	1.84	1.61	< 0.10	3.80	< 0.50
100M X 325M	55.34	0.96	23.00	< 0.10	2.42	41.70	1.78	247.50	2.28	2.09	< 0.10	9.50	< 0.50
325M X 0	39.88	3.32	24.80	< 0.10	2.81	51.40	1.79	327.90	3.69	1.60	< 0.10	14.80	< 0.50

CUMULATIVE RESULTS

SCREEN SIZE OR GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
+100M	4.78	1.16	11.50	< 0.10	1.84	45.20	1.44	125.00	1.84	1.61	< 0.10	3.80	< 0.50
100M X 325M	60.12	0.98	22.09	< 0.10	2.37	41.98	1.75	237.76	2.25	2.05	< 0.10	9.05	< 0.50
325M X 0	100.00	1.91	23.17	< 0.10	2.55	45.74	1.77	273.71	2.82	1.87	< 0.10	11.34	< 0.50

ALL TRACE ELEMENT RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY Lois Kuey
APPROVED BY Thomas A. Right

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GOULD ENERGY DIVISION
PO BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

CQ, INC.
ONE QUALITY CENTER
HOMER CITY, PA 15748

DATE: 06/10/93
SAMPLE NO: 131089

SAMPLE ID: ROCHELLE COAL
RUN # 91092301

SAMPLED BY:

DATE SAMPLED:

DATE RECEIVED: 10/16/91

OTHER ID: POWDER RIVER BASIN AS RECD COAL 1.30 SINK CRUSHED TO 100M

CORRECTED REPORT - THIS REPORT SUPERSEDES ALL PRIOR REPORTS IDENTIFIED WITH THE SAME LABORATORY NUMBER.

CERTIFICATE OF ANALYSIS

TRACE ELEMENTS

ARSENIC	0.97 ppm
BARIUM	31.6 ppm
CADMIUM	< 0.10 ppm
CHROMIUM	5.04 ppm
FLUORINE	106.00 ppm
LEAD	4.41 ppm
MERCURY	290.6 ppb
NICKEL	5.67 ppm
SELENIUM	1.13 ppm
SILVER	< 0.10 ppm
ZINC	21.00 ppm
ANTIMONY	< 0.50 ppm

APPROVED BY Lori Athey
Thomas A. Rafft

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STANDARD LABORATORIES, INC.

.Q., INC.
QUALITY CENTER BOX 280
OMER CITY, PA 15748

DATE: 06/10/93
MASTER WARNER NO. 131089

SAMPLE ID: RUN 91092301 ROCHELLE COAL

PERATING CO: PROJECT 90D0101 TASK 2.4 *CORRECTED REPORT-THIS REPORT SUPERSEDES ALL PRIOR REPORTS
INE:
AMPLED BY: CUSTOMER PROVIDED GROSS WEIGHT: 117.6 KG
ATE SAMPLED: DATE RECEIVED: 10/16/91

THER ID: POWDER RIVER BASIN RAW COAL LIBERATION. 1.30 SINK OF AS-RECD SAMPLE CRUSHED TO 100M. ALL WEIGHT % ON A DRY BASIS
INSUFFICIENT MATERIAL FOR 1.25, 1.30 AND 1.35 GRAVITY ANALYSIS
THE 1.80 GRAVITY IS A COMPOSITE OF THE 1.80, 2.00, 2.45, AND 2.45 SINK FRACTIONS

CERTIFICATE OF ANALYSIS

CREEN SIZE R GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
.40	47.60	< 1.00	31.40	< 0.10	2.78	72.20	2.90	275.10	3.83	0.47	< 0.10	19.40	< 0.50
.60	38.81	1.40	38.30	< 0.10	3.78	79.10	3.53	272.20	5.57	2.10	< 0.10	14.60	< 0.50
.80	13.59	1.96	39.40	< 0.10	19.20	421.50	13.30	342.30	12.30	0.86	< 0.10	70.60	< 0.50
.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
.45 SINK	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CUMULATIVE RESULTS

CREEN SIZE R GRAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
.40	47.60	0.00	31.40	< 0.10	2.78	72.20	2.90	275.10	3.83	0.47	< 0.10	19.40	< 0.50
.60	86.41	0.63	34.50	< 0.10	3.23	75.30	3.18	273.80	4.66	1.20	< 0.10	17.24	< 0.50
.80	100.00	0.81	35.17	< 0.10	5.40	122.35	4.56	283.11	5.70	1.16	< 0.10	24.50	< 0.50
.00	100.00	0.81	35.17	< 0.10	5.40	122.35	4.56	283.11	5.70	1.16	< 0.10	24.50	< 0.50
.45	100.00	0.81	35.17	< 0.10	5.40	122.35	4.56	283.11	5.70	1.16	< 0.10	24.50	< 0.50
.45 SINK	100.00	0.81	35.17	< 0.10	5.40	122.35	4.56	283.11	5.70	1.16	< 0.10	24.50	< 0.50

ALL TRACE ELEMENT RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY _____

APPROVED BY Thomas A. Rizzo

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CQE: POWDER RIVER COAL CHARACTERIZATIONS

Powder River Coal Co. (Rochelle Mine) **As-Received**

INCREMENTAL

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
+	1-1/2 in.	23.15	12110	0.48	8.68	2.66	52.30	1.62	233.30	3.01	1.54	3.36
1-1/2 in.	3/4 in.	27.98	12005	1.82	14.00	2.40	52.20	1.87	127.20	2.40	1.80	3.73
		51.13										

INCREMENTAL

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
3/4 in.	3/8 in.	21.48	12171	1.74	53.50	2.75	50.00	1.37	416.90	2.99	1.86	5.49
3/8 in.	28 M	26.44	12114	1.77	57.30	2.58	46.20	1.81	150.30	2.84	1.59	8.39
		47.92										

INCREMENTAL

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
28 M	100 M	0.69	11878	1.13	21.00	3.09	43.50	2.01	184.40	3.09	1.92	18.50

INCREMENTAL

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
100 M	325 M	0.17	11752	2.61	13.50	2.88	48.00	3.27	238.50	2.31	3.58	53.10
325 M	+0	0.09	11007	0.49	13.70	6.16	65.10	5.81	370.80	3.42	1.32	54.70
		0.26										

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Powder River Coal Co. (Rochelle Mine) **As-Received**

CUMULATIVE (BY SIZE GROUP)

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
+	1-1/2 in.	23.15	12110	0.48	8.68	2.66	52.30	1.62	233.30	3.01	1.54	3.36
1-1/2 in.	3/4 in.	51.13	12053	1.21	11.59	2.52	52.25	1.76	175.24	2.68	1.68	3.56

CUMULATIVE (BY SIZE GROUP)

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
3/4 in.	3/8 in.	21.48	12171	1.74	53.50	2.75	50.00	1.37	416.90	2.99	1.86	5.49
3/8 in.	28 M	47.92	12140	1.76	55.60	2.66	47.90	1.61	269.80	2.91	1.71	7.09

CUMULATIVE (BY SIZE GROUP)

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
28 M	100 M	0.69	11878	1.13	21.00	3.09	43.50	2.01	184.40	3.09	1.92	18.50

CUMULATIVE (BY SIZE GROUP)

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
100 M	325 M	0.17	11752	2.61	13.50	2.88	48.00	3.27	238.50	2.31	3.58	53.10
325 M	+0	0.26	11494	1.88	13.57	4.02	53.92	4.15	284.30	2.69	2.80	53.65

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Powder River Coal Co. (Rochelle Mine) **As-Received**

				CUMULATIVE (ppm)								
Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
+	1-1/2 in.	23.15	12110	0.48	8.68	2.66	52.30	1.62	0.23	3.01	1.54	3.36
1-1/2 in.	3/4 in.	51.13	12053	1.21	11.59	2.52	52.25	1.76	0.18	2.68	1.68	3.56
3/4 in.	3/8 in.	72.61	12088	1.37	23.99	2.59	51.58	1.64	0.25	2.77	1.73	4.13
3/8 in.	28 M	99.05	12095	1.48	32.88	2.58	50.14	1.69	0.22	2.79	1.70	5.27
28 M	100 M	99.74	12093	1.47	32.80	2.59	50.10	1.69	0.22	2.79	1.70	5.36
100 M	325 M	99.91	12093	1.48	32.77	2.59	50.10	1.69	0.22	2.79	1.70	5.44
325 M	+0	100.00	12092	1.47	32.75	2.59	50.11	1.70	0.22	2.79	1.70	5.49
Head Sample Analysis:			12080	1.50	28.00	2.79	47.20	1.78	0.23	2.29	2.50	6.48

		CUM. REC. (%)		CUMULATIVE ELEMENT REJECTION (Wt.%)								
Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
+	1-1/2 in.	23.15	23.19	92.47	93.86	76.24	75.84	77.88	75.55	75.02	79.04	85.82
1-1/2 in.	3/4 in.	51.13	50.96	57.94	81.90	50.33	46.69	47.03	59.44	50.95	49.42	66.80
3/4 in.	3/8 in.	72.61	72.59	32.59	46.81	27.54	25.26	29.68	18.90	27.93	25.93	45.30
3/8 in.	28 M	99.05	99.08	0.86	0.55	1.23	0.88	1.45	0.91	1.02	1.21	4.87
28 M	100 M	99.74	99.75	0.33	0.11	0.40	0.28	0.64	0.33	0.25	0.43	2.54
100 M	325 M	99.91	99.92	0.03	0.04	0.21	0.12	0.31	0.15	0.11	0.07	0.90
325 M	+0	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Powder River Coal Co. (Rochelle Mine) **As-Received**

Size Interval: + 3/4-in % Amount This Size: 51.13

INCREMENTAL

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
	1.25	28.64	12186	2.03	5.62	1.52	37.30	1.36	131.80	1.69	1.52	2.49
1.25	1.30	59.63	12135	0.87	11.80	2.36	51.20	1.62	166.70	2.49	1.62	2.86
1.30	1.35	9.73	11504	1.09	21.20	4.23	51.30	2.75	265.60	4.44	1.07	4.44
1.35	1.40	0.75	10789	0.73	73.80	5.39	76.80	5.18	543.10	5.39	0.54	15.80
1.40	1.60	0.80	9081	0.10	230.00	8.62	93.70	8.28	612.10	11.90	0.45	13.90
1.60	1.80	0.30	6525	0.97	290.80	13.30	115.90	13.80	545.70	18.80	0.41	35.40
1.80	2.00	0.08	5130	0.79	324.50	16.30	109.60	17.00	438.90	29.90	0.52	93.70
2.00	2.45	0.05	2785	2.51	386.30	57.20	125.30	28.60	938.10	53.60	2.86	223.50
2.45		0.02	3568	15.10	264.30	121.60	114.80	88.10	1133.20	149.80	4.99	121.60
		100.00										

Size Interval: 3/4-in x 28 mesh % Amount This Size: 47.92

INCREMENTAL

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
	1.25	25.45	12396	2.68	18.70	1.37	48.50	1.18	215.40	1.91	1.66	5.10
1.25	1.30	58.93	12297	1.03	46.90	2.43	46.60	1.69	329.40	1.80	1.98	6.56
1.30	1.35	11.03	11796	2.79	33.60	4.79	53.30	1.20	236.50	2.80	2.69	3.42
1.35	1.40	2.06	11569	0.85	43.60	5.35	45.40	1.97	286.90	3.38	0.45	7.04
1.40	1.60	1.84	10121	1.68	65.20	6.47	56.10	6.22	416.60	10.50	0.49	11.90
1.60	1.80	0.29	7125	1.05	1455.40	13.00	107.50	16.10	683.80	20.10	0.10	18.10
1.80	2.00	0.17	5332	0.75	321.70	10.50	103.60	16.50	791.50	23.70	0.37	21.10
2.00	2.45	0.18	1819	3.21	249.10	45.10	135.20	24.50	296.50	41.20	1.37	45.10
2.45		0.05	2145	12.00	310.40	91.70	114.00	43.90	2715.50	89.80	3.97	298.70
		100.00										

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Powder River Coal Co. (Rochelle Mine) **As-Received**

