

PR-SAYON 77 (4) A

DRILL CORE ANALYSES  
ADIT WASHABILITY DATA  
COKE TEST RESULTS

DENISON MINES LTD. 1977

628

**CONFIDENTIAL**

PROJECT: Saxon
DATE SAMPLED: 31/ 3/77
DRILL HOLE #1: 7620
LAR COMPOSITE #177-4276-4279 WT. RFC. 16.79

DENISON COAL DATA

Table with columns: COMPOSITE DESCRIPTION, MINING SECTION, THICKNESS, DIP, COAL/COAL+ROCK, DRILL CORF RECOVERY, ESTIMATED YIELD.

WARNOCK HERSEY ANALYSIS

Table with columns: SIMULATED PRODUCT, SIZE, CUTPOINT, CONTRIBUTION, AIR DRIED, DRY BASIS, D.M.M.F., SP.G.

YIELD

Table with columns: MOISTURE, ASH, VOLATILE, F.C., SULPHUR, PHOSPHORUS, S.F.S.I., F.S.I., HARDGROVE.

HEAD ANALYSIS - COMPOSITE RAW COAL

Table with columns: AIR DRIED, DRY BASIS, D.M.M.F., MOISTURE, ASH, VOLATILE, F.C., F.S.I., SULPHUR, SP.G. (-3/8 MESH), PHOSPHORUS.

SEAM: 1

FLOAT SINK ANALYSIS
SIZE REL. WEIGHT
3/8 X 28 65.60

Table with columns: SP.G., WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI.

SIZE REL. WEIGHT
28 X 100 25.10

Table with columns: SP.G., WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI.

FROTH FLOTATION
SIZE REL. WEIGHT
100 X 0 4.70

Table with columns: TIME, WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI.

CENTRIFUGE SEPARATION
SIZE REL. WEIGHT
100 X 0 4.60

Table with columns: SP.G., WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI.

DRILL HOLE #: 7620

SEAM: 1

FLUIDITY

DILATATION

Table with columns: START TEMP., FINAL TEMP., MAX. FLUIDITY TEMP., MAX. FLUIDITY (NDPM), MAX. FLUIDITY (LOG), SOFT TEMP., SOLID TEMP., MAX. CONTRACTION, MAX. DILATATION, G. FACTOR.

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S. F.S.I., 1.5 FLOAT, 1.5 SINK, TOTAL.

Table with columns: DRY BASIS, D.M.M.F. BASIS.

COMPONENT NO. 77-4278R INTERVAL 175.58-175.96

Table with columns: AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S. F.S.I., 1.5 FLOAT, 1.5 SINK, TOTAL.

Table with columns: DRY BASIS, D.M.M.F. BASIS.

COMPONENT NO. 77-4278 INTERVAL 175.96-178.99

Table with columns: AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S. F.S.I., 1.5 FLOAT, 1.5 SINK, TOTAL.

Table with columns: DRY BASIS, D.M.M.F. BASIS.

DRILL HOLE #: 7620

SEAM: 1

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S. F.S.I., 1.5 FLOAT, 1.5 SINK, TOTAL.

Table with columns: DRY BASIS, D.M.M.F. BASIS.

COMPONENT NO. 77-4276 INTERVAL 179.52-183.40

Table with columns: AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S. F.S.I., 1.5 FLOAT, 1.5 SINK, TOTAL.

Table with columns: DRY BASIS, D.M.M.F. BASIS.

PROJECT: SAXON  
DATE SAMPLED: 0 / 0 / 0  
DRILL HOLE #: 7620  
LAB COMPOSITE #:

APFA: FAST  
DATE ANALYSED: 0 / 0 / 0  
SEAM: 1L  
WT. REC. 0.

DENISON COAL DATA

COMPOSITE DESCRIPTION INTERVAL	MINING SECTION	
	191.25-192.60	
THICKNESS	0.	1.35
DIP		13
COAL/COAL+ROCK	0. / 0.	7.54 / 8.41
DRILL CORE RECOVERY	0. %	69.00 %
ESTIMATED YIELD	74.00	

WARNOCK HERSEY ANALYSIS

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0
SIF			
CUTPOINT			

DRILL HOLE #: 7620

SEAM: 1L

DRILL HOLE #: 7620

SEAM: 1L

FLUIDITY

DILATATION

START TEMP. *****	SOFT TEMP. *****
FINAL TEMP. *****	SOLID TEMP. *****
MAX. FLUIDITY TEMP. *****	MAX. CONTRACTION *****
MAX. FLUIDITY (DMPH) *****	MAX. DILATATION *****
MAX. FLUIDITY (LOG) *****	G. FACTOR *****

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-4275B	INTERVAL	191.25-191.69			
		AIR DRIED BASIS				
	WT% ASH%	MOIST VOL.	F.C.	S.	F.S.I.	
1.5 FLOAT	41.50 8.00	.50	19.00	72.50	.55 5.0	
1.5 SINK	58.50 39.28					
TOTAL	100.00 26.30					

DRY BASIS	8.04	19.10	72.86
D.M.M.F. BASIS	-	20.03	79.97

COMPONENT NO.	77-4275	INTERVAL	191.69-192.60			
		AIR DRIED BASIS				
	WT% ASH%	MOIST VOL.	F.C.	S.	F.S.I.	
1.5 FLOAT	91.70 7.80	.40	16.90	74.90	.52 2.0	
1.5 SINK	8.30 29.49					
TOTAL	100.00 9.60					

DRY BASIS	7.83	16.97	75.20
D.M.M.F. BASIS	-	17.68	82.32

PROJECT: SAXON AREA: EAST  
 DATE SAMPLED: 31/ 3/77 DATE ANALYSED: 12/7/ 6/77  
 DRILL HOLE #: 7620 SFAM: 2U  
 LAB COMPOSITE #: 774282-42828 WT. PFC. A.A1

DENISON COAL DATA

COMPOSITE DESCRIPTION		MINING SECTION	
INTERVAL	157.79-163.67	157.79-163.67	
THICKNESS	5.88	5.88	
NIP	29	29	
COAL/COAL+ROCK	4.48/ 5.14	4.68/ 5.14	
DRILL CORF RECOVERY	51.00%	51.00 %	
ESTIMATED YIELD	48.00		

WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0	1.80 SPG
SIZE	SP.G. 1.54	SP.G. 1.76	135 SECS	
CUTPOINT				
CONTRIBUTION	41.0	16.6	8.9	

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
	66.50		

MOISTURE	.90		
ASH	8.70	8.78	
VOLATILE	19.60	19.78	20.96
F.C.	70.80	71.44	79.04
SULPHUR	.36		
PHOSPHORUS	.015		
S.P.G.	1.330		
F.S.I.	6.5		
HARDGROVE	RS.10		

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.40		
ASH	23.30	23.39	
VOLATILE	16.80	16.87	19.94
F.C.	59.50	59.74	80.06
F.S.I.	2.5		
SULPHUR	.31		
SP.G. (1-3/4 MESH)	1.52		
PHOSPHOROUS	.016		

DRILL HOLE #: 7620 SEAM: 2U

FLOAT SINK ANALYSIS  
 SIZE REL. WEIGHT  
 3/8 X 28 71.60

SP.G.	WT%	ASH%	WT%	ASH%	WT%	ASH%	F.S.I.	FSI
1.40	38.10	5.40	38.10	5.40	61.90	38.54	7.5	7.5
1.50	15.40	16.20	53.50	8.51	46.50	45.94	1.5	6.0
1.54	3.70	25.40	57.20	9.60	42.80	47.72	1.0	6.0
1.60	6.00	29.90	63.20	11.53	36.80	50.62	1.0	5.0
1.80	18.30	36.80	81.50	17.20	18.50	64.30	1.0	3.5
****	18.50	64.30	100.00	25.92	*****	*****	1.0	2.0

SIZE REL. WEIGHT  
 28 X 100 18.70

SP.G.	WT%	ASH%	WT%	ASH%	WT%	ASH%	F.S.I.	FSI
1.40	64.00	3.80	64.00	3.80	36.00	31.42	8.5	8.5
1.50	9.70	11.80	73.70	4.85	26.30	38.66	2.5	8.0
1.60	5.00	19.30	78.70	5.77	21.30	43.20	1.0	7.5
1.76	10.20	30.60	88.90	8.62	11.10	54.78	1.0	7.0
1.90	3.60	41.00	92.50	9.88	7.50	61.40	1.0	6.5
****	7.50	61.40	100.00	13.74	*****	*****	1.0	5.5

FROTH FLOATATION

SIZE REL. WEIGHT  
 100 X 0 4.90

TIME	WT%	ASH%	WT%	ASH%	F.S.I.	FSI
45	54.90	7.00	54.90	7.00	6.5	6.5
90	22.90	12.10	77.80	8.50	5.0	6.0
135	11.40	22.40	89.20	10.28	1.0	5.5
180	7.60	33.80	96.80	12.12	1.0	5.0
225	3.20	47.60	100.00	13.26	1.0	4.0

CENTRIFUGE SEPARATION

SIZE REL. WEIGHT  
 100 X 0 4.90

SP.G.	WT%	ASH%	WT%	ASH%	WT%	ASH%	F.S.I.	FSI
1.40	77.00	4.00	77.00	4.00	23.00	40.93	7.5	7.5
1.50	8.40	15.60	85.40	5.14	14.60	55.50	1.0	6.5
1.60	4.50	25.60	89.90	6.17	10.10	68.82	1.0	6.0
1.80	3.20	37.40	93.10	7.24	6.90	83.40	1.0	6.0
1.90	2.60	69.00	95.70	8.92	4.30	92.10	1.0	6.0
****	4.30	92.10	100.00	12.49	*****	*****	1.0	5.5

DRILL HOLE #: 7620 SEAM: 2U

FLUIDITY	DILATATION
START TEMP. 493.0	SOFT TEMP. 407.0
FINAL TEMP. 492.0	SOLID TEMP. 492.0
MAX.FLUIDITY TEMP. 480.0	MAX.CONTRACTION 23.0
MAX.FLUIDITY (DDPH) 8.0	MAX.DILATATION -13.0
MAX.FLUIDITY (LOG) .903	G.FACTOR .990

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	INTERVAL	AIR DRIED BASIS	WT%	ASH%	MOIST VOL.	F.C.	S.	F.S.I.
77-4282B	157.79-158.25							
1.5 FLOAT	17.40	16.20	.60	19.60	63.60	.60	7.0	
1.5 SINK	82.60	52.64						
TOTAL	100.00	46.30						

DRY BASIS	16.30	19.72	63.98
D.M.M.F. BASIS	-	22.14	77.86

COMPONENT NO.	INTERVAL	AIR DRIED BASIS	WT%	ASH%	MOIST VOL.	F.C.	S.	F.S.I.
77-4282	158.25-163.67							
1.5 FLOAT	50.80	8.10	.60	19.50	71.80	.38	8.0	
1.5 SINK	39.20	39.48						
TOTAL	100.00	20.40						

DRY BASIS	8.15	19.62	72.23
D.M.M.F. BASIS	-	20.68	79.32

PROJECT: SAXON  
 DATE SAMPLED: 31/ 3/77  
 DRILL HOLE #: 7620  
 IAR COMPOSITE #: 77-4281 WT. RFC. 2.08

APFA: FAST  
 DATE ANALYSED: 24/ 6/77  
 SFAM: 2M

DENISON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION
INTERVAL : 145.60-167.72	165.60-167.72
THICKNESS : 2.12	2.12
DTP : 28	28
COAL/COAL+ROCK : 1.87/ 1.87	0. / 1.87
DRILL CORE RECOVERY : 35.00%	35.00 %
ESTIMATED YIELD : 68.00	

WARNOCK HERSEY ANALYSIS

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0	1.00 SP6
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SECS	
CONTRIBUTION	43.4	23.7	7.7	

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	74.80		
ASH	.98	6.16	
VOLATILE	6.10	20.28	21.10
F.C.	72.40	73.56	78.90
SULPHUR	.32		
PHOSPHORUS	.016		
%P.G.	1.340		
F.S.I.	7.0		
HARDGROVE	*****		

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.40		
ASH	17.00	17.07	
VOLATILE	18.50	18.57	20.99
F.C.	64.10	64.36	79.01
F.S.I.	4.0		
SULPHUR	.3P		
SP.GR. (-3/8 MFSH)	1.40		
PHOSPHOROUS	.012		

DRILL HOLE #: 7620 SEAM: 2M

FLOAT SINK ANALYSES  
 SIZE REL. WEIGHT  
 3/8 X 28 65.40

SP.G.	WT%	ASH%	CUM. WT%	FLOATS	CUM. SINKS	F.S.I.	FSI
1.40	51.80	4.50	51.80	4.50	48.20	35.47	7.0
1.50	11.20	16.80	63.00	6.49	37.00	41.12	1.5
1.54	3.48	20.50	66.40	7.39	33.60	43.21	1.0
1.60	6.70	25.90	73.10	9.09	26.90	47.92	1.0
1.80	15.70	35.90	88.80	13.83	11.20	63.80	1.0
****	11.20	63.80	100.00	19.43	*****	*****	1.0

SIZE REL. WEIGHT  
 28 X 100 25.70

SP.G.	WT%	ASH%	CUM. WT%	FLOATS	CUM. SINKS	F.S.I.	FSI
1.40	73.30	3.50	73.30	3.50	26.70	26.75	8.0
1.50	8.00	11.00	81.30	4.24	18.70	33.40	2.0
1.60	5.90	16.30	87.20	5.05	12.80	41.42	1.0
1.76	5.00	27.80	92.20	6.29	7.80	50.14	1.0
1.90	2.80	32.90	95.00	7.07	5.00	59.80	1.0
****	5.00	59.80	100.00	9.71	*****	*****	1.0

FROTH FLOTATION

SIZE REL. WEIGHT  
 100 X 0 4.50

TIME	WT%	ASH%	CUM. WT%	FLOATS	CUM. SINKS	F.S.I.	FSI
45	36.20	5.70	36.20	5.70	7.0	7.0	
90	23.40	9.30	59.60	7.11	4.0	6.5	
135	19.10	14.80	78.70	8.98	3.0	6.5	
180	12.80	16.80	91.50	10.07	2.5	5.0	
225	8.50	27.00	100.00	11.51	1.5	4.5	

CENTRIFUGE SEPARATION

SIZE REL. WEIGHT  
 100 X 0 4.40

SP.G.	WT%	ASH%	CUM. WT%	FLOATS	CUM. SINKS	F.S.I.	FSI
1.40	83.30	4.10	83.30	4.10	16.70	43.04	6.5
1.50	4.70	17.60	88.00	4.82	12.00	53.01	1.0
1.60	3.70	28.20	91.70	5.76	8.30	64.07	1.0
1.80	3.10	36.50	94.80	6.77	5.20	80.50	1.0
****	5.20	80.50	100.00	10.60	*****	*****	1.0

DRILL HOLE #: 7620 SEAM: 2M

FLUIDITY

DILATATION

START TEMP.	456.0	SOFT TEMP.	412.0
FINAL TEMP.	498.0	SOLID TEMP.	489.0
MAX. FLUIDITY TEMP.	480.0	MAX. CONTRACTION	24.0
MAX. FLUIDITY (DDPM)	8.0	MAX. DILATATION	-10.0
MAX. FLUIDITY (LOG)	.903	G. FACTOR	.810

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-4281	INTERVAL	165.60-167.72
		AIR DRIED BASIS	
1.5 FLOAT	67.40	6.90	.60 20.10 72.40 .41 7.5
1.5 SINK	32.60	42.79	
TOTAL	100.00	18.60	

DRY BASIS	6.94	20.22 72.84
D.M.M.F. BASIS	-	21.13 78.87

PROJECT: SAXON  
 DATE SAMPLED: 0/ 0/ 0  
 DRILL HOLE #: 7A20  
 LAB COMPOSITE #:

AREA: FAST  
 DATE ANALYSED: 0/ 0/ 0  
 SEAM: 2L  
 WT. REC. 0.

## DENISON COAL DATA

COMPOSITE DESCRIPTION INTERVAL	MINING SECTION 170.30-171.62	
THICKNESS	0.	1.32
DIP		22
COAL/COAL+ROCK	0. / 0.	1.22/ 1.22
DRILL CORE RECOVERY	0. %	34.00 %
ESTIMATED YIELD	68.00	

## WARNOCK HERSEY ANALYSES

STIMULATED PRODUCT  
 SIZF 3/8 X 28 28 X 100 100 X 0  
 OUTPOINT

DRILL HOLE #: 7A20 SEAM: 2L

## DENISON COAL LIMITED

DRILL HOLE #: 7620 SEAM: 2L

## FLUIDITY

START TEMP. \*\*\*\*\*  
 FINAL TEMP. \*\*\*\*\*  
 MAX. FLUIDITY TEMP. \*\*\*\*\*  
 MAX. FLUIDITY (DOPH) \*\*\*\*\*  
 MAX. FLUIDITY (LOG) \*\*\*\*\*

## DILATATION

SOFT TEMP. \*\*\*\*\*  
 SOLID TEMP. \*\*\*\*\*  
 MAX. CONTRACTION \*\*\*\*\*  
 MAX. DILATATION \*\*\*\*\*  
 G. FACTOR \*\*\*\*\*

## 1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-4280	INTERVAL	170.30-171.62			
		AIR DRIED BASIS				
	WT%	ASH%	MOIST VOL.	F.C.	S. F.S.I.	
1.5 FLOAT	79.80	5.20	.40	20.60	73.80 .43 9.0	
1.5 SINK	20.20	57.18				
TOTAL	100.00	15.70				

DRY BASIS 5.22 20.68 74.10  
 D.M.W.F. BASIS - 21.35 78.65

PROJECT: SAXON AREA: FAST  
 DATE SAMPLED: 30/ 3/77 DATE ANALYSED: 8/ 8/77  
 DRILL HOLE #: 7701 SEAM: 1U  
 LAB COMPOSITE #: 77-4264 WT. PFC. 6.66

DEFINSON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION
INTERVAL : 122.28-124.88	120.86-128.21
THICKNESS : 2.60	7.35
DTP : 49	49
COAL/COAL+ROCK : 1.71/ 1.71	4.36/ 4.82
DRILL CORE RECOVERY : 100.00%	38.00 %
ESTIMATED YIELD : 81.00	

WARNOCK HERSEY ANALYSIS

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0	1.80 SPG
SIZE	SP.G. 1.54	SP.G. 1.76		
CONTRIBUTION	65.2	16.1	7.2	

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
	88.50		
MOISTURE	.70		
ASH	6.40	6.45	
VOLATILE	19.70	19.84	20.68
F.C.	73.20	73.72	79.32

SULPHUR	.28
PHOSPHORUS	.008
S.P.G.	1.300
F.S.I.	6.5
HARDGROVE	94.80

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.50		
ASH	10.50	10.55	
VOLATILE	21.00	21.11	22.76
F.C.	68.00	68.34	77.24

F.S.I.	5.5
SULPHUR	.33
SP.G. (-3/8 WFSH)	1.45
PHOSPHORUS	.011

DRILL HOLE #: 7701 SEAM: 1U

FLOAT SINK ANALYSES

SIZE	REL. WEIGHT	CUM. FLOATS		CUM. SINKS		F.S.I.	FST
3/8 X 28	74.40						
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	FST	
1.40	76.90 5.50	76.90 5.50	23.10 26.91	7.5	7.5		
1.50	8.40 12.90	85.30 6.23	14.70 34.92	1.5	5.5		
1.60	2.40 16.50	87.70 6.51	12.30 38.51	1.5	5.0		
1.80	2.00 22.70	89.70 6.87	10.30 41.58	1.0	5.0		
1.90	5.80 25.90	95.50 8.03	4.50 61.80	1.0	5.0		
****	4.50 61.80	100.00 10.45	*****		5.0		

SIZE REL. WEIGHT

SIZE	REL. WEIGHT	CUM. FLOATS		CUM. SINKS		F.S.I.	FST
3/8 X 100	17.50						
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	FST		
1.40	64.00 3.90	64.00 3.90	36.00 19.51	8.5	8.5		
1.50	15.90 9.10	79.90 4.93	20.10 27.74	1.5	6.0		
1.60	3.90 13.00	83.80 5.31	16.20 31.28	1.0	5.5		
1.76	8.10 19.20	91.90 6.53	8.10 43.37	1.0	5.5		
1.90	1.90 26.30	93.80 6.93	6.20 48.60	1.0	5.5		
****	6.20 48.60	100.00 9.52	*****		5.5		

CENTRIFUGE SEPARATION

SIZE	REL. WEIGHT	CUM. FLOATS		CUM. SINKS		F.S.I.	FST
100 X 0	8.10						
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	FST		
1.40	75.10 5.50	75.10 5.50	24.90 45.44	6.0	6.0		
1.50	8.20 16.40	83.30 6.57	16.70 59.70	1.5	5.5		
1.60	1.90 21.70	85.20 6.91	14.80 64.58	1.5	5.5		
1.80	3.20 33.10	88.40 7.86	11.60 73.26	1.0	5.0		
1.90	.70 43.10	89.10 8.14	10.90 75.20	1.0	5.0		
****	10.90 75.20	100.00 15.45	*****		5.0		

DRILL HOLE #: 7701 SEAM: 1U

FLUIDITY	DILATATION
START TEMP. 459.0	SOFT TEMP. 416.0
FINAL TEMP. 498.0	SOLID TEMP. 487.0
MAX.FLUIDITY TEMP. 486.0	MAX.CONTRACTION 14.0
MAX.FLUIDITY (DDPM) 5.0	MAX.DILATATION -6.0
MAX.FLUIDITY (LOG) .699	G.FACTOR .836

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-4264	INTERVAL	122.28-124.88
		AIR DRIED BASIS	
	WT% ASH%	MOIST VOL.	F.C. S. F.S.I.
1.5 FLOAT	82.60 6.80	.60 20.40	72.20 .35 6.5
1.5 SINK	17.40 29.21		
TOTAL	100.00 10.70		
DRY BASIS	6.84	20.52	72.64
D.M.M.F. BASIS	-	21.46	78.54



PROJECT: SAXON AREA: EAST  
 DATE SAMPLED: 30/ 3/77 DATE ANALYSED: 7/ 6/77  
 DRILL HOLE #: 7701 SPAN: 1L  
 LAB COMPOSITE #: 77-4263 WT. REC. 4.47

DENISON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION
INTERVAL : 145.56-146.86	145.56-147.38
THICKNESS : 1.30	1.82
DTP : 49	49
COAL/COAL+SPK : .85/ .85	1.19/ 1.19
DRILL CORF RECOVERY : 100.00%	71.00 %
ESTIMATED YIELD :	81.00

WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0	1.80 SPG
SIZE	SP.G. 1.54	SP.G. 1.76		
CUTPOINT	67.9	8.7	3.8	
CONTRIBUTION				

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
	80.40		

MOISTURE	ASH	VOLATILE	F.C.
.60	7.90	19.32	72.30
	7.95	20.28	72.74
		79.72	

SULPHUR	PHOSPHORUS	S.P.G.	F.S.I.	HARDENOVE
.49	.007	1.320	6.0	98.20

HEAD ANALYSIS - COMPOSITE RAW COAL

MOISTURE	ASH	VOLATILE	F.C.
.50	17.50	17.79	64.30
	17.59	20.01	64.62
		79.99	

F.S.I.	SULPHUR
5.5	.59

SP.G. (-3/8 MESH)	PHOSPHOROUS
1.43	.009

DRILL HOLE #: 7701 SEAM: 1L

FLOAT SINK ANALYSES  
 SIZE REL. WEIGHT  
 3/8 X 28 86.40

SP.G.	WT%	ASH%	WT%	ASH%	WT%	ASH%	F.S.I.	CUM FST
1.40	64.20	6.20	66.20	6.20	33.80	40.09	7.5	7.5
1.50	9.60	17.50	75.80	7.63	24.20	49.06	6.0	6.5
1.54	2.80	23.60	78.60	8.20	21.40	52.39	5.5	6.0
1.60	3.40	31.10	82.00	9.15	18.00	56.41	4.5	6.0
1.80	7.90	39.80	89.90	11.84	10.10	69.40	1.5	5.5
****	10.10	69.40	100.00	17.66	*****	*****	5.0	

SIZE REL. WEIGHT  
 28 X 100 9.50

SP.G.	WT%	ASH%	WT%	ASH%	WT%	ASH%	F.S.I.	CUM FST
1.40	53.30	4.00	53.30	4.00	46.70	19.51	8.5	8.5
1.50	23.40	8.40	76.70	5.34	23.30	30.67	3.0	7.0
1.60	10.40	13.60	87.10	6.33	12.90	44.43	3.0	6.5
1.76	4.30	27.20	91.40	7.31	8.60	53.05	2.5	6.5
1.90	3.00	32.60	94.40	8.11	5.60	64.00	2.0	6.0
****	5.60	64.00	100.00	11.24	*****	*****	5.0	

CENTRIFUGE SEPARATION  
 SIZE REL. WEIGHT  
 100 X 0 4.10

SP.G.	WT%	ASH%	WT%	ASH%	WT%	ASH%	F.S.I.	CUM FST
1.40	78.30	5.60	78.30	5.60	21.70	41.77	8.0	8.0
1.50	10.90	19.80	89.20	7.34	10.80	63.94	2.5	6.5
1.60	1.00	25.10	90.20	7.53	9.80	67.90	1.0	6.0
1.80	3.30	42.50	93.50	8.77	6.50	80.80	1.0	6.0
****	6.50	80.80	100.00	13.45	*****	*****	5.0	

DRILL HOLE #: 7701 SEAM: 1L

FLUIDITY DILATATION

START TEMP.	450.0	SOFT TEMP.	406.0
FINAL TEMP.	501.0	SOLID TEMP.	484.0
MAX.FLUIDITY TEMP.	483.0	MAX.CONTRACTION	19.0
MAX.FLUIDITY (NDPM)	14.2	MAX.DILATATION	8.0
MAX.FLUIDITY (LOG)	1.152	G.FACTOR	.966

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-4263	INTERVAL	145.56-146.86	
		AIR DRIED BASIS		
		WT% ASH% MOIST VOL. F.C.	S. F.S.I.	
1.5 FLOAT	75.30	9.00	.40 19.50 71.10	.53 7.5
1.5 SINK	23.70	46.55		
TOTAL	100.00	17.90		

DRY BASIS	9.04	19.58 71.39
D.M.M.F. BASIS	-	20.73 79.27

PROJECT: SAXON  
 DATE SAMPLED: 0/ 0/ 0  
 DRILL HOLE #: 7701  
 LAB COMPOSITE #:

AREA: EAST  
 DATE ANALYSED: 0/ 0/ 0  
 SEAM: 2  
 WT. RFC: 0.

DENISON COAL DATA

COMPOSITE DESCRIPTION INTERVAL	MINING SECTION	
	92.68-94.52	
THICKNESS	0.	5.84
DIP		51
COAL/COAL+ROCK	0. / 0.	3.34/ 3.68
DRILL CORE RECOVERY	0. %	23.00 %
ESTIMATED YIELD	70.00	

WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT SIZE	3/8 X 28	28 X 100	100 X 0
CUTPOINT			

DRILL HOLE #: 7701 SFAM: 2

DRILL HOLE #: 7701 SFAM: 2

FLUIDITY	DILATATION
START TEMP. *****	SOFT TEMP. *****
FINAL TEMP. *****	SOLID TEMP. *****
MAX. FLUIDITY TEMP. *****	MAX. CONTRACTION *****
MAX. FLUIDITY (DDPH) *****	MAX. DILATATION *****
MAX. FLUIDITY (LOG) *****	G. FACTOR *****

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-4266	INTERVAL	92.68-93.05		
			AIR DRIED BASIS		
	WT% ASH	MOIST VOL.	F.C.	S.	F.S.I.
1.5 FLOAT	78.30	5.20	.40	21.90	72.50 .53 9.0
1.5 SINK	21.70	47.14			
TOTAL	100.00	14.30			

DRY BASIS	5.22	21.99	72.79
D.M.M.F. BASIS	-	22.70	77.30

COMPONENT NO.	77-4265	INTERVAL	93.68-94.33		
			AIR DRIED BASIS		
	WT% ASH	MOIST VOL.	F.C.	S.	F.S.I.
1.5 FLOAT	68.50	8.70	.46	26.16	70.60 .48 8.0
1.5 SINK	39.50	51.23			
TOTAL	100.00	25.50			

DRY BASIS	8.73	20.18	71.08
D.M.M.F. BASIS	-	21.36	78.64

PROJECT: Saxon  
 DATE SAMPLED: 1/ 4/77  
 DRILL HOLE #: 7702  
 LAR COMPOSITE #: 77-5026 WT. REC. 11.70

ANALYST: AMFAFAST  
 DATE ANALYSED: 21/ 6/77  
 SFAM: 1U

DENISON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION
INTERVAL : 385.86-390.10	385.86-390.10
THICKNESS : 4.24	4.24
DP : 24	24
COAL/COAL+ROCK : 3.82/ 3.90	3.82/ 3.90
DRILL CORE RECOVERY: 75.00%	75.00 %
ESTIMATED YIELD :	85.00

WARNOCK HERSEY ANALYSSES

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0	1.80 SPG
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SECS	
CONTRIBUTION	50.3	73.5	7.7	

YIELD	AIR DRIED	DRY BASIS	D.M.W.F.
MOISTURE	.80		
ASH	6.30	6.75	
VOLATILE	18.40	18.55	19.22
F.C.	74.50	75.10	80.78
SULPHUR	.46		
PHOSPHORUS	.004		
S.P.G.	1.320		
F.S.I.	4.5		
HARDNESS	103.10		

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.W.F.
MOISTURE	.50		
ASH	6.70	9.75	
VOLATILE	17.30	17.39	18.42
F.C.	72.50	72.86	81.58
F.S.I.	4.0		
SULPHUR	.41		
SP.G. (-1/8 MESH)	1.36		
PHOSPHORUS	.005		

DRILL HOLE #: 7702 SFAM: 1U

FLOAT SINK ANALYSSES

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
3/8 X 28	66.90				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%		
1.40	76.00 5.00	76.00	5.00	24.00	29.70
1.40	10.20 15.00	86.20	6.18	13.80	40.56
1.54	2.50 23.50	88.70	6.67	11.30	44.34
1.40	2.90 27.80	91.60	7.34	8.40	50.05
1.80	4.20 35.00	95.80	8.55	4.20	65.10
****	4.20 65.10	100.00	10.93	*****	1.0 3.0

SIZE REL. WEIGHT

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
28 X 100	24.10				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%		
1.40	82.40 3.60	82.40	3.60	17.40	20.57
1.50	9.00 12.00	91.40	4.43	8.60	29.53
1.40	4.00 18.60	95.40	5.02	4.60	39.03
1.76	2.10 27.40	97.50	5.50	2.50	48.80
1.90	.70 35.70	98.20	5.72	1.80	53.90
****	1.80 53.90	100.00	6.59	*****	1.0 5.0

FROTH FLOTATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
100 X 0	4.50				
TIME	WT% ASH%	WT% ASH%	F.S.I.	FSI	
45	46.90 4.00	46.90	4.00	5.5	5.5
90	14.60 6.70	61.50	4.64	5.0	5.0
135	12.40 9.30	73.90	5.42	3.0	5.0
180	18.30 12.10	92.20	6.75	2.5	4.5
225	7.80 21.60	100.00	7.91	1.5	4.0

CENTRIFUGE SEPARATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
100 X 0	4.50				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	FSI
1.40	86.00 3.80	86.00	3.80	14.00	30.76
1.50	7.70 15.40	93.70	4.75	6.30	49.53
1.60	1.30 24.40	95.00	5.02	5.00	56.06
1.80	1.90 33.40	96.90	5.58	3.10	69.95
1.90	.70 43.40	97.60	5.85	2.40	77.70
****	2.40 77.70	100.00	7.57	*****	1.0 4.5

DRILL HOLE #: 7702 SFAM: 1U

FLUIDITY DILATATION

START TEMP.	477.0	SOFT TEMP.	425.0
FINAL TEMP.	492.0	SOLID TEMP.	*****
MAX. FLUIDITY TEMP.	483.0	MAX. CONTRACTION	20.0
MAX. FLUIDITY (ODPH)	2.0	MAX. DILATATION	*****
MAX. FLUIDITY (LOG)	.301	G. FACTOR	*****

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-5026	INTERVAL	385.86-390.10
		AIR DRIED BASIS	
		WT% ASH% MOIST VOL. F.C. S. F.S.I.	
1.5 FLOAT	84.90 6.70	.50	17.90 74.90 .43 5.0
1.5 SINK	15.10 39.81		
TOTAL	100.00 11.70		
DRY BASIS	6.73	17.99 75.28	
D.M.W.F. BASIS	-	18.68 81.32	

