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DOE/ET/10615-17(App.8A)
(DE82017040)

THE CHARACTERISTICS OF AMERICAN COALS IN RELATION TO
THEIR CONVERSION INTO CLEAN ENERGY FUELS

Final Report. Appendix VIII A

MASTER

By
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June 1982
Date Published

Work Performed Under Contract No. AC01-76ET10615

Pennsylvania State University
University Park, Pennsylvania

U. S. DEPARTMENT OF ENERGY

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DOE/ET/10615-17(App.8A)

(FE-2030-17(App.8A)

(DE82017040)

Distribution Categories UC-90a, UC-90b, UC-90c, UC-90d, and UC-90e

APPENDIX VIII-A

Representative Compositional Data
on
Full Seam Samples
(PSOC-357 to PSOC-794)

** PENN STATE COAL DATA BASE **

** PSOC-357 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-357
COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
COLLECTION DATE 10/ 6/75
COLLECTOR'S NUMBER 357
REPORTED RANK HIGH VOLATILE A BITUMINOUS (HVAB)
SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION LITHOTYPE DATA AVAILABLE
SAMPLE RESERVE

SEAM NAME LOWER ELKHORN
ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 5 FT. 3 IN.
THICKNESS OF SEAM SAMPLED 5 FT. 3 IN.
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE KENTUCKY
COUNTY PIKE
TOWNSHIP
NEAREST TOWN MOUTHCARD

COAL PROVINCE EASTERN
COAL REGION APPALACHIAN
COAL FIELD

MAP REFERENCE: LATITUDE 37D 25M 30S
LONGITUDE 82D 13M 20S
QUADRANGLE JAMBORE 7.5

** PENN STATE COAL DATA BASE **

 ** PSOC-357 **
 ** PAGE 3 **

SEAM NAME LOWER ELKHORN COUNTRY U.S.A.
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB) STATE KENTUCKY

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	1.36					
% ASH	10.69	10.84				
% VOLATILE MATTER	30.80	31.22	35.02	34.26	33.75	
% FIXED CARBON	57.15	57.94	64.98	65.74	66.25	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	13741	13554	13425
MM-FREE (PARR)	15584	15343	15178
MM-FREE (MOD.P)	15662	15391	15224
BEST MM FREE		15391	15224

NET CV, DMMF BTU/LB 15143
 ASH-FREE 15412

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	2.30	2.61
% TOTAL SULFUR	0.51	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE A BITUMINOUS (HVAB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE A BITUMINOUS (HVAB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE A BITUMINOUS (HVAB)
INTERNATIONAL RANK	
AS REC'D MOIST.	630
EQUIL. MOIST.	630
REPORTED RANK	HIGH VOLATILE A BITUMINOUS (HVAB)

** PENN STATE COAL DATA BASE **

 ** PSOC-357 **
 ** PAGE 4 **

SEAM NAME LOWER ELKHORN
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)
-----	-----	---	---	-----
				(11.99 %MM)
% ASH	10.69	10.84		
% CARBON	76.08	77.13	86.51	87.64
% HYDROGEN	4.85*	4.92	5.52	5.59
% NITROGEN	1.31	1.33	1.49	1.51
% SULFUR	0.50	0.51	0.57	
% CHLORINE	0.03	0.03	0.03	0.03
% OXYGEN(DIFF)	5.17*	5.24	5.88	5.23

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	0.03	0.00	0.48	0.51
DAF	0.03	0.00	0.54	0.57

OPTICAL.

ELEMENTAL ANALYSIS	DRY	DMMF (MOD.P)	DMMF (DIR.)
-----	---	-----	-----
		(12.28%MM)	(%MM)
% CARBON	76.98	87.75	
% HYDROGEN	4.78	5.45	
% NITROGEN	1.33	1.51	
% ORGANIC SULFUR	0.48	0.55	
% OXYGEN(DIFF)	4.16	4.71	
% CHLORINE	0.03	0.03	
% MINERAL MATTER	12.28		
(INCLUDES 0.06 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.766	0.746	
ATOMIC O/C	0.045	0.046	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH	3.10	3.53	74.61
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.06		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-357 **
 ** PAGE 5 **

SEAM NAME LOWER ELKHORN
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 0.80
 % HIGH TEMPERATURE ASH = 10.30 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	58.70	2.83
B			AL2O3	28.80	1.57
BA	2580	266	TiO2	1.52	0.09
BE	20	2	Fe2O3	3.40	0.24
BI	< 20	2	MgO	1.13	0.07
CE	< 100	10	CaO	0.84	0.06
CO	120	12	Na2O	0.55	0.04
CR	240	25	K2O	3.55	0.30
CU	150	15	P2O5	0.08	0.00
GA	54	6	SO3	0.60	0.02
GE	< 25	3			
LA	76	8			
LI					
MN	85	9			
MO			VOLATILES		PPM TOTAL COAL
NI	150	15	AS		
NB	< 20	2	BR		
PB	56	6	CD		
RB			CL		
SC	43	4	F		
SN	< 10	1	HG		
SR	700	72	SB		
TH			SE		
U	< 8	1			
V	300	31			
Y	140	14			
YB	29	3			
ZN	86	9			
ZR	360	37			

** PENN STATE COAL DATA BASE **

 ** PSOC-357 **
 ** PAGE 7 **

SEAM NAME LOWER ELKHORN
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION COMBINED WHITE AND BLUE LIGHT

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	71.9	76.6	66.4
INERTINITE (CALC.)	15.8	16.8	16.1
LIPTINITE (CALC.)	6.3	6.7	5.5
MINERAL MATTER (CALC.)	6.2		12.0
VITRINOIDS			
VITRINITE	52.2	55.6	48.2
PSEUDOVITRINITE	19.7	21.0	18.2
FUSINITE	6.0	6.4	6.4
SEMI-FUSINITE	4.8	5.1	4.8
MACRINITE	1.4	1.5	1.4
MICRINITE	3.6	3.8	3.5
SCLEROTINITE	0.0	0.0	0.0
SPORINITE	5.7	6.1	5.0
CUTINITE	0.0	0.0	0.0
EXINITE (ANAL.)			
RESINITE	0.6	0.6	0.5
SUBERINITE			
EXUDATINITE	0.0	0.0	0.0
FLUORINITE	0.0	0.0	0.0
BITUMINITE	0.0	0.0	0.0
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE	0.0	0.0	0.0
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	1.15	0.88	0.27	1.02	
PSEUDOVITRINITE	1.26	0.97	0.29	1.11	
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-363 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-363
COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
COLLECTION DATE 10/ 8/75
COLLECTOR'S NUMBER 363
REPORTED RANK HIGH VOLATILE A BITUMINOUS (HVAB)
SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
SAMPLE RESERVE
SEAM NAME HAZARD #5A
ALTERNATE SEAM NAME
TOTAL SEAM THICKNESS 3 FT. 2 IN.
THICKNESS OF SEAM SAMPLED 3 FT. 2 IN.
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE KENTUCKY
COUNTY PERRY
TOWNSHIP
NEAREST TOWN HAZARD
COAL PROVINCE EASTERN
COAL REGION APPALACHIAN
COAL FIELD

MAP REFERENCE: LATITUDE 37D 17M 50S
LONGITUDE 83D 12M 50S
QUADRANGLE HAZARD NORTH 7.5

** PENN STATE COAL DATA BASE **

 ** PSOC-363 **
 ** PAGE 3 **

SEAM NAME HAZARD #5A
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	3.79					
% ASH	9.12	9.48				
% VOLATILE MATTER	34.64	36.00	39.77	39.11	38.76	
% FIXED CARBON	52.45	54.52	60.23	60.89	61.24	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	13369	12862	12580
MM-FREE (PARR)	14920	14290	13942
MM-FREE (MOD.P)	14979	14306	13957
BEST MM FREE		14306	13957
NET CV, DMMF BTU/LB	14458		
ASH-FREE	14769		

MOTT-SPOONER DIFFERENCE = 5.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	5.90	6.60
% TOTAL SULFUR	0.74	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE A BITUMINOUS (HVAB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE B BITUMINOUS (HVBB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE A BITUMINOUS (HVAB)
INTERNATIONAL RANK	
AS REC'D MOIST.	610
EQUIL. MOIST.	610
REPORTED RANK	HIGH VOLATILE A BITUMINOUS (HVAB)

** PSOC-363 **
** PAGE 4 **

COUNTRY U.S.A.
STATE KENTUCKY

```
*****
*                                     *
*  CHEMICAL DATA. 2  *
*                                     *
*****
```

(10.65 %MM)

OPTICAL

(INCLUDES 0.11 % FES2)

ATOMIC H/C

% O AS COOH

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-363 **
 ** PAGE 5 **

SEAM NAME HAZARD #5A
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 2.00
 % HIGH TEMPERATURE ASH = 9.82 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	54.10	2.48
B			Al2O3	31.10	1.62
BA	1490	146	TiO2	1.81	0.11
BE	14	1	Fe2O3	3.86	0.27
BI	< 20	2	MgO	0.83	0.05
CE	150	15	CaO	2.09	0.15
CO	130	13	Na2O	0.32	0.02
CR	320	31	K2O	2.08	0.17
CU	250	25	P2O5	0.42	0.02
GA	62	6	SO3	1.20	0.05
GE	< 25	2			
LA	120	12			
LI					
MN	160	16			
MO			VOLATILES		PPM TOTAL COAL
NI	240	24	AS		
NB	< 20	2	BR		
PB	100	10	CD		
RB			CL		
SC	50	5	F		
SN	< 10	1	HG		
SR	3030	298	SB		
TH			SE		
U	12	1			
V	350	34			
Y	120	12			
YB	13	1			
ZN	92	9			
ZR	500	49			

** PENN STATE COAL DATA BASE **

 ** PSOC-363 **
 ** PAGE 7 **

SEAM NAME HAZARD #5A
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION COMBINED WHITE AND BLUE LIGHT

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %		
VITRINITE (CALC.)	57.0	60.3	53.3		
INERTINITE (CALC.)	20.0	21.1	20.6		
LIPTINITE (CALC.)	17.7	18.7	15.5		
MINERAL MATTER (CALC.)	5.4		10.6		
VITRINOLDS					
VITRINITE	50.6	53.5	47.3		
PSEUDOVITRINITE	6.4	6.8	6.0		
FUSINITE	6.6	7.0	7.1		
SEMI-FUSINITE	7.9	8.4	8.0		
MACRINITE	1.7	1.8	1.7		
MICRINITE	3.7	3.9	3.7		
SCLEROTINITE	0.0	0.0	0.0		
SPORINITE	14.4	15.2	12.6		
CUTINITE	1.6	1.7	1.4		
EXINITE (ANAL.)					
RESINITE	1.7	1.8	1.5		
SUBERINITE					
EXUDATINITE	0.0	0.0	0.0		
FLUORINITE	0.0	0.0	0.0		
BITUMINITE	0.0	0.0	0.0		
ALGINITE	0.0	0.0	0.0		
LIPTODETRINITE	0.0	0.0	0.0		
MINERAL MATTER(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
(%, IN OIL)					
VITRINITE	0.88	0.65	0.23	0.79	
PSEUDOVITRINITE	0.92	0.81	0.11	0.86	
VITRINOLDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-367 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-367

COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
 COLLECTION DATE 10/ 8/75
 COLLECTOR'S NUMBER 367

REPORTED RANK HIGH VOLATILE A BITUMINOUS (HVAB)

SAMPLE TYPE CHANNEL WHOLE SEAM
 OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
 SAMPLE RESERVE

SEAM NAME HAZARD #7
 ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 5 FT. 0 IN.
 THICKNESS OF SEAM SAMPLED 5 FT. 0 IN.
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE KENTUCKY
 COUNTY PERRY
 TOWNSHIP
 NEAREST TOWN HAZARD

COAL PROVINCE EASTERN
 COAL REGION APPALACHIAN
 COAL FIELD

MAP REFERENCE: LATITUDE 37D 17M 60S
 LONGITUDE 83D 12M 50S
 QUADRANGLE HAZARD NORTH 7.5

** PSOC-367 **
** PAGE 3 **

COUNTRY U.S.A.
STATE KENTUCKY

```
*  CHEMICAL DATA 1  *
*                               *
*****
```

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	3.32					
% ASH	5.23	5.41				
% VOLATILE MATTER	35.18	36.39	38.47	38.08	38.01	
% FIXED CARBON	56.27	58.20	61.53	61.92	61.99	

CALORIFIC VALUE	DRY	AS REC'D	EQUIL.
-----		MOIST.	MOIST.
(GROSS BTU/LB)	---	-----	-----

MM-FREE, DIRECT			
MM-CONTAINING	13994	13529	13350
MM-FREE (PARR)	14881	14356	14154
MM-FREE (MOD.P)	14908	14353	14151
BEST MM FREE		14353	14151
NET CV, DMMF BTU/LB	14395		
ASH-FREE	14794		

MOTT-SPOONER DIFFERENCE -

ASSOCIATED ANALYSES	DRY	MMF
-----	---	---
% EQUILIBRIUM MOISTURE	4.60	4.90
% TOTAL SULFUR	0.55	

```

* RANK CALCULATIONS *
*
*****

```

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE A BITUMINOUS (HVAB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE A BITUMINOUS (HVAB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE A BITUMINOUS (HVAB)
INTERNATIONAL RANK	
AS REC'D MOIST.	620
EQUIL. MOIST.	620
REPORTED RANK	HIGH VOLATILE A BITUMINOUS (HVAB)

** PENN STATE COAL DATA BASE **

 ** PSOC-367 **
 ** PAGE 4 **

SEAM NAME HAZARD #7
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR) (6.15 %MM)
% ASH	5.23	5.41		
% CARBON	76.38	79.00	83.52	84.17
% HYDROGEN	5.02*	5.19	5.49	5.53
% NITROGEN	1.39	1.44	1.52	1.53
% SULFUR	0.53	0.55	0.58	
% CHLORINE	0.02	0.03	0.03	0.03
% OXYGEN(DIFF)	8.11*	8.38	8.87	8.74

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	0.03	0.00	0.52	0.55
DAF	0.03	0.00	0.55	0.58
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P) (6.14%MM)	DMMF(DIR.) (%MM)
% CARBON	78.92	84.09	
% HYDROGEN	5.12	5.45	
% NITROGEN	1.44	1.53	
% ORGANIC SULFUR	0.52	0.55	
% OXYGEN(DIFF)	7.86	8.35	
% CHLORINE	0.03	0.03	
% MINERAL MATTER	6.14		
(INCLUDES 0.06 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
ATOMIC H/C	0.789	0.779	
ATOMIC O/C	0.078	0.079	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.05		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-367 **
 ** PAGE 5 **

SEAM NAME HAZARD #7
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 1.90
 % HIGH TEMPERATURE ASH = 5.25 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SI02	54.00	1.33
B			AL2O3	34.60	0.96
BA	850	45	TIO2	1.91	0.06
BE	11	1	FE2O3	3.43	0.13
BI	< 20	1	MGO	0.55	0.02
CE	200	10	CAO	1.80	0.07
CO	70	4	NA2O	0.40	0.02
CR	260	14	K2O	1.12	0.05
CU	235	12	P2O5	0.66	0.02
GA	70	4	S03	1.10	0.02
GE	< 25	1			
LA	140	7			
LI					
MN	110	6			
MO			VOLATILES		PPM TOTAL COAL
NI	170	9	AS		
NB	< 20	1	BR		
PB	86	5	CD		
RB	51	3	CL		
SC	49	3	F		
SN	< 10	1	HG		
SR	1860	98	SB		
TH			SE		
U	14	1			
V	360	19			
Y	110	6			
YB	10	1			
ZN	60	3			
ZR	540	28			

** PENN STATE COAL DATA BASE **

 ** PSOC-367 **
 ** PAGE 7 **

SEAM NAME HAZARD #7
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION COMBINED WHITE AND BLUE LIGHT

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	66.2	68.3	63.4
INERTINITE (CALC.)	18.5	19.1	19.5
LIPTINITE (CALC.)	12.2	12.6	11.0
MINERAL MATTER (CALC.)	3.1		6.1

VITRINOIDS			
VITRINITE	58.4	60.2	55.9
PSEUDOVITRINITE	7.9	8.1	7.5
FUSINITE	5.0	5.2	5.6
SEMI-FUSINITE	5.2	5.4	5.4
MACRINITE	3.2	3.3	3.3
MICRINITE	5.0	5.2	5.2
SCLEROTINITE	0.0	0.0	0.0
SPORINITE	10.4	10.7	9.3
CUTINITE	0.0	0.0	0.0
EXINITE (ANAL.)			
RESINITE	1.8	1.9	1.7
SUBERINITE			
EXUDATINITE	0.0	0.0	0.0
FLUORINITE	0.0	0.0	0.0
BITUMINITE	0.0	0.0	0.0
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE	0.0	0.0	0.0
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	0.93	0.68	0.25	0.83	
PSEUDOVITRINITE	0.98	0.81	0.17	0.90	
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-371 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-371

COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
 COLLECTION DATE 10/11/75
 COLLECTOR'S NUMBER 371

REPORTED RANK HIGH VOLATILE A BITUMINOUS (HVAB)

SAMPLE TYPE CHANNEL WHOLE SEAM
 OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
 SAMPLE RESERVE

SEAM NAME IMBODEN
 ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 5 FT. 4 IN.
 THICKNESS OF SEAM SAMPLED 5 FT. 4 IN.
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE KENTUCKY
 COUNTY LETCHER
 TOWNSHIP
 NEAREST TOWN OVENFORK

COAL PROVINCE EASTERN
 COAL REGION APPALACHIAN
 COAL FIELD

MAP REFERENCE: LATITUDE 37D 1M 20S
 LONGITUDE 82D 51M 50S
 QUADRANGLE WHITESBURG 7.5

** PENN STATE COAL DATA BASE **

 ** PSOC-371 **
 ** PAGE 3 **

SEAM NAME IMBODEN
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	1.14					
% ASH	16.54	16.73				
% VOLATILE MATTER	30.39	30.74	36.92	35.63	34.72	
% FIXED CARBON	51.93	52.53	63.08	64.37	65.28	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	12711	12566	12126
MM-FREE (PARR)	15559	15341	14688
MM-FREE (MOD.P)	15686	15427	14767
BEST MM FREE		15427	14767
NET CV, DMMF BTU/LB	15161		
ASH-FREE	15265		

MOTT-SPOONER DIFFERENCE = 133.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	4.60	5.65
% TOTAL SULFUR	1.03	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE A BITUMINOUS (HVAB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE A BITUMINOUS (HVAB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE A BITUMINOUS (HVAB)
INTERNATIONAL RANK	
AS REC'D MOIST.	630
EQUIL. MOIST.	630
REPORTED RANK	HIGH VOLATILE A BITUMINOUS (HVAB)

** PENN STATE COAL DATA BASE **

 ** PSOC-371 **
 ** PAGE 4 **

SEAM NAME IMBODEN
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR) (18.63 %MM)
% ASH	16.54	16.73		
% CARBON	69.82	70.63	84.82	86.81
% HYDROGEN	4.53*	4.58	5.50	5.63
% NITROGEN	1.18	1.19	1.43	1.46
% SULFUR	1.02	1.03	1.24	
% CHLORINE	0.01	0.01	0.01	0.01
% OXYGEN(DIFF)	5.76*	5.83	7.00	6.09

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	0.45	0.00	0.58	1.03
DAF	0.54	0.00	0.70	1.24
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P) (19.12%MM)	DMMF(DIR.) (%MM)
% CARBON	70.39	87.04	
% HYDROGEN	4.35	5.38	
% NITROGEN	1.19	1.46	
% ORGANIC SULFUR	0.58	0.72	
% OXYGEN(DIFF)	4.36	5.38	
% CHLORINE	0.01	0.01	
% MINERAL MATTER (INCLUDES 0.84 % FES2)	19.12		

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
ATOMIC H/C	0.779	0.743	
ATOMIC O/C	0.053	0.057	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.02		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-371 **
 ** PAGE 5 **

SEAM NAME IMBODEN
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 1.50

% HIGH TEMPERATURE ASH = 16.99 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	52.90	4.20
B			AL2O3	29.20	2.63
BA	800	136	TiO2	1.20	0.12
BE	11	2	FE2O3	6.68	0.79
BI	< 20	3	MGO	1.38	0.14
CE	< 100	17	CAO	1.46	0.18
CO	50	8	NA2O	0.72	0.09
CR	200	34	K2O	3.79	0.53
CU	160	27	P2O5	0.05	0.00
GA	56	10	SO3	1.30	0.09
GE	< 25	4			
LA	86	15			
LI					
MN	260	44			
MO					
NI	100	17			
NB	< 20	3			
PB	60	10			
RB	211	36			
SC	37	6			
SN	< 10	2			
SR	400	68			
TH					
U	15	3			
V	350	59			
Y	80	14			
YB	10	2			
ZN	150	25			
ZR	340	58			

VOLATILES	PPM TOTAL COAL
AS	
BR	
CD	
CL	
F	
HG	
SB	
SE	

** PENN STATE COAL DATA BASE **

 ** PSOC-371 **
 ** PAGE 7 **

SEAM NAME IMBODEN
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION COMBINED WHITE AND BLUE LIGHT

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	73.1	81.2	65.5
INERTINITE (CALC.)	11.1	12.3	10.9
LIPTINITE (CALC.)	5.9	6.6	5.0
MINERAL MATTER (CALC.)	9.9		18.6
VITRINOIDS			
VITRINITE	52.7	58.5	47.2
PSEUDOVITRINITE	20.4	22.7	18.3
FUSINITE	2.9	3.2	3.0
SEMI-FUSINITE	3.8	4.2	3.6
MACRINITE	0.7	0.8	0.7
MICRINITE	3.7	4.1	3.6
SCLEROTINITE	0.0	0.0	0.0
SPORINITE	5.8	6.4	4.8
CUTINITE	0.0	0.0	0.0
EXINITE (ANAL.)			
RESINITE	0.2	0.2	0.2
SUBERINITE			
EXUDATINITE	0.0	0.0	0.0
FLUORINITE	0.0	0.0	0.0
BITUMINITE	0.0	0.0	0.0
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE	0.0	0.0	0.0
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	1.07	0.90	0.17	1.01	
PSEUDOVITRINITE	1.18	1.04	0.14	1.10	
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-375 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-375
 COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
 COLLECTION DATE 11/13/75
 COLLECTOR'S NUMBER 375
 REPORTED RANK HIGH VOLATILE A BITUMINOUS (HVAB)
 SAMPLE TYPE CHANNEL WHOLE SEAM
 OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
 SAMPLE RESERVE

SEAM NAME HAZARD #9
 ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 1 FT. 10 IN.
 THICKNESS OF SEAM SAMPLED 10100 FT. 0 IN.
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE KENTUCKY
 COUNTY HARLAN
 TOWNSHIP
 NEAREST TOWN HARLAN
 COAL PROVINCE EASTERN
 COAL REGION APPALACHIAN
 COAL FIELD

MAP REFERENCE: LATITUDE 36D 55M 20S
 LONGITUDE 83D 20M 20S
 QUADRANGLE BLEDSOE 7.5

** PENN STATE COAL DATA BASE **

 ** PSOC-375 **
 ** PAGE 3 **

SEAM NAME HAZARD #9
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	2.76					
% ASH	13.77	14.16				
% VOLATILE MATTER	33.36	34.31	39.97	38.92	38.27	
% FIXED CARBON	50.11	51.53	60.03	61.08	61.73	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	12650	12301	12233
MM-FREE (PARR)	14976	14487	14392
MM-FREE (MOD.P)	15070	14531	14435
BEST MM FREE		14531	14435
NET CV, DMMF BTU/LB	14537		
ASH-FREE	14737		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	3.30	3.92
% TOTAL SULFUR	1.11	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE A BITUMINOUS (HVAB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE A BITUMINOUS (HVAB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE A BITUMINOUS (HVAB)
INTERNATIONAL RANK	
AS REC'D MOIST.	610
EQUIL. MOIST.	610
REPORTED RANK	HIGH VOLATILE A BITUMINOUS (HVAB)

** PENN STATE COAL DATA BASE **

 ** PSOC-375 **
 ** PAGE 4 **

SEAM NAME HAZARD #9
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR) (15.90 %MM)
% ASH	13.77	14.16		
% CARBON	69.02	70.98	82.69	84.40
% HYDROGEN	4.69*	4.82	5.62	5.73
% NITROGEN	1.23	1.26	1.47	1.50
% SULFUR	1.08	1.11	1.29	
% CHLORINE	0.03	0.03	0.03	0.04
% OXYGEN(DIFF)	7.43*	7.64	8.91	8.34

SULFUR FORMS.	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	0.38	0.05	0.68	1.11
DAF	0.44	0.06	0.79	1.29

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P) (16.19%MM)	DMMF(DIR.) (%MM)
% CARBON	70.78	84.46	
% HYDROGEN	4.63	5.52	
% NITROGEN	1.26	1.50	
% ORGANIC SULFUR	0.68	0.81	
% OXYGEN(DIFF)	6.46	7.68	
% CHLORINE	0.03	0.04	
% MINERAL MATTER (INCLUDES 0.71 % FES2)	16.19		

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
ATOMIC H/C	0.816	0.785	
ATOMIC O/C	0.074	0.081	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO4.IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.06		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-375 **
 ** PAGE 5 **

SEAM NAME HAZARD #9
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 2.40
 % HIGH TEMPERATURE ASH = 14.31 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	57.80	3.87
B			AL2O3	28.20	2.14
BA	600	86	TiO2	1.40	0.12
BE	13	2	FE2O3	6.50	0.65
BI	< 20	3	MGO	1.02	0.09
CE	150	21	CAO	0.91	0.09
CO	40	6	NA2O	0.26	0.03
CR	240	34	K2O	3.19	0.38
CU	175	25	P2O5	0.15	0.01
GA	48	7	SO3	0.62	0.04
GE	< 25	4			
LA	38	13			
LI					
MN	155	22			
MO			VOLATILES		PPM TOTAL COAL
NI	140	20	-----		-----
NB	< 20	3	AS		
PB	52	7	BR		
RB	210	30	CD		
SC	38	5	CL		
SN	< 10	1	F		
SR	380	54	HG		
TH			SB		
U	< 8	1	SE		
V	140	20			
Y	90	13			
YB	10	1			
ZN	150	21			
ZR	330	47			

** PENN STATE COAL DATA BASE **

 ** PSOC-375 **
 ** PAGE 7 **

SEAM NAME HAZARD #9
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION COMBINED WHITE AND BLUE LIGHT

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	69.5	75.8	63.3
INERTINITE (CALC.)	11.2	12.2	11.3
LIPTINITE (CALC.)	11.0	12.0	9.4
MINERAL MATTER (CALC.)	8.4		15.9
VITRINOIDS			
VITRINITE	55.5	60.6	50.6
PSEUDOVITRINITE	13.9	15.2	12.7
FUSINITE	5.1	5.6	5.4
SEMI-FUSINITE	2.3	2.5	2.2
MACRINITE	1.2	1.3	1.2
MICRINITE	2.6	2.8	2.5
SCLEROTINITE	0.0	0.0	0.0
SPORINITE	9.9	10.8	8.5
CUTINITE	0.8	0.9	0.7
EXINITE (ANAL.)			
RESINITE	0.3	0.3	0.2
SUBERINITE			
EXUDATINITE	0.0	0.0	0.0
FLUORINITE	0.0	0.0	0.0
BITUMINITE	0.0	0.0	0.0
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE	0.0	0.0	0.0
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	0.87	0.66	0.21	0.78	
PSEUDOVITRINITE	0.95	0.83	0.12	0.88	
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-379 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER	PSOC-379
COLLECTED BY	PENNSYLVANIA STATE UNIVERSITY
COLLECTION DATE	5/ 5/76
COLLECTOR'S NUMBER	379
REPORTED RANK	SEMIANTHRACITE (SA)
SAMPLE TYPE	CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION	SUBSECTION DATA AVAILABLE
SAMPLE RESERVE	
SEAM NAME	P&M 'B'
ALTERNATE SEAM NAME	
TOTAL SEAM THICKNESS	6 FT. 4 IN.
THICKNESS OF SEAM SAMPLED	6 FT. 4 IN.
PORTION RECOVERED IN CORE	
DIAMETER OF CORE	

 *
 * SAMPLE LOCATION *
 *

COUNTRY	U.S.A.
STATE	PENNSYLVANIA
COUNTY	SULLIVAN
TOWNSHIP	COLLEY
NEAREST TOWN	MILDRED
COAL PROVINCE	EASTERN
COAL REGION	ANTHRACITE
COAL FIELD	

MAP REFERENCE:	LATITUDE	41D 28M 30S
	LONGITUDE	76D 19M 30S
	QUADRANGLE	LAPORTE 15'

** PENN STATE COAL DATA BASE **

 ** PSOC-379 **
 ** PAGE 3 **

SEAM NAME P&M 'B'
 APPARENT RANK SEMIANTHRACITE (SA)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	1.62					
% ASH	15.80	16.06				
% VOLATILE MATTER	8.71	8.85	10.54	8.94	7.79	
% FIXED CARBON	73.87	75.09	89.46	91.06	92.21	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	13207	12993	12557
MM-FREE (PARR)	16002	15688	15056
MM-FREE (MOD.P)	16139	15792	15151
BEST MM FREE		15792	15151
NET CV, DMMF BTU/LB	15769		
ASH-FREE	15734		

MOTT-SPOONER DIFFERENCE = 459.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	4.92	5.97
% TOTAL SULFUR	0.51	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	SEMIANTHRACITE (SA)
ASTM RANK (EQUIL. MOIST.)	SEMIANTHRACITE (SA)
REFLECTANCE RANK CATEGORY	SEMIANTHRACITE (SA)
INTERNATIONAL RANK	
AS REC'D MOIST.	
EQUIL. MOIST.	
REPORTED RANK	SEMIANTHRACITE (SA)

** PSOC-379 **
** PAGE 4 **

COUNTRY U.S.A.
STATE PENNSYLVANIA

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*****
*
*  CHEMICAL DATA 2  *
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ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(17.63 %MM)
% ASH	15.80	16.06		
% CARBON	75.22	76.46	91.09	92.82
% HYDROGEN	3.22*	3.27	3.90	3.97
% NITROGEN	0.89	0.90	1.07	1.09
% SULFUR	0.50	0.51	0.61	
% CHLORINE	0.02	0.03	0.03	0.03
% OXYGEN(DIFF)	2.73*	2.78	3.31	2.09

SULFUR FORMS.	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	0.06	0.00	0.45	0.51
DAF	0.07	0.00	0.54	0.61

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF (MOD.P)	DMMF (DIR.)
-----	---	-----	-----
		(18.19%MM)	(%MM)
% CARBON	76.23	93.18	
% HYDROGEN	3.06	3.74	
% NITROGEN	0.90	1.09	
% ORGANIC SULFUR	0.45	0.55	
% OXYGEN(DIFF)	1.17	1.40	
% CHLORINE	0.03	0.03	
% MINERAL MATTER	18.19		
(INCLUDES 0.11 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD. PAR	DIRECT
-----	-----	-----	-----
ATOMIC H/C	0.514	0.482	
ATOMIC O/C	0.017	0.014	

MISC. CHEMICAL DATA	DRY	OF DMF COAL	OF DMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO ₄ , IN ASH			
% CARBONATE AS CO ₂			
% CHLORINE	0.05		

INFRA-RED ANALYSIS

** PENN STATE COAL DATA BASE **

 ** PSOC-379 **
 ** PAGE 5 **

SEAM NAME P&M 'B'
 APPARENT RANK SEMIANTHRACITE (SA)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 0.80

% HIGH TEMPERATURE ASH = 16.01 AT 750 DEGREES C.

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	53.80	4.03
B			Al2O3	36.00	3.05
BA	460	74	TiO2	2.85	0.27
BE	9	1	Fe2O3	1.55	0.17
BI	< 20	3	MgO	0.40	0.04
CE	160	26	CaO	0.50	0.06
CO	52	8	Na2O	0.29	0.03
CR	310	50	K2O	2.30	0.31
CU	160	26	P2O5	0.15	0.01
GA	56	9	SO3	0.45	0.03
GE	< 25	4			
LA	140	22			
LI					
MN	130	21			
MO			VOLATILES		PPM TOTAL COAL
NI	130	21	AS		
NB	< 20	3	BR		
PB	110	18	CD		
RB	105	17	CL		
SC	47	8	F		
SN	< 10	2	HG		
SR	480	77	SB		
TH			SE		
U	12	2			
V	390	62			
Y	100	16			
YB	10	2			
ZN	40	6			
ZR	560	90			

** PENN STATE COAL DATA BASE **

 ** PSOC-379 **
 ** PAGE 7 **

SEAM NAME P&M 'B'
 APPARENT RANK SEMIANTHRACITE (SA)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	75.0	82.7	67.4
INERTINITE (CALC.)	15.7	17.3	14.9
LIPTINITE (CALC.)	0.0	0.0	0.0
MINERAL MATTER (CALC.)	9.4		17.6
VITRINOIDS			
VITRINITE	75.0	82.7	67.4
PSEUDOVITRINITE	0.0	0.0	0.0
FUSINITE	3.4	3.7	3.3
SEMI-FUSINITE	8.0	8.8	7.5
MACRINITE	0.1	0.1	0.1
MICRINITE	4.3	4.7	4.0
SCLEROTINITE	0.0	0.0	0.0
SPORINITE			
CUTINITE			
EXINITE (ANAL.)	0.0	0.0	0.0
RESINITE	0.0	0.0	0.0
SUBERINITE			
EXUDATINITE			
FLUORINITE			
BITUMINITE			
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE			
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	2.95	2.56	0.39	2.80	
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-383 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-383

COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
 COLLECTION DATE 5/ 5/76
 COLLECTOR'S NUMBER 383

REPORTED RANK SEMIANTHRACITE (SA)

SAMPLE TYPE CHANNEL WHOLE SEAM
 OTHER SAMPLE INFORMATION
 SAMPLE RESERVE

SEAM NAME P&M 'A'
 ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 1 FT. 2 IN.
 THICKNESS OF SEAM SAMPLED 1 FT. 2 IN.
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE PENNSYLVANIA
 COUNTY SULLIVAN
 TOWNSHIP COLLEY
 NEAREST TOWN MILDRED

COAL PROVINCE EASTERN
 COAL REGION ANTHRACITE
 COAL FIELD

MAP REFERENCE: LATITUDE 41D 28M 30S
 LONGITUDE 76D 20M 10S
 QUADRANGLE LAPORTE 15'

** PENN STATE COAL DATA BASE **

 ** PSOC-383 **
 ** PAGE 3 **

SEAM NAME P&M 'A'
 APPARENT RANK SEMIANTHRACITE (SA)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	1.66					
% ASH	21.70	22.07				
% VOLATILE MATTER	9.88	10.05	12.90	10.55	8.73	
% FIXED CARBON	66.75	67.88	87.10	89.45	91.27	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.

MM-FREE, DIRECT		
MM-CONTAINING	11734	11539
MM-FREE (PARR)	15440	15103
MM-FREE (MOD.P)	15641	15263
BEST MM FREE		15263
NET CV, DMMF BTU/LB	15250	
ASH-FREE	15057	

MOTT-SPOONER DIFFERENCE = 20.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE		
% TOTAL SULFUR	0.73	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	SEMIANTHRACITE (SA)
ASTM RANK (EQUIL. MOIST.)	
REFLECTANCE RANK CATEGORY	SEMIANTHRACITE (SA)
INTERNATIONAL RANK	
AS REC'D MOIST.	
EQUIL. MOIST.	
REPORTED RANK	SEMIANTHRACITE (SA)

 ** PSOC-383 **
 ** PAGE 4 **

COUNTRY U.S.A.
STATE PENNSYLVANIA

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*****
*
*  CHEMICAL DATA 2  *
*
*****

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ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)
-----	-----	---	---	-----
				(24.24 %MM)
% ASH	21.70	22.07		
% CARBON	68.52	69.68	89.41	91.97
% HYDROGEN	3.11*	3.16	4.05	4.17
% NITROGEN	0.80	0.81	1.04	1.07
% SULFUR	0.72	0.73	0.94	
% CHLORINE	0.01	0.01	0.02	0.02
% OXYGEN (DIFF)	3.48*	3.54	4.54	2.77

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	0.26	0.00	0.47	0.73
DAF	0.33	0.00	0.60	0.94
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF (MOD.P)	DMMF (DIR.)
-----	---	-----	-----
		(25.07%MM)	(%MM)
% CARBON	69.37	92.58	
% HYDROGEN	2.87	3.83	
% NITROGEN	0.81	1.07	
% ORGANIC SULFUR	0.47	0.63	
% OXYGEN (DIFF)	1.41	1.87	
% CHLORINE	0.01	0.02	
% MINERAL MATTER	25.07		
(INCLUDES 0.49 % FES ₂)			

ATOM RATIOS (DMMF)	PARR	MOD. PAR	DIRECT
-----	----	-----	-----
ATOMIC H/C	0.545	0.497	
ATOMIC O/C	0.023	0.020	

MISC. CHEMICAL DATA	DRY	OF DMDF COAL	OF DMDF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO ₄ , IN ASH			
% CARBONATE AS CO ₂			
% CHLORINE	0.03		

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-383 **
 ** PAGE 5 **

SEAM NAME P&M 'A'
 APPARENT RANK SEMIANTHRACITE (SA)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 0.40
 % HIGH TEMPERATURE ASH = 22.91 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	51.70	5.54
B			Al2O3	39.20	4.75
BA	470	108	TiO2	2.52	0.35
BE	20	5	Fe2O3	2.56	0.41
BI	< 20	5	MgO	0.33	0.05
CE	220	50	CaO	0.25	0.04
CO	100	23	Na2O	0.32	0.05
CR	330	76	K2O	2.27	0.43
CU	320	73	P2O5	0.17	0.02
GA	120	27	SO3	0.35	0.03
GE	41	9			
LA	130	30			
LI					
MN	93	21			
MO			VOLATILES		PPM TOTAL COAL
NI	210	48	AS		
NB	< 20	5	BR		
PB	210	48	CD		
RB	91	21	CL		
SC	52	12	F		
SN	20	5	HG		0.20
SR	350	80	SB		
TH			SE		
U	23	5			
V	620	142			
Y	130	30			
YB	14	3			
ZN	130	30			
ZR	520	119			

** PENN STATE COAL DATA BASE **

 ** PSOC-383 **
 ** PAGE 7 **

SEAM NAME P&M 'A'
 APPARENT RANK SEMIANTHRACITE (SA)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	71.7	82.8	62.1
INERTINITE (CALC.)	14.9	17.2	13.6
LIPTINITE (CALC.)	0.0	0.0	0.0
MINERAL MATTER (CALC.)	13.4		24.2

VITRINOIDS			
VITRINITE	71.7	82.8	62.1
PSEUDOVITRINITE	0.0	0.0	0.0
FUSINITE	1.7	2.0	1.6
SEMI-FUSINITE	10.2	11.8	9.3
MACRINITE	0.3	0.4	0.3
MICRINITE	2.6	3.0	2.4
SCLEROTINITE	0.0	0.0	0.0
SPORINITE			
CUTINITE			
EXINITE (ANAL.)	0.0	0.0	0.0
RESINITE	0.0	0.0	0.0
SUBERINITE			
EXUDATINITE			
FLUORINITE			
BITUMINITE			
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE			
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND. DEV.
VITRINITE	2.81	2.38	0.43	2.57	
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-384 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-384

COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
 COLLECTION DATE 5/ 5/76
 COLLECTOR'S NUMBER 384

REPORTED RANK SEMIANTHRACITE (SA)

SAMPLE TYPE CHANNEL WHOLE SEAM
 OTHER SAMPLE INFORMATION SMALL CHANNEL
 SAMPLE RESERVE

SEAM NAME P&M 'B'
 ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 5 FT. 3 IN.
 THICKNESS OF SEAM SAMPLED 5 FT. 3 IN.
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE PENNSYLVANIA
 COUNTY SULLIVAN
 TOWNSHIP COLLEY
 NEAREST TOWN MILDRED

COAL PROVINCE EASTERN
 COAL REGION ANTHRACITE
 COAL FIELD

MAP REFERENCE: LATITUDE 41D 28M 30S
 LONGITUDE 76D 20M 10S
 QUADRANGLE LAPORTE 15'

** PENN STATE COAL DATA BASE **

 ** PSOC-384 **
 ** PAGE 3 **

SEAM NAME P&M 'B'
 APPARENT RANK SEMIANTHRACITE (SA)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	1.66					
% ASH	20.91	21.26				
% VOLATILE MATTER	8.36	8.50	10.80	8.54	6.78	
% FIXED CARBON	69.07	70.24	89.20	91.46	93.22	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	11931	11733	11549
MM-FREE (PARR)	15516	15182	14875
MM-FREE (MOD.P)	15709	15335	15022
BEST MM FREE		15335	15022

NET CV, DMMF BTU/LB 15343
 ASH-FREE 15152

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	3.20	4.17
% TOTAL SULFUR	0.63	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	SEMIANTHRACITE (SA)
ASTM RANK (EQUIL. MOIST.)	SEMIANTHRACITE (SA)
REFLECTANCE RANK CATEGORY	SEMIANTHRACITE (SA)
INTERNATIONAL RANK	
AS REC'D MOIST.	
EQUIL. MOIST.	
REPORTED RANK	SEMIANTHRACITE (SA)

** PENN STATE COAL DATA BASE **

 ** PSOC-384 **
 ** PAGE 4 **

SEAM NAME P&M 'B'
 APPARENT RANK SEMIANTHRACITE (SA)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(23.31 %MM)
% ASH	20.91	21.26		
% CARBON	70.57	71.76	91.14	93.57
% HYDROGEN	2.95*	3.00	3.81	3.91
% NITROGEN	0.75	0.76	0.97	0.99
% SULFUR	0.62	0.63	0.80	
% CHLORINE	0.01	0.01	0.02	0.02
% OXYGEN(DIFF)	2.53*	2.58	3.27	1.51

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	0.16	0.00	0.47	0.63
DAF	0.20	0.00	0.60	0.80

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF (MOD.P)	DMMF (DIR.)
-----	---	-----	-----
		(24.11%MM)	(%MM)
% CARBON	71.46	94.16	
% HYDROGEN	2.72	3.58	
% NITROGEN	0.76	0.99	
% ORGANIC SULFUR	0.47	0.62	
% OXYGEN(DIFF)	0.48	0.62	
% CHLORINE	0.01	0.02	
% MINERAL MATTER	24.11		
(INCLUDES 0.30 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	----	-----	-----
ATOMIC H/C	0.502	0.457	
ATOMIC O/C	0.012	0.007	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.03		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-384 **
 ** PAGE 5 **

SEAM NAME P&M 'B'
 APPARENT RANK SEMIANTHRACITE (SA)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 * *
 * CHEMICAL DATA 3 *
 * *

% MOISTURE IN COAL = 0.80
 % HIGH TEMPERATURE ASH = 20.24 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SI02	55.80	5.28
B			AL2O3	33.20	3.56
BA	430	87	TIO2	2.89	0.35
BE	10	2	FE2O3	3.11	0.44
BI	< 20	4	MGO	0.40	0.05
CE	170	34	CAO	0.37	0.05
CO	66	13	NA2O	0.28	0.04
CR	310	63	K2O	2.51	0.42
CU	150	30	P2O5	0.13	0.01
GA	68	14	S03	0.32	0.03
GE	< 25	5			
LA	150	30			
LI					
MN	130	26			
MO			VOLATILES		PPM TOTAL COAL
NI	210	43			
NB	< 20	4	AS		
PB	120	24	BR		
RB	125	25	CD		
SC	47	10	CL		
SN	17	3	F		
SR	370	75	HG		0.13
TH			SB		
U	11	2	SE		
V	350	71			
Y	96	19			
YB	10	2			
ZN	50	10			
ZR	560	113			

** PENN STATE COAL DATA BASE **

 ** PSOC-384 **
 ** PAGE 7 **

SEAM NAME P&M 'B'
 APPARENT RANK SEMIANTHRACITE (SA)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	72.7	83.4	63.4
INERTINITE (CALC.)	14.5	16.6	13.3
LIPTINITE (CALC.)	0.0	0.0	0.0
MINERAL MATTER (CALC.)	12.8		23.3
VITRINOIDS			
VITRINITE	72.7	83.4	63.4
PSEUDOVITRINITE	0.0	0.0	0.0
FUSINITE	1.6	1.8	1.5
SEMI-FUSINITE	8.8	10.1	8.1
MACRINITE	0.6	0.7	0.6
MICRINITE	3.5	4.0	3.2
SCLEROTINITE	0.0	0.0	0.0
SPORINITE			
CUTINITE			
EXINITE (ANAL.)	0.0	0.0	0.0
RESINITE	0.0	0.0	0.0
SUBERINITE			
EXUDATINITE			
FLUORINITE			
BITUMINITE			
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE			
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	2.84	2.49	0.35	2.70	
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-385 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER
 COLLECTED BY
 COLLECTION DATE
 COLLECTOR'S NUMBER

PSOC-385
 SHELL DEVELOPMENT CORPORATION
 5/11/76

REPORTED RANK

SAMPLE TYPE
 OTHER SAMPLE INFORMATION
 SAMPLE RESERVE

CORE WHOLE SEAM
 SUBSECTION DATA AVAILABLE SCH-49-2

SEAM NAME
 ALTERNATE SEAM NAME

UNNAMED
 TOP SEAM

TOTAL SEAM THICKNESS
 THICKNESS OF SEAM SAMPLED
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

3 FT. 1 IN.
 3 FT. 0 IN.

 *
 * SAMPLE LOCATION *
 *

COUNTRY
 STATE
 COUNTY
 TOWNSHIP
 NEAREST TOWN

U.S.A.
 TEXAS
 WEBB
 LAREDO

COAL PROVINCE
 COAL REGION
 COAL FIELD

GULF

MAP REFERENCE: LATITUDE 27D 43M 10S
 LONGITUDE 99D 43M 30S
 QUADRANGLE DOLORES RANCH 7.5'

** PENN STATE COAL DATA BASE **

 ** PSOC-385 **
 ** PAGE 3 **

SEAM NAME UNNAMED
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	4.32					
% ASH	17.81	18.61				
% VOLATILE MATTER	43.96	45.95	56.46	55.45	54.61	
% FIXED CARBON	33.91	35.44	43.54	44.55	45.39	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	11940	11424	11345
MM-FREE (PARR)	15009	14198	14076
MM-FREE (MOD.P)	15145	14286	14162
BEST MM FREE		14286	14162
NET CV, DMMF BTU/LB	14494		
ASH-FREE	14670		

MOTT-SPOONER DIFFERENCE = 5.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	4.98	6.30
% TOTAL SULFUR	1.62	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE A BITUMINOUS (HVAB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE A BITUMINOUS (HVAB)
REFLECTANCE RANK CATEGORY	SUBBITUMINOUS A (SUBA)
INTERNATIONAL RANK	
AS REC'D MOIST.	610
EQUIL. MOIST.	610
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-385 **
 ** PAGE 4 **

SEAM NAME UNNAMED
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(20.99 %MM)
% ASH	17.81	18.61		
% CARBON	60.92	63.67	78.23	80.58
% HYDROGEN	5.27*	5.51	6.77	6.97
% NITROGEN	1.10	1.15	1.41	1.46
% SULFUR	1.55	1.62	1.99	
% CHLORINE	0.01	0.01	0.02	0.02
% OXYGEN(DIFF)	9.02*	9.43	11.58	10.97

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	1.09	0.00	0.53	1.62
DAF	1.34	0.00	0.65	1.99

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(21.55%MM)	(%MM)
% CARBON	63.40	80.82	
% HYDROGEN	5.25	6.69	
% NITROGEN	1.15	1.46	
% ORGANIC SULFUR	0.53	0.68	
% OXYGEN(DIFF)	8.12	10.34	
% CHLORINE	0.01	0.02	
% MINERAL MATTER	21.55		

(INCLUDES 2.04 % FES2)

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	1.039	0.994	
ATOMIC O/C	0.102	0.122	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.03		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-385 **
 ** PAGE 5 **

SEAM NAME UNNAMED COUNTRY U.S.A.
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB) STATE TEXAS

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 4.40
 % HIGH TEMPERATURE ASH = 17.52 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SI02	54.10	4.43
B			AL2O3	27.40	2.54
BA	230	40	TIO2	1.58	0.17
BE	11	2	FE2O3	11.10	1.36
BI	< 20	4	MGO	1.03	0.11
CE	190	33	CAO	2.41	0.30
CO	31	5	NA2O	0.67	0.09
CR	190	33	K2O	0.29	0.04
CU	130	23	P2O5	0.04	0.00
GA	43	8	S03	2.00	0.14
GE	< 25	4			
LA	100	18			
LI					
MN	155	27			
MO			VOLATILES		PPM TOTAL COAL
NI	100	18	AS		
NB	< 20	4	BR		
PB	90	16	CD		
RB	10	2	CL		
SC	47	8	F		
SN	< 10	2	HG		0.41
SR	440	77	SB		
TH			SE		
U	19	3			
V	390	68			
Y	130	23			
YB	14	2			
ZN	100	18			
ZR	520	91			

** PENN STATE COAL DATA BASE **

 ** PSOC-385 **
 ** PAGE 7 **

SEAM NAME UNNAMED
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION COMBINED WHITE AND BLUE LIGHT

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	72.4	81.7	64.6
INERTINITE (CALC.)	6.0	6.8	5.8
LIPTINITE (CALC.)	10.3	11.6	8.6
MINERAL MATTER (CALC.)	11.4		21.0
VITRINOIDS			
VITRINITE	72.4	81.7	64.6
PSEUDOVITRINITE	0.0	0.0	0.0
FUSINITE	0.3	0.3	0.3
SEMI-FUSINITE	2.6	2.9	2.5
MACRINITE	0.8	0.9	0.8
MICRINITE	2.4	2.7	2.3
SCLEROTINITE	0.0	0.0	0.0
SPORINITE	8.4	9.5	7.0
CUTINITE	0.2	0.2	0.1
EXINITE (ANAL.)			
RESINITE	1.7	1.9	1.4
SUBERINITE			
EXUDATINITE	0.0	0.0	0.0
FLUORINITE	0.0	0.0	0.0
BITUMINITE	0.0	0.0	0.0
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE	0.0	0.0	0.0
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	0.57	0.34	0.23	0.45	
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-389 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER

PSOC-389

COLLECTED BY
COLLECTION DATE
COLLECTOR'S NUMBER

SHELL DEVELOPMENT CORPORATION
5/11/76

REPORTED RANK

SAMPLE TYPE
OTHER SAMPLE INFORMATION
SAMPLE RESERVE

CORE WHOLE SEAM
SUBSECTION DATA AVAILABLE SCH-49-2

SEAM NAME
ALTERNATE SEAM NAME

UNNAMED
LOWER SEAM

TOTAL SEAM THICKNESS
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

1 FT. 8 IN.
1 FT. 8 IN.

*
* SAMPLE LOCATION *
*

COUNTRY
STATE
COUNTY
TOWNSHIP
NEAREST TOWN

U.S.A.
TEXAS
WEBB
LAREDO

COAL PROVINCE
COAL REGION
COAL FIELD

GULF

MAP REFERENCE: LATITUDE 27D 43M 10S
LONGITUDE 99D 43M 30S
QUADRANGLE DOLORES RANCH 7.5'

** PENN STATE COAL DATA BASE **

 ** PSOC-389 **
 ** PAGE 3 **

SEAM NAME UNNAMED
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	4.01					
% ASH	26.59	27.70				
% VOLATILE MATTER	41.00	42.71	59.07	57.49	55.95	
% FIXED CARBON	28.40	29.59	40.93	42.51	44.05	

CALORIFIC VALUE	DRY	AS REC'D MOIST.	EQUIL. MOIST.
(GROSS BTU/LB)			

MM-FREE, DIRECT			
MM-CONTAINING	10660	10233	10108
MM-FREE (PARR)	15327	14449	14199
MM-FREE (MOD.P)	15570	14628	14371
BEST MM FREE		14628	14371
NET CV, DMMF BTU/LB	14928		
ASH-FREE	14744		

MOTT-SPOONER DIFFERENCE = 5.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	5.18	7.53
% TOTAL SULFUR	2.38	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE A BITUMINOUS (HVAB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE A BITUMINOUS (HVAB)
REFLECTANCE RANK CATEGORY	SUBBITUMINOUS A (SUBA)
INTERNATIONAL RANK	
AS REC'D MOIST.	610
EQUIL. MOIST.	610
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-389 **
 ** PAGE 4 **

SEAM NAME UNNAMED
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(31.23 %MM)
% ASH	26.59	27.70		
% CARBON	55.06	57.36	79.34	83.40
% HYDROGEN	4.51*	4.70	6.50	6.83
% NITROGEN	0.85	0.89	1.23	1.29
% SULFUR	2.28	2.38	3.29	
% CHLORINE	0.01	0.01	0.01	0.01
% OXYGEN(DIFF)	6.68*	6.96	9.63	8.46

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	1.86	0.00	0.52	2.38
DAF	2.57	0.00	0.72	3.29

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(32.18%MM)	(, %MM)
% CARBON	56.96	83.99	
% HYDROGEN	4.30	6.34	
% NITROGEN	0.89	1.29	
% ORGANIC SULFUR	0.52	0.77	
% OXYGEN(DIFF)	5.15	7.58	
% CHLORINE	0.01	0.01	
% MINERAL MATTER	32.18		
(INCLUDES 3.49 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.984	0.907	
ATOMIC O/C	0.076	0.100	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4,IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.02		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-389 **
 ** PAGE 5 **

SEAM NAME UNNAMED
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 2.20
 % HIGH TEMPERATURE ASH = 25.77 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	65.10	7.84
B			AL2O3	14.10	1.92
BA	338	87	TiO2	1.09	0.17
BE	10	3	FE2O3	11.20	2.02
BI	< 20	5	MGO	0.87	0.14
CE	< 100	26	CAO	3.29	0.61
CO	< 20	5	NA2O	0.64	0.12
CR	86	22	K2O	0.90	0.19
CU	60	15	P2O5	0.05	0.01
GA	23	6	S03		
GE	< 25	6			
LA	< 20	5			
LI					
MN	155	40			
MO			VOLATILES		PPM TOTAL COAL
NI	60	15	-----	-----	-----
NB	< 20	5	AS		
PB	< 40	10	BR		
RB	33	9	CD		
SC	20	5	CL		
SN	49	13	F		
SR	404	104	HG		0.75
TH			SB		
U	12	3	SE		
V	170	44			
Y	36	9			
YB	7	2			
ZN	105	27			
ZR	400	103			

** PENN STATE COAL DATA BASE **

 ** PSOC-389 **
 ** PAGE 7 **

SEAM NAME UNNAMED
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION COMBINED WHITE AND BLUE LIGHT

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	66.5	81.0	56.2
INERTINITE (CALC.)	0.8	1.0	0.7
LIPTINITE (CALC.)	14.8	18.1	11.8
MINERAL MATTER (CALC.)	18.0		31.2

VITRINIDS			
VITRINITE	66.5	81.0	56.2
PSEUDOVITRINITE	0.0	0.0	0.0
FUSINITE	0.0	0.0	0.0
SEMI-FUSINITE	0.3	0.4	0.3
MACRINITE	0.4	0.5	0.4
MICRINITE	0.1	0.1	0.1
SCLEROTINITE	0.0	0.0	0.0
SPORINITE	13.0	15.9	10.4
CUTINITE	0.1	0.1	0.1
EXINITE (ANAL.)			
RESINITE	1.7	2.1	1.4
SUBERINITE			
EXUDATINITE	0.0	0.0	0.0
FLUORINITE	0.0	0.0	0.0
BITUMINITE	0.0	0.0	0.0
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE	0.0	0.0	0.0
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	0.54	0.36	0.18	0.43	
PSEUDOVITRINITE					
VITRINIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-394 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-394
 COLLECTED BY SHELL DEVELOPMENT CORPORATION
 COLLECTION DATE 6/ 1/76
 COLLECTOR'S NUMBER

REPORTED RANK

SAMPLE TYPE CORE WHOLE SEAM
 OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
 SAMPLE RESERVE

SEAM NAME UNNAMED
 ALTERNATE SEAM NAME SCH-45A-1

TOTAL SEAM THICKNESS 2 FT. 9 IN.
 THICKNESS OF SEAM SAMPLED 2 FT. 9 IN.
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE TEXAS
 COUNTY WEDD
 TOWNSHIP
 NEAREST TOWN LAREDO

COAL PROVINCE GULF
 COAL REGION
 COAL FIELD

MAP REFERENCE: LATITUDE 27D 40N 40S
 LONGITUDE 99D 43W 30E
 QUADRANGLE DOLORES RANCH 7.5'

*** PENN STATE COAL DATA BASE ***

 ** PSOC-394 **
 ** PAGE 3 **

SEAM NAME UNNAMED
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	2.98					
% ASH	4.97	5.12				
% VOLATILE MATTER	42.74	44.05	46.43	45.88	46.07	
% FIXED CARBON	49.32	50.83	53.57	54.12	53.93	

CALORIFIC VALUE	DRY	AS REC'D MOIST.	EQUIL. MOIST.
(GROSS BTU/LB)	---	---	---
MM-FREE, DIRECT			
MM-CONTAINING	11793	11442	11110
MM-FREE (PARR)	12524	12125	11750
MM-FREE (MOD.P)	12525	12079	11707
BEST MM FREE		12079	11707
NET CV, DMMF BTU/LB	11985		
ASH-FREE	12429		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	5.79	6.20
% TOTAL SULFUR	2.04	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST) HIGH VOLATILE C BITUMINOUS (HVCB)
 ASTM RANK (EQUIL. MOIST.) HIGH VOLATILE C BITUMINOUS (HVCB)
 REFLECTANCE RANK CATEGORY
 INTERNATIONAL RANK
 AS REC'D MOIST.
 EQUIL. MOIST.
 REPORTED RANK

** PENN STATE COAL DATA BASE **

 ** PSOC-394 **
 ** PAGE 4 **

SEAM NAME UNNAMED
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR) (6.65 %MM)
% ASH	4.97	5.12		
% CARBON	66.25	68.23	71.96	73.15
% HYDROGEN	5.29*	5.45	5.74	5.84
% NITROGEN	1.09	1.12	1.19	1.20
% SULFUR	1.98	2.04	2.15	
% CHLORINE	0.02	0.02	0.02	0.02
% OXYGEN(DIFF)	17.43*	17.97	18.94	19.80

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	1.19	0.00	0.85	2.04
DAF	1.25	0.00	0.90	2.15
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P) (6.35%MM)	DMMF(DIR.) (%MM)
% CARBON	68.20	72.83	
% HYDROGEN	5.36	5.72	
% NITROGEN	1.12	1.20	
% ORGANIC SULFUR	0.85	0.91	
% OXYGEN(DIFF)	18.11	19.32	
% CHLORINE	0.02	0.02	
% MINERAL MATTER (INCLUDES 2.23 % FES2)	6.35		

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
ATOMIC H/C	0.959	0.944	
ATOMIC O/C	0.203	0.213	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.04		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PG00-394 **
 ** PAGE 5 **

SEAM NAME UNNAMED
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 2.80
 % HIGH TEMPERATURE ASH = 18.60 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG			SI02	50.10	4.36
B			AL2O3	24.70	2.43
BA	230	52	TI02	0.93	0.10
BE	6	1	FE2O3	11.80	1.54
BI			NGO	1.28	0.14
CE			CAO	3.95	0.53
CO			NA2O	1.27	0.18
CR	120	22	K2O	0.91	0.14
CU	75	14	P2O5	0.10	0.01
GA			S03	3.60	0.27
GE					
LA					
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	75	14	AS		
NS			BR		
PB			CD		
RD	40	7	CL		
SC			F		
SV			HC		
SR	670	125	SB		
TH			SE		
U					
V	370	56			
Y					
YB					
ZI	170	19			
ZR	230	43			

** PENN STATE COAL DATA BASE **

 ** PSOC-394 **
 ** PAGE 7 **

SEAM NAME UNNAMED
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %		
VITRINITE (CALC.)	88.9	91.9	89.2		
INERTINITE (CALC.)	2.9	3.0	3.1		
LIPTINITE (CALC.)	5.0	5.2	4.3		
MINERAL MATTER (CALC.)	3.3		6.7		
VITRINOIDS					
VITRINITE	86.7	89.7	87.2		
PSEUDOVITRINITE	2.0	2.1	2.0		
FUSINITE	0.0	0.0	0.0		
SEMI-FUSINITE	2.0	2.1	2.2		
MACRINITE	0.0	0.0	0.0		
MICRINITE	0.8	0.8	0.8		
SCLEROTINITE	0.1	0.1	0.1		
SPORINITE					
CUTINITE					
EXINITE (ANAL.)	3.9	4.0	3.3		
PESINITE	1.2	1.2	1.0		
SUBERINITE					
EXUDATINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0	0.0	0.0		
LIPTODETRINITE					
MINERAL MATTER(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA (% IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	0.52	0.38	0.14	0.45	
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-398 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-398
 COLLECTED BY SHELL DEVELOPMENT CORPORATION
 COLLECTION DATE 6/ 1/76
 COLLECTOR'S NUMBER

REPORTED RANK

SAMPLE TYPE CORE WHOLE SEAM
 OTHER SAMPLE INFORMATION SCH-15-1
 SAMPLE RESERVE

SEAM NAME UNNAMED
 ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 1 FT. 2 IN.
 THICKNESS OF SEAM SAMPLED 1 FT. 2 IN.
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE TEXAS
 COUNTY WEBB
 TOWNSHIP
 NEAREST TOWN LAREDO
 COAL PROVINCE GULF
 COAL REGION
 COAL FIELD

MAP REFERENCE: LATITUDE 27D 38M 40S
 LONGITUDE 99D 36M 50S
 QUADRANGLE CUERVO CREEK

** PENN STATE COAL DATA BASE **

 ** PSOC-398 **
 ** PAGE 3 **

SEAM NAME UNNAMED
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	3.74					
% ASH	31.76	32.99				
% VOLATILE MATTER	36.80	38.23	57.05	54.40	52.85	
% FIXED CARBON	27.70	28.78	42.95	45.60	47.15	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	9250	8904	
MM-FREE (PARR)	14641	13767	
MM-FREE (MOD.P)	14859	13852	
BEST MM FREE		13852	
NET CV, DMMF BTU/LB	14176		
ASH-FREE	13804		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE		
% TOTAL SULFUR	5.71	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST) HIGH VOLATILE B BITUMINOUS (HVBB)
 ASTM RANK (EQUIL. MOIST.)
 REFLECTANCE RANK CATEGORY SUBBITUMINOUS A (SUBA)
 INTERNATIONAL RANK
 AS REC'D MOIST.
 EQUIL. MOIST.
 REPORTED RANK

** PENN STATE COAL DATA BASE **

 ** PSOC-398 **
 ** PAGE 4 **

SEAM NAME UNNAMED
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(39.77 %MM)
% ASH	31.76	32.99		
% CARBON	47.24	49.08	73.24	80.16
% HYDROGEN	4.30*	4.47	6.67	7.30
% NITROGEN	0.00	0.00	0.00	0.00
% SULFUR	5.50	5.71	8.52	
% CHLORINE	0.01	0.01	0.01	0.02
% OXYGEN(DIFF)	7.45*	7.74	11.56	12.53

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	4.36	0.01	1.34	5.71
DAF	6.51	0.01	2.00	8.52
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(39.33%MM)	(%MM)
% CARBON	48.59	80.10	
% HYDROGEN	3.95	6.52	
% NITROGEN	0.00	0.00	
% ORGANIC SULFUR	1.34	2.21	
% OXYGEN(DIFF)	6.78	11.16	
% CHLORINE	0.01	0.02	
% MINERAL MATTER	39.33		
(INCLUDES 8.16 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	1.094	0.977	
ATOMIC O/C	0.117	0.173	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.02		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-398 **
 ** PAGE 5 **

SEAM NAME UNNAMED
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 4.10
 % HIGH TEMPERATURE ASH = 32.85 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	42.70	6.56
B			AL2O3	24.50	4.26
BA	190	62	TiO2	0.89	0.18
BE	4	1	Fe2O3	28.00	6.43
BI	< 20	7	MGO	0.93	0.18
CE	< 100	33	CAO	1.21	0.28
CO	< 20	7	NA2O	1.05	0.26
CR	120	39	K2O	0.60	0.16
CU	74	24	P2O5	0.03	0.00
GA	36	12	SO3	0.70	0.09
GE	< 25	8			
LA	36	12			
LI					
MN	110	36			
MO			VOLATILES		PPM TOTAL COAL
NI	60	20	-----		-----
NB	< 20	7	AS		
PB	76	25	BR		
RB	20	7	CD		
SC	28	9	CL		
SN	47	15	F		
SR	300	99	HG		0.70
TH			SB		
U	< 6	2	SE		
V	230	76			
Y	39	13			
YB	10	3			
ZN	71	23			
ZR	210	69			

** PENN STATE COAL DATA BASE **

 ** PSOC-398 **
 ** PAGE 7 **

SEAM NAME UNNAMED
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION COMBINED WHITE AND BLUE LIGHT

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	58.3	76.1	47.0
INERTINITE (CALC.)	4.4	5.7	3.8
LIPTINITE (CALC.)	14.0	18.3	10.4
MINERAL MATTER (CALC.)	23.4		38.8
VITRINOIDS			
VITRINITE	57.8	75.4	46.6
PSEUDOVITRINITE	0.5	0.7	0.4
FUSINITE	0.1	0.1	0.1
SEMI-FUSINITE	2.4	3.1	2.1
MACRINITE	0.8	1.0	0.7
MICRINITE	1.1	1.5	1.0
SCLEROTINITE	0.0	0.0	0.0
SPORINITE	13.8	18.0	10.3
CUTINITE	0.0	0.0	0.0
EXINITE (ANAL.)			
RESINITE	0.2	0.3	0.2
SUBERINITE			
EXUDATINITE	0.0	0.0	0.0
FLUORINITE	0.0	0.0	0.0
BITUMINITE	0.0	0.0	0.0
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE	0.0	0.0	0.0
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	0.56	0.39	0.17	0.46	
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-399 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-399
COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
COLLECTION DATE 7/19/76
COLLECTOR'S NUMBER 399

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION LARGE CHANNEL
SAMPLE RESERVE

SEAM NAME FORT SCOTT
ALTERNATE SEAM NAME IRON POST

TOTAL SEAM THICKNESS 1 FT. 0 IN.
THICKNESS OF SEAM SAMPLED 1 FT. 0 IN.
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE OKLAHOMA
COUNTY CRAIG
TOWNSHIP
NEAREST TOWN VENITA

COAL PROVINCE INTERIOR
COAL REGION WESTERN
COAL FIELD

MAP REFERENCE: LATITUDE 36D 42M 40S
LONGITUDE 95D 21M 30S
QUADRANGLE VENITA 30'

** PENN STATE COAL DATA BASE **

 ** PSOC-399 **
 ** PAGE 3 **

SEAM NAME FORT SCOTT
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	3.99					
% ASH	7.75	8.07				
% VOLATILE MATTER	42.30	44.06	47.93	46.95	47.17	
% FIXED CARBON	45.96	47.87	52.07	53.05	52.83	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	13715	13168	13197
MM-FREE (PARR)	15167	14492	14527
MM-FREE (MOD.P)	15142	14358	14393
BEST MM FREE		14358	14393
NET CV, DMMF BTU/LB	14583		
ASH-FREE	14919		

MOTT-SPOONER DIFFERENCE = 34.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	3.78	4.24
% TOTAL SULFUR	3.90	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE A BITUMINOUS (HVAB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE A BITUMINOUS (HVAB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE B BITUMINOUS (HVBB)
INTERNATIONAL RANK	
AS REC'D MOIST.	630
EQUIL. MOIST.	630
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-399 **
 ** PAGE 4 **

SEAM NAME FORT SCOTT
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(10.86 %MM)
% ASH	7.75	8.07		
% CARBON	71.33	74.29	80.81	83.34
% HYDROGEN	5.20*	5.42	5.90	6.08
% NITROGEN	1.51	1.57	1.71	1.76
% SULFUR	3.74	3.90	4.24	
% CHLORINE	0.18	0.18	0.20	0.21
% OXYGEN(DIFF)	6.30*	6.57	7.16	8.63

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	1.89	0.07	1.94	3.90
DAF	2.06	0.08	2.11	4.24

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(10.10%MM)	(%MM)
% CARBON	74.17	82.50	
% HYDROGEN	5.28	5.87	
% NITROGEN	1.57	1.76	
% ORGANIC SULFUR	1.94	2.16	
% OXYGEN(DIFF)	6.95	7.54	
% CHLORINE	0.18	0.21	
% MINERAL MATTER	10.10		
(INCLUDES 3.54 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.876	0.855	
ATOMIC O/C	0.078	0.076	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.37		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-399 **
 ** PAGE 5 **

SEAM NAME FORT SCOTT
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 1.72
 % HIGH TEMPERATURE ASH = 8.22 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	14.80	0.57
B			AL2O3	6.49	0.28
BA	310	25	TiO2	0.35	0.02
BE	40	3	FE2O3	30.90	1.78
BI	< 20	2	MGO	0.70	0.03
CE	< 100	8	CAO	21.50	1.26
CO	< 20	2	NA2O	0.29	0.02
CR	200	16	K2O	0.72	0.05
CU	160	13	P2O5	0.21	0.01
GA	45	4	S03	23.00	0.76
GE	220	18			
LA	< 20	2			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	260	21	-----		-----
NB	< 20	2	AS		
PB	420	35	BR		
RB	40	3	CD		
SC	17	1	CL		
SN	62	5	F		
SR	530	44	HG		0.49
TH			SB		
U	62	5	SE		
V	160	13			
Y	74	6			
YB	12	1			
ZN	340	28			
ZR	150	12			

** PENN STATE COAL DATA BASE **

 ** PSOC-399 **
 ** PAGE 7 **

SEAM NAME FORT SCOTT
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION COMBINED WHITE AND BLUE LIGHT

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	85.5	90.5	80.4
INERTINITE (CALC.)	4.8	5.1	5.0
LIPTINITE (CALC.)	4.2	4.4	3.7
MINERAL MATTER (CALC.)	5.5		10.9
VITRINOIDS			
VITRINITE	80.1	84.8	75.4
PSEUDOVITRINITE	5.4	5.7	5.1
FUSINITE	1.9	2.0	2.1
SEMI-FUSINITE	1.1	1.2	1.1
MACRINITE	0.4	0.4	0.4
MICRINITE	1.4	1.5	1.4
SCLEROTINITE	0.0	0.0	0.0
SPORINITE	4.0	4.2	3.5
CUTINITE	0.0	0.0	0.0
EXINITE (ANAL.)			
RESINITE	0.2	0.2	0.2
SUBERINITE			
EXUDATINITE	0.0	0.0	0.0
FLUORINITE	0.0	0.0	0.0
BITUMINITE	0.0	0.0	0.0
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE	0.0	0.0	0.0
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	0.61	0.51	0.10	0.57	
PSEUDOVITRINITE	0.63	0.56	0.07	0.60	
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-400 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-400
COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
COLLECTION DATE 7/19/76
COLLECTOR'S NUMBER 400

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION SMALL CHANNEL
SAMPLE RESERVE

SEAM NAME FORT SCOTT
ALTERNATE SEAM NAME IRON POST

TOTAL SEAM THICKNESS 0 FT. 11 IN.
THICKNESS OF SEAM SAMPLED 0 FT. 11 IN.
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE OKLAHOMA
COUNTY CRAIG
TOWNSHIP
NEAREST TOWN VENITA
COAL PROVINCE INTERIOR
COAL REGION WESTERN
COAL FIELD

MAP REFERENCE: LATITUDE 36D 43M 10S
LONGITUDE 95D 24M 00S
QUADRANGLE VENITA 30'

** PENN STATE COAL DATA BASE **

 ** PSOC-400 **
 ** PAGE 3 **

SEAM NAME FORT SCOTT
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	3.01					
% ASH	8.41	8.67				
% VOLATILE MATTER	40.95	42.22	46.23	45.20	45.36	
% FIXED CARBON	47.63	49.11	53.77	54.80	54.64	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.