Size Interval: + 3/4-in % Amount This Size: 51.13

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
						CUMULATIVE						
	1.25	28.64	12186	2.03	5.62	1.52	37.30	1.36	131.80	1.69	1.52	2.49
1.25	1.30	88.27	12152	1.25	9.79	2.09	46.69	1.54	155.38	2.23	1.59	2.74
1.30	1.35	98.00	12087	1.23	10.93	2.30	47.15	1.66	166.32	2.45	1.54	2.91
1.35	1.40	98.75	12077	1.23	11.40	2.32	47.37	1.68	169.18	2.47	1.53	3.01
1.40	1.60	99.55	12053	1.22	13.16	2.37	47.75	1.74	172.74	2.55	1.52	3.09
1.60	1.80	99.85	12037	1.22	14.00	2.41	47.95	1.77	173.86	2.60	1.52	3.19
1.80	2.00	99.93	12031	1.22	14.24	2.42	48.00	1.78	174.07	2.62	1.52	3.26
2.00	2.45	99.98	12027	1.22	14.43	2.45	48.04	1.80	174.46	2.64	1.52	3.37
2.45		100.00	12025	1.22	14.48	2.47	48.05	1.82	174.65	2.67	1.52	3.40
Size Analysis Heads:				1.21	11.59	2.52	52.25	1.76	175.24	2.68	1.68	3.56

Size Interval: 3/4-in x 28 mesh % Amount This Size: 47.92

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
						CUMULATIVE						
	1.25	25.45	12396	2.68	18.70	1.37	48.50	1.18	215.40	1.91	1.66	5.10
1.25	1.30	84.38	12327	1.53	38.39	2.11	47.17	1.54	295.02	1.83	1.88	6.12
1.30	1.35	95.41	12265	1.67	37.84	2.42	47.88	1.50	288.25	1.94	1.98	5.81
1.35	1.40	97.47	12251	1.66	37.96	2.48	47.83	1.51	288.22	1.98	1.94	5.83
1.40	1.60	99.31	12211	1.66	38.47	2.56	47.98	1.59	290.60	2.13	1.92	5.95
1.60	1.80	99.60	12196	1.65	42.59	2.59	48.16	1.64	291.75	2.19	1.91	5.98
1.80	2.00	99.77	12185	1.65	43.07	2.60	48.25	1.66	292.60	2.22	1.91	6.01
2.00	2.45	99.95	12166	1.66	43.44	2.68	48.41	1.70	292.60	2.29	1.91	6.08
2.45		100.00	12161	1.66	43.57	2.72	48.44	1.72	293.82	2.34	1.91	6.22
Size Analysis Heads:				1.76	55.60	2.66	47.90	1.61	269.80	2.91	1.71	7.09

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Powder River Coal Co. (Rochelle Mine) **As-Received**

Size Interval: 28 x 100 mesh % Amount This Size: 0.69

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
					INCREMENTAL							
	1.25											
1.25	1.30											
1.30	1.35											
1.35	1.40	2.48	12671	1.64	30.80	4.75	50.10	2.24	355.70	3.92	2.25	38.00
1.40	1.60	94.02	11975	1.25	12.40	2.84	43.10	1.98	168.40	1.98	1.57	13.10
1.60	1.80	2.19	11766	1.35	93.20	5.14	81.20	5.79	185.70	15.40	1.37	29.60
1.80	2.00	0.51	7081	2.37	407.00	26.80	166.90	4.67	574.70	25.70	1.58	70.00
2.00	2.45	0.41	3505	2.22	925.10	45.40	279.90	11.80	887.60	48.80	2.93	267.40
2.45		0.39	1838	12.20	265.70	139.80	94.40	56.20	1529.30	213.70	6.37	1717.80
		100.00										

Size Interval: -100 mesh % Amount This Size: 0.26

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
					INCREMENTAL							
	1.25											
1.25	1.30											
1.30	1.35											
1.35	1.40											
1.40	1.60	83.68	12346	1.39	13.70	2.38	55.50	5.23	326.30	1.78	2.87	41.90
1.60	1.80	10.62	11180	2.17	11.00	7.33	107.20	4.09	278.10	7.33	2.55	108.10
1.80	2.00	0.99	5521	2.17	11.00	7.33	107.20	4.09	278.10	7.33	2.55	108.10
2.00	2.45	1.03	3148	2.17	11.00	7.33	107.20	4.09	278.10	7.33	2.55	108.10
2.45		3.68	662	2.17	11.00	7.33	107.20	4.09	278.10	7.33	2.55	108.10
		100.00										

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Powder River Coal Co. (Rochelle Mine) **As-Received**

Size Interval: 28 x 100 mesh % Amount This Size: 0.69

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
						CUMULATIVE						
	1.25											
1.25	1.30											
1.30	1.35											
1.35	1.40	2.48	12671	1.64	30.80	4.75	50.10	2.24	355.70	3.92	2.25	38.00
1.40	1.60	96.50	11993	1.26	12.87	2.89	43.28	1.99	173.21	2.03	1.59	13.74
1.60	1.80	98.69	11988	1.26	14.66	2.94	44.12	2.07	173.49	2.33	1.58	14.09
1.80	2.00	99.20	11963	1.27	16.67	3.06	44.75	2.08	175.55	2.45	1.58	14.38
2.00	2.45	99.61	11928	1.27	20.41	3.24	45.72	2.12	178.48	2.64	1.59	15.42
2.45		100.00	11888	1.31	21.37	3.77	45.91	2.34	183.75	3.46	1.61	22.06
Size Analysis Heads:				1.13	21.00	3.09	43.50	2.01	184.40	3.09	1.92	18.50

Size Interval: -100 mesh % Amount This Size: 0.26

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
						CUMULATIVE						
	1.25											
1.25	1.30											
1.30	1.35											
1.35	1.40											
1.40	1.60	83.68	12346	1.39	13.70	2.38	55.50	5.23	326.30	1.78	2.87	41.90
1.60	1.80	94.30	12215	1.48	13.40	2.94	61.32	5.10	320.87	2.41	2.83	49.36
1.80	2.00	95.29	12145	1.49	13.37	2.98	61.80	5.09	320.43	2.46	2.83	49.97
2.00	2.45	96.32	12049	1.49	13.35	3.03	62.28	5.08	319.97	2.51	2.83	50.59
2.45		100.00	11630	1.52	13.26	3.19	63.94	5.04	318.43	2.69	2.82	52.70
Size Analysis Heads:				1.88	13.57	4.02	53.92	4.15	284.30	2.69	2.80	53.65

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Powder River Coal Co. (Rochelle Mine) **As-Received**

Total: Top Size x 0 % Amount This Size: 100.00

INCREMENTAL

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
	1.25	26.84	12281	2.33	11.56	1.45	42.39	1.28	169.79	1.79	1.58	3.68
1.25	1.30	58.73	12213	0.95	28.68	2.39	48.99	1.65	244.93	2.16	1.79	4.64
1.30	1.35	10.26	11654	1.97	27.59	4.52	52.33	1.95	250.61	3.60	1.90	3.91
1.35	1.40	1.39	11367	0.83	51.79	5.35	54.13	2.86	358.54	3.94	0.50	9.84
1.40	1.60	2.16	10706	1.22	75.38	5.37	59.26	5.24	369.92	7.32	1.05	15.67
1.60	1.80	0.34	7394	1.12	741.83	12.32	110.13	13.59	564.69	18.24	0.50	33.95
1.80	2.00	0.13	5319	0.84	318.70	12.73	107.32	16.09	663.00	25.40	0.49	47.30
2.00	2.45	0.12	2100	3.01	289.86	46.88	135.89	24.62	450.13	43.31	1.76	90.77
2.45		0.05	2135	10.67	235.98	83.69	111.64	46.14	1796.27	93.20	4.04	302.66
		100.00										

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Powder River Coal Co. (Rochelle Mine) **As-Received**

Total: Top Size x 0 % Amount This Size: 100.00

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
						CUMULATIVE						
	1.25	26.84	12281	2.33	11.56	1.45	42.39	1.28	169.79	1.79	1.58	3.68
1.25	1.30	85.57	12234	1.38	23.31	2.10	46.92	1.54	221.36	2.04	1.73	4.34
1.30	1.35	95.83	12172	1.44	23.77	2.36	47.50	1.58	224.49	2.21	1.75	4.29
1.35	1.40	97.22	12161	1.43	24.17	2.40	47.59	1.60	226.41	2.23	1.73	4.37
1.40	1.60	99.37	12129	1.43	25.28	2.46	47.85	1.68	229.52	2.34	1.71	4.62
1.60	1.80	99.71	12113	1.43	27.69	2.50	48.06	1.72	230.65	2.40	1.71	4.71
1.80	2.00	99.84	12105	1.43	28.06	2.51	48.13	1.74	231.21	2.43	1.71	4.77
2.00	2.45	99.95	12093	1.43	28.37	2.56	48.23	1.76	231.46	2.48	1.71	4.87
2.45		100.00	12088	1.43	28.47	2.60	48.26	1.78	232.19	2.52	1.71	5.01
Size Analysis Heads:				1.47	32.75	2.59	50.11	1.70	220.90	2.79	1.70	5.48
Head Sample Analysis:				1.50	28.00	2.79	47.20	1.78	226.30	2.29	2.50	6.48

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Powder River Coal Co. (Rochelle Mine) **As-Received**

		CUM. REC. (%)		CUMULATIVE ELEMENT REJECTION (Wt.%)								
Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
	1.25	26.84	27.27	56.45	89.10	85.02	76.43	80.77	80.37	80.92	75.13	80.30
1.25	1.30	85.57	86.60	17.64	29.93	30.97	16.82	26.32	18.42	30.57	13.52	25.91
1.30	1.35	95.83	96.49	3.57	19.99	13.14	5.69	15.09	7.35	15.91	2.09	17.89
1.35	1.40	97.22	97.80	2.77	17.46	10.28	4.14	12.87	5.21	13.74	1.69	15.16
1.40	1.60	99.37	99.71	0.93	11.75	5.83	1.49	6.53	1.77	7.46	0.37	8.42
1.60	1.80	99.71	99.91	0.67	3.02	4.24	0.72	3.98	0.95	5.03	0.27	6.15
1.80	2.00	99.84	99.97	0.59	1.58	3.61	0.44	2.82	0.59	3.74	0.23	4.93
2.00	2.45	99.95	99.99	0.35	0.39	1.49	0.11	1.20	0.36	1.72	0.11	2.81
2.45		100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Powder River Coal Co. (Rochelle Mine) **Crushed to -100 Mesh**

				INCREMENTAL								
Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
+	100 M	4.78	12114	1.16	11.50	1.84	45.20	1.44	125.00	1.84	1.61	3.80
100 M	325 M	55.34	12003	0.96	23.00	2.42	41.70	1.78	247.50	2.28	2.09	9.50
325 M	+0	39.88	11877	3.32	24.80	2.81	51.40	1.79	327.90	3.69	1.60	14.80
		95.22										

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Powder River Coal Co. (Rochelle Mine)

Crushed to - 100 Mesh

CUMULATIVE (BY SIZE GROUP)

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
	+100 M	4.78	12114	1.16	11.50	1.84	45.20	1.44	125.00	1.84	1.61	3.80
100 M	325 M	55.34	12003	0.96	23.00	2.42	41.70	1.78	247.50	2.28	2.09	9.50
325 M	+0	95.22	11950	1.95	23.75	2.58	45.76	1.78	281.17	2.87	1.88	11.72

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Powder River Coal Co. (Rochelle Mine) **Crushed to -100 Mesh**

				CUMULATIVE (ppm)								
Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
	+100 M	4.78	12114	1.16	11.50	1.84	45.20	1.44	0.13	1.84	1.61	3.80
100 M	325 M	60.12	12012	0.98	22.09	2.37	41.98	1.75	0.24	2.25	2.05	9.05
325 M	+0	100.00	11958	1.91	23.17	2.55	45.74	1.77	0.27	2.82	1.87	11.34
Head Sample Analysis:			11949	1.72	29.70	2.29	49.20	1.79	0.25	2.57	2.38	10.30

