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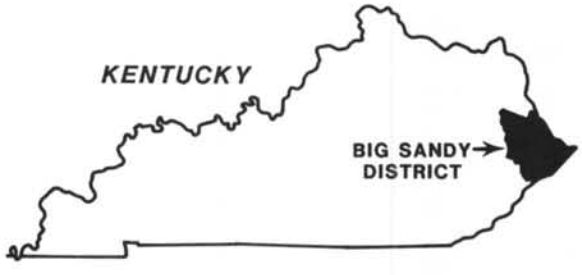
ANALYSIS OF COAL SAMPLES FROM THE BIG SANDY DISTRICT, KENTUCKY

Floyd, Johnson, Martin, and Pike Counties



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ANALYSIS OF COAL SAMPLES FROM THE BIG SANDY DISTRICT, KENTUCKY (Floyd, Johnson, Martin, and Pike Counties)

James C. Currens[1], Linda Jean Bragg[2], and James C. Hower[3]

ABSTRACT

Chemical and petrographic data are presented for 146 samples of coal collected in the Big Sandy District, eastern Kentucky. The data include sample-site locations, sampling conditions, stratigraphic position, megascopic description of the coal, air-drying loss, proximate and ultimate analyses, Btu content, forms of sulfur, initial deformation temperature, softening temperature, fluid temperature, free-swelling index, concentration of major- and minor-oxides and trace elements, and petrographic analyses.

INTRODUCTION

The Eastern Kentucky Coal Field has been subdivided into six reserve districts to facilitate the tabulation of coal-resource estimates. These districts are the Princess, Big Sandy, Licking River, Southwestern, Hazard, and Upper Cumberland. This report on the Big Sandy District (Fig. 1) is one in a series of coal-quality publications planned for each of the districts. This report provides easily accessible geological and analytical data describing the quality of coals in the Big Sandy District, which includes Floyd, Johnson, Martin, and Pike Counties.

One-hundred-forty-six samples of coal were collected for chemical and petrographic analyses. Field-sampling data, proximate and ultimate analyses, Btu content, forms of sulfur, and free-swelling index are presented for 146 samples, and determinations of major- and minor-oxides and trace elements are presented for 145 samples. Petrographic analyses for 140 samples are included in this report.

Brant (1982, 1983) and Brant and others (1983a-d) estimated the coal resources for each of the six districts in the Eastern Kentucky Coal Field. Brant and others (1983b) reported that 32 coal beds (Fig. 2) in the Big Sandy District originally contained 20.3 billion tons of coal. Isopach maps (Brant and others, 1983b) are published for the Fire Clay and Upper Elkhorn No.3 coal beds. When used together, the coal-resource and coal-quality reports provide the essential tools for integrating the quantity and quality of eastern Kentucky coals on a regional basis.

[1]Kentucky Geological Survey, Lexington, Kentucky.
[2]U.S. Geological Survey, Reston, Virginia.
[3]Kentucky Center for Energy Research Laboratory, Lexington, Kentucky.

METHODS

Although this report contains only the results for samples collected in the Big Sandy District, the methods of sampling were developed to determine coal quality for the entire Eastern Kentucky Coal Field. The choice of sampling sites and field techniques was largely determined by the logistical constraints associated with the collection of more than 600 coal samples distributed over a stratigraphic section containing more than 30 major coal zones and an area including all or parts of 38 eastern Kentucky counties. Therefore, expediency, uniform areal and stratigraphic distribution of sample sites, consistent sampling technique, and thorough sample documentation were major considerations in sample collection.

Sample Sites

The selection of sample sites was influenced by many factors. First, maintaining a consistent distribution of samples over a coal bed area, regardless of coal thickness, was important to delineate the regional characteristics of the coal beds. However, exposures of coal beds of mineable thickness were selected where possible to make the data economically relevant. Second, sites were chosen where many coal beds were exposed and easily accessible so that changes in coal-quality characteristics from one coal bed to another could be identified. Therefore, many of the samples are either from roadcuts along major highways that were under construction at the time of sampling or from surface mines. Third, thin coal beds were sampled in areas where they might be mineable by themselves or in conjunction with overlying or underlying beds, or in areas of widespread coal occurrence.

The freshness of the exposed coal was also a major consideration in the choice of sample sites. In general, a coal outcrop was not sampled if it had been exposed

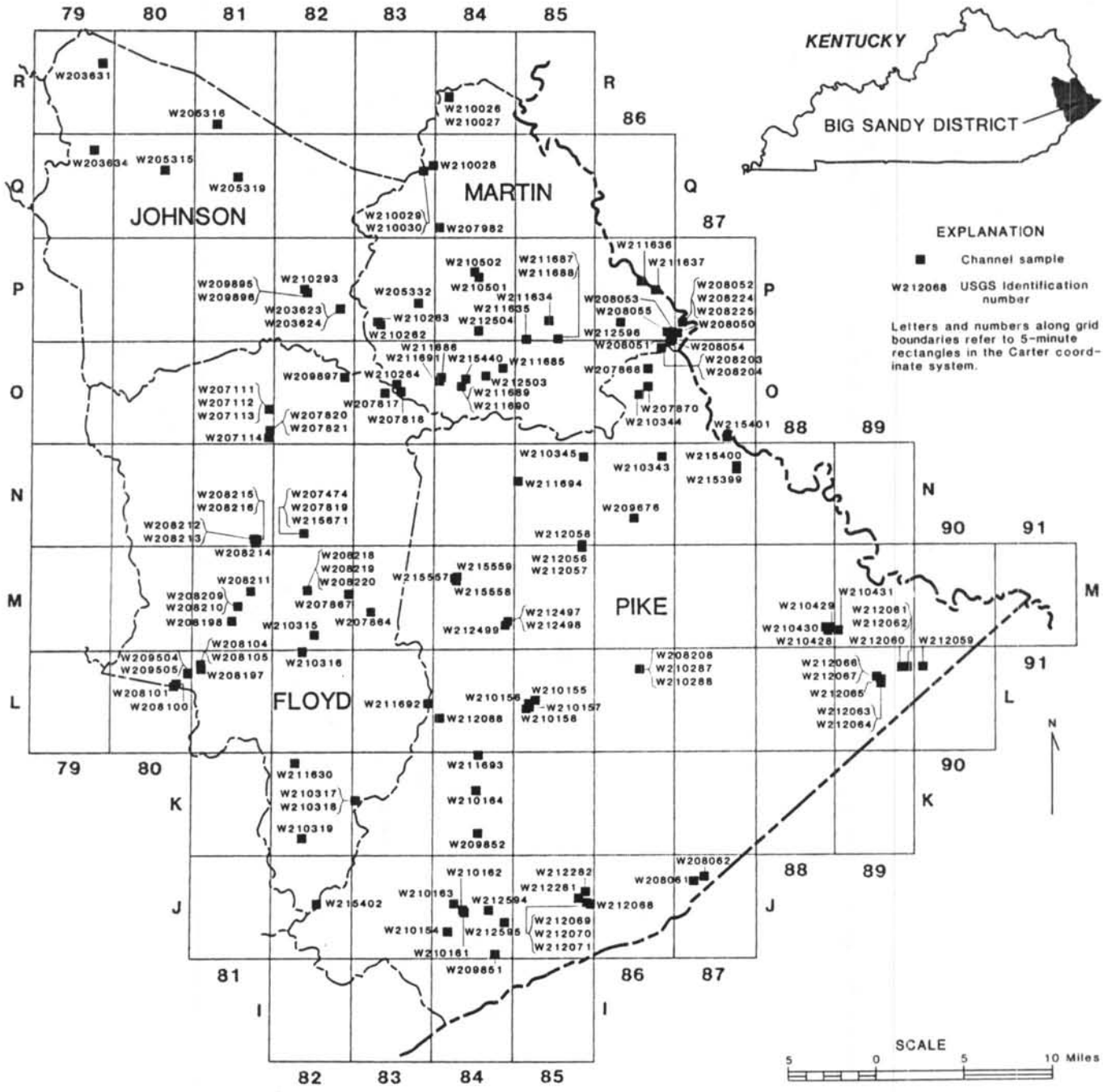
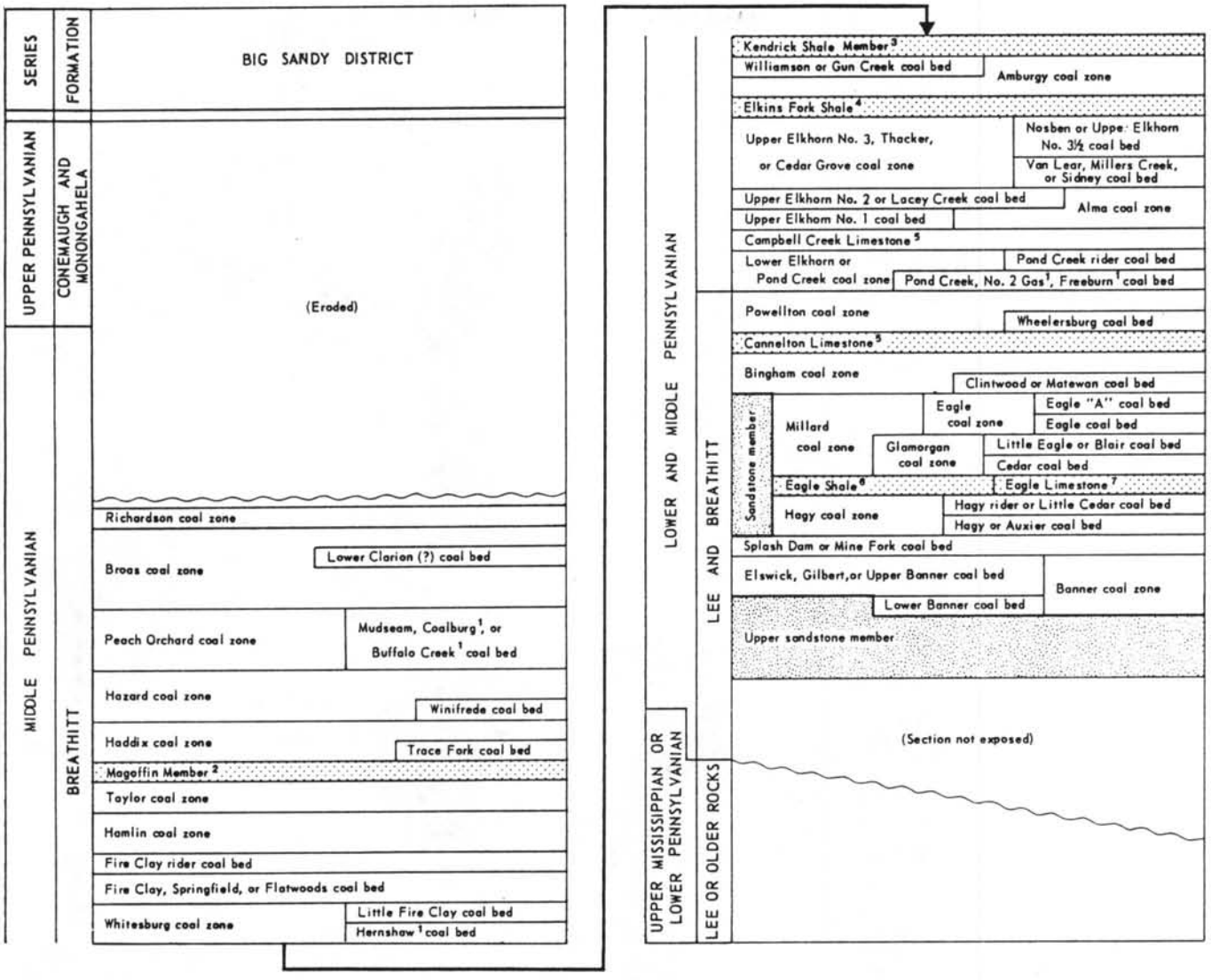


Figure 1. Locations of coal-sampling sites in the Big Sandy District.

for more than 6 weeks. Exceptions were made if other opportunities to sample the coal bed were unlikely. A few samples from highly weathered roadcuts and abandoned surface mines were included because fresh exposures could not be found. The freshness of the exposures along highway construction projects ranged from a few months to several hours. Samples from surface mines and prospect openings were generally fresh, but a few samples were taken in areas where deeply weathered coal beds were being mined. Underground mines generally provided the freshest samples, but because of the time and effort needed to travel to the working face, above-ground exposures were used where available. Nevertheless, more than 100 underground mines were sampled in eastern Kentucky. A few core samples were obtained for analysis; these samples were normally in excellent condition.

Elevations of sample sites were determined by several methods. A barometric altimeter was used for many determinations, and all two-way traverses from bench-



[1] Name used for coal bed in adjacent areas

[2] Includes the Salt Lick Beds of Morse (1931)

[3] Formerly Kendrick Shale of Jillson (1920)

[4] Of Morse (1931)

[5] Of White (1885)

[6] Of Hennen and Reger (1914)

[7] Of White (1891)

Figure 2. Key stratigraphic units in the Big Sandy District.

mark to sample site were adjusted for temperature changes and pressure fluctuations. Wherever possible, local leveling surveys were used to determine elevation. Underground elevations were typically determined from mine maps. Hand-leveling was used extensively to tie sample sites to benchmarks and to measure elevation differences between coal beds at surface mines and roadcuts. Topographic maps were used to estimate elevations in remote areas where other methods were not feasible.

Sampling Methods

Two sampling regimes were used. During the first 6 months of collection the guidelines of Swanson and Huffman (1976) were followed, and partings less than 10 cm (4 in.) thick were included in the sample (Fig. 3). The method of Holmes (1918) was adopted after the first field season and was used for the majority of the samples. The Holmes method is the standard method of the American Society for Testing and Materials (ASTM) for collecting channel samples for the determination of rank

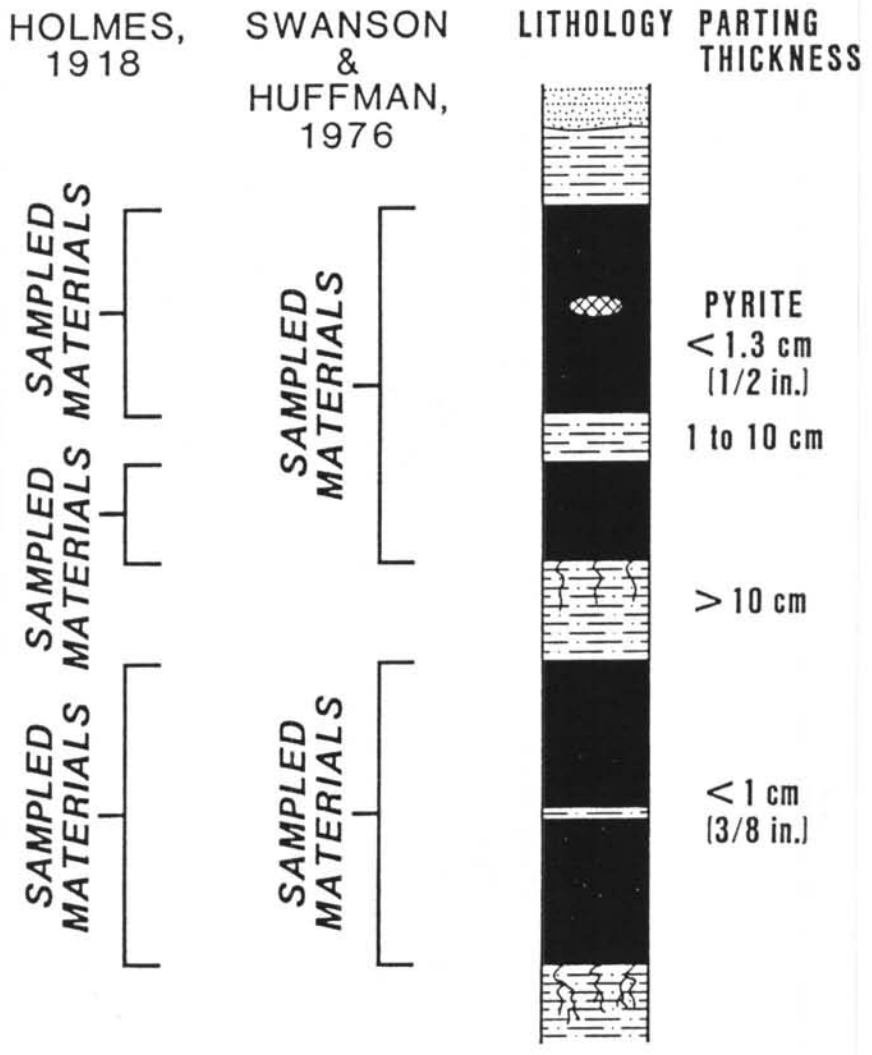


Figure 3. Diagrammatic column showing different criteria for excluding partings in the sampling methods of Holmes (1918) and Swanson and Huffman (1976).

(ASTM, 1981) (ASTM D-388-77). Under the Holmes method, all partings greater than 1 cm (3/8 in.) are excluded from the sample. The sampling regime is recorded in the Sampling Report (Appendix I). The guidelines for the exclusion of partings of either regime were exceeded at some exposures to make the samples conform to local mining practice. These samples are described in Appendix I as having "thick partings included." The same guidelines were also applied to core samples. The sampling guidelines for several samples collected before June 1979 are unknown and are so noted.

Dimensions of channel cuts were commonly adjusted to the thickness of the coal bed. The channels were typically 4 to 6 inches square (10 to 15 cm), and none was less than 3 inches (8 cm) square. In thick coal beds these channel cuts produced a large volume of sample, which was split in the field by coning and quartering. However, after the first 2 years of the sampling program, field splitting was discontinued. All of the core samples were 2.25 inches (6.4 cm) in diameter.

Megascopic Description

The descriptive methods of Schopf (1960) were chosen as a basis for the megascopic descriptions, but modifications were made in the terminology. Semiquantitative terms were chosen to reflect the thickness and abundance ranges defined by Schopf. The terms "bright attrital," "dull attrital," and "nonbanded" were replaced by "clarain," "durain," and "canneloid," respectively. Additional concentration categories were used; "scattered" was defined as 5 to 15 percent, and "sparse" was redefined as less than 5 percent. "Dominant" was changed to "very abundant," and "moderate" was changed to "common." The total seam thickness was measured and recorded separately from the megascopic description.

Sample Preparation

Samples with field-identification numbers higher than 063 were delivered to the University of Kentucky Institute for Mining and Minerals Research (IMMR) at the Kentucky Center for Energy Research Laboratory for drying, crushing, splitting, and repackaging. The samples were air-dried and crushed to 0.5-inch (1.3 cm) maximum size before splitting to minimize the possibility of contamination. Generally, three splits of each sample were prepared; 50 percent went to the U.S. Geological Survey (USGS), 25 percent went to IMMR for petrographic and other analyses, and the remainder is stored at the Kentucky Geological Survey's (KGS) Well Sample and Core Library. Small samples were not split. The 0.5-inch (1.3 cm) samples were crushed to 0.1 inch (0.3 cm) by the USGS. The split for chemical analysis was crushed to 0.08 inch (0.177 mm). The pulverizer used for this crushing was equipped with ceramic plates to minimize contamination.

PRESENTATION OF DATA

Field Notes and Laboratory Analyses

The coal-sampling reports (field notes) and the coal-analysis reports (laboratory analyses) for each sample are presented on facing pages in Appendix I. The field notes and analyses are arranged in numerical order by the USGS identification number. Most of the information in the field notes is self explanatory, but a few items need clarification. For example, the date on the sampling report is the day the sample was collected. However, samples KGS 001 through KGS 041, which were collected before the USGS/KGS cooperative sampling program began, have a sampling date of January 1, 1978, to indicate that the sample was collected sometime during that year. All thickness measurements except total seam thickness have been converted from meters to feet. The section in each sampling report on structural features applies primarily to cleat azimuths, which were measured for most exposures. Structural features other than jointing (cleat) were seldom encountered during the sampling program. The dips of cleat surfaces were recorded if they were measurably different from vertical; these data are available from the Kentucky Geological Survey. The "IN SAMPLE?" column indicates which units were included in the sample.

The laboratory analyses were performed by the U.S. Bureau of Mines (USBM) and Geochemical Testing, Inc. (Geo Test). The as-received values are shown as reported by the laboratory. The moisture-free and moisture- and ash-free values have been recalculated using standard formulas (ASTM, 1981) (ASTM D-3180-74). Other calculated values not shown on these analysis reports, such as volume-percent mineral matter and moist, mineral-matter-free Btu, are available from KGS. Specific gravity, Hardgrove grindability, washability, and similar tests were not performed. Most of the laboratory analyses were completed within 3 months after the samples were received by USGS. However, many of the samples from the Big Sandy District were stored for as long as a year, and these samples may have undergone some oxidation.

Table 1 of Appendix II shows the location, rank, and thickness of coal samples collected from the Big Sandy District. The apparent rank of each sample was calculated by using data in the coal-analysis reports (Appendix I) and the Parr formulas (ASTM, 1981) (ASTM D-388-77). Apparent ranks for these samples range between high-volatile C and high-volatile A bituminous coal, except samples W208052 and W208224. These samples have an erroneous apparent rank of subbituminous A because of their highly weathered condition.

Chemical Analyses

Major- and minor-oxide and trace-element concentrations are reported for 145 coal samples from the Big Sandy District. Table 2 (Appendix II) presents the results of analyses (in weight percent) performed on coal ash, and Table 3 (Appendix II) contains the results of analyses for 23 trace elements (in parts per million) in the whole coal. Table 4 (Appendix II) summarizes the results for all of the chemical species on a whole-coal basis. A total of 65 elements was searched for, and the following 10 elements were not found: Au, Ir, Os, Pd, Pt, Re, Rh, Ru, Te, and Tm. The whole-coal determinations were performed on air-dried coal (32°C) by wet chemical analysis, atomic absorption spectroscopy, X-ray fluorescence spectroscopy, and instrumental neutron activation analysis. The chemical composition of the ash (from coal ashed at 525°C) was determined by wet chemical analysis, X-ray fluorescence, and optical emission spectroscopy.

Figure 4 is a flow diagram that illustrates the various stages of preparation and analysis involved in processing coal samples. Analyses were performed by the USGS Branch of Analytical Chemistry. Analytical procedures used by the USGS were described by Swanson and Huffman (1976).

Petrographic Analyses

Petrographic analyses were performed at the Kentucky Center for Energy Research Laboratory. This laboratory is equipped with four Leitz petrographic microscopes, including one MPV-II and two MPV-Compact photometer systems for the determination of vitrinite maximum reflectance. Preparation and examination of the samples followed ASTM (1981) standards D-2797-72 (preparation), D-2796-81 and D-2799-72 (maceral analysis), and

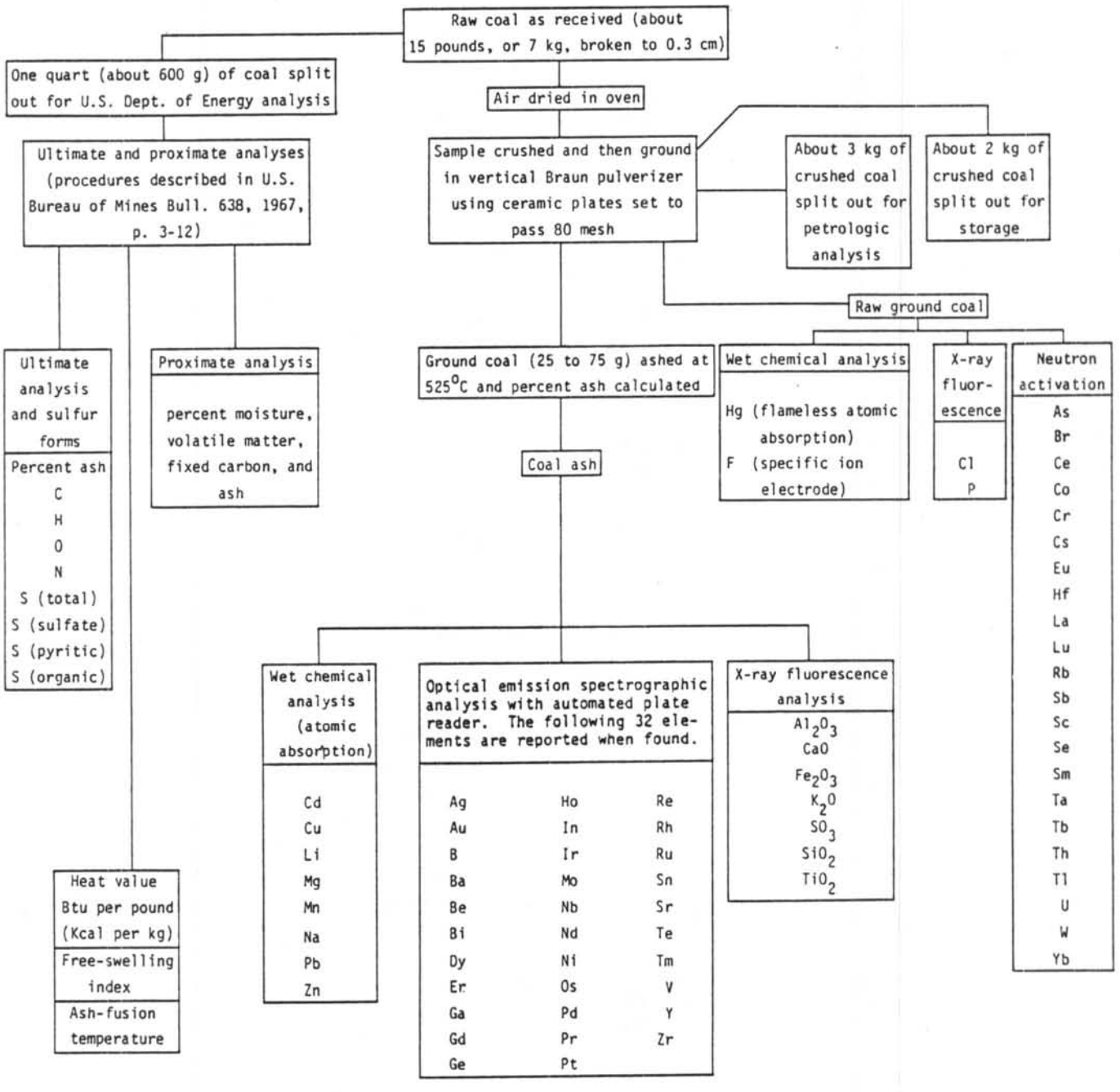


Figure 4. Flow diagram illustrating procedures used for coal-sample analysis.

D-2798-79 (vitrinite reflectance). Results of the petrographic analyses for 140 samples are shown in Appendix III.

ACKNOWLEDGMENTS

The field work, classification, and major- and minor-oxide and trace-element analyses were supported through grants from the USGS (U.S. Department of Interior, 14-08-0001-G 602 and 14-08-0001-A 0077). The support of the USGS, particularly the staff of the Branch of Coal Resources, is gratefully acknowledged. The assistance of Peter Zubovic during the early phase of the program is especially appreciated. Funding for petrographic analyses was provided by the Kentucky Energy Cabinet.

Collection of the coal samples would have been vastly more expensive and time consuming if it were not for the generous cooperation of the several hundred coal companies that allowed sampling in their mines. These companies are too numerous to acknowledge individually, but the authors extend sincere thanks to all of them.

Many individuals and agencies that were not directly involved in the research provided support for the program. The University of Kentucky IMMR provided sam-

ple preparation, proximate analyses, petrographic analyses, and an assistant during part of the project in exchange for splits of the coal samples. The authors also thank the personnel of the Kentucky Department of Mines and Minerals and the Department of Transportation for their help in locating prospective sample sites.

Finally, the entire staff of the Kentucky Geological Survey has been very supportive. Special thanks are due to Dr. James C. Cobb and Russell Brant for their helpful suggestions and to Kim R. Blackburn, Elizabeth K. Estes, and Douglas Hayes, student assistants, who contributed significantly both in the field and in the office.

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APPENDIX I:
COAL SAMPLING AND CLASSICAL ANALYSIS REPORTS

COAL SAMPLING REPORT

LABORATORY NO: K89304 FIELD NO: KGS 005A U.S.G.S. NO: W203623
SAMPLER: Walker AGENCY: KGS DATE: Jan/01/1978
7.5' QUAD: Offutt COUNTY: Johnson DISTRICT: Big Sandy
CARTER COORDINATE: SEC 20 ROW P TIER 82 2925 FT FSL, 4750 FT FEL
LATITUDE: 37 DEG 46 MIN 29 SEC LONGITUDE: 82 DEG 40 MIN 59 SEC
ELEVATION (FT): 1103.00, OF POINT AT base of 5B, USING altimeter
COMMENTARY: Transcribed 1-11-82 by Currens.
REGIONAL COAL NAME: Broas zone GEO. MAP COAL NAME: Broas
REPORTED COAL NAME: Lower Clarion FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): top bench
EXPOSURE: TYPE, surface mine; CONDITION, unknown
SAMPLE CONDITION: unknown
RECOVERY METHOD: channel SAMPLING REGIME: unknown
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 18.0, SAMPLE 18.0, COAL ONLY 18.0
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	15.09	Shale, light- to medium-gray, medium- to thin-bedded, micaceous, soft; irregular bedding surfaces.
Y	1.50	Coal. See KGS 5B for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: K89304 FIELD NO: KGS 005A U.S.G.S. NO: W203623
LABORATORY: USBM REPORT DATE: Feb/15/1979

AIR DRIED LOSS: 3.40 %

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	5.70%		
VOLATILE MATTER	36.20%	38.39%	41.33%
FIXED CARBON	51.40%	54.50%	58.68%
ASH	6.70%	7.10%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.40%	5.05%	5.44%
CARBON	71.70%	76.03%	81.85%
NITROGEN	1.40%	1.48%	1.60%
TOTAL SULFUR	0.70%	0.74%	0.80%
OXYGEN	14.00%	9.60%	10.31%
ASH	6.70%	7.10%	
HEATING VALUE (BTU/LB):	12747	13517	14552
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.30%	0.32%	0.34%
ORGANIC	0.39%	0.41%	0.45%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2560 deg F
SOFTENING TEMP.	2660 deg F
FLUID TEMP.	2750 deg F

FREE SWELLING INDEX	1.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.1

COAL SAMPLING REPORT

LABORATORY NO: K89301 FIELD NO: KGS 005B U.S.G.S. NO: W203624
SAMPLER: Walker AGENCY: KGS DATE: Jan/01/1978
7.5' QUAD: Offutt COUNTY: Johnson DISTRICT: Big Sandy
CARTER COORDINATE: SEC 20 ROW P TIER 82 2925 FT FSL, 4750 FT FEL
LATITUDE: 37 DEG 46 MIN 29 SEC LONGITUDE: 82 DEG 40 MIN 59 SEC
ELEVATION (FT): 1103.00, OF POINT AT base of 5B, USING altimeter
COMMENTARY: Transcribed 1-11-82 by Currens.
REGIONAL COAL NAME: Broas zone GEO. MAP COAL NAME: Broas
REPORTED COAL NAME: Lower Clarion FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): bottom bench
EXPOSURE: TYPE, surface mine; CONDITION, unknown
SAMPLE CONDITION: unknown
RECOVERY METHOD: channel SAMPLING REGIME: unknown
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 11.8, SAMPLE 11.8, COAL ONLY 11.8
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 5A.
N	1.05	Shale.
Y	0.98	Coal.
N		Underclay.

COAL ANALYSIS REPORT

LABORATORY NO: K89301 FIELD NO: KGS 005B U.S.G.S. NO: W203624
LABORATORY: USBM REPORT DATE: Feb/15/1979

AIR DRIED LOSS: 3.60%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	5.60%		
VOLATILE MATTER	37.20%	39.41%	41.89%
FIXED CARBON	51.60%	54.66%	58.11%
ASH	5.60%	5.93%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.50%	5.16%	5.49%
CARBON	72.90%	77.22%	82.09%
NITROGEN	1.50%	1.59%	1.69%
TOTAL SULFUR	0.80%	0.85%	0.90%
OXYGEN	13.70%	9.25%	9.83%
ASH	5.60%	5.93%	
HEATING VALUE (BTU/LB):	12892	13657	14518
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.32%	0.34%	0.36%
ORGANIC	0.43%	0.46%	0.48%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2720 deg F
SOFTENING TEMP.	2800 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX	1.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.2

COAL SAMPLING REPORT

LABORATORY NO: K89300 FIELD NO: KGS 009 U.S.G.S. NO: W203631
SAMPLER: Casper AGENCY: KGS DATE: Jan/01/1978
7.5' QUAD: Redbush COUNTY: Johnson DISTRICT: Big Sandy
CARTER COORDINATE: SEC 10 ROW R TIER 79 2950 FT FSL, 3200 FT FEL
LATITUDE: 37 DEG 58 MIN 29 SEC LONGITUDE: 82 DEG 55 MIN 40 SEC
ELEVATION (FT): 1025.00, OF POINT AT base of 009, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.3 GEO. MAP COAL NAME: Van Lear
REPORTED COAL NAME: Van Lear FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, surface mine; CONDITION, unknown
SAMPLE CONDITION: unknown
RECOVERY METHOD: channel SAMPLING REGIME: unknown
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 26.0, SAMPLE 26.0, COAL ONLY 26.0
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Overburden removed.
Y	2.17	Coal.
N	0.23	Clay, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: K89300 FIELD NO: KGS 009 U.S.G.S. NO: W203631
LABORATORY: USBM REPORT DATE: Feb/15/1979

AIR DRIED LOSS: 4.60%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	7.40%		
VOLATILE MATTER	33.90%	36.61%	37.25%
FIXED CARBON	57.10%	61.66%	62.75%
ASH	1.60%	1.73%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.20%	4.72%	4.80%
CARBON	75.00%	80.99%	82.42%
NITROGEN	1.60%	1.73%	1.76%
TOTAL SULFUR	0.60%	0.65%	0.66%
OXYGEN	16.00%	10.18%	10.36%
ASH	1.60%	1.73%	
HEATING VALUE (BTU/LB):	12926	13959	14204
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.14%	0.15%	0.15%
ORGANIC	0.47%	0.51%	0.52%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2615 deg F
SOFTENING TEMP.	2715 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX	1.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	0.9

COAL SAMPLING REPORT

LABORATORY NO: K89305 FIELD NO: KGS 007 U.S.G.S. NO: W203634
SAMPLER: Casper AGENCY: KGS DATE: Jan/01/1978
7.5' QUAD: Redbush COUNTY: Johnson DISTRICT: Big Sandy
CARTER COORDINATE: SEC 2 ROW Q TIER 79 2550 FT FSL, 850 FT FEL
LATITUDE: 37 DEG 54 MIN 25 SEC LONGITUDE: 82 DEG 56 MIN 11 SEC
ELEVATION (FT): 980.00, OF POINT AT base of 007, USING topo
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.3 GEO. MAP COAL NAME: Van Lear
REPORTED COAL NAME: Van Lear FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, surface mine; CONDITION, unknown
SAMPLE CONDITION: unknown
RECOVERY METHOD: channel SAMPLING REGIME: unknown
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 16.9, SAMPLE 16.9, COAL ONLY 16.9
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	9.00	Shale.
Y	1.41	Coal.
N	0.49	Clay, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: K89305 FIELD NO: KGS 007 U.S.G.S. NO: W203634
LABORATORY: USBM REPORT DATE: Feb/15/1979

AIR DRIED LOSS: 4.10%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	6.60%		
VOLATILE MATTER	36.20%	38.76%	39.14%
FIXED CARBON	56.30%	60.28%	60.87%
ASH	0.90%	0.96%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.80%	5.42%	5.47%
CARBON	76.40%	81.80%	82.60%
NITROGEN	1.60%	1.71%	1.73%
TOTAL SULFUR	0.60%	0.64%	0.65%
OXYGEN	14.60%	9.47%	9.55%
ASH	0.90%	0.96%	
HEATING VALUE (BTU/LB):	13349	14293	14432
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.11%	0.12%	0.12%
ORGANIC	0.50%	0.54%	0.54%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2360 deg F
SOFTENING TEMP.	2450 deg F
FLUID TEMP.	2560 deg F

FREE SWELLING INDEX	1.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	0.9

COAL SAMPLING REPORT

LABORATORY NO: K92633 FIELD NO: KGS 012 U.S.G.S. NO: W205315
SAMPLER: KGS AGENCY: KGS DATE: Jan/01/1978
7.5' QUAD: Sitka COUNTY: Johnson DISTRICT: Big Sandy
CARTER COORDINATE: SEC 9 ROW Q TIER 80 2100 FT FSL, 4100 FT FEL
LATITUDE: 37 DEG 53 MIN 21 SEC LONGITUDE: 82 DEG 51 MIN 51 SEC
ELEVATION (FT): 826.00, OF POINT AT base of 012, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.3 GEO. MAP COAL NAME: Van Lear
REPORTED COAL NAME: Van Lear FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, unknown
SAMPLE CONDITION: unknown
RECOVERY METHOD: channel SAMPLING REGIME: unknown
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 32.7, SAMPLE 32.7, COAL ONLY 32.7
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	21.00	Sandstone, silty.
Y	2.72	Coal.

COAL ANALYSIS REPORT

LABORATORY NO: K92633 FIELD NO: KGS 012 U.S.G.S. NO: W205315
LABORATORY: USBM REPORT DATE: May/18/1979

AIR DRIED LOSS: 2.60%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	5.60%		
VOLATILE MATTER	36.80%	38.98%	43.24%
FIXED CARBON	48.10%	50.95%	56.52%
ASH	9.30%	9.85%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.60%	5.27%	5.84%
CARBON	68.60%	72.67%	80.61%
NITROGEN	1.60%	1.69%	1.88%
TOTAL SULFUR	3.00%	3.18%	3.53%
OXYGEN	12.00%	7.34%	8.14%
ASH	9.30%	9.85%	
HEATING VALUE (BTU/LB):	12305	13035	14460
SULFUR FORMS:			
SULFATE	0.02%	0.02%	0.02%
PYRITIC	2.42%	2.56%	2.84%
ORGANIC	0.57%	0.60%	0.67%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	1970 deg F
SOFTENING TEMP.	2060 deg F
FLUID TEMP.	2150 deg F

FREE SWELLING INDEX	2.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	4.9

COAL SAMPLING REPORT

LABORATORY NO: K92634 FIELD NO: KGS 013 U.S.G.S. NO: W205316
SAMPLER: Walker AGENCY: KGS DATE: Jan/01/1978
7.5' QUAD: Sitka COUNTY: Johnson DISTRICT: Big Sandy
CARTER COORDINATE: SEC 24 ROW R TIER 81 2150 FT FSL, 3400 FT FEL
LATITUDE: 37 DEG 55 MIN 21 SEC LONGITUDE: 82 DEG 48 MIN 42 SEC
ELEVATION (FT): 1041.00, OF POINT AT base of 013, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: Peach Orchard z GEO. MAP COAL NAME: Peach Orchard
REPORTED COAL NAME: Peach Orchard FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, mine face; CONDITION, unknown
SAMPLE CONDITION: unknown
RECOVERY METHOD: channel SAMPLING REGIME: unknown
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 33.1, SAMPLE 33.1 ,COAL ONLY 33.1
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	29.86	Sandstone.
N	6.89	Shale.
Y	2.76	Coal.

COAL ANALYSIS REPORT

LABORATORY NO: K92634 FIELD NO: KGS 013 U.S.G.S. NO: W205316
LABORATORY: USBM REPORT DATE: May/21/1979

AIR DRIED LOSS: 1.80%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	4.70%		
VOLATILE MATTER	27.30%	28.65%	42.26%
FIXED CARBON	37.30%	39.14%	57.74%
ASH	30.70%	32.21%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.20%	3.86%	5.69%
CARBON	51.70%	54.25%	80.03%
NITROGEN	1.20%	1.26%	1.86%
TOTAL SULFUR	0.80%	0.84%	1.24%
OXYGEN	11.30%	7.58%	11.18%
ASH	30.70%	32.21%	
HEATING VALUE (BTU/LB):	9070	9517	14040
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.02%
PYRITIC	0.18%	0.19%	0.28%
ORGANIC	0.63%	0.66%	0.98%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 deg F
SOFTENING TEMP.	2800 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX	1.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.8

COAL SAMPLING REPORT

LABORATORY NO: K92637 FIELD NO: KGS 016 U.S.G.S. NO: W205319
SAMPLER: Walker AGENCY: KGS DATE: Jan/01/1978
7.5' QUAD: Sitka COUNTY: Johnson DISTRICT: Big Sandy
CARTER COORDINATE: SEC 13 ROW Q TIER 81 5600 FT FSL, 1200 FT FEL
LATITUDE: 37 DEG 52 MIN 55 SEC LONGITUDE: 82 DEG 47 MIN 15 SEC
ELEVATION (FT): 934.00, OF POINT AT base of 016, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: Hazard zone GEO. MAP COAL NAME: Hazard
REPORTED COAL NAME: Hazard FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, mine face; CONDITION, fresh
SAMPLE CONDITION: fresh
RECOVERY METHOD: channel SAMPLING REGIME: unknown
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 24.0, SAMPLE 24.0, COAL ONLY 22.4
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	5.91	Sandstone.
Y	1.08	Coal.
Y	0.13	Shale.
Y	0.79	Coal.
N	0.49	Underclay, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: K92637 FIELD NO: KGS 016 U.S.G.S. NO: W205319
LABORATORY: USBM REPORT DATE: May/18/1979

AIR DRIED LOSS: 6.30%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	10.20%		
VOLATILE MATTER	29.10%	32.41%	43.30%
FIXED CARBON	38.10%	42.43%	56.70%
ASH	22.60%	25.17%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.80%	4.07%	5.44%
CARBON	51.40%	57.24%	76.49%
NITROGEN	1.30%	1.45%	1.93%
TOTAL SULFUR	0.70%	0.78%	1.04%
OXYGEN	19.20%	11.29%	15.10%
ASH	22.60%	25.17%	
HEATING VALUE (BTU/LB):	8953	9970	13323
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.22%	0.24%	0.33%
ORGANIC	0.45%	0.50%	0.67%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2200 deg F
SOFTENING TEMP.	2310 deg F
FLUID TEMP.	2400 deg F

FREE SWELLING INDEX
POUNDS OF SULFUR DIOXIDE PER MILLION BTU 1.6

COAL SAMPLING REPORT

LABORATORY NO: K92901 FIELD NO: KGS 032 U.S.G.S. NO: W205332
SAMPLER: KGS AGENCY: KGS DATE: Jan/01/1978
7.5' QUAD: Inez COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 19 ROW P TIER 83 4000 FT FSL, 800 FT FEL
LATITUDE: 37 DEG 46 MIN 40 SEC LONGITUDE: 82 DEG 36 MIN 10 SEC
ELEVATION (FT): 1021.00, OF POINT AT base Of 032, USING unknown
COMMENTARY:
REGIONAL COAL NAME: Broas zone GEO. MAP COAL NAME: Broas
REPORTED COAL NAME: Broas FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, surface mine; CONDITION, unknown
SAMPLE CONDITION: unknown
RECOVERY METHOD: channel SAMPLING REGIME: unknown
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 48.0, SAMPLE 48.0, COAL ONLY 48.0
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
Y	4.00	Coal.

COAL ANALYSIS REPORT

LABORATORY NO: K92901 FIELD NO: KGS 032 U.S.G.S. NO: W205332
LABORATORY: USBM REPORT DATE: May/25/1979

AIR DRIED LOSS: 2.80%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	5.70%		
VOLATILE MATTER	31.10%	32.98%	40.44%
FIXED CARBON	45.80%	48.57%	59.56%
ASH	17.40%	18.45%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.10%	4.73%	5.80%
CARBON	63.00%	66.81%	81.93%
NITROGEN	1.40%	1.48%	1.82%
TOTAL SULFUR	0.60%	0.64%	0.78%
OXYGEN	12.70%	7.89%	9.67%
ASH	17.40%	18.45%	
HEATING VALUE (BTU/LB):	11060	11728	14382
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.25%	0.27%	0.33%
ORGANIC	0.30%	0.32%	0.39%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 deg F
SOFTENING TEMP.	2800 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX	1.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.1

COAL SAMPLING REPORT

LABORATORY NO: K96806 FIELD NO: KGS 070 U.S.G.S. NO: W207111
SAMPLER: Currens & Kung AGENCY: KGS DATE: Jun/27/1979
7.5' QUAD: Prestonsburg COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 20 ROW 0 TIER 81 4800 FT FSL, 1900 FT FEL
LATITUDE: 37 DEG 41 MIN 47 SEC LONGITUDE: 82 DEG 45 MIN 24 SEC
ELEVATION (FT): 1366.40, OF POINT AT base of 70, USING survey
COMMENTARY:
REGIONAL COAL NAME: Richardson zone GEO. MAP COAL NAME: Richardson
REPORTED COAL NAME: 5 Block FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): top bench
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: 1 month old, mud-streaked
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 32.7, SAMPLE 32.7, COAL ONLY 31.1
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Shale, medium-gray, sideritic, silty, laminated to bioturbated.
N	0.16	Shale, carbonaceous, laminated.
Y	0.69	Durain, with sparse thin-banded vitrain.
Y	0.13	Shale, dark-gray, laminated, carbonaceous.
Y	1.12	Clarain, with vitrain.
Y	0.30	Durain.
Y	0.49	Clarain
		See KGS 072 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: K96806 FIELD NO: KGS 070 U.S.G.S. NO: W207111
LABORATORY: USBM REPORT DATE: Nov/15/1979

AIR DRIED LOSS: 3.30%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	5.50%		
VOLATILE MATTER	31.50%	33.33%	42.57%
FIXED CARBON	42.50%	44.97%	57.43%
ASH	20.50%	21.69%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.80%	4.43%	5.66%
CARBON	59.00%	62.43%	79.73%
NITROGEN	1.20%	1.27%	1.62%
TOTAL SULFUR	0.70%	0.74%	0.95%
OXYGEN	13.70%	9.44%	12.04%
ASH	20.50%	21.69%	
HEATING VALUE (BTU/LB):	10546	11160	14252
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.32%	0.34%	0.43%
ORGANIC	0.36%	0.38%	0.49%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 deg F
SOFTENING TEMP.	2800 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX
POUNDS OF SULFUR DIOXIDE PER MILLION BTU 1.3

COAL SAMPLING REPORT

LABORATORY NO: K96807 FIELD NO: KGS 072 U.S.G.S. NO: W207112
SAMPLER: Currens & Kung AGENCY: KGS DATE: Jun/27/1979
7.5' QUAD: Prestonsburg COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 20 ROW 0 TIER 81 4800 FT FSL, 1900 FT FEL
LATITUDE: 37 DEG 41 MIN 47 SEC LONGITUDE: 82 DEG 45 MIN 24 SEC
ELEVATION (FT): 1360.50, OF POINT AT base of 72, USING survey
COMMENTARY:
REGIONAL COAL NAME: Richardson zone GEO. MAP COAL NAME: Richardson
REPORTED COAL NAME: 5 Block FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): middle bench
EXPOSURE: TYPE, surface mine; CONDITION, 1 month old
SAMPLE CONDITION: mud-streaked, faced-up
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 65.5, SAMPLE 65.5, COAL ONLY 65.3
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 070.
N	0.36	Shale, carbonaceous, laminated to rooted.
Y	1.12	Durain, with scattered interbedded clarain.
Y	0.98	Durain, with clarain.
Y	0.26	Durain.
Y	0.02	Pyrite.
Y	0.36	Durain.
Y	0.62	Clarain.
Y	0.59	Durain, with vitrain.
Y	0.82	Clarain, with abundant vitrain.
Y	0.69	Durain.
N	0.69	Shale, laminated, carbonaceous.
		Horizon KGS 074.

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ANALYSIS OF COAL SAMPLES FROM THE BIG SANDY DISTRICT, KENTUCKY (Floyd, Johnson, Martin, and Pike Counties)

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COAL ANALYSIS REPORT

LABORATORY NO: K96807 FIELD NO: KGS 072 U.S.G.S. NO: W207112
LABORATORY: USBM REPORT DATE: Nov/15/1979

AIR DRIED LOSS: 2.60%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	4.90%		
VOLATILE MATTER	33.90%	35.65%	40.12%
FIXED CARBON	50.60%	53.21%	59.88%
ASH	10.60%	11.15%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.10%	4.79%	5.39%
CARBON	67.80%	71.29%	80.23%
NITROGEN	1.40%	1.47%	1.66%
TOTAL SULFUR	0.60%	0.63%	0.71%
OXYGEN	14.50%	10.67%	12.01%
ASH	10.60%	11.15%	
HEATING VALUE (BTU/LB):	12228	12858	14471
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.36%	0.38%	0.43%
ORGANIC	0.27%	0.28%	0.32%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 deg F
SOFTENING TEMP.	2800 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX	1.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.0

COAL SAMPLING REPORT

LABORATORY NO: K96808 FIELD NO: KGS 074 U.S.G.S. NO: W207113
SAMPLER: Currens & Kung AGENCY: KGS DATE: Jun/27/1984
7.5' QUAD: Prestonsburg COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 20 ROW 0 TIER 81 4800 FT FSL, 1900 FT FEL
LATITUDE: 37 DEG 41 MIN 47 SEC LONGITUDE: 82 DEG 45 MIN 24 SEC
ELEVATION (FT): 1355.00, OF POINT AT base of 74, USING survey
COMMENTARY:
REGIONAL COAL NAME: Richardson zone GEO. MAP COAL NAME: Richardson
REPORTED COAL NAME: 5 Block FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): bottom bench
EXPOSURE: TYPE, surface mine; CONDITION, 1 month old
SAMPLE CONDITION: mud streaks
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 58.1, SAMPLE 58.2, COAL ONLY 51.8
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 130, SET 2 45, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		See KGS 072 for overlying strata.
Y	0.39	Durain, with clarain.
Y	0.62	Clarain, with vitrain.
Y	0.26	Clarain, with durain.
Y	0.03	Shale, carbonaceous.
Y	0.10	Clarain.
Y	0.07	Shale, carbonaceous.
Y	0.23	Clarain, with durain.
Y	0.13	Shale, carbonaceous.
Y	0.39	Durain, with clarain.
Y	0.20	Durain.
Y	0.43	Clarain, with durain.
Y	0.13	Shale, carbonaceous.
Y	0.69	Clarain, with durain.
Y	0.33	Durain.
Y	0.15	Shale, carbonaceous.
Y	0.36	Clarain.
Y	0.02	Shale, carbonaceous.
Y	0.31	Vitrain, interlaminated with clarain.
		Siltstone, light-gray, slightly carbonaceous, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: K96808 FIELD NO: KGS 074 U.S.G.S. NO: W207113
LABORATORY: USBM REPORT DATE: Nov/15/1979

AIR DRIED LOSS: 3.20%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	5.70%		
VOLATILE MATTER	32.00%	33.93%	39.36%
FIXED CARBON	49.30%	52.28%	60.64%
ASH	13.00%	13.79%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.10%	4.73%	5.49%
CARBON	66.00%	69.99%	81.18%
NITROGEN	1.30%	1.38%	1.60%
TOTAL SULFUR	0.70%	0.74%	0.86%
OXYGEN	13.90%	9.37%	10.87%
ASH	13.00%	13.79%	
HEATING VALUE (BTU/LB):	11711	12418	14405
SULFUR FORMS:			
SULFATE	0.02%	0.02%	0.02%
PYRITIC	0.33%	0.35%	0.41%
ORGANIC	0.32%	0.34%	0.39%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 deg F
SOFTENING TEMP.	2800 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX
POUNDS OF SULFUR DIOXIDE PER MILLION BTU 1.2

COAL SAMPLING REPORT

LABORATORY NO: K96809 FIELD NO: KGS 075 U.S.G.S. NO: W207114
SAMPLER: Currens & Kung AGENCY: KGS DATE: Jul/27/1979
7.5' QUAD: Prestonsburg COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 21 ROW 0 TIER 81 1500 FT FSL, 1850 FT FEL
LATITUDE: 37 DEG 40 MIN 15 SEC LONGITUDE: 82 DEG 45 MIN 23 SEC
ELEVATION (FT): 650.00, OF POINT AT base of 75, USING topo
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.3 GEO. MAP COAL NAME: U Elkhorn No.3
REPORTED COAL NAME: U Elkhorn No.3 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, mine portal; CONDITION, 1 year old
SAMPLE CONDITION: weathered
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 42.5, SAMPLE 42.5, COAL ONLY 42.5
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 250, SET 2 330, SET 3 15

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	32.81	Siltstone, sandy, laminated to ripple-bedded, partly bioturbated.
Y	0.46	Clarain.
Y	0.82	Durain, with vitrain.
Y	0.07	Vitrain.
Y	0.72	Clarain.
Y	0.03	Vitrain.
Y	0.75	Clarain.
Y	0.30	Durain.
Y	0.39	Clarain.
N		Shale, medium-gray, carbonaceous, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: K96809 FIELD NO: KGS 075 U.S.G.S. NO: W207114
LABORATORY: USBM REPORT DATE: Nov/15/1979

AIR DRIED LOSS: 1.60%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	3.60%		
VOLATILE MATTER	38.50%	39.94%	44.05%
FIXED CARBON	48.90%	50.72%	55.95%
ASH	9.00%	9.34%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.30%	5.08%	5.60%
CARBON	68.30%	70.85%	78.15%
NITROGEN	1.50%	1.56%	1.72%
TOTAL SULFUR	2.20%	2.28%	2.52%
OXYGEN	13.80%	10.89%	12.01%
ASH	9.00%	9.34%	
HEATING VALUE (BTU/LB):	12493	12959	14295
SULFUR FORMS:			
SULFATE	0.03%	0.03%	0.03%
PYRITIC	1.41%	1.46%	1.61%
ORGANIC	0.73%	0.76%	0.84%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2120 deg F
SOFTENING TEMP.	2260 deg F
FLUID TEMP.	2350 deg F

FREE SWELLING INDEX	3.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	3.5

COAL SAMPLING REPORT

LABORATORY NO: K96954 FIELD NO: KGS 102 U.S.G.S. NO: W207474
SAMPLER: Currens & Kung AGENCY: KGS DATE: Jul/25/1979
7.5' QUAD: Harold COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 24 ROW N TIER 82 3600 FT FSL, 700 FT FEL
LATITUDE: 37 DEG 35 MIN 36 SEC LONGITUDE: 82 DEG 43 MIN 9 SEC
ELEVATION (FT): 1202.00, OF POINT AT base of 102, USING topo
COMMENTARY:
REGIONAL COAL NAME: L Peach Orch GEO. MAP COAL NAME: L Peach Orch
REPORTED COAL NAME: L Peach Orch FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): top bench
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: very fresh
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 32.7, SAMPLE 32.7, COAL ONLY 32.7
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 120, SET 2 220, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Covered.
N	9.84	Sandstone.
N	16.40	Shale, gray to dark-gray.
N	8.20	Sandstone, medium-gray.
N	1.64	Coal.
N	8.20	Shale, dark-gray; roof very carbonaceous.
Y	0.98	Clarain, with scattered vitrain.
Y	0.16	Clarain; pyrite 0.005 m thick 0.54 m from top.
Y	0.23	Durain, with scattered vitrain.
Y	0.43	Clarain, with durain.
Y	0.39	Durain, with clarain.
Y	0.52	Durain, with sparse clarain.
		See KGS 104 (W215671) for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: K96954 FIELD NO: KGS 102 U.S.G.S. NO: W207474
LABORATORY: USBM REPORT DATE: Nov/30/1979

AIR DRIED LOSS: 2.50%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	4.50%		
VOLATILE MATTER	33.70%	35.29%	40.41%
FIXED CARBON	49.70%	52.04%	59.59%
ASH	12.10%	12.67%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.00%	4.71%	5.39%
CARBON	68.20%	71.41%	81.77%
NITROGEN	1.40%	1.47%	1.68%
TOTAL SULFUR	0.70%	0.73%	0.84%
OXYGEN	12.60%	9.01%	10.32%
ASH	12.10%	12.67%	
HEATING VALUE (BTU/LB):	12013	12579	14404
SULFUR FORMS:			
SULFATE	0.02%	0.02%	0.02%
PYRITIC	0.17%	0.18%	0.20%
ORGANIC	0.53%	0.55%	0.64%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 deg F
SOFTENING TEMP.	2800 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX	1.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.2

COAL SAMPLING REPORT

LABORATORY NO: K97560 FIELD NO: KGS 183 U.S.G.S. NO: W207817
SAMPLER: Currens, Kung, Portig AGENCY: KGS DATE: Aug/02/1979
7.5' QUAD: Lancer COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 14 ROW 0 TIER 83 3300 FT FSL, 100 FT FEL
LATITUDE: 37 DEG 42 MIN 33 SEC LONGITUDE: 82 DEG 38 MIN 1 SEC
ELEVATION (FT): 1060.00, OF POINT AT base of 183, USING topo
COMMENTARY:
REGIONAL COAL NAME: Broas zone GEO. MAP COAL NAME: Broas
REPORTED COAL NAME: Broas FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: very fresh
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 54.5, SAMPLE 54.5, COAL ONLY 53.7
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 130, SET 2 40, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	9.84	Siltstone, medium-gray.
Y	0.30	Durain.
Y	0.30	Clarain.
Y	0.03	Pyrite.
Y	0.16	Clarain.
Y	0.02	Fusain.
Y	0.07	Vitrain.
Y	0.26	Durain.
Y	0.39	Clarain.
Y	0.23	Durain and clarain, intermixed.
Y	0.66	Durain, with scattered clarain.
Y	0.23	Durain, with clarain.
Y	0.03	Vitrain.
Y	0.23	Clarain, with abundant fusain.
Y	0.02	Pyrite.
Y	0.66	Durain, with scattered clarain.
Y	0.02	Clay, light-gray.
Y	0.95	Clarain.
N		Siltstone, light-gray, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: K97560 FIELD NO: KGS 183 U.S.G.S. NO: W207817
LABORATORY: USBM REPORT DATE: Dec/10/1979

AIR DRIED LOSS: 3.40%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	5.70%		
VOLATILE MATTER	31.10%	32.98%	38.73%
FIXED CARBON	49.20%	52.17%	61.27%
ASH	14.00%	14.85%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.90%	4.52%	5.31%
CARBON	65.90%	69.88%	82.07%
NITROGEN	1.30%	1.38%	1.62%
TOTAL SULFUR	0.80%	0.85%	1.00%
OXYGEN	13.10%	8.52%	10.00%
ASH	14.00%	14.85%	
HEATING VALUE (BTU/LB):	11609	12310	14457
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.25%	0.27%	0.31%
ORGANIC	0.58%	0.62%	0.72%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 deg F
SOFTENING TEMP.	2800 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX	4.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.4

COAL SAMPLING REPORT

LABORATORY NO: K97576 FIELD NO: KGS 184 U.S.G.S. NO: W207818
SAMPLER: Currens, Kung, Portig AGENCY: KGS DATE: Aug/02/1979
7.5' QUAD: Lancer COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 13 ROW 0 TIER 83 3300 FT FSL, 4700 FT FEL
LATITUDE: 37 DEG 42 MIN 33 SEC LONGITUDE: 82 DEG 37 MIN 58 SEC
ELEVATION (FT): 1060.00, OF POINT AT base of 184, USING survey
COMMENTARY:
REGIONAL COAL NAME: Broas zone GEO. MAP COAL NAME: Broas
REPORTED COAL NAME: Broas FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: very fresh
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 57.2, SAMPLE 57.2, COAL ONLY 54.3
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 40, SET 2 300, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	9.84	Siltstone, light- to medium-gray, carbonaceous, micaceous, laminated to ripple-bedded, bioturbated.
Y	0.13	Vitrain.
Y	0.15	Shale, very carbonaceous, silty.
Y	0.08	Clarain, with vitrain.
Y	0.01	Pyrite.
Y	0.46	Clarain, with abundant durain near top.
Y	0.07	Pyrite.
Y	0.26	Clarain.
Y	0.03	Fusain.
Y	0.13	Clarain, with abundant vitrain.
Y	0.08	Durain.
Y	0.30	Clarain, with abundant vitrain.
Y	0.46	Durain.
Y	0.92	Durain, mixed with vitrain.
Y	0.07	Fusain.
Y	0.26	Clarain.
Y	0.20	Durain.
Y	0.89	Clarain.
Y	0.02	Shale, light-gray, laminated.
Y	0.26	Clarain.
		Siltstone, light-gray, sandy, rooted, carbonaceous.

COAL ANALYSIS REPORT

LABORATORY NO: K97576 FIELD NO: KGS 184 U.S.G.S. NO: W207818
LABORATORY: USBM REPORT DATE: Dec/10/1979

AIR DRIED LOSS: 2.90%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	5.00%		
VOLATILE MATTER	31.40%	33.05%	39.35%
FIXED CARBON	48.40%	50.95%	60.65%
ASH	15.20%	16.00%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.70%	4.36%	5.19%
CARBON	65.00%	68.42%	81.45%
NITROGEN	1.30%	1.37%	1.63%
TOTAL SULFUR	1.00%	1.05%	1.25%
OXYGEN	12.80%	8.80%	10.48%
ASH	15.20%	16.00%	
HEATING VALUE (BTU/LB):	11492	12097	14401
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.42%	0.44%	0.53%
ORGANIC	0.60%	0.63%	0.75%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 deg F
SOFTENING TEMP.	2800 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX	1.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.7

COAL SAMPLING REPORT

LABORATORY NO: K97568 FIELD NO: KGS 106 U.S.G.S. NO: W207819
SAMPLER: Currens & Kung AGENCY: KGS DATE: Jul/25/1979
7.5' QUAD: Harold COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 24 ROW N TIER 82 3600 FT FSL, 700 FT FEL
LATITUDE: 37 DEG 35 MIN 36 SEC LONGITUDE: 82 DEG 43 MIN 9 SEC
ELEVATION (FT): 1200.00, OF POINT AT base of 106, USING topo
COMMENTARY: Sample was collected 20 feet west of KGS 102-105.
REGIONAL COAL NAME: L Peach Orch GEO. MAP COAL NAME: L Peach Orch
REPORTED COAL NAME: L Peach Orch FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): bottom bench
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: very fresh
RECOVERY METHOD: channel SAMPLING REGIME: TK partings included
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 62.6, SAMPLE 62.6, COAL ONLY 56.7
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	8.20	Shale, dark-gray, very carbonaceous.
Y	0.92	Clarain.
Y	0.52	Durain, with clarain.
Y	0.62	Clarain, with durain.
Y	0.82	Durain.
Y	0.49	Shale, sandy, carbonaceous.
Y	0.33	Clarain.
Y	0.33	Durain.
Y	1.18	Clarain, with durain.
N	0.98	Shale, gray, slickensided, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: K97568 FIELD NO: KGS 106 U.S.G.S. NO: W207819
LABORATORY: USBM REPORT DATE: Dec/10/1979

AIR DRIED LOSS: 3.70%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	6.00%		
VOLATILE MATTER	33.60%	35.74%	41.48%
FIXED CARBON	47.40%	50.42%	58.52%
ASH	13.00%	13.83%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.10%	4.71%	5.47%
CARBON	66.20%	70.42%	81.73%
NITROGEN	1.40%	1.49%	1.73%
TOTAL SULFUR	0.70%	0.74%	0.86%
OXYGEN	13.60%	8.81%	10.21%
ASH	13.00%	13.83%	
HEATING VALUE (BTU/LB):	11778	12529	14541
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.16%	0.17%	0.20%
ORGANIC	0.49%	0.52%	0.60%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	1.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.2

COAL SAMPLING REPORT

LABORATORY NO: K97569 FIELD NO: KGS 110 U.S.G.S. NO: W207820
SAMPLER: Currens & Kung AGENCY: KGS DATE: Jul/25/1979
7.5' QUAD: Prestonsburg COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 21 ROW 0 TIER 81 3800 FT FSL, 1400 FT FEL
LATITUDE: 37 DEG 40 MIN 38 SEC LONGITUDE: 82 DEG 45 MIN 17 SEC
ELEVATION (FT): 625.00, OF POINT AT base of 110, USING topo
COMMENTARY: On opposite side of entry from KGS 176.
REGIONAL COAL NAME: U Elkhorn No.3 GEO. MAP COAL NAME: U Elkhorn No.3
REPORTED COAL NAME: U Elkhorn No.3 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: very fresh
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 44.7, SAMPLE 44.7, COAL ONLY 41.9
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 150, SET 2 60, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Shale, carbonaceous, silty.
Y	0.52	Durain and clarain, equally intermixed with vitrain, silty.
Y	0.18	Shale, dark-gray, carbonaceous, slightly silty, not rooted.
Y	0.16	Durain, with some clarain.
Y	0.02	Pyrite.
Y	0.41	Durain, with some clarain.
Y	0.07	Clarain.
Y	0.30	Durain.
Y	0.49	Clarain, with abundant durain at base.
Y	0.03	Pyrite.
Y	0.39	Clarain.
Y	0.07	Pyrite, nodular.
Y	1.08	Clarain, with scattered vitrain.
N	0.33	Shale, medium-gray, silty, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: K97569 FIELD NO: KGS 110 U.S.G.S. NO: W207820
LABORATORY: USBM REPORT DATE: Dec/10/1979

AIR DRIED LOSS: 1.90%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	3.80%		
VOLATILE MATTER	36.80%	38.25%	45.43%
FIXED CARBON	44.20%	45.95%	54.57%
ASH	15.20%	15.80%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.10%	4.86%	5.77%
CARBON	65.50%	68.09%	80.87%
NITROGEN	1.40%	1.46%	1.73%
TOTAL SULFUR	2.80%	2.91%	3.46%
OXYGEN	10.00%	6.88%	8.17%
ASH	15.20%	15.80%	
HEATING VALUE (BTU/LB):	11833	12300	14609
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	2.17%	2.26%	2.68%
ORGANIC	0.64%	0.67%	0.79%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2170 deg F
SOFTENING TEMP.	2250 deg F
FLUID TEMP.	2340 deg F

FREE SWELLING INDEX	4.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	4.7

COAL SAMPLING REPORT

LABORATORY NO: K97575 FIELD NO: KGS 176 U.S.G.S. NO: W207821
SAMPLER: Currens & Kung AGENCY: KGS DATE: Jul/25/1979
7.5' QUAD: Prestonsburg COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 21 ROW 0 TIER 81 3800 FT FSL, 1300 FT FEL
LATITUDE: 37 DEG 40 MIN 38 SEC LONGITUDE: 82 DEG 45 MIN 16 SEC
ELEVATION (FT): 625.00, OF POINT AT base of 176, USING topo
COMMENTARY: Sample collected from opposite side of entry from KGS 107.
REGIONAL COAL NAME: U Elkhorn No.3 GEO. MAP COAL NAME: U Elkhorn No.3
REPORTED COAL NAME: U Elkhorn No.3 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: very fresh
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 44.5, SAMPLE 44.5, COAL ONLY 40.4
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 335, SET 2 250, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Shale, silty, carbonaceous.
Y	0.49	Clarain, durain, intermixed.
Y	0.23	Shale, medium-gray, silty.
Y	0.15	Clarain.
Y	0.03	Pyrite.
Y	0.33	Clarain, with vitrain.
Y	0.39	Durain and clarain.
Y	0.26	Clarain.
Y	0.03	Pyrite.
Y	0.20	Clarain and durain.
Y	0.03	Pyrite.
Y	0.26	Durain.
Y	0.02	Pyrite.
Y	1.28	Clarain.
N	0.33	Shale, medium-gray, silty, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: K97575 FIELD NO: KGS 176 U.S.G.S. NO: W207821
LABORATORY: USBM REPORT DATE: Dec/13/1979

AIR DRIED LOSS: 1.70%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	3.70%		
VOLATILE MATTER	35.10%	36.45%	42.96%
FIXED CARBON	46.60%	48.39%	57.04%
ASH	14.60%	15.16%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.00%	4.76%	5.61%
CARBON	66.30%	68.85%	81.15%
NITROGEN	1.40%	1.45%	1.71%
TOTAL SULFUR	2.10%	2.18%	2.57%
OXYGEN	10.50%	7.60%	8.96%
ASH	14.60%	15.16%	
HEATING VALUE (BTU/LB):	11967	12427	14648
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	1.52%	1.58%	1.86%
ORGANIC	0.52%	0.54%	0.64%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2300 deg F
SOFTENING TEMP.	2390 deg F
FLUID TEMP.	2540 deg F

FREE SWELLING INDEX	4.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	3.5

COAL SAMPLING REPORT

LABORATORY NO: K97851 FIELD NO: KGS 237 U.S.G.S. NO: W207864
SAMPLER: Currens & Kung AGENCY: KGS DATE: Aug/15/1979
7.5' QUAD: Harold COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 17 ROW M TIER 83 4800 FT FSL, 4200 FT FEL
LATITUDE: 37 DEG 31 MIN 47 SEC LONGITUDE: 82 DEG 38 MIN 52 SEC
ELEVATION (FT): 760.00, OF POINT AT base of 237, USING topo
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.2 GEO. MAP COAL NAME: U Elkhorn No.2
REPORTED COAL NAME: U Elkhorn No.2 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: hours old, clean, dry
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 37.5, SAMPLE 37.5, COAL ONLY 35.1
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Siltstone, dark-gray, micaceous, carbonaceous, laminated.
Y	0.07	Clarain.
Y	0.16	Shale, dark-gray, carbonaceous, slickensided, micaceous.
Y	0.18	Clarain, with abundant durain.
Y	0.03	Shale, black, laminated, carbonaceous.
Y	0.15	Clarain.
Y	0.01	Pyrite.
Y	0.16	Durain.
Y	0.92	Clarain, with scattered fusain.
Y	0.03	Durain.
Y	0.39	Clarain.
Y	0.02	Fusain.
Y	0.30	Clarain, with scattered fusain.
Y	0.02	Fusain.
Y	0.03	Vitrain.
Y	0.20	Clarain.
Y	0.03	Fusain.
Y	0.43	Clarain, with scattered fusain.
N		Shale, dark-gray, silty, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: K97851 FIELD NO: KGS 237 U.S.G.S. NO: W207864
LABORATORY: USBM REPORT DATE: Dec/26/1979

AIR DRIED LOSS: 2.10%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	3.30%		
VOLATILE MATTER	32.10%	33.19%	41.37%
FIXED CARBON	45.50%	47.05%	58.64%
ASH	19.10%	19.75%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.80%	4.58%	5.71%
CARBON	63.10%	65.25%	81.32%
NITROGEN	1.20%	1.24%	1.55%
TOTAL SULFUR	1.80%	1.86%	2.32%
OXYGEN	9.80%	7.32%	9.10%
ASH	19.10%	19.75%	
HEATING VALUE (BTU/LB):	11384	11772	14671
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	1.23%	1.27%	1.59%
ORGANIC	0.60%	0.62%	0.77%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2590 deg F
SOFTENING TEMP.	2680 deg F
FLUID TEMP.	2780 deg F

FREE SWELLING INDEX 4.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU 3.2

COAL SAMPLING REPORT

LABORATORY NO: K97852 FIELD NO: KGS 238 U.S.G.S. NO: W207867
SAMPLER: Currens & Kung AGENCY: KGS DATE: Jul/15/1979
7.5' QUAD: Harold COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 11 ROW M TIER 82 3500 FT FSL, 1700 FT FEL
LATITUDE: 37 DEG 32 MIN 35 SEC LONGITUDE: 82 DEG 40 MIN 21 SEC
ELEVATION (FT): 1080.00, OF POINT AT base of 328, USING topo
COMMENTARY:
REGIONAL COAL NAME: Fire Clay GEO. MAP COAL NAME: Fire Clay
REPORTED COAL NAME: Fire Clay FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: very fresh
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 45.8, SAMPLE 45.8, COAL ONLY 42.7
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 45, SET 2 125, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Sandstone(?), covered with wet coal dust.
Y	0.30	Durain, with clarain.
Y	0.43	Clarain, with abundant durain.
Y	0.07	Durain.
Y	0.89	Clarain, with abundant vitrain.
Y	0.01	Pyrite.
Y	0.23	Clarain.
Y	0.16	Durain.
Y	0.02	Pyrite.
Y	0.15	Durain, with vitrain.
Y	0.13	Clarain.
Y	0.23	Shale, brown to dark-gray, brittle, silty.
Y	0.03	Durain, with abundant clarain.
Y	0.23	Clarain.
Y	0.95	Durain.
N		Shale, medium-gray, rooted, plastic, wet, carbonaceous.

COAL ANALYSIS REPORT

LABORATORY NO: K97852 FIELD NO: KGS 238 U.S.G.S. NO: W207867
LABORATORY: USBM REPORT DATE: Dec/26/1979

AIR DRIED LOSS: 2.20%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	3.60%		
VOLATILE MATTER	33.50%	34.75%	40.80%
FIXED CARBON	48.60%	50.41%	59.19%
ASH	14.30%	14.83%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.00%	4.77%	5.60%
CARBON	67.20%	69.71%	81.85%
NITROGEN	1.40%	1.45%	1.71%
TOTAL SULFUR	0.80%	0.83%	0.97%
OXYGEN	11.40%	8.41%	9.87%
ASH	14.30%	14.83%	
HEATING VALUE (BTU/LB):	12028	12477	14650
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.12%	0.12%	0.15%
ORGANIC	0.63%	0.65%	0.77%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 deg F
SOFTENING TEMP.	2800 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX	3.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.3

COAL SAMPLING REPORT

LABORATORY NO: K97854 FIELD NO: KGS 247 U.S.G.S. NO: W207868
SAMPLER: Currens & Kung AGENCY: KGS DATE: Aug/30/1979
7.5' QUAD: Williamson COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 9 ROW 0 TIER 86 3500 FT FSL, 3650 FT FEL
LATITUDE: 37 DEG 43 MIN 35 SEC LONGITUDE: 82 DEG 21 MIN 45 SEC
ELEVATION (FT): 659.00, OF POINT AT base of 247, USING survey
COMMENTARY:
REGIONAL COAL NAME: Amburgy zone GEO. MAP COAL NAME: Williamson
REPORTED COAL NAME: Williamson FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: very fresh
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 44.9, SAMPLE 44.9, COAL ONLY 41.3
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 205, SET 2 320, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	32.81	Siltstone, medium-grained, with abundant plant impressions.
Y	0.13	Clarain, with abundant pyrite.
Y	0.10	Siltstone, black, nonlaminated, carbonaceous.
Y	0.36	Clarain, with abundant vitrain; pyrite at top.
Y	0.03	Shale, dark-gray to black, silty, carbonaceous.
Y	0.46	Clarain, with fusain, pyritic.
Y	0.10	Siltstone, dark-gray to black, nonlaminated, carbonaceous.
Y	0.49	Durain, with scattered vitrain.
Y	0.20	Clarain, with abundant interlaminated durain.
Y	0.52	Clarain; calcite in cleat.
Y	0.39	Clarain; abundant vitrain at base.
Y	0.07	Shale, dark-gray, nonlaminated, pyritic.
Y	0.39	Clarain, with abundant durain.
Y	0.16	Durain.
Y	0.33	Clarain.
N		Siltstone, dark-gray, rooted, argillaceous.

COAL ANALYSIS REPORT

LABORATORY NO: K97854 FIELD NO: KGS 247 U.S.G.S. NO: W207868
LABORATORY: USBM REPORT DATE: Dec/26/1979

AIR DRIED LOSS: 1.30%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.40%		
VOLATILE MATTER	32.60%	33.40%	45.59%
FIXED CARBON	38.90%	39.86%	54.41%
ASH	26.10%	26.74%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.40%	4.23%	5.78%
CARBON	56.80%	58.20%	79.44%
NITROGEN	1.10%	1.13%	1.54%
TOTAL SULFUR	4.00%	4.10%	5.59%
OXYGEN	7.70%	5.60%	7.65%
ASH	26.10%	26.74%	
HEATING VALUE (BTU/LB):	10382	10637	14520
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	3.34%	3.42%	4.67%
ORGANIC	0.62%	0.64%	0.87%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2370 deg F
SOFTENING TEMP.	2480 deg F
FLUID TEMP.	2590 deg F

FREE SWELLING INDEX	4.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	7.7

COAL SAMPLING REPORT

LABORATORY NO: K97855 FIELD NO: KGS 248 U.S.G.S. NO: W207870
SAMPLER: Currens & Kung AGENCY: KGS DATE: Aug/30/1979
7.5' QUAD: Williamson COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 12 ROW 0 TIER 86 4450 FT FSL, 3100 FT FEL
LATITUDE: 37 DEG 42 MIN 44 SEC LONGITUDE: 82 DEG 21 MIN 39 SEC
ELEVATION (FT): 680.00, OF POINT AT base of 248, USING topo
COMMENTARY:
REGIONAL COAL NAME: Amburgy zone GEO. MAP COAL NAME: Williamson
REPORTED COAL NAME: Williamson FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, 4 days old
SAMPLE CONDITION: very fresh
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 48.3, SAMPLE 48.3, COAL ONLY 45.8
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 220, SET 2 355, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Siltstone, medium-gray, laminated, with scattered plant fragments.
Y	0.56	Clarain, with abundant vitrain; pyritic.
Y	0.01	Fusain.
Y	0.03	Clarain.
Y	0.02	Fusain.
Y	0.08	Vitrain.
Y	0.01	Fusain.
Y	0.31	Clarain.
Y	0.02	Shale, dark-gray, carbonaceous.
Y	0.79	Clarain, with abundant vitrain; pyritic.
Y	0.03	Shale, dark-gray, silty, laminated.
Y	1.38	Clarain, with abundant vitrain near base, scattered fusain; pyrite up to 2 cm thick.
Y	0.16	Siltstone, black, nonlaminated, hard.
Y	0.62	Clarain, very pyritic at base.
N		Seat rock.

COAL ANALYSIS REPORT

LABORATORY NO: K97855 FIELD NO: KGS 248 U.S.G.S. NO: W207870
LABORATORY: USBM REPORT DATE: Dec/27/1979

AIR DRIED LOSS: 2.00%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	3.40%		
VOLATILE MATTER	38.90%	40.27%	43.37%
FIXED CARBON	50.80%	52.59%	56.63%
ASH	6.90%	7.14%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.50%	5.30%	5.71%
CARBON	73.60%	76.19%	82.05%
NITROGEN	1.50%	1.55%	1.67%
TOTAL SULFUR	2.70%	2.80%	3.01%
OXYGEN	9.70%	7.02%	7.56%
ASH	6.90%	7.14%	
HEATING VALUE (BTU/LB):	13315	13784	14844
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	1.89%	1.96%	2.11%
ORGANIC	0.76%	0.79%	0.85%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2170 deg F
SOFTENING TEMP.	2280 deg F
FLUID TEMP.	2400 deg F

FREE SWELLING INDEX	4.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	4.1

COAL SAMPLING REPORT

LABORATORY NO: K97972 FIELD NO: KGS 011 U.S.G.S. NO: W207982
SAMPLER: Scanlon AGENCY: KGS DATE: Jan/01/1978
7.5' QUAD: Inez COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 25 ROW Q TIER 84 2700 FT FSL, 4100 FT FEL
LATITUDE: 37 DEG 50 MIN 27 SEC LONGITUDE: 82 DEG 34 MIN 51 SEC
ELEVATION (FT): 1015.00, OF POINT AT base of 011, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: U Peach Orch GEO. MAP COAL NAME: U Peach Orch
REPORTED COAL NAME: U Peach Orchard FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh
RECOVERY METHOD: channel SAMPLING REGIME: unknown
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 28.0, SAMPLE 28.0, COAL ONLY 28.0
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	24.93	Sandstone, argillaceous (or siltstone).
N	2.95	Sandstone.
N	1.51	Coal.
N	3.35	Shale, rooted.
N	0.82	Coal.
N	2.99	Shale, rooted.
Y	2.33	Coal.
N	0.10	Shale, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: K97972 FIELD NO: KGS 011 U.S.G.S. NO: W207982
LABORATORY: USBM REPORT DATE: Dec/31/1979

AIR DRIED LOSS: 3.20%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	5.10%		
VOLATILE MATTER	33.80%	35.62%	41.37%
FIXED CARBON	47.90%	50.47%	58.63%
ASH	13.20%	13.91%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.20%	4.88%	5.67%
CARBON	66.20%	69.75%	81.03%
NITROGEN	1.40%	1.48%	1.71%
TOTAL SULFUR	0.90%	0.95%	1.10%
OXYGEN	13.10%	9.03%	10.49%
ASH	13.20%	13.91%	
HEATING VALUE (BTU/LB):	11848	12484	14502
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.27%	0.28%	0.33%
ORGANIC	0.66%	0.70%	0.81%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 deg F
SOFTENING TEMP.	2800 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX	1.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.5

COAL SAMPLING REPORT

LABORATORY NO: K97862 FIELD NO: KGS 262 U.S.G.S. NO: W208050
SAMPLER: Currens & Kung AGENCY: KGS DATE: Sep/25/1979
7.5' QUAD: Naugatuck COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 21 ROW P TIER 86 2600 FT FSL, 0 FT FEL
LATITUDE: 37 DEG 45 MIN 26 SEC LONGITUDE: 82 DEG 20 MIN 0 SEC
ELEVATION (FT): 1217.84, OF POINT AT base of 262, USING survey
COMMENTARY:
REGIONAL COAL NAME: Broas zone GEO. MAP COAL NAME: Broas
REPORTED COAL NAME: Broas FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, surface mine; CONDITION, old, faced-up by company
SAMPLE CONDITION: unknown
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 50.4, SAMPLE 50.4, COAL ONLY 46.5
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 153, SET 2 65 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	16.40	Sandstone.
N	0.16	Coal.
N	32.81	Siltstone, dark- to medium-gray, very sideritic; linguloid brachiopods at base.
Y	0.03	Canneloid coal.
Y	1.48	Clarain, with abundant thin-banded vitrain; pyritic.
Y	0.16	Durain(?) (argillaceous coal?).
Y	0.16	Shale, black, silty.
Y	0.49	Durain, with abundant clarain, scattered thin- to medium-banded vitrain.
Y	0.02	Pyrite.
Y	0.33	Durain, with abundant clarain.
Y	0.16	Clarain.
Y	0.23	Clarain, with abundant durain.
Y	0.43	Durain, with scattered clarain.
Y	0.15	Shale, black, slightly silty, laminated, pyritic, rooted.
Y	0.13	Clarain.
Y	0.13	Durain.
Y	0.30	Clarain.
N		Shale, dark-gray to black, silty, rooted, plastic when wet.