PROJECT: SAXON AREA: EAST  
 DATE SAMPLED: 1/ 4/77 DATE ANALYSED: 21/ 6/77  
 DRILL HOLE #: 7702 SEAM: 1M  
 LAB COMPOSITE #: 77-5023 WT. RFC. 2.16

DENISON COAL DATA

COMPOSITE DESCRIPTION	INTERVAL	MINING SECTION
	394.88-395.63	393.11-395.63
THICKNESS	3.25	2.52
OTF	.74	.24
COAL/COAL+ROCK	.67/ .71	1.66/ 2.30
DRILL CORE RECOVERY	85.00%	56.00 %
ESTIMATED YIELD	85.00	

WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT		3/8 X 28		28 X 100		100 X 0		1.80 SPG	
SIZE	SP.G.	1.54	SP.G.	1.76	135 SECS				
CUTPOINT		59.7		24.6		6.9			
CONTRIBUTION									
YIELD		AIR DRIED		DRY BASIS		D.M.M.F.			
		91.20							
MOISTURE		.70							
ASH		6.30		6.34					
VOLATILE		19.20		19.34		20.07			
F.C.		73.80		74.32		79.93			
SULPHUR		.45							
PHOSPHORUS		.005							
S.P.G.		1.320							
F.S.I.		7.0							
HARDGRAVE		*****							

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.40		
ASH	10.00	10.04	
VOLATILE	17.40	17.87	19.00
F.C.	71.80	72.09	81.00
F.S.I.	5.5		
SULPHUR	.42		
SP.GR. (-3/8 MESH)	1.34		
PHOSPHOROUS	.010		

DRILL HOLE #: 7702 SEAM: 1M

FLOAT SINK ANALYSES

SP.G.	WT%	ASH%	WT%	ASH%	WT%	ASH%	F.S.I.	FSI
1.40	75.10	4.50	75.10	4.50	24.00	28.33	7.0	7.0
1.50	10.10	16.40	95.20	5.91	14.80	36.47	1.5	6.5
1.54	4.10	23.40	99.30	6.71	10.70	41.48	1.0	6.5
1.60	1.20	28.90	92.50	7.48	7.50	46.84	1.0	6.0
1.80	3.40	32.70	96.10	8.43	3.90	59.90	1.0	6.0
****	1.90	59.90	100.00	10.43	*****	*****	*****	5.0

SIZE REL. WEIGHT

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	CUM.
2R X 100	25.60			
SP.G.	WT%	ASH%	WT%	ASH%
1.40	75.60	3.70	75.60	3.70
1.50	10.90	11.00	96.50	4.62
1.60	7.70	16.10	94.20	5.56
1.76	2.00	23.20	96.20	5.93
1.90	.60	44.00	96.80	6.16
****	3.20	49.20	100.00	7.54

FROTH FLOTATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM.
100 X 0	3.80		
TIME	WT%	ASH%	F.S.I.
45	40.50	4.40	40.50
90	15.20	9.60	75.70
135	9.10	12.80	84.80
180	9.10	14.60	93.90
225	6.10	18.70	100.00

CENTRIFUGE SEPARATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	CUM.
100 X 0	3.80			
SP.G.	WT%	ASH%	WT%	ASH%
1.40	92.20	4.90	92.20	4.90
1.50	4.00	19.40	96.20	5.50
1.60	1.50	25.20	97.70	5.81
****	2.30	71.40	100.00	7.31

DRILL HOLE #: 7702 SEAM: 1M

FLUIDITY

START TEMP.	456.0
FINAL TEMP.	504.0
MAX. FLUIDITY (TEMP)	446.0
MAX. FLUIDITY (NDPM)	7.0
MAX. FLUIDITY (LOG)	.845

DILATATION

SOFT TEMP.	414.0
SOLID TEMP.	494.0
MAX. CONTRACTION	24.0
MAX. DILATATION	-8.0
G. FACTOR	.863

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	INTERVAL	AIR DRIED BASIS	F.C.	S. F.S.I.
77-5025	393.11-394.43			
		WT%	ASH%	MOIST VOL.
1.5 FLOAT		68.50	7.80	.50 18.00 73.70
1.5 SINK		31.50	53.83	.48 5.5
TOTAL		100.00	22.30	

DRY BASIS	7.84	18.09 74.07
D.M.M.F. BASIS	-	18.92 81.08

COMPONENT NO.	INTERVAL	AIR DRIED BASIS	F.C.	S. F.S.I.
77-5024	394.43-394.88			
		WT%	ASH%	MOIST VOL.
1.5 FLOAT		2.20	10.30	.50 18.00 71.20
1.5 SINK		97.80	78.60	.49 5.0
TOTAL		100.00	77.10	

DRY BASIS	10.35	18.09 71.56
D.M.M.F. BASIS	-	19.27 80.73

COMPONENT NO.	INTERVAL	AIR DRIED BASIS	F.C.	S. F.S.I.
77-5023	394.88-395.63			
		WT%	ASH%	MOIST VOL.
1.5 FLOAT		82.70	7.70	.40 18.40 73.50
1.5 SINK		17.30	23.31	.44 6.0
TOTAL		100.00	10.40	

DRY BASIS	7.73	18.47 73.80
D.M.M.F. BASIS	-	19.34 80.66

COAL ANALYSIS PREPARED BY  
 WARNOCK HERSEY PROFESSIONAL SERVICES LTD  
 SIGNED:

PROJECT: Saxon  
 DATE SAMPLED: 0/ 0/ 0  
 DRILL HOLE #: 7702  
 LAB COMPOSITE #:

AREA: EAST  
 DATE ANALYSED: 0/ 0/ 0  
 SEAM: 1L  
 WT. RFC: 0.

## DENISON COAL DATA

COMPOSITE DESCRIPTION	INTERVAL	MINING SECTION
	406.20-407.00	406.20-407.00
THICKNESS	.80	.80
BTB	.21	.21
COAL/COAL+ROCK	.66/ .74	.66/ .74
DRILL CORE RECOVERY	86.00%	86.00%
ESTIMATED YIELD	89.00	

## WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT SIZE  
 3/8 X 28 28 X 100 100 X 0.  
 OUTPOINT

DRILL HOLE #: 7702 SEAM: 1L

DRILL HOLE #: 7702 SEAM: 1L

FLUIDITY		DILATATION	
START TEMP.	*****	SOFT TEMP.	*****
FINAL TEMP.	*****	SOLID TEMP.	*****
MAX. FLUIDITY TEMP.	*****	MAX. CONTRACTION	*****
MAX. FLUIDITY (DDPH)	*****	MAX. DILATATION	*****
MAX. FLUIDITY (LOG)	*****	G. FACTOR	*****

## 1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-5022	INTERVAL	406.20-407.00	AIR DRIED BASIS		
				WT% ASH	MOIST VOL. F.C.	S. F.S.I.
1.5 FLOAT	81.00	11.40	.40	16.80	71.40	.48 2.5
1.5 SINK	19.00	27.19				
TOTAL	100.00	14.40				
DRY BASIS	11.45	16.87	71.69			
O.M.F. BASIS	-	16.94	81.96			

PROJECT: SAKON  
 DATE SAMPLED: 1/ 4/77  
 DRILL HOLE #: 7702  
 LAR COMPOSITE #: 77-5030 WT. RFC. 6.15

AREA: EAST  
 DATE ANALYSED: 22/ 6/77  
 SFAM: 2U

DENISON COAL DATA

COMPOSITE DESCRIPTION	INTERVAL	MINING SECTION
	363.02-369.04	363.02-369.04
THICKNESS	6.02	6.02
TOP	11	11
COAL/COAL+ROCK	4.92/ 5.91	4.92/ 5.91
DRILL CORE RECOVERY	44.00%	46.00 %
ESTIMATED YIELD	70.00	

WARNOCK HERSEY ANALYSIS

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0	1.00 SPG
SIZE	SP.G. 1.54	SP.G. 1.76	135 SECS	
CUTOFF	52.7	23.3	7.5	
CONTRIBUTION				
YIELD	AIR DRIED 83.50	DRY BASIS	D.M.M.F.	
MOISTURE	1.10			
ASH	4.50	6.57		
VOLATILE	20.60	20.83	21.71	
F.C.	71.80	72.60	78.29	
SULPHUR	.48			
PHOSPHORUS	.013			
%P.G.	1.320			
F.S.I.	4.5			
HARDGROVE	100.70			

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.40		
ASH	14.00	14.06	
VOLATILE	18.40	18.47	20.32
F.C.	67.20	67.47	79.68
F.S.I.	4.0		
SULPHUR	.39		
SP.GR. (-3/8 MESH)	1.33		
PHOSPHOROUS	.015		

DRILL HOLE #: 7702 SFAM: 2U

FLOAT SINK ANALYSIS

SP.G.	WT%	ASH%	WT%	ASH%	WT%	ASH%	F.S.I.	FSI
1.40	42.20	4.40	62.20	4.40	37.80	35.12	7.0	7.0
1.50	13.50	16.20	75.70	6.50	24.30	45.63	1.0	6.5
1.60	3.30	23.30	79.00	7.21	21.00	49.14	1.0	6.0
1.80	3.50	27.80	82.50	8.08	17.50	53.41	1.0	6.0
1.80	5.80	36.90	88.70	9.97	11.70	61.60	1.0	5.0
****	11.70	61.60	100.00	16.01	*****	*****	1.0	4.0

SIZE REL. WEIGHT

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
28 X 100	24.50				
SP.G.	WT%	ASH%	WT%	ASH%	F.S.I.
1.40	78.40	3.60	78.40	3.60	21.60 23.92
1.50	9.80	11.80	88.20	4.51	11.80 33.99
1.60	4.30	19.10	92.50	5.19	7.50 42.53
1.76	2.80	29.10	95.30	5.89	4.70 50.53
1.90	.80	37.00	96.10	6.15	3.90 53.30
****	3.90	53.30	100.00	7.99	*****

FROTH FLOATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
100 X 0	4.40				
TIME	WT%	ASH%	WT%	ASH%	F.S.I.
45	21.70	5.60	21.70	5.60	5.5 5.5
90	35.90	8.30	57.60	7.28	5.0 5.0
135	16.30	11.60	73.90	8.24	4.5 5.0
180	15.00	14.30	88.90	9.26	3.5 4.5
225	11.10	20.00	100.00	10.45	2.5 4.5

CENTRIFUGE SEPARATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
100 X 0	4.40				
SP.G.	WT%	ASH%	WT%	ASH%	F.S.I.
1.40	96.90	4.60	88.90	4.60	13.10 43.14
1.50	3.70	16.70	90.60	5.09	9.40 53.55
1.60	5.20	38.80	95.80	6.92	4.20 71.81
1.80	.70	49.00	96.50	7.23	3.50 76.37
1.90	.80	68.50	97.30	7.72	2.70 79.30
****	2.70	79.30	100.00	9.65	*****

DRILL HOLE #: 7702 SFAM: 2U

FLUIDITY

START TEMP.	462.0	SOFT TEMP.	413.0
FINAL TEMP.	495.0	SOLID TEMP.	487.0
MAX. FLUIDITY TEMP.	486.0	MAX. CONTRACTION	24.0
MAX. FLUIDITY (DOPM)	3.0	MAX. DILATION	-17.0
MAX. FLUIDITY (LOG)	.477	G. FACTOR	.675

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-5030	INTERVAL	363.02-369.04
		AIR DRIED BASIS	
	WT% ASH%	MOIST VOL.	F.C. S. F.S.I.
1.5 FLOAT	76.10 7.10	.60 20.00	72.30 .41 6.0
1.5 SINK	23.90 37.23		
TOTAL	100.00 14.30		
DRY BASIS	7.14	20.12 72.74	
D.M.M.F. BASIS	-	21.06 78.94	

PROJECT: SAXON  
 DATE SAMPLED: 1/ 4/77  
 DRILL HOLE #: 7702  
 LAB COMPOSITE #: 77-5027-5029 WT. REC. 3.59

AREA: FAST  
 DATE ANALYSED: 22/ 6/77  
 SEAM: 2L

DENISON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION
INTERVAL : 371.04-372.21	371.04-372.19
THICKNESS : 6.45	6.45
HTP : 25	25
COAL/COAL+ROCK : 5.88/ 6.48	5.88/ 6.48
DRILL CORP RECOVERY : 24.00%	24.00 %
ESTIMATED YIELD :	70.00

WARNOCK HERSEY ANALYSIS

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0	1.00 SPO
SIZE	SP.G. 1.54	SP.G. 1.76	135 SECS	
CONTRIBUTION	43.0	24.8	11.5	
YIELD	AIR DRIED 79.30	DRY BASIS	D.M.M.F.	
MOISTURE	1.00			
ASH	5.10	5.15		
VOLATILE	20.30	20.51	21.15	
F.C.	73.60	74.34	78.85	
SULPHUR	.42			
PHOSPHORUS	.004			
S.P.G.	1.280			
F.S.I.	7.5			
WARNOROVE	*****			

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.40		
ASH	13.90	13.96	
VOLATILE	17.90	17.97	19.70
F.C.	67.80	68.07	80.30
F.S.I.	5.0		
SULPHUR	.43		
SP.G. (=3/8 MFSH)	1.34		
PHOSPHOROUS	.012		

DRILL HOLE #: 7702 SEAM: 2L

FLOAT SINK ANALYSIS

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
3/8 X 28	62.80				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	FSI
1.40	56.10 3.60	56.10 3.60	43.90 35.40	7.5	7.5
1.50	9.70 15.70	65.80 5.30	34.20 41.10	1.0	7.0
1.54	2.60 23.90	68.40 6.09	31.60 42.51	1.0	6.5
1.60	5.10 28.60	73.50 7.65	26.50 45.19	1.0	6.5
1.80	20.10 39.90	93.60 14.58	6.40 61.80	1.0	5.0
****	6.40 41.80	100.00 17.60	*****	1.0	4.5

SIZE REL. WEIGHT

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
28 X 100	25.40				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	FSI
1.40	75.80 2.80	75.80 2.80	24.20 17.55	8.0	8.0
1.50	13.60 9.00	89.40 3.74	10.60 28.51	2.0	7.5
1.60	3.90 18.80	93.30 4.37	6.70 34.16	1.0	7.5
1.76	4.30 29.40	97.60 5.48	2.40 42.70	1.0	7.5
1.90	1.60 37.70	99.20 5.99	.80 52.70	1.0	6.5
****	.80 52.70	100.00 6.37	*****	1.0	6.0

FROTH FLOATATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
100 X 0	5.90				
TIME	WT% ASH%	WT% ASH%	F.S.I.	FSI	
45.	63.60 4.60	63.60 4.60	8.0	8.0	
90.	22.20 9.80	85.80 5.95	5.0	7.0	
135.	11.10 13.60	96.90 6.82	3.0	6.5	
180.	2.00 22.50	98.90 7.14	1.0	6.5	
225.	1.10 32.10	100.00 7.41	1.0	6.5	

CENTRIFUGE SEPARATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
100 X 0	5.90				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	FSI
1.40	91.40 3.20	91.40 3.20	8.60 42.91	5.5	5.5
1.50	3.30 24.40	94.70 3.94	5.30 54.44	1.5	5.5
1.60	2.20 34.00	96.90 4.62	3.10 68.94	1.0	5.5
1.80	1.50 50.00	98.40 5.31	1.60 86.70	1.0	5.5
****	1.60 86.70	100.00 6.62	*****	1.0	5.5

DRILL HOLE #: 7702 SEAM: 2L

FLUIDITY

START TEMP.	462.0	SOFT TEMP.	422.0
FINAL TEMP.	408.0	SOLID TEMP.	488.0
MAX. FLUIDITY TEMP.	486.0	MAX. CONTRACTION	26.0
MAX. FLUIDITY (DDPM)	4.0	MAX. DILATATION	-13.0
MAX. FLUIDITY (LOG)	.60?	G. FACTOR	.819

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-5029	INTERVAL	371.04-372.21
		AIR DRIED BASIS	
	WT% ASH%	MOIST VOL.	F.C. S. F.S.I.
1.5 FLOAT	73.00 6.80	.70	19.10 73.40 .39 5.5
1.5 SINK	27.00 30.87		
TOTAL	100.00 13.30		
DRY BASIS	6.85	19.23	73.92
D.M.M.F. BASIS	-	20.06	79.94
COMPONENT NO.	77-5028	INTERVAL	372.21-372.71
		AIR DRIED BASIS	
	WT% ASH%	MOIST VOL.	F.C. S. F.S.I.
1.5 FLOAT	2.10 7.70	.60	19.40 72.30 .59 5.0
1.5 SINK	97.90 76.65		
TOTAL	100.00 75.20		
DRY BASIS	7.75	19.52	72.74
D.M.M.F. BASIS	-	20.44	79.56
COMPONENT NO.	77-5027	INTERVAL	372.91-378.19
		AIR DRIED BASIS	
	WT% ASH%	MOIST VOL.	F.C. S. F.S.I.
1.5 FLOAT	54.80 6.20	.60	18.80 74.40 .40 6.5
1.5 SINK	45.20 35.40		
TOTAL	100.00 19.40		
DRY BASIS	6.24	18.91	74.85
D.M.M.F. BASIS	-	19.62	80.38

COAL ANALYSIS PREPARED BY  
 WARNOCK HERSEY PROFESSIONAL SERVICES LTD  
 SIGNED:

PROJ: Saxon  
 DATE SAMPLED: 1/ 4/77  
 DRILL HOLE #: 7702  
 LAB COMPOSITE #: 77-5031-5032 WT. PFC. 8.2%

APFA: FACY  
 DATE ANALYSED: 23/ 6/77  
 SFAM: 4

DENISON COAL DATA

COMPONENT DESCRIPTION	INTERVAL	MINING SECTION
	270.84-280.16	270.84-280.16
THICKNESS	9.32	9.32
DIP	10	10
COAL/COAL-ROCK	7.90/ 9.15	7.90/ 9.15
DRILL CORE RECOVERY	30.50%	30.50 %
ESTIMATED YIELD	65.00	

WARNOCK MERSEY ANALYSIS

SP. G.	3/8 X 28	28 X 100	100 X 0	1.80 SPG
CUTPOINT	55.8	21.5	8.2	
CONTRIBUTION				

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
	85.50		

MOISTURE	ASH	VOLATILE	F.C.
1.10	5.18	21.84	72.20
	5.16	21.84	73.00
		22.59	77.41

SULPHUR	.73
PHOSPHORUS	.040
S.P.G.	1.710
F.S.I.	6.5
HARDGROVE	113.50

HEAD ANALYSIS - COMPOSITE RAW COAL

MOISTURE	ASH	VOLATILE	F.C.
.40	9.30	21.60	68.70
	9.34	21.69	69.98
	23.21	76.79	

F.S.I.	6.0
SULPHUR	.27

SP.GR. (-3/8 MESH)	1.75
PHOSPHOROUS	.049

DRILL HOLE #: 7702 SFAM: 4

FLOAT SINK ANALYSIS  
 SIZE REL. WEIGHT  
 3/8 X 28 68.90

SP.G.	WT%	ASH%	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
1.40	71.80	3.90	71.80	3.90	28.20	26.55
1.50	7.80	15.40	79.40	5.03	20.40	30.82
1.64	1.90	20.50	81.50	5.39	16.50	31.87
1.80	3.40	23.10	85.30	6.18	14.70	34.14
1.80	9.10	27.40	94.40	8.22	5.60	45.10
****	5.60	45.10	100.00	10.29	*****	1.0

SIZE REL. WEIGHT  
 28 X 100 22.90

SP.G.	WT%	ASH%	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
1.40	84.20	3.30	84.20	3.30	15.80	25.30
1.50	5.50	10.40	89.70	3.74	10.30	33.25
1.60	2.40	18.30	92.10	4.11	7.90	37.80
1.76	1.90	25.50	94.00	4.55	6.00	41.69
1.90	1.90	29.80	95.90	5.05	4.10	47.20
****	4.10	47.20	100.00	6.78	*****	1.0

FROTH FLOTATION  
 SIZE REL. WEIGHT  
 100 X 0 4.30

TIME	WT%	ASH%	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
45	83.90	6.50	83.90	6.50	7.0	7.0
90	8.60	17.10	92.50	7.49	3.5	6.5
135	3.00	26.00	95.50	8.07	2.0	6.5
180	1.50	36.60	97.00	8.51	1.0	6.5
225	3.00	38.20	100.00	9.40	1.0	6.0

CENTRIFUGE SEPARATION

SP.G.	WT%	ASH%	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
1.40	88.50	3.50	88.50	3.50	11.50	52.81
1.50	3.00	20.20	91.50	4.05	8.50	64.32
1.60	1.60	28.60	93.10	4.47	6.90	72.61
1.80	1.20	35.60	94.30	4.87	5.70	80.40
****	5.70	80.40	100.00	9.17	*****	1.0

DRILL HOLE #: 7702 SEAM: 4

FLUIDITY	DILATATION
START TEMP. 453.0	SOFT TEMP. 408.0
FINAL TEMP. 495.0	SOLID TEMP. 482.0
MAX. FLUIDITY TEMP. 480.0	MAX. CONTRACTION 12.0
MAX. FLUIDITY (DDPH) 5.0	MAX. DILATATION -11.0
MAX. FLUIDITY (LOG) .699	G. FACTOR .356

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	INTERVAL	AIR DRIED BASIS	MOIST VOL.	F.C.	S.	F.S.I.
1.5 FLOAT	71.00	5.60	.60	20.70	73.10	.27
1.5 SINK	29.00	25.40				
TOTAL	100.00	11.40				

DRY BASIS	5.63	20.82	73.54
D.M.M.F. BASIS	-	21.61	78.39

COMPONENT NO.	INTERVAL	AIR DRIED BASIS	MOIST VOL.	F.C.	S.	F.S.I.
1.5 FLOAT	77.70	5.60	.70	21.00	72.70	.28
1.5 SINK	26.30	21.57				
TOTAL	100.00	9.80				

DRY BASIS	5.64	21.15	73.21
D.M.M.F. BASIS	-	21.96	78.04



PROJECT: SAXON  
 DATE SAMPLED: 5/ 4/77  
 DRILL HOLE #: 7702  
 LAB COMPOSITE #: 77-4105-4112 WT. RFG. 3.06

APFA: FAST  
 DATE ANALYSED: 2/ 6/77  
 SFAM: 5

DENTSON COAL DATA

COMPOSITE DESCRIPTION	INTERVAL	MINING SECTION
	189.70-190.96	189.70-190.96
THICKNESS	1.26	1.26
HTP	12	12
COAL/COAL+ROCK	1.23/ 1.23	1.23/ 1.23
DRILL CORE RECOVERY	100.00%	100.00 %
ESTIMATED YIELD	*****	

WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0	
SIZE				
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SECS	1.80 SPG
CONTRIBUTION	80.3	10.7	3.7	

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
	94.70		

MOISTURE	ASH	VOLATILE	F.C.
.80	4.60	21.70	72.90
	4.64	21.88	73.49
	22.46	77.54	

SULPHUR	PHOSPHORUS	S.P.C.	F.C.I.	WARDGRAVE
.50	.194	1.320	9.5	114.30

HEAD ANALYSIS - COMPOSITE RAW COAL

MOISTURE	ASH	VOLATILE	F.C.
.50	4.70	23.60	69.20
	6.73	23.72	69.55
	24.82	75.18	

F.C.I.	SULPHUR
9.5	.61

SP.G. (-1/8 MESH)	PHOSPHORUS
1.35	.033

DRILL HOLE #: 7702 SFAM: 5

FLOAT SINK ANALYSES

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
3/8 X 28	84.60				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	FSI
1.40	87.80 4.10	87.80 4.10	12.20 28.88	9.0	9.0
1.50	6.60 10.40	94.40 4.54	5.60 50.66	1.5	8.5
1.54	.50 15.20	94.90 4.60	5.10 54.13	1.5	8.5
1.60	.90 24.80	95.80 4.79	4.20 60.42	1.0	8.5
1.80	.50 30.20	96.30 4.92	3.70 64.50	1.0	8.0
****	3.70 64.50	100.00 7.12	*****		8.0

SIZE REL. WEIGHT

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
28 X 100	11.50				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	FSI
1.40	72.20 2.80	72.20 2.80	27.80 15.41	8.0	8.0
1.50	14.30 4.80	86.50 3.13	13.50 26.65	8.0	8.0
1.60	3.80 9.20	90.30 3.39	9.70 33.44	2.5	8.0
1.76	2.50 17.00	92.80 3.75	7.20 39.21	2.5	7.5
1.90	1.30 22.90	94.10 4.02	5.90 42.80	1.5	7.5
****	5.90 42.80	100.00 6.31	*****		7.5

CENTRIFUGE SEPARATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
100 X 0	3.90				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	FSI
1.40	75.00 3.00	75.00 3.00	25.00 25.10	8.0	8.0
1.50	17.90 14.10	92.90 5.14	7.10 52.83	2.0	7.5
1.60	1.80 27.60	94.70 5.57	5.30 61.40	1.5	7.5
****	5.30 61.40	100.00 8.52	*****		7.0

DRILL HOLE #: 7702 SEAM: 5

FLUIDITY	DILATATION
START TEMP. 450.0	SOFT TEMP. 402.0
FINAL TEMP. 510.0	SOLID TEMP. 480.0
MAX. FLUIDITY TEMP. 499.0	MAX. CONTRACTION 22.0
MAX. FLUIDITY (NDPH) 30.0	MAX. DILATATION 13.0
MAX. FLUIDITY (LOG) 1.477	G. FACTOR .978

GYE REPORT	DRILL HOLE S07702	SEAM 5
DEPTH FROM TO	SAMPLE NO.	SPG ASH WT%
18800 18820	115	2.71 82.8
18820 18842	125	2.69 83.6
18842 18854	135	2.67 85.1
18854 18891		
18891 18904	145	2.59 84.7
18904 18922	155	2.42 85.6
18922 18938	165	2.52 85.4
18938 18948	175	2.48 84.5
18948 18960	185	2.56 84.9
18960 18970	19	2.33 73.4
18970 18976	20	1.45 21.5
18976 18987	30	1.30 5.4
18987 18999	40	1.30 3.7
18999 19014	50	1.37 7.6
19014 19026	60	1.33 6.0
19026 19050	70	1.27 3.1
19050 19073	80	1.24 2.9
19073 19096	90	1.39 15.0
19096 19100	100	2.07 59.3
19100 19115	195	2.63 85.4
19115 19142	205	2.66 86.1
19142	*****	

PROJECT: Saxon AREA: FAST  
 DATE SAMPLED: 4/ 4/77 DATE ANALYSED: 2/ 6/77  
 DRILL HOLE #: 7703 SFAM: 1U  
 LAB COMPOSITE #: 77-4114-4135 WT. REC. 12.11

DENISON COAL DATA

COMPOSITE DESCRIPTION	264.2R-26R.05	MINING SECTION	261.30-26R.05
THICKNESS	3.77	6.75	
TOP	35	35	
COAL/COAL+ROCK	3.00/ 3.07	5.44/ 5.51	
DRILL CORE RECOVERY	100.00%	56.00 %	
ESTIMATED YIELD	90.00		

WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0	
SIZE				
CUTPOINT	SP.G. 1.54	SP.G. 1.76		1.80 SPG
CONTRIBUTION	77.9	10.5	2.6	
YIELD	AIR DRIED 91.00	DRY BASIS	D.M.M.F.	

MOISTURE	.80		
ASH	5.60	5.65	
VOLATILE	20.40	20.56	21.35
F.C.	73.20	73.79	78.65
SULPHUR	.24		
PHOSPHORUS	.019		
S.P.C.	1.310		
F.S.I.	4.0		
WARRANTY	91.40		

WFAO ANALYSIS - COMPOSITE RAW COAL

MOISTURE	AIR DRIED .50	DRY BASIS	D.M.M.F.
ASH	8.50	8.54	
VOLATILE	20.50	20.60	21.85
F.C.	70.50	70.85	78.15
F.S.I.	5.5		
SULPHUR	.31		
SP.GR. (-3/8 MESH)	1.43		
PHOSPHOROUS	.021		

DENISON COAL LIMITED

DRILL HOLE #: 7703 SFAM: 1U  
 FLUIDITY DILATATION  
 START TEMP. 450.0 SOFT TEMP. 406.0  
 FINAL TEMP. 498.0 SOLID TEMP. 484.0  
 MAX. FLUIDITY TEMP. 490.0 MAX. CONTRACTION 18.0  
 MAX. FLUIDITY (DPPH) 11.0 MAX. DILATATION -4.0  
 MAX. FLUIDITY (LOG) 1.041 G.FACTOR .878

RYE REPORT

DEPTH FROM TO	SAMPLE NO.	SPG	ASH WT%
26010 26024	345	2.67	85.1
26024 26040	355	2.62	84.8
26040 26058	345	2.61	83.0
26058 26070	375	2.67	85.5
26070 26088	385	2.61	87.5
26088 26104	395	2.65	88.4
26104 26114	405	2.58	89.3
26114 26130			
26130 2642R			
2642R 26451	10	1.50	20.7
26451 26481	20	1.33	8.4
26481 26495	30	1.41	13.8
26495 26516	40	1.34	7.0
26516 26531	50	1.42	11.7
26531 26552	60	1.37	9.2
26552 26563	70	1.39	14.8
26563 26574	80	1.49	19.8
26574 26586	90	1.37	9.9
26586 26604	100	1.32	7.5
26604 26616	110	1.31	4.7
26616 26626	120	1.32	4.8
26626 26648	130	1.27	3.6
26648 26663	140	1.32	5.1
26663 26676	150	1.37	9.1
26676 26688	160	1.36	7.7
26688 26702	170	1.35	6.5
26702 26718	180	1.29	3.5
26718 26747	190	1.28	5.5
26747 26767	200	1.31	4.5
26767 26780	210	1.31	3.9
26780 26805	220	1.32	6.9

FLOAT SINK ANALYSES

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FST
3/8 X 28	86.30				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	FST
1.40	83.30 5.00	83.30 5.00	16.70 27.53	7.0	7.0
1.50	5.90 12.70	89.20 5.51	10.80 35.63	3.0	6.5
1.54	1.10 16.80	90.30 5.65	9.70 37.77	2.0	6.0
1.60	1.90 21.60	92.20 5.98	7.80 41.71	1.0	6.0
1.80	4.40 25.10	96.60 6.85	3.40 63.20	1.0	5.5
****	3.40 63.20	100.00 8.76	*****		5.5

SIZE REL. WEIGHT

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FST
3/8 X 100	11.00				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	FST
1.40	66.00 3.40	66.00 3.40	34.00 17.90	8.0	8.0
1.50	20.80 7.80	86.80 4.45	13.20 20.94	1.5	7.0
1.60	6.90 10.50	93.70 4.90	6.30 32.38	1.0	6.5
1.76	2.00 17.40	95.70 5.16	4.30 39.34	1.0	6.5
1.90	1.60 21.70	97.30 5.43	2.70 49.80	1.0	6.5
****	2.70 49.80	100.00 6.63	*****		6.0

CENTRIFUGE SEPARATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FST
100 X 0	2.70				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	FST
1.40	45.60 4.60	45.60 4.60	14.40 42.08	6.5	4.5
1.50	5.70 17.70	51.30 5.42	8.70 58.05	1.5	6.0
1.60	1.10 29.40	42.40 5.70	7.60 62.20	1.5	6.0
1.80	2.90 45.50	45.30 6.91	4.70 72.50	1.0	6.0
****	4.70 72.50	100.00 10.00	*****		5.0

DENISON COAL LIMITED

RYE REPORT DRILL HOLE SD7703 SEAM 1  
 DEPTH FROM TO SAMPLE NO. SPG ASH WTE  
 26805 26828 270 2.30 80.8  
 26828 26842 280 1.65 43.5  
 26842 26858 290 2.53 89.7  
 26858 26862 260 1.68 44.9  
 26862 26874

PROJ: FT: SAXON  
 DATE SAMPLED: 4/ 4/77  
 DRILL HOLE #: 7703  
 LAR COMPOSITE #177-4140-4144

APFA: FAST  
 DATE ANALYSED: 2/ 6/77  
 SFAM: 1L  
 WT. PFC. 3.9A

DENISON COAL DATA

COMPOSITE DESCRIPTION	INTERVAL	MINING SECTION
	271.65-272.80	271.65-272.80
THICKNESS	1.15	1.15
DP	36	36
COAL/COAL ROCK	.96/ .96	.96/ .96
DRILL CORR RECOVERY	100.00%	100.00 %
ESTIMATED YIELD	90.00	

WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0	1.80 SPG
CUTPOINT	SP.G. 1.54	SP.G. 1.76		
CONTRIBUTION	75.0	8.4	3.3	

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
	86.70		
MOISTURE	.70		
ASH	6.40	6.45	
VOLATILE	20.10	20.24	21.07
F.C.	72.80	73.31	78.93
SULPHUR	.43		
PHOSPHORUS	.003		
S.P.G.	1.700		
F.S.I.	7.5		
HARDGROVE	99.60		

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.40		
ASH	10.90	10.95	
VOLATILE	20.00	20.10	21.66
F.C.	64.60	68.94	78.34
F.S.I.	6.5		
SULPHUR	.46		
SP.GR. (=3/8 MFSH)	1.38		
PHOSPHOROUS	.003		

DRILL HOLE #: 7703 SEAM: 1L

FLOAT TANK ANALYSES  
 SIZE REL. WEIGHT  
 3/8 X 28 - 87.50

SP.G.	WT%	ASH%	WT%	ASH%	WT%	ASH%	F.S.I.	CUM FSI
1.40	74.40	5.40	75.40	5.40	24.60	25.09	8.0	8.0
1.90	9.28	14.80	84.60	6.42	15.40	32.67	1.5	8.0
1.54	1.10	22.00	95.70	6.62	14.30	33.49	1.5	7.5
1.60	4.30	24.30	90.00	7.47	10.00	37.44	1.0	7.5
1.80	8.50	34.20	98.50	9.77	1.50	55.80	1.0	6.5
****	1.50	55.80	100.00	10.46	*****	*****	6.0	

SIZE REL. WEIGHT  
 28 X 100 9.10

SP.G.	WT%	ASH%	WT%	ASH%	WT%	ASH%	F.S.I.	CUM FSI
1.40	52.20	3.60	52.20	3.60	47.80	15.15	9.0	9.0
1.90	23.70	8.80	75.90	5.22	24.10	21.40	4.0	8.5
1.60	9.10	12.30	85.00	5.98	15.00	26.91	1.0	8.0
1.76	7.50	21.20	92.50	7.22	7.50	32.63	1.0	7.5
1.90	3.20	24.60	95.70	7.80	4.30	38.60	1.0	7.5
****	4.30	38.60	100.00	9.12	*****	*****	7.0	

CENTRIFUGE SEPARATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	CUM FSI
100 X 0	3.40				
SP.G.	WT%	ASH%	WT%	ASH%	F.S.I.
1.40	72.00	5.80	72.00	5.80	28.00 21.25 8.0
1.50	21.10	10.10	93.10	6.77	6.90 55.34 6.0
1.60	1.70	29.60	94.80	7.18	5.20 63.75 1.5
1.80	1.70	47.60	96.50	7.90	3.50 71.60 1.0
****	3.40	71.60	100.00	10.13	*****

DRILL HOLE #: 7703 SEAM: 1L

FLUIDITY	DILATATION
START TEMP. 447.0	SOFT TEMP. 407.0
FINAL TEMP. 507.0	SOLID TEMP. 483.0
MAX. FLUIDITY TEMP. 493.0	MAX. CONTRACTION 21.0
MAX. FLUIDITY (DDPH) 33.0	MAX. DILATATION 17.0
MAX. FLUIDITY (LOG) 1.519	G.FACTOR .991

GVE REPORT DRILL HOLE 942 SEAM 0

DEPTH FROM	TO	SAMPLE NO.	SPG	ASH WT%
0	26959			
26959	26971			
26971	26978			
26978	26993			
26993	27026			
27026	27065			
27065	27086	415	2.63	96.4
27086	27105	425	2.65	94.2
27105	27139	435	2.61	93.1
27139	27164	445	2.53	90.2
27164	27192	270	1.47	22.2
27192	27208	280	1.34	11.8
27208	27244	290	1.32	4.6
27244	27256	300	1.33	7.0
27256	27279	310	1.34	8.7
27279	27320	320	2.41	83.4
27320	27330	330	1.47	18.3
27330	27350	455	2.57	94.5
27350	27376	465	2.63	94.2
27376	27386			
27386	*****			

PROJCT: Saxon
DATE SAMPLED: 30/ 3/77
DRILL HOLE #: 7703
LAR COMPOSITE #: 77-4267-4270 WT. REC. 11.74

DENISON COAL DATA

Table with columns: COMPOSITE DESCRIPTION INTERVAL, MINING SECTION, THICKNESS, etc.