		CUM. REC. (%)		CUMULATIVE ELEMENT REJECTION (Wt.%)								
Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
	+100 M	4.78	4.84	97.10	97.63	96.55	95.28	96.11	97.82	96.88	95.89	98.40
100 M	325 M	60.12	60.39	69.29	42.69	43.98	44.82	40.38	47.78	52.16	34.09	52.04
325 M	+0	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Powder River Coal Co. (Rochelle Mine) **Crushed to -100 Mesh**

Total: Top Size x 0 % Amount This Size: 100.00

INCREMENTAL

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
	1.25	26.84	12281	2.33	11.56	1.45	42.39	1.28	169.76	1.79	1.58	3.68
1.25	1.30	58.73	12213	0.95	28.68	2.39	48.99	1.65	244.93	2.16	1.79	4.64
1.30	1.35	0.00										
1.35	1.40	6.87	12296	0.10	31.40	2.78	72.20	2.90	275.10	3.83	0.47	19.40
1.40	1.60	5.60	11522	1.40	38.30	3.78	79.10	3.53	272.20	5.67	2.10	14.60
1.60	1.80	0.99	10036	1.96	39.40	19.20	421.50	13.30	342.30	12.30	0.86	70.60
1.80	2.00	0.23	7384	1.96	39.40	19.20	421.50	13.30	342.30	12.30	0.86	70.60
2.00	2.45	0.29	3012	1.96	39.40	19.20	421.50	13.30	342.30	12.30	0.86	70.60
2.45		0.45	699	1.96	39.40	19.20	421.50	13.30	342.30	12.30	0.86	70.60
		100.00										

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Powder River Coal Co. (Rochelle Mine) **Crushed to -100 Mesh**

Total:	Top Size x 0	% Amount This Size:	100.00

CUMULATIVE

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
	1.25	26.84	12281	2.33	11.56	1.45	42.39	1.28	169.76	1.79	1.58	3.68
1.25	1.30	85.57	12234	1.38	23.31	2.10	46.92	1.53	221.35	2.04	1.72	4.34
1.30	1.35	85.57	12234	1.38	23.31	2.10	46.92	1.53	221.35	2.04	1.72	4.34
1.35	1.40	92.44	12239	1.29	23.91	2.15	48.80	1.64	225.34	2.18	1.63	5.46
1.40	1.60	98.04	12198	1.29	24.73	2.24	50.53	1.74	228.02	2.38	1.66	5.98
1.60	1.80	99.03	12176	1.30	24.88	2.41	54.24	1.86	229.16	2.48	1.65	6.63
1.80	2.00	99.26	12165	1.30	24.91	2.45	55.09	1.89	229.42	2.50	1.65	6.77
2.00	2.45	99.55	12139	1.30	24.96	2.50	56.16	1.92	229.75	2.53	1.65	6.96
2.45		100.00	12087	1.31	25.02	2.57	57.80	1.97	230.26	2.57	1.64	7.25
Size Analysis Heads:				1.91	23.16	2.54	45.73	1.76	273.71	2.82	1.87	11.34
Head Sample Analyses:				1.72	29.70	2.29	49.20	1.79	254.80	2.57	2.38	10.30

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Powder River Coal Co. (Rochelle Mine) **Crushed to -100 Mesh**

		CUM. REC. (%)		CUMULATIVE ELEMENT REJECTION (Wt.%)								
Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
	1.25	26.84	27.27	52.15	87.60	84.87	80.31	82.56	80.21	81.31	74.17	86.37
1.25	1.30	85.57	86.61	9.46	20.28	30.29	30.54	33.38	17.74	31.96	10.15	48.77
1.30	1.35	85.57	86.61	9.46	20.28	30.29	30.54	33.38	17.74	31.96	10.15	48.77
1.35	1.40	92.44	93.60	8.94	11.66	22.86	21.96	23.27	9.53	21.73	8.19	30.38
1.40	1.60	98.04	98.94	2.94	3.09	14.63	14.29	13.23	2.91	9.38	1.03	19.10
1.60	1.80	99.03	99.76	1.45	1.53	7.24	7.07	6.55	1.44	4.64	0.51	9.45
1.80	2.00	99.26	99.90	1.11	1.17	5.52	5.40	5.00	1.10	3.54	0.39	7.21
2.00	2.45	99.55	99.97	0.67	0.71	3.36	3.28	3.04	0.67	2.15	0.24	4.38
2.45		100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Antelope Coal Co. (NERCO)
Antelope Mine

STANDARD LABORATORIES, INC.

GOULD ENERGY DIVISION
PO BOX 214
CRESSON, PA 16630

DATE: 06/12/92
SAMPLE NO: 138734

CQ, INC.
ONE QUALITY CENTER
HOMER CITY, PA 15748

SAMPLE ID: ANTELOPE

SAMPLED BY:

DATE SAMPLED:

DATE RECEIVED: 12/10/91

OTHER ID: POWDER RIVER BASIN COAL AS-RECEIVED SAMPLE

CERTIFICATE OF ANALYSIS

TRACE ELEMENTS

ARSENIC	2.49 ppm
BARIUM	6.38 ppm
CADMIUM	< 0.10 ppm
CHROMIUM	4.20 ppm
FLUORINE	49.0 ppm
LEAD	3.21 ppm
MERCURY	268.0 ppb
NICKEL	4.54 ppm
SELENIUM	1.95 ppm
SILVER	< 0.10 ppm
ZINC	10.6 ppm
ANTIMONY	< 0.50 ppm

APPROVED BY Timothy
Thomas A. Right

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STANDARD LABORATORIES, INC.

, INC.
ALITY CENTER BOX 280
R CITY, PA 15748

DATE: 06/11/92
MASTER WARNER NO. 138734

SAMPLE ID: POWDER RIVER BASIN COAL - ANTELOPE

ATING CO: PROJECT 90D0101 TASK 2.4
LED BY: CUSTOMER PROVIDED

GROSS WEIGHT:
DATE RECEIVED: 12/10/91

R ID: AS-RECEIVED SAMPLE. WEIGHT PERCENTS REPORTED ON A DRY BASIS
*CORRECTED COPY-THIS REPORT SUPERSEDES ALL PRIOR REPORTS

CERTIFICATE OF ANALYSIS

EN SIZE RAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	ZINC	ANTIMON
/2" SQ	8.79	4.85	9.62	< 0.10	4.44	58.90	4.63	117.80	4.44	2.32	< 0.10	7.03	< 0.5
2" X 3/4"	30.63	1.65	5.15	< 0.10	3.57	44.90	2.92	289.10	4.33	1.82	< 0.10	10.90	< 0.5
X 3/8"	23.15	2.93	5.00	< 0.10	2.89	45.10	3.80	129.60	3.50	1.50	< 0.10	7.75	< 0.5
X 28M	33.57	1.60	9.83	< 0.10	6.22	35.10	2.90	256.30	5.57	1.64	< 0.10	7.37	< 0.5
X 100M	2.73	1.81	11.90	< 0.10	10.10	33.20	2.63	208.60	6.26	1.34	< 0.10	30.30	< 0.5
X 325M	0.68	5.05	10.10	< 0.10	14.40	47.90	4.71	268.60	7.79	1.84	< 0.10	47.60	< 0.5
X 0	0.45	1.10	101.80	< 0.10	23.60	69.10	9.73	241.90	12.30	0.58	< 0.10	193.60	< 0.5

CUMULATIVE RESULTS

EN SIZE RAVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMON
/2" SQ	8.79	4.85	9.62	< 0.10	4.44	58.90	4.63	117.80	4.44	2.32	< 0.10	7.03	< 0.5
2" X 3/4"	39.42	2.36	6.15	< 0.10	3.76	48.02	3.30	250.90	4.35	1.93	< 0.10	10.04	< 0.5
X 3/8"	62.57	2.57	5.72	< 0.10	3.44	46.94	3.49	206.02	4.04	1.77	< 0.10	9.19	< 0.5
X 28M	96.14	2.23	7.16	< 0.10	4.41	42.81	3.28	223.58	4.57	1.73	< 0.10	8.56	< 0.5
X 100M	98.87	2.22	7.29	< 0.10	4.57	42.54	3.26	223.16	4.62	1.72	< 0.10	9.16	< 0.5
X 325M	99.55	2.24	7.31	< 0.10	4.64	42.58	3.27	223.48	4.64	1.72	< 0.10	9.42	< 0.5
X 0	100.00	2.24	7.73	< 0.10	4.72	42.70	3.30	223.56	4.68	1.71	< 0.10	10.25	< 0.5

ALL TRACE ELEMENTS RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY Lori Pathey

APPROVED BY Thomas A. Light

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STANDARD LABORATORIES, INC.

INC.
ITY CENTER BOX 280
CITY, PA 15748

DATE: 06/09/93
MASTER WARNER NO. 137842

SAMPLE ID: POWDER RIVER BASIN COAL - ANTELOPE

ING CO: PROJECT 90D0101 TASK 2.4
) BY: CUSTOMER PROVIDED
AMPLED:

GROSS WEIGHT:
DATE RECEIVED: 12/10/91

ID: AS-RECEIVED SAMPLE. WEIGHT PERCENTS REPORTED ON A DRY BASIS
*CORRECTED COPY-THIS REPORT SUPERSEDES ALL PRIOR REPORTS

CERTIFICATE OF ANALYSIS

FEED FOR SIZE +3/4"SQ

SIZE ITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
	11.80	0.96	3.79	< 0.10	1.65	33.40	1.95	165.90	2.82	1.72	< 0.10	5.39	< 0.50
	69.29	2.26	3.54	< 0.10	2.71	45.30	2.48	280.30	4.37	2.10	< 0.10	10.30	< 0.50
	14.77	0.84	3.16	< 0.10	5.02	61.20	2.60	119.60	5.78	1.39	< 0.10	8.66	< 0.50
	1.43	2.12	5.15	< 0.10	6.36	59.20	2.58	197.30	6.36	0.97	< 0.10	4.55	< 0.50
	1.41	1.75	15.70	< 0.10	19.30	106.00	12.90	112.40	6.44	1.02	< 0.10	12.90	< 0.50
	0.31	2.44	34.20	< 0.10	38.00	195.90	20.30	106.10	12.70	0.99	< 0.10	9.62	< 0.50
	0.03	7.90	65.50	< 0.10	52.70	185.40	32.00	143.90	57.50	3.15	< 0.10	230.00	< 0.50
	0.49	10.20	120.80	< 0.10	75.60	45.60	43.00	208.30	28.70	4.03	< 0.10	264.10	< 0.50
NK	0.47	9.89	228.30	< 0.10	61.60	104.90	32.00	896.60	16.00	4.37	< 0.10	57.10	< 0.50

CUMULATIVE RESULTS

SIZE ITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
	11.80	0.96	3.79	< 0.10	1.65	33.40	1.95	165.90	2.82	1.72	< 0.10	5.39	< 0.50
	81.09	2.07	3.58	< 0.10	2.56	43.57	2.40	263.65	4.14	2.04	< 0.10	9.59	< 0.50
	95.86	1.88	3.51	< 0.10	2.94	46.29	2.43	241.46	4.40	1.94	< 0.10	9.44	< 0.50
	97.29	1.88	3.54	< 0.10	2.99	46.47	2.44	240.81	4.43	1.93	< 0.10	9.37	< 0.50
	98.70	1.88	3.71	< 0.10	3.22	47.33	2.58	238.97	4.45	1.92	< 0.10	9.42	< 0.50
	99.01	1.88	3.81	< 0.10	3.33	47.79	2.64	238.56	4.48	1.91	< 0.10	9.42	< 0.50
	99.04	1.89	3.82	< 0.10	3.34	47.83	2.65	238.53	4.50	1.91	< 0.10	9.49	< 0.50
	99.53	1.93	4.40	< 0.10	3.70	47.82	2.85	238.38	4.62	1.92	< 0.10	10.74	< 0.50
NK	100.00	1.96	5.45	< 0.10	3.97	48.09	2.98	241.47	4.67	1.94	< 0.10	10.96	< 0.50

ALL TRACE ELEMENT RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY Don Storey

APPROVED BY Thomas A. Right

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STANDARD LABORATORIES, INC.