COAL ANALYSIS REPORT

LABORATORY NO: K97862 FIELD NO: KGS 262 U.S.G.S. NO: W208050
LABORATORY: USBM REPORT DATE: Dec/26/1979

AIR DRIED LOSS: 2.80%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	4.30%		
VOLATILE MATTER	34.20%	35.74%	41.35%
FIXED CARBON	48.50%	50.68%	58.65%
ASH	13.00%	13.58%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.20%	4.93%	5.71%
CARBON	68.30%	71.37%	82.59%
NITROGEN	1.30%	1.36%	1.57%
TOTAL SULFUR	0.90%	0.94%	1.09%
OXYGEN	11.20%	7.82%	9.04%
ASH	13.00%	13.58%	
HEATING VALUE (BTU/LB):	12220	12769	14776
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.32%	0.33%	0.39%
ORGANIC	0.60%	0.63%	0.73%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2740 deg F
SOFTENING TEMP.	2800 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX	4.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.5

COAL SAMPLING REPORT

LABORATORY NO: K97863 FIELD NO: KGS 263 U.S.G.S. NO: W208051
SAMPLER: Currens & Kung AGENCY: KGS DATE: Sep/25/1979
7.5' QUAD: Naugatuck COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 21 ROW P TIER 86 400 FT FSL, 800 FT FEL
LATITUDE: 37 DEG 45 MIN 4 SEC LONGITUDE: 82 DEG 20 MIN 10 SEC
ELEVATION (FT): 1256.81, OF POINT AT base of 263, USING survey
COMMENTARY:
REGIONAL COAL NAME: Broas zone GEO. MAP COAL NAME: Broas
REPORTED COAL NAME: Broas FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, prospect; CONDITION, 2 weeks old
SAMPLE CONDITION: "outcroppy," mud streaked
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 29.1, SAMPLE 29.1, COAL ONLY 26.0
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 150, SET 2 76 , SET 3 45

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	9.84	Shale, silty, sideritic, laminated to bioturbated.
Y	0.20	Clarain.
Y	0.16	Shale, black, coaly, silty, laminated to bioturbated.
Y	1.54	Clarain, with scattered durain and thin- to medium-banded vitrain.
Y	0.10	Shale, black, carbonaceous.
Y	0.43	Clarain, with abundant durain (obscured).
N		Shale, medium-gray, plastic, silty, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: K97863 FIELD NO: KGS 263 U.S.G.S. NO: W208051
LABORATORY: USBM REPORT DATE: Dec/26/1979

AIR DRIED LOSS: 7.90%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	10.70%		
VOLATILE MATTER	27.90%	31.24%	37.10%
FIXED CARBON	47.30%	52.97%	62.90%
ASH	14.10%	15.79%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.80%	4.03%	4.79%
CARBON	58.30%	65.28%	77.53%
NITROGEN	1.20%	1.34%	1.60%
TOTAL SULFUR	0.60%	0.67%	0.80%
OXYGEN	21.20%	12.89%	15.28%
ASH	14.10%	15.79%	
HEATING VALUE (BTU/LB):	10028	11229	13335
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.08%	0.09%	0.11%
ORGANIC	0.47%	0.53%	0.63%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 deg F
SOFTENING TEMP.	2800 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX	0.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.2

COAL SAMPLING REPORT

LABORATORY NO: K97864 FIELD NO: KGS 264 U.S.G.S. NO: W208052
SAMPLER: Currens & Kung AGENCY: KGS DATE: Sep/25/1979
7.5' QUAD: Naugatuck COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 25 ROW P TIER 87 3500 FT FSL, 4350 FT FEL
LATITUDE: 37 DEG 45 MIN 35 SEC LONGITUDE: 82 DEG 19 MIN 54 SEC
ELEVATION (FT): 1165.77, OF POINT AT base of 264, USING survey
COMMENTARY:
REGIONAL COAL NAME: U Peach Orch GEO. MAP COAL NAME: U Peach Orch
REPORTED COAL NAME: U Peach Orchard FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, prospect; CONDITION, 1 week old
SAMPLE CONDITION: "outcroppy"
RECOVERY METHOD: channel SAMPLING REGIME: TK partings included
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 94.9, SAMPLE 94.9, COAL ONLY 63.4
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 315, SET 2 260, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	16.40	Sandstone.
N	3.61	Shale, medium-gray, silty.
Y	0.49	Clarain, with medium- to thick-banded vitrain; slightly weathered.
Y	0.66	Clarain, with scattered thin- to medium-banded vitrain.
Y	1.64	Shale, black, coaly.
Y	0.75	Durain, with abundant thin- to medium-banded vitrain.
Y	0.98	Clarain, with thin- to medium-banded vitrain.
Y	0.03	Durain.
Y	0.33	Clarain.
Y	0.03	Vitrain.
Y	0.39	Clarain.
Y	0.98	Siltstone, dark-gray, nonlaminated, rooted.
Y	1.08	Clarain, with scattered fusain, medium vitrain.
Y	0.13	Durain, with clarain.
Y	0.07	Durain.
Y	0.33	Clarain, with abundant medium-banded vitrain.
N	0.16	Sandstone, light-gray to buff, friable, micaceous, rooted.
N	1.64	Shale, medium-gray, plastic, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: K97864 FIELD NO: KGS 264 U.S.G.S. NO: W208052
LABORATORY: USBM REPORT DATE: Dec/27/1979

AIR DRIED LOSS: 10.80%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	13.80%		
VOLATILE MATTER	27.60%	32.02%	40.06%
FIXED CARBON	41.30%	47.91%	59.94%
ASH	17.30%	20.07%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.80%	3.78%	4.73%
CARBON	52.00%	60.33%	75.47%
NITROGEN	1.10%	1.28%	1.60%
TOTAL SULFUR	0.40%	0.46%	0.58%
OXYGEN	24.30%	14.08%	17.62%
ASH	17.30%	20.07%	
HEATING VALUE (BTU/LB):	8697	10089	12623
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.05%	0.06%	0.07%
ORGANIC	0.38%	0.44%	0.55%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 deg F
SOFTENING TEMP.	2800 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX
POUNDS OF SULFUR DIOXIDE PER MILLION BTU 0.9

COAL SAMPLING REPORT

LABORATORY NO: K97865 FIELD NO: KGS 267 U.S.G.S. NO: W208053
SAMPLER: Currens & Kung AGENCY: KGS DATE: Sep/25/1979
7.5' QUAD: Naugatuck COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 21 ROW P TIER 86 2600 FT FSL, 400 FT FEL
LATITUDE: 37 DEG 45 MIN 26 SEC LONGITUDE: 82 DEG 20 MIN 5 SEC
ELEVATION (FT): 1073.00, OF POINT AT base of 267, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: L Peach Orch GEO. MAP COAL NAME: L Peach Orch
REPORTED COAL NAME: L Peach Orchard FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): bottom split
EXPOSURE: TYPE, prospect; CONDITION, weathered
SAMPLE CONDITION: wet
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 17.5, SAMPLE 17.5, COAL ONLY 17.5
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 135, SET 2 235, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	3.28	Shale, medium-gray, coaly, weathered.
Y	0.30	Clarain(?); obscured by limonite on cleat surfaces.
Y	0.11	Fusain, interlaminated with scattered thin-banded vitrain.
Y	0.30	Clarain.
Y	0.13	Vitrain.
Y	0.62	Clarain and durain, interbedded; abundant vitrain in clarain.
N		Shale, medium-gray, silty, rooted, slickensided, plastic when wet.

COAL ANALYSIS REPORT

LABORATORY NO: K97865 FIELD NO: KGS 267 U.S.G.S. NO: W208053
LABORATORY: USBM REPORT DATE: Dec/26/1979

AIR DRIED LOSS: 3.30%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	5.00%		
VOLATILE MATTER	35.10%	36.95%	38.11%
FIXED CARBON	57.00%	60.00%	61.89%
ASH	2.90%	3.05%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.60%	5.31%	5.47%
CARBON	76.50%	80.52%	83.06%
NITROGEN	1.60%	1.68%	1.74%
TOTAL SULFUR	0.70%	0.74%	0.76%
OXYGEN	12.90%	8.70%	8.97%
ASH	2.90%	3.05%	
HEATING VALUE (BTU/LB):	13721	14443	14898
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.03%	0.03%	0.03%
ORGANIC	0.65%	0.68%	0.71%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2500 deg F
SOFTENING TEMP.	2580 deg F
FLUID TEMP.	2690 deg F

FREE SWELLING INDEX	3.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.0

COAL SAMPLING REPORT

LABORATORY NO: K97866 FIELD NO: KGS 268 U.S.G.S. NO: W208054
SAMPLER: Currens & Kung AGENCY: KGS DATE: Sep/25/1979
7.5' QUAD: Naugatuck COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 21 ROW P TIER 86 2050 FT FSL, 200 FT FEL
LATITUDE: 37 DEG 45 MIN 20 SEC LONGITUDE: 82 DEG 20 MIN 2 SEC
ELEVATION (FT): 1038.00, OF POINT AT base of 268, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: Hazard zone GEO. MAP COAL NAME: Winifrede
REPORTED COAL NAME: Winifrede FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, prospect; CONDITION, slightly weathered, faced-up
SAMPLE CONDITION: wet
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 31.1, SAMPLE 31.1, COAL ONLY 31.1
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 153, SET 2 53 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	9.84	Sandstone, medium-gray, micaceous, feldspathic, with liesegang banding.
N	0.10	Shale, carbonaceous, dark-gray to black, laminated.
Y	0.26	Clarain.
Y	0.05	Durain.
Y	0.49	Clarain, with scattered thin-banded vitrain, abundant thin-banded fusain.
Y	0.07	Durain.
Y	0.33	Clarain, with abundant thin-banded vitrain.
Y	0.18	Durain.
Y	0.75	Clarain, with scattered durain and thin-banded vitrain; pyritic.
Y	0.16	Durain.
Y	0.10	Vitrain.
Y	0.20	Clarain.
N	1.97	Shale, medium-gray, silty, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: K97866 FIELD NO: KGS 268 U.S.G.S. NO: W208054
LABORATORY: USBM REPORT DATE: Dec/26/1979

AIR DRIED LOSS: 2.60%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	4.20%		
VOLATILE MATTER	36.10%	37.68%	41.64%
FIXED CARBON	50.60%	52.82%	58.36%
ASH	9.10%	9.50%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.30%	5.04%	5.57%
CARBON	71.70%	74.84%	82.70%
NITROGEN	1.60%	1.67%	1.85%
TOTAL SULFUR	0.70%	0.73%	0.81%
OXYGEN	11.70%	8.22%	9.07%
ASH	9.10%	9.50%	
HEATING VALUE (BTU/LB):	12835	13397	14804
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.06%	0.06%	0.07%
ORGANIC	0.62%	0.65%	0.72%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2700 deg F
SOFTENING TEMP.	2790 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX	3.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.1

COAL SAMPLING REPORT

LABORATORY NO: K97867 FIELD NO: KGS 269 U.S.G.S. NO: W208055
SAMPLER: Currens & Kung AGENCY: KGS DATE: Sep/25/1979
7.5' QUAD: Naugatuck COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 21 ROW P TIER 86 2650 FT FSL, 900 FT FEL
LATITUDE: 37 DEG 45 MIN 26 SEC LONGITUDE: 82 DEG 20 MIN 11 SEC
ELEVATION (FT): 900.00, OF POINT AT base of 269, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: Taylor GEO. MAP COAL NAME: Taylor
REPORTED COAL NAME: Taylor FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, surface mine; CONDITION, old, faced-up
SAMPLE CONDITION: wet
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 31.1, SAMPLE 31.1, COAL ONLY 30.3
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 139, SET 2 248, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	10.00	Siltstone, calcareous; inaccessible (Magoffin Zone?).
N	16.40	Shale, medium-gray, silty, sideritic, micaceous, rooted.
N	0.20	Shale, black, carbonaceous.
Y	0.49	Clarain, with abundant vitrain.
Y	0.07	Siltstone, dark-gray.
Y	0.13	Durain, with scattered fusain.
Y	0.30	Durain.
Y	0.56	Clarain, with durain.
Y	0.43	Clarain, with durain and thin-banded vitrain.
Y	0.23	Clarain, with scattered vitrain.
Y	0.39	Durain, with abundant interlaminated clarain.
N		Shale, very dark, rooted(?).

COAL ANALYSIS REPORT

LABORATORY NO: K97867 FIELD NO: KGS 269 U.S.G.S. NO: W208055
LABORATORY: USBM REPORT DATE: Dec/26/1979

AIR DRIED LOSS: 2.80%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	4.20%		
VOLATILE MATTER	33.80%	35.28%	40.82%
FIXED CARBON	49.00%	51.15%	59.18%
ASH	13.00%	13.57%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.10%	4.83%	5.59%
CARBON	68.40%	71.40%	82.61%
NITROGEN	1.40%	1.46%	1.69%
TOTAL SULFUR	0.90%	0.94%	1.09%
OXYGEN	11.20%	7.80%	9.02%
ASH	13.00%	13.57%	
HEATING VALUE (BTU/LB):	12236	12772	14777
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.18%	0.19%	0.22%
ORGANIC	0.68%	0.71%	0.82%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 deg F
SOFTENING TEMP.	2800 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX	1.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.5

COAL SAMPLING REPORT

LABORATORY NO: K97965 FIELD NO: KGS 260 U.S.G.S. NO: W208061
SAMPLER: Currens & Kung AGENCY: KGS DATE: Sep/20/1979
7.5' QUAD: Elkhorn City COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 7 ROW J TIER 87 4200 FT FSL, 3400 FT FEL
LATITUDE: 37 DEG 18 MIN 42 SEC LONGITUDE: 82 DEG 18 MIN 42 SEC
ELEVATION (FT): 1195.00, OF POINT AT base of 260, USING survey
COMMENTARY:
REGIONAL COAL NAME: Hagy zone GEO. MAP COAL NAME: Hagy
REPORTED COAL NAME: Hagy FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, 2 weeks old
SAMPLE CONDITION: fresh, dry
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 33.7, SAMPLE 33.3, COAL ONLY 27.0
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 81 , SET 2 345, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Siltstone, dark-gray, laminated to partly bioturbated, carbonaceous (plant fragments), arenaceous, micaceous.
Y	0.07	Clarain, with abundant vitrain.
N	0.03	Pyrite and coal laminae (clarain).
Y	0.95	Clarain, with abundant thin-banded vitrain, scattered thin-banded pyrite (with fusain?).
Y	0.07	Durain.
Y	0.16	Durain, with abundant clarain.
Y	0.05	Vitrain.
Y	0.10	Clarain, with durain.
Y	0.23	Durain, pyritic (with clarain?).
Y	0.52	Siltstone, dark-gray to black, rooted, very hard.
Y	0.39	Durain, very hard; argillaceous at top.
Y	0.23	Clarain, with abundant thin- to medium-banded vitrain.
N	0.33	Siltstone, rooted, very hard, very arenaceous.
N	0.30	Clarain.
N		Siltstone, slightly sandy, plastic when wet, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: K97965 FIELD NO: KGS 260 U.S.G.S. NO: W208061
LABORATORY: USBM REPORT DATE: Dec/31/1979

AIR DRIED LOSS: 0.60%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.20%		
VOLATILE MATTER	27.60%	27.93%	36.32%
FIXED CARBON	48.40%	48.99%	63.68%
ASH	22.80%	23.08%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.30%	4.22%	5.48%
CARBON	63.50%	64.27%	83.55%
NITROGEN	1.30%	1.32%	1.71%
TOTAL SULFUR	2.50%	2.53%	3.29%
OXYGEN	5.70%	4.58%	5.97%
ASH	22.80%	23.08%	
HEATING VALUE (BTU/LB):	11578	11718	15234
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.12%	0.12%	0.16%
ORGANIC	2.40%	2.43%	3.16%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2520 deg F
SOFTENING TEMP.	2610 deg F
FLUID TEMP.	2740 deg F

FREE SWELLING INDEX	5.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	4.3

COAL SAMPLING REPORT

LABORATORY NO: K97966 FIELD NO: KGS 261 U.S.G.S. NO: W208062
SAMPLER: Currens & Kung AGENCY: KGS DATE: Sep/20/1979
7.5' QUAD: Elkhorn City COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 7 ROW J TIER 87 5950 FT FSL, 400 FT FEL
LATITUDE: 37 DEG 18 MIN 59 SEC LONGITUDE: 82 DEG 18 MIN 5 SEC
ELEVATION (FT): 1107.00, OF POINT AT base of 261, USING survey
COMMENTARY:
REGIONAL COAL NAME: Gray Hawk GEO. MAP COAL NAME: Splash Dam
REPORTED COAL NAME: Splash Dam FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: very fresh, dry
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 52.4, SAMPLE 52.3, COAL ONLY 48.0
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 155, SET 2 43 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Siltstone, black, laminated, with pyrite.
Y	0.16	Durain.
Y	0.02	Vitrain.
Y	0.43	Canneloid(?) coal.
Y	0.03	Clarain.
Y	0.18	Durain.
Y	0.66	Clarain, with abundant medium-banded vitrain.
Y	0.36	Siltstone, medium- to dark-gray, rooted, arenaceous.
Y	0.16	Clarain, with durain.
Y	0.59	Clarain, with abundant thick- to medium-banded vitrain.
Y	0.08	Clarain, with fusain lenses up to 5 mm in diameter.
Y	0.13	Vitrain, medium- to thick-bedded.
Y	0.30	Clarain.
Y	0.02	Fusain.
Y	0.05	Vitrain.
Y	0.02	Fusain.
Y	1.18	Clarain, with abundant thick- to medium-banded vitrain, scattered thin-banded fusain.
N		Shale, medium-gray, rooted, slickensided, plastic when wet.

COAL ANALYSIS REPORT

LABORATORY NO: K97966 FIELD NO: KGS 261 U.S.G.S. NO: W208062
LABORATORY: USBM REPORT DATE: Dec/31/1979

AIR DRIED LOSS: 0.80%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.50%		
VOLATILE MATTER	25.80%	26.19%	35.25%
FIXED CARBON	47.40%	48.12%	64.75%
ASH	25.30%	25.68%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.20%	4.09%	5.51%
CARBON	62.70%	63.65%	85.65%
NITROGEN	1.40%	1.42%	1.91%
TOTAL SULFUR	0.70%	0.71%	0.96%
OXYGEN	5.80%	4.45%	5.97%
ASH	25.30%	25.68%	
HEATING VALUE (BTU/LB):	11200	11370	15300
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.23%	0.23%	0.31%
ORGANIC	0.42%	0.43%	0.57%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 deg F
SOFTENING TEMP.	2800 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX	6.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.3

COAL SAMPLING REPORT

LABORATORY NO: K99278 FIELD NO: KGS 286 U.S.G.S. NO: W208100
SAMPLER: Currens & Kung AGENCY: KGS DATE: Oct/18/1979
7.5' QUAD: Wayland COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 10 ROW L TIER 80 2550 FT FSL, 4650 FT FEL
LATITUDE: 37 DEG 28 MIN 25 SEC LONGITUDE: 82 DEG 50 MIN 58 SEC
ELEVATION (FT): 720.00, OF POINT AT base of 286, USING topo
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.1 GEO. MAP COAL NAME: U Elkhorn No.1
REPORTED COAL NAME: U Elkhorn No.1 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, roadcut; CONDITION, a few months old
SAMPLE CONDITION: fresh, damp
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 63.4, SAMPLE 63.4, COAL ONLY 60.8
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 53, SET 2 155, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	32.81	Sandstone, light-gray to buff, medium-grained, flaser-bedded.
Y	0.07	Clarain.
Y	0.20	Durain.
Y	0.20	Shale, black, very carbonaceous.
Y	0.39	Durain, very argillaceous.
Y	0.72	Clarain, with abundant thin- to thick-banded vitrain.
Y	0.02	Pyrite.
Y	0.48	Clarain, with abundant medium- to thick-banded vitrain.
Y	0.03	Fusain.
Y	1.02	Clarain, with abundant medium- to thick-banded vitrain.
Y	0.30	Durain.
Y	0.13	Clarain.
Y	1.74	Durain, possibly canneloid, very homogeneous, very hard; conchoidal fracture at base.
N		Shale, medium-gray, plastic, silty; has abundant plant impressions, but cannot positively identify rooting.

COAL ANALYSIS REPORT

LABORATORY NO: K99278 FIELD NO: KGS 286 U.S.G.S. NO: W208100
LABORATORY: USBM REPORT DATE: Feb/13/1980

AIR DRIED LOSS: 1.40%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.50%		
VOLATILE MATTER	41.30%	42.36%	46.77%
FIXED CARBON	47.00%	48.20%	53.23%
ASH	9.20%	9.44%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.60%	5.46%	6.03%
CARBON	73.10%	74.97%	82.79%
NITROGEN	1.60%	1.64%	1.81%
TOTAL SULFUR	0.70%	0.72%	0.79%
OXYGEN	9.60%	7.77%	8.58%
ASH	9.20%	9.44%	
HEATING VALUE (BTU/LB):	13342	13684	15110
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.08%	0.08%	0.09%
ORGANIC	0.60%	0.62%	0.68%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2660 deg F
SOFTENING TEMP.	2780 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX	1.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.0

COAL SAMPLING REPORT

LABORATORY NO: K99279 FIELD NO: KGS 287 U.S.G.S. NO: W208101
SAMPLER: Currens & Kung AGENCY: KGS DATE: Oct/18/1979
7.5' QUAD: Wayland COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 9 ROW L TIER 80 1300 FT FSL, 400 FT FEL
LATITUDE: 37 DEG 28 MIN 13 SEC LONGITUDE: 82 DEG 51 MIN 5 SEC
ELEVATION (FT): 820.00, OF POINT AT base of 287, USING topo
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.3 GEO. MAP COAL NAME: U Elkhorn No.3
REPORTED COAL NAME: U Elkhorn No.3 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, roadcut; CONDITION, hours old
SAMPLE CONDITION: very fresh, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 39.0, SAMPLE 39.0, COAL ONLY 38.6
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 225, SET 2 115, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	32.81	Siltstone, medium-gray, laminated.
Y	0.62	Durain, with scattered thin-banded vitrain.
Y	0.98	Clarain, with abundant medium-banded vitrain.
Y	0.03	Pyrite.
Y	1.61	Clarain, with abundant medium-banded vitrain.
N		Siltstone, tan, carbonaceous, arenaceous, hard, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: K99279 FIELD NO: KGS 287 U.S.G.S. NO: W208101
LABORATORY: USBM REPORT DATE: Feb/13/1980

AIR DRIED LOSS: 2.80%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	4.20%		
VOLATILE MATTER	37.00%	38.62%	40.61%
FIXED CARBON	54.10%	56.47%	59.39%
ASH	4.70%	4.91%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.60%	5.35%	5.63%
CARBON	75.90%	79.22%	83.32%
NITROGEN	1.70%	1.77%	1.87%
TOTAL SULFUR	0.70%	0.73%	0.77%
OXYGEN	11.50%	8.02%	8.41%
ASH	4.70%	4.91%	
HEATING VALUE (BTU/LB):	13576	14171	14902
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.04%	0.04%	0.04%
ORGANIC	0.62%	0.65%	0.68%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2240 deg F
SOFTENING TEMP.	2380 deg F
FLUID TEMP.	2520 deg F

FREE SWELLING INDEX	5.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.0

COAL SAMPLING REPORT

LABORATORY NO: K99282 FIELD NO: KGS 290 U.S.G.S. NO: W208104
SAMPLER: Currens & Kung AGENCY: KGS DATE: Oct/18/1979
7.5' QUAD: Wayland COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 5 ROW L TIER 81 2000 FT FSL, 1800 FT FEL
LATITUDE: 37 DEG 29 MIN 20 SEC LONGITUDE: 82 DEG 49 MIN 22 SEC
ELEVATION (FT): 1062.00, OF POINT AT base of 290, USING topo
COMMENTARY: Daniel Boone Parkway.
REGIONAL COAL NAME: Whitesburg zone GEO. MAP COAL NAME: Whitesburg
REPORTED COAL NAME: Whitesburg FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): top bench
EXPOSURE: TYPE, roadcut; CONDITION, under talus, faced up
SAMPLE CONDITION: slightly weathered
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 13.8, SAMPLE 13.8, COAL ONLY 13.8
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 25, SET 2 120, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	9.84	Siltstone.
N	3.28	Shale.
N	0.16	Coal.
N	1.64	Shale, rooted.
N	1.64	Sandstone.
N	0.16	Shale, rooted.
N	19.69	Siltstone, arenaceous, laminated, sideritic.
Y	0.20	Durain.
Y	0.95	Clarain, with abundant thin- to medium-banded vitrain.
		See KGS 292 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: K99282 FIELD NO: KGS 290 U.S.G.S. NO: W208104
LABORATORY: USBM REPORT DATE: Feb/13/1980

AIR DRIED LOSS: 1.90%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	3.30%		
VOLATILE MATTER	38.70%	40.02%	44.84%
FIXED CARBON	47.60%	49.22%	55.15%
ASH	10.40%	10.75%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.40%	5.20%	5.83%
CARBON	69.90%	72.28%	80.99%
NITROGEN	1.80%	1.86%	2.09%
TOTAL SULFUR	1.10%	1.14%	1.27%
OXYGEN	11.50%	8.77%	9.82%
ASH	10.40%	10.75%	
HEATING VALUE (BTU/LB):	12627	13058	14631
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.28%	0.29%	0.32%
ORGANIC	0.78%	0.81%	0.90%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	1970 deg F
SOFTENING TEMP.	2060 deg F
FLUID TEMP.	2190 deg F

FREE SWELLING INDEX	4.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.7

COAL SAMPLING REPORT

LABORATORY NO: K99283 FIELD NO: KGS 292 U.S.G.S. NO: W208105
SAMPLER: Currens & Kung AGENCY: KGS DATE: Oct/18/1979
7.5' QUAD: Wayland COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 5 ROW L TIER 81 2000 FT FSL, 1800 FT FEL
LATITUDE: 37 DEG 29 MIN 20 SEC LONGITUDE: 82 DEG 49 MIN 22 SEC
ELEVATION (FT): 1060.00, OF POINT AT base of 292, USING topo
COMMENTARY: Daniel Boone Parkway.
REGIONAL COAL NAME: Whitesburg zone GEO. MAP COAL NAME: Whitesburg
REPORTED COAL NAME: Whitesburg FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): bottom bench
EXPOSURE: TYPE, roadcut; CONDITION, faced-up
SAMPLE CONDITION: slightly weathered
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 17.3, SAMPLE 17.3, COAL ONLY 14.2
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 25, SET 2 120, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 290
N	0.49	Shale, medium-gray, silty, rooted.
Y	0.39	Clarain, with abundant medium-banded vitrain.
Y	0.26	Shale, dark-gray, carbonaceous, rooted.
Y	0.52	Clarain, with abundant medium- to thick-banded vitrain.
Y	0.26	Durain, with scattered thin-banded vitrain.
N		Siltstone, dark-gray, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: K99283 FIELD NO: KGS 292 U.S.G.S. NO: W208105
LABORATORY: USBM REPORT DATE: Feb/13/1980

AIR DRIED LOSS: 1.40%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.60%		
VOLATILE MATTER	29.90%	30.70%	43.91%
FIXED CARBON	38.20%	39.22%	56.09%
ASH	29.30%	30.08%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.30%	4.12%	5.89%
CARBON	54.20%	55.65%	79.59%
NITROGEN	1.30%	1.33%	1.91%
TOTAL SULFUR	2.00%	2.05%	2.94%
OXYGEN	8.80%	6.77%	9.67%
ASH	29.30%	30.08%	
HEATING VALUE (BTU/LB):	9745	10005	14310
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	1.33%	1.37%	1.95%
ORGANIC	0.70%	0.72%	1.03%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2760 deg F
SOFTENING TEMP.	2800 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX	4.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	4.1

COAL SAMPLING REPORT

LABORATORY NO: K99442 FIELD NO: KGS 116 U.S.G.S. NO: W208197
SAMPLER: Currens & Kung AGENCY: KGS DATE: Oct/23/1979
7.5' QUAD: Wayland COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 5 ROW L TIER 81 1500 FT FSL, 1750 FT FEL
LATITUDE: 37 DEG 29 MIN 15 SEC LONGITUDE: 82 DEG 49 MIN 22 SEC
ELEVATION (FT): 1160.00, OF POINT AT base of 116, USING topo
COMMENTARY:
REGIONAL COAL NAME: Fire Clay GEO. MAP COAL NAME: Fire Clay
REPORTED COAL NAME: Fire Clay FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, roadcut; CONDITION, faced-up
SAMPLE CONDITION: slightly weathered
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 36.6, SAMPLE 36.6, COAL ONLY 32.3
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 121, SET 2 25, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	19.69	Sandstone, light-gray, coarse-grained, crossbedded; lag gravel at base.
Y	0.74	Durain, with abundant thin- to thick-banded vitrain; pyrite nodules up to 1 cm thick scattered throughout.
Y	0.36	Shale, flint clay, dark-brown to black, brittle, with medium-banded vitrain scattered throughout.
Y	0.69	Durain, with scattered thin-banded vitrain.
Y	0.20	Clarain, with common medium-banded vitrain.
Y	0.15	Durain, with scattered thin-banded vitrain.
Y	0.10	Clarain.
Y	0.30	Durain, with scattered thin-banded vitrain.
Y	0.20	Clarain, with medium- to thick-banded vitrain.
Y	0.33	Durain, with scattered thin- to medium-banded durain.
N		Clay, medium-gray, slightly silty, carbonaceous, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: K99442 FIELD NO: KGS 116 U.S.G.S. NO: W208197
LABORATORY: USBM REPORT DATE: Feb/15/1980

AIR DRIED LOSS: 1.90%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	3.10%		
VOLATILE MATTER	33.20%	34.26%	42.46%
FIXED CARBON	45.00%	46.44%	57.55%
ASH	18.70%	19.30%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.80%	4.60%	5.69%
CARBON	63.50%	65.53%	81.20%
NITROGEN	1.50%	1.55%	1.92%
TOTAL SULFUR	1.00%	1.03%	1.28%
OXYGEN	10.50%	7.99%	9.91%
ASH	18.70%	19.30%	
HEATING VALUE (BTU/LB):	11287	11648	14434
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.23%	0.24%	0.29%
ORGANIC	0.76%	0.78%	0.97%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 deg F
SOFTENING TEMP.	2800 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX	1.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.8

COAL SAMPLING REPORT

LABORATORY NO: K99443 FIELD NO: KGS 118 U.S.G.S. NO: W208198
SAMPLER: Currens & Kung AGENCY: KGS DATE: Oct/23/1979
7.5' QUAD: Martin COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 18 ROW M TIER 81 2100 FT FSL, 2850 FT FEL
LATITUDE: 37 DEG 31 MIN 21 SEC LONGITUDE: 82 DEG 47 MIN 35 SEC
ELEVATION (FT): 800.00, OF POINT AT base of 118, USING topo
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.2 GEO. MAP COAL NAME: U Elkhorn No.2
REPORTED COAL NAME: U Elkhorn No.2 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): bottom split
EXPOSURE: TYPE, roadcut; CONDITION, less than 6 months old
SAMPLE CONDITION: fresh
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 20.5, SAMPLE 20.5, COAL ONLY 20.3
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 306, SET 2 51, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Siltstone, weathered.
N	3.28	Coal, Upper Elkhorn No.3; big fusain band 1 foot from base (too soft to sample).
N	16.40	Siltstone.
N	1.64	Coal, Upper Elkhorn No.2 upper split (inaccessible).
N	9.84	Siltstone, medium-gray, sideritic.
Y	0.26	Clarain, with abundant medium-banded vitrain; pyritic.
Y	0.02	Fusain, pyritic.
Y	0.56	Clarain, with abundant medium-banded vitrain, medium-banded fusain near top and bottom.
Y	0.52	Durain, with abundant thin-banded vitrain.
Y	0.13	Clarain and durain, equally mixed.
Y	0.02	Pyrite.
Y	0.20	Clarain.
N	4.92	Siltstone, light-gray, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: K99443 FIELD NO: KGS 118 U.S.G.S. NO: W208198
LABORATORY: USBM REPORT DATE: Feb/15/1980

AIR DRIED LOSS: 1.60%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	3.00%		
VOLATILE MATTER	39.50%	40.72%	45.09%
FIXED CARBON	48.10%	49.59%	54.91%
ASH	9.40%	9.69%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.30%	5.12%	5.67%
CARBON	70.10%	72.27%	80.03%
NITROGEN	1.50%	1.55%	1.71%
TOTAL SULFUR	5.70%	5.88%	6.51%
OXYGEN	7.90%	5.49%	6.08%
ASH	9.40%	9.69%	
HEATING VALUE (BTU/LB):	12903	13302	14730
SULFUR FORMS:			
SULFATE	0.02%	0.02%	0.02%
PYRITIC	3.89%	4.01%	4.44%
ORGANIC	1.81%	1.87%	2.07%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 deg F
SOFTENING TEMP.	2800 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX	3.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	8.8

COAL SAMPLING REPORT

LABORATORY NO: K99441 FIELD NO: KGS 245 U.S.G.S. NO: W208203
SAMPLER: Currens AGENCY: KGS DATE: Aug/30/1979
7.5' QUAD: Williamson COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 1 ROW 0 TIER 86 4400 FT FSL, 3700 FT FEL
LATITUDE: 37 DEG 44 MIN 44 SEC LONGITUDE: 82 DEG 20 MIN 46 SEC
ELEVATION (FT): 1162.50, OF POINT AT base of 245, USING topo
COMMENTARY:
REGIONAL COAL NAME: U Peach Orch GEO. MAP COAL NAME: U Peach Orch
REPORTED COAL NAME: Coalburg FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): top bench
EXPOSURE: TYPE, auger mine; CONDITION, old, weathered, faced-up
SAMPLE CONDITION: wet
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 80.1, SAMPLE 80.1, COAL ONLY 77.5
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 330, SET 2 60, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Sandstone, weathers buff, medium- to coarse-grained, crossbedded.
N	5.91	Shale, medium-gray, dark gray at base, silty, sideritic, laminated.
Y	0.02	Clarain, with durain.
Y	0.05	Fusain.
Y	0.39	Clarain, with abundant vitrain.
Y	0.01	Pyrite.
Y	0.05	Clarain.
Y	0.01	Shale, medium-gray, carbonaceous.
Y	0.33	Clarain, with abundant durain, scattered fusain.
Y	0.20	Siltstone, black, nonlaminated, carbonaceous, coaly; may grade into durain at base.
Y	0.27	Clarain, with abundant interlaminated durain.
Y	0.08	Durain.
Y	0.49	Clarain, with abundant vitrain.
Y	0.18	Durain.
Y	2.79	Clarain, with abundant interlaminated durain.
Y	0.20	Durain.
Y	0.75	Clarain, with abundant vitrain.
Y	0.16	Durain.
Y	0.43	Clarain, with abundant interlaminated durain.
Y	0.26	Durain.

See KGS 246 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: K99441 FIELD NO: KGS 245 U.S.G.S. NO: W208203
LABORATORY: USBM REPORT DATE: Feb/15/1980

AIR DRIED LOSS: 3.20%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	5.30%		
VOLATILE MATTER	31.30%	33.05%	39.37%
FIXED CARBON	48.20%	50.90%	60.63%
ASH	15.20%	16.05%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.90%	4.55%	5.42%
CARBON	64.20%	67.80%	80.76%
NITROGEN	1.50%	1.58%	1.89%
TOTAL SULFUR	0.80%	0.84%	1.01%
OXYGEN	13.60%	9.18%	10.92%
ASH	15.20%	16.05%	
HEATING VALUE (BTU/LB):	11294	11927	14207
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.12%	0.13%	0.15%
ORGANIC	0.63%	0.67%	0.79%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2790 deg F
SOFTENING TEMP.	2800 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX	1.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.4

COAL SAMPLING REPORT

LABORATORY NO: K99447 FIELD NO: KGS 246 U.S.G.S. NO: W208204
SAMPLER: Currens & Kung AGENCY: KGS DATE: Aug/30/1979
7.5' QUAD: Williamson COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 1 ROW 0 TIER 86 4400 FT FSL, 3700 FT FEL
LATITUDE: 37 DEG 44 MIN 44 SEC LONGITUDE: 82 DEG 20 MIN 46 SEC
ELEVATION (FT): 1160.00, OF POINT AT base of 246, USING topo
COMMENTARY:
REGIONAL COAL NAME: U Peach Orch GEO. MAP COAL NAME: U Peach Orch
REPORTED COAL NAME: Coalburg FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): bottom bench
EXPOSURE: TYPE, auger mine; CONDITION, old, faced-up
SAMPLE CONDITION: weathered, wet
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 16.9, SAMPLE 16.9, COAL ONLY 16.9
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 330, SET 2 60, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 245.
N	1.08	Shale, medium- to dark-gray, slickensided, rooted.
Y	0.79	Clarain, with abundant durain.
Y	0.62	Clarain, equally mixed with durain.
N		Clay, light-gray, plastic, slightly silty, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: K99447 FIELD NO: KGS 246 U.S.G.S. NO: W208204
LABORATORY: USBM REPORT DATE: Feb/15/1980

AIR DRIED LOSS: 3.60%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	5.50%		
VOLATILE MATTER	36.50%	38.62%	42.39%
FIXED CARBON	49.60%	52.49%	57.61%
ASH	8.40%	8.89%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.50%	5.17%	5.67%
CARBON	70.60%	74.71%	81.99%
NITROGEN	1.60%	1.69%	1.86%
TOTAL SULFUR	0.70%	0.74%	0.81%
OXYGEN	13.30%	8.80%	9.67%
ASH	8.40%	8.89%	
HEATING VALUE (BTU/LB):	12533	13262	14556
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.07%	0.07%	0.08%
ORGANIC	0.57%	0.60%	0.66%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2790 deg F
SOFTENING TEMP.	2800 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX	1.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.1

COAL SAMPLING REPORT

LABORATORY NO: K99456 FIELD NO: KGS 121 U.S.G.S. NO: W208208
SAMPLER: Currens & Kung AGENCY: KGS DATE: Oct/30/1979
7.5' QUAD: Lick Creek COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 3 ROW L TIER 86 300 FT FSL, 600 FT FEL
LATITUDE: 37 DEG 29 MIN 3 SEC LONGITUDE: 82 DEG 22 MIN 7 SEC
ELEVATION (FT): 1155.00, OF POINT AT base of 121, USING survey
COMMENTARY:
REGIONAL COAL NAME: Lower Elkhorn GEO. MAP COAL NAME: Pond Creek
REPORTED COAL NAME: Pond Creek FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: very fresh
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 31.5, SAMPLE 31.5, COAL ONLY 31.5
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		See KGS 120 (W210288) for overlying strata.
N	5.68	Siltstone, medium-gray; arenaceous at top; rooted at bottom; with abundant thin coal beds (.05 m) and coal streaks; becomes increasingly sandy toward base; bottom 0.8 m is medium-grained sandstone with trough crossbedding; bottom 0.2 m is sandstone with very abundant coal fragments (probably due to rip-up) to the point of being an arenaceous rash; unit fines upward.
Y	0.39	Clarain, intermixed with abundant durain and scattered vitrain.
Y	0.02	Fusain.
Y	0.28	Durain, with abundant thin-banded vitrain.
Y	0.20	Durain, with scattered thin-banded vitrain, thin-banded fusain.
Y	0.75	Durain, with abundant thin-banded vitrain (approaches clarain).
Y	0.56	Clarain.
Y	0.02	Fusain.
Y	0.26	Clarain.
Y	0.02	Fusain.
Y	0.13	Clarain.

COAL ANALYSIS REPORT

LABORATORY NO: K99456 FIELD NO: KGS 121 U.S.G.S. NO: W208208
LABORATORY: USBM REPORT DATE: Feb/15/1980

AIR DRIED LOSS: 0.60%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.60%		
VOLATILE MATTER	33.90%	34.45%	38.39%
FIXED CARBON	54.40%	55.29%	61.61%
ASH	10.10%	10.26%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.20%	5.10%	5.69%
CARBON	74.70%	75.92%	84.60%
NITROGEN	1.60%	1.63%	1.81%
TOTAL SULFUR	0.70%	0.71%	0.79%
OXYGEN	7.70%	6.38%	7.11%
ASH	10.10%	10.26%	
HEATING VALUE (BTU/LB):	13276	13492	15035
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.05%	0.05%	0.06%
ORGANIC	0.59%	0.60%	0.67%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 deg F
SOFTENING TEMP.	2800 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX	6.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.1

COAL SAMPLING REPORT

LABORATORY NO: K99431 FIELD NO: KGS 122 U.S.G.S. NO: W208209
SAMPLER: Currens AGENCY: KGS DATE: Oct/31/1979
7.5' QUAD: Martin COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 13 ROW M TIER 81 300 FT FSL, 500 FT FEL
LATITUDE: 37 DEG 32 MIN 3 SEC LONGITUDE: 82 DEG 47 MIN 6 SEC
ELEVATION (FT): 844.00, OF POINT AT base of 122, USING topo
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.3 GEO. MAP COAL NAME: U Elkhorn No.3
REPORTED COAL NAME: U Elkhorn No.3 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): top split
EXPOSURE: TYPE, roadcut; CONDITION, a few days old
SAMPLE CONDITION: very fresh
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 26.5, SAMPLE 26.5, COAL ONLY 25.2
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	0.33	Siltstone, medium-gray, sideritic (nodular), laminated to bioturbated.
Y	0.46	Clarain, with abundant thin- to medium-banded vitrain.
Y	0.01	Pyrite.
Y	0.07	Clarain.
Y	0.10	Siltstone, dark-gray.
Y	0.23	Durain, with scattered thin-banded vitrain.
Y	1.35	Clarain, with medium- to thin-banded vitrain; .005 m pyrite lens 1 cm above base; no fusain observed, very homogeneous; no other pyrite observed.

See KGS 123 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: K99431 FIELD NO: KGS 122 U.S.G.S. NO: W208209
LABORATORY: USBM REPORT DATE: Feb/13/1980

AIR DRIED LOSS: 0.80%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.00%		
VOLATILE MATTER	37.30%	38.06%	43.37%
FIXED CARBON	48.70%	49.69%	56.63%
ASH	12.00%	12.24%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.10%	4.98%	5.67%
CARBON	70.50%	71.94%	81.98%
NITROGEN	1.50%	1.53%	1.74%
TOTAL SULFUR	1.60%	1.63%	1.86%
OXYGEN	9.20%	7.68%	8.75%
ASH	12.00%	12.24%	
HEATING VALUE (BTU/LB):	12710	12969	14779
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.40%	0.41%	0.47%
ORGANIC	1.24%	1.27%	1.44%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2660 deg F
SOFTENING TEMP.	2740 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX	4.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	2.5

COAL SAMPLING REPORT

LABORATORY NO: K99434 FIELD NO: KGS 123 U.S.G.S. NO: W208210
SAMPLER: Currens, Kung, Hester AGENCY: KGS DATE: Oct/31/1979
7.5' QUAD: Martin COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 13 ROW M TIER 81 300 FT FSL, 500 FT FEL
LATITUDE: 37 DEG 32 MIN 3 SEC LONGITUDE: 82 DEG 47 MIN 6 SEC
ELEVATION (FT): 840.00, OF POINT AT base of 123, USING topo
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.3 GEO. MAP COAL NAME: U Elkhorn No.3
REPORTED COAL NAME: U Elkhorn No.3 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): bottom split
EXPOSURE: TYPE, roadcut; CONDITION, hours old
SAMPLE CONDITION: very fresh
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 31.9, SAMPLE 31.9, COAL ONLY 31.5
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 122.
N	1.57	Siltstone, medium- to dark-gray, coaly, rooted.
Y	0.11	Durain, pyritic.
Y	0.20	Clarain.
Y	0.03	Siltstone, light-brown.
Y	0.11	Durain, with thin vitrain.
Y	1.67	Clarain, with abundant medium- to thick-banded vitrain.
Y	0.52	Durain.
N		Siltstone, dark-gray, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: K99434 FIELD NO: KGS 123 U.S.G.S. NO: W208210
LABORATORY: USBM REPORT DATE: Feb/13/1980

AIR DRIED LOSS: 1.40%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.90%		
VOLATILE MATTER	37.80%	38.93%	41.45%
FIXED CARBON	53.40%	55.00%	58.55%
ASH	5.90%	6.08%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.50%	5.33%	5.67%
CARBON	75.60%	77.86%	82.90%
NITROGEN	1.70%	1.75%	1.86%
TOTAL SULFUR	1.10%	1.13%	1.21%
OXYGEN	10.10%	7.85%	8.36%
ASH	5.90%	6.08%	
HEATING VALUE (BTU/LB):	13575	13981	14885
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.30%	0.31%	0.33%
ORGANIC	0.82%	0.84%	0.90%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2400 deg F
SOFTENING TEMP.	2520 deg F
FLUID TEMP.	2610 deg F

FREE SWELLING INDEX	5.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.6

COAL SAMPLING REPORT

LABORATORY NO: K99433 FIELD NO: KGS 124 U.S.G.S. NO: W208211
SAMPLER: Currens, Kung, Hester AGENCY: KGS DATE: Oct/31/1979
7.5' QUAD: Martin COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 12 ROW M TIER 81 4850 FT FSL, 1950 FT FEL
LATITUDE: 37 DEG 32 MIN 48 SEC LONGITUDE: 82 DEG 46 MIN 24 SEC
ELEVATION (FT): 780.00, OF POINT AT base of 124, USING topo
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.1 GEO. MAP COAL NAME: U Elkhorn No.1
REPORTED COAL NAME: U Elkhorn No.1 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, roadcut; CONDITION, few months old
SAMPLE CONDITION: fresh
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 30.3, SAMPLE 30.3, COAL ONLY 28.2
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	16.40	Sandstone, medium-gray, coarse- to medium-grained; abundant coal spars (peat rip-up); large-scale trough crossbeds; micaceous; feldspathic; some liesegang along joints; no clay or siderite clasts seen.
Y	0.23	Clarain.
Y	0.02	Fusain.
Y	0.20	Clarain.
Y	0.03	Fusain.
Y	0.20	Clarain.
Y	0.56	Clarain.
Y	0.16	Shale, black, carbonaceous, silty, partly laminated.
Y	0.26	Clarain, with abundant medium-banded vitrain.
Y	0.02	Pyrite.
Y	0.52	Clarain, with abundant medium- to thick-banded vitrain.
Y	0.33	Clarain, with abundant thin-banded vitrain.
N	1.31	Shale, medium-gray, rooted, silty, plastic.

COAL ANALYSIS REPORT

LABORATORY NO: K99433 FIELD NO: KGS 124 U.S.G.S. NO: W208211
LABORATORY: USBM REPORT DATE: Feb/13/1980

AIR DRIED LOSS: 1.40%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.80%		
VOLATILE MATTER	39.70%	40.84%	44.86%
FIXED CARBON	48.80%	50.21%	55.14%
ASH	8.70%	8.95%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.50%	5.34%	5.86%
CARBON	72.50%	74.59%	81.92%
NITROGEN	1.80%	1.85%	2.03%
TOTAL SULFUR	1.10%	1.13%	1.24%
OXYGEN	10.40%	8.14%	8.95%
ASH	8.70%	8.95%	
HEATING VALUE (BTU/LB):	13075	13452	14773
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.24%	0.25%	0.27%
ORGANIC	0.87%	0.90%	0.98%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 deg F
SOFTENING TEMP.	2800 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX	4.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.7

COAL SAMPLING REPORT

LABORATORY NO: K99457 FIELD NO: KGS 125 U.S.G.S. NO: W208212
SAMPLER: Currens & Kung AGENCY: KGS DATE: Oct/31/1979
7.5' QUAD: Martin COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 22 ROW N TIER 81 1350 FT FSL, 250 FT FEL
LATITUDE: 37 DEG 35 MIN 13 SEC LONGITUDE: 82 DEG 46 MIN 3 SEC
ELEVATION (FT): 1080.00, OF POINT AT base of 125, USING topo
COMMENTARY:
REGIONAL COAL NAME: Taylor GEO. MAP COAL NAME: Taylor
REPORTED COAL NAME: Taylor FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): bottom split
EXPOSURE: TYPE, roadcut; CONDITION, slightly weathered, faced up
SAMPLE CONDITION: fresh
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 26.4, SAMPLE 26.4, COAL ONLY 24.0
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 126.
N	0.23	Shale, black, carbonaceous.
N	3.74	Siltstone, medium-gray, arenaceous, weathered.
N	1.51	Sandstone, light gray, weathers buff, medium-grained, carbonaceous.
Y	1.02	Clarain, with abundant, thin- to medium-banded vitrain; top part slightly pyritic.
Y	0.07	Shale, black, laminated, carbonaceous, slightly silty.
Y	0.36	Durain, very hard.
Y	0.13	Pyrite and interbedded durain (nodules to 3 cm thick).
Y	0.07	Clarain.
Y	0.56	Durain, very hard, argillaceous.
N		Siltstone.

COAL ANALYSIS REPORT

LABORATORY NO: K99457 FIELD NO: KGS 125 U.S.G.S. NO: W208212
LABORATORY: USBM REPORT DATE: Feb/15/1980

AIR DRIED LOSS: 1.00%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.10%		
VOLATILE MATTER	28.40%	29.01%	49.91%
FIXED CARBON	28.50%	29.11%	50.09%
ASH	41.00%	41.88%	
ULTIMATE ANALYSIS:			
HYDROGEN	3.70%	3.54%	6.09%
CARBON	44.10%	45.05%	77.51%
NITROGEN	1.10%	1.12%	1.93%
TOTAL SULFUR	3.80%	3.88%	6.68%
OXYGEN	6.30%	4.53%	7.79%
ASH	41.00%	41.88%	
HEATING VALUE (BTU/LB):	7942	8113	13958
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.02%
PYRITIC	2.72%	2.78%	4.78%
ORGANIC	1.02%	1.04%	1.79%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2470 deg F
SOFTENING TEMP.	2560 deg F
FLUID TEMP.	2670 deg F

FREE SWELLING INDEX	2.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	9.6

COAL SAMPLING REPORT

LABORATORY NO: K99460 FIELD NO: KGS 126 U.S.G.S. NO: W208213
SAMPLER: Currens & Kung AGENCY: KGS DATE: Oct/31/1979
7.5' QUAD: Martin COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 22 ROW N TIER 81 1350 FT FSL, 250 FT FEL
LATITUDE: 37 DEG 35 MIN 13 SEC LONGITUDE: 82 DEG 46 MIN 3 SEC
ELEVATION (FT): 1090.00, OF POINT AT base of 126, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: Taylor GEO. MAP COAL NAME: Taylor
REPORTED COAL NAME: Taylor FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): top split
EXPOSURE: TYPE, roadcut; CONDITION, roadcut
SAMPLE CONDITION: slightly weathered, hard
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 5.5, SAMPLE 5.5, COAL ONLY 5.5
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Siltstone.
N	20.00	Shale, dark- to medium-gray.
N	0.33	Shale, black, carbonaceous.
Y	0.13	Clarain, with abundant vitrain.
Y	0.07	Clarain, with very thin-banded fusain.
Y	0.26	Vitrain, with scattered clarain.
		See KGS 125 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: K99460 FIELD NO: KGS 126 U.S.G.S. NO: W208213
LABORATORY: USBM REPORT DATE: Feb/15/1980

AIR DRIED LOSS: 1.00%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.10%		
VOLATILE MATTER	44.10%	45.05%	52.06%
FIXED CARBON	40.60%	41.47%	47.93%
ASH	13.20%	13.48%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.40%	5.28%	6.10%
CARBON	66.70%	68.13%	78.75%
NITROGEN	1.50%	1.53%	1.77%
TOTAL SULFUR	4.90%	5.01%	5.78%
OXYGEN	8.30%	6.57%	7.60%
ASH	13.20%	13.48%	
HEATING VALUE (BTU/LB):	12463	12731	14714
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	2.55%	2.60%	3.01%
ORGANIC	2.37%	2.42%	2.80%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2540 deg F
SOFTENING TEMP.	2630 deg F
FLUID TEMP.	2720 deg F

FREE SWELLING INDEX	4.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	7.9

COAL SAMPLING REPORT

LABORATORY NO: K99449 FIELD NO: KGS 127 U.S.G.S. NO: W208214
SAMPLER: Currens & Kung AGENCY: KGS DATE: Oct/31/1979
7.5' QUAD: Martin COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 22 ROW N TIER 81 1000 FT FSL, 100 FT FEL
LATITUDE: 37 DEG 35 MIN 10 SEC LONGITUDE: 82 DEG 46 MIN 1 SEC
ELEVATION (FT): 1040.00, OF POINT AT base of 127, USING topo
COMMENTARY:
REGIONAL COAL NAME: Fire Clay rdr GEO. MAP COAL NAME: Fire Clay rdr
REPORTED COAL NAME: Fire Clay rdr FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, roadcut; CONDITION, faced-up
SAMPLE CONDITION: fresh
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 16.9, SAMPLE 16.9, COAL ONLY 16.9
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	32.81	Siltstone, medium-gray, grades to crossbedded sandstone; limestone 5 m above black shale described below.
N	3.87	Shale, black, laminated, sparsely fossiliferous, not bioturbated; restricted to abandoned channel.
N	0.33	Clarain, pyritic.
N	0.75	Siltstone, medium-gray, rooted.
Y	0.82	Durain, with scattered, thin- to thick-banded vitrain.
Y	0.03	Vitrain.
Y	0.13	Durain, with scattered, thin-banded vitrain.
Y	0.43	Clarain, with scattered, thin-banded vitrain.
N	0.66	Siltstone, medium-gray, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: K99449 FIELD NO: KGS 127 U.S.G.S. NO: W208214
LABORATORY: USBM REPORT DATE: Feb/15/1980

AIR DRIED LOSS: 1.70%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	3.30%		
VOLATILE MATTER	35.60%	36.81%	40.73%
FIXED CARBON	51.80%	53.57%	59.27%
ASH	9.30%	9.62%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.40%	5.20%	5.76%
CARBON	72.40%	74.87%	82.84%
NITROGEN	1.70%	1.76%	1.95%
TOTAL SULFUR	0.80%	0.83%	0.92%
OXYGEN	10.50%	7.72%	8.53%
ASH	9.30%	9.62%	
HEATING VALUE (BTU/LB):	12942	13383	14808
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.06%	0.06%	0.07%
ORGANIC	0.70%	0.72%	0.80%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 deg F
SOFTENING TEMP.	2800 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX	5.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.2

COAL SAMPLING REPORT

LABORATORY NO: K99451 FIELD NO: KGS 128 U.S.G.S. NO: W208215
SAMPLER: Currens AGENCY: KGS DATE: Oct/31/1979
7.5' QUAD: Martin COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 22 ROW N TIER 81 1350 FT FSL, 50 FT FEL
LATITUDE: 37 DEG 35 MIN 13 SEC LONGITUDE: 82 DEG 46 MIN 1 SEC
ELEVATION (FT): 1020.00, OF POINT AT base of 128, USING topo
COMMENTARY:
REGIONAL COAL NAME: Fire Clay GEO. MAP COAL NAME: Fire Clay
REPORTED COAL NAME: Fire Clay FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): top bench
EXPOSURE: TYPE, roadcut; CONDITION, few months old
SAMPLE CONDITION: fresh
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 29.2, SAMPLE 29.2, COAL ONLY 24.4
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	16.40	Sandstone, medium- to light-gray, coarse-grained, massive to large-scale crossbedding; large siltstone clasts (to 3 m long); locally cuts out underlying coal.
Y	0.75	Clarain, with abundant medium-banded vitrain.
Y	0.03	Fusain, continuous.
Y	0.62	Clarain, with abundant medium- to thick-banded vitrain.
Y	0.30	Siltstone, medium-gray, coaly, rooted.
Y	0.20	Clarain.
Y	0.03	Siltstone, tan to dark-gray.
Y	0.07	Clarain.
Y	0.07	Siltstone, dark-gray.
Y	0.03	Clarain.
Y	0.07	Vitrain.
Y	0.07	Clarain.
Y	0.10	Pyrite and clarain (pyrite in nodules).
Y	0.10	Clarain, with abundant thick-banded vitrain. See KGS 129 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: K99451 FIELD NO: KGS 128 U.S.G.S. NO: W208215
LABORATORY: USBM REPORT DATE: Feb/15/1980

AIR DRIED LOSS: 1.50%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.80%		
VOLATILE MATTER	28.00%	28.81%	44.37%
FIXED CARBON	35.10%	36.11%	55.63%
ASH	34.10%	35.08%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.10%	3.90%	6.00%
CARBON	50.70%	52.16%	80.35%
NITROGEN	1.30%	1.34%	2.06%
TOTAL SULFUR	1.00%	1.03%	1.58%
OXYGEN	8.70%	6.49%	10.01%
ASH	34.10%	35.08%	
HEATING VALUE (BTU/LB):	8938	9195	14165
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.02%
PYRITIC	0.34%	0.35%	0.54%
ORGANIC	0.67%	0.69%	1.06%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 deg F
SOFTENING TEMP.	2800 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX	2.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	2.2

COAL SAMPLING REPORT

LABORATORY NO: K99435 FIELD NO: KGS 129 U.S.G.S. NO: W208216
SAMPLER: Currens & Kung & Hester AGENCY: KGS DATE: Oct/31/1979
7.5' QUAD: Martin COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 22 ROW N TIER 81 1350 FT FSL, 50 FT FEL
LATITUDE: 37 DEG 35 MIN 13 SEC LONGITUDE: 82 DEG 46 MIN 1 SEC
ELEVATION (FT): 1020.00, OF POINT AT base of 129, USING topo
COMMENTARY:
REGIONAL COAL NAME: Fire Clay GEO. MAP COAL NAME: Fire Clay
REPORTED COAL NAME: Fire Clay FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): bottom bench
EXPOSURE: TYPE, roadcut; CONDITION, few months old
SAMPLE CONDITION: fresh
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 12.2, SAMPLE 12.2, COAL ONLY 12.2
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 128.
N	0.79	Siltstone, medium-gray, rooted, coaly.
Y	0.59	Durain, argillaceous (possibly canneloid).
Y	0.43	Clarain, with scattered to moderate, medium- to thick-banded vitrain.
N	0.98	Siltstone, medium-gray, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: K99435 FIELD NO: KGS 129 U.S.G.S. NO: W208216
LABORATORY: USBM REPORT DATE: Feb/13/1980

AIR DRIED LOSS: 1.10%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.10%		
VOLATILE MATTER	21.40%	21.86%	47.66%
FIXED CARBON	23.50%	24.01%	52.34%
ASH	53.00%	54.14%	
ULTIMATE ANALYSIS:			
HYDROGEN	3.20%	3.03%	6.60%
CARBON	32.80%	33.51%	73.05%
NITROGEN	0.80%	0.82%	1.78%
TOTAL SULFUR	0.30%	0.31%	0.67%
OXYGEN	9.90%	8.19%	17.90%
ASH	53.00%	54.14%	
HEATING VALUE (BTU/LB):	5702	5825	12700
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.02%
PYRITIC	0.04%	0.04%	0.09%
ORGANIC	0.23%	0.23%	0.51%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 deg F
SOFTENING TEMP.	2800 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX	1.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.1

COAL SAMPLING REPORT

LABORATORY NO: K99459 FIELD NO: KGS 177 U.S.G.S. NO: W208218
SAMPLER: Currens & Kung AGENCY: KGS DATE: Jul/25/1979
7.5' QUAD: Harold COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 13 ROW M TIER 82 5200 FT FSL, 4200 FT FEL
LATITUDE: 37 DEG 32 MIN 51 SEC LONGITUDE: 82 DEG 42 MIN 52 SEC
ELEVATION (FT): 1280.00, OF POINT AT base of 177, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: Peach Orchard z GEO. MAP COAL NAME: Peach Orchard
REPORTED COAL NAME: Peach Orchard FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): top bench
EXPOSURE: TYPE, surface mine; CONDITION, 1 week old
SAMPLE CONDITION: fresh
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 22.1, SAMPLE 22.1, COAL ONLY 22.1
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 220, SET 2 310, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Shale, dark-gray, silty, bioturbated.
Y	0.33	Clarain, with durain.
Y	0.75	Clarain.
Y	0.43	Clarain and durain.
Y	0.20	Durain, pyritic.
Y	0.13	Clarain.
		See KGS 179 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: K99459 FIELD NO: KGS 177 U.S.G.S. NO: W208218
LABORATORY: USBM REPORT DATE: Feb/15/1980

AIR DRIED LOSS: 2.50%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	4.10%		
VOLATILE MATTER	34.10%	35.56%	42.68%
FIXED CARBON	45.80%	47.76%	57.32%
ASH	16.00%	16.68%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.90%	4.63%	5.56%
CARBON	64.40%	67.16%	80.60%
NITROGEN	1.50%	1.56%	1.88%
TOTAL SULFUR	2.10%	2.19%	2.63%
OXYGEN	11.00%	7.78%	9.33%
ASH	16.00%	16.68%	
HEATING VALUE (BTU/LB):	11581	12077	14495
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	1.03%	1.07%	1.29%
ORGANIC	1.05%	1.09%	1.31%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 deg F
SOFTENING TEMP.	2800 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX	4.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	3.6

COAL SAMPLING REPORT

LABORATORY NO: K99436 FIELD NO: KGS 179 U.S.G.S. NO: W208219
SAMPLER: Currens AGENCY: KGS DATE: Jul/25/1979
7.5' QUAD: Harold COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 13 ROW M TIER 82 5200 FT FSL, 4200 FT FEL
LATITUDE: 37 DEG 32 MIN 51 SEC LONGITUDE: 82 DEG 42 MIN 52 SEC
ELEVATION (FT): 1280.00, OF POINT AT base of 179, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: Peach Orchard z GEO. MAP COAL NAME: Peach Orchard
REPORTED COAL NAME: Peach Orchard FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): middle bench
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 24.8, SAMPLE 24.8, COAL ONLY 24.8
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 310, SET 2 220, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 177.
N	2.03	Shale, gray, silty, rooted, carbonaceous.
Y	0.10	Durain.
Y	0.95	Durain, with abundant vitrain and clarain.
Y	1.02	Clarain, with vitrain.
		See KGS 181 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: K99436 FIELD NO: KGS 179 U.S.G.S. NO: W208219
LABORATORY: USBM REPORT DATE: Feb/15/1980

AIR DRIED LOSS: 3.80%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	5.60%		
VOLATILE MATTER	35.10%	37.18%	39.13%
FIXED CARBON	54.60%	57.84%	60.87%
ASH	4.70%	4.98%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.40%	5.06%	5.32%
CARBON	74.10%	78.49%	82.61%
NITROGEN	1.60%	1.69%	1.78%
TOTAL SULFUR	0.90%	0.95%	1.00%
OXYGEN	13.20%	8.83%	9.29%
ASH	4.70%	4.98%	
HEATING VALUE (BTU/LB):	13045	13819	14543
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.14%	0.15%	0.16%
ORGANIC	0.77%	0.82%	0.86%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 deg F
SOFTENING TEMP.	2800 deg F
FLUID TEMP.	2800 deg F

FREE SWELLING INDEX	3.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.4

COAL SAMPLING REPORT

LABORATORY NO: K99452 FIELD NO: KGS 181 U.S.G.S. NO: W208220
SAMPLER: Currens & Kung AGENCY: KGS DATE:Jul/25/1979
7.5' QUAD: Harold COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 13 ROW M TIER 82 5200 FT FSL, 4200 FT FEL
LATITUDE: 37 DEG 32 MIN 51 SEC LONGITUDE: 82 DEG 42 MIN 52 SEC
ELEVATION (FT): 1280.00, OF POINT AT base of 181, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: Peach Orchard z GEO. MAP COAL NAME: Peach Orchard
REPORTED COAL NAME: Peach Orchard FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): bottom bench
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 16.9, SAMPLE 16.9, COAL ONLY 16.9
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 310, SET 2 220, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 179.
N	0.82	Claystone, light-gray to light-brown; silty at base; rooted.
Y	0.26	Clarain.
Y	0.26	Durain.
Y	0.72	Clarain.
Y	0.16	Durain.
N		Shale, silty, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: K99452 FIELD NO: KGS 181 U.S.G.S. NO: W208220
LABORATORY: USBM REPORT DATE: Feb/15/1980

AIR DRIED LOSS: 3.10 %

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	4.90%		
VOLATILE MATTER	36.20%	38.06%	41.33%
FIXED CARBON	51.40%	54.05%	58.68%
ASH	7.50%	7.89%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.40%	5.10%	5.54%
CARBON	72.50%	76.23%	82.77%
NITROGEN	1.60%	1.68%	1.83%
TOTAL SULFUR	0.70%	0.74%	0.80%
OXYGEN	12.30%	8.36%	9.06%
ASH	7.50%	7.89%	
HEATING VALUE (BTU/LB):	12979	13647	14817
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.03%	0.03%	0.03%
ORGANIC	0.66%	0.69%	0.75%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	3.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.1

COAL SAMPLING REPORT

LABORATORY NO: K99453 FIELD NO: KGS 265 U.S.G.S. NO: W208224
SAMPLER: Currens & Kung AGENCY: KGS DATE: Sep/25/1979
7.5' QUAD: Naugatuck COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 25 ROW P TIER 87 3500 FT FSL, 4350 FT FEL
LATITUDE: 37 DEG 45 MIN 35 SEC LONGITUDE: 82 DEG 19 MIN 54 SEC
ELEVATION (FT): 1168.30, OF POINT AT base of 265, USING survey
COMMENTARY:
REGIONAL COAL NAME: Up Peach Orch GEO. MAP COAL NAME: Up Peach Orch
REPORTED COAL NAME: U Peach Orchard FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): top bench
EXPOSURE: TYPE, prospect; CONDITION, 1 week old
SAMPLE CONDITION: "outcroppy"
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 63.8, SAMPLE 63.8, COAL ONLY 44.1
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 315, SET 2 260, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	16.40	Sandstone.
N	3.61	Shale, medium-gray, silty.
Y	0.49	Clarain, with medium- to thick-banded vitrain, slightly weathered.
Y	0.66	Clarain, with scattered thin- to medium-banded vitrain.
Y	1.64	Shale, black, coaly.
Y	.75	Durain, with abundant thin- to medium-banded vitrain.
Y	0.98	Clarain, with thin- to medium-banded vitrain.
Y	0.03	Durain.
Y	0.33	Clarain.
Y	0.03	Vitrain.
Y	0.39	Clarain.
		See KGS 266 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: K99453 FIELD NO: KGS 265 U.S.G.S. NO: W208224
LABORATORY: USBM REPORT DATE: Feb/15/1980

AIR DRIED LOSS: 10.00%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	14.00%		
VOLATILE MATTER	27.60%	32.09%	37.76%
FIXED CARBON	45.50%	52.91%	62.24%
ASH	12.90%	15.00%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.70%	3.64%	4.29%
CARBON	54.40%	63.26%	74.42%
NITROGEN	1.50%	1.74%	2.05%
TOTAL SULFUR	0.50%	0.58%	0.68%
OXYGEN	26.00%	15.78%	18.56%
ASH	12.90%	15.00%	
HEATING VALUE (BTU/LB):	9043	10515	12371
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.03%	0.03%	0.04%
ORGANIC	0.44%	0.51%	0.60%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX
POUNDS OF SULFUR DIOXIDE PER MILLION BTU 1.1

COAL SAMPLING REPORT

LABORATORY NO: K99432 FIELD NO: KGS 266 U.S.G.S. NO: W208225
SAMPLER: Currens & Kung AGENCY: KGS DATE: Sep/25/1979
7.5' QUAD: Naugatuck COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 25 ROW P TIER 87 3500 FT FSL, 4350 FT FEL
LATITUDE: 37 DEG 45 MIN 35 SEC LONGITUDE: 82 DEG 19 MIN 54 SEC
ELEVATION (FT): 1165.77, OF POINT AT base of 266, USING survey
COMMENTARY:
REGIONAL COAL NAME: Up Peach Orch GEO. MAP COAL NAME: Up Peach Orch
REPORTED COAL NAME: U Peach Orchard FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): bottom bench
EXPOSURE: TYPE, prospect; CONDITION, 1 week old
SAMPLE CONDITION: "outcroppy"
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 19.3, SAMPLE 19.3, COAL ONLY 19.3
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 315, SET 2 260, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 265.
N	0.98	Siltstone, dark-gray, rooted.
Y	1.08	Clarain, with scattered fusain and medium-banded vitrain.
Y	0.13	Durain, with clarain.
Y	0.07	Durain.
Y	0.33	Clarain, with abundant medium-banded vitrain.
N	0.16	Sandstone, light-gray to buff, friable, micaceous, rooted.
N	1.64	Shale, medium-gray, plastic, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: K99432 FIELD NO: KGS 266 U.S.G.S. NO: W208225
LABORATORY: USBM REPORT DATE: Feb/13/1980

AIR DRIED LOSS: 7.10%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	10.20%		
VOLATILE MATTER	34.70%	38.64%	41.61%
FIXED CARBON	48.70%	54.23%	58.39%
ASH	6.40%	7.13%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.30%	4.63%	4.99%
CARBON	65.00%	72.38%	77.94%
NITROGEN	1.40%	1.56%	1.68%
TOTAL SULFUR	0.60%	0.67%	0.72%
OXYGEN	21.30%	13.63%	14.67%
ASH	6.40%	7.13%	
HEATING VALUE (BTU/LB):	11273	12554	13516
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.05%	0.06%	0.06%
ORGANIC	0.52%	0.58%	0.62%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	0.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.1

COAL SAMPLING REPORT

LABORATORY NO: L00122 FIELD NO: KGS 144 U.S.G.S. NO: W209504
SAMPLER: Currens & Kung AGENCY: KGS DATE: Nov/20/1979
7.5' QUAD: WAYLAND COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 10 ROW L TIER 80 5150 FT FSL, 900 FT FEL
LATITUDE: 37 DEG 28 MIN 51 SEC LONGITUDE: 82 DEG 50 MIN 11 SEC
ELEVATION (FT): 750.00, OF POINT AT base of 144, USING topo
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.2 GEO. MAP COAL NAME: U Elkhorn No.2
REPORTED COAL NAME: U Elkhorn No.2 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): bottom split
EXPOSURE: TYPE, roadcut; CONDITION, 1-2 months old, faced-up
SAMPLE CONDITION: slightly weathered
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 15.7, SAMPLE 15.7, COAL ONLY 15.4
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 286, SET 20 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 145.
N	9.51	Siltstone, medium-gray, laminated, slightly sideritic and carbonaceous; top 0.5 m rooted; exhibits pencil weathering in joints.
Y	0.03	Clarain and pyrite.
Y	0.62	Clarain, with some durain at base, scattered medium-banded vitrain and thin-banded fusain.
Y	0.03	Pyrite, continuous layer.
Y	0.46	Clarain.
Y	0.02	Fusain, pyritic.
Y	0.15	Clarain.
N	3.00	Shale, silty, slightly plastic, slickensided, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: L00122 FIELD NO: KGS 144 U.S.G.S. NO: W209504
LABORATORY: USBM REPORT DATE: Mar/19/1980

AIR DRIED LOSS: 0.60%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.10%		
VOLATILE MATTER	41.30%	42.19%	44.74%
FIXED CARBON	51.00%	52.10%	55.25%
ASH	5.60%	5.72%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.60%	5.48%	5.81%
CARBON	75.10%	76.71%	81.36%
NITROGEN	1.70%	1.74%	1.84%
TOTAL SULFUR	3.50%	3.58%	3.79%
OXYGEN	8.40%	6.77%	7.20%
ASH	5.60%	5.72%	
HEATING VALUE (BTU/LB):	13762	14058	14910
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	2.73%	2.79%	2.96%
ORGANIC	0.79%	0.81%	0.86%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	1920 DEG F
SOFTENING TEMP.	1990 DEG F
FLUID TEMP.	2100 DEG F

FREE SWELLING INDEX	3.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	5.1

COAL SAMPLING REPORT

LABORATORY NO: L00123 FIELD NO: KGS 145 U.S.G.S. NO: W209505
SAMPLER: Currens & Kung AGENCY: KGS DATE: Nov/20/1979
7.5' QUAD: WAYLAND COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 10 ROW L TIER 80 5150 FT FSL, 900 FT FEL
LATITUDE: 37 DEG 28 MIN 51 SEC LONGITUDE: 82 DEG 50 MIN 11 SEC
ELEVATION (FT): 761.00, OF POINT AT base of 145, USING topo
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.2 GEO. MAP COAL NAME: U Elkhorn No.2
REPORTED COAL NAME: U Elkhorn No.2 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): top split
EXPOSURE: TYPE, roadcut; CONDITION, few months old, faced-up
SAMPLE CONDITION: old, slightly wet
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 7.7, SAMPLE 7.7, COAL ONLY 7.5
STRUCTURAL FEATURE:, SEPARATION:
STRIKE AZIMUTHS: SET 1, SET 2, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	19.69	Sandstone, medium- to light-gray, coarse-grained, micaceous; with feldspar, coal spar, and clay galls at base; crossbedded to massive.
N	4.27	Siltstone, medium-gray, laminated, sideritic.
N	0.16	Shale, carbonaceous.
Y	0.20	Clarain.
Y	0.02	Pyrite.
Y	0.43	Clarain.
		See KGS 144 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: L00123 FIELD NO: KGS 145 U.S.G.S. NO: W209505
LABORATORY: USBM REPORT DATE: Mar/19/1980

AIR DRIED LOSS: 0.50%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.00%		
VOLATILE MATTER	43.10%	43.98%	46.75%
FIXED CARBON	49.10%	50.10%	53.25%
ASH	5.80%	5.92%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.70%	5.59%	5.94%
CARBON	75.90%	77.45%	82.32%
NITROGEN	1.70%	1.73%	1.84%
TOTAL SULFUR	2.60%	2.65%	2.82%
OXYGEN	8.30%	6.66%	7.08%
ASH	5.80%	5.92%	
HEATING VALUE (BTU/LB):	13786	14067	14952
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	1.79%	1.83%	1.94%
ORGANIC	0.83%	0.85%	0.90%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	1930 DEG F
SOFTENING TEMP.	2030 DEG F
FLUID TEMP.	2120 DEG F

FREE SWELLING INDEX	3.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	3.8

COAL SAMPLING REPORT

LABORATORY NO: L03162 FIELD NO: KGS 294 U.S.G.S. NO: W209676
SAMPLER: Currens & Kung AGENCY: KGS DATE: Jan/15/1980
7.5' QUAD: Belfry COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 18 ROW N TIER 86 1200 FT FSL, 2400 FT FEL
LATITUDE: 37 DEG 36 MIN 12 SEC LONGITUDE: 82 DEG 22 MIN 30 SEC
ELEVATION (FT): 610.00, OF POINT AT base of 294, USING survey
COMMENTARY:
REGIONAL COAL NAME: Lower Elkhorn GEO. MAP COAL NAME: Pond Creek
REPORTED COAL NAME: Pond Creek FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, 3 months old, faced-up
SAMPLE CONDITION: fresh
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 44.0, SAMPLE 43.8, COAL ONLY 43.6
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 213, SET 2 155, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	6.56	Siltstone, medium-gray, sideritic; with coal streaks.
Y	0.26	Clarain.
Y	0.02	Fusain.
Y	0.57	Clarain, with scattered medium-banded vitrain, thin-banded fusain.
Y	0.03	Fusain.
Y	0.30	Clarain, with abundant medium-banded fusain.
Y	0.07	Vitrain.
Y	1.25	Clarain, 60 percent durain interlayered at top; grades to 40 percent durain at base; with scattered thin-banded vitrain.
Y	0.02	Fusain.
Y	0.10	Clarain.
Y	0.02	Fusain.
Y	0.07	Clarain, with abundant thin-banded vitrain; hard, calcite(?) in cleat.
Y	0.02	Siltstone, dark-gray, carbonaceous.
Y	0.95	Clarain, with abundant durain intermixed; bottom not exposed; reported total thickness, 54 inches.

COAL ANALYSIS REPORT

LABORATORY NO: L03162 FIELD NO: KGS 294 U.S.G.S. NO: W209676
LABORATORY: USBM REPORT DATE: Aug/06/1980

AIR DRIED LOSS: ****

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.90%		
VOLATILE MATTER	34.60%	35.27%	39.50%
FIXED CARBON	53.00%	54.03%	60.50%
ASH	10.50%	10.70%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.20%	5.08%	5.69%
CARBON	73.50%	74.93%	83.91%
NITROGEN	1.20%	1.22%	1.37%
TOTAL SULFUR	0.50%	0.51%	0.57%
OXYGEN	9.00%	7.56%	8.46%
ASH	10.50%	10.70%	
HEATING VALUE (BTU/LB):	13038	13291	14884
SULFUR FORMS:			
SULFATE	0.02%	0.02%	0.02%
PYRITIC	0.02%	0.02%	0.02%
ORGANIC	0.51%	0.52%	0.58%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2910 DEG F
SOFTENING TEMP.	2910 DEG F
FLUID TEMP.	2910 DEG F

FREE SWELLING INDEX	3.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	0.8

COAL SAMPLING REPORT

LABORATORY NO: L05035 FIELD NO: KGS 296 U.S.G.S. NO: W209851
SAMPLER: Pollock AGENCY: IMMR DATE: Feb/12/1980
7.5' QUAD: Dorton COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 22 ROW J TIER 84 1250 FT FSL, 325 FT FEL
LATITUDE: 37 DEG 15 MIN 12 SEC LONGITUDE: 82 DEG 31 MIN 4 SEC
ELEVATION (FT): 1582.00, OF POINT AT mine portal, USING survey
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.2 GEO. MAP COAL NAME: U Elkhorn No.2
REPORTED COAL NAME: U Elkhorn No.2 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: fresh
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 39.8, SAMPLE 39.7, COAL ONLY 39.7
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	0.69	Shale, dark-gray, silty, micaceous, with coal spars, slickensided.
Y	0.30	Clarain, with scattered vitrain.
Y	0.10	Vitrain and fusain, interlaminated.
Y	1.31	Vitrain and clarain laminae, alternating.
Y	0.10	Fusain.
Y	1.51	Vitrain and clarain, interlaminated, with scattered fusain.
N	0.30	Shale, canneloid, micaceous, fissile.

COAL ANALYSIS REPORT

LABORATORY NO: L05035 FIELD NO: KGS 296 U.S.G.S. NO: W209851
LABORATORY: USBM REPORT DATE: Dec/01/1980

AIR DRIED LOSS: 1.10%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.30%		
VOLATILE MATTER	35.80%	36.64%	37.92%
FIXED CARBON	58.60%	59.98%	62.07%
ASH	3.30%	3.38%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.50%	5.37%	5.55%
CARBON	80.20%	82.08%	84.96%
NITROGEN	1.50%	1.54%	1.59%
TOTAL SULFUR	0.60%	0.61%	0.64%
OXYGEN	9.10%	7.02%	7.26%
ASH	3.30%	3.38%	
HEATING VALUE (BTU/LB):	14389	14727	15242
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.05%	0.05%	0.05%
ORGANIC	0.53%	0.54%	0.56%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2350 DEG F
SOFTENING TEMP.	2470 DEG F
FLUID TEMP.	2550 DEG F

FREE SWELLING INDEX	6.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	0.8

COAL SAMPLING REPORT

LABORATORY NO: L05030 FIELD NO: KGS 297 U.S.G.S. NO: W209852
SAMPLER: Pollock AGENCY: IMMR DATE: Feb/12/1980
7.5' QUAD: Dorton COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 18 ROW K TIER 84 425 FT FSL, 1700 FT FEL
LATITUDE: 37 DEG 21 MIN 4 SEC LONGITUDE: 82 DEG 32 MIN 21 SEC
ELEVATION (FT): 1319.00, OF POINT AT base of 297, USING survey
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.2 GEO. MAP COAL NAME: U Elkhorn No.2
REPORTED COAL NAME: U Elkhorn No.2 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: fresh
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 44.2, SAMPLE 44.2, COAL ONLY 41.5
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	0.98	Shale, dark-gray, silty, micaceous, with plant fragments.
N	0.05	Clay, medium-gray, plastic.
Y	0.23	Clarain, with scattered vitrain.
Y	0.02	Fusain.
Y	0.10	Durain.
Y	0.39	Clarain, with scattered vitrain and durain.
Y	0.16	Fusain.
Y	0.07	Vitrain.
Y	0.01	Fusain.
Y	0.23	Clarain, with traces of vitrain.
Y	0.23	Siltstone, medium-gray, micaceous, sandy, laminated with coaly streaks.
Y	0.02	Vitrain.
Y	1.61	Clarain, with scattered vitrain.
Y	0.03	Fusain.
Y	0.59	Clarain, with scattered vitrain.
N	0.39	Clay, light-gray, rooted; total thickness, 3.70 feet.