WARNOCK HERSEY ANALYSES

Table with columns: SIMULATED PRODUCT SIZE, CONTRIBUTION, etc.

Table with columns: YIELD, AIR DRIED, DRY BASIS, D.M.M.F.

Table with columns: MOISTURE, ASH, VOLATILE, F.C.

Table with columns: SULPHUR, PHOSPHORUS, S.P.G., F.S.I., HARDGROVE

HEAD ANALYSIS - COMPOSITE RAW COAL

Table with columns: MOISTURE, ASH, VOLATILE, F.C.

Table with columns: F.S.I., SULPHUR

Table with columns: SP.GR. (~1/8 MESH), PHOSPHOROUS

DRILL HOLE #: 7703 SEAM: 2

FLOAT SINK ANALYSES

Table with columns: SIZE REL. WEIGHT, SP.G., WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FST

SIZE REL. WEIGHT

Table with columns: SIZE REL. WEIGHT, SP.G., WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FST

CENTRIFUGE SEPARATION

Table with columns: SIZE REL. WEIGHT, SP.G., WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FST

DRILL HOLE #: 7703 SEAM: 2

Table with columns: FLUIDITY, DILATATION, START TEMP., FINAL TEMP., etc.

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, etc.

Table with columns: DRY BASIS, D.M.M.F. BASIS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, etc.

Table with columns: DRY BASIS, D.M.M.F. BASIS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, etc.

Table with columns: DRY BASIS, D.M.M.F. BASIS

DRILL HOLE #: 7703 SEAM: 2

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, etc.

Table with columns: DRY BASIS, D.M.M.F. BASIS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, etc.

Table with columns: DRY BASIS, D.M.M.F. BASIS

PROJECT: SAKON  
 DATE SAMPLED: 27/4/77  
 DRILL HOLE #: 7703  
 ARFA: EAST  
 DATE ANALYSED: 23/6/77  
 SFAM: 4  
 1st COMPOSITE #: 77-5033 WT. REC. 7.75

DENISON COAL DATA

COMPOSITE DESCRIPTION	INTERVAL	MINING SECTION
	122.44-127.27	122.44-127.27
THICKNESS	4.83	4.83
ATP	39	39
COAL/COAL+ROCK	3.51/ 3.78	3.51/ 3.78
DRILL CORE RECOVERY	53.00%	53.00 %
ESTIMATED YIELD	73.00	

WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT	3/4 X 28	28 X 100	100 X 0	
SIZE	SP.G. 1.54	SP.G. 1.76	135 SECS	1.80 SPB
CONTRIBUTION	62.3	25.0	7.6	

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
	94.90		

MOISTURE	ASH	VOLATILE	F.C.
1.00	5.10	22.30	71.60
	5.15	22.53	72.32
		23.31	76.69

SULPHUR	.37
PHOSPHOROUS	.050
S.P.G.	1.320
F.S.I.	7.0
HARDNESS	95.50

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.50		
ASH	6.50	6.53	
VOLATILE	22.40	22.51	23.56
F.C.	70.60	70.95	76.44

F.S.I.	6.0
SULPHUR	.34

SP.G. (-3/4 MESH)	1.30
PHOSPHOROUS	.044

DRILL HOLE #: 7703 SFAM: 4

FLOAT SINK ANALYSES  
 3/4 X 28 REL. WEIGHT 65.70

SP.G.	WT%	ASH%	CUM. WT%	FLOATS ASH%	CUM. SINKS WT%	ASH%	F.S.I.	FSI
1.40	85.10	4.20	85.10	4.20	14.90	21.08	6.0	6.0
1.50	8.80	14.70	93.90	5.18	6.10	30.29	1.5	5.5
1.60	.90	20.30	94.80	5.33	5.20	32.02	1.0	5.5
1.70	1.20	22.00	96.00	5.54	4.00	35.03	1.0	5.5
1.80	2.10	27.00	98.10	6.00	1.90	43.90	1.0	5.5
****	1.90	43.90	100.00	6.72	*****	*****	1.0	5.0

SIZE REL. WEIGHT  
 100 X 100 25.90

SP.G.	WT%	ASH%	CUM. WT%	FLOATS ASH%	CUM. SINKS WT%	ASH%	F.S.I.	FSI
1.40	86.50	3.10	86.50	3.10	13.50	20.03	8.5	8.5
1.50	6.40	10.00	92.90	3.58	7.10	29.06	1.5	8.0
1.60	2.40	14.50	95.30	3.85	4.70	36.45	1.0	8.0
1.70	1.40	23.50	96.70	4.14	3.30	41.95	1.0	8.0
1.80	.80	29.90	97.50	4.35	2.50	45.80	1.0	8.0
****	2.50	45.80	100.00	5.39	*****	*****	1.0	7.5

FROTH FLOATATION  
 SIZE REL. WEIGHT  
 100 X 0 4.20

TIME	WT%	ASH%	CUM. WT%	FLOATS ASH%	F.S.I.	FSI
45	64.10	3.70	64.10	3.70	7.5	7.5
90	11.30	8.00	75.40	4.34	6.0	7.0
135	7.70	11.80	83.10	5.04	4.5	7.0
180	13.80	13.10	96.90	6.18	3.5	6.5
225	3.10	28.30	100.00	6.87	1.0	6.0

CENTRIFUGE SEPARATION  
 SIZE REL. WEIGHT  
 100 X 0 4.20

SP.G.	WT%	ASH%	CUM. WT%	FLOATS ASH%	CUM. SINKS WT%	ASH%	F.S.I.	FSI
1.40	86.90	3.10	86.90	3.10	13.10	37.00	6.5	6.5
1.50	3.70	22.40	90.60	3.89	9.40	42.75	1.0	6.5
1.60	5.20	31.70	95.80	5.40	4.20	56.43	1.0	6.5
1.80	.70	42.60	96.50	5.67	3.50	59.19	*****	6.5
1.90	.80	48.70	97.30	6.02	2.70	62.30	*****	6.5
****	2.70	62.30	100.00	7.54	*****	*****	1.0	6.0

DRILL HOLE #: 7703 SEAM: 4

FLUIDITY

DILATATION

START TEMP.	450.0	SOFT.TEMP.	403.0
FINAL TEMP.	492.0	SOLID.TEMP.	484.0
MAX.FLUIDITY TEMP.	477.0	MAX.CONTRACTION	22.0
MAX.FLUIDITY (DDPM)	6.0	MAX.DILATATION	-10.0
MAX.FLUIDITY (LOG)	.778	G.FACTOR	.799

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-5033	INTERVAL	123.06-127.08
		ATR DRIED BASIS	
	WT%	ASH%	MOIST VOL.
1.5 FLOAT	87.10	5.50	.80 22.70 71.00
1.5 SINK	12.90	19.45	.37 7.0
TOTAL	100.00	7.30	

DPY BASIS	5.54	22.88	71.57
D.M.M.F. BASIS	-	23.76	76.24

PROJECT: Saxon ADFA: FAST
DATE SAMPLED: 7/ 4/77 DATE ANALYSED: 3/ 6/77
DRILL HOLE #: 7704 SFAM: 1U
LAR COMPOSITE #: 77-417-4172 WT. RFC. 13.87

DENISON COAL DATA

Table with columns: COMPOSITE DESCRIPTION, INTERVAL, THICKNESS, MIP, COAL/COAL+ROCK, DRILL CORE RECOVERY, ESTIMATED YIELD, MINING SECTION.

WARNOCK HERSEY ANALYSES

Table with columns: SIMULATED PRODUCT SIZE, CUTPOINT, CONTRIBUTION, YIELD, AIR DRIED, DRY BASIS, D.M.M.F., WET STUFF, ASH, VOLATILE, F.C., SULPHUR, PHOSPHORUS, S.P.P., F.S.I., HARDGROVE.

HEAD ANALYSIS - COMPOSITE PAW COAL

Table with columns: WET STUFF, ASH, VOLATILE, F.C., F.S.I., SULPHUR, SP.GR. (-7/8 MESH), PHOSPHOROUS, AIR DRIED, DRY BASIS, D.M.M.F.

DRILL HOLE #: 7704 SFAM: 1U

Table with columns: FLUIDITY, DILATATION, START TEMP., FINAL TEMP., MAX. FLUIDITY TEMP., MAX. FLUIDITY (DDPM), MAX. FLUIDITY (LOG), SOFT TEMP., SOLID TEMP., MAX. CONTRACTION, MAX. DILATATION, G. FACTOR.

GYE REPORT DRILL HOLE D-7704 SEAM 1

Table with columns: DEPTH FROM, TO, SAMPLE NO., SPG, ASH WT%, listing various depth intervals and their corresponding ash percentages.

DRILL HOLE #: 7704 SFAM: 1U

FLOAT SINK ANALYSES SIZE REL. WEIGHT

Table with columns: SP.G., WTK, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FST, listing weight percentages for different sizes and ash content.

SIZE REL. WEIGHT

Table with columns: SP.G., WTK, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FST, listing weight percentages for different sizes and ash content.

CENTRIFUGE SEPARATION

Table with columns: SIZE, REL. WEIGHT, SP.G., WTK, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FST, listing weight percentages for different sizes and ash content.

GYE REPORT DRILL HOLE D-7704 SEAM 1

Table with columns: DEPTH FROM, TO, SAMPLE NO., SPG, ASH WT%, listing various depth intervals and their corresponding ash percentages.

PROJECT: Saxon  
 DATE SAMPLED: 3/ 4/77  
 DRILL HOLE #: 7704  
 IAR COMPOSITE #: 77-4177-4182 WT. PFC. 3.09

APFA:FAST  
 DATE ANALYSED: 3/ 6/77  
 SFAM: IL

DEMISON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION
INTERVAL	246.39-247.49
THICKNESS	1.10
DIP	30
COAL/COAL-ROCK	.95/ .95
DRILL CORE RECOVERY	90.00%
ESTIMATED YIELD	77.00

WADNOCK HERSEY ANALYSES

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0	1.80 SP8
SIZE	SP.G. 1.54	SP.G. 1.76		
CUTPOINT	85.7	6.4	2.9	
CONTRIBUTION				

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
	95.00		

MOISTURE	ASH	VOLATILE	F.C.
.60	7.10	20.00	72.30
	7.14	20.12	72.74
		21.05	78.95

SULPHUR	.42
PHOSPHORUS	.004
S.P.G.	1.330
F.S.I.	5.5
HARDNESS	78.10

HEAD ANALYSIS - COMPOSITE RAW COAL

MOISTURE	AIR DRIED	DRY BASIS	D.M.M.F.
.50	9.00	19.40	71.10
	9.05	19.50	71.46
		20.85	79.35

F.S.I.	5.5
SULPHUR	.48

SP.G. (-1/8 MESH)	1.38
PHOSPHORUS	.005

DRILL HOLE #: 7704 SFAM: IL

FLOAT SINK ANALYSIS  
 SIZE REL. WEIGHT  
 3/8 X 28 90.00

SP.G.	WT%	ASH%	CUM. FLOATS	WT%	ASH%	CUM. SINKS	WT%	ASH%	F.S.I.	FST
1.40	87.60	6.40	87.60	6.40	12.40	28.54	7.0	7.0		
1.50	6.80	14.30	94.40	6.97	5.60	45.83	1.5	7.0		
1.54	.80	19.10	95.20	7.07	4.80	50.28	1.0	6.0		
1.60	.50	19.10	95.70	7.13	4.30	53.91	1.0	6.0		
1.80	1.40	27.00	97.10	7.42	2.90	66.90	1.0	5.5		
****	2.90	66.90	100.00	9.15	*****	*****	1.0	5.0		

SIZE REL. WEIGHT  
 28 X 100 6.80

SP.G.	WT%	ASH%	CUM. FLOATS	WT%	ASH%	CUM. SINKS	WT%	ASH%	F.S.I.	FST
1.40	43.30	4.90	43.30	4.90	36.70	14.90	7.0	7.0		
1.50	18.30	8.50	61.60	5.71	18.40	21.27	3.5	6.5		
1.60	8.30	12.10	69.90	6.30	10.10	28.80	1.0	6.0		
1.76	3.70	16.20	93.60	6.69	6.40	36.09	1.0	6.0		
1.90	.90	22.60	94.50	6.84	5.50	38.30	1.0	6.0		
****	5.50	38.30	100.00	8.57	*****	*****	1.0	5.5		

CENTRIFUGE SEPARATION

SIZE	REL. WEIGHT	CUM. FLOATS	WT%	ASH%	CUM. SINKS	WT%	ASH%	F.S.I.	FST
100 X 0	3.20								
SP.G.	WT%	ASH%	WT%	ASH%	WT%	ASH%	F.S.I.	FST	
1.40	65.50	4.20	65.50	4.20	34.50	26.99	7.5	7.5	
1.50	20.70	15.90	86.20	7.01	13.80	43.62	2.5	6.0	
1.60	3.40	29.60	89.60	7.87	10.40	48.20	1.0	6.0	
****	10.40	48.20	100.00	12.06	*****	*****		5.0	

DRILL HOLE #: 7704 SFAM: IL

FLUIDITY	DILATATION
START TEMP. 450.0	SOFT.TEMP. 411.0
FINAL TEMP. 498.0	SOLID.TEMP. 483.0
MAX.FLUIDITY TEMP. 483.0	MAX.CONTRACTION 20.0
MAX.FLUIDITY (DDPM) 10.5	MAX.DILATATION -5.0
MAX.FLUIDITY (LOG) 1.021	G.FACTOR .882

GYE REPORT DRILL HOLE 420 SEAM 55

DEPTH FROM	DEPTH TO	SAMPLE NO.	SPG	ASH WT%
4600944	24460	565	2.63	93.7
24460	24492	575	2.56	90.8
24492	24519	585	2.29	81.3
24519	24535			
24535	24544	595	2.63	91.1
24544	24558	605	2.68	93.9
24558	24620	615	2.59	92.7
24620	24639			
24639	24660	310	1.35	9.1
24660	24676	320	1.38	10.2
24676	24691	330	1.37	8.6
24691	24706	340	1.34	7.7
24706	24714			
24714	24727	350	1.34	6.8
24727	24749	360	1.36	9.9
24749	24777	370	2.47	85.1
24777	24785	380	1.76	54.4
24785	24794			
24794	24816	620	2.60	84.4
24816	24850	630	2.65	97.6
24850	24890	645	2.67	97.9
24890	*****			
*****	*****			

PROJECT: Saxon  
 DATE SAMPLED: 3/ 4/77  
 DRILL HOLE #: 7704  
 IAR COMPOSITE #: 77-41R5-4202 WT. RFC. 8.00

AREA: EAST  
 DATE ANALYSED: 3/ 6/77  
 SEAM: 2

## DENISON COAL DATA

COMPOSITE DESCRIPTION	INTERVAL	MINING SECTION
	210.02-213.23	210.02-213.23
THICKNESS	3.21	3.21
DTP	30	30
COAL/COAL+POCK	2.43/ 2.77	2.43/ 2.77
DRILL CORF RECOVERY	63.00%	87.00 %
ESTIMATED YIELD	68.00	

## WARNOCK MERSBY ANALYSSES

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0	1.80 SP8
CUTPOINT	SP.G. 1.54	SP.G. 1.76		
CONTIBUTION	50.8	8.9	3.0	

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
	62.70		
MOISTURE	.80		
ASH	6.20	6.25	
VOLATILE	20.60	20.77	21.62
F.C.	72.40	72.98	78.38
SULPHUR	.36		
PHOSPHORUS	.018		
S.P.G.	1.310		
F.S.I.	7.0		
HARDENESS	112.10		

## HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.70		
ASH	30.90	31.12	
VOLATILE	17.00	17.12	21.90
F.C.	51.40	51.76	78.10
F.S.I.	9.5		
SULPHUR	.32		
SP.G. (-3/8 MESH)	1.41		
PHOSPHORUS	.029		

DRILL HOLE #: 7704 SEAM: 2

## FLOAT SINK ANALYSIS

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
3/8 X 28	85.40				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	FSI
1.40	52.30 4.50	52.30 4.50	47.70 64.78	7.5	7.5
1.50	6.00 15.70	58.30 5.65	41.70 71.84	2.0	7.0
1.54	1.20 20.00	59.50 5.94	40.50 73.38	1.5	7.0
1.60	2.20 29.00	61.70 6.76	38.30 75.93	1.0	6.0
1.80	5.90 36.00	67.60 9.32	32.40 83.20	1.0	5.0
****	32.40 83.20	100.00 33.25	*****		3.0

## SIZE REL. WEIGHT

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
28 X 100	11.20				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	FSI
1.40	49.60 3.80	49.60 3.80	50.40 37.93	8.0	8.0
1.50	14.00 9.60	63.60 5.08	36.40 48.83	2.5	7.5
1.60	8.70 16.20	72.30 6.42	27.70 59.08	1.0	7.0
1.76	7.00 30.00	79.30 8.50	20.70 68.91	1.0	7.0
1.90	3.20 34.50	82.50 9.51	17.50 75.20	1.0	6.0
****	17.50 75.20	100.00 21.00	*****		4.0

## CENTRIFUGE SEPARATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
100 X 0	3.40				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	FSI
1.40	88.80 5.60	88.80 5.60	31.20 49.23	7.5	7.5
1.50	12.50 21.10	81.30 7.98	18.70 68.03	1.5	7.0
1.60	2.10 31.10	83.40 8.57	16.60 72.71	1.5	7.0
1.80	5.20 49.30	88.60 10.96	11.40 83.38	1.0	6.5
1.90	2.10 74.90	90.70 12.44	9.30 85.30	1.0	6.0
****	9.30 85.30	100.00 19.21	*****		4.0

DRILL HOLE #: 7704 SEAM: 2

FLUIDITY	DILATATION
START TEMP.	450.0
FINAL TEMP.	498.0
MAX. FLUIDITY TEMP.	480.0
MAX. FLUIDITY (DDPM)	11.5
MAX. FLUIDITY (LOG)	1.061
SOFT TEMP.	404.0
SOLID TEMP.	484.0
MAX. CONTRACTION	22.0
MAX. DILATATION	7.0
G. FACTOR	.955

## GVE REPORT DRILL HOLE 0-7704 SEAM 2

DEPTH FROM	TO	SAMPLE NO.	SPG	ASH WT%
20841	20885	195	2.66	82.9
20885	20923	205	2.67	83.8
20923	20971	215	2.69	83.5
20971	20996	225	2.63	84.6
20996	21002	10	2.10	63.3
21002	21008	20	1.51	28.2
21008	21014			
21016	21031	30	2.31	79.3
21031	21044	40	2.42	86.8
21044	21068	50	2.33	79.2
21068	21096	60	1.54	34.4
21096	21120			
21129	21148	70	1.34	9.4
21148	21172	80	1.27	5.1
21172	21190	90	1.31	6.2
21190	21205	100	1.36	10.8
21205	21224	110	1.38	12.4
21224	21238	120	1.32	5.2
21238	21251	130	1.32	4.9
21251	21268	140	1.27	2.5
21268	21289	150	1.29	2.8
21289	21301	160	1.29	3.7
21301	21307	170	1.70	44.9
21307	21323	180	1.55	30.5
21323	21334	235	2.71	91.0
21334	21351	245	2.72	87.8
21351	21367	255	2.67	87.3
21367	21406	265	2.68	85.2
21406	21437	275	2.70	84.7



PROJECT: Saxon  
 DATE SAMPLED: 0/ 0/ 0  
 DRILL HOLE #: 7704  
 LAB COMPOSITE #:

AREA: EAST  
 DATE ANALYSED: 0/ 0/ 0  
 SEAM: 3  
 WT. REC. 0.

## DENISON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION	
INTERVAL	162.23-163.05	
THICKNESS	0.	1.62
RIP		30
COAL/COAL+ROCK	0. / 0.	1.23/ 1.38
DRILL CORE RECOVERY	0. %	40.00 %
ESTIMATED YIELD	*****	

## WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT SIZE	3/8 X 28	28 X 100	100 X 0	
CUTPOINT	SP.G. 1.54	SP.G. 1.76		1.00 SPG

DRILL HOLE #: 7704 SEAM: 3

## DENISON COAL LIMITED

DRILL HOLE #: 7704 SEAM: 3

FLUIDITY		DILATATION	
START TEMP.	*****	SOFT TEMP.	*****
FINAL TEMP.	*****	SOLID TEMP.	*****
MAX. FLUIDITY TEMP.	*****	MAX. CONTRACTION	*****
MAX. FLUIDITY (DDPH)	*****	MAX. DILATATION	*****
MAX. FLUIDITY (LOG)	*****	G. FACTOR	*****

## 1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-5034	INTERVAL	162.23-162.49	AIR DRIED BASIS			
	WT%	ASH%	MOIST VOL.	F.C.	S.	F.S.I.	
1.5 FLOAT	33.30	8.20	.50	21.90	69.40	.73	8.5
1.5 SINK	66.70	50.63					
TOTAL	100.00	36.50					
DRY BASIS		8.24		22.01	69.75		
D.M.M.F. BASIS		-		23.22	76.78		
COMPONENT NO.	77-5035	INTERVAL	162.49-162.67	AIR DRIED BASIS			
	WT%	ASH%	MOIST VOL.	F.C.	S.	F.S.I.	
1.5 FLOAT	11.40	10.50	.50	21.10	67.90	.66	8.0
1.5 SINK	88.20	66.17					
TOTAL	100.00	59.60					
DRY BASIS		10.55		21.21	69.24		
D.M.M.F. BASIS		-		22.78	77.22		
COMPONENT NO.	77-5036	INTERVAL	162.67-163.05	AIR DRIED BASIS			
	WT%	ASH%	MOIST VOL.	F.C.	S.	F.S.I.	
1.5 FLOAT	64.90	7.10	.70	21.90	70.30	.60	9.0
1.5 SINK	35.10	44.99					
TOTAL	100.00	20.40					
DRY BASIS		7.15		22.05	70.80		
D.M.M.F. BASIS		-		23.10	76.90		

COAL ANALYSIS PREPARED BY  
 WARNOCK HERSEY PROFESSIONAL SERVICES LTD  
 SIGNED:

PROJCT: SAXON AREA: EAST  
 DATE SAMPLED: 2/ 4/77 DATE ANALYSED: 16/ 6/77  
 DRILL HOLE #: 7704 SFAM: 4U  
 LAB COMPOSITE #: 17-4207-4207 WT. REC. 2.00

DEWISON COAL DATA

COMPOSITE DESCRIPTION	126.33-127.1A	MINING SECTION	126.33-129.74
THICKNESS		.83	3.41
MD		35	35
COAL/COAL+ROCK	.29/ .69		2.01/ 2.79
DRILL CORE RECOVERY		83.00%	80.00 %
ESTIMATED YIELD		70.00	

WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0	1.80 SPG
SIZE				
CUTPOINT	SP.G. 1.54	SP.G. 1.76		
CONTRIBUTION	19.2	3.8	2.7	

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
	24.70		

MOISTURE	ASH	VOLATILE	F.C.
.80	8.70	21.07	22.35
	20.90	21.07	77.65
	69.60	70.16	

SULPHUR	PHOSPHORUS	S.P.G.	F.S.I.	HARDGRAVE
.47	.035	1.340	7.5	*****

HEAN ANALYSIS - COMPOSITE RAW COAL

MOISTURE	ASH	VOLATILE	F.C.
.80	56.70	16.90	27.40
	56.15	16.03	27.82
		29.11	70.89

F.S.I.	SULPHUR
1.0	.37

SP.GR. (-1/8 MESH)	PHOSPHORUS
1.77	.078

DRILL HOLE #: 7704 SFAM: 4U

FLOAT SINK ANALYSIS  
 SIZE REL. WEIGHT  
 3/8 X 28 89.70

SP.G.	WT%	ASH%	CUM. FLOATS	CUM. SINKS	F.S.I.	CUM
1.40	13.90	6.00	13.90	6.00	86.10	68.49
1.50	4.50	17.10	18.40	8.71	81.60	71.33
1.60	1.90	21.10	20.30	9.87	79.70	72.53
1.60	2.00	29.10	22.30	11.60	77.70	73.64
1.80	6.20	36.10	28.50	16.93	71.50	76.90
****	71.50	76.90	100.00	59.81	*****	1.0

SIZE REL. WEIGHT  
 28 X 100 6.40

SP.G.	WT%	ASH%	CUM. FLOATS	CUM. SINKS	F.S.I.	CUM
1.40	33.30	4.30	33.30	4.30	66.70	46.84
1.50	16.20	9.70	49.50	6.07	50.50	58.75
1.60	5.70	17.10	55.20	7.21	44.80	64.05
1.76	3.80	26.00	59.00	8.42	41.00	67.58
1.90	4.80	31.20	63.80	10.13	36.20	72.40
****	36.20	72.40	100.00	32.67	*****	2.0

CENTRIFUGE SEPARATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	CUM	
100 X 0	3.90					
SP.G. <th>WT%</th> <th>ASH%</th> <th>WT%</th> <th>ASH%</th> <th>F.S.I.</th> <th>FST</th>	WT%	ASH%	WT%	ASH%	F.S.I.	FST
1.40	50.00	4.90	50.00	4.90	50.00	57.74
1.50	13.30	17.60	63.30	7.57	36.70	72.29
1.60	3.30	41.10	66.60	9.23	33.40	75.38
1.80	3.30	51.70	69.90	11.23	30.10	77.97
1.90	3.30	68.80	73.20	13.83	26.80	79.10
****	26.80	79.10	100.00	31.32	*****	2.0

DRILL HOLE #: 7704 SFAM: 4U

FLUIDITY	DILATATION
START TEMP. 450.0	SOFT TEMP. 402.0
FINAL TEMP. 498.0	SOLID TEMP. 491.0
MAX. FLUIDITY TEMP. 480.0	MAX. CONTRACTION 18.0
MAX. FLUIDITY (DDPH) 11.0	MAX. DILATATION 4.0
MAX. FLUIDITY (LOG) 1.041	G. FACTOR .946

GVE REPORT DRILL HOLE D-7704 SEAM 4

DEPTH FROM	DEPTH TO	SAMPLE NO.	SPG	ASH WTS
12445	12461	215	2.68	85.6
12461	12507	225	2.71	84.3
12507	12520	235	2.72	85.5
12520	12555			
12555	12598	245	2.67	87.2
12598	12610			
12610	12622	255	2.62	87.3
12622	12633			
12633	12641	10	1.48	24.4
12641	12648			
12648	12655			
12655	12679	20	1.84	52.6
12679	12688	30	2.03	63.4
12688	12705	40	2.24	74.8
12705	12716	50	1.55	31.3

PROJECT: SAYOH  
DATE SAMPLED: 2/ 4/77  
DRILL HOLE #: 7704  
LAR COMPOSITE #: 77-420A-421B WT. PFC. 6.12

APFA: EAST  
DATE ANALYSED: 6/ 6/77  
SFAM: 4L

DEMISON COAL DATA

Table with columns: COMPOSITE DESCRIPTION, INTERVAL, THICKNESS, etc. Values include 127.62-129.74, 2.12, 3.41, etc.

WARNOCK HERSEY ANALYSES

Table with columns: SIMULATED PRODUCT, CUTPOINT, CONTRIBUTION, AIR DRIED, DRY BASIS, D.M.M.F., etc.

HEAD ANALYSIS - COMPOSITE RAW COAL

Table with columns: AIR DRIED, DRY BASIS, D.M.M.F., etc. Values include 1.20, 4.10, 22.20, etc.

DRILL HOLE #: 7704 SFAM: 4L

FLOAT SINK ANALYSES  
3/8 X 28

Table with columns: SP.G., WTK, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI. Values include 1.40, 90.90, 3.90, etc.

SIZE REL. WEIGHT  
28 X 100

Table with columns: SP.G., WTK, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI. Values include 1.40, 80.60, 2.50, etc.

CENTRIFUGE SEPARATION  
100 X 0

Table with columns: SP.G., WTK, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI. Values include 1.40, 88.30, 2.60, etc.

DRILL HOLE #: 7704 SFAM: 4L

FLUIDITY

Table with columns: START TEMP., FINAL TEMP., MAX. FLUIDITY TEMP., MAX. FLUIDITY (NDPM), MAX. FLUIDITY (LOG). Values include 445.0, 489.0, 474.0, etc.