INC.
LITY CENTER BOX 280
CITY, PA 15748

DATE: 06/11/92
MASTER WARNER NO. 137842

SAMPLE ID: POWDER RIVER BASIN COAL - ANTELOPE

TING CO: PROJECT 90D0101 TASK 2.4
ED BY: CUSTOMER PROVIDED
SAMPLED:

GROSS WEIGHT:
DATE RECEIVED: 12/10/91

ID: AS-RECEIVED SAMPLE. WEIGHT PERCENTS REPORTED ON A DRY BASIS
*CORRECTED COPY-THIS REPORT SUPERSEDES ALL PRIOR REPORTS

CERTIFICATE OF ANALYSIS

FEED FOR SIZE 3/4"SQ X 28M

N SIZE AVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
	3.90	1.61	1.80	< 0.10	2.23	38.50	0.74	69.10	0.64	0.68	< 0.10	4.03	< 0.50
	71.41	2.46	5.04	< 0.10	1.64	43.40	2.11	192.10	3.28	1.50	< 0.10	5.75	< 0.50
	19.07	1.68	2.51	< 0.10	4.63	36.80	2.84	204.70	3.66	1.26	< 0.10	4.05	< 0.50
	1.76	1.45	5.03	< 0.10	12.80	39.20	5.03	249.90	8.51	1.11	< 0.10	17.80	< 0.50
	1.96	2.00	38.40	< 0.10	16.20	44.30	9.42	185.80	12.10	1.01	< 0.10	15.50	< 0.50
	0.34	2.89	104.80	< 0.10	53.60	122.10	30.30	333.00	26.80	1.53	< 0.10	32.60	< 0.50
	0.12	3.60	103.40	< 0.10	72.80	146.80	37.90	665.90	33.50	1.68	< 0.10	69.90	< 0.50
	0.52	5.61	288.50	< 0.10	108.50	113.30	47.70	466.00	49.90	2.49	< 0.10	19.50	< 0.50
SINK	0.92	8.16	155.40	< 0.10	146.60	90.90	52.50	964.90	65.70	4.98	< 0.10	203.50	< 0.50

CUMULATIVE RESULTS

N SIZE AVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
	3.90	1.61	1.80	< 0.10	2.23	38.50	0.74	69.10	0.64	0.68	< 0.10	4.03	< 0.50
	75.31	2.42	4.87	< 0.10	1.67	43.15	2.04	185.73	3.14	1.46	< 0.10	5.66	< 0.50
	94.38	2.27	4.39	< 0.10	2.27	41.86	2.20	189.56	3.25	1.42	< 0.10	5.34	< 0.50
	96.14	2.25	4.41	< 0.10	2.46	41.82	2.25	190.67	3.34	1.41	< 0.10	5.56	< 0.50
	98.10	2.25	5.09	< 0.10	2.74	41.86	2.40	190.57	3.52	1.40	< 0.10	5.76	< 0.50
	98.44	2.25	5.43	< 0.10	2.91	42.14	2.49	191.06	3.60	1.40	< 0.10	5.85	< 0.50
	98.56	2.25	5.55	< 0.10	3.00	42.27	2.54	191.64	3.64	1.40	< 0.10	5.93	< 0.50
	99.08	2.27	7.03	< 0.10	3.55	42.64	2.77	193.08	3.88	1.41	< 0.10	6.00	< 0.50
SINK	100.00	2.32	8.40	< 0.10	4.87	43.09	3.23	200.18	4.45	1.44	< 0.10	7.82	< 0.50

ALL TRACE ELEMENT RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY Lori Pethey

APPROVED BY Thomas A. Rifot

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STANDARD LABORATORIES, INC.

INC.
'TY CENTER BOX 280
:ITY, PA 15748

DATE: 06/11/92
MASTER WARNER NO. 137842

SAMPLE ID: POWDER RIVER BASIN COAL - ANTELOPE

:NG CO: PROJECT 90D0101 TASK 2.4
) BY: CUSTOMER PROVIDED
AMPLED:

GROSS WEIGHT:
DATE RECEIVED: 12/10/91

*CORRECTED COPY-THIS REPORT SUPERSEDES ALL PRIOR REPORTS
:D: AS-RECEIVED SAMPLE. WEIGHT PERCENTS REPORTED ON A DRY BASIS
INSUFFICIENT MATERIAL FOR THE 1.25, 1.30, 1.35, 2.00, 2.45 AND 2.45
SINK GRAVITY ANALYSIS.

CERTIFICATE OF ANALYSIS

FEED FOR SIZE 28M X 100M

SIZE :ITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	12.59	3.14	3.92	< 0.10	7.16	41.10	1.76	173.50	5.27	1.60	< 0.10	19.80	< 0.50
	82.25	2.06	7.75	< 0.10	7.45	31.10	2.24	176.90	4.62	1.15	< 0.10	31.70	< 0.50
	5.16	2.12	71.80	< 0.10	43.40	49.50	13.80	185.70	23.90	1.07	< 0.10	91.30	< 0.50
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
:NK	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CUMULATIVE RESULTS

SIZE 'ITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	12.59	3.14	3.92	< 0.10	7.16	41.10	1.76	173.50	5.27	1.60	< 0.10	19.80	< 0.50
	94.84	2.20	7.24	< 0.10	7.41	32.43	2.18	176.45	4.71	1.21	< 0.10	30.12	< 0.50
	100.00	2.20	10.57	< 0.10	9.27	33.31	2.78	176.93	5.70	1.20	< 0.10	33.28	< 0.50
	100.00	2.20	10.57	< 0.10	9.27	33.31	2.78	176.93	5.70	1.20	< 0.10	33.28	< 0.50
	100.00	2.20	10.57	< 0.10	9.27	33.31	2.78	176.93	5.70	1.20	< 0.10	33.28	< 0.50
:NK	100.00	2.20	10.57	< 0.10	9.27	33.31	2.78	176.93	5.70	1.20	< 0.10	33.28	< 0.50

ALL TRACE ELEMENT RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY Doris Pathney

APPROVED BY Thomas A. Right

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STANDARD LABORATORIES, INC.

INC.
LITY CENTER BOX 280
CITY, PA 15748

DATE: 06/11/92
MASTER WARNER NO. 137842

SAMPLE ID: POWDER RIVER BASIN COAL - ANTELOPE

TING CO: PROJECT 90D0101 TASK 2.4
ED BY: CUSTOMER PROVIDED
SAMPLED:

GROSS WEIGHT:
DATE RECEIVED: 12/10/91

ID: AS-RECEIVED SAMPLE. WEIGHT PERCENTS REPORTED ON A DRY BASIS
*CORRECTED COPY-THIS REPORT SUPERSEDES ALL PRIOR REPORTS
INSUFFICIENT MATERIAL FOR THE 1.25, 1.30 AND 1.35 GRAVITY ANALYSIS.

CERTIFICATE OF ANALYSIS

FEED FOR SIZE 100M X 0

N SIZE AVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	40.94	1.06	4.89	< 0.10	8.90	26.10	1.93	173.20	5.19	1.25	< 0.10	82.00	< 0.50
	43.47	4.45	14.30	< 0.10	8.75	46.60	3.68	175.70	6.45	1.66	< 0.10	78.30	< 0.50
	6.29	2.90	23.90	< 0.10	24.40	51.20	6.47	201.30	14.90	1.20	< 0.10	178.20	< 0.50
	2.62	2.97	76.90	< 0.10	84.50	144.20	32.50	207.00	27.10	1.58	< 0.10	270.80	< 0.50
	2.81	3.03	490.90	< 0.10	80.40	158.90	41.90	377.50	59.40	2.30	< 0.10	312.70	< 0.50
SINK	3.87	8.28	460.40	< 0.10	175.40	41.60	61.40	1176.50	72.40	3.44	< 0.10	530.60	< 0.50

CUMULATIVE RESULTS

N SIZE AVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	40.94	1.06	4.89	< 0.10	8.90	26.10	1.93	173.20	5.19	1.25	< 0.10	82.00	< 0.50
	84.41	2.81	9.74	< 0.10	8.82	36.66	2.83	174.49	5.84	1.46	< 0.10	80.09	< 0.50
	90.70	2.81	10.72	< 0.10	9.90	37.67	3.08	176.35	6.47	1.44	< 0.10	86.90	< 0.50
	93.32	2.82	12.58	< 0.10	12.00	40.66	3.91	177.21	7.05	1.45	< 0.10	92.06	< 0.50
	96.13	2.82	26.56	< 0.10	14.00	44.11	5.02	183.06	8.58	1.47	< 0.10	98.51	< 0.50
SINK	100.00	3.03	43.35	< 0.10	20.24	44.02	7.20	221.51	11.05	1.55	< 0.10	115.23	< 0.50

ALL TRACE ELEMENT RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY Don Pethy

APPROVED BY Thomas A. Right

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

STANDARD LABORATORIES, INC.

GOULD ENERGY DIVISION
PO BOX 214
CRESSON, PA 16630

CQ, INC.
ONE QUALITY CENTER
HOMER CITY, PA 15748

DATE: 06/12/92
SAMPLE NO: 138785

SAMPLE ID: ANTELOPE

SAMPLED BY:

DATE SAMPLED:

DATE RECEIVED: 12/10/91

OTHER ID: POWDER RIVER BASIN CRUSHED TO 100M

CERTIFICATE OF ANALYSIS

TRACE ELEMENTS

ARSENIC	2.70 ppm
BARIUM	7.36 ppm
CADMIUM	< 0.10 ppm
CHROMIUM	4.48 ppm
FLUORINE	47.2 ppm
LEAD	3.25 ppm
MERCURY	245.9 ppb
NICKEL	5.14 ppm
SELENIUM	1.91 ppm
SILVER	< 0.10 ppm
ZINC	8.39 ppm
ANTIMONY	< 0.50 ppm

APPROVED BY Doris Pathney
Thomas A. Pight

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STANDARD LABORATORIES, INC.

INC.
LITY CENTER BOX 280
CITY, PA 15748

DATE: 06/09/93
MASTER WARNER NO. 138785

SAMPLE ID: POWDER RIVER BASIN COAL - ANTELOPE

TING CO: PROJECT 90D0101 TASK 2.4
ED BY: CUSTOMER PROVIDED
SAMPLED:

GROSS WEIGHT:
DATE RECEIVED: 12/10/91

ID: RAW COAL CRUSHED TO 100M. WEIGHT PERCENTS REPORTED ON A DRY BASIS
*CORRECTED COPY-THIS REPORT SUPERSEDES ALL PRIOR REPORTS

CERTIFICATE OF ANALYSIS

N SIZE AVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
	4.06	2.92	3.55	< 0.10	2.65	42.00	2.05	238.70	5.42	1.46	< 0.10	2.80	< 0.50
X 325M	73.52	1.45	4.54	< 0.10	3.18	34.40	2.46	215.80	5.49	1.62	< 0.10	9.00	< 0.50
X 0	22.42	4.79	24.20	< 0.10	7.83	92.80	6.03	323.10	7.23	1.36	< 0.10	15.90	< 0.50

CUMULATIVE RESULTS

N SIZE AVITY	WEIGHT %	ARSENIC	BARIUM	CADMIUM	CHROMIUM	FLUORINE	LEAD	MERCURY (*)	NICKEL	SELENIUM	SILVER	ZINC	ANTIMONY
	4.06	2.92	3.55	< 0.10	2.65	42.00	2.05	238.70	5.42	1.46	< 0.10	2.80	< 0.50
X 325M	77.58	1.53	4.49	< 0.10	3.15	34.80	2.44	217.00	5.49	1.61	< 0.10	8.68	< 0.50
X 0	100.00	2.26	8.91	< 0.10	4.20	47.80	3.24	240.79	5.88	1.56	< 0.10	10.30	< 0.50

ALL TRACE ELEMENT RESULTS ARE STATED IN ppm EXCEPT THOSE INDICATED BY * WHICH ARE IN ppb

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

APPROVED BY Lori Petrey
APPROVED BY Thomas A. Right

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CQE: POWDER RIVER COAL CHARACTERIZATIONS