COAL ANALYSIS REPORT

LABORATORY NO: L05030 FIELD NO: KGS 297 U.S.G.S. NO: W209852
LABORATORY: USBM REPORT DATE: Dec/01/1980

AIR DRIED LOSS: 1.00%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.20%		
VOLATILE MATTER	37.10%	37.93%	40.37%
FIXED CARBON	54.80%	56.03%	59.63%
ASH	5.90%	6.03%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.50%	5.37%	5.72%
CARBON	77.80%	79.55%	84.65%
NITROGEN	1.50%	1.53%	1.63%
TOTAL SULFUR	0.70%	0.72%	0.76%
OXYGEN	8.70%	6.80%	7.24%
ASH	5.90%	6.03%	
HEATING VALUE (BTU/LB):	14002	14317	15236
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.17%	0.17%	0.18%
ORGANIC	0.52%	0.53%	0.57%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2490 DEG F
SOFTENING TEMP.	2600 DEG F
FLUID TEMP.	2740 DEG F

FREE SWELLING INDEX	6.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.0

COAL SAMPLING REPORT

LABORATORY NO: L03164 FIELD NO: KGS 311 U.S.G.S. NO: W209895
SAMPLER: Currens AGENCY: KGS DATE: Mar/26/1980
7.5' QUAD: Offutt COUNTY: Johnson DISTRICT: Big Sandy
CARTER COORDINATE: SEC 13 ROW P TIER 82 2300 FT FSL, 4650 FT FEL
LATITUDE: 37 DEG 47 MIN 23 SEC LONGITUDE: 82 DEG 42 MIN 58 SEC
ELEVATION (FT): 1006.50, OF POINT AT base of 311, USING altimeter
COMMENTARY: Barometric elevation not adjusted for atmospheric changes.
REGIONAL COAL NAME: U Peach Orch GEO. MAP COAL NAME: U Peach Orch
REPORTED COAL NAME: U Peach Orchard FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): top split
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 20.5, SAMPLE 20.5, COAL ONLY 20.1
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 340, SET 2 65, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 313 (W210293).
N	1.64	Claystone, soft, plastic, rooted.
N	13.12	Siltstone, medium-gray, sideritic.
Y	1.12	Clarain, with scattered thin-banded fusain, abundant thin- to medium-banded vitrain.
Y	0.07	Durain.
Y	0.26	Clarain, with abundant vitrain.
Y	0.03	Siltstone, dark-gray.
Y	0.23	Clarain.
		See KGS 312 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: L03164 FIELD NO: KGS 311 U.S.G.S. NO: W209895
LABORATORY: USBM REPORT DATE: Aug/06/1980

AIR DRIED LOSS: 0.40%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	4.00%		
VOLATILE MATTER	38.00%	39.58%	43.08%
FIXED CARBON	50.20%	52.29%	56.92%
ASH	7.80%	8.13%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.30%	5.05%	5.50%
CARBON	71.90%	74.90%	81.52%
NITROGEN	1.10%	1.15%	1.25%
TOTAL SULFUR	1.00%	1.04%	1.13%
OXYGEN	12.70%	9.73%	10.60%
ASH	7.80%	8.13%	
HEATING VALUE (BTU/LB):	12793	13327	14505
SULFUR FORMS:			
SULFATE	0.02%	0.02%	0.02%
PYRITIC	0.10%	0.10%	0.11%
ORGANIC	0.92%	0.96%	1.04%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2910 DEG F
SOFTENING TEMP.	2910 DEG F
FLUID TEMP.	2910 DEG F

FREE SWELLING INDEX	1.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.6

COAL SAMPLING REPORT

LABORATORY NO: L03165 FIELD NO: KGS 312 U.S.G.S. NO: W209896
SAMPLER: Currens AGENCY: KGS DATE: Mar/26/1980
7.5' QUAD: Offutt COUNTY: Johnson DISTRICT: Big Sandy
CARTER COORDINATE: SEC 13 ROW P TIER 82 2300 FT FSL, 4650 FT FEL
LATITUDE: 37 DEG 47 MIN 23 SEC LONGITUDE: 82 DEG 42 MIN 58 SEC
ELEVATION (FT): 1003.00, OF POINT AT base of 312, USING altimeter
COMMENTARY: Barometric elevation not adjusted for atmospheric changes.
REGIONAL COAL NAME: U Peach Orch GEO. MAP COAL NAME: U Peach Orch
REPORTED COAL NAME: U Peach Orchard FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): bottom split
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh, wet
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 18.1, SAMPLE 18.1, COAL ONLY 15.0
STRUCTURAL FEATURE:, SEPARATION:
STRIKE AZIMUTHS: SET 1, SET 2, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 311.
N	2.07	Siltstone, dark- to medium-gray, rooted.
Y	0.43	Clarain, with scattered thin- to medium-banded vitrain.
Y	0.13	Siltstone, dark-gray, brittle.
Y	0.10	Durain.
Y	0.13	Pyrite and clarain, interlaminated.
Y	0.43	Clarain.
Y	0.30	Durain and clarain, interbedded.
N		Siltstone, dark-gray, hard, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: L03165 FIELD NO: KGS 312 U.S.G.S. NO: W209896
LABORATORY: USBM REPORT DATE: Aug/06/1980

AIR DRIED LOSS: 0.10%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.60%		
VOLATILE MATTER	31.60%	32.44%	46.27%
FIXED CARBON	36.70%	37.68%	53.73%
ASH	29.10%	29.88%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.20%	4.01%	5.72%
CARBON	54.50%	55.96%	79.79%
NITROGEN	0.90%	0.92%	1.32%
TOTAL SULFUR	2.20%	2.26%	3.22%
OXYGEN	9.20%	6.97%	9.95%
ASH	29.10%	29.88%	
SULFUR FORMS:			
SULFATE	0.06%	0.06%	0.09%
PYRITIC	1.19%	1.22%	1.74%
ORGANIC	0.93%	0.95%	1.36%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2660 DEG F
SOFTENING TEMP.	2710 DEG F
FLUID TEMP.	2880 DEG F

FREE SWELLING INDEX	1.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	4.6

COAL SAMPLING REPORT

LABORATORY NO: L03166 FIELD NO: KGS 314 U.S.G.S. NO: W209897
SAMPLER: Currens AGENCY: KGS DATE: Mar/26/1980
7.5' QUAD: Lancer COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 10 ROW 0 TIER 82 1000 FT FSL, 3350 FT FEL
LATITUDE: 37 DEG 43 MIN 10 SEC LONGITUDE: 82 DEG 40 MIN 42 SEC
ELEVATION (FT): 1190.40, OF POINT AT base of 314, USING altimeter
COMMENTARY: Unnamed coal 30 feet below Richardson.
REGIONAL COAL NAME: Broas zone GEO. MAP COAL NAME: Broas
REPORTED COAL NAME: Lower Clarion FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 41.8, SAMPLE 41.7, COAL ONLY 41.7
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 130, SET 2 40, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	13.12	Sandstone, fine-grained; grades upward to siltstone, light-gray, carbonaceous, micaceous.
Y	0.66	Clarain, with abundant thin- to medium-banded vitrain.
Y	0.13	Durain.
Y	0.03	Vitrain.
Y	0.82	Durain, with abundant medium- to thick-banded vitrain.
Y	0.07	Vitrain.
Y	0.49	Durain, with scattered thin-banded vitrain.
Y	0.46	Clarain, with abundant vitrain.
Y	0.39	Durain.
Y	0.43	Clarain.
N		Siltstone.

COAL ANALYSIS REPORT

LABORATORY NO: L03166 FIELD NO: KGS 314 U.S.G.S. NO: W209897
LABORATORY: USBM REPORT DATE: Aug/06/1980

AIR DRIED LOSS: 0.50 %

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	3.50%		
VOLATILE MATTER	39.90%	41.35%	43.42%
FIXED CARBON	52.00%	53.89%	56.58%
ASH	4.60%	4.77%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.60%	5.40%	5.67%
CARBON	76.00%	78.76%	82.70%
NITROGEN	1.30%	1.35%	1.41%
TOTAL SULFUR	0.60%	0.62%	0.65%
OXYGEN	11.90%	9.10%	9.57%
ASH	4.60%	4.77%	
HEATING VALUE (BTU/LB):	13469	13958	14656
SULFUR FORMS:			
SULFATE	0.02%	0.02%	0.02%
PYRITIC	0.02%	0.02%	0.02%
ORGANIC	0.57%	0.59%	0.62%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2910 DEG F
SOFTENING TEMP.	2910 DEG F
FLUID TEMP.	2910 DEG F

FREE SWELLING INDEX	1.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	0.9

COAL SAMPLING REPORT

LABORATORY NO: L05168 FIELD NO: KGS 320 U.S.G.S. NO: W210026
SAMPLER: Currens AGENCY: KGS DATE: Apr/02/1980
7.5' QUAD: Milo COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 16 ROW R TIER 84 4250 FT FSL, 100 FT FEL
LATITUDE: 37 DEG 56 MIN 42 SEC LONGITUDE: 82 DEG 34 MIN 1 SEC
ELEVATION (FT): 763.00, OF POINT AT base of 320, USING topo
COMMENTARY:
REGIONAL COAL NAME: U Peach Orch GEO. MAP COAL NAME: U Peach Orch
REPORTED COAL NAME: U Peach Orch FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): top bench
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh, wet
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 38.0, SAMPLE 29.7, COAL ONLY 29.7
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 320, SET 2 230, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	32.81	Siltstone, medium-gray, sideritic, arenaceous.
Y	0.59	Clarain.
Y	0.02	Fusain.
Y	0.56	Clarain.
N	0.10	Pyrite nodule.
Y	0.36	Clarain.
N	0.10	Siltstone.
Y	0.26	Clarain and durain.
N	0.49	Siltstone.
Y	0.69	Clarain; pyrite at base, obscured.
		See KGS 321 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: L05168 FIELD NO: KGS 320 U.S.G.S. NO: W210026
LABORATORY: USBM REPORT DATE: Dec/04/1980

AIR DRIED LOSS: 2.90%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	4.50%		
VOLATILE MATTER	37.70%	39.48%	42.94%
FIXED CARBON	50.10%	52.46%	57.06%
ASH	7.70%	8.06%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.50%	5.23%	5.69%
CARBON	71.40%	74.76%	81.32%
NITROGEN	1.40%	1.47%	1.59%
TOTAL SULFUR	0.90%	0.94%	1.03%
OXYGEN	12.90%	9.54%	10.37%
ASH	7.70%	8.06%	
HEATING VALUE (BTU/LB):	12827	13431	14610
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.26%	0.27%	0.30%
ORGANIC	0.64%	0.67%	0.73%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	1.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.4

COAL SAMPLING REPORT

LABORATORY NO: L05165 FIELD NO: KGS 321 U.S.G.S. NO: W210027
SAMPLER: Currens AGENCY: KGS DATE: Apr/02/1980
7.5' QUAD: Milo COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 16 ROW R TIER 84 4250 FT FSL, 100 FT FEL
LATITUDE: 37 DEG 56 MIN 42 SEC LONGITUDE: 82 DEG 34 MIN 1 SEC
ELEVATION (FT): 760.00, OF POINT AT base of 321, USING topo
COMMENTARY:
REGIONAL COAL NAME: U Peach Orch GEO. MAP COAL NAME: U Peach Orch
REPORTED COAL NAME: U Peach Orch FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): bottom bench
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh, wet
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 24.4, SAMPLE 24.4, COAL ONLY 24.4
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 320, SET 2 230, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 320.
N	1.44	Siltstone, medium-gray, rooted; carbonaceous at top.
Y	0.30	Clarain.
Y	0.39	Durain.
Y	0.95	Clarain, with abundant thin- to medium-banded vitrain.
Y	0.16	Durain.
Y	0.23	Clarain.
N		Siltstone, dark-gray, rooted, plastic when wet.

COAL ANALYSIS REPORT

LABORATORY NO: L05165 FIELD NO: KGS 321 U.S.G.S. NO: W210027
LABORATORY: USBM REPORT DATE: Dec/04/1980

AIR DRIED LOSS: 2.10%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	3.50%		
VOLATILE MATTER	36.80%	38.14%	42.49%
FIXED CARBON	49.80%	51.61%	57.50%
ASH	9.90%	10.26%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.30%	5.09%	5.67%
CARBON	69.40%	71.92%	80.14%
NITROGEN	1.40%	1.45%	1.62%
TOTAL SULFUR	1.10%	1.14%	1.27%
OXYGEN	12.80%	10.14%	11.30%
ASH	9.90%	10.26%	
HEATING VALUE (BTU/LB):	12517	12971	14453
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.31%	0.32%	0.36%
ORGANIC	0.81%	0.84%	0.94%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	1.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.8

COAL SAMPLING REPORT

LABORATORY NO: L05166 FIELD NO: KGS 322 U.S.G.S. NO: W210028
SAMPLER: Currens AGENCY: KGS DATE: Apr/02/1980
7.5' QUAD: Milo COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 10 ROW Q TIER 83 2300 FT FSL, 700 FT FEL
LATITUDE: 37 DEG 53 MIN 23 SEC LONGITUDE: 82 DEG 35 MIN 9 SEC
ELEVATION (FT): 1018.00, OF POINT AT base of 322, USING altimeter
COMMENTARY: Barometric elevation not adjusted for atmospheric changes.
REGIONAL COAL NAME: Richardson zone GEO. MAP COAL NAME: Richardson
REPORTED COAL NAME: Richardson FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): rider
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh, damp
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 30.9, SAMPLE 29.7, COAL ONLY 29.7
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 10, SET 2 90, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	32.81	Sandstone, light-gray to buff, coarse- to medium-grained, crossbedded, with coal spar and lag gravel at base.
Y	0.79	Clarain and durain, mixed.
Y	0.02	Fusain.
Y	0.10	Durain.
Y	0.23	Clarain.
N	0.10	Siltstone, very carbonaceous, soft.
Y	1.35	Clarain, with clay in cleats.
		See KGS 324 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: L05166 FIELD NO: KGS 322 U.S.G.S. NO: W210028
LABORATORY: USBM REPORT DATE: Dec/04/1980

AIR DRIED LOSS: 2.50%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	4.10%		
VOLATILE MATTER	37.20%	38.79%	42.86%
FIXED CARBON	49.60%	51.72%	57.14%
ASH	9.10%	9.49%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.40%	5.15%	5.69%
CARBON	70.10%	73.10%	80.76%
NITROGEN	1.30%	1.36%	1.50%
TOTAL SULFUR	1.40%	1.46%	1.61%
OXYGEN	12.70%	9.44%	10.44%
ASH	9.10%	9.49%	
HEATING VALUE (BTU/LB):	12537	13074	14444
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.77%	0.80%	0.89%
ORGANIC	0.64%	0.67%	0.74%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2480 DEG F
SOFTENING TEMP.	2570 DEG F
FLUID TEMP.	2690 DEG F

FREE SWELLING INDEX	1.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	2.2

COAL SAMPLING REPORT

LABORATORY NO: L05172 FIELD NO: KGS 323 U.S.G.S. NO: W210029
SAMPLER: Currens AGENCY: KGS DATE: Apr/02/1980
7.5' QUAD: Milo COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 10 ROW Q TIER 83 1800 FT FSL, 4400 FT FEL
LATITUDE: 37 DEG 53 MIN 18 SEC LONGITUDE: 82 DEG 35 MIN 55 SEC
ELEVATION (FT): 993.00, OF POINT AT base of 323, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: Richardson zone GEO. MAP COAL NAME: Richardson
REPORTED COAL NAME: Richardson FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): bottom bench
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh, dry
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 61.4, SAMPLE 59.1, COAL ONLY 55.9
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 210, SET 2 155, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 324.
N	0.49	Siltstone, dark-gray, slickensided, rooted, coaly.
Y	0.36	Clarain, with scattered medium- to thick-banded vitrain, pyritic.
Y	0.36	Durain, with thin-banded vitrain.
Y	0.26	Siltstone, very carbonaceous, very hard.
Y	1.05	Durain.
N	0.20	Siltstone, coal, and pyrite.
Y	1.35	Durain, with scattered thin-banded vitrain.
Y	1.54	Durain.
N		Siltstone, black.

COAL ANALYSIS REPORT

LABORATORY NO: L05172 FIELD NO: KGS 323 U.S.G.S. NO: W210029
LABORATORY: USBM REPORT DATE: Dec/10/1980

AIR DRIED LOSS: 2.70%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	4.00%		
VOLATILE MATTER	33.90%	35.31%	41.90%
FIXED CARBON	47.00%	48.96%	58.10%
ASH	15.10%	15.73%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.90%	4.64%	5.50%
CARBON	66.00%	68.75%	81.58%
NITROGEN	1.30%	1.35%	1.61%
TOTAL SULFUR	0.50%	0.52%	0.62%
OXYGEN	12.20%	9.01%	10.69%
ASH	15.10%	15.73%	
HEATING VALUE (BTU/LB):	11669	12156	14424
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.05%	0.05%	0.06%
ORGANIC	0.47%	0.49%	0.58%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	1.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	0.9

COAL SAMPLING REPORT

LABORATORY NO: L05167 FIELD NO: KGS 324 U.S.G.S. NO: W210030
SAMPLER: Currens AGENCY: KGS DATE: Apr/02/1980
7.5' QUAD: Milo COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 10 ROW Q TIER 83 1800 FT FSL, 4400 FT FEL
LATITUDE: 37 DEG 53 MIN 18 SEC LONGITUDE: 82 DEG 35 MIN 55 SEC
ELEVATION (FT): 998.60, OF POINT AT base of 324, USING altimeter
COMMENTARY: Barometric elevation not adjusted for atmospheric changes.
REGIONAL COAL NAME: Richardson zone GEO. MAP COAL NAME: Richardson
REPORTED COAL NAME: Richardson FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): top bench
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh, dry
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 31.9, SAMPLE 29.9, COAL ONLY 29.9
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 240, SET 2 155, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 322.
N	13.12	Siltstone, light-gray; top rooted, plastic.
Y	0.72	Clarain; pyritic at top.
Y	0.26	Canneloid coal (or durain?).
N	0.16	Siltstone, very carbonaceous, soft.
Y	1.51	Clarain, with abundant medium-banded vitrain, thin-banded fusain; slightly pyritic.
		See KGS 323 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: L05167 FIELD NO: KGS 324 U.S.G.S. NO: W210030
LABORATORY: USBM REPORT DATE: Dec/04/1980

AIR DRIED LOSS: 2.60%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	4.30%		
VOLATILE MATTER	35.00%	36.57%	40.55%
FIXED CARBON	51.30%	53.60%	59.44%
ASH	9.40%	9.82%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.30%	5.04%	5.58%
CARBON	69.60%	72.73%	80.65%
NITROGEN	1.40%	1.46%	1.62%
TOTAL SULFUR	0.70%	0.73%	0.81%
OXYGEN	13.70%	10.22%	11.34%
ASH	9.40%	9.82%	
HEATING VALUE (BTU/LB):	12404	12961	14373
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.07%	0.07%	0.08%
ORGANIC	0.57%	0.60%	0.66%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	1.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.1

COAL SAMPLING REPORT

LABORATORY NO: U10089 FIELD NO: KGS 330 U.S.G.S. NO: W210154
SAMPLER: Currens AGENCY: KGS DATE: Apr/16/1980
7.5' QUAD: Dorton COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 16 ROW J TIER 84 1850 FT FSL, 400 FT FEL
LATITUDE: 37 DEG 16 MIN 18 SEC LONGITUDE: 82 DEG 34 MIN 5 SEC
ELEVATION (FT): 1395.25, OF POINT AT base of 330, USING survey
COMMENTARY:
REGIONAL COAL NAME: Lower Elkhorn GEO. MAP COAL NAME: Lower Elkhorn
REPORTED COAL NAME: Lower Elkhorn FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: fresh, clean
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 45.3, SAMPLE 44.1, COAL ONLY 43.7
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 77, SET 2 335, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	9.84	Siltstone.
N	2.62	Coal and siltstone, interbedded (60 percent coal).
N	4.92	Siltstone, laminated, slickensided, carbonaceous, coaly.
Y	0.13	Durain, with thin-banded vitrain.
Y	0.11	Clarain.
Y	0.07	Durain.
N	0.10	Siltstone, buff to dark-gray, slickensided, rooted.
Y	0.07	Clarain.
Y	0.03	Siltstone, buff to dark-gray, slickensided, rooted.
Y	0.66	Clarain, with abundant medium-banded vitrain.
Y	0.02	Fusain.
Y	0.69	Clarain, with abundant medium-banded vitrain.
Y	0.15	Durain with clarain, argillaceous.
Y	0.43	Clarain.
Y	0.02	Fusain.
Y	1.31	Clarain, with abundant medium-banded vitrain.
N		Siltstone, dark-gray, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: U10089 FIELD NO: KGS 330 U.S.G.S. NO: W210154
LABORATORY: Geo Test REPORT DATE: Nov/20/1981

AIR DRIED LOSS: 0.85%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.90%		
VOLATILE MATTER	29.77%	30.35%	36.56%
FIXED CARBON	51.66%	52.66%	63.44%
ASH	16.67%	16.99%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.71%	4.58%	5.52%
CARBON	68.00%	69.32%	83.50%
NITROGEN	1.41%	1.44%	1.73%
TOTAL SULFUR	0.68%	0.69%	0.84%
OXYGEN	8.53%	6.98%	8.41%
ASH	16.67%	16.99%	
HEATING VALUE (BTU/LB):	11982	12215	14714
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.06%	0.06%	0.07%
ORGANIC	0.61%	0.62%	0.75%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	3.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.1

COAL SAMPLING REPORT

LABORATORY NO: U10090 FIELD NO: KGS 331 U.S.G.S. NO: W210155
SAMPLER: Currens AGENCY: KGS DATE: Apr/16/1980
7.5' QUAD: Millard COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 14 ROW L TIER 85 2100 FT FSL, 3850 FT FEL
LATITUDE: 37 DEG 27 MIN 21 SEC LONGITUDE: 82 DEG 28 MIN 48 SEC
ELEVATION (FT): 1114.00, OF POINT AT base of 331, USING altimeter
COMMENTARY: Barometric elevation not adjusted for atmospheric changes.
REGIONAL COAL NAME: U Elkhorn 2-1 GEO. MAP COAL NAME: U Elkhorn 2-1
REPORTED COAL NAME: U Elkhorn No.2-1 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh, wet at base
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 102.4, SAMPLE 69.3, COAL ONLY 69.3
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 215, SET 2 295, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	6.56	Siltstone, medium-gray, sideritic; carbonaceous at base.
Y	0.26	Clarain.
Y	0.03	Fusain.
Y	1.61	Clarain, with abundant medium- to thick-banded vitrain.
N	1.18	Sandstone, dark-gray, fine-grained, rooted, argillaceous.
Y	1.71	Clarain, with abundant medium- to thick-banded vitrain, scattered thin-banded fusain; no pyrite apparent; very homogeneous.
N	1.57	Siltstone, medium-gray, plastic when wet, rooted.
Y	1.38	Clarain, with abundant medium-banded vitrain.
Y	0.26	Durain.
Y	0.52	Clarain.
N		Siltstone, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: U10090 FIELD NO: KGS 331 U.S.G.S. NO: W210155
LABORATORY: Geo Test REPORT DATE: Nov/20/1981

AIR DRIED LOSS: 0.88%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.22%		
VOLATILE MATTER	36.68%	37.51%	39.22%
FIXED CARBON	56.85%	58.14%	60.78%
ASH	4.25%	4.35%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.51%	5.38%	5.63%
CARBON	78.65%	80.44%	84.09%
NITROGEN	1.67%	1.71%	1.79%
TOTAL SULFUR	0.77%	0.79%	0.82%
OXYGEN	9.15%	7.33%	7.67%
ASH	4.25%	4.35%	
HEATING VALUE (BTU/LB):	14058	14377	15031
SULFUR FORMS:			
SULFATE	0.02%	0.02%	0.02%
PYRITIC	0.14%	0.14%	0.15%
ORGANIC	0.61%	0.62%	0.65%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	5.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.1

COAL SAMPLING REPORT

LABORATORY NO: U10091 FIELD NO: KGS 332 U.S.G.S. NO: W210156
SAMPLER: Currens AGENCY: KGS DATE: Apr/16/1980
7.5' QUAD: Millard COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 15 ROW L TIER 85 1500 FT FSL, 500 FT FEL
LATITUDE: 37 DEG 27 MIN 15 SEC LONGITUDE: 82 DEG 29 MIN 6 SEC
ELEVATION (FT): 1266.00, OF POINT AT base of 332, USING altimeter
COMMENTARY: Barometric elevation not adjusted for atmospheric changes.
REGIONAL COAL NAME: U Elkhorn No.3 GEO. MAP COAL NAME: U Elkhorn No.3
REPORTED COAL NAME: U Elkhorn No.3 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): 2nd rider
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh, wet
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 7.5, SAMPLE 7.5, COAL ONLY 7.5
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 200, SET 2 280, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	32.81	Siltstone, light-gray.
Y	0.46	Clarain, pyritic.
Y	0.16	Durain and clarain, mixed.
N		Sandstone.

COAL ANALYSIS REPORT

LABORATORY NO: U10091 FIELD NO: KGS 332 U.S.G.S. NO: W210156
LABORATORY: Geo Test REPORT DATE: Nov/20/1981

AIR DRIED LOSS: 0.57%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.60%		
VOLATILE MATTER	41.94%	42.62%	46.91%
FIXED CARBON	47.46%	48.23%	53.09%
ASH	9.00%	9.15%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.54%	5.45%	6.00%
CARBON	71.91%	73.08%	80.44%
NITROGEN	1.51%	1.53%	1.69%
TOTAL SULFUR	5.10%	5.18%	5.70%
OXYGEN	6.94%	5.61%	6.17%
ASH	9.00%	9.15%	
HEATING VALUE (BTU/LB):	13338	13555	14920
SULFUR FORMS:			
SULFATE	0.26%	0.26%	0.29%
PYRITIC	3.50%	3.56%	3.92%
ORGANIC	1.34%	1.36%	1.50%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2040 DEG F
SOFTENING TEMP.	2090 DEG F
FLUID TEMP.	2160 DEG F

FREE SWELLING INDEX	3.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	7.6

COAL SAMPLING REPORT

LABORATORY NO: U10092 FIELD NO: KGS 333 U.S.G.S. NO: W210157
SAMPLER: Currens AGENCY: KGS DATE: Apr/16/1980
7.5' QUAD: Millard COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 15 ROW L TIER 85 1200 FT FSL, 500 FT FEL
LATITUDE: 37 DEG 27 MIN 12 SEC LONGITUDE: 82 DEG 29 MIN 6 SEC
ELEVATION (FT): 1191.00, OF POINT AT base of 333, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.3 GEO. MAP COAL NAME: U Elkhorn No.3
REPORTED COAL NAME: U Elkhorn No.3 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh, dry, some clay in cleat
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 32.5, SAMPLE 32.5, COAL ONLY 32.5
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 215, SET 2 300, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 332.
N	65.62	Siltstone, medium-gray, sideritic; coarsens upward to sandstone.
N	0.07	Clarain.
N	0.10	Siltstone, black, carbonaceous.
Y	1.48	Clarain, with abundant thick-banded vitrain; pyritic.
Y	0.02	Fusain.
Y	0.56	Clarain, with abundant thick-banded vitrain.
Y	0.36	Durain.
Y	0.30	Clarain, with abundant vitrain.
N	6.56	Siltstone, medium-gray, rooted.
N	9.84	Siltstone, medium-gray.
		See KGS 334 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: U10092 FIELD NO: KGS 333 U.S.G.S. NO: W210157
LABORATORY: Geo Test REPORT DATE: Nov/20/1981

AIR DRIED LOSS: 0.86%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.03%		
VOLATILE MATTER	37.92%	38.70%	40.09%
FIXED CARBON	56.68%	57.85%	59.92%
ASH	3.37%	3.44%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.55%	5.43%	5.63%
CARBON	79.43%	81.07%	83.97%
NITROGEN	1.63%	1.66%	1.72%
TOTAL SULFUR	1.25%	1.28%	1.32%
OXYGEN	8.77%	7.12%	7.36%
ASH	3.37%	3.44%	
HEATING VALUE (BTU/LB):	14177	14471	14987
SULFUR FORMS:			
SULFATE	0.04%	0.04%	0.04%
PYRITIC	0.36%	0.37%	0.38%
ORGANIC	0.85%	0.87%	0.90%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2170 DEG F
SOFTENING TEMP.	2240 DEG F
FLUID TEMP.	2370 DEG F

FREE SWELLING INDEX	5.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.8

COAL SAMPLING REPORT

LABORATORY NO: U10093 FIELD NO: KGS 334 U.S.G.S. NO: W210158
SAMPLER: Currens AGENCY: KGS DATE: Apr/16/1980
7.5' QUAD: Millard COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 15 ROW L TIER 85 1100 FT FSL, 600 FT FEL
LATITUDE: 37 DEG 27 MIN 11 SEC LONGITUDE: 82 DEG 29 MIN 7 SEC
ELEVATION (FT): 1154.00, OF POINT AT base of 334, USING altimeter
COMMENTARY: Barometric elevation not adjusted for atmospheric changes.
REGIONAL COAL NAME: U Elkhorn 2-1 GEO. MAP COAL NAME: U Elkhorn 2-1
REPORTED COAL NAME: U Elkhorn No.2-1 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): rider
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: slightly weathered
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 13.8, SAMPLE 12.4, COAL ONLY 12.2
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 60, SET 2 330, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 333.
N	35.43	Siltstone; interbedded with sandstone near base; sideritic.
N	0.13	Coal and pyrite, interlaminated.
Y	0.23	Durain, argillaceous.
Y	0.02	Pyrite.
N	0.11	Siltstone, black, carbonaceous.
Y	0.69	Clarain, with abundant medium-banded vitrain.
Y	0.10	Durain.
N	3.28	Siltstone, dark- to medium-gray, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: U10093 FIELD NO: KGS 334 U.S.G.S. NO: W210158
LABORATORY: Geo Test REPORT DATE: Nov/20/1981

AIR DRIED LOSS: 0.85 %

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.16%		
VOLATILE MATTER	31.50%	32.20%	41.74%
FIXED CARBON	43.97%	44.94%	58.26%
ASH	22.37%	22.86%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.62%	4.48%	5.80%
CARBON	62.00%	63.37%	82.15%
NITROGEN	1.39%	1.42%	1.84%
TOTAL SULFUR	1.08%	1.10%	1.43%
OXYGEN	8.54%	6.77%	8.78%
ASH	22.37%	22.86%	
HEATING VALUE (BTU/LB):	11123	11369	14738
SULFUR FORMS:			
SULFATE	0.04%	0.04%	0.05%
PYRITIC	0.41%	0.42%	0.54%
ORGANIC	0.63%	0.64%	0.83%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2500 DEG F
SOFTENING TEMP.	2600 DEG F
FLUID TEMP.	2680 DEG F

FREE SWELLING INDEX	2.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.9

COAL SAMPLING REPORT

LABORATORY NO: U10095 FIELD NO: KGS 339 U.S.G.S. NO: W210161
SAMPLER: Currens AGENCY: KGS DATE: May/07/1980
7.5' QUAD: Dorton COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 14 ROW J TIER 84 2550 FT FSL, 200 FT FEL
LATITUDE: 37 DEG 17 MIN 25 SEC LONGITUDE: 82 DEG 33 MIN 2 SEC
ELEVATION (FT): 1577.50, OF POINT AT base of 339, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.2 GEO. MAP COAL NAME: U Elkhorn No.2
REPORTED COAL NAME: U Elkhorn No.2 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, roadcut; CONDITION, 6 months old
SAMPLE CONDITION: fresh, clean, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 38.0, SAMPLE 38.0, COAL ONLY 38.0
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 130, SET 2 195, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Siltstone?
N	1.31	Coal, inaccessible (Upper Elkhorn No. 3).
N	11.48	Siltstone, medium- to dark-gray; thin sandstone near top.
N	0.33	Clarain, pyritic.
N	0.98	Claystone, arenaceous, rooted; top 2 cm carbonaceous.
N	55.77	Sandstone, medium-gray, coarse-grained, crossbedded, micaceous; top 1 meter rooted.
N	0.85	Siltstone, black, coaly, laminated.
Y	0.79	Clarain.
Y	0.02	Fusain.
Y	0.95	Clarain; pyrite lenses (4 x 10 cm) occur laterally.
Y	0.07	Fusain.
Y	0.75	Clarain.
Y	0.03	Fusain, argillaceous.
Y	0.46	Clarain.
Y	0.10	Durain.
		See KGS 340 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: U10095 FIELD NO: KGS 339 U.S.G.S. NO: W210161
LABORATORY: Geo Test REPORT DATE: Nov/20/1981

AIR DRIED LOSS: 0.94%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.10%		
VOLATILE MATTER	33.84%	34.57%	35.32%
FIXED CARBON	61.98%	63.31%	64.68%
ASH	2.08%	2.12%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.50%	5.38%	5.49%
CARBON	81.52%	83.27%	85.07%
NITROGEN	1.54%	1.57%	1.61%
TOTAL SULFUR	0.72%	0.74%	0.75%
OXYGEN	8.64%	6.92%	7.08%
ASH	2.08%	2.12%	
HEATING VALUE (BTU/LB):	14485	14796	15117
SULFUR FORMS:			
SULFATE	0.03%	0.03%	0.03%
PYRITIC	0.19%	0.19%	0.20%
ORGANIC	0.50%	0.51%	0.52%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2250 DEG F
SOFTENING TEMP.	2560 DEG F
FLUID TEMP.	2660 DEG F

FREE SWELLING INDEX	5.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.0

COAL SAMPLING REPORT

LABORATORY NO: U10020 FIELD NO: KGS 340 U.S.G.S. NO: W210162
SAMPLER: Currens AGENCY: KGS DATE: May/07/1980
7.5' QUAD: Dorton COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 14 ROW J TIER 84 2750 FT FSL, 250 FT FEL
LATITUDE: 37 DEG 17 MIN 27 SEC LONGITUDE: 82 DEG 33 MIN 3 SEC
ELEVATION (FT): 1551.10, OF POINT AT base of 340, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.1 GEO. MAP COAL NAME: U Elkhorn No.1
REPORTED COAL NAME: U Elkhorn No.1 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, roadcut, CONDITION, 3 months old
SAMPLE CONDITION: fresh, clean, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 29.1, SAMPLE 29.1, COAL ONLY 29.1
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 65, SET 2 350, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 339.
N	0.33	Siltstone, dark-gray, rooted.
N	22.97	Sandstone, coarse-grained, carbonaceous, micaceous, crossbedded; cuts out coal 50 feet north of KGS 340.
Y	0.95	Clarain, with abundant medium- to thick-banded vitrain.
Y	0.02	Fusain.
Y	0.66	Clarain, with abundant thick-banded vitrain.
Y	0.05	Vitrain.
Y	0.75	Clarain and durain.
N		Siltstone, medium-gray, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: U10020 FIELD NO: KGS 340 U.S.G.S. NO: W210162
LABORATORY: Geo Test REPORT DATE: Nov/11/1981

AIR DRIED LOSS: 0.57%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.81%		
VOLATILE MATTER	36.01%	36.67%	38.74%
FIXED CARBON	56.95%	58.00%	61.26%
ASH	5.23%	5.33%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.48%	5.37%	5.68%
CARBON	78.74%	80.19%	84.70%
NITROGEN	1.52%	1.55%	1.64%
TOTAL SULFUR	0.87%	0.89%	0.94%
OXYGEN	8.16%	6.67%	7.04%
ASH	5.23%	5.33%	
HEATING VALUE (BTU/LB):	14069	14328	15134
SULFUR FORMS:			
SULFATE	0.04%	0.04%	0.04%
PYRITIC	0.15%	0.15%	0.16%
ORGANIC	0.68%	0.69%	0.73%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	7.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.2

COAL SAMPLING REPORT

LABORATORY NO: U10096 FIELD NO: KGS 341 U.S.G.S. NO: W210163
SAMPLER: Currens AGENCY: KGS DATE: May/07/1980
7.5' QUAD: Dorton COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 14 ROW J TIER 84 3200 FT FSL, 450 FT FEL
LATITUDE: 37 DEG 17 MIN 32 SEC LONGITUDE: 82 DEG 33 MIN 06 SEC
ELEVATION (FT): 1688.30, OF POINT AT base of 341, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.3 GEO. MAP COAL NAME: U Elkhorn 3 rdr
REPORTED COAL NAME: U Elkhorn No.3 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): rider
EXPOSURE: TYPE, roadcut; CONDITION, slightly weathered
SAMPLE CONDITION: some clay in cleats
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 7.9, SAMPLE 7.9, COAL ONLY 7.9
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 290, SET 2 360, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	19.69	Siltstone, dark-gray, with thin sandstone beds.
N	0.59	Siltstone, black, carbonaceous.
Y	0.66	Clarain.
N	1.64	Siltstone, light-gray, rooted.
		Upper Elkhorn No. 3 inaccessible, 2.5 m below KGS 341.

COAL ANALYSIS REPORT

LABORATORY NO: U10096 FIELD NO: KGS 341 U.S.G.S. NO: W210163
LABORATORY: Geo Test REPORT DATE: Nov/20/1981

AIR DRIED LOSS: 0.82%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.01%		
VOLATILE MATTER	33.39%	34.07%	36.05%
FIXED CARBON	59.22%	60.43%	63.95%
ASH	5.38%	5.49%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.23%	5.11%	5.40%
CARBON	78.46%	80.07%	84.72%
NITROGEN	1.41%	1.44%	1.52%
TOTAL SULFUR	0.74%	0.76%	0.80%
OXYGEN	8.78%	7.13%	7.56%
ASH	5.38%	5.49%	
HEATING VALUE (BTU/LB):	13831	14115	14935
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.03%	0.03%	0.03%
ORGANIC	0.70%	0.71%	0.76%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	5.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.1

COAL SAMPLING REPORT

LABORATORY NO: U10021 FIELD NO: KGS 342 U.S.G.S. NO: W210164
SAMPLER: Currens AGENCY: KGS DATE: May/07/1980
7.5' QUAD: Pikeville COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 8 ROW K TIER 84 900 FT FSL, 2000 FT FEL
LATITUDE: 37 DEG 23 MIN 9 SEC LONGITUDE: 82 DEG 32 MIN 25 SEC
ELEVATION (FT): 800.00, OF POINT AT base of 342, USING topo
COMMENTARY:
REGIONAL COAL NAME: Millard zone GEO. MAP COAL NAME: Millard
REPORTED COAL NAME: Millard FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, roadcut; CONDITION, 3 years old, faced-up
SAMPLE CONDITION: slightly weathered
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 18.1, SAMPLE 18.1, COAL ONLY 18.1
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	26.25	Sandstone, medium-gray, coarse-grained, crossbedded; sideritic lag gravel at base.
Y	0.95	Clarain, with abundant thick-banded vitrain; pyritic at base.
Y	0.30	Clarain.
Y	0.26	Durain.
N	3.28	Siltstone, light-gray, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: U10021 FIELD NO: KGS 342 U.S.G.S. NO: W210164
LABORATORY: Geo Test REPORT DATE: Nov/11/1981

AIR DRIED LOSS: 0.53%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.90%		
VOLATILE MATTER	35.92%	36.62%	40.31%
FIXED CARBON	53.20%	54.23%	59.70%
ASH	8.98%	9.15%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.45%	5.34%	5.88%
CARBON	74.65%	76.10%	83.76%
NITROGEN	1.80%	1.83%	2.02%
TOTAL SULFUR	1.66%	1.69%	1.86%
OXYGEN	7.46%	5.89%	6.48%
ASH	8.98%	9.15%	
HEATING VALUE (BTU/LB):	13401	13661	15037
SULFUR FORMS:			
SULFATE	0.09%	0.09%	0.10%
PYRITIC	0.79%	0.81%	0.89%
ORGANIC	0.78%	0.80%	0.88%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2170 DEG F
SOFTENING TEMP.	2310 DEG F
FLUID TEMP.	2460 DEG F

FREE SWELLING INDEX	7.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	2.5

COAL SAMPLING REPORT

LABORATORY NO: U10194 FIELD NO: KGS 352 U.S.G.S. NO: W210262
SAMPLER: Currens AGENCY: KGS DATE: May/28/1980
7.5' QUAD: Offutt COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 24 ROW P TIER 83 4700 FT FSL, 2100 FT FEL
LATITUDE: 37 DEG 45 MIN 46 SEC LONGITUDE: 82 DEG 38 MIN 26 SEC
ELEVATION (FT): 1160.00, OF POINT AT base of 352, USING topo
COMMENTARY:
REGIONAL COAL NAME: Broas zone GEO. MAP COAL NAME: Broas
REPORTED COAL NAME: Lower Clarion FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, surface mine; CONDITION, few weeks old, faced-up
SAMPLE CONDITION: fresh, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 29.9, SAMPLE 29.9, COAL ONLY 29.5
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 125, SET 2 220, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	6.56	Coal, inaccessible.
N	8.20	Sandstone, light-gray, medium-grained, micaceous; top 0.5 meter rooted.
N	1.64	Shale, medium-gray, arenaceous, micaceous.
Y	0.07	Durain.
Y	1.21	Clarain, with durain at base, abundant thin-banded vitrain.
Y	0.03	Pyrite.
Y	0.23	Durain.
Y	0.16	Clarain.
Y	0.03	Fusain.
Y	0.26	Clarain.
Y	0.03	Durain.
Y	0.46	Clarain, with abundant thick-banded vitrain.
N		Siltstone, dark-gray, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: U10194 FIELD NO: KGS 352 U.S.G.S. NO: W210262
LABORATORY: Geo Test REPORT DATE: Dec/18/1981

AIR DRIED LOSS: 0.83%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	3.69%		
VOLATILE MATTER	36.21%	37.60%	40.04%
FIXED CARBON	54.22%	56.30%	59.96%
ASH	5.88%	6.11%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.15%	4.92%	5.24%
CARBON	73.79%	76.62%	81.60%
NITROGEN	1.44%	1.50%	1.59%
TOTAL SULFUR	1.31%	1.36%	1.45%
OXYGEN	12.43%	9.49%	10.12%
ASH	5.88%	6.11%	
HEATING VALUE (BTU/LB):	12951	13447	14321
SULFUR FORMS:			
SULFATE	0.03%	0.03%	0.03%
PYRITIC	0.59%	0.61%	0.65%
ORGANIC	0.69%	0.72%	0.76%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2680 DEG F
SOFTENING TEMP.	2750 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	1.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	2.0

COAL SAMPLING REPORT

LABORATORY NO: U10195 FIELD NO: KGS 353 U.S.G.S. NO: W210263
SAMPLER: Currens AGENCY: KGS DATE: May/28/1980
7.5' QUAD: Offutt COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 24 ROW P TIER 83 5300 FT FSL, 3100 FT FEL
LATITUDE: 37 DEG 45 MIN 52 SEC LONGITUDE: 82 DEG 38 MIN 39 SEC
ELEVATION (FT): 1180.00, OF POINT AT base of 353, USING topo
COMMENTARY:
REGIONAL COAL NAME: Richardson zone GEO. MAP COAL NAME: Richardson
REPORTED COAL NAME: Richardson FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, surface mine; CONDITION, 6 weeks old, faced-up
SAMPLE CONDITION: fresh
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 151.2, SAMPLE 142.1, COAL ONLY 142.1
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 130, SET 2 225, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	9.84	Siltstone, medium-gray, sideritic, micaceous.
Y	1.97	Clarain; argillaceous near top.
N	0.46	Siltstone, medium-gray, rooted.
Y	1.84	Durain, very hard, with clarain near top (canneloid).
Y	1.67	Clarain, with scattered medium-banded vitrain; interlaminated with thin durain.
Y	0.23	Clarain, with abundant thick-banded fusain.
Y	1.54	Clarain, with abundant thick-banded vitrain.
N	0.23	Siltstone, black, very carbonaceous.
Y	1.51	Clarain.
Y	0.30	Clarain, with abundant fusain.
N	0.07	Siltstone, dark-gray.
Y	0.30	Clarain, pyritic.
Y	0.33	Durain, argillaceous.
Y	0.89	Clarain, pyritic at top.
Y	0.39	Durain, argillaceous.
Y	0.66	Clarain.
Y	0.23	Durain.
N	0.33	Siltstone, dark-gray, coaly.
N		Siltstone, light-gray, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: U10195 FIELD NO: KGS 353 U.S.G.S. NO: W210263
LABORATORY: Geo Test REPORT DATE: Dec/18/1981

AIR DRIED LOSS: 1.15%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	3.88%		
VOLATILE MATTER	27.89%	29.02%	37.58%
FIXED CARBON	46.33%	48.20%	62.42%
ASH	21.90%	22.78%	
ULTIMATE ANALYSIS:			
HYDROGEN	3.80%	3.50%	4.53%
CARBON	61.45%	63.93%	82.79%
NITROGEN	1.08%	1.12%	1.46%
TOTAL SULFUR	0.41%	0.43%	0.55%
OXYGEN	11.36%	8.24%	10.67%
ASH	21.90%	22.78%	
HEATING VALUE (BTU/LB):	10540	10966	14201
SULFUR FORMS:			
SULFATE	0.02%	0.02%	0.03%
PYRITIC	0.08%	0.08%	0.11%
ORGANIC	0.31%	0.32%	0.42%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	1.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	0.8

COAL SAMPLING REPORT

LABORATORY NO: U10196 FIELD NO: KGS 354 U.S.G.S. NO: W210264
SAMPLER: Currens AGENCY: KGS DATE: May/28/1980
7.5' QUAD: Thomas COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 13 ROW 0 TIER 83 5800 FT FSL, 1700 FT FEL
LATITUDE: 37 DEG 42 MIN 57 SEC LONGITUDE: 82 DEG 37 MIN 21 SEC
ELEVATION (FT): 1020.00, OF POINT AT base of 354, USING survey
COMMENTARY:
REGIONAL COAL NAME: Broas zone GEO. MAP COAL NAME: Broas
REPORTED COAL NAME: Broas FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: clean, dry
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 84.3, SAMPLE 84.2, COAL ONLY 83.1
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 320, SET 2 40, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Siltstone, dark-gray, with abundant plant fragments, pyritic.
Y	0.23	Clarain.
Y	0.10	Siltstone, dark-gray to black, carbonaceous, soft.
Y	1.02	Clarain, with durain near top, pyritic.
Y	0.10	Durain.
Y	0.39	Durain, with abundant medium- to thick-banded vitrain.
Y	1.90	Durain.
Y	0.16	Clarain.
Y	0.16	Durain.
Y	0.10	Clarain.
Y	0.02	Fusain.
Y	0.07	Clarain.
Y	0.05	Fusain.
Y	1.02	Clarain.
Y	0.03	Durain.
Y	1.64	Clarain.
Y	0.03	Durain.
N		Seatrock.

COAL ANALYSIS REPORT

LABORATORY NO: U10196 FIELD NO: KGS 354 U.S.G.S. NO: W210264
LABORATORY: Geo Test REPORT DATE: Dec/18/1981

AIR DRIED LOSS: 0.88%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	3.43%		
VOLATILE MATTER	34.89%	36.13%	39.72%
FIXED CARBON	52.95%	54.83%	60.28%
ASH	8.73%	9.04%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.92%	4.70%	5.16%
CARBON	71.79%	74.34%	81.73%
NITROGEN	1.33%	1.38%	1.51%
TOTAL SULFUR	1.03%	1.07%	1.17%
OXYGEN	12.20%	9.47%	10.43%
ASH	8.73%	9.04%	
HEATING VALUE (BTU/LB):	12661	13111	14413
SULFUR FORMS:			
SULFATE	0.04%	0.04%	0.05%
PYRITIC	0.39%	0.40%	0.44%
ORGANIC	0.60%	0.62%	0.68%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	1.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.6

COAL SAMPLING REPORT

LABORATORY NO: U10053 FIELD NO: KGS 119 U.S.G.S. NO: W210287
SAMPLER: Currens & Kung AGENCY: KGS DATE: Oct/30/1979
7.5' QUAD: Lick Creek COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 3 ROW L TIER 86 300 FT FSL, 600 FT FEL
LATITUDE: 37 DEG 29 MIN 3 SEC LONGITUDE: 82 DEG 22 MIN 7 SEC
ELEVATION (FT): 1167.00, OF POINT AT base of 119, USING survey
COMMENTARY:
REGIONAL COAL NAME: L Elkhorn rdr GEO. MAP COAL NAME: Pond Creek rdr
REPORTED COAL NAME: Pond Creek rdr FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): top split
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: very fresh
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 13.6, SAMPLE 13.6, COAL ONLY 13.6
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Siltstone, medium-gray.
Y	0.13	Clarain.
Y	0.03	Fusain, pyritic.
Y	0.20	Clarain.
Y	0.16	Fusain.
Y	0.46	Clarain, with scattered thin-banded vitrain, abundant thin-banded fusain.
Y	0.08	Vitrain and fusain, equally interlaminated, to 5 mm thick.
Y	0.07	Clarain.
		See KGS 120 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: U10053 FIELD NO: KGS 119 U.S.G.S. NO: W210287
LABORATORY: Geo Test REPORT DATE: Nov/20/1981

AIR DRIED LOSS: 0.26%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.49%		
VOLATILE MATTER	38.13%	38.71%	41.54%
FIXED CARBON	53.66%	54.47%	58.46%
ASH	6.72%	6.82%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.38%	5.29%	5.68%
CARBON	75.42%	76.56%	82.16%
NITROGEN	1.46%	1.48%	1.59%
TOTAL SULFUR	3.65%	3.71%	3.98%
OXYGEN	7.37%	6.14%	6.59%
ASH	6.72%	6.82%	
HEATING VALUE (BTU/LB):	13892	14102	15134
SULFUR FORMS:			
SULFATE	0.13%	0.13%	0.14%
PYRITIC	2.25%	2.28%	2.45%
ORGANIC	1.27%	1.29%	1.38%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2080 DEG F
SOFTENING TEMP.	2150 DEG F
FLUID TEMP.	2310 DEG F

FREE SWELLING INDEX	7.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	5.3

COAL SAMPLING REPORT

LABORATORY NO: U10062 FIELD NO: KGS 120 U.S.G.S. NO: W210288
SAMPLER: Currens & Kung AGENCY: KGS DATE: Oct/30/1979
7.5' QUAD: Lick Creek COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 3 ROW L TIER 86 300 FT FSL, 600 FT FEL
LATITUDE: 37 DEG 29 MIN 3 SEC LONGITUDE: 82 DEG 22 MIN 7 SEC
ELEVATION (FT): 1162.50, OF POINT AT base of 120, USING survey
COMMENTARY:
REGIONAL COAL NAME: L Elkhorn rdr GEO. MAP COAL NAME: Pond Creek rdr
REPORTED COAL NAME: Pond Creek rdr FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): bottom split
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: very fresh
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 42.7, SAMPLE 42.7, COAL ONLY 42.5
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 119.
N	0.85	Siltstone, dark-gray, rooted, with abundant coal streaks.
Y	0.30	Clarain and durain, mixed with scattered thin- to medium-banded vitrain.
Y	0.07	Fusain; thins laterally to 0.005 m.
Y	0.03	Vitrain.
Y	0.02	Fusain.
Y	0.11	Durain, argillaceous, thin, discontinuous, brown, with siltstone parting.
Y	0.33	Clarain, with abundant medium-banded vitrain.
Y	2.30	Durain.
Y	0.33	Clarain, pyritic.
Y	0.01	Pyrite.
Y	0.07	Clarain.
		See KGS 121 (W208208) for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: U10062 FIELD NO: KGS 120 U.S.G.S. NO: W210288
LABORATORY: Geo Test REPORT DATE: Nov/20/1981

AIR DRIED LOSS: 0.32%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.52%		
VOLATILE MATTER	32.53%	33.03%	37.47%
FIXED CARBON	54.29%	55.13%	62.53%
ASH	11.66%	11.84%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.99%	4.89%	5.55%
CARBON	72.68%	73.80%	83.71%
NITROGEN	1.37%	1.39%	1.58%
TOTAL SULFUR	2.02%	2.05%	2.33%
OXYGEN	7.28%	6.03%	6.83%
ASH	11.66%	11.84%	
HEATING VALUE (BTU/LB):	13051	13252	15032
SULFUR FORMS:			
SULFATE	0.03%	0.03%	0.03%
PYRITIC	1.20%	1.22%	1.38%
ORGANIC	0.79%	0.80%	0.91%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2310 DEG F
SOFTENING TEMP.	2540 DEG F
FLUID TEMP.	2650 DEG F

FREE SWELLING INDEX	7.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	3.1

COAL SAMPLING REPORT

LABORATORY NO: U10067 FIELD NO: KGS 313 U.S.G.S. NO: W210293
SAMPLER: Currens AGENCY: KGS DATE: Mar/26/1980
7.5' QUAD: Offutt COUNTY: Johnson DISTRICT: Big Sandy
CARTER COORDINATE: SEC 14 ROW P TIER 82 2700 FT FSL, 150 FT FEL
LATITUDE: 37 DEG 47 MIN 27 SEC LONGITUDE: 82 DEG 43 MIN 2 SEC
ELEVATION (FT): 1020.00, OF POINT AT base of 313, USING topo
COMMENTARY:
REGIONAL COAL NAME: U Peach Orch GEO. MAP COAL NAME: U Peach Orch
REPORTED COAL NAME: U Peach Orch FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): rider
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh, wet
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 5.5, SAMPLE 5.5, COAL ONLY 5.5
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Siltstone, medium-gray, sideritic.
N	0.20	Siltstone, black, highly carbonaceous.
Y	0.46	Canneloid coal, nonlaminated to finely laminated, with conchoidal fracture.
		See KGS 311 (W209895) for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: U10067 FIELD NO: KGS 313 U.S.G.S. NO: W210293
LABORATORY: Geo Test REPORT DATE: Nov/20/1981

AIR DRIED LOSS: 0.76%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.65%		
VOLATILE MATTER	28.87%	29.66%	44.93%
FIXED CARBON	35.38%	36.34%	55.07%
ASH	33.10%	34.00%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.21%	4.02%	6.09%
CARBON	51.00%	52.39%	79.38%
NITROGEN	1.18%	1.21%	1.84%
TOTAL SULFUR	1.72%	1.77%	2.68%
OXYGEN	8.79%	6.61%	10.01%
ASH	33.10%	34.00%	
HEATING VALUE (BTU/LB):	9123	9371	14199
SULFUR FORMS:			
SULFATE	0.05%	0.05%	0.08%
PYRITIC	1.05%	1.08%	1.63%
ORGANIC	0.62%	0.64%	0.96%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2760 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	1.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	3.8

COAL SAMPLING REPORT

LABORATORY NO: U10173 FIELD NO: KGS 359 U.S.G.S. NO: W210315
SAMPLER: Currens AGENCY: KGS DATE: Jun/05/1980
7.5' QUAD: Harold COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 23 ROW M TIER 82 4600 FT FSL, 1500 FT FEL
LATITUDE: 37 DEG 30 MIN 45 SEC LONGITUDE: 82 DEG 42 MIN 19 SEC
ELEVATION (FT): 1140.00, OF POINT AT base of 359, USING topo
COMMENTARY:
REGIONAL COAL NAME: Fire Clay GEO. MAP COAL NAME: Fire Clay
REPORTED COAL NAME: Fire Clay FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, few months old
SAMPLE CONDITION: damp
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 54.5, SAMPLE 49.8, COAL ONLY 49.6
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 110, SET 2 220, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Sandstone.
Y	0.10	Durain.
Y	0.89	Clarain, pyritic.
Y	0.02	Pyrite.
Y	1.05	Clarain, with abundant medium-banded vitrain, pyritic.
N	0.30	Siltstone, dark-brown, hard, brittle, carbonaceous.
Y	0.75	Durain, with scattered thin-banded vitrain.
Y	0.56	Clarain.
N	0.10	Shale, light-gray, with carbonaceous streaks, soft.
Y	0.79	Clarain.
N		Shale, light-gray, silty, rooted, plastic when wet.

COAL ANALYSIS REPORT

LABORATORY NO: U10173 FIELD NO: KGS 359 U.S.G.S. NO: W210315
LABORATORY: Geo Test REPORT DATE: Dec/18/1981

AIR DRIED LOSS: 0.41%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.53%		
VOLATILE MATTER	36.91%	37.87%	41.91%
FIXED CARBON	51.16%	52.49%	58.09%
ASH	9.40%	9.64%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.22%	5.07%	5.61%
CARBON	72.38%	74.26%	82.19%
NITROGEN	1.53%	1.57%	1.74%
TOTAL SULFUR	1.29%	1.32%	1.46%
OXYGEN	10.18%	8.14%	9.00%
ASH	9.40%	9.64%	
HEATING VALUE (BTU/LB):	12899	13234	14647
SULFUR FORMS:			
SULFATE	0.07%	0.07%	0.08%
PYRITIC	0.72%	0.74%	0.82%
ORGANIC	0.50%	0.51%	0.57%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2640 DEG F
SOFTENING TEMP.	2720 DEG F
FLUID TEMP.	2780 DEG F

FREE SWELLING INDEX	3.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	2.0

COAL SAMPLING REPORT

LABORATORY NO: U10174 FIELD NO: KGS 360 U.S.G.S. NO: W210316
SAMPLER: Currens AGENCY: KGS DATE: Jun/05/1980
7.5' QUAD: McDowell COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 4 ROW L TIER 82 5400 FT FSL, 450 FT FEL
LATITUDE: 37 DEG 29 MIN 53 SEC LONGITUDE: 82 DEG 43 MIN 6 SEC
ELEVATION (FT): 838.00, OF POINT AT base of 360, USING survey
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.2 GEO. MAP COAL NAME: U Elkhorn No.2
REPORTED COAL NAME: U Elkhorn No.2 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: fresh, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 32.7, SAMPLE 32.7, COAL ONLY 32.7
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 290, SET 2 190, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Sandstone, dark-gray, micaceous, carbonaceous.
Y	0.62	Clarain, with abundant thick-banded vitrain, pyritic.
Y	0.43	Durain, with abundant medium-banded vitrain, pyritic.
Y	1.67	Clarain, with abundant thin- to medium-banded vitrain, scattered thin- to medium-banded fusain; pyritic.
N		Sandstone, medium-gray, rooted, carbonaceous, with abundant plant fragments.

COAL ANALYSIS REPORT

LABORATORY NO: U10174 FIELD NO: KGS 360 U.S.G.S. NO: W210316
LABORATORY: Geo Test REPORT DATE: Dec/18/1981

AIR DRIED LOSS: 0.40%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.32%		
VOLATILE MATTER	38.82%	39.74%	42.72%
FIXED CARBON	52.06%	53.30%	57.29%
ASH	6.80%	6.96%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.42%	5.28%	5.68%
CARBON	74.72%	76.50%	82.22%
NITROGEN	1.50%	1.54%	1.65%
TOTAL SULFUR	2.36%	2.42%	2.60%
OXYGEN	9.20%	7.30%	7.85%
ASH	6.80%	6.96%	
HEATING VALUE (BTU/LB):	13447	13767	14797
SULFUR FORMS:			
SULFATE	0.08%	0.08%	0.09%
PYRITIC	1.45%	1.48%	1.60%
ORGANIC	0.83%	0.85%	0.91%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2060 DEG F
SOFTENING TEMP.	2140 DEG F
FLUID TEMP.	2240 DEG F

FREE SWELLING INDEX	4.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	3.5

COAL SAMPLING REPORT

LABORATORY NO: U10175 FIELD NO: KGS 361 U.S.G.S. NO: W210317
SAMPLER: Currens AGENCY: KGS DATE: Jun/05/1980
7.5' QUAD: McDowell COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 15 ROW K TIER 83 4600 FT FSL, 3850 FT FEL
LATITUDE: 37 DEG 22 MIN 45 SEC LONGITUDE: 82 DEG 39 MIN 48 SEC
ELEVATION (FT): 1163.80, OF POINT AT base of 361, USING survey
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.3 GEO. MAP COAL NAME: U Elkhorn No.3
REPORTED COAL NAME: U Elkhorn No.3 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): top split
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: fresh, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 32.1, SAMPLE 32.1, COAL ONLY 32.1
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 190, SET 2 100, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Siltstone, dark-gray, carbonaceous, with abundant plant fragments.
Y	0.13	Clarain.
Y	0.16	Durain, argillaceous.
Y	0.46	Clarain, with abundant thin-banded vitrain, scattered thin-banded fusain.
Y	0.10	Durain, with scattered thin-banded vitrain.
Y	1.25	Clarain, with abundant medium-banded vitrain; medium- to thick-banded fusain at base.
Y	0.02	Fusain.
Y	0.56	Clarain, with abundant thin-banded vitrain. See KGS 362 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: U10175 FIELD NO: KGS 361 U.S.G.S. NO: W210317
LABORATORY: Geo Test REPORT DATE: Dec/18/1981

AIR DRIED LOSS: 0.39%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.18%		
VOLATILE MATTER	33.31%	34.05%	37.75%
FIXED CARBON	54.92%	56.14%	62.25%
ASH	9.59%	9.80%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.07%	4.93%	5.47%
CARBON	74.08%	75.73%	83.96%
NITROGEN	1.41%	1.44%	1.60%
TOTAL SULFUR	0.57%	0.58%	0.65%
OXYGEN	9.28%	7.52%	8.32%
ASH	9.59%	9.80%	
HEATING VALUE (BTU/LB):	13077	13369	14822
SULFUR FORMS:			
SULFATE	0.00%	0.00%	0.00%
PYRITIC	0.04%	0.04%	0.05%
ORGANIC	0.53%	0.54%	0.60%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2760 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	4.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	0.9

COAL SAMPLING REPORT

LABORATORY NO: U10176 FIELD NO: KGS 362 U.S.G.S. NO: W210318
SAMPLER: Currens AGENCY: KGS DATE: Jun/05/1980
7.5' QUAD: McDowell COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 15 ROW K TIER 83 4600 FT FSL, 3850 FT FEL
LATITUDE: 37 DEG 22 MIN 45 SEC LONGITUDE: 82 DEG 39 MIN 48 SEC
ELEVATION (FT): 1160.00, OF POINT AT base of 362, USING survey
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.3 GEO. MAP COAL NAME: U Elkhorn No.3
REPORTED COAL NAME: U Elkhorn No.3 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): bottom split
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: fresh, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 27.6, SAMPLE 27.6, COAL ONLY 27.6
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 180, SET 2 90, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 361.
N	1.57	Siltstone, medium-gray, carbonaceous, rooted.
Y	0.95	Clarain, with abundant medium- to thick-banded vitrain.
Y	0.03	Fusain.
Y	1.31	Clarain, with scattered medium-banded fusain.
N		Siltstone, dark-gray, rooted, carbonaceous.

COAL ANALYSIS REPORT

LABORATORY NO: U10176 FIELD NO: KGS 362 U.S.G.S. NO: W210318
LABORATORY: Geo Test REPORT DATE: Dec/18/1981

AIR DRIED LOSS: 0.47%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.29%		
VOLATILE MATTER	35.95%	36.79%	37.64%
FIXED CARBON	59.56%	60.95%	62.36%
ASH	2.20%	2.25%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.55%	5.42%	5.54%
CARBON	80.75%	82.64%	84.55%
NITROGEN	1.51%	1.55%	1.58%
TOTAL SULFUR	0.62%	0.63%	0.65%
OXYGEN	9.37%	7.51%	7.68%
ASH	2.20%	2.25%	
HEATING VALUE (BTU/LB):	14311	14646	14984
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.10%	0.10%	0.10%
ORGANIC	0.51%	0.52%	0.53%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2380 DEG F
SOFTENING TEMP.	2580 DEG F
FLUID TEMP.	2740 DEG F

FREE SWELLING INDEX	4.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	0.9

COAL SAMPLING REPORT

LABORATORY NO: U10177 FIELD NO: KGS 363 U.S.G.S. NO: W210319
SAMPLER: Currens AGENCY: KGS DATE: Jul/05/1980
7.5' QUAD: Wheelwright COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 24 ROW K TIER 82 5300 FT FSL, 150 FT FEL
LATITUDE: 37 DEG 20 MIN 52 SEC LONGITUDE: 82 DEG 43 MIN 2 SEC
ELEVATION (FT): 1120.00, OF POINT AT base of 363, USING survey
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.1 GEO. MAP COAL NAME: U Elkhorn No.1
REPORTED COAL NAME: U Elkhorn No.1 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, mine portal; CONDITION, active
SAMPLE CONDITION: clean, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 57.0, SAMPLE 36.6, COAL ONLY 36.2
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	13.12	Sandstone, light-gray, medium-grained, micaceous, crossbedded.
Y	1.02	Clarain, pyritic.
N	0.20	Siltstone, dark-gray, carbonaceous, laminated.
Y	0.20	Clarain.
N	0.16	Siltstone, dark-gray, carbonaceous, laminated.
Y	0.33	Clarain.
N	1.31	Siltstone, medium-gray, slightly carbonaceous, rooted.
Y	0.79	Clarain, with abundant medium-banded vitrain, pyritic.
Y	0.03	Sandstone, fine-grained.
Y	0.69	Clarain, with abundant medium-banded vitrain.
N		Siltstone, medium-gray.

COAL ANALYSIS REPORT

LABORATORY NO: U10177 FIELD NO: KGS 363 U.S.G.S. NO: W210319
LABORATORY: Geo Test REPORT DATE: Dec/18/1981

AIR DRIED LOSS: 0.83%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	3.40%		
VOLATILE MATTER	33.27%	34.44%	38.07%
FIXED CARBON	54.11%	56.01%	61.92%
ASH	9.22%	9.54%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.09%	4.88%	5.39%
CARBON	72.63%	75.19%	83.12%
NITROGEN	1.43%	1.48%	1.64%
TOTAL SULFUR	0.73%	0.76%	0.84%
OXYGEN	10.90%	8.15%	9.01%
ASH	9.22%	9.54%	
HEATING VALUE (BTU/LB):	12745	13194	14585
SULFUR FORMS:			
SULFATE	0.02%	0.02%	0.02%
PYRITIC	0.15%	0.16%	0.17%
ORGANIC	0.56%	0.58%	0.64%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2400 DEG F
SOFTENING TEMP.	2650 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	1.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.1

COAL SAMPLING REPORT

LABORATORY NO: U10102 FIELD NO: KGS 364 U.S.G.S. NO: W210343
SAMPLER: Currens AGENCY: KGS DATE: Jun/10/1980
7.5' QUAD: Williamson COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 1 ROW N TIER 86 2700 FT FSL, 4200 FT FEL
LATITUDE: 37 DEG 39 MIN 27 SEC LONGITUDE: 82 DEG 20 MIN 52 SEC
ELEVATION (FT): 533.00, OF POINT AT base of 364, USING survey
COMMENTARY:
REGIONAL COAL NAME: Lower Elkhorn GEO. MAP COAL NAME: Pond Creek
REPORTED COAL NAME: Pond Creek FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: fresh, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 43.1, SAMPLE 43.1, COAL ONLY 43.1
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 140, SET 2 220, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	1.18	Siltstone, medium-gray, sideritic, carbonaceous, with abundant plant fragments.
N	0.08	Durain, argillaceous, pyritic, with thin-banded vitrain.
Y	0.66	Clarain, with abundant thin-banded vitrain, scattered durain.
Y	0.07	Durain, with thin-banded vitrain.
Y	2.03	Clarain, with abundant thin- to medium-banded vitrain, scattered medium-banded fusain.
Y	0.02	Fusain.
Y	0.82	Clarain, with abundant thin-banded vitrain, common thick-banded fusain.
N	1.08	Siltstone, black, carbonaceous, laminated, with abundant coal streaks.
N	0.03	Coal.
N	1.64	Siltstone, light-gray, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: U10102 FIELD NO: KGS 364 U.S.G.S. NO: W210343
LABORATORY: Geo Test REPORT DATE: Dec/08/1981

AIR DRIED LOSS: 1.86%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.83%		
VOLATILE MATTER	33.05%	34.01%	37.56%
FIXED CARBON	54.95%	56.55%	62.45%
ASH	9.17%	9.44%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.15%	4.97%	5.49%
CARBON	74.05%	76.20%	84.15%
NITROGEN	1.53%	1.57%	1.74%
TOTAL SULFUR	0.56%	0.58%	0.64%
OXYGEN	9.54%	7.24%	7.98%
ASH	9.17%	9.44%	
HEATING VALUE (BTU/LB):	13084	13465	14869
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.11%	0.11%	0.13%
ORGANIC	0.44%	0.45%	0.50%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2440 DEG F
SOFTENING TEMP.	2550 DEG F
FLUID TEMP.	2660 DEG F

FREE SWELLING INDEX	2.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	0.9

COAL SAMPLING REPORT

LABORATORY NO: U10103 FIELD NO: KGS 365 U.S.G.S. NO: W210344
SAMPLER: Currens AGENCY: KGS DATE: Jun/10/1980
7.5' QUAD: Williamson COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 13 ROW 0 TIER 86 2600 FT FSL, 1150 FT FEL
LATITUDE: 37 DEG 42 MIN 26 SEC LONGITUDE: 82 DEG 22 MIN 14 SEC
ELEVATION (FT): 694.00, OF POINT AT base of 365, USING survey
COMMENTARY:
REGIONAL COAL NAME: Amburgy zone GEO. MAP COAL NAME: Williamson
REPORTED COAL NAME: Williamson FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: fresh, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 44.5, SAMPLE 41.7, COAL ONLY 41.7
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Siltstone, medium-gray, arenaceous.
Y	0.23	Clarain, with abundant medium-banded vitrain.
Y	0.03	Siltstone, dark-gray.
Y	0.43	Clarain, with abundant medium-banded vitrain.
N	0.13	Siltstone, medium-gray, slightly carbonaceous, laminated, hard.
Y	1.31	Clarain, with abundant thin-banded vitrain.
N	0.10	Pyrite.
Y	1.08	Clarain, with abundant thin-banded vitrain.
Y	0.10	Durain.
Y	0.30	Clarain.
N		Siltstone(?).

COAL ANALYSIS REPORT

LABORATORY NO: U10103 FIELD NO: KGS 365 U.S.G.S. NO: W210344
LABORATORY: Geo Test REPORT DATE: Dec/08/1981

AIR DRIED LOSS: 1.55%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.45%		
VOLATILE MATTER	36.61%	37.53%	42.82%
FIXED CARBON	48.88%	50.11%	57.17%
ASH	12.06%	12.36%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.18%	5.03%	5.74%
CARBON	69.78%	71.53%	81.62%
NITROGEN	1.44%	1.48%	1.68%
TOTAL SULFUR	2.33%	2.39%	2.73%
OXYGEN	9.21%	7.21%	8.23%
ASH	12.06%	12.36%	
HEATING VALUE (BTU/LB):	12549	12864	14679
SULFUR FORMS:			
SULFATE	0.13%	0.13%	0.15%
PYRITIC	1.18%	1.21%	1.38%
ORGANIC	1.02%	1.05%	1.19%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2290 DEG F
SOFTENING TEMP.	2500 DEG F
FLUID TEMP.	2600 DEG F

FREE SWELLING INDEX	4.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	3.7

COAL SAMPLING REPORT

LABORATORY NO: U10104 FIELD NO: KGS 366 U.S.G.S. NO: W210345
SAMPLER: Currens AGENCY: KGS DATE: Jun/10/1980
7.5' QUAD: Varney COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 1 ROW N TIER 85 2450 FT FSL, 2700 FT FEL
LATITUDE: 37 DEG 39 MIN 24 SEC LONGITUDE: 82 DEG 25 MIN 34 SEC
ELEVATION (FT): 1526.60, OF POINT AT base of 366, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: Richardson z GEO. MAP COAL NAME: L Richardson
REPORTED COAL NAME: Lower Richardson FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: fresh, dry, mud in cleats
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 69.0, SAMPLE 68.9, COAL ONLY 68.9
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 45, SET 2 310, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	13.12	Sandstone, light-gray, coarse- to medium-grained, crossbedded.
Y	0.59	Clarain, with abundant medium-banded vitrain.
Y	1.54	Durain, with abundant thin- to medium-banded vitrain.
Y	0.10	Durain.
Y	1.44	Clarain; with abundant thin-banded vitrain at base; abundant durain near top.
Y	0.20	Durain, argillaceous.
Y	0.52	Clarain.
Y	0.03	Fusain.
Y	0.43	Durain.
Y	0.07	Fusain.
Y	0.82	Clarain, with abundant thin-banded vitrain.
N		Siltstone.

COAL ANALYSIS REPORT

LABORATORY NO: U10104 FIELD NO: KGS 366 U.S.G.S. NO: W210345
LABORATORY: Geo Test REPORT DATE: Dec/08/1981

AIR DRIED LOSS: 2.51%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	3.63%		
VOLATILE MATTER	35.02%	36.34%	38.20%
FIXED CARBON	56.65%	58.79%	61.80%
ASH	4.70%	4.88%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.22%	5.00%	5.25%
CARBON	75.72%	78.57%	82.60%
NITROGEN	1.54%	1.60%	1.68%
TOTAL SULFUR	0.74%	0.77%	0.81%
OXYGEN	12.08%	9.18%	9.66%
ASH	4.70%	4.88%	
HEATING VALUE (BTU/LB):	13248	13747	14452
SULFUR FORMS:			
SULFATE	0.02%	0.02%	0.02%
PYRITIC	0.10%	0.10%	0.11%
ORGANIC	0.62%	0.64%	0.68%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2700 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	1.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.1

COAL SAMPLING REPORT

LABORATORY NO: U10116 FIELD NO: KGS 369 U.S.G.S. NO: W210428
SAMPLER: Currens AGENCY: KGS DATE: Jun/17/1980
7.5' QUAD: MATEWAN COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 21 ROW M TIER 88 5600 FT FSL, 1700 FT FEL
LATITUDE: 37 DEG 30 MIN 55 SEC LONGITUDE: 82 DEG 10 MIN 21 SEC
ELEVATION (FT): 1845.60, OF POINT AT base of 369, USING altimeter
COMMENTARY: New prospect in an old surface mine
REGIONAL COAL NAME: Fire Clay GEO. MAP COAL NAME: Fire Clay
REPORTED COAL NAME: Fire Clay FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, prospect; CONDITION, 6 months old
SAMPLE CONDITION: slightly weathered, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x3 in.
THICKNESS (INCHES): SEAM HEIGHT 58.0, SAMPLE 44.1, COAL ONLY 44.1
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 50, SET 2 130, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 370.
N	12.80	Siltstone, medium-gray, sideritic, with abundant thin coal beds and plant fragments; arenaceous at base; rooted and plastic at top.
Y	0.72	Clarain.
N	0.10	Siltstone, dark-gray, carbonaceous, laminated.
Y	1.05	Clarain; grades to durain at top; abundant medium-banded vitrain at base.
N	0.92	Sandstone, dark-gray, argillaceous, carbonaceous, rooted.
Y	0.49	Clarain, with abundant thick-banded vitrain.
N	0.10	Siltstone, dark-gray, brittle.
Y	0.20	Clarain.
Y	0.07	Clarain, highly pyritic.
Y	1.15	Clarain, with abundant medium- to thick-banded vitrain.
N	0.07	Siltstone, dark-gray, laminated.
N	0.10	Coal.
N		Siltstone, light-gray, rooted, plastic when wet.

COAL ANALYSIS REPORT

LABORATORY NO: U10116 FIELD NO: KGS 369 U.S.G.S. NO: W210428
LABORATORY: Geo Test REPORT DATE: Dec/08/1981

AIR DRIED LOSS: 0.23%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.45%		
VOLATILE MATTER	35.58%	36.10%	38.76%
FIXED CARBON	56.22%	57.05%	61.24%
ASH	6.75%	6.85%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.35%	5.26%	5.65%
CARBON	77.79%	78.93%	84.74%
NITROGEN	1.64%	1.66%	1.79%
TOTAL SULFUR	0.81%	0.82%	0.88%
OXYGEN	7.66%	6.48%	6.94%
ASH	6.75%	6.85%	
HEATING VALUE (BTU/LB):	13912	14117	15154
SULFUR FORMS:			
SULFATE	0.03%	0.03%	0.03%
PYRITIC	0.15%	0.15%	0.16%
ORGANIC	0.63%	0.64%	0.69%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	7.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.2

COAL SAMPLING REPORT

LABORATORY NO: U10001 FIELD NO: KGS 370 U.S.G.S. NO: W210429
SAMPLER: Currens AGENCY: KGS DATE: Jun/17/1980
7.5' QUAD: Matewan COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 21 ROW M TIER 88 5850 FT FSL, 1700 FT FEL
LATITUDE: 37 DEG 30 MIN 58 SEC LONGITUDE: 82 DEG 10 MIN 21 SEC
ELEVATION (FT): 1863.20, OF POINT AT base of 370, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: Fire Clay rdr GEO. MAP COAL NAME: Fire Clay rdr
REPORTED COAL NAME: Fire Clay rdr FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, prospect; CONDITION, faced-up
SAMPLE CONDITION: slightly weathered
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 44.1, SAMPLE 35.0, COAL ONLY 35.0
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 310, SET 2 240, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 371.
N	41.01	Sandstone, light-gray?, medium- to coarse-grained, massive, covered with dried mud; outcrop obscured.
N	0.85	Shale, sideritic.
Y	1.38	Clarain, with scattered thin-banded fusain, abundant medium-banded vitrain.
N	0.75	Siltstone, dark-gray, rooted; with abundant thin coal beds, 1 to 2 cm thick.
Y	1.54	Clarain, with abundant medium- to thick-banded vitrain.
		See KGS 369 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: U10001 FIELD NO: KGS 370 U.S.G.S. NO: W210429
LABORATORY: Geo Test REPORT DATE: Nov/11/1981

AIR DRIED LOSS: 0.17%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.97%		
VOLATILE MATTER	36.99%	37.73%	41.04%
FIXED CARBON	53.15%	54.22%	58.96%
ASH	7.89%	8.05%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.40%	5.28%	5.75%
CARBON	76.29%	77.82%	84.64%
NITROGEN	1.89%	1.93%	2.10%
TOTAL SULFUR	1.60%	1.63%	1.78%
OXYGEN	6.93%	5.29%	5.73%
ASH	7.89%	8.05%	
HEATING VALUE (BTU/LB):	13673	13948	15169
SULFUR FORMS:			
SULFATE	0.06%	0.06%	0.07%
PYRITIC	0.84%	0.86%	0.93%
ORGANIC	0.70%	0.71%	0.78%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2230 DEG F
SOFTENING TEMP.	2310 DEG F
FLUID TEMP.	2520 DEG F

FREE SWELLING INDEX	7.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	2.3

COAL SAMPLING REPORT

LABORATORY NO: U10002 FIELD NO: KGS 371 U.S.G.S. NO: W210430
SAMPLER: Currens AGENCY: KGS DATE: Jun/17/1980
7.5' QUAD: Matewan COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 21 ROW M TIER 88 5850 FT FSL, 1800 FT FEL
LATITUDE: 37 DEG 30 MIN 58 SEC LONGITUDE: 82 DEG 10 MIN 22 SEC
ELEVATION (FT): 1908.70, OF POINT AT base of 371, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: Hamlin zone GEO. MAP COAL NAME: Hamlin
REPORTED COAL NAME: Hamlin FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, prospect; CONDITION, 1 year old, faced-up
SAMPLE CONDITION: weathered
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 45.3, SAMPLE 38.6, COAL ONLY 38.6
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 320, SET 2 50, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	9.84	Sandstone, coarse-grained, massive.
N	6.56	Siltstone, medium-gray, arenaceous, sideritic.
Y	0.66	Clarain, with abundant medium-banded vitrain.
N	0.56	Siltstone, dark-gray, rooted, with coal streaks to 2 cm thick.
Y	0.43	Durain.
Y	2.13	Clarain, with abundant medium-banded vitrain. See KGS 370 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: U10002 FIELD NO: KGS 371 U.S.G.S. NO: W210430
LABORATORY: Geo Test REPORT DATE: Nov/11/1981

AIR DRIED LOSS: 0.19%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.56%		
VOLATILE MATTER	30.38%	31.18%	37.61%
FIXED CARBON	50.39%	51.72%	62.39%
ASH	16.67%	17.11%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.60%	4.43%	5.34%
CARBON	67.87%	69.65%	84.03%
NITROGEN	1.46%	1.50%	1.81%
TOTAL SULFUR	0.64%	0.66%	0.79%
OXYGEN	8.76%	6.65%	8.03%
ASH	16.67%	17.11%	
HEATING VALUE (BTU/LB):	11751	12060	14549
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.09%	0.09%	0.11%
ORGANIC	0.54%	0.55%	0.67%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	2.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.1

COAL SAMPLING REPORT

LABORATORY NO: U10003 FIELD NO: KGS 372 U.S.G.S. NO: W210431
SAMPLER: Currens AGENCY: KGS DATE: Jun/17/1980
7.5' QUAD: Matewan COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 25 ROW M TIER 89 5450 FT FSL, 4450 FT FEL
LATITUDE: 37 DEG 30 MIN 54 SEC LONGITUDE: 82 DEG 9 MIN 55 SEC
ELEVATION (FT): 1340.00, OF POINT AT base of 372, USING altimeter
COMMENTARY: Barometric elevation not adjusted for atmospheric changes.
REGIONAL COAL NAME: Lower Elkhorn GEO. MAP COAL NAME: Pond Creek
REPORTED COAL NAME: Pond Creek FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): top split
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 32.7, SAMPLE 32.7, COAL ONLY 32.7
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 20, SET 2 90, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	16.40	Sandstone, medium-gray, medium-grained.
N	3.28	Siltstone, medium-gray.
Y	1.38	Clarain, with abundant medium-banded vitrain, pyritic.
Y	0.10	Durain.
Y	0.49	Clarain.
Y	0.23	Durain.
Y	0.52	Clarain, with scattered medium-banded fusain, pyritic.
N		Siltstone.