MM-FREE, DIRECT		
MM-CONTAINING	13723	13310
MM-FREE (PARR)	15279	14762
MM-FREE (MOD.P)	15262	14640
BEST MM FREE		14640
NET CV, DMMF BTU/LB	14719	
ASH-FREE	15026	

MOTT-SPOONER DIFFERENCE = 237.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE		
% TOTAL SULFUR	3.68	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE A BITUMINOUS (HVAB)
ASTM RANK (EQUIL. MOIST.)	
REFLECTANCE RANK CATEGORY	HIGH VOLATILE B BITUMINOUS (HVBB)
INTERNATIONAL RANK	
AS REC'D MOIST.	630
EQUIL. MOIST.	630
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-400 **
 ** PAGE 4 **

SEAM NAME FORT SCOTT
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(11.39 %MM)
% ASH	8.41	8.67		
% CARBON	71.78	74.01	81.04	83.52
% HYDROGEN	5.07*	5.23	5.73	5.90
% NITROGEN	1.49	1.54	1.69	1.74
% SULFUR	3.57	3.68	4.03	
% CHLORINE	0.16	0.16	0.18	0.18
% OXYGEN(DIFF)	6.50*	6.71	7.36	8.68

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	1.80	0.07	1.81	3.68
DAF	1.97	0.08	1.98	4.03

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(10.72%MM)	(%MM)
% CARBON	73.88	82.75	
% HYDROGEN	5.08	5.69	
% NITROGEN	1.54	1.74	
% ORGANIC SULFUR	1.81	2.03	
% OXYGEN(DIFF)	6.97	7.64	
% CHLORINE	0.16	0.18	
% MINERAL MATTER	10.72		
(INCLUDES 3.37 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.849	0.826	
ATOMIC O/C	0.078	0.078	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4,IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.32		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-400 **
 ** PAGE 5 **

SEAM NAME. FORT SCOTT
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 1.90
 % HIGH TEMPERATURE ASH = 9.46 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	12.50	0.55
B			AL2O3	5.71	0.29
BA	130	12	TiO2	0.34	0.02
BE	39	4	Fe2O3	26.30	1.74
BI	< 20	2	MGO	0.39	0.02
CE	< 100	9	CAO	24.10	1.63
CO	22	2	NA2O	0.40	0.03
CR	120	11	K2O	0.57	0.04
CU	120	11	P2O5	0.23	0.01
GA	34	3	SO3	26.30	1.00
GE	180	17			
LA	< 20	2			
LI					
MN	1000	95			
MO			VOLATILES		PPM TOTAL COAL
NI	190	18	-----		
NB	< 20	2	AS		
PB	360	34	BR		
RB	29	3	CD		
SC	9	1	CL		
SN	48	5	F		
SR	600	57	HG		0.39
TH			SB		
U	60	6	SE		
V	150	14			
Y	54	5			
YB	9	1			
ZN	250	24			
ZR	150	14			

** PENN STATE COAL DATA BASE **

 ** PSOC-400 **
 ** PAGE 7 **

SEAM NAME FORT SCOTT
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION COMBINED WHITE AND BLUE LIGHT

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	84.6	89.8	79.2
INERTINITE (CALC.)	6.7	7.1	6.9
LIPTINITE (CALC.)	2.8	3.0	2.5
MINERAL MATTER (CALC.)	5.8		11.4
VITRINOIDS			
VITRINITE	78.0	82.8	73.0
PSEUDOVITRINITE	6.6	7.0	6.2
FUSINITE	2.4	2.5	2.5
SEMI-FUSINITE	1.9	2.0	1.9
MACRINITE	0.6	0.6	0.6
MICRINITE	1.9	2.0	1.9
SCLEROTINITE	0.0	0.0	0.0
SPORINITE	2.6	2.8	2.3
CUTINITE	0.1	0.1	0.1
EXINITE (ANAL.)			
RESINITE	0.1	0.1	0.1
SUBERINITE			
EXUDATINITE	0.0	0.0	0.0
FLUORINITE	0.0	0.0	0.0
BITUMINITE	0.0	0.0	0.0
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE	0.0	0.0	0.0
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	0.62	0.54	0.08	0.59	
PSEUDOVITRINITE	0.67	0.60	0.07	0.63	
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-401 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-401
 COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
 COLLECTION DATE 7/20/76
 COLLECTOR'S NUMBER 401

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
 OTHER SAMPLE INFORMATION LARGE CHANNEL
 SAMPLE RESERVE

SEAM NAME MINERAL
 ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 0 FT. 11 IN.
 THICKNESS OF SEAM SAMPLED 0 FT. 11 IN.
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE OKLAHOMA
 COUNTY CRAIG
 TOWNSHIP
 NEAREST TOWN WELCH

COAL PROVINCE INTERIOR
 COAL REGION WESTERN
 COAL FIELD

MAP REFERENCE: LATITUDE 36D 57M 30S
 LONGITUDE 95D 13M 20S
 QUADRANGLE PYRAMID CORNERS 7.5'

** PENN STATE COAL DATA BASE **

 ** PSOC-401 **
 ** PAGE 3 **

SEAM NAME MINERAL COUNTRY U.S.A.
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB) STATE OKLAHOMA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	3.89					
% ASH	10.05	10.46				
% VOLATILE MATTER	35.93	37.38	41.75	40.53	40.52	
% FIXED CARBON	50.13	52.16	58.25	59.47	59.48	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
	---	---	---

MM-FREE, DIRECT			
MM-CONTAINING	13564	13036	12891
MM-FREE (PARR)	15423	14736	14549
MM-FREE (MOD.P)	15439	14672	14486
BEST MM FREE		14672	14486
NET CV, DMMF BTU/LB	14816		
ASH FREE	15149		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	4.96	5.71
% TOTAL SULFUR	3.34	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE A BITUMINOUS (HVAB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE A BITUMINOUS (HVAB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE A BITUMINOUS (HVAB)
INTERNATIONAL RANK	
AS REC'D MOIST.	630
EQUIL. MOIST.	630
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-401 **
 ** PAGE 4 **

SEAM NAME MINERAL
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----

				(13.13 %MM)
% ASH	10.05	10.46		
% CARBON	69.29	72.09	80.51	82.99
% HYDROGEN	5.63*	5.86	6.54	6.75
% NITROGEN	1.31	1.36	1.52	1.57
% SULFUR	3.21	3.34	3.73	
% CHLORINE	0.17	0.18	0.20	0.20
% OXYGEN(DIFF)	6.45*	6.71	7.52	8.52

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	1.96	0.18	1.20	3.34
DAF	2.19	0.20	1.34	3.73
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(12.83%MM)	(%MM)
% CARBON	71.93	82.52	
% HYDROGEN	5.68	6.52	
% NITROGEN	1.36	1.57	
% ORGANIC SULFUR	1.20	1.38	
% OXYGEN(DIFF)	6.99	7.85	
% CHLORINE	0.18	0.20	
% MINERAL MATTER	12.83		
(INCLUDES 3.67 % FE32)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.976	0.949	
ATOMIC O/C	0.077	0.082	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.35		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-401 **
 ** PAGE 5 **

SEAM NAME MINERAL
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 2.19

% HIGH TEMPERATURE ASH = 9.87 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	28.10	1.30
B			AL2O3	12.50	0.65
BA	1130	112	TiO2	0.62	0.04
BE	29	3	FE2O3	30.20	2.08
BI	< 20	2	MGO	1.02	0.06
CE	110	11	CAO	12.00	0.85
CO	100	10	NA2O	0.35	0.03
CR	140	14	K2O	1.33	0.11
CU	110	11	P2O5	0.06	0.00
GA	46	5	SO3	13.20	0.52
GE	190	19			
LA	52	5			
LI					
MN	1200	118			
MO			VOLATILES		PPM TOTAL COAL
NI	480	47	AS		
NB	< 20	2	BR		
PB	940	93	CD		
RB	83	8	CL		
SC	20	2	F		
SN	48	5	HG		
SR	310	31	SB		
TH			SE		
U	23	2			
V	200	20			
Y	64	6			
YB	9	1			
ZN	280	28			
ZR	180	18			

** PENN STATE COAL DATA BASE **

 ** PSOC-401 **
 ** PAGE 7 **

SEAM NAME MINERAL
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION COMBINED WHITE AND BLUE LIGHT

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	81.6	87.5	75.6
INERTINITE (CALC.)	7.5	8.1	7.7
LIPTINITE (CALC.)	4.2	4.5	3.6
MINERAL MATTER (CALC.)	6.8		13.1
VITRINOIDS			
VITRINITE	77.1	82.7	71.4
PSEUDOVITRINITE	4.5	4.8	4.1
FUSINITE	1.9	2.0	2.0
SEMI-FUSINITE	3.6	3.9	3.6
MACRINITE	0.2	0.2	0.2
MICRINITE	1.9	2.0	1.9
SCLEROTINITE	0.0	0.0	0.0
SPORINITE	4.2	4.5	3.6
CUTINITE	0.0	0.0	0.0
EXINITE (ANAL.)			
RESINITE	0.0	0.0	0.0
SUBERINITE			
EXUDATINITE	0.0	0.0	0.0
FLUORINITE	0.0	0.0	0.0
BITUMINITE	0.0	0.0	0.0
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE	0.0	0.0	0.0
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	0.77	0.66	0.11	0.73	
PSEUDOVITRINITE	0.83	0.72	0.11	0.76	
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-403 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-403
COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
COLLECTION DATE 7/21/76
COLLECTOR'S NUMBER 403

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION
SAMPLE RESERVE

SEAM NAME STIGLER
ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 1 FT. 7 IN.
THICKNESS OF SEAM SAMPLED 1 FT. 7 IN.
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE OKLAHOMA
COUNTY HASKELL
TOWNSHIP STIGLER
NEAREST TOWN STIGLER

COAL PROVINCE INTERIOR
COAL REGION WESTERN
COAL FIELD

MAP REFERENCE: LATITUDE 35D 16M 60S
LONGITUDE 95D 6M 50S
QUADRANGLE STIGLER EAST 7.5'

** PENN STATE COAL DATA BASE **

 ** PSOC-403 **
 ** PAGE 3 **

SEAM NAME STIGLER
 APPARENT RANK MEDIUM VOLATILE BITUMINOUS (MVB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	2.95					
% ASH	9.37	9.65				
% VOLATILE MATTER	25.67	26.45	29.28	28.54	28.07	
% FIXED CARBON	62.01	63.90	70.72	71.46	71.93	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	14149	13732	13860
MM-FREE (PARR)	15814	15294	15454
MM-FREE (MOD.P)	15889	15343	15505
BEST MM FREE		15343	15505
NET CV, DMMF BTU/LB	15393		
ASH-FREE	15660		

MOTT-SPOONER DIFFERENCE = 153.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	2.04	2.28
% TOTAL SULFUR	0.46	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	MEDIUM VOLATILE BITUMINOUS (MVB)
ASTM RANK (EQUIL. MOIST.)	MEDIUM VOLATILE BITUMINOUS (MVB)
REFLECTANCE RANK CATEGORY	MEDIUM VOLATILE BITUMINOUS (MVB)
INTERNATIONAL RANK	
AS REC'D MOIST.	530
EQUIL. MOIST.	530
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-403 **
 ** PAGE 4 **

SEAM NAME STIGLER
 APPARENT RANK MEDIUM VOLATILE BITUMINOUS (MVB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR) (10.67 %MM)
% ASH	9.37	9.65		
% CARBON	76.55	78.88	87.30	88.31
% HYDROGEN	4.63*	4.77	5.28	5.34
% NITROGEN	1.71	1.76	1.95	1.97
% SULFUR	0.45	0.46	0.51	
% CHLORINE	0.07	0.07	0.08	0.08
% OXYGEN(DIFF)	4.28*	4.41	4.89	4.31

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	0.10	0.00	0.36	0.46
DAF	0.11	0.00	0.40	0.51

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P) (10.99%MM)	DMMF(DIR.) (%MM)
% CARBON	78.74	88.46	
% HYDROGEN	4.64	5.22	
% NITROGEN	1.76	1.97	
% ORGANIC SULFUR	0.36	0.40	
% OXYGEN(DIFF)	3.51	3.87	
% CHLORINE	0.07	0.08	
% MINERAL MATTER	10.99		

(INCLUDES 0.19 % FES2)

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
ATOMIC H/C	0.726	0.708	
ATOMIC O/C	0.037	0.037	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.14		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-403 **
 ** PAGE 5 **

SEAM NAME STIGLER
 APPARENT RANK MEDIUM VOLATILE BITUMINOUS (MVB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 0.88

% HIGH TEMPERATURE ASH = 9.48 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	43.70	1.94
B			Al2O3	20.20	1.01
BA	520	49	TiO2	0.85	0.05
BE	7	1	Fe2O3	11.90	0.79
BI	< 20	2	MgO	1.84	0.11
CE	< 100	9	CaO	9.54	0.65
CO	76	7	Na2O	0.87	0.06
CR	150	14	K2O	2.43	0.19
CU	15	1	P2O5	0.12	0.00
GA	< 10	1	SO3	8.00	0.30
GE	< 25	2			
LA	35	3			
LI					
MN	1750	166			
MO			Volatiles		PPM TOTAL COAL
NI	190	18	AS		
NB	< 20	2	BR		
PB	48	5	CD		
RB	125	12	CL		
SC	18	2	F		
SN	< 10	1	HG		
SR	350	33	SB		
TH			SE		
U	< 4	0			
V	200	19			
Y	60	6			
YB	7	1			
ZN	210	20			
ZR	150	14			

** PENN STATE COAL DATA BASE **

 ** PSOC-403 **
 ** PAGE 7 **

SEAM NAME STIGLER
 APPARENT RANK MEDIUM VOLATILE BITUMINOUS (MVB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION COMBINED WHITE AND BLUE LIGHT

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
	-----	-----	-----
VITRINITE (CALC.)	86.0	91.0	80.7
INERTINITE (CALC.)	7.3	7.7	7.6
LIPTINITE (CALC.)	1.1	1.2	1.0
MINERAL MATTER (CALC.)	5.4		10.7
VITRINOIDS			
VITRINITE	71.3	75.4	56.9
PSEUDOVITRINITE	14.8	15.6	13.8
FUSINITE	3.5	3.7	3.8
SEMI-FUSINITE	2.3	2.4	2.3
MACRINITE	0.2	0.2	0.2
MICRINITE	1.3	1.4	1.3
SCLEROTINITE	0.0	0.0	0.0
SPORINITE	1.1	1.2	1.0
CUTINITE	0.0	0.0	0.0
EXINITE (ANAL.)			
RESINITE	0.0	0.0	0.0
SUBERINITE			
EXUDATINITE	0.0	0.0	0.0
FLUORINITE	0.0	0.0	0.0
BITUMINITE	0.0	0.0	0.0
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE	0.0	0.0	0.0
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
-----	----	---	-----	-----	-----
VITRINITE	1.30	1.17	0.13	1.23	
PSEUDOVITRINITE	1.36	1.24	0.12	1.28	
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-404 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-404

COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
 COLLECTION DATE 7/21/76
 COLLECTOR'S NUMBER 404

REPORTED RANK MEDIUM VOLATILE BITUMINOUS (MVB)

SAMPLE TYPE CHANNEL WHOLE SEAM
 OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
 SAMPLE RESERVE

SEAM NAME LOWER HARTSHORNE
 ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 2 FT. 6 IN.
 THICKNESS OF SEAM SAMPLED 2 FT. 6 IN.
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE OKLAHOMA
 COUNTY LE FLORE
 TOWNSHIP
 NEAREST TOWN BOKOSHE

COAL PROVINCE INTERIOR
 COAL REGION WESTERN
 COAL FIELD

MAP REFERENCE: LATITUDE 35D 10M 10S
 LONGITUDE 94D 47M 20S
 QUADRANGLE BOKOSHE 7.5'

** PENN STATE COAL DATA BASE **

 ** PSOC-404 **
 ** PAGE 3 **

SEAM NAME LOWER HARTSHORNE
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	3.09					
% ASH	9.35	9.65				
% VOLATILE MATTER	17.21	17.76	19.66	18.70	18.29	
% FIXED CARBON	70.35	72.59	80.34	81.30	81.71	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	14045	13611	13440
MM-FREE (PARR)	15711	15169	14956
MM-FREE (MOD.P)	15776	15199	14985
BEST MM FREE		15199	14985
NET CV, DMMF BTU/LB	15342		
ASH-FREE	15545		

MOTT-SPOONER DIFFERENCE = 54.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	4.31	4.83
% TOTAL SULFUR	0.79	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	LOW VOLATILE BITUMINOUS (LVB)
ASTM RANK (EQUIL. MOIST.)	LOW VOLATILE BITUMINOUS (LVB)
REFLECTANCE RANK CATEGORY	LOW VOLATILE BITUMINOUS (LVB)
INTERNATIONAL RANK	
AS REC'D MOIST.	330
EQUIL. MOIST.	330
REPORTED RANK	MEDIUM VOLATILE BITUMINOUS (MVB)

** PENN STATE COAL DATA BASE **

 ** PSOC-404 **
 ** PAGE 4 **

SEAM NAME LOWER HARTSHORNE
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR) (10.86 %MM)
% ASH	9.35	9.65		
% CARBON	78.23	80.72	89.34	90.55
% HYDROGEN	4.03*	4.16	4.60	4.67
% NITROGEN	1.59	1.64	1.82	1.84
% SULFUR	0.77	0.79	0.87	
% CHLORINE	0.06	0.06	0.07	0.07
% OXYGEN(DIFF)	2.88*	2.98	3.30	2.88

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	0.26	0.07	0.46	0.79
DAF	0.29	0.08	0.51	0.87

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P) (11.06%MM)	DMMF(DIR.) (%MM)
% CARBON	80.58	90.60	
% HYDROGEN	4.03	4.53	
% NITROGEN	1.64	1.84	
% ORGANIC SULFUR	0.46	0.52	
% OXYGEN(DIFF)	2.23	2.44	
% CHLORINE	0.06	0.07	
% MINERAL MATTER	11.06		
(INCLUDES 0.49 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
ATOMIC H/C	0.619	0.601	
ATOMIC O/C	0.024	0.023	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.13		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-404 **
 ** PAGE 5 **

SEAM NAME LOWER HARTSHORNE
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 0.37
 % HIGH TEMPERATURE ASH = 9.67 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	31.10	1.41
B			Al2O3	18.10	0.93
BA	500	48	TiO2	0.75	0.04
BE	5	0	Fe2O3	11.10	0.75
BI	< 20	2	MgO	5.04	0.29
CE	< 100	10	CaO	14.70	1.02
CO	29	3	Na2O	1.00	0.07
CR	150	15	K2O	1.50	0.12
CU	60	6	P2O5	0.17	0.01
GA	19	2	SO3	16.20	0.63
GE	< 25	2			
LA	34	3			
LI					
MN	1130	109			
MO			VOLATILES		PPM TOTAL COAL
NI	170	16	-----		
NB	< 20	2	AS		
PB	< 40	4	BR		
RB	62	6	CD		
SC	17	2	CL		
SN	< 10	1	F		
SR	240	23	HG		
TH			SB		
U	< 7	1	SE		
V	190	17			
Y	50	5			
YB	7	1			
ZN	80	8			
ZR	130	13			

** PENN STATE COAL DATA BASE **

 ** PSOC-404 **
 ** PAGE 7 **

SEAM NAME LOWER HARTSHORNE
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %		DMMF VOLUME %		DRY WEIGHT %
	-----		-----		-----
VITRINITE (CALC.)	81.3		86.1		75.9
INERTINITE (CALC.)	13.1		13.9		13.2
LIPTINITE (CALC.)	0.0		0.0		0.0
MINERAL MATTER (CALC.)	5.5				10.9
VITRINOIDS					
VITRINITE	75.2		79.6		70.2
PSEUDOVITRINITE	6.1		6.5		5.7
FUSINITE	4.2		4.4		4.4
SEMI-FUSINITE	5.5		5.8		5.4
MACRINITE	0.4		0.4		0.4
MICRINITE	3.1		3.3		3.1
SCLEROTINITE	0.0		0.0		0.0
SPORINITE					
CUTINITE					
EXINITE (ANAL.)	0.0		0.0		0.0
RESINITE	0.0		0.0		0.0
SUBERINITE					
EXUDATINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0		0.0		0.0
LIPTODETRINITE					
MINERAL MATTER(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
(%, IN OIL)	----	----	----	-----	-----
VITRINITE	1.73	1.56	0.17	1.66	
PSEUDOVITRINITE	1.75	1.66	0.09	1.70	
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-408 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER	PSOC-408
COLLECTED BY	PENNSYLVANIA STATE UNIVERSITY
COLLECTION DATE	7/21/76
COLLECTOR'S NUMBER	408
REPORTED RANK	MEDIUM VOLATILE BITUMINOUS (MVB)
SAMPLE TYPE	CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION	SUBSECTION DATA AVAILABLE
SAMPLE RESERVE	
SEAM NAME	UPPER HARTSHORNE
ALTERNATE SEAM NAME	
TOTAL SEAM THICKNESS	3 FT. 9 IN.
THICKNESS OF SEAM SAMPLED	3 FT. 9 IN.
PORTION RECOVERED IN CORE	
DIAMETER OF CORE	

 *
 * SAMPLE LOCATION *
 *

COUNTRY	U.S.A.
STATE	OKLAHOMA
COUNTY	LE FLORE
TOWNSHIP	
NEAREST TOWN	BOKOSHE
COAL PROVINCE	INTERIOR
COAL REGION	WESTERN
COAL FIELD	

MAP REFERENCE:	LATITUDE	35D 10M 10S
	LONGITUDE	94D 47M 20S
	QUADRANGLE	BOKOSHE 7.5'

** PENN STATE COAL DATA BASE **

 ** PSOC-408 **
 ** PAGE 3 **

SEAM NAME UPPER HARTSHORNE
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	2.51					
% ASH	12.42	12.74				
% VOLATILE MATTER	18.70	19.18	21.98	19.95	20.05	
% FIXED CARBON	66.37	68.08	78.02	80.05	79.95	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	13414	13077	13122
MM-FREE (PARR)	15693	15228	15289
MM-FREE (MOD.P)	15691	15064	15124
BEST MM FREE		15064	15124
NET CV, DMMF BTU/LB	15223		
ASH-FREE	15372		

MOTT-SPOONER DIFFERENCE = 36.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	2.18	2.58
% TOTAL SULFUR	3.29	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	LOW VOLATILE BITUMINOUS (LVB)
ASTM RANK (EQUIL. MOIST.)	LOW VOLATILE BITUMINOUS (LVB)
REFLECTANCE RANK CATEGORY	LOW VOLATILE BITUMINOUS (LVB)
INTERNATIONAL RANK	
AS REC'D MOIST.	420
EQUIL. MOIST.	420
REPORTED RANK	MEDIUM VOLATILE BITUMINOUS (MVB)

** PENN STATE COAL DATA BASE **

 ** PSOC-408 **
 ** PAGE 4 **

SEAM NAME UPPER HARTSHORNE
 APPARENT RANK LOW VOLATILE BITUMINOUS (LV3)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(15.57 %MM)
% ASH	12.42	12.74		
% CARBON	73.42	75.31	86.31	89.20
% HYDROGEN	4.19*	4.30	4.93	5.09
% NITROGEN	1.37	1.41	1.62	1.67
% SULFUR	3.21	3.29	3.77	
% CHLORINE	0.08	0.08	0.09	0.09
% OXYGEN(DIFF)	2.80*	2.87	3.30	3.96

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	0.58	0.09	2.62	3.29
DAF	0.66	0.10	3.00	3.77
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(14.71%MM)	(%MM)
% CARBON	75.13	88.08	
% HYDROGEN	4.12	4.83	
% NITROGEN	1.41	1.67	
% ORGANIC SULFUR	2.62	3.07	
% OXYGEN(DIFF)	2.01	2.28	
% CHLORINE	0.08	0.09	
% MINERAL MATTER	14.71		
(INCLUDES 1.09 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.686	0.659	
ATOMIC O/C	0.033	0.023	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.16		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-408 **
 ** PAGE 5 **

SEAM NAME UPPER HARTSHORNE COUNTRY U.S.A.
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB) STATE OKLAHOMA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 1.55
 % HIGH TEMPERATURE ASH = 12.80 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	17.40	1.04
B			AL2O3	11.30	0.77
BA	500	64	TiO2	0.40	0.03
BE	6	1	FE2O3	23.90	2.14
BI	< 20	3	MGO	3.93	0.30
CE	< 100	13	CAO	21.30	1.95
CO	47	6	NA2O	0.81	0.08
CR	130	17	K2O	0.82	0.09
CU	< 5	1	P2O5	0.29	0.02
GA	< 10	1	SO3	18.90	0.97
GE	< 25	3			
LA	< 20	3			
LI					
MN	3400	435			
MO			VOLATILES		PPM TOTAL COAL
NI	250	32	AS		
NB	< 20	3	BR		
PB	< 40	5	CD		
RB	38	5	CL		
SC	11	1	F		
SN	< 10	1	HG		
SR	350	45	SB		
TH			SE		
U	< 4	1			
V	190	23			
Y	35	4			
YB	8	1			
ZN	110	14			
ZR	85	11			

** PENN STATE COAL DATA BASE **

 ** PSOC-408 **
 ** PAGE 7 **

SEAM NAME UPPER HARTSHORNE
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

 *
 * PETROGRAPHIC DATA *
 *

COUNTRY U.S.A.
 STATE OKLAHOMA

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
	-----	-----	-----
VITRINITE (CALC.)	85.2	92.8	77.8
INERTINITE (CALC.)	6.6	7.2	6.6
LIPTINITE (CALC.)	0.0	0.0	0.0
MINERAL MATTER (CALC.)	8.2		15.6
VITRINOIDS			
VITRINITE	69.9	76.1	63.8
PSEUDOVITRINITE	15.3	16.7	14.0
FUSINITE	3.3	3.6	3.4
SEMI-FUSINITE	2.4	2.6	2.3
MACRINITE	0.0	0.0	0.0
MICRINITE	0.9	1.0	0.9
SCLEROTINITE	0.0	0.0	0.0
SPORINITE			
CUTINITE			
EXINITE (ANAL.)	0.0	0.0	0.0
RESINITE	0.0	0.0	0.0
SUBERINITE			
EXUDATINITE			
FLUORINITE			
BITUMINITE			
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE			
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
-----	----	----	-----	-----	-----
VITRINITE	1.73	1.55	0.18	1.66	
PSEUDOVITRINITE	1.79	1.63	0.16	1.70	
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-412 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-412
 COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
 COLLECTION DATE 7/23/76
 COLLECTOR'S NUMBER 412
 REPORTED RANK LIGNITE A (LIGA)
 SAMPLE TYPE CHANNEL WHOLE SEAM
 OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
 SAMPLE RESERVE
 SEAM NAME DARCO LIGNITE
 ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 9 FT. 0 IN.
 THICKNESS OF SEAM SAMPLED 9 FT. 0 IN.
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE TEXAS
 COUNTY HARRISON
 TOWNSHIP
 NEAREST TOWN MARSHALL
 COAL PROVINCE GULF
 COAL REGION
 COAL FIELD

MAP REFERENCE: LATITUDE 32D 24M 50S
 LONGITUDE 94D 27M 20S
 QUADRANGLE DARCO 15'

** PENN STATE COAL DATA BASE **

 ** PSOC-412 **
 ** PAGE 3 **

SEAM NAME DARCO LIGNITE
 APPARENT RANK SUBBITUMINOUS C (SUBC)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	22.43					
% ASH	12.36	15.93				
% VOLATILE MATTER	33.34	42.98	51.12	50.16	49.43	
% FIXED CARBON	31.87	41.09	48.88	49.84	50.57	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
-----------------------------------	-----	--------------------	------------------

MM-FREE, DIRECT			
MM-CONTAINING	10444	8101	6284
MM-FREE (PARR)	12647	9351	6999
MM-FREE (MOD.P)	12744	9367	7007
BEST MM FREE		9367	7007
NET CV, DMMF BTU/LB	12236		
ASH-FREE	12423		

MOTT-SPOONER DIFFERENCE = 56.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	39.83	48.55
% TOTAL SULFUR	1.38	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	SUBBITUMINOUS C (SUBC)
ASTM RANK (EQUIL. MOIST.)	LIGNITE A (LIGA)
REFLECTANCE RANK CATEGORY	
INTERNATIONAL RANK	
AS REC'D MOIST.	
EQUIL. MOIST.	
REPORTED RANK	LIGNITE A (LIGA)

** PENN STATE COAL DATA BASE **

 ** PSOC-412 **
 ** PAGE 4 **

SEAM NAME DARCO LIGNITE
 APPARENT RANK SUBBITUMINOUS C (SUBC)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(17.96 %MM)

% ASH	12.36	15.93		
% CARBON	46.68	60.18	71.58	73.36
% HYDROGEN	3.48*	4.48	5.33	5.46
% NITROGEN	0.94	1.21	1.44	1.47
% SULFUR	1.07	1.38	1.64	
% CHLORINE	0.05	0.06	0.07	0.07
% OXYGEN(DIFF)	12.99*	16.76	19.95	19.65

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	0.38	0.07	0.93	1.38
DAF	0.45	0.08	1.11	1.64

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(18.21%MM)	(%MM)
% CARBON	59.95	73.30	
% HYDROGEN	4.27	5.21	
% NITROGEN	1.21	1.47	
% ORGANIC SULFUR	0.93	1.14	
% OXYGEN(DIFF)	15.43	18.81	
% CHLORINE	0.06	0.07	
% MINERAL MATTER	18.21		
(INCLUDES 0.71 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.894	0.854	
ATOMIC O/C	0.201	0.236	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.12		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-412 **
 ** PAGE 5 **

SEAM NAME DARCO LIGNITE
 APPARENT RANK SUBBITUMINOUS C (SUBC)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 8.77
 % HIGH TEMPERATURE ASH = 11.73 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	40.70	2.23
B			AL2O3	21.90	1.36
BA	2250	264	TiO2	1.13	0.08
BE	5	1	FE2O3	13.20	1.08
BI	< 20	2	MGO	2.17	0.15
CE	< 100	12	CAO	8.80	0.74
CO	< 20	2	NA2O	0.38	0.03
CR	110	13	K2O	1.49	0.15
CU	190	22	P2O5	0.04	0.00
GA	35	4	SO3	10.00	0.47
GE	< 25	3			
LA	34	4			
LI					
MN	1200	141			
MO			VOLATILES		PPM TOTAL COAL
NI	< 25	3	AS		
NB	< 20	2	BR		
PB	45	5	CD		
RB	64	8	CL		
SC	24	3	F		
SN	< 10	1	HG		0.13
SR	1200	141	SB		
TH			SE		
U	< 10	1			
V	220	26			
Y	42	5			
YB	7	1			
ZN	20	2			
ZR	260	30			

** PENN STATE COAL DATA BASE **

 ** PSOC-412 **
 ** PAGE 7 **

SEAM NAME DARCO LIGNITE
 APPARENT RANK SUBBITUMINOUS C (SUBC)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %
HUMINITE	66.0	73.0
INERTINITE	11.4	12.6
LIPTINITE	0.1	0.1
MINERAL MATTER(CALC.)	9.5	
TEXTINITE	0.0	0.0
ULMINITE	64.7	71.5
ATTRINITE	0.0	0.0
DENSINITE	0.0	0.0
HUMODETRINITE(ANAL)		
GELINITE	0.6	0.7
CORPOHUMINITE	0.7	0.8
SPORINITE		
CUTINITE		
EXINITE		1.4
RESINITE	0.1	0.1
SUBERINITE		
FLUORINITE		
BITUMINITE		
ALGINITE	0.0	0.0
LIPTODETRINITE		
FUSINITE	4.7	5.2
SEMI-FUSINITE	3.9	4.3
MACRINITE	2.7	3.0
MICRINITE	0.0	0.0
SCLEROTINITE	0.1	0.1
INERTODETRINITE	0.0	0.0
MINERAL MATTER(ANAL.)		
HUMINITE(ANAL.)		
INERTINITE(ANAL.)		
LIPTINITE(ANAL.)		

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
ULMINITE	0.44	0.27	0.17	0.37	

** PENN STATE COAL DATA BASE **

** PSOC-416 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-416
COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
COLLECTION DATE 7/24/76
COLLECTOR'S NUMBER 416
REPORTED RANK LIGNITE A (LIGA)
SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
SAMPLE RESERVE
SEAM NAME UNNAMED
ALTERNATE SEAM NAME LIGNITE
TOTAL SEAM THICKNESS 9 FT. 0 IN.
THICKNESS OF SEAM SAMPLED 9 FT. 0 IN.
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE TEXAS
COUNTY TITUS
TOWNSHIP MT. PLEASANT
NEAREST TOWN WINFIELD
COAL PROVINCE GULF
COAL REGION
COAL FIELD

MAP REFERENCE: LATITUDE 33D 11M 20S
LONGITUDE 95D 5M 20S
QUADRANGLE WINFIELD 7.5'

** PENN STATE COAL DATA BASE **

 ** PSOC-416 **
 ** PAGE 3 **

SEAM NAME UNNAMED
 APPARENT RANK SUBBITUMINOUS C (SUBC)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	27.84					
% ASH	15.59	21.60				
% VOLATILE MATTER	32.47	45.00	57.40	56.34	55.05	
% FIXED CARBON	24.10	33.40	42.60	43.66	44.95	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.

MM-FREE, DIRECT			
MM-CONTAINING	9801	7072	6648
MM-FREE (PARR)	12806	8502	7893
MM-FREE (MOD.P)	12971	8547	7932
BEST MM FREE		8547	7932
NET CV, DMMF BTU/LB	12410		
ASH-FREE	12501		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	32.17	42.22
% TOTAL SULFUR	0.85	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	SUBBITUMINOUS C (SUBC)
ASTM RANK (EQUIL. MOIST.)	LIGNITE A (LIGA)
REFLECTANCE RANK CATEGORY	
INTERNATIONAL RANK	
AS REC'D MOIST.	
EQUIL. MOIST.	
REPORTED RANK	LIGNITE A (LIGA)

** PENN STATE COAL DATA BASE **

 ** PSOC-416 **
 ** PAGE 4 **

SEAM NAME UNNAMED COUNTRY U.S.A.
 APPARENT RANK SUBBITUMINOUS C (SUBC) STATE TEXAS

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(23.80 %MM)
% ASH	15.59	21.60		
% CARBON	40.94	56.74	72.37	74.46
% HYDROGEN	3.30*	4.57	5.83	6.00
% NITROGEN	0.79	1.10	1.40	1.44
% SULFUR	0.61	0.85	1.08	
% CHLORINE	0.04	0.05	0.07	0.07
% OXYGEN(DIFF)	10.87*	15.08	19.26	18.05

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	0.03	0.00	0.82	0.85
DAF	0.04	0.00	1.05	1.08

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(24.45%MM)	(%MM)
% CARBON	56.44	74.70	
% HYDROGEN	4.29	5.68	
% NITROGEN	1.10	1.44	
% ORGANIC SULFUR	0.82	1.09	
% OXYGEN(DIFF)	12.90	17.03	
% CHLORINE	0.05	0.07	
% MINERAL MATTER	24.45		
(INCLUDES 0.06 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.967	0.913	
ATOMIC O/C	0.182	0.227	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.11		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-416 **
 ** PAGE 5 **

SEAM NAME UNNAMED
 APPARENT RANK SUBBITUMINOUS C (SUBC)

COUNTRY U.S.A.
 STATE TEXAS

 * *
 * CHEMICAL DATA 3 *
 * *

% MOISTURE IN COAL = 10.30
 % HIGH TEMPERATURE ASH = 17.73 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	49.70	4.12
B			Al2O3	22.40	2.10
BA	1140	202	TiO2	1.62	0.17
BE	5	1	Fe2O3	3.41	0.42
BI	< 20	4	MgO	2.77	0.30
CE	130	23	CaO	11.50	1.46
CO	< 20	4	Na2O	0.25	0.03
CR	110	20	K2O	0.67	0.10
CU	160	28	P2O5	0.12	0.01
GA	40	7	SO3	7.90	0.56
GE	< 25	4			
LA	66	12			
LI					
MN	670	119			
MO			VOLATILES		PPM TOTAL COAL
NI	< 25	4	AS		
NB	< 20	4	BR		
PB	< 40	7	CD		
RB	38	7	CL		
SC	26	5	F		
SN	< 10	2	HG		
SR	1120	199	SB		
TH			SE		
U	14	2			
V	240	43			
Y	56	10			
YB	6	1			
ZN	10	2			
ZR	310	55			

** PENN STATE COAL DATA BASE **

 ** PSOC-416 **
 ** PAGE 7 **

SEAM NAME UNNAMED
 APPARENT RANK SUBBITUMINOUS C (SUBC)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %		DMMF VOLUME %	
	-----		-----	
HUMINITE	52.8		60.7	
INERTINITE	11.1		12.8	
LIPTINITE	0.3		0.3	
MINERAL MATTER(CALC.)	13.1			
TEXTINITE	0.2		0.2	
ULMINITE	52.1		59.9	
ATTRINITE	0.0		0.0	
DENSINITE	0.0		0.0	
HUMODETRINITE(ANAL)				
GELINITE	0.4		0.5	
CORPOHUMINITE	0.1		0.1	
SPORINITE				
CUTINITE				
EXINITE			1.6	
RESINITE	0.3		0.3	
SUBERINITE				
FLUORINITE				
BITUMINITE				
ALGINITE	0.0		0.0	
LIPTODETRINITE				
FUSINITE	5.5		6.3	
SEMI-FUSINITE	2.3		2.7	
MACRINITE	3.2		3.7	
MICRINITE	0.0		0.0	
SCLEROTINITE	0.1		0.1	
INERTODETRINITE	0.0		0.0	
MINERAL MATTER(ANAL.)				
HUMINITE(ANAL.)				
INERTINITE(ANAL.)				
LIPTINITE(ANAL.)				
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX STAND.DEV.
(%, IN OIL)				
-----	----	----	-----	-----
ULMINITE	0.44	0.24	0.20	0.36

** PENN STATE COAL DATA BASE **

** PSOC-420 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-420
COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
COLLECTION DATE 7/26/76
COLLECTOR'S NUMBER 420

REPORTED RANK LIGNITE A (LIGA)
SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
SAMPLE RESERVE

SEAM NAME WILDCAT
ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 6 FT. 2 IN.
THICKNESS OF SEAM SAMPLED 6 FT. 2 IN.
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE TEXAS
COUNTY MILAM
TOWNSHIP
NEAREST TOWN ROCKDALE

COAL PROVINCE GULF
COAL REGION
COAL FIELD

MAP REFERENCE: LATITUDE 30D 33M 50S
LONGITUDE 97D 3M 30S
QUADRANGLE ALCOA LAKE 7.5'

** PENN STATE COAL DATA BASE **

 ** PSOC-420 **
 ** PAGE 3 **

SEAM NAME WILDCAT
 APPARENT RANK SUBBITUMINOUS C (SUBC)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	30.52					
% ASH	10.96	15.78				
% VOLATILE MATTER	34.49	49.64	58.94	58.15	57.47	
% FIXED CARBON	24.03	34.58	41.06	41.85	42.53	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	10962	7616	7460
MM-FREE (PARR)	13262	8636	8433
MM-FREE (MOD.P)	13353	8636	8434
BEST MM FREE		8636	8434
NET CV, DMMF BTU/LB	12776		
ASH-FREE	13016		

MOTT-SPOONER DIFFERENCE = 126.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	31.95	38.97
% TOTAL SULFUR	1.75	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST) SUBBITUMINOUS C (SUBC)
 ASTM RANK (EQUIL. MOIST.) SUBBITUMINOUS C (SUBC)
 REFLECTANCE RANK CATEGORY
 INTERNATIONAL RANK
 AS REC'D MOIST.
 EQUIL. MOIST.
 REPORTED RANK LIGNITE A (LIGA)

** PENN STATE COAL DATA BASE **

 ** PSOC-420 **
 ** PAGE 4 **

SEAM NAME WILDCAT
 APPARENT RANK SUBBITUMINOUS C (SUBC)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR) (18.00 %MM)
% ASH	10.96	15.78		
% CARBON	41.88	60.27	71.56	73.50
% HYDROGEN	3.54*	5.10	6.06	6.22
% NITROGEN	0.87	1.25	1.48	1.52
% SULFUR	1.22	1.75	2.08	
% CHLORINE	0.07	0.09	0.11	0.12
% OXYGEN(DIFF)	10.92*	15.75	18.72	18.66

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	0.45	0.05	1.25	1.75
DAF	0.53	0.06	1.48	2.08
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P) (18.09%MM)	DMMF(DIR.) (%MM)
% CARBON	60.05	73.31	
% HYDROGEN	4.89	5.96	
% NITROGEN	1.25	1.52	
% ORGANIC SULFUR	1.25	1.53	
% OXYGEN(DIFF)	14.48	17.58	
% CHLORINE	0.09	0.12	
% MINERAL MATTER	18.09		
(INCLUDES 0.84 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
ATOMIC H/C	1.016	0.977	
ATOMIC O/C	0.191	0.220	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.19		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-420 **
 ** PAGE 5 **

SEAM NAME WILDCAT
 APPARENT RANK SUBBITUMINOUS C (SUBC)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 10.90
 % HIGH TEMPERATURE ASH = 19.64 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SI02	48.00	4.41
B			AL2O3	25.90	2.69
BA	1160	228	TiO2	1.66	0.20
BE	4	1	FE2O3	3.81	0.52
BI	< 20	4	MGO	2.75	0.33
CE	140	27	CAO	10.30	1.45
CO	< 20	4	NA2O	0.26	0.04
CR	100	20	K2O	0.80	0.13
CU	130	26	P2O5	0.05	0.00
GA	45	9	S03	6.80	0.53
GE	< 25	5			
LA	72	14			
LI					
MN	500	98			
MO			VOLATILES		PPM TOTAL COAL
NI	60	12	AS		
NB	< 20	4	BR		
PB	< 40	8	CD		
RB	41	8	CL		
SC	29	6	F		
SN	< 10	2	HG		
SR	1080	212	SB		
TH			SE		
U	15	3			
V	270	53			
Y	54	11			
YB	7	1			
ZN	45	9			
ZR	270	53			

** PENN STATE COAL DATA BASE **

 ** PSOC-420 **
 ** PAGE 7 **

SEAM NAME WILDCAT
 APPARENT RANK SUBBITUMINOUS C (SUBC)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %			
	-----	-----			
HUMINITE	55.7	61.6			
INERTINITE	7.1	7.9			
LIPTINITE	0.3	0.3			
MINERAL MATTER(CALC.)	9.6				
TEXTINITE	0.0	0.0			
ULMINITE	55.1	60.9			
ATTRINITE	0.0	0.0			
DENSINITE	0.0	0.0			
HUMODETRINITE(ANAL)					
GELINITE	0.2	0.2			
CORPOHUMINITE	0.5	0.5			
SPORINITE					
CUTINITE					
EXINITE		2.0			
RESINITE	0.3	0.3			
SUBERINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0	0.0			
LIPTODETRINITE					
FUSINITE	3.3	3.6			
SEMI-FUSINITE	1.9	2.1			
MACRINITE	1.7	1.9			
MICRINITE	0.0	0.0			
SCLEROTINITE	0.3	0.3			
INERTODETRINITE	0.0	0.0			
MINERAL MATTER(ANAL.)					
HUMINITE(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
(%, IN OIL)					
-----	----	----	-----	-----	-----
ULMINITE	0.41	0.22	0.19	0.32	

** PENN STATE COAL DATA BASE **

 ** PSOC-425 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-425

COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
 COLLECTION DATE 7/27/76
 COLLECTOR'S NUMBER 425

REPORTED RANK LIGNITE A (LIGA)

SAMPLE TYPE CHANNEL WHOLE SEAM
 OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
 SAMPLE RESERVE

SEAM NAME UNNAMED
 ALTERNATE SEAM NAME LIGNITE

TOTAL SEAM THICKNESS 5 FT. 9 IN.
 THICKNESS OF SEAM SAMPLED 5 FT. 9 IN.
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE TEXAS
 COUNTY FREESTONE
 TOWNSHIP
 NEAREST TOWN FAIRFIELD

COAL PROVINCE GULF
 COAL REGION
 COAL FIELD

MAP REFERENCE: LATITUDE 31D 48M 00S
 LONGITUDE 96D 8M 30S
 QUADRANGLE STEWARDS MILL 7.5'

** PENN STATE COAL DATA BASE **

 ** PSOC-425 **
 ** PAGE 3 **

SEAM NAME UNNAMED

COUNTRY U.S.A.

APPARENT RANK SUBBITUMINOUS C (SUBC)

STATE TEXAS

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	28.60					
% ASH	10.03	14.05				
% VOLATILE MATTER	35.66	49.94	58.10	57.41	56.83	
% FIXED CARBON	25.71	36.01	41.90	42.59	43.17	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	11015	7865	7564
MM-FREE (PARR)	13020	8819	8440
MM-FREE (MOD.P)	13102	8822	8443
BEST MM FREE		8822	8443
NET CV, DMMF BTU/LB	12569		
ASH-FREE	12816		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	31.33	37.27
% TOTAL SULFUR	1.37	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	SUBBITUMINOUS C (SUBC)
ASTM RANK (EQUIL. MOIST.)	SUBBITUMINOUS C (SUBC)
REFLECTANCE RANK CATEGORY	
INTERNATIONAL RANK	
AS REC'D MOIST.	
EQUIL. MOIST.	
REPORTED RANK	LIGNITE A (LIGA)

** PENN STATE COAL DATA BASE **

 ** PSOC-425 **
 ** PAGE 4 **

SEAM NAME UNNAMED
 APPARENT RANK SUBBITUMINOUS C (SUBC)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(15.93 %MM)
% ASH	10.03	14.05		
% CARBON	45.71	64.02	74.49	76.15
% HYDROGEN	3.45*	4.83	5.62	5.75
% NITROGEN	0.81	1.13	1.31	1.34
% SULFUR	0.98	1.37	1.59	
% CHLORINE	0.05	0.07	0.09	0.09
% OXYGEN(DIFF)	10.35*	14.52	16.91	16.69

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	0.26	0.05	1.06	1.37
DAF	0.30	0.06	1.23	1.59
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF (MOD.P)	DMMF (DIR.)
-----	---	-----	-----
		(16.04%MM)	(%MM)
% CARBON	63.82	76.01	
% HYDROGEN	4.64	5.53	
% NITROGEN	1.13	1.34	
% ORGANIC SULFUR	1.06	1.26	
% OXYGEN(DIFF)	13.31	15.78	
% CHLORINE	0.07	0.09	
% MINERAL MATTER	16.04		
(INCLUDES 0.49 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.906	0.874	
ATOMIC O/C	0.165	0.186	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.15		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-425 **
 ** PAGE 5 **

SEAM NAME UNNAMED
 APPARENT RANK SUBBITUMINOUS C (SUBC)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 10.60
 % HIGH TEMPERATURE ASH = 11.30 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	29.40	1.55
B			AL2O3	11.40	0.68
BA	2960	334	TiO2	1.18	0.08
BE	8	1	FE2O3	7.49	0.59
BI	< 20	2	MGO	3.89	0.27
CE	< 100	11	CAO	24.80	2.00
CO	< 20	2	NA2O	0.56	0.05
CR	100	11	K2O	0.21	0.02
CU	120	14	P2O5	0.03	0.00
GA	22	2	SO3	17.50	0.79
GE	< 25	3			
LA	32	4			
LI					
MN	1950	220			
MO			VOLATILES		PPM TOTAL COAL
NI	100	11	AS		
NB	< 20	2	BR		
PB	< 40	5	CD		
RB	14	2	CL		
SC	21	2	F		
SN	< 10	1	HG		
SR	3700	418	SB		
TH			SE		
U	11	1			
V	170	19			
Y	60	7			
YB	6	1			
ZN	35	4			
ZR	250	29			

** PENN STATE COAL DATA BASE **

 ** PSOC-425 **
 ** PAGE 7 **

SEAM NAME UNNAMED
 APPARENT RANK SUBBITUMINOUS C (SUBC)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %		DMMF VOLUME %	
	-----		-----	
HUMINITE	61.9		67.5	
INERTINITE	8.3		9.1	
LIPTINITE	0.1		0.1	
MINERAL MATTER(CALC.)	8.4			
TEXTINITE	0.0		0.0	
ULMINITE	61.0		66.6	
ATTRINITE	0.0		0.0	
DENSINITE	0.0		0.0	
HUMODETRINITE(ANAL.)				
GELINITE	0.3		0.3	
CORPOHUMINITE	0.5		0.6	
SPORINITE				
CUTINITE				
EXINITE			1.5	
RESINITE	0.1		0.1	
SUBERINITE				
FLUORINITE				
BITUMINITE				
ALGINITE	0.0		0.0	
LIPTODETRINITE				
FUSINITE	3.3		3.6	
SEMI-FUSINITE	2.5		2.7	
MACRINITE	2.5		2.7	
MICRINITE	0.0		0.0	
SCLEROTINITE	0.1		0.1	
INERTODETRINITE	0.0		0.0	
MINERAL MATTER(ANAL.)				
HUMINITE(ANAL.)				
INERTINITE(ANAL.)				
LIPTINITE(ANAL.)				
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX STAND.DEV.
(%, IN OIL)				
-----	----	----	-----	-----
ULMINITE	0.42	0.21	0.21	0.33

** PENN STATE COAL DATA BASE **

 ** PSOC-429 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-429

COLLECTED BY UNIVERSITY OF UTAH
 COLLECTION DATE 7/14/76
 COLLECTOR'S NUMBER

REPORTED RANK HIGH VOLATILE C BITUMINOUS (HVCB)

SAMPLE TYPE CHANNEL WORKING SECTION
 OTHER SAMPLE INFORMATION
 SAMPLE RESERVE 500

SEAM NAME UPPER HIAWATHA
 ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 13 FT. 0 IN.
 THICKNESS OF SEAM SAMPLED 7 FT. 6 IN.
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE UTAH
 COUNTY SEVIER
 TOWNSHIP
 NEAREST TOWN EMERY

COAL PROVINCE ROCKY MOUNTAIN
 COAL REGION UINTA
 COAL FIELD WASATCH PLATEAU

MAP REFERENCE: LATITUDE 38D 56M 20S
 LONGITUDE 111D 24M 10S
 QUADRANGLE ACORD LAKES (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-429 **
 ** PAGE 3 **

SEAM NAME UPPER HIAWATHA
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE UTAH

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	6.82					
% ASH	15.74	16.89				
% VOLATILE MATTER	41.17	44.18	53.16	52.31	51.40	
% FIXED CARBON	36.27	38.93	46.84	47.69	48.60	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
-----------------------------------	-----	--------------------	------------------

MM-FREE, DIRECT			
MM-CONTAINING	11420	10641	10576
MM-FREE (PARR)	13986	12833	12738
MM-FREE (MOD.P)	14117	12919	12823
BEST MM FREE		12919	12823
NET CV, DMF BTU/LB	13542		
ASH-FREE	13741		

NOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	7.39	9.07
% TOTAL SULFUR	0.56	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE C BITUMINOUS (HVCB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE C BITUMINOUS (HVCB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE C BITUMINOUS (HVCB)
INTERNATIONAL RANK	
AS REC'D MOIST.	700
EQUIL. MOIST.	700
REPORTED RANK	HIGH VOLATILE C BITUMINOUS (HVCB)

** PENN STATE COAL DATA BASE **

 ** PSOC-429 **
 ** PAGE 4 **

SEAM NAME UPPER HIAWATHA
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE UTAH

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR) (18.55 %MM)
% ASH	15.74	16.99		
% CARBON	59.64	64.01	77.02	78.59
% HYDROGEN	4.68*	5.02	6.04	6.16
% NITROGEN	0.94	1.01	1.22	1.24
% SULFUR	0.52	0.56	0.67	
% CHLORINE	0.02	0.02	0.02	0.02
% OXYGEN(DIFF)	11.64*	12.49	15.03	13.99

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	0.13	0.00	0.43	0.56
DAF	0.16	0.00	0.52	0.67

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P) (19.16%MM)	DMMF(DIR.) (%MM)
% CARBON	63.77	78.88	
% HYDROGEN	4.80	5.93	
% NITROGEN	1.01	1.24	
% ORGANIC SULFUR	0.43	0.53	
% OXYGEN(DIFF)	10.83	13.38	
% CHLORINE	0.02	0.02	
% MINERAL MATTER	19.16		
(INCLUDES 0.24 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
ATOMIC H/C	0.942	0.904	
ATOMIC O/C	0.134	0.158	

MISC. CHEMICAL DATA	DRY	OF DMDF COAL	OF DMDF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.04		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-429 **
 ** PAGE 5 **

SEAM NAME UPPER HIAWATHA
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE UTAH

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 6.16
 % HIGH TEMPERATURE ASH = 16.10 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG			SI02	53.60	4.03
B			AL2O3	15.90	1.35
BA	650	105	TIO2	0.68	0.07
BE	5	1	FE2O3	4.12	0.46
BI			MGO	2.92	0.28
CE			CAO	9.73	1.12
CO			NA2O	0.20	0.02
CR	100	16	K2O	1.44	0.19
CU	55	9	P2O5	0.18	0.01
GA			S03	9.60	0.62
GE					
LA					
LI					
MM					
MO			VOLATILES		PPM TOTAL COAL
NI	40	6	AS		
NB			BR		
PB			CD		
RB	60	10	CL		
SC			F		
SH			HG		
SR	390	63	SB		
TH			SE		
U					
V	160	26			
Y					
YB					
ZN	100	16			
ZR	210	34			

** PENN STATE COAL DATA BASE **

 ** PSOC-429 **
 ** PAGE 7 **

SEAM NAME UPPER HIAWATHA
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE UTAH

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	77.0	85.4	69.6
INERTINITE (CALC.)	11.6	12.9	11.5
LIPTINITE (CALC.)	1.5	1.7	1.2
MINERAL MATTER (CALC.)	9.9		18.5
VITRINOIDS			
VITRINITE	75.1	83.4	67.9
PSEUDOVITRINITE	1.8	2.0	1.6
FUSINITE	5.4	6.0	5.4
SEMI-FUSINITE	4.5	5.0	4.4
MACRINITE	0.9	1.0	0.9
MICRINITE	0.8	0.9	0.8
SCLEROTINITE	0.0	0.0	0.0
SPORINITE			
CUTINITE			
EXINITE (ANAL.)	1.0	1.1	0.8
RESINITE	0.5	0.6	0.4
SUBERINITE			
EXUDATINITE			
FLUORINITE			
BITUMINITE			
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE			
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND. DEV.
VITRINITE	0.59	0.44	0.15	0.52	
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-435 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-435

COLLECTED BY UNIVERSITY OF UTAH
COLLECTION DATE 7/16/76
COLLECTOR'S NUMBER

REPORTED RANK HIGH VOLATILE B BITUMINOUS (HVBB)

SAMPLE TYPE CHANNEL WORKING SECTION
OTHER SAMPLE INFORMATION LITHOTYPE DATA AVAILABLE
SAMPLE RESERVE 500

SEAM NAME UTAH B
ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 9 FT. 0 IN.
THICKNESS OF SEAM SAMPLED 6 FT. 8 IN.
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE UTAH
COUNTY EMERY
TOWNSHIP
NEAREST TOWN HIAWATHA

COAL PROVINCE ROCKY MOUNTAIN
COAL REGION UINTA
COAL FIELD WASATCH PLATEAU

MAP REFERENCE: LATITUDE 39D 29M 50S
LONGITUDE 111D 4M 50S
QUADRANGLE HIAWATHA (15')

** PENN STATE COAL DATA BASE **

 ** PSOC-435 **
 ** PAGE 3 **

SEAM NAME UTAH B
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE UTAH

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	5.08					
% ASH	4.37	4.60				
% VOLATILE MATTER	45.85	48.30	50.63	50.37	50.36	
% FIXED CARBON	44.71	47.10	49.37	49.63	49.64	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	13915	13208	13189
MM-FREE (PARR)	14660	13876	13854
MM-FREE (MOD.P)	14680	13871	13850
BEST MM FREE		13871	13850
NET CV, DMMF BTU/LB	14023		
ASH-FREE	14586		

MOTT-SPOONER DIFFERENCE = 303.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	5.22	5.51
% TOTAL SULFUR	0.54	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE B BITUMINOUS (HVBB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE B BITUMINOUS (HVBB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE C BITUMINOUS (HVCB)
INTERNATIONAL RANK	
AS REC'D MOIST.	620
EQUIL. MOIST.	620
REPORTED RANK	HIGH VOLATILE B BITUMINOUS (HVBB)

** PENN STATE COAL DATA BASE **

 ** PSOC-435 **
 ** PAGE 4 **

SEAM NAME UTAH B
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE UTAH

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(5.26 %MM)
% ASH	4.37	4.60		
% CARBON	68.58	72.25	75.73	76.27
% HYDROGEN	6.37*	6.71	7.03	7.08
% NITROGEN	1.27	1.34	1.40	1.41
% SULFUR	0.51	0.54	0.57	
% CHLORINE	0.00	0.00	0.01	0.01
% OXYGEN(DIFF)	13.82*	14.55	15.26	15.23

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	0.10	0.00	0.44	0.54
DAF	0.10	0.00	0.46	0.57
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(5.25%MM)	(%MM)
% CARBON	72.19	76.18	
% HYDROGEN	6.65	7.02	
% NITROGEN	1.34	1.41	
% ORGANIC SULFUR	0.44	0.46	
% OXYGEN(DIFF)	14.14	14.92	
% CHLORINE	0.00	0.01	
% MINERAL MATTER	5.25		
(INCLUDES 0.19 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	1.115	1.106	
ATOMIC O/C	0.150	0.155	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.01		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-435 **
 ** PAGE 5 **

SEAM NAME UTAH B
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE UTAH

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 2.61
 % HIGH TEMPERATURE ASH = 4.64 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	52.50	1.14
B			Al2O3	12.60	0.31
BA	345	16	TiO2	0.93	0.03
BE	< 3	0	Fe2O3	5.39	0.17
BI	< 20	1	MgO	0.91	0.03
CE	< 100	5	CaO	12.20	0.40
CO	< 20	1	Na2O	3.09	0.11
CR	130	6	K2O	0.26	0.01
CU	75	3	P2O5	0.14	0.00
GA	20	1	SO3	9.10	0.17
GE	< 25	1			
LA	40	2			
LI					
MN	140	6			
MO			VOLATILES		PPM TOTAL COAL
NI	110	5	-----	-----	-----
NB	< 20	1	AS		
PB	< 40	2	BR		
RB	25	1	CD		
SC	11	1	CL		
SN	20	1	F		
SR	1320	61	HG		
TH			SB		
U	< 8	0	SE		
V	100	5			
Y	42	2			
YB	< 5	0			
ZN	50	2			
ZR	390	18			

** PENN STATE COAL DATA BASE **

 ** PSOC-435 **
 ** PAGE 7 **

SEAM NAME UTAH B
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE UTAH

 * PETROGRAPHIC DATA *

MACERAL COMPOSITION COMBINED WHITE AND BLUE LIGHT

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	83.8	86.0	81.4
INERTINITE (CALC.)	6.3	6.5	6.8
LIPTINITE (CALC.)	7.3	7.5	6.6
MINERAL MATTER (CALC.)	2.6		5.3

VITRINOIDS			
VITRINITE	79.2	81.3	76.9
PSEUDOVITRINITE	4.6	4.7	4.4
FUSINITE	2.2	2.3	2.5
SEMI-FUSINITE	2.0	2.1	2.1
MACRINITE	1.1	1.1	1.1
MICRINITE	0.8	0.8	0.8
SCLEROTINITE	0.2	0.2	0.2
SPORINITE	4.9	5.0	4.4
CUTINITE	0.8	0.8	0.7
EXINITE (ANAL.)			
RESINITE	1.7	1.7	1.5
SUBERINITE			
EXUDATINITE	0.0	0.0	0.0
FLUORINITE	0.0	0.0	0.0
BITUMINITE	0.0	0.0	0.0
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE	0.0	0.0	0.0
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	0.61	0.48	0.13	0.55	
PSEUDOVITRINITE	0.65	0.54	0.11	0.59	
VITRINOIDS					

*** PENN STATE COAL DATA BASE ***

 ** PSOC-442 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER
 COLLECTED BY
 COLLECTION DATE
 COLLECTOR'S NUMBER

PSOC-442
 UNIVERSITY OF UTAH
 7/20/76

REPORTED RANK HIGH VOLATILE B BITUMINOUS (HVBB)
 SAMPLE TYPE CHANNEL WORKING SECTION
 OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
 SAMPLE RESERVE 50

SEAM NAME COLORADO E
 ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 8 FT. 10 IN.
 THICKNESS OF SEAM SAMPLED 7 FT. 10 IN.
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE COLORADO
 COUNTY GUNNISON
 TOWNSHIP
 NEAREST TOWN SOMERSET

COAL PROVINCE ROCKY MOUNTAIN
 COAL REGION UINTA
 COAL FIELD SOMERSET

MAP REFERENCE: LATITUDE 38D 56M 10S
 LONGITUDE 107D 24M 50S
 QUADRANGLE SOMERSET (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-442 **
 ** PAGE 3 **

SEAM NAME COLORADO E
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE COLORADO

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	4.33					
% ASH	3.29	3.44				
% VOLATILE MATTER	38.11	39.83	41.25	40.97	41.04	
% FIXED CARBON	54.27	56.73	58.75	59.03	58.96	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	13851	13251	13066
MM-FREE (PARR)	14404	13755	13555
MM-FREE (MOD.P)	14415	13741	13541
BEST MM FREE		13741	13541
NET CV, DMMF BTU/LB	13886		
ASH-FREE	14344		