DILATATION

Table with columns: SOFT TEMP., SOLID TEMP., MAX. CONTRACTION, MAX. DILATATION, G. FACTOR. Values include 408.0, 486.0, 22.0, etc.

GYE REPORT DRILL HOLE 762 SEAM 0

Table with columns: DEPTH FROM TO, SAMPLE NO., SPG, ASH WTK. Values include 0, 12790, 60, 1.30, 4.9, etc.

PROJECT: Saxon ARFAFAST
DATE SAMPLED: 5/ 4/77 DATE ANALYSED: 6/ 6/77
DRILL HOLE #: 7705 SFAM: JUST
LAR COMPOSITE #: 77-4223-4224 WT. RFC. 2.12

DENISON COAL DATA

Table with columns: COMPOSITE DESCRIPTION, INTERVAL, MINING SECTION. Rows include thickness, ash, coal/coal-rock, and estimated yield.

WARNOCK HERSEY ANALYSYS

Table with columns: SIMULATED PRODUCT, SIZE, OUTPUT, CONTRIBUTION. Rows include 3/8 x 28, 28 x 100, and 100 x 0 sizes.

Table with columns: YIELD, AIR DRIED, DRY BASIS, D.M.H.F.

Table with columns: MOISTURE, ASH, VOLATILE, F.C., SULPHUR, PHOSPHORUS, S.P.G., F.S.I., HAPRODRIVE.

HEAD ANALYSIS - COMPOSITE RAW COAL

Table with columns: MOISTURE, ASH, VOLATILE, F.C., SULPHUR.

Table with columns: S.P.G. (-1/8 MESH), PHOSPHOROUS.

DRILL HOLE #: 7705 SFAM: JUST

FLUIDITY

DILATATION

Table with columns: START TEMP., FINAL TEMP., MAX. FLUIDITY TEMP., MAX. FLUIDITY (NDPH), MAX. FLUIDITY (LOG), SOFT. TEMP., SOLID. TEMP., MAX. CONTRACTION, MAX. DILATATION, G. FACTOR.

GVE REPORT

DRILL HOLE S07705

SEAM 1

Table with columns: DEPTH FROM, TO, SAMPLE NO., SPG, ASH WT%.

DRILL HOLE #: 7705 SFAM: JUST

FLOAT SINK ANALYSYS SIZE REL. WEIGHT 3/8 X 28 87.60

Table with columns: SP.G., WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI.

SIZE REL. WEIGHT 28 X 100 7.60

Table with columns: SP.G., WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI.

CENTRIFUGE SEPARATION SIZE REL. WEIGHT 100 X 0 4.80

Table with columns: SP.G., WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI.

GVE REPORT

DRILL HOLE S07705

SEAM 1

Table with columns: DEPTH FROM, TO, SAMPLE NO., SPG, ASH WT%.

PROJECT: SAXON  
 DATE SAMPLED: 5/ 4/77  
 DRILL HOLE #: 7705  
 LAR COMPOSITE #: 77-4272-4273

APFA: FAST  
 DATE ANALYSED: 8/ 6/77  
 SEAM: 1U  
 WT. PFC. 10.13

DENISON COAL DATA

COMPOSITE DESCRIPTION	INTERVAL	MINING SECTION
	247.62-252.82	246.08-252.82
THICKNESS	5.70	6.74
ATP	32	32
COAL/COAL+ROCK	4.41/ 4.41	4.91/ 5.73
DRILL CORE RECOVERY	59.00%	67.00 %
ESTIMATED YIELD	83.00	

WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0	1.80 SP0
CUTPOINT	SP.G. 1.54	SP.G. 1.76		
CONTRIBUTION	71.6	15.5	5.4	

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
	92.50		
MOISTURE	7.50		
ASH	5.60	5.63	
VOLATILE	20.20	20.32	21.08
F.C.	73.40	74.04	78.92
SULPHUR	.76		
PHOSPHORUS	.020		
S.P.G.	1.700		
F.S.I.	7.5		
HARDGRAVE	94.10		

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	7.50		
ASH	5.60	5.64	
VOLATILE	20.70	20.40	22.07
F.C.	70.30	70.65	77.93
F.S.I.	7.5		
SULPHUR	.30		
SP.G. (-3/8 MESH)	1.39		
PHOSPHORUS	.021		

DRILL HOLE #: 7705 SEAM: 1U

3/8 X 28 78.10  
 FLOAT SINK ANALYSIS  
 SIZE REL. WEIGHT

SP.G.	WT%	ASH%	CUM. FLOATS	WT%	ASH%	CUM. SINKS	WT%	ASH%	F.S.I.	CUM FSI
1.40	83.20	4.70	83.20	4.70	16.80	25.92	8.5	8.5		
1.50	6.70	15.00	89.90	5.47	10.10	33.16	1.0	7.5		
1.54	1.80	18.80	91.70	5.73	8.30	36.27	1.0	7.0		
1.60	2.00	20.80	93.70	6.05	6.38	41.18	1.0	7.0		
1.80	3.30	26.80	97.00	6.76	3.00	57.00	1.0	7.0		
****	3.00	57.00	100.00	8.26	*****	*****		7.0		

28 X 100 16.10  
 SIZE REL. WEIGHT

SP.G.	WT%	ASH%	CUM. FLOATS	WT%	ASH%	CUM. SINKS	WT%	ASH%	F.S.I.	CUM FSI
1.40	70.90	3.40	70.90	3.40	29.10	16.25	8.5	8.5		
1.50	14.90	8.80	85.80	4.34	14.20	24.07	1.5	8.5		
1.60	7.00	15.10	92.80	5.15	7.20	32.80	1.0	8.0		
1.76	3.30	23.20	96.10	5.77	3.90	40.92	1.0	8.0		
1.90	.30	31.60	96.40	5.85	3.60	41.70	1.0	7.5		
****	3.60	41.70	100.00	7.14	*****	*****		7.5		

CENTRIFUGE SEPARATION

SIZE	REL. WEIGHT	CUM. FLOATS	WT%	ASH%	CUM. SINKS	WT%	ASH%	F.S.I.	CUM FSI
100 X 0	5.80								
SP.G.	WT%	ASH%	WT%	ASH%	WT%	ASH%	F.S.I.	FSI	
1.40	82.60	4.20	82.60	4.20	17.40	40.45	8.5	8.5	
1.50	7.40	16.80	90.00	5.24	10.00	57.95	1.5	8.0	
1.60	1.20	22.80	91.20	5.47	8.80	62.74	1.5	8.0	
1.80	1.20	32.70	92.40	5.82	7.60	67.48	1.0	7.5	
1.90	.30	45.20	92.70	5.95	7.30	68.40	1.0	7.0	
****	7.30	68.40	100.00	10.51	*****	*****		7.0	

DRILL HOLE #: 7705 SEAM: 1U

FLUIDITY	DILATATION
START TEMP. 450.0	SOFT TEMP. 406.0
FINAL TEMP. 504.0	SOLID TEMP. 484.0
MAX.FLUIDITY TEMP. 483.0	MAX.CONTRACTION 18.0
MAX.FLUIDITY(DDPN) 21.0	MAX.DILATATION 17.0
MAX.FLUIDITY(LOG) 1.322	G.FACTOR .998

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-4273	INTERVAL	247.62-250.37
		AIR DRIED BASIS	
		WT% ASH% MOIST VOL. F.C. S. F.S.I.	
1.5 FLOAT	86.00	6.50	.40 19.80 73.30 .30 7.5
1.5 SINK	14.00	28.64	
TOTAL	100.00	9.40	
DRY BASIS	6.53	19.88	73.59
D.M.M.F. BASIS	-	20.73	79.27
COMPONENT NO.	77-4272	INTERVAL	250.37-252.82
		AIR DRIED BASIS	
		WT% ASH% MOIST VOL. F.C. S. F.S.I.	
1.5 FLOAT	88.70	5.40	.40 20.60 73.68 .35 8.5
1.5 SINK	11.30	40.80	
TOTAL	100.00	9.40	
DRY BASIS	5.42	20.68	73.90
D.M.M.F. BASIS	-	21.40	78.60

PROJECT: SAXON ARFA: FAST  
 DATE SAMPLED: 5/ 4/77 DATE ANALYSED: 7/ 6/77  
 DRILL HOLE #: 7705 SEAM: 1L  
 LAB COMPOSITE #: 77-422A-4232 WT. PFC. 3.53

DENISON COAL DATA

COMPOSITE DESCRIPTION	INTERVAL	MINING SECTION
	257.20-258.28	257.20-258.28
THICKNESS	1.08	1.08
DIP	32	32
COAL/COAL+POCK	.92/ .92	.92/ .92
DRILL CORE RECOVERY	90.00%	90.00 %
ESTIMATED YIELD	83.00	

WARNOCK HERSEY ANALYSIS

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0	1.80 SPG
CUTPOINT	SP.G. 1.54	SP.G. 1.76	2.7	
CONTRIBUTION	82.0	6.3		

YIELD	ATP DRIED	DRY BASIS	D.M.M.F.
	91.00		
MOISTURE	.70		
ASH	6.80	6.95	
VOLATILE	19.50	19.64	20.48
F.C.	73.00	73.51	79.52
SULPHUR	.47		
PHOSPHORUS	.005		
S.P.G.	1.750		
F.S.I.	7.0		
HARDGROVE	99.60		

HFB ANALYSIS - COMPOSITE RAW COAL

	ATP DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.40		
ASH	9.70	9.74	
VOLATILE	19.20	19.28	20.51
F.C.	70.70	70.98	79.49
F.S.I.	6.0		
SULPHUR	.49		
SP.G. (-3/8 MESH)	1.42		
PHOSPHOROUS	.008		

DRILL HOLE #: 7705 SEAM: 1L

FLOAT SINK ANALYSIS  
 3/8 X 28 PFL. WEIGHT  
 90.10

SP.G.	WT%	ASH%	CUM. WT%	FLOATS WT%	CUM. SINKS WT%	F.S.I.	CUM. FST
1.40	80.50	5.80	80.50	5.80	19.50	24.53	7.0
1.50	8.90	14.40	89.40	6.66	10.60	33.04	3.0
1.54	1.60	16.40	91.00	6.83	9.00	35.99	2.0
1.60	3.90	28.60	94.90	7.72	5.10	41.65	1.5
1.80	3.30	34.20	98.20	8.61	1.80	55.30	1.0
****	1.80	55.30	100.00	9.45			6.0

SIZE REL. WEIGHT  
 28 X 100 6.90

SP.G.	WT%	ASH%	CUM. WT%	FLOATS WT%	CUM. SINKS WT%	F.S.I.	CUM. FST
1.40	65.20	3.80	65.20	3.80	34.80	15.82	8.0
1.50	16.90	8.80	82.10	4.85	17.90	22.35	5.0
1.60	5.40	11.40	87.50	5.25	12.50	27.08	2.5
1.76	4.50	17.80	92.00	5.87	8.00	32.30	2.5
1.80	3.60	20.20	95.60	6.41	4.40	42.20	2.0
****	4.40	42.20	100.00	7.98			6.0

CENTRIFUGE SEPARATION  
 SIZE REL. WEIGHT  
 100 X 0 3.00

SP.G.	WT%	ASH%	CUM. WT%	FLOATS WT%	CUM. SINKS WT%	F.S.I.	CUM. FST
1.40	69.70	3.80	69.70	3.80	30.30	28.74	8.0
1.40	21.20	17.30	90.90	6.95	9.10	55.40	1.0
****	9.10	55.40	100.00	11.36			6.0

DRILL HOLE #: 7705 SEAM: 1L

FLUIDITY

DILATATION

START TEMP.	456.0	SOFT TEMP.	404.0
FINAL TEMP.	495.0	SOLID TEMP.	483.0
MAX. FLUIDITY TEMP.	483.0	MAX. CONTRACTION	18.0
MAX. FLUIDITY (NDPM)	8.0	MAX. DILATATION	-4.0
MAX. FLUIDITY (LOG)	.903	G. FACTOR	.878

GYE REPORT DRILL HOLE 565

SEAM 0

DEPTH FROM	TO	SAMPLE NO.	SPG	ASH WTS
0	25576			
25576	25618			
25618	25640	265	2.45	88.5
25640	25650	275	2.47	88.7
25650	25670	285	2.45	89.5
25670	25700	295	2.62	96.1
25700	25720	50	2.52	91.3
25720	25731	60	1.32	9.8
25731	25754	70	1.44	17.7
25754	25779	80	1.32	8.1
25779	25799	90	1.31	6.9
25799	25817	100	1.30	6.6
25817	25828			
25828	25864	110	2.36	85.3
25864	25878	120	1.48	22.7
25878	25890	130	2.58	94.0
25890	25808	305	2.57	93.5
25808	25934	315	2.65	97.1

PROJECT: Saxon ARFA: FAST  
 DATE SAMPLED: 5/ 4/77 DATE ANALYSED: 8/ 4/77  
 DRILL HOLE #: 7705 SEAM:  
 LAB COMPOSITE #: 277-4274 WT. REC. 3.42

DENISON COAL DATA

COMPOSITE DESCRIPTION	INTERVAL	MINING SECTION
	218.24-219.29	218.24-220.66
THICKNESS	1.05	2.42
DTP	35	35
COAL/COAL ROCK	.86/ .86	1.98/ 1.98
DRILL CORR RECOVERY	100.00%	43.00 %
ESTIMATED YIELD	80.00	

WARNOCK HERSEY ANALYSES

STIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0	1.80 SPG
SIZE	SP.G. 1.54	SP.G. 1.76		
CUTPOINT	64.4	12.5	5.4	
CONTRIBUTION				
YIELD	AIR DRIED 86.30	DRY BASIS	D.M.M.F.	
MOISTURE	1.00	5.96		
ASH	4.80	21.41	22.21	
VOLATILE	21.70	72.73	77.79	
F.C.				
SULPHUR	.51			
PHOSPHORUS	.020			
S.P.G.	1.300			
F.S.I.	6.5			
HARDGROVE	*****			

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.50		
ASH	12.30	12.36	
VOLATILE	20.10	20.20	22.05
F.C.	47.10	67.44	77.95
F.S.I.	4.0		
SULPHUR	.38		
SP.GR. (-3/8 MESH)	1.42		
PHOSPHOROUS	.022		

DRILL HOLE #: 7705 SEAM:

FLOAT SINK ANALYSYS

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FST
3/8 X 28	81.00				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	FST
1.40	77.10 5.10	77.10 5.10	22.90 39.61	7.0	7.0
1.50	5.60 15.40	82.70 5.81	17.30 47.39	1.5	6.5
1.54	1.70 17.80	84.40 6.05	15.60 50.61	1.5	6.0
1.60	1.40 21.80	85.80 6.31	14.20 53.45	1.0	6.0
1.80	4.90 28.50	90.70 7.51	9.30 66.60	1.0	6.0
****	9.70 66.60	100.00 13.00	*****		6.0

SIZE REL. WEIGHT

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FST
28 X 100	13.40				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	FST
1.40	69.20 3.70	69.20 3.70	30.80 18.85	8.0	8.0
1.50	12.00 8.90	81.20 4.47	18.80 25.20	1.5	7.0
1.60	10.70 12.90	91.90 5.45	8.10 41.46	1.0	6.5
1.76	1.30 22.50	93.20 5.69	6.80 45.08	1.0	6.5
1.90	2.10 24.00	95.30 6.09	4.70 54.50	1.0	6.5
****	4.70 54.50	100.00 8.37	*****		6.5

CENTRIFUGE SEPARATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FST
100 X 0	5.60				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	FST
1.40	83.90 4.70	83.90 4.70	16.10 37.14	6.5	6.5
1.50	7.50 18.50	91.40 5.83	8.60 53.40	1.5	6.0
1.60	2.20 29.70	93.60 6.39	6.40 61.64	1.5	6.0
1.80	2.20 43.30	95.80 7.24	4.20 71.10	1.0	6.0
****	4.20 71.10	100.00 9.92	*****		6.0

DRILL HOLE #: 7705 SEAM:

FLUIDITY	DILATATION
START TEMP.	450.0
FINAL TEMP.	498.0
MAX.FLUIDITY TEMP.	482.0
MAX.FLUIDITY(DDPM)	5.0
MAX.FLUIDITY(LOG)	.699
SOFT TEMP.	415.0
SOLID TEMP.	487.0
MAX.CONTRACTION	22.0
MAX.DILATATION	-1.0
G.FACTOR	.920

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-4274	INTERVAL	218.24-220.66
		AIR DRIED BASIS	
		MOIST VDL. F.C.	S. F.S.I.
1.5 FLOAT	81.40 6.50	.70 20.20 72.60	.41 8.0
1.5 SINK	18.60 40.37		
TOTAL	100.00 12.80		
DRY BASIS	6.55	20.34 73.11	
D.M.M.F. BASIS	-	21.20 78.80	

PROJECT: Saxon ARFA: FAST
DATE SAMPLED: 5/ 4/77 DATE ANALYSED: 8/ 6/77
DRILL HOLE #: 7705 SFAM: #
LAB COMPOSITE #: 77-423A-4259 WT. RFC. 14.95

DENISON COAL DATA

Table with columns: COMPOSITE DESCRIPTION, INTERVAL, MINING SECTION, THICKNESS, RTP, COAL/COAL+ROCK, DRILL CORF RECOVERY, ESTIMATED YIELD.

WARNOCK HERSEY ANALYSES

Table with columns: SIMULATED PRODUCT SIZE, CUTPOINT, CONTRIBUTION, AIR DRIED, DRY BASIS, D.M.H.F., SP.G.

Table with columns: YIELD, MOISTURE, ASH, VOLATILE, F.C., SULPHUR, PHOSPHORUS, F.S.I., HARDGROVE.

HEAD ANALYSIS - COMPOSITE RAW COAL

Table with columns: AIR DRIED, DRY BASIS, D.M.H.F., MOISTURE, ASH, VOLATILE, F.C., F.S.I., SULPHUR, SP.G., PHOSPHORUS.

DRILL HOLE #: 7705 SFAM: 4

FLOAT SINK ANALYSIS SIZE REL. WEIGHT

Table with columns: SP.G., WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI.

SIZE REL. WEIGHT 28 X 100

Table with columns: SP.G., WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI.

CENTRIFUGE SEPARATION SIZE REL. WEIGHT 100 X 0

Table with columns: SP.G., WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI.

DRILL HOLE #: 7705 SFAM: 4

FLUIDITY

Table with columns: START TEMP., FINAL TEMP., MAX. FLUIDITY TEMP., MAX. FLUIDITY (DDPM), MAX. FLUIDITY (LOG), SOFT. TEMP., SOLID. TEMP., MAX. CONTRACTION, MAX. DILATATION, G. FACTOR.

DILATATION

GVE REPORT DRILL HOLE SD7705 SEAM 4

Table with columns: DEPTH FROM TO, SAMPLE NO., SPG, ASH WT%.

GVE REPORT DRILL HOLE SD7705 SEAM 4

Table with columns: DEPTH FROM TO, SAMPLE NO., SPG, ASH WT%.



PROD.FCT: SAKON  
 DATE SAMPLD: 7/ 5/77  
 DRILL HOLE #: 7706  
 IAR COMPOSITE #: 77-5403-9404 WT. REC. 15.79

ANALYST: AFJAFJAST  
 DATE ANALYSIS: 7/ 7/77  
 SEAM: 4

DENTSON COAL DATA

COMPOSITE DESCRIPTION	INTERVAL	MINING SECTION
THICKNESS	491.95-501.40	492.32-501.40
OTP	7.62	9.08
COAL/COAL+POCK	7.39/ 7.62	7.33/ 7.62
DRILL CORE RECOVERY	53.00%	56.00 %
ESTIMATED YIELD	70.00	

WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT	3/8 X 28	2R X 100	100 X 0	1.80 SPG
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SECS	
CONTRIBUTION	50.6	20.2	7.2	

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
	78.00		

MOISTURE	ASH	VOLATILE	F.C.
.80	6.96	20.77	72.28
21.74	78.26		

SULPHUR	PHOSPHORUS	S.P.G.	F.S.I.	HARDGROVE
.75	.01R	1.280	5.5	92.70

HEAD ANALYSIS - COMPOSITE RAW COAL

MOISTURE	ASH	VOLATILE	F.C.
.90	16.65	19.98	63.37
22.62	77.38		

F.S.I.	SULPHUR	SP.GR. (-3/8 MESH)	PHOSPHORUS
5.0	.75	1.33	.021

DRILL HOLE #: 7706 SEAM: 4

FLOAT SINK ANALYSES

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	CUM FSI
2A X 28	70.10				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	FSI
1.40	59.50 5.40	59.50 5.40	40.50 37.79	7.0	7.0
1.50	9.40 13.20	68.90 6.46	31.10 45.22	2.5	5.5
1.60	3.30 20.30	72.20 7.10	27.80 48.18	1.5	5.0
1.80	3.90 27.50	76.10 8.14	23.90 51.56	1.0	5.0
1.90	10.70 34.70	86.80 11.66	13.20 63.60	1.0	5.0
****	13.20 63.60	100.00 18.52	*****	*****	5.0

SIZE REL. WEIGHT

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	CUM FSI
2A X 100	21.70				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	FSI
1.40	70.20 3.70	70.20 3.70	29.80 23.95	7.0	7.0
1.50	12.30 10.10	82.50 4.65	17.50 33.69	7.0	6.5
1.60	5.30 15.90	87.80 5.33	12.20 41.42	2.0	6.0
1.76	5.50 27.30	93.30 6.63	6.70 53.01	1.0	6.0
1.90	2.50 45.80	95.80 7.65	4.20 57.30	1.0	6.0
****	4.20 57.30	100.00 9.74	*****	*****	1.0 5.0

FROTH FLOTATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
100 X 0	4.10				
TIME	WT% ASH%	WT% ASH%	F.S.I.	FSI	
45	53.50 7.30	53.50 7.30	6.0	6.0	
90	19.60 13.50	73.10 8.96	2.0	5.5	
135	11.50 19.70	84.60 10.42	1.0	5.5	
180	7.90 24.30	92.50 11.61	1.0	5.5	
225	7.50 30.30	100.00 13.01	1.0	5.5	

CENTRIFUGE SEPARATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	CUM FSI
100 X 0	4.10				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	FSI
1.40	77.10 4.60	77.10 4.60	22.90 39.40	5.5	5.5
1.50	7.90 12.00	85.00 5.29	15.00 53.83	1.0	5.5
1.60	3.00 24.40	88.00 5.94	12.00 61.10	1.0	5.5
1.80	3.00 38.60	91.00 7.02	9.00 68.72	1.0	5.5
1.90	1.10 51.60	92.10 7.55	7.90 71.10	1.0	5.5
****	7.90 71.10	100.00 12.57	*****	*****	1.0 5.5

DRILL HOLE #: 7706 SEAM: 4

FLUIDITY	DILATATION
START TEMP. 444.0	SOFT TEMP. 408.0
FINAL TEMP. 507.0	SOLID TEMP. 482.0
MAX.FLUIDITY TEMP. 483.0	MAX.CONTRACTION 22.0
MAX.FLUIDITY (DDPH) 11.0	MAX.DILATATION -7.0
MAX.FLUIDITY (LOG) 1.041	G.FACTOR .890

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	INTERVAL	AIR DRIED BASIS	F.C.	S.	F.S.I.
77-5403	491.95-492.32				
WT% ASH%	WT% ASH%	WT% ASH%	WT% ASH%	WT% ASH%	WT% ASH%
1.5 FLOAT 21.30 13.20		.30 19.90 66.60	.78	7.5	
1.5 SINK 78.70 67.84					
TOTAL 100.00 56.20					

DRY BASIS	D.M.M.F. BASIS
13.24	19.96 66.80
-	21.80 78.20

COMPONENT NO.	INTERVAL	AIR DRIED BASIS	F.C.	S.	F.S.I.
77-5404	492.32-501.40				
WT% ASH%	WT% ASH%	WT% ASH%	WT% ASH%	WT% ASH%	WT% ASH%
1.5 FLOAT 74.90 6.70		.40 18.90 74.00	.37	6.0	
1.5 SINK 25.10 44.15					
TOTAL 100.00 18.10					

DRY BASIS	D.M.M.F. BASIS
6.73	18.98 74.30
-	19.77 80.23

PROJECT: Saxon APFA: SOUTH
DATE SAMPLED: 7/ 6/77 DATE ANALYSED: 23/ 6/77
DRILL HOLE #: 7707 SEAM: 1
LAR COMPOSITE #: 77-5037-5039 WT. RFC. 3.53

DENTSON COAL DATA

Table with columns: COMPOSITE DESCRIPTION, INTERVAL, THICKNESS, NTP, COAL/COAL-ROCK, DRILL CORE REC'D/COV'D, ESTIMATED YIELD. Values include 344.24-348.20, 3.96, 34, 2.95/ 3.25, 35.00%, 74.00.

WARNOCK HERSEY ANALYSES

Table with columns: SIMULATED PRODUCT, SIZE, CUTPOINT, CONTRIBUTION. Values include 3/8 X 20, 20 X 100, 100 X 0, 1.80 SP6.

Table with columns: YIELD, AIR DRIED, DRY BASIS, D.M.M.F. Values include 79.80, 7.00, 7.06, 24.20, 24.42, 25.73, 74.27.

HEAD ANALYSIS - COMPOSITE RAW COAL

Table with columns: AIR DRIED, DRY BASIS, D.M.M.F. Values include 7.5, 19.40, 19.50, 22.20, 22.31, 26.17, 73.83.

DRILL HOLE #: 7707 SEAM: 1

FLOAT SINK ANALYSIS

Table with columns: SIZE, REL. WEIGHT, CUM. FLOATS, CUM. SINKS, CUM F.S.I., FSI. Values include 7/8 X 20, 65.60, 1.54, 75.10, 7.40, 75.10, 7.40, 24.90, 72.20, 7.5, 7.5.

SIZE REL. WEIGHT

Table with columns: SIZE, REL. WEIGHT, CUM. FLOATS, CUM. SINKS, CUM F.S.I., FSI. Values include 28 X 100, 25.90, 1.76, 87.60, 6.60, 87.60, 6.60, 12.40, 59.40, 8.0, 8.0.

PROTH FLOTATION

Table with columns: SIZE, REL. WEIGHT, CUM. FLOATS, CUM. SINKS, CUM F.S.I., FSI. Values include 100 X 0, 4.30, 45, 49.40, 6.30, 49.40, 6.30, 9.0, 9.0.

CENTRIFUGE SEPARATION

Table with columns: SIZE, REL. WEIGHT, CUM. FLOATS, CUM. SINKS, CUM F.S.I., FSI. Values include 100 X 0, 4.20, 1.40, 80.30, 4.60, 80.30, 4.60, 19.70, 46.46, 8.0, 8.0.

DRILL HOLE #: 7707 SEAM: 1

Table with columns: FLUIDITY, DILATATION, START TEMP., FINAL TEMP., MAX. FLUIDITY TEMP., MAX. FLUIDITY (NDPM), MAX. FLUIDITY (LOG), SOFT. TEMP., SOLID. TEMP., MAX. CONTRACTION, MAX. DILATATION, G.FACTOR.

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT% ASH%, MOIST VOL., F.C., S, F.S.I., FSI. Values include 77-5039, 344.24-345.96, 1.5 FLOAT 77.40, 10.80, .50, 21.20, 67.50, .36, 5.0.

Table with columns: DRY BASIS, D.M.M.F. BASIS, 10.85, 21.31, 67.84, 23.04, 76.96.

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT% ASH%, MOIST VOL., F.C., S, F.S.I., FSI. Values include 77-5038, 345.96-346.25, 1.5 FLOAT 22.50, 11.00, .60, 21.40, 67.00, .61, 7.0.

Table with columns: DRY BASIS, D.M.M.F. BASIS, 11.07, 21.53, 67.40, 23.26, 76.74.

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT% ASH%, MOIST VOL., F.C., S, F.S.I., FSI. Values include 77-5037, 346.25-348.20, 1.5 FLOAT 84.90, 6.30, .60, 24.00, 69.10, .40, 8.5.

Table with columns: DRY BASIS, D.M.M.F. BASIS, 6.34, 24.14, 69.52, 25.26, 74.74.

COAL ANALYSIS PREPARED BY WARNOCK HERSEY PROFESSIONAL SERVICES LTD SIGNED:

PROJECT: Saxon
DATE SAMPLED: 4/ 5/77
DRILL HOLE #: 7707
1 AR COMPOSITE #: 77-5260-5300 WT. RFG. 14.74

APPA: SOUTH
DATE ANALYSED: 25/ 8/77
SEAM: 2

DEMISON COAL DATA

Table with columns: COMPOSITE DESCRIPTION, MINING SECTION, THICKNESS, RTP, COAL/COAL+POCK, DRILL CORP RECOVERY, ESTIMATED YIELD.

WARNOCK HFRSEY ANALYSES

Table with columns: SIMULATED PRODUCT, SIZE, CUTPOINT, CONTRIBUTION, AIR DRIED, DRY BASIS, D.M.H.F.

Table with columns: YIELD, MOISTURE, ASH, VOLATILE, F.C., SULPHUR, PHOSPHORUS, F.S.I., HARDNESS.

HEAD ANALYSIS - COMPOSITE RAW COAL

Table with columns: AIR DRIED, DRY BASIS, D.M.H.F., MOISTURE, ASH, VOLATILE, F.C., F.S.I., SULPHUR, SP.GR. (-3/8 MESH), PHOSPHOROUS.

DRILL HOLE #: 7707 SEAM: 2

FLOAT SINK ANALYSES
SIZE REL. WEIGHT
3/8 X 28 74.90

Table with columns: SP.G., WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FST.

SIZE REL. WEIGHT
28 X 100 18.70

Table with columns: SP.G., WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FST.

CENTRIFUGE SEPARATION
SIZE REL. WEIGHT
100 X 0 6.40

Table with columns: SP.G., WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FST.

DRILL HOLE #: 7707 SEAM: 2

Table with columns: FLUIDITY, DILATATION, START TEMP., FINAL TEMP., MAX.FLUIDITY TEMP., MAX.FLUIDITY(DDPH), MAX.FLUIDITY(LDR).

GYE REPORT DRILL HOLE 507707 SEAM 2

Table with columns: DEPTH FROM TO, SAMPLE NO., SPG, ASH WT%.

GYE REPORT DRILL HOLE 507707 SEAM 2

Table with columns: DEPTH FROM TO, SAMPLE NO., SPG, ASH WT%.