COAL ANALYSIS REPORT

LABORATORY NO: U10003 FIELD NO: KGS 372 U.S.G.S. NO: W210431
LABORATORY: Geo Test REPORT DATE: Nov/11/1981

AIR DRIED LOSS: 0.16%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.85%		
VOLATILE MATTER	32.14%	32.74%	34.54%
FIXED CARBON	60.90%	62.04%	65.46%
ASH	5.11%	5.21%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.23%	5.12%	5.40%
CARBON	80.44%	81.95%	86.46%
NITROGEN	1.56%	1.59%	1.68%
TOTAL SULFUR	0.85%	0.87%	0.91%
OXYGEN	6.81%	5.26%	5.55%
ASH	5.11%	5.21%	
HEATING VALUE (BTU/LB):	14196	14463	15258
SULFUR FORMS:			
SULFATE	0.03%	0.03%	0.03%
PYRITIC	0.12%	0.12%	0.13%
ORGANIC	0.70%	0.71%	0.75%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2740 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	8.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.2

COAL SAMPLING REPORT

LABORATORY NO: U10117 FIELD NO: KGS 375 U.S.G.S. NO: W210501
SAMPLER: Currens AGENCY: KGS DATE: Jul/02/1980
7.5' QUAD: Inez COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 8 ROW P TIER 84 1700 FT FSL, 1600 FT FEL
LATITUDE: 37 DEG 48 MIN 17 SEC LONGITUDE: 82 DEG 32 MIN 20 SEC
ELEVATION (FT): 1040.00, OF POINT AT base of 375, USING topo
COMMENTARY:
REGIONAL COAL NAME: U Peach Orch GEO. MAP COAL NAME: U Peach Orch
REPORTED COAL NAME: U Peach Orchard FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): middle split
EXPOSURE: TYPE, surface mine; CONDITION, 6 weeks old
SAMPLE CONDITION: fresh, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 25.6, SAMPLE 25.6, COAL ONLY 25.6
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 150, SET 2 240, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 376.
N	1.71	Shale, medium-gray, rooted, slightly carbonaceous, plastic when wet.
N	2.30	Siltstone.
Y	2.13	Clarain, with abundant medium-banded vitrain, slightly pyritic.
N	0.52	Siltstone, dark-gray, rooted.
N	0.59	Clarain.
N	2.30	Siltstone, medium-gray, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: U10117 FIELD NO: KGS 375 U.S.G.S. NO: W210501
LABORATORY: Geo Test REPORT DATE: Dec/08/1981

AIR DRIED LOSS: 0.90%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	3.50%		
VOLATILE MATTER	33.96%	35.19%	37.18%
FIXED CARBON	57.37%	59.45%	62.81%
ASH	5.17%	5.36%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.23%	5.01%	5.30%
CARBON	74.88%	77.60%	81.99%
NITROGEN	1.50%	1.55%	1.64%
TOTAL SULFUR	0.81%	0.84%	0.89%
OXYGEN	12.41%	9.64%	10.18%
ASH	5.17%	5.36%	
HEATING VALUE (BTU/LB):	13253	13734	14511
SULFUR FORMS:			
SULFATE	0.03%	0.03%	0.03%
PYRITIC	0.21%	0.22%	0.23%
ORGANIC	0.57%	0.59%	0.62%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2780 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	1.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.2

COAL SAMPLING REPORT

LABORATORY NO: U10118 FIELD NO: KGS 376 U.S.G.S. NO: W210502
SAMPLER: Currens AGENCY: KGS DATE: Jul/02/1980
7.5' QUAD: Inez COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 8 ROW P TIER 84 2350 FT FSL, 2250 FT FEL
LATITUDE: 37 DEG 48 MIN 23 SEC LONGITUDE: 82 DEG 32 MIN 28 SEC
ELEVATION (FT): 1040.00, OF POINT AT base of 375, USING topo
COMMENTARY:
REGIONAL COAL NAME: U Peach Orch GEO. MAP COAL NAME: U Peach Orch
REPORTED COAL NAME: U Peach Orchard FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): top split
EXPOSURE: TYPE, prospect; CONDITION, active
SAMPLE CONDITION: fresh, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 52.4, SAMPLE 52.4, COAL ONLY 52.4
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 150, SET 2 240, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	6.56	Siltstone, medium-gray, sideritic.
Y	1.54	Clarain, with scattered thin-banded vitrain; 3-cm-thick durain in middle.
Y	0.59	Durain, with scattered thin-banded vitrain at base; argillaceous at top.
Y	0.33	Clarain.
Y	0.36	Durain.
Y	1.54	Clarain, with abundant, thick-banded vitrain. See KGS 375 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: U10118 FIELD NO: KGS 376 U.S.G.S. NO: W210502
LABORATORY: Geo Test REPORT DATE: Dec/08/1981

AIR DRIED LOSS: 0.88%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	3.42%		
VOLATILE MATTER	33.94%	35.14%	39.65%
FIXED CARBON	51.66%	53.49%	60.35%
ASH	10.98%	11.37%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.93%	4.71%	5.31%
CARBON	69.31%	71.76%	80.97%
NITROGEN	1.47%	1.52%	1.72%
TOTAL SULFUR	0.70%	0.72%	0.82%
OXYGEN	12.61%	9.92%	11.18%
ASH	10.98%	11.37%	
HEATING VALUE (BTU/LB):	12161	12592	14207
SULFUR FORMS:			
SULFATE	0.02%	0.02%	0.02%
PYRITIC	0.09%	0.09%	0.11%
ORGANIC	0.59%	0.61%	0.69%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	1.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.2

COAL SAMPLING REPORT

LABORATORY NO: U10036 FIELD NO: KGS 392 U.S.G.S. NO: W211630
SAMPLER: Currens AGENCY: KGS DATE: Aug/06/1980
7.5' QUAD: McDowell COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 4 ROW K TIER 82 3500 FT FSL, 3200 FT FEL
LATITUDE: 37 DEG 24 MIN 35 SEC LONGITUDE: 82 DEG 43 MIN 40 SEC
ELEVATION (FT): 1009.00, OF POINT AT base of 392, USING survey
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.2 GEO. MAP COAL NAME: U Elkhorn No.2
REPORTED COAL NAME: U Elkhorn No.2 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: fresh, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 38.6, SAMPLE 38.6, COAL ONLY 38.4
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 60, SET 2 340, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Sandstone, coarse-grained, massive, with abundant plant fragments, pyritic, cuts out black shale.
Y	0.30	Clarain, medium- to thick-banded vitrain; some durain at base; pyritic.
Y	0.02	Pyrite, nodular.
Y	0.89	Clarain, with scattered thin-banded vitrain, abundant thick-banded fusain, pyritic.
Y	0.02	Fusain.
Y	2.00	Clarain, with abundant thin-banded vitrain, common thin-banded fusain.
N		Siltstone, dark-gray, hard.

COAL ANALYSIS REPORT

LABORATORY NO: U10036 FIELD NO: KGS 392 U.S.G.S. NO: W211630
LABORATORY: Geo Test REPORT DATE: Nov/11/1981

AIR DRIED LOSS: 0.36%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.23%		
VOLATILE MATTER	37.04%	37.88%	41.45%
FIXED CARBON	52.32%	53.51%	58.55%
ASH	8.41%	8.60%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.28%	5.15%	5.63%
CARBON	73.40%	75.07%	82.14%
NITROGEN	1.60%	1.64%	1.79%
TOTAL SULFUR	3.18%	3.25%	3.56%
OXYGEN	8.13%	6.29%	6.88%
ASH	8.41%	8.60%	
HEATING VALUE (BTU/LB):	13156	13456	14723
SULFUR FORMS:			
SULFATE	0.09%	0.09%	0.10%
PYRITIC	2.22%	2.27%	2.48%
ORGANIC	0.87%	0.89%	0.97%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2080 DEG F
SOFTENING TEMP.	2300 DEG F
FLUID TEMP.	2400 DEG F

FREE SWELLING INDEX	5.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	4.8

COAL SAMPLING REPORT

LABORATORY NO: U10039 FIELD NO: KGS 385 U.S.G.S. NO: W211634
SAMPLER: Currens AGENCY: KGS DATE: Aug/12/1980
7.5' QUAD: Kermit COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 23 ROW P TIER 85 5500 FT FSL, 4500 FT FEL
LATITUDE: 37 DEG 45 MIN 54 SEC LONGITUDE: 82 DEG 27 MIN 56 SEC
ELEVATION (FT): 973.80, OF POINT AT base of 385, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: Broas zone GEO. MAP COAL NAME: Broas
REPORTED COAL NAME: Stockton FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, surface mine; CONDITION, 4 weeks old, faced-up
SAMPLE CONDITION: dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 62.6, SAMPLE 61.4, COAL ONLY 61.0
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 340, SET 2 60, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	16.40	Sandstone.
N	6.56	Siltstone, medium-gray.
N	9.84	Sandstone, light-gray, coarse-grained, large-scale longitudinal crossbedding, with abundant thin coal beds.
N	4.92	Siltstone; arenaceous towards top.
Y	0.49	Clarain, with abundant medium-banded vitrain.
N	0.10	Siltstone, dark-gray to dark-brown, laminated to rooted.
Y	0.95	Clarain, with abundant medium-banded vitrain, pyritic.
Y	0.03	Fusain.
Y	0.36	Clarain.
Y	0.03	Siltstone, dark-gray to brown, laminated.
Y	0.52	Clarain, with abundant medium-banded vitrain, scattered thin-banded pyritic fusain.
Y	0.49	Durain, argillaceous.
Y	0.56	Clarain, with scattered durain.
Y	1.02	Clarain, with abundant thin-banded vitrain, scattered thin-banded fusain.
Y	0.66	Durain, with scattered thin-banded vitrain; argillaceous at top.
N		Siltstone, medium-gray, rooted, plastic when wet.

COAL ANALYSIS REPORT

LABORATORY NO: U10039 FIELD NO: KGS 385 U.S.G.S. NO: W211634
LABORATORY: Geo Test REPORT DATE: Nov/11/1981

AIR DRIED LOSS: 0.37%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	3.04%		
VOLATILE MATTER	34.37%	35.45%	40.11%
FIXED CARBON	51.32%	52.93%	59.89%
ASH	11.27%	11.62%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.81%	4.61%	5.22%
CARBON	70.69%	72.91%	82.50%
NITROGEN	1.37%	1.41%	1.60%
TOTAL SULFUR	0.63%	0.65%	0.74%
OXYGEN	11.23%	8.80%	9.94%
ASH	11.27%	11.62%	
HEATING VALUE (BTU/LB):	12452	12843	14532
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.06%	0.06%	0.07%
ORGANIC	0.56%	0.58%	0.65%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	1.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.0

COAL SAMPLING REPORT

LABORATORY NO: U10040 FIELD NO: KGS 386 U.S.G.S. NO: W211635
SAMPLER: Currens AGENCY: KGS DATE: Aug/12/1980
7.5' QUAD: Kermit COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 25 ROW P TIER 85 350 FT FSL, 1450 FT FEL
LATITUDE: 37 DEG 45 MIN 3 SEC LONGITUDE: 82 DEG 29 MIN 18 SEC
ELEVATION (FT): 943.00, OF POINT AT base of 386, USING survey
COMMENTARY:
REGIONAL COAL NAME: Peach Orchard z GEO. MAP COAL NAME: Peach Orchard
REPORTED COAL NAME: Peach Orchard FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): top split
EXPOSURE: TYPE, surface mine; CONDITION, 4 weeks, old, faced-up
SAMPLE CONDITION: dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 37.8, SAMPLE 37.8, COAL ONLY 37.8
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 240, SET 2 330, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Coal (Broas).
N	32.81	Sandstone, buff, coarse-grained, massive (crossbedding indistinct); rooted at top; argillaceous (ganister ?).
N	16.40	Sandstone, medium-gray, fines upward, flaser-bedded.
N	0.26	Siltstone, black, carbonaceous, laminated.
Y	0.36	Clarain, with abundant medium-banded vitrain.
Y	0.13	Durain, very argillaceous.
Y	0.62	Clarain, with abundant medium-banded vitrain, scattered thin-banded fusain.
Y	0.23	Vitrain, medium- to thick-banded.
Y	0.49	Durain, with scattered thin-banded vitrain; 0.005-meter fusain 4 cm from top.
Y	1.31	Clarain, with abundant medium-banded vitrain, durain near base.
N	0.98	Siltstone, medium-gray, arenaceous, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: U10040 FIELD NO: KGS 386 U.S.G.S. NO: W211635
LABORATORY: Geo Test REPORT DATE: Nov/11/1981

AIR DRIED LOSS: 0.36%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.85%		
VOLATILE MATTER	34.06%	35.06%	41.14%
FIXED CARBON	48.73%	50.16%	58.86%
ASH	14.36%	14.78%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.80%	4.61%	5.41%
CARBON	67.86%	69.85%	81.97%
NITROGEN	1.52%	1.56%	1.84%
TOTAL SULFUR	0.89%	0.92%	1.08%
OXYGEN	10.57%	8.28%	9.70%
ASH	14.36%	14.78%	
HEATING VALUE (BTU/LB):	11953	12303	14438
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.28%	0.29%	0.34%
ORGANIC	0.60%	0.62%	0.72%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	1.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.5

COAL SAMPLING REPORT

LABORATORY NO: U10041 FIELD NO: KGS 389 U.S.G.S. NO: W211636
SAMPLER: Currens AGENCY: KGS DATE: Aug/13/1980
7.5' QUAD: Naugatuck COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 13 ROW P TIER 86 5000 FT FSL, 500 FT FEL
LATITUDE: 37 DEG 47 MIN 49 SEC LONGITUDE: 82 DEG 22 MIN 6 SEC
ELEVATION (FT): 381.00, OF POINT AT base of 389, USING survey
COMMENTARY:
REGIONAL COAL NAME: Lower Elkhorn GEO. MAP COAL NAME: Pond Creek
REPORTED COAL NAME: Pond Creek FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: fresh, dry, clean
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 63.8, SAMPLE 61.0, COAL ONLY 60.6
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 230, SET 2 135, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Siltstone, black, laminated, with scattered pyritized plant fragments.
Y	2.03	Clarain, with durain streaks toward top, abundant thin- to medium-banded vitrain.
Y	0.16	Durain, with thin-banded vitrain.
Y	1.08	Clarain, with abundant medium-banded vitrain.
Y	0.16	Durain.
N	0.13	Siltstone, light-gray.
Y	0.46	Clarain, with abundant thin-banded vitrain.
N	0.10	Siltstone, black, grades to durain.
Y	0.36	Clarain.
Y	0.03	Siltstone.
Y	0.03	Vitrain.
Y	0.26	Durain.
Y	0.49	Clarain, pyritic.
N		Siltstone, arenaceous, dark-gray, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: U10041 FIELD NO: KGS 389 U.S.G.S. NO: W211636
LABORATORY: Geo Test REPORT DATE: Nov/11/1981

AIR DRIED LOSS: 0.32%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.10%		
VOLATILE MATTER	36.38%	37.16%	41.52%
FIXED CARBON	51.23%	52.33%	58.47%
ASH	10.29%	10.51%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.10%	4.97%	5.55%
CARBON	73.61%	75.19%	84.02%
NITROGEN	1.56%	1.59%	1.78%
TOTAL SULFUR	0.86%	0.88%	0.98%
OXYGEN	8.58%	6.86%	7.67%
ASH	10.29%	10.51%	
HEATING VALUE (BTU/LB):	12953	13232	14785
SULFUR FORMS:			
SULFATE	0.00%	0.00%	0.00%
PYRITIC	0.20%	0.20%	0.23%
ORGANIC	0.66%	0.67%	0.75%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2460 DEG F
SOFTENING TEMP.	2560 DEG F
FLUID TEMP.	2680 DEG F

FREE SWELLING INDEX	4.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.3

COAL SAMPLING REPORT

LABORATORY NO: U10042 FIELD NO: KGS 396 U.S.G.S. NO: W211637
SAMPLER: Currens AGENCY: KGS DATE: Aug/13/1980
7.5' QUAD: Naugatuck COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 12 ROW P TIER 86 3200 FT FSL, 1850 FT FEL
LATITUDE: 37 DEG 47 MIN 32 SEC LONGITUDE: 82 DEG 21 MIN 23 SEC
ELEVATION (FT): 415.00, OF POINT AT base of 396, USING survey
COMMENTARY:
REGIONAL COAL NAME: Lower Elkhorn GEO. MAP COAL NAME: Pond Creek
REPORTED COAL NAME: Pond Creek FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: fresh, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 61.0, SAMPLE 60.8, COAL ONLY 60.6
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 320, SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
Y	0.52	Clarain.
Y	0.02	Pyrite.
Y	0.43	Durain.
Y	1.02	Clarain, with abundant thin-banded vitrain.
Y	0.02	Fusain.
Y	0.03	Clarain.
Y	0.02	Fusain.
Y	1.28	Clarain, with abundant thin- to medium-banded vitrain.
Y	0.16	Durain.
Y	0.85	Clarain.
Y	0.72	Durain.
N		Siltstone.

COAL ANALYSIS REPORT

LABORATORY NO: U10042 FIELD NO: KGS 396 U.S.G.S. NO: W211637
LABORATORY: Geo Test REPORT DATE: Nov/11/1981

AIR DRIED LOSS: 0.19%

	AS RECIEVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.92%		
VOLATILE MATTER	36.47%	37.18%	40.38%
FIXED CARBON	53.84%	54.90%	59.62%
ASH	7.77%	7.92%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.15%	5.03%	5.46%
CARBON	75.32%	76.80%	83.40%
NITROGEN	1.65%	1.68%	1.83%
TOTAL SULFUR	1.73%	1.76%	1.92%
OXYGEN	8.38%	6.81%	7.39%
ASH	7.77%	7.92%	
HEATING VALUE (BTU/LB):	13408	13671	14847
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.89%	0.91%	0.99%
ORGANIC	0.83%	0.85%	0.92%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2260 DEG F
SOFTENING TEMP.	2480 DEG F
FLUID TEMP.	2600 DEG F

FREE SWELLING INDEX	5.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	2.6

COAL SAMPLING REPORT

LABORATORY NO: U10028 FIELD NO: KGS 414 U.S.G.S. NO: W211685
SAMPLER: Currens AGENCY: KGS DATE: Sep/09/1980
7.5' QUAD: Thomas COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 10 ROW 0 TIER 84 3600 FT FSL, 3900 FT FEL
LATITUDE: 37 DEG 43 MIN 36 SEC LONGITUDE: 82 DEG 30 MIN 49 SEC
ELEVATION (FT): 335.00, OF POINT AT base of 414, USING survey
COMMENTARY:
REGIONAL COAL NAME: Lower Elkhorn GEO. MAP COAL NAME: Pond Creek
REPORTED COAL NAME: Pond Creek FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: dry, very fresh
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 58.7, SAMPLE 46.9, COAL ONLY 46.9
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 250, SET 2 150?, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Siltstone, medium-gray, sideritic, slightly carbonaceous.
Y	0.62	Durain, with scattered medium-banded vitrain.
Y	0.39	Clarain, with scattered medium-banded vitrain.
Y	0.03	Fusain.
Y	0.07	Clarain, pyritic.
Y	0.03	Fusain.
Y	0.05	Clarain.
Y	0.02	Fusain.
Y	1.28	Clarain, with abundant thin-banded vitrain, scattered medium-banded fusain, abundant medium-banded pyrite; scattered durain zones near top.
Y	0.20	Durain.
Y	0.36	Clarain, with scattered interbedded durain, slightly pyritic.
N	0.98	Siltstone, medium-gray, rooted.
Y	0.13	Durain.
Y	0.72	Clarain, with very abundant thin-banded vitrain, scattered thin-banded fusain.
N	1.15	Siltstone, medium- to light-gray, rooted, plastic when wet.

COAL ANALYSIS REPORT

LABORATORY NO: U10028 FIELD NO: KGS 414 U.S.G.S. NO: W211685
LABORATORY: Geo Test REPORT DATE: Nov/11/1981

AIR DRIED LOSS: 0.34%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.15%		
VOLATILE MATTER	36.88%	37.69%	40.97%
FIXED CARBON	53.14%	54.31%	59.03%
ASH	7.83%	8.00%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.36%	5.23%	5.69%
CARBON	74.18%	75.81%	82.41%
NITROGEN	1.68%	1.72%	1.87%
TOTAL SULFUR	1.17%	1.20%	1.30%
OXYGEN	9.78%	8.04%	8.73%
ASH	7.83%	8.00%	
HEATING VALUE (BTU/LB):	13233	13524	14701
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.52%	0.53%	0.58%
ORGANIC	0.64%	0.65%	0.71%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2580 DEG F
SOFTENING TEMP.	2700 DEG F
FLUID TEMP.	2760 DEG F

FREE SWELLING INDEX	3.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.8

COAL SAMPLING REPORT

LABORATORY NO: U10029 FIELD NO: KGS 415 U.S.G.S. NO: W211686
SAMPLER: Currens AGENCY: KGS DATE: Sep/09/1980
7.5' QUAD: Thomas COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 6 ROW 0 TIER 84 1600 FT FSL, 3450 FT FEL
LATITUDE: 37 DEG 43 MIN 16 SEC LONGITUDE: 82 DEG 34 MIN 43 SEC
ELEVATION (FT): 1126.00, OF POINT AT base of 415, USING survey
COMMENTARY:
REGIONAL COAL NAME: Broas zone GEO. MAP COAL NAME: Broas
REPORTED COAL NAME: Stockton FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: fresh, wet
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 52.6, SAMPLE 52.6, COAL ONLY 51.8
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 110, SET 2 205, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Siltstone, light-gray, with abundant plant fragments.
Y	0.26	Clarain, with abundant medium-banded vitrain, pyritic at top.
Y	0.07	Siltstone, and coal streaks.
Y	0.92	Clarain, with abundant medium-banded vitrain, scattered medium-banded fusain, pyritic.
Y	0.02	Fusain.
Y	0.62	Clarain, with abundant medium-banded vitrain, scattered thin-banded fusain.
Y	0.33	Durain.
Y	0.62	Clarain.
Y	0.69	Durain.
Y	0.85	Clarain.
N		Siltstone, rooted?

COAL ANALYSIS REPORT

LABORATORY NO: U10029 FIELD NO: KGS 415 U.S.G.S. NO: W211686
LABORATORY: Geo Test REPORT DATE: Nov/11/1981

AIR DRIED LOSS: 0.74%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.85%		
VOLATILE MATTER	33.33%	34.31%	40.36%
FIXED CARBON	49.26%	50.70%	59.64%
ASH	14.56%	14.99%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.87%	4.68%	5.51%
CARBON	67.40%	69.37%	81.61%
NITROGEN	1.37%	1.41%	1.66%
TOTAL SULFUR	0.83%	0.85%	1.00%
OXYGEN	10.97%	8.70%	10.22%
ASH	14.56%	14.99%	
HEATING VALUE (BTU/LB):	11890	12238	14396
SULFUR FORMS:			
SULFATE	0.02%	0.02%	0.02%
PYRITIC	0.22%	0.23%	0.27%
ORGANIC	0.59%	0.61%	0.71%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	1.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.4

COAL SAMPLING REPORT

LABORATORY NO: U10030 FIELD NO: KGS 416 U.S.G.S. NO: W211687
SAMPLER: Currens AGENCY: KGS DATE: Sep/10/1980
7.5' QUAD: Kermit COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 23 ROW P TIER 85 600 FT FSL, 2200 FT FEL
LATITUDE: 37 DEG 45 MIN 6 SEC LONGITUDE: 82 DEG 27 MIN 27 SEC
ELEVATION (FT): 951.00, OF POINT AT base of 416, USING topo
COMMENTARY:
REGIONAL COAL NAME: Peach Orchard z GEO. MAP COAL NAME: Peach Orchard
REPORTED COAL NAME: Peach Orchard FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): middle split
EXPOSURE: TYPE, surface mine; CONDITION, 1 week old
SAMPLE CONDITION: fresh, damp, slightly muddy
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 28.3, SAMPLE 25.2, COAL ONLY 25.2
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 250, SET 2 340, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	1.64	Coal.
N	32.81	Sandstone, coarse-grained, massive, with no lag gravel, trough crossbedded at base.
N	4.27	Siltstone, light-gray, rooted, with interbedded thin coals up to 0.1 meter thick.
N	2.79	Coal (Horizon KGS 386 [W211635]).
N	2.33	Siltstone, dark-gray, coaly, rooted.
Y	1.57	Clarain, with abundant medium- to thick-banded vitrain.
N	0.13	Siltstone, black, carbonaceous.
Y	0.23	Clarain.
N	0.13	Siltstone, black, carbonaceous.
Y	0.30	Clarain.
		See KGS 417 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: U10030 FIELD NO: KGS 416 U.S.G.S. NO: W211687
LABORATORY: Geo Test REPORT DATE: Nov/11/1981

AIR DRIED LOSS: 0.57%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.53%		
VOLATILE MATTER	36.59%	37.54%	41.26%
FIXED CARBON	52.09%	53.44%	58.74%
ASH	8.79%	9.02%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.16%	5.00%	5.50%
CARBON	73.27%	75.18%	82.62%
NITROGEN	1.59%	1.63%	1.79%
TOTAL SULFUR	1.00%	1.03%	1.13%
OXYGEN	10.19%	8.14%	8.96%
ASH	8.79%	9.02%	
HEATING VALUE (BTU/LB):	12970	13307	14625
SULFUR FORMS:			
SULFATE	0.02%	0.02%	0.02%
PYRITIC	0.34%	0.35%	0.38%
ORGANIC	0.64%	0.66%	0.72%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	2.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.5

COAL SAMPLING REPORT

LABORATORY NO: U10164 FIELD NO: KGS 417 U.S.G.S. NO: W211688
SAMPLER: Currens AGENCY: KGS DATE: Sep/10/1980
7.5' QUAD: Kermit COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 23 ROW P TIER 85 600 FT FSL, 2200 FT FEL
LATITUDE: 37 DEG 45 MIN 6 SEC LONGITUDE: 82 DEG 27 MIN 27 SEC
ELEVATION (FT): 945.00, OF POINT AT base of 417, USING topo
COMMENTARY:
REGIONAL COAL NAME: Peach Orchard z GEO. MAP COAL NAME: Peach Orchard
REPORTED COAL NAME: Peach Orchard FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): bottom split
EXPOSURE: TYPE, surface mine; CONDITION, 1 week old
SAMPLE CONDITION: damp
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 57.5, SAMPLE 51.2, COAL ONLY 51.2
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 320, SET 2 250, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 416.
N	1.15	Siltstone, dark-gray, rooted.
N	0.26	Coal (clarain).
N	1.18	Siltstone, dark-gray, rooted.
Y	1.84	Clarain, with abundant thin-banded vitrain, scattered thin-banded fusain, pyritic at top.
N	0.30	Siltstone, medium-gray, rooted.
Y	0.49	Durain, with some clarain at top.
Y	1.48	Clarain, with abundant thin-banded vitrain, scattered medium-banded fusain, homogeneous.
N	0.30	Siltstone, dark-gray, carbonaceous, laminated.
Y	0.46	Clarain.
N		Siltstone.

COAL ANALYSIS REPORT

LABORATORY NO: U10164 FIELD NO: KGS 417 U.S.G.S. NO: W211688
LABORATORY: Geo Test REPORT DATE: Dec/18/1981

AIR DRIED LOSS: 0.55%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.48%		
VOLATILE MATTER	34.68%	35.56%	41.57%
FIXED CARBON	48.74%	49.98%	58.43%
ASH	14.10%	14.46%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.98%	4.82%	5.64%
CARBON	69.04%	70.79%	82.77%
NITROGEN	1.36%	1.39%	1.63%
TOTAL SULFUR	0.86%	0.88%	1.03%
OXYGEN	9.66%	7.66%	8.93%
ASH	14.10%	14.46%	
HEATING VALUE (BTU/LB):	12176	12485	14597
SULFUR FORMS:			
SULFATE	0.03%	0.03%	0.04%
PYRITIC	0.24%	0.25%	0.29%
ORGANIC	0.59%	0.60%	0.71%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2600 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	1.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.4

COAL SAMPLING REPORT

LABORATORY NO: U10165 FIELD NO: KGS 418 U.S.G.S. NO: W211689
SAMPLER: Currens AGENCY: KGS DATE: Sep/10/1980
7.5' QUAD: Thomas COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 14 ROW 0 TIER 84 5300 FT FSL, 2300 FT FEL
LATITUDE: 37 DEG 42 MIN 52 SEC LONGITUDE: 82 DEG 33 MIN 29 SEC
ELEVATION (FT): 1305.00, OF POINT AT base of 418, USING topo
COMMENTARY: *Excessively thick, but highly carbonaceous, parting included
REGIONAL COAL NAME: Richardson zone GEO. MAP COAL NAME: Richardson
REPORTED COAL NAME: Richardson FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): top bench
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: dry, fresh
RECOVERY METHOD: channel SAMPLING REGIME: Holmes*
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 59.4, SAMPLE 46.5, COAL ONLY 39.4
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 120, SET 2, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	10.00	Removed; sandstone, coarse-grained.
Y	0.39	Clarain, pyritic.
Y	0.03	Pyrite, lenticular.
Y	0.10	Clarain.
Y	0.56	Claystone, black, carbonaceous.
Y	0.33	Canneloid coal, argillaceous.
Y	0.66	Clarain, with abundant medium-banded vitrain, pyritic.
N	1.08	Siltstone, medium-gray, slightly carbonaceous, sideritic, rooted.
Y	0.39	Clarain, with abundant medium-banded vitrain, abundant medium-banded fusain.
Y	0.20	Durain.
Y	0.16	Clarain.
Y	0.36	Durain.
Y	0.69	Durain, grainy, arenaceous. Horizon KGS 419.

COAL ANALYSIS REPORT

LABORATORY NO: U10165 FIELD NO: KGS 418 U.S.G.S. NO: W211689
LABORATORY: Geo Test REPORT DATE: Dec/18/1981

AIR DRIED LOSS: 1.16%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	3.44%		
VOLATILE MATTER	28.45%	29.46%	40.19%
FIXED CARBON	42.34%	43.85%	59.81%
ASH	25.77%	26.69%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.15%	3.90%	5.32%
CARBON	57.13%	59.16%	80.70%
NITROGEN	1.12%	1.16%	1.58%
TOTAL SULFUR	1.23%	1.27%	1.74%
OXYGEN	10.60%	7.82%	10.66%
ASH	25.77%	26.69%	
HEATING VALUE (BTU/LB):	9947	10301	14051
SULFUR FORMS:			
SULFATE	0.07%	0.07%	0.10%
PYRITIC	0.74%	0.77%	1.05%
ORGANIC	0.42%	0.43%	0.59%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2650 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	1.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	2.5

COAL SAMPLING REPORT

LABORATORY NO: U10166 FIELD NO: KGS 419 U.S.G.S. NO: W211690
SAMPLER: Currens AGENCY: KGS DATE: Sep/10/1980
7.5' QUAD: Thomas COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 14 ROW 0 TIER 84 5300 FT FSL, 2300 FT FEL
LATITUDE: 37 DEG 42 MIN 52 SEC LONGITUDE: 82 DEG 33 MIN 29 SEC
ELEVATION (FT): 1300.00, OF POINT AT base of 419, USING topo
COMMENTARY:
REGIONAL COAL NAME: Richardson zone GEO. MAP COAL NAME: Richardson
REPORTED COAL NAME: Richardson FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): bottom bench
EXPOSURE: TYPE, surface mine, CONDITION, active
SAMPLE CONDITION: dry, fresh
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 55.1, SAMPLE 55.1, COAL ONLY 55.1
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 310, SET 2 50, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 418.
Y	0.33	Durain.
Y	3.54	Clarain, with scattered medium-banded vitrain, durain zones to 2 cm thick.
Y	0.30	Durain.
Y	0.10	Clarain.
Y	0.33	Durain.
N	6.56	Siltstone, medium- to dark-gray, rooted at top.

COAL ANALYSIS REPORT

LABORATORY NO: U10166 FIELD NO: KGS 419 U.S.G.S. NO: W211690
LABORATORY: Geo Test REPORT DATE: Dec/18/1981

AIR DRIED LOSS: 0.85%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	3.31%		
VOLATILE MATTER	28.13%	29.09%	32.52%
FIXED CARBON	58.36%	60.36%	67.48%
ASH	10.20%	10.55%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.03%	4.82%	5.39%
CARBON	71.27%	73.71%	82.40%
NITROGEN	1.45%	1.50%	1.68%
TOTAL SULFUR	0.54%	0.56%	0.62%
OXYGEN	11.51%	8.86%	9.91%
ASH	10.20%	10.55%	
HEATING VALUE (BTU/LB):	12447	12873	14391
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.04%	0.04%	0.05%
ORGANIC	0.49%	0.51%	0.57%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	1.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	0.9

COAL SAMPLING REPORT

LABORATORY NO: U10180 FIELD NO: KGS 420 U.S.G.S. NO: W211691
SAMPLER: Currens AGENCY: KGS DATE: Sep/10/1980
7.5' QUAD: Thomas COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 6 ROW 0 TIER 84 1000 FT FSL, 3800 FT FEL
LATITUDE: 37 DEG 43 MIN 10 SEC LONGITUDE: 82 DEG 34 MIN 47 SEC
ELEVATION (FT): 1240.00, OF POINT AT base of 420, USING topo
COMMENTARY:
REGIONAL COAL NAME: Broas zone GEO. MAP COAL NAME: Upper Broas
REPORTED COAL NAME: Clarion FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 46.1, SAMPLE 46.1, COAL ONLY 46.1
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 260, SET 2, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon of Richardson coal bed.
N	9.84	Siltstone, laminated, sideritic.
N	1.31	Coal, inaccessible.
N	1.64	Siltstone, light-gray, rooted?
N	1.64	Coal, inaccessible.
N	9.19	Siltstone, light-gray, arenaceous; grades laterally to fine grained sandstone; rooted at top.
N	0.33	Siltstone, highly carbonaceous.
Y	0.33	Clarain, with abundant thick-banded vitrain.
Y	0.03	Fusain.
Y	1.18	Clarain, with scattered thin- to medium-banded vitrain.
Y	0.10	Durain.
Y	1.38	Clarain, with scattered medium-banded vitrain.
Y	0.30	Durain.
Y	0.52	Clarain.
N		Siltstone.

COAL ANALYSIS REPORT

LABORATORY NO: U10180 FIELD NO: KGS 420 U.S.G.S. NO: W211691
LABORATORY: Geo Test REPORT DATE: Dec/18/1981

AIR DRIED LOSS: 0.62%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	3.04%		
VOLATILE MATTER	37.45%	38.63%	40.38%
FIXED CARBON	55.29%	57.03%	59.62%
ASH	4.22%	4.35%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.32%	5.14%	5.37%
CARBON	76.26%	78.65%	82.23%
NITROGEN	1.44%	1.49%	1.55%
TOTAL SULFUR	0.59%	0.61%	0.64%
OXYGEN	12.17%	9.76%	10.21%
ASH	4.22%	4.35%	
HEATING VALUE (BTU/LB):	13430	13852	14482
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.01%	0.01%	0.01%
ORGANIC	0.57%	0.59%	0.61%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	1.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	0.9

COAL SAMPLING REPORT

LABORATORY NO: U10136 FIELD NO: KGS 421 U.S.G.S. NO: W211692
SAMPLER: Currens AGENCY: KGS DATE: Sep/23/1980
7.5' QUAD: Pikeville COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 11 ROW L TIER 83 2200 FT FSL, 1800 FT FEL
LATITUDE: 37 DEG 27 MIN 22 SEC LONGITUDE: 82 DEG 35 MIN 22 SEC
ELEVATION (FT): 1454.50, OF POINT AT base of 421, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: Fire Clay GEO. MAP COAL NAME: Fire Clay
REPORTED COAL NAME: Fire Clay FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, surface mine; CONDITION, slightly weathered
SAMPLE CONDITION: wet
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 67.3, SAMPLE 65.8, COAL ONLY 65.8
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 190, SET 2 280, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	0.66	Coal, weathered.
N	0.98	Siltstone, rooted.
N	8.20	Sandstone, light-gray, medium-grained.
N	34.45	Siltstone, gray, sideritic; lenticularly interbedded with fine-grained sandstone; thin coal 15 feet above base.
N	0.52	Siltstone, highly carbonaceous.
Y	1.21	Clarain.
Y	0.20	Durain.
Y	0.98	Clarain, slightly weathered.
N	0.13	Siltstone, brown-gray, brittle.
Y	0.26	Durain.
Y	0.20	Clarain.
Y	0.39	Durain.
Y	2.23	Clarain, with interlaminated durain; obscured by mud.
N		Siltstone, light-gray, rooted, plastic when wet.

COAL ANALYSIS REPORT

LABORATORY NO: U10136 FIELD NO: KGS 421 U.S.G.S. NO: W211692
LABORATORY: Geo Test REPORT DATE: Dec/08/1981

AIR DRIED LOSS: 0.79%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	3.32%		
VOLATILE MATTER	34.47%	35.65%	37.93%
FIXED CARBON	56.41%	58.34%	62.07%
ASH	5.80%	6.00%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.14%	4.93%	5.25%
CARBON	75.94%	78.54%	83.56%
NITROGEN	1.60%	1.65%	1.76%
TOTAL SULFUR	0.55%	0.57%	0.61%
OXYGEN	10.97%	8.31%	8.82%
ASH	5.80%	6.00%	
HEATING VALUE (BTU/LB):	13277	13732	14610
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.05%	0.05%	0.06%
ORGANIC	0.49%	0.51%	0.54%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2660 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	1.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	0.8

COAL SAMPLING REPORT

LABORATORY NO: U10181 FIELD NO: KGS 422 U.S.G.S. NO: W211693
SAMPLER: Currens AGENCY: KGS DATE: Sep/23/1980
7.5' QUAD: Pikeville COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 3 ROW K TIER 84 5600 FT FSL, 800 FT FEL
LATITUDE: 37 DEG 24 MIN 55 SEC LONGITUDE: 82 DEG 32 MIN 10 SEC
ELEVATION (FT): 1250.50, OF POINT AT base of 422, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.2 GEO. MAP COAL NAME: U Elkhorn No.2
REPORTED COAL NAME: U Elkhorn No.2 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: dry, very fresh
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 36.6, SAMPLE 34.7, COAL ONLY 34.7
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 95, SET 2 15, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Siltstone, weathered.
N	0.66	Coal.
N	26.25	Siltstone, medium-gray, sideritic; rooted at top.
Y	0.03	Durain.
Y	0.20	Clarain.
N	0.16	Siltstone, highly carbonaceous, laminated.
Y	1.02	Clarain, with abundant medium- to thick-banded vitrain, very homogenous.
Y	0.03	Fusain.
Y	1.61	Clarain, with abundant medium- to thick-banded vitrain, very homogenous.
N		Sandstone, light-gray, fine- to medium-grained, hard, slightly carbonaceous, probably rooted.

COAL ANALYSIS REPORT

LABORATORY NO: U10181 FIELD NO: KGS 422 U.S.G.S. NO: W211693
LABORATORY: Geo Test REPORT DATE: Dec/18/1981

AIR DRIED LOSS: 0.23%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.85%		
VOLATILE MATTER	37.51%	38.22%	39.85%
FIXED CARBON	56.61%	57.67%	60.15%
ASH	4.03%	4.11%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.52%	5.41%	5.65%
CARBON	79.79%	81.29%	84.78%
NITROGEN	1.57%	1.60%	1.67%
TOTAL SULFUR	0.51%	0.52%	0.54%
OXYGEN	8.58%	7.07%	7.36%
ASH	4.03%	4.11%	
HEATING VALUE (BTU/LB):	14189	14456	15076
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.02%	0.02%	0.02%
ORGANIC	0.48%	0.49%	0.51%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2260 DEG F
SOFTENING TEMP.	2550 DEG F
FLUID TEMP.	2670 DEG F

FREE SWELLING INDEX	4.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	0.7

COAL SAMPLING REPORT

LABORATORY NO: U10137 FIELD NO: KGS 423 U.S.G.S. NO: W211694
SAMPLER: Currens AGENCY: KGS DATE: Sep/23/1980
7.5' QUAD: Varney COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 6 ROW N TIER 85 600 FT FSL, 4200 FT FEL
LATITUDE: 37 DEG 38 MIN 6 SEC LONGITUDE: 82 DEG 29 MIN 52 SEC
ELEVATION (FT): 1400.00, OF POINT AT base of 423, USING topo
COMMENTARY: *Excessively thick parting inadvertently included.
REGIONAL COAL NAME: Broas zone GEO. MAP COAL NAME: Upper Broas
REPORTED COAL NAME: Upper Broas FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh, damp
RECOVERY METHOD: channel SAMPLING REGIME: Holmes*
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 74.8, SAMPLE 70.1, COAL ONLY 70.1
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 270, SET 2 335, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	65.62	Siltstone, medium-gray, sideritic, arenaceous.
Y	0.10	Durain, argillaceous.
Y	1.74	Clarain, pyritic.
N	0.39	Siltstone, dark-gray, rooted.
Y	0.20	Clarain.
Y	0.07	Siltstone, very carbonaceous.
Y	0.85	Clarain.
Y	1.21	Durain.
Y	1.67	Clarain, pyritic.
N		Siltstone, plastic, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: U10137 FIELD NO: KGS 423 U.S.G.S. NO: W211694
LABORATORY: Geo Test REPORT DATE: Dec/08/1981

AIR DRIED LOSS: 0.59%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	3.33%		
VOLATILE MATTER	37.02%	38.29%	41.57%
FIXED CARBON	52.03%	53.82%	58.43%
ASH	7.62%	7.88%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.24%	5.03%	5.47%
CARBON	73.32%	75.84%	82.34%
NITROGEN	1.47%	1.52%	1.65%
TOTAL SULFUR	1.34%	1.39%	1.50%
OXYGEN	11.01%	8.34%	9.04%
ASH	7.62%	7.88%	
HEATING VALUE (BTU/LB):	12982	13429	14579
SULFUR FORMS:			
SULFATE	0.04%	0.04%	0.04%
PYRITIC	0.57%	0.59%	0.64%
ORGANIC	0.73%	0.76%	0.82%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2620 DEG F
SOFTENING TEMP.	2750 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	2.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	2.1

COAL SAMPLING REPORT

LABORATORY NO: U10248 FIELD NO: KGS 430 U.S.G.S. NO: W212056
SAMPLER: Currens AGENCY: KGS DATE: Oct/15/1980
7.5' QUAD: Meta COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 1 ROW M TIER 85 5500 FT FSL, 3000 FT FEL
LATITUDE: 37 DEG 34 MIN 54 SEC LONGITUDE: 82 DEG 25 MIN 37 SEC
ELEVATION (FT): 1504.50, OF POINT AT base of 430, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: L Peach Orch GEO. MAP COAL NAME: L Peach Orch
REPORTED COAL NAME: L Peach Orchard FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): bottom split
EXPOSURE: TYPE, surface mine; CONDITION, slightly weathered
SAMPLE CONDITION: clean, dry, mud in cleat
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 18.5, SAMPLE 18.5, COAL ONLY 18.5
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 325, SET 2 240, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 314.
N	1.61	Siltstone, black, laminated to bioturbated, coaly, with abundant slickensides, rooting obscure.
Y	1.54	Clarain, with abundant thin- to medium-banded vitrain, scattered thin-banded fusain, some mud in cleats.
N		Siltstone, medium-gray, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: U10248 FIELD NO: KGS 430 U.S.G.S. NO: W212056
LABORATORY: Geo Test REPORT DATE: Dec/31/1981

AIR DRIED LOSS: 0.93%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.99%		
VOLATILE MATTER	36.37%	37.49%	40.15%
FIXED CARBON	54.23%	55.90%	59.86%
ASH	6.41%	6.61%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.22%	5.04%	5.39%
CARBON	75.16%	77.47%	82.96%
NITROGEN	1.47%	1.52%	1.62%
TOTAL SULFUR	0.59%	0.61%	0.65%
OXYGEN	11.15%	8.75%	9.38%
ASH	6.41%	6.61%	
HEATING VALUE (BTU/LB):	13301	13711	14682
SULFUR FORMS:			
SULFATE	0.03%	0.03%	0.03%
PYRITIC	0.08%	0.08%	0.09%
ORGANIC	0.48%	0.49%	0.53%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	2.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	0.9

COAL SAMPLING REPORT

LABORATORY NO: U10225 FIELD NO: KGS 431 U.S.G.S. NO: W212057
SAMPLER: Currens AGENCY: KGS DATE: Oct/15/1980
7.5' QUAD: Meta COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 1 ROW M TIER 85 5500 FT FSL, 3000 FT FEL
LATITUDE: 37 DEG 34 MIN 54 SEC LONGITUDE: 82 DEG 25 MIN 37 SEC
ELEVATION (FT): 1507.70, OF POINT AT base of 431, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: L Peach Orch GEO. MAP COAL NAME: L Peach Orch
REPORTED COAL NAME: L Peach Orchard FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): top split
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh, clean, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 38.6, SAMPLE 37.0, COAL ONLY 37.0
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 325, SET 2 240, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	9.84	Sandstone, coarse-grained.
N	6.56	Siltstone.
N	3.28	Coal, weathered.
N	9.84	Siltstone; dark-gray at base; light-gray and rooted at top; sideritic.
Y	0.20	Durain, with 1-cm-thick clarain at base.
N	0.13	Siltstone, highly carbonaceous, laminated.
Y	0.92	Clarain, with scattered medium- to thick-banded vitrain.
Y	1.97	Clarain, with abundant medium- to thick-banded vitrain, sparse thin-banded fusain; very homogeneous; no pyrite observed. See KGS 430 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: U10225 FIELD NO: KGS 431 U.S.G.S. NO: W212057
LABORATORY: Geo Test REPORT DATE: Dec/31/1981

AIR DRIED LOSS: 0.75%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.54%		
VOLATILE MATTER	38.12%	39.11%	41.71%
FIXED CARBON	53.26%	54.65%	58.28%
ASH	6.08%	6.24%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.22%	5.06%	5.40%
CARBON	74.80%	76.75%	81.85%
NITROGEN	1.59%	1.63%	1.74%
TOTAL SULFUR	0.71%	0.73%	0.78%
OXYGEN	11.60%	9.59%	10.23%
ASH	6.08%	6.24%	
HEATING VALUE (BTU/LB):	13210	13555	14456
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.04%	0.04%	0.04%
ORGANIC	0.66%	0.68%	0.72%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2770 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	2.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.1

COAL SAMPLING REPORT

LABORATORY NO: U10249 FIELD NO: KGS 432 U.S.G.S. NO: W212058
SAMPLER: Currens AGENCY: KGS DATE: Oct/15/1980
7.5' QUAD: Meta COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 1 ROW M TIER 85 6000 FT FSL, 3000 FT FEL
LATITUDE: 37 DEG 34 MIN 59 SEC LONGITUDE: 82 DEG 25 MIN 37 SEC
ELEVATION (FT): 1540.40, OF POINT AT base of 432, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: U Peach Orch GEO. MAP COAL NAME: U Peach Orch
REPORTED COAL NAME: U Peach Orchard FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): bottom split
EXPOSURE: TYPE, surface mine; CONDITION, a few weeks old, "croppy"
SAMPLE CONDITION: slightly weathered, dry, faced-up
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 29.5, SAMPLE 29.5, COAL ONLY 29.5
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 40, SET 2 180, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	3.12	Sandstone, coarse-grained.
N	1.31	Siltstone, medium-gray.
N	1.12	Coal, discontinuous, weathered, predominantly clarain, (upper split).
N	0.23	Siltstone, dark-gray.
N	1.44	Siltstone, highly carbonaceous, laminated; interbedded with vitrain to 5 mm thick, in zones of 1 to 3 cm (rash).
Y	0.30	Clarain, with abundant medium-banded vitrain.
Y	0.07	Fusain, with scattered thin-banded vitrain, pyritic.
Y	0.79	Clarain, with abundant medium-banded vitrain, scattered thin-banded fusain.
Y	0.03	Fusain.
Y	1.28	Clarain, with abundant medium- to thick-banded vitrain.
N		Claystone, medium-gray, rooted, slightly silty. See KGS 431 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: U10249 FIELD NO: KGS 432 U.S.G.S. NO: W212058
LABORATORY: Geo Test REPORT DATE: Dec/31/1981

AIR DRIED LOSS: 1.32%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	3.62%		
VOLATILE MATTER	34.77%	36.08%	37.46%
FIXED CARBON	58.05%	60.23%	62.54%
ASH	3.56%	3.69%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.20%	4.98%	5.17%
CARBON	76.82%	79.71%	82.77%
NITROGEN	1.51%	1.57%	1.63%
TOTAL SULFUR	0.71%	0.74%	0.76%
OXYGEN	12.20%	9.31%	9.67%
ASH	3.56%	3.69%	
HEATING VALUE (BTU/LB):	13558	14068	14607
SULFUR FORMS:			
SULFATE	0.02%	0.02%	0.02%
PYRITIC	0.09%	0.09%	0.10%
ORGANIC	0.60%	0.62%	0.65%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2540 DEG F
SOFTENING TEMP.	2760 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	2.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.0

COAL SAMPLING REPORT

LABORATORY NO: U10313 FIELD NO: KGS 433 U.S.G.S. NO: W212059
SAMPLER: Currens AGENCY: KGS DATE: Oct/28/1980
7.5' QUAD: Hurley COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 5 ROW L TIER 90 450 FT FSL, 2850 FT FEL
LATITUDE: 37 DEG 29 MIN 4 SEC LONGITUDE: 82 DEG 4 MIN 35 SEC
ELEVATION (FT): 1550.80, OF POINT AT base of 433, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: Lower Elkhorn GEO. MAP COAL NAME: Pond Creek
REPORTED COAL NAME: No.1 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh, damp
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 22.0, SAMPLE 22.0, COAL ONLY 22.0
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 260, SET 2 170, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Removed.
Y	0.30	Clarain, with abundant thin-banded vitrain; pyritic at top.
Y	0.16	Durain.
Y	0.89	Clarain, with scattered medium-banded vitrain.
Y	0.03	Fusain.
Y	0.46	Clarain, with abundant medium-banded vitrain.
N		Siltstone, medium-gray to buff, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: U10313 FIELD NO: KGS 433 U.S.G.S. NO: W212059
LABORATORY: Geo Test REPORT DATE: Jan/25/1982

AIR DRIED LOSS: 0.71%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.05%		
VOLATILE MATTER	33.29%	33.99%	36.64%
FIXED CARBON	57.56%	58.76%	63.36%
ASH	7.10%	7.25%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.15%	5.02%	5.42%
CARBON	78.68%	80.32%	86.60%
NITROGEN	1.47%	1.50%	1.62%
TOTAL SULFUR	0.69%	0.70%	0.76%
OXYGEN	6.91%	5.21%	5.60%
ASH	7.10%	7.25%	
HEATING VALUE (BTU/LB):	13922	14213	15324
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.07%	0.07%	0.08%
ORGANIC	0.61%	0.62%	0.67%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2770 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	7.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.0

COAL SAMPLING REPORT

LABORATORY NO: U10250 FIELD NO: KGS 434 U.S.G.S. NO: W212060
SAMPLER: Currens AGENCY: KGS DATE: Oct/28/1980
7.5' QUAD: Hurley COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 1 ROW L TIER 89 400 FT FSL, 3500 FT FEL
LATITUDE: 37 DEG 29 MIN 4 SEC LONGITUDE: 82 DEG 5 MIN 43 SEC
ELEVATION (FT): 1606.90, OF POINT AT base of 434, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.1 GEO. MAP COAL NAME: Alma
REPORTED COAL NAME: No.2 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 42.9, SAMPLE 42.9, COAL ONLY 42.9
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 135, SET 2 55, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	2.81	Sandstone, massive.
N	2.62	Coal.
N	3.28	Shale, rooted?
N	1.64	Coal.
N	3.28	Ganister?
N	2.65	Sandstone, light-gray, medium- to coarse-grained, massive, trough crossbedded, micaceous, feldspathic, scattered plant fragments, slight carbonaceous.
Y	0.66	Clarain, with scattered thin-banded vitrain.
Y	0.03	Fusain.
Y	2.89	Clarain, with abundant medium- to thick-banded vitrain, scattered thin-banded fusain and pyrite; very homogeneous.
N		Claystone, medium-gray, plastic, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: U10250 FIELD NO: KGS 434 U.S.G.S. NO: W212060
LABORATORY: Geo Test REPORT DATE: Dec/31/1981

AIR DRIED LOSS: 0.42%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.35%		
VOLATILE MATTER	34.98%	35.46%	36.84%
FIXED CARBON	59.96%	60.78%	63.16%
ASH	3.71%	3.76%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.23%	5.15%	5.35%
CARBON	81.64%	82.76%	85.99%
NITROGEN	1.51%	1.53%	1.59%
TOTAL SULFUR	0.60%	0.61%	0.63%
OXYGEN	7.31%	6.19%	6.44%
ASH	3.71%	3.76%	
HEATING VALUE (BTU/LB):	14544	14743	15319
SULFUR FORMS:			
SULFATE	0.02%	0.02%	0.02%
PYRITIC	0.06%	0.06%	0.06%
ORGANIC	0.52%	0.53%	0.55%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2640 DEG F
SOFTENING TEMP.	2780 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	8.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	0.8

COAL SAMPLING REPORT

LABORATORY NO: U10226 FIELD NO: KGS 435 U.S.G.S. NO: W212061
SAMPLER: Currens AGENCY: KGS DATE: Oct/28/1980
7.5' QUAD: Hurley COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 1 ROW L TIER 89 500 FT FSL, 2200 FT FEL
LATITUDE: 37 DEG 29 MIN 5 SEC LONGITUDE: 82 DEG 5 MIN 27 SEC
ELEVATION (FT): 1679.30, OF POINT AT base of 435, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.2 GEO. MAP COAL NAME: Upper Alma
REPORTED COAL NAME: Upper Alma FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): top split
EXPOSURE: TYPE, surface mine; CONDITION, faced-up
SAMPLE CONDITION: slightly weathered, wet
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 25.4, SAMPLE 23.8, COAL ONLY 23.8
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 295, SET 2 25, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	2.81	Sandstone, light-gray, coarse-grained, trough crossbedded, with abundant plant fragments, micaceous, feldspathic; cuts into underlying coal.
Y	0.52	Clarain.
N	0.13	Siltstone, dark-brown to black, laminated.
Y	0.46	Clarain.
Y	0.02	Fusain.
Y	0.10	Clarain.
Y	0.03	Fusain.
Y	0.85	Clarain, with abundant vitrain, scattered medium-banded fusain.

See KGS 436 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: U10226 FIELD NO: KGS 435 U.S.G.S. NO: W212061
LABORATORY: Geo Test REPORT DATE: Dec/31/1981

AIR DRIED LOSS: 0.43%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.45%		
VOLATILE MATTER	34.18%	34.68%	36.95%
FIXED CARBON	58.33%	59.19%	63.05%
ASH	6.04%	6.13%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.33%	5.24%	5.59%
CARBON	79.38%	80.55%	85.81%
NITROGEN	1.34%	1.36%	1.45%
TOTAL SULFUR	0.61%	0.62%	0.66%
OXYGEN	7.30%	6.10%	6.49%
ASH	6.04%	6.13%	
HEATING VALUE (BTU/LB):	14145	14353	15291
SULFUR FORMS:			
SULFATE	0.02%	0.02%	0.02%
PYRITIC	0.02%	0.02%	0.02%
ORGANIC	0.57%	0.58%	0.62%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	8.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	0.9

COAL SAMPLING REPORT

LABORATORY NO: U10315 FIELD NO: KGS 436 U.S.G.S. NO: W212062
SAMPLER: Currens AGENCY: KGS DATE: Oct/28/1980
7.5' QUAD: Hurley COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 1 ROW L TIER 89 500 FT FSL, 2200 FT FEL
LATITUDE: 37 DEG 29 MIN 5 SEC LONGITUDE: 82 DEG 5 MIN 27 SEC
ELEVATION (FT): 1674.90, OF POINT AT base of 436, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.2 GEO. MAP COAL NAME: Upper Alma
REPORTED COAL NAME: Upper Alma FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): bottom split
EXPOSURE: TYPE, surface mine; CONDITION, 3 weeks old, faced-up
SAMPLE CONDITION: slightly weathered
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 15.0, SAMPLE 15.0, COAL ONLY 15.0
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 435.
N	3.12	Claystone, light-gray, rooted.
Y	0.56	Clarain.
Y	0.33	Durain.
Y	0.36	Clarain.
N		Siltstone.

COAL ANALYSIS REPORT

LABORATORY NO: U10315 FIELD NO: KGS 436 U.S.G.S. NO: W212062
LABORATORY: Geo Test REPORT DATE: Jan/25/1982

AIR DRIED LOSS: 0.43%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.96%		
VOLATILE MATTER	32.82%	33.48%	36.01%
FIXED CARBON	58.33%	59.50%	63.99%
ASH	6.89%	7.03%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.02%	4.90%	5.27%
CARBON	79.47%	81.06%	87.19%
NITROGEN	1.42%	1.45%	1.56%
TOTAL SULFUR	0.62%	0.63%	0.68%
OXYGEN	6.58%	4.93%	5.30%
ASH	6.89%	7.03%	
HEATING VALUE (BTU/LB):	14114	14396	15485
SULFUR FORMS:			
SULFATE	0.03%	0.03%	0.03%
PYRITIC	0.04%	0.04%	0.04%
ORGANIC	0.55%	0.56%	0.60%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2720 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX 7.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU 0.9

COAL SAMPLING REPORT

LABORATORY NO: U10227 FIELD NO: KGS 437 U.S.G.S. NO: W212063
SAMPLER: Currens AGENCY: KGS DATE: Oct/29/1980
7.5' QUAD: Hurley COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 8 ROW L TIER 89 2100 FT FSL, 250 FT FEL
LATITUDE: 37 DEG 28 MIN 21 SEC LONGITUDE: 82 DEG 7 MIN 3 SEC
ELEVATION (FT): 1873.90, OF POINT AT base of 437, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: Amburgy zone GEO. MAP COAL NAME: Williamson
REPORTED COAL NAME: Williamson FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): top split
EXPOSURE: TYPE, surface mine; CONDITION, 1 week old, faced-up
SAMPLE CONDITION: weathered
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 54.3, SAMPLE 39.0, COAL ONLY 39.0
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 35, SET 2 125, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	6.40	Siltstone, medium-gray, highly sideritic, with scattered calcite nodules.
Y	0.33	Clarain.
N	0.20	Siltstone, dark-gray to black, coaly, rooted.
Y	1.08	Clarain, with abundant medium-banded vitrain, scattered thin-banded fusain, mud in cleat.
Y	0.10	Durain, with mud in cleat.
Y	1.31	Clarain, with abundant medium-banded vitrain, mud in cleat.
N	1.02	Siltstone, black to medium-gray, coaly, rooted.
Y	0.20	Clarain.
N	0.07	Siltstone, carbonaceous.
Y	0.23	Clarain.
		See KGS 438 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: U10227 FIELD NO: KGS 437 U.S.G.S. NO: W212063
LABORATORY: Geo Test REPORT DATE: Dec/31/1981

AIR DRIED LOSS: 0.71%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.67%		
VOLATILE MATTER	33.68%	34.60%	37.42%
FIXED CARBON	56.34%	57.88%	62.59%
ASH	7.31%	7.51%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.08%	4.91%	5.31%
CARBON	75.46%	77.53%	83.83%
NITROGEN	1.51%	1.55%	1.68%
TOTAL SULFUR	1.06%	1.09%	1.18%
OXYGEN	9.58%	7.41%	8.00%
ASH	7.31%	7.51%	
HEATING VALUE (BTU/LB):	13226	13588	14693
SULFUR FORMS:			
SULFATE	0.07%	0.07%	0.08%
PYRITIC	0.27%	0.28%	0.30%
ORGANIC	0.72%	0.74%	0.80%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2220 DEG F
SOFTENING TEMP.	2440 DEG F
FLUID TEMP.	2590 DEG F

FREE SWELLING INDEX	2.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.6

COAL SAMPLING REPORT

LABORATORY NO: U10316 FIELD NO: KGS 438 U.S.G.S. NO: W212064
SAMPLER: Currens AGENCY: KGS DATE: Oct/29/1980
7.5' QUAD: Hurley COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 8 ROW L TIER 89 2100 FT FSL, 250 FT FEL
LATITUDE: 37 DEG 28 MIN 21 SEC LONGITUDE: 82 DEG 7 MIN 3 SEC
ELEVATION (FT): 1870.90, OF POINT AT base of 348, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: Amburgy zone GEO. MAP COAL NAME: Williamson
REPORTED COAL NAME: Williamson FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): bottom split
EXPOSURE: TYPE, surface mine; CONDITION, active to weathered
SAMPLE CONDITION: fresh, faced-up
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 20.3, SAMPLE 20.3, COAL ONLY 20.1
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 315, SET 2 55, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 437.
N	0.13	Siltstone, medium-gray, rooted.
N	0.10	Coal.
N	1.05	Siltstone, light-gray, rooted, slightly carbonaceous.
Y	1.25	Clarain.
Y	0.02	Claystone, light-gray.
Y	0.43	Clarain.
		See KGS 439 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: U10316 FIELD NO: KGS 438 U.S.G.S. NO: W212064
LABORATORY: Geo Test REPORT DATE: Jan/25/1982

AIR DRIED LOSS: 0.67%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.96%		
VOLATILE MATTER	34.26%	34.95%	36.49%
FIXED CARBON	59.63%	60.82%	63.51%
ASH	4.15%	4.23%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.39%	5.27%	5.51%
CARBON	80.09%	81.69%	85.30%
NITROGEN	1.59%	1.62%	1.69%
TOTAL SULFUR	0.75%	0.77%	0.80%
OXYGEN	8.03%	6.42%	6.70%
ASH	4.15%	4.23%	
HEATING VALUE (BTU/LB):	14327	14614	15260
SULFUR FORMS:			
SULFATE	0.02%	0.02%	0.02%
PYRITIC	0.06%	0.06%	0.06%
ORGANIC	0.67%	0.68%	0.71%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2470 DEG F
SOFTENING TEMP.	2640 DEG F
FLUID TEMP.	2740 DEG F

FREE SWELLING INDEX	8.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.0

COAL SAMPLING REPORT

LABORATORY NO: U10228 FIELD NO: KGS 439 U.S.G.S. NO: W212065
SAMPLER: Currens AGENCY: KGS DATE: Oct/29/1980
7.5' QUAD: Hurley COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 8 ROW L TIER 89 3200 FT FSL, 200 FT FEL
LATITUDE: 37 DEG 28 MIN 32 SEC LONGITUDE: 82 DEG 7 MIN 2 SEC
ELEVATION (FT): 1833.80, OF POINT AT base of 439, USING altimeter
COMMENTARY: Coal lies 10 feet below the Williamson.
REGIONAL COAL NAME: uncorrelated GEO. MAP COAL NAME: unnamed
REPORTED COAL NAME: No.6 leader FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh, clean, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 24.8, SAMPLE 24.8, COAL ONLY 24.8
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 200, SET 2 110, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 438.
N	1.48	Siltstone, medium-gray, sideritic, with abundant plant fragments; coaly and rooted at top.
Y	2.07	Clarain, with abundant medium- to thick-banded vitrain, very homogeneous, soft.
N		Siltstone.

COAL ANALYSIS REPORT

LABORATORY NO: U10228 FIELD NO: KGS 439 U.S.G.S. NO: W212065
LABORATORY: Geo Test REPORT DATE: Dec/31/1981

AIR DRIED LOSS: 1.69%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	5.70%		
VOLATILE MATTER	37.17%	39.42%	41.23%
FIXED CARBON	52.99%	56.19%	58.77%
ASH	4.14%	4.39%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.16%	4.80%	5.02%
CARBON	74.14%	78.62%	82.23%
NITROGEN	1.46%	1.55%	1.62%
TOTAL SULFUR	0.60%	0.64%	0.67%
OXYGEN	14.50%	10.00%	10.46%
ASH	4.14%	4.39%	
HEATING VALUE (BTU/LB):	12796	13569	14192
SULFUR FORMS:			
SULFATE	0.02%	0.02%	0.02%
PYRITIC	0.03%	0.03%	0.03%
ORGANIC	0.55%	0.58%	0.61%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2200 DEG F
SOFTENING TEMP.	2250 DEG F
FLUID TEMP.	2290 DEG F

FREE SWELLING INDEX	2.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	0.9

COAL SAMPLING REPORT

LABORATORY NO: U10229 FIELD NO: KGS 440 U.S.G.S. NO: W212066
SAMPLER: Currens AGENCY: KGS DATE: Oct/29/1980
7.5' QUAD: Hurley COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 8 ROW L TIER 89 3800 FT FSL, 1250 FT FEL
LATITUDE: 37 DEG 28 MIN 38 SEC LONGITUDE: 82 DEG 7 MIN 16 SEC
ELEVATION (FT): 1681.10, OF POINT AT base of 440, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.3 GEO. MAP COAL NAME: L Cedar Grove
REPORTED COAL NAME: L Cedar Grove FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): bottom split
EXPOSURE: TYPE, surface mine; CONDITION, 3 weeks old, faced-up
SAMPLE CONDITION: fresh
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 26.6, SAMPLE 26.6, COAL ONLY 26.4
STRUCTURAL FEATURE: cleat SEPARATION:
STRIKE AZIMUTHS: SET 1 320, SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 441.
N	7.32	Shale, light-gray, slightly silty, sideritic; upper two-thirds rooted and slickensided; thins to 2 feet thick; 2000 feet to the northeast.
Y	0.82	Clarain, with abundant thin-banded vitrain.
Y	0.02	Claystone, medium-gray.
Y	0.56	Clarain, with abundant medium-banded vitrain, scattered thin-banded fusain.
Y	0.82	Durain, with scattered medium-banded vitrain.
N		Siltstone, carbonaceous.

COAL ANALYSIS REPORT

LABORATORY NO: U10229 FIELD NO: KGS 440 U.S.G.S. NO: W212066
LABORATORY: Geo Test REPORT DATE: Dec/31/1981

AIR DRIED LOSS: 0.37%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.50%		
VOLATILE MATTER	31.12%	31.59%	37.13%
FIXED CARBON	52.69%	53.49%	62.87%
ASH	14.69%	14.91%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.62%	4.52%	5.31%
CARBON	71.29%	72.37%	85.06%
NITROGEN	1.33%	1.35%	1.59%
TOTAL SULFUR	1.00%	1.02%	1.19%
OXYGEN	7.07%	5.83%	6.85%
ASH	14.69%	14.91%	
HEATING VALUE (BTU/LB):	12644	12836	15087
SULFUR FORMS:			
SULFATE	0.03%	0.03%	0.04%
PYRITIC	0.25%	0.25%	0.30%
ORGANIC	0.72%	0.73%	0.86%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	6.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.6

COAL SAMPLING REPORT

LABORATORY NO: U10230 FIELD NO: KGS 441 U.S.G.S. NO: W212067
SAMPLER: Currens AGENCY: KGS DATE: Oct/29/1980
7.5' QUAD: Hurley COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 8 ROW L TIER 89 3800 FT FSL, 1250 FT FEL
LATITUDE: 37 DEG 28 MIN 38 SEC LONGITUDE: 82 DEG 7 MIN 16 SEC
ELEVATION (FT): 1691.50, OF POINT AT base of 441, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.3 GEO. MAP COAL NAME: L Cedar Grove
REPORTED COAL NAME: L Cedar Grove FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): top split
EXPOSURE: TYPE, surface mine; CONDITION, 3 weeks old
SAMPLE CONDITION: weathered, faced-up
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 28.3, SAMPLE 27.2, COAL ONLY 27.2
STRUCTURAL FEATURE: cleat SEPARATION:
STRIKE AZIMUTHS: SET 1 305, SET 2 25, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	9.84	Sandstone, weathered.
N	16.40	Siltstone, medium-gray, sideritic.
N	0.20	Coal, canneloid, argillaceous.
N	0.52	Siltstone, dark-gray to black, carbonaceous.
Y	0.20	Durain.
Y	0.85	Clarain, nearly 100 percent medium- to thick-banded vitrain.
Y	0.03	Fusain.
Y	0.16	Vitrain.
N	0.10	Siltstone, medium-gray, rooted.
Y	1.02	Clarain, nearly 100 percent medium- to thick-banded vitrain.