MOTT-SPOONER DIFFERENCE = 295.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	5.67	5.91
% TOTAL SULFUR	0.60	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE B BITUMINOUS (HVBB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE B BITUMINOUS (HVBB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE B BITUMINOUS (HVBB)
INTERNATIONAL RANK	
AS REC'D MOIST.	620
EQUIL. MOIST.	620
REPORTED RANK	HIGH VOLATILE B BITUMINOUS (HVBB)

** PENN STATE COAL DATA BASE **

 ** PSOC-442 **
 ** PAGE 4 **

SEAM NAME COLORADO E
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE COLORADO

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(4.05 %MM)
% ASH	3.29	3.44		
% CARBON	72.99	76.19	78.90	79.40
% HYDROGEN	5.24*	5.48	5.68	5.71
% NITROGEN	1.50	1.57	1.63	1.64
% SULFUR	0.57	0.60	0.62	
% CHLORINE	0.02	0.03	0.03	0.03
% OXYGEN(DIFF)	12.14*	12.69	13.15	13.23

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	0.13	0.00	0.47	0.60
DAF	0.13	0.00	0.49	0.62
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(3.96%MM)	(%MM)
% CARBON	76.14	79.28	
% HYDROGEN	5.43	5.66	
% NITROGEN	1.57	1.64	
% ORGANIC SULFUR	0.47	0.49	
% OXYGEN(DIFF)	12.43	12.91	
% CHLORINE	0.03	0.03	
% MINERAL MATTER	3.96		
(INCLUDES 0.24 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.864	0.857	
ATOMIC O/C	0.125	0.127	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.05		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-442 **
 ** PAGE 5 **

SEAM NAME COLORADO E
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE COLORADO

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 4.00

% HIGH TEMPERATURE ASH = 3.52 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	33.30	0.55
B			AL2O3	25.30	0.47
BA	5270	186	TiO2	1.03	0.02
BE	5	0	FE2O3	15.50	0.38
BI	< 20	1	MGO	2.12	0.05
CE	110	4	CAO	9.42	0.24
CO	< 20	1	NA2O	1.37	0.04
CR	110	4	K2O	0.45	0.01
CU	75	3	P2O5	1.28	0.02
GA	35	1	SO3	9.10	0.13
GE	< 25	1			
LA	64	3			
LI					
MN	390	14			
MO			VOLATILES		PPM TOTAL COAL
NI	60	2	AS		
NB	< 20	1	BR		
PB	60	2	CD		
RB	20	1	CL		
SC	18	1	F		
SN	48	2	HG		
SR	3460	122	SB		
TH			SE		
U					
V	150	5			
Y	58	2			
YB	7	0			
ZN	60	2			
ZR	350	12			

** PENN STATE COAL DATA BASE **

 ** PSOC-442 **
 ** PAGE 7 **

SEAM NAME COLORADO E
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE COLORADO

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %		
	-----	-----	-----		
VITRINITE (CALC.)	89.5	91.3	88.0		
INERTINITE (CALC.)	7.4	7.5	8.0		
LIPTINITE (CALC.)	1.2	1.2	1.1		
MINERAL MATTER (CALC.)	2.0		4.0		
VITRINOIDS					
VITRINITE	81.3	83.0	80.0		
PSEUDOVITRINITE	8.1	8.3	8.0		
FUSINITE	2.3	2.3	2.6		
SEMI-FUSINITE	4.3	4.4	4.6		
MACRINITE	0.4	0.4	0.4		
MICRINITE	0.3	0.3	0.3		
SCLEROTINITE	0.1	0.1	0.1		
SPORINITE					
CUTINITE					
EXINITE (ANAL.)	1.2	1.2	1.1		
RESINITE	0.0	0.0	0.0		
SUBERINITE					
EXUDATINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0	0.0	0.0		
LIPTODETRINITE					
MINERAL MATTER(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
(%, IN OIL)	----	----	-----	-----	-----
VITRINITE	0.75	0.55	0.20	0.66	
PSEUDOVITRINITE	0.81	0.64	0.17	0.73	
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-449 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-449

COLLECTED BY UNIVERSITY OF UTAH
 COLLECTION DATE 7/21/76
 COLLECTOR'S NUMBER

REPORTED RANK MEDIUM VOLATILE BITUMINOUS (MVB)

SAMPLE TYPE CHANNEL WORKING SECTION
 OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
 SAMPLE RESERVE 40

SEAM NAME COLORADO UPPER B
 ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 8 FT. 0 IN.
 THICKNESS OF SEAM SAMPLED 6 FT. 0 IN.
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE COLORADO
 COUNTY PITKIN
 TOWNSHIP
 NEAREST TOWN REDSTONE

COAL PROVINCE ROCKY MOUNTAIN
 COAL REGION UINTA
 COAL FIELD CARBONDALE

MAP REFERENCE: LATITUDE 39D 11M 20S
 LONGITUDE 107D 21M 00S
 QUADRANGLE PLACITA (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-449 **
 ** PAGE 3 **

SEAM NAME COLORADO UPPER B
 APPARENT RANK MEDIUM VOLATILE BITUMINOUS (MVB)

COUNTRY U.S.A.
 STATE COLORADO

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	0.95					
% ASH	9.85	9.94				
% VOLATILE MATTER	23.85	24.08	26.74	25.69	25.44	
% FIXED CARBON	65.35	65.98	73.26	74.31	74.56	

CALORIFIC VALUE	DRY	AS REC'D MOIST.	EQUIL. MOIST.
(GROSS BTU/LB)	---	---	---

MM-FREE, DIRECT			
MM-CONTAINING	14111	13977	13959
MM-FREE (PARR)	15864	15694	15671
MM-FREE (MOD.P)	15911	15693	15670
BEST MM FREE		15693	15670
NET CV, DMMF BTU/LB	15390		
ASH-FREE	15668		

MOTT-SPOONER DIFFERENCE = 308.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	1.08	1.22
% TOTAL SULFUR	1.35	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	MEDIUM VOLATILE BITUMINOUS (MVB)
ASTM RANK (EQUIL. MOIST.)	MEDIUM VOLATILE BITUMINOUS (MVB)
REFLECTANCE RANK CATEGORY	MEDIUM VOLATILE BITUMINOUS (MVB)
INTERNATIONAL RANK	
AS REC'D MOIST.	430
EQUIL. MOIST.	430
REPORTED RANK	MEDIUM VOLATILE BITUMINOUS (MVB)

** PENN STATE COAL DATA BASE **

 ** PSOC-449 **
 ** PAGE 4 **

SEAM NAME COLORADO UPPER B
 APPARENT RANK MEDIUM VOLATILE BITUMINOUS (MVB)

COUNTRY U.S.A.
 STATE COLORADO

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(11.48 %MM)
% ASH	9.85	9.94		
% CARBON	76.25	76.98	85.48	86.96
% HYDROGEN	4.92*	4.97	5.52	5.61
% NITROGEN	1.72	1.74	1.93	1.97
% SULFUR	1.34	1.35	1.50	
% CHLORINE	0.00	0.00	0.01	0.01
% OXYGEN(DIFF)	4.97*	5.01	5.57	5.45

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	0.58	0.04	0.73	1.35
DAF	0.64	0.04	0.81	1.50
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(11.51%MM)	(%MM)
% CARBON	76.84	86.83	
% HYDROGEN	4.83	5.46	
% NITROGEN	1.74	1.97	
% ORGANIC SULFUR	0.73	0.82	
% OXYGEN(DIFF)	4.36	4.92	
% CHLORINE	0.00	0.01	
% MINERAL MATTER	11.51		
(INCLUDES 1.09 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.775	0.755	
ATOMIC O/C	0.047	0.048	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4,IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.01		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-449 **
 ** PAGE 5 **

SEAM NAME COLORADO UPPER B
 APPARENT RANK MEDIUM VOLATILE BITUMINOUS (MVB)

COUNTRY U.S.A.
 STATE COLORADO

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 0.80
 % HIGH TEMPERATURE ASH = 8.73 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	49.80	2.03
B			Al2O3	26.40	1.22
BA	3360	293	TiO2	0.75	0.04
BE	6	1	Fe2O3	9.04	0.55
BI	< 20	2	MgO	1.12	0.06
CE	130	11	CaO	4.54	0.28
CO	< 20	2	Na2O	2.83	0.18
CR	50	4	K2O	1.00	0.07
CU	150	13	P2O5	0.89	0.03
GA	37	3	SO3	4.00	0.14
GE	< 25	2			
LA	58	5			
LI					
MN	470	41			
MO			VOLATILES		PPM TOTAL COAL
NI	< 25	2	AS		
NB	< 20	2	BR		
PB	48	4	CD		
RB	40	3	CL		
SC	12	1	F		
SN	< 10	1	HG		
SR	2450	214	SB		
TH			SE		
U					
V	130	11			
Y	60	5			
YB	7	1			
ZN	350	31			
ZR	270	24			

** PENN STATE COAL DATA BASE **

 ** PSOC-449 **
 ** PAGE 7 **

SEAM NAME COLORADO UPPER B
 APPARENT RANK MEDIUM VOLATILE BITUMINOUS (MVB)

COUNTRY U.S.A.
 STATE COLORADO

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	88.4	93.9	82.6
INERTINITE (CALC.)	5.7	6.1	5.9
LIPTINITE (CALC.)	0.0	0.0	0.0
MINERAL MATTER (CALC.)	5.9		11.5
VITRINOIDS			
VITRINITE	79.4	84.4	74.2
PSEUDOVITRINITE	8.9	9.5	8.4
FUSINITE	2.1	2.2	2.2
SEMI-FUSINITE	2.3	2.4	2.3
MACRINITE	0.6	0.6	0.6
MICRINITE	0.8	0.9	0.9
SCLEROTINITE	0.0	0.0	0.0
SPORINITE			
CUTINITE			
EXINITE (ANAL.)	0.0	0.0	0.0
RESINITE	0.0	0.0	0.0
SUBERINITE			
EXUDATINITE			
FLUORINITE			
BITUMINITE			
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE			
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	1.44	1.32	0.12	1.38	
PSEUDOVITRINITE	1.47	1.35	0.12	1.40	
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-453 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-453

COLLECTED BY UNIVERSITY OF UTAH
 COLLECTION DATE 7/28/76
 COLLECTOR'S NUMBER

REPORTED RANK HIGH VOLATILE A BITUMINOUS (HVAB)

SAMPLE TYPE CHANNEL WORKING SECTION
 OTHER SAMPLE INFORMATION
 SAMPLE RESERVE 500

SEAM NAME BLIND CANYON
 ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 14 FT. 0 IN.
 THICKNESS OF SEAM SAMPLED 7 FT. 7 IN.
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE UTAH
 COUNTY EMERY
 TOWNSHIP
 NEAREST TOWN ORANGEVILLE

COAL PROVINCE ROCKY MOUNTAIN
 COAL REGION UINTA
 COAL FIELD WASATCH PLATEAU

MAP REFERENCE: LATITUDE 39D 19M 50S
 LONGITUDE 111D 6M 30S
 QUADRANGLE HIAWATHA (15')

** PENN STATE COAL DATA BASE **

 ** PSOC-453 **
 ** PAGE 3 **

SEAM NAME BLIND CANYON
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE UTAH

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	4.29					
% ASH	5.24	5.48				
% VOLATILE MATTER	43.31	45.25	47.87	47.56	47.49	
% FIXED CARBON	47.16	49.27	52.13	52.44	52.51	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	13869	13274	13120
MM-FREE (PARR)	14758	14085	13912
MM-FREE (MOD.P)	14788	14093	13920
BEST MM FREE		14093	13920
NET CV, DMMF BTU/LB	14206		
ASH-FREE	14673		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	5.40	5.76
% TOTAL SULFUR	0.51	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE A BITUMINOUS (HVAB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE B BITUMINOUS (HVBB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE C BITUMINOUS (HVCB)
INTERNATIONAL RANK	
AS REC'D MOIST.	620
EQUIL. MOIST.	620
REPORTED RANK	HIGH VOLATILE A BITUMINOUS (HVAB)

** PENN STATE COAL DATA BASE **

 ** PSOC-453 **
 ** PAGE 4 **

SEAM NAME BLIND CANYON
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE UTAH

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(6.20 %MM)
% ASH	5.24	5.48		
% CARBON	72.87	76.14	80.55	81.17
% HYDROGEN	5.63*	5.88	6.22	6.27
% NITROGEN	1.31	1.37	1.45	1.46
% SULFUR	0.49	0.51	0.54	
% CHLORINE	0.00	0.00	0.01	0.01
% OXYGEN(DIFF)	10.16*	10.62	11.23	11.09

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	0.16	0.00	0.35	0.51
DAF	0.17	0.00	0.37	0.54
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(6.27%MM)	(%MM)
% CARBON	76.06	81.15	
% HYDROGEN	5.81	6.19	
% NITROGEN	1.37	1.46	
% ORGANIC SULFUR	0.35	0.37	
% OXYGEN(DIFF)	10.14	10.82	
% CHLORINE	0.00	0.01	
% MINERAL MATTER	6.27		
(INCLUDES 0.30 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.928	0.917	
ATOMIC O/C	0.103	0.107	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.01		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-453 **
 ** PAGE 5 **

SEAM NAME BLIND CANYON
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE UTAH

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 2.30
 % HIGH TEMPERATURE ASH = 5.70 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	42.50	1.13
B			AL2O3	16.70	0.50
BA	380	22	TiO2	0.86	0.03
BE	< 3	0	FE2O3	7.44	0.30
BI	< 20	1	MGO	1.14	0.04
CE	< 100	6	CAO	8.82	0.36
CO	< 20	1	NA2O	9.30	0.39
CR	130	7	K2O	0.31	0.01
CU	80	5	P2O5	0.21	0.01
GA	22	1	SO3	10.90	0.25
GE	< 25	1			
LA	22	1			
LI					
MN	130	7			
MO			VOLATILES		PPM TOTAL COAL
NI	130	7	AS		
NB	< 20	1	BR		
PB	58	3	CD		
RB	10	1	CL		
SC	10	1	F		
SN	56	3	HG		
SR	1290	74	SB		
TH			SE		
U					
V	95	5			
Y	28	2			
YS	< 5	0			
ZN	45	3			
ZR	390	22			

** PENN STATE COAL DATA BASE **

 ** PSOC-453 **
 ** PAGE 7 **

SEAM NAME BLIND CANYON
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE UTAH

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION COMBINED WHITE AND BLUE LIGHT

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	84.9	87.6	82.2
INERTINITE (CALC.)	3.7	3.8	3.9
LIPTINITE (CALC.)	8.5	8.8	7.7
MINERAL MATTER (CALC.)	3.1		6.2
VITRINOIDS			
VITRINITE	80.0	82.6	77.5
PSEUDOVITRINITE	4.8	5.0	4.7
FUSINITE	0.3	0.3	0.3
SEMI-FUSINITE	2.0	2.1	2.1
MACRINITE	0.8	0.8	0.8
MICRINITE	0.6	0.6	0.6
SCLEROTINITE	0.0	0.0	0.0
SPORINITE	5.7	5.9	5.2
CUTINITE	0.7	0.7	0.6
EXINITE (ANAL.)			
RESINITE	2.1	2.2	1.9
SUBERINITE			
EXUDATINITE	0.0	0.0	0.0
FLUORINITE	0.0	0.0	0.0
BITUMINITE	0.0	0.0	0.0
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE	0.0	0.0	0.0
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	0.60	0.44	0.16	0.52	
PSEUDOVITRINITE	0.65	0.49	0.16	0.56	
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-459 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-459
 COLLECTED BY UNIVERSITY OF UTAH
 COLLECTION DATE 7/29/76
 COLLECTOR'S NUMBER
 REPORTED RANK HIGH VOLATILE B BITUMINOUS (HVBB)
 SAMPLE TYPE CHANNEL WORKING SECTION
 OTHER SAMPLE INFORMATION
 SAMPLE RESERVE 500
 SEAM NAME LOWER SUNNYSIDE
 ALTERNATE SEAM NAME
 TOTAL SEAM THICKNESS 14 FT. 0 IN.
 THICKNESS OF SEAM SAMPLED 9 FT. 9 IN.
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE UTAH
 COUNTY EMERY
 TOWNSHIP
 NEAREST TOWN HORSE CANYON
 COAL PROVINCE ROCKY MOUNTAIN
 COAL REGION UINTA
 COAL FIELD BOOK CLIFFS

MAP REFERENCE: LATITUDE 39D 27M 30S
 LONGITUDE 110D 21M 00S
 QUADRANGLE WOODSIDE (15')

** PENN STATE COAL DATA BASE **

 ** PSOC-459 **
 ** PAGE 3 **

SEAM NAME LOWER SUNNYSIDE
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE UTAH

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	4.81					
% ASH	7.95	8.35				
% VOLATILE MATTER	37.72	39.63	43.24	42.66	42.45	
% FIXED CARBON	49.52	52.02	56.76	57.34	57.55	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	13411	12766	12736
MM-FREE (PARR)	14771	13990	13954
MM-FREE (MOD.P)	14813	13989	13953
BEST MM FREE		13989	13953
NET CV, DMMF BTU/LB	14250		
ASH-FREE	14633		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	5.03	5.56
% TOTAL SULFUR	0.90	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE B BITUMINOUS (HVBB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE B BITUMINOUS (HVBB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE B BITUMINOUS (HVBB)
INTERNATIONAL RANK	
AS REC'D MOIST.	620
EQUIL. MOIST.	620
REPORTED RANK	HIGH VOLATILE B BITUMINOUS (HVBB)

** PENN STATE COAL DATA BASE **

 ** PSOC-459 **
 ** PAGE 4 **

SEAM NAME LOWER SUNNYSIDE
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE UTAH

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
				(9.51 %MM)
% ASH	7.95	8.35		
% CARBON	71.32	74.92	81.75	82.80
% HYDROGEN	5.23*	5.49	5.99	6.07
% NITROGEN	1.29	1.36	1.48	1.50
% SULFUR	0.86	0.90	0.98	
% CHLORINE	0.01	0.01	0.02	0.02
% OXYGEN(DIFF)	8.53*	8.96	9.78	9.62

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	0.19	0.00	0.71	0.90
DAF	0.21	0.00	0.77	0.98
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
		(9.53%MM)	(%MM)
% CARBON	74.80	82.68	
% HYDROGEN	5.38	5.94	
% NITROGEN	1.36	1.50	
% ORGANIC SULFUR	0.71	0.78	
% OXYGEN(DIFF)	8.22	9.07	
% CHLORINE	0.01	0.02	
% MINERAL MATTER	9.53		
(INCLUDES 0.36 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
ATOMIC H/C	0.880	0.863	
ATOMIC O/C	0.087	0.091	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.03		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-459 **
 ** PAGE 5 **

SEAM NAME LOWER SUNNYSIDE
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE UTAH

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 5.40

% HIGH TEMPERATURE ASH = 7.80 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	44.30	1.62
B			Al2O3	24.00	0.99
BA	790	62	TiO2	1.02	0.05
BE	8	1	Fe2O3	4.51	0.25
BI	< 20	2	MgO	2.93	0.14
CE	110	9	CaO	10.20	0.57
CO	< 20	2	Na2O	3.23	0.19
CR	130	10	K2O	0.75	0.05
CU	85	7	P2O5	0.34	0.01
GA	29	2	SO3	9.30	0.29
GE	< 25	2			
LA	64	5			
LI					
MN	10	1			
MO			VOLATILES		PPM TOTAL COAL
NI	120	9	AS		
NB	< 20	2	BR		
PB	< 40	3	CD		
RB	35	3	CL		
SC	17	1	F		
SN	160	12	HG		
SR	810	63	SB		
TH			SE		
U					
V	110	9			
Y	70	5			
YB	6	0			
ZN	85	7			
ZR	350	27			

** PENN STATE COAL DATA BASE **

 ** PSOC-459 **
 ** PAGE 7 **

SEAM NAME LOWER SUNNYSIDE
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE UTAH

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %		DMMF VOLUME %		DRY WEIGHT %
	-----		-----		-----
VITRINITE (CALC.)	84.8		89.1		80.3
INERTINITE (CALC.)	9.5		10.0		9.9
LIPTINITE (CALC.)	0.9		0.9		0.7
MINERAL MATTER (CALC.)	4.8				9.5
VITRINOIDS					
VITRINITE	82.5		86.7		78.1
PSEUDOVITRINITE	2.3		2.4		2.2
FUSINITE	3.1		3.3		3.4
SEMI-FUSINITE	5.2		5.5		5.3
MACRINITE	0.7		0.7		0.7
MICRINITE	0.5		0.5		0.5
SCLEROTINITE	0.0		0.0		0.0
SPORINITE					
CUTINITE					
EXINITE (ANAL.)	0.6		0.6		0.5
RESINITE	0.3		0.3		0.2
SUBERINITE					
EXUDATINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0		0.0		0.0
LIPTODETRINITE					
MINERAL MATTER(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
(%, IN OIL)					
-----	----	----	-----	-----	-----
VITRINITE	0.82	0.58	0.24	0.70	0.05
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-465 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-465

COLLECTED BY UNIVERSITY OF UTAH
COLLECTION DATE 8/ 4/76
COLLECTOR'S NUMBER

REPORTED RANK SUBBITUMINOUS A (SUBA)

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
SAMPLE RESERVE 480

SEAM NAME DEADMAN
ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 17 FT. 8 IN.
THICKNESS OF SEAM SAMPLED 17 FT. 8 IN.
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE WYOMING
COUNTY SWEETWATER
TOWNSHIP
NEAREST TOWN POINT OF ROCKS

COAL PROVINCE ROCKY MOUNTAIN
COAL REGION GREEN RIVER
COAL FIELD JIM BRIDGER

MAP REFERENCE: LATITUDE 41D 44M 40S
LONGITUDE 108D 43M 30S
QUADRANGLE BITTER CREEK, NW (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-465 **
 ** PAGE 3 **

SEAM NAME DEADMAN
 APPARENT RANK SUBBITUMINOUS A (SUBA)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	18.13					
% ASH	9.45	11.54				
% VOLATILE MATTER	31.59	38.58	43.61	42.85	42.39	
% FIXED CARBON	40.84	49.88	56.39	57.15	57.61	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	11757	9625	9542
MM-FREE (PARR)	13455	10727	10623
MM-FREE (MOD.P)	13525	10748	10643
BEST MM FREE		10748	10643
NET CV, DMMF BTU/LB	13190		
ASH-FREE	13291		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	18.84	21.64
% TOTAL SULFUR	0.89	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	SUBBITUMINOUS A (SUBA)
ASTM RANK (EQUIL. MOIST.)	SUBBITUMINOUS A (SUBA)
REFLECTANCE RANK CATEGORY	SUBBITUMINOUS A (SUBA)
INTERNATIONAL RANK	
AS REC'D MOIST.	
EQUIL. MOIST.	
REPORTED RANK	SUBBITUMINOUS A (SUBA)

** PENN STATE COAL DATA BASE **

 ** PSOC-465 **
 ** PAGE 4 **

SEAM NAME DEADMAN
 APPARENT RANK SUBBITUMINOUS A (SUBA)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR) (12.95 %MM)
% ASH	9.45	11.54		
% CARBON	60.10	73.41	82.99	84.33
% HYDROGEN	2.57*	3.14	3.55	3.61
% NITROGEN	1.00	1.22	1.38	1.40
% SULFUR	0.73	0.89	1.01	
% CHLORINE	0.02	0.02	0.02	0.02
% OXYGEN(DIFF)	8.00*	9.78	11.06	10.64

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	0.32	0.07	0.50	0.89
DAF	0.36	0.08	0.57	1.01

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P) (13.20%MM)	DMMF(DIR.) (%MM)
% CARBON	73.25	84.39	
% HYDROGEN	2.98	3.44	
% NITROGEN	1.22	1.40	
% ORGANIC SULFUR	0.50	0.58	
% OXYGEN(DIFF)	8.85	10.17	
% CHLORINE	0.02	0.02	
% MINERAL MATTER	13.20		

(INCLUDES 0.60 % FES2)

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
ATOMIC H/C	0.514	0.489	
ATOMIC O/C	0.095	0.104	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.04		

INFRA-RED ANALYSIS

(*)--EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-465 **
 ** PAGE 5 **

SEAM NAME DEADMAN
 APPARENT RANK SUBBITUMINOUS A (SUBA)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 11.10

% HIGH TEMPERATURE ASH = 8.63 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	52.10	2.10
B			AL2O3	17.60	0.80
BA	3600	311	TiO2	0.77	0.04
BE	14	1	FE2O3	6.67	0.40
BI	< 20	2	MGO	3.96	0.21
CE	< 100	9	CAO	6.34	0.39
CO	< 20	2	NA2O	1.46	0.09
CR	160	14	K2O	1.36	0.10
CU	95	8	P2O5	0.05	0.00
GA	33	3	SO3	8.40	0.29
GE	< 25	2			
LA	46	4			
LI					
MN	640	55			
MO			VOLATILES		PPM TOTAL COAL
NI	100	9	AS		
NB	< 20	2	BR		
PB	< 40	3	CD		
RB	50	4	CL		
SC	21	2	F		
SN	< 10	1	HG		
SR	1350	117	SB		
TH			SE		
U					
V	130	11			
Y	68	6			
YB	7	1			
ZN	50	4			
ZR	290	25			

** PENN STATE COAL DATA BASE **

 ** PSOC-465 **
 ** PAGE 7 **

SEAM NAME DEADMAN
 APPARENT RANK SUBBITUMINOUS A (SUBA)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	83.8	89.8	78.1
INERTINITE (CALC.)	8.9	9.5	9.0
LIPTINITE (CALC.)	0.7	0.7	0.5
MINERAL MATTER (CALC.)	6.7		13.0

VITRINOIDS			
VITRINITE	79.5	85.2	74.1
PSEUDOVITRINITE	4.3	4.6	4.0
FUSINITE	2.4	2.6	2.5
SEMI-FUSINITE	4.9	5.2	4.9
MACRINITE	0.7	0.7	0.7
MICRINITE	0.9	1.0	0.9
SCLEROTINITE	0.0	0.0	0.0
SPORINITE			
CUTINITE			
EXINITE (ANAL.)	0.7	0.7	0.5
RESINITE	0.0	0.0	0.0
SUBERINITE			
EXUDATINITE			
FLUORINITE			
BITUMINITE			
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE			
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	0.52	0.34	0.18	0.45	0.04
PSEUDOVITRINITE	0.56	0.39	0.17	0.47	0.04
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-472 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-472
COLLECTED BY UNIVERSITY OF UTAH
COLLECTION DATE 8/ 5/76
COLLECTOR'S NUMBER
REPORTED RANK SUBBITUMINOUS B (SUBB)
SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION SAMPLE FROM TWO SITES
SAMPLE RESERVE 40
SEAM NAME ADAVILLE #2
ALTERNATE SEAM NAME
TOTAL SEAM THICKNESS 28 FT. 6 IN.
THICKNESS OF SEAM SAMPLED 27 FT. 8 IN.
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE WYOMING
COUNTY LINCOLN
TOWNSHIP
NEAREST TOWN KEMMERER
COAL PROVINCE ROCKY MOUNTAIN
COAL REGION HAMS FORK
COAL FIELD KEMMERER

MAP REFERENCE: LATITUDE 41D 47M 00S
LONGITUDE 110D 33M 00S
QUADRANGLE

** PENN STATE COAL DATA BASE **

 ** PSOC-472 **
 ** PAGE 3 **

SEAM NAME ADAVILLE #2
 APPARENT RANK SUBBITUMINOUS A (SUBA)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	18.30					
% ASH	3.18	3.89				
% VOLATILE MATTER	37.73	46.18	48.05	47.78	47.84	
% FIXED CARBON	40.79	49.93	51.95	52.22	52.16	

CALORIFIC VALUE	DRY	AS REC'D MOIST.	EQUIL. MOIST.
(GROSS BTU/LB)	---	---	---

MM-FREE, DIRECT			
MM-CONTAINING	12544	10248	9991
MM-FREE (PARR)	13111	10618	10341
MM-FREE (MOD.P)	13123	10603	10327
BEST MM FREE		10603	10327
NET CV, DMMF BTU/LB	12740		
ASH-FREE	13052		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	20.35	21.33
% TOTAL SULFUR	0.73	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	SUBBITUMINOUS A (SUBA)
ASTM RANK (EQUIL. MOIST.)	SUBBITUMINOUS B (SUBB)
REFLECTANCE RANK CATEGORY	SUBBITUMINOUS A (SUBA)
INTERNATIONAL RANK	
AS REC'D MOIST.	
EQUIL. MOIST.	
REPORTED RANK	SUBBITUMINOUS B (SUBB)

 ** PSOC-472 **
 ** PAGE 4 **

COUNTRY U.S.A.
STATE WYOMING

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*****
*                                     *
*  CHEMICAL DATA 2  *
*                                     *
*****

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ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(4.60 %MM)
% ASH	3.18	3.89		
% CARBON	63.28	77.46	80.60	81.20
% HYDROGEN	3.23*	3.95	4.11	4.14
% NITROGEN	1.11	1.36	1.42	1.43
% SULFUR	0.60	0.73	0.76	
% CHLORINE	0.01	0.01	0.02	0.02
% OXYGEN(DIFF)	10.29*	12.59	13.11	13.22

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	0.13	0.00	0.60	0.73
DAF	0.14	0.00	0.62	0.76
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF (MOD.P)	DMMF (DIR.)
-----	---	-----	-----
		(4.46%MM)	(%MM)
% CARBON	77.40	81.02	
% HYDROGEN	3.90	4.08	
% NITROGEN	1.36	1.43	
% ORGANIC SULFUR	0.60	0.63	
% OXYGEN (DIFF)	12.27	12.83	
% CHLORINE	0.01	0.02	
% MINERAL MATTER	4.46		
(INCLUDES 0.24 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD. PAR	DIRECT
-----	----	-----	-----
ATOMIC H/C	0.612	0.605	
ATOMIC O/C	0.122	0.125	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO ₄ , IN ASH			
% CARBONATE AS CO ₂			
% CHLORINE	0.03		

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-472 **
 ** PAGE 5 **

SEAM NAME ADAVILLE #2
 APPARENT RANK SUBBITUMINOUS A (SUBA)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 14.20
 % HIGH TEMPERATURE ASH = 3.42 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	47.10	0.75
B			AL2O3	12.10	0.22
BA	1540	53	TiO2	0.48	0.01
BE	9	0	FE2O3	12.70	0.30
BI	< 20	1	MGO	4.03	0.08
CE	< 100	3	CAO	9.07	0.22
CO	< 20	1	NA2O	0.27	0.01
CR	190	6	K2O	0.71	0.02
CU	90	3	P2O5	0.30	0.00
GA	16	1	SO3	11.40	0.16
GE	< 25	1			
LA	< 20	1			
LI					
MN	700	24			
MO			VOLATILES		PPM TOTAL COAL
NI	250	9	AS		
NB	< 20	1	BR		
PB	< 40	1	CD		
RB	25	1	CL		
SC	8	0	F		
SN	16	1	HG		
SR	1000	34	SB		
TH			SE		
U					
V	150	5			
Y	40	1			
YB	6	0			
ZN	95	3			
ZR	240	8			

** PENN STATE COAL DATA BASE **

 ** PSOC-472 **
 ** PAGE 7 **

SEAM NAME ADAVILLE #2
 APPARENT RANK SUBBITUMINOUS A (SUBA)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %			
HUMINITE	95.3	97.5			
INERTINITE	2.1	2.1			
LIPTINITE	0.0	0.0			
MINERAL MATTER(CALC.)	2.3				
TEXTINITE	0.0	0.0			
ULMINITE	94.6	96.8			
ATTRINITE	0.0	0.0			
DENSINITE	0.0	0.0			
HUMODETRINITE(ANAL)					
GELINITE	0.3	0.3			
CORPOHUMINITE	0.4	0.4			
SPORINITE					
CUTINITE					
EXINITE		0.4			
RESINITE	0.0	0.0			
SUBERINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0	0.0			
LIPTODETRINITE					
FUSINITE	0.1	0.1			
SEMI-FUSINITE	1.0	1.0			
MACRINITE	0.7	0.7			
MICRINITE	0.0	0.0			
SCLEROTINITE	0.3	0.3			
INERTODETRINITE	0.0	0.0			
MINERAL MATTER(ANAL.)					
HUMINITE(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
ULMINITE	0.54	0.36	0.18	0.44	0.04

** PENN STATE COAL DATA BASE **

 ** PSOC-479 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-479

COLLECTED BY UNIVERSITY OF UTAH
 COLLECTION DATE 8/13/76
 COLLECTOR'S NUMBER

REPORTED RANK SUBBITUMINOUS C (SUBC)

SAMPLE TYPE CHANNEL WORKING SECTION
 OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
 SAMPLE RESERVE 40

SEAM NAME HANNA #5
 ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 26 FT. 6 IN.
 THICKNESS OF SEAM SAMPLED 15 FT. 0 IN.
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE WYOMING
 COUNTY CARBON
 TOWNSHIP
 NEAREST TOWN HANNA

COAL PROVINCE ROCKY MOUNTAIN
 COAL REGION GREEN RIVER
 COAL FIELD HANNA

MAP REFERENCE: LATITUDE 41D 52M 30S
 LONGITUDE 106D 36M 00S
 QUADRANGLE HANNA (15')

** PENN STATE COAL DATA BASE **

 ** PSOC-479 **
 ** PAGE 3 **

SEAM NAME HANNA #5
 APPARENT RANK SUBBITUMINOUS C (SUBC)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	20.56					
% ASH	5.74	7.23				
% VOLATILE MATTER	36.49	45.94	49.52	49.14	48.94	
% FIXED CARBON	37.20	46.83	50.48	50.86	51.06	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
-----------------------------------	-----	--------------------	------------------

MM-FREE, DIRECT			
MM-CONTAINING	11178	8880	8705
MM-FREE (PARR)	12133	9468	9269
MM-FREE (MOD.P)	12174	9479	9281
BEST MM FREE		9479	9281
NET CV, DMMF BTU/LB	11856		
ASH-FREE	12049		

MOTT-SPOONER DIFFERENCE = 61.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	22.12	24.06
% TOTAL SULFUR	0.43	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	SUBBITUMINOUS C (SUBC)
ASTM RANK (EQUIL. MOIST.)	SUBBITUMINOUS C (SUBC)
REFLECTANCE RANK CATEGORY	
INTERNATIONAL RANK	
AS REC'D MOIST.	
EQUIL. MOIST.	
REPORTED RANK	SUBBITUMINOUS C (SUBC)

** PENN STATE COAL DATA BASE **

 ** PSOC-479 **
 ** PAGE 4 **

SEAM NAME HANNA #5 COUNTRY U.S.A.
 APPARENT RANK SUBBITUMINOUS C (SUBC) STATE WYOMING

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(9.04 %MM)
% ASH	5.74	7.23		
% CARBON	56.34	70.92	76.45	77.12
% HYDROGEN	2.50*	3.15	3.40	3.43
% NITROGEN	0.85	1.07	1.15	1.16
% SULFUR	0.34	0.43	0.46	
% CHLORINE	0.02	0.02	0.02	0.02
% OXYGEN(DIFF)	13.64*	17.18	18.52	18.27

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	0.06	0.00	0.37	0.43
DAF	0.06	0.00	0.40	0.46

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(8.21%MM)	(%MM)
% CARBON	70.82	77.15	
% HYDROGEN	3.05	3.33	
% NITROGEN	1.07	1.16	
% ORGANIC SULFUR	0.37	0.40	
% OXYGEN(DIFF)	16.48	17.93	
% CHLORINE	0.02	0.02	
% MINERAL MATTER	8.21		
(INCLUDES 0.11 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.533	0.518	
ATOMIC O/C	0.179	0.190	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.04		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-479 **
 ** PAGE 5 **

SEAM NAME HANNA #5
 APPARENT RANK SUBBITUMINOUS C (SUBC)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 13.90
 % HIGH TEMPERATURE ASH = 6.95 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	29.10	0.95
B			AL2O3	14.70	0.54
BA	2370	165	TiO2	0.57	0.02
BE	7	0	FE2O3	11.30	0.55
BI	< 20	1	MGO	4.34	0.18
CE	110	8	CAO	27.00	1.34
CO	< 20	1	NA2O	0.30	0.02
CR	160	11	K2O	0.49	0.03
CU	90	6	P2O5	0.22	0.01
GA	20	1	SO3	12.10	0.34
GE	< 25	2			
LA	35	2			
LI					
MN	1750	122			
MO			VOLATILES		PPM TOTAL COAL
NI	220	15	-----		-----
NB	< 20	1	AS		
PB	68	5	BR		
RB	25	2	CD		
SC	10	1	CL		
SN	< 10	1	F		
SR	1990	138	HG		
TH			SB		
U	12	1	SE		
V	130	9			
Y	64	4			
YB	7	0			
ZN	180	13			
ZR	180	13			

** PENN STATE COAL DATA BASE **

 ** PSOC-479 **
 ** PAGE 7 **

SEAM NAME HANNA #5
 APPARENT RANK SUBBITUMINOUS C (SUBC)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION COMBINED WHITE AND BLUE LIGHT

	DRY VOLUME %	DMMF VOLUME %
HUMINITE	83.4	86.9
INERTINITE	2.2	2.3
LIPTINITE	9.3	9.7
MINERAL MATTER(CALC.)	4.0	
TEXTINITE	0.0	0.0
ULMINITE	81.2	84.6
ATTRINITE	0.0	0.0
DENSINITE	0.0	0.0
HUMODETRINITE(ANAL)		
GELINITE	2.2	2.3
CORPOHUMINITE	0.0	0.0
SPORINITE	8.7	9.1
CUTINITE	0.0	0.0
EXINITE		
RESINITE	0.6	0.6
SUBERINITE		
FLUORINITE	0.0	0.0
BITUMINITE	0.0	0.0
ALGINITE	0.0	0.0
LIPTODETRINITE	0.0	0.0
FUSINITE	0.5	0.5
SEMI-FUSINITE	0.4	0.4
MACRINITE	1.2	1.3
MICRINITE	0.0	0.0
SCLEROTINITE	0.1	0.1
INERTODETRINITE	0.0	0.0
MINERAL MATTER(ANAL.)		
HUMINITE(ANAL.)		
INERTINITE(ANAL.)		
LIPTINITE(ANAL.)		

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
ULMINITE	0.50	0.33	0.17	0.41	0.04

** PENN STATE COAL DATA BASE **

 ** PSOC-483 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-483

COLLECTED BY UNIVERSITY OF UTAH
 COLLECTION DATE 8/11/76
 COLLECTOR'S NUMBER

REPORTED RANK SUBBITUMINOUS A (SUBA)

SAMPLE TYPE CHANNEL WHOLE SEAM
 OTHER SAMPLE INFORMATION
 SAMPLE RESERVE 300

SEAM NAME BED #53
 ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 7 FT. 2 IN.
 THICKNESS OF SEAM SAMPLED 7 FT. 2 IN.
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE WYOMING
 COUNTY CARBON
 TOWNSHIP
 NEAREST TOWN HANNA

COAL PROVINCE ROCKY MOUNTAIN
 COAL REGION GREEN RIVER
 COAL FIELD HANNA

MAP REFERENCE: LATITUDE 41D 54M 20S
 LONGITUDE 106D 47M 60S
 QUADRANGLE PATS BOTTOM (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-483 **
 ** PAGE 3 **

SEAM NAME BED #53
 APPARENT RANK SUBBITUMINOUS A (SUBA)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	11.70					
% ASH	5.60	6.34				
% VOLATILE MATTER	34.56	39.14	41.79	41.37	41.24	
% FIXED CARBON	48.14	54.52	58.21	58.63	58.76	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	12063	10652	10749
MM-FREE (PARR)	12962	11343	11454
MM-FREE (MOD.P)	12995	11350	11461
BEST MM FREE		11350	11461
NET CV, DMMF BTU/LB	12625		
ASH-FREE	12880		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	10.89	11.73
% TOTAL SULFUR	0.53	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	SUBBITUMINOUS A (SUBA)
ASTM RANK (EQUIL. MOIST.)	SUBBITUMINOUS A (SUBA)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE C BITUMINOUS (HVCB)
INTERNATIONAL RANK	
AS REC'D MOIST.	
EQUIL. MOIST.	
REPORTED RANK	SUBBITUMINOUS A (SUBA)

** PENN STATE COAL DATA BASE **

 ** PSOC-483 **
 ** PAGE 4 **

SEAM NAME BED #53
 APPARENT RANK SUBBITUMINOUS A (SUBA)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(7.14 %MM)
% ASH	5.60	6.34		
% CARBON	65.85	74.57	79.62	80.30
% HYDROGEN	3.28*	3.71	3.96	4.00
% NITROGEN	1.05	1.19	1.27	1.28
% SULFUR	0.47	0.53	0.57	
% CHLORINE	0.01	0.01	0.01	0.01
% OXYGEN(DIFF)	12.05*	13.65	14.57	14.41

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	0.10	0.00	0.43	0.53
DAF	0.11	0.00	0.46	0.57
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(7.22%MM)	(%MM)
% CARBON	74.48	90.27	
% HYDROGEN	3.63	3.91	
% NITROGEN	1.19	1.28	
% ORGANIC SULFUR	0.43	0.46	
% OXYGEN(DIFF)	13.06	14.06	
% CHLORINE	0.01	0.01	
% MINERAL MATTER	7.22		
(INCLUDES 0.19 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.598	0.585	
ATOMIC O/C	0.135	0.142	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.02		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-483 **
 ** PAGE 5 **

SEAM NAME BED #53
 APPARENT RANK SUBBITUMINOUS A (SUBA)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 8.40

% HIGH TEMPERATURE ASH = 6.68 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	14.30	0.45
B			Al2O3	8.53	0.30
BA	2230	149	TiO2	0.34	0.01
BE	< 3	0	Fe2O3	6.68	0.31
BI	< 20	1	MgO	2.95	0.12
CE	< 100	7	CaO	38.80	1.85
CO	< 20	1	Na2O	0.20	0.01
CR	100	7	K2O	0.20	0.01
CU	110	7	P2O5	0.41	0.01
GA	< 10	1	SO3	11.80	0.32
GE	< 25	2			
LA	< 20	1			
LI					
MN	1430	96			
MO			VOLATILES		PPM TOTAL COAL
NI	190	13	AS		
NB	< 20	1	BR		
PB	< 40	3	CD		
RB	15	1	CL		
SC	< 5	0	F		
SN	< 10	1	HG		
SR	3590	240	SB		
TH			SE		
U	< 10	1			
V	110	7			
Y	45	3			
YB	< 5	0			
ZN	< 5	0			
ZR	140	9			

** PENN STATE COAL DATA BASE **

 ** PSOC-483 **
 ** PAGE 7 **

SEAM NAME BED #53
 APPARENT RANK SUBBITUMINOUS A (SUBA)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %		
VITRINITE (CALC.)	84.1	87.2	81.6		
INERTINITE (CALC.)	10.6	11.0	11.2		
LIPTINITE (CALC.)	1.7	1.8	1.4		
MINERAL MATTER (CALC.)	3.6		7.1		
VITRINOIDS					
VITRINITE	78.3	81.2	76.0		
PSEUDOVITRINITE	5.8	6.0	5.6		
FUSINITE	3.3	3.4	3.5		
SEMI-FUSINITE	5.7	5.9	5.9		
MACRINITE	0.8	0.8	0.8		
MICRINITE	0.9	0.9	0.9		
SCLEROTINITE	0.0	0.0	0.0		
SPORINITE					
CUTINITE					
EXINITE (ANAL.)	1.6	1.7	1.4		
RESINITE	0.1	0.1	0.1		
SUBERINITE					
EXUDATINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0	0.0	0.0		
LIPTODETRINITE					
MINERAL MATTER(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	0.61	0.43	0.18	0.52	0.03
PSEUDOVITRINITE	0.60	0.51	0.09	0.55	0.02
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-489 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-489

COLLECTED BY UNIVERSITY OF UTAH
 COLLECTION DATE 8/11/76
 COLLECTOR'S NUMBER

REPORTED RANK SUBBITUMINOUS A (SUBA)

SAMPLE TYPE CHANNEL WHOLE SEAM
 OTHER SAMPLE INFORMATION
 SAMPLE RESERVE 50

SEAM NAME BED #80
 ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 10 FT. 0 IN.
 THICKNESS OF SEAM SAMPLED 10 FT. 0 IN.
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE WYOMING
 COUNTY CARBON
 TOWNSHIP
 NEAREST TOWN HANNA

COAL PROVINCE ROCKY MOUNTAIN
 COAL REGION GREEN RIVER
 COAL FIELD HANNA

MAP REFERENCE: LATITUDE 41D 55M 20S
 LONGITUDE 106D 28M 10S
 QUADRANGLE COMO WEST (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-489 **
 ** PAGE 3 **

SEAM NAME BED #80
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	12.97					
% ASH	7.48	8.59				
% VOLATILE MATTER	37.44	43.02	47.06	46.48	46.29	
% FIXED CARBON	42.11	48.39	52.94	53.52	53.71	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.

MM-FREE, DIRECT			
MM-CONTAINING	12277	10685	10433
MM-FREE (PARR)	13563	11638	11339
MM-FREE (MOD.P)	13599	11619	11320
BEST MM FREE		11619	11320
NET CV, DMMF BTU/LB	13075		
ASH-FREE	13431		

MOTT-SPOONER DIFFERENCE = 46.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	15.02	16.67
% TOTAL SULFUR	1.13	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE C BITUMINOUS (HVCB)
ASTM RANK (EQUIL. MOIST.)	SUBBITUMINOUS A (SUBA)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE C BITUMINOUS (HVCB)
INTERNATIONAL RANK	
AS REC'D MOIST.	
EQUIL. MOIST.	
REPORTED RANK	SUBBITUMINOUS A (SUBA)

** PENN STATE COAL DATA BASE **

 ** PSOC-489 **
 ** PAGE 4 **

SEAM NAME BED #80
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR) (9.90 %MM)
% ASH	7.48	8.59		
% CARBON	60.24	69.22	75.72	76.82
% HYDROGEN	4.44*	5.10	5.58	5.66
% NITROGEN	1.24	1.42	1.55	1.58
% SULFUR	0.98	1.13	1.24	
% CHLORINE	0.01	0.01	0.02	0.02
% OXYGEN(DIFF)	12.64*	14.52	15.89	15.92

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	0.10	0.01	1.02	1.13
DAF	0.11	0.01	1.12	1.24

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
		(9.76%MM)	(%MM)
% CARBON	69.10	76.57	
% HYDROGEN	4.99	5.53	
% NITROGEN	1.42	1.58	
% ORGANIC SULFUR	1.02	1.13	
% OXYGEN(DIFF)	13.71	15.18	
% CHLORINE	0.01	0.02	
% MINERAL MATTER	9.76		
(INCLUDES 0.19 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
ATOMIC H/C	0.885	0.867	
ATOMIC O/C	0.156	0.165	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.03		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-489 **
 ** PAGE 5 **

SEAM NAME BED #80
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 15.70
 % HIGH TEMPERATURE ASH = 7.32 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	36.10	1.24
B			AL2O3	18.30	0.71
BA	3170	232	TiO2		
BE	6	0	FE2O3	9.55	0.49
BI	< 20	1	MGO	4.37	0.19
CE	130	10	CAO	13.90	0.73
CO	26	2	NA2O	0.33	0.02
CR	120	9	K2O	0.89	0.05
CU	120	9	P2O5	1.01	0.03
GA	15	1	SO3	15.30	0.45
GE	< 25	2			
LA	36	3			
LI					
MN	830	61			
MO			VOLATILES		PPM TOTAL COAL
NI	120	9	-----	-----	-----
NB	< 20	1	AS		
PB	49	4	BR		
RB	40	3	CD		
SC	15	1	CL		
SN	130	10	F		
SR	3130	229	HG		
TH			SB		
U			SE		
V	200	15			
Y	74	5			
YB	8	1			
ZN	160	12			
ZR	200	15			

** PENN STATE COAL DATA BASE **

 ** PSOC-489 **
 ** PAGE 7 **

SEAM NAME BED #80
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %		
	-----	-----	-----		
VITRINITE (CALC.)	90.8	95.6	86.2		
INERTINITE (CALC.)	3.4	3.6	3.5		
LIPTINITE (CALC.)	1.5	1.6	1.2		
MINERAL MATTER (CALC.)	5.0		9.9		
VITRINOIDS					
VITRINITE	89.1	93.8	84.6		
PSEUDOVITRINITE	1.7	1.8	1.6		
FUSINITE	1.4	1.5	1.5		
SEMI-FUSINITE	1.3	1.4	1.4		
MACRINITE	0.2	0.2	0.2		
MICRINITE	0.5	0.5	0.5		
SCLEROTINITE	0.0	0.0	0.0		
SPORINITE					
CUTINITE					
EXINITE (ANAL.)	1.0	1.1	0.8		
RESINITE	0.5	0.5	0.4		
SUBERINITE					
EXUDATINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0	0.0	0.0		
LIPTODETRINITE					
MINERAL MATTER(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA					
(%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
-----	----	---	-----	-----	-----
VITRINITE	0.62	0.36	0.26	0.47	0.05
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-495 **
 ** PAGE 1 **

 * *
 * SAMPLE HISTORY *
 * *

PENN STATE NUMBER	PSOC-495
COLLECTED BY	UNIVERSITY OF UTAH
COLLECTION DATE	8/19/76
COLLECTOR'S NUMBER	
REPORTED RANK	HIGH VOLATILE B BITUMINOUS (HVEB)
SAMPLE TYPE	CHANNEL WORKING SECTION
OTHER SAMPLE INFORMATION	
SAMPLE RESERVE	480
SEAM NAME	HIAWATHA
ALTERNATE SEAM NAME	
TOTAL SEAM THICKNESS	11 FT. 0 IN.
THICKNESS OF SEAM SAMPLED	6 FT. 10 IN.
PORTION RECOVERED IN CORE	
DIAMETER OF CORE	

 * *
 * SAMPLE LOCATION *
 * *

COUNTRY	U.S.A.
STATE	UTAH
COUNTY	EMERY
TOWNSHIP	
NEAREST TOWN	ORANGEVILLE
COAL PROVINCE	ROCKY MOUNTAIN
COAL REGION	UINTA
COAL FIELD	WASATCH PLATEAU
MAP REFERENCE:	
LATITUDE	39D 23M 30S
LONGITUDE	111D 7M 10S
QUADRANGLE	HIAWATHA (15')

** PENN STATE COAL DATA BASE **

 ** PSOC-495 **
 ** PAGE 3 **

SEAM NAME HIAWATHA
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE UTAH

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	4.60					
% ASH	7.29	7.64				
% VOLATILE MATTER	40.32	42.26	45.76	45.28	45.09	
% FIXED CARBON	47.80	50.10	54.24	54.72	54.91	

CALORIFIC VALUE	DRY	AS REC'D MOIST.	EQUIL. MOIST.
(GROSS BTU/LB)			

MM-FREE, DIRECT			
MM-CONTAINING	13352	12738	12538
MM-FREE (PARR)	14576	13846	13609
MM-FREE (MOD.P)	14617	13852	13615
BEST MM FREE		13852	13615
NET CV, DMMF BTU/LB	14074		
ASH-FREE	14456		

MOTT-SPOONER DIFFERENCE = 12.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	6.10	6.68
% TOTAL SULFUR	0.72	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE B BITUMINOUS (HVBB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE B BITUMINOUS (HVBB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE C BITUMINOUS (HVCB)
INTERNATIONAL RANK	
AS REC'D MOIST.	620
EQUIL. MOIST.	620
REPORTED RANK	HIGH VOLATILE B BITUMINOUS (HVBB)

** PENN STATE COAL DATA BASE **

 ** PSOC-495 **
 ** PAGE 4 **

SEAM NAME HIAWATHA COUNTRY U.S.A.
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB) STATE UTAH

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(8.65 %MM)
% ASH	7.29	7.64		
% CARBON	70.93	74.35	80.50	81.39
% HYDROGEN	5.10*	5.35	5.79	5.86
% NITROGEN	1.24	1.30	1.41	1.42
% SULFUR	0.69	0.72	0.78	
% CHLORINE	0.01	0.01	0.01	0.01
% OXYGEN(DIFF)	10.14*	10.63	11.51	11.32
SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	0.16	0.00	0.56	0.72
DAF	0.17	0.00	0.61	0.78
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(8.71%MM)	(%MM)
% CARBON	74.24	81.33	
% HYDROGEN	5.25	5.75	
% NITROGEN	1.30	1.42	
% ORGANIC SULFUR	0.56	0.61	
% OXYGEN(DIFF)	9.94	10.88	
% CHLORINE	0.01	0.01	
% MINERAL MATTER	8.71		
(INCLUDES 0.30 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.864	0.849	
ATOMIC O/C	0.104	0.110	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.02		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-495 **
 ** PAGE 5 **

SEAM NAME HIAWATHA
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE UTAH

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 2.00
 % HIGH TEMPERATURE ASH = 7.49 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	47.50	1.66
B			AL2O3	22.50	0.89
BA	700	52	TiO2	1.05	0.05
BE	4	0	FE2O3	4.07	0.21
BI	< 20	1	MGO	1.19	0.05
CE	< 100	7	CAO	8.46	0.45
CO	< 20	1	NA2O	5.60	0.31
CR	230	17	K2O	0.31	0.02
CU	190	14	P2O5	1.14	0.04
GA	34	3	S03	7.40	0.22
GE	< 25	2			
LA	43	3			
LI					
MN	100	7			
MO			VOLATILES		PPM TOTAL COAL
NI	350	26	-----		-----
NB	< 20	1	AS		
PB	62	5	BR		
RB	15	1	CD		
SC	16	1	CL		
SN	< 10	1	F		
SR	4190	314	HG		
TH			SB		
U	< 8	1	SE		
V	170	13			
Y	47	4			
YB	< 5	0			
ZN	40	3			
ZR	370	28			

** PENN STATE COAL DATA BASE **

 ** PSOC-495 **
 ** PAGE 7 **

SEAM NAME HIAWATHA
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE UTAH

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %		
	-----	-----	-----		
VITRINITE (CALC.)	86.6	90.6	82.3		
INERTINITE (CALC.)	8.3	8.7	8.7		
LIPTINITE (CALC.)	0.7	0.7	0.6		
MINERAL MATTER (CALC.)	4.4		8.6		
VITRINOIDS					
VITRINITE	83.9	87.7	79.7		
PSEUDOVITRINITE	2.8	2.9	2.6		
FUSINITE	3.0	3.1	3.2		
SEMI-FUSINITE	3.6	3.8	3.7		
MACRINITE	1.4	1.5	1.5		
MICRINITE	0.3	0.3	0.3		
SCLEROTINITE	0.0	0.0	0.0		
SPORINITE					
CUTINITE					
EXINITE (ANAL.)	0.3	0.3	0.3		
RESINITE	0.4	0.4	0.3		
SUBERINITE					
EXUDATINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0	0.0	0.0		
LIPTODETRINITE					
MINERAL MATTER(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
(%, IN OIL)	----	----	-----	-----	-----
VITRINITE	0.61	0.47	0.14	0.54	0.03
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-501 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-501

COLLECTED BY UNIVERSITY OF UTAH
 COLLECTION DATE 8/20/76
 COLLECTOR'S NUMBER

REPORTED RANK HIGH VOLATILE A BITUMINOUS (HVAB)

SAMPLE TYPE CHANNEL WHOLE SEAM
 OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
 SAMPLE RESERVE 480

SEAM NAME UPPER SUNNYSIDE
 ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 4 FT. 9 IN.
 THICKNESS OF SEAM SAMPLED 4 FT. 9 IN.
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE UTAH
 COUNTY CARBON
 TOWNSHIP
 NEAREST TOWN SUNNYSIDE

COAL PROVINCE ROCKY MOUNTAIN
 COAL REGION UINTA
 COAL FIELD BOOK CLIFFS

MAP REFERENCE: LATITUDE 39D 33M 50S
 LONGITUDE 110D 21M 30S
 QUADRANGLE PATMOS HEAD (7.5')

*** PENN STATE COAL DATA BASE ***

 ** PSOC-501 **
 ** PAGE 3 **

SEAM NAME UPPER SUNNYSIDE
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE UTAH

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	1.72					
% ASH	7.54	7.67				
% VOLATILE MATTER	38.86	39.54	42.82	42.33	42.09	
% FIXED CARBON	51.88	52.79	57.18	57.67	57.91	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	13748	13512	13375
MM-FREE (PARR)	15012	14730	14568
MM-FREE (MOD.P)	15061	14749	14586
BEST MM FREE		14749	14586
NET CV, DMMF BTU/LB	14530		
ASH-FREE	14890		

MOTT-SPOONER DIFFERENCE = 139.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	2.71	2.97
% TOTAL SULFUR	0.62	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE A BITUMINOUS (HVAB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE A BITUMINOUS (HVAB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE A BITUMINOUS (HVAB)
INTERNATIONAL RANK	
AS REC'D MOIST.	630
EQUIL. MOIST.	630
REPORTED RANK	HIGH VOLATILE A BITUMINOUS (HVAB)

** PENN STATE COAL DATA BASE **

 ** PSOC-501 **
 ** PAGE 4 **

SEAM NAME UPPER SUNNYSIDE
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE UTAH

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
				(8.62 %MM)
% ASH	7.54	7.67		
% CARBON	74.84	76.15	82.48	83.34
% HYDROGEN	5.13*	5.22	5.65	5.71
% NITROGEN	1.29	1.31	1.42	1.43
% SULFUR	0.61	0.62	0.67	
% CHLORINE	0.07	0.07	0.09	0.08
% OXYGEN(DIFF)	8.80*	8.96	9.71	9.45

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	0.13	0.00	0.49	0.62
DAF	0.14	0.00	0.53	0.67
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
		(8.76%MM)	(%MM)
% CARBON	76.04	83.35	
% HYDROGEN	5.12	5.61	
% NITROGEN	1.31	1.43	
% ORGANIC SULFUR	0.49	0.54	
% OXYGEN(DIFF)	8.28	9.00	
% CHLORINE	0.07	0.08	
% MINERAL MATTER	8.76		
(INCLUDES 0.34 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
ATOMIC H/C	0.923	0.808	
ATOMIC O/C	0.085	0.089	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.14		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-501 **
 ** PAGE 5 **

SEAM NAME UPPER SUNNYSIDE
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE UTAH

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 1.30
 % HIGH TEMPERATURE ASH = 7.64 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SI02	71.30	2.55
B			AL2O3	15.10	0.61
BA	190	14	TI02	0.96	0.04
BE	5	0	FE2O3	5.62	0.30
BI	< 20	2	MGO	0.41	0.02
CE	120	9	CAO	2.58	0.14
CO	< 20	2	NA2O	0.72	0.04
CR	290	21	K2O	0.66	0.04
CU	250	19	P2O5	1.20	0.04
GA	30	2	SO3	0.80	0.02
GE	< 25	2			
LA	44	3			
LI					
MN	600	46			
MO			VOLATILES		PPM TOTAL COAL
NI	320	24	-----		-----
NB	< 20	2	AS		
PB	90	7	BR		
RB	30	2	CD		
SC	14	1	CL		
SN	< 10	1	F		
SR	270	21	HG		
TH			SB		
U	< 4	0	SE		
V	35	6			
Y	52	4			
YB	< 5	0			
ZN	85	6			
ZR	400	31			

** PENN STATE COAL DATA BASE **

 ** PSOC-501 **
 ** PAGE 7 **

SEAM NAME UPPER SUNNYSIDE
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE UTAH

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %		DMMF VOLUME %		DRY WEIGHT %
	-----		-----		-----
VITRINITE (CALC.)	82.0		85.7		77.8
INERTINITE (CALC.)	12.6		13.2		13.1
LIPTINITE (CALC.)	1.1		1.1		0.9
MINERAL MATTER (CALC.)	4.4				8.6
VITRINOIDS					
VITRINITE	77.2		80.7		73.3
PSEUDOVITRINITE	4.8		5.0		4.5
FUSINITE	3.1		3.2		3.4
SEMI-FUSINITE	7.3		7.6		7.4
MACRINITE	1.4		1.5		1.5
MICRINITE	0.9		0.9		0.9
SCLEROTINITE	0.0		0.0		0.0
SPORINITE					
CUTINITE					
EXINITE (ANAL.)	0.6		0.6		0.5
RESINITE	0.5		0.5		0.4
SUBERINITE					
EXUDATINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0		0.0		0.0
LIPTODETRINITE					
MINERAL MATTER(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
(%, IN OIL)	-----	---	-----	-----	-----
VITRINITE	0.85	0.61	0.24	0.72	0.04
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-507 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-507

COLLECTED BY UNIVERSITY OF UTAH
COLLECTION DATE 8/25/76
COLLECTOR'S NUMBER

REPORTED RANK SUBBITUMINOUS A (SUBA)

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION SAMPLE FROM TWO SITES
SAMPLE RESERVE 480

SEAM NAME BED #24
ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 20 FT. 8 IN.
THICKNESS OF SEAM SAMPLED 20 FT. 8 IN.
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE WYOMING
COUNTY CARBON
TOWNSHIP
NEAREST TOWN HANNA

COAL PROVINCE ROCKY MOUNTAIN
COAL REGION GREEN RIVER
COAL FIELD HANNA

MAP REFERENCE: LATITUDE 41D 53M 30S
LONGITUDE 106D 46M 20S
QUADRANGLE PATS BOTTOM (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-507 **
 ** PAGE 3 **

SEAM NAME BED #24
 APPARENT RANK SUBBITUMINOUS A (SUBA)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS. REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	9.52					
% ASH	8.99	9.94				
% VOLATILE MATTER	34.06	37.64	41.79	41.22	40.77	
% FIXED CARBON	47.43	52.42	58.21	58.78	59.23	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	11395	10310	9793
MM-FREE (PARR)	12772	11423	10791
MM-FREE (MOD.P)	12838	11464	10827
BEST MM FREE		11464	10827
NET CV, DMMF BTU/LB	12381		
ASH-FREE	12653		

MOTT-SPOONER DIFFERENCE = 86.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	14.06	15.78
% TOTAL SULFUR	0.31	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	SUBBITUMINOUS A (SUBA)
ASTM RANK (EQUIL. MOIST.)	SUBBITUMINOUS A (SUBA)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE C BITUMINOUS (HVCB)
INTERNATIONAL RANK	
AS REC'D MOIST.	
EQUIL. MOIST.	
REPORTED RANK	SUBBITUMINOUS A (SUBA)

** PENN STATE COAL DATA BASE **

 ** PSOC-507 **
 ** PAGE 4 **

SEAM NAME BED #24
 APPARENT RANK SUBBITUMINOUS A (SUBA)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(10.91 %MM)
% ASH	8.99	9.94		
% CARBON	60.81	67.21	74.63	75.44
% HYDROGEN	3.95*	4.37	4.85	4.90
% NITROGEN	0.91	1.01	1.12	1.13
% SULFUR	0.28	0.31	0.34	
% CHLORINE	0.01	0.01	0.01	0.01
% OXYGEN(DIFF)	15.52*	17.15	19.04	18.51

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	0.06	0.00	0.25	0.31
DAF	0.07	0.00	0.28	0.34
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(11.27%MM)	(%MM)
% CARBON	67.07	75.59	
% HYDROGEN	4.24	4.78	
% NITROGEN	1.01	1.13	
% ORGANIC SULFUR	0.25	0.28	
% OXYGEN(DIFF)	16.16	18.21	
% CHLORINE	0.01	0.01	
% MINERAL MATTER	11.27		
(INCLUDES 0.11 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	----	-----	-----
ATOMIC H/C	0.781	0.759	
ATOMIC O/C	0.184	0.204	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.02		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-507 **
 ** PAGE 5 **

SEAM NAME BED #24
 APPARENT RANK SUBBITUMINOUS A (SUBA)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 8.30

% HIGH TEMPERATURE ASH = 8.51 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	41.80	1.66
B			Al2O3	15.00	0.68
BA	3400	289	TiO2	0.66	0.03
BE	6	1	Fe2O3	3.50	0.21
BI	< 20	2	MgO	4.73	0.24
CE	< 100	9	CaO	21.80	1.33
CO	< 20	2	Na2O	0.71	0.04
CR	140	12	K2O	1.06	0.07
CU	80	7	P2O5	0.07	0.00
GA	14	1	SO3	7.30	0.25
GE	< 25	2			
LA	< 20	2			
LI					
MN	320	27			
MO			VOLATILES		PPM TOTAL COAL
NI	80	7	AS		
NB	< 20	2	BR		
PB	< 40	3	CD		
RB	50	4	CL		
SC	10	1	F		
SN	< 10	1	HG		
SR	6050	515	SB		
TH			SE		
U	< 8	1			
V	150	13			
Y	38	3			
YB	< 5	0			
ZN	27	2			
ZR	140	12			

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** PSOC-507 **
** PAGE 7 **
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COUNTRY U.S.A.
STATE WYOMING

* PETROGRAPHIC DATA *

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	85.8	90.9	80.7
INERTINITE (CALC.)	8.2	8.7	8.4
LIPTINITE (CALC.)	0.4	0.4	0.3
MINERAL MATTER (CALC.)	5.6		10.9

VITRINOIDS			
VITRINITE	75.0	79.4	70.5
PSEUDOVITRINITE	10.9	11.5	10.2
FUSINITE	3.5	3.7	3.6
SEMI-FUSINITE	3.7	3.9	3.7
MACRINITE	0.5	0.5	0.5
MICRINITE	0.6	0.6	0.6
SCLEROTINITE	0.0	0.0	0.0
SPORINITE			
CUTINITE			
EXINITE (ANAL.)	0.4	0.4	0.3
RESINITE	0.0	0.0	0.0
SUBERINITE			
EXUDATINITE			
FLUORINITE			
BITUMINITE			
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE			
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND. DEV.
-----	----	----	-----	-----	-----
VITRINITE	0.55	0.38	0.17	0.48	0.03
PSEUDOVITRINITE	0.57	0.47	0.10	0.52	0.02
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-513 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-513
 COLLECTED BY UNIVERSITY OF UTAH
 COLLECTION DATE 8/25/76
 COLLECTOR'S NUMBER
 REPORTED RANK SUBBITUMINOUS A (SUBA)
 SAMPLE TYPE CHANNEL WHOLE SEAM
 OTHER SAMPLE INFORMATION
 SAMPLE RESERVE 480
 SEAM NAME HANNA #2
 ALTERNATE SEAM NAME
 TOTAL SEAM THICKNESS 22 FT. 0 IN.
 THICKNESS OF SEAM SAMPLED 20 FT. 8 IN.
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE WYOMING
 COUNTY CARBON
 TOWNSHIP
 NEAREST TOWN HANNA
 COAL PROVINCE ROCKY MOUNTAIN
 COAL REGION GREEN RIVER
 COAL FIELD HANNA

MAP REFERENCE: LATITUDE 41D 55M 00S
 LONGITUDE 106D 32M 30S
 QUADRANGLE ELMO (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-513 **
 ** PAGE 3 **