PROJECT: SAXON AREA: SOUTH  
 DATE SAMPLED: 3/ 5/77 DATE ANALYSED: 11/ 7/77  
 DRILL HOLE #: 7707 SEAM: 3  
 LAB COMPOSITE #: 77-5405-5407 WT. RFC. 5.18

## DENISON COAL DATA

COMPOSITE DESCRIPTION	INTERVAL	MINING SECTION
	285.16-288.14	285.16-288.14
THICKNESS	2.98	2.98
OTD	31	31
COAL/COAL+ROCK	2.02/ 2.55	2.02/ 2.55
DRILL CORE RECOVERY	43.00%	43.00%
ESTIMATED YIELD	65.00	

## WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0	1.80 SPG
SIZE				
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SECS	
CONTRIBUTION	37.4	11.0	4.6	

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.80		
ASH	7.70	7.76	
VOLATILE	23.10	23.29	24.56
F.C.	68.40	68.95	75.44
SULPHUR	.41		
PHOSPHORUS	.015		
S.P.G.	1.710		
F.S.I.	7.0		
HARDGROVE	*****		

## HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.70		
ASH	31.40	31.62	
VOLATILE	18.10	18.23	23.59
F.C.	49.40	50.15	76.41
F.S.I.	7.5		
SULPHUR	.41		
SP.GR. (-3/8 MESH)	1.42		
PHOSPHOROUS	.018		

DRILL HOLE #: 7707 SEAM: 3

## FLOAT SINK ANALYSES

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
3/8 X 28	80.10	WT% ASH%	WT% ASH%	WT% ASH%	WT% ASH%
1.40	36.70	5.60	36.70	5.60	63.30 53.27 8.0
1.50	8.00	14.10	44.70	7.12	55.30 58.94 3.0
1.54	2.00	20.70	46.70	7.70	53.30 60.37 1.0
1.60	2.00	28.50	48.70	8.56	51.30 61.62 1.0
1.80	10.70	42.70	59.40	14.71	40.60 66.60 1.0
****	40.60	66.60	100.00	75.78	***** 3.0

## SIZE REL. WEIGHT

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
28 X 100	14.70	WT% ASH%	WT% ASH%	WT% ASH%	WT% ASH%
1.40	39.40	3.90	39.40	3.90	60.60 31.24 9.0
1.50	18.50	8.30	57.90	5.31	42.10 41.31 6.5
1.60	10.60	13.10	68.50	6.51	31.50 50.81 2.5
1.76	6.50	23.50	75.00	7.98	25.00 57.91 1.0
1.90	7.50	51.40	82.50	11.93	17.50 60.70 1.0
****	17.50	60.70	100.00	20.47	***** 1.0

## FROTH FLOATATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
100 X 0	3.10	WT% ASH%	WT% ASH%	WT% ASH%	WT% ASH%
45.	65.80	12.30	65.80	12.30	5.5 5.5
90.	17.70	21.40	83.50	14.23	3.0 5.0
135.	10.10	40.90	93.60	17.11	1.0 5.0
180.	5.10	48.20	98.70	18.71	1.0 5.0
225.	1.30	59.30	100.00	19.24	1.0 5.0

## CENTRIFUGE SEPARATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
100 X 0	2.10	WT% ASH%	WT% ASH%	WT% ASH%	WT% ASH%
1.40	72.00	4.80	72.00	4.80	28.00 54.07 7.5
1.50	2.30	16.00	74.30	5.15	25.70 57.48 1.0
1.60	4.70	24.00	79.00	6.27	21.00 64.97 1.0
1.80	4.70	40.30	83.70	8.18	16.30 72.08 1.0
1.90	2.30	53.70	86.00	9.40	14.00 75.10 1.0
****	14.00	75.10	100.00	18.60	***** 1.0

DRILL HOLE #: 7707

SEAM: 3

## FLUIDITY

## DILATATION

START TEMP.	435.0	SOFT TEMP.	385.0
FINAL TEMP.	507.8	SOLID TEMP.	470.0
MAX. FLUIDITY TEMP.	480.0	MAX. CONTRACTION	22.0
MAX. FLUIDITY (NDPM)	102.0	MAX. DILATATION	27.0
MAX. FLUIDITY (LOG)	2.009	G. FACTOR	1.026

## 1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-5405	INTERVAL	285.03-286.18
		AIR DRIED BASIS	
		WT% ASH%	MOIST VOL. F.C. S. F.S.I.
1.5 FLOAT	62.30	7.70	.40 21.10 70.80 .68 6.5
1.5 SINK	37.70	59.69	
TOTAL	100.00	27.30	

DRY BASIS	7.73	21.18 71.08
D.M.M.F. BASIS	-	22.23 77.77

COMPONENT NO.	77-5406	INTERVAL	286.18-286.42
		AIR DRIED BASIS	
		WT% ASH%	MOIST VOL. F.C. S. F.S.I.
1.5 FLOAT	1.80	7.80	.60 21.60 70.00 .66 6.5
1.5 SINK	98.20	64.83	
TOTAL	100.00	63.40	

DRY BASIS	7.85	21.73 70.42
D.M.M.F. BASIS	-	22.86 77.14

COMPONENT NO.	77-5407	INTERVAL	286.42-288.14
		AIR DRIED BASIS	
		WT% ASH%	MOIST VOL. F.C. S. F.S.I.
1.5 FLOAT	67.80	6.90	.90 21.90 70.30 .60 7.0
1.5 SINK	32.20	50.38	
TOTAL	100.00	20.90	

DRY BASIS	6.96	22.10 70.94
D.M.M.F. BASIS	-	23.11 76.89

PROJECT: SAXON  
 DATE SAMPLED: 1/ 5/77  
 DRILL HOLE #: 7707  
 LAB COMPOSITE #: 77-5408 WT. PFC. 12.90

APPA: SOUTH  
 DATE ANALYSED: 11/ 7/77  
 SEAM: 4U

DEFINSON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION
INTERVAL : 229.63-231.91	229.63-231.91
THICKNESS :	2.28
DTP :	33
COAL/COAL+POCK :	1.71/ 1.88
DRILL CORF RECOVERY :	38.00%
ESTIMATED YIELD :	84.00

WARNOCK HERSEY ANALYSIS

STIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0	1.80 SPG
SIZE	SP.G. 1.54	SP.G. 1.76	135 SECS	
CUTPOINT	58.0	18.4	7.1	
CONTRIBUTION				
YIELD	AIR DRIED 83.50	DRY BASIS	D.M.M.F.	
MOISTURE	1.50			
ASH	4.40	6.50		
VOLATILE	25.70	26.09	27.42	
F.C.	66.40	67.41	72.58	
SULPHUR	.30			
PHOSPHORUS	.019			
S.P.G.	1.700			
F.S.I.	7.0			
HARDNESS	128.00			

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	1.50		
ASH	4.40	13.81	
VOLATILE	24.40	24.60	27.44
F.C.	61.10	61.59	72.56
F.S.I.	7.0		
SULPHUR	.58		
SP.GR. (1-3/8 MESH)	1.32		
PHOSPHORUS	.019		

DRILL HOLE #: 7707 SEAM: 4U

FLOAT SINK ANALYSIS  
 SIZE REL. WEIGHT  
 3/8 X 28 71.50

SP.G.	WT%	ASH%	CUM. FLOATS	WT%	ASH%	CUM. SINKS	WT%	ASH%	F.S.I.	CUM FSI
1.40	70.10	4.90	70.10	4.90	29.90	34.48	8.5	8.5		8.5
1.50	8.00	15.30	78.10	5.97	21.90	41.48	7.0	7.0		7.0
1.54	3.00	20.70	81.10	6.51	18.90	44.78	1.0	6.5		6.5
1.60	2.70	26.90	83.80	7.17	16.20	47.76	1.0	6.5		6.5
1.80	7.30	39.30	91.10	9.74	8.90	54.70	1.0	6.5		6.5
****	8.90	54.70	100.00	13.74	*****	*****				6.5

SIZE REL. WEIGHT  
 28 X 100 20.70

SP.G.	WT%	ASH%	CUM. FLOATS	WT%	ASH%	CUM. SINKS	WT%	ASH%	F.S.I.	CUM FSI
1.40	73.20	3.50	73.20	3.50	26.80	27.64	8.0	8.0		8.0
1.50	11.10	10.30	84.30	4.40	15.70	39.90	4.5	7.5		7.5
1.60	2.40	18.90	86.70	4.80	13.30	43.69	1.0	7.5		7.5
1.76	2.10	29.30	88.80	5.38	11.20	46.39	1.0	7.5		7.5
1.90	1.60	39.10	90.40	5.97	9.60	47.60	1.0	7.5		7.5
****	9.60	47.60	100.00	9.97	*****	*****				7.5

PROTH FLOTATION

SIZE	REL. WEIGHT	CUM. FLOATS	WT%	ASH%	F.S.I.	CUM FSI
100 X 0	3.90					
TMP.	WT%	ASH%	WT%	ASH%	F.S.I.	FSI
45	59.40	7.10	59.40	7.10	7.5	7.5
90	23.40	14.20	82.80	9.11	6.0	7.0
135	9.80	23.30	92.60	10.61	2.5	7.0
180	4.10	34.70	96.70	11.63	1.0	7.0
225	3.30	47.80	100.00	12.82	1.0	7.0

CENTRIFUGE SEPARATION

SIZE	REL. WEIGHT	CUM. FLOATS	WT%	ASH%	CUM. SINKS	WT%	ASH%	F.S.I.	CUM FSI
100 X 0	3.90								
SP.G.	WT%	ASH%	WT%	ASH%	WT%	ASH%	F.S.I.	FSI	
1.40	80.70	4.30	80.70	4.30	19.30	43.13	8.0	8.0	
1.50	4.10	14.00	84.80	4.77	15.20	50.99	1.0	7.5	
1.60	1.70	22.10	86.50	5.11	13.50	54.63	1.0	7.5	
1.80	3.50	33.00	90.00	6.23	10.00	61.92	1.0	7.0	
1.90	1.40	43.60	91.40	6.80	8.60	64.90	1.0	7.0	
****	8.60	64.90	100.00	11.79	*****	*****			

DRILL HOLE #: 7707 SEAM: 4U

FLUIDITY DILATATION

START TEMP.	429.0	SOFT TEMP.	392.0
FINAL TEMP.	507.0	SOLID TEMP.	470.0
MAX. FLUIDITY TEMP.	471.0	MAX. CONTRACTION	23.0
MAX. FLUIDITY (DDPH)	116.0	MAX. DILATATION	14.0
MAX. FLUIDITY (LOG)	2.064	G. FACTOR	.991

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-5413	INTERVAL	229.63-231.91
		AIR DRIED BASIS	
		WT% ASH% MOIST VOL. F.C.	S. F.S.I.
1.5 FLOAT	88.30	5.40	.60 24.80 69.20 .67 8.5
1.5 SINK	11.70	67.79	
TOTAL	100.00	12.70	
DRY BASIS	5.43	24.95	69.62
D.M.M.F. BASIS	-	25.86	74.14

PROJECT: SAXON
DATE SAMPLED: 3/4/77
DRILL HOLE #: 7707
SEAM: 4L
EAR COMPOSITE #: 77-5413 WT. REC. 2.91

ANALYSIS WITH
DATE ANALYSED: 11/7/77
SEAM: 4L

DENISON COAL DATA

Table with columns: COMPOSITE DESCRIPTION INTERVAL, MINING SECTION, THICKNESS, GTP, COAL/COAL+ROCK, DRILL CORE RECOVERY, ESTIMATED YIELD.

WARNOCK HERSEY ANALYSIS

Table with columns: SIMULATED PRODUCT SIZE, CUTPOINT CONTRIBUTION, YIELD, AIR DRIED, DRY BASIS, D.M.M.F., MOISTURE, ASH, VOLATILE, F.C., SULPHUR, PHOSPHORUS, S.P.G., F.S.I., WARNOCK.

HEAD ANALYSIS - COMPOSITE RAW COAL

Table with columns: AIR DRIED, DRY BASIS, D.M.M.F., MOISTURE, ASH, VOLATILE, F.C., F.S.I., SULPHUR, SP.G. (+3/8 MESH), PHOSPHORUS.

DRILL HOLE #: 7707 SEAM: 4L

FLOAT SINK ANALYSIS SIZE REL. WEIGHT 3/8 X 28 69.10

Table with columns: SP.G., WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI.

SIZE REL. WEIGHT 28 X 100 24.30

Table with columns: SP.G., WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI.

FROTH FLOTATION

SIZE REL. WEIGHT 100 X 0 3.30

Table with columns: TIME, WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI.

CENTRIFUGE SEPARATION

SIZE REL. WEIGHT 100 X 0 3.30

Table with columns: SP.G., WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI.

DRILL HOLE #: 7707 SEAM: 4L

FLUIDITY

Table with columns: START TEMP., FINAL TEMP., MAX. FLUIDITY TEMP., MAX. FLUIDITY (DPPM), MAX. FLUIDITY (LOG), SOFT. TEMP., SOLID. TEMP., MAX. CONTRACTION, MAX. DILATATION, G. FACTOR.

DILATATION

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S. F.S.I., DRY BASIS, D.M.M.F. BASIS.

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S. F.S.I., DRY BASIS, D.M.M.F. BASIS.

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S. F.S.I., DRY BASIS, D.M.M.F. BASIS.

DRILL HOLE #: 7707 SEAM: 4L

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S. F.S.I., DRY BASIS, D.M.M.F. BASIS.

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S. F.S.I., DRY BASIS, D.M.M.F. BASIS.

PROJFCT: SAXON  
 DATE SAMPLED: 4/ 6/77  
 DRILL HOLE #: SD 7708  
 IAR COMPOSITE #: 77-60049

APFA: FAST  
 DATE ANALYSED: 12/9/ 9/77  
 SFAN: 1  
 WT. REC. 6.95

DENISON COAL DATA

COMPOSITE DESCRIPTION	INTERVAL	MINING SECTION
	384.10-388.40	387.00-388.40
THICKNESS		
ATP	4.30	6.40
COAL/COAL+ROCK	3.15/ 3.36	4.03/ 4.86
DRILL CORE RECOVERY	53.00%	56.00 %
ESTIMATED YIELD	78.00	

WARNOCK HERSEY ANALYSES

SAMPLED PRODUCT	SIZE	CUTPOINT	CONTRIBUTION	AIR DRIED	DRY BASIS	D.M.M.F.
	3/8 X 28	28 X 100	100 X 0			
	SP.G. 1.54	SP.G. 1.76	135 SECS			
	59.3	18.4	5.3			
YIELD				83.00		
MOISTURE	.80					
ASH	7.00	7.06				
VOLATILE	21.10	21.27	22.31			
F.C.	71.10	71.67	77.69			
SULPHUR	.33					
PHOSPHORUS	.014					
S.P.G.	1.340					
F.S.I.	7.0					
HARDGROVE	*****					

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.70		
ASH	11.30	11.38	
VOLATILE	20.20	20.34	22.04
F.C.	67.80	68.28	77.96
F.S.I.	6.0		
SULPHUR	.35		
SP.GR. (-3/8 MESH)	1.36		
PHOSPHOROUS	.016		

DRILL HOLE #: SD 7708 SEAM: 1

FLOAT SINK ANALYSES

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
3/8 X 28	72.20				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.
1.54	42.20 7.00	42.20 7.00	17.80 37.00	7.0	7.0
***	17.80 37.00	100.00 12.34	*****	1.0	5.5

FROTH FLOATATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
2R X 100	22.20				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.
1.78	83.00 5.50	83.00 5.50	17.00 38.90	8.0	8.0
***	17.00 38.90	100.00 11.18	*****	1.0	7.0

FROTH FLOATATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
100 X 0	5.60				
TIME	WT% ASH%	WT% ASH%	F.S.I.	FSI	
45	76.40 8.80	76.40 8.80	5.5	5.5	
90	12.70 23.10	89.10 10.84	1.0	5.5	
135	5.50 25.20	94.60 11.67	1.0	5.5	
180	3.60 27.80	98.20 12.26	1.0	5.0	
225	1.80 42.20	100.00 12.80	*****	5.0	

DRILL HOLE #: SD 7708 SEAM: 1

FLUIDITY

DILATATION

START TEMP.	444.0	SOFT TEMP.	407.0
FINAL TEMP.	504.0	SOLID TEMP.	484.0
MAX. FLUIDITY TEMP.	481.0	MAX. CONTRACTION	23.0
MAX. FLUIDITY (DDPM)	8.0	MAX. DILATATION	-3.0
MAX. FLUIDITY (LOG)	.903	G. FACTOR	.899

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	INTERVAL	AIR DRIED BASIS
77-6006	382.00-383.25	
		WT% ASH% MOIST. VOL. F.C. S. F.S.I.
1.5 FLOAT	6.70 5.20	.80 21.80 72.20 .61 1.0
1.5 SINK	93.30 79.37	
TOTAL	100.00 74.40	

DRY BASIS	5.24	21.98 72.78
D.M.M.F. BASIS	-	22.67 77.33

COMPONENT NO.	INTERVAL	AIR DRIED BASIS
77-6005	383.25-384.10	
		WT% ASH% MOIST VOL. F.C. S. F.S.I.
1.5 FLOAT	1.50 6.50	.90 22.20 70.40 .55 8.5
1.5 SINK	98.50 81.93	
TOTAL	100.00 80.80	

DRY BASIS	6.56	22.40 71.04
D.M.M.F. BASIS	-	23.38 76.62

COMPONENT NO.	INTERVAL	AIR DRIED BASIS
77-6004	384.10-388.40	
		WT% ASH% MOIST VOL. F.C. S. F.S.I.
1.5 FLOAT	76.30 5.30	.60 20.80 73.30 .25 8.0
1.5 SINK	23.70 25.98	
TOTAL	100.00 10.20	

DRY BASIS	5.33	20.93 73.74
D.M.M.F. BASIS	-	21.68 78.32

PROJECT: SAXON  
 DATE SAMPLED: 0/ 0/ 0  
 DRILL HOLE #: 7708  
 LAB COMPOSITE #:

AREA: EAST  
 DATE ANALYSED: 0/ 0/ 0  
 SEAM: 1L  
 WT. RFC. 0.

DENISON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION	
	INTERVAL	
INTERVAL	408.14-409.62	408.16-409.62
THICKNESS	1.46	1.46
OTP	52	52
COAL/COAL+POCK	.83/ .90	.83/ .90
DRILL CORE RECOVERY	100.00%	100.00%
ESTIMATED YIELD	78.00	

WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT SIZE	1/8 X 28	28 X 100	100 X 0
CUTPOINT			

DRILL HOLE #: 7708 SEAM: 1L

DRILL HOLE #: 7708 SEAM: 1L

FLUIDITY		DILATATION	
START TEMP.	*****	SOFT TEMP.	*****
FINAL TEMP.	*****	SOLID TEMP.	*****
MAX FLUIDITY TEMP.	*****	MAX CONTRACTION	*****
MAX FLUIDITY (ODPH)	*****	MAX DILATATION	*****
MAX FLUIDITY (LOG)	*****	G FACTOR	*****

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-6003	INTERVAL	408.16-409.62	AIR DRIED BASIS		
	WT%	ASH%	MOIST VOL.	F.C.	S.	F.S.I.
1.5 FLOAT	78.90	7.10	.50	18.50	73.90	.46 5.5
1.5 SINK	21.10	37.91				
TOTAL	100.00	13.60				
DRY BASIS		7.14		18.59	74.27	
D.M.H.F. BASIS		-		19.38	80.62	



présentés sur la figure 1. Le premier lot de Canadien (CND 1) n'était pas homogène et renfermait deux populations, alors que le second lot (CND 2) est homogène et correspond semble-t'il à la population de plus haut rang contenue dans le premier stock.

Il faut évidemment s'attendre que les propriétés cokéfiantes du second stock de Canadien soient différentes de celles du premier stock.

### II. 2. Cuissons en four 400 kg.

Nous avons effectué les cuissons en four 400 kg dans les mêmes conditions que celles qui avaient été adoptées en juin dernier.

Les résultats détaillés des essais en four 400 kg sont portés dans le tableau 2.

On peut noter un écart important sur la densité de chargement entre les deux formules, pour lequel nous n'avons pas trouvé d'explication. Cela pourrait avantager l'Australien.

### III. RESULTATS ET CONCLUSION.

Les résultats relatifs à la poussée, au retrait latéral et à la productivité n'appellent pas d'observation particulière.

Le tableau suivant résume les résultats des contrôles mécaniques des cokes :

Charbon étudié	80 mm	40 mm	M 40	M 10	I 10	I 20	I 40
	%	%					
Australien (QLD)	50,8	91,2	78,7	8,5	24,3	72,4	48,4
Canadien	42,4	91,6	78,0	8,0	24,2	73,2	47,2

Les chiffres précédents conduisent à conclure que le Canadien est un peu moins favorable que l'Australien en ce qui concerne la résistance à la fragmentation, et qu'il est en revanche un peu plus favorable à la résistance à l'abrasion, malgré une densité de chargement relativement faible.

Les différences observées entre les deux formules sur les indices de résistance mécanique, et jugées sur un seul point de comparaison, ne sont sans doute pas significatives.

*Guichet*

PROJECT: SAXON AREA: EAST  
 DATE SAMPLED: 4/ 6/77 DATE ANALYSED: 26/ 8/77  
 DRILL HOLE #: 7708 SFAM: 3  
 LAB COMPOSITE #: 77-6010 WT. REC. .16

DENISON COAL DATA

COMPOSITE DESCRIPTION	INTERVAL	243.80-245.42	MINING SECTION	243.80-245.42
THICKNESS		1.62		1.62
OTP		25		25
COAL/COAL+ROCK		1.46/ 1.46		1.46/ 1.46
DRILL CORE RECOVERY		37.00%		37.00 %
ESTIMATED YIELD		*****		

WARNOCK HERSEY ANALYSES

STIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0
CUTPOINT CONTRIBUTION	45.4	34.2	11.6
YIELD	AIR DRIED 91.20	DRY BASIS	D.M.M.F.
MOISTURE	.70		
ASH	4.00	6.04	
VOLATILE	20.80	20.95	21.71
F.C.	72.50	73.01	78.29
SULPHUR	.60		
PHOSPHORUS	.013		
S.P.G.	1.310		
F.S.I.	8.0		
HARDNESS	94.80		

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.70		
ASH	9.50	9.57	
VOLATILE	19.40	19.54	20.74
F.C.	70.40	70.90	79.26
F.S.I.	7.5		
SULPHUR	.60		
S.P.G. (-3/8 MESH)	1.35		
PHOSPHORUS	.014		

DRILL HOLE #: 7708 SEAM: 3

FLOAT/SINK ANALYSES  
 SIZE PFL. WEIGHT  
 3/8 X 28 51.30

SP.G.	WT%	ASH%	CUM. WT%	FLOATS ASH%	CUM. SINKS WT%	ASH%	F.S.I.	FST	CUM
1.40	81.80	5.00	81.80	5.00	18.20	32.50	7.5	7.5	
1.50	5.70	9.70	87.50	5.31	12.50	43.03	1.5	7.5	
1.54	1.00	14.00	88.50	5.40	11.50	45.55	1.5	7.0	
1.60	.90	14.30	89.40	5.49	10.60	48.21	1.0	7.0	
1.80	1.50	25.80	90.90	5.83	9.10	51.90	1.0	7.0	
****	9.10	51.90	100.00	10.02	*****	*****		6.5	

SIZE REL. WEIGHT  
 28 X 100 36.40

SP.G.	WT%	ASH%	CUM. WT%	FLOATS ASH%	CUM. SINKS WT%	ASH%	F.S.I.	FST	CUM
1.40	77.50	4.50	77.50	4.50	22.50	17.04	8.5	8.5	
1.50	10.60	6.00	88.10	4.68	11.90	26.87	5.5	8.5	
1.60	3.80	9.60	91.90	4.88	8.10	34.98	2.0	8.5	
1.76	2.10	15.30	94.00	5.12	6.00	41.87	1.0	8.0	
1.90	1.30	16.80	95.30	5.28	4.70	48.80	1.0	8.0	
****	4.70	48.80	100.00	7.32	*****	*****		7.5	

CENTRIFUGE SEPARATION  
 SIZE REL. WEIGHT  
 100 X 0 12.30

SP.G.	WT%	ASH%	CUM. WT%	FLOATS ASH%	CUM. SINKS WT%	ASH%	F.S.I.	FST	CUM
1.40	88.30	10.80	88.30	10.80	11.70	45.51	9.0	9.0	
1.50	4.20	13.80	92.50	10.94	7.50	63.27	5.0	8.5	
1.60	1.10	20.60	93.60	11.05	6.40	70.60	2.0	8.5	
1.80	1.00	33.00	94.60	11.28	5.40	77.56	1.0	8.5	
1.90	.40	42.10	95.00	11.41	5.00	80.40	1.0	8.5	
****	5.00	88.40	100.00	14.86	*****	*****		8.0	

DRILL HOLE #: 7708 SEAM: 3

FLUIDITY	DILATATION
START TEMP. 459.0	SOFT TEMP. 410.0
FINAL TEMP. 504.0	SOLID TEMP. 484.0
MAX. FLUIDITY TEMP. 489.0	MAX. CONTRACTION 27.0
MAX. FLUIDITY (ODPH) 9.0	MAX. DILATATION 10.0
MAX. FLUIDITY (LOG) .954	G. FACTOR .983

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-6010	INTERVAL	243.80-245.42
		AIR DRIED BASIS	
1.5 FLOAT	83.90	WT%	ASH%
1.5 SINK	16.40	MOIST VOL.	F.C.
TOTAL	100.00	74.90	.63
		S. F.S.I.	7.5
DRY BASIS	4.42	20.30	75.28
D.M.M.F. BASIS	-	20.76	79.24

PROJECT: SAGON  
 DATE SAMPLED: 4/ 4/77  
 DRILL HOLE #: 7708  
 LAB COMPOSITE #: 77-6011-6012 WT. REC. 1.77

APFA: FAST  
 DATE ANALYSED: 26/ 8/77  
 SFAM: 4

## DENISON COAL DATA

COMPOSITE DESCRIPTION	INTERVAL	MINING SECTION
	202.12-212.28	202.12-212.28
THICKNESS	10.16	10.16
OTF	40	40
COAL/COAL+ROCK	7.68/ 7.77	7.68/ 7.77
DRILL CORE RECOVERY:	54.00%	54.00 %
ESTIMATED YIELD	70.00	

## WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0	1.80 SPG
SIZE	SP.G. 1.54	SP.G. 1.76	135 SFCS	
CONTRIBUTION	36.6	35.8	13.1	
YIELD	AIR DRIED 86.50	DRY BASIS	D.M.M.F.	
MOISTURE	.80			
ASH	5.40	5.44		
VOLATILE	22.10	22.28	23.13	
F.C.	71.70	72.28	76.87	
SULPHUR	.25			
PHOSPHORUS	.025			
S.P.G.	1.440			
F.S.I.	6.0			
HARDGROVE	89.20			

## HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.70		
ASH	12.60	12.69	
VOLATILE	20.00	20.14	22.06
F.C.	66.70	67.17	77.94
F.S.I.	4.0		
SULPHUR	.31		
SP.G. (-3/8 MESH)	1.38		
PHOSPHOROUS	.019		

DRILL HOLE #: 7708 SFAM: 4

## FLOAT SINK ANALYSIS

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	CUM
3/8 X 28	46.40			
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.
1.40	71.30 4.80	71.30 4.80	28.70 46.35	3.5
1.50	6.00 13.70	77.30 5.49	22.70 54.98	1.5
1.54	1.60 19.80	78.90 5.78	21.10 57.64	1.0
1.60	1.80 20.40	80.70 6.11	19.30 61.12	1.0
1.80	3.20 29.00	83.90 6.98	16.10 67.50	1.0
****	16.10 67.50	100.00 16.72	*****	2.0

## SIZE REL. WEIGHT

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	CUM
28 X 100	39.40			
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.
1.40	83.40 3.40	83.40 3.40	16.60 27.42	7.5
1.50	4.40 10.50	88.30 3.79	11.70 34.51	1.5
1.60	3.20 14.70	91.50 4.18	8.50 41.97	1.0
1.75	1.90 20.70	93.40 4.51	6.60 48.09	1.0
3	1.20 27.80	94.60 4.81	5.40 52.60	1.0
****	5.40 52.60	100.00 7.39	*****	6.8

## FROTH FLOATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM
100 X 0	7.10		
TIME	WT% ASH%	WT% ASH%	F.S.I.
45	72.60 4.50	72.60 4.50	7.5
90	10.20 11.80	82.80 5.40	4.0
135	8.40 15.70	91.20 6.35	2.5
180	5.20 27.40	96.40 7.48	1.5
225	3.60 48.80	100.00 8.97	4.5

## CENTRIFUGE SEPARATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	CUM
100 X 0	7.10			
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.
1.40	84.90 2.90	84.90 2.90	15.10 42.33	7.0
1.50	5.10 17.30	90.00 3.72	10.00 55.10	2.5
1.60	1.40 24.90	91.40 4.04	8.60 60.02	1.5
1.80	1.60 33.10	93.00 4.54	7.00 66.17	1.0
1.90	.70 46.10	93.70 4.85	6.30 68.40	1.0
****	6.30 68.40	100.00 8.85	*****	5.0

DRILL HOLE #: 7708 SFAM: 4

## FLUIDITY

	SOFT TEMP.	408.0
START TEMP.	462.0	
FINAL TEMP.	489.0	*****
MAX. FLUIDITY TEMP.	493.0	
MAX. FLUIDITY (NDPH)	2.0	MAX. CONTRACTION 22.0
MAX. FLUIDITY (LOG)	.301	MAX. DILATATION *****
		G. FACTOR *****

## DILATATION

DRILL HOLE #: 7708 SEAM: 4

## 1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-6011	INTERVAL	207.87-212.28
		AIR DRIED BASIS	
	WT% ASH%	MOIST VOL.	F.C. S. F.S.I.
1.5 FLOAT	84.90 4.20	1.20 21.40	73.20 .34 5.5
1.5 SINK	15.10 45.92		
TOTAL	100.00 10.50		
DRY BASIS	4.25	21.66	74.09
D.M.M.F. BASIS	-	22.25	77.75

## 1.5 FLOAT/SINK ANALYSIS OF SFAM COMPONENTS

COMPONENT NO.	77-6014	INTERVAL	199.44-200.47
		AIR DRIED BASIS	
	WT% ASH%	MOIST VOL.	F.C. S. F.S.I.
1.5 FLOAT	14.90 9.20	.90 21.10	68.80 .50 7.0
1.5 SINK	85.20 67.53		
TOTAL	100.00 58.90		
DRY BASIS	9.28	21.29	49.42
D.M.M.F. BASIS	-	22.68	77.32

COMPONENT NO.	77-6013	INTERVAL	200.47-202.12
		AIR DRIED BASIS	
	WT% ASH%	MOIST VOL.	F.C. S. F.S.I.
1.5 FLOAT	1.20 5.10	.90 21.80	72.20 .58 8.0
1.5 SINK	98.80 81.92		
TOTAL	100.00 81.00		
DRY BASIS	5.15	22.00	72.86
D.M.M.F. BASIS	-	22.69	77.31

COMPONENT NO.	77-6012	INTERVAL	202.12-207.87
		AIR DRIED BASIS	
	WT% ASH%	MOIST VOL.	F.C. S. F.S.I.
1.5 FLOAT	76.20 6.20	1.30 20.60	71.90 .70 5.0
1.5 SINK	23.80 40.65		
TOTAL	100.00 14.40		
DRY BASIS	6.28	20.87	72.85
D.M.M.F. BASIS	-	21.76	78.24

PROJECT: Saxon AREA: EAST
DATE SAMPLED: 1/ 5/77 DATE ANALYSED: 24/ 8/77
DRILL HOLE #: 7709 SEAM: 1U
LAB COMPOSITE #: 77-5054-5105 WT. REC. 18.02

DENISON COAL DATA

Table with columns: COMPOSITE DESCRIPTION, INTERVAL, MINING SECTION, THICKNESS, BTU, COAL/COAL+ROCK, DRILL CORE RECOVERY, ESTIMATED YIELD.

WARNOCK HERSEY ANALYSES

Table with columns: SIMULATED PRODUCT, SIZE, CUTPOINT, CONTRIBUTION, AIR DRIED, DRY BASIS, D.M.M.F.

Table with columns: MOISTURE, ASH, VOLATILE, F.C., SULPHUR, PHOSPHORUS, F.S.I., HARDGROVE.

HFO ANALYSIS - COMPOSITE RAW COAL

Table with columns: MOISTURE, ASH, VOLATILE, F.C., F.S.I., SULPHUR, SP.G. (-3/8 MESH), PHOSPHOROUS.

DRILL HOLE #: 7709 SEAM: 1U

FLOAT-SINK ANALYSES

Table with columns: SIZE, REL. WEIGHT, SP.G., WT% ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI.

Table with columns: SIZE, REL. WEIGHT, SP.G., WT% ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI.

Table with columns: SIZE, REL. WEIGHT, SP.G., WT% ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI.

DRILL HOLE #: 7709 SEAM: 1U

Table with columns: FLUIDITY, DILATATION, START TEMP., FINAL TEMP., MAX. FLUIDITY TEMP., MAX. FLUIDITY (HORN), MAX. FLUIDITY (LOG), SOFT. TEMP., SOLID. TEMP., MAX. CONTRACTION, MAX. DILATATION, G.FACTOR.

Table with columns: GVE REPORT, DRILL HOLE S07709, SEAM 1, DEPTH FROM, TO, SAMPLE NO., SPG, ASH WT%.

GVE REPORT DRILL HOLE S07709 SEAM 1

Table with columns: DEPTH FROM, TO, SAMPLE NO., SPG, ASH WT%.