See KGS 440 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: U10230 FIELD NO: KGS 441 U.S.G.S. NO: W212067
LABORATORY: Geo Test REPORT DATE: Dec/31/1981

AIR DRIED LOSS: 0.43%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.87%		
VOLATILE MATTER	32.12%	32.73%	34.54%
FIXED CARBON	60.87%	62.03%	65.46%
ASH	5.14%	5.24%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.96%	4.84%	5.11%
CARBON	79.26%	80.77%	85.24%
NITROGEN	1.40%	1.43%	1.51%
TOTAL SULFUR	0.72%	0.73%	0.77%
OXYGEN	8.52%	6.99%	7.37%
ASH	5.14%	5.24%	
HEATING VALUE (BTU/LB):	14152	14422	15219
SULFUR FORMS:			
SULFATE	0.02%	0.02%	0.02%
PYRITIC	0.07%	0.07%	0.08%
ORGANIC	0.63%	0.64%	0.68%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2750 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	7.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.0

COAL SAMPLING REPORT

LABORATORY NO: U10251 FIELD NO: KGS 442 U.S.G.S. NO: W212068
SAMPLER: Currens AGENCY: KGS DATE: Oct/30/1980
7.5' QUAD: Hellier COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 11 ROW J TIER 85 3900 FT FSL, 1050 FT FEL
LATITUDE: 37 DEG 17 MIN 39 SEC LONGITUDE: 82 DEG 25 MIN 13 SEC
ELEVATION (FT): 1841.70, OF POINT AT base of 442, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn 3 1/2 GEO.MAP COAL NAME: U Elkhorn 3 1/2
REPORTED COAL NAME: U Elkhorn 3 1/2 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh, clean, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 29.9, SAMPLE 29.9, COAL ONLY 29.9
STRUCTURAL FEATURE: cleat SEPARATION:
STRIKE AZIMUTHS: SET 1 70, SET 2 165, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	16.40	Sandstone, medium- to coarse-grained, large-scale trough crossbedding.
Y	1.80	Clarain, with abundant medium- to thick-banded vitrain, scattered medium-banded fusain.
Y	0.07	Durain, argillaceous.
Y	0.62	Clarain, with abundant medium- to thick-banded vitrain.
N		Claystone, light- to medium-gray, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: U10251 FIELD NO: KGS 442 U.S.G.S. NO: W212068
LABORATORY: Geo Test REPORT DATE: Dec/31/1981

AIR DRIED LOSS: 0.41%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.55%		
VOLATILE MATTER	35.56%	36.12%	38.13%
FIXED CARBON	57.69%	58.60%	61.87%
ASH	5.20%	5.28%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.15%	5.05%	5.34%
CARBON	78.87%	80.11%	84.58%
NITROGEN	1.59%	1.61%	1.71%
TOTAL SULFUR	0.92%	0.93%	0.99%
OXYGEN	8.27%	7.02%	7.38%
ASH	5.20%	5.28%	
HEATING VALUE (BTU/LB):	14089	14310	15109
SULFUR FORMS:			
SULFATE	0.02%	0.02%	0.02%
PYRITIC	0.15%	0.15%	0.16%
ORGANIC	0.75%	0.76%	0.80%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2640 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	7.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.3

COAL SAMPLING REPORT

LABORATORY NO: U10231 FIELD NO: KGS 443 U.S.G.S. NO: W212069
SAMPLER: Currens AGENCY: KGS DATE: Oct/30/1980
7.5' QUAD: Hellier COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 11 ROW J TIER 85 4000 FT FSL, 1500 FT FEL
LATITUDE: 37 DEG 17 MIN 40 SEC LONGITUDE: 82 DEG 25 MIN 19 SEC
ELEVATION (FT): 1741.80, OF POINT AT base of 443, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.3 GEO. MAP COAL NAME: U Elkhorn No.3
REPORTED COAL NAME: U Elkhorn No.3 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): top split
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh, clean, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 24.8, SAMPLE 24.0, COAL ONLY 24.0
STRUCTURAL FEATURE: cleat SEPARATION:
STRIKE AZIMUTHS: SET 1 265, SET 2 180, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	9.84	Sandstone, coarse-grained.
N	2.95	Coal, weathered (Upper Elkhorn No. 3 1/2?).
N	21.98	Covered, probably siltstone, as below.
N	27.56	Siltstone, medium-gray, arenaceous in zones, sideritic, with flaser and lenticular bedding, intensive bioturbation.
N	1.48	Coal, pyritic, weathered.
N	3.61	Siltstone, dark-gray, arenaceous, rooted.
N	18.37	Sandstone, medium-gray, coarse-grained, slightly carbonaceous; fine-grained, silty, flaser-bedded, sideritic, and rooted at top.
N	0.07	Siltstone, medium-gray.
Y	0.20	Durain, argillaceous, pyritic.
Y	0.46	Clarain, with abundant thick-banded vitrain.
N	0.07	Siltstone, dark-gray, rooted.
Y	1.35	Clarain, with abundant thick-banded vitrain; very homogeneous.
		See KGS 444 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: U10231 FIELD NO: KGS 443 U.S.G.S. NO: W212069
LABORATORY: Geo Test REPORT DATE: Dec/31/1981

AIR DRIED LOSS: 0.36%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.70%		
VOLATILE MATTER	31.64%	32.19%	36.89%
FIXED CARBON	54.13%	55.07%	63.11%
ASH	12.53%	12.75%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.75%	4.64%	5.32%
CARBON	73.06%	74.32%	85.18%
NITROGEN	1.37%	1.39%	1.60%
TOTAL SULFUR	0.83%	0.84%	0.97%
OXYGEN	7.46%	6.06%	6.93%
ASH	12.53%	12.75%	
HEATING VALUE (BTU/LB):	12882	13105	15019
SULFUR FORMS:			
SULFATE	0.05%	0.05%	0.06%
PYRITIC	0.11%	0.11%	0.13%
ORGANIC	0.67%	0.68%	0.78%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	7.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.3

COAL SAMPLING REPORT

LABORATORY NO: U10252 FIELD NO: KGS 444 U.S.G.S. NO: W212070
SAMPLER: Currens AGENCY: KGS DATE: Oct/30/1980
7.5' QUAD: Hellier COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 11 ROW J TIER 85 4000 FT FSL, 1500 FT FEL
LATITUDE: 37 DEG 17 MIN 40 SEC LONGITUDE: 82 DEG 25 MIN 19 SEC
ELEVATION (FT): 1737.00, OF POINT AT base of 444, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.3 GEO. MAP COAL NAME: U Elkhorn No.3
REPORTED COAL NAME: U Elkhorn No.3 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): middle split
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh, clean, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 28.0, SAMPLE 26.8, COAL ONLY 26.8
STRUCTURAL FEATURE: cleat SEPARATION:
STRIKE AZIMUTHS: SET 1 260, SET 2 180, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 443.
N	2.43	Sandstone, medium- to dark-gray, fine grained, argillaceous, intensively rooted; thins to 1 foot thick, 500 feet north-northwest; ganister.
Y	0.16	Clarain.
N	0.10	Siltstone, dark-gray, coaly, discontinuous.
Y	0.49	Clarain, with abundant medium- to thick-banded vitrain, scattered medium-banded fusain.
Y	0.10	Durain.
Y	0.26	Clarain, with abundant medium- to thick-banded vitrain.
Y	0.02	Fusain.
Y	0.56	Clarain, with abundant medium- to thick-banded vitrain, scattered thin-banded fusain.
Y	0.02	Fusain.
Y	0.62	Clarain, with abundant medium- to thick-banded vitrain.
		See KGS 445 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: U10252 FIELD NO: KGS 444 U.S.G.S. NO: W212070
LABORATORY: Geo Test REPORT DATE: Dec/31/1981

AIR DRIED LOSS: 0.55%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.71%		
VOLATILE MATTER	35.75%	36.37%	38.31%
FIXED CARBON	57.57%	58.57%	61.69%
ASH	4.97%	5.06%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.32%	5.22%	5.50%
CARBON	79.66%	81.05%	85.36%
NITROGEN	1.46%	1.49%	1.56%
TOTAL SULFUR	0.62%	0.63%	0.66%
OXYGEN	7.97%	6.55%	6.92%
ASH	4.97%	5.06%	
HEATING VALUE (BTU/LB):	14221	14468	15239
SULFUR FORMS:			
SULFATE	0.05%	0.05%	0.05%
PYRITIC	0.04%	0.04%	0.04%
ORGANIC	0.53%	0.54%	0.57%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2690 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	7.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	0.9

COAL SAMPLING REPORT

LABORATORY NO: U10232 FIELD NO: KGS 445 U.S.G.S. NO: W212071
SAMPLER: Currens AGENCY: KGS DATE: Oct/30/1980
7.5' QUAD: Hellier COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 11 ROW J TIER 85 4000 FT FSL, 1500 FT FEL
LATITUDE: 37 DEG 17 MIN 40 SEC LONGITUDE: 82 DEG 25 MIN 19 SEC
ELEVATION (FT): 1725.70, OF POINT AT base of 445, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.3 GEO. MAP COAL NAME: U Elkhorn No.3
REPORTED COAL NAME: U Elkhorn No.3 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): bottom split
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh, clean, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 26.0, SAMPLE 26.0, COAL ONLY 26.0
STRUCTURAL FEATURE: cleat SEPARATION: 2 to 5 cm
STRIKE AZIMUTHS: SET 1 260, SET 2 180, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 444.
N	2.95	Claystone and coal (to 5 cm thick); interbedded coal is predominantly clarain, with abundant vitrain, pyritic; claystone is dark-gray, silty, rooted.
N	2.00	Claystone, dark-gray, rooted, carbonaceous.
N	0.33	Coal, predominantly clarain, argillaceous?
N	3.94	Siltstone, dark-gray to black at base, carbonaceous, sideritic, intensively rooted.
Y	0.39	Clarain, with abundant thick-banded vitrain, scattered thick-banded fusain; pyritic at top.
Y	0.03	Fusain.
Y	0.56	Clarain, nearly 100 percent medium- to thick-banded vitrain, with abundant medium-banded fusain.
Y	0.03	Fusain.
Y	0.13	Vitrain.
Y	0.03	Fusain, laterally continuous.
Y	0.98	Clarain, nearly 100 percent medium- to thick-banded vitrain, with abundant thick-banded fusain.
N		Siltstone, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: U10232 FIELD NO: KGS 445 U.S.G.S. NO: W212071
LABORATORY: Geo Test REPORT DATE: Dec/31/1981

AIR DRIED LOSS: 0.39%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.75%		
VOLATILE MATTER	32.48%	33.06%	34.25%
FIXED CARBON	62.36%	63.47%	65.75%
ASH	3.41%	3.47%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.22%	5.11%	5.30%
CARBON	81.43%	82.88%	85.86%
NITROGEN	1.35%	1.37%	1.42%
TOTAL SULFUR	1.15%	1.17%	1.21%
OXYGEN	7.44%	6.00%	6.21%
ASH	3.41%	3.47%	
HEATING VALUE (BTU/LB):	14364	14620	15145
SULFUR FORMS:			
SULFATE	0.05%	0.05%	0.05%
PYRITIC	0.26%	0.26%	0.27%
ORGANIC	0.84%	0.85%	0.89%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2600 DEG F
SOFTENING TEMP.	2670 DEG F
FLUID TEMP.	2740 DEG F

FREE SWELLING INDEX	7.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.6

COAL SAMPLING REPORT

LABORATORY NO: U10138 FIELD NO: KGS 426 U.S.G.S. NO: W212088
SAMPLER: Currens AGENCY: KGS DATE: Oct/07/1980
7.5' QUAD: Pikeville COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 16 ROW L TIER 84 3800 FT FSL, 2600 FT FEL
LATITUDE: 37 DEG 26 MIN 38 SEC LONGITUDE: 82 DEG 34 MIN 32 SEC
ELEVATION (FT): 1325.00, OF POINT AT base of 426, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: Amburgy zone GEO. MAP COAL NAME: Amburgy
REPORTED COAL NAME: Amburgy FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh, damp
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 55.1, SAMPLE 51.2, COAL ONLY 51.2
STRUCTURAL FEATURE: cleat SEPARATION:
STRIKE AZIMUTHS: SET 1 175, SET 2 65, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	22.97	Siltstone, dark-gray, with abundant marine fossils near base (brachiopods, cephalopods, pelecypods).
Y	1.64	Clarain, with abundant thin-banded vitrain, scattered interlaminated durain; abundant clay in cleats.
N	0.07	Siltstone.
Y	0.26	Durain, grades to clarain at top.
N	0.07	Siltstone, medium-gray, carbonaceous.
Y	0.23	Durain.
N	0.03	Claystone, medium-gray, carbonaceous.
Y	0.59	Clarain, pyritic.
N	0.16	Siltstone, highly carbonaceous, pyritic (bone).
Y	1.54	Clarain, with scattered thin-banded vitrain, pyritic.
N		Siltstone, dark-gray, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: U10138 FIELD NO: KGS 426 U.S.G.S. NO: W212088
LABORATORY: Geo Test REPORT DATE: Dec/08/1981

AIR DRIED LOSS: 0.19%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.03%		
VOLATILE MATTER	40.46%	41.30%	44.79%
FIXED CARBON	49.88%	50.91%	55.21%
ASH	7.63%	7.79%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.40%	5.28%	5.73%
CARBON	75.06%	76.61%	83.08%
NITROGEN	1.76%	1.80%	1.95%
TOTAL SULFUR	2.59%	2.64%	2.87%
OXYGEN	7.56%	5.88%	6.37%
ASH	7.63%	7.79%	
HEATING VALUE (BTU/LB):	13518	13798	14963
SULFUR FORMS:			
SULFATE	0.05%	0.05%	0.06%
PYRITIC	1.26%	1.29%	1.39%
ORGANIC	1.28%	1.31%	1.42%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2070 DEG F
SOFTENING TEMP.	2180 DEG F
FLUID TEMP.	2450 DEG F

FREE SWELLING INDEX	4.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	3.8

COAL SAMPLING REPORT

LABORATORY NO: U10178 FIELD NO: KGS 446 U.S.G.S. NO: W212281
SAMPLER: Currens AGENCY: KGS DATE: Nov/06/1980
7.5' QUAD: Hellier COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 11 ROW J TIER 85 6000 FT FSL, 3900 FT FEL
LATITUDE: 37 DEG 17 MIN 59 SEC LONGITUDE: 82 DEG 25 MIN 48 SEC
ELEVATION (FT): 1414.00, OF POINT AT base of 446, USING survey
COMMENTARY:
REGIONAL COAL NAME: Lower Elkhorn GEO. MAP COAL NAME: Lower Elkhorn
REPORTED COAL NAME: Lower Elkhorn FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: dry, fresh
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 46.5, SAMPLE 40.2, COAL ONLY 40.2
STRUCTURAL FEATURE: cleat SEPARATION: closely spaced
STRIKE AZIMUTHS: SET 1 270, SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Siltstone, dark-gray to black, laminated, highly carbonaceous, with abundant plant fragments and stumps.
Y	0.82	Clarain, with abundant thin- to medium-banded vitrain, scattered medium-banded fusain.
N	0.52	Claystone, black, highly carbonaceous, soft, with abundant slickensides.
Y	2.53	Clarain, predominantly medium- to thick-banded vitrain, with abundant medium- to thick-banded fusain; very bright, very soft.
N		Claystone, light-gray, silty, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: U10178 FIELD NO: KGS 446 U.S.G.S. NO: W212281
LABORATORY: Geo Test REPORT DATE: Dec/18/1981

AIR DRIED LOSS: 0.35%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.81%		
VOLATILE MATTER	29.42%	29.96%	33.51%
FIXED CARBON	58.38%	59.45%	66.49%
ASH	10.39%	10.58%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.83%	4.71%	5.27%
CARBON	74.84%	76.22%	85.24%
NITROGEN	1.36%	1.39%	1.55%
TOTAL SULFUR	0.41%	0.42%	0.47%
OXYGEN	8.17%	6.68%	7.47%
ASH	10.39%	10.58%	
HEATING VALUE (BTU/LB):	13233	13477	15072
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.06%	0.06%	0.07%
ORGANIC	0.34%	0.35%	0.39%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2520 DEG F
SOFTENING TEMP.	2660 DEG F
FLUID TEMP.	2760 DEG F

FREE SWELLING INDEX	3.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	0.6

COAL SAMPLING REPORT

LABORATORY NO: U10179 FIELD NO: KGS 447 U.S.G.S. NO: W212282
SAMPLER: Currens AGENCY: KGS DATE: Nov/16/1980
7.5' QUAD: Hellier COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 10 ROW J TIER 85 1500 FT FSL, 2800 FT FEL
LATITUDE: 37 DEG 18 MIN 15 SEC LONGITUDE: 82 DEG 25 MIN 35 SEC
ELEVATION (FT): 1577.60, OF POINT AT base of 447, USING survey
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.2 GEO. MAP COAL NAME: U Elkhorn No.2
REPORTED COAL NAME: U Elkhorn No.2 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: clean, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 40.2, SAMPLE 37.0, COAL ONLY 37.0
STRUCTURAL FEATURE: cleat SEPARATION:
STRIKE AZIMUTHS: SET 1 80, SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Siltstone, dark-gray, laminated, arenaceous, with abundant plant fragments; locally cut out by overlying sandstone.
Y	0.33	Clarain.
N	0.26	Claystone, highly carbonaceous.
Y	0.75	Clarain.
Y	2.00	Clarain, with abundant medium-banded vitrain, scattered medium- to thick-banded fusain.
N		Siltstone, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: U10179 FIELD NO: KGS 447 U.S.G.S. NO: W212282
LABORATORY: Geo Test REPORT DATE: Dec/18/1981

AIR DRIED LOSS: 0.32%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.55%		
VOLATILE MATTER	33.62%	34.15%	36.39%
FIXED CARBON	58.78%	59.70%	63.62%
ASH	6.05%	6.14%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.24%	5.15%	5.48%
CARBON	79.07%	80.31%	85.58%
NITROGEN	1.38%	1.40%	1.49%
TOTAL SULFUR	0.69%	0.70%	0.75%
OXYGEN	7.57%	6.30%	6.70%
ASH	6.05%	6.14%	
HEATING VALUE (BTU/LB):	14031	14251	15186
SULFUR FORMS:			
SULFATE	0.03%	0.03%	0.03%
PYRITIC	0.18%	0.18%	0.19%
ORGANIC	0.48%	0.49%	0.52%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2670 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX 7.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU 1.0

COAL SAMPLING REPORT

LABORATORY NO: U10615 FIELD NO: KGS 450 U.S.G.S. NO: W212497
SAMPLER: Currens AGENCY: KGS DATE: Nov/13/1980
7.5' QUAD: Broad Bottom COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 20 ROW M TIER 84 1800 FT FSL, 2300 FT FEL
LATITUDE: 37 DEG 31 MIN 18 SEC LONGITUDE: 82 DEG 30 MIN 29 SEC
ELEVATION (FT): 930.00, OF POINT AT base of 450, USING topo
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.1 GEO. MAP COAL NAME: U Elkhorn No.1
REPORTED COAL NAME: U Elkhorn No.1 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh, clean, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 31.9, SAMPLE 31.9, COAL ONLY 31.9
STRUCTURAL FEATURE: cleat SEPARATION:
STRIKE AZIMUTHS: SET 1 200, SET 2 270, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 451.
N	7.05	Siltstone, medium-gray; laminated to ripple-bedded near bottom; top half rooted; sideritic.
Y	0.98	Clarain, with abundant medium- to thick-banded vitrain, scattered thin-banded fusain; pyrite nodules 2 x 5cm thick, 5 cm from base.
Y	0.13	Durain.
Y	0.66	Clarain, with abundant medium-banded vitrain.
Y	0.62	Durain, with interlaminated thin-banded vitrain.
Y	0.26	Clarain.
N		Siltstone, medium-gray, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: U10615 FIELD NO: KGS 450 U.S.G.S. NO: W212497
LABORATORY: Geo Test REPORT DATE: Apr/15/1982

AIR DRIED LOSS: 0.57%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.71%		
VOLATILE MATTER	36.55%	37.57%	39.05%
FIXED CARBON	57.05%	58.64%	60.95%
ASH	3.69%	3.79%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.54%	5.38%	5.59%
CARBON	78.99%	81.19%	84.39%
NITROGEN	1.62%	1.67%	1.73%
TOTAL SULFUR	0.80%	0.82%	0.85%
OXYGEN	9.36%	7.15%	7.44%
ASH	3.69%	3.79%	
HEATING VALUE (BTU/LB):	13951	14340	14905
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.07%	0.07%	0.07%
ORGANIC	0.72%	0.74%	0.77%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2680 DEG F
SOFTENING TEMP.	2780 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	3.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.1

COAL SAMPLING REPORT

LABORATORY NO: U10616 FIELD NO: KGS 451 U.S.G.S. NO: W212498
SAMPLER: Currens AGENCY: KGS DATE: Nov/13/1980
7.5' QUAD: Broad Bottom COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 20 ROW M TIER 84 1800 FT FSL, 2300 FT FEL
LATITUDE: 37 DEG 31 MIN 18 SEC LONGITUDE: 82 DEG 30 MIN 29 SEC
ELEVATION (FT): 939.00, OF POINT AT base of 451, USING topo
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.2 GEO. MAP COAL NAME: U Elkhorn No.2
REPORTED COAL NAME: U Elkhorn No.2 FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh, clean, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 29.9, SAMPLE 28.3, COAL ONLY 28.3
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 300, SET 2 210, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	0.98	Coal.
N	32.81	Sandstone, light-gray, silty, flaser-bedded; with sideritic, highly silty zones up to 1 m thick; rooted at top.
Y	0.46	Clarain, with abundant medium- to thick-banded vitrain.
Y	0.66	Durain, with interlaminated medium-banded vitrain.
Y	1.15	Clarain, with abundant thick-banded vitrain.
N	0.13	Siltstone, dark-gray to black, laminated, carbonaceous.
Y	0.10	Clarain.
		See KGS 450 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: U10616 FIELD NO: KGS 451 U.S.G.S. NO: W212498
LABORATORY: Geo Test REPORT DATE: Apr/15/1982

AIR DRIED LOSS: 0.55%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.71%		
VOLATILE MATTER	36.36%	37.37%	39.53%
FIXED CARBON	55.62%	57.17%	60.47%
ASH	5.31%	5.46%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.31%	5.15%	5.44%
CARBON	78.01%	80.19%	84.81%
NITROGEN	1.63%	1.68%	1.77%
TOTAL SULFUR	0.88%	0.90%	0.96%
OXYGEN	8.86%	6.62%	7.02%
ASH	5.31%	5.46%	
HEATING VALUE (BTU/LB):	13780	14165	14982
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.11%	0.11%	0.12%
ORGANIC	0.76%	0.78%	0.83%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2660 DEG F
SOFTENING TEMP.	2780 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	4.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.3

COAL SAMPLING REPORT

LABORATORY NO: U10617 FIELD NO: KGS 452 U.S.G.S. NO: W212499
SAMPLER: Currens AGENCY: KGS DATE: Nov/13/1980
7.5' QUAD: Broad Bottom COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 20 ROW M TIER 84 1500 FT FSL, 2600 FT FEL
LATITUDE: 37 DEG 31 MIN 15 SEC LONGITUDE: 82 DEG 30 MIN 32 SEC
ELEVATION (FT): 970.00, OF POINT AT base of 452, USING topo
COMMENTARY: Coal lies between the Upper Elkhorn No. 2 and No. 3; Upper Elkhorn No. 3 leader?
REGIONAL COAL NAME: uncorrelated GEO. MAP COAL NAME: unnamed
REPORTED COAL NAME: unnamed FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh, clean, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 9.6, SAMPLE 9.6, COAL ONLY 9.5
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 210, SET 2 300, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	16.40	Siltstone(?), medium-gray, inaccessible.
N	6.56	Sandstone, light-gray, coarse-grained.
N	13.12	Siltstone, dark-gray, micaceous, carbonaceous, laminated, with scattered plant fragments.
Y	0.23	Clarain, with abundant thin-banded vitrain.
Y	0.01	Pyrite.
Y	0.56	Clarain, with abundant thin-banded vitrain.
N		Siltstone, light-gray, rooted.
		See KGS 451 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: U10617 FIELD NO: KGS 452 U.S.G.S. NO: W212499
LABORATORY: Geo Test REPORT DATE: Apr/15/1982

AIR DRIED LOSS: 0.25%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.05%		
VOLATILE MATTER	44.28%	45.21%	48.23%
FIXED CARBON	47.53%	48.52%	51.77%
ASH	6.14%	6.27%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.50%	5.38%	5.74%
CARBON	74.30%	75.85%	80.93%
NITROGEN	1.58%	1.61%	1.72%
TOTAL SULFUR	3.85%	3.93%	4.19%
OXYGEN	8.63%	6.96%	7.42%
ASH	6.14%	6.27%	
HEATING VALUE (BTU/LB):	13725	14012	14949
SULFUR FORMS:			
SULFATE	0.09%	0.09%	0.10%
PYRITIC	2.48%	2.53%	2.70%
ORGANIC	1.28%	1.31%	1.39%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	1960 DEG F
SOFTENING TEMP.	2150 DEG F
FLUID TEMP.	2230 DEG F

FREE SWELLING INDEX	3.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	5.6

COAL SAMPLING REPORT

LABORATORY NO: U10621 FIELD NO: KGS 456 U.S.G.S. NO: W212503
SAMPLER: Currens AGENCY: KGS DATE: Nov/20/1980
7.5' QUAD: Thomas COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 9 ROW 0 TIER 84 1600 FT FSL, 4400 FT FEL
LATITUDE: 37 DEG 43 MIN 16 SEC LONGITUDE: 82 DEG 31 MIN 55 SEC
ELEVATION (FT): 1015.00, OF POINT AT base of 456, USING survey
COMMENTARY:
REGIONAL COAL NAME: Peach Orchard z GEO. MAP COAL NAME: Peach Orchard
REPORTED COAL NAME: Peach Orchard FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): middle split
EXPOSURE: TYPE, surface mine; CONDITION, 3 weeks old
SAMPLE CONDITION: slightly weathered, wet
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 58.9, SAMPLE 53.7, COAL ONLY 53.5
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 315, SET 2 70 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	32.81	Sandstone, light-gray to brown, massive, with silty zones.
N	1.64	Coal; upper split of the Peach Orchard(?).
N	16.40	Sandstone, light- to medium-gray, flaser-bedded, micaceous; silty and rooted at top.
N	2.79	Siltstone, medium-gray, laminated to bioturbated, sideritic.
N	0.33	Shale, black, highly carbonaceous, laminated, canneloid.
N	0.98	Siltstone, dark-gray, bioturbated (rooted?), carbonaceous.
Y	1.41	Clarain, with abundant thin-banded vitrain, scattered thick-banded fusain.
N	0.16	Claystone, light-gray, rooted.
Y	0.79	Clarain, with abundant medium- to thick-banded vitrain; pyritic.
N	0.26	Claystone, dark-gray, rooted.
Y	0.07	Clarain.
Y	0.02	Pyrite.
Y	1.25	Clarain, with abundant medium- to thick-banded vitrain.
Y	0.10	Durain.
Y	0.85	Clarain.
N		Siltstone, medium-gray to black, carbonaceous, rooted; reported 5 feet thick.

COAL ANALYSIS REPORT

LABORATORY NO: U10621 FIELD NO: KGS 456 U.S.G.S. NO: W212503
LABORATORY: Geo Test REPORT DATE: Apr/15/1982

AIR DRIED LOSS: 1.04%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	3.52%		
VOLATILE MATTER	34.68%	35.95%	42.63%
FIXED CARBON	46.68%	48.38%	57.37%
ASH	15.12%	15.67%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.56%	4.32%	5.12%
CARBON	66.21%	68.63%	81.38%
NITROGEN	1.34%	1.39%	1.65%
TOTAL SULFUR	2.22%	2.30%	2.73%
OXYGEN	10.55%	7.69%	9.12%
ASH	15.12%	15.67%	
HEATING VALUE (BTU/LB):	11743	12172	14433
SULFUR FORMS:			
SULFATE	0.16%	0.17%	0.20%
PYRITIC	1.27%	1.32%	1.56%
ORGANIC	0.79%	0.82%	0.97%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2390 DEG F
SOFTENING TEMP.	2540 DEG F
FLUID TEMP.	2620 DEG F

FREE SWELLING INDEX	1.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	3.8

COAL SAMPLING REPORT

LABORATORY NO: U10622 FIELD NO: KGS 457 U.S.G.S. NO: W212504
SAMPLER: Currens AGENCY: KGS DATE: Nov/20/1980
7.5' QUAD: Inez COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 23 ROW P TIER 84 2900 FT FSL, 1200 FT FEL
LATITUDE: 37 DEG 45 MIN 29 SEC LONGITUDE: 82 DEG 32 MIN 15 SEC
ELEVATION (FT): 1260.00, OF POINT AT base of 457, USING topo
COMMENTARY:
REGIONAL COAL NAME: Richardson z GEO. MAP COAL NAME: U Richardson
REPORTED COAL NAME: U Richardson FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, surface mine; CONDITION, active
SAMPLE CONDITION: fresh, damp, mud in cleat
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 113.0, SAMPLE 92.9, COAL ONLY 92.9
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 340, SET 2 150, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	16.40	Sandstone, light-gray, coarse-grained, with large-scale crossbeds; lag gravel at base; coal spar.
N	6.56	Siltstone, medium-gray, laminated, carbonaceous, arenaceous.
Y	0.98	Clarain, pyritic.
N	0.43	Siltstone, dark-gray, hard.
Y	0.33	Clarain, with abundant thick-banded vitrain.
N	0.43	Claystone, black, coaly, very soft.
Y	1.15	Durain; grades to clarain at top; pyritic, with abundant medium-banded vitrain.
N	0.33	Siltstone, black, highly carbonaceous, hard.
Y	0.56	Clarain.
Y	0.26	Durain; grades to clarain at base; with scattered thin-banded vitrain.
N	0.13	Siltstone, black, highly carbonaceous, hard.
Y	2.13	Clarain, with scattered thin- to medium-banded vitrain; 5-mm-thick pyrite band at 0.6 and 1.5 feet above base.
Y	0.75	Clarain, with abundant medium- to thick-banded vitrain.
Y	0.69	Durain, with scattered thin-banded vitrain.
N	0.20	Siltstone, medium-gray, rooted.
Y	0.52	Clarain, with abundant medium-banded vitrain.
N	0.16	Siltstone, dark-gray, rooted.
Y	0.36	Clarain.
N		Siltstone, light-gray, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: U10622 FIELD NO: KGS 457 U.S.G.S. NO: W212504
LABORATORY: Geo Test REPORT DATE: Apr/15/1982

AIR DRIED LOSS: 1.47%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	4.10%		
VOLATILE MATTER	32.76%	34.16%	40.82%
FIXED CARBON	47.50%	49.53%	59.19%
ASH	15.64%	16.31%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.68%	4.40%	5.26%
CARBON	65.09%	67.88%	81.10%
NITROGEN	1.31%	1.37%	1.63%
TOTAL SULFUR	1.04%	1.08%	1.30%
OXYGEN	12.24%	8.96%	10.71%
ASH	15.64%	16.31%	
HEATING VALUE (BTU/LB):	11340	11825	14130
SULFUR FORMS:			
SULFATE	0.09%	0.09%	0.11%
PYRITIC	0.27%	0.28%	0.34%
ORGANIC	0.68%	0.71%	0.85%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	1.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.8

COAL SAMPLING REPORT

LABORATORY NO: U10607 FIELD NO: KGS 461 U.S.G.S. NO: W212594
SAMPLER: Pollock AGENCY: IMMR DATE: Dec/22/1980
7.5' QUAD: Dorton COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 12 ROW J TIER 84 1400 FT FSL, 3800 FT FEL
LATITUDE: 37 DEG 17 MIN 14 SEC LONGITUDE: 82 DEG 31 MIN 47 SEC
ELEVATION (FT): 2165.00, OF POINT AT base of 461, USING survey
COMMENTARY:
REGIONAL COAL NAME: Fire Clay GEO. MAP COAL NAME: Fire Clay
REPORTED COAL NAME: Fire Clay FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: fresh
RECOVERY METHOD: channel SAMPLING REGIME: TK partings included
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 68.5, SAMPLE 68.5, COAL ONLY 62.6
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Shale, medium- to medium-dark-gray, silty, with abundant plant impressions, micaceous.
Y	0.49	Clarain and vitrain, alternating.
Y	0.10	Durain.
Y	0.03	Vitrain and durain, alternating.
Y	0.13	Durain.
Y	0.20	Clarain.
Y	0.30	Durain.
Y	0.69	Vitrain and clarain, alternating.
Y	0.16	Durain.
Y	0.23	Vitrain and durain, alternating.
Y	0.23	Durain, with scattered vitrain stringers.
Y	0.33	Vitrain and clarain, with occasional durain bands.
Y	0.03	Fusain.
Y	0.16	Vitrain, interlaminated with clarain.
Y	0.49	Flint clay, very fine-grained, micaceous, feldspathic, medium- to medium-dark-gray; abundant vitrain stringers in lower 0.2 foot.
Y	1.05	Vitrain, clarain, and durain, interlaminated.
Y	0.49	Durain, with abundant vitrain laminae.
Y	0.59	Vitrain and clarain, interlaminated.
N		Shale, medium-gray, clayey, slickensided, micaceous.

COAL ANALYSIS REPORT

LABORATORY NO: U10607 FIELD NO: KGS 461 U.S.G.S. NO: W212594
LABORATORY: Geo Test REPORT DATE: Mar/31/1982

AIR DRIED LOSS: 0.45%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.74%		
VOLATILE MATTER	34.05%	34.65%	40.24%
FIXED CARBON	50.57%	51.47%	59.76%
ASH	13.64%	13.88%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.04%	4.93%	5.73%
CARBON	71.33%	72.59%	84.30%
NITROGEN	1.46%	1.49%	1.73%
TOTAL SULFUR	0.81%	0.82%	0.96%
OXYGEN	7.72%	6.29%	7.28%
ASH	13.64%	13.88%	
HEATING VALUE (BTU/LB):	12713	12938	15024
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.14%	0.14%	0.17%
ORGANIC	0.66%	0.67%	0.78%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	4.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.3

COAL SAMPLING REPORT

LABORATORY NO: U10608 FIELD NO: KGS 462 U.S.G.S. NO: W212595
SAMPLER: Pollock AGENCY: IMMR DATE: Dec/22/1980
7.5' QUAD: Dorton COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 20 ROW J TIER 84 4200 FT FSL, 2500 FT FEL
LATITUDE: 37 DEG 16 MIN 42 SEC LONGITUDE: 82 DEG 30 MIN 31 SEC
ELEVATION (FT): 2097.00, OF POINT AT base of 462, USING survey
COMMENTARY:
REGIONAL COAL NAME: Fire Clay rdr GEO. MAP COAL NAME: Fire Clay rdr
REPORTED COAL NAME: Fire Clay rdr FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: fresh
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 94.9, SAMPLE 91.3, COAL ONLY 81.5
STRUCTURAL FEATURE: , SEPARATION:
STRIKE AZIMUTHS: SET 1 , SET 2 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Shale, medium- to dark-gray, micaceous, with abundant coal spars and plant fragments.
Y	0.49	Vitrain.
Y	0.33	Vitrain and clarain, interlaminated.
N	0.30	Shale, medium-gray, clayey, micaceous, with scattered vitrain lenses and laminae.
Y	0.03	Vitrain, pyritic.
Y	0.03	Fusain.
Y	1.31	Clarain, interbedded with durain; scattered thick vitrain and occasional fusain near base.
Y	0.03	Shale, medium- to light-gray, clayey.
Y	0.13	Vitrain and clarain, interlaminated.
Y	0.07	Fusain.
Y	0.16	Shale, medium- to dark-gray, micaceous, silty.
Y	0.46	Clarain, with abundant vitrain bands.
Y	1.18	Vitrain and clarain, interlaminated, with occasional durain bands.
Y	0.07	Shale, medium-gray, silty.
Y	0.85	Durain, with scattered clarain and vitrain bands.
Y	0.66	Clarain, with scattered vitrain laminae and bands.
Y	0.07	Shale, medium-dark-gray, very silty.
Y	1.25	Vitrain, with occasional clarain and durain bands.
Y	0.49	Canneloid coal, shaly.
N		Shale, medium-gray, silty, with abundant plant fragments.

COAL ANALYSIS REPORT

LABORATORY NO: U10608 FIELD NO: KGS 462 U.S.G.S. NO: W212595
LABORATORY: Geo Test REPORT DATE: Mar/31/1982

AIR DRIED LOSS: 0.43%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.82%		
VOLATILE MATTER	32.94%	33.55%	40.32%
FIXED CARBON	48.75%	49.65%	59.67%
ASH	16.49%	16.80%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.85%	4.73%	5.69%
CARBON	67.80%	69.05%	82.99%
NITROGEN	1.44%	1.47%	1.76%
TOTAL SULFUR	0.96%	0.98%	1.18%
OXYGEN	8.46%	6.97%	8.38%
ASH	16.49%	16.80%	
HEATING VALUE (BTU/LB):	12235	12461	14977
SULFUR FORMS:			
SULFATE	0.03%	0.03%	0.04%
PYRITIC	0.27%	0.27%	0.33%
ORGANIC	0.66%	0.67%	0.81%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2650 DEG F
SOFTENING TEMP.	2750 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	5.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.6

COAL SAMPLING REPORT

LABORATORY NO: U10609 FIELD NO: KGS 463 U.S.G.S. NO: W212596
SAMPLER: Currens AGENCY: KGS DATE: Jan/15/1981
7.5' QUAD: Kermit COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 24 ROW P TIER 86 5700 FT FSL, 1200 FT FEL
LATITUDE: 37 DEG 45 MIN 56 SEC LONGITUDE: 82 DEG 23 MIN 15 SEC
ELEVATION (FT): 760.00, OF POINT AT base of 463, USING topo
COMMENTARY:
REGIONAL COAL NAME: Taylor GEO. MAP COAL NAME: Taylor
REPORTED COAL NAME: Taylor FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, surface mine; CONDITION, 3 months old, faced-up
SAMPLE CONDITION: clean, wet
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 38.6, SAMPLE 37.8, COAL ONLY 36.2
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 310, SET 2 225, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Magoffin Limestone (marine fossils and thin limestone bed) 28 feet above top of coal.
N	29.53	Siltstone, dark-gray, sideritic; arenaceous at top; slightly carbonaceous, with scattered plant fragments; no marine fossils at base.
Y	0.89	Clarain, with abundant thin-banded vitrain.
Y	0.92	Durain, interlaminated with thin-banded vitrain.
Y	0.52	Clarain.
Y	0.10	Pyrite, lenticular.
Y	0.33	Clarain; grades to durain at top.
Y	0.03	Siltstone, dark-brown, arenaceous.
Y	0.13	Clarain.
N	0.07	Durain, highly argillaceous, hard (bone).
Y	0.23	Clarain.
N		Siltstone, dark-brown, arenaceous, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: U10609 FIELD NO: KGS 463 U.S.G.S. NO: W212596
LABORATORY: Geo Test REPORT DATE: Mar/31/1982

AIR DRIED LOSS: 0.77%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.76%		
VOLATILE MATTER	36.81%	37.86%	41.81%
FIXED CARBON	51.23%	52.68%	58.19%
ASH	9.20%	9.46%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.14%	4.97%	5.49%
CARBON	72.54%	74.60%	82.39%
NITROGEN	1.65%	1.70%	1.87%
TOTAL SULFUR	1.32%	1.36%	1.50%
OXYGEN	10.15%	7.91%	8.75%
ASH	9.20%	9.46%	
HEATING VALUE (BTU/LB):	13000	13369	14765
SULFUR FORMS:			
SULFATE	0.05%	0.05%	0.06%
PYRITIC	0.47%	0.48%	0.53%
ORGANIC	0.80%	0.82%	0.91%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	3.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	2.0

COAL SAMPLING REPORT

LABORATORY NO: U10585 FIELD NO: KGS 558 U.S.G.S. NO: W215399
SAMPLER: Currens AGENCY: KGS DATE: Aug/26/1981
7.5' QUAD: Williamson COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 9 ROW N TIER 87 4600 FT FSL, 250 FT FEL
LATITUDE: 37 DEG 38 MIN 45 SEC LONGITUDE: 82 DEG 16 MIN 3 SEC
ELEVATION (FT): 736.60, OF POINT AT base of 558, USING hand level
COMMENTARY:
REGIONAL COAL NAME: Lower Elkhorn GEO. MAP COAL NAME: Pond Creek
REPORTED COAL NAME: Pond Creek FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, roadcut; CONDITION, 8 weeks old
SAMPLE CONDITION: slightly weathered, clean, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 44.9, SAMPLE 44.9, COAL ONLY 44.9
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 320, SET 2 235, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	32.81	Siltstone, dark-gray; thin coal (3 to 6 inches thick) at base.
N	9.84	Sandstone, light-gray, coarse-grained, crossbedded, micaceous, feldspathic; rooted at top; cuts out underlying siltstone and into coal.
N	3.61	Siltstone, light-gray, laminated to partly bioturbated, arenaceous, carbonaceous, with scattered plant fragments.
Y	0.26	Clarain, with abundant medium- to thick-banded vitrain.
Y	0.82	Durain, highly argillaceous, interbedded with medium- to thick-banded vitrain, scattered thick-banded fusain; pyritic (approaches black shale).
Y	1.90	Clarain, with abundant thin- to thick-banded vitrain, scattered thin-banded fusain, slightly pyritic.
Y	0.75	Durain, with scattered thin- to medium-banded vitrain.

See KGS 559 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: U10585 FIELD NO: KGS 558 U.S.G.S. NO: W215399
LABORATORY: Geo Test REPORT DATE: Mar/31/1982

AIR DRIED LOSS: 0.23%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.89%		
VOLATILE MATTER	32.24%	32.86%	37.43%
FIXED CARBON	53.89%	54.93%	62.57%
ASH	11.98%	12.21%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.76%	4.64%	5.28%
CARBON	73.05%	74.46%	84.81%
NITROGEN	1.45%	1.48%	1.68%
TOTAL SULFUR	0.50%	0.51%	0.58%
OXYGEN	8.26%	6.70%	7.65%
ASH	11.98%	12.21%	
HEATING VALUE (BTU/LB):	12894	13143	14970
SULFUR FORMS:			
SULFATE	0.00%	0.00%	0.00%
PYRITIC	0.05%	0.05%	0.06%
ORGANIC	0.45%	0.46%	0.52%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2460 DEG F
SOFTENING TEMP.	2580 DEG F
FLUID TEMP.	2630 DEG F

FREE SWELLING INDEX	3.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	0.8

COAL SAMPLING REPORT

LABORATORY NO: U10586 FIELD NO: KGS 559 U.S.G.S. NO: W215400
SAMPLER: Currens AGENCY: KGS DATE: Aug/26/1981
7.5' QUAD: Williamson COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 9 ROW N TIER 87 4950 FT FSL, 200 FT FEL
LATITUDE: 37 DEG 38 MIN 49 SEC LONGITUDE: 82 DEG 16 MIN 2 SEC
ELEVATION (FT): 685.70, OF POINT AT base of 559, USING hand level
COMMENTARY:
REGIONAL COAL NAME: uncorrelated GEO. MAP COAL NAME: unnamed
REPORTED COAL NAME: unnamed FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, roadcut; CONDITION,
SAMPLE CONDITION: very fresh, clean, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 16.9, SAMPLE 16.2, COAL ONLY 16.2
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 25 , SET 2 140, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 558.
N	24.61	Sandstone, light-gray, coarse-grained; rooted at top, with thin coal beds, silty; largely inaccessible.
N	0.33	Coal (predominantly clarain?).
N	2.62	Ganister, medium-gray, rooted; horizon TBM elevation 709.9 feet.
N	20.67	Sandstone, light-gray, coarse-grained, crossbedded, slightly carbonaceous, micaceous, feldspathic.
N	1.12	Shale, silty, dark-gray, laminated, slightly carbonaceous.
Y	0.75	Clarain, with abundant thick-banded vitrain, scattered thin-banded fusain.
N	0.07	Shale, dark-gray.
Y	0.59	Clarain, with abundant thin-banded vitrain, pyritic.
N		Siltstone, dark-gray, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: U10586 FIELD NO: KGS 559 U.S.G.S. NO: W215400
LABORATORY: Geo Test REPORT DATE: Mar/31/1982

AIR DRIED LOSS: 0.29%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	2.14%		
VOLATILE MATTER	35.88%	36.67%	38.78%
FIXED CARBON	56.65%	57.89%	61.22%
ASH	5.33%	5.45%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.39%	5.26%	5.57%
CARBON	78.07%	79.78%	84.37%
NITROGEN	1.70%	1.74%	1.84%
TOTAL SULFUR	0.87%	0.89%	0.94%
OXYGEN	8.64%	6.88%	7.28%
ASH	5.33%	5.45%	
HEATING VALUE (BTU/LB):	13892	14196	15013
SULFUR FORMS:			
SULFATE	0.02%	0.02%	0.02%
PYRITIC	0.14%	0.14%	0.15%
ORGANIC	0.71%	0.73%	0.77%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2750 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	5.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.3

COAL SAMPLING REPORT

LABORATORY NO: U10587 FIELD NO: KGS 560 U.S.G.S. NO: W215401
SAMPLER: Currens AGENCY: KGS DATE: Aug/26/1981
7.5' QUAD: Williamson COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 22 ROW 0 TIER 87 1950 FT FSL, 4250 FT FEL
LATITUDE: 37 DEG 40 MIN 19 SEC LONGITUDE: 82 DEG 16 MIN 53 SEC
ELEVATION (FT): 760.00, OF POINT AT base of 560, USING topo
COMMENTARY:
REGIONAL COAL NAME: U Elkhorn No.1 GEO. MAP COAL NAME: Alma
REPORTED COAL NAME: Alma FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, roadcut; CONDITION, a few weeks old
SAMPLE CONDITION: slightly weathered, clean, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 10.3, SAMPLE 10.2, COAL ONLY 10.2
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 295, SET 2 210, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Removed.
N	19.69	Siltstone, dark-gray, carbonaceous, micaceous, laminated; weathered at top.
Y	0.85	Clarain, common thin- to medium-banded vitrain, scattered thin-banded fusain.
N		Claystone, medium-gray, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: U10587 FIELD NO: KGS 560 U.S.G.S. NO: W215401
LABORATORY: Geo Test REPORT DATE: Mar/31/1982

AIR DRIED LOSS: 0.17%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.76%		
VOLATILE MATTER	39.01%	39.71%	44.82%
FIXED CARBON	48.03%	48.89%	55.18%
ASH	11.20%	11.40%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.12%	5.01%	5.66%
CARBON	69.94%	71.19%	80.35%
NITROGEN	1.41%	1.44%	1.62%
TOTAL SULFUR	5.79%	5.89%	6.65%
OXYGEN	6.54%	5.07%	5.72%
ASH	11.20%	11.40%	
HEATING VALUE (BTU/LB):	12939	13171	14866
SULFUR FORMS:			
SULFATE	0.15%	0.15%	0.17%
PYRITIC	4.60%	4.68%	5.28%
ORGANIC	1.04%	1.06%	1.19%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2070 DEG F
SOFTENING TEMP.	2160 DEG F
FLUID TEMP.	2200 DEG F

FREE SWELLING INDEX	4.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	8.9

COAL SAMPLING REPORT

LABORATORY NO: U10588 FIELD NO: KGS 561 U.S.G.S. NO: W215402
SAMPLER: Currens AGENCY: KGS DATE: Aug/27/1981
7.5' QUAD: Wheelwright COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 13 ROW J TIER 82 3350 FT FSL, 1300 FT FEL
LATITUDE: 37 DEG 17 MIN 33 SEC LONGITUDE: 82 DEG 42 MIN 16 SEC
ELEVATION (FT): 1715.00, OF POINT AT base of 561, USING survey
COMMENTARY:
REGIONAL COAL NAME: Fire Clay GEO. MAP COAL NAME: Fire Clay
REPORTED COAL NAME: Fire Clay FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: fresh, clean, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 31.5, SAMPLE 27.6, COAL ONLY 27.6
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 235, SET 2 340, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Soil.
N	6.56	Sandstone, light-gray, fine-grained, argillaceous; grades into underlying shale.
N	9.84	Shale, medium-gray, laminated, with a few plant fragments, sideritic, with sparse fine-grained lenses, carbonaceous, micaceous; sandstone interbedded.
Y	0.07	Canneloid coal, argillaceous.
Y	0.39	Clarain, with abundant medium- to thick-banded vitrain, common medium-banded fusain.
Y	0.10	Durain.
Y	1.08	Clarain, with abundant thin- to thick-banded vitrain, common medium-banded fusain, scattered durain up to 1 cm thick.
N	0.33	Claystone, dark-brown, carbonaceous, brittle.
Y	0.66	Clarain, with abundant vitrain, scattered thin-banded fusain; pyritic.
N		Siltstone, rooted(?).

COAL ANALYSIS REPORT

LABORATORY NO: U10588 FIELD NO: KGS 561 U.S.G.S. NO: W215402
LABORATORY: Geo Test REPORT DATE: Mar/31/1982

AIR DRIED LOSS: 0.20%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	1.92%		
VOLATILE MATTER	33.00%	33.65%	38.76%
FIXED CARBON	52.15%	53.17%	61.24%
ASH	12.93%	13.18%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.01%	4.89%	5.63%
CARBON	70.08%	71.45%	82.30%
NITROGEN	1.54%	1.57%	1.81%
TOTAL SULFUR	0.65%	0.66%	0.76%
OXYGEN	9.79%	8.25%	9.50%
ASH	12.93%	13.18%	
HEATING VALUE (BTU/LB):	12680	12929	14891
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.10%	0.10%	0.12%
ORGANIC	0.54%	0.55%	0.63%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2660 DEG F
SOFTENING TEMP.	2740 DEG F
FLUID TEMP.	2790 DEG F

FREE SWELLING INDEX	4.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.0

COAL SAMPLING REPORT

LABORATORY NO: U10726 FIELD NO: KGS 603 U.S.G.S. NO: W215440
SAMPLER: Currens AGENCY: KGS DATE: Oct/22/1981
7.5' QUAD: Thomas COUNTY: Martin DISTRICT: Big Sandy
CARTER COORDINATE: SEC 7 ROW 0 TIER 84 1000 FT FSL, 200 FT FEL
LATITUDE: 37 DEG 43 MIN 10 SEC LONGITUDE: 82 DEG 33 MIN 2 SEC
ELEVATION (FT): 1400.00, OF POINT AT base of 603, USING topo
COMMENTARY: KGS 603 overlies sample KCER 10-22-1 of the Richardson coal.
REGIONAL COAL NAME: Richardson zone GEO. MAP COAL NAME: Richardson
REPORTED COAL NAME: Skyline FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): full thickness
EXPOSURE: TYPE, surface mine; CONDITION, few days old
SAMPLE CONDITION: clean, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 45.9, SAMPLE 43.1, COAL ONLY 42.3
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 320, SET 2 45 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N		Removed (sandstone reported).
Y	0.03	Durain.
Y	0.07	Vitrain, lenticular.
Y	0.30	Durain.
Y	1.02	Clarain, with scattered medium- to thick-banded vitrain, sparse thin-banded fusain; pyritic.
Y	0.18	Durain.
Y	0.62	Clarain, with abundant medium- to thick-banded vitrain, scattered thin-banded fusain.
N	0.23	Claystone, black, carbonaceous.
Y	0.85	Clarain, with abundant medium-banded vitrain.
Y	0.03	Pyrite.
Y	0.30	Clarain, with common medium-banded vitrain.
Y	0.03	Clay, light-gray.
Y	0.16	Clarain.
N	6.56	Sandstone; ganister.

COAL ANALYSIS REPORT

LABORATORY NO: U10726 FIELD NO: KGS 603 U.S.G.S. NO: W215440
LABORATORY: Geo Test REPORT DATE: Apr/29/1982

AIR DRIED LOSS: 1.60%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	3.71%		
VOLATILE MATTER	33.50%	34.79%	39.88%
FIXED CARBON	50.51%	52.45%	60.12%
ASH	12.28%	12.75%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.91%	4.67%	5.35%
CARBON	68.21%	70.84%	81.19%
NITROGEN	1.44%	1.50%	1.71%
TOTAL SULFUR	1.06%	1.10%	1.26%
OXYGEN	12.10%	9.14%	10.49%
ASH	12.28%	12.75%	
HEATING VALUE (BTU/LB):	12063	12527	14359
SULFUR FORMS:			
SULFATE	0.01%	0.01%	0.01%
PYRITIC	0.49%	0.51%	0.58%
ORGANIC	0.56%	0.58%	0.67%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	2.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.8

COAL SAMPLING REPORT

LABORATORY NO: U10778 FIELD NO: KGS 616 U.S.G.S. NO: W215557
SAMPLER: Currens AGENCY: KGS DATE: Nov/12/1981
7.5' QUAD: Broad Bottom COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 7 ROW M TIER 84 3000 FT FSL, 3900 FT FEL
LATITUDE: 37 DEG 33 MIN 30 SEC LONGITUDE: 82 DEG 33 MIN 48 SEC
ELEVATION (FT): 1553.00, OF POINT AT base of 616, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: Peach Orchard z GEO. MAP COAL NAME: Peach Orchard
REPORTED COAL NAME: Peach Orchard FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): 4th split from bottom
EXPOSURE: TYPE, construction site; CONDITION, 1 year old
SAMPLE CONDITION: weathered, clean, dry
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 45.7, SAMPLE 39.0, COAL ONLY 39.0
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 300, SET 2 235, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
N	82.02	Sandstone, light-gray, coarse-grained, trough crossbedded; thin lag gravel at base; locally cuts out underlying coal.
Y	0.16	Clarain, pyritic, with common thin-banded vitrain.
Y	0.13	Durain, pyritic.
Y	0.82	Clarain, with abundant medium-banded vitrain, scattered thin-banded fusain; slightly pyritic.
N	0.56	Siltstone, black, rooted, carbonaceous.
Y	0.82	Siltstone, highly carbonaceous, coaly (40 percent), with common medium-banded vitrain, scattered thick-banded vitrain.
Y	1.31	Clarain, with very abundant medium- to thick-banded vitrain.
		See KGS 617 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: U10778 FIELD NO: KGS 616 U.S.G.S. NO: W215557
LABORATORY: Geo Test REPORT DATE: May/07/1982

AIR DRIED LOSS: 3.36%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	5.52%		
VOLATILE MATTER	32.32%	34.21%	39.89%
FIXED CARBON	48.71%	51.55%	60.11%
ASH	13.45%	14.24%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.05%	4.69%	5.47%
CARBON	66.82%	70.72%	82.46%
NITROGEN	1.24%	1.31%	1.53%
TOTAL SULFUR	0.82%	0.87%	1.01%
OXYGEN	12.62%	8.17%	9.53%
ASH	13.45%	14.24%	
HEATING VALUE (BTU/LB):	11769	12456	14524
SULFUR FORMS:			
SULFATE	0.02%	0.02%	0.02%
PYRITIC	0.22%	0.23%	0.27%
ORGANIC	0.58%	0.61%	0.72%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	1.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.4

COAL SAMPLING REPORT

LABORATORY NO: U10779 FIELD NO: KGS 617 U.S.G.S. NO: W215558
SAMPLER: Currens AGENCY: KGS DATE: Nov/12/1981
7.5' QUAD: Broad Bottom COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 7 ROW M TIER 84 2900 FT FSL, 3800 FT FEL
LATITUDE: 37 DEG 33 MIN 29 SEC LONGITUDE: 82 DEG 33 MIN 47 SEC
ELEVATION (FT): 1518.30, OF POINT AT base of 617, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: Peach Orchard z GEO. MAP COAL NAME: Peach Orchard
REPORTED COAL NAME: Peach Orchard FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): 3rd split from bottom
EXPOSURE: TYPE, construction site; CONDITION, 9 months old, faced-up
SAMPLE CONDITION: clean, very hard
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 49.6, SAMPLE 46.5, COAL ONLY 46.5
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 305, SET 2 215, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 616.
N	16.40	Sandstone, light-gray, fine-grained, thin-bedded, argillaceous; dark-gray and rooted at top.
N	18.37	Siltstone, light-gray, sideritic; arenaceous at top.
Y	0.75	Clarain, with abundant medium-banded vitrain, common medium-banded fusain; pyritic.
N	0.26	Shale, dark-gray, rooted.
Y	0.43	Clarain, with abundant medium-banded vitrain, common thin-banded fusain.
Y	1.51	Durain, with sparse medium- to thick-banded vitrain; argillaceous at top.
Y	1.18	Clarain, with common medium- to thick-banded vitrain, scattered thin-banded fusain.
		See KGS 618 for underlying strata.

COAL ANALYSIS REPORT

LABORATORY NO: U10779 FIELD NO: KGS 617 U.S.G.S. NO: W215558
LABORATORY: Geo Test REPORT DATE: May/07/1982

AIR DRIED LOSS: 2.19%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	4.31%		
VOLATILE MATTER	35.22%	36.80%	42.51%
FIXED CARBON	47.62%	49.76%	57.48%
ASH	12.85%	13.43%	
ULTIMATE ANALYSIS:			
HYDROGEN	4.74%	4.45%	5.14%
CARBON	68.06%	71.12%	82.16%
NITROGEN	1.38%	1.44%	1.67%
TOTAL SULFUR	1.11%	1.16%	1.34%
OXYGEN	11.86%	8.40%	9.69%
ASH	12.85%	13.43%	
HEATING VALUE (BTU/LB):	12146	12693	14661
SULFUR FORMS:			
SULFATE	0.04%	0.04%	0.05%
PYRITIC	0.40%	0.42%	0.48%
ORGANIC	0.67%	0.70%	0.81%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	1.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.8

COAL SAMPLING REPORT

LABORATORY NO: U10780 FIELD NO: KGS 618 U.S.G.S. NO: W215559
SAMPLER: Currens AGENCY: KGS DATE: Nov/12/1981
7.5' QUAD: Broad Bottom COUNTY: Pike DISTRICT: Big Sandy
CARTER COORDINATE: SEC 7 ROW M TIER 84 3000 FT FSL, 3700 FT FEL
LATITUDE: 37 DEG 33 MIN 30 SEC LONGITUDE: 82 DEG 33 MIN 46 SEC
ELEVATION (FT): 1506.10, OF POINT AT base of 618, USING altimeter
COMMENTARY:
REGIONAL COAL NAME: Peach Orchard z GEO. MAP COAL NAME: Peach Orchard
REPORTED COAL NAME: Peach Orchard FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): 2nd split from bottom
EXPOSURE: TYPE, construction site; CONDITION, 6 weeks old
SAMPLE CONDITION: slightly weathered
RECOVERY METHOD: channel SAMPLING REGIME: Holmes
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 16.5, SAMPLE 16.5, COAL ONLY 16.5
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 280, SET 2 40 , SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 617.
N	10.50	Sandstone, medium-gray, fine-grained, flaser-bedded, highly argillaceous, with abundant Calamites fragments; dark-gray and rooted at top.
N	0.39	Siltstone, dark-gray, carbonaceous.
N	0.43	Siltstone, black, coaly.
Y	1.38	Clarain, with abundant medium-banded vitrain, common medium-banded fusain; sulfates in cleat near top.
N		Siltstone, medium-gray, rooted.

COAL ANALYSIS REPORT

LABORATORY NO: U10780 FIELD NO: KGS 618 U.S.G.S. NO: W215559
LABORATORY: Geo Test REPORT DATE: May/07/1982

AIR DRIED LOSS: 3.62%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	5.69%		
VOLATILE MATTER	35.56%	37.70%	40.08%
FIXED CARBON	53.17%	56.38%	59.92%
ASH	5.58%	5.92%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.34%	4.99%	5.30%
CARBON	74.01%	78.47%	83.41%
NITROGEN	1.43%	1.52%	1.61%
TOTAL SULFUR	0.72%	0.76%	0.81%
OXYGEN	12.92%	8.34%	8.87%
ASH	5.58%	5.92%	
HEATING VALUE (BTU/LB):	13073	13861	14733
SULFUR FORMS:			
SULFATE	0.06%	0.06%	0.07%
PYRITIC	0.05%	0.05%	0.06%
ORGANIC	0.61%	0.65%	0.69%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	2.0
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.1

COAL SAMPLING REPORT

LABORATORY NO: U10611 FIELD NO: KGS 104 U.S.G.S. NO: W215671
SAMPLER: Currens & Kung AGENCY: KGS DATE: Jul/25/1979
7.5' QUAD: Harold COUNTY: Floyd DISTRICT: Big Sandy
CARTER COORDINATE: SEC 24 ROW N TIER 82 3600 FT FSL, 700 FT FEL
LATITUDE: 37 DEG 35 MIN 36 SEC LONGITUDE: 82 DEG 43 MIN 9 SEC
ELEVATION (FT): 1200.00, OF POINT AT base of 104, USING topo
COMMENTARY:
REGIONAL COAL NAME: L Peach Orch GEO. MAP COAL NAME: L Peach Orch
REPORTED COAL NAME: L Peach Orch FORMATION OR MEMBER: Breathitt
RANGE SAMPLED (SPLITS, BENCHES, ETC.): middle bench
EXPOSURE: TYPE, underground; CONDITION, active
SAMPLE CONDITION: very fresh
RECOVERY METHOD: channel SAMPLING REGIME: Swanson & Huffman
SAMPLE SIZE (CORE DIA., CHANNEL SIZE, OR LBS.): 3 x 3 in.
THICKNESS (INCHES): SEAM HEIGHT 19.7, SAMPLE 19.7, COAL ONLY 19.7
STRUCTURAL FEATURE: cleat, SEPARATION:
STRIKE AZIMUTHS: SET 1 120, SET 2 220, SET 3

THE MEASURED SECTION IS REPORTED IN FEET

STRATIGRAPHIC SECTION

IN SAMPLE?	THICKNESS	DESCRIPTION
		Horizon KGS 102 (W207474).
N	0.43	Shale, dark-gray to black, coaly, slickensided, no apparent rooting.
Y	0.36	Clarain.
Y	0.16	Durain.
Y	0.33	Clarain.
Y	0.79	Durain.
N	0.98	Shale, light-gray, slickensided, rooted, carbonaceous.

COAL ANALYSIS REPORT

LABORATORY NO: U10611 FIELD NO: KGS 104 U.S.G.S. NO: W215671
LABORATORY: Geo Test REPORT DATE: Mar/31/1982

AIR DRIED LOSS: 1.51%

	AS RECEIVED	MOISTURE FREE	MOISTURE/ASH FREE
PROXIMATE ANALYSIS:			
TOTAL MOISTURE	4.52%		
VOLATILE MATTER	29.15%	30.53%	34.45%
FIXED CARBON	55.47%	58.09%	65.55%
ASH	10.86%	11.37%	
ULTIMATE ANALYSIS:			
HYDROGEN	5.06%	4.77%	5.38%
CARBON	69.06%	72.33%	81.62%
NITROGEN	1.45%	1.52%	1.71%
TOTAL SULFUR	0.96%	1.01%	1.13%
OXYGEN	12.61%	9.00%	10.16%
ASH	10.86%	11.37%	
HEATING VALUE (BTU/LB):	12243	12822	14469
SULFUR FORMS:			
SULFATE	0.08%	0.08%	0.09%
PYRITIC	0.19%	0.20%	0.22%
ORGANIC	0.69%	0.72%	0.82%

ASH FUSION TEMPERATURE (REDUCING ATMOSPHERE)

INITIAL DEFORMATION	2800 DEG F
SOFTENING TEMP.	2800 DEG F
FLUID TEMP.	2800 DEG F

FREE SWELLING INDEX	1.5
POUNDS OF SULFUR DIOXIDE PER MILLION BTU	1.6

Table 1.--Descriptions for 145 Coal Samples from the Big Sandy Reserve District, Eastern Kentucky.

Sample No.	Field No.	County	Latitude	Longitude	Formation	Coal Bed	Estimated Rank	Sampled Thickness (inches)
W210028	KGS 322	Martin	375323N	823609W	Breathitt	Richardson Rider	High Volatile B Bit	29.7
W212504	KGS 457	Martin	374529N	823215W	Breathitt	Upper Richardson	High Volatile B Bit	92.9
W207111	KGS 70	Floyd	374147N	824524W	Breathitt	Richardson	High Volatile B Bit	32.7*
W207112	KGS 72	Floyd	374147N	824524W	Breathitt	Richardson	High Volatile B Bit	65.5*
W207113	KGS 74	Floyd	374147N	824524W	Breathitt	Richardson	High Volatile B Bit	58.2*
W210029	KGS 323	Martin	375318N	823555W	Breathitt	Richardson	High Volatile B Bit	59.1
W210030	KGS 324	Martin	375318N	823555W	Breathitt	Richardson	High Volatile B Bit	29.9
W210263	KGS 353	Martin	374552N	823839W	Breathitt	Richardson	High Volatile B Bit	142.1
W211689	KGS 418	Martin	374252N	823329W	Breathitt	Richardson	High Volatile B Bit	46.5
W211690	KGS 419	Martin	374252N	823329W	Breathitt	Richardson	High Volatile A Bit	55.1
W215440	KGS 603	Martin	374310N	823302W	Breathitt	Richardson	High Volatile B Bit	43.1*
W210345	KGS 366	Pike	373924N	822534W	Breathitt	Lower Richardson	High Volatile B Bit	68.9
W211691	KGS 420	Martin	374310N	823447W	Breathitt	Upper Broas	High Volatile A Bit	46.1
W211694	KGS 423	Pike	373806N	822952W	Breathitt	Upper Broas	High Volatile A Bit	70.1
W207817	KGS 183	Floyd	374233N	823801W	Breathitt	Broas	High Volatile B Bit	54.5
W207818	KGS 184	Floyd	374233N	823758W	Breathitt	Broas	High Volatile B Bit	57.2
W209897	KGS 314	Floyd	374310N	824042W	Breathitt	Broas	High Volatile A Bit	41.7
W203623	KGS 5A	Johnson	374629N	824059W	Breathitt	Broas	High Volatile B Bit	18.0*
W203624	KGS 5B	Johnson	374629N	824059W	Breathitt	Broas	High Volatile B Bit	11.8*
W205332	KGS 32	Martin	374640N	823610W	Breathitt	Broas	High Volatile B Bit	48.0*

Table 1.--Descriptions for 145 Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

Sample No.	Field No.	County	Latitude	Longitude	Formation	Coal Bed	Estimated Rank	Sampled Thickness (inches)
W208050	KGS 262	Martin	374526N	822000W	Breathitt	Broas	High Volatile A Bit	50.4
W208051	KGS 263	Martin	374504N	822010W	Breathitt	Broas	High Volatile C Bit	29.1**
W210262	KGS 352	Martin	374546N	823826W	Breathitt	Broas	High Volatile B Bit	29.9
W210264	KGS 354	Martin	374257N	823721W	Breathitt	Broas	High Volatile A Bit	84.2
W211634	KGS 385	Martin	374554N	822756W	Breathitt	Broas	High Volatile A Bit	61.4
W211686	KGS 415	Martin	374316N	823443W	Breathitt	Broas	High Volatile A Bit	52.6
W210293	KGS 313	Johnson	374727N	824302W	Breathitt	U Peach Orchard Rdr	High Volatile A Bit	5.5
W209895	KGS 311	Johnson	374723N	824258W	Breathitt	Upper Peach Orchard	High Volatile B Bit	20.5
W209896	KGS 312	Johnson	374723N	824258W	Breathitt	Upper Peach Orchard	High Volatile A Bit	18.1
W207982	KGS 11	Martin	375027N	823451W	Breathitt	Upper Peach Orchard	High Volatile B Bit	28.0
W208203	KGS 245	Martin	374444N	822046W	Breathitt	Upper Peach Orchard	High Volatile B Bit	80.1*
W208204	KGS 246	Martin	374444N	822046W	Breathitt	Upper Peach Orchard	High Volatile B Bit	16.9*
W208052	KGS 264	Martin	374535N	821954W	Breathitt	Upper Peach Orchard	Subbituminous A	94.9***
W208224	KGS 265	Martin	374535N	821954W	Breathitt	Upper Peach Orchard	Subbituminous A	63.8***
W208225	KGS 266	Martin	374535N	821954W	Breathitt	Upper Peach Orchard	High Volatile C Bit	19.3**
W210026	KGS 320	Martin	375642N	823401W	Breathitt	Upper Peach Orchard	High Volatile A Bit	29.7
W210027	KGS 321	Martin	375642N	823401W	Breathitt	Upper Peach Orchard	High Volatile A Bit	24.4
W210501	KGS 375	Martin	374817N	823220W	Breathitt	Upper Peach Orchard	High Volatile A Bit	25.6
W210502	KGS 376	Martin	374823N	823228W	Breathitt	Upper Peach Orchard	High Volatile B Bit	52.4
W212058	KGS 432	Pike	373459N	822537W	Breathitt	Upper Peach Orchard	High Volatile A Bit	29.5

Table 1.--Descriptions for 145 Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

Sample No.	Field No.	County	Latitude	Longitude	Formation	Coal Bed	Estimated Rank	Sampled Thickness (inches)
W208218	KGS 177	Floyd	373251N	824252W	Breathitt	Peach Orchard	High Volatile A Bit	22.1
W208219	KGS 179	Floyd	373251N	824252W	Breathitt	Peach Orchard	High Volatile B Bit	24.8
W208220	KGS 181	Floyd	373251N	824252W	Breathitt	Peach Orchard	High Volatile A Bit	16.9
W205316	KGS 13	Johnson	375521N	824842W	Breathitt	Peach Orchard	High Volatile B Bit	33.1
W211635	KGS 386	Martin	374503N	822918W	Breathitt	Peach Orchard	High Volatile A Bit	37.8
W211687	KGS 416	Martin	374506N	822727W	Breathitt	Peach Orchard	High Volatile A Bit	25.2
W211688	KGS 417	Martin	374506N	822727W	Breathitt	Peach Orchard	High Volatile A Bit	51.2
W212503	KGS 456	Martin	374316N	823155W	Breathitt	Peach Orchard	High Volatile A Bit	53.7
W215557	KGS 616	Pike	373330N	823348W	Breathitt	Peach Orchard	High Volatile B Bit	39.0*
W215558	KGS 617	Pike	373329N	823347W	Breathitt	Peach Orchard	High Volatile A Bit	46.5
W215559	KGS 618	Pike	373330N	823346W	Breathitt	Peach Orchard	High Volatile B Bit	16.5*
W207474	KGS 102	Floyd	373536N	824309W	Breathitt	Lower Peach Orchard	High Volatile B Bit	32.7
W207819	KGS 106	Floyd	373536N	824309W	Breathitt	Lower Peach Orchard	High Volatile B Bit	62.6
W208053	KGS 267	Martin	374526N	822005W	Breathitt	Lower Peach Orchard	High Volatile A Bit	17.5
W212056	KGS 430	Pike	373454N	822537W	Breathitt	Lower Peach Orchard	High Volatile A Bit	18.5
W212057	KGS 431	Pike	373454N	822537W	Breathitt	Lower Peach Orchard	High Volatile A Bit	37.0
W205319	KGS 16	Johnson	375255N	824715W	Breathitt	Hazard	High Volatile C Bit	24.0**
W208054	KGS 268	Martin	374520N	822002W	Breathitt	Winifrede	High Volatile A Bit	31.1
W208212	KGS 125	Floyd	373513N	824603W	Breathitt	Taylor	High Volatile A Bit	26.4
W208213	KGS 126	Floyd	373513N	824603W	Breathitt	Taylor	High Volatile A Bit	5.5

Table 1.--Descriptions for 145 Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

Sample No.	Field No.	County	Latitude	Longitude	Formation	Coal Bed	Estimated Rank	Sampled Thickness (inches)
W208055	KGS 269	Martin	374526N	822011W	Breathitt	Taylor	High Volatile A Bit	31.1
W212596	KGS 463	Martin	374556N	822315W	Breathitt	Taylor	High Volatile A Bit	37.8
W210430	KGS 371	Pike	373058N	821022W	Breathitt	Hamlin	High Volatile A Bit	38.6
W208214	KGS 127	Floyd	373510N	824601W	Breathitt	Fire Clay Rider	High Volatile A Bit	16.9
W210429	KGS 370	Pike	373058N	821021W	Breathitt	Fire Clay Rider	High Volatile A Bit	35.0
W212595	KGS 462	Pike	371642N	823031W	Breathitt	Fire Clay Rider	High Volatile A Bit	91.3
W208197	KGS 116	Floyd	372915N	824922W	Breathitt	Fire Clay	High Volatile A Bit	36.6
W208215	KGS 128	Floyd	373513N	824601W	Breathitt	Fire Clay	High Volatile A Bit	29.2
W208216	KGS 129	Floyd	373513N	824601W	Breathitt	Fire Clay	High Volatile B Bit	12.2
W207867	KGS 238	Floyd	373235N	824021W	Breathitt	Fire Clay	High Volatile A Bit	45.8
W210315	KGS 359	Floyd	373045N	824219W	Breathitt	Fire Clay	High Volatile A Bit	49.8
W211692	KGS 421	Floyd	372722N	823522W	Breathitt	Fire Clay	High Volatile A Bit	65.8
W215402	KGS 561	Floyd	371733N	824216W	Breathitt	Fire Clay	High Volatile A Bit	27.6
W210428	KGS 369	Pike	373055N	821021W	Breathitt	Fire Clay	High Volatile A Bit	44.1
W212594	KGS 461	Pike	371714N	823147W	Breathitt	Fire Clay	High Volatile A Bit	68.5
W208104	KGS 290	Floyd	372920N	824922W	Breathitt	Whitesburg	High Volatile A Bit	13.8
W208105	KGS 292	Floyd	372920N	824922W	Breathitt	Whitesburg	High Volatile A Bit	17.3
W207868	KGS 247	Pike	374335N	822145W	Breathitt	Williamson	High Volatile A Bit	44.9
W207870	KGS 248	Pike	374244N	822139W	Breathitt	Williamson	High Volatile A Bit	48.3
W210344	KGS 365	Pike	374226N	822214W	Breathitt	Williamson	High Volatile A Bit	41.7

Table 1.--Descriptions for 145 Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

Sample No.	Field No.	County	Latitude	Longitude	Formation	Coal Bed	Estimated Rank	Sampled Thickness (inches)
W212063	KGS 437	Pike	372821N	820703W	Breathitt	Williamson	High Volatile A Bit	39.0
W212064	KGS 438	Pike	372821N	820703W	Breathitt	Williamson	High Volatile A Bit	20.3
W212088	KGS 426	Pike	372638N	823432W	Breathitt	Amburgy	High Volatile A Bit	51.2
W212068	KGS 442	Pike	371739N	822513W	Breathitt	Upper Elkhorn No.3.5	High Volatile A Bit	29.9
W210156	KGS 332	Pike	372715N	822906W	Breathitt	U Elkhorn 3 2nd Rdr	High Volatile A Bit	7.5
W210163	KGS 341	Pike	371732N	823306W	Breathitt	U Elkhorn No.3 Rider	High Volatile A Bit	7.9
W207114	KGS 75	Floyd	374015N	824523W	Breathitt	Upper Elkhorn No.3	High Volatile B Bit	42.5*
W207820	KGS 110	Floyd	374038N	824517W	Breathitt	Upper Elkhorn No.3	High Volatile A Bit	44.7
W208209	KGS 122	Floyd	373203N	824706W	Breathitt	Upper Elkhorn No.3	High Volatile A Bit	26.5
W208210	KGS 123	Floyd	373203N	824706W	Breathitt	Upper Elkhorn No.3	High Volatile A Bit	31.9
W207821	KGS 176	Floyd	374038N	824516W	Breathitt	Upper Elkhorn No.3	High Volatile A Bit	44.5
W208101	KGS 287	Floyd	372813N	825105W	Breathitt	Upper Elkhorn No.3	High Volatile A Bit	39.0
W210317	KGS 361	Floyd	372245N	823948W	Breathitt	Upper Elkhorn No.3	High Volatile A Bit	32.1
W210318	KGS 362	Floyd	372245N	823948W	Breathitt	Upper Elkhorn No.3	High Volatile A Bit	27.6
W210157	KGS 333	Pike	372712N	822906W	Breathitt	Upper Elkhorn No.3	High Volatile A Bit	32.5
W212069	KGS 443	Pike	371740N	822519W	Breathitt	Upper Elkhorn No.3	High Volatile A Bit	24.0
W212070	KGS 444	Pike	371740N	822519W	Breathitt	Upper Elkhorn No.3	High Volatile A Bit	26.8
W212071	KGS 445	Pike	371740N	822519W	Breathitt	Upper Elkhorn No.3	High Volatile A Bit	26.0
W203631	KGS 9	Johnson	375829N	825540W	Breathitt	Van Lear	High Volatile B Bit	26.0*
W203634	KGS 7	Johnson	375425N	825611W	Breathitt	Van Lear	High Volatile B Bit	16.9*

Table 1.--Descriptions for 145 Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

Sample No.	Field No.	County	Latitude	Longitude	Formation	Coal Bed	Estimated Rank	Sampled Thickness (inches)
W205315	KGS 12	Johnson	375321N	825151W	Breathitt	Van Lear	High Volatile B Bit	32.7*
W212066	KGS 440	Pike	372838N	820716W	Breathitt	Lower Cedar Grove	High Volatile A Bit	26.6
W212067	KGS 441	Pike	372838N	820716W	Breathitt	Lower Cedar Grove	High Volatile A Bit	27.2
W210158	KGS 334	Pike	372711N	822907W	Breathitt	U Elkhorn No.2-1 Rdr	High Volatile A Bit	12.4
W210155	KGS 331	Pike	372721N	822848W	Breathitt	Upper Elkhorn No.2-1	High Volatile A Bit	69.3
W208198	KGS 118	Floyd	373121N	824735W	Breathitt	Upper Elkhorn No.2	High Volatile A Bit	20.5
W209504	KGS 144	Floyd	372851N	825011W	Breathitt	Upper Elkhorn No.2	High Volatile A Bit	15.7
W209505	KGS 145	Floyd	372851N	825011W	Breathitt	Upper Elkhorn No.2	High Volatile A Bit	7.7
W207864	KGS 237	Floyd	373147N	823852W	Breathitt	Upper Elkhorn No.2	High Volatile A Bit	37.5
W210316	KGS 360	Floyd	372953N	824306W	Breathitt	Upper Elkhorn No.2	High Volatile A Bit	32.7
W211630	KGS 392	Floyd	372435N	824340W	Breathitt	Upper Elkhorn No.2	High Volatile A Bit	38.6
W209851	KGS 296	Pike	371512N	823104W	Breathitt	Upper Elkhorn No.2	High Volatile A Bit	39.7
W209852	KGS 297	Pike	372104N	823221W	Breathitt	Upper Elkhorn No.2	High Volatile A Bit	44.2
W210161	KGS 339	Pike	371725N	823302W	Breathitt	Upper Elkhorn No.2	High Volatile A Bit	38.0
W211693	KGS 422	Pike	372455N	823210W	Breathitt	Upper Elkhorn No.2	High Volatile A Bit	34.7
W212282	KGS 447	Pike	371815N	822535W	Breathitt	Upper Elkhorn No.2	High Volatile A Bit	37.0
W212498	KGS 451	Pike	373118N	823029W	Breathitt	Upper Elkhorn No.2	High Volatile A Bit	28.3
W208211	KGS 124	Floyd	373248N	824624W	Breathitt	Upper Elkhorn No.1	High Volatile A Bit	30.3
W208100	KGS 286	Floyd	372825N	825058W	Breathitt	Upper Elkhorn No.1	High Volatile A Bit	63.4
W210319	KGS 363	Floyd	372052N	824302W	Breathitt	Upper Elkhorn No.1	High Volatile A Bit	36.6

Table 1.--Descriptions for 145 Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

Sample No.	Field No.	County	Latitude	Longitude	Formation	Coal Bed	Estimated Rank	Sampled Thickness (inches)
W210162	KGS 340	Pike	371727N	823303W	Breathitt	Upper Elkhorn No.1	High Volatile A Bit	29.1
W212497	KGS 450	Pike	373118N	823029W	Breathitt	Upper Elkhorn No.1	High Volatile A Bit	31.9
W212061	KGS 435	Pike	372905N	820527W	Breathitt	Upper Alma	High Volatile A Bit	23.8
W212062	KGS 436	Pike	372905N	820527W	Breathitt	Upper Alma	High Volatile A Bit	15.0
W212060	KGS 434	Pike	372904N	820543W	Breathitt	Alma	High Volatile A Bit	42.9
W210154	KGS 330	Pike	371618N	823405W	Breathitt	Lower Elkhorn	High Volatile A Bit	44.1
W212281	KGS 446	Pike	371759N	822548W	Breathitt	Lower Elkhorn	High Volatile A Bit	40.2
W210287	KGS 119	Pike	372903N	822207W	Breathitt	Pond Creek Rider	High Volatile A Bit	13.6
W210288	KGS 120	Pike	372903N	822207W	Breathitt	Pond Creek Rider	High Volatile A Bit	42.7
W211636	KGS 389	Martin	374749N	822206W	Breathitt	Pond Creek	High Volatile A Bit	61.0
W211637	KGS 396	Martin	374732N	822123W	Breathitt	Pond Creek	High Volatile A Bit	60.8
W211685	KGS 414	Martin	374336N	823049W	Breathitt	Pond Creek	High Volatile A Bit	46.9
W208208	KGS 121	Pike	372903N	822207W	Breathitt	Pond Creek	High Volatile A Bit	31.5
W209676	KGS 294	Pike	373612N	822230W	Breathitt	Pond Creek	High Volatile A Bit	43.8
W210343	KGS 364	Pike	373927N	822052W	Breathitt	Pond Creek	High Volatile A Bit	43.1
W210431	KGS 372	Pike	373054N	820955W	Breathitt	Pond Creek	High Volatile A Bit	32.7
W212059	KGS 433	Pike	372904N	820435W	Breathitt	Pond Creek	High Volatile A Bit	22.0
W215399	KGS 558	Pike	373845N	821603W	Breathitt	Pond Creek	High Volatile A Bit	44.9
W210164	KGS 342	Pike	372309N	823225W	Breathitt	Millard	High Volatile A Bit	18.1
W208061	KGS 260	Pike	371842N	821842W	Breathitt	Hagy	High Volatile A Bit	33.3

Table 1.--Descriptions for 145 Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

Sample No.	Field No.	County	Latitude	Longitude	Formation	Coal Bed	Estimated Rank	Sampled Thickness (inches)
W208062	KGS 261	Pike	371859N	821805W	Breathitt	Splash Dam	High Volatile A Bit	52.3
W212065	KGS 439	Pike	372832N	820702W	Breathitt	Unnamed	High Volatile B Bit	24.8
W212499	KGS 452	Pike	373115N	823032W	Breathitt	Unnamed	High Volatile A Bit	9.6
W215400	KGS 559	Pike	373849N	821602W	Breathitt	Unnamed	High Volatile A Bit	16.2
W215401	KGS 560	Pike	374019N	821653W	Breathitt	Alma	High Volatile A Bit	10.2

* This sample was slightly weathered.
* This sample was weathered.
* This sample was very weathered.

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky.

[Values in percent or parts-per-million. Coal ashed at 525°C. L means less than the value shown; H, interference for an element which cannot be resolved by any routine method; G greater than; B, not determined; S, after element title indicates determinations by automatic plate reading computer assisted, emission spectographic analyses. The standard deviation of any single answer should be taken as plus 50% and minus 35%. Sample number is laboratory number.]