SEAM NAME HANNA #2
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	9.74					
% ASH	8.93	9.89				
% VOLATILE MATTER	37.84	41.92	46.52	45.94	45.57	
% FIXED CARBON	43.50	48.19	53.48	54.06	54.43	

CALORIFIC VALUE	DRY	AS REC'D MOIST.	EQUIL. MOIST.
(GROSS BTU/LB)			

MM-FREE, DIRECT			
MM-CONTAINING	12086	10909	10417
MM-FREE (PARR)	13548	12083	11481
MM-FREE (MOD.P)	13610	12108	11503
BEST MM FREE		12108	11503
NET CV, DMMF BTU/LB	13081		
ASH-FREE	13412		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	13.81	15.52
% TOTAL SULFUR	0.62	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE C BITUMINOUS (HVCB)
ASTM RANK (EQUIL. MOIST.)	SUBBITUMINOUS A (SUBA)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE C BITUMINOUS (HVCB)
INTERNATIONAL RANK	
AS REC'D MOIST.	
EQUIL. MOIST.	
REPORTED RANK	SUBBITUMINOUS A (SUBA)

** PENN STATE COAL DATA BASE **

 ** PSOC-513 **
 ** PAGE 4 **

SEAM NAME HANNA #2
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(11.02 %MM)
% ASH	8.93	9.89		
% CARBON	62.90	69.69	77.34	78.32
% HYDROGEN	4.57*	5.06	5.62	5.69
% NITROGEN	1.02	1.13	1.25	1.27
% SULFUR	0.56	0.62	0.69	
% CHLORINE	0.02	0.02	0.02	0.02
% OXYGEN(DIFF)	12.26*	13.59	15.08	14.70

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	0.13	0.00	0.49	0.62
DAF	0.14	0.00	0.54	0.69
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(11.25%MM)	(%MM)
% CARBON	69.55	78.36	
% HYDROGEN	4.93	5.55	
% NITROGEN	1.13	1.27	
% ORGANIC SULFUR	0.49	0.55	
% OXYGEN(DIFF)	12.65	14.24	
% CHLORINE	0.02	0.02	
% MINERAL MATTER	11.25		
(INCLUDES 0.24 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.872	0.851	
ATOMIC O/C	0.141	0.154	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.04		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-513 **
 ** PAGE 5 **

SEAM NAME HANNA #2 COUNTRY U.S.A.
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB) STATE WYOMING

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 6.40
 % HIGH TEMPERATURE ASH = 8.87 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	42.40	1.76
B			AL2O3	20.80	0.98
BA	2070	184	TiO2	0.76	0.04
BE	7	1	FE2O3	9.22	0.57
BI	< 20	2	MGO	2.63	0.14
CE	< 100	9	CAO	13.10	0.83
CO	< 20	2	NA2O	0.22	0.01
CR	140	12	K2O	1.14	0.08
CU	130	12	P2O5	0.39	0.02
GA	26	2	SO3	9.70	0.34
GE	< 25	3			
LA	210	19			
LI					
MN	580	51			
MO			VOLATILES		PPM TOTAL COAL
NI	150	13	-----		-----
NB	< 20	2	AS		
PB	52	5	BR		
RB	60	5	CD		
SC	21	2	CL		
SN	< 10	1	F		
SR	1070	95	HG		
TH			SB		
U	31	3	SE		
V	230	20			
Y	110	10			
YB	11	1			
ZN	200	18			
ZR	170	15			

** PENN STATE COAL DATA BASE **

 ** PSOC-513 **
 ** PAGE 7 **

SEAM NAME HANNA #2
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	91.3	96.8	86.9
INERTINITE (CALC.)	1.7	1.8	1.8
LIPTINITE (CALC.)	1.3	1.4	1.1
MINERAL MATTER (CALC.)	5.6		11.0

VITRINOIDS			
VITRINITE	79.3	84.0	75.4
PSEUDOVITRINITE	12.1	12.8	11.5
FUSINITE	0.6	0.6	0.6
SEMI-FUSINITE	0.3	0.3	0.3
MACRINITE	0.0	0.0	0.0
MICRINITE	0.8	0.8	0.8
SCLEROTINITE	0.1	0.1	0.1
SPORINITE			
CUTINITE			
EXINITE (ANAL.)	0.9	1.0	0.8
RESINITE	0.4	0.4	0.3
SUBERINITE			
EXUDATINITE			
FLUORINITE			
BITUMINITE			
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE			
MINERAL MATTER (ANAL.)			
INERTINITE (ANAL.)			
LIPTINITE (ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND. DEV.
VITRINITE	0.53	0.40	0.13	0.48	0.03
PSEUDOVITRINITE	0.59	0.47	0.12	0.53	0.03
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-521 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER	PSOC-521
COLLECTED BY	UNIVERSITY OF UTAH
COLLECTION DATE	8/27/76
COLLECTOR'S NUMBER	
REPORTED RANK	HIGH VOLATILE C BITUMINOUS (HVCB)
SAMPLE TYPE	CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION	
SAMPLE RESERVE	40
SEAM NAME	ROCK SPRINGS #7
ALTERNATE SEAM NAME	
TOTAL SEAM THICKNESS	4 FT. 5 IN.
THICKNESS OF SEAM SAMPLED	4 FT. 5 IN.
PORTION RECOVERED IN CORE	
DIAMETER OF CORE	

 *
 * SAMPLE LOCATION *
 *

COUNTRY	U.S.A.
STATE	WYOMING
COUNTY	SWEETWATER
TOWNSHIP	
NEAREST TOWN	QUEALY
COAL PROVINCE	ROCKY MOUNTAIN
COAL REGION	GREEN RIVER
COAL FIELD	ROCK SPRINGS

MAP REFERENCE:	LATITUDE	41D 31M 20S
	LONGITUDE	109D 13M 20S
	QUADRANGLE	ROCK SPRINGS (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-521 **
 ** PAGE 3 **

SEAM NAME ROCK SPRINGS #7
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	7.08					
% ASH	3.67	3.95				
% VOLATILE MATTER	38.38	41.30	43.00	42.68	42.75	
% FIXED CARBON	50.87	54.75	57.00	57.32	57.25	

CALORIFIC VALUE	DRY	AS REC'D MOIST.	EQUIL. MOIST.
(GROSS BTU/LB)			

MM-FREE, DIRECT			
MM-CONTAINING	13310	12368	11865
MM-FREE (PARR)	13925	12894	12346
MM-FREE (MOD.P)	13935	12874	12328
BEST MM FREE		12874	12328
NET CV, DMMF BTU/LB	13443		
ASH-FREE	13857		

MOTT-SPOONER DIFFERENCE = 153.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	10.86	11.39
% TOTAL SULFUR	0.78	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE C BITUMINOUS (HVCB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE C BITUMINOUS (HVCB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE C BITUMINOUS (HVCB)
INTERNATIONAL RANK	
AS REC'D MOIST.	710
EQUIL. MOIST.	710
REPORTED RANK	HIGH VOLATILE C BITUMINOUS (HVCB)

** PENN STATE COAL DATA BASE **

 ** PSOC-521 **
 ** PAGE 4 **

SEAM NAME ROCK SPRINGS #7
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(4.69 %MM)
% ASH	3.67	3.95		
% CARBON	70.15	75.49	78.59	79.21
% HYDROGEN	4.70*	5.06	5.27	5.31
% NITROGEN	1.13	1.22	1.27	1.28
% SULFUR	0.72	0.78	0.81	
% CHLORINE	0.01	0.01	0.01	0.01
% OXYGEN(DIFF)	12.53*	13.49	14.05	14.19

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	0.19	0.00	0.59	0.78
DAF	0.20	0.00	0.61	0.81
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(4.56%MM)	(%MM)
% CARBON	75.43	79.04	
% HYDROGEN	5.00	5.24	
% NITROGEN	1.22	1.28	
% ORGANIC SULFUR	0.59	0.62	
% OXYGEN(DIFF)	13.19	13.81	
% CHLORINE	0.01	0.01	
% MINERAL MATTER	4.56		
(INCLUDES 0.36 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.805	0.797	
ATOMIC O/C	0.135	0.138	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.02		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-521 **
 ** PAGE 5 **

SEAM NAME ROCK SPRINGS #7
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 3.60
 % HIGH TEMPERATURE ASH = 3.73 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	60.20	1.05
B			AL2O3	25.20	0.50
BA	3200	119	TiO2	0.99	0.02
BE	25	1	FE2O3	4.26	0.11
BI	< 20	1	MGO	0.79	0.02
CE	160	6	CAO	3.28	0.09
CO	< 20	1	NA2O	0.33	0.01
CR	120	4	K2O	0.75	0.02
CU	130	5	P2O5	2.17	0.04
GA	38	1	SO3	1.00	0.01
GE	< 25	1			
LA	66	2			
LI					
MN	190	7			
MO			VOLATILES		PPM TOTAL COAL
NI	55	2	AS		
NB	< 20	1	BR		
PB	98	4	CD		
RB	35	1	CL		
SC	40	1	F		
SN	< 10	0	HG		
SR	5200	194	SB		
TH			SE		
U	45	2			
V	230	9			
Y	150	6			
YB	10	0			
ZN	45	2			
ZR	490	18			

** PENN STATE COAL DATA BASE **

 ** PSOC-521 **
 ** PAGE 7 **

SEAM NAME ROCK SPRINGS #7
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %		DMMF VOLUME %		DRY WEIGHT %
	-----		-----		-----
VITRINITE (CALC.)	92.0		94.2		90.3
INERTINITE (CALC.)	4.7		4.8		5.0
LIPTINITE (CALC.)	1.0		1.0		0.8
MINERAL MATTER (CALC.)	2.3				4.7
VITRINIDS					
VITRINITE	92.0		94.2		90.3
PSEUDOVITRINITE	0.0		0.0		0.0
FUSINITE	1.4		1.4		1.5
SEMI-FUSINITE	2.8		2.9		3.0
MACRINITE	0.3		0.3		0.3
MICRINITE	0.2		0.2		0.2
SCLEROTINITE	0.0		0.0		0.0
SPORINITE					
CUTINITE					
EXINITE (ANAL.)	1.0		1.0		0.8
RESINITE	0.0		0.0		0.0
SUBERINITE					
EXUDATINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0		0.0		0.0
LIPTODETRINITE					
MINERAL MATTER(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
(%, IN OIL)					
-----	----	----	-----	-----	-----
VITRINITE	0.64	0.43	0.21	0.52	0.05
PSEUDOVITRINITE					
VITRINIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-525 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-525

COLLECTED BY UNIVERSITY OF UTAH
 COLLECTION DATE 9/ 2/76
 COLLECTOR'S NUMBER

REPORTED RANK SUBBITUMINOUS B (SUBB)

SAMPLE TYPE CHANNEL WHOLE SEAM
 OTHER SAMPLE INFORMATION
 SAMPLE RESERVE 325

SEAM NAME DIETZ #3
 ALTERNATE SEAM NAME UPPER MONARCH

TOTAL SEAM THICKNESS 17 FT. 0 IN.
 THICKNESS OF SEAM SAMPLED 17 FT. 0 IN.
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE WYOMING
 COUNTY SHERIDAN
 TOWNSHIP
 NEAREST TOWN SHERIDAN

COAL PROVINCE NORTHERN GREAT PLAINS
 COAL REGION POWDER RIVER
 COAL FIELD SHERIDAN

MAP REFERENCE: LATITUDE 44D 55M 00S
 LONGITUDE 106D 57M 00S
 QUADRANGLE SHERIDAN (30')

** PENN STATE COAL DATA BASE **

 ** PSOC-525 **
 ** PAGE 3 **

SEAM NAME DIETZ #3
 APPARENT RANK SUBBITUMINOUS B (SUBB)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	19.15					
% ASH	5.04	6.23				
% VOLATILE MATTER	34.94	43.22	46.09	45.69	45.60	
% FIXED CARBON	40.87	50.55	53.91	54.31	54.40	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
-----------------------------------	-----	--------------------	------------------

MM-FREE, DIRECT			
MM-CONTAINING	11972	9679	9339
MM-FREE (PARR)	12851	10240	9859
MM-FREE (MOD.P)	12881	10238	9857
BEST MM FREE		10238	9857
NET CV, DMMF BTU/LB	12388		
ASH-FREE	12767		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	21.99	23.68
% TOTAL SULFUR	0.71	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST) SUBBITUMINOUS B (SUBB)
 ASTM RANK (EQUIL. MOIST.) SUBBITUMINOUS B (SUBB)
 REFLECTANCE RANK CATEGORY
 INTERNATIONAL RANK
 AS REC'D MOIST.
 EQUIL. MOIST.
 REPORTED RANK SUBBITUMINOUS B (SUBB)

** PENN STATE COAL DATA BASE **

 ** PSOC-525 **
 ** PAGE 4 **

SEAM NAME DIETZ #3
 APPARENT RANK SUBBITUMINOUS B (SUBB)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(7.12 %MM)
% ASH	5.04	6.23		
% CARBON	56.76	70.21	74.87	75.59
% HYDROGEN	3.99*	4.94	5.27	5.32
% NITROGEN	0.85	1.05	1.12	1.13
% SULFUR	0.57	0.71	0.76	
% CHLORINE	0.01	0.01	0.02	0.02
% OXYGEN(DIFF)	13.62*	16.84	17.97	17.94

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	0.16	0.04	0.51	0.71
DAF	0.17	0.04	0.54	0.76

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(7.12%MM)	(%MM)
% CARBON	70.12	75.50	
% HYDROGEN	4.86	5.23	
% NITROGEN	1.05	1.13	
% ORGANIC SULFUR	0.51	0.55	
% OXYGEN(DIFF)	16.34	17.58	
% CHLORINE	0.01	0.02	
% MINERAL MATTER	7.12		
(INCLUDES 0.30 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.845	0.832	
ATOMIC O/C	0.178	0.188	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.03		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-525 **
 ** PAGE 5 **

SEAM NAME DIETZ #3
 APPARENT RANK SUBBITUMINOUS B (SUBB)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 7.57
 % HIGH TEMPERATURE ASH = 5.79 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG			SiO2	25.00	0.68
B			AL2O3	19.00	0.58
BA	5900	342	TiO2	0.78	0.03
BE	7	0	FE2O3	23.40	0.95
BI			MGO	4.61	0.16
CE			CAO	14.80	0.61
CO			NA2O	3.35	0.14
CR	75	4	K2O	0.70	0.03
CU	95	6	P2O5	0.53	0.01
GA			SO3	18.50	0.43
GE					
LA					
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	120	7	AS		
NB			BR		
PB			CD		
RB	35	2	CL		
SC			F		
SN			HG		
SR	2200	127	SB		
TH			SE		
U					
V	200	12			
Y					
YB					
ZN	120	7			
ZR	270	16			

** PENN STATE COAL DATA BASE **

 ** PSOC-525 **
 ** PAGE 7 **

SEAM NAME DIETZ #3
 APPARENT RANK SUBBITUMINOUS B (SUBB)

COUNTRY U.S.A.
 STATE WYOMING

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION COMBINED WHITE AND BLUE LIGHT

	DRY VOLUME %	DMMF VOLUME %
HUMINITE	81.5	84.5
INERTINITE	6.7	6.9
LIPTINITE	5.5	5.7
MINERAL MATTER(CALC.)	3.6	
TEXTINITE	0.0	0.0
ULMINITE	80.5	83.5
ATTRINITE		
DENSINITE		
HUMODETRINITE(ANAL)	2.8	2.9
GELINITE	0.8	0.8
CORPOHUMINITE	0.2	0.2
SPORINITE	4.6	4.8
CUTINITE	0.2	0.2
EXINITE		
RESINITE	0.1	0.1
SUBERINITE	0.0	0.0
FLUORINITE	0.0	0.0
BITUMINITE	0.3	0.3
ALGINITE	0.0	0.0
LIPTODETRINITE		
FUSINITE	2.1	2.2
SEMI-FUSINITE	4.0	4.1
MACRINITE	0.5	0.5
MICRINITE		
SCLEROTINITE	0.1	0.1
INERTODETRINITE		
MINERAL MATTER(ANAL.)		
HUMINITE(ANAL.)		
INERTINITE(ANAL.)		
LIPTINITE(ANAL.)		

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
ULMINITE	0.61	0.30	0.31	0.44	0.05

** PENN STATE COAL DATA BASE **

 ** PSOC-531 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-531
 COLLECTED BY UNIVERSITY OF UTAH
 COLLECTION DATE 9/ 2/76
 COLLECTOR'S NUMBER
 REPORTED RANK SUBBITUMINOUS B (SUBB)
 SAMPLE TYPE CHANNEL
 OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
 SAMPLE RESERVE 480
 SEAM NAME DIETZ
 ALTERNATE SEAM NAME
 TOTAL SEAM THICKNESS 51 FT. 0 IN.
 THICKNESS OF SEAM SAMPLED
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE MONTANA
 COUNTY BIG HORN
 TOWNSHIP
 NEAREST TOWN DECKER
 COAL PROVINCE NORTHERN GREAT PLAINS
 COAL REGION FORT UNION
 COAL FIELD DECKER

MAP REFERENCE: LATITUDE 45D 2M 30S
 LONGITUDE 106D 50M 30S
 QUADRANGLE DECKER (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-531 **
 ** PAGE 3 **

SEAM NAME DIETZ
 APPARENT RANK SUBBITUMINOUS A (SUBA)

COUNTRY U.S.A.
 STATE MONTANA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	14.23					
% ASH	3.80	4.43				
% VOLATILE MATTER	36.35	42.38	44.34	44.09	44.05	
% FIXED CARBON	45.62	53.19	55.66	55.91	55.95	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	12477	10702	9969
MM-FREE (PARR)	13111	11163	10367
MM-FREE (MOD.P)	13136	11172	10375
BEST MM FREE		11172	10375
NET CV, DMMF BTU/LB	12655		
ASH-FREE	13055		

MOTT-SPOONER DIFFERENCE = 51.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	20.10	21.15
% TOTAL SULFUR	0.30	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	SUBBITUMINOUS A (SUBA)
ASTM RANK (EQUIL. MOIST.)	SUBBITUMINOUS B (SUBB)
REFLECTANCE RANK CATEGORY	SUBBITUMINOUS A (SUBA)
INTERNATIONAL RANK	
AS REC'D MOIST.	
EQUIL. MOIST.	
REPORTED RANK	SUBBITUMINOUS B (SUBB)

** PENN STATE COAL DATA BASE **

 ** PSOC-531 **
 ** PAGE 4 **

SEAM NAME DIETZ
 APPARENT RANK SUBBITUMINOUS A (SUBA)

COUNTRY U.S.A.
 STATE MONTANA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR) (4.95 %MM)
% ASH	3.80	4.43		
% CARBON	62.12	72.43	75.79	76.20
% HYDROGEN	4.22*	4.92	5.15	5.18
% NITROGEN	0.72	0.84	0.88	0.88
% SULFUR	0.26	0.30	0.31	
% CHLORINE	0.00	0.00	0.01	0.01
% OXYGEN(DIFF)	14.64*	17.07	17.87	17.73

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	0.10	0.00	0.20	0.30
DAF	0.10	0.00	0.21	0.31
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P) (5.06%MM)	DMMF(DIR.) (%MM)
% CARBON	72.37	76.22	
% HYDROGEN	4.86	5.12	
% NITROGEN	0.84	0.88	
% ORGANIC SULFUR	0.20	0.21	
% OXYGEN(DIFF)	16.68	17.56	
% CHLORINE	0.00	0.01	
% MINERAL MATTER (INCLUDES 0.19 % FES2)	5.06		

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
ATOMIC H/C	0.816	0.807	
ATOMIC O/C	0.175	0.182	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.01		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-531 **
 ** PAGE 5 **

SEAM NAME DIETZ
 APPARENT RANK SUBBITUMINOUS A (SUBA)

COUNTRY U.S.A.
 STATE MONTANA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 8.90
 % HIGH TEMPERATURE ASH = 4.32 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG			SI02	27.70	0.56
B			AL2O3	19.00	0.43
BA	14200	613	TiO2	1.29	0.03
BE	< 3	0	FE2O3	4.29	0.13
BI	< 20	1	MGO	4.00	0.10
CE	170	7	CAO	18.00	0.56
CO	< 20	1	NA2O	10.00	0.32
CR	90	4	K2O	0.56	0.02
CU	190	8	P2O5	0.37	0.01
GA	< 10	0	SO3	12.50	0.22
GE	< 25	1			
LA	28	1			
LI					
MN	225	10			
MO			VOLATILES		PPM TOTAL COAL
NI	75	3	AS		
NB	< 20	1	BR		
PB	< 40	2	CD		
RB	25	1	CL		
SC	16	1	F		
SN	< 10	0	HG		
SR	8730	377	SB		
TH			SE		
U	< 3	0			
V	210	9			
Y	20	1			
YB	15	1			
ZN	40	2			
ZR	250	11			

** PENN STATE COAL DATA BASE **

 ** PSOC-531 **
 ** PAGE 7 **

SEAM NAME DIETZ
 APPARENT RANK SUBBITUMINOUS A (SUBA)

COUNTRY U.S.A.
 STATE MONTANA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %		DMMF VOLUME %		DRY WEIGHT %
	-----		-----		-----
VITRINITE (CALC.)	92.1		94.4		89.8
INERTINITE (CALC.)	4.9		5.0		5.2
LIPTINITE (CALC.)	0.6		0.6		0.5
MINERAL MATTER (CALC.)	2.4				4.9
VITRINOIDS					
VITRINITE	82.4		84.5		80.4
PSEUDOVITRINITE	9.7		9.9		9.4
FUSINITE	2.7		2.8		3.0
SEMI-FUSINITE	1.6		1.6		1.6
MACRINITE	0.3		0.3		0.3
MICRINITE	0.3		0.3		0.3
SCLEROTINITE	0.0		0.0		0.0
SPORINITE					
CUTINITE					
EXINITE (ANAL.)	0.6		0.6		0.5
RESINITE	0.0		0.0		0.0
SUBERINITE					
EXUDATINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0		0.0		0.0
LIPTODETRINITE					
MINERAL MATTER(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
(%, IN OIL)	----	----	-----	-----	-----
VITRINITE	0.47	0.32	0.15	0.40	0.03
PSEUDOVITRINITE	0.52	0.38	0.14	0.43	0.03
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-537 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-537

COLLECTED BY UNIVERSITY OF UTAH
COLLECTION DATE 9/21/76
COLLECTOR'S NUMBER

REPORTED RANK HIGH VOLATILE C BITUMINOUS (HVCB)

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
SAMPLE RESERVE 380

SEAM NAME WADGE
ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 5 FT. 9 IN.
THICKNESS OF SEAM SAMPLED 5 FT. 9 IN.
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE COLORADO
COUNTY ROUTT
TOWNSHIP
NEAREST TOWN OAK CREEK

COAL PROVINCE ROCKY MOUNTAIN
COAL REGION GREEN RIVER
COAL FIELD YAMPA

MAP REFERENCE: LATITUDE 40D 19M 50S
LONGITUDE 106D 58M 10S
QUADRANGLE OAK CREEK (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-537 **
 ** PAGE 3 **

SEAM NAME WADGE
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE COLORADO

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	9.74					
% ASH	6.16	6.82				
% VOLATILE MATTER	37.46	41.50	44.54	44.05	43.95	
% FIXED CARBON	46.65	51.68	55.46	55.95	56.05	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	12604	11376	11142
MM-FREE (PARR)	13632	12202	11932
MM-FREE (MOD.P)	13660	12189	11919
BEST MM FREE		12189	11919
NET CV, DMMF BTU/LB	13161		
ASH-FREE	13527		

MOTT-SPOONER DIFFERENCE = 41.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	11.60	12.59
% TOTAL SULFUR	0.94	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE C BITUMINOUS (HVCB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE C BITUMINOUS (HVCB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE C BITUMINOUS (HVCB)
INTERNATIONAL RANK	
AS REC'D MOIST.	
EQUIL. MOIST.	
REPORTED RANK	HIGH VOLATILE C BITUMINOUS (HVCB)

** PENN STATE COAL DATA BASE **

 ** PSOC-537 **
 ** PAGE 4 **

SEAM NAME WADGE
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE COLORADO

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(7.88 %MM)
% ASH	6.16	6.82		
% CARBON	64.97	71.98	77.25	78.14
% HYDROGEN	4.48*	4.96	5.32	5.38
% NITROGEN	1.25	1.38	1.48	1.50
% SULFUR	0.85	0.94	1.01	
% CHLORINE	0.01	0.01	0.02	0.02
% OXYGEN(DIFF)	12.55*	13.90	14.92	14.96

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	0.19	0.00	0.75	0.94
DAF	0.20	0.00	0.80	1.01
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF (MOD.P)	DMMF (DIR.)
-----	---	-----	-----
		(7.80%MM)	(%MM)
% CARBON	71.88	77.97	
% HYDROGEN	4.87	5.28	
% NITROGEN	1.38	1.50	
% ORGANIC SULFUR	0.75	0.81	
% OXYGEN(DIFF)	13.32	14.43	
% CHLORINE	0.01	0.02	
% MINERAL MATTER	7.80		
(INCLUDES 0.36 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.828	0.813	
ATOMIC O/C	0.144	0.151	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.03		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-537 **
 ** PAGE 5 **

SEAM NAME WADGE
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE COLORADO

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 10.90
 % HIGH TEMPERATURE ASH = 5.95 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	41.70	1.16
B			AL2O3	34.80	1.10
BA	2390	142	TiO2	1.04	0.04
BE	7	0	Fe2O3	7.51	0.31
BI	< 20	1	MgO	1.44	0.05
CE	190	11	CaO	6.89	0.29
CO	< 20	1	Na2O	0.24	0.01
CR	80	5	K2O	0.50	0.02
CU	150	9	P2O5	2.07	0.05
GA	39	2	SO3	3.50	0.08
GE	< 25	1			
LA	70	4			
LI					
MN	290	17			
MO			VOLATILES		PPM TOTAL COAL
NI	65	4	AS		
NB	< 20	1	BR		
PB	92	5	CD		
RB	15	1	CL		
SC	17	1	F		
SN	210	12	HG		
SR	3280	195	SB		
TH			SE		
U					
V	90	5			
Y	68	4			
YB	6	0			
ZN	90	5			
ZR	500	30			

** PENN STATE COAL DATA BASE **

 ** PSOC-537 **
 ** PAGE 7 **

SEAM NAME WADGE
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE COLORADO

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	86.8	90.4	83.3
INERTINITE (CALC.)	8.5	8.8	8.8
LIPTINITE (CALC.)	0.8	0.8	0.6
MINERAL MATTER (CALC.)	4.0		7.9
VITRINOIDS			
VITRINITE	85.1	88.6	81.6
PSEUDOVITRINITE	1.7	1.8	1.7
FUSINITE	3.6	3.8	3.9
SEMI-FUSINITE	3.3	3.4	3.4
MACRINITE	0.7	0.7	0.7
MICRINITE	0.9	0.9	0.9
SCLEROTINITE	0.0	0.0	0.0
SPORINITE			
CUTINITE			
EXINITE (ANAL.)	0.8	0.8	0.6
RESINITE	0.0	0.0	0.0
SUBERINITE			
EXUDATINITE			
FLUORINITE			
BITUMINITE			
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE			
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	0.64	0.44	0.20	0.55	0.04
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-543 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-543
 COLLECTED BY UNIVERSITY OF UTAH
 COLLECTION DATE 9/22/76
 COLLECTOR'S NUMBER

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
 OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
 SAMPLE RESERVE

SEAM NAME WOLF CREEK
 ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 14 FT. 0 IN.
 THICKNESS OF SEAM SAMPLED
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE COLORADO
 COUNTY ROUTT
 TOWNSHIP
 NEAREST TOWN HAYDEN

COAL PROVINCE ROCKY MOUNTAIN
 COAL REGION GREEN RIVER
 COAL FIELD

MAP REFERENCE: LATITUDE 40D 20M 50S
 LONGITUDE 107D 7M 00S
 QUADRANGLE MOUNT HARRIS (15')

** PENN STATE COAL DATA BASE **

 ** PSOC-543 **
 ** PAGE 3 **

SEAM NAME WOLF CREEK
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE COLORADO

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	10.18					
% ASH	7.66	8.53				
% VOLATILE MATTER	36.57	40.72	44.52	44.00	43.72	
% FIXED CARBON	45.58	50.75	55.48	56.00	56.28	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	12479	11209	11095
MM-FREE (PARR)	13761	12229	12094
MM-FREE (MOD.P)	13813	12251	12115
BEST MM FREE		12251	12115
NET CV, DMMF BTU/LB	13296		
ASH-FREE	13643		

MOTT-SPOONER DIFFERENCE = 93.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	11.09	12.26
% TOTAL SULFUR	0.56	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE C BITUMINOUS (HVCB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE C BITUMINOUS (HVCB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE C BITUMINOUS (HVCB)
INTERNATIONAL RANK	
AS REC'D MOIST.	
EQUIL. MOIST.	
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-543 **
 ** PAGE 4 **

SEAM NAME WOLF CREEK
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE COLORADO

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(9.52 %MM)
% ASH	7.66	8.53		
% CARBON	63.47	70.66	77.25	78.09
% HYDROGEN	4.52*	5.03	5.50	5.56
% NITROGEN	1.13	1.26	1.38	1.39
% SULFUR	0.50	0.56	0.61	
% CHLORINE	0.01	0.01	0.01	0.01
% OXYGEN(DIFF)	12.53*	13.95	15.25	14.94

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	0.16	0.00	0.40	0.56
DAF	0.17	0.00	0.44	0.61
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF (MOD.P)	DMMF (DIR.)
-----	---	-----	-----
		(9.72%MM)	(%MM)
% CARBON	70.54	78.13	
% HYDROGEN	4.92	5.45	
% NITROGEN	1.26	1.39	
% ORGANIC SULFUR	0.40	0.44	
% OXYGEN(DIFF)	13.17	14.57	
% CHLORINE	0.01	0.01	
% MINERAL MATTER	9.72		
(INCLUDES 0.30 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.855	0.837	
ATOMIC O/C	0.144	0.155	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.02		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-543 **
 ** PAGE 5 **

SEAM NAME WOLF CREEK
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE COLORADO

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 9.30
 % HIGH TEMPERATURE ASH = 7.61 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	53.30	1.90
B			Al2O3	30.60	1.23
BA	2790	212	TiO2	1.21	0.06
BE	5	0	Fe2O3	3.38	0.18
BI	< 20	2	MgO	1.02	0.05
CE	110	8	CaO	4.20	0.23
CO	< 20	2	Na2O	0.30	0.02
CR	75	6	K2O	0.60	0.04
CU	110	8	P2O5	1.15	0.04
GA	43	3	SO3	2.30	0.07
GE	< 25	2			
LA	64	5			
LI					
MN	170	13			
MO			VOLATILES		PPM TOTAL COAL
NI	40	3	AS		
NB	< 20	2	BR		
PB	94	7	CD		
RB	15	1	CL		
SC	12	1	F		
SN	43	3	HG		
SR	1930	147	SB		
TH			SE		
U					
V	90	6			
Y	60	5			
YB	< 5	0			
ZN	40	3			
ZR	75	6			

** PENN STATE COAL DATA BASE **

 ** PSOC-543 **
 ** PAGE 7 **

SEAM NAME WOLF CREEK
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE COLORADO

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %		
VITRINITE (CALC.)	85.3	89.6	81.4		
INERTINITE (CALC.)	8.8	9.2	9.1		
LIPTINITE (CALC.)	1.1	1.2	0.9		
MINERAL MATTER (CALC.)	4.8		9.5		
VITRINOLDS					
VITRINITE	81.8	85.9	78.0		
PSEUDOVITRINITE	3.5	3.7	3.4		
FUSINITE	3.4	3.6	3.6		
SEMI-FUSINITE	3.0	3.2	3.1		
MACRINITE	1.5	1.6	1.6		
MICRINITE	0.8	0.8	0.8		
SCLEROTINITE	0.0	0.0	0.0		
SPORINITE					
CUTINITE					
EXINITE (ANAL.)	1.1	1.2	0.9		
RESINITE	0.0	0.0	0.0		
SUBERINITE					
EXUDATINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0	0.0	0.0		
LIPTODETRINITE					
MINERAL MATTER(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
(%, IN OIL)					
VITRINITE	0.64	0.44	0.20	0.53	0.04
PSEUDOVITRINITE					
VITRINOLDS					

** PENN STATE COAL DATA BASE **

** PSOC-549 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-549
COLLECTED BY SOUTHERN ILLINOIS UNIVERSITY
COLLECTION DATE 8/19/76
COLLECTOR'S NUMBER

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION LITHOTYPE DATA AVAILABLE
SAMPLE RESERVE

SEAM NAME UNNAMED
ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 3 FT. 9 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE IOWA
COUNTY MAHASKA
TOWNSHIP
NEAREST TOWN OSKALOOSA

COAL PROVINCE INTERIOR
COAL REGION WESTERN
COAL FIELD

MAP REFERENCE: LATITUDE 41D 20M 10S
LONGITUDE 92D 31M 30S
QUADRANGLE UNIVERSITY PARK (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-549 **
 ** PAGE 3 **

SEAM NAME UNNAMED
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE IOWA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	13.10					
% ASH	18.28	21.03				
% VOLATILE MATTER	36.58	42.10	53.31	51.10	51.09	
% FIXED CARBON	32.04	36.87	46.69	48.90	48.91	

CALORIFIC VALUE	DRY	AS REC'D MOIST.	EQUIL. MOIST.
(GROSS BTU/LB)			

MM-FREE, DIRECT			
MM-CONTAINING	10890	9463	9360
MM-FREE (PARR)	14384	11922	11752
MM-FREE (MOD.P)	14360	11718	11554
BEST MM FREE		11718	11554
NET CV, DMMF BTU/LB	13825		
ASH-FREE	13790		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	14.05	19.25
% TOTAL SULFUR	7.79	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE C BITUMINOUS (HVCB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE C BITUMINOUS (HVCB)
REFLECTANCE RANK CATEGORY	
INTERNATIONAL RANK	
AS REC'D MOIST.	710
EQUIL. MOIST.	710
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-549 **
 ** PAGE 4 **

SEAM NAME UNNAMED
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE IOWA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(27.00 %MM)
% ASH	18.28	21.03		
% CARBON	52.29	60.17	76.19	82.42
% HYDROGEN	3.73*	4.29	5.43	5.88
% NITROGEN	0.65	0.75	0.95	1.03
% SULFUR	6.77	7.79	9.86	
% CHLORINE	0.02	0.02	0.03	0.03
% OXYGEN(DIFF)	5.17*	5.95	7.54	10.66

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	4.17	0.54	3.08	7.79
DAF	5.28	0.68	3.90	9.86
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(25.73%MM)	(%MM)
% CARBON	59.85	80.59	
% HYDROGEN	3.93	5.30	
% NITROGEN	0.75	1.03	
% ORGANIC SULFUR	3.08	4.15	
% OXYGEN(DIFF)	6.65	8.93	
% CHLORINE	0.02	0.03	
% MINERAL MATTER	25.73		
(INCLUDES 7.80 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.856	0.789	
ATOMIC O/C	0.097	0.112	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.04		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-549 **
 ** PAGE 5 **

SEAM NAME UNNAMED
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE IOWA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 10.20
 % HIGH TEMPERATURE ASH = 24.28 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	11.50	1.31
B			AL2O3	5.82	0.75
BA	140	34	TiO2	0.29	0.04
BE	20	5	FE2O3	35.70	6.06
BI	< 20	5	MGO	0.36	0.05
CE	< 100	24	CAO	19.70	3.42
CO	22	5	NA2O	0.14	0.03
CR	150	36	K2O	0.44	0.09
CU	110	27	P2O5	0.38	0.04
GA	14	3	SO3	26.20	2.54
GE	56	14			
LA	< 20	5			
LI					
MN	1300	316			
MO			VOLATILES		PPM TOTAL COAL
NI	200	49	-----		-----
NB			AS		
PB			BR		
RB	25	6	CD		
SC	13	3	CL		
SN	< 10	2	F		
SR	170	41	HG		
TH			SB		
U	< 4	1	SE		
V	85	21			
Y	70	17			
YB	10	2			
ZN	150	36			
ZR	65	16			

** PENN STATE COAL DATA BASE **

 ** PSOC-549 **
 ** PAGE 7 **

SEAM NAME UNNAMED
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE IOWA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %			
	-----	-----			
HUMINITE	73.2	86.3			
INERTINITE	9.2	10.8			
LIPTINITE	0.0	0.0			
MINERAL MATTER(CALC.)	15.1				
TEXTINITE	0.0	0.0			
ULMINITE	73.2	86.3			
ATTRINITE					
DENSINITE					
HUMODETRINITE(ANAL)	0.8	0.9			
GELINITE					
CORPOHUMINITE	0.0	0.0			
SPORINITE					
CUTINITE					
EXINITE		1.0			
RESINITE	0.0	0.0			
SUBERINITE	0.0	0.0			
FLUORINITE					
BITUMINITE					
ALGINITE	0.0	0.0			
LIPTODETRINITE					
FUSINITE	4.0	4.7			
SEMI-FUSINITE	4.2	5.0			
MACRINITE	0.9	1.1			
MICRINITE					
SCLEROTINITE	0.0	0.0			
INERTODETRINITE					
MINERAL MATTER(ANAL.)					
HUMINITE(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
(%, IN OIL)	----	----	----	-----	-----
ULMINITE	0.43	0.29	0.14	0.36	0.03

** PENN STATE COAL DATA BASE **

** PSOC-554 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-554
COLLECTED BY SOUTHERN ILLINOIS UNIVERSITY
COLLECTION DATE 8/19/76
COLLECTOR'S NUMBER

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION LITHOTYPE DATA AVAILABLE
SAMPLE RESERVE

SEAM NAME IOWA #1
ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 6 FT. 1 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE IOWA
COUNTY LUCAS
TOWNSHIP
NEAREST TOWN

COAL PROVINCE INTERIOR
COAL REGION WESTERN
COAL FIELD

MAP REFERENCE: LATITUDE 41D 7M 30S
LONGITUDE 93D 10M 20S
QUADRANGLE MELCHER (15')

*** PENN STATE COAL DATA BASE ***

 ** PSOC-554 **
 ** PAGE 3 **

SEAM NAME IOWA #1
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE IOWA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	16.81					
% ASH	12.82	15.41				
% VOLATILE MATTER	33.33	40.07	47.37	45.80	45.68	
% FIXED CARBON	37.04	44.52	52.63	54.20	54.32	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	11959	9949	9883
MM-FREE (PARR)	14506	11607	11516
MM-FREE (MOD.P)	14528	11539	11448
BEST MM FREE		11539	11448
NET CV, DMMF BTU/LB	13985		
ASH-FREE	14138		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	17.36	21.46
% TOTAL SULFUR	4.46	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE C BITUMINOUS (HVCB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE C BITUMINOUS (HVCB)
REFLECTANCE RANK CATEGORY	
INTERNATIONAL RANK	
AS REC'D MOIST.	620
EQUIL. MOIST.	620
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-554 **
 ** PAGE 4 **

SEAM NAME IOWA #1
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE IOWA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
				(19.10 %MM)
% ASH	12.82	15.41		
% CARBON	55.14	66.28	78.35	81.92
% HYDROGEN	3.97*	4.77	5.64	5.90
% NITROGEN	1.03	1.24	1.47	1.53
% SULFUR	3.71	4.46	5.27	
% CHLORINE	0.02	0.03	0.04	0.04
% OXYGEN(DIFF)	6.49*	7.81	9.24	10.62

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	2.60	0.09	1.77	4.46
DAF	3.07	0.11	2.09	5.27

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
		(18.65%MM)	(%MM)
% CARBON	66.05	81.19	
% HYDROGEN	4.52	5.55	
% NITROGEN	1.24	1.53	
% ORGANIC SULFUR	1.77	2.18	
% OXYGEN(DIFF)	7.77	9.52	
% CHLORINE	0.03	0.04	
% MINERAL MATTER	18.65		
(INCLUDES 4.86 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
ATOMIC H/C	0.864	0.822	
ATOMIC O/C	0.097	0.108	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO4,IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.06		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-554 **
 ** PAGE 5 **

SEAM NAME: IOWA #1
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE IOWA

 *
 * CHEMICAL DATA '3 *
 *

% MOISTURE IN COAL = 13.50
 % HIGH TEMPERATURE ASH = 19.31 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	25.70	2.32
B			AL2O3	11.50	1.18
BA	200	39	TiO2	0.48	0.06
BE	20	4	FE2O3	27.40	3.70
BI	< 20	4	MGO	0.66	0.08
CE	< 100	19	CAO	15.30	2.11
CO	50	10	NA2O	0.33	0.05
CR	170	33	K2O	0.89	0.14
CU	190	35	P2O5	0.31	0.03
GA	27	5	SO3	17.60	1.36
GE	92	18			
LA	< 20	4			
LI					
MN	1500	290			
MO			VOLATILES		PPM TOTAL COAL
NI	360	70	AS		
NB	< 20	4	BR		
PB			CD		
RB	45	9	CL		
SC	20	4	F		
SN	< 10	2	HG		
SR	170	33	SB		
TH			SE		
U	< 9	2			
V	170	33			
Y	68	13			
YB	9	2			
ZN	3360	649			
ZR	120	23			

** PENN STATE COAL DATA BASE **

 ** PSOC-554 **
 ** PAGE 7 **

SEAM NAME IOWA #1
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE IOWA

 * *
 * PETROGRAPHIC DATA *
 * *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %			
	-----	-----			
HUMINITE	80.7	89.9			
INERTINITE	6.7	7.5			
LIPTINITE	0.0	0.0			
MINERAL MATTER(CALC.)	10.2				
TEXTINITE	0.0	0.0			
ULMINITE	80.1	89.2			
ATTRINITE					
DENSINITE					
HUMODETRINITE(ANAL)	0.3	0.3			
GELINITE	0.6	0.7			
CORPOHUMINITE	0.0	0.0			
SPORINITE					
CUTINITE					
EXINITE		2.3			
RESINITE	0.0	0.0			
SUBERINITE	0.0	0.0			
FLUORINITE					
BITUMINITE					
ALGINITE	0.0	0.0			
LIPTODETRINITE					
FUSINITE	2.4	2.7			
SEMI-FUSINITE	0.9	1.0			
MACRINITE	3.4	3.8			
MICRINITE					
SCLEROTINITE	0.0	0.0			
INERTODETRINITE					
MINERAL MATTER(ANAL.)					
HUMINITE(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
(%, IN OIL)					
-----	----	----	-----	-----	-----
ULMINITE	0.52	0.30	0.22	0.39	0.05

** PENN STATE COAL DATA BASE **

** PSOC-574 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-574
COLLECTED BY SHELL DEVELOPMENT CORPORATION
COLLECTION DATE 10/15/76
COLLECTOR'S NUMBER 4402

REPORTED RANK

SAMPLE TYPE CORE WHOLE SEAM
OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
SAMPLE RESERVE

SEAM NAME UNNAMED
ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 4 FT. 6 IN.
THICKNESS OF SEAM SAMPLED 4 FT. 6 IN.
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE TEXAS
COUNTY MAVERICK
TOWNSHIP
NEAREST TOWN EAGLE PASS
COAL PROVINCE GULF
COAL REGION
COAL FIELD

MAP REFERENCE: LATITUDE
LONGITUDE
QUADRANGLE

** PENN STATE COAL DATA BASE **

 ** PSOC-574 **
 ** PAGE 3 **

SEAM NAME UNNAMED
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	2.87					
% ASH	28.60	29.45				
% VOLATILE MATTER	31.53	32.46	46.01	43.93	41.66	
% FIXED CARBON	37.00	38.09	53.99	56.07	58.34	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	8467	8224	7465
MM-FREE (PARR)	12441	11921	10383
MM-FREE (MOD.P)	12692	12098	10517
BEST MM FREE		12098	10517
NET CV, DMMF BTU/LB	12191		
ASH-FREE	12001		

MOTT-SPOONER DIFFERENCE = 150.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	11.83	17.48
% TOTAL SULFUR	0.93	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE C BITUMINOUS (HVCB)
ASTM RANK (EQUIL. MOIST.)	SUBBITUMINOUS B (SUBB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE C BITUMINOUS (HVCB)
INTERNATIONAL RANK	
AS REC'D MOIST.	800
EQUIL. MOIST.	800
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-574 **
 ** PAGE 4 **

SEAM NAME UNNAMED
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(32.32 %MM)
% ASH	28.60	29.45		
% CARBON	48.49	49.92	70.76	73.76
% HYDROGEN	3.50*	3.60	5.10	5.32
% NITROGEN	0.00	0.00	0.00	0.00
% SULFUR	0.90	0.93	1.32	
% CHLORINE	0.00	0.00	0.01	0.01
% OXYGEN(DIFF)	15.63*	16.10	22.82	20.92

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	0.22	0.00	0.71	0.93
DAF	0.31	0.00	1.01	1.32
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(33.38%MM)	(%MM)
% CARBON	49.51	74.32	
% HYDROGEN	3.21	4.82	
% NITROGEN	0.00	0.00	
% ORGANIC SULFUR	0.71	1.07	
% OXYGEN(DIFF)	13.19	19.79	
% CHLORINE	0.00	0.01	
% MINERAL MATTER	33.38		
(INCLUDES 0.41 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.866	0.779	
ATOMIC O/C	0.213	0.300	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.01		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-574 **
 ** PAGE 5 **

SEAM NAME UNNAMED
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 2.30
 % HIGH TEMPERATURE ASH = 29.27 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG			SiO2	59.40	8.13
B			AL2O3	31.30	4.85
BA	200	59	TiO2	1.31	0.23
BE	20	6	FE2O3	2.61	0.53
BI			MGO	0.35	0.06
CE			CAO	0.54	0.11
CO			NA2O	1.02	0.22
CR	40	12	K2O	0.47	0.11
CU	200	59	P2O5	0.04	0.01
GA			SO3	0.40	0.05
GE					
LA					
LI					
MN					
MO					
NI	45	13			
NB	< 20	6			
PB	88	26			
RB	20	6			
SC	21	6			
SN	< 10	3			
SR	300	88			
TH					
U	14	4			
V	110	32			
Y	60	18			
YB	< 5	1			
ZN	35	10			
ZR	370	108			

VOLATILES		PPM TOTAL COAL
AS		
BR		
CD		
CL		
F		
HG		
SB		
SE		

** PENN STATE COAL DATA BASE **

 ** PSOC-574 **
 ** PAGE 7 **

SEAM NAME UNNAMED COUNTRY U.S.A.
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB) STATE TEXAS

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %			
	-----	-----			
HUMINITE	68.3	84.0			
INERTINITE	9.8	12.0			
LIPTINITE	0.0	0.0			
MINERAL MATTER(CALC.)	18.7				
TEXTINITE	0.0	0.0			
ULMINITE	68.1	83.8			
ATTRINITE	0.0	0.0			
DENSINITE	0.0	0.0			
HUMODETRINITE(ANAL)					
GELINITE	0.0	0.0			
CORPOHUMINITE	0.2	0.2			
SPORINITE					
CUTINITE					
EXINITE		0.7			
RESINITE	0.0	0.0			
SUBERINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0	0.0			
LIPTODETRINITE					
FUSINITE	4.5	5.5			
SEMI-FUSINITE	3.7	4.6			
MACRINITE	1.5	1.8			
MICRINITE	0.0	0.0			
SCLEROTINITE	0.1	0.1			
INERTODETRINITE	0.0	0.0			
MINERAL MATTER(ANAL.)					
HUMINITE(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
(%, IN OIL)	-----	-----	-----	-----	-----
ULMINITE	0.61	0.40	0.21	0.50	0.04

** PENN STATE COAL DATA BASE **

** PSOC-580 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-580
COLLECTED BY SOUTHERN ILLINOIS UNIVERSITY
COLLECTION DATE 11/15/76
COLLECTOR'S NUMBER

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION LITHOTYPE DATA AVAILABLE
SAMPLE RESERVE

SEAM NAME ILLINOIS #5
ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 5 FT. 5 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE ILLINOIS
COUNTY RANDOLPH
TOWNSHIP
NEAREST TOWN SPARTA

COAL PROVINCE INTERIOR
COAL REGION EASTERN
COAL FIELD

MAP REFERENCE: LATITUDE 38D 4M 20S
LONGITUDE 89D 45M 30S
QUADRANGLE WALSH (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-580 **
 ** PAGE 3 **

SEAM NAME ILLINOIS #5
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE ILLINOIS

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	6.75					
% ASH	14.39	15.43				
% VOLATILE MATTER	38.49	41.28	48.81	46.94	47.20	
% FIXED CARBON	40.37	43.29	51.19	53.06	52.80	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	12121	11303	11256
MM-FREE (PARR)	14792	13561	13491
MM-FREE (MOD.P)	14761	13397	13328
BEST MM FREE		13397	13328
NET CV, DMMF BTU/LB	14204		
ASH-FREE	14333		

MOTT-SPOONER DIFFERENCE = 19.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	7.14	8.96
% TOTAL SULFUR	6.57	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE B BITUMINOUS (HVBB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE B BITUMINOUS (HVBB)
REFLECTANCE RANK CATEGORY	
INTERNATIONAL RANK	
AS REC'D MOIST.	620
EQUIL. MOIST.	620
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-580 **
 ** PAGE 4 **

SEAM NAME ILLINOIS #5
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE ILLINOIS

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR) (20.28 %MM)
% ASH	14.39	15.43		
% CARBON	61.22	65.65	77.63	82.35
% HYDROGEN	4.51*	4.84	5.72	6.07
% NITROGEN	0.99	1.06	1.25	1.33
% SULFUR	6.13	6.57	7.77	
% CHLORINE	0.02	0.03	0.03	0.03
% OXYGEN(DIFF)	5.99*	6.43	7.60	10.23

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	4.17	0.01	2.39	6.57
DAF	4.93	0.01	2.83	7.77
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P) (19.41%MM)	DMMF(DIR.) (%MM)
% CARBON	65.41	81.16	
% HYDROGEN	4.56	5.65	
% NITROGEN	1.06	1.33	
% ORGANIC SULFUR	2.39	2.97	
% OXYGEN(DIFF)	7.17	8.88	
% CHLORINE	0.03	0.03	
% MINERAL MATTER (INCLUDES 7.80 % FES2)	19.41		

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
ATOMIC H/C	0.886	0.837	
ATOMIC O/C	0.093	0.102	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.05		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-580 **
 ** PAGE 5 **

SEAM NAME ILLINOIS #5
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE ILLINOIS

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL =
 % HIGH TEMPERATURE ASH = AT DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1		SiO2	31.30	
B			AL2O3	11.60	
BA	200		TiO2	0.57	
BE	280		FE2O3	37.30	
BI	< 20		MGO	0.65	
CE	< 100		CAO	7.23	
CO	29		NA2O	0.23	
CR	150		K2O	1.18	
CU	150		P2O5	0.07	
GA	17		S03	9.30	
GE	< 25				
LA	< 20				
LI					
MN					
MO					
NI	160				
NB	< 20				
PB	82				
RB	60				
SC	10				
SN	62				
SR	290				
TH					
U					
V	100				
Y	33				
YB	9				
ZN	1400				
ZR	120				

VOLATILES		PPM TOTAL COAL
AS		
BR		
CD		
CL		
F		
HG		
SB		
SE		

** PENN STATE COAL DATA BASE **

 ** PSOC-580 **
 ** PAGE 7 **

SEAM NAME ILLINOIS #5
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE ILLINOIS

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %		
	-----	-----	-----		
VITRINITE (CALC.)	79.9	89.7	71.1		
INERTINITE (CALC.)	8.7	9.8	8.6		
LIPTINITE (CALC.)	0.4	0.5	0.4		
MINERAL MATTER (CALC.)	10.9		20.3		
VITRINOIDS					
VITRINITE	76.2	85.5	67.8		
PSEUDOVITRINITE	3.7	4.2	3.3		
FUSINITE	3.8	4.3	3.9		
SEMI-FUSINITE	3.6	4.0	3.4		
MACRINITE	0.4	0.5	0.4		
MICRINITE	0.9	1.0	0.9		
SCLEROTINITE	0.0	0.0	0.0		
SPORINITE					
CUTINITE					
EXINITE (ANAL.)	0.4	0.5	0.4		
RESINITE	0.0	0.0	0.0		
SUBERINITE					
EXUDATINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0	0.0	0.0		
LIPTODETRINITE					
MINERAL MATTER(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
(%, IN OIL)					
-----	-----	-----	-----	-----	-----
VITRINITE	0.51	0.34	0.17	0.42	0.04
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-585 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-585
COLLECTED BY SOUTHERN ILLINOIS UNIVERSITY
COLLECTION DATE 11/15/76
COLLECTOR'S NUMBER

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION LITHOTYPE DATA AVAILABLE
SAMPLE RESERVE

SEAM NAME INDIANA #5
ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 4 FT. 10 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE INDIANA
COUNTY GIBSON
TOWNSHIP
NEAREST TOWN

COAL PROVINCE INTERIOR
COAL REGION EASTERN
COAL FIELD

MAP REFERENCE: LATITUDE 38D 13M 40S
LONGITUDE 87D 13M 60S
QUADRANGLE FOLSOMVILLE (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-585 **
 ** PAGE 3 **

SEAM NAME INDIANA #5 COUNTRY U.S.A.
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB) STATE INDIANA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	9.65					
% ASH	12.40	13.72				
% VOLATILE MATTER	35.73	39.55	45.84	44.08	44.35	
% FIXED CARBON	42.22	46.73	54.16	55.92	55.65	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	12365	11172	11284
MM-FREE (PARR)	14724	13028	13185
MM-FREE (MOD.P)	14695	12880	13033
BEST MM FREE		12880	13033
NET CV, DMMF BTU/LB	14154		
ASH-FREE	14331		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	8.74	10.65
% TOTAL SULFUR	5.73	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST) HIGH VOLATILE B BITUMINOUS (HVBB)
 ASTM RANK (EQUIL. MOIST.) HIGH VOLATILE B BITUMINOUS (HVBB)
 REFLECTANCE RANK CATEGORY
 INTERNATIONAL RANK
 AS REC'D MOIST. 630
 EQUIL. MOIST. 630
 REPORTED RANK

** PENN STATE COAL DATA BASE **

 ** PSOC-585 **
 ** PAGE 4 **

SEAM NAME INDIANA #5 COUNTRY U.S.A.
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB) STATE INDIANA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(17.97 %MM)
% ASH	12.40	13.72		
% CARBON	61.15	67.68	78.44	82.51
% HYDROGEN	4.37*	4.84	5.61	5.90
% NITROGEN	1.07	1.18	1.37	1.44
% SULFUR	5.18	5.73	6.64	
% CHLORINE	0.02	0.02	0.02	0.02
% OXYGEN(DIFF)	6.17*	6.83	7.92	10.14

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	3.33	0.03	2.37	5.73
DAF	3.86	0.03	2.75	6.64

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(17.08%MM)	(%MM)
% CARBON	67.47	81.37	
% HYDROGEN	4.60	5.54	
% NITROGEN	1.18	1.44	
% ORGANIC SULFUR	2.37	2.86	
% OXYGEN(DIFF)	7.31	8.79	
% CHLORINE	0.02	0.02	
% MINERAL MATTER	17.08		
(INCLUDES 6.23 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.859	0.818	
ATOMIC O/C	0.092	0.098	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.04		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-585 **
 ** PAGE 5 **

SEAM NAME INDIANA #5
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE INDIANA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 3.10
 % HIGH TEMPERATURE ASH = 14.45 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	27.80	1.88
B			AL2O3	13.40	1.02
BA	160	23	TiO2	0.54	0.05
BE	250	36	FE2O3	34.60	3.50
BI	< 20	3	MGO	0.71	0.06
CE	< 100	14	CAO	9.86	1.02
CO	28	4	NA2O	0.40	0.04
CR	190	27	K2O	1.43	0.17
CU	160	23	P2O5	0.08	0.01
GA	15	2	SO3	11.50	0.66
GE	< 25	4			
LA	< 20	3			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	210	30	-----		-----
NB	< 20	3	AS		
PB	120	17	BR		
RB	70	10	CD		
SC	12	2	CL		
SN	56	8	F		
SR	160	23	HG		
TH			SB		
U			SE		
V	150	22			
Y	60	9			
YB	12	2			
ZN	220	32			
ZR	110	16			

** PENN STATE COAL DATA BASE **

 ** PSOC-585 **
 ** PAGE 7 **

SEAM NAME INDIANA #5
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE INDIANA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %		
	-----	-----	-----		
VITRINITE (CALC.)	81.6	90.2	73.8		
INERTINITE (CALC.)	8.1	9.0	8.2		
LIPTINITE (CALC.)	0.7	0.8	0.6		
MINERAL MATTER (CALC.)	9.6		18.0		
VITRINOIDS					
VITRINITE	80.0	98.5	72.5		
PSEUDOVITRINITE	1.5	1.7	1.4		
FUSINITE	3.6	4.0	3.8		
SEMI-FUSINITE	3.8	4.2	3.7		
MACRINITE	0.0	0.0	0.0		
MICRINITE	0.7	0.8	0.7		
SCLEROTINITE	0.0	0.0	0.0		
SPORINITE					
CUTINITE					
EXINITE (ANAL.)	0.7	0.8	0.6		
RESINITE	0.0	0.0	0.0		
SUBERINITE					
EXUDATINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0	0.0	0.0		
LIPTODETRINITE					
MINERAL MATTER(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
(%, IN OIL)	-----	---	-----	-----	-----
VITRINITE	0.52	0.33	0.19	0.41	0.04
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-591 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-591
 COLLECTED BY SOUTHERN ILLINOIS UNIVERSITY
 COLLECTION DATE 11/16/76
 COLLECTOR'S NUMBER

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
 OTHER SAMPLE INFORMATION LITHOTYPE DATA AVAILABLE
 SAMPLE RESERVE

SEAM NAME ILLINOIS #5
 ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 4 FT. 7 IN.
 THICKNESS OF SEAM SAMPLED
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE ILLINOIS
 COUNTY FULTON
 TOWNSHIP
 NEAREST TOWN NORRIS
 COAL PROVINCE INTERIOR
 COAL REGION EASTERN
 COAL FIELD

MAP REFERENCE: LATITUDE 40D 35M 40S
 LONGITUDE 90D 7M 10S
 QUADRANGLE CANTON (15')

** PENN STATE COAL DATA BASE **

 ** PSOC-591 **
 ** PAGE 3 **

SEAM NAME ILLINOIS #5
 APPARENT RANK SUBBITUMINOUS A (SUBA)

COUNTRY U.S.A.
 STATE ILLINOIS

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	15.90					
% ASH	9.30	11.06				
% VOLATILE MATTER	34.18	40.64	45.69	44.57	44.58	
% FIXED CARBON	40.62	48.30	54.31	55.43	55.42	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	11501	9672	9586
MM-FREE (PARR)	13144	10781	10672
MM-FREE (MOD.P)	13153	10685	10578
BEST MM FREE		10685	10578
NET CV, DMMF BTU/LB	12721		
ASH-FREE	12931		

MOTT-SPOONER DIFFERENCE = 122.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	16.65	19.31
% TOTAL SULFUR	3.29	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)
 ASTM RANK (EQUIL. MOIST.)
 REFLECTANCE RANK CATEGORY
 INTERNATIONAL RANK
 AS REC'D MOIST. 820
 EQUIL. MOIST. 820
 REPORTED RANK

** PENN STATE COAL DATA BASE **

 ** PSOC-591 **
 ** PAGE 4 **

SEAM NAME ILLINOIS #5
 APPARENT RANK SUBBITUMINOUS A (SUBA)

COUNTRY U.S.A.
 STATE ILLINOIS

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR) (13.75 %MM)
% ASH	9.30	11.06		
% CARBON	56.46	67.13	75.48	77.84
% HYDROGEN	3.41*	4.06	4.56	4.71
% NITROGEN	0.98	1.16	1.30	1.34
% SULFUR	2.77	3.29	3.70	
% CHLORINE	0.02	0.02	0.02	0.02
% OXYGEN(DIFF)	11.17*	13.28	14.93	16.09

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	0.90	0.16	2.23	3.29
DAF	1.01	0.18	2.51	3.70

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P) (12.93%MM)	DMMF(DIR.) (%MM)
% CARBON	66.97	76.92	
% HYDROGEN	3.90	4.48	
% NITROGEN	1.16	1.34	
% ORGANIC SULFUR	2.23	2.56	
% OXYGEN(DIFF)	12.81	14.69	
% CHLORINE	0.02	0.02	
% MINERAL MATTER (INCLUDES 1.68 % FES2)	12.93		

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
ATOMIC H/C	0.726	0.699	
ATOMIC O/C	0.155	0.165	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.04		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-591 **
 ** PAGE 5 **

SEAM NAME ILLINOIS #5
 APPARENT RANK SUBBITUMINOUS A (SUBA)

COUNTRY U.S.A.
 STATE ILLINOIS

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 2.20
 % HIGH TEMPERATURE ASH = 12.06 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	32.80	1.85
B			Al2O3	11.80	0.75
BA	230	28	TiO2	0.58	0.04
BE	110	13	Fe2O3	14.80	1.25
BI	< 20	2	MgO	0.63	0.05
CE	< 100	12	CaO	16.50	1.42
CO	< 20	2	Na2O	0.49	0.04
CR	140	17	K2O	1.29	0.13
CU	120	14	P2O5	0.05	0.00
GA	< 10	1	SO3	18.30	0.88
GE	96	10			
LA	< 20	2			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	120	14	AS		
NB	< 20	2	BR		
PB	350	42	CD		
RB	60	7	CL		
SC	11	1	F		
SN	< 10	1	HG		
SR	180	22	SB		
TH			SE		
U					
V	95	11			
Y	27	3			
YB	6	1			
ZN	16000	1930			
ZR	100	12			

** PENN STATE COAL DATA BASE **

 ** PSOC-591 **
 ** PAGE 7 **

SEAM NAME ILLINOIS #5
 APPARENT RANK SUBBITUMINOUS A (SUBA)

COUNTRY U.S.A.
 STATE ILLINOIS

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	87.2	93.9	81.2
INERTINITE (CALC.)	4.9	5.3	5.0
LIPTINITE (CALC.)	0.7	0.8	0.6
MINERAL MATTER (CALC.)	7.1		13.8
VITRINIDS			
VITRINITE	87.2	93.9	81.2
PSEUDOVITRINITE	0.0	0.0	0.0
FUSINITE	2.7	2.9	2.8
SEMI-FUSINITE	1.8	1.9	1.8
MACRINITE	0.1	0.1	0.1
MICRINITE	0.4	0.4	0.4
SCLEROTINITE	0.0	0.0	0.0
SPORINITE			
CUTINITE			
EXINITE (ANAL.)	0.7	0.8	0.6
RESINITE	0.0	0.0	0.0
SUBERINITE			
EXUDATINITE			
FLUORINITE			
BITUMINITE			
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE			
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	0.52	0.31	0.21	0.40	0.05
PSEUDOVITRINITE					
VITRINIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-595 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-595
 COLLECTED BY SOUTHERN ILLINOIS UNIVERSITY
 COLLECTION DATE 11/15/76
 COLLECTOR'S NUMBER

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
 OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
 SAMPLE RESERVE

SEAM NAME INDIANA #7
 ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 3 FT. 1 IN.
 THICKNESS OF SEAM SAMPLED
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE INDIANA
 COUNTY WARRICK
 TOWNSHIP
 NEAREST TOWN CHANDLER

COAL PROVINCE INTERIOR
 COAL REGION EASTERN
 COAL FIELD

MAP REFERENCE: LATITUDE 38D 4M 50S
 LONGITUDE 87D 24M 50S
 QUADRANGLE DAYLIGHT (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-595 **
 ** PAGE 3 **

SEAM NAME INDIANA #7
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE INDIANA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	9.55					
% ASH	15.45	17.08				
% VOLATILE MATTER	36.14	39.96	48.19	46.14	46.30	
% FIXED CARBON	38.86	42.96	51.81	53.86	53.70	

CALORIFIC VALUE	DRY	AS REC'D MOIST.	EQUIL. MOIST.
(GROSS BTU/LB)	---	---	---

MM-FREE, DIRECT			
MM-CONTAINING	11777	10652	10639
MM-FREE (PARR)	14690	12937	12917
MM-FREE (MOD.P)	14677	12806	12787
BEST MM FREE		12806	12787
NET CV, DMMF BTU/LB	14234		
ASH-FREE	14203		

MOTT-SPOONER DIFFERENCE = 105..