Antelope Coal Co. (Antelope Mine) **As-Received**

Size Interval: 28 x 100 mesh % Amount This Size: 2.73

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
						CUMULATIVE						
	1.25											
1.25	1.30											
1.30	1.35	5.22	11817	3.14	3.92	7.16	41.10	1.76	173.50	5.27	1.60	19.80
1.35	1.40	12.59	11774	3.14	3.92	7.16	41.10	1.76	173.50	5.27	1.60	19.80
1.40	1.60	94.84	11732	2.20	7.24	7.41	32.43	2.18	176.45	4.71	1.21	30.12
1.60	1.80	97.64	11654	2.20	9.09	8.44	32.92	2.51	176.71	5.26	1.21	31.87
1.80	2.00	98.24	11621	2.20	9.48	8.66	33.02	2.58	176.77	5.37	1.20	32.24
2.00	2.45	98.92	11566	2.20	9.90	8.90	33.13	2.66	176.83	5.50	1.20	32.64
2.45		100.00	11461	2.20	10.57	9.27	33.31	2.78	176.93	5.70	1.20	33.28
	Size Analysis Heads:			1.81	11.90	10.10	33.20	2.63	208.60	6.26	1.34	30.30

Size Interval: -100 mesh % Amount This Size: 1.13

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
						CUMULATIVE						
	1.25											
1.25	1.30											
1.30	1.35											
1.35	1.40	40.94	11879	1.06	4.89	8.90	26.10	1.93	173.20	5.19	1.25	82.00
1.40	1.60	84.41	11646	2.81	9.74	8.82	36.66	2.83	174.49	5.84	1.46	80.09
1.60	1.80	90.70	11551	2.81	10.72	9.90	37.67	3.08	176.35	6.47	1.44	86.90
1.80	2.00	93.32	11432	2.82	12.58	12.00	40.66	3.91	177.21	7.05	1.45	92.06
2.00	2.45	96.13	11181	2.82	26.56	14.00	44.11	5.02	183.06	8.58	1.47	98.51
2.45		100.00	10792	3.03	43.35	20.24	44.02	7.20	221.51	11.05	1.55	115.23
	Size Analysis Heads:			3.48	46.62	18.06	56.34	6.71	257.97	9.59	1.34	105.74

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Antelope Coal Co. (Antelope Mine) **As-Received**

Total: Top Size x 0 % Amount This Size: 100.00

INCREMENTAL

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
	1.25	6.86	12105	1.17	3.15	1.84	35.04	1.56	134.70	2.12	1.38	4.95
1.25	1.30	67.82	12033	2.38	4.44	2.07	44.17	2.26	227.62	3.72	1.74	7.58
1.30	1.35	16.78	11693	1.40	2.75	4.79	45.30	2.75	174.91	4.41	1.31	5.78
1.35	1.40	2.23	11113	1.69	4.93	9.85	41.71	3.47	213.73	6.98	1.15	27.97
1.40	1.60	4.40	10566	2.27	17.22	11.30	45.61	5.56	170.87	6.94	1.16	30.44
1.60	1.80	0.46	7117	2.65	68.26	43.31	118.71	21.27	228.48	20.77	1.26	58.60
1.80	2.00	0.13	5381	3.66	89.49	69.84	137.15	32.94	446.44	33.00	1.72	134.98
2.00	2.45	0.54	1003	6.98	232.80	92.80	89.50	44.50	358.67	41.96	2.98	127.02
2.45		0.78	590	8.35	186.64	124.13	89.90	46.67	931.10	52.70	4.60	182.83
		100.00										

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Antelope Coal Co. (Antelope Mine) **As-Received**

		CUM. REC. (%)		CUMULATIVE ELEMENT REJECTION (Wt.%)								
Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
	1.25	6.86	7.09	96.33	97.19	97.38	94.63	96.62	95.72	96.87	94.18	96.90
1.25	1.30	74.68	76.74	22.52	58.08	68.16	27.78	48.23	24.28	42.55	21.80	50.01
1.30	1.35	91.46	93.49	11.77	52.09	51.45	10.81	33.66	10.69	26.62	8.36	41.16
1.35	1.40	93.69	95.60	10.05	50.66	46.89	8.74	31.22	8.49	23.27	6.79	35.49
1.40	1.60	98.09	99.58	5.47	40.80	36.54	4.25	23.49	5.01	16.68	3.67	23.27
1.60	1.80	98.56	99.86	4.91	36.69	32.37	3.03	20.38	4.52	14.62	3.32	20.79
1.80	2.00	98.68	99.91	4.70	35.23	30.54	2.64	19.07	4.26	13.72	3.18	19.24
2.00	2.45	99.22	99.96	2.98	18.93	20.15	1.57	11.50	3.36	8.86	2.20	13.01
2.45		100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Antelope Coal Co. (Antelope Mine) **Crushed to -100 Mesh**

INCREMENTAL

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
	+100 M	4.06	11778	2.92	3.55	2.65	42.00	2.05	238.70	5.42	1.46	2.80
100 M	325 M	73.52	11803	1.45	4.54	3.18	34.40	2.46	215.80	5.49	1.62	9.00
325 M	+0	22.42	11609	4.79	24.20	7.83	92.80	6.03	323.10	7.23	1.36	15.90
		95.94										

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Antelope Coal Co. (Antelope Mine)

Crushed to -100 Mesh

CUMULATIVE (BY SIZE GROUP)

Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
	+100 M	4.06	11778	2.92	3.55	2.65	42.00	2.05	238.70	5.42	1.46	2.80
100 M	325 M	73.52	11803	1.45	4.54	3.18	34.40	2.46	215.80	5.49	1.62	9.00
325 M	+0	95.94	11758	2.23	9.13	4.27	48.05	3.29	240.87	5.90	1.56	10.61

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Antelope Coal Co. (Antelope Mine) **Crushed to -100 Mesh**

				CUMULATIVE (ppm)								
Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
	+100 M	4.06	11778	2.92	3.55	2.65	42.00	2.05	0.24	5.42	1.46	2.80
100 M	325 M	77.58	11802	1.53	4.49	3.15	34.80	2.44	0.22	5.49	1.61	8.68
325 M	+0	100.00	11758	2.26	8.91	4.20	47.80	3.24	0.24	5.88	1.56	10.30
Head Sample Analysis:			11791	2.70	7.36	4.48	47.20	3.25	0.25	5.14	1.91	8.39

		CUM. REC. (%)		CUMULATIVE ELEMENT REJECTION (Wt.%)								
Passing	Retained	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
	+100 M	4.06	4.07	94.75	98.38	97.44	96.43	97.43	95.98	96.26	96.19	98.90
100 M	325 M	77.58	77.87	47.55	60.91	41.79	43.53	41.68	30.08	27.58	19.61	34.63
325 M	+0	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Antelope Coal Co. (Antelope Mine)

Crushed to -100 Mesh

Total: Top Size x 0 % Amount This Size: 100.00

INCREMENTAL

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
	1.25	6.86	12105	1.17	3.15	1.84	35.04	1.56	134.70	2.12	1.38	4.95
1.25	1.30	67.82	12033	2.38	4.44	2.07	44.17	2.26	227.62	3.72	1.74	7.58
1.30	1.35	0.00										
1.35	1.40	0.00										
1.40	1.60	18.12	11913	4.05	32.30	12.80	37.60	3.15	286.90	4.72	1.06	17.80
1.60	1.80	4.66	11081	1.24	27.30	28.30	59.50	9.30	541.40	6.98	0.78	31.40
1.80	2.00	0.88	7951	4.60	219.50	66.90	104.90	20.70	250.20	25.40	1.40	90.40
2.00	2.45	0.58	2779	6.61	461.10	122.60	158.10	47.60	227.80	64.00	2.99	195.80
2.45		1.07	882	9.28	256.80	196.00	47.80	54.10	1192.40	103.60	3.73	468.50
		100.00										

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Antelope Coal Co. (Antelope Mine) **Crushed to -100 Mesh**

Total: Top Size x 0 % Amount This Size: 100.00

CUMULATIVE

Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg*	Ni	Se	Zn
	1.25	6.86	12105	1.17	3.15	1.84	35.04	1.56	134.70	2.12	1.38	4.95
1.25	1.30	74.68	12040	2.27	4.32	2.05	43.33	2.20	219.08	3.57	1.71	7.34
1.30	1.35	74.68	12040	2.27	4.32	2.05	43.33	2.20	219.08	3.57	1.71	7.34
1.35	1.40	74.68	12040	2.27	4.32	2.05	43.33	2.20	219.08	3.57	1.71	7.34
1.40	1.60	92.80	12015	2.62	9.78	4.15	42.21	2.38	232.32	3.80	1.58	9.38
1.60	1.80	97.46	11970	2.55	10.62	5.30	43.04	2.71	247.11	3.95	1.54	10.43
1.80	2.00	98.34	11934	2.57	12.50	5.86	43.60	2.87	247.14	4.14	1.54	11.15
2.00	2.45	98.93	11880	2.59	15.14	6.54	44.27	3.14	247.03	4.49	1.55	12.24
2.45		100.00	11762	2.66	17.73	8.58	44.31	3.69	257.17	5.56	1.57	17.14
Size Analysis Heads:				2.26	8.90	4.20	47.80	3.24	240.78	5.88	1.37	10.29
Head Sample Analyses:				2.70	7.36	4.48	47.20	3.25	245.90	5.14	1.91	8.39

*** Indicates ppb rather than ppm basis**

CQE: POWDER RIVER COAL CHARACTERIZATIONS

Antelope Coal Co. (Antelope Mine) **Crushed to -100 Mesh**

		CUM. REC. (%)		CUMULATIVE ELEMENT REJECTION (Wt.%)								
Sink	Float	Wt.%	Btu/lb	As	Ba	Cr	F	Pb	Hg	Ni	Se	Zn
	1.25	6.86	7.06	96.99	98.78	98.53	94.57	97.09	96.41	97.38	93.98	98.02
1.25	1.30	74.68	76.44	36.41	81.80	82.16	26.97	55.50	36.38	51.99	18.96	68.02
1.30	1.35	74.68	76.44	36.41	81.80	82.16	26.97	55.50	36.38	51.99	18.96	68.02
1.35	1.40	74.68	76.44	36.41	81.80	82.16	26.97	55.50	36.38	51.99	18.96	68.02
1.40	1.60	92.80	94.79	8.88	48.81	55.13	11.59	40.02	16.17	36.61	6.75	49.21
1.60	1.80	97.46	99.18	6.71	41.63	39.74	5.33	28.25	6.35	30.75	4.44	40.66
1.80	2.00	98.34	99.78	5.18	30.69	32.85	3.24	23.28	5.49	26.72	3.65	36.00
2.00	2.45	98.93	99.92	3.74	15.55	24.53	1.16	15.76	4.98	20.01	2.55	29.35
2.45		100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

APPENDIX C

Petroleum Coke Data

GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE: 9-25-93
MASTER SAMPLE NO. 148097

C.&., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: PETROLEUM COKE (PINE BEND - KOCH CARBON)

'ERATING CO.:
AMPLED BY: CUSTOMER PROVIDED
INE:
CATION:

TE SAMPLED:
ATHER:
ROSS WEIGHT: 32.7

DATE RECEIVED: 2/6/92

'HER ID: CHARACTERIZATION NSP KING STATION (COAL-B) AS-RECEIVED SAMPLE TOP X 0 WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS ON AN SO3 -FREE BASIS

CERTIFICATE OF ANALYSIS

		AS RECEIVED	DRY BASIS
MOISTURE D2961	D3302 D3173	.27%	XXX
VOLATILE MATTER	D3175	9.17%	9.19%
FIXED CARBON	D3172	90.18%	90.43%
ASH	D3174	.38%	.38%
SULFUR	D4239 METHOD 3.3	6.06%	6.08%
CARBON	D3178	86.96%	87.20%
HYDROGEN	D3178	3.66%	3.67%
NITROGEN	D3179	1.58%	1.58%
OXYGEN	D3176	1.09%	1.09%
BTU/LB	D2015 D1989	15100	15141
MAF BTU/LB			15199
LBS OF SO2 PER MILLION BTU			8.02
LBS OF SULFUR PER MILLION BTU			4.015
HARDGROVE GRINDABILITY INDEX	D409	28	
ORMS OF SULFUR	D2492		
PYRITIC SULFUR		.02%	.02%
SULFATE SULFUR		.01%	.01%
ORGANIC SULFUR		6.03%	6.05%
CHLORINE	D4208	.03%	.03%
PERCENT SOLIDS			99.73%
EQUILIBRIUM MOISTURE	D1412	1.18%	

APPROVED BY Lori Petrey

APPROVED BY RCCLG

BLACK SEAL ANALYSIS

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GOULD ENERGY DIVISION
P.O. BOX 214
CRESSON, PA 16630

STANDARD LABORATORIES, INC.