SAMPLE NUMBER	ASH (PERCENT)	SiO_2 (PERCENT)	Al_2O_3 (PERCENT)	CAO (PERCENT)	MGO (PERCENT)	Na_2O (PERCENT)	K_2O (PERCENT)	Fe_2O_3 (PERCENT)	TiO_2 (PERCENT)	P_2O_5 (PERCENT)	SAMPLE NUMBER
W203623	6.5	46	30	4.2	0.68	0.14	2.0	5.4	1.1	0.08L	W203623
W203624	5.9	43	28	6.8	.63	.13	1.2	7.9	.99	.08L	W203624
W203631	1.3	38	34	5.1	1.2	.96	1.4	5.5	.99	.38L	W203631
W203634	.7	39	30	9.0	1.2	1.2	.28	7.2	1.6	.69L	W203634
W205315	4.2	42	15	1.4	.51	.31	1.7	34	1.3	.12L	W205315
W205316	31.8	66	22	.48	.56	.14	2.0	2.7	2.4	.06	W205316
W205319	25.1	50	28	1.1	1.2	.28	4.2	6.5	1.4	.15	W205319
W205332	18.8	58	28	.67	.78	.22	2.8	2.2	1.8	.04	W205332
W207111	21.2	55	32	.57	.75	.19	3.2	2.4	1.7	.02L	W207111
W207112	11.3	58	32	.63	.43	.13	1.6	3.3	2.2	.04L	W207112
W207113	12.6	56	33	.63	.66	.18	2.7	2.6	1.9	.04L	W207113
W207114	9.7	46	21	1.8	.68	.50	1.4	22	1.5	.42	W207114
W207474	12.5	60	29	2.3	.53	.14	1.3	2.6	2.5	.08L	W207474
W207817	14.4	59	29	.70	.45	.12	1.3	2.7	2.2	.07L	W207817
W207818	16.0	59	28	.63	.46	.12	1.5	4.6	2.3	.06L	W207818
W207819	13.0	57	30	2.0	.75	.22	2.3	23	1.9	.08L	W207819
W207820	15.5	49	22	1.7	1.1	.40	2.6	19	1.1	.06L	W207820
W207821	16.7	50	23	1.6	1.3	.46	3.1	13	1.2	.06L	W207821
W207864	19.4	51	28	.52	1.4	.53	4.0	10	1.2	.05L	W207864
W207867	14.4	56	36	.76	.50	.15	.85	2.2	2.2	.07L	W207867

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	SO_3 (PERCENT)	AG-S PPM	B-S PPM	BA-S PPM	BE-S PPM	BI-S PPM	CD PPM	CE PPM	CO PPM	CR PPM	SAMPLE NUMBER
W203623	4.5	0.10L	700	450	16	15L	0.54	260	190	200	W203623
W203624	5.0	.10L	1,000	350	20	15L	1.4	290	230	120	W203624
W203631	8.3	1.4	2,000	700	170	15L	.30	380	270	180	W203631
W203634	16	1.6	3,000	1,100	410	15L	1.1	560	430	250	W203634
W205315	2.5	.33	500	260	23	10L	.19	260	93	200	W205315
W205316	.75	.14	260	340	13	10L	.15	140	20	150	W205316
W205319	1.2	.35	220	760	19	10L	.28	230	29	140	W205319
W205332	.50	.13	290	390	17	10L	.21	170	39	160	W205332
W207111	.65	.21	320	430	6.6	10L	.50	170	48	160	W207111
W207112	.65	.20	350	270	5.4	10L	.24	190	29	180	W207112
W207113	.77	.14	500	420	9.0	10L	.34	180	100	180	W207113
W207114	3.0	.51	350	880	12	10L	.39	140	28	92	W207114
W207474	1.1	.41	320	550	7.1	10L	.35	190	38	180	W207474
W207817	.80	.10	290	210	16	10L	.13	200	43	190	W207817
W207818	.75	.12	230	190	14	10L	.29	190	44	190	W207818
W207819	1.5	.13	300	530	8.7	10L	.38	180	56	190	W207819
W207820	3.0	.26	310	500	11	10L	.52	120	38	120	W207820
W207821	3.0	.12	300	600	9.1	10L	.42	110	25	95	W207821
W207864	1.3	.20	210	730	11	10L	.50	140	34	120	W207864
W207867	.88	.57	220	700	87	10L	.46	390	25	100	W207867

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	CS PPM	CU PPM	DY-S PPM	ER-S PPM	EU PPM	GA-S PPM	GD-S PPM	GE-S PPM	HF PPM	HO-S PPM	SAMPLE NUMBER
W203623	9.2	100	22L	10L	6.2	50	23	5.5	7.7	6.8L	W203623
W203624	6.8	130	22L	10L	7.5	38	25	2.2	5.1	6.8L	W203624
W203631	7.7	820	38	20	11	130	39	9.1	7.7	8.9	W203631
W203634	28L	1,000	87	66	24	250	80	34	14	24	W203634
W205315	19	140	22L	10L	4.8	46	15L	16	19	6.8L	W205315
W205316	6.6	96	22L	10L	2.4	33	15L	8.5	9.1	6.8L	W205316
W205319	21	180	22L	10L	3.4	52	15L	7.4	6.0	6.8L	W205319
W205332	9.6	110	22L	10L	2.3	34	15L	8.1	8.0	6.8L	W205332
W207111	12	120	22L	10L	3.0	40	15L	1.7	8.5	6.8L	W207111
W207112	6.2	120	22L	10	3.0	45	15L	2.5	11	6.8L	W207112
W207113	10	110	22L	10L	3.0	47	24	9.2	7.9	6.8L	W207113
W207114	5.2	140	22L	10L	2.2	45	24	40	10	6.8L	W207114
W207474	4.8	140	22L	10L	2.5	56	15L	5.8	11	6.8L	W207474
W207817	7.6	120	22L	10L	3.2	25	15L	2.1	10	6.8L	W207817
W207818	6.3	130	22L	10L	3.1	26	15L	2.6	11	6.8L	W207818
W207819	9.2	130	22L	10L	3.1	37	15L	6.5	9.2	6.8L	W207819
W207820	9.0	130	22L	10L	1.9	23	15L	33	6.5	6.8L	W207820
W207821	7.8	120	22L	10L	2.0	19	15L	12	5.4	6.8L	W207821
W207864	12	160	22L	10L	2.2	54	15L	43	4.6	6.8L	W207864
W207867	3.5	150	25	17	2.8	80	25	14	19	6.8L	W207867

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	LA PPM	LI PPM	LU PPM	MN PPM	MO-S PPM	NB-S PPM	ND-S PPM	NI-S PPM	PB PPM	PR-S PPM	SAMPLE NUMBER
W203623	120	170	1.7	310	25	7	120	170	74	68L	W203623
W203624	140	140	1.7	400	36	8	140	220	66	68L	W203624
W203631	150	200	2.3	140	27	10	180	360	320	85	W203631
W203634	140	130	11	170	75	22	260	400	300	170	W203634
W205315	140	120	2.6	140	6.8	12	32L	73	100	100	W205315
W205316	75	180	1.3	54	8.3	43	76	61	73	68L	W205316
W205319	130	140	1.3	130	19	19	110	110	85	68L	W205319
W205332	96	210	1.0	67	2.8	23	78	95	82	68L	W205332
W207111	94	190	1.3	58	6.9	24	89	85	59	68L	W207111
W207112	120	150	1.3	37	7.0	35	100	110	77	68L	W207112
W207113	110	150	1.5	40	16	28	77	140	58	68L	W207113
W207114	82	240	1.1	100	12	30	75	110	43	68L	W207114
W207474	100	170	1.1	84	10	42	66	120	73	68L	W207474
W207817	120	260	1.5	37	4.6	24	52	64	74	68L	W207817
W207818	110	270	1.4	35	1.5	22	51	69	78	68L	W207818
W207819	100	290	1.2	80	7.2	26	56	80	77	68L	W207819
W207820	71	200	1.2	280	9.4	20	73	93	95	68L	W207820
W207821	66	230	.9	260	8.1	20	56	57	40	68L	W207821
W207864	67	260	1.5L	91	8.1	124	44	78	56	68L	W207864
W207867	220	220	2.1L	22	3.9	41	220	69	110	71	W207867

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	RB PPM	RE-S PPM	SC PPM	SM PPM	SN-S PPM	SR-S PPM	TA PPM	TB PPM	TH PPM	TL-S PPM	SAMPLE NUMBER
W203623	230	10L	44	26	1.5L	790	3.1L	4.3	20	3.2L	W203623
W203624	120	10L	27	31	1.5L	930	1.5	4.9	15	20	W203624
W203631	540L	10L	40	50	2.9	1,700	3.1	10	27	3.2L	W203631
W203634	830L	10L	110	97	5.5	3,200L	12L	22	28	3.2L	W203634
W205315	1,900L	10L	48	26	1.6	370	3.8	4.5	36	4.6L	W205315
W205316	120	10L	31	12	9.7	280	2.9	1.8	32	4.6L	W205316
W205319	340	10L	37	21	4.0	580	1.8	2.2	34	4.6L	W205319
W205332	370L	10L	32	14	7.7	280	2.0	1.9	30	4.6L	W205332
W207111	190	10L	34	15	7.9	290	2.4	2.4	28	4.6L	W207111
W207112	270L	10L	36	17	12	420	2.4	2.4	37	4.6L	W207112
W207113	190	10L	41	15	8.2	440	2.2	1.5	30	4.6L	W207113
W207114	410L	10L	25	11	1.5L	3,600	4.1L	1.6	25	4.6L	W207114
W207474	240L	10L	32	14	18	1,300	2.3	1.8	33	4.6L	W207474
W207817	280L	10L	39	14	8.3	280	2.5	2.1	36	4.6L	W207817
W207818	250L	10L	39	15	13	240	3.2	2.3	37	4.6L	W207818
W207819	290	10L	36	14	7.2	940	2.2	2.2	29	4.6L	W207819
W207820	320L	10L	31	11	1.5L	1,000	1.2	1.5	22	4.6L	W207820
W207821	300L	10L	23	9.0	4.6	1,100	1.4	1.4	20	4.6L	W207821
W207864	310L	10L	32	12	5.3	890	1.1	1.9	24	4.6L	W207864
W207867	280L	10L	34	37	24	1,100	4.0	4.5	76	4.6L	W207867

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	TM-S PPM	U PPM	V-S PPM	W PPM	Y-S PPM	YB PPM	ZN PPM	ZR-S PPM	SAMPLE NUMBER
W203623	4.6L	6.9	240	9.2L	99	12	140	110	W203623
W203624	4.6L	4.6	150	5.1	110	14	160	100	W203624
W203631	4.6L	15L	200	140	210	23	320	97	W203631
W203634	11	26L	210	240	1,100	83	710	250	W203634
W205315	4.6L	12	72	19	39	19	51	160	W205315
W205316	4.6L	9.7	160	5.7	53	7.2	65	330	W205316
W205319	4.6L	12	220	3.2	51	8.8	140	190	W205319
W205332	4.6L	8.4	170	3.2	42	6.4	46	150	W205332
W207111	4.6L	9.8	190	4.7	39	7.1	60	150	W207111
W207112	4.6L	11	180	6.2	37	8.0	38	150	W207112
W207113	4.6L	10	190	6.3	37	8.7	130	130	W207113
W207114	4.6L	8.5	150	9.3	37	6.2	66	160	W207114
W207474	4.6L	18	200	6.4	52	7.2	25	240	W207474
W207817	4.6L	10	120	5.6	34	8.3	67	150	W207817
W207818	4.6L	10	120	5.0	26	8.8	53	88	W207818
W207819	4.6L	11	150	5.4	35	7.7	56	120	W207819
W207820	4.6L	6.6	150	5.2	44	7.1	110	190	W207820
W207821	4.6L	5.4	110	3.6	35	5.4	86	150	W207821
W207864	4.6L	24	170	6.2	28	5.2	120	190	W207864
W207867	4.6L	22	160	11	87	16	37	460	W207867

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	ASH (PERCENT)	SiO_2 (PERCENT)	Al_2O_3 (PERCENT)	CAO (PERCENT)	MGO (PERCENT)	Na_2O (PERCENT)	K_2O (PERCENT)	Fe_2O_3 (PERCENT)	TiO_2 (PERCENT)	P_2O_5 (PERCENT)	SAMPLE NUMBER
W207868	25.8	47	26	1.7	.71	.19	1.9	18	1.5	.04L	W207868
W207870	7.1	33	25	2.1	.68	.30	1.5	33	1.0	.14L	W207870
W207982	13.3	50	35	.59	1.0	.24	3.8	6.2	1.0	.08	W207982
W208050	13.0	57	29	.73	.90	.19	2.7	6.6	1.3	.08L	W208050
W208051	15.5	56	28	1.0	1.1	.18	3.2	5.1	1.4	.06L	W208051
W208052	19.1	56	28	.63	1.0	.15	2.8	2.9	1.7	.05L	W208052
W208053	3.0	0B	0B	0.0B	1.3	.27	0.0B	0.0B	0.0B	.33L	W208053
W208054	8.9	61	24	1.9	.75	.18	1.8	4.2	2.4	.11L	W208054
W208055	13.1	53	32	1.1	.66	.20	2.3	5.3	2.1	.08L	W208055
W208061	23.0	52	26	.36	.81	.43	3.5	13	1.2	.04L	W208061
W208062	26.4	56	29	.31	1.1	.32	5.7	4.3	1.3	.04L	W208062
W208100	10.2	53	28	1.8	1.4	.89	3.3	5.7	1.3	.51	W208100
W208101	4.7	52	21	2.6	1.8	1.1	2.5	9.4	1.2	.21L	W208101
W208104	11.8	43	20	17	2.2	.42	3.4	22	.87	.08L	W208104
W208105	31.4	56	26	.43	1.2	.27	3.8	8.3	1.9	.03L	W208105
W208197	19.8	53	37	.38	.30	.28	.76	3.8	2.1	.05L	W208197
W208198	8.8	19	9.5	2.2	.41	.28	1.1	59	.53	.11L	W208198
W208203	16.9	55	28	1.2	.78	.20	2.8	4.9	1.5	.06L	W208203
W208204	8.4	48	31	2.5	.96	.27	2.9	6.3	1.0	.12L	W208204
W208208	9.9	55	34	.97	.90	.42	3.6	3.0	1.8	.10L	W208208
W208209	13.8	55	29	1.2	0.83	0.35	4.0	7.3	2.1	0.07L	W208209
W208210	7.5	50	29	1.8	1.1	.65	3.8	9.1	1.4	.13L	W208210
W208211	9.0	52	31	2.2	.66	.27	2.1	7.1	1.6	.58	W208211
W208212	42.6	54	27	.63	.88	.19	3.1	12	2.0	.02L	W208212
W208213	13.9	32	24	2.7	.63	.30	1.2	35	.50	.07L	W208213

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	SO_3 (PERCENT)	AG-S PPM	B-S PPM	BA-S PPM	BE-S PPM	BI-S PPM	CD PPM	CE PPM	CO PPM	CR PPM	SAMPLE NUMBER
W207868	1.7	.47	220	490	11	10L	.38	270	21	120	W207868
W207870	2.6	6.8	250	640	22	10L	.68	170	66	92	W207870
W207982	.80	.30	400	1,300	49	10L	.39	180	90	170	W207982
W208050	.88	.73	330	560	24	10L	.62	160	46	130	W208050
W208051	1.2	4.5	210	1,600	9.9	10L	.48	160	34	140	W208051
W208052	1.3	.19	190	570	8.3	10L	.30	160	39	150	W208052
W208053	0.0B	1.3	600	860	270	10L	1.7	270	160	180	W208053
W208054	2.0	.32	370	730	110	10L	.26	240	60	170	W208054
W208055	1.2	.53	230	900	7.6	10L	.46	210	35	170	W208055
W208061	1.1	.28	140	790	11	10L	.42	140	22	120	W208061
W208062	.85	.18	140	1,400	9.3	10L	.52	130	32	140	W208062
W208100	1.7	1.1	500	1,400	18	10L	1.1	190	42	120	W208100
W208101	3.5	.61	550	1,200	81	10L	.96	150	110	87	W208101
W208104	3.0	.35	300	710	21	10L	.57	140	42	95	W208104
W208105	1.0	.37	230	690	14	10L	.23	200	36	150	W208105
W208197	.50	.32	190	850	22	10L	.42	290	16	91	W208197
W208198	2.5	1.9	200	530	74	10L	.75	130	55	70	W208198
W208203	1.4	.24	320	610	13	10L	.14	200	40	150	W208203
W208204	2.3	.75	400	1,100	110	10L	.42	230	210	180	W208204
W208208	.63	.10L	190	560	15	10L	.18	150	33	170	W208208
W208209	0.88	0.19	270	620	9.8	10L	0.52	250	36	180	W208209
W208210	2.1	.10L	500	810	15	10L	.16	160	57	120	W208210
W208211	1.4	.10L	290	470	25	10L	.44	210	86	180	W208211
W208212	.75	.10L	120	270	11	10L	.19	160	8.9	150	W208212
W208213	2.4	.10L	220	400	11	10L	2.6	110	38	79	W208213

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	CS PPM	CU PPM	DY-S PPM	ER-S PPM	EU PPM	GA-S PPM	GD-S PPM	GE-S PPM	HF PPM	HO-S PPM	SAMPLE NUMBER
W207868	7.8	110	22L	10L	2.9	48	15L	16	8.5	6.8L	W207868
W207870	4.2	130	22L	10L	3.0	66	15L	64	7.0	6.8L	W207870
W207982	13	190	22L	10L	3.2	61	15L	34	6.0	6.8L	W207982
W208050	8.5	140	22L	12	3.2	41	15L	20	6.2	6.8L	W208050
W208051	12	110	22L	10L	3.2	44	15L	3.4	6.5	6.8L	W208051
W208052	12	76	22L	10L	2.7	45	15L	2.4	7.9	6.8L	W208052
W208053	13	560	58	41	8.7	76	18	44	6.7	14	W208053
W208054	7.9	150	22L	10L	4.4	39	15L	6.5	13	6.8L	W208054
W208055	7.6	140	22L	10L	3.2	64	15L	12	11	6.8L	W208055
W208061	11	70	22L	10L	2.3	54	15L	32	6.1	6.8L	W208061
W208062	14	100	22L	10L	2.1	56	15L	2.9	7.2	6.8L	W208062
W208100	7.8	230	22L	10L	3.2	49	15L	2.9	6.9	6.8L	W208100
W208101	4.3	270	22L	10L	3.4	64	15L	23	6.4	6.8L	W208101
W208104	11	110	22L	10L	3.4	64	15L	37	3.4	6.8L	W208104
W208105	15	140	22L	10L	3.2	67	15	12	9.2	6.8L	W208105
W208197	3.0	72	22L	10L	2.7	68	21	19	18	6.8L	W208197
W208198	4.0	220	22L	10L	4.0	82	28	92	3.4	6.8L	W208198
W208203	9.5	190	22L	12	3.3	48	22	1.9	5.9	6.8L	W208203
W208204	9.5	190	44	28	7.1	57	23	26	4.8	6.8L	W208204
W208208	14	120	22L	10L	3.4	29	15L	3.0	6.1	6.8L	W208208
W208209	15	180	22L	10L	5.1	35	15L	11	14	6.8L	W208209
W208210	9.3	160	22L	10L	4.5	38	15L	1.5L	4.0	6.8L	W208210
W208211	9.4	210	22L	10L	4.8	29	15L	8.0	6.1	6.8L	W208211
W208212	11	76	22L	10L	3.0	24	15L	1.5L	6.9	6.8L	W208212
W208213	4.0	170	22L	10L	3.0	42	15L	37	2.2	6.8L	W208213

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	LA PPM	LI PPM	LU PPM	MN PPM	MO-S PPM	NB-S PPM	ND-S PPM	NI-S PPM	PB PPM	PR-S PPM	SAMPLE NUMBER
W207868	160	220	1.6L	150	2.6	25	100	46	64	80	W207868
W207870	85	180	2.8L	120	8.1	18	140	140	41	68L	W207870
W207982	90	200	1.4	210	11	9	68	130	67	68L	W207982
W208050	85	170	1.5	120	13	18	110	100	53	68L	W208050
W208051	90	140	1.3	140	5.5	15	68	84	49	68L	W208051
W208052	94	120	1.2	60	2.0	27	76	97	48	68L	W208052
W208053	100	110	7.7	230	61	15	150	210	93	68L	W208053
W208054	130	150	2.1	350	14	31	140	140	63	68L	W208054
W208055	110	220	1.3	96	6.4	29	150	94	64	68L	W208055
W208061	78	200	1.0	90	1.0L	17	47	73	50	68L	W208061
W208062	76	190	1.1	180	1.0L	20	120	88	64	68L	W208062
W208100	98	110	1.8	200	9.4	22	50	100	81	68L	W208100
W208101	64	110	1.5	1,200	22	21	120	130	130	68L	W208101
W208104	59	88	1.5	5,100	15	7	45	66	29	68L	W208104
W208105	110	180	1.6	97	23	30	72	130	59	73	W208105
W208197	150	220	1.5	42	3.5	36	170	48	100	68L	W208197
W208198	57	58	1.8	280	120	26	44	77	140	68L	W208198
W208203	95	120	.9	150	7.6	27	34	120	64	68L	W208203
W208204	95	120	2.3	190	17	9	210	320	100	68L	W208204
W208208	81	230	1.2	140	1.0L	18	55	43	38	68L	W208208
W208209	140	200	1.7	130	16	13	39	37	76	68L	W208209
W208210	80	350	1.5	78	3.8	7	32	60	53	68L	W208210
W208211	110	230	1.8	95	5.8	7	35	120	83	68L	W208211
W208212	90	230	1.0	180	2.8	13	32L	18	58	68L	W208212
W208213	65	240	1.2	610	22	4	32L	24	28	68L	W208213

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	RB PPM	RE-S PPM	SC PPM	SM PPM	SN-S PPM	SR-S PPM	TA PPM	TB PPM	TH PPM	TL-S PPM	SAMPLE NUMBER
W207868	230L	10L	29	20	1.5L	710	1.8	2.4	39	4.6L	W207868
W207870	560L	10L	30	23	0.0H	1,400	1.4	2.3	18	4.6L	W207870
W207982	200	5L	39	17	4.9	440	1.1	2.4	27	4.6L	W207982
W208050	77	10L	32	12	4.8	700	1.2	2.1	23	4.6L	W208050
W208051	190	10L	29	15	5.7	460	.90	2.0	26	4.6L	W208051
W208052	210	10L	29	13	11	480	1.4	2.1	26	4.6L	W208052
W208053	670L	10L	57	33	11	1,700	3.3L	8.7	23	4.6L	W208053
W208054	180	10L	35	19	8.5	1,400	3.0	3.5	39	4.6L	W208054
W208055	110	10L	39	14	11	840	2.7	1.9	33	4.6L	W208055
W208061	170	10L	28	12	1.5L	540	1.5	1.7	25	4.6L	W208061
W208062	200	10L	30	12	5.4	560	1.9	1.9	24	4.6L	W208062
W208100	590L	10L	31	16	7.5	4,800	1.9	1.1	26	4.6L	W208100
W208101	850L	10L	25	13	12	2,600	1.9	2.3	17	4.6L	W208101
W208104	420L	10L	30	17	1.5L	820	1.4	2.8	16	4.6L	W208104
W208105	250	10L	35	16	9.2	520	2.4	2.6	33	4.6L	W208105
W208197	150L	10L	28	19	22	860	4.6	6.0	82	4.6L	W208197
W208198	340L	10L	36	14	0.0H	1,100	1.7	5.3	12	4.6L	W208198
W208203	220	10L	30	14	5.3	690	1.9	2.4	24	4.6L	W208203
W208204	120	10L	40	27	6.7	910	1.2	6.9	23	4.6L	W208204
W208208	180	10L	37	14	5.5	1,000	2.6	3.4	23	4.6L	W208208
W208209	220	10L	48	24	2.8	1,000	3.6	4.9	40	4.6L	W208209
W208210	150	10L	36	17	3.0	2,000	2.8	4.7	25	4.6L	W208210
W208211	120	10L	45	19	1.5	1,400	2.1	4.8	27	4.6L	W208211
W208212	140	10L	32	13	2.9	310	3.0	3.2	27	4.6L	W208212
W208213	72	10L	34	13	1.5L	990	.79	4.0	15	4.6L	W208213

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	TM-S PPM	U PPM	V-S PPM	W PPM	Y-S PPM	YB PPM	ZN PPM	ZR-S PPM	SAMPLE NUMBER
W207868	4.6L	10	120	5.0	34	7.4	74	180	W207868
W207870	4.6L	5.2	98	9.9	53	11	180	160	W207870
W207982	4.6L	12	190	5.3	30	9.0	97	71	W207982
W208050	4.6L	7.7	200	5.4	66	8.5	100	160	W208050
W208051	4.6L	8.8	150	4.5	26	7.1	75	110	W208051
W208052	4.6L	7.3	160	4.2	35	6.8	64	180	W208052
W208053	4.6L	18	230	30	190	40	350	99	W208053
W208054	4.6L	8.2	170	11	75	12	56	210	W208054
W208055	4.6L	7.9	200	6.9	53	7.6	51	180	W208055
W208061	4.6L	8.0	160	3.0	27	6.1	76	78	W208061
W208062	4.6L	11	170	3.0	38	6.4	100	160	W208062
W208100	4.6L	12	160	5.9	39	6.9	270	180	W208100
W208101	4.6L	12	170	19	95	11	200	240	W208101
W208104	4.6L	12	120	19	54	9.3	250	94	W208104
W208105	4.6L	12	190	6.7	39	8.3	88	180	W208105
W208197	4.6L	23	150	6.3	65	12	19	360	W208197
W208198	4.6L	10	110	15	71	13	64	140	W208198
W208203	4.6L	13	180	3.0	36	6.5	50	170	W208203
W208204	4.6L	11	260	3.6	120	17	98	110	W208204
W208208	4.6L	12	140	0.0B	47	9.1	31	140	W208208
W208209	4.6L	18	140	0B	22	13	67	96	W208209
W208210	4.6L	8.4	97	0B	31	11	84	46	W208210
W208211	4.6L	12	140	0B	35	13	92	62	W208211
W208212	4.6L	8.0	81	0B	15	7.4	41	99	W208212
W208213	4.6L	27	87	0B	41	9.7	210	30	W208213

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	ASH (PERCENT)	SiO_2 (PERCENT)	Al_2O_3 (PERCENT)	CAO (PERCENT)	MGO (PERCENT)	Na_2O (PERCENT)	K_2O (PERCENT)	Fe_2O_3 (PERCENT)	TiO_2 (PERCENT)	P_2O_5 (PERCENT)	SAMPLE NUMBER
W208214	9.4	56	32	1.7	.96	.34	3.3	3.3	1.5	.11L	W208214
W208215	34.1	55	30	.49	1.4	.34	5.8	5.7	1.2	.03L	W208215
W208216	55.7	58	38	.34	.43	.16	1.3	1.1	2.3	.02L	W208216
W208218	15.9	54	29	.69	.81	.19	2.7	12	1.4	.06L	W208218
W208219	5.0	46	36	2.4	.56	.20	1.0	8.3	1.5	.40	W208219
W208220	7.8	61	30	.97	.56	.26	1.8	1.8	2.0	.13L	W208220
W208224	14.3	58	31	1.2	1.1	.18	2.3	2.4	1.9	.07L	W208224
W208225	7.2	48	35	1.9	1.1	.23	2.3	6.3	1.1	.14L	W208225
W209504	5.6	18	11	3.6	.71	.23	1.0	57	.43	.18L	W209504
W209505	5.6	26	21	37	.73	.19	.92	38	.50	.18L	W209505
W209676	10.4	56	29	1.6	.96	.49	3.1	3.8	1.5	.10L	W209676
W209851	3.9	46	29	3.9	1.8	.45	4.1	7.0	1.1	.26L	W209851
W209852	7.1	51	27	1.5	1.5	.42	3.7	9.0	1.4	.14L	W209852
W209895	7.5	48	36	2.3	.73	.20	1.9	3.7	.73	1.2	W209895
W209896	30.6	53	30	.38	1.2	.20	3.4	8.1	1.5	.03L	W209896
W209897	4.6	52	39	1.5	.30	.09	.23	1.1	2.0	.22L	W209897
W210026	7.3	53	29	1.1	.83	.23	2.7	7.1	1.4	.14L	W210026
W210027	9.8	50	37	1.1	.46	.16	1.4	5.7	1.7	.10L	W210027
W210028	11.3	45	30	1.2	.63	.11	2.1	17	1.4	.09L	W210028
W210029	15.3	60	30	.31	.50	.14	2.4	1.2	2.0	.07L	W210029
W210030	8.8	56	34	.76	.63	.12	2.0	2.0	1.9	.11L	W210030
W210 154	16.6	53	31	.50	1.1	.38	4.2	2.9	1.4	.06L	W210154
W210155	4.3	45	33	3.0	.60	.85	1.0	6.3	1.2	1.1	W210155
W210156	9.5	24	14	2.2	.56	.24	1.1	56	.67	.11L	W210156
W210157	3.4	39	25	3.9	.80	.92	1.2	17	2.3	1.5	W210157

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	SO_3 (PERCENT)	AG-S PPM	B-S PPM	BA-S PPM	BE-S PPM	BI-S PPM	CD PPM	CE PPM	CO PPM	CR PPM	SAMPLE NUMBER
W208214	1.5	.14	460	390	57	10L	.22	190	92	170	W208214
W208215	.63	.16	450	360	57	10L	.26	150	29	130	W208215
W208216	.12L	.10L	70	280	8.3	10L	.12	200	7.9	86	W208216
W208218	.63	.14	230	970	13	10L	1.1	150	73	140	W208218
W208219	1.9	.31	500	950	14	10L	.36	180	160	200	W208219
W208220	.75	.39	380	590	44	10L	.36	210	250	170	W208220
W208224	1.6	.11	140	330	6.7	10L	.42	170	44	170	W208224
W208225	3.3	.19	340	520	41	10L	.79	260	200	220	W208225
W209504	3.3	1.2	400	1,200	55	10L	.73	110	62	57	W209504
W209505	4.2	.80	500	1,200	150	10L	.77	140	110	120	W209505
W209676	1.1	.10L	300	860	7.1	10L	.32	140	26	150	W209676
W209851	3.7	.30	240	950	59	10L	.50	170	310	120	W209851
W209852	1.7	.16	210	860	67	10L	.40	150	120	130	W209852
W209895	1.8	.49	1,000	860	48	10L	.50	250	130	220	W209895
W209896	.75	.24	250	500	7.2	10L	.38	160	35	140	W209896
W209897	1.5	.35	910	1,500	180	10L	.16	220	330	250	W209897
W210026	1.2	.90	700	690	16	10L	.65	170	130	170	W210026
W210027	1.2	1.3	700	500	38	10L	.62	210	110	270	W210027
W210028	1.6	.44	320	420	99	10L	.57	190	81	150	W210028
W210029	.47	.35	380	610	6.4	10L	.47	200	16	160	W210029
W210030	.90	.57	800	530	11	10L	.40	220	89	220	W210030
W210154	1.1	.22	160	1,300	13	10L	.40	150	56	150	W210154
W210155	2.7	1.3	340	1,900	51	10L	1.8	330	200	200	W210155
W210156	3.3	.49	140	2,600	53	10L	1.1	95	55	93	W210156
W210157	3.7	.95	290	2,400	68	10L	1.4	290	200	220	W210157

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	CS PPM	CU PPM	DY-S PPM	ER-S PPM	EU PPM	GA-S PPM	GD-S PPM	GE-S PPM	HF PPM	HO-S PPM	SAMPLE NUMBER
W208214	23	180	22L	10L	3.8	58	15L	21	6.4	6.8L	W208214
W208215	17	95	22L	10L	2.9	53	15L	21	4.8	6.8L	W208215
W208216	6.0	55	22L	10L	2.5	31	15L	1.5L	16	6.8L	W208216
W208218	11	170	22L	10L	3.3	30	15L	12	5.7	6.8L	W208218
W208219	4.0	200	22L	10L	4.0	38	15L	5.9	6.0	6.8L	W208219
W208220	6.4	300	22L	11	5.6	39	15	16	9.0	6.8L	W208220
W208224	8.4	97	22L	10L	3.4	29	15L	1.5L	6.3	6.8L	W208224
W208225	9.7	200	22L	10L	9.2	30	15L	4.0	4.2	6.8L	W208225
W209504	3.6	320	22L	10L	3.8	78	15L	71	1.8	6.8L	W209504
W209505	3.6	320	46	30	5.9	120	27	130	3.6	6.8L	W209505
W209676	12	92	22L	10L	2.5	35	15L	1.8	6.7	6.8L	W209676
W209851	8.5	340	22L	11	3.2	77	36	77	5.1	6.8L	W209851
W209852	15	190	22L	13	3.4	37	21	8.6	5.6	6.8L	W209852
W209895	6.7	170	31	18	6.4	40	15L	39	4.0	6.8L	W209895
W209896	14	110	46L	10L	3.3	40	15L	1.7	5.2	6.8L	W209896
W209897	4.3L	330	22L	32L	6.1	58	15L	59	8.7	6.8L	W209897
W210026	12	230	22L	10L	5.3	67	15L	13	6.2	6.8L	W210026
W210027	4.1	390	34	15	5.5	69	32	14	7.1	6.8L	W210027
W210028	9.7	120	22L	10L	4.2	54	15L	15	5.3	6.8L	W210028
W210029	5.9	120	22L	10L	3.5	50	15L	1.8	8.5	6.8L	W210029
W210030	10	200	22L	10L	5.0	58	15L	7.8	9.1	6.8L	W210030
W210154	12	150	22L	10L	2.9	64	15L	30	5.7	6.8L	W210154
W210155	4.7	470	22L	10L	7.0	96	15L	62	7.0	6.8L	W210155
W210156	5.8	190	22L	10L	3.7	120	15L	120	3.2	6.8L	W210156
W210157	7.4	610	22L	10L	5.3	100	15L	96	12	6.8L	W21057

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	LA PPM	LI PPM	LU PPM	MN PPM	MO-S PPM	NB-S PPM	ND-S PPM	NI-S PPM	PB PPM	PR-S PPM	SAMPLE NUMBER
W208214	110	250	1.3	78	4.5	9	57	140	67	68L	W208214
W208215	82	180	1.0	120	4.8	12	53	140	59	68L	W208215
W208216	110	390	1.1	34	1.0L	33	57	24	79	68L	W208216
W208218	75	150	1.3	150	17	10	32L	120	54	68L	W208218
W208219	120	280	1.6	95	14	9	74	270	110	68L	W208219
W208220	90	140	2.6	60	9.6	13	89	150	100	68L	W208220
W208224	98	120	1.0	85	2.2	11	39	85	64	68L	W208224
W208225	110	150	2.2	83	9.8	8	94	170	71	68L	W208225
W209504	54	60	2.5	140	78	13	45	160	23	68L	W209504
W209505	71	200	5.0	180	14	15	92	190	54	140	W209505
W209676	77	190	.9	84	1.0L	32	88	66	49	68L	W209676
W209851	94	140	.8	730	1.8	7	61	420	94	11	W209851
W209852	85	140	1.4	330	1.0L	14	49	140	43	68L	W209852
W209895	150	250	1.5	81	27	15	170	170	91	68L	W209895
W209896	85	390	1.0	70	9.1	15	42	83	56	68L	W209896
W209897	150	190	2.4	27	13	48	81	370	160	68L	W209897
W210026	96	130	1.8	58	39	22	110	250	66	68L	W210026
W210027	110	170	1.5	33	41	35	260	230	170	91	W210027
W210028	88	170	1.6	88	11	15	110	170	50	68L	W210028
W210029	120	120	1.1	25	5.6	51	140	69	62	68L	W210029
W210030	110	180	1.8	44	37	35	120	130	67	68L	W210030
W210154	81	170	1.0	84	1.9	15	50	79	57	68L	W210154
W210155	160	210	2.1	69	26	13	210	360	120	68L	W210155
W210156	42	49	2.4	320	18	11	32L	100	240	68L	W210156
W210157	180	140	1.5	86	27	32	140	340	89	100	W210157

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	RB PPM	RE-S PPM	SC PPM	SM PPM	SN-S PPM	SR-S PPM	TA PPM	TB PPM	TH PPM	TL-S PPM	SAMPLE NUMBER
W208214	210	10L	41	18	7.1	560	2.3	3.6	30	4.6L	W208214
W208215	210	10L	29	14	6.3	530	1.8	1.4	29	4.6L	W208215
W208216	57	10L	24	19	11	210	4.4	4.9	64	4.6L	W208216
W208218	130	10L	36	11	1.5L	380	2.1	3.1	23	27	W208218
W208219	400L	10L	41	18	1.9	2,300	2.4	4.2	28	4.6L	W208219
W208220	260L	10L	51	23	6.0	1,400	2.6	6.8	37	4.6L	W208220
W208224	91	10L	31	15	5.8	290	2.6	3.9	24	4.6L	W208224
W208225	280L	10L	49	39	1.5L	630	1.9	11	26	4.6L	W208225
W209504	360L	10L	53	13	0.0H	1,900	3.6L	5.4	8.9	4.6L	W209504
W209505	360L	10L	110	20	0.0H	2,800	3.6L	10	14	4.6L	W209505
W209676	200	10L	30	11	3.7	1,500	2.2	1.4	23	4.6L	W209676
W209851	770L	10L	32	13	1.9	2,000	4.1	3.6	21	4.6L	W209851
W209852	210	10L	29	140	1.5L	1,900	2.4	2.6	22	4.6L	W209852
W209895	670L	10L	45	23	9.1	2,800	1.3	6.4	27	4.6L	W209895
W209896	290L	10L	29	17	6.3	370	2.0	3.3	26	4.6L	W209896
W209897	650L	10L	53	30	9.2	820	3.0	5.9	43	4.6L	W209897
W210026	550L	10L	47	27	7.0	900	2.1	6.0	25	4.6L	W210026
W210027	310L	10L	52	32	8.2	690	2.4	7.0	57	4.6L	W210027
W210028	270L	10L	35	20	1.5L	650	1.9	3.1	22	83	W210028
W210029	130	10L	35	20	11	360	3.3	4.8	32	4.6L	W210029
W210030	280	10L	45	24	12	710	3.5	4.3	32	4.6L	W210030
W210154	280	10L	34	13	9.4	840	2.1	2.4	24	4.6L	W210154
W210155	1,400L	10L	59	27	5.9	5,200	1.6	4.9	38	4.6L	W210155
W210156	530L	10L	50	13	0.0H	1,900	.95	6.0	11	4.6L	W210156
W210157	1,500L	10L	49	21	6.3	5,900	4.1	5.3	50	4.6L	W210157

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	TM-S PPM	U PPM	V-S PPM	W PPM	Y-S PPM	YB PPM	ZN PPM	ZR-S PPM	SAMPLE NUMBER
W208214	4.6L	7.2	120	0B	28	9.6	160	52	W208214
W208215	4.6L	10	120	0B	28	6.6	74	77	W208215
W208216	4.6L	15	75	0B	33	8.6	38	250	W208216
W208218	4.6L	11	150	0B	26	9.4	77	61	W208218
W208219	4.6L	7.4	130	0B	48	12	74	86	W208219
W208220	4.6L	8.8	160	0B	82	17	39	150	W208220
W208224	4.6L	8.1	120	0B	20	7.7	54	72	W208224
W208225	4.6L	7.2	160	0B	61	18	150	100	W208225
W209504	4.6L	24	65	25	85	18	90	46	W209504
W209505	4.6L	11	140	34	180	34	130	110	W209505
W209676	4.6L	9.2	150	4.8	41	5.8	48	200	W209676
W209851	4.6L	23	170	15	39	7.7	150	81	W209851
W209852	4.6L	19	130	8.0	52	9.9	77	110	W209852
W209895	4.6L	13	320	8.0	92	11	95	180	W209895
W209896	4.6L	8.4	160	3.3	30	6.9	88	87	W209896
W209897	4.6L	10	190	6.5	92	17	77	350	W209897
W210026	4.6L	9.0	220	5.5	83	14	180	140	W210026
W210027	4.6L	21	270	4.1	100	12	140	320	W210027
W210028	4.6L	8.4	200	7.1	67	12	170	110	W210028
W210029	4.6L	7.8	160	3.9	47	8.5	28	410	W210029
W210030	4.6L	9.4	240	6.8	57	14	73	240	W210030
W210154	4.6L	13	180	4.8	23	7.2	59	91	W210154
W210155	4.6L	25	320	14	110	15	160	150	W210155
W210156	4.6L	13	110	17	86	16	180	66	W210156
W210157	4.6L	29	220	16	100	12	160	340	W210157

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	ASH (PERCENT)	SiO_2 (PERCENT)	Al_2O_3 (PERCENT)	CAO (PERCENT)	MGO (PERCENT)	Na_2O (PERCENT)	K_2O (PERCENT)	Fe_2O_3 (PERCENT)	TiO_2 (PERCENT)	P_2O_5 (PERCENT)	SAMPLE NUMBER
W210158	23.3	54	23	.95	1.3	.45	3.1	8.2	.94	.18	W210158
W210161	2.3	37	27	3.5	.80	.34	1.1	21	1.5	.43L	W210161
W210162	5.8	49	34	1.7	.58	.22	1.3	4.6	1.9	.17L	W210162
W210163	5.6	56	28	1.2	.70	.22	2.0	2.7	1.8	.18L	W210163
W210164	9.3	43	25	1.2	1.2	.43	3.3	16	1.4	.11L	W210164
W210262	5.9	42	27	.99	.35	.09	.89	22	1.9	.17L	W210262
W210263	20.5	68	25	.42	.37	.08	1.4	1.1	1.9	.05L	W210263
W210264	6.9	53	30	1.2	.51	.12	1.3	7.4	2.0	.14L	W210264
W210287	6.0	24	13	2.2	.61	.32	1.4	48	.70	.17L	W210287
W210288	11.0	49	25	1.9	.25	.18	.48	16	2.1	1.1	W210288
W210293	32.6	56	27	.36	.76	.20	3.0	7.2	1.2	.03L	W210293
W210315	9.8	42	30	1.5	.76	.20	1.3	18	1.4	.10L	W210315
W210316	7.9	32	18	3.9	1.0	.30	1.7	32	1.2	.13L	W210316
W210317	10.4	51	32	1.8	1.2	0.46	3.0	4.0	1.7	0.10L	W210317
W210318	2.4	0B	0B	0.0B	1.1	2.8	0.0B	0.0B	0.0B	.42L	W210318
W210319	8.9	44	28	1.9	1.3	.35	3.5	14	1.1	.11L	W210319
W210343	9.5	49	25	7.0	1.1	.32	2.7	5.0	1.1	.11L	W210343
W210344	12.2	44	25	4.2	.81	.26	2.8	13	1.3	.08L	W210344
W210345	6.1	52	34	1.6	.51	.07	.60	4.0	2.8	.16L	W210345
W210428	6.5	54	29	1.7	.63	.26	1.0	5.6	1.6	.15L	W210428

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	SO_3 (PERCENT)	AG-S PPM	B-S PPM	BA-S PPM	BE-S PPM	BI-S PPM	CD PPM	CE PPM	CO PPM	CR PPM	SAMPLE NUMBER
W210158	1.6	.10L	120	2,700	29	10L	.75	140	47	110	W210158
W210161	4.0	2.0	260	740	72	10L	1.1	220	400	160	W210161
W210162	2.0	.51	180	790	140	10L	1.1	340	96	190	W210162
W210163	1.7	1.1	180	2,200	220	10L	.72	190	310	200	W210163
W210164	2.2	.26	210	1,400	110	10L	.62	150	110	140	W210164
W210262	1.5	.64	400	330	98	10L	.69	230	370	240	W210262
W210263	.72	.20	310	280	11	10L	.83	200	24	180	W210263
W210264	1.7	.63	300	730	48	10L	.69	280	49	210	W210264
W210287	2.7	.53	240	870	47	10L	1.3	83	60	120	W210287
W210288	1.4	.36	150	650	17	10L	.44	200	45	150	W210288
W210293	.85	.77	220	700	23	10L	1.2	150	56	140	W210293
W210315	1.9	.39	290	1,000	63	10L	.52	410	34	130	W210315
W210316	4.0	.30	300	930	40	10L	.35	110	56	97	W210316
W210317	1.8	0.52	260	950	55	10L	0.30	230	56	160	W210317
W210318	0.0B	1.4	500	1,700	75	10L	.88	290	170	160	W210318
W210319	2.2	.50	260	590	56	10L	.35	180	100	160	W210319
W210343	3.4	.21	500	640	17	10L	.40	130	33	120	W210343
W210344	2.3	.38	350	750	20	10L	.72	150	44	130	W210344
W210345	1.8	.58	800	370	54	10L	.87	230	140	180	W210345
W210428	2.3	.68	220	990	61	10L	.74	230	140	160	W210428

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	CS PPM	CU PPM	DY-S PPM	ER-S PPM	EU PPM	GA-S PPM	GD-S PPM	GE-S PPM	HF PPM	HO-S PPM	SAMPLE NUMBER
W210158	9.7	140	26	15	3.2	56	35	60	5.6	6.8L	W210158
W210161	4.3	590	22L	10L	4.3	110	15L	160	8.7	6.8L	W210161
W210162	6.9	310	22	20	7.8	79	26	55	12	6.8L	W210162
W210163	8.0	480	30	28	7.0	160	33	200	8.0	6.8L	W210163
W210164	18	200	22L	10L	3.5	88	15L	44	6.5	6.8L	W210164
W210262	3.4	270	22L	31	6.4	53	32	31	8.5	15L	W210262
W210263	4.9	83	22L	11	3.6	33	15L	1.5L	10	6.8L	W210263
W210264	7.2	190	22L	11	5.5	45	29	8.6	8.7	6.8L	W210264
W210287	3.3	280	33	10L	4.0	97	28	110	1.7	15L	W210287
W210288	1.8	230	22L	10L	3.9	45	16	2.9	7.3	15L	W210288
W210293	11	220	22L	10L	3.4	49	17	43	6.4	6.8L	W210293
W210315	5.1	140	35	24	4.6	77	71	30	11	6.8L	W210315
W210316	7.0	120	22L	10L	2.5	74	15L	64	4.4	6.8L	W210316
W210317	21	160	22L	15	5.4	77	15L	5.1	7.7	6.8L	W210317
W210318	8.3	360	22L	22	10	92	29	12	8.3	8.0	W210318
W210319	12	310	22L	10L	5.5	82	15L	18	5.6	6.8L	W210319
W210343	8.4	120	22L	10L	2.9	51	15L	12	5.3	6.8L	W210343
W210344	8.2	110	24	13	3.0	47	15L	26	7.4	6.8L	W210344
W210345	1.6	320	22L	15	4.6	41	15	23	9.8	6.8L	W210345
W210428	4.6	200	55	22	6.2	53	30	17	7.7	6.8L	W210428

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	LA PPM	LI PPM	LU PPM	MN PPM	MO-S PPM	NB-S PPM	ND-S PPM	NI-S PPM	PB PPM	PR-S PPM	SAMPLE NUMBER
W210158	73	94	1.0	320	6.3	16	130	85	26	68L	W210158
W210161	130	180	.9	120	2.7	13	47	460	120	80	W210161
W210162	170	180	2.3	46	8.8	42	250	180	75	71	W210162
W210163	89	140	4.4	57	10	39	170	400	95	68L	W210163
W210164	81	95	1.5	190	3.4	11	95	200	27	74	W210164
W210262	120	170	4.2	34	39	53	110	320	110	68L	W210262
W210263	110	150	.9	23	3.1	56	59	76	79	68L	W210263
W210264	160	250	1.6	50	17	48	110	130	69	68L	W210264
W210287	33	79	1.7	250	91	26	73	170	47	68L	W210287
W210288	120	330	1.2	79	20	82	93	130	55	68L	W210288
W210293	71	230	1.3	60	6.0	19	32L	190	130	68L	W210293
W210315	210	250	2.2	440	16	32	170	110	93	68L	W210315
W210316	51	150	1.1	220	45	22	33	140	43	68L	W210316
W210317	130	300	2.0	130	3.7	33	786	160	84	68L	W210317
W210318	120	190	4.2	140	33	6	85	350	77	68L	W210318
W210319	90	150	2.0	530	7.5	14	86	200	80	68L	W210319
W210343	63	190	1.1	440	9.9	18	45	130	62	68L	W210343
W210344	82	220	1.3	210	11	24	32L	89	63	68L	W210344
W210345	130	190	1.6	28	40	53	120	340	100	68L	W210345
W210428	120	160	2.6	110	17	37	160	300	100	68L	W210428

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	RB PPM	RE-S PPM	SC PPM	SM PPM	SN-S PPM	SR-S PPM	TA PPM	TB PPM	TH PPM	TL-S PPM	SAMPLE NUMBER
W210158	220	10L	26	12	3.0	1,400	1.4	3.0	16	4.6L	W210158
W210161	1,300L	10L	43	20	1.5L	2,600	2.6	5.7	43	59	W210161
W210162	690L	10L	47	25	8.2	2,400	4.3	6.0	46	4.6L	W210162
W210163	710L	10L	76	27	13	2,100	3.9	9.8	39	4.6L	W210163
W210164	540L	10L	36	13	1.5L	1,700	2.6	2.7	22	4.6L	W210164
W210262	510L	19	76	25	1.5L	710	2.5	5.1	45	4.6L	W210262
W210263	120	10L	36	16	7.9	400	2.8	2.9	36	4.6L	W210263
W210264	430L	10L	50	25	6.2	810	1.4	3.6	280	4.6L	W210264
W210287	500L	10L	56	12	0.0H	2,300	3.3L	4.0	13	4.6L	W210287
W210288	270L	10L	37	15	1.5L	3,100	3.1	2.4	36	4.6L	W210288
W210293	170	10L	37	15	1.5L	240	2.0	2.1	28	4.6L	W210293
W210315	310L	10L	39	32	5.3	1,800	3.0	7.1	62	4.6L	W210315
W210316	380L	10L	28	8.9	1.5L	2,400	1.8	2.2	16	4.6L	W210316
W210317	160	10L	46	20	7.8	1,500	3.1	4.7	37	4.6L	W210317
W210318	1,200L	10L	56	33	8.2	6,400	2.5	12	37	4.6L	W210318
W210319	180	10L	43	19	1.5L	940	1.7	7.2	38	4.6L	210319
W210343	320L	10L	30	9.5	4.9	1,300	1.5	3.6	23	4.6L	W210343
W210344	150	10L	36	11	2.1	1,300	2.0	3.1	26	4.6L	W210344
W210345	330L	10L	39	18	6.5	970	3.3	3.4	36	4.6L	W210345
W210428	310L	10L	45	23	2.0	3,000	3.7	4.9	37	4.6L	W210428

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	TM-S PPM	U PPM	V-S PPM	W PPM	Y-S PPM	YB PPM	ZN PPM	ZR-S PPM	SAMPLE NUMBER
W210158	4.6L	7.4	180	4.9	57	7.7	280	230	W210158
W210161	4.6L	16L	110	22	51	8.7	210	140	W210161
W210162	4.6L	12	270	10	150	17	170	370	W210162
W210163	4.6L	30	320	19	210	33	130	210	W210163
W210164	4.6L	11	160	9.1	77	12	140	110	W210164
W210262	4.6L	15	220	5.9	290	34	150	340	W210262
W210263	4.6L	12	150	2.4	60	8.8	30	390	W210263
W210264	4.6L	13	250	5.8	87	13	63	310	W210264
W210287	4.6L	36	350	15	170	17	190	170	W210287
W210288	4.6L	13	190	5.5	100	10	43	530	W210288
W210293	4.6L	16	210	1.8	36	10	310	110	W210293
W210315	4.6L	27	190	10	120	17	83	220	W210315
W210316	4.6L	10	160	16	56	7.6	80	130	W210316
W210317	4.6L	16	220	7.7	89	14	49	190	W210317
W210318	4.6L	37	250	29	130	29	130	78	W210318
W210319	4.6L	17	230	11	74	13	110	110	W210319
W210343	4.6L	10	200	7.4	53	7.4	86	130	W210343
W210344	4.6L	10	160	6.6	56	9.0	130	180	W210344
W210345	4.6L	8.5	240	4.9	90	11	53	340	W210345
W210428	4.6L	26	320	11	170	18	140	270	W210428

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	ASH (PERCENT)	SiO_2 (PERCENT)	Al_2O_3 (PERCENT)	CAO (PERCENT)	MGO (PERCENT)	Na_2O (PERCENT)	K_2O (PERCENT)	Fe_2O_3 (PERCENT)	TiO_2 (PERCENT)	P_2O_5 (PERCENT)	SAMPLE NUMBER
W210429	8.2	44	23	1.2	1.2	.51	2.9	19	.99	12L	W210429
W210430	17.4	55	30	1.1	.83	.14	2.7	3.7	2.1	.06L	W210430
W210431	5.1	54	28	1.3	.71	.40	2.4	3.1	1.4	.20L	W210431
W210501	17.1	47	32	1.5	.83	.26	2.3	8.5	1.1	.06L	W210501
W210502	11.9	55	32	1.1	.73	.18	2.1	2.6	2.0	.08L	W210502
W211630	8.9	34	20	1.6	.61	.23	1.6	36	1.1	.11L	W211630
W211634	11.9	56	33	.73	.61	.15	1.8	2.1	2.4	.08L	W211634
W211635	15.0	58	30	.73	.75	.18	2.4	3.9	1.6	.07L	W211635
W211636	9.9	43	28	9.7	.71	.76	1.9	2.7	1.6	.10L	W211636
W211637	7.6	38	28	5.3	.55	.89	1.4	17	1.5	.13L	W211637
W211685	7.0	43	31	3.7	.83	1.3	2.1	11	1.6	.14	W211685
W211686	15.2	58	29	.56	.40	.08	1.1	4.8	2.2	.07L	W211686
W211687	8.9	49	32	1.1	.98	.30	2.7	8.1	.99	.11L	W211687
W211688	14.6	56	31	.62	.71	.24	2.2	3.7	2.1	.07L	W211688
W211689	27.0	63	24	.28	.53	.11	1.9	4.6	1.6	.04L	W211689
W211690	11.2	62	30	.43	.33	.07	1.0	.9	2.0	.09L	W211690
W211691	4.3	50	38	1.5	.48	.13	.97	1.4	2.3	.23L	W211691
W211692	6.5	51	32	1.8	.83	.46	1.0	5.9	1.9	.15L	W211692
W211693	3.7	46	27	3.5	1.7	.59	2.8	10	1.2	.27L	W211693
W211694	7.3	48	31	1.5	.73	.22	1.6	13	1.7	.14L	W211694
W212056	6.9	48	33	1.4	.83	.16	1.9	4.5	.97	.14L	W212056
W212057	6.3	54	31	1.4	.75	.18	1.4	3.3	1.7	.16L	W212057
W212058	3.5	42	33	2.7	1.4	0.28	3.2	5.9	1.0	0.29L	W212058
W212059	7.4	56	32	.91	.48	.65	1.2	2.4	2.3	.14L	W212059
W212060	4.0	49	30	2.3	.83	.86	1.1	5.9	1.9	.25L	W212060

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	SO_3 (PERCENT)	AG-S PPM	B-S PPM	BA-S PPM	BE-S PPM	BI-S PPM	CD PPM	CE PPM	CO PPM	CR PPM	SAMPLE NUMBER
W210429	2.3	.56	200	2,200	110	10L	.78	150	49	120	W210429
W210430	1.5	.16	110	1,200	15	10L	.53	180	32	170	W210430
W210431	2.3	.71	170	4,000	67	10L	.84	200	120	130	W210431
W210501	1.6	.33	800	470	45	10L	1.1	82	61	66	W210501
W210502	1.7	.41	520	360	12	10L	.40	210	55	200	W210502
W211630	1.8	.41	290	540	61	10L	.59	120	73	98	W211630
W211634	.47	.30	460	300	19	10L	.35	220	54	200	W211634
W211635	.60	.25	350	470	21	10L	.50	140	29	140	W211635
W211636	7.5	.25	360	580	15	10L	.46	170	30	170	W211636
W211637	5.1	.46	400	570	13	10L	.70	200	39	140	W211637
W211685	3.7	.35	500	740	39	10L	.50	260	130	160	W211685
W211686	.50	.15	320	560	23	10L	.19	170	38	170	W211686
W211687	1.2	.40	600	530	22	10L	1.0	200	130	260	W211687
W211688	.67	.34	430	620	14	10L	.66	210	75	190	W211688
W211689	.30	.18	190	510	7.5	10L	.54	160	39	160	W211689
W211690	.35	.12	350	250	8.3	10L	.34	290	29	160	W211690
W211691	1.3	.37	950	410	84	10L	.55	210	190	230	W211691
W211692	1.6	.34	370	1,400	35	10L	.74	170	82	200	W211692
W211693	4.2	.46	420	1,300	65	10L	.98	190	180	220	W211693
W211694	1.7	.52	700	640	34	10L	.92	150	85	150	W211694
W212056	2.0	.49	650	530	67	10L	1.4	250	220	570	W212056
W212057	2.0	.72	650	500	17	10L	.66	200	67	170	W212057
W212058	3.3	1.3	1,200	1,100	46	10L	1.3	240	190	470	W212058
W212059	1.6	.80	170	940	45	10L	.66	260	220	200	W212059
W212060	3.2	.86	210	1,800	110	10L	.70	230	72	210	W212060

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	CS PPM	CU PPM	DY-S PPM	ER-S PPM	EU PPM	GA-S PPM	GD-S PPM	GE-S PPM	HF PPM	HO-S PPM	SAMPLE NUMBER
W210429	16	130	22L	21	4.5	73	22	65	3.7	11	W210429
W210430	16	90	22L	13	3.2	50	15L	2.9	8.3	6.8L	W210430
W210431	5.9	270	34	14	4.5	73	16	61	5.9	6.8L	W210431
W210501	2.3	190	32L	18	2.7	66	15L	14	1.8	7.0	W210501
W210502	8.0	160	22L	10L	3.9	44	15L	4.5	9.7	6.8L	W210502
W211630	6.7	130	22L	10L	2.8	63	15L	32	4.5	6.8L	W211630
W211634	9.2	180	22L	10L	3.6	36	15L	6.3	8.4	6.8L	W211634
W211635	8.0	140	22L	10L	2.7	32	15L	11	5.3	6.8L	W211635
W211636	6.1	290	22L	10L	3.4	37	15L	22	6.1	6.8L	W211636
W211637	3.9	280	22L	10L	3.7	51	15L	46	5.3	6.8L	W211637
W211685	7.9	220	22L	10L	5.9	71	15L	60	6.4	6.8L	W211685
W211686	5.3	140	22L	10L	2.9	25	15L	2.5	8.6	6.8L	W211686
W211687	10	190	22L	10L	5.8	57	15L	8.7	4.5	6.8L	W211687
W211688	8.9	160	22L	10L	4.3	48	15L	8.3	8.2	6.8L	W211688
W211689	6.3	74	22L	10L	3.3	27	15L	2.2	8.5	6.8L	W211689
W211690	3.6	100	22L	10L	3.7	27	15L	1.5L	8.9	6.8L	W211690
W211691	2.3	290	22L	10L	5.1	50	15L	40	9.3	6.8L	W211691
W211692	4.6	250	22L	10L	3.8	47	15L	5.1	6.2	6.8L	W211692
W211693	16	260	22L	10L	4.6	62	15L	45	8.1	6.8L	W211693
W211694	6.8	190	22L	10L	4.0	45	15L	19	6.8	6.8L	W211694
W212056	8.7	210	22L	22	7.8	48	25	15	5.8	6.8L	W212056
W212057	6.3	190	22L	11	4.3	47	15L	8.6	7.1	6.8L	W212057
W212058	19	300	22L	15	6.0	53	15L	11	5.7	6.8L	W212058
W212059	4.1	310	22L	10L	4.7	65	15L	38	9.5	6.8L	W212059
W212060	2.5	330	22L	21	5.5	69	15L	22	8.8	6.8L	W212060

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	LA PPM	LI PPM	LU PPM	MN PPM	MO-S PPM	NB-S PPM	ND-S PPM	NI-S PPM	PB PPM	PR-S PPM	SAMPLE NUMBER
W210429	73	110	1.8	140	35	28	160	180	51	100	W210429
W210430	100	180	1.2	200	1.0L	25	59	68	54	68L	W210430
W210431	120	140	2.0	64	14	23	91	320	85	68L	W210431
W210501	35	230	.8	73	50	18	100	310	93	68L	W210501
W210502	130	160	1.2	51	12	23	110	120	80	68L	W210502
W211630	62	160	1.0	170	15	15	53	130	35	68L	W211630
W211634	120	220	1.2	58	12	31	81	100	88	68L	W211634
W211635	80	140	1.1	66	6.0	20	58	65	57	68L	W211635
W211636	91	240	1.0	250	9.8	30	40	59	100	68L	W211636
W211637	110	240	1.1	170	9.2	16	36	81	86	68L	W211637
W211685	140	380	1.9	180	6.5	25	110	190	85	68L	W211685
W211686	110	250	1.2	31	6.4	58	92	65	68	68L	W211686
W211687	90	210	1.7	250	31	15	150	250	92	68L	W211687
W211688	96	280	1.5	74	13	33	95	130	72	68L	W211688
W211689	93	120	1.0	56	4.0	27	70	92	50	68L	W211689
W211690	120	190	1.5	28	2.6	30	61	71	64	68L	W211690
W211691	120	190	1.6	42	18	57	120	320	120	68L	W211691
W211692	110	240	1.1	78	4.9	27	110	180	73	68L	W211692
W211693	110	180	1.6	800	7.4	19	32L	240	32	68L	W211693
W211694	96	180	1.5	90	19	20	84	170	64	68L	W211694
W212056	100	190	2.5	81	29	20	180	270	82	68L	W212056
W212057	110	140	1.3	90	36	24	99	230	67	68L	W212057
W212058	110	130	2.3	120	71	12	120	280	63	68L	W212058
W212059	140	160	1.2	40	5.2	22	100	360	93	68L	W212059
W212060	130	140	2.3	61	7.7	36	110	150	95	68L	W212060

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	RB PPM	RE-S PPM	SC PPM	SM PPM	SN-S PPM	SR-S PPM	TA PPM	TB PPM	TH PPM	TL-S PPM	SAMPLE NUMBER
W210429	220	10L	30	17	1.5L	2,500	1.8	4.8	22	81	W210429
W210430	220	10L	32	15	7.7	730	3.6	3.3	31	4.6L	W210430
W210431	390L	10L	44	20	5.9	2,600	2.7	4.9	27	4.6L	W210431
W210501	230L	10L	21	11	4.1	1,000	.70	2.0	8.2	13	W210501
W210502	420L	10L	39	16	11	580	3.1	2.5	37	6.8	W210502
W211630	79	10L	28	9.6	0.0H	1,100	1.9	2.8	15	4.6L	W211630
W211634	140	10L	41	17	11	390	3.0	2.9	39	4.6L	W211634
W211635	150	10L	30	12	9.5	440	2.2	2.1	25	4.6L	W211635
W211636	110	10L	41	15	11	1,100	2.4	2.6	36	4.6L	W211636
W211637	66	10L	36	16	1.5L	1,100	2.1	2.9	30	4.6L	W211637
W211685	860L	10L	63	24	5.2	2,500	3.4	4.5	25	4.6L	W211685
W211686	200L	10L	38	13	4.0	390	2.9	1.6	35	4.6L	W211686
W211687	340L	10L	59	18	3.4	1,200	1.5	4.4	29	4.6L	W211687
W211688	140	10L	41	18	8.6	680	3.2	2.9	34	4.6L	W211688
W211689	150L	10L	30	15	2.1	230	2.9	2.0	27	4.6L	W211689
W211690	180L	10L	33	16	5.7	410	3.4	2.2	32	4.6L	W211690
W211691	470L	10L	54	21	10	960	2.3	2.8	37	4.6L	W211691
W211692	460L	10L	34	15	6.5	2,700	3.2	2.7	34	4.6L	W211692
W211693	810L	10L	39	16	3.1	4,000	7.0	3.2	30	4.6L	W211693
W211694	270L	10L	39	18	1.5L	1,600	4.1L	2.5	32	36	W211694
W212056	140	10L	44	28	2.1	1,000	1.6	5.4	27	4.6L	W212056
W212057	110	10L	41	16	7.8	1,300	3.0	3.7	28	4.6L	W212057
W212058	230	10L	45	21	5.1	2,600	2.0	4.6	30	15	W212058
W212059	410L	10L	45	18	11	1,300	3.6	3.8	39	4.6L	W212059
W212060	750L	10L	42	20	8.4	3,600	2.5	5.2	36	4.6L	W212060

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	TM-S PPM	U PPM	V-S PPM	W PPM	Y-S PPM	YB PPM	ZN PPM	ZR-S PPM	SAMPLE NUMBER
W210429	4.6L	19	250	9.8	170	13	100	220	W210429
W210430	4.6L	10	190	6.9	35	8.0	45	110	W210430
W210431	4.6L	19	350	18	110	16	210	180	W210431
W210501	4.6L	4.9	320	2.9	130	5.8	260	160	W210501
W210502	4.6L	12	210	5.9	55	9.7	80	190	W210502
W211630	4.6L	6.5	120	10	40	6.7	63	120	W211630
W211634	4.6L	13	170	5.9	55	9.2	50	160	W211634
W211635	4.6L	9.2	150	5.3	47	6.7	46	130	W211635
W211636	4.6L	17	180	8.1	59	8.1	60	190	W211636
W211637	4.6L	15	150	6.6	37	6.6	64	110	W211637
W211685	4.6L	25	230	10	96	13	220	160	W211685
W211686	4.6L	8.9	170	4.6	74	7.6	44	470	W211686
W211687	4.6L	16	420	5.6	100	13	330	170	W211687
W211688	4.6L	13	210	5.5	73	10	130	270	W211688
W211689	4.6L	7.6	130	2.6	41	7.4	82	190	W211689
W211690	4.6L	10	120	5.4	44	8.0	35	250	W211690
W211691	4.6L	17	240	7.0	100	16	130	430	W211691
W211692	4.6L	13	180	8.5	61	8.5	74	200	W211692
W211693	4.6L	9.7	130	14	55	14	81	120	W211693
W211694	4.6L	10	190	6.8	53	12	77	130	W211694
W212056	4.6L	13	330	8.7	170	18	240	220	W212056
W212057	4.6L	14	210	8.7	69	9.5	98	160	W212057
W212058	4.6L	9.7	250	10	130	17	340	180	W212058
W212059	4.6L	20	260	8.1	60	11	350	180	W212059
W212060	4.6L	13	260	14	160	15	40	310	W212060

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	ASH (PERCENT)	SiO_2 (PERCENT)	Al_2O_3 (PERCENT)	CAO (PERCENT)	MGO (PERCENT)	Na_2O (PERCENT)	K_2O (PERCENT)	Fe_2O_3 (PERCENT)	TiO_2 (PERCENT)	P_2O_5 (PERCENT)	SAMPLE NUMBER
W212061	6.7	53	31	.98	.91	.55	3.4	3.3	1.3	.15L	W212061
W212062	7.9	69	20	.83	.46	.28	1.3	2.0	2.7	.13L	W212062
W212063	7.5	41	25	2.2	1.1	.50	1.7	16	1.1	.29	W212063
W212064	4.3	48	29	2.0	1.2	1.5	3.0	5.6	1.3	.23L	W212064
W212065	4.3	27	19	15	2.2	1.6	1.5	4.9	.84	.23L	W212065
W212066	15.8	54	32	.41	.66	.22	3.0	3.7	1.7	.06L	W212066
W212067	5.6	49	30	1.1	.85	.53	2.9	4.8	1.2	.18L	W212067
W212068	5.3	52	30	2.0	.85	.28	2.2	5.3	1.4	.19L	W212068
W212069	14.0	58	26	.59	.71	.39	1.2	2.3	2.0	.14	W212069
W212070	5.2	45	36	2.1	.70	1.2	1.6	4.4	1.1	.48	W212070
W212071	2.9	46	20	2.7	.66	.27	1.1	8.9	.62	.34L	W212071
W212088	3.1	43	22	1.9	.61	.59	1.1	25	2.4	.32L	W212088
W212281	10.4	51	26	12	1.2	.16	3.8	10	1.3	.10L	W212281
W212282	6.4	53	28	1.3	1.3	.16	2.8	7.2	1.3	.16L	W212282
W212497	4.1	50	27	1.9	.76	.70	2.0	5.6	3.0	.24L	W212497
W212498	6.9	52	28	1.2	1.3	.77	3.4	6.4	1.2	.14L	W212498
W212499	6.6	17	12	4.1	.61	.43	.95	50	.58	.15L	W212499
W212503	16.9	54	24	.48	.70	.32	2.4	15	1.1	.06L	W212503
W212504	17.8	58	28	.41	.58	.27	2.4	4.4	1.7	.06L	W212504
W212594	13.8	53	32	1.3	.45	.66	1.1	3.2	1.5	.07L	W212594
W212595	18.4	56	25	.43	1.3	.49	4.1	5.1	1.5	.05L	W212595
W212596	9.8	45	29	1.4	.80	.26	1.7	12	1.5	.10L	W212596
W215399	13.8	52	23	1.0	.76	.16	2.8	15	1.7	.06	W215399
W215400	5.3	49	32	2.2	.76	.43	2.3	6.1	1.1	.26	W215400
W215401	12.7	18	7.4	1.7	.66	.16	.86	62	.28	.09	W215401

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	SO_3 (PERCENT)	AG-S PPM	B-S PPM	BA-S PPM	BE-S PPM	BI-S PPM	CD PPM	CE PPM	CO PPM	CR PPM	SAMPLE NUMBER
W212061	2.0	.86	150	1,200	160	10L	.63	190	170	150	W212061
W212062	1.8	2.1	100	720	110	10L	.92	210	290	220	W212062
W212063	3.7	.71	160	2,200	25	13	.58	210	58	160	W212063
W212064	3.3	4.3	270	2,200	54	10L	1.4	220	110	190	W212064
W212065	17	.58	200	2,200	130	10L	.83	160	178	130	W212065
W212066	1.3	.68	99	1,400	33	10L	.90	280	41	190	W212066
W212067	2.1	.51	170	1,600	51	10L	.63	140	210	140	W212067
W212068	2.8	.66	210	880	97	10L	1.1	230	87	160	W212068
W212069	1.4	.25	120	910	32	10L	.36	210	39	140	W212069
W212070	2.5	.49	270	1,600	24	10L	.63	360	140	220	W212070
W212071	1.9	1.5	220	1,00	140	11	1.5	240	580	170	W212071
W212088	2.1	.30	310	740	11	10L	.52	530	71	350	W212088
W212281	1.6	.10L	140	640	35	10L	.50	120	37	120	W212281
W212282	1.1	.30	160	690	65	10L	.40	160	92	170	W212282
W212497	2.5	.61	400	2,100	100	10L	.62	270	110	230	W212497
W212498	1.6	.43	400	1,600	87	10L	.56	190	110	120	W212498
W212499	3.6	.60	220	1,600	110	10L	1.5	76	76	97	W212499
W212503	1.0	.65	330	490	13	10L	.83	140	99	140	W212503
W212504	.75	.25	330	450	13	10L	.67	150	70	160	W212504
W212594	1.4	.35	180	740	16	10L	.40	300	26	78	W212594
W212595	1.2	.18	220	990	10	10L	.48	170	24	130	W212595
W212596	1.8	.54	370	580	27	10L	.58	170	35	150	W212596
W215399	1.2	.10L	190	500	35	10L	.28	140	91	120	W215399
W215400	2.2	1.1	380	1,800	210	10L	.72	230	120	170	W215400
W215401	2.2	.76	230	520	34	10L	.92	47	30	49	W215401

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	CS PPM	CU PPM	DY-S PPM	ER-S PPM	EU PPM	GA-S PPM	GD-S PPM	GE-S PPM	HF PPM	HO-S PPM	SAMPLE NUMBER
W212061	15	270	22L	21	5.1	150	15L	59	6.0	6.8L	W212061
W212062	7.0	350	22L	15	4.1	61	15L	44	11	6.80L	W212062
W212063	6.7	170	22L	20	5.1	62	15L	110	6.7	6.8L	W212063
W212064	9.3	280	22L	20	7.0	85	15L	15	4.7	6.8L	W212064
W212065	4.7	170	22L	14	5.1	89	15L	32	4.7	6.8L	W212065
W212066	9.5	360	22L	14	5.1	38	18	3.8	6.6	6.8L	W212066
W212067	7.1	250	29	15	4.5	65	18	40	3.6	6.8L	W212067
W212068	9.4	250	22L	14	5.8	57	15L	58	7.5	6.8L	W212068
W212069	4.3	160	22L	10	3.4	43	15L	2.2	9.3	6.8L	W212069
W212070	4.8	230	32	17	9.6	62	33	9.1	4.8	6.8L	W212070
W212071	6.9	600	50	30	9.0	120	35	89	6.9	11	W212071
W212088	11	290	22L	10L	11	31	15L	11	34	6.8L	W212088
W212281	22	100	22L	10L	2.5	39	15L	12	4.8	6.8L	W212281
W212282	16	96	22L	10L	4.5	41	15L	34	4.7	6.8L	W212282
W212497	7.3	460	22L	10L	5.6	100	15L	110	12	6.8L	W212497
W212498	8.7	260	31	10L	4.8	91	15L	64	4.3	6.8L	W212498
W212499	6.1	190	22L	19	3.2	140	16	180	3.0	6.8L	W212499
W212503	11	150	22L	10L	3.3	49	15L	7.8	4.7	6.8L	W212503
W212504	9.6	110	22L	10L	2.8	56	15L	4.3	7.3	6.8L	W212504
W212594	4.3	120	22L	14	3.0	44	15L	5.0	13	6.8L	W212594
W212595	12	130	22L	10L	3.0	40	15L	1.9	6.5	6.8L	W212595
W212596	7.1	170	22L	10L	3.6	48	15L	31	6.1	6.8L	W212596
W215399	9.4	100	22L	10L	2.6	51	15L	17	6.5	6.8L	W215399
W215400	9.4	380	37	21	6.6	140	15L	110	3.8	7.5	W215400
W215401	3.9	180	22L	10L	2.5	64	15L	57	.8	6.8L	W215401

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	LA PPM	LI PPM	LU PPM	MN PPM	MO-S PPM	NB-S PPM	ND-S PPM	NI-S PPM	PB PPM	PR-S PPM	SAMPLE NUMBER
W212061	90	120	2.5	69	2.2	221	170	330	50	68L	W212061
W212062	120	96	1.6	40	6.2	57	160	430	89	68L	W212062
W212063	110	150	1.7	160	11	22	99	190	56	68L	W212063
W212064	93	110	3.0	180	34	14	110	230	61	68L	W212064
W212065	93	79	1.6	440	11	19	77	130	34	68L	W212065
W212066	150	170	1.3	47	10	27	140	83	140	68L	W212066
W212067	71	140	1.4	59	28	18	94	230	93	68L	W212067
W212068	110	120	1.9	70	14	27	97	240	71	68L	W212068
W212069	110	250	1.2	26	14	42	120	110	79	68L	W212069
W212070	150	230	2.5	99	26	9	120	270	110	68L	W212070
W212071	100	130	4.1	62	120	17	140	810	150	68L	W212071
W212088	320	220	4.5	300	15	58	72	65	49	68L	W212088
W212281	67	110	.8	1,800	2.2	25	60	86	36	68L	W212281
W212282	94	110	1.7	1,700	4.2	18	65	150	36	68L	W212282
W212497	150	190	2.7	250	22	57	150	250	130	77	W212497
W212498	100	170	2.2	130	21	29	130	250	78	68L	W212498
W212499	45	62	2.6	340	18	32	45	160	19	68L	W212499
W212503	65	200	1.1	57	21	16	66	250	62	74	W212503
W212504	79	140	.9	54	9.3	35	74	190	61	68L	W212504
W212594	160	150	1.7	80	4.9	32	180	78	75	71	W212594
W212595	92	120	1.0	130	6.9	29	94	76	40	68L	W212595
W212596	92	310	1.2	90	26	37	110	120	48	87	W212596
W215399	80	88	.9	1,100	7.3	19	39	120	54	68L	W215399
W215400	110	150	3.0	62	4.7	18	97	250	78	68L	W215400
W215401	24	100	1.0	64	38	17	32L	72	64	68L	W215401

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	RB PPM	RE-S PPM	SC PPM	SM PPM	SN-S PPM	SR-S PPM	TA PPM	TB PPM	TH PPM	TL-S PPM	SAMPLE NUMBER
W212061	190	10L	47	18	5.0	1,800	1.9	4.5	22	4.6L	W212061
W212062	380L	10L	38	16	15	1,400	4.6	3.7	39	4.6L	W212062
W212063	170	10L	44	22	1.5L	2,600	2.1	4.9	30	4.6L	W212063
W212064	930L	10L	60	22	6.1	3,200	1.9	7.0	26	4.6L	W212064
W212065	700L	10L	26	16	1.8	12,000	1.9	4.0	17	4.6L	W212065
W212066	130	10L	56	22	10	740	2.7	3.9	68	4.6L	W212066
W212067	540L	10L	35	16	4.7	2,200	1.8	3.6	23	10	W212067
W212068	380L	10L	37	19	4.5	2,000	2.3	4.3	30	4.6L	W212068
W212069	71	10L	34	15	13	1,600	4.3	2.6	44	4.6L	W212069
W212070	770L	10L	65	36	3.7	3,600	1.9	7.9	36	4.6L	W212070
W212071	310	10L	85	34	1.5L	2,600	2.1	7.9	34	4.6L	W212071
W212088	970L	10L	93	44	1.5L	2,100	14	10	94	4.6L	W212088
W212281	300	10L	25	11	3.8	790	2.2	2.1	21	4.6L	W212281
W212282	190	10L	35	17	3.1	1,300	3.1	4.1	30	4.6L	W212282
W212497	730L	10L	80	20	11	3,600	5.4	5.1	49	4.6L	W212497
W212498	510L	10L	46	19	2.5	2,300	1.7	7.4	26	4.6L	W212498
W212499	450L	10L	71	11	0.0H	12,000	3.0L	8.9	11	4.6L	W212499
W212503	120	10L	33	12	1.5L	460	2.0	3.0	25	33	W212503
W212504	120	10L	33	12	4.4	400	2.5	1.9	29	12	W212504
W212594	430L	10L	24	24	10	1,200	3.1	2.5	57	4.6L	W212594
W212595	76	10L	31	12	2.9	890	1.9	1.1	26	4.6L	W212595
W212596	310L	10L	34	13	1.5L	1,100	2.0	3.8	23	4.6L	W212596
W215399	150	10L	28	10	1.5L	550	2.4	1.7	21	4.6L	W215399
W215400	570L	10L	70	25	3.4	1,800	1.5	8.3	26	20	W215400
W215401	240L	10L	26	7.1	0.0H	940	1.6L	2.8	6.3	4.6L	W215401

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	TM-S PPM	U PPM	V-S PPM	W PPM	Y-S PPM	YB PPM	ZN PPM	ZR-S PPM	SAMPLE NUMBER
W212061	4.6L	14	270	16	170	19	61	200	W212061
W212062	4.6L	15	160	11	120	13	63	480	W212062
W212063	4.6L	19	270	8.0	120	14	150	200	W212063
W212064	4.6L	15	280	26	170	22	100	110	W212064
W212065	4.6L	9.1	140	24	130	13	40	240	W212065
W212066	4.6L	32	240	5.7	88	10	48	240	W212066
W212067	4.6L	18	240	14	97	11	55	140	W212067
W212068	4.6L	13	240	11	130	13	82	320	W212068
W212069	4.6L	20	180	7.1	70	7.9	120	360	W212069
W212070	4.6L	23	310	8.7	100	19	170	82	W212070
W212071	4.6L	50	480	28	210	31	180	170	W212071
W212088	4.6L	47	180	31	68	31	130	360	W212088
W212281	4.6L	4.3	140	6.3	36	6.3	59	110	W212281
W212282	4.6L	15	160	7.8	71	14	59	110	W212281
W212497	4.6L	23	330	17	170	20	57	460	W212497
W212498	4.6L	27	320	16	120	14	71	280	W212498
W212499	4.6L	11	170	33	150	18	100	180	W212499
W212503	4.6L	14	270	3.6	37	7.7	110	120	W212503
W212504	4.6L	11	220	5.1	44	6.7	99	250	W212504
W212594	4.6L	22	170	6.9	110	13	66	420	W212594
W212595	4.6L	13	230	3.8	60	7.1	80	230	W212595
W212596	4.6L	22	260	8.2	83	8.2	120	330	W212596
W215399	4.6L	3.0	110	5.8	27	7.2	110	97	W215399
W215400	4.6L	6.4L	290	36	160	28	120	140	W215400
W215401	4.6L	8.6	89	13	60	10	230	41	W215401

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	ASH (PERCENT)	SiO_2 (PERCENT)	Al_2O_3 (PERCENT)	CAO (PERCENT)	MGO (PERCENT)	Na_2O (PERCENT)	K_2O (PERCENT)	Fe_2O_3 (PERCENT)	TiO_2 (PERCENT)	P_2O_5 (PERCENT)	SAMPLE NUMBER
W215402	13.5	55	32	1.1	.63	.16	1.6	3.4	2.3	.12	W215402
W215440	12.7	56	33	.49	.27	.24	1.2	5.6	2.3	.14	W215440
W215557	14.6	54	30	.90	.85	.22	3.7	6.9	1.6	.14	W215557
W215558	12.6	56	29	1.0	.73	.23	2.5	3.7	1.9	.16	W2145558
W215559	5.5	48	34	1.8	.80	.27	2.1	22	1.1	.91	W215559

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	SO_3 (PERCENT)	AG-S PPM	B-S PPM	BA-S PPM	BE-S PPM	BI-S PPM	CD PPM	CE PPM	CO PPM	CR PPM	SAMPLE NUMBER
W215402	1.0	.38	120	640	33	10L	.52	240	61	100	W215402
W215440	.67	.43	290	270	13	10L	.60	170	77	210	W215440
W215557	1.4	.19	280	450	36	10L	.52	170	62	170	W215557
W214558	1.7	.11	320	650	15	10L	.60	190	30	190	W215558
W215559	3.8	.91	680	3,100	80	10L	.82	310	280	250	W215559

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	CS PPM	CU PPM	DY-S PPM	ER-S PPM	EU PPM	GA-S PPM	GD-S PPM	GE-S PPM	HF PPM	HO-S PPM	SAMPLE NUMBER
W215402	4.4	200	22L	10L	2.7	68	15L	27	17	6.8L	W215402
W215440	4.7	170	22L	10L	3.9	45	15L	7.0	8.7	6.8L	W215440
W215557	17	87	22L	10L	3.6	44	15L	13	6.2	6.8L	W215557
W215558	10	130	22L	10L	3.7	31	15L	2.4	7.1	6.8L	W215558
W215559	7.3	270	33	20	10	60	15	34	5.5	6.8L	W215559

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	LA PPM	LI PPM	LU PPM	MN PPM	MO-S PPM	NB-S PPM	ND-S PPM	NI-S PPM	PB PPM	PR-S PPM	SAMPLE NUMBER
W215402	120	160	1.3	46	9.0	52	98	140	94	68L	W215402
W215440	100	110	1.3	60	11	23	67	160	83	68L	W215440
W215557	89	73	1.3	46	9.7	26	59	120	52	68L	W215557
W215558	95	110	1.3	35	9.8	24	49	75	65	68L	W215558
W215559	130	150	3.8	62	32	15	150	260	78	68L	W215559

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	RB PPM	RE-S PPM	SC PPM	SM PPM	SN-S PPM	SR-S PPM	TA PPM	TB PPM	TH PPM	TL-S PPM	SAMPLE NUMBER
W215402	96	10L	30	18	26	980	4.8	5.1	64	4.6L	W215402
W215440	310L	10L	42	15	6.2	350	3.3	3.1	36	4.6L	W215440
W215557	160	10L	35	14	5.4	430	2.3	3.1	23	4.6L	W215557
W215558	63	10L	39	14	4.0	760	2.7	2.3	33	4.6L	W215558
W215559	360L	10L	59	36	3.3	1,600	.73	10	27	4.6L	W215559

Table 2.--Major- and Minor-Oxides and Trace-Element Concentrations in the Laboratory Ash of 145 Bituminous Coal Samples from the Big Sandy Reserve District, Eastern Kentucky--Continued.

SAMPLE NUMBER	TM-S PPM	U PPM	V-S PPM	W PPM	Y-S PPM	YB PPM	ZN PPM	ZR-S PPM	SAMPLE NUMBER
W215402	4.6L	18	140	11	64	11	120	480	W215402
W215440	4.6L	14	170	16L	47	8.7	50	260	W215440
W215557	4.6L	9.7	210	5.1	47	9.2	40	110	W215557
W215558	4.6L	12	190	7.1	43	9.5	54	130	W215558
W215559	4.6L	18	400	16	160	27	88	110	W215559

Table 3.--Content of 23 Trace Elements in 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky.

[Analysis performed on whole-coal. Values in parts-per-million (ppm). L, less than the value shown; B, not determined.]

SAMPLE NUMBER	AS PPM	CE PPM	CL PPM	CO PPM	CR PPM	CS PPM	EU PPM	F PPM	HF PPM	HG PPM	SAMPLE NUMBER
W203623	1.4	17	200	12	13	0.6	0.40	91	0.5	0.11	W203623
W203624	2.1	17	220	14	7.3	.4	.44	71	.3	.21	W203624
W203631	1.1	5.0	920	3.5	2.3	.1	.15	58	.1	.010L	W203631
W203634	1.5	4.0	640	3.1	1.8	.2L	.17	31	.1	.010L	W203634
W205315	20.2	11	1,300	3.9	8.2	.8	.20	32	.8	.17	W205315
W205316	5.7	46	170	6.5	49	2.1	.76	46	2.9	.036	W205316
W205319	6.5	57	180	7.3	36	5.3	.86	180	1.5	.098	W205319
W205332	1.3	32	180	7.4	30	1.8	.44	120	1.5	.019	W205332
W207111	2.2	35	50	10	34	2.5	.63	160	1.8	.22	W207111
W207112	3.2	22	110	3.3	21	.7	.34	60	1.2	.17	W207112
W207113	2.0	23	160	13	23	1.3	.38	130	1.0	.060	W207113
W207114	9.7	14	1,700	2.7	8.9	.5	.21	90	1.0	.11	W207114
W207474	2.1	24	290	4.7	23	.6	.31	120	1.4	.062	W207474
W207817	2.5	29	110	6.2	27	1.1	.46	70	1.5	.11	W207817
W207818	7.1	31	60	7.1	30	1.0	.49	100	1.7	.23	W207818
W207819	1.3	24	230	7.3	24	1.2	.40	110	1.2	.060	W207819
W207820	10.4	19	1,700	5.9	18	1.4	.29	90	1.0	.22	W207820
W207821	7.8	19	1,600	4.1	16	1.3	.33	90	.9	.20	W207821
W207864	59.7	28	1,100	6.6	23	2.3	.43	120	.9	.26	W207864
W207867	7.9	56	880	3.6	15	.5	.41	30	2.8	.034	W207867

Table 3.--Content of 23 Trace Elements in 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky--Continued.

SAMPLE NUMBER	LA PPM	LU PPM	NA PPM	P PPM	RB PPM	SB PPM	SC PPM	SE PPM	SM PPM	TB PPM	SAMPLE NUMBER
W203623	8	0.1	65	22L	15	0.30	2.8	3.5	1.7	0.3	W203623
W203624	8	.1	56	22L	7	.10	1.6	5.3	1.8	.3	W203624
W203631	2	.1L	92	22L	7L	.10	.53	1.8	.65	.1	W203631
W203634	1	.1	62	22L	6L	.30	.76	1.0	.70	.2	W203634
W205315	6	.1	96	22L	80L	.50	2.0	5.7	1.1	.2	W205315
W205316	24	.4	320	83	38	1.7	9.9	3.0	3.9	.6	W205316
W205319	33	.3	530	160	85	2.2	9.2	3.6	5.2	.5	W205319
W205332	18	.2	300	35	70L	.70	6.0	3.1	2.7	.4	W205332
W207111	20	.3	300	22L	41	.50	7.3	9.9	3.1	.5	W207111
W207112	14	.2	110	22L	30L	.30	4.1	7.8	1.9	.3	W207112
W207113	14	.2	160	22L	24	.70	5.2	5.4	1.9	.2	W207113
W207114	8	.1	360	180	40L	.40	2.5	5.4	1.1	.2	W207114
W207474	13	.1	130	44L	30L	.40	4.0	7.6	1.8	.2	W207474
W207817	17	.2	130	44L	40L	.40	5.7	5.7	2.0	.3	W207817
W207818	18	.2	140	44L	40L	.40	6.2	6.9	2.4	.4	W207818
W207819	13	.2	210	44L	38	1.0	4.7	7.2	1.8	.3	W207819
W207820	11	.2	460	44L	50L	.60	4.7	4.0	1.7	.2	W207820
W207821	11	.2	570	44L	50L	.40	3.9	4.4	1.5	.2	W207821
W207864	13	.3L	760	44L	60L	2.1	6.3	7.0	2.3	.4	W207864
W207867	32	.3L	160	44L	40L	.50	4.9	4.8	5.4	.7	W207867

Table 3.--Content of 23 Trace Elements in 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky--Continued.

SAMPLE NUMBER	TH PPM	U PPM	YB PPM
W203623	1.3	0.45	0.8
W203624	.9	.27	.8
W203631	.4	.20L	.3
W203634	.2	.19L	.6
W205315	1.5	.52	.8
W205316	10	3.1	2.3
W205319	8.6	2.9	2.2
W205332	5.6	1.6	1.2
W207111	6.0	2.1	1.5
W207112	4.2	1.3	.9
W207113	3.8	1.3	1.1
W207114	2.4	.82	.6
W207474	4.1	2.3	.9
W207817	5.2	1.5	1.2
W207818	5.9	1.7	1.4
W207819	3.8	1.5	1.0
W207820	3.4	1.0	1.1
W207821	3.3	.91	.9
W207864	4.6	4.6	1.0
W207867	11	3.2	2.3

Table 3.--Content of 23 Trace Elements in 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky--Continued.