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	9.66	12.40
% TOTAL SULFUR	6.60	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE C BITUMINOUS (HVCB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE C BITUMINOUS (HVCB)
REFLECTANCE RANK CATEGORY	
INTERNATIONAL RANK	
AS REC'D MOIST.	620
EQUIL. MOIST.	620
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-595 **
 ** PAGE 4 **

SEAM NAME INDIANA #7
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE INDIANA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(22.08 %MM)
% ASH	15.45	17.08		
% CARBON	60.47	66.86	80.63	85.80
% HYDROGEN	3.40*	3.76	4.53	4.83
% NITROGEN	1.10	1.22	1.47	1.57
% SULFUR	5.97	6.60	7.96	
% CHLORINE	0.02	0.03	0.03	0.03
% OXYGEN(DIFF)	4.03*	4.46	5.38	7.78

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	4.39	0.38	1.83	6.60
DAF	5.29	0.46	2.21	7.96
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(21.38%MM)	(%MM)
% CARBON	66.60	84.70	
% HYDROGEN	3.45	4.39	
% NITROGEN	1.22	1.57	
% ORGANIC SULFUR	1.83	2.33	
% OXYGEN(DIFF)	5.53	7.00	
% CHLORINE	0.03	0.03	
% MINERAL MATTER	21.38		
(INCLUDES 8.21 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.675	0.622	
ATOMIC O/C	0.068	0.079	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.05		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-595 **
 ** PAGE 5 **

SEAM NAME INDIANA #7
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE INDIANA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 3.40
 % HIGH TEMPERATURE ASH = 17.29 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	35.70	2.89
B			AL2O3	17.60	1.61
BA	470	81	TiO2	0.74	0.08
BE	15	3	FE2O3	34.50	4.17
BI	< 20	3	MGO	0.80	0.08
CE	< 100	17	CAO	4.40	0.54
CO	< 20	3	NA2O	0.44	0.06
CR	290	50	K2O	1.80	0.26
CU	140	24	P2O5	0.41	0.03
GA	23	4	SO3	3.50	0.24
GE	< 25	4			
LA	22	4			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	200	35	AS		
NB	< 20	3	BR		
PB	66	11	CD		
RB	120	21	CL		
SC	13	2	F		
SN	< 10	2	HG		
SR	390	67	SB		
TH			SE		
U					
V	130	22			
Y	30	5			
YB	8	1			
ZN	720	124			
ZR	160	28			

** PENN STATE COAL DATA BASE **

 ** PSOC-595 **
 ** PAGE 7 **

SEAM NAME INDIANA #7
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE INDIANA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %		
VITRINITE (CALC.)	81.8	93.0	72.9		
INERTINITE (CALC.)	5.2	5.9	5.1		
LIPTINITE (CALC.)	1.0	1.1	0.7		
MINERAL MATTER (CALC.)	12.0		22.1		
VITRINOIDS					
VITRINITE	79.7	90.6	71.0		
PSEUDOVITRINITE	2.1	2.4	1.9		
FUSINITE	2.6	3.0	2.6		
SEMI-FUSINITE	2.1	2.4	2.0		
MACRINITE	0.0	0.0	0.0		
MICRINITE	0.4	0.5	0.4		
SCLEROTINITE	0.0	0.0	0.0		
SPORINITE					
CUTINITE					
EXINITE (ANAL.)	1.0	1.1	0.7		
RESINITE	0.0	0.0	0.0		
SUBERINITE					
EXUDATINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0	0.0	0.0		
LIPTODETRINITE					
MINERAL MATTER(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
(%, IN OIL)					
VITRINITE	0.50	0.36	0.14	0.43	0.04
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-600 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-600
COLLECTED BY SOUTHERN ILLINOIS UNIVERSITY
COLLECTION DATE 11/15/76
COLLECTOR'S NUMBER

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION LITHOTYPE DATA AVAILABLE
SAMPLE RESERVE

SEAM NAME KENTUCKY #12
ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 5 FT. 5 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE KENTUCKY
COUNTY MUHLENBERG
TOWNSHIP
NEAREST TOWN DRAKESBORO

COAL PROVINCE INTERIOR
COAL REGION EASTERN
COAL FIELD

MAP REFERENCE: LATITUDE
LONGITUDE
QUADRANGLE

** PENN STATE COAL DATA BASE **

 ** PSOC-600 **
 ** PAGE 3 **

SEAM NAME KENTUCKY #12
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	7.43					
% ASH	16.96	18.32				
% VOLATILE MATTER	33.81	36.52	44.71	42.90	42.46	
% FIXED CARBON	41.80	45.16	55.29	57.10	57.54	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	11880	10997	10911
MM-FREE (PARR)	14968	13573	13439
MM-FREE (MOD.P)	15031	13533	13400
BEST MM FREE		13533	13400
NET CV, DMMF BTU/LB	14510		
ASH-FREE	14545		

MOTT-SPOONER DIFFERENCE = 231.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	8.16	10.45
% TOTAL SULFUR	3.92	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE B BITUMINOUS (HVBB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE B BITUMINOUS (HVBB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE C BITUMINOUS (HVCB)
INTERNATIONAL RANK	
AS REC'D MOIST.	630
EQUIL. MOIST.	630
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-600 **
 ** PAGE 4 **

SEAM NAME KENTUCKY #12
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(21.94 %MM)
% ASH	16.96	18.32		
% CARBON	60.46	65.31	79.96	83.67
% HYDROGEN	4.07*	4.40	5.39	5.64
% NITROGEN	1.11	1.20	1.47	1.54
% SULFUR	3.63	3.92	4.80	
% CHLORINE	0.01	0.01	0.01	0.01
% OXYGEN(DIFF)	6.33*	6.84	8.38	9.15

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	2.34	0.09	1.49	3.92
DAF	2.86	0.11	1.82	4.80
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	-----	-----	-----
		(21.81%MM)	(%MM)
% CARBON	65.04	83.18	
% HYDROGEN	4.12	5.26	
% NITROGEN	1.20	1.54	
% ORGANIC SULFUR	1.49	1.91	
% OXYGEN(DIFF)	6.35	8.11	
% CHLORINE	0.01	0.01	
% MINERAL MATTER	21.81		
(INCLUDES 4.38 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	-----	-----	-----
ATOMIC H/C	0.809	0.760	
ATOMIC O/C	0.082	0.094	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4,IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.02		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-600 **
 ** PAGE 5 **

SEAM NAME KENTUCKY #12
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 2.50
 % HIGH TEMPERATURE ASH = 16.61 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	47.60	3.70
B			Al2O3	20.30	1.78
BA	390	65	TiO2	0.99	0.10
BE	9	1	Fe2O3	19.10	2.22
BI	< 20	3	MgO	0.83	0.08
CE	< 100	17	CaO	3.77	0.45
CO	< 20	3	Na2O	0.39	0.05
CR	190	32	K2O	2.42	0.33
CU	80	13	P2O5	0.20	0.01
GA	24	4	SO3	4.50	0.30
GE	< 25	4			
LA	30	5			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	110	18	AS		
NB	< 20	3	BR		
PB	< 40	7	CD		
RB	110	18	CL		
SC	22	4	F		
SN	24	4	HG		
SR	190	32	SB		
TH			SE		
U					
V	170	28			
Y	38	6			
YB	7	1			
ZN	230	38			
ZR	200	33			

** PENN STATE COAL DATA BASE **

 ** PSOC-600 **
 ** PAGE 7 **

SEAM NAME KENTUCKY #12
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	80.1	91.0	71.5
INERTINITE (CALC.)	6.5	7.4	6.5
LIPTINITE (CALC.)	1.4	1.6	1.2
MINERAL MATTER (CALC.)	11.9		21.9
VITRINOIDS			
VITRINITE	78.0	88.6	69.7
PSEUDOVITRINITE	2.1	2.4	1.9
FUSINITE	3.6	4.1	3.7
SEMI-FUSINITE	2.6	3.0	2.5
MACRINITE	0.1	0.1	0.1
MICRINITE	0.2	0.2	0.2
SCLEROTINITE	0.0	0.0	0.0
SPORINITE			
CUTINITE			
EXINITE (ANAL.)	1.4	1.6	1.2
RESINITE	0.0	0.0	0.0
SUBERINITE			
EXUDATINITE			
FLUORINITE			
BITUMINITE			
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE			
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	0.69	0.46	0.23	0.54	0.05
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-609 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-609
COLLECTED BY SHELL DEVELOPMENT CORPORATION
COLLECTION DATE 8/15/76
COLLECTOR'S NUMBER 1401

REPORTED RANK

SAMPLE TYPE CORE WHOLE SEAM
OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
SAMPLE RESERVE

SEAM NAME UNNAMED
ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 8 FT. 0 IN.
THICKNESS OF SEAM SAMPLED 8 FT. 0 IN.
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE TEXAS
COUNTY MAVERICK
TOWNSHIP
NEAREST TOWN EAGLE PASS

COAL PROVINCE GULF
COAL REGION
COAL FIELD

MAP REFERENCE: LATITUDE
LONGITUDE
QUADRANGLE

** PENN STATE COAL DATA BASE **

 ** PSOC-609 **
 ** PAGE 3 **

SEAM NAME UNNAMED
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE TEXAS

* * *

* CHEMICAL DATA 1 *

* * *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	4.09					
% ASH	25.79	26.89				
% VOLATILE MATTER	30.65	31.96	43.71	41.78	39.81	
% FIXED CARBON	39.47	41.15	56.29	58.22	60.19	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	9831	9429	8653
MM-FREE (PARR)	13890	13097	11641
MM-FREE (MOD.P)	14127	13255	11765
BEST MM FREE		13255	11765
NET CV, DMMF BTU/LB	13580		
ASH-FREE	13447		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	11.98	17.01
% TOTAL SULFUR	0.95	

* * *

* RANK CALCULATIONS *

* * *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE B BITUMINOUS (HVBB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE C BITUMINOUS (HVCB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE C BITUMINOUS (HVCB)
INTERNATIONAL RANK	
AS REC'D MOIST.	700
EQUIL. MOIST.	700
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-609 **
 ** PAGE 4 **

SEAM NAME UNNAMED
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVEB)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(29.56 %MM)
% ASH	25.79	26.89		
% CARBON	54.46	56.78	77.66	80.61
% HYDROGEN	3.93*	4.10	5.61	5.82
% NITROGEN	0.91	0.95	1.30	1.35
% SULFUR	0.91	0.95	1.30	
% CHLORINE	0.01	0.01	0.02	0.02
% OXYGEN(DIFF)	9.89*	10.32	14.11	12.20

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	0.19	0.13	0.63	0.95
DAF	0.26	0.18	0.86	1.30
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(30.48%MM)	(%MM)
% CARBON	56.40	81.13	
% HYDROGEN	3.75	5.39	
% NITROGEN	0.95	1.35	
% ORGANIC SULFUR	0.63	0.91	
% OXYGEN(DIFF)	7.79	11.19	
% CHLORINE	0.01	0.02	
% MINERAL MATTER	30.48		
(INCLUDES 0.36 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.867	0.798	
ATOMIC O/C	0.114	0.149	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.03		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-609 **
 ** PAGE 5 **

SEAM NAME UNNAMED
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 2.90
 % HIGH TEMPERATURE ASH = 27.08 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	58.70	7.43
B			Al2O3	31.20	4.47
BA	1150	311	TiO2	1.28	0.21
BE	8	2	Fe2O3	3.05	0.58
BI	< 20	5	MgO	0.55	0.09
CE	< 100	27	CaO	0.76	0.15
CO	< 20	5	Na2O	0.71	0.14
CR	35	9	K2O	0.53	0.12
CU	55	15	P2O5	0.08	0.01
GA	46	12	SO3	0.60	0.06
GE	< 25	7			
LA	58	16			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	< 5	1	AS		
NB	< 20	5	BR		
PB	56	15	CD		
RB	25	7	CL		
SC	18	5	F		
SN	< 10	3	HG		
SR	320	87	SB		
TH			SE		
U					
V	120	32			
Y	45	12			
YB	6	2			
ZN	75	20			
ZR	420	114			

** PENN STATE COAL DATA BASE **

 ** PSOC-609 **
 ** PAGE 7 **

SEAM NAME UNNAMED
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE TEXAS

 * *
 * PETROGRAPHIC DATA *
 * *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %		DMMF VOLUME %		DRY WEIGHT %
	-----		-----		-----
VITRINITE (CALC.)	73.9		88.8		62.6
INERTINITE (CALC.)	8.4		10.1		7.9
LIPTINITE (CALC.)	0.9		1.1		0.7
MINERAL MATTER (CALC.)	16.8				29.6
VITRINOIDS					
VITRINITE	71.4		85.9		60.5
PSEUDOVITRINITE	2.4		2.9		2.0
FUSINITE	3.2		3.8		3.1
SEMI-FUSINITE	3.2		3.9		3.0
MACRINITE	1.0		1.2		0.9
MICRINITE	1.0		1.2		0.9
SCLEROTINITE	0.0		0.0		0.0
SPORINITE					
CUTINITE					
EXINITE (ANAL.)	0.9		1.1		0.7
RESINITE	0.0		0.0		0.0
SUBERINITE					
EXUDATINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0		0.0		0.0
LIPTODETRINITE					
MINERAL MATTER(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
(%, IN OIL)					
-----	-----	---	-----	-----	-----
VITRINITE	0.60	0.41	0.19	0.50	
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-614 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-614

COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
COLLECTION DATE 1/13/77
COLLECTOR'S NUMBER

REPORTED RANK HIGH VOLATILE B BITUMINOUS (HVBB)

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION
SAMPLE RESERVE

SEAM NAME LOWER CLARION
ALTERNATE SEAM NAME PENNSYLVANIA A

TOTAL SEAM THICKNESS 2 FT. 10 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE PENNSYLVANIA
COUNTY CLARION
TOWNSHIP PERRY
NEAREST TOWN WEST FREEDOM

COAL PROVINCE EASTERN
COAL REGION APPALACHIAN
COAL FIELD

MAP REFERENCE: LATITUDE 41D 7M 30S
LONGITUDE 79D 38M 10S
QUADRANGLE PARKER (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-614 **
 ** PAGE 3 **

SEAM NAME LOWER CLARION
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	2.30					
% ASH	12.35	12.64				
% VOLATILE MATTER	36.08	36.93	42.27	40.67	40.75	
% FIXED CARBON	49.27	50.43	57.73	59.33	59.25	

CALORIFIC VALUE	DRY	AS REC'D MOIST.	EQUIL. MOIST.
(GROSS BTU/LB)	---	---	---

MM-FREE, DIRECT			
MM-CONTAINING	13157	12854	12428
MM-FREE (PARR)	15419	14998	14411
MM-FREE (MOD.P)	15430	14936	14353
BEST MM FREE		14936	14353
NET CV, DMMF BTU/LB	14888		
ASH-FREE	15061		

MOTT-SPOONER DIFFERENCE = 2.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	5.54	6.61
% TOTAL SULFUR	4.52	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE A BITUMINOUS (HVAB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE A BITUMINOUS (HVAB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE A BITUMINOUS (HVAB)
INTERNATIONAL RANK	
AS REC'D MOIST.	630
EQUIL. MOIST.	630
REPORTED RANK	HIGH VOLATILE B BITUMINOUS (HVBB)

** PENN STATE COAL DATA BASE **

 ** PSOC-614 **
 ** PAGE 4 **

SEAM NAME LOWER CLARION
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(16.14 %MM)
% ASH	12.35	12.64		
% CARBON	70.45	72.11	82.54	85.99
% HYDROGEN	4.81*	4.92	5.63	5.87
% NITROGEN	1.06	1.09	1.25	1.30
% SULFUR	4.42	4.52	5.17	
% CHLORINE	0.10	0.10	0.11	0.12
% OXYGEN(DIFF)	4.51*	4.62	5.30	6.75

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	3.33	0.00	1.19	4.52
DAF	3.81	0.00	1.36	5.17
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(15.90%MM)	(%MM)
% CARBON	71.91	85.51	
% HYDROGEN	4.69	5.58	
% NITROGEN	1.09	1.30	
% ORGANIC SULFUR	1.19	1.41	
% OXYGEN(DIFF)	5.22	6.10	
% CHLORINE	0.10	0.12	
% MINERAL MATTER	15.90		
(INCLUDES 6.23 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.819	0.783	
ATOMIC O/C	0.059	0.064	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.20		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-614 **
 ** PAGE 5 **

SEAM NAME LOWER CLARION
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 1.40
 % HIGH TEMPERATURE ASH = 11.66 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	40.60	2.21
B			AL2O3	20.10	1.24
BA	290	33	TiO2	1.18	0.08
BE	35	4	FE2O3	31.40	2.56
BI	< 20	2	MGO	0.41	0.03
CE	< 100	12	CAO	1.16	0.10
CO	140	16	NA2O	0.23	0.02
CR	230	27	K2O	1.06	0.10
CU	140	16	P2O5	0.20	0.01
GA	50	6	S03	1.02	0.05
GE	< 25	3			
LA	82	10			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	250	29	-----		-----
NB	< 20	2	AS		
PB	52	6	BR		
RB	55	6	CD		
SC	25	3	CL		
SN	140	16	F		
SR	400	47	HG		
TH			SB		
U			SE		
V	190	22			
Y	66	8			
YB	19	2			
ZN	430	50			
ZR	220	26			

** PENN STATE COAL DATA BASE **

 ** PSOC-614 **
 ** PAGE 7 **

SEAM NAME LOWER CLARION
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION COMBINED WHITE AND BLUE LIGHT

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
	-----	-----	-----
VITRINITE (CALC.)	63.2	69.1	57.8
INERTINITE (CALC.)	13.5	14.7	13.4
LIPTINITE (CALC.)	14.8	16.2	12.7
MINERAL MATTER (CALC.)	8.5		16.1
VITRINOIDS			
VITRINITE	47.8	52.2	43.6
PSEUDOVITRINITE	15.5	16.9	14.1
FUSINITE	2.1	2.3	2.2
SEMI-FUSINITE	5.4	5.9	5.3
MACRINITE	0.3	0.3	0.3
MICRINITE	5.7	6.2	5.6
SCLEROTINITE	0.0	0.0	0.0
SPORINITE	13.9	15.2	11.9
CUTINITE	0.1	0.1	0.1
EXINITE (ANAL.)			
RESINITE	0.8	0.9	0.7
SUBERINITE			
EXUDATINITE	0.0	0.0	0.0
FLUORINITE	0.0	0.0	0.0
BITUMINITE	0.0	0.0	0.0
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE	0.0	0.0	0.0
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
-----	----	----	-----	-----	-----
VITRINITE	0.77	0.64	0.13	0.71	
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-615 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-615

COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
COLLECTION DATE 3/ 3/77
COLLECTOR'S NUMBER 615

REPORTED RANK LOW VOLATILE BITUMINOUS (LVB)

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION
SAMPLE RESERVE

SEAM NAME KELLY
ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 6 FT. 0 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE PENNSYLVANIA
COUNTY BEDFORD
TOWNSHIP BROAD TOP
NEAREST TOWN DEFIANCE

COAL PROVINCE EASTERN
COAL REGION APPALACHIAN
COAL FIELD

MAP REFERENCE: LATITUDE 40D 2M 30S
LONGITUDE 78D 14M 50S
QUADRANGLE SAXTON (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-615 **
 ** PAGE 3 **

SEAM NAME KELLY

COUNTRY U.S.A.

APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	3.22					
% ASH	15.22	15.73				
% VOLATILE MATTER	18.63	19.25	22.84	21.31	20.44	
% FIXED CARBON	62.93	65.02	77.16	78.69	79.56	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	12894	12479	12579
MM-FREE (PARR)	15579	14975	15120
MM-FREE (MOD.P)	15690	15029	15176
BEST MM FREE		15029	15176
NET CV, DMMF BTU/LB	15218		
ASH-FREE	15301		

MOTT-SPOONER DIFFERENCE = 301.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	2.44	2.96
% TOTAL SULFUR	1.08	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	LOW VOLATILE BITUMINOUS (LVB)
ASTM RANK (EQUIL. MOIST.)	LOW VOLATILE BITUMINOUS (LVB)
REFLECTANCE RANK CATEGORY	LOW VOLATILE BITUMINOUS (LVB)
INTERNATIONAL RANK	
AS REC'D MOIST.	420
EQUIL. MOIST.	420
REPORTED RANK	LOW VOLATILE BITUMINOUS (LVB)

** PENN STATE COAL DATA BASE **

 ** PSOC-615 **
 ** PAGE 4 **

SEAM NAME KELLY
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR) (17.58 %MM)
% ASH	15.22	15.73		
% CARBON	70.06	72.39	85.90	87.83
% HYDROGEN	4.05*	4.18	4.96	5.07
% NITROGEN	1.10	1.14	1.35	1.38
% SULFUR	1.05	1.08	1.28	
% CHLORINE	0.02	0.02	0.02	0.02
% OXYGEN(DIFF)	5.28*	5.46	6.48	5.69

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	0.29	0.01	0.78	1.08
DAF	0.34	0.01	0.93	1.28

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P) (17.92%MM)	DMMF(DIR.) (%MM)
% CARBON	72.17	87.93	
% HYDROGEN	3.97	4.84	
% NITROGEN	1.14	1.38	
% ORGANIC SULFUR	0.78	0.95	
% OXYGEN(DIFF)	4.02	4.88	
% CHLORINE	0.02	0.02	
% MINERAL MATTER (INCLUDES 0.54 % FES2)	17.92		

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
ATOMIC H/C	0.694	0.661	
ATOMIC O/C	0.049	0.051	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.04		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-615 **
 ** PAGE 5 **

SEAM NAME KELLY
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 0.60
 % HIGH TEMPERATURE ASH = 14.18 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	54.30	3.60
B			AL2O3	34.70	2.60
BA	620	88	TiO2	1.58	0.13
BE	11	2	FE2O3	3.55	0.35
BI	< 20	3	MGO	0.86	0.07
CE	< 100	14	CAO	0.36	0.04
CO	< 20	3	NA2O	0.27	0.03
CR	250	35	K2O	3.19	0.38
CU	130	18	P2O5	0.12	0.01
GA	52	7	SO3	0.30	0.02
GE	< 25	4			
LA	84	12			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	80	11	AS		
NB	< 20	3	BR		
PB	66	9	CD		
RB	190	27	CL		
SC	27	4	F		
SN	< 10	1	HG		
SR	170	24	SB		
TH			SE		
U					
V	300	43			
Y	37	5			
YB	< 5	1			
ZN	70	10			
ZR	280	40			

** PENN STATE COAL DATA BASE **

 ** PSOC-615 **
 ** PAGE 7 **

SEAM NAME KELLY
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	83.5	92.1	75.6
INERTINITE (CALC.)	7.2	7.9	6.9
LIPTINITE (CALC.)	0.0	0.0	0.0
MINERAL MATTER (CALC.)	9.3		17.6
VITRINOIDS			
VITRINITE	78.4	86.5	71.0
PSEUDOVITRINITE	5.1	5.6	4.6
FUSINITE	0.6	0.7	0.6
SEMI-FUSINITE	4.9	5.4	4.7
MACRINITE	0.3	0.3	0.3
MICRINITE	1.4	1.5	1.3
SCLEROTINITE	0.0	0.0	0.0
SPORINITE			
CUTINITE			
EXINITE (ANAL.)	0.0	0.0	0.0
RESINITE	0.0	0.0	0.0
SUBERINITE			
EXUDATINITE			
FLUORINITE			
BITUMINITE			
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE			
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	1.68	1.40	0.28	1.56	
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-619 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-619

COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
 COLLECTION DATE 3/ 3/77
 COLLECTOR'S NUMBER 619

REPORTED RANK LOW VOLATILE BITUMINOUS (LVB)

SAMPLE TYPE CHANNEL WHOLE SEAM
 OTHER SAMPLE INFORMATION
 SAMPLE RESERVE

SEAM NAME BARNETT
 ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 2 FT. 0 IN.
 THICKNESS OF SEAM SAMPLED
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE PENNSYLVANIA
 COUNTY BEDFORD
 TOWNSHIP BROAD TOP
 NEAREST TOWN DEFIANCE

COAL PROVINCE EASTERN
 COAL REGION APPALACHIAN
 COAL FIELD

MAP REFERENCE: LATITUDE 40D 9M 30S
 LONGITUDE 78D 14M 50S
 QUADRANGLE SAXTON (7.5')

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** ** ** ** ** ** ** ** ** ** ** 
**  PSOC-619  **
**  PAGE 3    **
** ** ** ** 

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COUNTRY U.S.A.
STATE PENNSYLVANIA

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*****
*
*  CHEMICAL DATA 1  *
*
*****

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CALORIFIC VALUE	DRY	AS REC'D	EQUIL.
-----		MOIST.	MOIST.
(GROSS BTU/LB)	---	-----	-----

MOTT-SPOONER DIFFERENCE = 26.

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*                                     *
*  RANK CALCULATIONS                *
*                                     *
*****

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** PENN STATE COAL DATA BASE **

 ** PSOC-619 **
 ** PAGE 4 **

SEAM NAME BARNETT
 APPARENT RANK MEDIUM VOLATILE BITUMINOUS (MVB)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR) (14.67 %MM)
% ASH	13.15	13.30		
% CARBON	77.13	78.04	90.01	91.45
% HYDROGEN	4.02*	4.07	4.69	4.77
% NITROGEN	1.02	1.03	1.19	1.21
% SULFUR	0.54	0.55	0.63	
% CHLORINE	0.02	0.02	0.02	0.02
% OXYGEN(DIFF)	2.96*	2.99	3.45	2.55

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	0.06	0.00	0.49	0.55
DAF	0.07	0.00	0.57	0.63
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P) (15.07%MM)	DMMF(DIR.) (%MM)
% CARBON	77.85	91.66	
% HYDROGEN	3.90	4.59	
% NITROGEN	1.03	1.21	
% ORGANIC SULFUR	0.49	0.58	
% OXYGEN(DIFF)	1.66	1.94	
% CHLORINE	0.02	0.02	
% MINERAL MATTER	15.07		
(INCLUDES 0.11 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
ATOMIC H/C	0.626	0.601	
ATOMIC O/C	0.021	0.019	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.04		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

*** PENN STATE COAL DATA BASE ***

 ** PSOC-619 **
 ** PAGE 5 **

SEAM NAME : BARNETT COUNTRY U.S.A.
 APPARENT RANK MEDIUM VOLATILE BITUMINOUS (MVB) STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 0.90
 % HIGH TEMPERATURE ASH = 14.83 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	57.50	3.99
B			AL2O3	27.90	2.19
BA	650	96	TiO2	2.00	0.18
BE	15	2	FE2O3	2.59	0.27
BI	< 20	3	MGO	0.89	0.08
CE	101	15	CAO	0.37	0.04
CO	82	12	NA2O	0.28	0.03
CR	180	27	K2O	3.42	0.42
CU	250	37	P2O5	0.30	0.02
GA	50	7	SO3	0.37	0.02
GE	< 25	4			
LA	82	12			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	130	19	-----		-----
NB	< 20	3	AS		
PB	70	10	BR		
RB	190	28	CD		
SC	42	6	CL		
SN	< 10	1	F		
SR	250	37	HG		
TH			SB		
U			SE		
V	230	34			
Y	80	12			
YB	7	1			
ZN	150	22			
ZR	290	43			

** PENN STATE COAL DATA BASE **

 ** PSOC-619 **
 ** PAGE 7 **

SEAM NAME BARNETT
 APPARENT RANK MEDIUM VOLATILE BITUMINOUS (MVB)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	85.6	92.7	78.5
INERTINITE (CALC.)	6.7	7.3	6.8
LIPTINITE (CALC.)	0.0	0.0	0.0
MINERAL MATTER (CALC.)	7.7		14.7

VITRINOLDS			
VITRINITE	82.3	89.1	75.5
PSEUDOVITRINITE	3.3	3.6	3.0
FUSINITE	2.5	2.7	2.6
SEMI-FUSINITE	2.5	2.7	2.5
MACRINITE	0.3	0.3	0.3
MICRINITE	1.5	1.6	1.5
SCLEROTINITE	0.0	0.0	0.0
SPORINITE			
CUTINITE			
EXINITE (ANAL.)	0.0	0.0	0.0
RESINITE	0.0	0.0	0.0
SUBERINITE			
EXUDATINITE			
FLUORINITE			
BITUMINITE			
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE			
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN, MAX	STAND. DEV.
VITRINITE	1.67	1.42	0.25	1.54	
PSEUDOVITRINITE					
VITRINOLDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-620 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-620

COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
 COLLECTION DATE 3/ 3/77
 COLLECTOR'S NUMBER 620

REPORTED RANK LOW VOLATILE BITUMINOUS (LVB)

SAMPLE TYPE CHANNEL WHOLE SEAM
 OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
 SAMPLE RESERVE

SEAM NAME TWIN
 ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 2 FT. 4 IN.
 THICKNESS OF SEAM SAMPLED
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE PENNSYLVANIA
 COUNTY BEDFORD
 TOWNSHIP BROAD TOP
 NEAREST TOWN ROUND KNOB

COAL PROVINCE EASTERN
 COAL REGION APPALACHIAN
 COAL FIELD

MAP REFERENCE: LATITUDE 40D 7M 30S
 LONGITUDE 78D 10M 00S
 QUADRANGLE SAXTON (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-620 **
 ** PAGE 3 **

SEAM NAME TWIN
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	1.40					
% ASH	13.87	14.07				
% VOLATILE MATTER	16.42	16.65	19.38	17.58	17.07	
% FIXED CARBON	68.31	69.28	80.62	82.42	82.93	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	13133	12949	12973
MM-FREE (PARR)	15572	15312	15345
MM-FREE (MOD.P)	15647	15337	15370
BEST MM FREE		15337	15370
NET CV, DMMF BTU/LB	15308		
ASH-FREE	15283		

MOTT-SPOONER DIFFERENCE = 487.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	1.22	1.46
% TOTAL SULFUR	2.04	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	LOW VOLATILE BITUMINOUS (LVB)
ASTM RANK (EQUIL. MOIST.)	LOW VOLATILE BITUMINOUS (LVB)
REFLECTANCE RANK CATEGORY	LOW VOLATILE BITUMINOUS (LVB)
INTERNATIONAL RANK	
AS REC'D MOIST.	330
EQUIL. MOIST.	330
REPORTED RANK	LOW VOLATILE BITUMINOUS (LVB)

** PENN STATE COAL DATA BASE **

 ** PSOC-620 **
 ** PAGE 4 **

SEAM NAME TWIN
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(16.32 %MM)
% ASH	13.87	14.07		
% CARBON	75.88	76.96	89.56	91.97
% HYDROGEN	3.01*	3.05	3.55	3.64
% NITROGEN	0.00	0.00	0.00	0.00
% SULFUR	2.01	2.04	2.37	
% CHLORINE	0.01	0.01	0.02	0.02
% OXYGEN(DIFF)	3.81*	3.86	4.50	4.37

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	1.28	0.03	0.73	2.04
DAF	1.49	0.03	0.85	2.37

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(16.51%MM)	(%MM)
% CARBON	76.76	91.93	
% HYDROGEN	2.84	3.40	
% NITROGEN	0.00	0.00	
% ORGANIC SULFUR	0.73	0.87	
% OXYGEN(DIFF)	3.16	3.77	
% CHLORINE	0.01	0.02	
% MINERAL MATTER	16.51		
(INCLUDES 2.39 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.476	0.445	
ATOMIC O/C	0.036	0.037	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.03		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-620 **
 ** PAGE 5 **

SEAM NAME TWIN
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 2.00
 % HIGH TEMPERATURE ASH = 12.95 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	45.80	2.77
B			AL2O3	30.50	2.09
BA	910	118	TiO2	1.42	0.11
BE	15	2	FE2O3	16.10	1.46
BI	< 20	3	MGO	0.80	0.06
CE	< 100	13	CAO	0.34	0.03
CO	110	14	NA2O	0.30	0.03
CR	230	30	K2O	3.35	0.36
CU	230	30	P2O5	0.18	0.01
GA	60	8	SO3	0.30	0.02
GE	< 25	3			
LA	78	10			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	160	21	AS		
NB	< 20	3	BR		
PB	84	11	CD		
RB	130	17	CL		
SC	44	6	F		
SN	< 10	1	HG		0.68
SR	180	23	SB		
TH			SE		
U	< 7	1			
V	320	41			
Y	54	7			
YB	9	1			
ZN	120	16			
ZR	240	31			

** PENN STATE COAL DATA BASE **

 ** PSOC-620 **
 ** PAGE 7 **

SEAM NAME TWIN
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %		
	-----	-----	-----		
VITRINITE (CALC.)	75.0	82.0	67.6		
INERTINITE (CALC.)	16.5	18.0	16.0		
LIPTINITE (CALC.)	0.0	0.0	0.0		
MINERAL MATTER (CALC.)	8.6		16.3		
VITRINOIDS					
VITRINITE	68.5	74.9	61.8		
PSEUDOVITRINITE	6.5	7.1	5.9		
FUSINITE	6.1	6.7	6.2		
SEMI-FUSINITE	7.5	8.2	7.1		
MACRINITE	0.4	0.4	0.3		
MICRINITE	2.5	2.7	2.3		
SCLEROTINITE	0.0	0.0	0.0		
SPORINITE					
CUTINITE					
EXINITE (ANAL.)	0.0	0.0	0.0		
RESINITE	0.0	0.0	0.0		
SUBERINITE					
EXUDATINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0	0.0	0.0		
LIPTODETRINITE					
MINERAL MATTER(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
(%, IN OIL)	----	----	-----	-----	-----
VITRINITE	1.91	1.61	0.30	1.79	
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-623 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-623

COLLECTED BY TEXAS A & M UNIVERSITY
COLLECTION DATE 2/26/77
COLLECTOR'S NUMBER

REPORTED RANK LIGNITE A (LIGA)

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION LITHOTYPE DATA AVAILABLE
SAMPLE RESERVE

SEAM NAME DARCO LIGNITE
ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 9 FT. 4 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE TEXAS
COUNTY HARRISON
TOWNSHIP DARCO
NEAREST TOWN MARSHALL

COAL PROVINCE GULF
COAL REGION
COAL FIELD

MAP REFERENCE: LATITUDE 32D 24M 30S
LONGITUDE 94D 26M 00S
QUADRANGLE DARCO (15')

** PENN STATE COAL DATA BASE **

 ** PS0C-623 **
 ** PAGE 3 **

SEAM NAME DARCO LIGNITE
 APPARENT RANK LIGNITE A (LIGA)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	34.87					
% ASH	10.81	16.60				
% VOLATILE MATTER	29.05	44.60	53.48	52.57	51.76	
% FIXED CARBON	25.27	38.80	46.52	47.43	48.24	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.

MM-FREE, DIRECT			
MM-CONTAINING	10481	6826	6412
MM-FREE (PARR)	12799	7722	7194
MM-FREE (MOD.P)	12905	7737	7207
BEST MM FREE		7737	7207
NET CV, DMMF BTU/LB	12392		
ASH-FREE	12567		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	38.82	47.66
% TOTAL SULFUR	1.13	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	LIGNITE A (LIGA)
ASTM RANK (EQUIL. MOIST.)	LIGNITE A (LIGA)
REFLECTANCE RANK CATEGORY	
INTERNATIONAL RANK	
AS REC'D MOIST.	
EQUIL. MOIST.	
REPORTED RANK	LIGNITE A (LIGA)

** PENN STATE COAL DATA BASE **

 ** PSOC-623 **
 ** PAGE 4 **

SEAM NAME DARCO LIGNITE
 APPARENT RANK LIGNITE A (LIGA)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(18.55 %MM)
% ASH	10.81	16.60		
% CARBON	39.66	60.90	73.02	74.77
% HYDROGEN	2.92*	4.49	5.38	5.51
% NITROGEN	0.70	1.07	1.28	1.31
% SULFUR	0.74	1.13	1.35	
% CHLORINE	0.02	0.03	0.04	0.04
% OXYGEN(DIFF)	10.27*	15.78	18.93	18.37

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	0.19	0.10	0.84	1.13
DAF	0.23	0.12	1.01	1.35

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(18.86%MM)	(%MM)
% CARBON	60.67	74.77	
% HYDROGEN	4.27	5.26	
% NITROGEN	1.07	1.31	
% ORGANIC SULFUR	0.84	1.04	
% OXYGEN(DIFF)	14.29	17.58	
% CHLORINE	0.03	0.04	
% MINERAL MATTER	18.86		
(INCLUDES 0.36 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	----	-----	-----
ATOMIC H/C	0.886	0.845	
ATOMIC O/C	0.185	0.218	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.06		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-623 **
 ** PAGE 5 **

SEAM NAME DARCO LIGNITE
 APPARENT RANK LIGNITE A (LIGA)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 31.30
 % HIGH TEMPERATURE ASH = 19.07 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG			SiO2	42.15	3.76
B			AL2O3	21.00	2.12
BA	2350	448	TiO2	1.16	0.13
BE	4	1	FE2O3	9.85	1.31
BI			MGO	2.89	0.33
CE			CAO	10.90	1.49
CO			NA2O	0.40	0.06
CR	160	31	K2O	0.29	0.05
CU	210	40	P2O5	0.08	0.01
GA			SO3	10.10	0.77
GE					
LA					
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	140	27	-----	-----	-----
NB			AS		
PB			BR		
RB	55	10	CD		
SC			CL		
SN			F		
SR	1400	267	HG		
TH			SB		
U			SE		
V	230	44			
Y					
YB					
ZN	110	21			
ZR	270	51			

** PENN STATE COAL DATA BASE **

 ** PSOC-623 **
 ** PAGE 7 **

SEAM NAME DARCO LIGNITE
 APPARENT RANK LIGNITE A (LIGA)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %		DMMF VOLUME %		
	-----		-----		
HUMINITE	65.8		73.0		
INERTINITE	15.5		17.2		
LIPTINITE	0.1		0.1		
MINERAL MATTER(CALC.)	9.9				
TEXTINITE	0.2		0.2		
ULMINITE	64.2		71.3		
ATTRINITE	0.0		0.0		
DENSINITE	0.0		0.0		
HUMODETRINITE (ANAL)					
GELINITE	1.3		1.4		
CORPOHUMINITE	0.1		0.1		
SPORINITE					
CUTINITE					
EXINITE			1.7		
RESINITE	0.1		0.1		
SUBERINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0		0.0		
LIPTODETRINITE					
FUSINITE	4.7		5.2		
SEMI-FUSINITE	6.5		7.2		
MACRINITE	3.9		4.3		
MICRINITE	0.0		0.0		
SCLEROTINITE	0.5		0.5		
INERTODETRINITE	0.0		0.0		
MINERAL MATTER(ANAL.)					
HUMINITE (ANAL.)					
INERTINITE (ANAL.)					
LIPTINITE (ANAL.)					
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
(%, IN OIL)					
-----	-----	-----	-----	-----	-----
ULMINITE	0.50	0.37	0.13	0.42	

** PENN STATE COAL DATA BASE **

** PSOC-627 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-627
COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
COLLECTION DATE 4/27/77
COLLECTOR'S NUMBER 627

REPORTED RANK ANTHRACITE (AN)

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
SAMPLE RESERVE

SEAM NAME PENNSYLVANIA #2
ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 4 FT. 8 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE PENNSYLVANIA
COUNTY NORTHUMBERLAND
TOWNSHIP COAL
NEAREST TOWN SHAMOKIN

COAL PROVINCE EASTERN
COAL REGION ANTHRACITE
COAL FIELD

MAP REFERENCE: LATITUDE 40D 47M 40S
LONGITUDE 76D 35M 10S
QUADRANGLE SHAMOKIN (15')

** PENN STATE COAL DATA BASE **

 ** PSOC-627 **
 ** PAGE 3 **

SEAM NAME PENNSYLVANIA #2
 APPARENT RANK SEMIANTHRACITE (SA)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	1.58					
% ASH	16.23	16.49				
% VOLATILE MATTER	8.62	8.76	10.49	8.80	7.64	
% FIXED CARBON	73.57	74.75	89.51	91.20	92.36	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	12805	12603	12559
MM-FREE (PARR)	15606	15306	15241
MM-FREE (MOD.P)	15740	15401	15335
BEST MM FREE		15401	15335
NET CV, DMMF BTU/LB	15418		
ASH-FREE	15333		

MOTT-SPOONER DIFFERENCE = 88.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	1.92	2.35
% TOTAL SULFUR	0.60	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	SEMIANTHRACITE (SA)
ASTM RANK (EQUIL. MOIST.)	SEMIANTHRACITE (SA)
REFLECTANCE RANK CATEGORY	ANTHRACITE (AN)
INTERNATIONAL RANK	
AS REC'D MOIST.	
EQUIL. MOIST.	
REPORTED RANK	ANTHRACITE (AN)

** PENN STATE COAL DATA BASE **

 ** PSOC-627 **
 ** PAGE 4 **

SEAM NAME PENNSYLVANIA #2
 APPARENT RANK SEMIANTHRACITE (SA)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR) (18.14 %MM)
% ASH	16.23	16.49		
% CARBON	76.09	77.31	92.58	94.44
% HYDROGEN	2.79*	2.83	3.39	3.46
% NITROGEN	0.72	0.73	0.87	0.89
% SULFUR	0.59	0.60	0.72	
% CHLORINE	0.01	0.01	0.02	0.02
% OXYGEN(DIFF)	1.99*	2.02	2.43	1.20

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	0.06	0.02	0.52	0.60
DAF	0.07	0.02	0.62	0.72

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P) (18.67%MM)	DMMF(DIR.) (%MM)
% CARBON	77.08	94.77	
% HYDROGEN	2.61	3.21	
% NITROGEN	0.73	0.89	
% ORGANIC SULFUR	0.52	0.64	
% OXYGEN(DIFF)	0.39	0.46	
% CHLORINE	0.01	0.02	
% MINERAL MATTER (INCLUDES 0.11 % FES2)	18.67		

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
ATOMIC H/C	0.440	0.407	
ATOMIC O/C	0.010	0.004	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.03		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-627 **
 ** PAGE 5 **

SEAM NAME PENNSYLVANIA #2 COUNTRY U.S.A.
 APPARENT RANK SEMIANTHRACITE (SA) STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 2.00
 % HIGH TEMPERATURE ASH = 19.18 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	68.50	6.14
B			AL2O3	22.80	2.31
BA	370	71	TiO2	2.93	0.34
BE	30	6	FE2O3	2.55	0.34
BI	< 20	4	MGO	0.31	0.04
CE	180	35	CAO	0.33	0.05
CO	92	18	NA2O	0.16	0.02
CR	330	63	K2O	1.66	0.26
CU	240	46	P2O5	0.06	0.01
GA	37	7	SO3	0.25	0.02
GE	< 25	5			
LA	140	27			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	250	48	AS		
NB	< 20	4	BR		
PB	96	16	CD		
RB	75	14	CL		
SC	36	7	F		
SN	47	9	HG		0.15
SR	85	16	SB		
TH			SE		
U	12	2			
V	130	25			
Y	38	17			
YB	13	2			
ZN	90	17			
ZR	630	121			

** PENN STATE COAL DATA BASE **

 ** PSOC-627 **
 ** PAGE 7 **

SEAM NAME PENNSYLVANIA #2
 APPARENT RANK SEMIANTHRACITE (SA)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %		
VITRINITE (CALC.)	79.4	86.8	70.6		
INERTINITE (CALC.)	11.9	13.2	11.3		
LIPTINITE (CALC.)	0.0	0.0	0.0		
MINERAL MATTER (CALC.)	9.7		18.1		
VITRINOIDS					
VITRINITE	78.4	86.8	70.6		
PSEUDOVITRINITE	0.0	0.0	0.0		
FUSINITE	0.0	0.0	0.0		
SEMI-FUSINITE	9.9	11.0	9.4		
MACRINITE	1.2	1.3	1.1		
MICRINITE	0.8	0.9	0.8		
SCLEROTINITE	0.0	0.0	0.0		
SPORINITE					
CUTINITE					
EXINITE (ANAL.)	0.0	0.0	0.0		
RESINITE	0.0	0.0	0.0		
SUBERINITE					
EXUDATINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0	0.0	0.0		
LIPTODETRINITE					
MINERAL MATTER(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
(%, IN OIL)					
VITRINITE	3.60	2.60	1.00	3.02	
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-631 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-631
COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
COLLECTION DATE 6/ 2/77
COLLECTOR'S NUMBER 631

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION
SAMPLE RESERVE

SEAM NAME
ALTERNATE SEAM NAME 4 TH SEAM

TOTAL SEAM THICKNESS 1 FT. 6 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE PENNSYLVANIA
COUNTY LYCOMING
TOWNSHIP COGAN HOUSE
NEAREST TOWN QUIGGLESVILLE

COAL PROVINCE EASTERN
COAL REGION APPALACHIAN
COAL FIELD

MAP REFERENCE: LATITUDE 41D 22M 20S
LONGITUDE 77D 9M 30S
QUADRANGLE SALLADASBURG (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-631 **
 ** PAGE 3 **

SEAM NAME

COUNTRY U.S.A.
 STATE PENNSYLVANIA

APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	1.95					
% ASH	29.73	30.32				
% VOLATILE MATTER	16.50	16.83	24.15	20.48	17.96	
% FIXED CARBON	51.82	52.85	75.85	79.52	82.04	

CALORIFIC VALUE	DRY	AS REC'D MOIST.	EQUIL. MOIST.
(GROSS BTU/LB)	---	---	---

MM-FREE, DIRECT			
MM-CONTAINING	11007	10792	10723
MM-FREE (PARR)	16499	16017	15863
MM-FREE (MOD.P)	16808	16259	16100
BEST MM FREE		16259	16100
NET CV, DMMF BTU/LB	16299		
ASH-FREE	15796		

MOTT-SPOONER DIFFERENCE = 603.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	2.58	3.91
% TOTAL SULFUR	2.19	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	LOW VOLATILE BITUMINOUS (LVB)
ASTM RANK (EQUIL. MOIST.)	LOW VOLATILE BITUMINOUS (LVB)
REFLECTANCE RANK CATEGORY	LOW VOLATILE BITUMINOUS (LVB)
INTERNATIONAL RANK	
AS REC'D MOIST.	420
EQUIL. MOIST.	420
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-631 **
 ** PAGE 4 **

SEAM NAME

APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.

STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(33.95 %MM)
% ASH	29.73	30.32		
% CARBON	58.96	60.13	86.29	91.04
% HYDROGEN	3.50*	3.57	5.12	5.41
% NITROGEN	0.88	0.90	1.29	1.36
% SULFUR	2.15	2.19	3.14	
% CHLORINE	0.03	0.03	0.05	0.05
% OXYGEN(DIFF)	2.80*	2.85	4.11	2.16

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	1.57	0.01	0.61	2.19
DAF	2.25	0.01	0.88	3.14

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(35.02%MM)	(%MM)
% CARBON	59.70	91.87	
% HYDROGEN	3.14	4.84	
% NITROGEN	0.90	1.36	
% ORGANIC SULFUR	0.61	0.94	
% OXYGEN(DIFF)	0.63	0.94	
% CHLORINE	0.03	0.05	
% MINERAL MATTER	35.02		
(INCLUDES 2.94 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.713	0.633	
ATOMIC O/C	0.018	0.012	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.07		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-631 **
 ** PAGE 5 **

SEAM NAME

APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.

STATE PENNSYLVANIA

*

* CHEMICAL DATA 3 *

*

% MOISTURE IN COAL = 2.00

% HIGH TEMPERATURE ASH = 34.80 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	46.10	7.50
B			Al2O3	33.20	6.11
BA	650	226	TiO2	1.27	0.26
BE	8	3	Fe2O3	12.70	3.09
BI	< 20	7	MgO	0.96	0.20
CE	170	59	CaO	0.23	0.06
CO	60	21	Na2O	0.40	0.10
CR	250	87	K2O	4.40	1.27
CU	210	73	P2O5	0.07	0.01
GA	76	26	S03	0.32	0.04
GE	< 25	9			
LA	64	22			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	160	56	-----		-----
NB	< 20	7	AS		
PB	82	29	BR		
RB	210	73	CD		
SC	41	14	CL		
SN	37	13	F		
SR	200	70	HG		1.65
TH			SB		
U			SE		
V	270	94			
Y	54	19			
YB	9	3			
ZN	75	26			
ZR	200	70			

** PENN STATE COAL DATA BASE **

 ** PSOC-631 **
 ** PAGE 7 **

SEAM NAME
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %		
VITRINITE (CALC.)	72.6	90.6	59.5		
INERTINITE (CALC.)	7.5	9.4	6.6		
LIPTINITE (CALC.)	0.0	0.0	0.0		
MINERAL MATTER (CALC.)	19.9		34.0		
VITRINOIDS					
VITRINITE	66.2	82.6	54.2		
PSEUDOVITRINITE	6.4	8.0	5.3		
FUSINITE	1.2	1.5	1.1		
SEMI-FUSINITE	4.1	5.1	3.5		
MACRINITE	0.3	0.4	0.3		
MICRINITE	1.9	2.4	1.7		
SCLEROTINITE	0.0	0.0	0.0		
SPORINITE					
CUTINITE					
EXINITE (ANAL.)	0.0	0.0	0.0		
RESINITE	0.0	0.0	0.0		
SUBERINITE					
EXUDATINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0	0.0	0.0		
LIPTODETRINITE					
MINERAL MATTER(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	1.83	1.57	0.26	1.71	
PSEUDOVITRINITE	1.88	1.71	0.17	1.79	
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-632 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-632
COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
COLLECTION DATE 6/ 2/77
COLLECTOR'S NUMBER 632

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION
SAMPLE RESERVE

SEAM NAME
ALTERNATE SEAM NAME #1 SEAM

TOTAL SEAM THICKNESS 5 FT. 0 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE PENNSYLVANIA
COUNTY LYCOMING
TOWNSHIP COGAN HOUSE
NEAREST TOWN QUIGGLESVILLE

COAL PROVINCE EASTERN
COAL REGION APPALACHIAN
COAL FIELD

MAP REFERENCE: LATITUDE 41D 22M 20S
LONGITUDE 77D 9M 30S
QUADRANGLE SALLADASBURG (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-632 **
 ** PAGE 3 **

SEAM NAME

COUNTRY U.S.A.
 STATE PENNSYLVANIA

APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	3.45					
% ASH	12.78	13.24				
% VOLATILE MATTER	15.78	16.34	18.83	17.54	16.78	
% FIXED CARBON	67.99	70.42	81.17	82.46	83.22	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	13254	12797	12733
MM-FREE (PARR)	15499	14875	14789
MM-FREE (MOD.P)	15599	14933	14846
BEST MM FREE		14933	14846
NET CV, DMMF BTU/LB	15194		
ASH-FREE	15277		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	3.93	4.61
% TOTAL SULFUR	0.81	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	LOW VOLATILE BITUMINOUS (LVB)
ASTM RANK (EQUIL. MOIST.)	LOW VOLATILE BITUMINOUS (LVB)
REFLECTANCE RANK CATEGORY	LOW VOLATILE BITUMINOUS (LVB)
INTERNATIONAL RANK	
AS REC'D MOIST.	300
EQUIL. MOIST.	300
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-632 **
 ** PAGE 4 **

SEAM NAME

APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
				(14.74 %MM)
% ASH	12.78	13.24		
% CARBON	75.08	77.76	89.63	91.21
% HYDROGEN	3.58*	3.71	4.28	4.35
% NITROGEN	1.16	1.20	1.38	1.41
% SULFUR	0.78	0.81	0.93	
% CHLORINE	0.08	0.08	0.10	0.10
% OXYGEN(DIFF)	3.08*	3.19	3.70	2.95

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	0.23	0.03	0.55	0.81
DAF	0.27	0.03	0.63	0.93

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
		(15.11%MM)	(%MM)
% CARBON	77.57	91.38	
% HYDROGEN	3.53	4.16	
% NITROGEN	1.20	1.41	
% ORGANIC SULFUR	0.55	0.65	
% OXYGEN(DIFF)	2.03	2.31	
% CHLORINE	0.08	0.10	
% MINERAL MATTER	15.11		

(INCLUDES 0.43 % FES2)

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
ATOMIC H/C	0.573	0.547	
ATOMIC O/C	0.024	0.022	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.17		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-632 **
 ** PAGE 5 **

SEAM NAME
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 2.10
 % HIGH TEMPERATURE ASH = 13.18 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	47.80	2.94
B			Al2O3	34.70	2.42
BA	290	38	TiO2	2.50	0.20
BE	15	2	Fe2O3	13.30	1.23
BI	< 20	3	MgO	0.23	0.02
CE	180	24	CaO	0.72	0.07
CO	< 20	3	Na2O	0.17	0.02
CR	290	38	K2O	0.94	0.10
CU	130	17	P2O5	0.11	0.01
GA	58	8	SO3	0.55	0.03
GE	< 25	3			
LA	120	16			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	90	12	AS		
NB	< 20	3	BR		
PB	44	6	CD		
RB	40	5	CL		
SC	50	7	F		
SN	< 10	1	HG		0.58
SR	420	55	SB		
TH			SE		
U	12	2			
V	270	36			
Y	96	13			
YB	12	2			
ZN	100	13			
ZR	390	51			

** PENN STATE COAL DATA BASE **

 ** PSOC-632 **
 ** PAGE 7 **

SEAM NAME

APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.

STATE PENNSYLVANIA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	69.2	75.0	63.0
INERTINITE (CALC.)	23.1	25.0	22.3
LIPTINITE (CALC.)	0.0	0.0	0.0
MINERAL MATTER (CALC.)	7.7		14.7

VITRINOIDS			
VITRINITE	63.8	69.1	58.0
PSEUDOVITRINITE	5.4	5.9	5.0
FUSINITE	2.8	3.0	2.8
SEMI-FUSINITE	15.6	16.9	14.9
MACRINITE	0.6	0.7	0.6
MICRINITE	4.1	4.4	3.9
SCLEROTINITE	0.0	0.0	0.0
SPORINITE			
CUTINITE			
EXINITE (ANAL.)	0.0	0.0	0.0
RESINITE	0.0	0.0	0.0
SUBERINITE			
EXUDATINITE			
FLUORINITE			
BITUMINITE			
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE			
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	1.87	1.58	0.29	1.72	
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-633 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-633
COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
COLLECTION DATE 6/ 2/77
COLLECTOR'S NUMBER 633

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION RIDER COAL
SAMPLE RESERVE

SEAM NAME
ALTERNATE SEAM NAME #1 SEAM

TOTAL SEAM THICKNESS 0 FT. 8 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE PENNSYLVANIA
COUNTY LYCOMING
TOWNSHIP COGAN HOUSE
NEAREST TOWN QUIGGLESVILLE

COAL PROVINCE EASTERN
COAL REGION APPALACHIAN
COAL FIELD

MAP REFERENCE: LATITUDE 41D 22M 20S
LONGITUDE 77D 9M 30S
QUADRANGLE SALLADASBURG (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-633 **
 ** PAGE 3 **

SEAM NAME

COUNTRY U.S.A.

APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	2.14					
% ASH	12.07	12.33				
% VOLATILE MATTER	18.20	18.60	21.22	19.54	19.19	
% FIXED CARBON	67.59	69.07	78.78	80.46	80.81	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	13587	13296	13299
MM-FREE (PARR)	15772	15378	15382
MM-FREE (MOD.P)	15834	15404	15408
BEST MM FREE		15404	15408
NET CV, DMMF BTU/LB	15396		
ASH-FREE	15498		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	2.12	2.49
% TOTAL SULFUR	2.30	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	LOW VOLATILE BITUMINOUS (LVB)
ASTM RANK (EQUIL. MOIST.)	LOW VOLATILE BITUMINOUS (LVB)
REFLECTANCE RANK CATEGORY	LOW VOLATILE BITUMINOUS (LVB)
INTERNATIONAL RANK	
AS REC'D MOIST.	430
EQUIL. MOIST.	430
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-633 **
 ** PAGE 4 **

SEAM NAME
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(14.58 %MM)
% ASH	12.07	12.33		
% CARBON	76.63	78.31	89.32	91.68
% HYDROGEN	3.93*	4.02	4.59	4.71
% NITROGEN	1.05	1.07	1.22	1.25
% SULFUR	2.25	2.30	2.62	
% CHLORINE	0.06	0.06	0.07	0.07
% OXYGEN(DIFF)	1.87*	1.91	2.19	2.30

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	1.76	0.00	0.54	2.30
DAF	2.01	0.00	0.62	2.62

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(14.79%MM)	(%MM)
% CARBON	78.13	91.69	
% HYDROGEN	3.82	4.49	
% NITROGEN	1.07	1.25	
% ORGANIC SULFUR	0.54	0.63	
% OXYGEN(DIFF)	1.65	1.87	
% CHLORINE	0.06	0.07	
% MINERAL MATTER	14.79		
(INCLUDES 3.29 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.617	0.588	
ATOMIC O/C	0.019	0.018	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.12		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-633 **
 ** PAGE 5 **

SEAM NAME

COUNTRY U.S.A.

APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 1.50

% HIGH TEMPERATURE ASH = 12.49 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	44.30	2.59
B			Al2O3	27.40	1.81
BA	490	61	TiO2	1.05	0.08
BE	50	6	Fe2O3	21.30	1.86
BI	< 20	2	MgO	0.56	0.04
CE	< 100	12	CaO	1.29	0.12
CO	150	19	Na2O	0.15	0.01
CR	310	39	K2O	1.84	0.19
CU	15	2	P2O5	0.06	0.00
GA	160	20	SO3	1.22	0.06
GE	170	21			
LA	36	4			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	200	25	-----		-----
NB	< 20	2	AS		
PB	70	9	BR		
RB	95	12	CD		
SC	70	9	CL		
SN	< 10	1	F		
SR	500	62	HG		0.64
TH			SB		
U	< 8	1	SE		
V	340	42			
Y	98	12			
YB	15	2			
ZN	350	44			
ZR	190	24			

*** PENN STATE COAL DATA BASE ***

 ** PSOC-633 **
 ** PAGE 7 **

SEAM NAME
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 * PETROGRAPHIC DATA *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	• DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	83.1	89.9	76.3
INERTINITE (CALC.)	9.3	10.1	9.1
LIPTINITE (CALC.)	0.0	0.0	0.0
MINERAL MATTER (CALC.)	7.6		14.6
VITRINOIDS			
VITRINITE	77.3	83.7	71.0
PSEUDOVITRINITE	5.7	6.2	5.3
FUSINITE	1.5	1.6	1.5
SEMI-FUSINITE	7.0	7.6	6.8
MACRINITE	0.3	0.3	0.3
MICRINITE	0.6	0.6	0.5
SCLEROTINITE	0.0	0.0	0.0
SPORINITE			
CUTINITE			
FXINITE (ANAL.)	0.0	0.0	0.0
RESINITE	0.0	0.0	0.0
SUBERINITE			
EXUDATINITE			
FLUORINITE			
BITUMINITE			
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE			
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	1.63	1.46	0.17	1.53	
PSEUDOVITRINITE	1.66	1.49	0.17	1.56	
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-634 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-634
COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
COLLECTION DATE 6/ 2/77
COLLECTOR'S NUMBER 634

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION
SAMPLE RESERVE

SEAM NAME UPPER FREEPORT
ALTERNATE SEAM NAME E SEAM

TOTAL SEAM THICKNESS 2 FT. 11 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE PENNSYLVANIA
COUNTY TIOGA
TOWNSHIP MORRIS
NEAREST TOWN MORRIS

COAL PROVINCE EASTERN
COAL REGION APPALACHIAN
COAL FIELD

MAP REFERENCE: LATITUDE 40D 35M 50S
LONGITUDE 77D 19M 20S
QUADRANGLE MORRIS (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-634 **
 ** PAGE 3 **

SEAM NAME UPPER FREEPORT
 APPARENT RANK MEDIUM VOLATILE BITUMINOUS (MVB)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	3.14					
% ASH	13.05	13.47				
% VOLATILE MATTER	23.22	23.97	27.70	25.63	25.51	
% FIXED CARBON	60.60	62.56	72.30	74.37	74.49	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.