DATE 8-25-93
MASTER SAMPLE NO. 148097

C.O., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

SAMPLE ID: PETROLEUM COKE (PINE BEND - KOCH CARBON)

OPERATING CO.:
MINE:
SAMPLED BY: CUSTOMER PROVIDED
GROSS WEIGHT: 32.7

DATE SAMPLED:

DATE RECEIVED: 2/6/92

OTHER ID: CHARACTERIZATION NSP KING STATION (COAL-B) AS-RECEIVED SAMPLE TOP X 0 WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS ON AN SO3-FREE BASIS

CERTIFICATE OF ANALYSIS

FRACTION	WT%	MOISTURE	ASH	SULFUR	BTU	LBS SO2 PER MBTU	MAF BTU
1/4"SQ	50.94	.41	.36	5.91	15142	7.80	15197
1/4"SQ X 28M	43.97	.41	.30	5.95	15141	7.85	15186
28M X 100M	3.60	.15	.56	5.86	15123	7.74	15208
100M X 325M	1.01	.38	1.19	5.79	14976	7.73	15155
325M X 0	.48	.80	4.55	5.65	14366	7.86	15050

CUMULATIVE RETAINED - DOWN

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
-1/4"SQ	50.94	.36	5.91	15142	7.80
1/4"SQ X 28M	94.91	.33	5.92	15142	7.81
28M X 100M	98.51	.34	5.92	15141	7.81
100M X 325M	99.52	.35	5.92	15140	7.81
325M X 0	100.00	.37	5.92	15136	7.82

CUMULATIVE RETAINED - UP

FRACTION	WT%	ASH	SULFUR	BTU	LBS SO2 PER MBTU
-1/4"SQ X 0	100.00	.37	5.92	15136	7.82
1/4"SQ X 0	49.06	.38	5.93	15129	7.83
28M X 0	5.09	1.06	5.82	15023	7.74
100M X 0	1.49	2.27	5.74	14779	7.76
325M X 0	.48	4.55	5.65	14366	7.86

ANALYTICAL RESULTS ARE STATED ON A DRY BASIS

PAGE 1

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APPROVED BY [signature]

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STANDARD LABORATORIES, INC.

C.Q., INC.
1 QUALITY CENTER BOX 280
HOMER CITY, PA 15748

DATE: 05/25/93
MASTER WARNER NO: 148097

SAMPLED BY: CUSTOMER PROVIDED

SAMPLE I.D.: NSP KING AS RECEIVED PETROLEUM COKE

DATE SAMPLED:

DATE RECEIVED: 2/6/92

GROSS WEIGHT: 32.7 KG

OTHER I.D.: RUN #92020702 AS-RECEIVED SAMPLE WEIGHT PERCENTS REPORTED ON A DRY BASIS ASH PERCENTS ON AN SO3 BASIS

THIS REPORT SUPERCEDES ALL PRIOR REPORTS IDENTIFIED WITH THE SAME LABORATORY NUMBER.

CERTIFICATE OF ANALYSIS

BARIUM	1.21	ppm
CHROMIUM	1.68	ppm
LEAD	0.26	ppm
LITHIUM	0.07	ppm
NICKEL	182.8	ppm
TIN	1.13	ppm
THALLIUM	< 0.50	ppm
TITANIUM	19.3	ppm
VANADIUM	360.0	ppm
ZINC	0.88	ppm
ARSENIC	< 2.00	ppb
SELENIUM	< 2.00	ppb
MERCURY	66.1	ppb
FLUORINE	14.9	ppm
STRONTIUM	1.13	ppm

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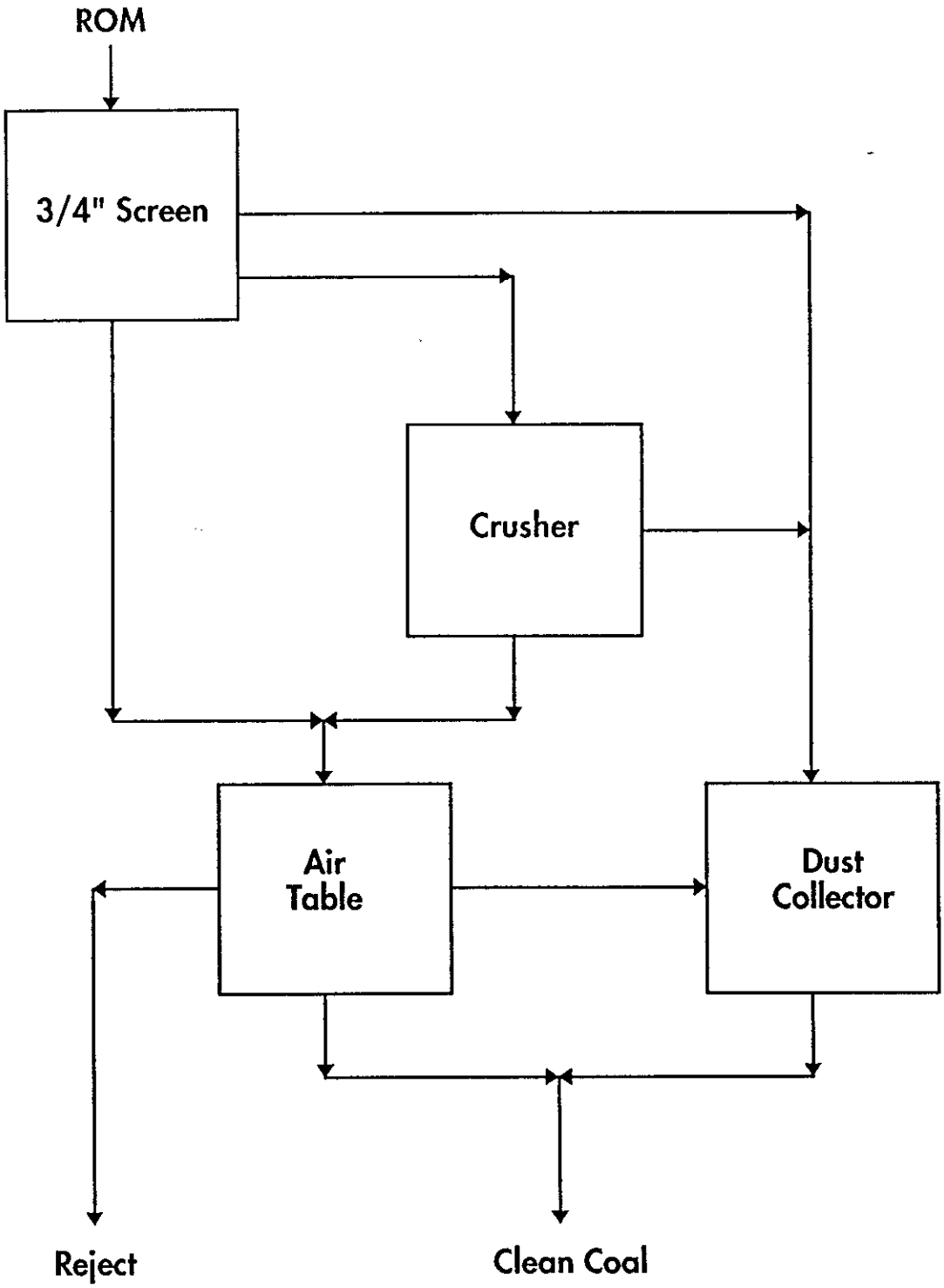
APPENDIX D

Cost Estimation Supplementals

AIR TABLE CIRCUIT



OPERATING COSTS

AIR TABLE PLANT

Production Costs	Dollars	Dollars/Raw Ton
Labor		
Union Employees	455,349	0.105
Union Fringes	192,931	0.045
Supervisory Employees	133,440	0.031
Supervisory Fringes	42,394	0.010
Workers Compensation	31,795	0.007
Payroll Taxes	56,465	0.013
Training Expenses	3,886	0.001
Inspection Expenses	765	0.001
Total Labor	917,025	0.213
Supplies & Expenses		
Maintenance Supplies	1,462,288	0.339
Operating Supplies	69,017	0.016
Electric Power	597,306	0.138
Handling Refuse	302,379	0.070
Governmental Compliance	34,508	0.008
Total Supplies & Expenses	2,465,498	0.572
Other Charges		
Insurance	By Owner	By Owner
Real Estate Taxes	By Owner	By Owner
Depreciation	By Owner	By Owner
Mine Closing Expense	By Owner	By Owner
Rentals	By Owner	By Owner
Total Other Charges	By Owner	By Owner
Total Production Costs	3,382,523	0.785

Given: Existing Facility 1000 tph Raw/Clean
1989 Production 4,011,156 Tons
4,011,156 Tons ÷ 1000 tph = 4011 hr/year
@ 95% Availability 4011 ÷ .95 = 4222 Scheduled hrs/year
For 48 week/year operation = 88 hrs/week
For five-day week 88 ÷ 5 = 17.6 hrs/day
For six-day week 88 ÷ 6 = 14.7 hrs/day

@ 92.99% yield needed to process $\frac{4,011,156}{.9299}$ = 4,313,535 tons

4,313,535 tons ÷ 1000 = 4314 hrs/year
@90% Availability 4314 ÷ .90 = 4793 hrs/year
4793 hrs/year ÷ 48 weeks = 99.86 hrs/week
99.86 ÷ 5 days/week = 19.97 hrs/day

Need: 3 shift/day operation
5 days/week
20 production hrs/day
4 maintenance hrs/day
12 maintenance over time days/year

	Year	Hour
Raw Tons	4,313,535	1000
Clean Tons	4,011,156	930
Reject Tons	302,379	70

Raw Feed

Passing	Retained	Wt. %	% Ash	% Sulfur	Btu	Crushing the 3/4" assume the size distribution stays the same for 3/4" x 0; we get new Wt %
+	1 1/2"	2.51	13.96	1.02	10,570	
1 1/2"	3/4"	21.18	11.09	0.71	11,370	
		23.69				
3/4"	3/8"	25.32	9.45	0.77	11,658	33.18
3/8"	28M	41.88	8.77	0.84	11,730	54.88
		67.20				88.06
28M	100M	5.05	10.77	1.08	11,451	6.62
100M	325M	1.42	13.58	1.14	10,792	1.86
325M	+0	2.64	37.03	0.46	7,571	3.46
		4.06				5.32
Total		100.00				100.00

CALCULATED CLEAN QUALITY
TYPICAL PRB
3/4" x 28M (Air Tables @ 1.85 sp.gr.)