SAMPLE NUMBER	AS PPM	CE PPM	CL PPM	CO PPM	CR PPM	CS PPM	EU PPM	F PPM	HF PPM	HG PPM	SAMPLE NUMBER
W207868	119	69	840	5.3	30	2.0	0.75	60	2.2	0.35	W207868
W207870	43.6	12	2,100	4.7	6.5	.3	.21	40	.5	.070	W207870
W207982	14.2	24	410	12	23	1.7	.43	80	.8	.082	W207982
W208050	22.6	21	790	6.0	17	1.1	.41	50	.8	.48	W208050
W208051	23.4	25	330	5.2	22	1.8	.49	70	1.0	.11	W208051
W208052	2.9	31	190	7.4	30	2.2	.51	40	1.5	.15	W208052
W208053	5.2	8.0	1,300	4.8	5.4	.4	.26	10	.2	.090	W208053
W208054	5.3	21	1,500	5.3	15	.7	.39	100	1.2	.45	W208054
W208055	30.6	27	990	4.6	22	1.0	.42	10	1.4	.30	W208055
W208061	296	32	470	5.1	28	2.6	.53	110	1.4	.29	W208061
W208062	5.7	35	610	8.4	36	3.7	.56	140	1.9	.12	W208062
W208100	7.9	19	1,400	4.3	13	.8	.33	40	.7	.18	W208100
W208101	7.8	7.0	2,700	5.0	4.1	.2	.16	30	.3	.21	W208101
W208104	48.1	16	2,200	4.9	11	1.3	.40	40	.4	.23	W208104
W208105	30.6	63	800	11	48	4.8	.99	220	2.9	.28	W208105
W208197	21.8	57	620	3.3	18	.6	.53	70	3.7	.25	W208197
W208198	113	11	2,000	4.9	6.2	.4	.36	20	.3	.44	W208198
W208203	5.0	34	460	6.8	25	1.6	.56	100	1.0	.18	W208203
W208204	5.3	19	650	18	15	.8	.60	40	.4	.33	W208204
W208208	1.8	15	1,000	3.3	17	1.4	.34	70	.6	.10	W208208
W208209	18.8	35	1,200	5.0	25	2.1	.70	100	2.0	.66	W208209
W208210	7.0	12	1,700	4.3	9.3	.7	.34	70	.3	.13	W208210
W208211	6.4	19	1,500	7.8	17	.9	.43	60	.6	.12	W208211
W208212	20.1	69	350	3.8	64	4.9	1.3	220	3.0	.66	W208212
W208213	6.3	16	1,300	5.3	11	.6	.42	30	.3	.29	W208213

Table 3.--Content of 23 Trace Elements in 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky--Continued.

SAMPLE NUMBER	LA PPM	LU PPM	NA PPM	P PPM	RB PPM	SB PPM	SC PPM	SE PPM	SM PPM	TB PPM	SAMPLE NUMBER
W207868	42	0.4L	360	44L	60L	1.8	7.5	7.3	5.1	0.6	W207868
W207870	6	.2L	160	44L	40L	.70	2.2	2.6	1.6	.2	W207870
W207982	12	.2	240	44	26	1.1	5.2	4.6	2.3	.3	W207982
W208050	11	.2	180	44L	10	.70	4.2	4.0	1.6	.3	W208050
W208051	14	.2	200	44L	30	.60	4.5	2.9	2.3	.3	W208051
W208052	18	.2	210	44L	40	.40	5.5	4.7	2.5	.4	W208052
W208053	3	.2	60	44L	20L	.80	1.7	2.6	1.0	.3	W208053
W208054	12	.2	120	44L	16	.50	3.1	3.6	1.7	.3	W208054
W208055	15	.2	200	44L	15	.60	5.1	3.8	1.8	.3	W208055
W208061	18	.2	730	44L	39	2.1	6.4	3.8	2.8	.4	W208061
W208062	20	.3	630	44L	52	1.7	7.8	2.9	3.1	.5	W208062
W208100	10	.2	670	230	60L	.50	3.2	6.0	1.6	.1	W208100
W208101	3	.1	370	44L	40L	.50	1.2	3.0	.60	.1	W208101
W208104	7	.2	370	44L	50L	2.2	3.6	2.6	2.0	.3	W208104
W208105	33	.5	630	44L	77	2.1	11	6.7	5.0	.8	W208105
W208197	30	.3	420	44L	30L	.85	5.6	5.9	3.9	1	W208197
W208198	5	.2	180	44L	30L	1.2	3.2	2.9	1.3	.5	W208198
W208203	16	.2	250	44L	38	.80	5.1	6.2	2.3	.4	W208203
W208204	8	.2	170	44L	10	.80	3.3	5.5	2.3	.6	W208204
W208208	8	.1	310	44L	18	.30	3.6	2.6	1.4	.3	W208208
W208209	19	.2	360	44L	30	.70	6.6	8.5	3.3	.7	W208209
W208210	6	.1	360	44L	11	.40	2.7	3.9	1.3	.4	W208210
W208211	10	.2	180	230	11	.90	4.0	1.7	1.8	.4	W208211
W208212	39	.4	600	44L	61	.85	14	12	5.6	1	W208212
W208213	9	.2	310	44L	10	.35	4.7	7.6	1.8	.6	W208213

Table 3.--Content of 23 Trace Elements in 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky--Continued.

SAMPLE NUMBER	TH PPM	U PPM	YB PPM
W207868	10	2.6	1.9
W207870	1.3	.37	.8
W207982	3.6	1.6	1.2
W208050	3.0	1.0	1.1
W208051	4.1	1.4	1.1
W208052	4.9	1.4	1.3
W208053	.7	.55	1.2
W208054	3.5	.73	1.1
W208055	4.3	1.0	1.0
W208061	5.8	1.8	1.4
W208062	6.4	2.8	1.7
W208100	2.7	1.2	.7
W208101	.8	.57	.5
W208104	1.9	1.4	1.1
W208105	10	3.9	2.6
W208197	16	4.5	2.3
W208198	1.1	.88	1.2
W208203	4.0	2.3	1.1
W208204	1.9	.92	1.4
W208208	2.3	1.2	.9
W208209	5.6	2.5	1.8
W208210	1.9	.63	.9
W208211	2.4	1.1	1.2
W208212	12	3.4	3.2
W208213	2.1	3.8	1.4

Table 3.--Content of 23 Trace Elements in 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky--Continued.

SAMPLE NUMBER	AS PPM	CE PPM	CL PPM	CO PPM	CR PPM	CS PPM	EU PPM	F PPM	HF PPM	HG PPM	SAMPLE NUMBER
W208214	1.7	18	2,100	8.6	16	2.2	0.36	60	0.6	0.055	W208214
W208215	19.3	52	730	10	44	5.7	1.0	200	1.7	.20	W208215
W208216	2.6	110	200	4.4	48	3.4	1.4	110	9.1	.090	W208216
W208218	56.5	24	370	12	22	1.7	.53	50	.9	.58	W208218
W208219	20.3	9.0	600	7.9	10	.2	.20	20	.3	.11	W208219
W208220	2.3	16	500	19	14	.5	.44	120	.7	.055	W208220
W208224	1.9	24	150	6.3	25	1.2	.49	180	.9	.075	W208224
W208225	2.4	19	670	15	16	.7	.66	30	.3	.17	W208225
W209504	47.6	6.0	2,200	3.5	3.2	.2	.21	30	.1	.28	W209504
W209505	22.7	8.0	1,900	6.0	7.0	.2	.33	30	.2	.22	W209505
W209676	1.2	15	1,500	2.7	16	1.3	.26	130	.7	.030	W209676
W209851	.9	6.7	2,200	12	4.8	.3	.12	50	.2	.016	W209851
W209852	5.0	11	1,600	8.2	9.4	1.0	.24	50	.4	.054	W209852
W209895	4.5	19	1,000	9.9	16	.5	.48	80	.3	.050	W209895
W209896	19.4	48	290	11	42	4.2	1.0	170	1.6	.090	W209896
W209897	.6	10	370	15	11	.2L	.28	20	.4	.060	W209897
W210026	8.0	13	880	9.3	12	.9	.39	50	.5	.090	W210026
W210027	9.4	21	830	10	27	.4	.54	70	.7	.10	W210027
W210028	38.8	22	200	9.1	17	1.1	.48	80	.6	.090	W210028
W210029	1.9	30	100	2.5	25	.9	.53	90	1.3	.13	W210029
W210030	1.9	19	190	7.8	19	.9	.44	70	.8	.11	W210030
W210154	1.6	26	1,400	9.3	24	2.0	.48	90	1.0	.090	W210154
W210155	6.2	14	1,600	8.5	8.5	.2	.30	60	.3	.060	W210155
W210156	131	9.0	1,300	5.3	8.8	.6	.36	40	.3	.080	W210156
W210157	20.7	10	1,700	6.8	7.6	.3	.18	50	.4	.060	W210157

Table 3.--Content of 23 Trace Elements in 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky--Continued.

SAMPLE NUMBER	LA PPM	LU PPM	NA PPM	P PPM	RB PPM	SB PPM	SC PPM	SE PPM	SM PPM	TB PPM	SAMPLE NUMBER
W208214	11	0.1	230	44L	20	0.95	3.9	2.5	1.7	0.3	W208214
W208215	28	.4	850	44L	72	1.4	9.8	2.0	4.9	.5	W208215
W208216	60	.6	670	44L	32	.65	13	6.8	10	3	W208216
W208218	12	.2	220	44L	21	1.9	5.8	5.6	1.8	.5	W208218
W208219	6	.1	75	87	20L	.50	2.1	2.5	.90	.2	W208219
W208220	7	.2	150	44L	20L	.60	4.0	5.1	1.8	.5	W208220
W208224	14	.1	190	44L	13	.40	4.4	5.1	2.2	.6	W208224
W208225	8	.2	120	44L	20L	.40	3.5	5.6	2.8	.8	W208225
W209504	3	.1	95	44L	20L	1.1	3.0	3.5	.70	.3	W209504
W209505	4	.3	78	44L	20L	1.5	6.1	4.1	1.1	.6	W209505
W209676	8	.1	370	44L	21	.20	3.1	5.4	1.1	.2	W209676
W209851	4	.1L	130	44L	30L	.93	1.2	2.7	.50	.1	W209851
W209852	6	.1	220	44L	15	.90	2.1	4.0	9.7	.2	W209852
W209895	11	.1	110	380	50L	.80	3.3	4.3	1.7	.5	W209895
W209896	26	.3	460	44L	90L	1.6	8.8	5.8	5.2	1	W209896
W209897	7	.1	32	44L	30L	.50	2.4	5.9	1.4	.3	W209897
W210026	7	.1	120	44L	40L	.85	3.4	4.1	2.0	.4	W210026
W210027	11	.2	120	44L	30L	1.2	5.1	11	3.1	.7	W210027
W210028	10	.2	90	44L	30L	.90	4.0	17	2.3	.4	W210028
W210029	18	.2	150	44L	20	.40	5.4	9.2	3.1	.7	W210029
W210030	10	.2	79	44L	25	.90	4.0	5.8	2.1	.4	W210030
W210154	14	.2	460	44L	46	1.3	5.7	5.6	2.2	.4	W210154
W210155	7	.1	270	210	60L	1.1	2.6	3.4	1.2	.2	W210155
W210156	4	.2	170	44L	50L	1.1	4.8	3.3	1.2	.6	W210156
W210157	6	.1	230	230	50L	.70	1.7	2.8	.70	.2	W210157

Table 3.--Content of 23 Trace Elements in 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky--Continued.

SAMPLE NUMBER	TH PPM	U PPM	YB PPM
W208214	2.8	0.68	0.9
W208215	9.8	3.6	2.3
W208216	36	8.6	4.8
W208218	3.6	1.8	1.5
W208219	1.4	.37	.6
W208220	2.9	.69	1.3
W208224	3.5	1.2	1.1
W208225	1.9	.52	1.3
W209504	.5	1.3	1.0
W209505	.8	.60	1.9
W209676	2.4	.96	.6
W209851	.8	.88	.3
W209852	1.5	1.3	.7
W209895	2.0	.99	.8
W209896	8.1	2.6	2.1
W209897	2.0	.46	.8
W210026	1.9	.66	1.0
W210027	5.6	2.1	1.2
W210028	2.5	.95	1.3
W210029	4.9	1.2	1.3
W210030	2.8	.83	1.2
W210154	4.0	2.2	1.2
W210155	1.7	1.1	.7
W210156	1.0	1.3	1.5
W210157	1.7	.99	.4

Table 3.--Content of 23 Trace Elements in 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky--Continued.

SAMPLE NUMBER	AS PPM	CE PPM	CL PPM	CO PPM	CR PPM	CS PPM	EU PPM	F PPM	HF PPM	HG PPM	SAMPLE NUMBER
W210158	51.8	33	1,500	11	25	2.3	.74	180	1.3	.25	W210158
W210161	34.1	5.0	2,500	9.3	3.7	.1	.10	20	.2	.17	W210161
W210162	7.1	20	1,800	5.6	11	.4	.45	20	.7	.13	W210162
W210163	2.0	11	1,800	17	11	.5	.39	110	.5	.060	W210163
W210164	100	14	2,100	10	13	1.7	.33	50	.6	.15	W210164
W210262	37.6	14	210	22	14	.2	.38	30	.5	.50	W210262
W210263	1.5	41	100L	4.9	38	1.0	.74	20	2.1	.23	W210263
W210264	2.8	19	270	3.4	14	.5	.38	10	.6	.16	W210264
W210287	59.3	5.0	1,500	3.6	7.3	.2	.24	20	.1	.21	W210287
W210288	5.9	22	1,200	5.0	16	.2	.43	100	.8	.20	W210288
W210293	128	48	100L	18	46	3.5	1.1	150	2.1	.28	W210293
W210315	19.1	40	870	3.3	13	.5	.45	10	1.1	.11	W210315
W210316	43.9	9.0	1,800	4.4	7.6	.6	.20	10	.4	.095	W210316
W210317	1.5	24	1,400	5.8	16	2.2	.56	30	.8	.070	W210317
W210318	2.8	7.0	2,000	4.2	3.8	.2	.25	70	.2	.062	W210318
W210319	10.2	16	1,900	9.1	14	1.1	.49	60	.5	.070	W210319
W210343	3.6	12	2,300	3.1	12	.8	.28	10L	.5	.055	W210343
W210344	13.6	18	1,800	5.4	16	1.0	.37	50	.9	.080	W210344
W210345	2.3	14	200	8.6	11	.1	.28	40	.6	.055	W210345
W210428	2.5	15	1,500	9.1	10	.3	.40	10	.5	.060	W210428
W210429	47.1	12	8,800	4.0	9.7	1.3	.37	10	.3	.26	W210429
W210430	3.7	31	910	5.6	29	2.9	.56	20	1.5	.055	W210430
W210431	2.2	10	1,500	5.9	6.6	.3	.23	10L	.3	.055	W210431
W210501	3.9	14	570	10	11	.4	.47	40	.3	.29	W210501
W210502	3.2	26	380	6.5	24	1.0	.46	60	1.2	.30	W210502

Table 3.--Content of 23 Trace Elements in 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky--Continued.

SAMPLE NUMBER	LA PPM	LU PPM	NA PPM	P PPM	RB PPM	SB PPM	SC PPM	SE PPM	SM PPM	TB PPM	SAMPLE NUMBER
W210158	17	0.2	770	180	52	3.5	6.0	5.8	2.9	0.7	W210158
W210161	3	.1L	57	44L	30L	.60	.99	6.7	.45	.1	W210161
W210162	10	.1	93	44L	40L	.80	2.7	2.7	1.5	.4	W210162
W210163	5	.2	90	44L	40L	3.1	4.2	4.6	1.5	.6	W210163
W210164	8	.1	300	44L	50L	1.9	3.4	2.5	1.2	.3	W210164
W210262	7	.2	41	44L	30L	2.0	4.5	5.5	1.5	.3	W210262
W210263	22	.2	120	44L	25	1.4	7.5	9.9	3.3	.6	W210263
W210264	11	.1	62	44L	30L	1.2	3.4	4.6	1.7	.3	W210264
W210287	2	.1	140	44L	30L	1.3	3.4	2.7	.70	.2	W210287
W210288	13	.1	140	550	30L	1.2	4.0	4.4	1.7	.3	W210288
W210293	23	.4	490	44L	54	4.0	12	14	4.9	.7	W210293
W210315	21	.2	150	44L	30L	1.0	3.8	4.0	3.1	.7	W210315
W210316	4	.1	170	44L	30L	1.8	2.3	7.0	.70	.2	W210316
W210317	13	.2	350	44L	17	1.3	4.8	5.6	2.1	.5	W210317
W210318	3	.1	500	44L	30L	1.3	1.4	2.1	.80	.3	W210318
W210319	8	.2	230	44L	16	1.6	3.8	2.5	1.7	.6	W210319
W210343	6	.1	230	44L	30L	1.6	2.9	4.1	.90	.3	W210343
W210344	10	.2	230	44L	18	1.2	4.4	3.8	1.3	.4	W210344
W210345	8	.1	30	44L	20L	1.1	2.4	6.7	1.1	.2	W210345
W210428	8	.2	120	44L	20L	1.2	2.9	2.5	1.5	.3	W210428
W210429	6	.2	310	44L	18	1.6	2.5	3.6	1.4	.4	W210429
W210430	18	.2	170	44L	38	.95	5.5	5.8	2.6	.6	W210430
W210431	6	.1	150	44L	20L	2.1	2.3	2.3	1.0	.3	W210431
W210501	6	.1	320	44L	40L	1.9	3.5	3.1	1.9	.3	W210501
W210502	16	.1	150	44L	50L	.95	4.7	5.2	1.9	.3	W210502

Table 3.--Content of 23 Trace Elements in 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky--Continued.

SAMPLE NUMBER	TH PPM	U PPM	YB PPM
W210158	3.7	1.7	1.8
W210161	1.0	.36L	.2
W210162	2.7	.70	1.0
W210163	2.2	1.7	1.9
W210164	2.0	1.0	1.1
W210262	2.7	.87	2.0
W210263	7.3	2.5	1.8
W210264	19	.92	.9
W210287	.8	2.2	1.0
W210288	4.0	1.5	1.1
W210293	9.0	5.4	3.3
W210315	6.1	2.7	1.7
W210316	1.3	.80	.6
W210317	3.9	1.7	1.5
W210318	.9	.90	.7
W210319	3.4	1.5	1.2
W210343	2.2	.96	.7
W210344	3.2	1.2	1.1
W210345	2.2	.52	.7
W210428	2.4	1.7	1.2
W210429	1.8	1.6	1.1
W210430	5.4	1.8	1.4
W210431	1.4	.98	.8
W210501	1.4	.83	1.0
W210502	4.4	1.5	1.2

Table 3.--Content of 23 Trace Elements in 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky--Continued.

SAMPLE NUMBER	AS PPM	CE PPM	CL PPM	CO PPM	CR PPM	CS PPM	EU PPM	F PPM	HF PPM	HG PPM	SAMPLE NUMBER
W211630	16.3	11	2,100	6.5	8.8	0.6	0.25	140	0.4	0.34	W211630
W211634	1.2	26	740	6.4	24	1.1	.43	250	1.0	.058	W211634
W211635	6.9	21	780	4.4	21	1.2	.41	290	.8	.10	W211635
W211636	2.6	17	3,400	3.0	17	.6	.34	160	.6	.058	W211636
W211637	18.4	15	3,700	3.0	11	.3	.28	50	.4	.075	W211637
W211685	6.7	18	3,400	9.2	12	.6	.42	50	.5	.16	W211685
W211686	20.9	27	170	5.9	26	.8	.44	40	1.3	.095	W211686
W211687	14.8	18	740	12	23	.9	.52	60	.4	.058	W211687
W211688	7.0	31	540	11	27	1.3	.63	130	1.2	.068	W211688
W211689	21.0	43	100L	10	44	1.7	.89	100	2.3	.075	W211689
W211690	1.0	33	100	3.2	18	.4	.41	70	1.0	.090	W211690
W211691	.6	9.0	210	8.0	9.9	.1	.22	20	.4	.075	W211691
W211692	2.1	11	740	5.3	13	.3	.25	70	.4	.058	W211692
W211693	1.0	7.0	1,700	6.6	8.2	.6	.17	50	.3	.048	W211693
W211694	20.6	11	520	6.2	11	.5	.29	50	.5	.058	W211694
W212056	2.8	18	640	15	39	.6	.54	70	.4	.10	W212056
W212057	1.4	13	730	4.2	11	.4	.27	70	.5	.074	W212057
W212058	2.3	8.5	510	6.7	16	.7	.21	20	.2	.080	W212058
W212059	2.4	19	1,200	16	15	.3	.35	20	.7	.035	W212059
W212060	1.0	9.0	1,100	2.9	8.4	.1	.22	10	.4	.047	W212060
W212061	1.5	13	1,200	11	10	1.0	.34	30	.4	.060	W212061
W212062	1.3	17	1,400	23	18	.6	.32	50	.9	.047	W212062
W212063	10.3	16	1,100	4.4	12	.5	.38	30	.5	.040	W212063
W212064	1.8	9.5	1,300	4.9	8.3	.4	.30	40	.2	.060	W212064
W212065	1.8	7.0	350	3.4	5.5	.2	.22	180	.2	.035	W212065

Table 3.--Content of 23 Trace Elements in 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky--Continued.

SAMPLE NUMBER	LA PPM	LU PPM	NA PPM	P PPM	RB PPM	SB PPM	SC PPM	SE PPM	SM PPM	TB PPM	SAMPLE NUMBER
W211630	6	0.1	150	44L	7	1.5	2.5	5.0	0.85	0.2	W211630
W211634	14	.1	130	44L	17	.70	4.8	4.8	2.0	.3	W211634
W211635	12	.2	190	44L	22	1.1	4.5	3.8	1.8	.3	W211635
W211636	9	.1	550	44L	11	.50	4.0	5.2	1.5	.3	W211636
W211637	8	.1	500	44L	5	.50	2.7	5.7	1.2	.2	W211637
W211685	10	.1	660	44	60L	1.2	4.4	4.2	1.7	.3	W211685
W211686	16	.2	90	44L	30L	.70	5.8	7.1	2.1	.3	W211686
W211687	8	.2	200	44L	30L	1.2	5.2	4.5	1.6	.4	W211687
W211688	14	.2	260	44L	20	1.7	6.0	4.3	2.6	.4	W211688
W211689	25	.3	230	44L	40L	.80	8.1	19	4.0	.5	W211689
W211690	14	.2	61	44L	20L	.80	3.7	5.5	1.8	.3	W211690
W211691	5	.1	42	44L	20L	.50	2.3	5.5	.90	.1	W211691
W211692	7	.1	220	44L	30L	.80	2.2	4.4	1.0	.2	W211692
W211693	4	.1	160	44L	30L	.90	1.5	3.2	.60	.1	W211693
W211694	7	.1	120	44L	20L	4.9	2.8	5.7	1.3	.2	W211694
W212056	7	.2	83	44L	10	1.0L	3.1	5.4	2.0	.4	W212056
W212057	7	.1	82	44L	7	1.0L	2.6	3.8	1.0	.2	W212057
W212058	4	.1	73	44L	8	1.0L	1.6	3.7	.75	.2	W212058
W212059	10	.1	350	44L	30L	1.0L	3.3	3.3	1.3	.3	W212059
W212060	5	.1	260	44L	30L	.50L	1.7	2.9	.80	.2	W212060
W212061	6	.2	270	44L	13	1.0L	3.1	3.1	1.2	.3	W212061
W212062	10	.1	170	44L	30L	2.0L	3.0	3.4	1.3	.3	W212062
W212063	8	.1	280	96	13	2.0L	3.3	4.2	1.7	.4	W212063
W212064	4	.1	470	44L	40L	1.0L	2.6	1.8	.95	.3	W212064
W212065	4	.1	520	44L	30L	.50L	1.1	1.7	.70	.2	W212065

Table 3.--Content of 23 Trace Elements in 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky--Continued.

SAMPLE NUMBER	TH PPM	U PPM	YB PPM
W211630	1.3	.58	.6
W211634	4.6	1.6	1.1
W211635	3.7	1.4	1.0
W211636	3.6	1.6	.8
W211637	2.3	1.1	.5
W211685	1.8	1.8	.9
W211686	5.3	1.4	1.2
W211687	2.6	1.4	1.2
W211688	5.0	1.9	1.5
W211689	7.2	2.1	2.0
W211690	3.6	1.1	.9
W211691	1.6	.75	.7
W211692	2.2	.86	.6
W211693	1.1	.36	.5
W211694	2.3	.73	.9
W212056	1.9	.92	1.3
W212057	1.8	.86	.6
W212058	1.1	.34	.6
W212059	2.9	1.5	.8
W212060	1.5	.51	.6
W212061	1.5	.91	1.3
W212062	3.1	1.2	1.0
W212063	2.3	1.4	1.1
W212064	1.1	.65	1.0
W212065	.8	.39	.6

Table 3.--Content of 23 Trace Elements in 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky--Continued.

SAMPLE NUMBER	AS PPM	CE PPM	CL PPM	CO PPM	CR PPM	CS PPM	EU PPM	F PPM	HF PPM	HG PPM	SAMPLE NUMBER
W212066	7.4	45	740	6.5	30	1.5	0.80	70	1.1	0.047	W212066
W212067	1.7	8.0	1,400	12	8.0	.4	.25	60	.2	.040	W212067
W212068	6.1	12	1,500	4.6	8.6	.5	.31	50	.4	.055	W212068
W212069	3.1	30	800	5.5	20	.6	.48	60	1.3	.067	W212069
W212070	1.5	19	1,000	7.5	11	.3	.50	30	.3	.074	W212070
W212071	4.7	7.0	1,700	17	5.0	.2	.26	40	.2	.055	W212071
W212088	5.5	17	930	2.2	11	.4	.35	40	1.1	.085	W212088
W212281	.7	13	1,400	3.9	12	2.3	.27	90	.5	.058	W212281
W212282	3.9	10	1,400	5.9	11	1.0	.29	30	.3	.046	W212282
W212497	4.3	11	1,800	4.6	9.4	.3	.23	50	.5	.070	W212497
W212498	5.1	13	1,600	7.9	8.0	.6	.33	60	.3	.080	W212498
W212499	127	5.0	1,800	5.0	6.4	.4	.21	40	.2	.16	W212499
W212503	43.2	23	540	17	24	1.8	.55	120	.8	.16	W212503
W212504	9.6	26	170	13	29	1.7	.49	130	1.3	.26	W212504
W212594	3.9	42	680	3.6	11	.6	.42	120	1.8	.30	W212594
W212595	6.2	32	590	4.5	23	2.3	.56	150	1.2	.11	W212595
W212596	13.7	17	1,400	3.4	15	.7	.35	100	.6	.16	W212596
W215399	2.1	20	1,500	13	17	1.3	.36	160	.9	.21	W215399
W215400	15.5	12	2,400	6.6	9.1	.5	.35	30	.2	.36	W215400
W215401	135	6.0	1,500	3.8	6.2	.5	.32	80	.1	.24	W215401
W215402	1.3	32	1,100	8.2	14	.6	.36	90	2.3	.26	W215402
W215440	8.8	21	130	9.8	27	.6	.50	60	1.1	.12	W215440
W215557	16.0	25	300	9.1	25	2.5	.52	280	.9	.24	W215557
W215558	9.8	24	400	3.8	24	1.3	.46	110	.9	.11	W215558
W215559	2.4	17	1,000	15	14	.4	.55	70	.3	.078	W215559

Table 3.--Content of 23 Trace Elements in 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky--Continued.

SAMPLE NUMBER	LA PPM	LU PPM	NA PPM	P PPM	RB PPM	SB PPM	SC PPM	SE PPM	SM PPM	TB PPM	SAMPLE NUMBER
W212066	23	0.2	250	44L	21	2.0L	8.8	6.0	3.5	0.6	W212066
W212067	4	.1	220	44L	30L	1.0L	2.0	3.6	.90	.2	W212067
W212068	6	.1	110	44L	20L	1.0L	2.0	2.2	1.0	.2	W212068
W212069	16	.2	410	83	10	1.0L	4.8	5.3	2.1	.4	W212069
W212070	8	.1	470	110	40L	1.0L	3.4	4.0	1.9	.4	W212070
W212071	3	.1	58	44L	9	1.0L	2.5	3.5	1.0	.2	W212071
W212088	10	.1	140	44L	30L	2.0L	2.9	4.3	1.4	.3	W212088
W212281	7	.1	120	44L	31	1.5	2.6	3.0	1.1	.2	W212281
W212282	6	.1	77	44L	12	2.8	2.3	4.7	1.1	.3	W212282
W212497	6	.1	210	44L	30L	1.0L	3.3	3.6	.80	.2	W212497
W212498	7	.2	390	44L	35L	1.5L	3.2	3.8	1.3	.5	W212498
W212499	3	.2	210	44L	30L	2.0L	4.7	3.2	.70	.6	W212499
W212503	11	.2	410	44L	20	2.0L	5.5	7.9	2.1	.5	W212503
W212504	14	.2	360	44L	21	1.0L	5.8	9.2	2.1	.3	W212504
W212594	22	.2	680	44L	60L	1.0L	3.4	3.6	3.3	.3	W212594
W212595	17	.2	660	44L	14	2.0L	5.6	3.3	2.3	.2	W212595
W212596	9	.1	190	44L	30L	2.0	3.4	2.8	1.3	.4	W212596
W215399	11	.1	170	44	21	.70	3.8	4.4	1.4	.2	W215399
W215400	6	.2	170	61	30L	1.3	3.7	2.4	1.3	.4	W215400
W215401	3	.1	150	48	30L	1.5	3.2	8.8	.90	.4	W215401
W215402	16	.2	160	70	13	.60	4.1	3.3	2.4	.7	W215402
W215440	13	.2	230	79	40L	.70	5.3	9.3	1.9	.4	W215440
W215557	13	.2	230	87	24	.70	5.1	6.9	2.0	.5	W215557
W215558	12	.2	210	87	8	.60	4.9	6.2	1.8	.3	W215558
W215559	7	.2	110	220	20L	.70	3.3	5.2	2.0	.6	W215559

Table 3.--Content of 23 Trace Elements in 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky--Continued.

SAMPLE NUMBER	TH PPM	U PPM	YB PPM
W212066	11	5.1	1.6
W212067	1.3	1.0	.6
W212068	1.6	.68	.7
W212069	6.2	2.8	1.1
W212070	1.9	1.2	1.0
W212071	1.0	1.4	.9
W212088	2.9	1.5	1.0
W212281	2.2	.45	.7
W212282	1.9	.93	.9
W212497	2.0	.93	.8
W212498	1.8	1.9	1.0
W212499	.7	.74	1.2
W212503	4.2	2.3	1.3
W212504	5.2	2.0	1.2
W212594	7.9	3.1	1.8
W212595	4.8	2.4	1.3
W212596	2.3	2.1	.8
W215399	2.9	.42	1.0
W215400	1.4	.34L	1.5
W215401	.8	1.1	1.3
W215402	8.7	2.4	1.5
W215440	4.6	1.8	1.1
W215557	3.4	1.4	1.4
W215558	4.2	1.6	1.2
W215559	1.5	1.0	1.5

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky, Reported on Whole-Coal Basis.

[Values in percent or parts-per-million. 23 elements are from direct determinations on whole coal; all other elements calculated from analyses of ash. S means analysis by emission spectography; L, less than the value shown; H, interference for an element which cannot be resolved by any routine method; B, not determined; G, greater than. Sample number is laboratory sample number.]

SAMPLE NUMBER	SI (PERCENT)	AL (PERCENT)	CA (PERCENT)	MG (PERCENT)	NA (PERCENT)	K (PERCENT)	FE (PERCENT)	TI (PERCENT)	AG-S PPM	AS PPM	SAMPLE NUMBER
W203623	1.4	1.0	0.20	0.027	0.007	0.11	0.25	0.044	0.007L	1.4	W203623
W203624	1.2	.88	.29	.022	.006	.061	.32	.035	.006L	2.1	W203624
W203631	.23	.23	.047	.009	.009	.015	.050	.008	.018	1.1	W203631
W203634	.13	.11	.046	.005	.006	.002	.036	.007	.012	1.5	W203634
W205315	.83	.33	.042	.013	.010	.059	.98	.032	.014	20	W205315
W205316	9.8	3.8	.11	.11	.032	.52	.60	.45	.045	5.7	W205316
W205319	5.9	3.7	.19	.19	.053	.88	1.1	.20	.088	6.5	W205319
W205332	5.1	2.8	.090	.088	.030	.45	.29	.20	.024	1.3	W205332
W207111	5.5	3.6	.086	.095	.030	.56	.36	.22	.045	2.2	W207111
W207112	3.1	1.9	.051	.029	.011	.15	.26	.15	.023	3.2	W207112
W207113	3.3	2.2	.057	.050	.016	.28	.23	.14	.018	2.0	W207113
W207114	2.1	1.1	.13	.040	.036	.11	1.5	.089	.049	9.7	W207114
W207474	3.5	1.9	.21	.040	.013	.14	.22	.19	.051	2.1	W207474
W207817	4.0	2.2	.072	.039	.013	.16	.27	.19	.014	2.5	W207817
W207818	4.4	2.4	.072	.045	.014	.19	.52	.22	.019	7.1	W207818
W207819	3.4	2.1	.18	.058	.021	.25	2.1	.15	.017	1.3	W207819
W207820	3.5	1.8	.19	.11	.046	.34	2.1	.099	.040	10	W207820
W207821	3.9	2.0	.19	.13	.057	.43	1.5	.12	.020	7.8	W207821
W207864	4.7	2.9	.072	.16	.076	.64	1.4	.14	.039	60	W207864
W207867	3.8	2.7	.078	.043	.016	.10	.22	.19	.082	7.9	W207867

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	B-S PPM	BA-S PPM	BE-S PPM	BI-S PPM	BR PPM	CD PPM	CE PPM	CL PPM	CO PPM	CR PPM	SAMPLE NUMBER
W203623	45	29	1	1.0L	7.4	0.04	17	200	12	13	W203623
W203624	59	21	1	.9L	7.7	.08	17	220	14	7.3	W203624
W203631	26	9.1	2	.2L	45	.00	5.0	920	3.5	2.3	W203631
W203634	22	7.9	3	.1L	26	.01	4.0	640	3.1	1.8	W203634
W205315	21	11	1	.4L	34	.01	11	1,300	3.9	8.2	W205315
W205316	83	110	4	3.2L	7.2	.05	46	170	6.5	49	W205316
W205319	55	190	5	2.5L	15	.07	57	180	7.3	36	W205319
W205332	55	73	3	1.9L	7.6	.04	32	180	7.4	30	W205332
W207111	68	91	1	2.1L	5.5	.11	35	50	10	34	W207111
W207112	40	31	1	1.1L	7.0	.03	22	110	3.3	21	W207112
W207113	63	53	1	1.3L	7.5	.04	23	160	13	23	W207113
W207114	34	85	1	1.0L	22	.04	14	1,700	2.7	8.9	W207114
W207474	40	69	1	1.3L	11	.04	24	290	4.7	23	W207474
W207817	42	30	2	1.4L	8.0	.02	29	110	6.2	27	W207817
W207818	37	30	2	1.6L	7.3	.05	31	60	7.1	30	W207818
W207819	39	69	1	1.3L	13	.05	24	230	7.3	24	W207819
W207820	48	77	2	1.6L	25	.08	19	1,700	5.9	18	W207820
W207821	50	100	2	1.7L	25	.07	19	1,600	4.1	16	W207821
W207864	41	140	2	1.9L	25	.10	28	1,100	6.6	23	W207864
W207867	32	100	13	1.4L	19	.07	56	880	3.6	15	W207867

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	CS PPM	CU PPM	DY-S PPM	ER-S PPM	EU PPM	F PPM	GA-S PPM	GD-S PPM	GE-S PPM	HF PPM	SAMPLE NUMBER
W203623	0.6	6.5	1.4L	0.7L	0.40	91	3.3	1.5	0.36	0.5	W203623
W203624	.4	7.7	1.3L	.6L	.44	71	2.2	1.5	.13	.3	W203624
W203631	.1	11	.5	.3	.15	58	1.7	.51	.12	.1	W203631
W203634	.2L	7.2	.6	.5	.17	31	1.8	.58	.24	.1	W203634
W205315	.8	5.9	.9L	.4L	.20	32	1.9	.63L	.67	.8	W205315
W205316	2.1	31	7.0L	3.2L	.76	46	10	4.8L	2.7	2.9	W205316
W205319	5.3	45	5.5L	2.5L	.86	180	13	3.8L	1.9	1.5	W205319
W205332	1.8	21	4.1L	1.9L	.44	120	6.4	2.8L	1.5	1.5	W205332
W207111	2.5	25	4.7L	2.1L	.63	160	8.5	3.2L	.36	1.8	W207111
W207112	.7	14	2.5L	1.1	.34	60	5.1	1.7L	.28	1.2	W207112
W207113	1.3	14	2.8L	1.3L	.38	130	5.9	3.0	1.2	1.0	W207113
W207114	.5	14	2.1L	1.0L	.21	90	4.4	2.3	3.9	1.0	W207114
W207474	.6	18	2.8L	1.3L	.31	120	7.0	1.9L	.73	1.4	W207474
W207817	1.1	17	3.2L	1.4L	.46	70	3.6	2.2L	.30	1.5	W207817
W207818	1.0	21	3.5L	1.6L	.49	100	4.2	2.4L	.42	1.7	W207818
W207819	1.2	17	2.9L	1.3L	.40	110	4.8	2.0L	.85	1.2	W207819
W207820	1.4	20	3.4L	1.6L	.29	90	3.6	2.3L	5.1	1.0	W207820
W207821	1.3	20	3.7L	1.7L	.33	90	3.2	2.5L	2.0	.9	W207821
W207864	2.3	31	4.3L	1.9L	.43	120	10	2.9L	8.3	.9	W207864
W207867	.5	22	3.6	2.4	.41	30	12	3.6	2.0	2.8	W207867

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	HG PPM	HO-S PPM	LA PPM	LI PPM	LU PPM	MN PPM	MO-S PPM	NB-S PPM	ND-S PPM	NI-S PPM	SAMPLE NUMBER
W203623	0.11	0.44L	8	11	0.1	20	1.6	0.43	7.8	11	W203623
W203624	.21	.40L	8	8.3	.1	24	2.1	.48	8.3	13	W203624
W203631	.010L	.12	2	2.6	.1L	1.8	.35	.13	2.3	4.7	W203631
W203634	.010L	.17	1	.9	.1	1.2	.54	.16	1.9	2.9	W203634
W205315	.17	.29L	6	5.0	.1	5.9	.29	.50	1.3L	3.1	W205315
W205316	.036	2.2L	24	57	.4	17	2.6	14	24	19	W205316
W205319	.098	1.7L	33	35	.3	33	4.8	4.8	28	28	W205319
W205332	.019	1.3L	18	39	.2	13	.53	4.3	15	18	W205332
W207111	.22	1.4L	20	40	.3	12	1.5	5.1	19	18	W207111
W207112	.17	.77L	14	17	.2	4.2	.79	4.0	11	12	W207112
W207113	.060	.86L	14	19	.2	5.0	2.0	3.5	9.7	18	W207113
W207114	.11	.66L	8	23	.1	9.7	1.2	2.9	7.3	11	W207114
W207474	.062	.85L	13	21	.1	11	1.3	5.3	8.3	15	W207474
W207817	.11	.98L	17	37	.2	5.3	.66	3.5	7.5	9.2	W207817
W207818	.23	1.1L	18	43	.2	5.6	.24	3.5	8.2	11	W207818
W207819	.060	.88L	13	38	.2	10	.94	3.4	7.3	10	W207819
W207820	.22	1.1L	11	31	.2	43	1.5	3.1	11	14	W207820
W207821	.20	1.1L	11	38	.2	43	1.4	3.3	9.4	9.5	W207821
W207864	.26	1.3L	13	50	.3L	18	1.6	2.7	8.5	15	W207864
W207867	.034	.98L	32	32	.3L	3.2	.56	5.9	32	9.9	W207867

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	P PPM	PB PPM	PR-S PPM	RB PPM	RE-S PPM	SB PPM	SC PPM	SE PPM	SM PPM	SN-S PPM	SAMPLE NUMBER
W203623	22L	4.8	4.4L	15	0.65L	0.30	2.8	3.5	1.7	0.10L	W203623
W203624	22L	3.9	4.0L	7	.59L	.10	1.6	5.3	1.8	.09L	W203624
W203631	22L	4.2	1.1	7L	.13L	.10	.53	1.8	.65	.04	W203631
W203634	22L	2.2	1.2	6L	.07L	.30	.76	1.0	.70	.04	W203634
W205315	22L	4.2	4.2	80L	.42L	.50	2.0	5.7	1.1	.07	W205315
W205316	83	23	22L	38	3.2L	1.7	9.9	3.0	3.9	3.1	W205316
W205319	160	21	17L	85	2.5L	2.2	9.2	3.6	5.2	1.0	W205319
W205332	35	15	13L	70L	1.9L	.70	6.0	3.1	2.7	1.4	W205332
W207111	22L	13	14L	41	2.1L	.50	7.3	9.9	3.1	1.7	W207111
W207112	22L	8.7	7.7L	30L	1.1L	.30	4.1	7.8	1.9	1.4	W207112
W207113	22L	7.3	8.6L	24	1.3L	.70	5.2	5.4	1.9	1.0	W207113
W207114	180	4.2	6.6L	40L	.97L	.40	2.5	5.4	1.1	.15L	W207114
W207474	44L	9.1	8.5L	30L	1.3L	.40	4.0	7.6	1.8	2.3	W207474
W207817	44L	11	9.8L	40L	1.4L	.40	5.7	5.7	2.0	1.2	W207817
W207818	44L	12	11L	40L	1.6L	.40	6.2	6.9	2.4	2.1	W207818
W207819	44L	10	8.8L	38	1.3L	1.0	4.7	7.2	1.8	.94	W207819
W207820	44L	15	11L	50L	1.6L	.60	4.7	4.0	1.7	.23L	W207820
W207821	44L	6.7	11L	50L	1.7L	.40	3.9	4.4	1.5	.77	W207821
W207864	44L	11	13L	60L	1.9L	2.1	6.3	7.0	2.3	1.0	W207864
W207867	44L	16	10	40L	1.4L	.50	4.9	4.8	5.4	3.5	W207867

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	SR-S PPM	TA PPM	TB PPM	TH PPM	TL-S PPM	TM-S PPM	U PPM	V-S PPM	W PPM	Y-S PPM	SAMPLE NUMBER
W203623	51	0.20L	0.28	1.3	0.21L	0.30L	0.45	16	0.60L	6.4	W203623
W203624	55	.09	.29	.90	1.2	.27L	.27	8.9	.30	6.5	W203624
W203631	22	.04	.14	.35	.04L	.06L	.20L	2.6	1.9	2.7	W203631
W203634	23L	.09L	.16	.20	.02L	.08	.19L	1.5	1.7	7.9	W203634
W205315	16	.16	.19	1.5	.19L	.19L	.52	3.0	.80	1.6	W205315
W205316	89	.93	.56	10	1.5L	1.5L	3.1	51	1.8	17	W205316
W205319	150	.46	.54	8.6	1.2L	1.2L	2.9	55	.80	13	W205319
W205332	53	.38	.35	5.6	.86L	.86L	1.6	32	.60	7.9	W205332
W207111	61	.51	.50	6.0	.98L	.98L	2.1	40	1.0	8.3	W207111
W207112	47	.27	.27	4.2	.52L	.52L	1.3	20	.70	4.2	W207112
W207113	55	.28	.19	3.8	.58L	.58L	1.3	24	.80	4.7	W207113
W207114	350	.40L	.16	2.4	.45L	.45L	.82	15	.90	3.6	W207114
W207474	160	.29	.23	4.1	.58L	.58L	2.3	25	.80	6.5	W207474
W207817	40	.36	.30	5.2	.66L	.66L	1.5	17	.80	4.9	W207817
W207818	38	.51	.36	5.9	.74L	.74L	1.7	19	.80	4.2	W207818
W207819	120	.29	.29	3.8	.60L	.60L	1.5	20	.70	4.6	W207819
W207820	150	.19	.23	3.4	.71L	.71L	1.0	23	.80	6.8	W207820
W207821	180	.23	.23	3.3	.77L	.77L	.91	18	.60	5.8	W207821
W207864	170	.21	.36	4.6	.89L	.89L	4.6	33	1.2	5.4	W207864
W207867	160	.58	.65	11	.66L	.66L	3.2	23	1.6	13	W207867

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	YB PPM	ZN PPM	ZR-S PPM
W203623	0.8	9.1	7.2
W203624	.8	9.4	5.9
W203631	.3	4.2	1.3
W203634	.6	5.1	1.8
W205315	.8	2.1	6.7
W205316	2.3	21	100
W205319	2.2	35	48
W205332	1.2	8.6	28
W207111	1.5	13	32
W207112	.9	4.3	17
W207113	1.1	16	16
W207114	.6	6.4	16
W207474	.9	3.1	30
W207817	1.2	9.6	22
W207818	1.4	8.5	14
W207819	1.0	7.3	16
W207820	1.1	17	29
W207821	.9	14	25
W207864	1.0	23	37
W207867	2.3	5.3	66

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	SI (PERCENT)	AL (PERCENT)	CA (PERCENT)	MG (PERCENT)	NA (PERCENT)	K (PERCENT)	FE (PERCENT)	TI (PERCENT)	AG-S PPM	AS PPM	SAMPLE NUMBER
W207868	5.7	3.5	0.31	0.11	0.036	0.40	3.2	0.23	0.12	120	W207868
W207870	1.1	.92	.11	.029	.016	.089	1.6	.043	.48	44	W207870
W207982	3.1	2.5	.056	.081	.024	.42	.57	.083	.040	14	W207982
W208050	3.5	2.0	.068	.070	.018	.29	.60	.10	.095	23	W208050
W208051	4.1	2.3	.11	.10	.020	.42	.55	.13	.70	23	W208051
W208052	5.0	2.8	.086	.12	.021	.45	.39	.20	.036	2.9	W208052
W208053	.0B	.00B	.000B	.024	.006	.00B	.00B	.00B	.039	5.2	W208053
W208054	2.5	1.1	.12	.040	.012	.13	.26	.13	.028	5.3	W208054
W208055	3.3	2.2	.10	.052	.020	.25	.49	.17	.069	31	W208055
W208061	5.5	3.2	.059	.11	.073	.67	2.2	.16	.064	300	W208061
W208062	6.8	4.1	.058	.18	.063	1.2	.80	.20	.048	5.7	W208062
W208100	2.5	1.5	.13	.089	.067	.28	.40	.081	.11	7.9	W208100
W208101	1.1	.53	.088	.052	.037	.097	.31	.032	.029	7.8	W208101
W208104	2.4	1.3	.14	.15	.037	.34	1.8	.061	.041	48	W208104
W208105	8.2	4.3	.096	.22	.063	.98	1.8	.36	.12	31	W208105
W208197	4.9	3.9	.054	.036	.042	.13	.52	.25	.063	22	W208197
W208198	.78	.44	.14	.022	.018	.082	3.7	.028	.17	110	W208198
W208203	4.4	2.5	.14	.079	.025	.39	.57	.15	.041	5.0	W208203
W208204	1.9	1.4	.15	.049	.017	.20	.37	.051	.063	5.3	W208204
W208208	2.5	1.8	.069	.053	.031	.30	.21	.10	.010L	1.8	W208208
W208209	3.5	2.1	.12	.069	.036	.46	.70	.18	.026	19	W208209
W208210	1.8	1.2	.097	.049	.036	.24	.48	.062	.008L	7.0	W208210
W208211	2.2	1.5	.14	.036	.018	.16	.45	.085	.009L	6.4	W208211
W208212	11	6.2	.19	.23	.060	1.1	3.5	.51	.043L	20	W208212
W208213	2.1	1.8	.27	.053	.031	.14	3.4	.042	.014L	6.3	W208213

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	B-S PPM	BA-S PPM	BE-S PPM	BI-S PPM	BR PPM	CD PPM	CE PPM	CL PPM	CO PPM	CR PPM	SAMPLE NUMBER
W207868	57	130	3	2.6L	16	0.10	69	840	5.3	30	W207868
W207870	18	45	2	.7L	32	.05	12	2,100	4.7	6.5	W207870
W207982	53	170	7	1.3L	13	.05	24	410	12	23	W207982
W208050	43	73	3	1.3L	15	.08	21	790	6.0	17	W208050
W208051	33	250	2	1.6L	19	.07	25	330	5.2	22	W208051
W208052	36	110	2	1.9L	15	.06	31	190	7.4	30	W208052
W208053	18	26	8	.3L	29	.05	8.0	1,300	4.8	5.4	W208053
W208054	33	65	10	.9L	26	.02	21	1,500	5.3	15	W208054
W208055	30	120	1	1.3L	24	.06	27	990	4.6	22	W208055
W208061	32	180	3	2.3L	13	.10	32	470	5.1	28	W208061
W208062	37	370	2	2.6L	19	.14	35	610	8.4	36	W208062
W208100	51	140	2	1.0L	18	.11	19	1,400	4.3	13	W208100
W208101	26	56	4	.5L	32	.05	7.0	2,700	5.0	4.1	W208101
W208104	35	84	2	1.2L	31	.07	16	2,200	4.9	11	W208104
W208105	72	220	4	3.1L	15	.07	63	800	11	48	W208105
W208197	38	170	4	2.0L	13	.08	57	620	3.3	18	W208197
W208198	18	47	7	.9L	25	.07	11	2,000	4.9	6.2	W208198
W208203	54	100	2	1.7L	12	.02	34	460	6.8	25	W208203
W208204	34	92	9	.8L	14	.04	19	650	18	15	W208204
W208208	19	55	1	1.0L	22	.02	15	1,000	3.3	17	W208208
W208209	37	86	1	1.4L	19	.07	35	1,200	5.0	25	W208209
W208210	37	61	1	.8L	30	.01	12	1,700	4.3	9.3	W208210
W208211	26	42	2	.9L	25	.04	19	1,500	7.8	17	W208211
W208212	51	120	5	4.3L	8.4	.08	69	350	3.8	64	W208212
W208213	31	56	2	1.4L	15	.36	16	1,300	5.3	11	W208213

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	CS PPM	CU PPM	DY-S PPM	ER-S PPM	EU PPM	F PPM	GA-S PPM	GD-S PPM	GE-S PPM	HF PPM	SAMPLE NUMBER
W207868	2.0	28	5.7L	2.6L	0.75	60	12	3.9L	4.1	2.2	W207868
W207870	.3	9.2	1.6L	.7L	.21	40	4.7	1.1L	4.5	.5	W207870
W207982	1.7	25	2.9L	1.3L	.43	80	8.1	2.0L	4.5	.8	W207982
W208050	1.1	18	2.9L	1.6	.41	50	5.3	2.0L	2.6	.8	W208050
W208051	1.8	17	3.4L	1.6L	.49	70	6.8	2.3L	.53	1.0	W208051
W208052	2.2	15	4.2L	1.9L	.51	40	8.6	2.9L	.46	1.5	W208052
W208053	.4	17	1.7	1.2	.26	10	2.3	.54	1.3	.2	W208053
W208054	.7	13	2.0L	.9L	.39	100	3.5	1.3L	.58	1.2	W208054
W208055	1.0	18	2.9L	1.3L	.42	10	8.4	2.0L	1.6	1.4	W208055
W208061	2.6	16	5.1L	2.3L	.53	110	12	3.5L	7.4	1.4	W208061
W208062	3.7	26	5.8L	2.6L	.56	140	15	4.0L	.77	1.9	W208062
W208100	.8	23	2.2L	1.0L	.33	40	5.0	1.5L	.30	.7	W208100
W208101	.2	13	1.0L	.5L	.16	30	3.0	.71L	1.1	.3	W208101
W208104	1.3	13	2.6L	1.2L	.40	40	7.6	1.8L	4.4	.4	W208104
W208105	4.8	44	6.9L	3.1L	.99	220	21	4.7	3.8	2.9	W208105
W208197	.6	14	4.4L	2.0L	.53	70	13	4.2	3.8	3.7	W208197
W208198	.4	19	1.9L	.9L	.36	20	7.2	2.5	8.1	.3	W208198
W208203	1.6	32	3.7L	2.0	.56	100	8.1	3.7	.32	1.0	W208203
W208204	.8	16	3.7	2.4	.60	40	4.8	1.9	2.2	.4	W208204
W208208	1.4	12	2.2L	1.0L	.34	70	2.9	1.5L	.30	.6	W208208
W208209	2.1	25	3.0L	1.4L	.70	100	4.8	2.1L	1.5	2.0	W208209
W208210	.7	12	1.7L	.8L	.34	70	2.9	1.1L	.11L	.3	W208210
W208211	.9	19	2.0L	.9L	.43	60	2.6	1.4L	.72	.6	W208211
W208212	4.9	32	9.4L	4.3L	1.3	220	10	6.4L	.64L	3.0	W208212
W208213	.6	24	3.1L	1.4L	.42	30	5.8	2.1L	5.1	.3	W208213

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	HG PPM	HO-S PPM	LA PPM	LI PPM	LU PPM	MN PPM	MO-S PPM	NB-S PPM	ND-S PPM	NI-S PPM	SAMPLE NUMBER
W207868	0.35	1.8L	42	57	0.4L	39	0.67	6.5	26	12	W207868
W207870	.070	.48L	6	13	.2L	8.5	.58	1.3	9.9	9.9	W207870
W207982	.082	.90L	12	27	.2	28	1.5	1.1	9.0	17	W207982
W208050	.48	.88L	11	22	.2	16	1.7	2.3	14	13	W208050
W208051	.11	1.1L	14	22	.2	22	.85	2.3	11	13	W208051
W208052	.15	1.3L	18	23	.2	11	.38	5.2	15	19	W208052
W208053	.090	.42	3	3.3	.2	6.9	1.8	.45	4.5	6.3	W208053
W208054	.45	.61L	12	13	.2	31	1.2	2.8	12	12	W208054
W208055	.30	.89L	15	29	.2	13	.84	3.8	20	12	W208055
W208061	.29	1.6L	18	46	.2	21	.23L	3.9	11	17	W208061
W208062	.12	1.8L	20	50	.3	48	.26L	5.3	32	23	W208062
W208100	.18	.69L	10	11	.2	20	.96	2.2	5.1	10	W208100
W208101	.21	.32L	3	5.2	.1	56	1.0	.99	5.6	6.1	W208101
W208104	.23	.80L	7	10	.2	600	1.8	.79	5.3	7.8	W208104
W208105	.28	2.1L	33	57	.5	30	7.2	9.4	23	41	W208105
W208197	.25	1.3L	30	44	.3	8.3	.69	7.1	34	9.5	W208197
W208198	.44	.60L	5	5.1	.2	25	11	2.3	3.9	6.8	W208198
W208203	.18	1.1L	16	20	.2	25	1.3	4.6	5.7	20	W208203
W208204	.33	.57L	8	10	.2	16	1.4	.73	18	27	W208204
W208208	.10	.67L	8	23	.1	14	.10L	1.8	5.4	4.3	W208208
W208209	.66	.94L	19	28	.2	18	2.2	1.8	5.4	5.1	W208209
W208210	.13	.51L	6	26	.1	5.9	.29	.53	2.4	4.5	W208210
W208211	.12	.61L	10	21	.2	8.6	.52	.64	3.2	11	W208211
W208212	.66	2.9L	39	98	.4	77	1.2	5.5	14L	7.7	W208212
W208213	.29	.95L	9	33	.2	85	3.1	.49	4.4L	3.3	W208213

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	P PPM	PB PPM	PR-S PPM	RB PPM	RE-S PPM	SB PPM	SC PPM	SE PPM	SM PPM	SN-S PPM	SAMPLE NUMBER
W207868	44L	17	21	60L	2.6L	1.8	7.5	7.3	5.1	0.39L	W207868
W207870	44L	2.9	4.8L	40L	.71L	.70	2.2	2.6	1.6	.00H	W207870
W207982	44	8.9	9.0L	26	.61L	1.1	5.2	4.6	2.3	.65	W207982
W208050	44L	6.9	8.8L	10	1.3L	.70	4.2	4.0	1.6	.62	W208050
W208051	44L	7.6	11L	30	1.6L	.60	4.5	2.9	2.3	.88	W208051
W208052	44L	9.2	13L	40	1.9L	.40	5.5	4.7	2.5	2.1	W208052
W208053	44L	2.8	2.0L	20L	.30L	.80	1.7	2.6	1.0	.33	W208053
W208054	44L	5.6	6.1L	16	.89L	.50	3.1	3.6	1.7	.76	W208054
W208055	44L	8.4	8.9L	15	1.3L	.60	5.1	3.8	1.8	1.4	W208055
W208061	44L	12	16L	39	2.3L	2.1	6.4	3.8	2.8	.35L	W208061
W208062	44L	17	18L	52	2.6L	1.7	7.8	2.9	3.1	1.4	W208062
W208100	230	8.3	6.9L	60L	1.0L	.50	3.2	6.0	1.6	.77	W208100
W208101	44L	6.1	3.2L	40L	.47L	.50	1.2	3.0	.60	.56	W208101
W208104	44L	3.4	8.0L	50L	1.2L	2.2	3.6	2.6	2.0	.18L	W208104
W208105	44L	19	23	77	3.1L	2.1	11	6.7	5.0	2.9	W208105
W208197	44L	20	13L	30L	2.0L	.85	5.6	5.9	3.9	4.4	W208197
W208198	44L	12	6.0L	30L	.88L	1.2	3.2	2.9	1.3	.00H	W208198
W208203	44L	11	11L	38	1.7L	.80	5.1	6.2	2.3	.90	W208203
W208204	44L	8.4	5.7L	10	.84L	.80	3.3	5.5	2.3	.56	W208204
W208208	44L	3.8	6.7L	18	.99L	.30	3.6	2.6	1.4	.54	W208208
W208209	44L	10	9.4L	30	1.4L	.70	6.6	8.5	3.3	.39	W208209
W208210	44L	4.0	5.1L	11	.75L	.40	2.7	3.9	1.3	.23	W208210
W208211	230	7.5	6.1L	11	.90L	.90	4.0	1.7	1.8	.14	W208211
W208212	44L	25	29L	61	4.3L	.85	14	12	5.6	1.2	W208212
W208213	44L	3.9	9.5L	10	1.4L	.35	4.7	7.6	1.8	.21L	W208213

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	SR-S PPM	TA PPM	TB PPM	TH PPM	TL-S PPM	TM-S PPM	U PPM	V-S PPM	W PPM	Y-S PPM	SAMPLE NUMBER
W207868	180	0.47	0.62	10	1.2L	1.2L	2.6	31	1.3	8.8	W207868
W207870	99	.10	.16	1.3	.33L	.33L	.37	7.0	.70	3.8	W207870
W207982	59	.15	.32	3.6	.61L	.61L	1.6	25	.70	4.0	W207982
W208050	91	.16	.27	3.0	.60L	.60L	1.0	26	.70	8.6	W208050
W208051	71	.14	.31	4.1	.71L	.71L	1.4	23	.70	4.0	W208051
W208052	92	.27	.40	4.9	.88L	.88L	1.4	31	.80	6.7	W208052
W208053	51	.10L	.26	.70	.14L	.14L	.55	6.9	.90	5.7	W208053
W208054	120	.27	.31	3.5	.41L	.41L	.73	15	1.0	6.7	W208054
W208055	110	.35	.25	4.3	.60L	.60L	1.0	26	.90	6.9	W208055
W208061	120	.35	.40	5.8	1.1L	1.1L	1.8	37	.70	6.2	W208061
W208062	150	.51	.49	6.4	1.2L	1.2L	2.8	45	.80	10	W208062
W208100	490	.19	.11	2.7	.47L	.47L	1.2	16	.60	4.0	W208100
W208101	120	.09	.11	.80	.22L	.22L	.57	8.0	.90	4.5	W208101
W208104	97	.16	.33	1.9	.54L	.54L	1.4	14	2.3	6.4	W208104
W208105	160	.76	.81	10	1.4L	1.4L	3.9	60	2.1	12	W208105
W208197	170	.91	1.2	16	.91L	.91L	4.5	30	1.3	13	W208197
W208198	97	.15	.47	1.1	.40L	.40L	.88	9.7	1.3	6.2	W208198
W208203	120	.32	.40	4.0	.78L	.78L	2.3	30	.50	6.1	W208203
W208204	76	.10	.58	1.9	.39L	.39L	.92	22	.30	10	W208204
W208208	99	.26	.34	2.3	.46L	.46L	1.2	14	.00B	4.7	W208208
W208209	140	.50	.67	5.6	.63L	.63L	2.5	19	.00B	3.0	W208209
W208210	150	.21	.35	1.9	.35L	.35L	.63	7.3	.00B	2.3	W208210
W208211	130	.19	.43	2.4	.41L	.41L	1.1	13	.00B	3.2	W208211
W208212	130	1.3	1.4	12	2.0L	2.0L	3.4	35	.00B	6.4	W208212
W208213	140	.11	.56	2.1	.64L	.64L	3.8	12	.00B	5.7	W208213

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	YB PPM	ZN PPM	ZR-S PPM
W207868	1.9	19	46
W207870	.8	13	11
W207982	1.2	13	9.4
W208050	1.1	13	21
W208051	1.1	12	17
W208052	1.3	12	34
W208053	1.2	11	3.0
W208054	1.1	5.0	19
W208055	1.0	6.7	24
W208061	1.4	17	18
W208062	1.7	26	42
W208100	.7	28	18
W208101	.5	9.4	11
W208104	1.1	30	11
W208105	2.6	28	57
W208197	2.3	3.8	71
W208198	1.2	5.6	12
W208203	1.1	8.5	29
W208204	1.4	8.2	9.2
W208208	.9	3.1	14
W208209	1.8	9.2	13
W208210	.9	6.3	3.5
W208211	1.2	8.3	5.6
W208212	3.2	17	42
W208213	1.4	29	4.2

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	SI (PERCENT)	AL (PERCENT)	CA (PERCENT)	MG (PERCENT)	NA (PERCENT)	K (PERCENT)	FE (PERCENT)	TI (PERCENT)	AG-S PPM	AS PPM	SAMPLE NUMBER
W208214	2.4	1.6	0.12	0.054	0.023	0.26	0.21	0.084	0.013	1.7	W208214
W208215	8.7	5.4	.12	.29	.085	1.7	1.4	.24	.055	19	W208215
W208216	15	11	.14	.14	.067	.61	.44	.77	.056L	2.6	W208216
W208218	4.0	2.4	.078	.078	.022	.36	1.3	.13	.022	57	W208218
W208219	1.1	.96	.086	.017	.007	.042	.29	.046	.016	20	W208219
W208220	2.2	1.2	.054	.026	.015	.12	.097	.093	.030	2.3	W208220
W208224	3.8	2.4	.12	.091	.019	.28	.24	.16	.016	1.9	W208224
W208225	1.6	1.3	.099	.046	.012	.14	.32	.048	.014	2.4	W208225
W209504	.47	.32	.15	.024	.010	.048	2.2	.014	.067	48	W209504
W209505	.69	.62	.15	.025	.008	.043	1.5	.017	.045	23	W209505
W209676	2.7	1.6	.12	.060	.037	.27	.28	.093	.010L	1.2	W209676
W209851	.83	.60	.11	.043	.013	.13	.19	.025	.012	.90	W209851
W209852	1.7	1.0	.075	.062	.022	.22	.45	.058	.011	5.0	W209852
W209895	1.7	1.4	.13	.033	.011	.12	.19	.033	.037	4.5	W209895
W209896	7.6	4.8	.083	.22	.046	.88	1.7	.27	.073	19	W209896
W209897	1.1	.94	.050	.008	.003	.009	.036	.054	.016	.60	W209897
W210026	1.8	1.1	.058	.036	.012	.16	.36	.060	.066	8.0	W210026
W210027	2.3	1.9	.076	.027	.012	.12	.39	.10	.13	9.4	W210027
W210028	2.4	1.8	.098	.043	.009	.20	1.3	.096	.050	39	W210028
W210029	4.3	2.4	.034	.046	.015	.30	.13	.19	.054	1.9	W210029
W210030	2.3	1.6	.048	.033	.008	.15	.12	.098	.050	1.9	W210030
W210154	4.1	2.7	.059	.11	.046	.59	.34	.14	.037	1.6	W210154
W210155	.90	.74	.091	.015	.027	.037	.19	.030	.056	6.2	W210155
W210156	1.0	.71	.15	.032	.017	.089	3.7	.038	.047	130	W210156
W210157	.62	.46	.095	.016	.023	.035	.40	.048	.032	21	W210157

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	B-S PPM	BA-S PPM	BE-S PPM	BI-S PPM	BR PPM	CD PPM	CE PPM	CL PPM	CO PPM	CR PPM	SAMPLE NUMBER
W208214	43	37	5	0.9L	31	0.02	18	2,100	8.6	16	W208214
W208215	150	120	19	3.4L	19	.09	52	730	10	44	W208215
W208216	39	160	5	5.6L	9.5	.07	110	200	4.4	48	W208216
W208218	37	150	2	1.6L	9.2	.17	24	370	12	22	W208218
W208219	25	47	1	.5L	12	.02	9.0	600	7.9	10	W208219
W208220	30	46	3	.8L	11	.03	16	500	19	14	W208220
W208224	20	47	1	1.4L	14	.06	24	150	6.3	25	W208224
W208225	24	37	3	.7L	16	.06	19	670	15	16	W208225
W209504	22	67	3	.6L	26	.04	6.0	2,200	3.5	3.2	W209504
W209505	28	67	8	.6L	24	.04	8.0	1,900	6.0	7.0	W209505
W209676	31	89	1	1.0L	21	.03	15	1,500	2.7	16	W209676
W209851	9.4	37	2	.4L	21	.02	6.7	2,200	12	4.8	W209851
W209852	15	61	5	.7L	21	.03	11	1,600	8.2	9.4	W209852
W209895	75	64	4	.8L	22	.04	19	1,000	9.9	16	W209895
W209896	76	150	2	3.1L	12	.12	48	290	11	42	W209896
W209897	42	69	8	.5L	8.2	.01	10	370	15	11	W209897
W210026	51	50	1	.7L	18	.05	13	880	9.3	12	W210026
W210027	69	49	4	1.0L	17	.06	21	830	10	27	W210027
W210028	36	47	11	1.1L	6.0	.06	22	200	9.1	17	W210028
W210029	58	93	1	1.5L	5.6	.07	30	100	2.5	25	W210029
W210030	70	47	1	.9L	8.8	.04	19	190	7.8	19	W210030
W210154	27	220	2	1.7L	25	.07	26	1,400	9.3	24	W210154
W210155	15	82	2	.4L	18	.08	14	1,600	8.5	8.5	W210155
W210156	13	250	5	1.0L	16	.10	9.0	1,300	5.3	8.8	W210156
W210157	9.9	82	2	.3L	19	.05	10	1,700	6.8	7.6	W210157

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	CS PPM	CU PPM	DY-S PPM	ER-S PPM	EU PPM	F PPM	GA-S PPM	GD-S PPM	GE-S PPM	HF PPM	SAMPLE NUMBER
W208214	2.2	17	2.1L	0.9L	0.36	60	5.5	1.4L	2.0	0.6	W208214
W208215	5.7	32	7.5L	3.4L	1.0	200	18	5.1L	7.2	1.7	W208215
W208216	3.4	31	12L	5.6L	1.4	110	17	8.4L	.84L	9.1	W208216
W208218	1.7	27	3.5L	1.6L	.53	50	4.8	2.4L	1.9	.9	W208218
W208219	.2	10	1.1L	.5L	.20	20	1.9	.75L	.30	.3	W208219
W208220	.5	23	1.7L	.9	.44	120	3.0	1.2	1.2	.7	W208220
W208224	1.2	14	3.1L	1.4L	.49	180	4.1	2.1L	.21L	.9	W208224
W208225	.7	14	1.6L	.7L	.66	30	2.2	1.1L	.29	.3	W208225
W209504	.2	18	1.2L	.6L	.21	30	4.4	.84L	4.0	.1	W209504
W209505	.2	18	2.6	1.7	.33	30	6.7	1.5	7.3	.2	W209505
W209676	1.3	9.6	2.3L	1.0L	.26	130	3.6	1.6L	.19	.7	W209676
W209851	.3	13	.9L	.4	.12	50	3.0	1.4	3.0	.2	W209851
W209852	1.0	13	1.6L	.9	.24	50	2.6	1.5	.61	.4	W209852
W209895	.5	13	2.3	1.4	.48	80	3.0	1.1L	2.9	.3	W209895
W209896	4.2	34	14L	3.1L	1.0	170	12	4.6L	.52	1.6	W209896
W209897	.2L	15	1.0L	1.5L	.28	20	2.7	.69L	2.7	.4	W209897
W210026	.9	17	1.6L	.7L	.39	50	4.9	1.1L	.95	.5	W210026
W210027	.4	38	3.3	1.5	.54	70	6.8	3.1	1.4	.7	W210027
W210028	1.1	14	2.5L	1.1L	.48	80	6.1	1.7L	1.7	.6	W210028
W210029	.9	18	3.4L	1.5L	.53	90	7.7	2.3L	.28	1.3	W210029
W210030	.9	18	1.9L	.9L	.44	70	5.1	1.3L	.69	.8	W210030
W210154	2.0	25	3.7L	1.7L	.48	90	11	2.5L	5.0	1.0	W210154
W210155	.2	20	.9L	.4L	.30	60	4.1	.65L	2.7	.3	W210155
W210156	.6	18	2.1L	1.0L	.36	40	11	1.4L	11	.3	W210156
W210157	.3	21	.7L	.3L	.18	50	3.4	.51L	3.3	.4	W210157

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	HG PPM	HO-S PPM	LA PPM	LI PPM	LU PPM	MN PPM	MO-S PPM	NB-S PPM	ND-S PPM	NI-S PPM	SAMPLE NUMBER
W208214	0.055	0.64L	11	23	0.1	7.3	0.42	0.80	5.4	13	W208214
W208215	.20	2.3L	28	61	.4	41	1.6	4.1	18	48	W208215
W208216	.090	3.8L	60	220	.6	19	.56L	18	32	13	W208216
W208218	.58	1.1L	12	24	.2	24	2.7	1.6	5.1L	19	W208218
W208219	.11	.34L	6	14	.1	4.8	.70	.43	3.7	14	W208219
W208220	.055	.53L	7	11	.2	4.7	.75	1.0	6.9	12	W208220
W208224	.075	.97L	14	17	.1	12	.31	1.6	5.6	12	W208224
W208225	.17	.49L	8	11	.2	6.0	.71	.55	6.8	12	W208225
W209504	.28	.38L	3	3.4	.1	7.8	4.4	.73	2.5	9.0	W209504
W209505	.22	.38L	4	11	.3	10	.78	.84	5.2	11	W209505
W209676	.030	.71L	8	20	.1	8.7	.10L	3.3	9.2	6.9	W209676
W209851	.016	.27L	4	5.5	.1L	28	.07	.26	2.4	16	W209851
W209852	.054	.48L	6	9.9	.1	23	.07L	.99	3.5	9.9	W209852
W209895	.050	.51L	11	19	.1	6.1	2.0	1.1	13	13	W209895
W209896	.090	2.1L	26	120	.3	21	2.8	4.6	13	25	W209896
W209897	.060	.31L	7	8.7	.1	1.2	.60	2.2	3.7	17	W209897
W210026	.090	.50L	7	9.5	.1	4.2	2.8	1.6	8.0	18	W210026
W210027	.10	.67L	11	17	.2	3.2	4.0	3.4	25	23	W210027
W210028	.090	.77L	10	19	.2	9.9	1.2	1.7	12	19	W210028
W210029	.13	1.0L	18	18	.2	3.8	.86	7.8	21	11	W210029
W210030	.11	.60L	10	16	.2	3.9	3.3	3.1	11	11	W210030
W210154	.090	1.1L	14	28	.2	14	.32	2.5	8.3	13	W210154
W210155	.060	.29L	7	9.0	.1	3.0	1.1	.56	9.0	15	W210155
W210156	.080	.65L	4	4.7	.2	30	1.7	1.0	3.0L	9.5	W210156
W210157	.060	.23L	6	4.8	.1	2.9	.92	1.1	4.8	12	W210157

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	P PPM	PB PPM	PR-S PPM	RB PPM	RE-S PPM	SB PPM	SC PPM	SE PPM	SM PPM	SN-S PPM	SAMPLE NUMBER
W208214	44L	6.3	6.4L	20	0.94L	0.95	3.9	2.5	1.7	0.67	W208214
W208215	44L	20	23L	72	3.4L	1.4	9.8	2.0	4.9	2.1	W208215
W208216	44L	44	38L	32	5.6L	.65	13	6.8	10	6.1	W208216
W208218	44L	8.6	11L	21	1.6L	1.9	5.8	5.6	1.8	.24L	W208218
W208219	87	5.5	3.4L	20L	.50L	.50	2.1	2.5	.90	.10	W208219
W208220	44L	7.8	5.3L	20L	.78L	.60	4.0	5.1	1.8	.47	W208220
W208224	44L	9.2	9.7L	13	1.4L	.40	4.4	5.1	2.2	.83	W208224
W208225	44L	5.1	4.9L	20L	.72L	.40	3.5	5.6	2.8	.11L	W208225
W209504	44L	1.3	3.8L	20L	.56L	1.1	3.0	3.5	.70	.00H	W209504
W209505	44L	3.0	7.8	20L	.56L	1.5	6.1	4.1	1.1	.00H	W209505
W209676	44L	5.1	7.1L	21	1.0L	.20	3.1	5.4	1.1	.38	W209676
W209851	44L	3.7	.4	30L	.39L	.93	1.2	2.7	.50	.07	W209851
W209852	44L	3.1	4.8L	15	.71L	.90	2.1	4.0	9.7	.11L	W209852
W209895	380	6.8	5.1L	50L	.75L	.80	3.3	4.3	1.7	.68	W209895
W209896	44L	17	21L	90L	3.1L	1.6	8.8	5.8	5.2	1.9	W209896
W209897	44L	7.4	3.1L	30L	.46L	.50	2.4	5.9	1.4	.42	W209897
W210026	44L	4.8	5.0L	40L	.73L	.85	3.4	4.1	2.0	.51	W210026
W210027	44L	17	8.9	30L	.98L	1.2	5.1	11	3.1	.80	W210027
W210028	44L	5.7	7.7L	30L	1.1L	.90	4.0	17	2.3	.17L	W210028
W210029	44L	9.5	10L	20	1.5L	.40	5.4	9.2	3.1	1.7	W210029
W210030	44L	5.9	6.0L	25	.88L	.90	4.0	5.8	2.1	1.1	W210030
W210154	44L	9.5	11L	46	1.7L	1.3	5.7	5.6	2.2	1.6	W210154
W210155	210	5.2	2.9L	60L	.43L	1.1	2.6	3.4	1.2	.25	W210155
W210156	44L	23	6.5L	50L	.95L	1.1	4.8	3.3	1.2	.00H	W210156
W210157	230	3.0	3.4	50L	.34L	.70	1.7	2.8	.70	.21	W210157

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	SR-S PPM	TA PPM	TB PPM	TH PPM	TL-S PPM	TM-S PPM	U PPM	V-S PPM	W PPM	Y-S PPM	SAMPLE NUMBER
W208214	53	0.22	0.34	2.8	0.43L	0.43L	0.68	11	0.00B	2.6	W208214
W208215	180	.62	.49	9.8	1.6L	1.6L	3.6	41	.00B	9.5	W208215
W208216	120	2.5	2.8	36	2.6L	2.6L	8.6	42	.00B	18	W208216
W208218	60	.33	.50	3.6	4.3	.73L	1.8	24	.00B	4.1	W208218
W208219	110	.12	.21	1.4	.23L	.23L	.37	6.5	.00B	2.4	W208219
W208220	110	.20	.53	2.9	.36L	.36L	.69	12	.00B	6.4	W208220
W208224	41	.37	.56	3.5	.66L	.66L	1.2	17	.00B	2.9	W208224
W208225	45	.14	.76	1.9	.33L	.33L	.52	12	.00B	4.4	W208225
W209504	110	.20L	.30	.50	.26L	.26L	1.3	3.6	1.4	4.8	W209504
W209505	160	.20L	.56	.80	.26L	.26L	.60	7.8	1.9	10	W209505
W209676	160	.23	.15	2.4	.48L	.48L	.96	16	.50	4.3	W209676
W209851	78	.16	.14	.80	.18L	.18L	.88	6.6	.60	1.5	W209851
W209852	130	.17	.19	1.5	.33L	.33L	1.3	9.2	.57	3.7	W209852
W209895	210	.10	.48	2.0	.35L	.35L	.99	24	.60	6.9	W209895
W209896	110	.61	1.0	8.1	1.4L	1.4L	2.6	49	1.0	9.2	W209896
W209897	38	.14	.27	2.0	.21L	.21L	.46	8.7	.30	4.2	W209897
W210026	66	.15	.44	1.9	.34L	.34L	.66	16	.40	6.1	W210026
W210027	68	.24	.69	5.6	.45L	.45L	2.1	26	.40	9.8	W210027
W210028	73	.22	.35	2.5	9.4	.52L	.95	23	.80	7.6	W210028
W210029	55	.50	.73	4.9	.70L	.70L	1.2	24	.60	7.2	W210029
W210030	62	.31	.38	2.8	.40L	.40L	.83	21	.60	5.0	W210030
W210154	140	.35	.40	4.0	.76L	.76L	2.2	30	.80	3.8	W210154
W210155	220	.07	.21	1.7	.20L	.20L	1.1	14	.60	4.7	W210155
W210156	180	.09	.57	1.0	.44L	.44L	1.3	10	1.7	8.2	W210156
W210157	200	.14	.18	1.7	.16L	.16L	.99	7.5	.55	3.4	W210157

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	YB PPM	ZN PPM	ZR-S PPM
W208214	0.9	15	4.9
W208215	2.3	25	26
W208216	4.8	21	140
W208218	1.5	12	9.7
W208219	.6	3.7	4.3
W208220	1.3	3.0	12
W208224	1.1	7.7	10
W208225	1.3	11	7.2
W209504	1.0	5.0	2.6
W209505	1.9	7.3	6.2
W209676	.6	5.0	21
W209851	.3	5.9	3.2
W209852	.7	5.5	7.8
W209895	.8	7.1	14
W209896	2.1	27	27
W209897	.8	3.5	16
W210026	1.0	13	10
W210027	1.2	14	31
W210028	1.3	19	12
W210029	1.3	4.3	63
W210030	1.2	6.4	21
W210154	1.2	9.8	15
W210155	.7	6.9	6.5
W210156	1.5	17	6.3
W210157	.4	5.4	12

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	SI (PERCENT)	AL (PERCENT)	CA (PERCENT)	MG (PERCENT)	NA (PERCENT)	K (PERCENT)	FE (PERCENT)	TI (PERCENT)	AG-S PPM	AS PPM	SAMPLE NUMBER
W210158	5.9	2.9	0.16	0.18	0.077	0.59	1.3	0.13	0.023L	52	W210158
W210161	.39	.33	.058	.011	.006	.022	.34	.020	.046	34	W210161
W210162	1.3	1.0	.068	.020	.009	.061	.19	.067	.030	7.1	W210162
W210163	1.5	.83	.048	.023	.009	.094	.10	.060	.062	2.0	W210163
W210164	1.9	1.2	.080	.067	.030	.26	1.1	.077	.024	100	W210164
W210262	1.2	.83	.042	.012	.004	.044	.92	.069	.038	38	W210262
W210263	6.5	2.7	.061	.045	.012	.24	.15	.23	.041	1.5	W210263
W210264	1.7	1.1	.059	.021	.006	.075	.36	.082	.043	2.8	W210264
W210287	.66	.43	.093	.022	.014	.069	2.0	.025	.032	59	W210287
W210288	2.5	1.5	.15	.016	.014	.044	1.2	.14	.040	5.9	W210288
W210293	8.6	4.7	.084	.15	.049	.81	1.6	.23	.25	130	W210293
W210315	1.9	1.5	.10	.045	.015	.11	1.2	.085	.038	19	W210315
W210316	1.2	.76	.22	.047	.017	.11	1.8	.054	.024	44	W210316
W210317	2.5	1.8	.13	.078	.035	.26	.29	.10	.054	1.5	W210317
W210318	.00B	.00B	.000B	.017	.050	.00B	.00B	.00B	.034	2.8	W210318
W210319	1.8	1.3	.12	.068	.023	.26	.90	.058	.045	10	W210319
W210343	2.2	1.2	.48	.064	.023	.22	.33	.065	.020	3.6	W210343
W210344	2.5	1.6	.37	.060	.023	.29	1.1	.095	.046	14	W210344
W210345	1.5	1.1	.070	.019	.003	.030	.17	.10	.035	2.3	W210345
W210428	1.6	1.0	.079	.025	.012	.055	.26	.061	.044	2.5	W210428
W210429	1.7	1.0	.071	.057	.031	.20	1.1	.049	.046	47	W210429
W210430	4.5	2.7	.13	.087	.017	.39	.45	.22	.028	3.7	W210430
W210431	1.3	.76	.047	.022	.015	.10	.11	.044	.036	2.2	W210431
W210501	3.8	2.9	.18	.085	.032	.33	1.0	.11	.056	3.9	W210501
W210502	3.1	2.0	.094	.052	.015	.21	.22	.14	.049	3.2	W210502