MM-FREE, DIRECT			
MM-CONTAINING	13449	13027	12826
MM-FREE (PARR)	15907	15311	15031
MM-FREE (MOD.P)	15948	15307	15026
BEST MM FREE		15307	15026
NET CV, DMMF BTU/LB	15480		
ASH-FREE	15543		

MOTT-SPOONER DIFFERENCE = 216.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	4.63	5.56
% TOTAL SULFUR	3.84	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	MEDIUM VOLATILE BITUMINOUS (MVB)
ASTM RANK (EQUIL. MOIST.)	MEDIUM VOLATILE BITUMINOUS (MVB)
REFLECTANCE RANK CATEGORY	MEDIUM VOLATILE BITUMINOUS (MVB)
INTERNATIONAL RANK	
AS REC'D MOIST.	430
EQUIL. MOIST.	430
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-634 **
 ** PAGE 4 **

SEAM NAME UPPER FREEPORT
 APPARENT RANK MEDIUM VOLATILE BITUMINOUS (MVB)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(16.66 %MM)
% ASH	13.05	13.47		
% CARBON	72.66	75.02	86.70	90.02
% HYDROGEN	4.07*	4.20	4.85	5.04
% NITROGEN	1.24	1.28	1.48	1.54
% SULFUR	3.72	3.84	4.44	
% CHLORINE	0.07	0.07	0.08	0.08
% OXYGEN(DIFF)	2.05*	2.12	2.46	3.34

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	3.14	0.00	0.70	3.84
DAF	3.63	0.00	0.81	4.44

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(16.73%MM)	(%MM)
% CARBON	74.81	89.85	
% HYDROGEN	3.96	4.76	
% NITROGEN	1.28	1.54	
% ORGANIC SULFUR	0.70	0.84	
% OXYGEN(DIFF)	2.51	2.95	
% CHLORINE	0.07	0.08	
% MINERAL MATTER	16.73		
(INCLUDES 5.87 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.672	0.636	
ATOMIC O/C	0.028	0.030	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.14		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-634 **
 ** PAGE 5 **

SEAM NAME UPPER FREEPORT
 APPARENT RANK MEDIUM VOLATILE BITUMINOUS (MVB)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 1.30
 % HIGH TEMPERATURE ASH = 12.06 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SI02	40.80	2.30
B			AL2O3	23.40	1.49
BA	340	41	TIO2	1.67	0.12
BE	20	2	FE2O3	30.70	2.59
BI	< 20	2	MGO	0.31	0.02
CE	< 100	12	CAO	1.04	0.09
CO	210	25	NA2O	0.17	0.02
CR	350	42	K2O	0.65	0.07
CU	190	22	P2O5	0.15	0.01
GA	78	9	SO3	1.22	0.06
GE	< 25	3			
LA	56	7			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	350	42	AS		
NB	< 20	2	BR		
PB	170	21	CD		
RB	20	2	CL		
SC	46	6	F		
SN	92	11	HG		0.80
SR	690	83	SB		
TH			SE		
U					
V	300	36			
Y	100	12			
YB	16	2			
ZN	280	34			
ZR	320	39			

** PENN STATE COAL DATA BASE **

 ** PSOC-634 **
 ** PAGE 7 **

SEAM NAME UPPER FREEPORT
 APPARENT RANK MEDIUM VOLATILE BITUMINOUS (MVB)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	78.6	86.2	70.9
INERTINITE (CALC.)	12.6	13.8	12.4
LIPTINITE (CALC.)	0.0	0.0	0.0
MINERAL MATTER (CALC.)	8.8		16.7
VITRINOIDS			
VITRINITE	76.8	84.2	69.2
PSEUDOVITRINITE	1.8	2.0	1.6
FUSINITE	3.3	3.6	3.4
SEMI-FUSINITE	5.9	6.5	5.8
MACRINITE	0.6	0.7	0.6
MICRINITE	2.7	3.0	2.7
SCLEROTINITE	0.0	0.0	0.0
SPORINITE			
CUTINITE			
EXINITE (ANAL.)	0.0	0.0	0.0
RESINITE	0.0	0.0	0.0
SUBERINITE			
EXUDATINITE			
FLUORINITE			
BITUMINITE			
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE			
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	1.40	1.13	0.27	1.26	
PSEUDOVITRINITE	1.42	1.22	0.20	1.29	
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-635 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-635
COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
COLLECTION DATE 6/ 3/77
COLLECTOR'S NUMBER 635

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION
SAMPLE RESERVE

SEAM NAME BLOSS
ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 1 FT. 4 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE PENNSYLVANIA
COUNTY TIOGA
TOWNSHIP WARD
NEAREST TOWN MORRIS RUN

COAL PROVINCE EASTERN
COAL REGION APPALACHIAN
COAL FIELD

MAP REFERENCE: LATITUDE 41D 42M 50S
LONGITUDE 76D 59M 00S
QUADRANGLE GLEASON (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-635 **
 ** PAGE 3 **

SEAM NAME BLOSS
 APPARENT RANK MEDIUM VOLATILE BITUMINOUS (MVB)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	1.35					
% ASH	27.08	27.45				
% VOLATILE MATTER	18.93	19.19	26.45	23.30	21.23	
% FIXED CARBON	52.64	53.36	73.55	76.70	78.77	

CALORIFIC VALUE	DRY	AS REC'D MOIST.	EQUIL. MOIST.
(GROSS BTU/LB)	---	---	---
MM-FREE, DIRECT			
MM-CONTAINING	11013	10864	10760
MM-FREE (PARR)	15770	15464	15250
MM-FREE (MOD.P)	16024	15670	15451
BEST MM FREE		15670	15451
NET CV, DMMF BTU/LB	15507		
ASH-FREE	15180		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	2.30	3.33
% TOTAL SULFUR	2.22	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	MEDIUM VOLATILE BITUMINOUS (MVB)
ASTM RANK (EQUIL. MOIST.)	MEDIUM VOLATILE BITUMINOUS (MVB)
REFLECTANCE RANK CATEGORY	MEDIUM VOLATILE BITUMINOUS (MVB)
INTERNATIONAL RANK	
AS REC'D MOIST.	420
EQUIL. MOIST.	420
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-635 **
 ** PAGE 4 **

SEAM NAME BLOSS
 APPARENT RANK MEDIUM VOLATILE BITUMINOUS (MVB)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)
-----	-----	---	---	-----
				(30.87 %MM)
% ASH	27.08	27.45		
% CARBON	61.97	62.82	86.59	90.87
% HYDROGEN	3.75*	3.80	5.24	5.50
% NITROGEN	0.90	0.91	1.25	1.32
% SULFUR	2.19	2.22	3.06	
% CHLORINE	0.04	0.05	0.06	0.07
% OXYGEN (DIFF)	2.72*	2.75	3.81	2.27

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	1.73	0.04	0.45	2.22
DAF	2.38	0.06	0.62	3.06
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF (MOD.P)	DMMF (DIR.)
-----	---	-----	-----
		(31.85%MM)	(%MM)
% CARBON	62.43	91.61	
% HYDROGEN	3.41	5.00	
% NITROGEN	0.91	1.32	
% ORGANIC SULFUR	0.45	0.66	
% OXYGEN (DIFF)	0.95	1.35	
% CHLORINE	0.05	0.07	
% MINERAL MATTER	31.85		
(INCLUDES 3.24 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.727	0.656	
ATOMIC O/C	0.019	0.016	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.09		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-635 **
 ** PAGE 5 **

SEAM NAME BLOSS COUNTRY U.S.A.
 APPARENT RANK MEDIUM VOLATILE BITUMINOUS (MVB) STATE PENNSYLVANIA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 1.60
 % HIGH TEMPERATURE ASH = 25.91 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	53.00	6.42
B			Al2O3	26.40	3.62
BA	470	122	TiO2	1.45	0.23
BE	15	4	Fe2O3	13.10	2.37
BI	< 20	5	MgO	0.65	0.10
CE	< 100	26	CaO	0.36	0.07
CO	36	9	Na2O	0.25	0.05
CR	170	44	K2O	3.03	0.65
CU	150	39	P2O5	0.08	0.01
GA	56	15	SO3	0.35	0.04
GE	< 25	6			
LA	56	15			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	130	34	AS		
NB	< 20	5	BR		
PB	76	20	CD		
RB	170	44	CL		
SC	32	8	F		
SN	36	9	HG		0.44
SR	260	67	SB		
TH			SE		
U	12	3			
V	260	67			
Y	62	16			
YB	9	2			
ZN	120	31			
ZR	230	60			

** PENN STATE COAL DATA BASE **

 ** PSOC-635 **
 ** PAGE 7 **

SEAM NAME BLOSS
 APPARENT RANK MEDIUM VOLATILE BITUMINOUS (MVB)

COUNTRY U.S.A.
 STATE PENNSYLVANIA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	71.4	36.8	59.2
INERTINITE (CALC.)	10.9	13.3	9.9
LIPTINITE (CALC.)	0.0	0.0	0.0
MINERAL MATTER (CALC.)	17.7		30.9

VITRINOIDS			
VITRINITE	64.1	77.9	53.2
PSEUDOVITRINITE	7.3	8.9	6.1
FUSINITE	1.7	2.1	1.7
SEMI-FUSINITE	6.7	8.2	6.0
MACRINITE	0.7	0.8	0.6
MICRINITE	1.8	2.2	1.6
SCLEROTINITE	0.0	0.0	0.0
SPORINITE			
CUTINITE			
FXINITE (ANAL.)	0.0	0.0	0.0
RESINITE	0.0	0.0	0.0
SUBERINITE			
EXUDATINITE			
FLUORINITE			
BITUMINITE			
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE			
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	1.41	1.19	0.22	1.30	
PSEUDOVITRINITE	1.43	1.26	0.17	1.35	
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-636 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-636
 COLLECTED BY TEXAS A & M UNIVERSITY
 COLLECTION DATE 3/ 9/77
 COLLECTOR'S NUMBER
 REPORTED RANK SUBBITUMINOUS C (SUBC)
 SAMPLE TYPE CHANNEL WHOLE SEAM
 OTHER SAMPLE INFORMATION
 SAMPLE RESERVE
 SEAM NAME WILDCAT
 ALTERNATE SEAM NAME C#36--UPPER SEAM
 TOTAL SEAM THICKNESS 5 FT. 10 IN.
 THICKNESS OF SEAM SAMPLED
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE TEXAS
 COUNTY MILAM
 TOWNSHIP
 NEAREST TOWN ROCKDALE
 COAL PROVINCE GULF
 COAL REGION
 COAL FIELD

MAP REFERENCE: LATITUDE 30D 33M 50S
 LONGITUDE 97D 3M 30S
 QUADRANGLE ALCOA LAKE & ROCKDALE

** PENN STATE COAL DATA BASE **

 ** PSOC-636 **
 ** PAGE 3 **

SEAM NAME WILDCAT COUNTRY U.S.A.
 APPARENT RANK SUBBITUMINOUS C (SUBC) STATE TEXAS

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	30.66					
% ASH	11.07	15.96				
% VOLATILE MATTER	33.53	48.36	57.54	56.62	56.07	
% FIXED CARBON	24.74	35.68	42.46	43.38	43.93	

CALORIFIC VALUE	DRY	AS REC'D MOIST.	EQUIL. MOIST.
(GROSS BTU/LB)	---	---	---

MM-FREE, DIRECT			
MM-CONTAINING	11226	7784	7727
MM-FREE (PARR)	13639	8838	8763
MM-FREE (MOD.P)	13710	8820	8746
BEST MM FREE		8820	8746
NET CV, DMMF BTU/LB	13154		
ASH-FREE	13358		

MOTT-SPOONER DIFFERENCE = 390.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	31.17	38.29
% TOTAL SULFUR	2.48	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	SUBBITUMINOUS C (SUBC)
ASTM RANK (EQUIL. MOIST.)	SUBBITUMINOUS C (SUBC)
REFLECTANCE RANK CATEGORY	
INTERNATIONAL RANK	
AS REC'D MOIST.	
EQUIL. MOIST.	
REPORTED RANK	SUBBITUMINOUS C (SUBC)

** ** ** ** **
 ** PSOC-636 **
 ** PAGE 4 **
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*
* CHEMICAL DATA 2
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** PENN STATE COAL DATA BASE **

 ** PSOC-636 **
 ** PAGE 5 **

SEAM NAME WILDCAT
 APPARENT RANK SUBBITUMINOUS C (SUBC)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 25.50
 % HIGH TEMPERATURE ASH = 16.38 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SI02	23.80	1.82
B			AL2O3	11.10	0.96
BA	830	136	TIO2	0.95	0.09
BE	9	1	FE2O3	14.60	1.67
BI	< 20	3	MGO	2.21	0.22
CE	< 100	16	CAO	21.30	2.49
CO	< 20	3	NA2O	0.35	0.04
CR	150	25	K2O	0.11	0.01
CU	85	14	P2O5	0.06	0.00
GA	23	4	SO3	22.40	1.47
GE	< 25	4			
LA	< 20	3			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	110	18	AS		
NB	< 20	3	BR		
PB	50	8	CD		
RB	20	3	CL		
SC	22	4	F		
SN	54	9	HG		0.62
SR	1750	287	SB		
TH			SE		
U					
V	150	25			
Y	60	10			
YB	< 5	1			
ZN	30	5			
ZR	260	43			

** PENN STATE COAL DATA BASE **

 ** PSOC-636 **
 ** PAGE 7 **

SEAM NAME WILDCAT
 APPARENT RANK SUBBITUMINOUS C (SUBC)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %			
	-----	-----			
HUMINITE	70.2	77.9			
INERTINITE	6.5	7.2			
LIPTINITE	0.3	0.3			
MINERAL MATTER(CALC.)	9.9				
TEXTINITE	0.0	0.0			
ULMINITE	70.0	77.7			
ATTRINITE	0.0	0.0			
DENSINITE	0.0	0.0			
HUMODETRINITE(ANAL)					
GELINITE	0.2	0.2			
CORPOHUMINITE	0.0	0.0			
SPORINITE					
CUTINITE					
EXINITE		1.5			
RESINITE	0.3	0.3			
SUBERINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0	0.0			
LIPTODETRINITE					
FUSINITE	2.0	2.2			
SEMI-FUSINITE	2.7	3.0			
MACRINITE	1.4	1.6			
MICRINITE	0.0	0.0			
SCLEROTINITE	0.4	0.4			
INERTODETRINITE	0.0	0.0			
MINERAL MATTER(ANAL.)					
HUMINITE(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
(%, IN OIL)	----	----	-----	-----	-----
ULMINITE	0.51	0.30	0.21	0.41	

** PENN STATE COAL DATA BASE **

** PSOC-640 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-640
COLLECTED BY SOUTHERN ILLINOIS UNIVERSITY
COLLECTION DATE 12/15/76
COLLECTOR'S NUMBER
REPORTED RANK
SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION LITHOTYPE DATA AVAILABLE
SAMPLE RESERVE
SEAM NAME KENTUCKY #6
ALTERNATE SEAM NAME
TOTAL SEAM THICKNESS 2 FT. 0 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE KENTUCKY
COUNTY HOPKINS
TOWNSHIP
NEAREST TOWN BEULAH
COAL PROVINCE INTERIOR
COAL REGION EASTERN
COAL FIELD

MAP REFERENCE: LATITUDE 37D 15M 60S
LONGITUDE 87D 44M 60S
QUADRANGLE DALTON & COILTOWN

** PENN STATE COAL DATA BASE **

 ** PSOC-640 **
 ** PAGE 3 **

SEAM NAME KENTUCKY #6
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	3.81					
% ASH	7.82	8.13				
% VOLATILE MATTER	35.85	37.27	40.57	39.58	39.73	
% FIXED CARBON	52.52	54.60	59.43	60.42	60.27	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	13414	12903	12712
MM-FREE (PARR)	14802	14176	13944
MM-FREE (MOD.P)	14796	14085	13856
BEST MM FREE		14085	13856
NET CV, DMMF BTU/LB	14263		
ASH-FREE	14601		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	5.23	5.83
% TOTAL SULFUR	2.82	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE A BITUMINOUS (HVAB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE B BITUMINOUS (HVBB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE A BITUMINOUS (HVAB)
INTERNATIONAL RANK	
AS REC'D MOIST.	630
EQUIL. MOIST.	630
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-640 **
 ** PAGE 4 **

SEAM NAME KENTUCKY #6
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(10.33 %MM)
% ASH	7.82	8.13		
% CARBON	71.85	74.70	81.31	83.31
% HYDROGEN	4.99*	5.19	5.65	5.79
% NITROGEN	1.22	1.27	1.38	1.42
% SULFUR	2.71	2.82	3.07	
% CHLORINE	0.04	0.04	0.04	0.04
% OXYGEN(DIFF)	7.55*	7.85	8.55	9.45

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	1.28	0.23	1.31	2.82
DAF	1.39	0.25	1.43	3.07

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(9.81%MM)	(%MM)
% CARBON	74.58	82.69	
% HYDROGEN	5.06	5.61	
% NITROGEN	1.27	1.42	
% ORGANIC SULFUR	1.31	1.45	
% OXYGEN(DIFF)	7.97	8.80	
% CHLORINE	0.04	0.04	
% MINERAL MATTER	9.81		
(INCLUDES 2.39 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.834	0.815	
ATOMIC O/C	0.085	0.089	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.09		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-640 **
 ** PAGE 5 **

SEAM NAME KENTUCKY #6
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 5.00

% HIGH TEMPERATURE ASH = 8.82 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	44.50	1.83
B			AL2O3	22.70	1.06
BA	250	22	TiO2	1.24	0.07
BE	50	4	Fe2O3	28.00	1.73
BI	< 20	2	MGO	0.54	0.03
CE	< 100	9	CAO	1.06	0.07
CO	< 20	2	NA2O	0.32	0.02
CR	300	26	K2O	1.34	0.10
CU	200	18	P2O5	0.09	0.00
GA	42	4	SO3	0.87	0.03
GE	220	19			
LA	42	4			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	380	34	-----		-----
NB	< 20	2	AS		
PB	800	71	BR		
RB	6	1	CD		
SC	34	3	CL		
SN	52	5	F		
SR	320	28	HG		
TH			SB		
U			SE		
V	400	35			
Y	96	8			
YB	12	1			
ZN	4600	406			
ZR	230	20			

** PENN STATE COAL DATA BASE **

 ** PSOC-640 **
 ** PAGE 7 **

SEAM NAME KENTUCKY #6
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %		
VITRINITE (CALC.)	83.7	88.4	80.6		
INERTINITE (CALC.)	8.4	8.9	9.0		
LIPTINITE (CALC.)	2.6	2.7	2.3		
MINERAL MATTER (CALC.)	5.3		10.3		
VITRINOIDS					
VITRINITE	78.3	82.7	75.4		
PSEUDOVITRINITE	5.4	5.7	5.2		
FUSINITE	2.8	3.0	3.2		
SEMI-FUSINITE	4.5	4.8	4.7		
MACRINITE	0.1	0.1	0.1		
MICRINITE	0.9	1.0	1.0		
SCLEROTINITE	0.0	0.0	0.0		
SPORINITE					
CUTINITE					
EXINITE (ANAL.)	2.5	2.6	2.2		
RESINITE	0.1	0.1	0.1		
SUBERINITE					
EXUDATINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0	0.0	0.0		
LIPTODETRINITE					
MINERAL MATTER(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	0.78	0.63	0.15	0.72	
PSEUDOVITRINITE	0.81	0.70	0.11	0.74	
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-644 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-644
COLLECTED BY SOUTHERN ILLINOIS UNIVERSITY
COLLECTION DATE 3/18/77
COLLECTOR'S NUMBER
REPORTED RANK LOW VOLATILE BITUMINOUS (LVB)
SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION
SAMPLE RESERVE
SEAM NAME PHILPOTT
ALTERNATE SEAM NAME
TOTAL SEAM THICKNESS 1 FT. 4 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE ARKANSAS
COUNTY FRANKLIN
TOWNSHIP WHITE OAK
NEAREST TOWN DUFF
COAL PROVINCE INTERIOR
COAL REGION WESTERN
COAL FIELD

MAP REFERENCE: LATITUDE 35D 29M 30S
LONGITUDE 93D 49M 30S
QUADRANGLE OZARK (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-644 **
 ** PAGE 3 **

SEAM NAME PHILPOTT
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE ARKANSAS

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	1.42					
% ASH	4.47	4.53				
% VOLATILE MATTER	16.88	17.12	17.93	17.34	17.43	
% FIXED CARBON	77.24	78.35	82.07	82.66	82.57	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	15055	14841	14323
MM-FREE (PARR)	15863	15625	15051
MM-FREE (MOD.P)	15872	15592	15020
BEST MM FREE		15592	15020
NET CV, DMMF BTU/LB	15460		
ASH-FREE	15769		

MOTT-SPOONER DIFFERENCE = 92.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	4.86	5.14
% TOTAL SULFUR	0.86	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	LOW VOLATILE BITUMINOUS (LVB)
ASTM RANK (EQUIL. MOIST.)	LOW VOLATILE BITUMINOUS (LVB)
REFLECTANCE RANK CATEGORY	LOW VOLATILE BITUMINOUS (LVB)
INTERNATIONAL RANK	
AS REC'D MOIST.	330
EQUIL. MOIST.	330
REPORTED RANK	LOW VOLATILE BITUMINOUS (LVB)

** PENN STATE COAL DATA BASE **

 ** PSOC-644 **
 ** PAGE 4 **

SEAM NAME PHILPOTT
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE ARKANSAS

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
				(5.37 %MM)
% ASH	4.47	4.53		
% CARBON	85.32	86.55	90.66	91.46
% HYDROGEN	4.16*	4.22	4.42	4.46
% NITROGEN	1.77	1.80	1.89	1.90
% SULFUR	0.85	0.86	0.90	
% CHLORINE	0.03	0.03	0.04	0.04
% OXYGEN(DIFF)	1.98*	2.00	2.10	2.15

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	0.10	0.03	0.73	0.86
DAF	0.10	0.03	0.76	0.90

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
		(5.18%MM)	(%MM)
% CARBON	86.49	91.21	
% HYDROGEN	4.16	4.39	
% NITROGEN	1.80	1.90	
% ORGANIC SULFUR	0.73	0.77	
% OXYGEN(DIFF)	1.64	1.70	
% CHLORINE	0.03	0.04	
% MINERAL MATTER	5.18		
(INCLUDES 0.19 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
ATOMIC H/C	0.586	0.578	
ATOMIC O/C	0.018	0.015	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.07		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-644 **
 ** PAGE 5 **

SEAM NAME PHILPOTT
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE ARKANSAS

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 1.20
 % HIGH TEMPERATURE ASH = 4.45 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SI02	26.70	0.56
B			AL2O3	29.70	0.70
BA	4000	178	TiO2	1.13	0.03
BE	15	1	FE2O3	16.90	0.53
BI	< 20	1	MGO	4.57	0.12
CE	230	10	CAO	8.03	0.26
CO	320	14	NA2O	1.85	0.06
CR	250	11	K2O	1.28	0.05
CU	220	10	P2O5	3.21	0.06
GA	23	1	SO3	6.60	0.12
GE	< 25	1			
LA	100	4			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	390	17	AS		
NB	< 20	1	BR		
PB	72	3	CD		
RB	65	3	CL		
SC	26	1	F		
SN	50	2	HG		
SR	5200	231	SB		
TH			SE		
U	23	1			
V	280	12			
Y	160	7			
YB	14	1			
ZN	120	5			
ZR	250	11			

** PENN STATE COAL DATA BASE **

 ** PSOC-644 **
 ** PAGE 7 **

SEAM NAME PHILPOTT
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE ARKANSAS

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %		
VITRINITE (CALC.)	83.9	86.2	80.9		
INERTINITE (CALC.)	13.4	13.8	13.8		
LIPTINITE (CALC.)	0.0	0.0	0.0		
MINERAL MATTER (CALC.)	2.7		5.4		
VITRINOIDS					
VITRINITE	73.7	75.7	71.0		
PSEUDOVITRINITE	10.2	10.5	9.9		
FUSINITE	1.8	1.8	1.9		
SEMI-FUSINITE	7.7	7.9	7.8		
MACRINITE	0.8	0.8	0.8		
MICRINITE	3.2	3.3	3.3		
SCLEROTINITE	0.0	0.0	0.0		
SPORINITE					
CUTINITE					
EXINITE (ANAL.)	0.0	0.0	0.0		
RESINITE	0.0	0.0	0.0		
SUBERINITE					
EXUDATINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0	0.0	0.0		
LIPTODETRINITE					
MINERAL MATTER(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	1.96	1.70	0.26	1.81	
PSEUDOVITRINITE	1.97	1.72	0.25	1.81	
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-650 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-650

COLLECTED BY SOUTHERN ILLINOIS UNIVERSITY
 COLLECTION DATE 3/19/77
 COLLECTOR'S NUMBER

REPORTED RANK LOW VOLATILE BITUMINOUS (LVB)

SAMPLE TYPE CHANNEL WHOLE SEAM
 OTHER SAMPLE INFORMATION SUBSECTION, DATA AVAILABLE
 SAMPLE RESERVE

SEAM NAME PARIS
 ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 1 FT. 6 IN.
 THICKNESS OF SEAM SAMPLED
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE ARKANSAS
 COUNTY LOGAN
 TOWNSHIP TITSWORTH
 NEAREST TOWN PARIS

COAL PROVINCE INTERIOR
 COAL REGION WESTERN
 COAL FIELD

MAP REFERENCE: LATITUDE 35D 21M 00S
 LONGITUDE 93D 43M 50S
 QUADRANGLE PARIS (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-650 **
 ** PAGE 3 **

SEAM NAME PARIS
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE ARKANSAS

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	2.19					
% ASH	5.54	5.66				
% VOLATILE MATTER	17.47	17.86	18.93	17.90	18.15	
% FIXED CARBON	74.81	76.48	81.07	82.10	81.85	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	14667	14346	14349
MM-FREE (PARR)	15699	15329	15333
MM-FREE (MOD.P)	15691	15259	15262
BEST MM FREE		15259	15262
NET CV, DMMF BTU/LB	15284		
ASH-FREE	15547		

MOTT-SPOONER DIFFERENCE = 182.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	2.17	2.34
% TOTAL SULFUR	2.00	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	LOW VOLATILE BITUMINOUS (LVB)
ASTM RANK (EQUIL. MOIST.)	LOW VOLATILE BITUMINOUS (LVB)
REFLECTANCE RANK CATEGORY	LOW VOLATILE BITUMINOUS (LVB)
INTERNATIONAL RANK	
AS REC'D MOIST.	330
EQUIL. MOIST.	330
REPORTED RANK	LOW VOLATILE BITUMINOUS (LVB)

** PSOC-650 **
** PAGE 4 **

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*****
*                                     *
*  CHEMICAL DATA 2  *
*                                     *
*****
```

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)
-----	-----	---	---	-----
				(7.21 %MM)
% ASH	5.54	5.66		
% CARBON	82.36	84.20	89.25	90.75
% HYDROGEN	4.00*	4.09	4.34	4.41
% NITROGEN	1.53	1.56	1.65	1.68
% SULFUR	1.96	2.00	2.12	
% CHLORINE	0.04	0.04	0.04	0.04
% OXYGEN (DIFF)	2.40*	2.45	2.60	3.13

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	0.87	0.41	0.72	2.00
DAF	0.92	0.43	0.76	2.12

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF (MOD.P)	DMMF (DIR.)
		(6.82%MM)	(%MM)
% CARBON	84.12	90.28	
% HYDROGEN	4.00	4.29	
% NITROGEN	1.56	1.68	
% ORGANIC SULFUR	0.72	0.77	
% OXYGEN (DIFF)	2.78	2.94	
% CHLORINE	0.04	0.04	
% MINERAL MATTER	6.82		
(INCLUDES 1.63 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD. PAR	DIRECT
-----	-----	-----	-----
ATOMIC H/C	0.583	0.571	
ATOMIC O/C	0.026	0.026	

MISC. CHEMICAL DATA	DRY	OF DMDF COAL	OF DMDF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO ₄ , IN ASH			
% CARBONATE AS CO ₂			
% CHLORINE	0.08		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-650 **
 ** PAGE 5 **

SEAM NAME PARIS
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE ARKANSAS

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 1.60
 % HIGH TEMPERATURE ASH = 5.24 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	22.50	0.55
B			AL2O3	13.40	0.37
BA	1250	65	TiO2	0.56	0.02
BE	9	0	FE2O3	35.30	1.29
BI	< 20	1	MGO	5.47	0.17
CE	< 100	5	CAO	10.60	0.40
CO	88	5	NA2O	0.59	0.02
CR	140	7	K2O	0.48	0.02
CU	200	10	P2O5	0.99	0.02
GA	20	1	S03	11.20	0.23
GE	< 25	1			
LA	29	2			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	240	13	AS		
NB	< 20	1	BR		
PB	84	4	CD		
RB	55	3	CL		
SC	11	1	F		
SN	58	3	HG		
SR	1150	60	SB		
TH			SE		
U					
V	130	7			
Y	82	4			
YB	11	1			
ZN	90	4			
ZR	160	8			

** PENN STATE COAL DATA BASE **

 ** PSOC-650 **
 ** PAGE 7 **

SEAM NAME PARIS
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE ARKANSAS

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	84.9	88.1	80.8
INERTINITE (CALC.)	11.5	11.9	12.0
LIPTINITE (CALC.)	0.0	0.0	0.0
MINERAL MATTER (CALC.)	3.6		7.2
VITRINOIDS			
VITRINITE	76.9	79.8	73.2
PSEUDOVITRINITE	8.0	8.3	7.6
FUSINITE	6.7	6.9	7.1
SEMI-FUSINITE	3.7	3.8	3.7
MACRINITE	0.4	0.4	0.4
MICRINITE	0.8	0.8	0.8
SCLEROTINITE	0.0	0.0	0.0
SPORINITE			
CUTINITE			
EXINITE (ANAL.)	0.0	0.0	0.0
RESINITE	0.0	0.0	0.0
SUBERINITE			
EXUDATINITE			
FLUORINITE			
BITUMINITE			
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE			
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	1.84	1.63	0.21	1.71	
PSEUDOVITRINITE	1.91	1.66	0.25	1.73	
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-656 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-656
 COLLECTED BY SOUTHERN ILLINOIS UNIVERSITY
 COLLECTION DATE 3/22/77
 COLLECTOR'S NUMBER
 REPORTED RANK HIGH VOLATILE C BITUMINOUS (HVCB)
 SAMPLE TYPE CHANNEL WHOLE SEAM
 OTHER SAMPLE INFORMATION
 SAMPLE RESERVE
 SEAM NAME IOWA #1
 ALTERNATE SEAM NAME
 TOTAL SEAM THICKNESS 7 FT. 1 IN.
 THICKNESS OF SEAM SAMPLED
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE IOWA
 COUNTY LUCAS
 TOWNSHIP KNOXVILLE
 NEAREST TOWN KNOXVILLE
 COAL PROVINCE INTERIOR
 COAL REGION WESTERN
 COAL FIELD

MAP REFERENCE: LATITUDE 41D 19M 00S
 LONGITUDE 93D 5M 50S
 QUADRANGLE KNOXVILLE (7.5')

** ** ** ** **
 ** PSOC-656 **
 ** PAGE 3 **
 ** ** **

COUNTRY U.S.A.
STATE IOWA

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*****
*
*  CHEMICAL DATA 1
*
*****

```

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
-----	-----	---	---	-----	-----	-----
% MOISTURE	16.92					
% ASH	12.29	14.79				
% VOLATILE MATTER	33.63	40.48	47.51	46.16	45.90	
% FIXED CARBON	37.16	44.73	52.49	53.84	54.10	

CALORIFIC VALUE	DRY	AS REC'D	EQUIL.
-----		MOIST.	MOIST.
(GROSS BTU/LB)	---	-----	-----

MM-FREE, DIRECT			
MM-CONTAINING	12262	10187	10094
MM-FREE (PARR)	14721	11795	11669
MM-FREE (MOD.P)	14753	11731	11606
BEST MM FREE		11731	11606
NET CV, DMMF BTU/LB	14252		
ASH-FREE	14390		

MOTT-3FOONER DIFFERENCE = 327.