GYE REPORT

DRILL HOLE SD7709

SEAM 1

DEPTH		SAMPLE NO.	SPG	ASH WT%
FROM	TO			
21724	21794			
21794	21804			
21804	21954			
21954	21964			
21964	22104			
22104	22240			
22240	22364			
22364	22369			
22369	22398			
22398	22430			
22430	22490	715	2.68	84.8
22490	22505	725	2.69	87.0
22505	22550	735	2.60	86.6

COAL ANALYSTS PREPARED BY  
WARNOCK HERSEY PROFESSIONAL SERVICES LTD  
SIGNED:

PROJECT: SAXON AREA: EAST  
 DATE SAMPLED: 1/ 5/77 DATE ANALYSED: 24/ 8/77  
 DRILL HOLE #: 7709 SEAM: IL  
 LAR COMPOSITE #: 177-5117-5126 WT. RFC. 4.54

DENISON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION	
INTERVAL	225.92-227.19	225.92-227.19
THICKNESS	1.27	1.27
STP	37	37
COAL/COAL+POCK	1.01/ 1.01	1.01/ 1.01
DRILL CORE RECOVERY	100.00%	100.00 %
ESTIMATED YIELD	83.00	

WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT	3/4 X 28	28 X 100	100 X 0	1.80 SPG
CUTPOINT	SP.G. 1.54	SP.G. 1.76		
CONTRIBUTION	74.8	12.1	4.2	

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
	91.10		
MOISTURE	.60		
ASH	7.40	7.44	
VOLATILE	19.40	19.52	20.41
F.C.	72.60	73.04	79.59

SULPHUR	.52
PHOSPHORUS	.006
S.P.A.	1.320
F.S.I.	6.0
WAPROGROVE	106.60

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.60		
ASH	10.10	10.16	
VOLATILE	19.40	19.52	20.80
F.C.	69.90	70.32	79.20

F.S.I.	5.5
SULPHUR	.65
SP.G. (-3/4 MESH)	1.36
PHOSPHOROUS	.005

FLOAT SINK ANALYSES

SIZE	REL. WEIGHT	CUM. FLOATS		CUM. SINKS		F.S.I.	FST
3/4 X 28	62.60	WT%	ASH%	WT%	ASH%		
1.40	76.00	5.80	76.00	5.80	24.00	23.53	6.0
1.50	12.70	12.20	88.70	4.72	11.30	36.77	2.0
1.60	1.90	18.10	90.60	6.96	9.40	39.94	1.5
1.80	3.00	22.90	93.60	7.47	6.40	47.93	1.5
1.80	2.80	31.00	96.40	8.15	3.60	61.10	1.0
****	3.60	61.10	100.00	10.06	*****	*****	4.5

SIZE REL. WEIGHT

SIZE	REL. WEIGHT	CUM. FLOATS		CUM. SINKS		F.S.I.	FST
28 X 100	13.00	WT%	ASH%	WT%	ASH%		
1.40	65.70	3.80	65.70	3.80	34.30	21.02	9.0
1.50	15.80	10.70	81.50	5.14	18.50	29.84	3.5
1.60	5.90	16.60	87.40	5.91	12.60	36.04	2.5
1.76	5.50	20.20	92.90	6.76	7.10	48.31	1.0
1.90	1.30	28.70	94.20	7.06	5.80	52.70	1.0
****	5.80	52.70	100.00	9.71	*****	*****	6.0

CENTRIFUGE SEPARATION

SIZE	REL. WEIGHT	CUM. FLOATS		CUM. SINKS		F.S.I.	FST
100 X 0	4.40	WT%	ASH%	WT%	ASH%		
1.40	83.00	3.80	83.00	3.80	17.00	33.00	9.0
1.50	9.10	16.00	92.10	5.01	7.90	52.59	1.5
1.60	2.20	28.00	94.30	5.47	5.70	63.24	1.0
1.80	1.50	37.60	95.80	5.97	4.20	72.40	1.0
1.90	.80	42.20	96.60	6.27	3.40	79.50	0.0
****	3.40	79.50	100.00	8.76	*****	*****	7.0

FLUIDITY

START TEMP.	450.0	SOFT TEMP.	400.0
FINAL TEMP.	513.0	SOLID TEMP.	488.0
MAX. FLUIDITY TEMP.	488.0	MAX. CONTRACTION	21.0
MAX. FLUIDITY (DOPN)	10.5	MAX. DILATATION	-16.0
MAX. FLUIDITY (LOG)	1.021	G. FACTOR	.577

GVE REPORT

DRILL HOLE 592

SEAM 0

DEPTH FROM	TO	SAMPLE NO.	SPG	ASH WT%
0	22600	740	1.38	12.0
22600	22612	750	1.32	6.1
22612	22618	760	1.37	6.6
22618	22630	770	1.36	9.0
22630	22639	780	1.42	13.9
22639	22658	790	1.33	5.2
22658	22669	800	1.37	6.7
22669	22680	810	1.35	5.6
22680	22702	820	1.32	5.2
22702	22719	830	1.53	27.0
22719	22734	845	2.37	85.5
22734	22751	855	2.63	91.9
22751	22771	865	2.60	93.0
22771	22794	875	2.47	85.8
22794	22802			
22802	22823	880	1.38	19.0
22823	22837			
22837	22840	890	1.60	29.6
22840	22868			
22868	22881	905	2.68	95.8
22881	22917	915	2.63	92.8
22917	22937	925	2.65	96.3
22937	23058			
23058	*****			
*****	*****			

PROJECT: SAXON AREA: EAST
DATE SAMPLED: 10/ 4/77 DATE ANALYSED: 25/ 8/77
DRILL HOLE #: 7709 SFAM: 2
LAR COMPOSITE #177-5142-5191 WT. RFC. 21.70

DENISON COAL DATA

Table with columns: COMPOSITE DESCRIPTION, INTERVAL, THICKNESS, ATP, COAL/COAL ROCK, DRILL CORE RECOVERY, ESTIMATED YIELD. Values include 176.83-184.85, 8.02, 37, 5.21/ 6.41, 83.00%, 68.00.

WARNOCK HERSEY ANALYSES

Table with columns: SIMULATED PRODUCT, SIZE, CUTPOINT, CONTRICTION. Values include 28 X 100, 100 X 0, 135 SECS, 1.80 SPG.

Table with columns: YIELD, AIR DRIED, DRY BASIS, D.M.M.F. Value: 68.20.

Table with columns: MOISTURE, ASH, VOLATILE, F.C., SULPHUR, PHOSPHORUS, S.P.G., F.S.I., HARDENGE. Values include 7.0, 8.10, 20.40, 70.80, .42, .004, 1.350, 4.0, 92.70.

HEAD ANALYSIS - COMPOSITE RAW COAL

Table with columns: MOISTURE, ASH, VOLATILE, F.C., F.S.I., SULPHUR, SP.GR. (-7/8 MESH), PHOSPHORUS. Values include 7.40, 24.90, 17.70, 56.90, 7.0, .31, 1.45, .006.

DRILL HOLE #: 7709 SFAM: 2

FLUIDITY

Table with columns: START TEMP., FINAL TEMP., MAX.FLUIDITY TEMP., MAX.FLUIDITY(NDPM), MAX.FLUIDITY(LOG). Values include 462.0, 501.0, 484.0, 2.0, .301.

DILATATION

Table with columns: SOFT TEMP., SOLID TEMP., MAX.CONTRACTION, MAX.DILATATION, G.FACTOR. Values include 421.0, \*\*\*\*\*.

GVE REPORT DRILL HOLE S07709 SEAM 2

Table with columns: DEPTH FROM TO, SAMPLE NO., SPG, ASH WTS. Values include 17524-17552, 15, 2.69, 86.0.

DRILL HOLE #: 7709 SEAM: 2

FLOAT SINK ANALYSES

Table with columns: SIZE, REL. WEIGHT, SP.G., WT% ASH, CUM. FLOATS, CUM. SINKS, F.S.I., FSI. Values include 28 X 28, 73.90.

SIZE REL. WEIGHT

Table with columns: SIZE, REL. WEIGHT, SP.G., WT% ASH, CUM. FLOATS, CUM. SINKS, F.S.I., FSI. Values include 28 X 100, 19.20.

FROTH FLOTATION

Table with columns: SIZE, REL. WEIGHT, TIME, WT% ASH, CUM. FLOATS, CUM. SINKS, F.S.I., FSI. Values include 100 X 0, 3.50.

CENTRIFUGE SEPARATION

Table with columns: SIZE, REL. WEIGHT, SP.G., WT% ASH, CUM. FLOATS, CUM. SINKS, F.S.I., FSI. Values include 100 X 0, 3.40.

GVE REPORT DRILL HOLE S07709 SEAM 2

Table with columns: DEPTH FROM TO, SAMPLE NO., SPG, ASH WTS. Values include 18040-18058, 310, 1.41, 13.2.

PROJECT: SAYON  
 DATE SAMPLED: 0/ 0/ 0  
 DRILL HOLE #: 7709  
 LAB COMPOSITE #:

APFA: FAST  
 DATE ANALYSED: 0/ 0/ 0  
 SEAM: 3  
 WT. REC. 4.36

DEWISON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION	
INTERVAL	101.97-103.88	
THICKNESS	0.	1.01
DIP		42
COAL/COAL-ROCK	0. / 0.	1.41/ 1.41
DRILL CORE RECOVERY	0. %	39.00 %
ESTIMATED YIELD	*****	

WARNOCK HERSEY ANALYSIS

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0	
SIZE				
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SECS	1.80 SPG

DRILL HOLE #: 7709

SEAM: 3

DRILL HOLE #: 7709

SEAM: 3

FLUIDITY

DILATATION

START TEMP.	*****	SOFT TEMP.	*****
FINAL TEMP.	*****	SOLID TEMP.	*****
MAX. FLUIDITY TEMP.	*****	MAX. CONTRACTION	*****
MAX. FLUIDITY (DDPH)	*****	MAX. DILATATION	*****
MAX. FLUIDITY (LOG)	*****	G. FACTOR	*****

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO. 77-5414 INTERVAL 100.88-101.29  
 AIR DRIED BASIS

WT%	ASH%	MOIST VOL.	F.C.	S.	F.S.I.
1.5 FLOAT	36.20	9.20	.30	22.00	68.50 1.27 8.0
1.5 SINK	63.80	58.26			
TOTAL	100.00	40.50			

DRY BASIS	9.23	22.07	68.71
D.M.M.F. BASIS	-	23.30	76.70

COMPONENT NO. 77-5415 INTERVAL 101.29-101.97  
 AIR DRIED BASIS

WT%	ASH%	MOIST VOL.	F.C.	S.	F.S.I.
1.5 FLOAT	3.58	18.70	.56	18.66	62.08 .97 4.0
1.5 SINK	96.50	81.60			
TOTAL	100.00	79.40			

DRY BASIS	18.79	18.89	62.31
D.M.M.F. BASIS	-	21.48	78.52

COMPONENT NO. 77-5416 INTERVAL 101.97-103.88  
 AIR DRIED BASIS

WT%	ASH%	MOIST VOL.	F.C.	S.	F.S.I.
1.5 FLOAT	92.70	5.60	.40	20.60	73.40 .60 7.5
1.5 SINK	7.30	46.70			
TOTAL	100.00	8.60			

DRY BASIS	5.62	20.68	73.69
D.M.M.F. BASIS	-	21.36	78.64

COAL ANALYSIS PREPARED BY  
 WARNOCK HERSEY PROFESSIONAL SERVICES LTD  
 SIGNED:



PROJECT: 54XDN AREA: FAST
DATE SAMPLED: 30/ 4/77 DATE ANALYSED: 126/ 8/77
DRILL HOLE #: 7709 SEAM: 4
LAB COMPOSITE #: 77-521R-5247 WT. RFC. 15.36

DENISON COAL DATA

Table with columns: COMPOSITE DESCRIPTION, MINING SECTION, THICKNESS, etc. Values include 64.04-69.6R, 64.04-69.6R, 5.64, etc.

WARNOCK HERSEY ANALYSES

Table with columns: SIMULATED PRODUCT, SIZE, CUTPOINT, CONTRIBUTION. Values include 7/8 X 28, 28 X 100, 100 X 0, 1.80 SPG.

Table with columns: YIELD, AIR DRIED, DRY BASIS, D.M.W.F. Value: 81.80.

Table with columns: MOISTURE, ASH, VOLATILE, F.C. Values include 8.80, 8.06, 20.80, 20.97, 70.40, 70.97, 77.87.

Table with columns: SULPHUR, PHOSPHORUS, S.P.G., F.S.I., HARGROVE. Values include .42, .036, 1.370, 3.5, 126.00.

HEAD ANALYSIS - COMPOSITE RAW COAL

Table with columns: MOISTURE, ASH, VOLATILE, F.C., D.M.W.F. Values include .60, 16.70, 16.80, 19.60, 19.72, 22.36, 77.64.

Table with columns: F.S.I., SULPHUR, SP.GR. (-3/8 MESH), PHOSPHOROUS. Values include 3.0, .25, 1.43, .033.

DRILL HOLE #: 7709 SEAM: 4

FLOAT SINK ANALYSES

Table with columns: SIZE, REL. WEIGHT, SP.G., WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI. Values include 3/8 X 28, 77.20, 1.40, 64.60, 5.20, etc.

SIZE REL. WEIGHT

Table with columns: SIZE, REL. WEIGHT, SP.G., WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI. Values include 28 X 100, 16.40, 1.40, 64.70, 4.00, etc.

FROTH FLOTATION

Table with columns: SIZE, REL. WEIGHT, TIME, WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI. Values include 100 X 0, 3.30, 45, 84.80, 8.00, etc.

CENTRIFUGE SEPARATION

Table with columns: SIZE, REL. WEIGHT, SP.G., WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI. Values include 100 X 0, 3.20, 1.40, 82.30, 4.80, etc.

DRILL HOLE #: 7709 SEAM: 4

Table with columns: FLUIDITY, DILATATION, START TEMP., FINAL TEMP., MAX. FLUIDITY TEMP., MAX. FLUIDITY (NDPM), MAX. FLUIDITY (LOG), SOFT. TEMP., SOLID. TEMP., MAX. CONTRACTION, MAX. DILATATION, G. FACTOR.

GVE REPORT DRILL HOLE 507709 SEAM 4

Table with columns: DEPTH FROM TO, SAMPLE NO., SPG, ASH WT%. Values include 5960, 5986, 15, 2.65, 83.3, etc.

GVE REPORT DRILL HOLE 507709 SEAM 4

Table with columns: DEPTH FROM TO, SAMPLE NO., SPG, ASH WT%. Values include 6644, 6665, 300, 1.37, 9.1, etc.

PROJECT: SAXON  
 DATE SAMPLED: 3/ 8/77  
 DRILL HOLE #: SD 7710  
 LAB COMPOSITE #: 77-800A-10

AREA: FAST  
 DATE ANALYSED: 30/ 9/77  
 SEAM: 1U  
 WT. PFC. 13.40

DENISON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION
INTERVAL : 440.08-444.76	440.08-444.76
THICKNESS : 4.6R	4.68
DIP : 30	30
COAL/COAL+ROCK : 3.20/ 4.04	3.20/ 4.04
DRILL CORE RECOVERY: 80.00%	80.00 %
ESTIMATED YIELD :	65.00

WARNOCK HERSEY ANALYSES

STIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0
SIZE	SP.G. 1.54	SP.G. 1.76	135 SECS
CUTPOINT	36.8	13.3	5.1
CONTRIBUTION			

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
	55.20		
MOISTURE	1.40		
ASH	6.40	6.49	
VOLATILE	22.30	22.62	23.65
F.C.	69.90	70.89	76.35

SULPHUR .38  
 PHOSPHORUS .014  
 S.P.G. 1.370  
 F.S.I. 7.5  
 WARRINGROVE \*\*\*\*\*

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.50		
ASH	36.50	36.68	
VOLATILE	15.90	15.98	21.47
F.C.	47.10	47.34	78.53

F.S.I. 3.0  
 SULPHUR .29

SP.G. (-3/8 MESH) 1.63  
 PHOSPHORUS .029

DRILL HOLE #: SD 7710 SEAM: 1U

FLOAT SINK ANALYSES

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
3/8 X 28	76.60				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	FSI
1.40	42.20 4.50	42.20 4.50	57.80 67.38	8.5	8.5
1.50	4.90 10.50	46.50 5.05	53.50 71.95	3.0	8.0
1.54	1.50 16.60	48.00 5.42	52.00 73.55	1.0	7.5
1.60	1.20 21.00	49.20 5.80	50.80 74.79	1.0	7.0
1.80	3.10 31.50	52.30 7.32	47.70 77.60	1.0	6.0
****	47.70 77.60	100.00 40.84	*****		2.0

SIZE REL. WEIGHT

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
28 X 100	17.00				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	FSI
1.40	61.10 4.00	61.10 4.00	38.90 47.24	8.5	8.5
1.50	10.30 8.70	71.40 4.68	28.60 61.12	3.5	8.0
1.60	3.30 15.20	74.70 5.14	25.30 67.11	1.0	8.0
1.76	3.70 19.60	78.40 5.83	21.60 75.25	1.0	7.5
1.90	1.80 25.20	80.20 6.26	19.80 79.80	1.0	7.0
****	19.80 79.80	100.00 20.82	*****		4.5

FROTH FLOATATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM
100 X 0	6.40		
TIME	WT% ASH%	WT% ASH%	F.S.I. FSI
45	51.20 6.00	51.20 6.00	8.0 8.0
90	19.90 15.60	70.10 8.59	4.0 7.5
135	10.20 28.20	80.30 11.08	1.0 7.0
180	8.60 44.10	88.90 14.27	1.0 6.0
225	11.10 62.60	100.00 19.64	1.0 4.0

DRILL HOLE #: SD 7710 SEAM: 1U

FLUIDIFY

DILATATION

START TEMP.	441.0	SOFT TEMP.	399.0
FINAL TEMP.	510.0	SOLID TEMP.	480.0
MAX. FLUIDITY TEMP.	493.0	MAX. CONTRACTION	24.0
MAX. FLUIDITY (ODPH)	32.0	MAX. DILATATION	7.0
MAX. FLUIDITY (LOG)	1.505	G. FACTOR	.952

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO. 77-800A INTERVAL 440.08-440.72

	WT% ASH%	MOIST VOL.	F.C.	S. F.S.I.
1.5 FLOAT	80.65 5.90	.80	22.60 70.70	.51 9.0
1.5 SINK	19.35 30.19			
TOTAL	100.00 10.60			

DRY BASIS 5.95 22.78 71.27  
 D.M.M.F. BASIS - 23.69 76.31

COMPONENT NO. 77-800B INTERVAL 440.72-441.69

	WT% ASH%	MOIST VOL.	F.C.	S. F.S.I.
1.5 FLOAT	4.08 7.98	.80	22.40 68.90	1.25 9.0
1.5 SINK	96.00 84.78			
TOTAL	100.00 81.70			

DRY BASIS 7.96 22.58 69.46  
 D.M.M.F. BASIS - 23.64 76.36

COMPONENT NO. 77-8010 INTERVAL 441.69-444.76

	WT% ASH%	MOIST VOL.	F.C.	S. F.S.I.
1.5 FLOAT	90.90 4.90	1.00	22.50 72.50	.62 8.5
1.5 SINK	9.10 36.77			
TOTAL	100.00 7.80			

DRY BASIS 4.95 22.73 73.23  
 D.M.M.F. BASIS - 22.45 77.55

COAL ANALYSIS PREPARED BY  
 WARNOCK HERSEY PROFESSIONAL SERVICES LTD  
 SIGNED:

PROJECT: Saxon  
 DATE SAMPLED: 7/ 8/77  
 DRILL HOLE #: SD 7710  
 LAB COMPOSITE #: 77-8011-13

AREA: EAST  
 DATE ANALYSED: 130/ 9/77  
 SFAM: 1L  
 WT. REC. 5.90

DEFINSON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION	
INTERVAL	449.44-451.16	449.44-450.49
THICKNESS	1.72	1.04
MP	30	30
COAL/COAL+ROCK	1.12/ 1.50	.88/ .90
DRILL CORE RECOVERY	86.00%	77.00 %
ESTIMATED YIELD	65.00	

WARNOCK HERSEY ANALYSFS

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0
SIZE			
CUTPOINT	Sp.G. 1.54	Sp.G. 1.76	135 SECS
CONTRIBUTION	21.7	14.0	6.1
YIELD	AIR DRIED 41.80	DRY BASIS	D.M.M.F.
MOISTURE	1.00		
ASH	8.20	8.28	
VOLATILE	20.50	20.71	21.87
F.C.	70.30	71.01	78.13
SULPHUR	.45		
PHOSPHORUS	.006		
S.P.G.	1.770		
F.S.I.	5.5		
HARDGROVE	*****		

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.50		
ASH	39.00	39.20	
VOLATILE	15.10	15.18	20.71
F.C.	45.40	45.63	79.29
F.S.I.	1.5		
SULPHUR	.34		
SP.G. (-3/8 MESH)	1.44		
PHOSPHOROUS	.033		

DRILL HOLE #: SD 7710 SFAM: 1L

FLOAT SINK ANALYSES

SIZE	REL. WEIGHT	CUM. FLOATS		CUM. SINKS		F.S.I.	FSI
3/8 X 28	73.80						
SP.G.	WT%	ASH%	WT%	ASH%	WT%	ASH%	F.S.I.
1.50	0.	0.	0.	0.	100.00	46.31	*****
1.54	43.20	8.20	43.20	8.20	56.80	75.30	4.5
****	56.80	75.30	100.00	46.31	*****		1.0

SIZE REL. WEIGHT

SIZE	REL. WEIGHT	CUM. FLOATS		CUM. SINKS		F.S.I.	FSI
28 X 100	19.10						
SP.G.	WT%	ASH%	WT%	ASH%	WT%	ASH%	F.S.I.
1.76	73.30	8.10	73.30	8.10	26.70	68.50	6.0
****	26.70	68.50	100.00	24.23	*****		2.5

FROTH FLOATION

SIZE	REL. WEIGHT	CUM. FLOATS		CUM. SINKS	
100 X 0	7.10				
TIME	WT%	ASH%	WT%	ASH%	F.S.I.
45.	62.10	11.70	62.10	11.70	5.5
90.	18.40	23.90	80.50	14.49	1.5
135.	5.00	47.10	85.50	16.40	1.0
180.	3.50	46.60	89.00	18.37	1.0
225.	11.00	80.50	100.00	25.20	*****
					2.0

DRILL HOLE #: SD 7710 SFAM: 1L

FLUIDITY	DILATATION	
START TEMP.	453.0	SOFT. TEMP.
FINAL TEMP.	501.0	SOLID. TEMP.
MAX. FLUIDITY TEMP.	484.0	MAX. CONTRACTION
MAX. FLUIDITY (DDPM)	6.0	MAX. DILATATION
MAX. FLUIDITY (LOG)	.778	G. FACTOR

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	INTERVAL	AIR DRIED BASIS			
77-8011	449.44-450.49				
		WT%	ASH%	MOIST VOL.	F.C.
1.5 FLOAT	86.00	6.20	.60	19.60	73.60
1.5 SINK	14.00	27.63			.58
TOTAL	100.00	9.20			4.5

DRY BASIS	6.24	19.72	74.04
D.M.M.F. BASIS	-	20.43	79.57

COMPONENT NO.	INTERVAL	AIR DRIED BASIS			
77-9012	450.48-450.49				
		WT%	ASH%	MOIST VOL.	F.C.
1.5 FLOAT	4.30	7.30	.86	22.00	69.90
1.5 SINK	95.70	78.46			.28
TOTAL	100.00	75.40			9.0

DRY BASIS	7.36	22.18	70.46
D.M.M.F. BASIS	-	23.37	76.63

COMPONENT NO.	INTERVAL	AIR DRIED BASIS			
77-8013	450.89-451.16				
		WT%	ASH%	MOIST VOL.	F.C.
1.5 FLOAT	55.90	9.30	.60	22.10	68.00
1.5 SINK	44.10	63.72			.61
TOTAL	100.00	33.30			9.0

DRY BASIS	9.36	22.23	68.41
D.M.M.F. BASIS	-	23.72	76.28

COAL ANALYSIS PREPARED BY  
 WARNOCK HERSEY PROFESSIONAL SERVICES LTD  
 SIGNED:

PROJECT: SAXON AREA: EAST  
 DATE SAMPLED: 7/ 8/77 DATE ANALYSED: 30/ 9/77  
 DRILL HOLE #: 5D 7710 SEAM: 2  
 IAR COMPOSITE #: 77-8014-17 WT. PFC. 10.60

DRILL HOLE #: 5D 7710 SEAM: 2

FLOAT SINK ANALYSYS  
 SIZE REL. WEIGHT  
 3/8 X 28 72.90

DENISON COAL DATA

COMPOSITE DESCRIPTION	INTERVAL	MINING SECTION
THICKNESS	12.07	12.07
ATP	32	32
COAL/COAL+ROCK	9.55/10.28	9.55/10.28
DRILL CORP RECOVERY	31.00%	30.00 %
ESTIMATED YIELD	63.00	

SP.G.	WT%	ASH%	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
1.40	63.70	4.80	63.70	4.80	36.30	46.28
1.50	7.30	13.40	71.00	5.68	29.00	56.56
1.60	1.80	18.50	72.80	6.00	27.20	56.95
1.60	3.10	24.00	75.90	6.74	24.10	61.10
1.80	7.50	35.70	83.40	9.34	16.60	72.70
****	16.60	72.70	100.00	19.84	*****	*****

WARNOCK HERSEY ANALYSYS

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SECS
CONTRIBUTION	53.1	17.9	6.1

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
28 X 100	20.10				
SP.G.	WT%	ASH%	WT%	ASH%	F.S.I.
1.40	79.90	3.00	79.90	3.00	20.10
1.50	3.40	7.90	83.30	3.20	16.70
1.60	4.90	15.20	88.20	3.87	11.80
1.76	.80	26.80	89.00	4.07	11.00
1.90	2.30	33.00	91.30	4.80	8.70
****	8.70	61.10	100.00	9.70	*****

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
	77.10		
MOISTURE	.80		
ASH	6.00	6.05	
VOLATILE	22.10	22.28	23.20
F.C.	71.10	71.67	76.80
SULPHUR	.40		
PHOSPHORUS	.016		
S.P.G.	1.740		
F.S.I.	8.0		
HARDGROVE	*****		

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
100 X 0	7.00				
TIME	WT%	ASH%	WT%	ASH%	F.S.I.
4%	97.70	5.00	57.70	5.00	8.0
90%	19.10	12.60	76.80	6.89	5.5
13%	9.70	22.50	86.50	8.64	3.0
18%	6.60	30.00	93.10	10.15	1.5
22%	6.90	42.00	100.00	12.35	1.0

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.40		
ASH	17.50	17.57	
VOLATILE	19.50	19.58	22.31
F.C.	62.60	62.85	77.69
F.S.I.	6.0		
SULPHUR	.36		
SP.G. (-3/4 MESH)	1.42		
PHOSPHORUS	.017		

DRILL HOLE #: 5D 7710 SEAM: 2

DRILL HOLE #: 5D 7710 SEAM: 2

FLUIDITY DILATATION

START TEMP.	447.0	SOFT TEMP.	406.0
FINAL TEMP.	510.0	SOLID TEMP.	487.0
MAX. FLUIDITY TEMP.	449.0	MAX. CONTRACTION	28.0
MAX. FLUIDITY (DRPN)	22.0	MAX. DILATATION	3.0
MAX. FLUIDITY (LOG)	1.342	G. FACTOR	.931

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-8017	INTERVAL	412.52-413.72
AIR DRIED BASIS			
1.5 FLOAT	91.50	3.10	
1.5 SINK	8.50	53.69	
TOTAL	100.00	7.40	
DRY BASIS	3.13	22.60	74.27
D.M.M.F. BASIS	-	23.03	76.97

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-8014	INTERVAL	401.65-401.85
AIR DRIED BASIS			
1.5 FLOAT	74.29	14.00	
1.5 SINK	65.80	53.67	
TOTAL	100.00	40.10	
DRY BASIS	14.88	19.52	66.40
D.M.M.F. BASIS	-	21.56	78.44

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-8015	INTERVAL	401.85-411.96
AIR DRIED BASIS			
1.5 FLOAT	79.80	5.90	
1.5 SINK	20.20	45.50	
TOTAL	100.00	13.90	
DRY BASIS	5.94	22.43	71.43
D.M.M.F. BASIS	-	23.36	76.64

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-8016	INTERVAL	411.96-412.52
AIR DRIED BASIS			
1.5 FLOAT	2.20	3.60	7.5
1.5 SINK	97.80	67.81	
TOTAL	100.00	66.40	

PROJECT: SAXON  
 DATE SAMPLED: 3/ 8/77  
 DRILL HOLE #: SD 7710  
 LAB COMPOSITE #: 77-R018 WT. PFC. 2.30

APFA: FAST  
 DATE ANALYSED: 1/10/77  
 SEAM: 4

DENTON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION
INTERVAL : 310.04-312.95	310.04-312.95
THICKNESS : 2.91	2.91
BTB : 30	30
COAL/COAL+ROCK : 2.47/ 2.51	2.47/ 2.51
DRILL CORF RECOVERY : 30.00%	30.00 %
ESTIMATED YIELD : 79.00	

WARNOCK HERSEY ANALYSIS

SIMULATED PRODUCT	28 X 100	100 X 0
SIZE 3/8 X 28	28 X 100	100 X 0
CUTPOINT SP.G. 1.54	SP.G. 1.76	135 SECS
CONTRIBUTION SP.1	11.6	5.3

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
	69.00		

MOISTURE	.90		
ASH	5.50	5.55	
VOLATILE	22.20	22.40	23.29
F.C.	71.40	72.05	76.72
SULPHUR	.28		
PHOSPHORUS	.019		
S.P.C.	1.710		
F.S.I.	8.0		
HARDGROVE	*****		

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.40		
ASH	21.30	21.39	
VOLATILE	18.90	18.98	22.35
F.C.	59.40	59.64	77.65

F.S.I.	4.0
SULPHUR	.29
SP.G. (1-3/8 MESH)	1.46
PHOSPHORUS	.023

DRILL HOLE #: SD 7710 SEAM: 4

FLOAT SINK ANALYSIS  
 SIF 3/8 X 28 PFL. WEIGHT 80.00

SP.G.	WT%	ASH%	WT%	ASH%	WT%	ASH%	F.S.I.	FSI
1.40	61.20	5.30	61.20	5.30	38.80	52.08	8.0	8.0
1.50	2.80	11.70	64.00	5.58	36.00	55.22	2.5	8.0
1.54	1.10	16.90	65.10	5.77	34.00	56.42	1.0	8.0
1.60	1.50	21.20	66.60	6.12	33.40	58.01	1.0	8.0
1.80	3.00	30.70	69.60	7.18	30.40	60.70	1.0	7.0
****	30.40	60.70	100.00	23.45	*****	*****		3.0

SIF REL. WEIGHT  
 28 X 100 14.30

SP.G.	WT%	ASH%	WT%	ASH%	WT%	ASH%	F.S.I.	FSI
1.40	59.50	4.30	58.50	4.30	41.50	29.10	8.5	8.5
1.50	12.90	7.20	71.40	4.82	28.60	39.12	4.0	8.0
1.60	4.70	12.40	76.10	5.29	23.90	44.37	1.5	8.0
1.76	5.30	18.70	81.40	6.16	18.60	51.68	1.0	7.5
1.90	4.10	25.10	85.50	7.07	14.50	59.20	1.0	7.0
****	14.50	59.20	100.00	14.63	*****	*****		4.5

FROTH FLOATION

SIF REL. WEIGHT  
 100 X 0 5.70

TIME	WT%	ASH%	WT%	ASH%	F.S.I.	FSI
45	62.60	7.20	62.60	7.20	7.5	7.5
90	23.40	14.00	86.00	9.05	3.5	7.0
135	7.80	30.10	93.80	10.80	1.5	6.5
180	3.10	48.60	96.90	12.01	1.0	6.0
225	3.10	61.40	100.00	13.54	1.0	5.0

DRILL HOLE #: SD 7710 SEAM: 4

FLUIDITY

DILATATION

START TEMP.	444.0	SOFT TEMP.	403.0
FINAL TEMP.	504.0	SOLID TEMP.	486.0
MAX. FLUIDITY TEMP.	480.0	MAX. CONTRACTION	25.0
MAX. FLUIDITY (DDPM)	16.0	MAX. DILATATION	-7.0
MAX. FLUIDITY (LOG)	1.204	G. FACTOR	.857

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-8018	INTERVAL	310.04-312.95
		AIR DRIED BASIS	
		WT% ASH% MOIST VOL. F.C.	S. F.S.I.
1.5 FLOAT	68.30	4.60	1.30 22.50 71.60 .26 9.0
1.5 SINK	31.70	60.75	
TOTAL	100.00	22.40	
DRY BASIS	4.66	22.80	72.54
D.M.M.F. BASIS	-	23.54	76.46

PROJECT: SAXON ARFA: SOUTH  
 DATE SAMPLED: 4/ 8/77 DATE ANALYSED: 0/ 0/ 0  
 DRILL HOLE #: 50 7711 SEAM: 1  
 IAR COMPOSITE #: 77-8019 WT. RFC. 7.40

DENISON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION
INTERVAL : 256.24-259.52	256.24-259.52
THICKNESS : 3.28	3.28
DIP : 33	33
COAL/COAL+ROCK : 2.87/ 3.08	2.87/ 3.08
DRILL CORE RECOVERY : 73.00%	73.00 %
ESTIMATED YIELD : 72.00	