Specific Gravity Separation	Distribution Factor	Weight %	Clean Coal Fraction	Refuse Fraction	Ash	Sulfur	Btu
1.25	97.0	5.30	5.14	0.16	5.06	0.50	12,295
1.30	95.5	52.98	50.60	2.38	6.56	0.51	12,178
1.35	93.5	18.16	16.98	1.18	7.36	0.52	12,039
1.40	91.5	12.25	11.21	1.04	10.49	0.45	11,735
1.60	84.0	7.69	6.46	1.23	19.04	0.77	10,313
1.80	67.5	1.18	0.80	0.38	40.18	2.90	6,922
2.00	48.5	0.62	0.30	0.32	49.49	4.63	5,126
2.45	32.5	1.26	0.41	0.85	61.06	6.04	3,075
Sink 2.45	25.5	0.56	0.14	0.42	66.56	23.47	2,672
		100.00	92.04	7.96			
			Clean Coal Quality		8.74	0.62	11,850
			Refuse Quality		21.41	2.63	9,806

Size	Cleaning	Wt %	Yield	Clean Coal	Ash	Sulfur	Btu
3/4" x 28M	Air Tables	88.06	92.04	81.05	8.74	0.62	11,850
28M x 100M	Raw	6.62	100.00	6.62	10.77	1.08	11,451
100M x 325M	Raw	1.86	100.00	1.86	13.58	1.14	10,792
325M x 0	Raw	3.46	100.00	3.46	37.03	0.46	7,571
			Yield =	92.99	10.03	0.66	11,641

MANPOWER

Classified Job Description	Midnight	Day	Afternoon	Total
Control Room Operator	1	1	1	3
Air Table Operator	1	1	1	3
Laborer	1	1	1	3
Mechanic	1	1	1	3
	4	4	4	12
Supervisory				
Foreman	1	1	1	3
	5	5	5	15

It is assumed that this mine already has a superintendent or plant manager along with the necessary clerical, purchasing, and administrative staff. The above listed persons are suggested additional requirements.

Overtime
It is projected that each person will work one day a month overtime for maintenance. Therefore, each person will work 12 x 8 = 96 hours/year overtime maintenance.

(52 wks)(5 days/wk)(7.25 hrs/day) = 1885 hrs/yr straight time operating
(52 wks)(5 days/wk)(0.75 hrs/day) = 195 hrs/yr overtime operating

Rates & Fringes - Hourly rates and fringes are based on UMWA values.

Annual Labor Cost

Job Description	Rate	Quantity	Base	Overtime	Total
Control Room Op.	16.564	3	93669	21691	115,360
Air Table Op.	16.320	3	92290	21371	113,661
Laborer	16.037	3	90689	20279	110,968
Mechanic	16.564	3	93669	21691	115,360
		12	370317	85032	455,349
Foreman	20.00	3	124800	8640	133,440

Actual 1991 Values for An Operating Plant

Line			Proposed
1	Union Employees	715,171	455,349
2	Union Fringe	303,038 (42.37% of 1)	192,931
3	Supervisory	371,256	133,440
4	Supv. Fringe	117,962 (31.77% of 3)	42,394
5	Total Labor (1+3)	1,086,427	588,789
6	Work. Comp.	58,678 (5.4% of 5)	31,795
7	Payroll Taxes	104,221 (9.59% of 5)	56,465
8	Training Expenses	7,173 (0.66% of 5)	3,886
9	Inspection Expenses	1,433 (0.13% of 5)	765

Plant Size

1000 tph ÷ 100 ton/table =	10	Tables
	2	Spare Tables
	12	Total Tables

Horsepower

Table

Pressure Fan	75	
Exhaust Fan	75	
Butterfly Valve	10	190/Table
Auger Drive	10	
Shovel Drive	5	
Ajax Vibrator	5	
Table Feeder	10	

Quantity	Description	Horsepower	Total
2	Raw Coal Feeders	20	40
2	Raw Coal Belts	150	300
12	Tables	190	2280
2	Reject Collection Belts	50	100
1	Final Refuse Belt	150	150
2	Clean Coal Collection Belts	100	200
1	Final Clean Coal Belt	300	300
1	Plant Air Compressor	150	150
1	Refuse Gate	5	5
12	Star Valves for Dust Collectors	5	60
	Subtotal		3585
	20% for HVAC		717
	20% for Lighting		717
	Grand Total		5019

Electric

Utility quote of $562,004/2000 hrs. @ 15844 H.P.

$$\$562{,}004 \frac{(5019\ HP)}{(15844\ HP)} = \$178{,}029$$

35,606 (20% for HVAC)
35,606 (20% for lights)
$249,241

$$\$249{,}241 \frac{(4793\ hrs)}{(2000\ hrs)} = \$597{,}306 \div 4313535 \text{ tons}$$

$= \$0.138$/raw ton

Handling Refuse

Not knowing the regulations governing refuse disposal. The easiest method of handling refuse is to store the material in a bin; the empty trucks used to haul the coal to the plant could be used, as required, to haul the refuse back to the pit where it could be burned as the pit is reclaimed. Total costs in Central Pennsylvania run around $1.85 per ton of refuse to haul in separate trucks to a designated refuse site, and maintain that site.

This dry refuse should be less of a problem and it is esimated that $1.00/ton should cover all costs.

$$302{,}379 \text{ tons} \left(\frac{\$1.00}{\text{ton}}\right) \div 4{,}313{,}535 \text{ tons} = \$0.070/\text{raw ton}$$

The following costs were for an air table plant that was processing on the average of 1100 tons per hour of raw feed in 1989:

Governmental Compliance
$0.007/raw ton for all 1989
5% escalation to 1992 = $(0.007)(1.05)^3 = 0.008$/raw ton

Operating Supplies
$0.014/raw ton for all 1989
5% escalation to 1992 = $(0.014)(1.05)^3 = 0.016$/raw ton

Maintenance Supplies
$0.293/raw ton for all 1990
5% escalation to 1992 = $(.293)(1.05)^3 = 0.339$/raw ton

CAPITAL COSTS FOR AIR TABLE PLANT

1. Currently this mine is screening and crushing to produce a 2" x 0 product. For this study, it is assumed that the existing equipment can be retrofitted to produce a 3/4" x 0 product.

2. The air table plant will be located in a manner that will allow this mine to utilize all other existing facilities.

3. Actual costs used for capital costs were from:
   - Current engineering cost values
   - Remembered prices for replacements costs
   - Educated guesses

4. This is a very wild cost estimate. But it should be around the ballpark number.

5. Manufacturer quoted $215,000 per table for replacement cost in the Fall of 1990. On a bulk order of 12 tables, there should be at least a 10% discount. Therefore, I used $200,000 as a cost per table.

			Purchased Cost		Installation Cost				
Equipment No.	Description	No. Units	Unit Cost	Total Cost	Factor	Installed Cost	Total Cost	Unit H.P.	Total H.P.
100	General Facility			1,072,000		1,167,800	2,239,800		1584
200	Raw Coal Handling			375,000		182,500	557,500		340
300	Air Table Circuit			2,710,000		710,000	3,420,000		1380
400	Dust Collection Circuit			1,092,000		736,800	1,828,800		960
500	Refuse Handling			257,500		230,250	487,750		255
600	Clean Coal Handling			375,000		187,500	562,500		500
			Total	5,881,500	Total	3,214,850	9,096,350	Total	5019

GENERAL FACILITY			Purchased Cost		Installation Cost				
Equipment No.	Description	No. Units	Unit Cost	Total Cost	Factor	Installed Cost	Total Cost	Unit H.P.	Total H.P.
100	Plant Bldg. 500,000 ft3	1	$1/ft3	500,000	1.6	800,000	1,300,000	--	--
101	Fire Protection System	1	--	30,000	1.6	48,000	78,000	--	--
102	Plant Hoists	2	25,000	50,000	0.2	20,000	70,000	20	40
103	Plant Air Compressor	1	35,000	35,000	0.2	7,000	42,000	150	150
104	Air Dryers	12	1,500	18,000	0.4	7,200	25,200	--	--
105	Roof Ventilators	4	3,500	14,000	0.4	5,600	19,600	2	8
106	MCC/Control Room HVAC	1	75,000	75,000	1.6	120,000	195,000	HPE	286
107	Heat/Lighting	1	--	100,000	1.6	160,000	260,000	HPE	1000
108	Plant Spare Parts	1	--	200,000	--	--	200,000	--	--
109	Plant Tools & Equipment	1	--	50,000	--	--	50,000	100	100
			Total	1,072,000	Total	1,167,800	2,239,800	Total	1584

RAW COAL HANDLING			Purchased Cost		Installation Cost				
Equipment No.	Description	No. Units	Unit Cost	Total Cost	Factor	Installed Cost	Total Cost	Unit H.P.	Total H.P.
200	Raw Coal Feeders	2	25,000	50,000	0.4	20,000	70,000	20	40
201	Raw Feed Belts	2	112,500	225,000	0.5	112,500	337,500	150	300
202	Screen & Crusher Retrofit	1	100,000	100,000	0.5	50,000	150,000	--	--
			Total	375,000	Total	182,500	557,500	Total	340

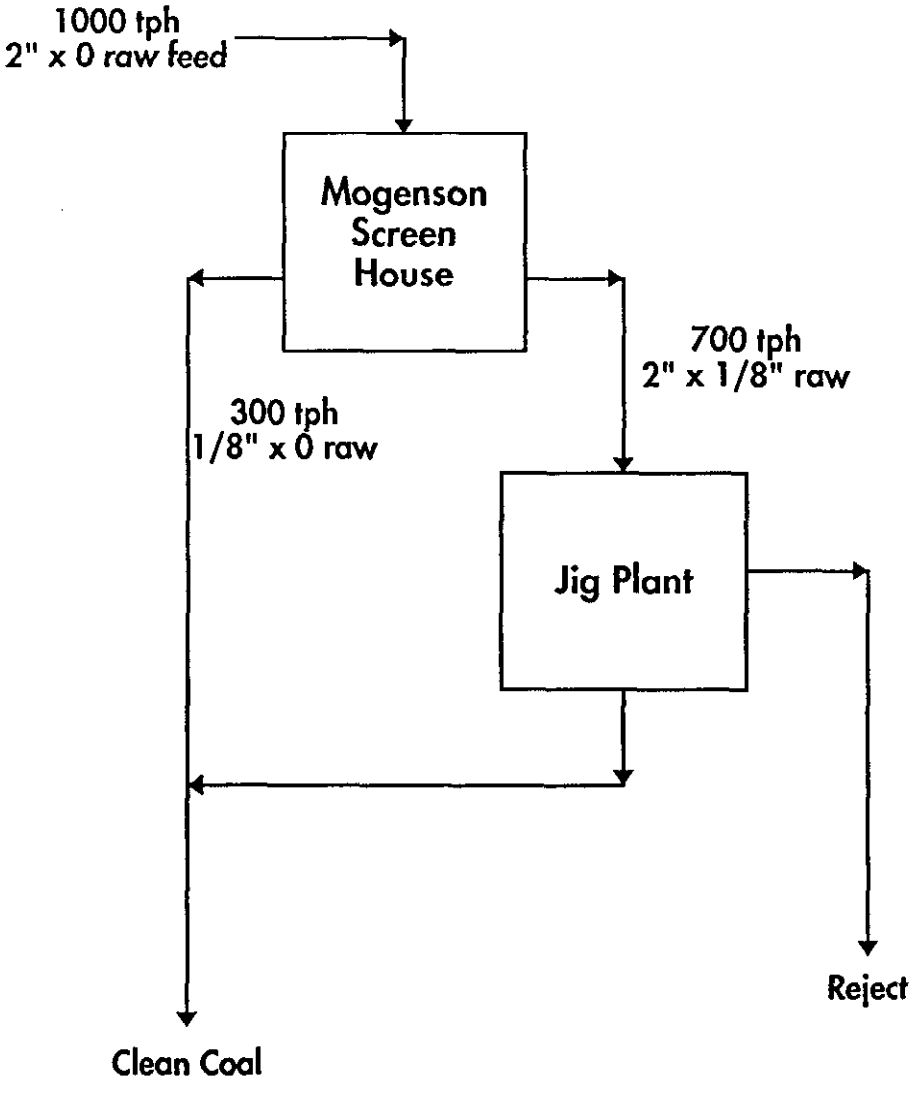
AIR TABLE CIRCUIT			Purchased Cost		Installation Cost				
Equipment No.	Description	No. Units	Unit Cost	Total Cost	Factor	Installed Cost	Total Cost	Unit H.P.	Total H.P.
300	Table Feed Bunkers (350 tons)	2	35,000	70,000	2.6	182,000	252,000	--	--
301	Air Tables	12	200,000	2,400,000	0.2	480,000	2,880,000	40	480
302	Pressure Fans	12	20,000	240,000	0.2	48,000	288,000	75	900
			Total	2,710,000	Total	710,000	3,420,000	Total	1380