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	B-S PPM	BA-S PPM	BE-S PPM	BI-S PPM	BR PPM	CD PPM	CE PPM	CL PPM	CO PPM	CR PPM	SAMPLE NUMBER
W210158	28	630	7	2.3L	17	0.17	33	1,500	11	25	W210158
W210161	6.0	17	2	.2L	21	.03	5.0	2,500	9.3	3.7	W210161
W210162	10	46	8	.6L	19	.06	20	1,800	5.6	11	W210162
W210163	10	120	12	.6L	26	.04	11	1,800	17	11	W210163
W210164	20	130	10	.9L	32	.06	14	2,100	10	13	W210164
W210262	24	19	6	.6L	8.0	.04	14	210	22	14	W210262
W210263	64	57	2	2.1L	4.0	.17	41	100L	4.9	38	W210263
W210264	21	50	3	.7L	7.3	.05	19	270	3.4	14	W210264
W210287	14	52	3	.6L	13	.08	5.0	1,500	3.6	7.3	W210287
W210288	17	71	2	1.1L	16	.05	22	1,200	5.0	16	W210288
W210293	72	230	7	3.3L	8.7	.39	48	100L	18	46	W210293
W210315	28	98	6	1.0L	15	.05	40	870	3.3	13	W210315
W210316	24	73	3	.8L	22	.03	9.0	1,800	4.4	7.6	W210316
W210317	27	99	6	1.0L	21	.03	24	1,400	5.8	16	W210317
W210318	12	41	2	.2L	24	.02	7.0	2,000	4.2	3.8	W210318
W210319	23	53	5	.9L	23	.03	16	1,900	9.1	14	W210319
W210343	47	61	2	1.0L	32	.04	12	2,300	3.1	12	W210343
W210344	43	91	2	1.2L	24	.09	18	1,800	5.4	16	W210344
W210345	49	23	3	.6L	5.8	.05	14	200	8.6	11	W210345
W210428	14	64	4	.7L	22	.05	15	1,500	9.1	10	W210428
W210429	16	180	9	.8L	20	.06	12	8,800	4.0	9.7	W210429
W210430	19	210	3	1.7L	22	.09	31	910	5.6	29	W210430
W210431	8.7	200	3	.5L	20	.04	10	1,500	5.9	6.6	W210431
W210501	140	80	8	1.7L	11	.19	14	570	10	11	W210501
W210502	62	43	1	1.2L	8.8	.05	26	380	6.5	24	W210502

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	CS PPM	CU PPM	DY-S PPM	ER-S PPM	EU PPM	F PPM	GA-S PPM	GD-S PPM	GE-S PPM	HF PPM	SAMPLE NUMBER
W210158	2.3	33	6.1	3.5	0.74	180	13	8.2	14	1.3	W210158
W210161	.1	14	.5L	.2L	.10	20	2.5	.35L	3.7	.2	W210161
W210162	.4	18	1.3	1.2	.45	20	4.6	1.5	3.2	.7	W210162
W210163	.5	27	1.7	1.6	.39	110	9.0	1.8	11	.5	W210163
W210164	1.7	19	2.0L	.9L	.33	50	8.2	1.4L	4.1	.6	W210164
W210262	.2	16	1.3L	1.8	.38	30	3.1	1.9	1.8	.5	W210262
W210263	1.0	17	4.5L	2.3	.74	20	6.8	3.1L	.31L	2.1	W210263
W210264	.5	13	1.5L	.8	.38	10	3.1	2.0	.59	.6	W210264
W210287	.2	17	2.0	.6L	.24	20	5.8	1.7	6.6	.1	W210287
W210288	.2	25	2.4L	1.1L	.43	100	5.0	1.8	.32	.8	W210288
W210293	3.5	72	7.2L	3.3L	1.1	150	16	5.5	14	2.1	W210293
W210315	.5	14	3.4	2.4	.45	10	7.5	7.0	2.9	1.1	W210315
W210316	.6	9.5	1.7L	.8L	.20	10	5.8	1.2L	5.1	.4	W210316
W210317	2.2	17	2.3L	1.6	.56	30	8.0	1.6L	.53	.8	W210317
W210318	.2	8.6	.5L	.5	.25	70	2.2	.70	.29	.2	W210318
W210319	1.1	28	2.0L	.9L	.49	60	7.3	1.3L	1.6	.5	W210319
W210343	.8	11	2.1L	1.0L	.28	10L	4.8	1.4L	1.1	.5	W210343
W210344	1.0	13	2.9	1.6	.37	50	5.7	1.8L	3.2	.9	W210344
W210345	.1	20	1.3L	.9	.28	40	2.5	.92	1.4	.6	W210345
W210428	.3	13	3.6	1.4	.40	10	3.4	2.0	1.1	.5	W210428
W210429	1.3	11	1.8L	1.7	.37	10	6.0	1.8	5.3	.3	W210429
W210430	2.9	16	3.8L	2.3	.56	20	8.7	2.6L	.50	1.5	W210430
W210431	.3	14	1.7	.7	.23	10L	3.7	.82	3.1	.3	W210431
W210501	.4	32	5.5L	3.1	.47	40	11	2.6L	2.4	.3	W210501
W210502	1.0	19	2.6L	1.2L	.46	60	5.2	1.8L	.54	1.2	W210502

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	HG PPM	HO-S PPM	LA PPM	LI PPM	LU PPM	MN PPM	MO-S PPM	NB-S PPM	ND-S PPM	NI-S PPM	SAMPLE NUMBER
W210158	0.25	1.6L	17	22	0.2	75	1.5	3.7	30	20	W210158
W210161	.17	.16L	3	4.1	.1L	2.8	.06	.30	1.1	11	W210161
W210162	.13	.39L	10	10	.1	2.7	.51	2.4	15	10	W210162
W210163	.060	.38L	5	7.8	.2	3.2	.56	2.2	9.5	22	W210163
W210164	.15	.63L	8	8.8	.1	18	.32	1.0	8.8	19	W210164
W210262	.50	.89L	7	10	.2	2.0	2.3	3.1	6.5	19	W210262
W210263	.23	1.4L	22	31	.2	4.7	.64	11	12	16	W210263
W210264	.16	.47L	11	17	.1	3.5	1.2	3.3	7.6	9.0	W210264
W210287	.21	.90L	2	4.7	.1	15	5.5	1.6	4.4	10	W210287
W210288	.20	1.7L	13	36	.1	8.7	2.2	9.0	10	14	W210288
W210293	.28	2.2L	23	75	.4	20	2.0	6.2	10L	62	W210293
W210315	.11	.67L	21	25	.2	43	1.6	3.1	17	11	W210315
W210316	.095	.54L	4	12	.1	17	3.6	1.7	2.6	11	W210316
W210317	.070	.71L	13	31	.2	14	.38	3.4	7.9	17	W210317
W210318	.062	.19	3	4.6	.1	3.4	.79	.14	2.0	8.4	W210318
W210319	.070	.61L	8	13	.2	47	.67	1.2	7.7	18	W210319
W210343	.055	.65L	6	18	.1	42	.94	1.7	4.3	12	W210343
W210344	.080	.83L	10	27	.2	26	1.3	2.9	3.9L	11	W210344
W210345	.055	.41L	8	12	.1	1.7	2.4	3.2	7.3	21	W210345
W210428	.060	.44L	8	10	.2	7.2	1.1	2.4	10	20	W210428
W210429	.26	.90	6	9.0	.2	11	2.9	2.3	13	15	W210429
W210430	.055	1.2L	18	31	.2	35	.17L	4.4	10	12	W210430
W210431	.055	.35L	6	7.1	.1	3.3	.71	1.2	4.6	16	W210431
W210501	.29	1.2	6	39	.1	12	8.6	3.1	17	53	W210501
W210502	.30	.81L	16	19	.1	6.1	1.4	2.7	13	14	W210502

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	P PPM	PB PPM	PR-S PPM	RB PPM	RE-S PPM	SB PPM	SC PPM	SE PPM	SM PPM	SN-S PPM	SAMPLE NUMBER
W210158	180	6.1	16L	52	2.3L	3.5	6.0	5.8	2.9	0.70	W210158
W210161	44L	2.8	1.8	30L	.23L	.60	.99	6.7	.45	.03L	W210161
W210162	44L	4.4	4.1	40L	.58L	.80	2.7	2.7	1.5	.48	W210162
W210163	44L	5.3	3.8L	40L	.56L	3.1	4.2	4.6	1.5	.73	W210163
W210164	44L	2.5	6.9	50L	.93L	1.9	3.4	2.5	1.2	.14L	W210164
W210262	44L	6.5	4.0L	30L	1.1	2.0	4.5	5.5	1.5	.09L	W210262
W210263	44L	16	14L	25	2.1L	1.4	7.5	9.9	3.3	1.6	W210263
W210264	44L	4.8	4.7L	30L	.69L	1.2	3.4	4.6	1.7	.43	W210264
W210287	44L	2.8	4.1L	30L	.60L	1.3	3.4	2.7	.70	.00H	W210287
W210288	550	6.1	7.5L	30L	1.1L	1.2	4.0	4.4	1.7	.17L	W210288
W210293	44L	42	22L	54	3.3L	4.0	12	14	4.9	.49L	W210293
W210315	44L	9.1	6.7L	30L	.98L	1.0	3.8	4.0	3.1	.52	W210315
W210316	44L	3.4	5.4L	30L	.79L	1.8	2.3	7.0	.70	.12L	W210316
W210317	44L	8.7	7.1L	17	1.0L	1.3	4.8	5.6	2.1	.81	W210317
W210318	44L	1.8	1.6L	30L	.24L	1.3	1.4	2.1	.80	.20	W210318
W210319	44L	7.1	6.1L	16	.89L	1.6	3.8	2.5	1.7	.13L	W210319
W210343	44L	5.9	6.5L	30L	.95L	1.6	2.9	4.1	.90	.47	W210343
W210344	44L	7.7	8.3L	18	1.2L	1.2	4.4	3.8	1.3	.26	W210344
W210345	44L	6.1	4.1L	20L	.61L	1.1	2.4	6.7	1.1	.40	W210345
W210428	44L	6.5	4.4L	20L	.65L	1.2	2.9	2.5	1.5	.13	W210428
W210429	44L	4.2	8.2	18	.82L	1.6	2.5	3.6	1.4	.12L	W210429
W210430	44L	9.4	12L	38	1.7L	.95	5.5	5.8	2.6	1.3	W210430
W210431	44L	4.3	3.5L	20L	.51L	2.1	2.3	2.3	1.0	.30	W210431
W210501	44L	16	12L	40L	1.7L	1.9	3.5	3.1	1.9	.70	W210501
W210502	44L	9.5	8.1L	50L	1.2L	.95	4.7	5.2	1.9	1.3	W210502

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	SR-S PPM	TA PPM	TB PPM	TH PPM	TL-S PPM	TM-S PPM	U PPM	V-S PPM	W PPM	Y-S PPM	SAMPLE NUMBER
W210158	330	0.32	0.70	3.7	1.1L	1.1L	1.7	42	1.2	13	W210158
W210161	60	.06	.13	1.0	1.4	.11L	.36L	2.5	.50	1.2	W210161
W210162	140	.25	.35	2.7	.27L	.27L	.70	16	.60	8.7	W210162
W210163	120	.22	.55	2.2	.26L	.26L	1.7	18	1.1	12	W210163
W210164	160	.24	.25	2.0	.43L	.43L	1.0	15	.85	7.2	W210164
W210262	42	.15	.30	2.7	.27L	.27L	.87	13	.35	17	W210262
W210263	82	.58	.59	7.3	.94L	.94L	2.5	31	.50	12	W210263
W210264	56	.10	.25	19	.32L	.32L	.92	17	.40	6.0	W210264
W210287	140	.20L	.24	.80	.28L	.28L	2.2	21	.90	10	W210287
W210288	340	.34	.26	4.0	.51L	.51L	1.5	21	.60	11	W210288
W210293	78	.65	.70	9.0	1.5L	1.5L	5.4	68	.60	12	W210293
W210315	180	.29	.70	6.1	.45L	.45L	2.7	19	1.0	12	W210315
W210316	190	.15	.18	1.3	.36L	.36L	.80	13	1.3	4.4	W210316
W210317	160	.32	.49	3.9	.48L	.48L	1.7	23	.80	9.3	W210317
W210318	150	.06	.29	.90	.11L	.11L	.90	6.0	.70	3.1	W210318
W210319	84	.15	.64	3.4	.41L	.41L	1.5	20	1.0	6.6	W210319
W210343	120	.14	.34	2.2	.44L	.44L	.96	19	.70	5.0	W210343
W210344	160	.25	.38	3.2	.56L	.56L	1.2	20	.80	6.8	W210344
W210345	59	.20	.21	2.2	.28L	.28L	.52	15	.30	5.5	W210345
W210428	190	.24	.32	2.4	.30L	.30L	1.7	21	.70	11	W210428
W210429	210	.15	.39	1.8	6.6	.38L	1.6	21	.80	14	W210429
W210430	130	.62	.57	5.4	.80L	.80L	1.8	33	1.2	6.1	W210430
W210431	130	.14	.25	1.4	.23L	.23L	.98	18	.90	5.6	W210431
W210501	170	.12	.34	1.4	2.2	.79L	.83	55	.50	22	W210501
W210502	69	.37	.30	4.4	.81	.55L	1.5	25	.70	6.5	W210502

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	YB PPM	ZN PPM	ZR-S PPM
W210158	1.8	65	54
W210161	.2	4.8	3.2
W210162	1.0	9.9	21
W210163	1.9	7.3	12
W210164	1.1	13	10
W210262	2.0	8.9	20
W210263	1.8	6.2	80
W210264	.9	4.3	21
W210287	1.0	11	10
W210288	1.1	4.7	58
W210293	3.3	100	36
W210315	1.7	8.1	22
W210316	.6	6.3	10
W210317	1.5	5.1	20
W210318	.7	3.1	1.9
W210319	1.2	9.8	9.8
W210343	.7	8.2	12
W210344	1.1	16	22
W210345	.7	3.2	21
W210428	1.2	9.1	18
W210429	1.1	8.2	18
W210430	1.4	7.8	19
W210431	.8	11	9.2
W210501	1.0	44	27
W210502	1.2	9.5	23

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	SI (PERCENT)	AL (PERCENT)	CA (PERCENT)	MG (PERCENT)	NA (PERCENT)	K (PERCENT)	FE (PERCENT)	TI (PERCENT)	AG-S PPM	AS PPM	SAMPLE NUMBER
W211630	1.4	0.95	0.10	0.033	0.015	0.12	2.3	0.058	0.036	16	W211630
W211634	3.1	2.1	.062	.044	.013	.18	.17	.17	.036	1.2	W211634
W211635	4.0	2.4	.078	.067	.019	.30	.41	.15	.038	6.9	W211635
W211636	2.0	1.5	.69	.042	.055	.16	.18	.093	.025	2.6	W211636
W211637	1.3	1.1	.29	.025	.050	.088	.92	.068	.035	18	W211637
W211685	1.4	1.1	.18	.035	.066	.12	.52	.066	.025	6.7	W211685
W211686	4.1	2.3	.061	.036	.009	.14	.51	.20	.023	21	W211686
W211687	2.1	1.5	.069	.052	.020	.20	.50	.053	.036	15	W211687
W211688	3.8	2.4	.065	.063	.026	.27	.38	.19	.050	7.0	W211688
W211689	8.0	3.5	.054	.086	.023	.43	.86	.27	.049	21	W211689
W211690	3.2	1.8	.034	.022	.006	.096	.068	.13	.013	1.0	W211690
W211691	1.0	.86	.047	.012	.004	.035	.043	.059	.016	.60	W211691
W211692	1.6	1.1	.083	.032	.022	.056	.27	.076	.022	2.1	W211692
W211693	.79	.53	.092	.037	.016	.085	.27	.026	.017	1.0	W211693
W211694	1.6	1.2	.080	.032	.012	.10	.64	.073	.038	21	W211694
W212056	1.6	1.2	.068	.034	.008	.11	.22	.040	.034	2.8	W212056
W212057	1.6	1.0	.063	.028	.008	.076	.14	.065	.045	1.4	W212057
W212058	.68	.61	.067	.030	.007	.094	.14	.021	.046	2.3	W212058
W212059	1.9	1.2	.048	.021	.035	.071	.13	.10	.059	2.4	W212059
W212060	.92	.63	.065	.020	.026	.036	.16	.046	.034	.95	W212060
W212061	1.6	1.1	.047	.037	.027	.19	.15	.051	.058	1.5	W212061
W212062	2.5	.85	.047	.022	.017	.082	.11	.13	.17	1.3	W212062
W212063	1.4	1.0	.12	.048	.028	.11	.85	.050	.053	10	W212063
W212064	.97	.67	.060	.030	.047	.11	.17	.033	.18	1.8	W212064
W212065	.53	.44	.45	.056	.052	.053	.15	.022	.025	1.8	W212065

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	B-S PPM	BA-S PPM	BE-S PPM	BI-S PPM	BR PPM	CD PPM	CE PPM	CL PPM	CO PPM	CR PPM	SAMPLE NUMBER
W211630	26	48	5	0.9L	19	0.05	11	2,100	6.5	8.8	W211630
W211634	55	36	2	1.2L	9.5	.04	26	740	6.4	24	W211634
W211635	52	70	3	1.5L	10	.08	21	780	4.4	21	W211635
W211636	36	57	1	1.0L	35	.05	17	3,400	3.0	17	W211636
W211637	30	43	1	.8L	36	.05	15	3,700	3.0	11	W211637
W211685	35	52	3	.7L	43	.04	18	3,400	9.2	12	W211685
W211686	49	85	3	1.5L	5.7	.03	27	170	5.9	26	W211686
W211687	53	47	2	.9L	11	.09	18	740	12	23	W211687
W211688	63	91	2	1.5L	11	.10	31	540	11	27	W211688
W211689	51	140	2	2.7L	2.5	.15	43	100L	10	44	W211689
W211690	39	28	1	1.1L	5.3	.04	33	100	3.2	18	W211690
W211691	41	18	4	.4L	5.7	.02	9.0	210	8.0	9.9	W211691
W211692	24	91	2	.7L	16	.05	11	740	5.3	13	W211692
W211693	16	48	2	.4L	18	.04	7.0	1,700	6.6	8.2	W211693
W211694	51	47	2	.7L	16	.07	11	520	6.2	11	W211694
W212056	45	37	5	.7L	10	.10	18	640	15	39	W212056
W212057	41	32	1	.6L	10	.04	13	730	4.2	11	W212057
W212058	42	38	2	.4L	7.9	.05	8.5	510	6.7	16	W212058
W212059	13	70	3	.7L	17	.05	19	1,200	16	15	W212059
W212060	8.4	72	4	.4L	9.1	.03	9.0	1,100	2.9	8.4	W212060
W212061	10	80	11	.7L	13	.04	13	1,200	11	10	W212061
W212062	7.9	57	9	.8L	14	.07	17	1,400	23	18	W212062
W212063	12	160	2	1.0	15	.04	16	1,100	4.4	12	W212063
W212064	12	95	2	.4L	19	.06	9.5	1,300	4.9	8.3	W212064
W212065	8.6	95	6	.4L	10	.04	7.0	350	3.4	5.5	W212065

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	CS PPM	CU PPM	DY-S PPM	ER-S PPM	EU PPM	F PPM	GA-S PPM	GD-S PPM	GE-S PPM	HF PPM	SAMPLE NUMBER
W211630	0.6	12	2.0L	0.9L	0.25	140	5.6	1.3L	2.8	0.4	W211630
W211634	1.1	21	2.6L	1.2L	.43	250	4.3	1.8L	.75	1.0	W211634
W211635	1.2	21	3.3L	1.5L	.41	290	4.8	2.3L	1.7	.8	W211635
W211636	.6	29	2.2L	1.0L	.34	160	3.7	1.5L	2.2	.6	W211636
W211637	.3	21	1.7L	.8L	.28	50	3.9	1.1L	3.5	.4	W211637
W211685	.6	15	1.5L	.7L	.42	50	5.0	1.1L	4.2	.5	W211685
W211686	.8	21	3.3L	1.5L	.44	40	3.8	2.3L	.38	1.3	W211686
W211687	.9	17	2.0L	.9L	.52	60	5.1	1.3L	.77	.4	W211687
W211688	1.3	23	3.2L	1.5L	.63	130	7.0	2.2L	1.2	1.2	W211688
W211689	1.7	20	5.9L	2.7L	.89	100	7.3	4.1L	.59	2.3	W211689
W211690	.4	11	2.5L	1.1L	.41	70	3.0	1.7L	.17L	1.0	W211690
W211691	.1	12	.9L	.4L	.22	20	2.2	.65L	1.7	.4	W211691
W211692	.3	16	1.4L	.7L	.25	70	3.1	.98L	.33	.4	W211692
W211693	.6	9.6	.8L	.4L	.17	50	2.3	.56L	1.7	.3	W211693
W211694	.5	14	1.6L	.7L	.29	50	3.3	1.1L	1.4	.5	W211694
W212056	.6	14	1.5L	1.5	.54	70	3.3	1.7	1.0	.4	W212056
W212057	.4	12	1.4L	.7	.27	70	3.0	.95L	.54	.5	W212057
W212058	.7	11	.8L	.5	.21	20	1.9	.53L	.39	.2	W212058
W212059	.3	23	1.6L	.7L	.35	20	4.8	1.1L	2.8	.7	W212059
W212060	.1	13	.9L	.8	.22	10	2.8	.60L	.88	.4	W212060
W212061	1.0	18	1.5L	1.4	.34	30	10	1.0L	4.0	.4	W212061
W212062	.6	28	1.7L	1.2	.32	50	4.8	1.2L	3.5	.9	W212062
W212063	.5	13	1.7L	1.5	.38	30	4.7	1.1L	8.3	.5	W212063
W212064	.4	12	.9L	.9	.30	40	3.7	.65L	.65	.2	W212064
W212065	.2	7.3	.9L	.6	.22	180	3.8	.65L	1.4	.2	W212065

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	HG PPM	HO-S PPM	LA PPM	LI PPM	LU PPM	MN PPM	MO-S PPM	NB-S PPM	ND-S PPM	NI-S PPM	SAMPLE NUMBER
W211630	0.34	0.61L	6	14	0.1	15	1.3	1.3	4.7	12	W211630
W211634	.058	.81L	14	26	.1	6.9	1.4	3.7	9.6	13	W211634
W211635	.10	1.0L	12	21	.2	9.9	.90	3.0	8.7	9.8	W211635
W211636	.058	.67L	9	24	.1	25	.97	3.0	4.0	5.8	W211636
W211637	.075	.52L	8	18	.1	13	.70	1.2	2.7	6.2	W211637
W211685	.16	.48L	10	27	.1	13	.46	1.8	7.7	13	W211685
W211686	.095	1.0L	16	38	.2	4.7	.97	8.8	14	9.9	W211686
W211687	.058	.61L	8	19	.2	22	2.8	1.3	13	22	W211687
W211688	.068	.99L	14	41	.2	11	1.9	4.8	14	19	W211688
W211689	.075	1.8L	25	32	.3	15	1.1	7.3	19	25	W211689
W211690	.090	.76L	14	21	.2	3.1	.29	3.4	6.8	8.0	W211690
W211691	.075	.29L	5	8.2	.1	1.8	.77	2.5	5.2	14	W211691
W211692	.058	.44L	7	16	.1	5.1	.32	1.8	7.2	12	W211692
W211693	.048	.25L	4	6.7	.1	30	.27	.70	1.2L	8.9	W211693
W211694	.058	.50L	7	13	.1	6.6	1.4	1.5	6.1	12	W211694
W212056	.10	.47L	7	13	.2	5.6	2.0	1.4	12	19	W212056
W212057	.074	.43L	7	8.8	.1	5.7	2.3	1.5	6.2	14	W212057
W212058	.080	.24L	4	4.6	.1	4.2	2.5	.42	4.2	9.8	W212058
W212059	.035	.50L	10	12	.1	3.0	.38	1.6	7.4	27	W212059
W212060	.047	.27L	5	5.6	.1	2.4	.31	1.4	4.4	6.0	W212060
W212061	.060	.46L	6	8.0	.2	4.6	.15	1.4	11	22	W212061
W212062	.047	.54L	10	7.6	.1	3.2	.49	4.5	13	34	W212062
W212063	.040	.51L	8	11	.1	12	.83	1.7	7.4	14	W212063
W212064	.060	.29L	4	4.7	.1	7.7	1.5	.60	4.7	9.9	W212064
W212065	.035	.29L	4	3.4	.1	19	.47	.82	3.3	5.6	W212065

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	P PPM	PB PPM	PR-S PPM	RB PPM	RE-S PPM	SB PPM	SC PPM	SE PPM	SM PPM	SN-S PPM	SAMPLE NUMBER
W211630	44L	3.1	6.1L	7	0.89L	1.5	2.5	5.0	0.85	0.00H	W211630
W211634	44L	10	8.1L	17	1.2L	.70	4.8	4.8	2.0	1.3	W211634
W211635	44L	8.6	10L	22	1.5L	1.1	4.5	3.8	1.8	1.4	W211635
W211636	44L	9.9	6.7L	11	.99L	.50	4.0	5.2	1.5	1.1	W211636
W211637	44L	6.5	5.2L	5	.76L	.50	2.7	5.7	1.2	.11L	W211637
W211685	44	6.0	4.8L	60L	.70L	1.2	4.4	4.2	1.7	.36	W211685
W211686	44L	10	10L	30L	1.5L	.70	5.8	7.1	2.1	.61	W211686
W211687	44L	8.2	6.1L	30L	.89L	1.2	5.2	4.5	1.6	.30	W211687
W211688	44L	11	9.9L	20	1.5L	1.7	6.0	4.3	2.6	1.3	W211688
W211689	44L	14	18L	40L	2.7L	.80	8.1	19	4.0	.57	W211689
W211690	44L	7.2	7.6L	20L	1.1L	.80	3.7	5.5	1.8	.64	W211690
W211691	44L	5.2	2.9L	20L	.43L	.50	2.3	5.5	.90	.43	W211691
W211692	44L	4.7	4.4L	30L	.65L	.80	2.2	4.4	1.0	.42	W211692
W211693	44L	1.2	2.5L	30L	.37L	.90	1.5	3.2	.60	.11	W211693
W211694	44L	4.7	5.0L	20L	.73L	4.9	2.8	5.7	1.3	.11L	W211694
W212056	44L	5.7	4.7L	10	.69L	1.0L	3.1	5.4	2.0	.14	W212056
W212057	44L	4.2	4.3L	7	.63L	1.0L	2.6	3.8	1.0	.49	W212057
W212058	44L	2.2	2.4L	8	.35L	1.0L	1.6	3.7	.75	.18	W212058
W212059	44L	6.9	5.0L	30L	.74L	1.0L	3.3	3.3	1.3	.81	W212059
W212060	44L	3.8	2.7L	30L	.40L	.50L	1.7	2.9	.80	.34	W212060
W212061	44L	3.4	4.6L	13	.67L	1.0L	3.1	3.1	1.2	.34	W212061
W212062	44L	7.0	5.4L	30L	.79L	2.0L	3.0	3.4	1.3	1.2	W212062
W212063	96	4.2	5.1L	13	.75L	2.0L	3.3	4.2	1.7	.11L	W212063
W212064	44L	2.6	2.9L	40L	.43L	1.0L	2.6	1.8	.95	.26	W212064
W212065	44L	1.5	2.9L	30L	.43L	.50L	1.1	1.7	.70	.08	W212065

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	SR-S PPM	TA PPM	TB PPM	TH PPM	TL-S PPM	TM-S PPM	U PPM	V-S PPM	W PPM	Y-S PPM	SAMPLE NUMBER
W211630	98	0.17	0.25	1.3	0.41L	0.41L	0.58	11	0.90	3.6	W211630
W211634	46	.36	.34	4.6	.55L	.55L	1.6	20	.70	6.5	W211634
W211635	66	.33	.32	3.7	.69L	.69L	1.4	23	.80	7.1	W211635
W211636	110	.24	.26	3.6	.46L	.46L	1.6	18	.80	5.8	W211636
W211637	84	.16	.22	2.3	.35L	.35L	1.1	11	.50	2.8	W211637
W211685	170	.24	.32	1.8	.32L	.32L	1.8	16	.70	6.7	W211685
W211686	59	.45	.25	5.3	.70L	.70L	1.4	26	.70	11	W211686
W211687	110	.13	.39	2.6	.41L	.41L	1.4	37	.50	8.9	W211687
W211688	99	.47	.42	5.0	.67L	.67L	1.9	31	.80	11	W211688
W211689	62	.78	.53	7.2	1.2L	1.2L	2.1	35	.70	11	W211689
W211690	46	.38	.25	3.6	.52L	.52L	1.1	13	.60	4.9	W211690
W211691	41	.10	.12	1.6	.20L	.20L	.75	10	.30	4.3	W211691
W211692	180	.21	.18	2.2	.30L	.30L	.86	12	.55	4.0	W211692
W211693	150	.26	.12	1.1	.17L	.17L	.36	4.8	.50	2.0	W211693
W211694	120	.30L	.18	2.3	2.6	.34L	.73	14	.50	3.9	W211694
W212056	69	.11	.37	1.9	.32L	.32L	.92	23	.60	12	W212056
W212057	82	.19	.23	1.8	.29L	.29L	.86	13	.55	4.3	W212057
W212058	91	.07	.16	1.1	.53	.16L	.34	8.8	.35	4.6	W212058
W212059	96	.27	.28	2.9	.34L	.34L	1.5	19	.60	4.4	W212059
W212060	140	.10	.21	1.5	.18L	.18L	.51	10	.55	6.4	W212060
W212061	120	.13	.30	1.5	.31L	.31L	.91	18	1.1	11	W212061
W212062	110	.36	.29	3.1	.36L	.36L	1.2	13	.85	9.5	W212062
W212063	190	.16	.37	2.3	.35L	.35L	1.4	20	.60	9.0	W212063
W212064	140	.08	.30	1.1	.20L	.20L	.65	12	1.1	7.3	W212064
W212065	520	.08	.17	.75	.20L	.20L	.39	6.0	1.1	5.6	W212065

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	YB PPM	ZN PPM	ZR-S PPM
W211630	0.6	5.6	11
W211634	1.1	6.0	19
W211635	1.0	6.9	20
W211636	.8	5.9	19
W211637	.5	4.9	8.4
W211685	.9	15	11
W211686	1.2	6.7	71
W211687	1.2	29	15
W211688	1.5	19	39
W211689	2.0	22	51
W211690	.9	3.9	28
W211691	.7	5.6	18
W211692	.6	4.8	13
W211693	.5	3.0	4.4
W211694	.9	5.6	9.5
W212056	1.3	17	15
W212057	.6	6.2	10
W212058	.6	12	6.3
W212059	.8	26	13
W212060	.6	1.6	12
W212061	1.3	4.1	13
W212062	1.0	5.0	38
W212063	1.1	11	15
W212064	1.0	4.3	4.7
W212065	.6	1.7	10

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	SI (PERCENT)	AL (PERCENT)	CA (PERCENT)	MG (PERCENT)	NA (PERCENT)	K (PERCENT)	FE (PERCENT)	TI (PERCENT)	AG-S PPM	AS PPM	SAMPLE NUMBER
W212066	4.0	2.7	0.046	0.063	0.025	0.40	0.41	0.16	0.11	7.4	W212066
W212067	1.3	.89	.045	.029	.022	.13	.19	.040	.029	1.7	W212067
W212068	1.3	.84	.075	.027	.011	.098	.20	.043	.035	6.1	W212068
W212069	3.8	2.0	.059	.060	.041	.14	.22	.17	.035	3.1	W212069
W212070	1.1	.98	.079	.022	.047	.069	.16	.034	.025	1.5	W212070
W212071	.63	.30	.056	.012	.006	.027	.18	.011	.044	4.7	W212071
W212088	.63	.35	.043	.011	.014	.028	.54	.044	.009	5.5	W212088
W212281	2.5	1.4	.088	.077	.012	.33	.74	.078	.010L	.65	W212281
W212282	1.6	.96	.060	.049	.008	.15	.32	.051	.019	3.9	W212282
W212497	.96	.59	.056	.019	.021	.069	.16	.074	.025	4.3	W212497
W212498	1.7	1.0	.057	.053	.039	.19	.31	.050	.030	5.1	W212498
W212499	.53	.40	.19	.024	.021	.052	2.3	.023	.040	130	W212499
W212503	4.2	2.1	.058	.071	.041	.34	1.7	.12	.11	43	W212503
W212504	4.8	2.7	.052	.062	.036	.35	.54	.18	.045	9.6	W212504
W212594	3.4	2.3	.13	.037	.068	.13	.30	.13	.048	3.9	W212594
W212595	4.8	2.5	.056	.15	.066	.63	.66	.16	.033	6.2	W212595
W212596	2.1	1.5	.096	.047	.019	.14	.84	.090	.053	14	W212596
W215399	3.4	1.7	.10	.063	.017	.32	1.5	.14	.014L	2.1	W215399
W215400	1.2	.90	.085	.024	.017	.10	.23	.036	.058	16	W215400
W215401	1.1	.50	.15	.051	.015	.091	5.5	.021	.097	140	W215401
W215402	3.5	2.3	.11	.051	.016	.18	.32	.19	.051	1.3	W215402
W215440	3.3	2.2	.044	.020	.023	.13	.50	.18	.055	8.8	W215440
W215557	3.7	2.4	.094	.074	.023	.45	.70	.14	.028	16	W215557
W215558	3.3	1.9	.091	.055	.021	.26	.32	.14	.014	9.8	W215558
W215559	1.2	.98	.072	.026	.011	.096	.86	.036	.050	2.4	W215559

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	B-S PPM	BA-S PPM	BE-S PPM	BI-S PPM	BR PPM	CD PPM	CE PPM	CL PPM	CO PPM	CR PPM	SAMPLE NUMBER
W212066	16	220	5	1.6L	13	0.14	45	740	6.5	30	W212066
W212067	9.5	90	3	.6L	17	.04	8.0	1,400	12	8.0	W212067
W212068	11	47	5	.5L	20	.06	12	1,500	4.6	8.6	W212068
W212069	17	130	4	1.4L	12	.05	30	800	5.5	20	W212069
W212070	14	83	1	.5L	12	.03	19	1,000	7.5	11	W212070
W212071	6.4	29	4	.3	20	.04	7.0	1,700	17	5.0	W212071
W212088	9.6	23		.3L	9.9	.02	17	930	2.2	11	W212088
W212281	15	67	4	1.0L	26	.05	13	1,400	3.9	12	W212281
W212282	10	44	4	.6L	18	.03	10	1,400	5.9	11	W212282
W212497	16	86	4	.4L	22	.03	11	1,800	4.6	9.4	W212497
W212498	28	110	6	.7L	24	.04	13	1,600	7.9	8.0	W212498
W212499	15	110	7	.7L	20	.10	5.0	1,800	5.0	6.4	W212499
W212503	56	83	2	1.7L	13	.14	23	540	17	24	W212503
W212504	59	80	2	1.8L	4.9	.12	26	170	13	29	W212504
W212594	25	100	2	1.4L	10	.06	42	680	3.6	11	W212594
W212595	40	180	2	1.8L	9.6	.09	32	590	4.5	23	W212595
W212596	36	57	3	1.0L	21	.06	17	1,400	3.4	15	W212596
W215399	26	69	5	1.4L	23	.04	20	1,500	13	17	W215399
W215400	20	95	11	.5L	29	.04	12	2,400	6.6	9.1	W215400
W215401	29	66	4	1.3L	17	.12	6.0	1,500	3.8	6.2	W215401
W215402	16	86	4	1.4L	18	.07	32	1,100	8.2	14	W215402
W215440	37	34	2	1.3L	3.9	.08	21	130	9.8	27	W215440
W215557	41	66	5	1.5L	4.6	.08	25	300	9.1	25	W215557
W215558	40	82	2	1.3L	7.2	.08	24	400	3.8	24	W215558
W215559	37	170	4	.6L	9.0	.05	17	1,000	15	14	W215559

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	CS PPM	CU PPM	DY-S PPM	ER-S PPM	EU PPM	F PPM	GA-S PPM	GD-S PPM	GE-S PPM	HF PPM	SAMPLE NUMBER
W212066	1.5	57	3.5L	2.2	0.80	70	6.0	2.8	0.60	1.1	W212066
W212067	.4	14	1.6	.8	.25	60	3.6	1.0	2.2	.2	W212067
W212068	.5	13	1.2L	.7	.31	50	3.0	.80L	3.1	.4	W212068
W212069	.6	22	3.1L	1.4	.48	60	6.0	2.1L	.31	1.3	W212069
W212070	.3	12	1.7	.9	.50	30	3.2	1.7	.47	.3	W212070
W212071	.2	17	1.5	.9	.26	40	3.5	1.0	2.6	.2	W212071
W212088	.4	9.0	.7L	.3L	.35	40	1.0	.47L	.34	1.1	W212088
W212281	2.3	10	2.3L	1.0L	.27	90	4.1	1.6L	1.2	.5	W212281
W212282	1.0	6.1	1.4L	.6L	.29	30	2.6	.96L	2.2	.3	W212282
W212497	.3	19	.9L	.4L	.23	50	4.1	.62L	4.5	.5	W212497
W212498	.6	18	2.1	.7L	.33	60	6.3	1.0L	4.4	.3	W212498
W212499	.4	13	1.5L	1.3	.21	40	9.2	1.1	12	.2	W212499
W212503	1.8	25	3.7L	1.7L	.55	120	8.3	2.5L	1.3	.8	W212503
W212504	1.7	20	3.9L	1.8L	.49	130	10	2.7L	.77	1.3	W212504
W212594	.6	17	3.0L	1.9	.42	120	6.1	2.1L	.69	1.8	W212594
W212595	2.3	24	4.0L	1.8L	.56	150	7.4	2.8L	.35	1.2	W212595
W212596	.7	17	2.2L	1.0L	.35	100	4.7	1.5L	3.0	.6	W212596
W215399	1.3	14	3.0L	1.4L	.36	160	7.0	2.1L	2.3	.9	W215399
W215400	.5	20	2.0	1.1	.35	30	7.4	.80L	5.8	.2	W215400
W215401	.5	23	2.8L	1.3L	.32	80	8.1	1.9L	7.2	.1	W215401
W215402	.6	27	3.0L	1.4L	.36	90	9.2	2.0L	3.6	2.3	W215402
W215440	.6	22	2.8L	1.3L	.50	60	5.7	1.9L	.89	1.1	W215440
W215557	2.5	13	3.2L	1.5L	.52	280	6.4	2.2L	1.9	.9	W215557
W215558	1.3	16	2.8L	1.3L	.46	110	3.9	1.9L	.30	.9	W215558
W215559	.4	15	1.8	1.1	.55	70	3.3	.83	1.9	.3	W215559

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	HG PPM	HO-S PPM	LA PPM	LI PPM	LU PPM	MN PPM	MO-S PPM	NB-S PPM	ND-S PPM	NI-S PPM	SAMPLE NUMBER
W212066	0.047	1.1L	23	27	0.2	7.4	1.6	4.3	22	13	W212066
W212067	.040	.38L	4	7.8	.1	3.3	1.6	1.0	5.3	13	W212067
W212068	.055	.36L	6	6.4	.1	3.7	.74	1.4	5.1	13	W212068
W212069	.067	.95L	16	35	.2	3.6	2.0	5.9	17	15	W212069
W212070	.074	.35L	8	12	.1	5.1	1.4	.48	6.2	14	W212070
W212071	.055	.32	3	3.8	.1	1.8	3.5	.49	4.1	23	W212071
W212088	.085	.21L	10	6.8	.1	9.3	.47	1.8	2.2	2.0	W212088
W212281	.058	.71L	7	11	.1	190	.23	2.6	6.2	8.9	W212281
W212282	.046	.44L	6	7.0	.1	110	.27	1.2	4.2	9.6	W212282
W212497	.070	.28L	6	7.8	.1	10	.90	2.3	6.2	10	W212497
W212498	.080	.47L	7	12	.2	9.0	1.4	2.0	9.0	17	W212498
W212499	.16	.45L	3	4.1	.2	22	1.2	2.1	3.0	11	W212499
W212503	.16	1.1L	11	34	.2	9.6	3.5	2.7	11	42	W212503
W212504	.26	1.2L	14	25	.2	9.6	1.7	6.2	13	34	W212504
W212594	.30	.94L	22	21	.2	11	.68	4.4	25	11	W212594
W212595	.11	1.3L	17	22	.2	24	1.3	5.3	17	14	W212595
W212596	.16	.67L	9	30	.1	8.8	2.5	3.6	11	12	W212596
W215399	.21	.94L	11	12	.1	160	1.0	2.6	5.4	17	W215399
W215400	.36	.40	6	8.0	.2	3.3	.25	.95	5.1	13	W215400
W215401	.24	.86L	3	13	.1	8.1	4.8	2.2	4.1L	9.1	W215401
W215402	.26	.92L	16	22	.2	6.2	1.2	7.0	13	19	W215402
W215440	.12	.86L	13	14	.2	7.6	1.4	2.9	8.5	20	W215440
W215557	.24	.99L	13	11	.2	6.7	1.4	3.8	8.6	18	W215557
W215558	.11	.86L	12	14	.2	4.4	1.2	3.0	6.2	9.5	W215558
W215559	.078	.37L	7	8.3	.2	3.4	1.8	.83	8.3	14	W215559

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	P PPM	PB PPM	PR-S PPM	RB PPM	RE-S PPM	SB PPM	SC PPM	SE PPM	SM PPM	SN-S PPM	SAMPLE NUMBER
W212066	44L	22	11L	21	1.6L	2.0L	8.8	6.0	3.5	1.6	W212066
W212067	44L	5.2	3.8L	30L	.56L	1.0L	2.0	3.6	.90	.26	W212067
W212068	44L	3.8	3.6L	20L	.53L	1.0L	2.0	2.2	1.0	.24	W212068
W212069	83	11	9.5L	10	1.4L	1.0L	4.8	5.3	2.1	1.8	W212069
W212070	110	5.7	3.5L	40L	.52L	1.0L	3.4	4.0	1.9	.19	W212070
W212071	44L	4.4	2.0L	9	.29L	1.0L	2.5	3.5	1.0	.04L	W212071
W212088	44L	1.5	2.1L	30L	.31L	2.0L	2.9	4.3	1.4	.05L	W212088
W212281	44L	3.7	7.1L	31	1.0L	1.5	2.6	3.0	1.1	.40	W212281
W212282	44L	2.3	4.4L	12	.64L	2.8	2.3	4.7	1.1	.20	W212282
W212497	44L	5.3	3.2	30L	.41L	1.0L	3.3	3.6	.80	.45	W212497
W212498	44L	5.4	4.7L	35L	.69L	1.5L	3.2	3.8	1.3	.17	W212498
W212499	44L	1.3	4.5L	30L	.66L	2.0L	4.7	3.2	.70	.00H	W212499
W212503	44L	10	13	20	1.7L	2.0L	5.5	7.9	2.1	.25L	W212503
W212504	44L	11	12L	21	1.8L	1.0L	5.8	9.2	2.1	.78	W212504
W212594	44L	10	9.8	60L	1.4L	1.0L	3.4	3.6	3.3	1.4	W212594
W212595	44L	7.4	13L	14	1.8L	2.0L	5.6	3.3	2.3	.53	W212595
W212596	44L	4.7	8.5	30L	.98L	2.0	3.4	2.8	1.3	.15L	W212596
W215399	44	7.5	9.4L	21	1.4L	.70	3.8	4.4	1.4	.21L	W215399
W215400	61	4.1	3.6L	30L	.53L	1.3	3.7	2.4	1.3	.18	W215400
W215401	48	8.1	8.6L	30L	1.3L	1.5	3.2	8.8	.90	.00H	W215401
W215402	70	13	9.2L	13	1.4L	.60	4.1	3.3	2.4	3.5	W215402
W215440	79	11	8.6L	40L	1.3L	.70	5.3	9.3	1.9	.79	W215440
W215557	87	7.6	9.9L	24	1.5L	.70	5.1	6.9	2.0	.79	W215557
W215558	87	8.2	8.6L	8	1.3L	.60	4.9	6.2	1.8	.50	W215558
W215559	220	4.3	3.7L	20L	.55L	.70	3.3	5.2	2.0	.18	W215559

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	SR-S PPM	TA PPM	TB PPM	TH PPM	TL-S PPM	TM-S PPM	U PPM	V-S PPM	W PPM	Y-S PPM	SAMPLE NUMBER
W212066	120	0.42	0.61	11	0.73L	0.73L	5.1	38	0.90	14	W212066
W212067	120	.10	.20	1.3	.56	.26L	1.0	13	.80	5.4	W212067
W212068	110	.12	.23	1.6	.24L	.24L	.68	13	.60	6.9	W212068
W212069	220	.60	.36	6.2	.64L	.64L	2.8	25	1.0	9.8	W212069
W212070	190	.10	.41	1.9	.24L	.24L	1.2	16	.45	5.2	W212070
W212071	75	.06	.23	1.0	.13L	.13L	1.4	14	.80	6.1	W212071
W212088	65	.44	.33	2.9	.14L	.14L	1.5	5.6	.95	2.1	W212088
W212281	82	.23	.22	2.2	.48L	.48L	.45	15	.65	3.7	W212281
W212282	83	.20	.26	1.9	.29L	.29L	.93	10	.50	4.5	W212282
W212497	150	.22	.21	2.0	.19L	.19L	.93	14	.70	7.0	W212497
W212498	160	.12	.51	1.8	.32L	.32L	1.9	22	1.1	8.3	W212498
W212499	790	.20L	.59	.70	.30L	.30L	.74	11	2.2	9.9	W212499
W212503	78	.33	.51	4.2	5.6	.78L	2.3	46	.60	6.3	W212503
W212504	71	.44	.33	5.2	2.1	.82L	2.0	39	.90	7.8	W212504
W212594	170	.43	.35	7.9	.63L	.63L	3.1	23	.95	15	W212594
W212595	160	.35	.21	4.8	.85L	.85L	2.4	42	.70	11	W212595
W212596	110	.20	.37	2.3	.45L	.45L	2.1	25	.80	8.1	W212596
W215399	76	.33	.24	2.9	.63L	.63L	.42	15	.80	3.7	W215399
W215400	95	.08	.44	1.4	1.1	.24L	.34L	15	1.9	8.5	W215400
W215401	120	.20L	.36	.80	.58L	.58L	1.1	11	1.6	7.6	W215401
W215402	130	.65	.69	8.7	.62L	.62L	2.4	19	1.5	8.6	W215402
W215440	44	.42	.39	4.6	.58L	.58L	1.8	22	2.0L	6.0	W215440
W215557	63	.33	.45	3.4	.67L	.67L	1.4	31	.74	6.9	W215557
W215558	96	.34	.29	4.2	.58L	.58L	1.6	24	.90	5.4	W215558
W215559	88	.04	.57	1.5	.25L	.25L	1.0	22	.90	8.8	W215559

Table 4.--Major-, Minor-, and Trace-Element Concentrations of 145 Bituminous Coal Samples from the Big Sandy District, Eastern Kentucky Reported on Whole-Coal Basis--Continued.

SAMPLE NUMBER	YB PPM	ZN PPM	ZR-S PPM
W212066	1.6	7.6	38
W212067	.6	3.1	7.8
W212068	.7	4.3	17
W212069	1.1	17	50
W212070	1.0	8.8	4.3
W212071	.9	5.2	4.9
W212088	1.0	4.0	11
W212281	.7	6.1	11
W212282	.9	3.8	7.0
W212497	.8	2.3	19
W212498	1.0	4.9	19
W212499	1.2	6.6	12
W212503	1.3	19	20
W212504	1.2	18	44
W212594	1.8	9.1	58
W212595	1.3	15	42
W212596	.8	12	32
W215399	1.0	15	13
W215400	1.5	6.4	7.4
W215401	1.3	29	5.2
W215402	1.5	16	65
W215440	1.1	6.4	33
W215557	1.4	5.8	16
W215558	1.2	6.8	16
W215559	1.5	4.8	6.1

APPENDIX III:
PETROGRAPHIC ANALYSES

Maceral Composition and Vitrinite Reflectance of Big Sandy District Coals

VIT - Vitrinite
PVT - Pseudovitrinite
FUS - Fusinite
SFS - Semifusinite
MIC - Micrinite
MAC - Macrinite
EX - Exinite
RES - Resinite
Rmax - Vitrinite maximum reflectance (Oil immersion: 546 nm)
S/D - Standard deviation
Rmn - Vitrinite mean reflectance (Oil immersion: 546 nm)

USGS# W-	KCER#	VIT	PVT	FUS	SFS	MIC	MAC	EX	RES	Rmax	S/D	Rmn	S/D
203631	3215	71.6	8.7	2.9	4.2	5.3	.4	6.2	.7	.77	.04	.71	.06
203634	3214	58.8	7.7	3.1	7.0	12.2	1.4	8.7	1.3	.78	.04	.73	.05
205315	3003	62.2	4.2	12.9	6.7	6.2	.1	7.0	.7	.64	.04	.59	.05
205316	3004	64.0	5.3	12.4	7.5	1.9	.1	8.8		.57	.07	.53	.06
205319	3005	71.8	3.9	8.3	1.9	4.0	.1	9.2	.8	.65	.03	.60	.05
205332	3006	58.1	8.4	8.5	7.4	4.3	.4	9.9	3.0	.78	.04	.72	.04
207111	3009	52.8	16.8	7.6	4.0	7.4	.8	10.5	.1	.77	.04	.71	.06
207112	3008	50.9	1.2	10.1	15.4	5.4	.3	14.2	2.5	.72	.03	.66	.05
207113	3010	67.5	3.4	9.4	6.3	4.6	.3	7.6	.9	.73	.03	.67	.05
207114	3011	71.4	3.9	7.0	3.8	5.0		8.9		.75	.03	.70	.05
207474	3015	54.3	1.2	8.4	16.4	6.1	.3	10.9	2.4	.72	.03	.67	.05
207817	3033	56.1	3.7	15.5	5.4	7.8	.3	11.2		.76	.04	.70	.06
207818	3038	52.0	3.7	16.9	9.3	7.2		10.8		.73	.06	.68	.07
207819	3014	61.6	3.3	9.8	9.3	4.8	.3	10.6	.3	.74	.04	.69	.06
207820	3026	70.2	4.7	8.1	2.7	4.7		9.6		.72	.04	.68	.05
207821	3020	67.3	7.8	5.4	4.8	7.4		6.9	.4	.68	.05	.64	.06
207864	3045	58.4	8.0	6.6	8.2	11.7	.9	5.4	.8	.98	.03	.93	.05
207867	3044	52.5	8.8	12.4	7.6	9.5	.6	7.5	1.1	.77	.04	.73	.05
207868	3210	55.3	6.0	6.0	11.5	6.1	.3	12.7	2.1	.72	.04	.68	.04
207870	3211	77.3	5.7	1.8	3.5	5.3		4.5	1.9	.75	.06	.72	.06
207982	3002	69.6	8.7	5.6	2.7	4.3	.2	7.8	1.1	.71	.04	.65	.06
208050	3059	56.4	9.1	9.1	6.6	7.1	.6	10.2	1.0	.78	.04	.73	.05
208051	3057	58.0	7.8	11.1	6.9	6.0	.6	8.3	1.3	.82	.04	.76	.07
208052	3058	57.8	2.7	7.9	15.2	5.5	.4	10.3	.2	.73	.05	.68	.09
208053	3054	61.4	17.2	9.4	3.0	4.1		4.9		.75	.04	.69	.06
208054	3055	68.0	6.1	9.7	1.9	4.8		9.4	.1	.76	.03	.70	.05
208055	3056	42.7	6.7	15.2	9.8	12.7	1.1	11.5	.3	.76	.04	.72	.05
208061	3050	50.2	4.3	9.8	10.6	15.0	1.2	8.6	.3	.84	.04	.81	.05
208062	3051	58.4	8.0	6.6	8.2	11.7	.9	5.4	.8	.98	.03	.93	.05
208100	4109	63.6	7.3	7.7	2.4	8.7		9.5		.78	.04	.73	.05
208101	4116	51.6	20.2	14.9	3.4	4.0	.4	5.3	.2	.78	.04	.73	.05
208104	3060	68.4	11.7	4.8	1.8	5.3		7.7	.3	.77	.03	.71	.05
208105	3061	69.3	7.8	5.2	7.1	3.5	.7	5.9	.5	.69	.04	.65	.05
208197	3062	48.8	6.4	14.4	11.0	8.9	.4	9.5	.6	.70	.05	.66	.05
208198	3063	66.6	11.6	6.2	2.7	5.6	.2	6.4	.7	.68	.03	.65	.04

USGS# W-	KCER#	VIT	PVT	FUS	SFS	MIC	MAC	EX	RES	Rmax	S/D	Rmn	S/D
208208	3066	66.4	13.3	9.4	2.5	3.0		5.2	.2	.88	.03	.82	.06
208209	3067	58.1	10.7	9.6	5.3	8.7	.3	6.7	.6	.71	.04	.67	.04
208210	3068	70.3	8.9	4.3	2.7	6.4		6.5	.9	.78	.03	.73	.04
208211	3069	69.4	10.9	8.1	2.0	3.8	.1	5.4	.3	.76	.03	.71	.05
208212	3070	52.2	5.1	7.0	16.4	4.4	.5	13.0	1.4	.58	.04	.56	.05
208213	3071	83.3	5.5	.2	.4	5.2		4.1	1.3	.61	.03	.58	.03
208214	3072	68.2	11.6	2.6	3.6	6.3		6.9	.9	.82	.04	.77	.06
208215	3073	70.9	14.6	5.7	.4	2.6	.1	5.6	.1	.73	.03	.68	.05
208216	3074	47.4	5.8	15.0	14.4	2.2	2.3	12.1	.8	.67	.04	.64	.05
208218	3025	72.0	5.0	8.5	3.0	3.6		7.9		.74	.04	.68	.08
208219	3024	72.4	2.8	8.1	4.6	5.2		6.9		.83	.03	.77	.06
208220	3022	66.6	4.6	7.9	4.6	3.6	.1	12.5	.1	.81	.03	.75	.06
208224	3052	55.9	3.5	10.5	16.1	5.1		8.7	.2	.78	.05	.73	.06
208225	3053	59.8	6.1	8.4	6.1	5.8	1.0	12.5	.3	.77	.05	.71	.07
209504	4129	61.5	20.1	4.0	.9	7.5	.1	5.7	.2	.69	.03	.66	.04
209505	4130	74.0	4.1	7.7	1.2	3.8		9.2		.68	.02	.64	.04
209676	3075	62.3	19.7	4.5	4.3	4.6	.3	3.0	1.3	1.00	.04	.91	.07
209851	3076	67.7	7.3	10.8	2.4	4.5		6.9	.4	.98	.04	.90	.07
209852	3080	70.0	5.7	9.5	4.6	3.1		7.1		.93	.05	.87	.07
209895	3082	56.1	8.7	16.6	5.7	3.9	.6	7.9	.6	.76	.03	.70	.05
209896	3083	58.6	11.0	10.5	7.2	5.1	.3	5.5	1.8	.77	.04	.71	.06
209897	3085	49.8	12.4	10.8	10.4	7.4	.3	6.0	2.9	.72	.05	.67	.06
210026	3086	59.3	11.1	10.4	6.0	3.5	.6	7.0	2.1	.79	.05	.71	.07
210027	3087	58.6	9.1	7.6	8.7	6.7	.2	7.3	1.8	.78	.04	.69	.07
210028	3088	59.3	9.5	11.3	9.5	4.0	.5	4.6	1.3	.77	.04	.68	.06
210029	3089	38.9	2.6	11.7	16.5	16.4	.5	10.4	3.0	.80	.06	.68	.08
210030	3090	69.8	7.8	8.0	5.0	3.7		4.5	1.2	.78	.05	.68	.07
210154	3091	68.4	15.5	3.7	2.9	2.4	.2	5.7	1.2	1.01	.05	.94	.07
210155	3092	58.6	15.7	5.9	5.5	6.7	.4	5.5	1.7	.91	.05	.86	.07
210156	3093	64.6	12.3	3.5	2.4	5.6	.1	9.0	2.5	.68	.03	.64	.04
210157	3094	56.2	10.3	4.4	11.4	8.5	.1	6.0	3.1	.80	.05	.73	.07
210158	3095	62.7	6.1	4.5	3.7	10.2	.2	11.5	1.1	.76	.05	.72	.06
210161	3097	61.8	12.4	6.7	6.2	5.4	.3	6.7	.6	.99	.05	.93	.06
210162	3098	58.6	11.8	7.9	7.3	3.7	.3	9.9	.6	.92	.06	.87	.07
210163	3099	61.0	13.3	7.3	7.6	2.4	.2	7.5	.7	1.01	.04	.93	.08
210164	3100	69.8	11.5	3.0	5.7	1.6		7.0	1.4	.95	.06	.89	.07
210262	3102	61.9	6.3	5.0	9.3	7.5	.1	8.6	1.3	.76	.04	.69	.06
210263	3103	60.8	6.1	6.0	10.4	6.1	.6	8.2	1.8	.77	.05	.72	.06
210264	3104	59.1	3.1	4.8	13.9	8.9	.2	8.3	1.7	.75	.06	.64	.07
210287	3064	63.9	9.3	6.5	4.4	6.6	.3	8.8	.2	.74	.03	.69	.05
210288	3065	58.6	6.9	7.4	9.2	8.1	.2	9.0	.6	.81	.04	.77	.09
210293	3084	37.9	.6	3.7	1.8	44.9		9.8	1.3	.72	.06	.68	.07
210315	4156	59.9	5.0	6.1	12.5	5.9		9.3	1.3	.75	.06	.71	.06
210316	3105	62.9	13.6	3.3	5.1	6.5	.1	7.0	1.5	.65	.05	.61	.05
210317	1102	60.9	14.4	4.7	6.3	5.1		8.1	.6	.95	.05	.91	.07
210318	1103	60.3	15.8	4.3	2.9	7.0	.2	9.0	.5	.92	.05	.85	.07

USGS# W-	KCER#	VIT	PVT	FUS	SFS	MIC	MAC	EX	RES	Rmax	S/D	Rmn	S/D
210319	4157	68.0	9.0	4.6	5.0	3.1	.2	9.9	.2	.94	.06	.88	.07
210343	3106	69.8	9.3	4.2	4.6	3.3	.3	7.0	1.5	.87	.04	.79	.06
210344	3107	70.7	7.7	3.0	4.4	6.9	.1	6.5	.7	.72	.03	.68	.04
210345	3108	53.6	6.1	7.5	12.5	9.5	.6	8.0	2.2	.74	.04	.68	.05
210428	3109	73.9	6.2	2.9	8.8	3.6	.3	3.9	.4	.84	.05	.79	.07
210429	3110	68.8	8.2	3.3	8.9	6.4	.4	2.9	1.1	.76	.05	.71	.06
210430	3111	65.2	9.9	6.2	8.7	2.8	.5	5.1	1.6	1.00	.07	.92	.08
210431	3112	64.9	13.2	8.5	4.4	4.7	.4	3.7	.2	1.02	.04	.95	.07
210501	3113	67.7	12.1	4.4	4.7	3.5	.3	5.2	2.1	.81	.04	.74	.06
210502	3114	63.5	3.4	3.6	10.8	8.2	.4	9.0	1.1	.82	.05	.75	.06
211630	3132	60.6	8.4	7.6	9.8	4.7	.2	7.5	1.2	.77	.06	.73	.06
211634	3133	64.7	6.3	4.2	8.0	7.4	.2	8.0	1.2	.80	.04	.74	.05
211635	3134	63.4	7.8	4.2	10.9	6.0	.3	6.7	.8	.77	.04	.73	.06
211636	3135	61.0	9.4	5.2	9.5	7.1	.6	6.2	1.0	.81	.04	.74	.05
211637	3136	55.4	8.6	8.6	10.9	8.0	.4	6.7	1.4	.82	.05	.78	.06
211685	3137	65.7	10.4	3.2	7.5	5.4	.6	5.5	1.7	.84	.05	.78	.07
211686	3138	55.0	4.9	7.2	16.2	6.9	.1	8.7	1.0	.77	.05	.71	.06
211687	3139	64.6	7.8	4.5	6.5	3.7		11.7	1.2	.79	.03	.74	.05
211688	3140	57.4	5.0	6.0	16.5	4.8	1.3	7.4	1.6	.79	.06	.74	.07
211689	3141	58.0	8.8	7.0	11.3	5.5	.1	8.6	.8	.79	.05	.73	.06
211690	3142	52.7	3.9	6.1	14.8	6.9	.3	14.3	1.0	.78	.04	.73	.06
211691	3143	54.8	4.3	7.4	15.4	8.1	.6	7.1	2.3	.80	.06	.73	.08
211692	3146	60.9	7.1	4.6	12.2	8.5	.1	3.8	2.8	.85	.05	.79	.06
211693	3147	56.1	17.0	7.6	3.7	7.1		8.1	.4	.90	.07	.84	.08
211694	3148	57.1	7.8	8.2	9.1	8.5	.2	9.1		.77	.04	.72	.05
212056	3150	58.3	15.0	4.4	7.0	3.5	.8	8.4	2.6	.81	.03	.75	.06
212057	3151	55.7	11.1	6.5	10.4	7.3	.2	8.1	.7	.79	.04	.74	.06
212058	3152	62.2	20.4	5.2	2.0	4.6	.1	5.0	.5	.85	.03	.79	.06
212059	3153	53.2	8.9	6.0	12.6	9.0	.4	8.0	1.9	1.01	.06	.93	.09
212060	3154	54.9	12.3	4.2	9.8	9.8	.7	6.4	1.9	.98	.04	.90	.07
212061	3155	56.1	22.1	5.6	4.1	4.8	.2	6.1	1.0	.97	.05	.91	.06
212062	3156	50.2	6.9	9.3	13.0	9.6	.9	7.5	2.6	1.00	.05	.93	.07
212063	3157	59.8	5.5	4.3	13.4	9.6	.5	5.0	2.0	.86	.05	.81	.06
212064	3158	68.0	10.9	2.8	3.7	6.7	.3	6.3	1.3	.99	.04	.92	.07
212065	3159	66.1	6.2	5.4	5.0	9.6	.4	6.5	.8	.99	.06	.91	.07
212066	3160	58.2	10.3	5.6	10.0	6.0	1.0	7.3	1.6	.99	.05	.94	.07
212067	3161	68.9	21.1	2.0	2.3	3.3	.1	2.2	.1	1.01	.06	.95	.07
212068	3162	64.6	11.6	4.0	5.8	8.2	.4	4.3	1.1	.97	.07	.91	.08
212069	3163	61.1	8.8	4.6	9.3	8.8	.1	5.7	1.6	.88	.05	.79	.08
212070	3164	63.0	11.2	5.8	5.9	6.0	.3	6.8	1.0	.94	.05	.88	.06
212071	3165	62.9	15.2	6.0	3.7	4.6		6.9	.7	.98	.03	.93	.05
212088	3149	68.7	7.9	3.9	6.7	6.1	.1	5.4	1.2	.75	.04	.71	.05
212281	3166	62.0	15.5	7.2	4.4	3.3	.1	6.5	1.0	1.10	.05	1.02	.08
212282	3167	59.9	10.2	5.7	7.8	7.2	.2	7.3	1.7	1.03	.07	.95	.09
212497	3168	52.9	10.6	8.7	9.2	9.4	.2	7.6	1.2	.85	.03	.78	.05
212498	3169	62.6	15.5	5.9	4.2	4.9	.3	4.6	.2	.85	.03	.78	.06

USGS# W-	KCER#	VIT	PVT	FUS	SFS	MIC	MAC	EX	RES	Rmax	S/D	Rmn	S/D
212499	3170	73.9	13.1	1.1	.6	3.8	.1	6.0	1.4	.70	.03	.66	.04
212503	3171	64.0	8.7	7.2	6.3	5.6	.1	6.9	1.2	.73	.03	.68	.05
212504	3172	60.6	9.6	5.1	10.2	5.8		8.5	.2	.78	.03	.72	.06
212596	3191	51.2	3.2	5.5	16.9	12.2	.5	10.0	.5	.75	.05	.90	.08
215399	3193	55.3	13.4	5.4	8.7	5.4	.2	9.1	2.5	.92	.04	.87	.06
215400	3194	74.2	11.2	3.4	2.7	2.0	.2	4.8	1.5	.87	.05	.81	.06
215401	3195	72.7	7.4	4.1	2.6	4.2	.4	7.3	1.3	.71	.03	.68	.04
215402	3196	65.0	7.4	8.8	4.8	6.7	.7	6.4	.2	.88	.04	.93	.06
215440	3203	55.9	2.8	9.1	9.3	10.5	.1	10.1	2.2	.71	.05	.67	.06
215557	3207	68.8	11.7	3.3	6.0	3.4	.4	4.5	1.9	.79	.05	.75	.06
215558	3208	52.1	6.4	4.9	17.3	6.4	.2	10.6	2.1	.76	.04	.71	.05
215559	3209	60.8	9.1	5.2	7.4	4.3	.6	9.4	2.9	.75	.03	.70	.04
215671	3027	70.3	10.2	4.7	1.6	5.0	.2	7.4	.6	.70	.08	.64	.08

COUNTY	7 1/2' QUADRANGLE	COAL NAME USED ON GQ	USGS ID NO.
Floyd	Harold	Low Peach Orchd	W207474
Floyd	Harold	Fire Clay	W210315
Floyd	Harold	Peach Orchard	W208220
Floyd	Harold	U Elkhorn No.2	W207864
Floyd	Harold	Fire Clay	W207867
Floyd	Harold	Peach Orchard	W208218
Floyd	Harold	Low Peach Orchd	W297819
Floyd	Harold	Low Peach Orchd	W215671
Floyd	Harold	Peach Orchard	W208219
Floyd	Lancer	Broas	W209897
Floyd	Lancer	Broas	W207817
Floyd	Lancer	Broas	W207818
Floyd	Martin	Fire Clay	W208215
Floyd	Martin	Fire Clay rdr	W208214
Floyd	Martin	U Elkhorn No.3	W208209
Floyd	Martin	U Elkhorn No.1	W208211
Floyd	Martin	Taylor	W208213
Floyd	Martin	U Elkhorn No.2	W208198
Floyd	Martin	Fire Clay	W208216
Floyd	Martin	Taylor	W208212
Floyd	Martin	U Elkhorn No.3	W208210
Floyd	McDowell	U Elkhorn No.3	W210317
Floyd	McDowell	U Elkhorn No.3	W210318
Floyd	McDowell	U Elkhorn No.2	W211630
Floyd	McDowell	U Elkhorn No.2	W210316
Floyd	Pikeville	Fire Clay	W211692
Floyd	Prestonsburg	U Elkhorn No.3	W207821
Floyd	Prestonsburg	Richardson	W207113
Floyd	Prestonsburg	U Elkhorn No.3	W207820
Floyd	Prestonsburg	Richardson	W207111
Floyd	Prestonsburg	U Elkhorn No.3	W207114
Floyd	Prestonsburg	Richardson	W207112
Floyd	Wayland	U Elkhorn No.2	W209504
Floyd	Wayland	U Elkhorn No.1	W208100
Floyd	Wayland	Whitesburg	W208104
Floyd	Wayland	U Elkhorn No.3	W208101
Floyd	Wayland	Fire Clay	W208197
Floyd	Wayland	Whitesburg	W208105
Floyd	Wayland	U Elkhorn No.2	W209505
Floyd	Wheelwright	Fire Clay	W215402
Floyd	Wheelwright	U Elkhorn No.1	W210319
Johnson	Offutt	U Peach Orchd	W210293
Johnson	Offutt	U Peach Orchd	W209896
Johnson	Offutt	Broas	W203624
Johnson	Offutt	Broas	W203623
Johnson	Offutt	U Peach Orchd	W209895
Johnson	Redbush	Van Lear	W203634

COUNTY	7 1/2' QUADRANGLE	COAL NAME USED ON GQ	USGS ID NO.
Johnson	Redbush	Van Lear	W203631
Johnson	Sitka	Hazard	W205319
Johnson	Sitka	Peach Orchard	W205316
Johnson	Sitka	Van Lear	W205315
Martin	Inez	U Peach Orchd	W207982
Martin	Inez	Broas	W205332
Martin	Inez	U Peach Orchd	W210502
Martin	Inez	U Richardson	W212504
Martin	Inez	U Peach Orchd	W210501
Martin	Kermit	Broas	W211634
Martin	Kermit	Peach Orchard	W211687
Martin	Kermit	Taylor	W212596
Martin	Kermit	Peach Orchard	W211635
Martin	Kermit	Peach Orchard	W211688
Martin	Milo	U Peach Orchd	W210026
Martin	Milo	Richardson	W210030
Martin	Milo	U Peach Orchd	W210027
Martin	Milo	Richardson	W210028
Martin	Milo	Richardson	W210029
Martin	Naugatuck	Pond Creek	W211636
Martin	Naugatuck	Taylor	W208055
Martin	Naugatuck	U Peach Orchd	W208052
Martin	Naugatuck	U Peach Orchd	W208225
Martin	Naugatuck	Low Peach Orchd	W208053
Martin	Naugatuck	Winifrede	W208054
Martin	Naugatuck	Broas	W208050
Martin	Naugatuck	Broas	W208051
Martin	Naugatuck	Pond Creek	W211637
Martin	Naugatuck	U Peach Orchd	W208224
Martin	Offutt	Broas	W210262
Martin	Offutt	Richardson	W210263
Martin	Thomas	Richardson	W211689
Martin	Thomas	Broas	W210264
Martin	Thomas	Richardson	W211690
Martin	Thomas	Broas	W211686
Martin	Thomas	Pond Creek	W211685
Martin	Thomas	Upper Broas	W211691
Martin	Thomas	Richardson	W215440
Martin	Thomas	Peach Orchard	W212503
Martin	Williamson	U Peach Orchd	W208203
Martin	Williamson	U Peach Orchd	W208204
Pike	Belfry	Pond Creek	W209676
Pike	Broad Bottom	Peach Orchard	W215559
Pike	Broad Bottom	U Elkhorn No.2	W212498
Pike	Broad Bottom	Peach Orchard	W215558
Pike	Broad Bottom	Peach Orchard	W215557
Pike	Broad Bottom	U Elkhorn No.1	W212497

COUNTY	7 1/2' QUADRANGLE	COAL NAME USED ON GQ	USGS ID NO.
Pike	Broad Bottom	unnamed	W212499
Pike	Dorton	U Elkhorn No.1	W210162
Pike	Dorton	Fire Clay	W212594
Pike	Dorton	Fire Clay rdr	W212595
Pike	Dorton	Lower Elkhorn	W210154
Pike	Dorton	U Elkhorn No.2	W209852
Pike	Dorton	U Elkhorn 3 rdr	W210163
Pike	Dorton	U Elkhorn No.2	W209851
Pike	Dorton	U Elkhorn No.2	W210161
Pike	Elkhorn City	Splash Dam	W208062
Pike	Elkhorn City	Hagy	W208061
Pike	Hellier	U Elkhorn No.2	W212282
Pike	Hellier	Lower Elkhorn	W212281
Pike	Hellier	U Elkhorn No.3	W212071
Pike	Hellier	U Elkhorn No.3	W212070
Pike	Hellier	U Elkhorn No.3	W212069
Pike	Hellier	U Elkhorn 3 1/2	W212068
Pike	Hurley	Alma	W212060
Pike	Hurley	Williamson	W212064
Pike	Hurley	unnamed	W212065
Pike	Hurley	Upper Alma	W212061
Pike	Hurley	Pond Creek	W212059
Pike	Hurley	Low Cedar Grove	W212067
Pike	Hurley	Williamson	W212063
Pike	Hurley	Upper Alma	W212062
Pike	Hurley	Low Cedar Grove	W212066
Pike	Lick Creek	Pond Creek rdr	W210287
Pike	Lick Creek	Pond Creek	W208208
Pike	Lick Creek	Pond Creek rdr	W210288
Pike	Matewan	Fire Clay	W210428
Pike	Matewan	Fire Clay rdr	W210429
Pike	Matewan	Hamlin	W210430
Pike	Matewan	Pond Creek	W210431
Pike	Meta	Low Peach Orchd	W212057
Pike	Meta	Low Peach Orchd	W212056
Pike	Meta	U Peach Orchd	W212058
Pike	Millard	U Elkhorn 2 & 1	W210155
Pike	Millard	U Elkhorn 2 & 1	W210158
Pike	Millard	U Elkhorn No.3	W210156
Pike	Millard	U Elkhorn No.3	W210157
Pike	Pikeville	U Elkhorn No.2	W211693
Pike	Pikeville	Millard	W210164
Pike	Pikeville	Amburgy	W212088
Pike	Varney	Upper Broas	W211694
Pike	Varney	Low Richardson	W210345
Pike	Williamson	Williamson	W210344
Pike	Williamson	Alma	W215401

COUNTY	7 1/2' QUADRANGLE	COAL NAME USED ON GQ	USGS ID NO.
Pike	Williamson	Pond Creek	W215399
Pike	Williamson	unnamed	W215400
Pike	Williamson	Williamson	W207868
Pike	Williamson	Pond Creek	W210343
Pike	Williamson	Williamson	W207870

INDEX OF COAL SAMPLES BY BED NAME, WITH SAMPLED INTERVAL AND SAMPLING REGIME

COAL NAME USED ON GQ	INTERVAL SAMPLED	SAMPLING REGIME	USGS ID NO.
Alma	full thickness	Holmes	W212060
Alma	full thickness	Holmes	W215401
Amburgy	full thickness	Holmes	W212088
Broas	bottom bench	unknown	W203624
Broas	full thickness	Swanson & Huffman	W208050
Broas	full thickness	Holmes	W210262
Broas	full thickness	Swanson & Huffman	W208051
Broas	full thickness	unknown	W205332
Broas	full thickness	Swanson & Huffman	W207818
Broas	full thickness	Holmes	W207817
Broas	full thickness	Holmes	W211634
Broas	full thickness	Holmes	W211686
Broas	full thickness	Swanson & Huffman	W210264
Broas	full thickness	Holmes	W209897
Broas	top bench	unknown	W203623
Fire Clay	bottom bench	Swanson & Huffman	W208216
Fire Clay	full thickness	Holmes	W210428
Fire Clay	full thickness	Swanson & Huffman	W207867
Fire Clay	full thickness	Holmes	W210315
Fire Clay	full thickness	Holmes	W215402
Fire Clay	full thickness	Swanson & Huffman	W208197
Fire Clay	full thickness	Holmes	W211692
Fire Clay	full thickness	TK partings included	W212594
Fire Clay	top bench	Swanson & Huffman	W208215
Fire Clay rdr	full thickness	Holmes	W208214
Fire Clay rdr	full thickness	Holmes	W210429
Fire Clay rdr	full thickness	Swanson & Huffman	W212595
Hagy	full thickness	Swanson & Huffman	W208061
Hamlin	full thickness	Holmes	W210430
Hazard	full thickness	unknown	W205319
Low Cedar Grove	bottom split	Holmes	W212066
Low Cedar Grove	top split	Holmes	W212067
Low Peach Orchd	bottom bench	TK partings included	W207819
Low Peach Orchd	bottom split	Holmes	W208053
Low Peach Orchd	bottom split	Holmes	W212056
Low Peach Orchd	middle bench	Swanson & Huffman	W215671
Low Peach Orchd	top bench	Swanson & Huffman	W207474
Low Peach Orchd	top split	Holmes	W212057
Low Richardson	full thickness	Holmes	W210345
Lower Elkhorn	full thickness	Holmes	W212281
Lower Elkhorn	full thickness	Holmes	W210154
Millard	full thickness	Holmes	W210164
Peach Orchard	2nd split from bottom	Holmes	W215559
Peach Orchard	3rd split from bottom	Holmes	W215558

COAL NAME USED ON GQ	INTERVAL SAMPLED	SAMPLING REGIME	USGS ID NO.
Peach Orchard	4th split from bottom	Holmes	W215557
Peach Orchard	bottom bench	Holmes	W208220
Peach Orchard	bottom split	Holmes	W211688
Peach Orchard	full thickness	unknown	W205316
Peach Orchard	middle bench	Holmes	W208219
Peach Orchard	middle split	Holmes	W211687
Peach Orchard	middle split	Holmes	W212503
Peach Orchard	top bench	Holmes	W208218
Peach Orchard	top split	Holmes	W211635
Pond Creek	full thickness	Holmes	W209676
Pond Creek	full thickness	Holmes	W208208
Pond Creek	full thickness	Holmes	W211637
Pond Creek	full thickness	Holmes	W210343
Pond Creek	full thickness	Holmes	W212059
Pond Creek	full thickness	Holmes	W211636
Pond Creek	full thickness	Holmes	W211685
Pond Creek	full thickness	Holmes	W215399
Pond Creek	top split	Holmes	W210431
Pond Creek rdr	bottom split	Holmes	W210288
Pond Creek rdr	top split	Holmes	W210287
Richardson	bottom bench	Swanson & Huffman	W210029
Richardson	bottom bench	Holmes	W211690
Richardson	bottom bench	Swanson & Huffman	W207113
Richardson	full thickness	Swanson & Huffman	W210263
Richardson	full thickness	Holmes	W215440
Richardson	middle bench	Swanson & Huffman	W207112
Richardson	rdr	Holmes	W210028
Richardson	top bench	Holmes	W211689
Richardson	top bench	Swanson & Huffman	W210030
Richardson	top bench	Swanson & Huffman	W207111
Splash Dam	full thickness	Swanson & Huffman	W208062
Taylor	bottom split	Swanson & Huffman	W208212
Taylor	full thickness	Swanson & Huffman	W208055
Taylor	full thickness	Holmes	W212596
Taylor	top split	Holmes	W208213
U Elkhorn 3 1/2	full thickness	Holmes	W212068
U Elkhorn 3 rdr	rdr	Holmes	W210163
unnamed	full thickness	Holmes	W215400
unnamed	full thickness	Holmes	W212065
unnamed	full thickness	Holmes	W212499
U Elkhorn 2 & 1	full thickness	Holmes	W210155
U Elkhorn 2 & 1	rdr	Holmes	W210158
U Elkhorn No.1	full thickness	Swanson & Huffman	W208211
U Elkhorn No.1	full thickness	Holmes	W210319
U Elkhorn No.1	full thickness	Swanson & Huffman	W208100
U Elkhorn No.1	full thickness	Holmes	W210162

COAL NAME USED ON GQ	INTERVAL SAMPLED	SAMPLING REGIME	USGS ID NO.
U Elkhorn No.1	full thickness	Holmes	W212497
U Elkhorn No.2	bottom split	Holmes	W208198
U Elkhorn No.2	bottom split	Holmes	W209504
U Elkhorn No.2	full thickness	Swanson & Huffman	W207864
U Elkhorn No.2	full thickness	Holmes	W211630
U Elkhorn No.2	full thickness	Holmes	W210161
U Elkhorn No.2	full thickness	3 x 3 in.	W209851
U Elkhorn No.2	full thickness	Holmes	W210316
U Elkhorn No.2	full thickness	Holmes	W212498
U Elkhorn No.2	full thickness	Holmes	W212282
U Elkhorn No.2	full thickness	Swanson & Huffman	W209852
U Elkhorn No.2	full thickness	Holmes	W211693
U Elkhorn No.2	top split	Holmes	W209505
U Elkhorn No.3	2nd rdr	Holmes	W210156
U Elkhorn No.3	bottom split	Holmes	W210318
U Elkhorn No.3	bottom split	Holmes	W212071
U Elkhorn No.3	bottom split	Holmes	W208210
U Elkhorn No.3	full thickness	Holmes	W210157
U Elkhorn No.3	full thickness	Swanson & Huffman	W207821
U Elkhorn No.3	full thickness	Holmes	W207114
U Elkhorn No.3	full thickness	Holmes	W208101
U Elkhorn No.3	full thickness	Swanson & Huffman	W207820
U Elkhorn No.3	middle split	Holmes	W212070
U Elkhorn No.3	top split	Holmes	W210317
U Elkhorn No.3	top split	Swanson & Huffman	W208209
U Elkhorn No.3	top split	Holmes	W212069
U Peach Orchd	bottom bench	Holmes	W210027
U Peach Orchd	bottom bench	Swanson & Huffman	W208225
U Peach Orchd	bottom bench	Swanson & Huffman	W208204
U Peach Orchd	bottom split	Swanson & Huffman	W209896
U Peach Orchd	bottom split	Holmes	W212058
U Peach Orchd	full thickness	TK partings included	W208052
U Peach Orchd	full thickness	unknown	W207982
U Peach Orchd	middle split	Holmes	W210501
U Peach Orchd	rdr	Holmes	W210293
U Peach Orchd	top bench	Swanson & Huffman	W208224
U Peach Orchd	top bench	Swanson & Huffman	W208203
U Peach Orchd	top bench	Holmes	W210026
U Peach Orchd	top split	Holmes	W210502
U Peach Orchd	top split	Holmes	W209895
U Richardson	full thickness	Holmes	W212504
Upper Alma	bottom split	Holmes	W212062
Upper Alma	top split	Holmes	W212061
Upper Broas	full thickness	Holmes	W211691
Upper Broas	full thickness	Holmes	W211694
Van Lear	full thickness	unknown	W203631
Van Lear	full thickness	unknown	W203634

COAL NAME USED ON GQ	INTERVAL SAMPLED	SAMPLING REGIME	USGS ID NO.
Van Lear	full thickness	unknown	W205315
Whitesburg	bottom bench	Swanson & Huffman	W208105
Whitesburg	top bench	Holmes	W208104
Williamson	bottom split	Holmes	W212064
Williamson	full thickness	Swanson & Huffman	W207870
Williamson	full thickness	Swanson & Huffman	W207868
Williamson	full thickness	Holmes	W210344
Williamson	top split	Holmes	W212063
Winifrede	full thickness	Holmes	W208054