WARNOCK MERSEY ANALYSYS

STIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0
SIZE			
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SECS
CONTRIBUTION	41.7	17.1	8.5

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
	67.30		

MOISTURE	ASH	VOLATILE	F.C.
.90	8.27	26.30	73.70
8.20	24.72		
24.50	67.00		
66.40			

SULPHUR	.42
PHOSPHOROUS	.005
S.P.C.	1.370
F.S.I.	7.0
HARDGROVE	*****

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.60		
ASH	31.70	31.89	
VOLATILE	18.60	18.71	24.51
F.C.	49.10	49.40	75.49

F.S.I.	3.5
SULPHUR	.36
SP.GR. (=3/8 MESH)	1.54
PHOSPHOROUS	.010

DRILL HOLE #: 50 7711 SFAM: 1

FLOAT SINK ANALYSYS

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
3/8 X 28	71.70				
SP.G.	WT%	ASH%	WT%	ASH%	WT%
1.40	40.50	5.80	40.50	5.80	59.50
1.50	15.80	14.20	56.30	8.14	43.70
1.54	4.70	20.40	61.00	9.10	39.00
1.60	2.90	23.90	63.90	9.77	36.10
1.80	2.30	31.10	66.20	10.51	33.80
****	33.80	83.40	100.00	35.15	*****

SIZE REL. WEIGHT

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
28 X 100	20.70				
SP.G.	WT%	ASH%	WT%	ASH%	WT%
1.40	56.70	6.20	56.70	6.20	43.30
1.50	13.70	12.40	70.40	7.41	29.60
1.60	6.20	21.50	76.60	8.55	23.40
1.76	5.90	23.70	82.90	9.63	17.50
1.90	1.50	37.40	84.00	10.13	16.00
****	16.00	76.00	100.00	20.67	*****

FROTH FLOTATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
100 X 0	7.60				
TIME	WT%	ASH%	WT%	ASH%	F.S.I.
45	54.60	11.20	54.60	11.20	6.0
90	21.30	16.20	75.90	12.60	3.5
135	9.50	31.50	85.40	14.71	1.0
180	2.00	47.20	87.40	15.45	1.0
225	12.60	68.60	100.00	22.15	1.0

DRILL HOLE #: 50 7711 SEAM: 1

FLUIDITY

START TEMP.	426.0	SOFT TEMP.	382.0
FINAL TEMP.	501.0	SOLID TEMP.	468.0
MAX. FLUIDITY TEMP.	468.0	MAX. CONTRACTION	27.0
MAX. FLUIDITY (DDPH)	176.0	MAX. DILATATION	19.0
MAX. FLUIDITY (LOG)	7.140	G. FACTOR	.983

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	INTERVAL	AIR DRIED BASIS	F.C.	S. F.S.I.
77-8019	256.24-259.52			
1.5 FLOAT	63.80	9.70	.90	25.20
1.5 SINK	36.20	69.37	64.20	.32
TOTAL	100.00	31.30		
DRY BASIS	9.79	25.43	64.78	
D.M.M.F. BASIS	-	27.47	72.53	

PROJECT: SAXON  
 DATE SAMPLED: 4/ 8/77  
 DRILL HOLE #: SD 7711  
 IAR COMPOSITE #: 77-8066R-68

APPA: SOUTH  
 DATE ANALYSED: 29/ 9/77  
 SFAM: 2  
 WT. RFC. 20.00

DENISON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION
INTERVAL : 233.16-239.84	233.64-239.84
THICKNESS : 6.68	6.20
OTF : 32	32
COAL/COAL+ROCK : 4.75/ 5.89	6.20/ 4.75
DRILL CORE RECOVERY : 94.00%	96.00 %
ESTIMATED YIELD : 79.00	

WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0
CUTPOINT CONTRIBUTION	SP.G. 1.54 52.0	SP.G. 1.76 22.1	135 SECS 4.4
YIELD	AIR DRIED 78.50	DRY BASIS	D.M.M.F.
MOISTURE	.60		
ASH	7.20	7.27	
VOLATILE	24.10	26.34	27.85
F.C.	65.80	66.40	72.15
SULPHUR	.38		
PHOSPHOROUS	.014		
S.P.G.	1.330		
F.S.I.	7.0		
HARDGROVE	*****		

HEAR ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.60		
ASH	22.70	22.84	
VOLATILE	22.50	22.64	27.52
F.C.	54.20	54.53	72.48
F.S.I.	4.5		
SULPHUR	.31		
SP.GR. (-3/8 MESH)	1.44		
PHOSPHOROUS	.021		

DRILL HOLE #: SD 7711 SFAM: 2

FLOAT SINK ANALYSIS  
 3/8 X 28 REL. WEIGHT 69.30

SP.G.	WT%	ASH%	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
1.40	56.70	5.40	56.70	5.40	43.30	49.91
1.50	15.70	13.30	72.40	7.11	27.60	70.73
1.54	2.70	20.70	75.10	7.40	24.90	76.16
1.60	1.40	24.00	76.50	7.90	23.50	79.26
1.80	1.00	35.70	77.50	8.76	22.50	81.20
****	22.50	81.20	100.00	24.67	*****	4.0

28 X 100 REL. WEIGHT 25.10

SP.G.	WT%	ASH%	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
1.40	69.70	5.20	69.70	5.20	30.30	37.97
1.50	12.60	12.70	82.30	6.35	17.70	55.96
1.60	3.00	21.40	85.30	6.88	14.70	63.01
1.75	2.60	28.80	87.90	7.53	12.10	70.36
1.90	2.40	39.50	90.30	8.38	9.70	78.00
****	9.70	78.00	100.00	15.13	*****	5.5

FROTH FLOATATION  
 100 X 0 REL. WEIGHT 5.60

TEMP.	WT%	ASH%	CUM. FLOATS	CUM. SINKS
45	38.40	9.10	78.40	9.10
90	23.50	14.40	61.80	11.11
135	16.90	17.40	78.80	12.46
180	11.00	25.60	89.80	14.07
225	10.20	42.90	100.00	17.01

DRILL HOLE #: SD 7711 SFAM: 2

FLUIDITY:	DILATATION
START TEMP. 470.0	SOFT TEMP. 373.0
FINAL TEMP. 501.0	SOLID TEMP. 471.0
MAX. FLUIDITY TEMP. 448.0	MAX. CONTRACTION 27.8
MAX. FLUIDITY (DDPM) 435.0	MAX. DILATATION 39.0
MAX. FLUIDITY (LOG) 2.638	G. FACTOR 1.022

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO. 77-8066R INTERVAL 233.16-233.64  
 AIR DRIED BASIS

	WT%	ASH%	MOIST VOL.	F.C.	S. F.S.I.
1.5 FLOAT	70.00	6.60	.70	27.30	65.40
1.5 SINK	30.00	55.27			.53
TOTAL	100.00	21.20			

DRY BASIS	6.65	27.49	65.86
D.M.M.F. BASIS	-	28.91	71.09

COMPONENT NO. 77-8067 INTERVAL 233.64-237.32  
 AIR DRIED BASIS

	WT%	ASH%	MOIST VOL.	F.C.	S. F.S.I.
1.5 FLOAT	69.20	8.70	.80	25.78	44.80
1.5 SINK	30.80	75.26			.41
TOTAL	100.00	29.20			

DRY BASIS	8.77	25.91	65.32
D.M.M.F. BASIS	-	27.73	72.27

COMPONENT NO. 77-8068 INTERVAL 237.32-239.84  
 AIR DRIED BASIS

	WT%	ASH%	MOIST VOL.	F.C.	S. F.S.I.
1.5 FLOAT	81.50	6.70	.70	27.10	65.50
1.5 SINK	18.50	49.40			.30
TOTAL	100.00	14.60			

DRY BASIS	6.75	27.29	65.96
D.M.M.F. BASIS	-	28.78	71.22

COAL ANALYSIS PREPARED BY  
 WARNOCK HERSEY PROFESSIONAL SERVICES LTD  
 SIGNED:

DRIFT: SAKON  
 DATE SAMPLED: 4/ R/77  
 DRILL HOLE #: SD 7711  
 LAB COMPOSITE #: 77-8024 WT. REC. 6.10

APFA: SOUTH  
 DATE ANALYSED: 1/10/77  
 SFAM: 3

DEMISON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION
INTERVAL	202.69-204.36
THICKNESS	2.27
DTP	40
COAL/COAL+ROCK	1.25/ 1.26
NETT CORF RECOVERY	91.00%
ESTIMATED YIELD	60.00

WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT	1/8 X 28	28 X 100	100 X 0
CONTRIBUTION	41.9	13.1	5.5

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	9.40	9.68	
ASH	26.80	26.81	28.88
VOLATILE	63.00	63.51	71.12
F.C.			
SULPHUR	.74		
PHOSPHORUS	.016		
S.P.G.	1.330		
F.S.I.	8.5		
WABGRAVE	*****		

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	9.50		
ASH	29.90	30.05	
VOLATILE	21.50	21.61	28.19
F.C.	48.10	48.34	71.81
F.S.I.	5.0		
SULPHUR	.65		
SP.G. (-3/8 MESH)	1.40		
PHOSPHOROUS	.022		

DRILL HOLE #: SD 7711 SEAM: 3

FLOAT SINK ANALYSIS  
 SIZE REL. WEIGHT  
 3/8 X 28 75.80

SP.G.	WT%	ASH%	CUM. FLOATS	CUM. SINKS	F.S.I.	CUM FSI
1.40	36.80	8.60	76.80	6.80	63.20	47.92
1.50	15.10	14.90	51.90	9.01	48.10	54.29
1.54	3.40	21.70	55.30	9.79	44.70	61.07
1.60	1.90	27.20	57.20	10.37	42.80	62.58
1.80	4.90	39.20	62.10	12.65	37.90	65.60
****	37.90	65.60	100.00	32.72	*****	4.5

SIZE REL. WEIGHT  
 28 X 100 17.70

SP.G.	WT%	ASH%	CUM. FLOATS	CUM. SINKS	F.S.I.	CUM FSI
1.40	43.70	5.20	43.70	5.20	56.30	41.40
1.50	16.10	13.20	59.80	7.35	40.20	52.70
1.60	9.80	20.00	68.60	8.98	31.40	61.86
1.76	5.30	29.90	73.90	10.48	26.10	68.35
1.90	4.70	39.90	78.60	12.24	21.40	74.60
****	21.40	74.60	100.00	25.58	*****	5.5

FROTH FLOATATION  
 SIZE REL. WEIGHT  
 100 X 0 6.50

TIME	WT%	ASH%	CUM. FLOATS	F.S.I.	FSI
45	26.60	8.30	26.60	8.30	8.0
90	42.70	15.20	69.30	12.55	5.5
135	15.10	20.80	84.40	14.03	5.0
180	4.70	62.80	89.10	16.60	1.0
225	10.90	78.50	100.00	23.35	5.5

DRILL HOLE #: 90 7711 SEAM: 3

FLUIDITY	DILATATION
START TEMP. 417.0	SOFT TEMP. 372.0
FINAL TEMP. 501.0	SOLID TEMP. 463.0
MAX. FLUIDITY TEMP. 471.0	MAX. CONTRACTION 28.0
MAX. FLUIDITY (ODPM) 407.0	MAX. DILATATION 81.0
MAX. FLUIDITY (LOG) 2.610	G. FACTOR 1.056

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-8024	INTERVAL	202.69-204.36
AIR DRIED BASIS			
1.5 FLOAT	56.10	9.60	.80 26.80 62.80 .77 9.0
1.5 SINK	43.90	54.02	
TOTAL	100.00	29.10	
DRY BASIS	9.68	27.02 63.31	
D.M.M.F. BASIS	-	29.10 70.90	



PROJECT: SAGON AREA: SOUTH  
 DATE SAMPLED: 1/10/77 DATE ANALYSED: 1/10/77  
 DRILL HOLE #: SD 7711 SEAM: 4U  
 LAB COMPOSITE #1778060-20-22 WT. REC. 37.00

DEWISON COAL DATA

COMPOSITE DESCRIPTION	INTERVAL	MINING SECTION
INTERVAL	137.00-140.00	137.00-140.00
THICKNESS	11.15	11.15
NETP	40	40
COAL/COAL-ROCK	8.07/ 8.48	8.07/ 8.48
DRILL CORE RECOVERY	98.00%	98.00 %
ESTIMATED YIELD	80.00	

WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT	3/8 X 28	2R X 100	100 X 0
SIZE	3/8 X 28	2R X 100	100 X 0
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SECS
CONTRIBUTION	40.8	14.8	4.6
YIELD	AIR DRIED 80.20	DRY BASIS	D.M.M.F.
MOISTURE	4.00	6.66	
ASH	4.60	29.90	
VOLATILE	28.10	29.90	
F.C.	64.40	64.98	70.10
SULPHUR	.20		
PHOSPHORUS	.012		
S.P.I.	1.330		
F.S.I.	7.5		
WARRANTY	*****		

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.70		
ASH	14.20	16.31	
VOLATILE	24.20	26.38	30.37
F.C.	56.90	57.30	69.63
F.S.I.	5.5		
SULPHUR	.26		
SP.G. (-3/8 MESH)	1.40		
PHOSPHOROUS	.015		

DRILL HOLE #: SD 7711 SEAM: 4U

FLUIDITY	DILATATION
START TEMP.	424.0
FINAL TEMP.	501.0
MAX.FLUIDITY TEMP.	465.0
MAX.FLUIDITY(NDPM)	223.0
MAX.FLUIDITY(LOR)	2.348
SOFT.TEMP.	361.0
SOLID.TEMP.	469.0
MAX.CONTRACTION	27.0
MAX.DILATATION	46.0
G.FACTOR	1.028

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-8069	INTERVAL	137.89-140.30
		AIR DRIED BASIS	
1.5 FLOAT	72.80	7.60	.60 27.80 64.00 .33 6.5
1.5 SINK	27.20	42.16	
TOTAL	100.00	17.00	

DRY BASIS	7.65	27.97 64.39
D.M.M.F. BASIS	-	29.73 70.27

COMPONENT NO.	77-8020	INTERVAL	140.30-144.64
		AIR DRIED BASIS	
1.5 FLOAT	84.80	6.70	.80 26.90 65.60 .25 5.5
1.5 SINK	15.20	32.36	
TOTAL	100.00	10.60	

DRY BASIS	6.75	27.12 66.13
D.M.M.F. BASIS	-	28.60 71.40

COMPONENT NO.	77-8021	INTERVAL	144.64-147.63
		AIR DRIED BASIS	
1.5 FLOAT	85.40	4.40	.70 29.60 65.30 .27 8.5
1.5 SINK	14.60	16.04	
TOTAL	100.00	6.10	

DRY BASIS	4.43	29.81 65.76
D.M.M.F. BASIS	-	30.87 69.13

DRILL HOLE #: SD 7711 SEAM: 4U

FLOAT SINK ANALYSIS  
 SIZE REL. WEIGHT  
 3/8 X 28 78.60

SP.G.	WT%	ASH%	CUM. FLOATS	WT% ASH%	CUM. SINKS	WT% ASH%	F.S.I.	FSI
1.40	63.60	5.20	63.60	5.20	36.40	38.60	8.0	8.0
1.50	9.00	13.00	73.60	6.25	26.60	48.27	7.5	7.5
1.54	3.90	21.40	77.40	7.01	22.60	52.91	1.5	7.5
1.40	7.00	26.90	80.40	7.76	19.60	56.89	1.0	7.0
1.80	6.90	35.70	87.30	9.96	12.70	68.40	1.0	6.5
****	12.70	68.40	100.00	17.39	*****	*****	*****	5.0

SIZE REL. WEIGHT  
 2R X 100 16.30

SP.G.	WT%	ASH%	CUM. FLOATS	WT% ASH%	CUM. SINKS	WT% ASH%	F.S.I.	FSI
1.40	79.50	3.90	79.50	3.90	20.50	37.31	8.5	8.5
1.50	6.10	13.00	85.60	4.55	14.40	47.61	3.5	8.0
1.60	2.70	22.90	88.30	5.11	11.70	53.31	1.5	7.5
1.76	2.20	30.40	90.50	5.73	9.50	58.53	1.0	7.5
1.90	2.50	37.60	93.00	6.50	7.00	66.00	1.0	7.0
****	7.00	66.00	100.00	10.75	*****	*****	*****	6.5

FROTH FLOTATION  
 SIZE REL. WEIGHT  
 100 X 0 5.10

TIME	WT%	ASH%	CUM. FLOATS	WT% ASH%	F.S.I.	FSI
45	49.90	7.30	49.90	7.30	7.0	7.0
90	26.20	13.30	76.10	9.37	6.5	7.0
135	13.20	22.60	89.30	11.32	3.0	7.0
180	8.30	31.40	97.60	13.03	3.0	6.5
225	2.40	58.50	100.00	14.12	1.0	6.5

DRILL HOLE #: SD 7711 SEAM: 4U

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-8022	INTERVAL	147.63-149.04
		AIR DRIED BASIS	
1.5 FLOAT	53.90	6.40	.70 29.70 62.80 .46 9.0
1.5 SINK	46.10	63.43	
TOTAL	100.00	33.00	

DRY BASIS	6.45	29.91 63.24
D.M.M.F. BASIS	-	31.59 68.41

PROJECT: SAYON AREA: SOUTH  
DATE SAMPLED: 7/ 8/77 DATE ANALYSED: 1/10/77  
DRILL HOLE #: SD 7711 SEAM: 4L  
LAR COMPOSITE #: 77-0023 WT. PFC. 3.50

DEMISON COAL DATA

COMPOSITE DESCRIPTION	INTERVAL	MINING SECTION
	150.9A-151.90	150.9A-151.90
THICKNESS	1.01	1.01
DIP	40	40
COAL/COAL ROCK	.6R/ .7R	.6R/ .7R
DRILL CORE RECOVERY	90.00%	90.00 %
ESTIMATED YIELD	80.00	

WARNOCK HERSEY ANALYSES

COMPOSITE PRODUCT	3/8 X 28	2R X 100	100 X 0
SIZE			
CUTPOINT	SP.G. 1.54	SP.G. 1.74	135 SECS
COMPOSITION	49.7	12.3	5.6
YIELD	AIR DRIED 67.60	DRY BASIS	D.M.M.F.
MOISTURE	.90		
ASH	7.10	7.16	
VOLATILE	28.40	28.66	30.27
F.C.	63.60	64.18	69.73
SULPHUR	.66		
PHOSPHORUS	.004		
S.P.G.	1.340		
F.S.I.	8.0		
HARDNESS	*****		

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.60		
ASH	26.40	26.76	
VOLATILE	23.10	23.24	29.48
F.C.	49.70	50.00	70.52
F.S.I.	6.5		
SULPHUR	.58		
SP.G. (-3/8 MESH)	1.47		
PHOSPHOROUS	.010		

DRILL HOLE #: SD 7711 SEAM: 4L

FLOAT SINK ANALYSES  
SIZE REL. WEIGHT  
3/8 X 28 77.40

SP.G.	WT%	ASH%	WT%	ASH%	WT%	ASH%	F.S.I.	FSI
1.54	44.20	6.60	44.20	6.60	35.80	61.80	8.0	8.0
****	35.80	61.80	100.00	26.36	*****	*****	*****	6.0

SIZE REL. WEIGHT  
2R X 100 16.30

SP.G.	WT%	ASH%	WT%	ASH%	WT%	ASH%	F.S.I.	FSI
1.76	75.50	9.70	75.50	9.70	24.50	67.80	7.5	7.5
****	24.50	67.80	100.00	23.93	*****	*****	*****	7.0

FROTH FLOTATION  
SIZE REL. WEIGHT  
100 X 0 6.30

TIME	WT%	ASH%	WT%	ASH%	F.S.I.	FSI
45.	50.90	10.80	50.90	10.80	7.0	7.0
90.	25.50	21.40	76.40	14.34	3.5	7.0
135.	13.20	32.90	89.60	17.07	3.5	6.5
180.	5.70	53.80	95.30	19.27	1.0	6.5
225.	4.70	74.30	100.00	21.84	1.0	6.0

DRILL HOLE #: SD 7711 SEAM: 4L

FLUIDITY

IL-YA-10

START TEMP.	423.0	SOFT TEMP.	373.0
FINAL TEMP.	498.0	SOLID TEMP.	467.0
MAX. FLUIDITY TEMP.	465.0	MAX. CONTRACTION	27.0
MAX. FLUIDITY (DDPH)	244.0	MAX. DILATATION	84.0
MAX. FLUIDITY (LOG)	2.387	G. FACTOR	1.061

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-0023	INTERVAL	150.9A-151.90
		AIR DRIED BASIS	
		WT% ASH% MOIST VOL. F.C.	S. F.S.I.
1.5 FLOAT	60.90	5.70	.70 29.30 44.30 .79 9.0
1.5 SINK	39.10	59.92	
TOTAL	100.00	26.90	

DRY BASIS	5.74	29.51	64.75
D.M.M.F. BASIS	-	30.77	69.23

PROJECT: Saxon  
 DATE SAMPLED: 0/ 0/ 0  
 DRILL HOLE #: 7711  
 LAB COMPOSITE #:

APFA: SOUTH  
 DATE ANALYSED: 0/ 0/ 0  
 SEAM: 7  
 WT. SEC. 0.

DENISON COAL DATA

COMPOSITE DESCRIPTION		MINING SECTION
INTERVAL		82.80-85.17
THICKNESS	0.	2.37
W.P.		35
COAL/COAL+ROCK	0. / 0.	1.58/ 1.04
DRILL CORE RECOVERY	0. %	67.00 %
ESTIMATED YIELD	*****	

WARNOCK HERSEY ANALYSES

STANDARD PRODUCT			
SIZE	3/8 X 28	28 X 100	100 X 0
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SECS

DRILL HOLE #: 7711

SEAM: 7

DRILL HOLE #: 7711

SEAM: 7

FLUIDITY

DILATATION

START TFMP. *****	SOFT TEMP. *****
FINAL TFMP. *****	SOLID TEMP. *****
MAX. FLUIDITY TEMP. *****	MAX. CONTRACTION *****
MAX. FLUIDITY (DDPM) *****	MAX. DILATATION *****
MAX. FLUIDITY (LOG) *****	G. FACTOR *****

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-8025	INTERVAL	82.80-85.17
		AIR DRIED BASIS	
	WT% ASH	MOIST VOL.	F.C. S. F.S.I.
1.5 FLOAT	33.50 6.40	.80	28.20 64.60 .85 9.0
1.5 SINK	66.50 69.26		
TOTAL	100.00 48.20		
DRY BASIS	6.45	28.43	65.12
D.M.M.F. BASIS	-	29.78	70.22

PROJECT: S1XON APFA: FAST  
 DATE SAMPLED: 7/ 8/77 DATE ANALYSED: 9/10/77  
 DRILL HOLE #: SD 7712 SFAM: 1U  
 LAB COMPOSITE #: 77-8026 WT. REC. 6.50

## DENISON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION	
INTERVAL	139.64-131.54	129.64-131.54
THICKNESS	1.90	1.90
DIP	12	12
COAL/COAL-ROCK	1.86/ 1.86	1.86/ 1.86
DRILL CORE RECOVERY	100.00%	100.00 %
ESTIMATED YIELD	84.00	

## WARNOCK HERSEY ANALYSYS

SIMULATED PRODUCT	MINING SECTION		
SIZE	7/8 X 28	28 X 100	100 X 0
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SECS
CONTRIBUTION	54.3	21.3	7.0
YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
	84.90		
MOISTURE	.70		
ASH	9.10	9.16	
VOLATILE	20.20	20.34	21.55
F.C.	70.00	70.49	78.45
SULPHUR	.67		
PHOSPHORUS	.007		
S.P.G.	1.750		
F.S.I.	4.5		
HADGRAVE	*****		

## HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.40		
ASH	14.60	14.66	
VOLATILE	18.20	18.27	20.13
F.C.	66.80	67.07	79.87
F.S.I.	4.0		
SULPHUR	.54		
SP.G. (1-3/8 HESH)	1.40		
PHOSPHORUS	.010		

DRILL HOLE #: SD 7712 SEAM: 1U

## FLOAT SINK ANALYSYS

SIZE	REL. WEIGHT		CUM. FLOATS		CUM. SINKS		CUM
3/8 X 28	WT%	ASH%	WT%	ASH%	WT%	ASH%	F.S.I.
1.40	48.80	6.00	48.80	6.00	51.20	27.54	7.5
1.50	23.10	15.70	71.90	8.99	28.10	37.60	2.5
1.54	7.40	23.70	79.30	10.36	20.70	42.56	1.5
1.60	5.50	29.70	84.80	11.62	15.20	47.72	1.0
1.80	9.70	40.20	94.50	14.95	5.50	59.60	1.0
****	5.50	59.60	100.00	17.03	*****	*****	5.0

## SIZE REL. WEIGHT

SIZE	REL. WEIGHT		CUM. FLOATS		CUM. SINKS		CUM
28 X 100	WT%	ASH%	WT%	ASH%	WT%	ASH%	F.S.I.
1.40	68.80	4.50	68.80	4.50	31.20	21.51	8.0
1.50	16.40	11.60	85.20	5.87	14.80	32.49	3.5
1.60	5.40	20.20	90.60	6.72	9.40	39.55	1.5
1.76	4.40	28.30	95.00	7.72	5.00	49.44	1.0
1.90	7.30	37.40	97.30	8.42	2.70	59.70	1.0
****	2.70	59.70	100.00	9.81	*****	*****	7.0

## FROTH FLOATATION

SIZE	REL. WEIGHT		CUM. FLOATS		CUM
100 X 0	WT%	ASH%	WT%	ASH%	F.S.I.
45	92.60	7.90	92.60	7.90	7.0
90	3.30	26.60	95.90	8.54	1.5
135	2.50	34.20	98.40	9.20	1.0
180	1.20	50.40	99.60	9.69	1.0
225	.40	61.00	100.00	9.90	6.5

DRILL HOLE #: SD 7712

SEAM: 1U

FLUIDITY	0	DILATATION	
START TEMP.	453.0	SOFT TEMP.	404.0
FINAL TEMP.	504.0	SOLID TEMP.	485.0
MAX. FLUIDITY TEMP.	486.0	MAX. CONTRACTION	23.0
MAX. FLUIDITY (DDPM)	7.0	MAX. DILATATION	4.0
MAX. FLUIDITY (LOG)	.845	G. FACTOR	.940

## 1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-8026	INTERVAL	129.64-131.54
		AIR DRIED BASIS	
1.5 FLOAT	78.00	8.60	.40 20.00 71.00 .58 7.0
1.5 SINK	22.00	40.87	
TOTAL	100.00	15.70	
DRY BASIS	8.63	20.00 71.29	
D.M.M.F. BASIS	-	21.20 78.80	

PROJECT: SAYON  
 DATE SAMPLED: 7/ 9/77  
 DRILL HOLE #: SD 7712  
 I.R. COMPOSITE #: 77-8027 WT. AFC. 3.40

ANALYST: WJF  
 DATE ANALYSED: 8/10/77  
 SEAM: 1L

DEWISON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION
INTERVAL	139.40-140.41
THICKNESS	1.01
DRP	11
COAL/COAL+ROCK	.99/ .99
DRILL CORE RECOVERY	100.00%
FRYTHATCH YIELD	82.00

WARNOCK HEPSEY ANALYSES

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0
SIZE			
CUTPOINT CONTRIBUTION	SP.G. 1.54 60.9	SP.G. 1.76 13.6	135 SFCS 4.9

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	4.0	8.75	
ASH	19.70	19.82	20.93
VOLATILE	71.00	71.43	79.07
F.C.			
SULPHUR	.58		
PHOSPHORUS	.005		
S.P.G.	1.740		
F.S.I.	4.0		
HARDNESS	*****		

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.50		
ASH	19.90	20.00	
VOLATILE	17.10	17.19	19.69
F.C.	62.50	62.81	80.31
F.S.I.	2.0		
SULPHUR	.50		
SP.G. (-3/8 MESH)	1.40		
PHOSPHORUS	.02%		

DRILL HOLE #: SD 7712 SEAM: 1L

FLOAT/SINK ANALYSES

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	WT% ASHK	F.S.I.	FSI
3/8 X 28	76.30					
SP.G.	WT% ASHK	WT% ASHK	WT% ASHK	F.S.I.	FSI	
1.54	79.90	9.10	79.80	9.10	20.20	66.10
3.0	3.0	3.0	3.0	3.0	3.0	3.0
****	20.20	66.10	100.00	20.61	*****	1.5

28 X 100 REL. WEIGHT

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	WT% ASHK	F.S.I.	FSI
28 X 100	18.00					
SP.G.	WT% ASHK	WT% ASHK	WT% ASHK	F.S.I.	FSI	
1.76	75.90	7.90	75.80	7.90	24.20	58.80
4.5	4.5	4.5	4.5	4.5	4.5	4.5
****	24.20	58.80	100.00	20.22	*****	1.0

FROTH FLOTATION

TIME	WT%	ASH%	CUM. FLOATS	F.S.I.	CUM
45	64.00	9.00	44.00	9.00	5.5
90	15.10	16.50	79.10	10.43	3.5
135	7.00	24.60	86.10	11.58	1.5
180	8.10	37.70	94.20	13.83	1.0
225	5.80	55.30	100.00	16.23	1.0

DRILL HOLE #: SD 7712 SEAM: 1L

FLUIDITY

START TEMP.	456.0	SOFT. TEMP.	395.0
FINAL TEMP.	498.0	SOLID. TEMP.	*****
MAX. FLUIDITY TEMP.	477.0	MAX. CONTRACTION	23.0
MAX. FLUIDITY (NDPM)	4.0	MAX. DILATATION	*****
MAX. FLUIDITY (LOG)	.602	G. FACTOR	*****

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	INTERVAL	AIR DRIED BASIS
77-8027	139.40-140.41	
		WT% ASHK
1.5 FLOAT	76.30	8.00
1.5 SINK	23.70	56.10
TOTAL	100.00	19.40
DRY BASIS	8.03	18.88
D.M.M.F. BASIS	-	19.80

PROJECT: SANON  
 DATE SAMPLED: 7/ 8/77  
 DRILL HOLE #1: 50 7712  
 LAR COMPOSITE #: 77-R02A-30 WT. R/R. 13.70

APFA:FAST  
 DATE ANALYSED: 8/10/77  
 SEAM: 2

DENISON COAL DATA

COMPOSITE DESCRIPTION	INTERVAL	MINING SECTION
INTERVAL	106.42-111.78	106.42-111.78
THICKNESS	5.36	5.36
NTP	20	20
COAL/COAL+GROY	4.30/ 5.04	4.30/ 5.04
DRILL CORE RECOVERY	93.00%	93.00%
ESTIMATED YIELD	55.00	

WAPNOCK HERSEY ANALYSES

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0
SIZE	SP.G. 1.54	SP.G. 1.76	135 SECS
CUTPOINT	29.2	17.8	5.0
CONTRIBUTION			

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
	52.00		

MOISTURE	ASH	VOLATILE	F.C.
.70	8.30	20.54	70.60
8.36	20.54	71.10	
21.70	78.30		
SULPHUR	.46		
PHOSPHORUS	.025		
S.P.G.	1.750		
F.C.I.	7.0		
WAPNOCK	*****		

HEAN ANALYSIS - COMPOSITE RAW COAL

MOISTURE	ASH	VOLATILE	F.C.
.60	37.20	16.00	46.20
37.42	16.10	46.48	
21.83	78.17		
F.C.I.	2.0		
SULPHUR	.74		
SP.G. (-1/8 MESH)	1.65		
PHOSPHORUS	.035		

DRILL HOLE #1: 50 7712 SEAM: 2

FLOAT SINK ANALYSES

SP.G.	WT%	ASH%	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
1.40	25.30	5.00	25.30	5.00	74.70	58.10
1.50	10.70	12.70	36.00	7.29	64.00	65.69
1.54	4.40	22.00	40.60	8.96	59.40	69.08
1.60	3.00	28.70	43.60	10.31	56.40	71.23
1.80	9.20	41.60	52.80	15.77	47.20	77.00
****	47.20	77.00	100.00	44.67	*****	1.0

SIZE REL. WEIGHT

SP.G.	WT%	ASH%	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
1.40	58.50	3.70	58.50	3.70	41.50	43.72
1.50	12.30	11.90	70.80	5.12	29.20	57.13
1.60	4.10	19.30	74.90	5.90	25.10	63.31
1.76	4.40	31.00	79.30	7.29	20.70	70.18
1.90	4.10	38.50	83.40	8.83	16.60	78.00
****	16.60	78.00	100.00	20.31	*****	3.0