DUST COLLECTION CIRCUIT			Purchased Cost		Installation Cost				
Equipment No.	Description	No. Units	Unit Cost	Total Cost	Factor	Installed Cost	Total Cost	Unit H.P.	Total H.P.
400	Air Cyclones	12	20,000	240,000	1.6	384,000	624,000	--	--
401	Dust Collectors	12	50,000	600,000	0.5	300,000	900,000	--	--
402	Exhaust Fans	12	20,000	240,000	0.2	48,000	288,000	75	900
403	Star Valves	12	1,000	12,000	0.4	4,800	16,800	5	60
			Total	1,092,000	Total	736,800	1,828,800	Total	960

REFUSE HANDLING			Purchased Cost		Installation Cost				
Equipment No.	Description	No. Units	Unit Cost	Total Cost	Factor	Installed Cost	Total Cost	Unit H.P.	Total H.P.
500	Refuse Collection Belts	2	37,500	75,000	0.5	37,500	112,500	50	100
501	Final Refuse Belt	1	112,500	112,500	0.5	56,250	168,750	150	150
502	Free Standing 350 ton Refuse Bin	1	52,500	70,000	2.6	136,500	206,500	5	5
			Total	257,500	Total	230,250	487,750	Total	255

CLEAN COAL HANDLING			Purchased Cost		Installation Cost				
Equipment No.	Description	No. Units	Unit Cost	Total Cost	Factor	Installed Cost	Total Cost	Unit H.P.	Total H.P.
600	Collection Belts	2	75,000	150,000	0.5	75,000	225,000	100	200
601	Final Transfer Belt	1	225,000	225,000	0.5	112,500	337,500	300	300
			Total	375,000	Total	187,500	562,500	Total	500

JIG PLANT CIRCUIT



OPERATING COSTS

DRY SCREEN AND JIG PLANT

Production Costs	Dollars	Dollars/Raw Ton
Labor		
Union Employees	679,978	
Union Fringes	288,107	
Supervisory Employees	133,440	
Supervisory Fringes	42,394	
Workers Compensation	43,925	
Payroll Taxes	78,007	
Training Expenses	5,369	
Inspection Expenses	1,057	
Total Labor	1,272,277	0.309
Supplies & Expenses		
Maintenance Supplies	1,440,345	0.350
Operating Supplies	65,844	0.016
Electric Power	535,253	0.130
Handling Refuse	104,116	0.025
Governmental Compliance	32,922	0.008
Total Supplies & Expenses	2,178,480	0.529
Other Charges		
Insurance	By Owner	By Owner
Real Estate Taxes	By Owner	By Owner
Depreciation	By Owner	By Owner
Mine Closing Expense	By Owner	By Owner
Rentals	By Owner	By Owner
Total Other Charges	By Owner	By Owner
Total Production Costs	3,450,757	0.838

Original Raw Feed

Passing	Retained	Wt. %	% Ash	% Sulfur	Btu	3/4" x 0
3/8"	28M	41.88	8.77	0.84	11,730	
3/8"	1/4"					
1/4"	1/8"		10.10	1.00	11,544	18.06
28M	100M	5.05	10.77	1.08	11,451	6.62
100M	325M	1.42	13.58	1.14	10,792	1.86
325M	0	2.64	37.03	0.46	7,571	3.46
Calculated Quality			13.57	0.96	11,019	30.00

Method	Wt	Yield	CC	% Ash	% Sulfur	Btu
Dry Screening	30	100.00	30.00	13.57	0.96	11,019
Jig @ 2.00	70	98.13	68.69	8.85	0.60	11,790
			98.69	10.28	0.71	11,556
				#SO2/MBtu =	1.23	

Method	Wt	Yield	CC	% Ash	% Sulfur	Btu
Dry Screening	30	100.00	30.00	13.57	0.96	11,019
Jig @ 1.80	70	96.39	67.47	8.52	0.56	11,841
			97.47	10.07	0.68	11,588
				#SO2/MBtu =	1.17	

@ 97.47% Yield	Year	Hour
Clean Tons	4011156	1000
Raw Tons	4115272	975
Reject Tons	104116	25

4,115,272 tons ÷ 1000 = 4115 hrs/year
@90% Availability 4115 ÷ .90 = 4572 hrs/year
4572 hrs/year ÷ 48 weeks = 95.25 hrs/week
95.25 ÷ 5 days/week = 19.05 hrs/day

Need: 3 shift/day operation
5 days/week
19 production hrs/day
5 maintenance hrs/day
12 maintenance over time days/year

Electric

Utility quote of $562,004/2000 hrs. @ 15844 H.P.

$$\$562{,}004 \frac{(4715\ HP)}{(15844\ HP)} = \$167{,}246$$

33,449 (20% for HVAC)
33,449 (20% for lights)
$234,144

$$\$234{,}144 \frac{(4572\ hrs)}{(2000\ hrs)} = \$535{,}253 \div 4{,}115{,}272 \text{ tons} = \$0.130/\text{raw ton}$$

Handling Refuse

$$104{,}116 \left(\frac{\$1.00}{ton}\right)\left(\frac{1}{4115272}\right) = \$0.025$$

MANPOWER

Classified Job Description	Midnight	Day	Afternoon	Total
Control Room Operator	1	1	1	3
Screen Controlman	1	1	1	3
Jig Controlman	1	1	1	3
Mechanic	1	1	1	3
Laborer	2	2	2	6
	6	6	6	18
Supervisory				
Foreman	1	1	1	3

Annual Labor Cost

Job Description	Rate	Quantity	Base	Overtime	Total
Control Room Op.	16.564	3	93,669	21,691	115,360
Screen Controlman	16.320	3	92,290	21,371	113,661
Jig Controlman	16.320	3	92,290	21,371	113,661
Mechanic	16.564	3	93,669	21,691	115,360
Laborer	16.037	2	181,378	40,558	221,936
					679,978
Foreman	20.00	3	124,800	8,640	133,440

Maintenance Supplies

$0.333/raw ton for 1991

5% escalation = 0.350/raw ton

1000 tph Dry Screen & Jig			Purchased Cost		Installation Cost				
Equipment No.	Description	No. Units	Unit Cost	Total Cost	Factor	Installed Cost	Total Cost	Unit H.P.	Total H.P.
100	General Facility			1,411,000		1,659,100	3,070,100		1487
200	Raw Coal Handling			375,000		182,500	557,500		340
300	Dry Screen Plant			846,970		423,485	1,270,455		865
400	Jig Circuit			1,201,424		1,922,280	3,123,704		1268
500	Refuse Handling			257,500		230,250	487,750		255
600	Clean Coal Handling			375,000		187,500	562,500		500
			Total	4,466,894	Total	4,605,115	9,072,009	Total	4715

GENERAL FACILITY 1000 tph Dry Screen & Jig			Purchased Cost		Installation Cost				
Equipment No.	Description	No. Units	Unit Cost	Total Cost	Factor	Installed Cost	Total Cost	Unit H.P.	Total H.P.
100	Fire Protection	1	50,000	50,000	1.6	80,000	130,000	75	75
101	Make-Up Water	1	350,000	350,000	1.6	525,000	875,000	150	150
102	Plant Elevator	1	200,000	200,000	1.6	320,000	520,000	20	20
103	Plant Hoist	2	25,000	50,000	1.6	80,000	130,000	20	40
104	Plant Air Pump	1	35,000	35,000	1.6	52,500	87,500	20	20
105	Inst. Air Comp.	1	25,000	25,000	1.6	40,000	65,000	20	20
106	Roof Ventilation	6	3,500	21,000	1.6	33,600	54,600	2	12
107	MCC/Control Rm. HVAC	1	200,000	200,000	1.6	320,000	520,000	100	100
108	Heat & Lights	1	--	100,000	1.6	160,000	260,000	HPE	1000
109	Plant Clean-up Pump	2	15,000	30,000	1.6	48,000	78,000	25	50
110	Plant Spare Parts		--	300,000	--	--	300,000	--	--
111	Plant Tools & Equip.		--	50,000	--	--	50,000	--	--
			Total	1,411,000	Total	1,659,100	3,070,100	Total	1487

RAW COAL HANDLING 1000 tph Dry Screen & Jig			Purchased Cost		Installation Cost				
Equipment No.	Description	No. Units	Unit Cost	Total Cost	Factor	Installed Cost	Total Cost	Unit H.P.	Total H.P.
200	Raw Coal Feeders	2	25,000	50,000	0.4	20,000	70,000	20	40
201	Raw Feed Belts	2	112,500	225,000	0.5	112,500	337,500	150	300
202	Screen & Crusher Retrofit	1	100,000	100,000	0.5	50,000	150,000	--	--
			Total	375,000	Total	182,500	557,500	Total	340

DRY SCREEN PLANT 1000 tph Dry Screen & Jig			Purchased Cost		Installation Cost				
Equipment No.	Description	No. Units	Unit Cost	Total Cost	Factor	Installed Cost	Total Cost	Unit H.P.	Total H.P.
300	Feeders	10	9,157	91,570	0.5	45,785	137,355	5	50
301	Mogensen Screens	10	43,040	430,400	0.5	215,200	645,600	14	140
302	1/8" x 0 Collection Belts	2	37,500	75,000	0.5	37,500	112,500	50	100
303	1/8" x 0 Transfer Belt	1	37,500	37,500	0.5	18,750	56,250	75	75
304	2" x 1/8" Collection Belts	2	37,500	75,000	0.5	37,500	112,500	100	200
305	2" x 1/8" Transfer Belt	1	37,500	37,500	0.5	18,750	56,250	150	150
306	Dust Collectors	2	50,000	100,000	0.5	50,000	150,000	75	150
			Total	846,970	Total	423,485	1,270,455	Total	865

JIG CIRCUIT 1000 tph Dry Screen & Jig			Purchased Cost		Installation Cost				
Equipment No.	Description	No. Units	Unit Cost	Total Cost	Factor	Installed Cost	Total Cost	Unit H.P.	Total H.P.
400	Jeffrey Jig	1	375,000	375,000	1.6	600,000	975,000	100	100
401	Reject Dewatering Screen	1	37,066	37,066	1.6	59,306	96,372	20	20
402	Reject Caking Screen	1	28,000	28,000	1.6	44,800	72,800	10	10
403	Coal Dewatering Screen	2	37,066	74,132	1.6	118,611	192,743	20	40
404	Coal Centrifuge	2	56,910	113,820	1.6	182,112	295,932	40	80
405	Refuse Sump & Pump	1	18,861	18,861	1.6	30,178	49,039	250	250
406	Coal Sump & Pump	1	20,446	20,446	1.6	32,714	53,160	300	300
407	Classifying Cyclones	4	15,000	60,000	1.6	96,000	156,000	--	--
408	Fine Coal Caking Screen	1	28,000	28,000	1.6	44,800	72,800	10	10
409	Fine Coal Centrifuge	1	109,190	109,190	1.6	174,704	283,894	100	100
410	Static Thickener	1	140,588	140,588	1.6	224,941	365,529	58	58
411	Vacuum Filter	1	196,321	196,321	1.6	314,114	510,435	300	300
			Total	1,201,424	Total	1,922,280	3,123,704	Total	1268

REFUSE HANDLING 1000 tph HMC			Purchased Cost		Installation Cost				
Equipment No.	Description	No. Units	Unit Cost	Total Cost	Factor	Installed Cost	Total Cost	Unit H.P.	Total H.P.
500	Refuse Collection Belts	2	37,500	75,000	0.5	37,500	112,500	50	100
501	Final Refuse Belt	1	112,500	112,500	0.5	56,250	168,750	150	150
502	350 ton Refuse Bin	1	52,500	70,000	2.6	136,500	206,500	5	5
			Total	257,500	Total	230,250	487,750	Total	255

CLEAN COAL HANDLING 1000 tph HMC			Purchased Cost		Installation Cost				
Equipment No.	Description	No. Units	Unit Cost	Total Cost	Factor	Installed Cost	Total Cost	Unit H.P.	Total H.P.
600	Collection Belts	2	75,000	150,000	0.5	75,000	225,000	100	200
601	Final Transfer Belt	1	225,000	225,000	0.5	112,500	337,500	300	300
			Total	375,000	Total	187,500	562,500	Total	500