ASSOCIATED ANALYSES	DRY	MMF
-----	---	---
% EQUILIBRIUM MOISTURE	17.68	21.53
% TOTAL SULFUR	3.47	

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*****
*
*  RANK CALCULATIONS  *
*
*****
```

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE C BITUMINOUS (HVCB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE C BITUMINOUS (HVCB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE C BITUMINOUS (HVCB)
INTERNATIONAL RANK	
AS REC'D MOIST.	610
EQUIL. MOIST.	610
REPORTED RANK	HIGH VOLATILE C BITUMINOUS (HVCB)

** PENN STATE COAL DATA BASE **

 ** PSOC-656 **
 ** PAGE 4 **

SEAM NAME IOWA #1
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE IOWA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(17.88 %MM)
% ASH	12.29	14.79		
% CARBON	56.16	67.60	79.33	82.32
% HYDROGEN	3.71*	4.47	5.25	5.44
% NITROGEN	1.10	1.33	1.56	1.62
% SULFUR	2.88	3.47	4.07	
% CHLORINE	0.03	0.03	0.04	0.04
% OXYGEN(DIFF)	6.89*	8.30	9.75	10.58

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	1.51	0.20	1.76	3.47
DAF	1.77	0.23	2.07	4.07
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(17.44%MM)	(%MM)
% CARBON	67.38	81.62	
% HYDROGEN	4.25	5.14	
% NITROGEN	1.33	1.62	
% ORGANIC SULFUR	1.76	2.13	
% OXYGEN(DIFF)	7.84	9.46	
% CHLORINE	0.03	0.04	
% MINERAL MATTER	17.44		
(INCLUDES 2.83 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.794	0.757	
ATOMIC O/C	0.097	0.105	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.07		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-656 **
 ** PAGE 5 **

SEAM NAME IOWA #1
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE IOWA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 8.10
 % HIGH TEMPERATURE ASH = 12.19 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	24.70	1.41
B			Al2O3	9.50	0.61
BA	360	44	TiO2	0.41	0.03
BE	20	2	Fe2O3	22.30	1.90
BI	< 20	2	MgO	0.72	0.05
CE	< 100	12	CaO	18.50	1.61
CO	26	3	Na2O	0.46	0.04
CR	130	16	K2O	0.77	0.08
CU	150	18	P2O5	0.35	0.02
GA	24	3	SO3	21.20	1.03
GE	100	12			
LA	42	5			
LI					
MN					
MO					
NI	330	40			
NB	< 20	2			
PB	360	44			
RB	35	4			
SC	17	2			
SN	96	10			
SR	320	39			
TH					
U	< 10	1			
V	120	15			
Y	120	15			
YB	10	1			
ZN	800	98			
ZR	110	13			

VOLATILES		PPM TOTAL COAL
AS		
BR		
CD		
CL		
F		
HG		
SB		
SE		

** PENN STATE COAL DATA BASE **

 ** PSOC-656 **
 ** PAGE 7 **

SEAM NAME IOWA #1
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE IOWA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	82.2	90.8	75.6
INERTINITE (CALC.)	6.5	7.2	6.5
LIPTINITE (CALC.)	1.8	2.0	1.4
MINERAL MATTER (CALC.)	9.5		17.9

VITRINOIDS			
VITRINITE	82.2	90.8	75.6
PSEUDOVITRINITE	0.0	0.0	0.0
FUSINITE	1.7	1.9	1.8
SEMI-FUSINITE	2.2	2.4	2.1
MACRINITE	0.1	0.1	0.1
MICRINITE	2.5	2.8	2.5
SCLEROTINITE	0.0	0.0	0.0
SPORINITE			
CUTINITE			
EXINITE (ANAL.)	1.8	2.0	1.4
RESINITE	0.0	0.0	0.0
SUBERINITE			
EXUDATINITE			
FLUORINITE			
BITUMINITE			
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE			
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	0.63	0.40	0.23	0.50	
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-657 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-657

COLLECTED BY SOUTHERN ILLINOIS UNIVERSITY
 COLLECTION DATE 3/23/77
 COLLECTOR'S NUMBER

REPORTED RANK HIGH VOLATILE C BITUMINOUS (HVCB)

SAMPLE TYPE CHANNEL WHOLE SEAM
 OTHER SAMPLE INFORMATION
 SAMPLE RESERVE

SEAM NAME LOWER FORD
 ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 4 FT. 6 IN.
 THICKNESS OF SEAM SAMPLED
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE IOWA
 COUNTY MAHASKA
 TOWNSHIP LINCOLN
 NEAREST TOWN OSKALOOSA

COAL PROVINCE INTERIOR
 COAL REGION WESTERN
 COAL FIELD

MAP REFERENCE: LATITUDE 41D 17M 50S
 LONGITUDE 92D 38M 50S
 QUADRANGLE OSKALOOSA (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-657 **
 ** PAGE 3 **

SEAM NAME LOWER FORD
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE IOWA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	11.91					
% ASH	16.69	18.95				
% VOLATILE MATTER	35.41	40.20	49.60	47.15	47.46	
% FIXED CARBON	35.98	40.85	50.40	52.85	52.54	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	10920	9619	9292
MM-FREE (PARR)	14017	11874	11359
MM-FREE (MOD.P)	13949	11564	11074
BEST MM FREE		11564	11074
NET CV, DMMF BTU/LB	13342		
ASH-FREE	13473		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	14.91	19.91
% TOTAL SULFUR	8.42	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE C BITUMINOUS (HVCB)
ASTM RANK (EQUIL. MOIST.)	SUBBITUMINOUS A (SUBA)
REFLECTANCE RANK CATEGORY	
INTERNATIONAL RANK	
AS REC'D MOIST.	710
EQUIL. MOIST.	710
REPORTED RANK	HIGH VOLATILE C BITUMINOUS (HVCB)

** PENN STATE COAL DATA BASE **

 ** PSOC-657 **
 ** PAGE 4 **

SEAM NAME LOWER FORD
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE IOWA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(25.10 %MM)
% ASH	16.69	18.95		
% CARBON	53.04	60.21	74.29	80.38
% HYDROGEN	4.44*	5.04	6.22	6.73
% NITROGEN	0.80	0.91	1.12	1.21
% SULFUR	7.42	8.42	10.39	
% CHLORINE	0.04	0.04	0.05	0.05
% OXYGEN(DIFF)	5.66*	6.43	7.94	11.63

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	3.37	1.69	3.36	8.42
DAF	4.16	2.09	4.15	10.39
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(23.02%MM)	(%MM)
% CARBON	59.93	77.84	
% HYDROGEN	4.73	6.14	
% NITROGEN	0.91	1.21	
% ORGANIC SULFUR	3.36	4.36	
% OXYGEN(DIFF)	8.06	10.43	
% CHLORINE	0.04	0.05	
% MINERAL MATTER	23.02		
(INCLUDES 6.31 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	1.005	0.947	
ATOMIC O/C	0.109	0.131	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.08		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-657 **
 ** PAGE 5 **

SEAM NAME LOWER FORD
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE IOWA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 11.80
 % HIGH TEMPERATURE ASH = 19.27 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SI02	13.80	1.24
B			AL2O3	6.60	0.67
BA	230	44	TIO2	0.34	0.04
BE	15	3	FE2O3	42.60	5.74
BI	< 20	4	MGO	0.31	0.04
CE	< 100	19	CAO	14.60	2.01
CO	< 20	4	NA2O	0.12	0.02
CR	110	21	K2O	0.54	0.09
CU	45	9	P2O5	0.17	0.01
GA	23	4	S03	20.50	1.58
GE	100	19			
LA	< 20	4			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	120	23	-----	-----	-----
NB	< 20	4	AS		
PB	460	89	BR		
RB	30	6	CD		
SC	11	2	CL		
SN	64	12	F		
SR	140	27	HG		
TH			SB		
U	19	4	SE		
V	120	23			
Y	39	8			
YB	8	2			
ZN	55	11			
ZR	120	23			

** PENN STATE COAL DATA BASE **

 ** PSOC-657 **
 ** PAGE 7 **

SEAM NAME LOWER FORD
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE IOWA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	76.4	88.8	66.7
INERTINITE (CALC.)	8.6	10.0	8.2
LIPTINITE (CALC.)	1.0	1.2	0.8
MINERAL MATTER (CALC.)	13.9		25.1

VITRINOIDS			
VITRINITE	76.4	88.8	66.7
PSEUDOVITRINITE	0.0	0.0	0.0
FUSINITE	3.9	4.5	3.8
SEMI-FUSINITE	2.9	3.4	2.7
MACRINITE	0.4	0.5	0.4
MICRINITE	1.4	1.6	1.3
SCLEROTINITE	0.0	0.0	0.0
SPORINITE			
CUTINITE			
EXINITE (ANAL.)	0.9	1.1	0.7
RESINITE	0.1	0.1	0.1
SUBERINITE			
EXUDATINITE			
FLUORINITE			
BITUMINITE			
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE			
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	0.52	0.31	0.21	0.40	
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-658 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-658
 COLLECTED BY SOUTHERN ILLINOIS UNIVERSITY
 COLLECTION DATE 3/24/77
 COLLECTOR'S NUMBER

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
 OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
 SAMPLE RESERVE

SEAM NAME UNKNOWN
 ALTERNATE SEAM NAME LOWER SEAM

TOTAL SEAM THICKNESS 3 FT. 0 IN.
 THICKNESS OF SEAM SAMPLED
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE IOWA
 COUNTY MAHASKA
 TOWNSHIP LINCOLN
 NEAREST TOWN OSKALOOSA

COAL PROVINCE INTERIOR
 COAL REGION WESTERN
 COAL FIELD

MAP REFERENCE: LATITUDE 41D 17M 50S
 LONGITUDE 92D 38M 50S
 QUADRANGLE OSKALOOSA (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-658 **
 ** PAGE 3 **

SEAM NAME UNKNOWN
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE IOWA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	7.28					
% ASH	15.15	16.34				
% VOLATILE MATTER	36.49	39.36	47.05	44.81	45.20	
% FIXED CARBON	41.07	44.30	52.95	55.19	54.80	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	11867	11003	10592
MM-FREE (PARR)	14690	13350	12732
MM-FREE (MOD.P)	14612	13037	12446
BEST MM FREE		13037	12446
NET CV, DMMF BTU/LB	14104		
ASH-FREE	14185		

MOTT-SPOONER DIFFERENCE = 213.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	10.74	13.73
% TOTAL SULFUR	7.48	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST) HIGH VOLATILE B BITUMINOUS (HVBB)
 ASTM RANK (EQUIL. MOIST.) HIGH VOLATILE C BITUMINOUS (HVCB)
 REFLECTANCE RANK CATEGORY
 INTERNATIONAL RANK
 AS REC'D MOIST. 610
 EQUIL. MOIST. 610
 REPORTED RANK

** PENN STATE COAL DATA BASE **

 ** PSOC-658 **
 ** PAGE 4 **

SEAM NAME UNKNOWN
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE IOWA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(21.76 %MM)
% ASH	15.15	16.34		
% CARBON	59.89	64.59	77.21	82.55
% HYDROGEN	4.07*	4.39	5.25	5.61
% NITROGEN	0.70	0.76	0.91	0.97
% SULFUR	6.94	7.48	8.94	
% CHLORINE	0.03	0.03	0.04	0.04
% OXYGEN(DIFF)	5.94*	6.41	7.67	10.83

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	3.08	0.53	3.87	7.48
DAF	3.68	0.63	4.63	8.94

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(19.93%MM)	(%MM)
% CARBON	64.34	80.36	
% HYDROGEN	4.12	5.14	
% NITROGEN	0.76	0.97	
% ORGANIC SULFUR	3.87	4.83	
% OXYGEN(DIFF)	6.98	8.69	
% CHLORINE	0.03	0.04	
% MINERAL MATTER	19.93		
(INCLUDES 5.76 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.816	0.768	
ATOMIC O/C	0.099	0.101	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.06		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-658 **
 ** PAGE 5 **

SEAM NAME UNKNOWN
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE IOWA

 * *
 * CHEMICAL DATA 3 *
 * *

% MOISTURE IN COAL = 8.80
 % HIGH TEMPERATURE ASH = 16.12 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	23.00	1.73
B			AL2O3	12.30	1.05
BA	370	60	TiO2	0.46	0.04
BE	20	3	FE2O3	30.50	3.44
BI	< 20	3	MGO	0.19	0.02
CE	290	47	CAO	12.60	1.45
CO	< 20	3	NA2O	0.23	0.03
CR	160	26	K2O	0.50	0.07
CU	90	15	P2O5	0.45	0.03
GA	26	4	S03	17.10	1.10
GE	76	12			
LA	110	18			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	170	27	AS		
NB	< 20	3	BR		
PB	100	16	CD		
RB	20	3	CL		
SC	22	4	F		
SN	60	10	HG		
SR	1370	221	SB		
TH			SE		
U	13	2			
V	150	24			
Y	110	18			
YB	13	2			
ZN	4200	677			
ZR	130	21			

** PENN STATE COAL DATA BASE **

 ** PSOC-658 **
 ** PAGE 7 **

SEAM NAME UNKNOWN COUNTRY U.S.A.
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB) STATE IOWA

 * *
 * PETROGRAPHIC DATA *
 * *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %
HUMINITE	59.4	67.4
INERTINITE	24.6	27.9
LIPTINITE	1.3	1.5
MINERAL MATTER(CALC.)	11.8	
TEXTINITE	0.0	0.0
ULMINITE	58.7	66.6
ATTRINITE		
DENSINITE		
HUMODETRINITE(ANAL)	1.2	1.4
GELINITE	0.7	0.8
CORPOHUMINITE	0.0	0.0
SPOKINITE		
CUTINITE		
EKINITE		1.8
RESINITE	1.3	1.5
SUBERINITE	0.0	0.0
FLUORINITE		
BITUMINITE		
ALGINITE	0.0	0.0
LIPTODETRINITE		
FUSINITE	8.7	9.9
SEMI-FUSINITE	11.9	13.5
MACRINITE	4.0	4.5
MICRINITE		
SCLEROTINITE	0.0	0.0
INERTODETRINITE		
MINERAL MATTER(ANAL.)		
HUMINITE(ANAL.)		
INERTINITE(ANAL.)		
LIPTINITE(ANAL.)		

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
ULMINITE	0.49	0.25	0.24	0.36	

** PENN STATE COAL DATA BASE **

** PSOC-664 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-664
COLLECTED BY SOUTHERN ILLINOIS UNIVERSITY
COLLECTION DATE 3/25/77
COLLECTOR'S NUMBER

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
SAMPLE RESERVE

SEAM NAME UNKNOWN
ALTERNATE SEAM NAME UPPER SEAM

TOTAL SEAM THICKNESS 3 FT. 11 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE IOWA
COUNTY MAHASKA
TOWNSHIP LINCOLN
NEAREST TOWN OSKALOOSA

COAL PROVINCE INTERIOR
COAL REGION WESTERN
COAL FIELD

MAP REFERENCE: LATITUDE 41D 17M 50S
LONGITUDE 92D 38M 50S
QUADRANGLE OSKALOOSA (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-664 **
 ** PAGE 3 **

SEAM NAME UNKNOWN
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE IOWA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	10.86					
% ASH	12.62	14.16				
% VOLATILE MATTER	36.23	40.64	47.34	45.19	45.84	
% FIXED CARBON	40.29	45.20	52.66	54.81	54.16	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	11746	10470	10087
MM-FREE (PARR)	14132	12269	11729
MM-FREE (MOD.P)	14034	11954	11439
BEST MM FREE		11954	11439
NET CV, DMMF BTU/LB	13515		
ASH-FREE	13684		

MOTT-SPOONER DIFFERENCE = 206.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	14.12	17.60
% TOTAL SULFUR	8.11	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE C BITUMINOUS (HVCB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE C BITUMINOUS (HVCB)
REFLECTANCE RANK CATEGORY	
INTERNATIONAL RANK	
AS REC'D MOIST.	710
EQUIL. MOIST.	710
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-664 **
 ** PAGE 4 **

SEAM NAME UNKNOWN COUNTRY U.S.A.
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB) STATE IOWA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR) (19.75 %MM)
% ASH	12.62	14.16		
% CARBON	56.97	63.91	74.45	79.64
% HYDROGEN	4.11*	4.61	5.37	5.74
% NITROGEN	0.94	1.06	1.23	1.32
% SULFUR	7.23	8.11	9.45	
% CHLORINE	0.03	0.03	0.04	0.04
% OXYGEN(DIFF)	7.23*	8.11	9.46	13.26

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	3.33	1.25	3.53	8.11
DAF	3.88	1.46	4.11	9.45

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P) (17.58%MM)	DMMF(DIR.) (%MM)
% CARBON	63.69	77.28	
% HYDROGEN	4.36	5.29	
% NITROGEN	1.06	1.32	
% ORGANIC SULFUR	3.53	4.28	
% OXYGEN(DIFF)	9.77	11.82	
% CHLORINE	0.03	0.04	
% MINERAL MATTER (INCLUDES 6.23 % FES2)	17.58		

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
ATOMIC H/C	0.866	0.822	
ATOMIC O/C	0.125	0.139	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.07		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-664 **
 ** PAGE 5 **

SEAM NAME UNKNOWN
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE IOWA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 4.60

% HIGH TEMPERATURE ASH = 12.89 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	7.55	0.45
B			AL2O3	8.44	0.58
BA	180	23	TiO2	0.37	0.03
BE	25	3	FE2O3	51.00	4.60
BI	< 20	3	MGO	0.46	0.04
CE	< 100	13	CAO	10.70	0.99
CO	36	5	NA2O	0.59	0.06
CR	120	15	K2O	0.54	0.06
CU	210	27	P2O5	0.08	0.00
GA	34	4	SO3	12.40	0.64
GE	60	8			
LA	21	3			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	360	46	AS		
NB	< 20	3	BR		
PB	250	32	CD		
RB	40	5	CL		
SC	19	2	F		
SN	66	9	HG		
SR	190	24	SB		
TH			SE		
U					
V	220	28			
Y	96	12			
YB	16	2			
ZN	1800	232			
ZR	110	14			

** PENN STATE COAL DATA BASE **

 ** PSOC-664 **
 ** PAGE 7 **

SEAM NAME UNKNOWN
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE IOWA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMF VOLUME %
HUMINITE	73.8	82.6
INERTINITE	13.1	14.7
LIPTINITE	0.4	0.5
MINERAL MATTER(CALC.)	10.6	
TEXTINITE	0.0	0.0
ULMINITE	72.3	80.9
ATTRINITE		
DENSINITE		
HUMODETRINITE(ANAL)	1.1	1.2
GELINITE	1.5	1.7
CORPOHUMINITE	0.0	0.0
SPORINITE		
CUTINITE		
EXINITE		1.0
RESINITE	0.4	0.5
SUBERINITE	0.0	0.0
FLUORINITE		
BITUMINITE		
ALGINITE	0.0	0.0
LIPTODETRINITE		
FUSINITE	5.9	6.6
SEMI-FUSINITE	5.9	6.6
MACRINITE	1.3	1.5
MICRINITE		
SCLEROTINITE	0.0	0.0
INERTODETRINITE		
MINERAL MATTER(ANAL.)		
HUMINITE(ANAL.)		
INERTINITE(ANAL.)		
LIPTINITE(ANAL.)		

REFLECTANCE DATA (%. IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
ULMINITE	0.54	0.34	0.20	0.41	

** PENN STATE COAL DATA BASE **

 ** PSOC-669 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-669

COLLECTED BY SOUTHERN ILLINOIS UNIVERSITY
 COLLECTION DATE 3/26/77
 COLLECTOR'S NUMBER

REPORTED RANK HIGH VOLATILE C BITUMINOUS (HVCB)

SAMPLE TYPE CHANNEL WHOLE SEAM
 OTHER SAMPLE INFORMATION
 SAMPLE RESERVE

SEAM NAME ILLINOIS #5
 ALTERNATE SEAM NAME HARRISBURG

TOTAL SEAM THICKNESS
 THICKNESS OF SEAM SAMPLED
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE ILLINOIS
 COUNTY FULTON
 TOWNSHIP FARMINGTON
 NEAREST TOWN NORRIS

COAL PROVINCE INTERIOR
 COAL REGION EASTERN
 COAL FIELD

MAP REFERENCE: LATITUDE 40D 35M 30S
 LONGITUDE 90D 2M 20S
 QUADRANGLE CANTON (15')

** PENN STATE COAL DATA BASE **

 ** PSOC-669 **
 ** PAGE 3 **

SEAM NAME ILLINOIS #5
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE ILLINOIS

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	14.32					
% ASH	10.32	12.04				
% VOLATILE MATTER	34.10	39.80	45.25	43.94	43.98	
% FIXED CARBON	41.26	48.16	54.75	56.06	56.02	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	12286	10527	9934
MM-FREE (PARR)	14248	11904	11141
MM-FREE (MOD.P)	14241	11780	11032
BEST MM FREE		11780	11032
NET CV, DMMF BTU/LB	13724		
ASH-FREE	13968		

MOTT-SPOONER DIFFERENCE = 144.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	19.14	22.55
% TOTAL SULFUR	3.86	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE C BITUMINOUS (HVCB)
ASTM RANK (EQUIL. MOIST.)	SUBBITUMINOUS A (SUBA)
REFLECTANCE RANK CATEGORY	
INTERNATIONAL RANK	
AS REC'D MOIST.	620
EQUIL. MOIST.	620
REPORTED RANK	HIGH VOLATILE C BITUMINOUS (HVCB)

** PENN STATE COAL DATA BASE **

 ** PSOC-669 **
 ** PAGE 4 **

SEAM NAME ILLINOIS #5
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE ILLINOIS

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(15.13 %MM)
% ASH	10.32	12.04		
% CARBON	58.23	67.96	77.26	80.07
% HYDROGEN	4.10*	4.79	5.45	5.64
% NITROGEN	1.07	1.25	1.42	1.47
% SULFUR	3.31	3.86	4.39	
% CHLORINE	0.02	0.03	0.03	0.03
% OXYGEN(DIFF)	8.63*	10.07	11.46	12.79

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	1.22	0.22	2.42	3.86
DAF	1.39	0.25	2.75	4.39
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(14.19%MM)	(%MM)
% CARBON	67.78	78.99	
% HYDROGEN	4.61	5.37	
% NITROGEN	1.25	1.47	
% ORGANIC SULFUR	2.42	2.82	
% OXYGEN(DIFF)	9.75	11.33	
% CHLORINE	0.03	0.03	
% MINERAL MATTER	14.19		
(INCLUDES 2.28 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	----	-----	-----
ATOMIC H/C	0.847	0.817	
ATOMIC O/C	0.120	0.126	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.05		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-669 **
 ** PAGE 5 **

SEAM NAME ILLINOIS #5
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE ILLINOIS

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 10.80
 % HIGH TEMPERATURE ASH = 12.56 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	45.00	2.64
B			AL2O3	14.10	0.94
BA	290	36	TiO2	0.74	0.06
BE	20	3	FE2O3	17.60	1.55
BI	< 20	3	MGO	0.73	0.06
CE	< 100	13	CAO	8.51	0.76
CO	< 20	3	NA2O	0.62	0.06
CR	160	20	K2O	1.79	0.19
CU	90	10	P2O5	0.12	0.01
GA	16	2	SO3	9.70	0.49
GE	160	20			
LA	< 20	3			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	160	20	AS		
NB	< 20	3	BR		
PB	170	21	CD		
RB	90	10	CL		
SC	17	2	F		
SN	45	6	HG		
SR	200	25	SB		
TH			SE		
U	11	1			
V	130	16			
Y	15	2			
YB	< 5	1			
ZN	10000	1256			
ZR	150	19			

** PENN STATE COAL DATA BASE **

 ** PSOC-669 **
 ** PAGE 7 **

SEAM NAME ILLINOIS #5
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE ILLINOIS

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	82.7	89.8	76.1
INERTINITE (CALC.)	8.7	9.4	8.7
LIPTINITE (CALC.)	0.7	0.8	0.6
MINERAL MATTER (CALC.)	7.9		15.1
VITRINIDS			
VITRINITE	82.7	89.8	76.1
PSEUDOVITRINITE	0.0	0.0	0.0
FUSINITE	4.0	4.3	4.0
SEMI-FUSINITE	2.7	2.9	2.6
MACRINITE	0.0	0.0	0.0
MICRINITE	2.0	2.2	2.0
SCLEROTINITE	0.0	0.0	0.0
SPORINITE			
CUTINITE			
EXINITE (ANAL.)	0.6	0.7	0.5
RESINITE	0.1	0.1	0.1
SUBERINITE			
EXUDATINITE			
FLUORINITE			
BITUMINITE			
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE			
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND. DEV.
VITRINITE	0.50	0.32	0.18	0.38	
PSEUDOVITRINITE					
VITRINIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-670 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-670

COLLECTED BY SOUTHERN ILLINOIS UNIVERSITY
 COLLECTION DATE 5/24/77
 COLLECTOR'S NUMBER

REPORTED RANK HIGH VOLATILE B BITUMINOUS (HVBB)

SAMPLE TYPE CHANNEL WHOLE SEAM
 OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
 SAMPLE RESERVE

SEAM NAME INDIANA #6
 ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 3 FT. 0 IN.
 THICKNESS OF SEAM SAMPLED
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE INDIANA
 COUNTY PIKE
 TOWNSHIP WASHINGTON
 NEAREST TOWN PETERSBURG

COAL PROVINCE INTERIOR
 COAL REGION EASTERN
 COAL FIELD

MAP REFERENCE: LATITUDE 38D 29M 30S
 LONGITUDE 87D 16M 40S
 QUADRANGLE PETERSBURG (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-670 **
 ** PAGE 3 **

SEAM NAME INDIANA #6
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE INDIANA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	11.95					
% ASH	11.29	12.82				
% VOLATILE MATTER	32.60	37.02	42.46	41.44	41.03	
% FIXED CARBON	44.17	50.16	57.54	58.56	58.97	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	12475	10984	10879
MM-FREE (PARR)	14539	12542	12404
MM-FREE (MOD.P)	14603	12543	12406
BEST MM FREE		12543	12406

NET CV, DMMF BTU/LB 14059
 ASH-FREE 14309

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	12.79	15.01
% TOTAL SULFUR	1.70	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE C BITUMINOUS (HVCB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE C BITUMINOUS (HVCB)
REFLECTANCE RANK CATEGORY	
INTERNATIONAL RANK	
AS REC'D MOIST.	620
EQUIL. MOIST.	620
REPORTED RANK	HIGH VOLATILE B BITUMINOUS (HVBB)

** PENN STATE COAL DATA BASE **

 ** PSOC-670 **
 ** PAGE 4 **

SEAM NAME INDIANA #6
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE INDIANA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(14.78 %MM)
% ASH	11.29	12.82		
% CARBON	61.58	69.94	80.22	82.07
% HYDROGEN	4.40*	5.00	5.74	5.87
% NITROGEN	0.00	0.00	0.00	0.00
% SULFUR	1.50	1.70	1.95	
% CHLORINE	0.02	0.02	0.02	0.02
% OXYGEN(DIFF)	9.26*	10.52	12.07	12.04

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	0.75	0.07	0.88	1.70
DAF	0.86	0.08	1.01	1.95

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(14.85%MM)	(%MM)
% CARBON	69.76	81.92	
% HYDROGEN	4.82	5.66	
% NITROGEN	0.00	0.00	
% ORGANIC SULFUR	0.88	1.03	
% OXYGEN(DIFF)	9.70	11.37	
% CHLORINE	0.02	0.02	
% MINERAL MATTER	14.85		
(INCLUDES 1.40 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.859	0.830	
ATOMIC O/C	0.110	0.122	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.04		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-670 **
 ** PAGE 5 **

SEAM NAME INDIANA #6
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE INDIANA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 9.50
 % HIGH TEMPERATURE ASH = 13.70 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	53.40	3.42
B			AL2O3	27.80	2.02
BA	490	67	TiO2	1.11	0.09
BE	30	4	FE2O3	9.75	0.93
BI	< 20	3	MGO	1.47	0.12
CE	160	22	CAO	0.82	0.08
CO	62	8	NA2O	0.44	0.04
CR	180	25	K2O	3.91	0.44
CU	260	36	P2O5	0.11	0.01
GA	32	4	SO3	0.60	0.03
GE	86	12			
LA	94	13			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	210	29	-----	-----	-----
NB	< 20	3	AS		
PB	110	15	BR		
RB	200	27	CD		
SC	40	5	CL		
SN	< 10	1	F		
SR	290	40	HG		
TH			SB		
U	< 10	1	SE		
V	260	36			
Y	45	6			
YB	6	1			
ZN	610	84			
ZR	170	23			

** PENN STATE COAL DATA BASE **

 ** PSOC-670 **
 ** PAGE 7 **

SEAM NAME INDIANA #6
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE INDIANA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %		
VITRINITE (CALC.)	84.0	91.0	77.9		
INERTINITE (CALC.)	7.3	7.9	7.4		
LIPTINITE (CALC.)	1.0	1.1	0.8		
MINERAL MATTER (CALC.)	7.7		14.8		
VITRINOIDS					
VITRINITE	82.1	89.0	76.1		
PSEUDOVITRINITE	1.8	2.0	1.7		
FUSINITE	3.1	3.4	3.2		
SEMI-FUSINITE	3.7	4.0	3.7		
MACRINITE	0.0	0.0	0.0		
MICRINITE	0.5	0.5	0.5		
SCLEROTINITE	0.0	0.0	0.0		
SPORINITE					
CUTINITE					
EXINITE (ANAL.)	1.0	1.1	0.8		
RESINITE	0.0	0.0	0.0		
SUBERINITE					
EXUDATINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0	0.0	0.0		
LIPTODETRINITE					
MINERAL MATTER(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	0.50	0.32	0.18	0.41	
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-676 **
 ** PAGE 1 **

 * * * * *
 * SAMPLE HISTORY *
 * * * * *

PENN STATE NUMBER PSOC-676

COLLECTED BY SOUTHERN ILLINOIS UNIVERSITY
 COLLECTION DATE 5/25/77
 COLLECTOR'S NUMBER

REPORTED RANK HIGH VOLATILE B BITUMINOUS (HVBB)

SAMPLE TYPE CHANNEL WHOLE SEAM
 OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
 SAMPLE RESERVE

SEAM NAME INDIANA #6
 ALTERNATE SEAM NAME LOWER MILLERSBURG

TOTAL SEAM THICKNESS 2 FT. 9 IN.
 THICKNESS OF SEAM SAMPLED
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 * * * * *
 * SAMPLE LOCATION *
 * * * * *

COUNTRY U.S.A.
 STATE INDIANA
 COUNTY WARRICK
 TOWNSHIP CAMPBELL
 NEAREST TOWN CHANDLER

COAL PROVINCE INTERIOR
 COAL REGION EASTERN
 COAL FIELD

MAP REFERENCE: LATITUDE 38D 2M 30S
 LONGITUDE 87D 22M 00S
 QUADRANGLE BOONVILLE (7.5')

*** PENN STATE COAL DATA BASE ***

 ** PSOC-676 **
 ** PAGE 3 **

SEAM NAME INDIANA #6
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE INDIANA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	9.54					
% ASH	13.07	14.45				
% VOLATILE MATTER	33.52	37.05	43.31	41.48	41.61	
% FIXED CARBON	43.87	48.50	56.69	58.52	58.39	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
-----------------------------------	-----	--------------------	------------------

MM-FREE, DIRECT			
MM-CONTAINING	11857	10726	10514
MM-FREE (PARR)	14223	12594	12296
MM-FREE (MOD.P)	14216	12464	12172
BEST MM FREE		12464	12172
NET CV, DMMF BTU/LB	13690		
ASH-FREE	13860		

MOTT-SPOONER DIFFERENCE = 98.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	11.33	13.89
% TOTAL SULFUR	5.18	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE C BITUMINOUS (HVCB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE C BITUMINOUS (HVCB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE C BITUMINOUS (HVCB)
INTERNATIONAL RANK	
AS REC'D MOIST.	710
EQUIL. MOIST.	710
REPORTED RANK	HIGH VOLATILE B BITUMINOUS (HVBB)

** PENN STATE COAL DATA BASE **

 ** PSOC-676 **
 ** PAGE 4 **

SEAM NAME INDIANA #6
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE INDIANA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	----	----	-----
				(18.45 %MM)
% ASH	13.07	14.45		
% CARBON	59.23	65.48	76.54	80.30
% HYDROGEN	4.22*	4.67	5.46	5.73
% NITROGEN	1.24	1.37	1.60	1.68
% SULFUR	4.69	5.18	6.05	
% CHLORINE	0.02	0.02	0.02	0.02
% OXYGEN(DIFF)	7.99*	8.83	10.32	12.27

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	2.82	0.44	1.92	5.18
DAF	3.30	0.51	2.24	6.05
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	----	-----	-----
		(17.66%MM)	(%MM)
% CARBON	65.26	79.26	
% HYDROGEN	4.43	5.38	
% NITROGEN	1.37	1.68	
% ORGANIC SULFUR	1.92	2.33	
% OXYGEN(DIFF)	9.36	11.35	
% CHLORINE	0.02	0.02	
% MINERAL MATTER	17.66		
(INCLUDES 5.28 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	-----	-----	-----
ATOMIC H/C	0.857	0.815	
ATOMIC O/C	0.115	0.131	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	----	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.04		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-676 **
 ** PAGE 5 **

SEAM NAME INDIANA #6
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE INDIANA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 9.40
 % HIGH TEMPERATURE ASH = 16.00 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	34.80	2.60
B			AL2O3	15.90	1.35
BA	340	54	TiO2	0.68	0.07
BE	20	3	FE2O3	31.90	3.57
BI	< 20	3	MGO	0.54	0.05
CE	< 100	16	CAO	7.24	0.83
CO	70	11	NA2O	0.55	0.07
CR	220	35	K2O	1.51	0.20
CU	130	21	P2O5	0.17	0.01
GA	31	5	SO3	8.20	0.52
GE	160	26			
LA	29	5			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	340	54	-----		-----
NB	< 20	3	AS		
PB	60	10	BR		
RB	85	14	CD		
SC	25	4	CL		
SN	33	5	F		
SR	260	42	HG		
TH			SB		
U	13	2	SE		
V	250	40			
Y	58	9			
YB	13	2			
ZN	1070	171			
ZR	230	37			

** PENN STATE COAL DATA BASE **

 ** PSOC-676 **
 ** PAGE 7 **

SEAM NAME INDIANA #6
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE INDIANA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %		
VITRINITE (CALC.)	82.9	91.9	75.3		
INERTINITE (CALC.)	6.3	7.0	6.2		
LIPTINITE (CALC.)	1.0	1.1	0.8		
MINERAL MATTER (CALC.)	9.8		18.5		
VITRINOIDS					
VITRINITE	81.3	90.2	73.9		
PSEUDOVITRINITE	1.5	1.7	1.4		
FUSINITE	1.3	1.4	1.3		
SEMI-FUSINITE	3.7	4.1	3.6		
MACRINITE	0.5	0.6	0.5		
MICRINITE	0.8	0.9	0.8		
SCLEROTINITE	0.0	0.0	0.0		
SPORINITE					
CUTINITE					
EXINITE (ANAL.)	1.0	1.1	0.8		
RESINITE	0.0	0.0	0.0		
SUBERINITE					
EXUDATINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0	0.0	0.0		
LIPTODETRINITE					
MINERAL MATTER(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	0.55	0.39	0.16	0.48	
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-682 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-682
COLLECTED BY SOUTHERN ILLINOIS UNIVERSITY
COLLECTION DATE 5/26/77
COLLECTOR'S NUMBER
REPORTED RANK HIGH VOLATILE B BITUMINOUS (HVBB)
SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
SAMPLE RESERVE
SEAM NAME INDIANA #6
ALTERNATE SEAM NAME LOWER MILLERSBURG
TOTAL SEAM THICKNESS 3 FT. 0 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE INDIANA
COUNTY WARRICK
TOWNSHIP HART
NEAREST TOWN LYNNVILLE
COAL PROVINCE INTERIOR
COAL REGION EASTERN
COAL FIELD

MAP REFERENCE: LATITUDE 38D 11M 50S
LONGITUDE 87D 18M 00S
QUADRANGLE LYNNVILLE (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-682 **
 ** PAGE 3 **

SEAM NAME INDIANA #6
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE INDIANA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	11.42					
% ASH	9.17	10.35				
% VOLATILE MATTER	32.53	36.72	40.96	39.83	39.83	
% FIXED CARBON	46.89	52.93	59.04	60.17	60.17	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
-----------------------------------	-----	--------------------	------------------

MM-FREE, DIRECT			
MM-CONTAINING	12600	11161	10907
MM-FREE (PARR)	14277	12439	12120
MM-FREE (MOD.P)	14289	12373	12057
BEST MM FREE		12373	12057
NET CV, DMMF BTU/LB	13761		
ASH-FREE	14055		

MOTT-SPOONER DIFFERENCE = 26.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	13.44	15.40
% TOTAL SULFUR	2.83	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE C BITUMINOUS (HVCB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE C BITUMINOUS (HVCB)
REFLECTANCE RANK CATEGORY	
INTERNATIONAL RANK	
AS REC'D MOIST.	620
EQUIL. MOIST.	620
REPORTED RANK	HIGH VOLATILE B BITUMINOUS (HVBB)

** PENN STATE COAL DATA BASE **

 ** PSOC-682 **
 ** PAGE 4 **

SEAM NAME INDIANA #6
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE INDIANA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(12.73 %MM)
% ASH	9.17	10.35		
% CARBON	62.28	70.31	78.43	80.57
% HYDROGEN	4.43*	5.00	5.58	5.73
% NITROGEN	1.20	1.35	1.51	1.55
% SULFUR	2.51	2.83	3.16	
% CHLORINE	0.02	0.02	0.02	0.02
% OXYGEN(DIFF)	8.98*	10.14	11.31	12.13

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	1.25	0.34	1.24	2.83
DAF	1.39	0.38	1.38	3.16

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(12.29%MM)	(%MM)
% CARBON	70.16	79.99	
% HYDROGEN	4.84	5.52	
% NITROGEN	1.35	1.55	
% ORGANIC SULFUR	1.24	1.41	
% OXYGEN(DIFF)	10.12	11.52	
% CHLORINE	0.02	0.02	
% MINERAL MATTER	12.29		
(INCLUDES 2.34 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.854	0.829	
ATOMIC O/C	0.113	0.123	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.04		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-682 **
 ** PAGE 5 **

SEAM NAME INDIANA #6
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE INDIANA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 8.00
 % HIGH TEMPERATURE ASH = 11.09 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	39.50	2.05
B			Al2O3	20.80	1.22
BA	1500	166	TiO2	0.92	0.06
BE	40	4	Fe2O3	21.20	1.64
BI	< 20	2	MgO	0.72	0.05
CE	240	27	CaO	6.74	0.53
CO	100	11	Na2O	0.27	0.02
CR	190	21	K2O	1.93	0.18
CU	170	19	P2O5	0.36	0.02
GA	50	6	SO3	6.30	0.28
GE	200	22			
LA	80	9			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	500	55	AS		
NB	< 20	2	BR		
PB	140	16	CD		
RB	100	11	CL		
SC	41	5	F		
SN	39	3	HG		
SR	1150	128	SB		
TH			SE		
U	21	2			
V	250	28			
Y	88	10			
YB	14	2			
ZN	550	61			
ZR	200	22			

** PENN STATE COAL DATA BASE **

 ** PSOC-682 **
 ** PAGE 7 **

SEAM NAME INDIANA #6
 APPARENT RANK HIGH VOLATILE C BITUMINOUS (HVCB)

COUNTRY U.S.A.
 STATE INDIANA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %		
VITRINITE (CALC.)	79.9	85.5	75.1		
INERTINITE (CALC.)	11.9	12.7	12.2		
LIPTINITE (CALC.)	1.7	1.8	1.3		
MINERAL MATTER (CALC.)	6.6		12.7		
VITRINOIDS					
VITRINITE	78.9	84.4	74.1		
PSEUDOVITRINITE	1.0	1.1	1.0		
FUSINITE	5.3	5.7	5.6		
SEMI-FUSINITE	5.6	6.0	5.7		
MACRINITE	0.5	0.5	0.5		
MICRINITE	0.5	0.5	0.5		
SCLEROTINITE	0.0	0.0	0.0		
SPORINITE					
CUTINITE					
EXINITE (ANAL.)	1.7	1.8	1.3		
RESINITE	0.0	0.0	0.0		
SUBERINITE					
EXUDATINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0	0.0	0.0		
LIPTODETRINITE					
MINERAL MATTER(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
(%, IN OIL)					
VITRINITE	0.62	0.36	0.26	0.46	
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-688 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-688

COLLECTED BY WEST VIRGINIA UNIVERSITY
COLLECTION DATE 4/15/77
COLLECTOR'S NUMBER

REPORTED RANK LOW VOLATILE BITUMINOUS (LVB)

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
SAMPLE RESERVE

SEAM NAME ELK LICK
ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 2 FT. 10 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE WEST VIRGINIA
COUNTY GRANT
TOWNSHIP
NEAREST TOWN MT. STORM

COAL PROVINCE EASTERN
COAL REGION APPALACHIAN
COAL FIELD

MAP REFERENCE: LATITUDE 39D 16M 20S
LONGITUDE 79D 12M 30S
QUADRANGLE MT. STORM (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-688 **
 ** PAGE 3 **

SEAM NAME ELK LICK
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	1.26					
% ASH	18.32	18.55				
% VOLATILE MATTER	15.95	16.15	19.83	17.30	16.51	
% FIXED CARBON	64.48	65.30	80.17	82.70	83.49	

CALORIFIC VALUE	DRY	AS REC'D MOIST.	EQUIL. MOIST.
(GROSS BTU/LB)	---	---	---

MM-FREE, DIRECT			
MM-CONTAINING	12535	12377	12298
MM-FREE (PARR)	15801	15548	15422
MM-FREE (MOD.P)	15907	15580	15454
BEST MM FREE		15580	15454
NET CV, DMMF BTU/LB	15451		
ASH-FREE	15390		

MOTT-SPOONER DIFFERENCE = 156.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	1.89	2.41
% TOTAL SULFUR	2.72	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	LOW VOLATILE BITUMINOUS (LVB)
ASTM RANK (EQUIL. MOIST.)	LOW VOLATILE BITUMINOUS (LVB)
REFLECTANCE RANK CATEGORY	LOW VOLATILE BITUMINOUS (LVB)
INTERNATIONAL RANK	
AS REC'D MOIST.	330
EQUIL. MOIST.	330
REPORTED RANK	LOW VOLATILE BITUMINOUS (LVB)

** PENN STATE COAL DATA BASE **

 ** PSOC-688 **
 ** PAGE 4 **

SEAM NAME ELK LICK
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(21.53 %MM)
% ASH	18.32	18.55		
% CARBON	70.11	71.00	87.17	90.48
% HYDROGEN	3.80*	3.85	4.73	4.91
% NITROGEN	1.22	1.24	1.52	1.58
% SULFUR	2.69	2.72	3.34	
% CHLORINE	0.03	0.03	0.04	0.04
% OXYGEN(DIFF)	2.57*	2.60	3.21	3.00

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	1.67	0.19	0.86	2.72
DAF	2.05	0.23	1.06	3.34
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(21.76%MM)	(%MM)
% CARBON	70.73	90.41	
% HYDROGEN	3.58	4.57	
% NITROGEN	1.24	1.58	
% ORGANIC SULFUR	0.86	1.10	
% OXYGEN(DIFF)	1.83	2.30	
% CHLORINE	0.03	0.04	
% MINERAL MATTER	21.76		
(INCLUDES 3.12 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.651	0.607	
ATOMIC O/C	0.025	0.024	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4,IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.07		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-688 **
 ** PAGE 5 **

SEAM NAME ELK LICK COUNTRY U.S.A.
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB) STATE WEST VIRGINIA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 0.60
 % HIGH TEMPERATURE ASH = 19.72 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	50.80	4.68
B			AL2O3	27.50	2.87
BA	770	152	TiO2	1.55	0.18
BE	7	1	FE2O3	14.50	2.00
BI	< 20	4	MGO	0.80	0.10
CE	130	26	CAO	1.15	0.16
CO	< 20	4	NA2O	0.49	0.07
CR	160	32	K2O	2.40	0.39
CU	95	19	P2O5	0.39	0.03
GA	44	9	SO3	0.82	0.06
GE	< 25	5			
LA	60	12			
LI					
MN					
MO					
NI	75	15	VOLATILES		PPM TOTAL COAL
NB	< 20	4	AS		
PB	41	8	BR		
RB	120	24	CD		
SC	30	6	CL		
SN	< 10	2	F		
SR	770	152	HG		
TH			SB		
U			SE		
V	190	37			
Y	39	8			
YB	7	1			
ZN	95	19			
ZR	230	45			

** PENN STATE COAL DATA BASE **

 ** PSOC-688 **
 ** PAGE 7 **

SEAM NAME ELK LICK
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %		DMMF VOLUME %	DRY WEIGHT %	
VITRINITE (CALC.)	81.9		92.7	72.4	
INERTINITE (CALC.)	6.4		7.3	6.0	
LIPTINITE (CALC.)	0.0		0.0	0.0	
MINERAL MATTER (CALC.)	11.7			21.5	
VITRINOIDS					
VITRINITE	78.1		88.4	69.1	
PSEUDOVITRINITE	3.8		4.3	3.4	
FUSINITE	0.6		0.7	0.6	
SEMI-FUSINITE	3.6		4.1	3.4	
MACRINITE	0.6		0.7	0.6	
MICRINITE	1.6		1.8	1.5	
SCLEROTINITE	0.0		0.0	0.0	
SPORINITE					
CUTINITE					
EXINITE (ANAL.)	0.0		0.0	0.0	
RESINITE	0.0		0.0	0.0	
SUBERINITE					
EXUDATINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0		0.0	0.0	
LIPTODETRINITE					
MINERAL MATTER(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
(%, IN OIL)	----	----	-----	-----	-----
VITRINITE	1.72	1.56	0.16	1.63	
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-694 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-694
COLLECTED BY WEST VIRGINIA UNIVERSITY
COLLECTION DATE 4/22/77
COLLECTOR'S NUMBER
REPORTED RANK MEDIUM VOLATILE BITUMINOUS (MVB)
SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION
SAMPLE RESERVE
SEAM NAME GILBERT
ALTERNATE SEAM NAME
TOTAL SEAM THICKNESS 2 FT. 7 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE WEST VIRGINIA
COUNTY RANDOLPH
TOWNSHIP
NEAREST TOWN CHEAT BRIDGE
COAL PROVINCE EASTERN
COAL REGION APPALACHIAN
COAL FIELD

MAP REFERENCE: LATITUDE 38D 34M 60S
LONGITUDE 79D 56M 10S
QUADRANGLE DURBIN (15')

** PENN STATE COAL DATA BASE **

 ** PSOC-694 **
 ** PAGE 3 **

SEAM NAME GILBERT
 APPARENT RANK MEDIUM VOLATILE BITUMINOUS (MVB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * CHEMICAL DATA I *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	1.82					
% ASH	11.31	11.52				
% VOLATILE MATTER	26.71	27.21	30.75	29.88	29.28	
% FIXED CARBON	60.15	61.27	69.25	70.12	70.72	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.

MM-FREE, DIRECT			
MM-CONTAINING	13648	13400	13350
MM-FREE (PARR)	15609	15285	15221
MM-FREE (MOD.P)	15700	15353	15289
BEST MM FREE		15353	15289
NET CV, DMMF BTU/LB	15212		
ASH-FREE	15425		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	2.18	2.50
% TOTAL SULFUR	0.54	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	MEDIUM VOLATILE BITUMINOUS (MVB)
ASTM RANK (EQUIL. MOIST.)	MEDIUM VOLATILE BITUMINOUS (MVB)
REFLECTANCE RANK CATEGORY	MEDIUM VOLATILE BITUMINOUS (MVB)
INTERNATIONAL RANK	
AS REC'D MOIST.	530
EQUIL. MOIST.	530
REPORTED RANK	MEDIUM VOLATILE BITUMINOUS (MVB)

** PENN STATE COAL DATA BASE **

 ** PSOC-694 **
 ** PAGE 4 **

SEAM NAME GILBERT
 APPARENT RANK MEDIUM VOLATILE BITUMINOUS (MVB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR) (12.74 %MM)
% ASH	11.31	11.52		
% CARBON	76.29	77.70	87.82	89.04
% HYDROGEN	4.49*	4.57	5.17	5.24
% NITROGEN	1.25	1.27	1.44	1.46
% SULFUR	0.53	0.54	0.61	
% CHLORINE	0.05	0.05	0.06	0.06
% OXYGEN(DIFF)	4.27*	4.35	4.92	4.21

SULFUR FORMS.	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	0.23	0.02	0.29	0.54
DAF	0.26	0.02	0.33	0.61
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF (MOD.P) (13.15%MM)	DMMF (DIR.) (%MM)
% CARBON	77.54	89.28	
% HYDROGEN	4.42	5.08	
% NITROGEN	1.27	1.46	
% ORGANIC SULFUR	0.29	0.33	
% OXYGEN(DIFF)	3.34	3.79	
% CHLORINE	0.05	0.06	
% MINERAL MATTER	13.15		
(INCLUDES 0.43 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
ATOMIC H/C	0.706	0.684	
ATOMIC O/C	0.036	0.037	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.10		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-694 **
 ** PAGE 5 **

SEAM NAME GILBERT
 APPARENT RANK MEDIUM VOLATILE BITUMINOUS (MVB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 0.50
 % HIGH TEMPERATURE ASH = 12.26 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SI02	54.80	3.14
B			AL2O3	30.80	2.00
BA	1240	152	TIO2	1.17	0.09
BE	18	2	FE2O3	2.62	0.22
BI	< 20	2	MGO	1.16	0.09
CE	200	25	CAO	1.72	0.15
CO	290	36	NA2O	0.36	0.03
CR	190	23	K2O	3.75	0.38
CU	240	29	P2O5	0.11	0.01
GA	78	10	S03	1.70	0.08
GE	< 25	3			
LA	110	13			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	240	29	AS		
NB	< 20	2	BR		
PB	68	8	CD		
RB	170	21	CL		
SC	41	5	F		
SN	< 10	1	HG		
SR	500	61	SB		
TH			SE		
U	11	1			
V	290	36			
Y	100	12			
YB	11	1			
ZN	210	26			
ZR	230	28			

** PENN STATE COAL DATA BASE **

 ** PSOC-694 **
 ** PAGE 7 **

SEAM NAME GILBERT
 APPARENT RANK MEDIUM VOLATILE BITUMINOUS (MVB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION COMBINED WHITE AND BLUE LIGHT

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
	-----	-----	-----
VITRINITE (CALC.)	64.6	69.1	59.6
INERTINITE (CALC.)	15.9	17.0	16.2
LIPTINITE (CALC.)	13.0	13.9	11.5
MINERAL MATTER (CALC.)	6.6		12.7
VITRINOIDS			
VITRINITE	53.9	57.7	49.8
PSEUDOVITRINITE	10.7	11.4	9.8
FUSINITE	5.2	5.6	5.6
SEMI-FUSINITE	8.1	8.7	8.1
MACRINITE	0.7	0.8	0.7
MICRINITE	1.8	1.9	1.8
SCLEROTINITE	0.0	0.0	0.0
SPORINITE	12.1	12.9	10.7
CUTINITE	0.0	0.0	0.0
EXINITE (ANAL.)			
RESINITE	0.9	1.0	0.8
SUBERINITE			
EXUDATINITE	0.0	0.0	0.0
FLUORINITE	0.0	0.0	0.0
BITUMINITE	0.0	0.0	0.0
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE	0.0	0.0	0.0
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
-----	----	----	-----	-----	-----
VITRINITE	1.25	1.03	0.22	1.13	
PSEUDOVITRINITE	1.30	1.08	0.22	1.18	
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-697 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-697
COLLECTED BY WEST VIRGINIA UNIVERSITY
COLLECTION DATE 5/27/77
COLLECTOR'S NUMBER
REPORTED RANK
SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION LITHOTYPE DATA AVAILABLE
SAMPLE RESERVE
SEAM NAME WAYNESBURG
ALTERNATE SEAM NAME
TOTAL SEAM THICKNESS 7 FT. 11 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE WEST VIRGINIA
COUNTY MONONGALIA
TOWNSHIP
NEAREST TOWN MAIDSVILLE
COAL PROVINCE EASTERN
COAL REGION APPALACHIAN
COAL FIELD

MAP REFERENCE: LATITUDE 39D 42M 00S
LONGITUDE 80D 0M 40S
QUADRANGLE OSAGE (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-697 **
 ** PAGE 3 **

SEAM NAME WAYNESBURG
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
--------------------	----------	-----	-----	----------------	------------------	------------------

WOIST.

MOIST.
 (GROSS BTU/LB)

MM-FREE, DIRECT						
MM-CONTAINING	12242	12051		12038		
MM-FREE (PARR)	15399	15095		15074		
MM-FREE (MOD.P)	15511	15149		15127		
BEST MM FREE		15149		15127		

NET CV, DMMF BTU/LB 14950
 ASH-FREE 15013

MOTT-SPOONER DIFFERENCE = 230.

ASSOCIATED ANALYSES

	DRY	MMF
% EQUILIBRIUM MOISTURE	1.67	2.12
% TOTAL SULFUR	2.51	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE A BITUMINOUS (HVAB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE A BITUMINOUS (HVAB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE A BITUMINOUS (HVAB)
INTERNATIONAL RANK	
AS REC'D MOIST.	630
EQUIL. MOIST.	630
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-697 **
 ** PAGE 4 **

SEAM NAME WAYNESBURG
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)
-----	-----	----	----	-----
				(21.32 %MM)
% ASH	18.17	18.46		
% CARBON	65.40	66.44	81.48	84.44
% HYDROGEN	4.67*	4.74	5.81	6.02
% NITROGEN	1.34	1.36	1.67	1.73
% SULFUR	2.47	2.51	3.08	
% CHLORINE	0.02	0.02	0.02	0.03
% OXYGEN (DIFF)	6.37*	6.47	7.94	7.79

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	1.70	0.05	0.76	2.51
DAF	2.08	0.06	0.93	3.08
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF (MOD.P)	DMMF (DIR.)
-----	----	-----	-----
		(21.67%MM)	(%MM)
% CARBON	66.17	84.48	
% HYDROGEN	4.47	5.70	
% NITROGEN	1.36	1.73	
% ORGANIC SULFUR	0.76	0.97	
% OXYGEN (DIFF)	5.57	7.09	
% CHLORINE	0.02	0.03	
% MINERAL MATTER	21.67		
(INCLUDES 3.18 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	-----	-----	-----
ATOMIC H/C	0.857	0.811	
ATOMIC O/C	0.069	0.081	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	----	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.04		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-697 **
 ** PAGE 5 **

SEAM NAME WAYNESBURG
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 1.40
 % HIGH TEMPERATURE ASH = 18.05 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	51.20	4.32
B			Al2O3	27.90	2.67
BA	2200	397	TiO2	1.34	0.15
BE	10	2	Fe2O3	13.80	1.74
BI	< 20	4	MgO	0.78	0.08
CE	< 100	18	CaO	0.91	0.12
CO	26	5	Na2O	0.33	0.04
CR	170	31	K2O	2.13	0.32
CU	70	13	P2O5	0.27	0.02
GA	54	10	SO3	0.45	0.03
GE	< 25	5			
LA	56	10			
I.T					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	90	16	-----		-----
NB	< 20	4	AS		
PB	< 40	7	BR		
RB	120	22	CD		
SC	28	5	CL		
SN	< 10	2	F		
SR	820	148	HG		
TH			SB		
U	< 5	1	SE		
V	220	40			
Y	54	10			
YB	9	2			
ZN	80	14			
ZR	210	38			

** PENN STATE COAL DATA BASE **

 ** PSOC-697 **
 ** PAGE 7 **

SEAM NAME WAYNESBURG
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION COMBINED WHITE AND BLUE LIGHT

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	69.3	78.4	61.4
INERTINITE (CALC.)	9.3	10.5	9.0
LIPTINITE (CALC.)	9.9	11.2	8.2
MINERAL MATTER (CALC.)	11.6		21.3
VITRINOIDS			
VITRINITE	66.9	75.6	59.2
PSEUDOVITRINITE	2.5	2.8	2.2
FUSINITE	2.0	2.3	2.1
SEMI-FUSINITE	6.1	6.9	5.8
MACRINITE	0.7	0.8	0.7
MICRINITE	0.4	0.5	0.4
SCLEROTINITE	0.0	0.0	0.0
SPORINITE	9.4	10.6	7.8
CUTINITE	0.0	0.0	0.0
EXINITE (ANAL.)			
RESINITE	0.5	0.6	0.4
SUBERINITE			
EXUDATINITE	0.0	0.0	0.0
FLUORINITE	0.0	0.0	0.0
BITUMINITE	0.0	0.0	0.0
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE	0.0	0.0	0.0
MINERAL MATTER (ANAL.)			
INERTINITE (ANAL.)			
LIPTINITE (ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND. DEV.
VITRINITE	0.88	0.65	0.23	0.77	
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-702 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-702
COLLECTED BY WEST VIRGINIA UNIVERSITY
COLLECTION DATE 6/ 2/77
COLLECTOR'S NUMBER

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
SAMPLE RESERVE

SEAM NAME PITTSBURGH
ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 4 FT. 4 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE WEST VIRGINIA
COUNTY BRAXTON
TOWNSHIP
NEAREST TOWN BURNSVILLE

COAL PROVINCE EASTERN
COAL REGION APPALACHIAN
COAL FIELD

MAP REFERENCE: LATITUDE 38D 50M 50S
LONGITUDE 80D 42M 20S
QUADRANGLE BURNSVILLE (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-702 **
 ** PAGE 3 **

SEAM NAME PITTSBURGH COUNTRY U.S.A.
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB) STATE WEST VIRGINIA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	2.18					
% ASH	6.66	6.81				
% VOLATILE MATTER	39.19	40.06	42.99	42.17	42.36	
% FIXED CARBON	51.97	53.13	57.01	57.83	57.64	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	13989	13684	13509
MM-FREE (PARR)	15197	14834	14627
MM-FREE (MOD.P)	15193	14782	14576
BEST MM FREE		14782	14576
NET CV, DMMF BTU/LB	14664		
ASH-FREE	15011		

MOTT-SPOONER DIFFERENCE = 120.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	3.43	3.76
% TOTAL SULFUR	2.68	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE A BITUMINOUS (HVAB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE A BITUMINOUS (HVAB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE A BITUMINOUS (HVAB)
INTERNATIONAL RANK	
AS REC'D MOIST.	630
EQUIL. MOIST.	630
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-702 **
 ** PAGE 4 **

SEAM NAME PITTSBURGH
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(8.83 %MM)
% ASH	6.66	6.81		
% CARBON	75.35	77.03	82.66	84.49
% HYDROGEN	5.10*	5.21	5.59	5.71
% NITROGEN	1.17	1.20	1.29	1.32
% SULFUR	2.62	2.68	2.88	
% CHLORINE	0.03	0.03	0.04	0.04
% OXYGEN(DIFF)	6.88*	7.04	7.55	8.44

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	1.83	0.12	0.73	2.68
DAF	1.96	0.13	0.78	2.88
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(8.57%MM)	(%MM)
% CARBON	76.92	84.14	
% HYDROGEN	5.08	5.56	
% NITROGEN	1.20	1.32	
% ORGANIC SULFUR	0.73	0.80	
% OXYGEN(DIFF)	7.49	8.15	
% CHLORINE	0.03	0.04	
% MINERAL MATTER	8.57		
(INCLUDES 3.42 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.812	0.794	
ATOMIC O/C	0.075	0.080	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.07		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-702 **
 ** PAGE 5 **

SEAM NAME PITTSBURGH COUNTRY U.S.A.
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB) STATE WEST VIRGINIA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 2.25
 % HIGH TEMPERATURE ASH = 7.06 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SI02	23.50	0.78
B			AL203	18.70	0.70
BA	1600	113	TIO2	0.78	0.03
BE	14	1	FE203	45.60	2.25
BI	< 20	1	MGO	0.85	0.04
CE	< 100	7	CA0	4.67	0.24
CO	160	11	NA2O	0.32	0.02
CR	250	18	K2O	0.84	0.05
CU	85	6	P2O5	0.61	0.02
GA	34	2	S03	5.10	0.14
GE	< 25	2			
LA	28	2			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	300	21	AS		
NB	< 20	1	BR		
PB	120	8	CD		
RB	35	2	CL		
SC	16	1	F		
SN	45	3	HG		
SR	1650	116	SB		
TH			SE		
U	< 4	0			
V	140	10			
Y	54	4			
YB	12	1			
ZN	240	17			
ZR	170	12			

** PENN STATE COAL DATA BASE **

 ** PSOC-702 **
 ** PAGE 7 **

SEAM NAME PITTSBURGH
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %		
VITRINITE (CALC.)	87.5	91.6	84.5		
INERTINITE (CALC.)	6.0	6.3	6.4		
LIPTINITE (CALC.)	2.0	2.1	1.8		
MINERAL MATTER (CALC.)	4.5		8.8		
VITRINOIDS					
VITRINITE	79.8	83.5	77.1		
PSEUDOVITRINITE	7.7	8.1	7.5		
FUSINITE	1.3	1.4	1.5		
SEMI-FUSINITE	3.6	3.8	3.8		
MACRINITE	0.1	0.1	0.1		
MICRINITE	1.0	1.0	1.0		
SCLEROTINITE	0.0	0.0	0.0		
SPORINITE					
CUTINITE					
EXINITE (ANAL.)	1.7	1.8	1.6		
RESINITE	0.3	0.3	0.3		
SUBERINITE					
EXUDATINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0	0.0	0.0		
LIPTODETRINITE					
MINERAL MATTER(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA					
(%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	0.90	0.73	0.17	0.82	
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-708 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-708
COLLECTED BY WEST VIRGINIA UNIVERSITY
COLLECTION DATE 6/10/77
COLLECTOR'S NUMBER

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
SAMPLE RESERVE

SEAM NAME REDSTONE
ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 4 FT. 9 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE WEST VIRGINIA
COUNTY BARBOUR
TOWNSHIP
NEAREST TOWN ELK CITY

COAL PROVINCE EASTERN
COAL REGION APPALACHIAN
COAL FIELD

MAP REFERENCE: LATITUDE 39D 10M 00S
LONGITUDE 80D 11M 30S
QUADRANGLE BROWNTON (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-708 **
 ** PAGE 3 **

SEAM NAME REDSTONE COUNTRY U.S.A.
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB) STATE WEST VIRGINIA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	2.07					
% ASH	5.32	5.43				
% VOLATILE MATTER	34.28	35.00	37.01	36.55	36.53	
% FIXED CARBON	58.34	59.57	62.99	63.45	63.47	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	14616	14313	13855
MM-FREE (PARR)	15557	15214	14695
MM-FREE (MOD.P)	15574	15190	14672
BEST MM FREE		15190	14672
NET CV, DMMF BTU/LB	15023		
ASH-FREE	15455		

MOTT-SPOONER DIFFERENCE = 49.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	5.21	5.56
% TOTAL SULFUR	0.80	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE A BITUMINOUS (HVAB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE A BITUMINOUS (HVAB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE A BITUMINOUS (HVAB)
INTERNATIONAL RANK	
AS REC'D MOIST.	630
EQUIL. MOIST.	630
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-708 **
 ** PAGE 4 **

SEAM NAME REDSTONE
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR) (6.30 %MM)
% ASH	5.32	5.43		
% CARBON	78.41	80.07	84.67	85.46
% HYDROGEN	5.46*	5.58	5.90	5.96
% NITROGEN	1.41	1.44	1.52	1.54
% SULFUR	0.78	0.80	0.85	
% CHLORINE	0.02	0.02	0.02	0.02
% OXYGEN(DIFF)	6.52*	6.66	7.04	7.03

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	0.06	0.00	0.74	0.80
DAF	0.06	0.00	0.78	0.85
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P) (6.17%MM)	DMMF(DIR.) (%MM)
% CARBON	79.99	85.26	
% HYDROGEN	5.51	5.87	
% NITROGEN	1.44	1.54	
% ORGANIC SULFUR	0.74	0.79	
% OXYGEN(DIFF)	6.14	6.53	
% CHLORINE	0.02	0.02	
% MINERAL MATTER (INCLUDES 0.11 % FES2)	6.17		

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
ATOMIC H/C	0.837	0.827	
ATOMIC O/C	0.062	0.061	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO4,IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.04		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-708 **
 ** PAGE 5 **

SEAM NAME REDSTONE
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 2.36
 % HIGH TEMPERATURE ASH = 5.63 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	41.20	1.08
B			Al2O3	31.50	0.94
BA	1500	84	TiO2	1.24	0.04
BE	7	0	Fe2O3	6.80	0.27
BI	< 20	1	MgO	1.38	0.05
CE	150	8	CaO	7.31	0.29
CO	40	2	Na2O	0.24	0.01
CR	160	9	K2O	1.61	0.08
CU	100	6	P2O5	0.53	0.01
GA	54	3	SO3	7.30	0.16
GE	< 25	1			
LA	52	3			
LI					
MN					
MO					
NI	70	4	VOLATILES		
NB	< 20	1	AS		
PB	70	4	BR		
RB	70	4	CD		
SC	27	2	CL		
SN	16	1	F		
SR	1200	68	HG		
TH			SB		
U	< 4	0	SE		
V	200	11			
Y	60	3			
YB	7	0			
ZN	120	7			
ZR	200	11			

** PENN STATE COAL DATA BASE **

 ** PSOC-708 **
 ** PAGE 7 **

SEAM NAME REDSTONE
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	90.5	93.4	87.9
INERTINITE (CALC.)	5.4	5.6	5.8
LIPTINITE (CALC.)	1.0	1.0	0.9
MINERAL MATTER (CALC.)	3.1		6.3
VITRINOIDS			
VITRINITE	80.1	82.7	77.9
PSEUDOVITRINITE	10.4	10.7	10.1
FUSINITE	1.2	1.2	1.3
SEMI-FUSINITE	2.8	2.9	2.9
MACRINITE	0.1	0.1	0.1
MICRINITE	1.4	1.4	1.4
SCLEROTINITE	0.0	0.0	0.0
SPORINITE			
CUTINITE			
EXINITE (ANAL.)	1.0	1.0	0.9
RESINITE	0.0	0.0	0.0
SUBERINITE			
EXUDATINITE			
FLUORINITE			
BITUMINITE			
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE			
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	1.04	0.89	0.15	0.94	
PSEUDOVITRINITE	1.08	0.96	0.12	1.01	
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-714 **
 ** PAGE 1 **

 *
 * SAMPLE HISTORY *
 *

PENN STATE NUMBER PSOC-714
 COLLECTED BY WEST VIRGINIA UNIVERSITY
 COLLECTION DATE 6/13/77
 COLLECTOR'S NUMBER
 REPORTED RANK
 SAMPLE TYPE CHANNEL WHOLE SEAM
 OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
 SAMPLE RESERVE
 SEAM NAME REDSTONE
 ALTERNATE SEAM NAME
 TOTAL SEAM THICKNESS 4 FT. 2 IN.
 THICKNESS OF SEAM SAMPLED
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 *
 * SAMPLE LOCATION *
 *

COUNTRY U.S.A.
 STATE WEST VIRGINIA
 COUNTY LEWIS
 TOWNSHIP
 NEAREST TOWN CAMDEN
 COAL PROVINCE EASTERN
 COAL REGION APPALACHIAN
 COAL FIELD

MAP REFERENCE: LATITUDE 39D 2M 30S
 LONGITUDE 80D 36M 00S
 QUADRANGLE CAMDEN (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-714 **
 ** PAGE 3 **

SEAM NAME REDSTONE
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	2.23					
% ASH	6.95	7.11				
% VOLATILE MATTER	39.01	39.90	42.95	42.15	42.30	
% FIXED CARBON	51.81	52.99	57.05	57.85	57.70	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	13818	13510	13477
MM-FREE (PARR)	15057	14688	14649
MM-FREE (MOD.P)	15049	14610	14571
BEST MM FREE		14610	14571
NET CV, DMMF BTU/LB	14511		
ASH-FREE	14876		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	2.47	2.72
% TOTAL SULFUR	2.51	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE A BITUMINOUS (HVAB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE A BITUMINOUS (HVAB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE A BITUMINOUS (HVAB)
INTERNATIONAL RANK	
AS REC'D MOIST.	630
EQUIL. MOIST.	630
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-714 **
 ** PAGE 4 **

SEAM NAME REDSTONE
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR) (9.06 %MM)
% ASH	6.95	7.11		
% CARBON	75.00	76.71	82.58	84.35
% HYDROGEN	5.18*	5.30	5.71	5.83
% NITROGEN	1.06	1.08	1.16	1.19
% SULFUR	2.45	2.51	2.70	
% CHLORINE	0.01	0.01	0.02	0.02
% OXYGEN(DIFF)	7.11*	7.27	7.83	8.62

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	1.25	0.06	1.20	2.51
DAF	1.35	0.06	1.29	2.70
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P) (8.63%MM)	DMMF(DIR.) (%MM)
% CARBON	76.60	83.84	
% HYDROGEN	5.18	5.67	
% NITROGEN	1.08	1.19	
% ORGANIC SULFUR	1.20	1.31	
% OXYGEN(DIFF)	7.30	7.98	
% CHLORINE	0.01	0.02	
% MINERAL MATTER (INCLUDES 2.34 % FES2)	8.63		

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
ATOMIC H/C	0.830	0.813	
ATOMIC O/C	0.077	0.078	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.03		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-714 **
 ** PAGE 5 **

SEAM NAME REDSTONE
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 2.28
 % HIGH TEMPERATURE ASH = 8.29 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	18.30	0.71
B			AL2O3	15.50	0.68
BA	1300	108	TiO2	0.60	0.03
BE	8	1	FE2O3	28.20	1.64
BI	< 20	2	MGO	0.85	0.04
CE	< 100	8	CAO	17.00	1.01
CO	< 20	2	NA2O	0.16	0.01
CR	110	9	K2O	0.84	0.06
CU	45	4	P2O5	0.08	0.00
GA	21	2	SO3	18.20	0.60
GE	< 25	2			
LA	< 20	2			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	70	6	AS		
NB	< 20	2	BR		
PB	110	9	CD		
RB	35	3	CL		
SC	11	1	F		
SN	46	4	HG		
SR	990	82	SB		
TH			SE		
U	< 2	0			
V	120	10			
Y	36	3			
YB	8	1			
ZN	90	7			
ZR	150	12			

** PENN STATE COAL DATA BASE **

 ** PSOC-714 **
 ** PAGE 7 **

SEAM NAME REDSTONE
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	89.3	93.6	86.4
INERTINITE (CALC.)	4.4	4.6	4.6
LIPTINITE (CALC.)	1.7	1.8	1.6
MINERAL MATTER (CALC.)	4.6		9.1
VITRINOIDS			
VITRINITE	77.0	80.7	74.5
PSEUDOVITRINITE	12.3	12.9	11.9
FUSINITE	0.2	0.2	0.2
SEMI-FUSINITE	2.7	2.8	2.8
MACRINITE	0.2	0.2	0.2
MICRINITE	1.3	1.4	1.4
SCLEROTINITE	0.0	0.0	0.0
SPORINITE			
CUTINITE			
EXINITE (ANAL.)	1.7	1.8	1.6
RESINITE	0.0	0.0	0.0
SUBERINITE			
EXUDATINITE			
FLUORINITE			
BITUMINITE			
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE			
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	0.83	0.67	0.16	0.74	
PSEUDOVITRINITE	0.87	0.73	0.14	0.79	
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-720 **
** PAGE 1 **

* * * * *
* SAMPLE HISTORY *
* * * * *

PENN STATE NUMBER PSOC-720

COLLECTED BY WEST VIRGINIA UNIVERSITY
COLLECTION DATE 6/14/77
COLLECTOR'S NUMBER

REPORTED RANK MEDIUM VOLATILE BITUMINOUS (MVB)

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
SAMPLE RESERVE

SEAM NAME UPPER KITTANNING
ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 3 FT. 0 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

* * * * *
* SAMPLE LOCATION *
* * * * *

COUNTRY U.S.A.
STATE WEST VIRGINIA
COUNTY PRESTON
TOWNSHIP
NEAREST TOWN CUZZART

COAL PROVINCE EASTERN
COAL REGION APPALACHIAN
COAL FIELD

MAP REFERENCE: LATITUDE 39D 37M 00S
LONGITUDE 79D 32M 10S
QUADRANGLE CUZZART (7.5')

** PENN STATE COAL DATA BASE **

 ** PSOC-720 **
 ** PAGE 3 **

SEAM NAME UPPER KITTANNING
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	2.15					
% ASH	11.01	11.25				
% VOLATILE MATTER	36.35	37.15	41.86	40.80	40.61	
% FIXED CARBON	50.49	51.60	58.14	59.20	59.39	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	13845	13547	13496
MM-FREE (PARR)	15859	15466	15399
MM-FREE (MOD.P)	15898	15449	15382
BEST MM FREE		15449	15382
NET CV, DMMF BTU/LB	15405		
ASH-FREE	15600		

MOTT-SPOONER DIFFERENCE = 237.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	2.52	2.91
% TOTAL SULFUR	2.33	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE A BITUMINOUS (HVAB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE A BITUMINOUS (HVAB)
REFLECTANCE RANK CATEGORY	MEDIUM VOLATILE BITUMINOUS (MVB)
INTERNATIONAL RANK	
AS REC'D MOIST.	630
EQUIL. MOIST.	630
REPORTED RANK	MEDIUM VOLATILE BITUMINOUS (MVB)

** PENN STATE COAL DATA BASE **

 ** PSOC-720 **
 ** PAGE 4 **

SEAM NAME UPPER KITTANNING
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(13.43 %MM)
% ASH	11.01	11.25		
% CARBON	74.97	76.62	86.33	88.51
% HYDROGEN	4.51*	4.61	5.19	5.33
% NITROGEN	1.30	1.33	1.50	1.54
% SULFUR	2.28	2.33	2.63	
% CHLORINE	0.04	0.04	0.05	0.05
% OXYGEN(DIFF)	3.74*	3.82	4.31	4.59

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	1.41	0.11	0.81	2.33
DAF	1.59	0.12	0.91	2.63
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(13.40%MM)	(%MM)
% CARBON	76.45	88.28	
% HYDROGEN	4.44	5.12	
% NITROGEN	1.33	1.54	
% ORGANIC SULFUR	0.81	0.94	
% OXYGEN(DIFF)	3.57	4.09	
% CHLORINE	0.04	0.05	
% MINERAL MATTER	13.40		
(INCLUDES 2.64 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.723	0.697	
ATOMIC O/C	0.039	0.040	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4,IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.08		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-720 **
 ** PAGE 5 **

SEAM NAME UPPER KITTANNING
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 0.65
 % HIGH TEMPERATURE ASH = 12.38 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	35.20	2.04
B			AL2O3	28.50	1.87
BA	420	52	TiO2	1.61	0.12
BE	16	2	FE2O3	27.50	2.38
BI	< 20	2	MGO	0.37	0.03
CE	250	31	CAO	1.95	0.17
CO	250	31	NA2O	0.14	0.01
CR	240	30	K2O	0.79	0.08
CU	130	16	P2O5	0.68	0.04
GA	60	7	SO3	1.90	0.09
GE	< 25	3			
LA	240	30			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	230	28	AS		
NB	< 20	2	BR		
PB	120	15	CD		
RB	25	3	CL		
SC	36	4	F		
SN	24	3	HG		
SR	1150	142	SB		
TH			SE		
U	< 10	1			
V	230	28			
Y	160	20			
YB	15	2			
ZN	250	31			
ZR	250	31			

** PENN STATE COAL DATA BASE **

 ** PSOC-720 **
 ** PAGE 7 **

SEAM NAME UPPER KITTANNING
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	84.9	91.3	78.9
INERTINITE (CALC.)	7.5	8.1	7.7
LIPTINITE (CALC.)	0.6	0.6	0.5
MINERAL MATTER (CALC.)	7.0		13.4
VITRINOIDS			
VITRINITE	81.0	87.1	75.3
PSEUDOVITRINITE	3.9	4.2	3.6
FUSINITE	1.7	1.8	1.8
SEMI-FUSINITE	2.4	2.6	2.4
MACRINITE	0.3	0.3	0.3
MICRINITE	3.2	3.4	3.2
SCLEROTINITE	0.0	0.0	0.0
SPORINITE			
CUTINITE			
EXINITE (ANAL.)	0.6	0.6	0.5
RESINITE	0.0	0.0	0.0
SUBERINITE			
EXUDATINITE			
FLUORINITE			
BITUMINITE			
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE			
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	1.23	1.07	0.16	1.14	
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-726 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-726
COLLECTED BY WEST VIRGINIA UNIVERSITY
COLLECTION DATE 6/15/77
COLLECTOR'S NUMBER

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
SAMPLE RESERVE

SEAM NAME SEWELL "B"
ALTERNATE SEAM NAME UPPER SEWELL

TOTAL SEAM THICKNESS
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE WEST VIRGINIA
COUNTY RANDOLPH
TOWNSHIP
NEAREST TOWN MONTERVILLE
COAL PROVINCE EASTERN
COAL REGION APPALACHIAN
COAL FIELD

MAP REFERENCE: LATITUDE 38D 34M 50S
LONGITUDE 80D 6M 50S
QUADRANGLE PICKEN (15')

** PENN STATE COAL DATA BASE **

 ** PS0C-726 **
 ** PAGE 3 **

SEAM NAME SEWELL "B"
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	1.71					
% ASH	4.50	4.58				
% VOLATILE MATTER	30.30	30.83	32.31	31.91	31.89	
% FIXED CARBON	63.49	64.59	67.69	68.09	68.11	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.

MM-FREE, DIRECT			
MM-CONTAINING	15035	14778	14745
MM-FREE (PARR)	15840	15554	15518
MM-FREE (MOD.P)	15865	15568	15531
BEST MM FREE		15568	15531
NET CV, DMMF BTU/LB	15366		
ASH-FREE	15757		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	1.93	2.04
% TOTAL SULFUR	0.58	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE A BITUMINOUS (HVAB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE A BITUMINOUS (HVAB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE A BITUMINOUS (HVAB)
INTERNATIONAL RANK	
AS REC'D MOIST.	530
EQUIL. MOIST.	530
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-726 **
 ** PAGE 4 **

SEAM NAME SEWELL "B"
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR) (5.27 %MM)
% ASH	4.50	4.58		
% CARBON	82.92	84.36	88.41	89.05
% HYDROGEN	5.01*	5.10	5.34	5.38
% NITROGEN	1.30	1.32	1.38	1.39
% SULFUR	0.57	0.58	0.61	
% CHLORINE	0.02	0.02	0.02	0.02
% OXYGEN(DIFF)	3.97*	4.04	4.23	4.15

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	0.38	0.02	0.18	0.58
DAF	0.40	0.02	0.19	0.61
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P) (5.36%MM)	DMMF(DIR.) (5.36%MM)
% CARBON	84.39	89.07	
% HYDROGEN	5.03	5.32	
% NITROGEN	1.32	1.39	
% ORGANIC SULFUR	0.18	0.19	
% OXYGEN(DIFF)	3.81	4.01	
% CHLORINE	0.02	0.02	
% MINERAL MATTER (INCLUDES 0.71 % FES2)	5.36		

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
ATOMIC H/C	0.726	0.717	
ATOMIC O/C	0.035	0.036	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.04		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-726 **
 ** PAGE 5 **

SEAM NAME SEWELL "B"
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 0.34

% HIGH TEMPERATURE ASH = 5.32 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	45.30	1.13
B			AL2O3	40.20	1.13
BA	3950	210	TiO2	1.09	0.03
BE	25	1	FE2O3	3.69	0.14
BI	< 20	1	MGO	0.55	0.02
CE	520	28	CAO	2.09	0.08
CO	360	19	NA2O	1.23	0.05
CR	210	11	K2O	0.75	0.03
CU	330	18	P2O5	1.45	0.03
GA	50	3	SO3	1.40	0.03
GE	< 25	1			
LA	260	14			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	310	16	AS		
NB	< 20	1	BR		
PB	100	5	CD		
RB	35	2	CL		
SC	56	3	F		
SN	16	1	HG		
SR	3350	178	SB		
TH			SE		
U	< 6	0			
V	280	15			
Y	190	10			
YB	15	1			
ZN	110	6			
ZR	160	9			

** PENN STATE COAL DATA BASE **

 ** PSOC-726 **
 ** PAGE 7 **

SEAM NAME SEWELL "B"
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION COMBINED WHITE AND BLUE LIGHT

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	51.9	53.3	49.5
INERTINITE (CALC.)	31.0	31.8	32.2
LIPTINITE (CALC.)	14.4	14.8	12.9
MINERAL MATTER (CALC.)	2.6		5.3
VITRINOIDS			
VITRINITE	49.8	51.1	47.5
PSEUDOVITRINITE	2.1	2.2	2.0
FUSINITE	5.5	5.6	6.0
SEMI-FUSINITE	16.1	16.5	16.5
MACRINITE	1.7	1.7	1.7
MICRINITE	7.8	8.0	8.0
SCLEROTINITE	0.0	0.0	0.0
SPORINITE	13.4	13.8	12.0
CUTINITE	0.0	0.0	0.0
EXINITE (ANAL.)			
RESINITE	1.0	1.0	0.9
SUBERINITE			
EXUDATINITE	0.0	0.0	0.0
FLUORINITE	0.0	0.0	0.0
BITUMINITE	0.0	0.0	0.0
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE	0.0	0.0	0.0
MINERAL MATTER (ANAL.)			
INERTINITE (ANAL.)			
LIPTINITE (ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND. DEV.
VITRINITE	1.07	0.92	0.15	0.99	0.03
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-732 **
 ** PAGE 1 **

 * *
 * SAMPLE HISTORY *
 * *

PENN STATE NUMBER PSOC-732
 COLLECTED BY WEST VIRGINIA UNIVERSITY
 COLLECTION DATE 6/15/77
 COLLECTOR'S NUMBER

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
 OTHER SAMPLE INFORMATION LITHOTYPE DATA AVAILABLE
 SAMPLE RESERVE

SEAM NAME UPPER KITTANNING
 ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 5 FT. 5 IN.
 THICKNESS OF SEAM SAMPLED
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 * *
 * SAMPLE LOCATION *
 * *

COUNTRY U.S.A.
 STATE WEST VIRGINIA
 COUNTY WEBSTER
 TOWNSHIP
 NEAREST TOWN ARCOLA

COAL PROVINCE EASTERN
 COAL REGION APPALACHIAN
 COAL FIELD

MAP REFERENCE: LATITUDE 38D 29M 30S
 LONGITUDE 80D 30M 20S
 QUADRANGLE COWEN (7.5')

** PENN STATE COAL DATA BASE **

 ** PS0C-732 **
 ** PAGE 3 **

SEAM NAME UPPER KITTANNING
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	2.11					
% ASH	18.33	18.73				
% VOLATILE MATTER	26.29	26.86	33.05	31.59	30.37	
% FIXED CARBON	53.26	54.41	66.95	68.41	69.63	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	12096	11841	11736
MM-FREE (PARR)	15194	14792	14628
MM-FREE (MOD.P)	15352	14911	14744
BEST MM FREE		14911	14744
NET CV, DMMF BTU/LB	14855		
ASH-FREE	14884		

MOTT-SPOONER DIFFERENCE = 232.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	2.98	3.75
% TOTAL SULFUR	0.73	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE A BITUMINOUS (HVAB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE A BITUMINOUS (HVAB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE A BITUMINOUS (HVAB)
INTERNATIONAL RANK	
AS REC'D MOIST.	610
EQUIL. MOIST.	610
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-732 **
 ** PAGE 4 **

SEAM NAME UPPER KITTANNING
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)
-----	-----	---	---	-----
				(20.63 %MM)
% ASH	18.33	18.73		
% CARBON	66.60	68.04	83.72	85.72
% HYDROGEN	4.13*	4.22	5.19	5.32
% NITROGEN	1.12	1.14	1.40	1.44
% SULFUR	0.71	0.73	0.90	
% CHLORINE	0.02	0.03	0.03	0.03
% OXYGEN (DIFF)	6.96*	7.12	8.76	7.50

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	0.26	0.03	0.44	0.73
DAF	0.32	0.04	0.54	0.90

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF (MOD.P)	DMMF (DIR.)
-----	---	-----	-----
		(21.30 %MM)	(%MM)
% CARBON	67.78	86.12	
% HYDROGEN	3.97	5.05	
% NITROGEN	1.14	1.44	
% ORGANIC SULFUR	0.44	0.56	
% OXYGEN (DIFF)	5.37	6.80	
% CHLORINE	0.03	0.03	
% MINERAL MATTER	21.30		
(INCLUDES 0.49 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD. PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.745	0.704	
ATOMIC O/C	0.066	0.075	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.05		

INFRA-RED ANALYSIS

(*) - EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-732 **
 ** PAGE 5 **

SEAM NAME UPPER KITTANNING
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 1.20
 % HIGH TEMPERATURE ASH = 19.94 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG	< 1	0	SiO2	61.00	5.69
B			Al2O3	26.80	2.83
BA	510	102	TiO2	1.99	0.24
BE	10	2	Fe2O3	3.23	0.45
BI	< 20	4	MgO	0.62	0.07
CE	170	34	CaO	0.54	0.08
CO	< 20	4	Na2O	0.22	0.03
CR	190	38	K2O	1.97	0.33
CU	110	22	P2O5	0.28	0.02
GA	50	10	S03	0.40	0.03
GE	< 25	5			
LA	120	24			
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	65	13	AS		
NB	< 20	4	BR		
PB	96	19	CD		
RB	95	19	CL		
SC	40	8	F		
SN	< 10	2	HG		
SR	760	152	SB		
TH			SE		
U					
V	170	34			
Y	80	16			
YB	9	2			
ZN	65	13			
ZR	300	60			

** PENN STATE COAL DATA BASE **

 ** PSOC-732 **
 ** PAGE 7 **

SEAM NAME UPPER KITTANNING
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE WEST VIRGINIA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION COMBINED WHITE AND BLUE LIGHT

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %		
VITRINITE (CALC.)	45.8	51.5	39.9		
INERTINITE (CALC.)	33.9	38.1	31.9		
LIPTINITE (CALC.)	9.2	10.3	7.5		
MINERAL MATTER (CALC.)	11.1		20.6		
VITRINOIDS					
VITRINITE	41.4	46.6	36.1		
PSEUDOVITRINITE	4.4	4.9	3.8		
FUSINITE	2.0	2.2	2.0		
SEMI-FUSINITE	25.0	28.1	23.5		
MACRINITE	1.4	1.6	1.3		
MICRINITE	5.5	6.2	5.2		
SCLEROTINITE	0.0	0.0	0.0		
SPORINITE	9.1	10.2	7.4		
CUTINITE	0.0	0.0	0.0		
EXINITE (ANAL.)					
RESINITE	0.1	0.1	0.1		
SUBERINITE					
EXUDATINITE	0.0	0.0	0.0		
FLUORINITE	0.0	0.0	0.0		
BITUMINITE	0.0	0.0	0.0		
ALGINITE	0.0	0.0	0.0		
LIPTODETRINITE	0.0	0.0	0.0		
MINERAL MATTER (ANAL.)					
INERTINITE (ANAL.)					
LIPTINITE (ANAL.)					
REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND. DEV.
VITRINITE	1.03	0.87	0.16	0.95	0.04
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-740 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-740
COLLECTED BY SOUTHERN ILLINOIS UNIVERSITY
COLLECTION DATE 6/ 9/77
COLLECTOR'S NUMBER
REPORTED RANK HIGH VOLATILE A BITUMINOUS (HVAB)
SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
SAMPLE RESERVE
SEAM NAME KENTUCKY #12
ALTERNATE SEAM NAME
TOTAL SEAM THICKNESS 4 FT. 9 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE KENTUCKY
COUNTY MUHLENBERG
TOWNSHIP
NEAREST TOWN GRAHAM
COAL PROVINCE INTERIOR
COAL REGION EASTERN
COAL FIELD

MAP REFERENCE: LATITUDE 37D 17M 30S
LONGITUDE 87D 16M 10S
QUADRANGLE MILLPORT (7.5')

** PENN STATE COAL DATA BASE **

 ** PS0C-740 **
 ** PAGE 3 **

SEAM NAME KENTUCKY #12
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	6.40					
% ASH	19.23	20.54				
% VOLATILE MATTER	32.45	34.67	43.63	41.43	40.94	
% FIXED CARBON	41.92	44.79	56.37	58.57	59.06	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	11614	10871	10789
MM-FREE (PARR)	15120	13861	13726
MM-FREE (MOD.P)	15176	13767	13634
BEST MM FREE		13767	13634
NET CV, DMMF BTU/LB	14643		
ASH-FREE	14616		

MOTT-SPOONER DIFFERENCE = 449.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	7.10	9.43
% TOTAL SULFUR	4.57	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE B BITUMINOUS (HVBB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE B BITUMINOUS (HVBB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE C BITUMINOUS (HVCB)
INTERNATIONAL RANK	
AS REC'D MOIST.	630
EQUIL. MOIST.	630
REPORTED RANK	HIGH VOLATILE A BITUMINOUS (HVAB)

** PENN STATE COAL DATA BASE **

 ** PSOC-740 **
 ** PAGE 4 **

SEAM NAME KENTUCKY #12
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(24.70 %MM)
% ASH	19.23	20.54		
% CARBON	58.49	62.49	78.64	82.98
% HYDROGEN	4.07*	4.35	5.47	5.78
% NITROGEN	1.16	1.24	1.56	1.65
% SULFUR	4.28	4.57	5.75	
% CHLORINE	0.01	0.01	0.01	0.01
% OXYGEN(DIFF)	6.36*	6.80	8.56	9.58

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	2.24	0.21	2.12	4.57
DAF	2.82	0.26	2.67	5.75
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(24.27%MM)	(%MM)
% CARBON	62.19	82.12	
% HYDROGEN	4.04	5.33	
% NITROGEN	1.24	1.65	
% ORGANIC SULFUR	2.12	2.80	
% OXYGEN(DIFF)	6.14	8.10	
% CHLORINE	0.01	0.01	
% MINERAL MATTER	24.27		
(INCLUDES 4.19 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.836	0.780	
ATOMIC O/C	0.087	0.098	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.02		

INFRA-RED ANALYSIS

(*) -EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-740 **
 ** PAGE 5 **

SEAM NAME KENTUCKY #12
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 3.30

% HIGH TEMPERATURE ASH = 20.58 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG			SiO2	48.50	4.67
B			AL2O3	17.90	1.95
BA	390	80	TiO2	0.90	0.11
BE	10	2	FE2O3	20.00	2.88
BI			MGO	0.99	0.12
CE			CAO	2.74	0.40
CO			NA2O	0.32	0.05
CR	180	37	K2O	2.68	0.46
CU	75	15	P2O5	0.24	0.02
GA			S03	3.20	0.26
GE					
LA					
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	100	21	-----	-----	-----
NB			AS		
PB			BR		
RB	140	29	CD		
SC			CL		
SN			F		
SR	200	41	HG		
TH			SB		
U	< 5	1	SE		
V	140	29			
Y					
YB					
ZN	280	58			
ZR	150	31			

** PENN STATE COAL DATA BASE **

 ** PSOC-740 **
 ** PAGE 7 **

SEAM NAME KENTUCKY #12
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	79.4	91.9	69.5
INERTINITE (CALC.)	5.9	6.8	5.8
LIPTINITE (CALC.)	1.1	1.3	0.9
MINERAL MATTER (CALC.)	13.7		24.7
VITRINOIDS			
VITRINITE	78.7	91.2	69.0
PSEUDOVITRINITE	0.6	0.7	0.5
FUSINITE	3.2	3.7	3.2
SEMI-FUSINITE	2.4	2.8	2.3
MACRINITE	0.0	0.0	0.0
MICRINITE	0.3	0.3	0.2
SCLEROTINITE	0.0	0.0	0.0
SPORINITE			
CUTINITE			
EXINITE (ANAL.)	1.0	1.2	0.8
RESINITE	0.1	0.1	0.1
SUBERINITE			
EXUDATINITE			
FLUORINITE			
BITUMINITE			
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE			
MINERAL MATTER (ANAL.)			
INERTINITE (ANAL.)			
LIPTINITE (ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND. DEV.
VITRINITE	0.67	0.42	0.25	0.53	0.05
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-746 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-746
COLLECTED BY SOUTHERN ILLINOIS UNIVERSITY
COLLECTION DATE 6/10/77
COLLECTOR'S NUMBER
REPORTED RANK HIGH VOLATILE A BITUMINOUS (HVAB)
SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION
SAMPLE RESERVE
SEAM NAME KENTUCKY #6
ALTERNATE SEAM NAME
TOTAL SEAM THICKNESS 2 FT. 6 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE KENTUCKY
COUNTY HOPKINS
TOWNSHIP
NEAREST TOWN BEULAH
COAL PROVINCE INTERIOR
COAL REGION EASTERN
COAL FIELD

MAP REFERENCE: LATITUDE 37D 15M 50S
LONGITUDE 87D 41M 00S
QUADRANGLE COILTOWN (7.5')

** PENN STATE COAL DATA BASE **

 ** PS0C-746 **
 ** PAGE 3 **

SEAM NAME KENTUCKY #6
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	5.76					
% ASH	12.90	13.69				
% VOLATILE MATTER	31.82	33.77	39.13	37.22	37.39	
% FIXED CARBON	49.51	52.54	60.87	62.78	62.61	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	12350	11639	11415
MM-FREE (PARR)	14670	13658	13345
MM-FREE (MOD.P)	14662	13536	13228
BEST MM FREE		13536	13228
NET CV, DMMF BTU/LB	14161		
ASH-FREE	14309		

MOTT-SPOONER DIFFERENCE = 215.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	7.57	9.17
% TOTAL SULFUR	4.92	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE B BITUMINOUS (HVBB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE B BITUMINOUS (HVBB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE B BITUMINOUS (HVBB)
INTERNATIONAL RANK	
AS REC'D MOIST.	620
EQUIL. MOIST.	620
REPORTED RANK	HIGH VOLATILE A BITUMINOUS (HVAB)

** PENN STATE COAL DATA BASE **

 ** PSOC-746 **
 ** PAGE 4 **

SEAM NAME KENTUCKY #6
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)
-----	-----	---	---	-----
				(17.49 %MM)
% ASH	12.90	13.69		
% CARBON	64.40	68.34	79.18	82.83
% HYDROGEN	4.24*	4.50	5.21	5.45
% NITROGEN	1.19	1.26	1.46	1.53
% SULFUR	4.64	4.92	5.70	
% CHLORINE	0.01	0.01	0.02	0.02
% OXYGEN (DIFF)	6.86*	7.28	8.43	10.18

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	2.89	0.46	1.57	4.92
DAF	3.35	0.53	1.82	5.70
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF (MOD.P)	DMMF (DIR.)
-----	---	-----	-----
		(16.84 %MM)	(%MM)
% CARBON	68.13	81.92	
% HYDROGEN	4.26	5.13	
% NITROGEN	1.26	1.53	
% ORGANIC SULFUR	1.57	1.89	
% OXYGEN (DIFF)	7.94	9.53	
% CHLORINE	0.01	0.02	
% MINERAL MATTER	16.84		
(INCLUDES 5.41 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.791	0.752	
ATOMIC O/C	0.092	0.105	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.03		

INFRA-RED ANALYSIS

(*) - EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-746 **
 ** PAGE 5 **

SEAM NAME KENTUCKY #6 COUNTRY U.S.A.
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB) STATE KENTUCKY

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 3.13
 % HIGH TEMPERATURE ASH = 12.49 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG			SI02	42.00	2.45
B			AL2O3	17.70	1.17
BA	1550	194	TIO2	1.15	0.09
BE	30	4	FE2O3	34.50	3.01
BI			MGO	0.57	0.04
CE			CA0	0.63	0.06
CO			NA2O	0.21	0.02
CR	230	29	K2O	1.56	0.16
CU	190	24	P2O5	0.08	0.00
GA			S03	0.80	0.04
GE					
LA					
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	240	30	AS		
NB			BR		
PB			CD		
RB	80	10	CL		
SC			F		
SN			HG		
SR	190	24	SB		
TH			SE		
U					
V	290	36			
Y					
YB					
ZN	1450	181			
ZR	250	31			

** PENN STATE COAL DATA BASE **

 ** PSOC-746 **
 ** PAGE 7 **

SEAM NAME KENTUCKY #6
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE KENTUCKY

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	77.3	85.2	70.6
INERTINITE (CALC.)	12.0	13.2	11.9
LIPTINITE (CALC.)	1.5	1.6	1.2
MINERAL MATTER (CALC.)	9.3		17.5
VITRINOIDS			
VITRINITE	74.7	82.3	68.2
PSEUDOVITRINITE	2.6	2.9	2.4
FUSINITE	2.2	2.4	2.3
SEMI-FUSINITE	7.8	8.6	7.7
MACRINITE	0.6	0.7	0.6
MICRINITE	1.4	1.5	1.3
SCLEROTINITE	0.0	0.0	0.0
SPORINITE			
CUTINITE			
EXINITE (ANAL.)	1.5	1.6	1.2
RESINITE	0.0	0.0	0.0
SUBERINITE			
EXUDATINITE			
FLUORINITE			
BITUMINITE			
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE			
MINERAL MATTER (ANAL.)			
INERTINITE (ANAL.)			
LIPTINITE (ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	0.73	0.55	0.18	0.64	0.04
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-748 **
** PAGE 1 **

* *
* SAMPLE HISTORY *
* *

PENN STATE NUMBER PSOC-748
COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
COLLECTION DATE 7/18/77
COLLECTOR'S NUMBER 748

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION BENCH DATA AVAILABLE
SAMPLE RESERVE

SEAM NAME 4A SEAM
ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 2 FT. 9 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

* *
* SAMPLE LOCATION *
* *

COUNTRY U.S.A.
STATE OHIO
COUNTY MAHONING
TOWNSHIP SMITH
NEAREST TOWN ALLIANCE

COAL PROVINCE EASTERN
COAL REGION APPALACHIAN
COAL FIELD

MAP REFERENCE: LATITUDE
LONGITUDE
QUADRANGLE ALLIANCE NE

** PENN STATE COAL DATA BASE **

 ** PS0C-748 **
 ** PAGE 3 **

SEAM NAME 4A SEAM
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE OHIO

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	5.82					
% ASH	11.67	12.39				
% VOLATILE MATTER	36.45	38.70	44.17	43.02	42.79	
% FIXED CARBON	46.06	48.91	55.83	56.98	57.21	

CALORIFIC VALUE	DRY	AS REC'D MOIST.	EQUIL. MOIST.
(GROSS BTU/LB)	---	---	---

MM-FREE, DIRECT			
MM-CONTAINING	12820	12074	12000
MM-FREE (PARR)	14902	13893	13793
MM-FREE (MOD.P)	14945	13867	13768
BEST MM FREE		13867	13768
NET CV, DMMF BTU/LB	14399		
ASH-FREE	14633		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	6.40	7.52
% TOTAL SULFUR	2.74	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE B BITUMINOUS (HVBB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE B BITUMINOUS (HVBB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE B BITUMINOUS (HVBB)
INTERNATIONAL RANK	
AS REC'D MOIST.	610
EQUIL. MOIST.	610
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-748 **
 ** PAGE 4 **

SEAM NAME 4A SEAM
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE OHIO

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(14.89 %MM)
% ASH	11.67	12.39		
% CARBON	66.82	70.95	80.98	83.36
% HYDROGEN	4.73*	5.02	5.73	5.90
% NITROGEN	1.13	1.20	1.37	1.41
% SULFUR	2.58	2.74	3.13	
% CHLORINE	0.08	0.08	0.10	0.10
% OXYGEN(DIFF)	7.17*	7.61	8.70	9.25

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	1.60	0.24	0.90	2.74
DAF	1.83	0.27	1.03	3.13

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(14.80%MM)	(%MM)
% CARBON	70.77	83.06	
% HYDROGEN	4.83	5.67	
% NITROGEN	1.20	1.41	
% ORGANIC SULFUR	0.90	1.06	
% OXYGEN(DIFF)	7.51	8.73	
% CHLORINE	0.08	0.10	
% MINERAL MATTER	14.80		
(INCLUDES 2.99 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.850	0.819	
ATOMIC O/C	0.083	0.093	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.17		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-748 **
 ** PAGE 5 **

SEAM NAME 4A SEAM
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE OHIO

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 3.01

% HIGH TEMPERATURE ASH = 14.64 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG			SiO2	51.80	3.54
B			Al2O3	23.40	1.81
BA	450	66	TiO2	1.40	0.12
BE	25	4	Fe2O3	16.80	1.72
BI			MgO	0.67	0.06
CE			CaO	0.93	0.10
CO			Na2O	0.33	0.04
CR	240	35	K2O	2.03	0.25
CU	150	22	P2O5	0.35	0.02
GA			S03	0.90	0.05
GE					
LA					
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	180	26	AS		
NB			BR		
PB			CD		
RB	120	18	CL		
SC			F		
SN			HG		
SR	1000	146	SB		
TH			SE		
U	< 7	1			
V	180	26			
Y					
YB					
ZN	330	48			
ZR	230	34			

** PENN STATE COAL DATA BASE **

 ** PSOC-748 **
 ** PAGE 7 **

SEAM NAME 4A SEAM
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE OHIO

 * *
 * PETROGRAPHIC DATA *
 * *

MACERAL COMPOSITION COMBINED WHITE AND BLUE LIGHT

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	68.6	74.4	62.9
INERTINITE (CALC.)	14.4	15.6	14.4
LIPTINITE (CALC.)	9.1	9.9	7.7
MINERAL MATTER (CALC.)	7.8		14.9
VITRINOIDS			
VITRINITE	65.8	71.3	60.3
PSEUDOVITRINITE	2.9	3.1	2.6
FUSINITE	3.1	3.4	3.3
SEMI-FUSINITE	6.5	7.0	6.4
MACRINITE	0.6	0.6	0.5
MICRINITE	4.2	4.6	4.2
SCLEROTINITE	0.0	0.0	0.0
SPORINITE	8.9	9.6	7.5
CUTINITE	0.1	0.1	0.1
EXINITE (ANAL.)			
RESINITE	0.2	0.2	0.2
SUBERINITE			
EXUDATINITE	0.0	0.0	0.0
FLUORINITE	0.0	0.0	0.0
BITUMINITE	0.0	0.0	0.0
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE	0.0	0.0	0.0
MINERAL MATTER (ANAL.)			
INERTINITE (ANAL.)			
LIPTINITE (ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND. DEV.
VITRINITE	0.70	0.47	0.23	0.58	0.05
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-751 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-751
COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
COLLECTION DATE 7/18/77
COLLECTOR'S NUMBER 751

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
SAMPLE RESERVE

SEAM NAME OHIO #6
ALTERNATE SEAM NAME MIDDLE KITTANNING

TOTAL SEAM THICKNESS 2 FT. 11 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE OHIO
COUNTY TUSCARAWAS
TOWNSHIP CLAY
NEAREST TOWN GNADENHUTTON

COAL PROVINCE EASTERN
COAL REGION APPALACHIAN
COAL FIELD

MAP REFERENCE: LATITUDE
LONGITUDE
QUADRANGLE GNADENHUTTEN

** PENN STATE COAL DATA BASE **

 ** PS0C-751 **
 ** PAGE 3 **

SEAM NAME OHIO #6
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE OHIO

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	4.20					
% ASH	18.59	19.41				
% VOLATILE MATTER	34.65	36.17	44.88	42.54	42.39	
% FIXED CARBON	42.55	44.42	55.12	57.46	57.61	

CALORIFIC VALUE	DRY	AS REC'D MOIST.	EQUIL. MOIST.
(GROSS BTU/LB)	---	---	---

MM-FREE, DIRECT			
MM-CONTAINING	11425	10945	10602
MM-FREE (PARR)	14689	13885	13324
MM-FREE (MOD.P)	14715	13767	13214
BEST MM FREE		13767	13214
NET CV, DMMF BTU/LB	14201		
ASH-FREE	14177		

MOTT-SPOONER DIFFERENCE = 315.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	7.20	9.51
% TOTAL SULFUR	5.99	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE B BITUMINOUS (HVBB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE B BITUMINOUS (HVBB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE B BITUMINOUS (HVBB)
INTERNATIONAL RANK	
AS REC'D MOIST.	620
EQUIL. MOIST.	620
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-751 **
 ** PAGE 4 **

SEAM NAME OHIO #6
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE OHIO

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(24.26 %MM)
% ASH	18.59	19.41		
% CARBON	59.78	62.40	77.43	82.38
% HYDROGEN	4.05*	4.23	5.25	5.58
% NITROGEN	1.09	1.14	1.41	1.51
% SULFUR	5.74	5.99	7.43	
% CHLORINE	0.07	0.07	0.09	0.09
% OXYGEN(DIFF)	6.47*	6.76	8.40	10.46

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	3.78	0.33	1.88	5.99
DAF	4.69	0.41	2.33	7.43
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(23.74%MM)	(%MM)
% CARBON	62.11	81.45	
% HYDROGEN	3.90	5.12	
% NITROGEN	1.14	1.51	
% ORGANIC SULFUR	1.88	2.47	
% OXYGEN(DIFF)	7.23	9.41	
% CHLORINE	0.07	0.09	
% MINERAL MATTER	23.74		
(INCLUDES 7.07 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.814	0.755	
ATOMIC O/C	0.095	0.114	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.14		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-751 **
 ** PAGE 5 **

SEAM NAME OHIO #6
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE OHIO

 * *
 * CHEMICAL DATA 3 *
 * *

% MOISTURE IN COAL = 3.09
 % HIGH TEMPERATURE ASH = 17.44 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG			SiO2	39.00	3.18
B			AL2O3	21.90	2.02
BA	310	54	TiO2	1.18	0.12
BE	15	3	FE2O3	32.30	3.94
BI			MGO	1.04	0.11
CE			CAO	0.75	0.09
CO			NA2O	0.29	0.04
CR	190	33	K2O	2.24	0.32
CU	110	19	P2O5	0.07	0.01
GA			S03	0.70	0.05
GE					
LA					
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	90	16	-----	-----	-----
NB			AS		
PB			BR		
RB	100	17	CD		
SC			CL		
SN			F		
SR	250	44	HG		
TH			SB		
U	< 7	1	SE		
V	170	30			
Y					
YB					
ZN	230	40			
ZR	200	35			

** PENN STATE COAL DATA BASE **

 ** PSOC-751 **
 ** PAGE 7 **

SEAM NAME OHIO #6
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE OHIO

 * *
 * PETROGRAPHIC DATA *
 * *

MACERAL COMPOSITION COMBINED WHITE AND BLUE LIGHT

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	67.1	77.5	58.1
INERTINITE (CALC.)	14.0	16.2	13.2
LIPTINITE (CALC.)	5.5	6.4	4.4
MINERAL MATTER (CALC.)	13.4		24.3
VITRINOIDS			
VITRINITE	62.0	71.6	53.7
PSEUDOVITRINITE	5.1	5.9	4.4
FUSINITE	1.9	2.2	1.9
SEMI-FUSINITE	7.3	8.4	6.8
MACRINITE	0.6	0.7	0.6
MICRINITE	4.2	4.9	4.0
SCLEROTINITE	0.0	0.0	0.0
SPORINITE	4.4	5.1	3.5
CUTINITE	0.4	0.5	0.3
EXINITE (ANAL.)			
RESINITE	0.7	0.8	0.6
SUBERINITE			
EXUDATINITE	0.0	0.0	0.0
FLUORINITE	0.0	0.0	0.0
BITUMINITE	0.0	0.0	0.0
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE	0.0	0.0	0.0
MINERAL MATTER (ANAL.)			
INERTINITE (ANAL.)			
LIPTINITE (ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND. DEV.
VITRINITE	0.65	0.51	0.14	0.57	0.03
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-756 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-756
COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
COLLECTION DATE 7/19/77
COLLECTOR'S NUMBER 756

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION BENCH DATA AVAILABLE
SAMPLE RESERVE

SEAM NAME OHIO #4
ALTERNATE SEAM NAME BROOKVILLE

TOTAL SEAM THICKNESS 2 FT. 1 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE OHIO
COUNTY WAYNE
TOWNSHIP FRANKLIN
NEAREST TOWN FREDRICKSBURG

COAL PROVINCE EASTERN
COAL REGION APPALACHIAN
COAL FIELD

MAP REFERENCE: LATITUDE
LONGITUDE
QUADRANGLE

** PENN STATE COAL DATA BASE **

 ** PS0C-756 **
 ** PAGE 3 **

SEAM NAME OHIO #4
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE OHIO

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	5.72					
% ASH	16.89	17.92				
% VOLATILE MATTER	37.02	39.27	47.84	45.91	45.77	
% FIXED CARBON	40.36	42.81	52.16	54.09	54.23	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
	---	-----	-----

MM-FREE, DIRECT			
MM-CONTAINING	11417	10764	10506
MM-FREE (PARR)	14354	13313	12911
MM-FREE (MOD.P)	14367	13160	12766
BEST MM FREE		13160	12766
NET CV, DMMF BTU/LB	13844		
ASH-FREE	13910		

MOTT-SPOONER DIFFERENCE = 21.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	7.98	10.28
% TOTAL SULFUR	5.48	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE B BITUMINOUS (HVBB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE C BITUMINOUS (HVCB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE C BITUMINOUS (HVCB)
INTERNATIONAL RANK	
AS REC'D MOIST.	710
EQUIL. MOIST.	710
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-756 **
 ** PAGE 4 **

SEAM NAME OHIO #4
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE OHIO

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(22.37 %MM)
% ASH	16.89	17.92		
% CARBON	59.69	63.31	77.13	81.55
% HYDROGEN	4.18*	4.43	5.40	5.71
% NITROGEN	1.03	1.09	1.33	1.40
% SULFUR	5.17	5.48	6.68	
% CHLORINE	0.05	0.05	0.07	0.07
% OXYGEN(DIFF)	7.27*	7.72	9.41	11.28

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	2.73	0.32	2.43	5.48
DAF	3.33	0.39	2.96	6.68
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(21.56%MM)	(%MM)
% CARBON	63.04	80.37	
% HYDROGEN	4.14	5.28	
% NITROGEN	1.09	1.40	
% ORGANIC SULFUR	2.43	3.10	
% OXYGEN(DIFF)	7.73	9.80	
% CHLORINE	0.05	0.07	
% MINERAL MATTER	21.56		
(INCLUDES 5.11 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.840	0.789	
ATOMIC O/C	0.104	0.117	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.11		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-756 **
 ** PAGE 5 **

SEAM NAME OHIO #4
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE OHIO

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 2.62
 % HIGH TEMPERATURE ASH = 18.59 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG			SiO2	35.50	3.08
B			Al2O3	23.30	2.29
BA	440	82	TiO2	0.75	0.08
BE	25	5	Fe2O3	33.60	4.37
BI			MgO	0.53	0.06
CE			CaO	1.53	0.20
CO			Na2O	0.21	0.03
CR	230	43	K2O	1.16	0.18
CU	85	16	P2O5	0.15	0.01
GA			S03	1.90	0.14
GE					
LA					
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	220	41	-----	-----	-----
NB			AS		
PB			BR		
RB	45	8	CD		
SC			CL		
SN			F		
SR	540	100	HG		
TH			SB		
U	< 8	1	SE		
V	190	35			
Y					
YB					
ZN	290	54			
ZR	150	28			

** PENN STATE COAL DATA BASE **

 ** PSOC-756 **
 ** PAGE 7 **

SEAM NAME OHIO #4
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE OHIO

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION COMBINED WHITE AND BLUE LIGHT

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	64.2	73.1	56.5
INERTINITE (CALC.)	13.3	15.1	12.8
LIPTINITE (CALC.)	10.3	11.7	8.4
MINERAL MATTER (CALC.)	12.2		22.4
VITRINOIDS			
VITRINITE	61.5	70.1	54.2
PSEUDOVITRINITE	2.6	3.0	2.3
FUSINITE	2.6	3.0	2.7
SEMI-FUSINITE	5.6	6.4	5.3
MACRINITE	0.1	0.1	0.1
MICRINITE	4.9	5.6	4.7
SCLEROTINITE	0.0	0.0	0.0
SPORINITE	9.4	10.7	7.6
CUTINITE	0.3	0.3	0.2
EXINITE (ANAL.)			
RESINITE	0.6	0.7	0.5
SUBERINITE			
EXUDATINITE	0.0	0.0	0.0
FLUORINITE	0.0	0.0	0.0
BITUMINITE	0.0	0.0	0.0
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE	0.0	0.0	0.0
MINERAL MATTER (ANAL.)			
INERTINITE (ANAL.)			
LIPTINITE (ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND. DEV.
VITRINITE	0.60	0.40	0.20	0.47	0.04
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-760 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-760
COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
COLLECTION DATE 7/20/77
COLLECTOR'S NUMBER 760

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
SAMPLE RESERVE

SEAM NAME OHIO #5
ALTERNATE SEAM NAME LOWER KITTANNING

TOTAL SEAM THICKNESS 1 FT. 8 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE OHIO
COUNTY COSHOCTON
TOWNSHIP ADAMS
NEAREST TOWN BAKERSVILLE

COAL PROVINCE EASTERN
COAL REGION APPALACHIAN
COAL FIELD

MAP REFERENCE: LATITUDE
LONGITUDE
QUADRANGLE

** PENN STATE COAL DATA BASE **

 ** PS0C-760 **
 ** PAGE 3 **

SEAM NAME OHIO #5
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE OHIO

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	5.81					
% ASH	11.40	12.10				
% VOLATILE MATTER	35.39	37.57	42.74	41.08	41.35	
% FIXED CARBON	47.41	50.33	57.26	58.92	58.65	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
	---	-----	-----

MM-FREE, DIRECT			
MM-CONTAINING	12545	11816	11758
MM-FREE (PARR)	14610	13611	13533
MM-FREE (MOD.P)	14588	13474	13398
BEST MM FREE		13474	13398
NET CV, DMMF BTU/LB	14037		
ASH-FREE	14272		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	6.27	7.45
% TOTAL SULFUR	5.12	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE B BITUMINOUS (HVBB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE B BITUMINOUS (HVBB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE B BITUMINOUS (HVBB)
INTERNATIONAL RANK	
AS REC'D MOIST.	620
EQUIL. MOIST.	620
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-760 **
 ** PAGE 4 **

SEAM NAME OHIO #5
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE OHIO

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(15.88 %MM)
% ASH	11.40	12.10		
% CARBON	65.05	69.06	78.57	82.10
% HYDROGEN	4.75*	5.04	5.73	5.99
% NITROGEN	1.00	1.06	1.21	1.26
% SULFUR	4.82	5.12	5.82	
% CHLORINE	0.06	0.06	0.07	0.07
% OXYGEN(DIFF)	7.12*	7.56	8.61	10.59

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	3.01	0.40	1.71	5.12
DAF	3.42	0.46	1.95	5.82

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(15.12%MM)	(%MM)
% CARBON	68.87	81.14	
% HYDROGEN	4.82	5.68	
% NITROGEN	1.06	1.26	
% ORGANIC SULFUR	1.71	2.01	
% OXYGEN(DIFF)	8.42	9.85	
% CHLORINE	0.06	0.07	
% MINERAL MATTER	15.12		
(INCLUDES 5.63 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.877	0.841	
ATOMIC O/C	0.097	0.107	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.12		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-760 **
 ** PAGE 5 **

SEAM NAME OHIO #5 COUNTRY U.S.A.
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB) STATE OHIO

 * *
 * CHEMICAL DATA 3 *
 * *

% MOISTURE IN COAL = 3.96
 % HIGH TEMPERATURE ASH = 38.11 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG			SiO2	32.70	5.82
B			AL2O3	18.00	3.63
BA	520	198	TiO2	0.67	0.15
BE	30	11	FE2O3	42.80	11.41
BI			MGO	0.73	0.17
CE			CAO	0.80	0.22
CO			NA2O	0.25	0.07
CR	260	99	K2O	1.40	0.44
CU	100	38	P2O5	0.14	0.02
GA			S03	1.10	0.17
GE					
LA					
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	470	179	AS		
NB			BR		
PB			CD		
RB	50	19	CL		
SC			F		
SN			HG		
SR	240	91	SB		
TH			SE		
U	27	10			
V	260	99			
Y					
YB					
ZN	140	53			
ZR	170	65			

** PENN STATE COAL DATA BASE **

 ** PSOC-760 **
 ** PAGE 7 **

SEAM NAME OHIO #5
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE OHIO

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION COMBINED WHITE AND BLUE LIGHT

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	78.0	85.1	71.1
INERTINITE (CALC.)	9.2	10.0	9.1
LIPTINITE (CALC.)	4.6	5.0	3.9
MINERAL MATTER (CALC.)	8.3		15.9
VITRINOIDS			
VITRINITE	78.0	85.1	71.1
PSEUDOVITRINITE	0.0	0.0	0.0
FUSINITE	1.6	1.7	1.6
SEMI-FUSINITE	2.3	2.5	2.3
MACRINITE	0.1	0.1	0.1
MICRINITE	5.2	5.7	5.1
SCLEROTINITE	0.0	0.0	0.0
SPORINITE	3.4	3.7	2.9
CUTINITE	0.2	0.2	0.2
EXINITE (ANAL.)			
RESINITE	1.0	1.1	0.8
SUBERINITE			
EXUDATINITE	0.0	0.0	0.0
FLUORINITE	0.0	0.0	0.0
BITUMINITE	0.0	0.0	0.0
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE	0.0	0.0	0.0
MINERAL MATTER (ANAL.)			
INERTINITE (ANAL.)			
LIPTINITE (ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	0.66	0.50	0.16	0.57	0.03
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-763 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-763
COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
COLLECTION DATE 7/20/77
COLLECTOR'S NUMBER 763

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
SAMPLE RESERVE

SEAM NAME OHIO #6
ALTERNATE SEAM NAME MIDDLE KITTANNING

TOTAL SEAM THICKNESS 3 FT. 7 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE OHIO
COUNTY TUSCARAWAS
TOWNSHIP AUBURN
NEAREST TOWN ROGERSVILLE

COAL PROVINCE EASTERN
COAL REGION APPALACHIAN
COAL FIELD

MAP REFERENCE: LATITUDE
LONGITUDE
QUADRANGLE

** PENN STATE COAL DATA BASE **

 ** PS0C-763 **
 ** PAGE 3 **

SEAM NAME OHIO #6
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE OHIO

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	3.90					
% ASH	12.67	13.18				
% VOLATILE MATTER	38.60	40.17	46.27	44.64	44.85	
% FIXED CARBON	44.83	46.65	53.73	55.36	55.15	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	12401	11917	11793
MM-FREE (PARR)	14651	13967	13793
MM-FREE (MOD.P)	14627	13799	13629
BEST MM FREE		13799	13629
NET CV, DMMF BTU/LB	14098		
ASH-FREE	14284		

MOTT-SPOONER DIFFERENCE = 221.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	4.90	5.92
% TOTAL SULFUR	5.39	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE B BITUMINOUS (HVBB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE B BITUMINOUS (HVBB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE C BITUMINOUS (HVCB)
INTERNATIONAL RANK	
AS REC'D MOIST.	620
EQUIL. MOIST.	620
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-763 **
 ** PAGE 4 **

SEAM NAME OHIO #6
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE OHIO

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(17.20 %MM)
% ASH	12.67	13.18		
% CARBON	64.81	67.44	77.68	81.45
% HYDROGEN	4.59*	4.78	5.51	5.77
% NITROGEN	1.13	1.18	1.36	1.43
% SULFUR	5.18	5.39	6.21	
% CHLORINE	0.06	0.06	0.07	0.07
% OXYGEN(DIFF)	7.66*	7.97	9.19	11.29

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	2.92	0.18	2.29	5.39
DAF	3.36	0.21	2.64	6.21

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(16.30%MM)	(%MM)
% CARBON	67.24	80.33	
% HYDROGEN	4.55	5.44	
% NITROGEN	1.18	1.43	
% ORGANIC SULFUR	2.29	2.74	
% OXYGEN(DIFF)	8.44	10.03	
% CHLORINE	0.06	0.07	
% MINERAL MATTER	16.30		
(INCLUDES 5.46 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.851	0.813	
ATOMIC O/C	0.104	0.112	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.12		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-763 **
 ** PAGE 5 **

SEAM NAME OHIO #6
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE OHIO

* *

* CHEMICAL DATA 3 *

* *

% MOISTURE IN COAL = 3.12

% HIGH TEMPERATURE ASH = 14.55 AT 750 DEGREES C.

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG			SiO2	35.50	2.41
B			Al2O3	20.10	1.55
BA	270	39	TiO2	0.96	0.08
BE	20	3	Fe2O3	34.00	3.46
BI			MgO	0.78	0.07
CE			CaO	2.57	0.27
CO			Na2O	0.28	0.03
CR	210	31	K2O	1.77	0.21
CU	120	17	P2O5	0.07	0.00
GA			S03	2.80	0.16
GE					
LA					
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	240	35	-----		-----
NB			AS		
PB			BR		
RB	100	15	CD		
SC			CL		
SN			F		
SR	360	52	HG		
TH			SB		
U	< 5	1	SE		
V	200	29			
Y					
YB					
ZN	200	29			
ZR	180	26			

** PENN STATE COAL DATA BASE **

 ** PSOC-763 **
 ** PAGE 7 **

SEAM NAME OHIO #6
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE OHIO

 * *
 * PETROGRAPHIC DATA *
 * *

MACERAL COMPOSITION COMBINED WHITE AND BLUE LIGHT

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %		
VITRINITE (CALC.)	73.9	81.3	66.8		
INERTINITE (CALC.)	12.5	13.7	12.3		
LIPTINITE (CALC.)	4.5	4.9	3.7		
MINERAL MATTER (CALC.)	9.1		17.2		
VITRINOIDS					
VITRINITE	70.4	77.4	63.6		
PSEUDOVITRINITE	3.5	3.9	3.2		
FUSINITE	2.5	2.8	2.7		
SEMI-FUSINITE	5.7	6.3	5.6		
MACRINITE	0.2	0.2	0.2		
MICRINITE	4.0	4.4	3.9		
SCLEROTINITE	0.0	0.0	0.0		
SPORINITE	4.2	4.6	3.5		
CUTINITE	0.0	0.0	0.0		
EXINITE (ANAL.)					
RESINITE	0.3	0.3	0.2		
SUBERINITE					
EXUDATINITE	0.0	0.0	0.0		
FLUORINITE	0.0	0.0	0.0		
BITUMINITE	0.0	0.0	0.0		
ALGINITE	0.0	0.0	0.0		
LIPTODETRINITE	0.0	0.0	0.0		
MINERAL MATTER (ANAL.)					
INERTINITE (ANAL.)					
LIPTINITE (ANAL.)					
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
(%, IN OIL)					
VITRINITE	0.62	0.43	0.19	0.52	0.04
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-767 **
** PAGE 1 **

* *
* SAMPLE HISTORY *
* *

PENN STATE NUMBER PSOC-767
COLLECTED BY TEXAS A & M UNIVERSITY
COLLECTION DATE 7/18/77
COLLECTOR'S NUMBER

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION
SAMPLE RESERVE

SEAM NAME
ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 1 FT. 0 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

* *
* SAMPLE LOCATION *
* *

COUNTRY U.S.A.
STATE OKLAHOMA
COUNTY CRAIG
TOWNSHIP
NEAREST TOWN VENITA
COAL PROVINCE INTERIOR
COAL REGION WESTERN
COAL FIELD

MAP REFERENCE: LATITUDE 36D 42M 40S
LONGITUDE 95D 21M 30S
QUADRANGLE VENITA (30')

** PENN STATE COAL DATA BASE **

 ** PS0C-767 **
 ** PAGE 3 **

SEAM NAME
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	3.00					
% ASH	5.29	5.45				
% VOLATILE MATTER	42.71	44.03	46.57	45.75	46.11	
% FIXED CARBON	49.00	50.52	53.43	54.25	53.89	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	14172	13747	13497
MM-FREE (PARR)	15187	14694	14405
MM-FREE (MOD.P)	15136	14515	14234
BEST MM FREE		14515	14234
NET CV, DMMF BTU/LB	14608		
ASH-FREE	14989		

MOTT-SPOONER DIFFERENCE = 301.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	4.76	5.17
% TOTAL SULFUR	3.61	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE A BITUMINOUS (HVAB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE A BITUMINOUS (HVAB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE C BITUMINOUS (HVCB)
INTERNATIONAL RANK	
AS REC'D MOIST.	630
EQUIL. MOIST.	630
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-767 **
 ** PAGE 4 **

SEAM NAME
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR) (7.87 %MM)
% ASH	5.29	5.45		
% CARBON	74.23	76.53	80.94	83.07
% HYDROGEN	5.14*	5.30	5.61	5.75
% NITROGEN	1.37	1.41	1.49	1.53
% SULFUR	3.50	3.61	3.82	
% CHLORINE	0.14	0.14	0.15	0.15
% OXYGEN(DIFF)	7.33*	7.56	8.00	9.51

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	1.22	0.10	2.29	3.61
DAF	1.29	0.11	2.42	3.82

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P) (6.80%MM)	DMMF(DIR.) (%MM)
% CARBON	76.45	82.03	
% HYDROGEN	5.20	5.58	
% NITROGEN	1.41	1.53	
% ORGANIC SULFUR	2.29	2.46	
% OXYGEN(DIFF)	7.85	8.28	
% CHLORINE	0.14	0.15	
% MINERAL MATTER (INCLUDES 2.28 % FES2)	6.80		

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
ATOMIC H/C	0.832	0.818	
ATOMIC O/C	0.086	0.081	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.28		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-767 **
 ** PAGE 5 **

SEAM NAME
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 2.46
 % HIGH TEMPERATURE ASH = 6.36 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG			SiO2	17.20	0.51
B			AL2O3	8.45	0.28
BA	280	18	TiO2	0.44	0.02
BE	65	4	FE2O3	31.60	1.41
BI			MGO	0.79	0.03
CE			CAO	17.80	0.81
CO			NA2O	0.43	0.02
CR	290	18	K2O	1.01	0.05
CU	150	10	P2O5	1.93	0.05
GA			SO3	18.20	0.46
GE					
LA					
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	380	24	-----	-----	-----
NB			AS		
PB			BR		
RB	55	3	CD		
SC			CL		
SN			F		
SR	760	48	HG		
TH			SB		
U	144	9	SE		
V	120	27			
Y					
YB					
ZN	310	20			
ZR	140	9			

** PENN STATE COAL DATA BASE **

 ** PSOC-767 **
 ** PAGE 7 **

SEAM NAME
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	87.9	91.5	85.5
INERTINITE (CALC.)	6.1	6.4	6.5
LIPTINITE (CALC.)	2.0	2.1	1.8
MINERAL MATTER (CALC.)	4.0		7.9
VITRINOIDS			
VITRINITE	85.6	89.1	83.2
PSEUDOVITRINITE	2.3	2.4	2.2
FUSINITE	0.9	0.9	1.0
SEMI-FUSINITE	2.0	2.1	2.1
MACRINITE	0.1	0.1	0.1
MICRINITE	3.2	3.3	3.3
SCLEROTINITE	0.0	0.0	0.0
SPORINITE			
CUTINITE			
EXINITE (ANAL.)	1.8	1.9	1.7
RESINITE	0.2	0.2	0.2
SUBERINITE			
EXUDATINITE			
FLUORINITE			
BITUMINITE			
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE			
MINERAL MATTER (ANAL.)			
INERTINITE (ANAL.)			
LIPTINITE (ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND. DEV.
VITRINITE	0.61	0.47	0.14	0.53	0.03
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-768 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-768
COLLECTED BY TEXAS A & M UNIVERSITY
COLLECTION DATE 7/18/77
COLLECTOR'S NUMBER

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION
SAMPLE RESERVE

SEAM NAME MINERAL
ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 1 FT. 0 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE OKLAHOMA
COUNTY CRAIG
TOWNSHIP
NEAREST TOWN WELCH

COAL PROVINCE INTERIOR
COAL REGION WESTERN
COAL FIELD

MAP REFERENCE: LATITUDE 36D 57M 30S
LONGITUDE 95D 13M 20S
QUADRANGLE PYRAMID CORNERS (7.5')

** PENN STATE COAL DATA BASE **

 ** PS0C-768 **
 ** PAGE 3 **

SEAM NAME MINERAL
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	2.62					
% ASH	15.76	16.18				
% VOLATILE MATTER	36.08	37.05	44.20	42.43	42.21	
% FIXED CARBON	45.54	46.77	55.80	57.57	57.79	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.

MM-FREE, DIRECT			
MM-CONTAINING	12540	12211	12107
MM-FREE (PARR)	15381	14881	14724
MM-FREE (MOD.P)	15419	14809	14653
BEST MM FREE		14809	14653
NET CV, DMMF BTU/LB	14856		
ASH-FREE	14961		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	3.45	4.31
% TOTAL SULFUR	4.43	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE A BITUMINOUS (HVAB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE A BITUMINOUS (HVAB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE B BITUMINOUS (HVBB)
INTERNATIONAL RANK	
AS REC'D MOIST.	630
EQUIL. MOIST.	630
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-768 **
 ** PAGE 4 **

SEAM NAME MINERAL
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(19.91 %MM)
% ASH	15.76	16.18		
% CARBON	67.06	68.86	82.15	85.98
% HYDROGEN	4.75*	4.88	5.82	6.09
% NITROGEN	1.14	1.17	1.40	1.46
% SULFUR	4.31	4.43	5.29	
% CHLORINE	0.12	0.12	0.14	0.15
% OXYGEN(DIFF)	4.24*	4.36	5.22	6.35

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	2.73	0.29	1.41	4.43
DAF	3.26	0.35	1.68	5.29
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(19.63%MM)	(%MM)
% CARBON	68.62	85.37	
% HYDROGEN	4.62	5.74	
% NITROGEN	1.17	1.46	
% ORGANIC SULFUR	1.41	1.75	
% OXYGEN(DIFF)	4.56	5.55	
% CHLORINE	0.12	0.15	
% MINERAL MATTER	19.63		
(INCLUDES 5.11 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.851	0.808	
ATOMIC O/C	0.055	0.061	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO ⁴ .IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.24		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-768 **
 ** PAGE 5 **

SEAM NAME MINERAL
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 1.89
 % HIGH TEMPERATURE ASH = 20.49 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG			SiO2	22.40	2.15
B			AL2O3	9.31	1.01
BA	23100	4733	TiO2	0.44	0.05
BE	10	2	Fe2O3	23.00	3.30
BI			MGO	1.05	0.13
CE			CaO	18.80	2.75
CO			Na2O	0.23	0.03
CR	80	16	K2O	1.04	0.18
CU	70	14	P2O5	0.09	0.01
GA			SO3	21.80	1.79
GE					
LA					
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	200	41	-----		-----
NB			AS		
PB			BR		
RB	65	13	CD		
SC			CL		
SN			F		
SR	360	74	HG		
TH			SB		
U	12	2	SE		
V	90	18			
Y					
YB					
ZN	4600	943			
ZR	110	23			

** PENN STATE COAL DATA BASE **

 ** PSOC-768 **
 ** PAGE 7 **

SEAM NAME MINERAL
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 * *
 * PETROGRAPHIC DATA *
 * *

MACERAL COMPOSITION COMBINED WHITE AND BLUE LIGHT

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
	-----	-----	-----
VITRINITE (CALC.)	75.5	84.6	67.7
INERTINITE (CALC.)	7.1	7.9	6.9
LIPTINITE (CALC.)	6.5	7.3	5.5
MINERAL MATTER (CALC.)	10.7		19.9
VITRINOIDS			
VITRINITE	73.8	82.7	66.2
PSEUDOVITRINITE	1.7	1.9	1.5
FUSINITE	1.7	1.9	1.8
SEMI-FUSINITE	3.3	3.7	3.2
MACRINITE	0.1	0.1	0.1
MICRINITE	2.0	2.2	1.9
SCLEROTINITE	0.0	0.0	0.0
SPORINITE	6.2	6.9	5.2
CUTINITE	0.4	0.4	0.3
EXINITE (ANAL.)			
RESINITE	0.0	0.0	0.0
SUBERINITE			
EXUDATINITE	0.0	0.0	0.0
FLUORINITE	0.0	0.0	0.0
BITUMINITE	0.0	0.0	0.0
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE	0.0	0.0	0.0
MINERAL MATTER (ANAL.)			
INERTINITE (ANAL.)			
LIPTINITE (ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
-----	----	----	-----	-----	-----
VITRINITE	0.75	0.58	0.17	0.67	0.04
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-769 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-769
COLLECTED BY TEXAS A & M UNIVERSITY
COLLECTION DATE 6/28/77
COLLECTOR'S NUMBER
REPORTED RANK
SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION
SAMPLE RESERVE
SEAM NAME LOWER PHILPOTT
ALTERNATE SEAM NAME
TOTAL SEAM THICKNESS 1 FT. 8 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE ARKANSAS
COUNTY FRANKLIN
TOWNSHIP
NEAREST TOWN CLARKSVILLE
COAL PROVINCE INTERIOR
COAL REGION WESTERN
COAL FIELD

MAP REFERENCE: LATITUDE
LONGITUDE
QUADRANGLE

** PENN STATE COAL DATA BASE **

 ** PS0C-769 **
 ** PAGE 3 **

SEAM NAME LOWER PHILPOTT
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE ARKANSAS

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	1.50					
% ASH	5.31	5.39				
% VOLATILE MATTER	16.58	16.83	17.79	17.11	17.15	
% FIXED CARBON	76.61	77.78	82.21	82.89	82.85	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
	---	-----	-----

MM-FREE, DIRECT			
MM-CONTAINING	14967	14742	14219
MM-FREE (PARR)	15929	15674	15082
MM-FREE (MOD.P)	15944	15647	15056
BEST MM FREE		15647	15056
NET CV, DMMF BTU/LB	15542		
ASH-FREE	15820		

MOTT-SPOONER DIFFERENCE = 207.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	5.00	5.34
% TOTAL SULFUR	0.93	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	LOW VOLATILE BITUMINOUS (LVB)
ASTM RANK (EQUIL. MOIST.)	LOW VOLATILE BITUMINOUS (LVB)
REFLECTANCE RANK CATEGORY	LOW VOLATILE BITUMINOUS (LVB)
INTERNATIONAL RANK	
AS REC'D MOIST.	330
EQUIL. MOIST.	330
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-769 **
 ** PAGE 4 **

SEAM NAME LOWER PHILPOTT
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE ARKANSAS

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(6.33 %MM)
% ASH	5.31	5.39		
% CARBON	84.61	85.90	90.79	91.71
% HYDROGEN	4.00*	4.06	4.29	4.33
% NITROGEN	1.63	1.65	1.74	1.76
% SULFUR	0.92	0.93	0.98	
% CHLORINE	0.02	0.02	0.02	0.02
% OXYGEN(DIFF)	2.02*	2.05	2.17	2.18

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	0.19	0.01	0.73	0.93
DAF	0.20	0.01	0.77	0.98
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(6.19%MM)	(%MM)
% CARBON	85.82	91.49	
% HYDROGEN	3.99	4.25	
% NITROGEN	1.65	1.76	
% ORGANIC SULFUR	0.73	0.78	
% OXYGEN(DIFF)	1.62	1.71	
% CHLORINE	0.02	0.02	
% MINERAL MATTER	6.19		
(INCLUDES 0.36 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.568	0.558	
ATOMIC O/C	0.018	0.015	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.04		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-769 **
 ** PAGE 5 **

SEAM NAME LOWER PHILPOTT
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE ARKANSAS

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 1.30
 % HIGH TEMPERATURE ASH = 5.47 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG			SiO2	27.60	0.71
B			Al2O3	26.10	0.76
BA	2900	159	TiO2	1.04	0.03
BE	15	1	Fe2O3	18.50	0.71
BI			MgO	4.45	0.15
CE			CaO	8.54	0.33
CO			Na2O	1.13	0.05
CR	270	15	K2O	1.37	0.06
CU	160	9	P2O5	2.77	0.07
GA			SO3	7.90	0.17
GE					
LA					
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	240	13	-----		-----
NB			AS		
PB			BR		
RB	65	4	CD		
SC			CL		
SN			F		
SR	3350	183	HG		
TH			SB		
U	11	1	SE		
V	280	15			
Y					
YB					
ZN	110	6			
ZR	210	11			

** PENN STATE COAL DATA BASE **

 ** PSOC-769 **
 ** PAGE 7 **

SEAM NAME LOWER PHILPOTT
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE ARKANSAS

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %		
	-----	-----	-----		
VITRINITE (CALC.)	78.8	81.4	75.3		
INERTINITE (CALC.)	18.0	18.6	18.4		
LIPTINITE (CALC.)	0.0	0.0	0.0		
MINERAL MATTER (CALC.)	3.2		6.3		
VITRINOIDS					
VITRINITE	74.8	77.2	71.4		
PSEUDOVITRINITE	4.1	4.2	3.9		
FUSINITE	4.3	4.4	4.6		
SEMI-FUSINITE	8.0	8.3	8.1		
MACRINITE	0.4	0.4	0.4		
MICRINITE	5.3	5.5	5.4		
SCLEROTINITE	0.0	0.0	0.0		
SPORINITE					
CUTINITE					
EXINITE (ANAL.)	0.0	0.0	0.0		
RESINITE	0.0	0.0	0.0		
SUBERINITE					
EXUDATINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0	0.0	0.0		
LIPTODETRINITE					
MINERAL MATTER (ANAL.)					
INERTINITE (ANAL.)					
LIPTINITE (ANAL.)					
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
(%, IN OIL)	----	----	-----	-----	-----
VITRINITE	1.93	1.71	0.22	1.79	0.05
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-770 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-770
COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
COLLECTION DATE 7/21/77
COLLECTOR'S NUMBER 770

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
SAMPLE RESERVE

SEAM NAME OHIO #6
ALTERNATE SEAM NAME MIDDLE KITTANNING

TOTAL SEAM THICKNESS 3 FT. 0 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE OHIO
COUNTY HOCKING
TOWNSHIP GREEN
NEAREST TOWN NEW STRAITSVILLE

COAL PROVINCE EASTERN
COAL REGION APPALACHIAN
COAL FIELD

MAP REFERENCE: LATITUDE
LONGITUDE
QUADRANGLE GORE

** PENN STATE COAL DATA BASE **

 ** PS0C-770 **
 ** PAGE 3 **

SEAM NAME OHIO #6
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE OHIO

* *

* CHEMICAL DATA 1 *

* *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	7.62					
% ASH	7.99	8.65				
% VOLATILE MATTER	37.54	40.64	44.49	43.53	43.67	
% FIXED CARBON	46.85	50.71	55.51	56.47	56.33	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	13238	12229	12162
MM-FREE (PARR)	14706	13458	13376
MM-FREE (MOD.P)	14704	13394	13312
BEST MM FREE		13394	13312
NET CV, DMMF BTU/LB	14187		
ASH-FREE	14492		

MOTT-SPOONER DIFFERENCE = 299.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	8.13	9.14
% TOTAL SULFUR	3.04	

* *

* RANK CALCULATIONS *

* *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE B BITUMINOUS (HVBB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE B BITUMINOUS (HVBB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE C BITUMINOUS (HVCB)
INTERNATIONAL RANK	
AS REC'D MOIST.	620
EQUIL. MOIST.	620
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-770 **
 ** PAGE 4 **

SEAM NAME OHIO #6
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE OHIO

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(11.01 %MM)
% ASH	7.99	8.65		
% CARBON	67.17	72.71	79.59	81.71
% HYDROGEN	4.60*	4.98	5.45	5.60
% NITROGEN	1.14	1.23	1.35	1.38
% SULFUR	2.81	3.04	3.33	
% CHLORINE	0.01	0.01	0.01	0.01
% OXYGEN(DIFF)	8.66*	9.38	10.27	11.30

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	1.83	0.18	1.03	3.04
DAF	2.00	0.20	1.13	3.33

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(10.64%MM)	(%MM)
% CARBON	72.58	81.22	
% HYDROGEN	4.83	5.41	
% NITROGEN	1.23	1.38	
% ORGANIC SULFUR	1.03	1.15	
% OXYGEN(DIFF)	9.69	10.83	
% CHLORINE	0.01	0.01	
% MINERAL MATTER	10.64		

(INCLUDES 3.42 % FES2)

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.823	0.799	
ATOMIC O/C	0.104	0.112	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.02		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-770 **
 ** PAGE 5 **

SEAM NAME OHIO #6
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE OHIO

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 4.86
 % HIGH TEMPERATURE ASH = 16.50 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG			SiO2	37.70	2.91
B			Al2O3	22.90	2.00
BA	250	41	TIQ2	0.98	0.10
BE	80	13	FE2O3	33.60	3.88
BI			MGO	0.50	0.05
CE			CAO	1.18	0.14
CO			NA2O	0.16	0.02
CR	290	48	K2O	0.95	0.13
CU	160	26	P2O5	0.13	0.01
GA			S03	0.80	0.05
GE					
LA					
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	250	41	-----		-----
NB			AS		
PB			BR		
RB	40	7	CD		
SC			CL		
SN			F		
SR	340	56	HG		
TH			SB		
U	< 6	1	SE		
V	230	38			
Y					
YB					
ZN	170	28			
ZR	200	33			

** PENN STATE COAL DATA BASE **

 ** PSOC-770 **
 ** PAGE 7 **

SEAM NAME OHIO #6
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE OHIO

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %		
	-----	-----	-----		
VITRINITE (CALC.)	81.3	86.1	80.2		
INERTINITE (CALC.)	8.1	8.6	8.7		
LIPTINITE (CALC.)	5.0	5.3	4.6		
MINERAL MATTER (CALC.)	5.6		11.0		
VITRINOIDS					
VITRINITE	79.1	83.8	78.0		
PSEUDOVITRINITE	2.2	2.3	2.1		
FUSINITE	1.6	1.7	1.8		
SEMI-FUSINITE	3.6	3.8	3.8		
MACRINITE	0.4	0.4	0.4		
MICRINITE	2.5	2.7	2.7		
SCLEROTINITE	0.0	0.0	0.0		
SPORINITE					
CUTINITE					
EXINITE (ANAL.)	4.9	5.2	4.5		
RESINITE	0.1	0.1	0.1		
SUBERINITE					
EXUDATINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0	0.0	0.0		
LIPTODETRINITE					
MINERAL MATTER (ANAL.)					
INERTINITE (ANAL.)					
LIPTINITE (ANAL.)					
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
(%, IN OIL)	----	----	-----	-----	-----
VITRINITE	0.60	0.42	0.18	0.50	0.05
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

 ** PSOC-774 **
 ** PAGE 1 **

 * *
 * SAMPLE HISTORY *
 * *

PENN STATE NUMBER PSOC-774
 COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
 COLLECTION DATE 7/21/77
 COLLECTOR'S NUMBER 774

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
 OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
 SAMPLE RESERVE

SEAM NAME OHIO #5
 ALTERNATE SEAM NAME LOWER KITTANNING

TOTAL SEAM THICKNESS 1 FT. 9 IN.
 THICKNESS OF SEAM SAMPLED
 PORTION RECOVERED IN CORE
 DIAMETER OF CORE

 * *
 * SAMPLE LOCATION *
 * *

COUNTRY U.S.A.
 STATE OHIO
 COUNTY HOCKING
 TOWNSHIP GREEN
 NEAREST TOWN NEW STRAITSVILLE

COAL PROVINCE EASTERN
 COAL REGION APPALACHIAN
 COAL FIELD

MAP REFERENCE: LATITUDE
 LONGITUDE
 QUADRANGLE GORE

** PENN STATE COAL DATA BASE **

 ** PS0C-774 **
 ** PAGE 3 **

SEAM NAME OHIO #5 COUNTRY U.S.A.
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB) STATE OHIO

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	5.99					
% ASH	11.44	12.17				
% VOLATILE MATTER	39.65	42.18	48.02	46.35	46.85	
% FIXED CARBON	42.92	45.65	51.98	53.65	53.15	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	12462	11716	11666
MM-FREE (PARR)	14575	13539	13471
MM-FREE (MOD.P)	14530	13398	13331
BEST MM FREE		13398	13331
NET CV, DMMF BTU/LB	13982		
ASH-FREE	14189		

MOTT-SPOONER DIFFERENCE = 317.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	6.39	7.67
% TOTAL SULFUR	6.54	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE B BITUMINOUS (HVBB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE B BITUMINOUS (HVBB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE C BITUMINOUS (HVCB)
INTERNATIONAL RANK	
AS REC'D MOIST.	620
EQUIL. MOIST.	520
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-774 **
 ** PAGE 4 **

SEAM NAME OHIO #5
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE OHIO

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(16.74 %MM)
% ASH	11.44	12.17		
% CARBON	62.76	66.76	76.01	80.18
% HYDROGEN	4.67*	4.97	5.66	5.97
% NITROGEN	1.17	1.24	1.41	1.49
% SULFUR	6.15	6.54	7.45	
% CHLORINE	0.03	0.03	0.03	0.04
% OXYGEN(DIFF)	7.79*	8.29	9.44	12.33

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	4.74	0.24	1.56	6.54
DAF	5.40	0.27	1.78	7.45

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(15.99%MM)	(%MM)
% CARBON	66.56	79.24	
% HYDROGEN	4.72	5.62	
% NITROGEN	1.24	1.49	
% ORGANIC SULFUR	1.56	1.86	
% OXYGEN(DIFF)	9.92	11.78	
% CHLORINE	0.03	0.04	
% MINERAL MATTER	15.99		
(INCLUDES 8.87 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.894	0.851	
ATOMIC O/C	0.115	0.133	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.06		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-774 **
 ** PAGE 5 **

SEAM NAME OHIO #5
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE OHIO

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 4.29
 % HIGH TEMPERATURE ASH = 12.43 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG			SiO2	22.90	1.33
B			AL2O3	15.80	1.04
BA	510	63	TiO2	0.60	0.04
BE	70	9	FE2O3	55.00	4.78
BI			MGO	0.35	0.03
CE			CAO	1.62	0.14
CO			NA2O	0.17	0.02
CR	290	36	K2O	0.44	0.05
CU	200	25	P2O5	0.81	0.04
GA			S03	1.60	0.08
GE					
LA					
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	620	77	-----		-----
NB			AS		
PB			BR		
RB	30	4	CD		
SC			CL		
SN			F		
SR	2100	261	HG		
TH			SB		
U	14	2	SE		
V	170	21			
Y					
YB					
ZN	400	50			
ZR	450	56			

** PENN STATE COAL DATA BASE **

 ** PSOC-774 **
 ** PAGE 7 **

SEAM NAME OHIO #5
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE OHIO

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %		
	-----	-----	-----		
VITRINITE (CALC.)	79.0	86.7	75.6		
INERTINITE (CALC.)	7.3	8.0	7.6		
LIPTINITE (CALC.)	4.8	5.3	4.3		
MINERAL MATTER (CALC.)	8.8		16.7		
VITRINOIDS					
VITRINITE	79.0	86.7	75.6		
PSEUDOVITRINITE	0.0	0.0	0.0		
FUSINITE	1.4	1.5	1.5		
SEMI-FUSINITE	3.3	3.6	3.4		
MACRINITE	0.5	0.5	0.5		
MICRINITE	2.2	2.4	2.3		
SCLEROTINITE	0.0	0.0	0.0		
SPORINITE					
CUTINITE					
EXINITE (ANAL.)	4.8	5.3	4.3		
RESINITE	0.0	0.0	0.0		
SUBERINITE					
EXUDATINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0	0.0	0.0		
LIPTODETRINITE					
MINERAL MATTER (ANAL.)					
INERTINITE (ANAL.)					
LIPTINITE (ANAL.)					
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
(%, IN OIL)					
-----	-----	-----	-----	-----	-----
VITRINITE	0.54	0.35	0.19	0.48	0.04
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-777 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-777
COLLECTED BY PENNSYLVANIA STATE UNIVERSITY
COLLECTION DATE 7/22/77
COLLECTOR'S NUMBER 777

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION SUBSECTION DATA AVAILABLE
SAMPLE RESERVE

SEAM NAME OHIO #1
ALTERNATE SEAM NAME SHARON
TOTAL SEAM THICKNESS 4 FT. 5 IN.
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE OHIO
COUNTY BELMONT
TOWNSHIP COLERAIN
NEAREST TOWN NEW ATHENS
COAL PROVINCE EASTERN
COAL REGION APPALACHIAN
COAL FIELD

MAP REFERENCE: LATITUDE
LONGITUDE
QUADRANGLE

** PENN STATE COAL DATA BASE **

 ** PS0C-777 **
 ** PAGE 3 **

SEAM NAME OHIO #1
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE OHIO

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	4.30					
% ASH	20.90	21.84				
% VOLATILE MATTER	31.78	33.21	42.49	40.40	39.50	
% FIXED CARBON	43.02	44.95	57.51	59.60	60.50	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.

MM-FREE, DIRECT			
MM-CONTAINING	11243	10760	10725
MM-FREE (PARR)	14851	14007	13947
MM-FREE (MOD.P)	14970	14018	13958
BEST MM FREE		14018	13958
NET CV, DMMF BTU/LB	14418		
ASH-FREE	14385		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	4.61	6.18
% TOTAL SULFUR	3.31	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE A BITUMINOUS (HVAB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE B BITUMINOUS (HVBB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE B BITUMINOUS (HVBB)
INTERNATIONAL RANK	
AS REC'D MOIST.	630
EQUIL. MOIST.	630
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-777 **
 ** PAGE 4 **

SEAM NAME OHIO #1
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE OHIO

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(25.41 %MM)
% ASH	20.90	21.84		
% CARBON	60.36	63.07	80.69	84.55
% HYDROGEN	4.24*	4.43	5.67	5.94
% NITROGEN	1.01	1.06	1.36	1.42
% SULFUR	3.17	3.31	4.23	
% CHLORINE	0.02	0.03	0.03	0.03
% OXYGEN(DIFF)	5.99*	6.26	8.02	8.06

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	1.86	0.17	1.28	3.31
DAF	2.38	0.22	1.64	4.23

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(25.57%MM)	(%MM)
% CARBON	62.75	84.31	
% HYDROGEN	4.11	5.52	
% NITROGEN	1.06	1.42	
% ORGANIC SULFUR	1.28	1.72	
% OXYGEN(DIFF)	5.23	7.00	
% CHLORINE	0.03	0.03	
% MINERAL MATTER	25.57		
(INCLUDES 3.48 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.844	0.786	
ATOMIC O/C	0.072	0.084	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.05		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-777 **
 ** PAGE 5 **

SEAM NAME OHIO #1
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE OHIO

 * *
 * CHEMICAL DATA 3 *
 * *

% MOISTURE IN COAL = 3.42
 % HIGH TEMPERATURE ASH = 21.01 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG			SI02	55.30	5.43
B			AL2O3	23.60	2.62
BA	770	162	TIO2	1.09	0.14
BE	10	2	FE2O3	12.10	1.78
BI			MGO	0.99	0.13
CE			CA0	0.64	0.10
CO			NA2O	0.30	0.05
CR	170	36	K2O	2.90	0.51
CU	70	15	P2O5	0.27	0.02
GA			S03	0.70	0.06
GE					
LA					
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	90	19	-----		-----
NB			AS		
PB			BR		
RB	160	34	CD		
SC			CL		
SN			F		
SR	430	90	HG		
TH			SB		
U	< 5	1	SE		
V	170	36			
Y					
YB					
ZN	60	13			
ZR	190	40			

** PENN STATE COAL DATA BASE **

 ** PSOC-777 **
 ** PAGE 7 **

SEAM NAME OHIO #1
 APPARENT RANK HIGH VOLATILE A BITUMINOUS (HVAB)

COUNTRY U.S.A.
 STATE OHIO

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %		
	-----	-----	-----		
VITRINITE (CALC.)	71.9	83.7	62.3		
INERTINITE (CALC.)	12.9	15.0	12.3		
LIPTINITE (CALC.)	1.1	1.3	0.9		
MINERAL MATTER (CALC.)	14.1		25.4		
VITRINOIDS					
VITRINITE	70.4	82.0	61.0		
PSEUDOVITRINITE	1.5	1.7	1.3		
FUSINITE	4.0	4.7	4.0		
SEMI-FUSINITE	7.5	8.7	7.0		
MACRINITE	0.3	0.4	0.3		
MICRINITE	1.0	1.2	1.0		
SCLEROTINITE	0.0	0.0	0.0		
SPORINITE					
CUTINITE					
EXINITE (ANAL.)	1.1	1.3	0.9		
RESINITE	0.0	0.0	0.0		
SUBERINITE					
EXUDATINITE					
FLUORINITE					
BITUMINITE					
ALGINITE	0.0	0.0	0.0		
LIPTODETRINITE					
MINERAL MATTER (ANAL.)					
INERTINITE (ANAL.)					
LIPTINITE (ANAL.)					
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX	STAND. DEV.
(%, IN OIL)	-----	-----	-----	-----	-----
VITRINITE	0.79	0.60	0.19	0.69	0.04
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-781 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER

PSOC-781

COLLECTED BY
COLLECTION DATE
COLLECTOR'S NUMBER

PENNSYLVANIA STATE UNIVERSITY
7/22/77
781

REPORTED RANK

SAMPLE TYPE
OTHER SAMPLE INFORMATION
SAMPLE RESERVE

CHANNEL WHOLE SEAM

288

SEAM NAME
ALTERNATE SEAM NAME

OHIO #11

TOTAL SEAM THICKNESS
THICKNESS OF SEAM SAMPLED
PORTION RECOVERED IN CORE
DIAMETER OF CORE

3 FT. 1 IN.
3 FT. 1 IN.

*
* SAMPLE LOCATION *
*

COUNTRY
STATE
COUNTY
TOWNSHIP
NEAREST TOWN

U.S.A.
OHIO
BELMONT
COLERAIN
SALESVILLE

COAL PROVINCE
COAL REGION
COAL FIELD

EASTERN
APPALACHIAN

MAP REFERENCE: LATITUDE
 LONGITUDE
 QUADRANGLE

** PENN STATE COAL DATA BASE **

 ** PSØC-781 **
 ** PAGE 3 **

SEAM NAME OHIO #11

COUNTRY U.S.A.

APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

STATE OHIO

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	1.27					
% ASH	3.76	3.81				
% VOLATILE MATTER	17.25	17.47	18.16	17.62	17.76	
% FIXED CARBON	77.72	78.72	81.84	82.38	82.24	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	15045	14854	14306
MM-FREE (PARR)	15725	15516	14917
MM-FREE (MOD.P)	15729	15482	14886
BEST MM FREE		15482	14886
NET CV, DMMF BTU/LB	15306		
ASH-FREE	15641		

MOTT-SPOONER DIFFERENCE = 100.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	4.91	5.15
% TOTAL SULFUR	0.90	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	LOW VOLATILE BITUMINOUS (LVB)
ASTM RANK (EQUIL. MOIST.)	LOW VOLATILE BITUMINOUS (LVB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE B BITUMINOUS (HVBB)
INTERNATIONAL RANK	
AS REC'D MOIST.	320
EQUIL. MOIST.	320
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-781 **
 ** PAGE 4 **

SEAM NAME OHIO #11
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE OHIO

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR) (4.61 %MM)
% ASH	3.76	3.81		
% CARBON	85.35	86.45	89.87	90.63
% HYDROGEN	4.30*	4.36	4.53	4.57
% NITROGEN	0.97	0.98	1.02	1.03
% SULFUR	0.89	0.90	0.94	
% CHLORINE	0.02	0.03	0.03	0.03
% OXYGEN(DIFF)	3.43*	3.48	3.61	3.75

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	0.22	0.01	0.67	0.90
DAF	0.23	0.01	0.70	0.94

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P) (4.42%MM)	DMMF(DIR.) (%MM)
% CARBON	86.40	90.39	
% HYDROGEN	4.31	4.51	
% NITROGEN	0.98	1.03	
% ORGANIC SULFUR	0.67	0.70	
% OXYGEN(DIFF)	3.23	3.35	
% CHLORINE	0.03	0.03	
% MINERAL MATTER	4.42		

(INCLUDES 0.41 % FES2)

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
ATOMIC H/C	0.606	0.599	
ATOMIC O/C	0.031	0.029	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.05		

INFRA-RED ANALYSIS

(*) - EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-781 **
 ** PAGE 5 **

SEAM NAME OHIO #11
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE OHIO

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 3.53
 % HIGH TEMPERATURE ASH = 21.66 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG			SiO2	51.90	5.25
B			Al2O3	20.10	2.30
BA	730	158	TiO2	0.93	0.12
BE	10	2	Fe2O3	19.50	2.95
BI			MgO	0.87	0.11
CE			CaO	0.75	0.12
CO			Na2O	0.33	0.05
CR	160	35	K2O	2.70	0.49
CU	95	21	P2O5	0.20	0.02
GA			SO3	0.90	0.08
GE					
LA					
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	190	41	-----		-----
NB			AS		
PB			BR		
RB	130	28	CD		
SC			CL		
SN			F		
SR	230	50	HG		
TH			SB		
U	< 5	1	SE		
V	150	32			
Y					
YB					
ZN	85	18			
ZR	170	37			

** PENN STATE COAL DATA BASE **

 ** PSOC-781 **
 ** PAGE 7 **

SEAM NAME OHIO #11
 APPARENT RANK LOW VOLATILE BITUMINOUS (LVB)

COUNTRY U.S.A.
 STATE OHIO

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %		
VITRINITE (CALC.)	89.3	91.4	86.7		
INERTINITE (CALC.)	7.9	8.1	8.2		
LIPTINITE (CALC.)	0.5	0.5	0.4		
MINERAL MATTER (CALC.)	2.3		4.6		
VITRINOIDS					
VITRINITE	88.0	90.0	85.4		
PSEUDOVITRINITE	1.4	1.4	1.3		
FUSINITE	2.0	2.0	2.1		
SEMI-FUSINITE	5.4	5.5	5.5		
MACRINITE	0.1	0.1	0.1		
MICRINITE	0.5	0.5	0.5		
SCLEROTINITE					
SPORINITE	0.5	0.5	0.4		
CUTINITE					
EXINITE (ANAL.)					
RESINITE					
SUBERINITE					
EXUDATINITE					
FLUORINITE					
BITUMINITE					
ALGINITE					
LIPTODETRINITE					
MINERAL MATTER (ANAL.)					
INERTINITE (ANAL.)					
LIPTINITE (ANAL.)					
REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND. DEV.
VITRINITE	0.83	0.59	0.24	0.70	0.05
PSEUDOVITRINITE					
VITRINOIDS					

** PENN STATE COAL DATA BASE **

** PSOC-785 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-785
COLLECTED BY TEXAS A & M UNIVERSITY
COLLECTION DATE 7/ 8/77
COLLECTOR'S NUMBER

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION
SAMPLE RESERVE

SEAM NAME LOWER WILCOX
ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 10 FT. 4 IN.
THICKNESS OF SEAM SAMPLED 6 FT. 11 IN.
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE TEXAS
COUNTY FREESTONE
TOWNSHIP
NEAREST TOWN FAIRFIELD

COAL PROVINCE GULF
COAL REGION
COAL FIELD

MAP REFERENCE: LATITUDE 96D 5M 10S
LONGITUDE 31D 49M 00S
QUADRANGLE

** PENN STATE COAL DATA BASE **

 ** PSOC-785 **
 ** PAGE 3 **

SEAM NAME LOWER WILCOX
 APPARENT RANK SUBBITUMINOUS C (SUBC)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	27.81					
% ASH	9.10	12.61				
% VOLATILE MATTER	33.55	46.48	53.19	52.50	52.00	
% FIXED CARBON	29.53	40.91	46.81	47.50	48.00	

CALORIFIC VALUE	DRY	AS REC'D MOIST.	EQUIL. MOIST.
(GROSS BTU/LB)	==	=====	=====

MM-FREE, DIRECT			
MM-CONTAINING	10973	7921	7873
MM-FREE (PARR)	12728	8794	8724
MM-FREE (MOD.P)	12798	8786	8726
BEST MM FREE		8786	8726
NET CV, DMF BTU/LB	12299		
ASH-FREE	12556		

MOTT-SPOONER DIFFERENCE = .178.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	28.25	32.93
% TOTAL SULFUR	1.06	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	SUBBITUMINOUS C (SUBC)
ASTM RANK (EQUIL. MOIST.)	SUBBITUMINOUS C (SUBC)
REFLECTANCE RANK CATEGORY	
INTERNATIONAL RANK	
AS REC'D MOIST.	800
EQUIL. MOIST.	800
REPORTED RANK	

** PENN STATE COAL DATA BASE **

 ** PSOC-785 **
 ** PAGE 4 **

STEAM NAME LOWER WILCOX COUNTRY U.S.A.
 APPARENT RANK SUBBITUMINOUS C (SUBC) STATE TEXAS

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
				(14.20 %MM)
% ASH	9.10	12.61		
% CARBON	45.34	62.81	71.97	73.21
% HYDROGEN	3.34*	4.62	5.29	5.38
% NITROGEN	0.77	1.06	1.21	1.24
% SULFUR	0.77	1.06	1.21	
% CHLORINE	0.02	0.03	0.03	0.03
% OXYGEN(DIFF)	12.85*	17.82	20.39	20.15
SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	0.03	0.01	1.02	1.06
DAF	0.03	0.01	1.17	1.21
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
		(14.28%MM)	(%MM)
% CARBON	62.63	73.06	
% HYDROGEN	4.46	5.20	
% NITROGEN	1.06	1.24	
% ORGANIC SULFUR	1.02	1.19	
% OXYGEN(DIFF)	16.56	19.29	
% CHLORINE	0.03	0.03	
% MINERAL MATTER	14.28		
(INCLUDES 0.06 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
ATOMIC H/C	0.883	0.854	
ATOMIC O/C	0.207	0.231	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.05		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

*** PENN STATE COAL DATA BASE ***

 ** PSOC-785 **
 ** PAGE 5 **

SEAM NAME LOWER WILCOX COUNTRY U.S.A.
 APPARENT RANK SUBBITUMINOUS C (SUBC) STATE TEXAS

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 21.80
 % HIGH TEMPERATURE ASH = 13.17 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG			SiO2	34.10	2.10
B			AL2O3	14.40	1.00
BA	1270	167	TiO2	1.27	0.10
BE	5	1	Fe2O3	5.57	0.51
BI			MGO	3.62	0.29
CE			CAO	20.00	1.88
CO			NA2O	0.35	0.03
CR	120	16	K2O	0.28	0.03
CU	140	18	P2O5	0.07	0.00
GA			SO3	17.00	0.90
GE					
LA					
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	35	11	-----		-----
NB			AS		
PR			BR		
RB	25	3	CD		
SC			CL		
SN			F		
SR	3750	494	HG		
TH			SB		
U	11	1	SE		
V	160	21			
Y					
YB					
ZN	35	5			
ZR	270	36			

** PENN STATE COAL DATA BASE **

 ** PSOC-785 **
 ** PAGE 7 **

STEAM NAME LOWER WILCOX COUNTRY U.S.A.
 APPARENT RANK SUBBITUMINOUS C (SUBC) STATE TEXAS

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %			
HUMINITE	59.2	63.9			
INERTINITE	9.6	10.4			
LIPTINITE	0.5	0.5			
MINERAL MATTER(CALC.)	7.4				
TEXTINITE	0.3	0.3			
ULMINITE	55.5	59.9			
ATTRINITE					
DENSINITE					
HUMODETRINITE(ANAL)	22.3	24.1			
GELINITE	3.0	3.2			
CORPOHUMINITE	0.5	0.5			
SPORINITE					
CUTINITE					
EXINITE		2.2			
RESINITE	0.5	0.5			
SUBERINITE	0.0	0.0			
FLUORINITE					
BITUMINITE					
ALGINITE	0.0	0.0			
LIPTODETRINITE					
FUSINITE	3.0	3.2			
SEMI-FUSINITE	4.4	4.8			
MACRINITE	2.1	2.3			
MICRINITE	0.0	0.0			
SCLEROTINITE	0.1	0.1			
INERTODETRINITE	0.0	0.0			
MINERAL MATTER(ANAL.)					
HUMINITE(ANAL.)					
INERTINITE(ANAL.)					
LIPTINITE(ANAL.)					
REFLECTANCE DATA	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
(%, IN OIL)					
ULMINITE	0.42	0.24	0.18	0.31	

** PENN STATE COAL DATA BASE **

** PSOC-789 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-789
COLLECTED BY TEXAS A & M UNIVERSITY
COLLECTION DATE 7/12/77
COLLECTOR'S NUMBER

REPORTED RANK

SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION
SAMPLE RESERVE 185

SEAM NAME
ALTERNATE SEAM NAME

TOTAL SEAM THICKNESS 12 FT. 0 IN.
THICKNESS OF SEAM SAMPLED 12 FT. 0 IN.
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE TEXAS
COUNTY TITUS
TOWNSHIP
NEAREST TOWN WINFIELD

COAL PROVINCE
COAL REGION
COAL FIELD

MAP REFERENCE: LATITUDE 33D 11M 00S
LONGITUDE 95D 4M 30S
QUADRANGLE WINFIELD

** PENN STATE COAL DATA BASE **

 ** PS0C-789 **
 ** PAGE 3 **

SEAM NAME
 APPARENT RANK LIGNITE A (LIGA)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	27.12					
% ASH	16.80	23.05				
% VOLATILE MATTER	33.71	46.26	60.12	59.05	57.67	
% FIXED CARBON	22.37	30.69	39.88	40.95	42.33	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	9312	6787	6532
MM-FREE (PARR)	12419	8287	7910
MM-FREE (MOD.P)	12593	8337	7955
BEST MM FREE		8337	7955
NET CV, DMMF BTU/LB	12058		
ASH-FREE	12101		

MOTT-SPOONER DIFFERENCE =

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	29.85	39.99
% TOTAL SULFUR	0.85	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST) LIGNITE A (LIGA)
 ASTM RANK (EQUIL. MOIST.) LIGNITE A (LIGA)
 REFLECTANCE RANK CATEGORY
 INTERNATIONAL RANK
 AS REC'D MOIST.
 EQUIL. MOIST.
 REPORTED RANK

** PENN STATE COAL DATA BASE **

 ** PSOC-789 **
 ** PAGE 4 **

SEAM NAME

COUNTRY U.S.A.

APPARENT RANK LIGNITE A (LIGA)

STATE TEXAS

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR)
-----	-----	---	---	-----
				(25.36 %MM)
% ASH	16.80	23.05		
% CARBON	39.86	54.69	71.07	73.27
% HYDROGEN	3.11*	4.27	5.55	5.72
% NITROGEN	7.22	9.90	12.87	13.26
% SULFUR	0.62	0.85	1.10	
% CHLORINE	0.01	0.01	0.02	0.02
% OXYGEN(DIFF)	5.26*	7.23	9.39	7.73

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
-----	-----	-----	-----	-----
DRY	0.03	0.01	0.81	0.85
DAF	0.04	0.01	1.05	1.10
OPTICAL				

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P)	DMMF(DIR.)
-----	---	-----	-----
		(26.07%MM)	(%MM)
% CARBON	54.37	73.54	
% HYDROGEN	3.97	5.37	
% NITROGEN	9.90	13.26	
% ORGANIC SULFUR	0.81	1.10	
% OXYGEN(DIFF)	4.89	6.59	
% CHLORINE	0.01	0.02	
% MINERAL MATTER	26.07		
(INCLUDES 0.06 % FES2)			

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
-----	---	-----	-----
ATOMIC H/C	0.938	0.877	
ATOMIC O/C	0.079	0.091	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
-----	---	-----	-----
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.03		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-789 **
 ** PAGE 5 **

SEAM NAME

COUNTRY U.S.A.
 STATE TEXAS

APPARENT RANK LIGNITE A (LIGA)

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 22.60

% HIGH TEMPERATURE ASH = 23.00 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG			SiO2	47.40	5.10
B			AL2O3	22.80	2.78
BA	11	3	TiO2	1.74	0.24
BE	4	1	FE2O3	3.03	0.49
BI			MGO	2.38	0.33
CE			CAO	10.90	1.79
CO			NA2O	0.24	0.04
CR	120	28	K2O	0.49	0.09
CU	210	48	P2O5	0.06	0.01
GA			SO3	8.80	0.81
GE					
LA					
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	35	8	AS		
NB			BR		
PB			CD		
RB	30	7	CL		
SC			F		
SN			HG		
SR	1140	262	SB		
TH			SE		
U	16	4			
V	260	60			
Y					
YB					
ZN	60	14			
ZR	310	71			

** PENN STATE COAL DATA BASE **

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 ** PAGE 7 **

SEAM NAME
 APPARENT RANK LIGNITE A (LIGA)

COUNTRY U.S.A.
 STATE TEXAS

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION WHITE ANALYSIS ONLY

	DRY VOLUME %	DMMF VOLUME %
HUMINITE	63.8	74.2
INERTINITE	10.7	12.5
LIPTINITE	0.1	0.1
MINERAL MATTER(CALC.)	14.1	
TEXTINITE	0.1	0.1
ULMINITE	63.5	73.9
ATTRINITE		
DENSINITE		
HUMODETRINITE (ANAL)	9.8	11.4
GELINITE	0.0	0.0
CORPOHUMINITE	0.2	0.2
SPORINITE		
CUTINITE		
EXINITE		0.8
RESINITE	0.1	0.1
SUBERINITE	0.0	0.0
FLUORINITE		
BITUMINITE		
ALGINITE	0.0	0.0
LIPTODETRINITE		
FUSINITE	2.2	2.6
SEMI-FUSINITE	6.7	7.8
MACRINITE	1.4	1.6
MICRINITE	0.0	0.0
SCLEROTINITE	0.4	0.5
INERTODETRINITE	0.0	0.0
MINERAL MATTER(ANAL.)		
HUMINITE(ANAL.)		
INERTINITE(ANAL.)		
LIPTINITE(ANAL.)		

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
ULMINITE	0.44	0.26	0.18	0.35	0.04

** PENN STATE COAL DATA BASE **

** PSOC-794 **
** PAGE 1 **

*
* SAMPLE HISTORY *
*

PENN STATE NUMBER PSOC-794
COLLECTED BY TEXAS A & M UNIVERSITY
COLLECTION DATE 7/14/77
COLLECTOR'S NUMBER
REPORTED RANK HIGH VOLATILE B BITUMINOUS (HVBB)
SAMPLE TYPE CHANNEL WHOLE SEAM
OTHER SAMPLE INFORMATION
SAMPLE RESERVE 480
SEAM NAME CROWEBURG
ALTERNATE SEAM NAME
TOTAL SEAM THICKNESS 3 FT. 0 IN.
THICKNESS OF SEAM SAMPLED 3 FT. 0 IN.
PORTION RECOVERED IN CORE
DIAMETER OF CORE

*
* SAMPLE LOCATION *
*

COUNTRY U.S.A.
STATE OKLAHOMA
COUNTY OKMULGEE
TOWNSHIP
NEAREST TOWN HENRYETTA

COAL PROVINCE
COAL REGION
COAL FIELD

MAP REFERENCE: LATITUDE
LONGITUDE
QUADRANGLE

** PENN STATE COAL DATA BASE **

 ** PSOC-794 **
 ** PAGE 3 **

SEAM NAME CROWEBURG
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * CHEMICAL DATA 1 *
 *

PROXIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF (PARR)	DMMF (PARR-G)	DMMF (DIR MM)
% MOISTURE	5.47					
% ASH	9.08	9.61				
% VOLATILE MATTER	31.47	33.29	36.83	35.74	35.68	
% FIXED CARBON	53.98	57.10	63.17	64.26	64.32	

CALORIFIC VALUE (GROSS BTU/LB)	DRY	AS REC'D MOIST.	EQUIL. MOIST.
MM-FREE, DIRECT			
MM-CONTAINING	13200	12478	12337
MM-FREE (PARR)	14813	13902	13725
MM-FREE (MOD.P)	14839	13871	13695
BEST MM FREE		13871	13695
NET CV, DMMF BTU/LB	14322		
ASH-FREE	14603		

MOTT-SPOONER DIFFERENCE = 71.

ASSOCIATED ANALYSES	DRY	MMF
% EQUILIBRIUM MOISTURE	6.54	7.41
% TOTAL SULFUR	2.40	

 *
 * RANK CALCULATIONS *
 *

APPARENT RANK (AS REC'D MOIST)	HIGH VOLATILE B BITUMINOUS (HVBB)
ASTM RANK (EQUIL. MOIST.)	HIGH VOLATILE B BITUMINOUS (HVBB)
REFLECTANCE RANK CATEGORY	HIGH VOLATILE A BITUMINOUS (HVAB)
INTERNATIONAL RANK	
AS REC'D MOIST.	620
EQUIL. MOIST.	620
REPORTED RANK	HIGH VOLATILE B BITUMINOUS (HVBB)

** PENN STATE COAL DATA BASE **

 ** PSOC-794 **
 ** PAGE 4 **

SEAM NAME CROWEBURG
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * CHEMICAL DATA 2 *
 *

ULTIMATE ANALYSIS	AS REC'D	DRY	DAF	DMMF(PARR) (11.70 %MM)
% ASH	9.08	9.61		
% CARBON	69.49	73.51	81.33	83.25
% HYDROGEN	4.66*	4.93	5.45	5.58
% NITROGEN	1.47	1.56	1.73	1.77
% SULFUR	2.27	2.40	2.66	
% CHLORINE	0.07	0.07	0.08	0.08
% OXYGEN(DIFF)	7.48*	7.92	8.76	9.33

SULFUR FORMS	% PYRITIC	% SULFATIC	% ORGANIC	% TOTAL
DRY	1.41	0.11	0.88	2.40
DAF	1.56	0.12	0.97	2.66

OPTICAL

ELEMENTAL ANALYSIS	DRY	DMMF(MOD.P) (11.56%MM)	DMMF(DIR.) (%MM)
% CARBON	73.37	82.96	
% HYDROGEN	4.78	5.40	
% NITROGEN	1.56	1.77	
% ORGANIC SULFUR	0.88	1.00	
% OXYGEN(DIFF)	7.86	8.81	
% CHLORINE	0.07	0.08	
% MINERAL MATTER	11.56		

(INCLUDES 2.64 % FES2)

ATOM RATIOS (DMMF)	PARR	MOD.PAR	DIRECT
ATOMIC H/C	0.806	0.782	
ATOMIC O/C	0.084	0.090	

MISC. CHEMICAL DATA	DRY	OF DMMF COAL	OF DMMF OXYGEN
% O AS COOH			
% O AS OH			
% S AS SO4, IN ASH			
% CARBONATE AS CO2			
% CHLORINE	0.15		

INFRA-RED ANALYSIS

(*)-EXCLUDES MOISTURE

** PENN STATE COAL DATA BASE **

 ** PSOC-794 **
 ** PAGE 5 **

SEAM NAME CROWEBURG
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * CHEMICAL DATA 3 *
 *

% MOISTURE IN COAL = 2.97

% HIGH TEMPERATURE ASH = 8.45 AT 750 DEGREES C

TRACE ELEMENT ANALYSIS	PPM HTA	PPM TOTAL COAL	MAJOR ELEMENT ANALYSIS	OXIDE % OF HTA	ELEMENT % OF TOTAL DRY COAL
AG			SiO2	45.00	1.78
B			Al2O3	24.00	1.07
BA	360	30	TiO2	0.84	0.04
BE	25	2	Fe2O3	22.50	1.33
BI			MgO	1.47	0.07
CE			CaO	1.19	0.07
CO			Na2O	0.35	0.02
CR	210	18	K2O	2.99	0.20
CU	240	20	P2O5	0.15	0.01
GA			SO3	1.30	0.04
GE					
LA					
LI					
MN					
MO			VOLATILES		PPM TOTAL COAL
NI	410	35	-----	-----	-----
NB			AS		
PB			BR		
RB	110	9	CD		
SC			CL		
SN			F		
SR	410	35	HG		
TH			SB		
U	< 10	1	SE		
V	220	19			
Y					
YB					
ZN	390	33			
ZR	170	14			

** PENN STATE COAL DATA BASE **

 ** PSOC-794 **
 ** PAGE 7 **

SEAM NAME CROWEBURG
 APPARENT RANK HIGH VOLATILE B BITUMINOUS (HVBB)

COUNTRY U.S.A.
 STATE OKLAHOMA

 *
 * PETROGRAPHIC DATA *
 *

MACERAL COMPOSITION COMBINED WHITE AND BLUE LIGHT

	DRY VOLUME %	DMMF VOLUME %	DRY WEIGHT %
VITRINITE (CALC.)	77.0	81.9	72.5
INERTINITE (CALC.)	6.9	7.3	7.1
LIPTINITE (CALC.)	10.1	10.7	8.7
MINERAL MATTER (CALC.)	6.0		11.7
VITRINOIDS			
VITRINITE	75.9	80.7	71.4
PSEUDOVITRINITE	1.1	1.2	1.1
FUSINITE	1.3	1.4	1.4
SEMI-FUSINITE	4.3	4.6	4.4
MACRINITE	0.5	0.5	0.5
MICRINITE	0.8	0.8	0.8
SCLEROTINITE	0.0	0.0	0.0
GFORINITE	9.0	9.6	7.8
CUTINITE	0.7	0.7	0.6
EXINITE (ANAL.)			
RESINITE	0.0	0.0	0.0
SUBERINITE			
EXUDATINITE	0.1	0.1	0.1
FLUORINITE	0.0	0.0	0.0
BITUMINITE	0.3	0.3	0.2
ALGINITE	0.0	0.0	0.0
LIPTODETRINITE	0.0	0.0	0.0
MINERAL MATTER(ANAL.)			
INERTINITE(ANAL.)			
LIPTINITE(ANAL.)			

REFLECTANCE DATA (%, IN OIL)	HIGH	LOW	RANGE	MEAN MAX	STAND.DEV.
VITRINITE	0.89	0.68	0.21	0.80	0.05
PSEUDOVITRINITE					
VITRINOIDS					