FROTH FLOTATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS
100 X 0	5.70		
TIME	WT%	ASH%	F.S.I.
45	63.30	7.80	63.30
90	15.50	20.00	78.80
135	8.70	36.10	87.50
180	5.70	50.80	93.20
225	6.80	68.60	100.00

DRILL HOLE #1: 50 7712 SEAM: 2

FLUIDITY	DILATATION
START TEMP. 444.0	SOFT. TEMP. 401.0
FINAL TEMP. 584.0	SOLID. TEMP. 482.0
MAX. FLUIDITY TEMP. 485.0	MAX. CONTRACTION 28.0
MAX. FLUIDITY (NDPM) 7.0	MAX. DILATATION -4.0
MAX. FLUIDITY (LOG) .845	G. FACTOR .891

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	INTERVAL	AIR DRIED BASIS
77-R02B	106.42-109.10	
		WT% ASH% MOIST VOL. F.C. S. F.S.I.
1.5 FLOAT	59.00	8.80 .50 19.80 70.90 .45 8.0
1.5 SINK	41.00	47.94
TOTAL	100.00	24.40
DRY BASIS	8.84	19.90 71.26
D.M.M.F. BASIS	-	21.08 78.92

COMPONENT NO.	INTERVAL	AIR DRIED BASIS
77-R029	109.10-109.70	
		WT% ASH% MOIST VOL. F.C. S. F.S.I.
1.5 FLOAT	*****	*****
1.5 SINK	*****	*****
TOTAL	100.00	77.40

COMPONENT NO.	INTERVAL	AIR DRIED BASIS
77-R030	109.70-111.78	
		WT% ASH% MOIST VOL. F.C. S. F.S.I.
1.5 FLOAT	66.90	6.20 .90 21.10 71.80 .49 8.0
1.5 SINK	33.10	56.05
TOTAL	100.00	22.70
DRY BASIS	6.26	21.29 72.45
D.M.M.F. BASIS	-	22.15 77.85

COAL ANALYSIS PREPARED BY  
 WAPNOCK HERSEY PROFESSIONAL SERVICES LTD  
 SIGNED:

PROJCT: SAKON APFA: EAST  
 DATE SAMPLED: 7/ 8/77 DATE ANALYSED: 8/10/77  
 DRILL HOLE #: SD 7712 SFAM: 4  
 LAB COMPOSITE #: 77-R031-33 WT. REC. 40.60

DENTSON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION
INTERVAL : 39.22-53.33	39.22-53.33
THICKNESS : 14.11	14.11
ATP : 14	14
COAL/COAL ROCK : 13.39/13.67	13.39/13.67
DRILL CORE RECOVERY : 92.00%	92.00 %
ESTIMATED YIELD : 82.00	

WARNOCK HFRSEY ANALYSSES

SIMULATED PRODUCT	3/8 X 2R	28 X 100	100 X 0
SIZE	SP.G. 1.54	SP.G. 1.76	135 SECS
CUTPOINT	52.7	20.1	9.3
CONTRIBUTION			

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
	82.10		

MOISTURE	ASH	VOLATILE	F.C.
.80	7.70	20.80	70.70
	7.76	20.97	71.27
		22.07	77.93

SULPHUR	PHOSPHORUS	S.P.G.	F.S.I.	HARDGROVE
.44	.016	1.710	6.0	*****

MFAD ANALYSIS - COMPOSITE RAW COAL

MOISTURE	ASH	VOLATILE	F.C.
.50	15.80	20.00	63.70
	15.88	20.10	64.02
		22.59	77.61

F.S.I.	SULPHUR	SP.G. (-3/8 MESH)	PHOSPHOROUS
4.0	.41	1.77	.012

DRILL HOLE #: SD 7712 SFAM: 4

FLOAT SINK ANALYSYS

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
3/8 X 2R	64.20				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	FSI
1.40	42.20 5.40	62.20 5.40	37.80 36.43	6.5	6.5
1.50	10.10 14.70	72.30 6.70	27.70 44.36	1.5	6.0
1.54	5.00 21.80	77.30 7.68	22.70 49.33	1.0	6.0
1.60	4.40 27.30	81.70 8.73	18.30 54.62	1.0	5.5
1.80	8.70 34.90	90.40 11.25	9.60 72.50	1.0	4.5
****	9.60 72.50	100.00 17.13	*****		3.5

SIZE REL. WEIGHT

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
2R X 100	21.90				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	FSI
1.40	71.00 4.30	71.00 4.30	29.00 28.43	7.5	7.5
1.50	12.70 11.80	83.30 5.41	16.70 40.68	2.0	7.0
1.60	5.40 12.40	88.70 5.83	11.30 54.20	1.5	6.5
1.76	2.90 34.20	91.60 6.73	8.40 61.10	1.0	6.5
1.90	2.40 39.60	94.00 7.57	6.00 69.70	1.0	6.0
****	6.00 69.70	100.00 11.30	*****		4.5

FROTH FLOATATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
100 X 0	9.90				
TIME	WT% ASH%	WT% ASH%	F.S.I.	FSI	
45	57.90 6.80	57.90 6.80	6.0	6.0	
90	27.90 13.40	85.80 8.95	5.0	6.0	
135	8.20 23.00	94.00 10.17	2.5	5.5	
180	3.70 37.30	97.30 11.09	1.0	5.0	
225	2.70 47.00	100.00 12.33	1.0	5.0	

DRILL HOLE #: SD 7712 SFAM: 4

FLUIDITY	DATA TO
START TEMP.	450.0
FINAL TEMP.	498.0
MAX. FLUIDITY TEMP.	478.0
MAX. FLUIDITY (DDPM)	3.0
MAX. FLUIDITY (LOG)	.477
SOFT TEMP.	409.0
SOLID TEMP.	*****
MAX. CONTRACTION	24.0
MAX. DILATATION	*****
G. FACTOR	*****

1.5 FLOAT/SINK ANALYSIS OF SFAM COMPONENTS

COMPONENT NO.	INTERVAL	AIR DRIED BASIS	F.C.	S. F.S.I.
77-8031	39.22-52.44			
WT% ASH%	MOIST VOL.	F.C.	S. F.S.I.	
1.5 FLOAT	81.00 5.60	.90 22.20 71.30	.52 9.0	
1.5 SINK	19.00 39.78			
TOTAL	100.00 12.00			

DRY BASIS	D.M.M.F. BASIS
5.65	22.40 71.95
-	23.22 76.78

COMPONENT NO.	INTERVAL	AIR DRIED BASIS	F.C.	S. F.S.I.
77-8032	52.44-52.78			
WT% ASH%	MOIST VOL.	F.C.	S. F.S.I.	
1.5 FLOAT	2.70 7.50	*****	1.01 8.5	
1.5 SINK	97.30 83.86			
TOTAL	100.00 81.80			

COMPONENT NO.	INTERVAL	AIR DRIED BASIS	F.C.	S. F.S.I.
77-8033	52.78-53.33			
WT% ASH%	MOIST VOL.	F.C.	S. F.S.I.	
1.5 FLOAT	78.50 6.50	1.00 22.00 70.50	.30 7.5	
1.5 SINK	61.50 71.70			
TOTAL	100.00 46.60			

DRY BASIS	D.M.M.F. BASIS
6.47	22.22 71.21
-	23.26 76.74

COAL ANALYSIS PREPARED BY  
 WARNOCK HFRSEY PROFESSIONAL SERVICES LTD  
 SIGNED:

S A X O N - COAL - PROJECT

Signification of sample	Saxon 76-4-1	Saxon 76-4-2	Saxon 76-4-4	Moun- tain	Loh- berg	Hugo	Mixture C	Mixture D	Mixture E	Mixture F	Mixture G
EB-No.	32	34	36	154	155	156	179	180	195	194	181
Date - 1977 -	4.3.	4.3.	4.3.	14.3.	14.3.	14.3.	15.3.	15.3.	16.3.	16.3.	15.3.
<b>Size analysis</b>											
> 10 mm	5.0	7.5	5.8	31.1	1.7	0.6	0	0.4	0.4	0.2	0.6
10 - 6.3 mm	8.1	10.7	7.2	11.7	12.0	4.3	2.7	4.9	3.3	2.5	3.7
6.3 - 3.15 mm	19.8	19.5	13.0	18.4	23.3	11.7	12.6	12.1	16.3	15.9	14.3
3.15 - 2 mm	7.9	7.5	5.9	5.1	8.0	4.9	6.9	5.9	8.7	9.3	8.1
2 - 1 mm	26.0	22.0	21.4	12.8	23.0	17.8	27.6	19.0	27.5	28.7	25.1
1 - 0.5 mm	16.0	12.5	15.4	7.0	11.0	19.0	19.6	17.6	16.7	17.2	17.4
0.5 - 0.2 mm	11.5	10.2	15.0	6.3	8.7	21.2	15.5	20.9	14.1	13.9	16.3
< 0.2 mm	5.7	10.1	16.3	7.6	12.3	20.5	15.1	19.2	13.0	12.3	14.5
Moisture %	0.8	1.5	1.5	5.8	1.8	1.4	1.2	1.0	1.3	0.8	1.1
Ash % dry	8.5	7.7	8.5	7.1	5.8	8.9	6.7	9.1	7.5	7.7	8.1
Volatile Matter % dry	19.8	27.5	24.0	32.3	31.9	24.4	28.5	23.7	29.7	28.3	26.0
Volatile Matter % d.a.f.	21.6	29.8	26.2	34.8	33.9	26.8	30.5	26.1	32.1	30.6	28.3
Sulphur % dry	0.45	0.34	0.38	0.86	1.01	0.95	0.84	0.77	0.69	0.61	0.68
Phosphorus % dry	0.059	0.027	0.033	0.008	0.021	0.023	0.026	0.030	0.018	0.023	0.037
Swelling Index	4 1/2	6 1/2	7 1/2	8	7 1/2	8	7 1/2	8	7 1/2	7 1/2	7
<b>Dilatometer Test</b>											
Softening Temp. °C	422	370	389	358	370	379	380	386	364	371	383
Solidification T. °C	491	458	460	455	443	464	457	457	449	464	461
Contraction %	31	32	32	27	30	27	31	25	26	31	30
Dilatation %	-3	73	31	174	76	102	35	65	110	57	44
G-Value	0.915	1.043	1.007	1.095	1.040	1.062	1.005	1.038	1.069	1.034	1.017
<b>Max. Fluidity</b>											
Softening Temp. °C	4	415	54	22200	2100	610	1060	225	2800	685	234
Temp. of max. Fluidity °C	477	444	462	423	435	447	441	453	432	435	444
Solidification T. °C	498	480	489	465	471	480	471	492	468	474	483
Solidification T. °C	513	510	510	510	504	>510	507	>510	510	510	510
<b>Maceral Group Analysis</b>											
Vitrinite Vol.-%	52	48	59	61	59	62	59	58	59	57	51
Exinite Vol.-%	1	6	3	14	13	9	13	7	13	9	11
Inertinite Vol.-%	41	39	31	20	23	23	24	30	21	27	32
Minerals Vol.-%	6	7	7	5	5	6	4	5	7	7	6
<b>Reflectance</b>											
Anlage	1	2	3	4	5	6	7	8	9	10	11
R <sub>m</sub> %	1.37	1.06	1.14	0.94	0.96	1.18	1.02	1.18	0.96	1.01	1.09
<b>Hardgrove-Index</b>											
°H	120	85	100	72	63	68	74	96	79	81	86



PROJECT: SAKON AREA: SOUTH
DATE SAMPLED: 6/ 9/77 DATE ANALYSED: 8/10/77
DRILL HOLE #: 50 7713 SFAM: 2
LAB COMPOSITE #: 77-8402-04 WT. REC. 1A,10

DENISON COAL DATA

Table with columns: COMPOSITE DESCRIPTION, INTERVAL, MINING SECTION, THICKNESS, etc.

WARNOCK HERSEY ANALYSIS

Table with columns: SIZED PRODUCT, SIZE, CUTPOINT, CONTRIBUTION, YIELD, AIR DRIED, DRY BASIS, D.M.M.F., etc.

HEAD ANALYSIS - COMPOSITE RAW COAL

Table with columns: AIR DRIED, DRY BASIS, D.M.M.F., etc.

DRILL HOLE #: 50 7713 SEAM: 2

FLOAT SINK ANALYSIS

Table with columns: SIZE, REL. WEIGHT, SP.G., WT%, ASH%, CUM. FLOATS, CUM. SINKS, etc.

PROTH FLOATATION

Table with columns: SIZE, REL. WEIGHT, TIME, WT%, ASH%, CUM. FLOATS, CUM. SINKS, etc.

DRILL HOLE #: 50 7713 SFAM: 2

Table with columns: FLUIDITY, D.L.A.M.O., START TEMP., SOFT TEMP., FINAL TEMP., SOLID TEMP., etc.

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S. F.S.I., DRY BASIS, D.M.M.F. BASIS, etc.

COAL ANALYSIS PREPARED BY WARNOCK HERSEY PROFESSIONAL SERVICES LTD SIGNED:

PROJECT: SAXON  
 DATE SAMPLED: 4/ 8/77  
 DRILL HOLE #: 50 7713  
 LAB COMPOSITE #: 77-8405-07 WT. RFC. 2.10

AREA: SOUTH  
 DATE ANALYSED: 8/10/77  
 SFAM: 7

DENTSON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION
INTERVAL : 218.20-219.95	218.20-219.95
THICKNESS : 1.75	1.75
Q.P. : 53	53
COAL/COAL+ROCK : .71/ 1.05	.71/ 1.05
DRILL CORP RECOVERY: 30.00%	30.00 %
ESTIMATED YIELD :	67.00

WARNOCK HFERSEY ANALYSES

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 8
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SECS
CONTRIBUTION	10.9	9.8	7.1
YIELD	AIR DRIED 34.80	DRY BASIS	D.M.M.F.
MOISTURE	.50		
ASH	11.60	11.66	
VOLATILE	27.10	27.24	29.87
F.C.	60.80	61.11	70.13
SULPHUR	.82		
PHOSPHORUS	.012		
S.P.G.	0.		
F.S.I.	7.0		
HARGRAVE	*****		

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.70		
ASH	42.20	42.50	
VOLATILE	17.30	17.42	25.64
F.C.	39.80	40.08	74.36
F.S.I.	7.0		
SULPHUR	.58		
SP.G. (-3/8 MESH)	1.72		
PHOSPHOROUS	.010		

DRILL HOLE #: 50 7713 SFAM: 3

FLOAT/SINK ANALYSIS

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	CUM. F.S.I.	FSI
3/8 X 28	69.40				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	FSI
1.54	28.70 12.00	28.70 12.00	71.30 61.90	6.5	6.5
****	71.30 61.90	100.00 47.58	*****		2.0

SIZE REL. WEIGHT

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	CUM. F.S.I.	FSI
28 X 100	20.70				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	FSI
1.76	47.30 8.00	47.30 8.00	52.70 79.00	7.0	7.0
****	52.70 79.00	100.00 45.42	*****		3.5

FROTH FLOTATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	CUM. F.S.I.	FSI
100 X 0	9.90				
TIME	WT% ASH%	WT% ASH%	F.S.I.	FSI	
45	35.10 8.00	35.10 8.00	7.5	7.5	
90	22.10 19.20	57.20 12.33	4.0	7.0	
135	14.30 32.60	71.50 16.38	1.0	6.5	
180	15.50 58.20	87.00 23.83	1.0	5.5	
225	13.00 74.50	100.00 30.42	*****	4.0	

DRILL HOLE #: 50 7713 SFAM: 3

FLUIDITY DILATATION

START TEMP. *****	SOFT TEMP. *****
FINAL TEMP. *****	SOLID TEMP. *****
MAX FLUIDITY TEMP. *****	MAX CONTRACTION *****
MAX FLUIDITY (RPH) *****	MAX DILATATION *****
MAX FLUIDITY (LOG) *****	G. FACTOR *****

1.5-FLOAT/SINK ANALYSIS OF SFAM COMPONENTS

COMPONENT NO.	INTERVAL	AIR DRIED BASIS	WT% ASH%	MOIST VOL.	F.C.	S.	F.S.I.
77-8405	218.20-218.85						
1.5 FLOAT	83.10 10.00	.70 27.00	62.30	.79	7.5		
1.5 SINK	16.90 34.85						
TOTAL	100.00 14.20						

DRY BASIS	10.07	27.19	62.74
D.M.M.F. BASIS	-	29.39	70.61

COMPONENT NO.	INTERVAL	AIR DRIED BASIS	WT% ASH%	MOIST VOL.	F.C.	S.	F.S.I.
77-8406	218.85-219.03						
1.5 FLOAT	*****						
1.5 SINK	*****						
TOTAL	100.00	*****					

COMPONENT NO.	INTERVAL	AIR DRIED BASIS	WT% ASH%	MOIST VOL.	F.C.	S.	F.S.I.
77-8407	219.03-219.95						
1.5 FLOAT	25.50 7.20	.80 28.60	63.40	.90	8.5		
1.5 SINK	74.50 52.43						
TOTAL	100.00 40.90						

DRY BASIS	7.26	28.83	63.91
D.M.M.F. BASIS	-	30.42	69.58

COAL ANALYSIS PREPARED BY  
 WARNOCK HFERSEY PROFESSIONAL SERVICES LTD  
 SIGNED:

PROJECT: SAKON ARFA: SOUTH
DATE ANALYSIS: 8/10/77
DRILL HOLE #: SD 7713 SFAM: 4U
LAB COMPOSITE #: 77-8400-11 WT. REC. 16.50

DENISON COAL DATA

Table with columns: COMPOSITE DESCRIPTION, INTERVAL, MINING SECTION. Rows include Thickness, DIP, Coal/Coal-Rock, Drill Core Recovery, Estimated Yield.

WAPNOCK HERSEY ANALYSES

Table with columns: SIMULATED PRODUCT, SIZE, CUTPOINT, CONTRIBUTION, AIR DRIED, DRY BASIS, D.M.M.F., MOISTURE, ASH, VOLATILE, F.C., SULPHUR, PHOSPHORUS, S.P.G., F.S.I., WAPNOCK.

HEAD ANALYSIS - COMPOSITE RAW COAL

Table with columns: AIR DRIED, DRY BASIS, D.M.M.F., MOISTURE, ASH, VOLATILE, F.C., F.S.I., SULPHUR, SP.GR. (-3/8 HFSM), PHOSPHORUS.

DRILL HOLE #: SD 7713 SEAM: 4U

FLOAT SINK ANALYSES
SIZE, PFI, WEIGHT
3/8 X 28 69.10

Table with columns: SP.G., WTK, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI. Rows for sizes 1.40, 1.40, 1.4A, 1.40, 1.40, 1.40.

SIZE, REL. WEIGHT
28 X 100 23.60

Table with columns: SP.G., WTK, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI. Rows for sizes 1.40, 1.40, 1.40, 1.76, 1.90, 1.90.

FROTH FLOTATION

Table with columns: SIZE, REL. WEIGHT, TIME, WTK, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI. Rows for sizes 100 X 0, 45, 90, 135, 180, 260.

DRILL HOLE #: SD 7713 SEAM: 4U

FLUIDITY DILATATION

Table with columns: START TEMP., FINAL TEMP., MAX. FLUIDITY TEMP., MAX. FLUIDITY (HDDM), MAX. FLUIDITY (LOG), SOFT TEMP., SOLID TEMP., MAX. CONTRACTION, MAX. DILATATION, G. FACTOR.

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WTK, ASH%, MOIST VOL., F.C., S. F.S.I., 1.5 FLOAT, 1.5 SINK, TOTAL, DRY BASIS, D.M.M.F. BASIS.

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WTK, ASH%, MOIST VOL., F.C., S. F.S.I., 1.5 FLOAT, 1.5 SINK, TOTAL, DRY BASIS, D.M.M.F. BASIS.

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WTK, ASH%, MOIST VOL., F.C., S. F.S.I., 1.5 FLOAT, 1.5 SINK, TOTAL, DRY BASIS, D.M.M.F. BASIS.

DRILL HOLE #: SD 7713 SEAM: 4U

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WTK, ASH%, MOIST VOL., F.C., S. F.S.I., 1.5 FLOAT, 1.5 SINK, TOTAL, DRY BASIS, D.M.M.F. BASIS.

## PROJECT: SAISON

APFA: SMITH

DATE SAMPLED: 4/ 8/77

DATE ANALYSED: 8/10/77

DRILL HOLE #: 50 7713

SEAM: 4L

LAB COMPOSITE #:

77-RA12 WT. REC. 4.20

## DENISON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION	
	181.15-182.75	181.15-182.75
INTERVAL		
THICKNESS	1.60	1.60
BT	56	56
COAL/COAL ROCK	.61/ .88	.61/ .88
DRILL CORE RECOVERY	84.00%	84.00 %
ESTIMATED YIELD	73.00	

## WARNOCK HERSEY ANALYSES

## SIMULATED PRODUCT

SIZE	3/8 X 28	28 X 100	100 X 0
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SECS
CONTRIBUTION	47.8	17.3	6.0

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
	71.10		

MOISTURE	ASH	VOLATILE	F.C.
.60	5.30	28.37	65.90
	5.33	28.48	66.30
		29.48	70.52
SULPHUR	.67		
PHOSPHORUS	.006		
S.P.G.	1.300		
F.S.I.	8.0		
HARGROVE	*****		

## WFAO ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.80		
ASH	24.00	24.19	
VOLATILE	22.70	22.88	28.14
F.C.	52.50	52.92	71.86
F.S.I.	7.0		
SULPHUR	.64		
S.P.G. (-3/8 MESH)	1.44		
PHOSPHOROUS	.007		

DRILL HOLE #: 50 7713

SEAM: 4L

## FLOAT SINK ANALYSES

SIZE	REL. WEIGHT		CUM. FLOATS		CUM. SINKS		F.S.I.	CUM FSI
3/8 X 28	WT%	ASH%	WT%	ASH%	WT%	ASH%		
1.40	62.00	4.60	62.00	4.60	38.00	61.20	8.0	8.0
1.50	5.40	14.40	67.40	5.39	32.60	68.95	4.0	7.4
1.54	1.90	20.60	69.30	5.90	30.70	71.05	3.5	7.5
1.60	1.60	27.30	70.90	6.29	29.10	74.40	1.0	7.5
1.80	2.70	39.20	73.60	7.49	26.40	78.00	1.0	7.5
****	24.40	78.00	100.00	26.11	*****	*****		6.0

## SIZE REL. WEIGHT

SIZE	REL. WEIGHT		CUM. FLOATS		CUM. SINKS		F.S.I.	CUM FSI
28 X 100	WT%	ASH%	WT%	ASH%	WT%	ASH%		
1.40	51.90	4.30	51.90	4.30	48.10	30.77	8.5	8.5
1.50-11.40	6.50	63.30	4.70	36.70	38.30	7.5	8.5	
1.60	9.40	9.60	72.70	5.33	27.30	48.19	6.5	8.5
1.76	5.10	15.60	77.80	6.00	22.20	59.67	6.0	8.5
1.90	2.90	26.20	80.70	6.73	19.30	60.10	2.5	8.5
****	19.30	60.10	100.00	17.03	*****	*****		7.5

## FROTH FLOATATION

SIZE	REL. WEIGHT		CUM. FLOATS		F.S.I.	CUM
100 X 0	WT%	ASH%	WT%	ASH%		
45	29.90	7.00	29.90	7.00	8.0	8.0
90	23.30	12.10	53.20	9.23	5.0	8.0
135	14.50	19.90	67.70	11.52	4.0	8.0
180	13.80	27.00	81.50	14.14	3.0	7.5
260	18.50	45.90	100.00	20.02	1.0	7.0

DRILL HOLE #: 50 7713

SEAM: 4L

## FLUIDITY:

## DILATATION:

START TEMP.	414.0	SOFT TEMP.	371.0
FINAL TEMP.	495.0	SOLID TEMP.	467.0
MAX. FLUIDITY TEMP.	445.0	MAX. CONTRACTION	27.0
MAX. FLUIDITY (DDPH)	454.0	MAX. DILATATION	100.0
MAX. FLUIDITY (LOG)	2.657	C.FACTOR	1.070

## 1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-RA12	INTERVAL	181.15-182.75	
AIR DRIED BASIS				
	WT%	ASH%	MOIST VOL. F.C.	S. F.S.I.
1.5 FLOAT	64.90	6.60	.70 28.20	64.50 .73 8.0
1.5 SINK	35.10	62.44		
TOTAL	100.00	26.20		
DRY BASIS	6.65		28.40	64.95
D.M.M.F. BASIS	-		29.84	70.16

PROJECT: SAXON  
 DATE SAMPLED: 4/ 8/77  
 DRILL HOLE #: 7713  
 LAB COMPOSITE #:

AREA: SOUTH  
 DATE ANALYSED: 0/ 0/ 0  
 SEAM: 5  
 WT. REC. 5.20

## DENISON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION	
INTERVAL	130.35-131.50	
THICKNESS	0.	1.15
STD		50
COAL / COAL+ROCK	0. / 0.	.44/ .61
DRILL CORE RECOVERY	0. %	63.00 %
RETRACTED YIELD	70.00	

## WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT  
 SIZE 3/8 X 2R 2R X 100 100 X 0  
 CUTPOINT

DRILL HOLE #: 7713

SEAM: 5

## FLUIDITY

## FLUIDITY

START TEMP.	*****	SOFT TEMP.	*****
FINAL TEMP.	*****	SOLID TEMP.	*****
MAX. FLUIDITY TEMP.	*****	MAX. CONTRACTION	*****
MAX. FLUIDITY (DDPH)	*****	MAX. INFLATION	*****
MAX. FLUIDITY (LOG)	*****	G. FACTOR	*****

## 1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-8413	INTERVAL	129.00-129.55
AIR DRIED BASIS			
WT%	ASH%	MOIST VOL.	F.C. S. F.S.I.
1.5 FLOAT	65.00	6.20	.90 27.20 65.70 .74 8.0
1.5 SINK	35.00	49.63	
TOTAL	100.00	21.40	

DRY BASIS 6.26 27.45 66.30  
 D.M.M.F. BASIS - 28.71 71.29

COMPONENT NO.	77-8414	INTERVAL	129.55-130.55
AIR DRIED BASIS			
WT%	ASH%	MOIST VOL.	F.C. S. F.S.I.
1.5 FLOAT	4.90	4.00	1.80 27.50 62.58 .85 9.0
1.5 SINK	95.10	69.99	
TOTAL	100.00	67.00	

DRY BASIS 9.09 27.78 63.13  
 D.M.M.F. BASIS - 29.77 70.23

COMPONENT NO.	77-8415	INTERVAL	130.55-131.50
AIR DRIED BASIS			
WT%	ASH%	MOIST VOL.	F.C. S. F.S.I.
1.5 FLOAT	7.40	8.60	.80 27.60 63.80 .85 8.0
1.5 SINK	92.60	65.19	
TOTAL	100.00	61.00	

DRY BASIS 8.67 27.82 63.51  
 D.M.M.F. BASIS - 29.71 70.29

COAL ANALYSIS PREPARED BY  
 WARNOCK HERSEY PROFESSIONAL SERVICES LTD  
 SIGNED:

PROJECT: 5474M AREA: SOUTH  
 DATE SAMPLED: 26/ 8/77 DATE ANALYSED: 26/ 8/77  
 DRILL HOLE #: 7714 SEAM: 2  
 LAB COMPOSITE #: 77-A022-A024 WT. RFC. 22.70

DENISON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION	
INTERVAL	46.66-54.44	46.66-54.44
THICKNESS	7.78	7.78
DTP	20	20
COAL/COAL ROCK	6.68/ 7.20	6.68/ 7.20
DRILL CORP RECOVERY	96.00%	96.00%
FSTT/MATHD YIELD	86.00	

WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT	3/8 X 28	2R X 100	100 X 0	
SIZE				
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SECS	1.80 SPG
CONTRIBUTION	59.1	19.1	8.1	

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
	86.30		

MOISTURE	ASH	VOLATILE	F.C.
.80	6.70	24.80	67.70
	6.75	25.00	68.25
		26.30	73.70

SULPHUR	.31
PHOSPHORUS	.024
S.P.G.	1.340
F.S.I.	7.5
HARDGROVE	80.20

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.80		
ASH	15.50	15.63	
VOLATILE	21.80	21.98	24.81
F.C.	61.90	62.40	75.19

F.S.I.	7.0
SULPHUR	.38
SP.G. (-7/8 MESH)	1.43
PHOSPHORUS	.016

DRILL HOLE #: 7714 SEAM: 2

FLOAT SINK ANALYSIS  
 3/8 X 28

SP.G.	WT%	ASH%	CUM. WT%	FLOATS	CUM. SINKS	WT%	ASH%	F.S.I.	FSI
1.40	75.10	5.50	75.10	5.50	24.90	52.37	7.5	7.5	
1.50	7.90	15.80	83.00	6.48	17.00	69.36	1.5	7.0	
1.54	1.00	19.40	84.00	6.63	16.00	72.49	1.0	7.0	
1.60	1.00	22.20	85.00	6.82	15.00	75.84	1.0	7.0	
1.80	2.30	35.20	87.30	7.47	12.70	83.20	1.0	6.5	
****	12.70	83.20	100.00	17.17				6.0	

SIZE REL. WEIGHT  
 2R X 100

SP.G.	WT%	ASH%	CUM. WT%	FLOATS	CUM. SINKS	WT%	ASH%	F.S.I.	FSI
1.40	79.80	3.90	79.80	3.90	20.20	34.39	8.5	8.5	
1.50	5.50	10.70	85.30	4.34	14.70	43.25	2.5	8.5	
1.60	4.50	13.10	89.80	4.78	10.20	56.55	1.5	8.0	
1.76	2.20	20.50	92.00	5.15	8.00	66.46	1.0	8.0	
1.90	.70	25.40	92.70	5.31	7.30	70.40	1.0	8.0	
****	7.30	70.40	100.00	10.04				7.0	

FROTH FLOTATION  
 SIZE REL. WEIGHT  
 100 X 0

TIME	WT%	ASH%	CUM. WT%	FLOATS	CUM. SINKS	WT%	ASH%	F.S.I.	FSI
45	76.70	6.00	76.70	6.00	8.0	8.0			
90	11.60	15.90	88.30	7.30	3.5	8.0			
135	4.00	15.60	92.30	8.53	2.0	7.5			
180	3.00	58.70	95.30	10.11	1.5	7.5			
225	4.70	71.40	100.00	12.99	1.0	7.0			

CENTRIFUGE SEPARATION

SIZE	REL. WEIGHT	CUM. WT%	FLOATS	CUM. SINKS	WT%	ASH%	F.S.I.	FSI
100 X 0	4.40							
SP.G.	WT%	ASH%	WT%	ASH%	WT%	ASH%	F.S.I.	FSI
1.40	80.80	4.50	80.80	4.50	19.20	46.56	8.5	8.5
1.50	6.70	18.70	87.50	5.59	12.50	61.50	3.0	8.0
1.60	2.10	18.90	89.60	5.90	10.40	70.10	1.5	8.0
1.80	1.80	28.10	91.40	6.34	8.60	78.89	1.0	8.0
1.90	.60	45.40	92.00	6.59	8.00	81.40	1.0	8.0
****	8.00	81.40	100.00	12.58				7.5

DRILL HOLE #: 7714 SEAM: 2

FLUIDITY

START TEMP.	461.0	SOFT TEMP.	390.0
FINAL TEMP.	493.0	SOLID TEMP.	471.0
MAX. FLUIDITY TEMP.	483.0	MAX. CONTRACTION	21.0
MAX. FLUIDITY (DMPH)	10.0	MAX. DILATATION	9.0
MAX. FLUIDITY (LOG)	1.000	G. FACTOR	.947

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	INTERVAL	AIR DRIED BASIS	WT%	ASH%	MOIST VOL.	F.C.	S.	F.S.I.
77-6024	46.66-48.76							
1.5 FLOAT	94.90	5.70	1.20	25.40	67.70	.36	7.5	
1.5 SINK	5.10	17.46						
TOTAL	100.00	6.70						

DRY BASIS	5.77	25.71	68.52
D.M.M.F. BASIS	-	26.83	73.17

COMPONENT NO.	INTERVAL	AIR DRIED BASIS	WT%	ASH%	MOIST VOL.	F.C.	S.	F.S.I.
77-6023	48.76-49.32							
1.5 FLOAT	2.10	9.50	1.00	24.80	64.70	.34	8.0	
1.5 SINK	97.90	73.54						
TOTAL	100.00	72.20						

DRY BASIS	9.60	25.05	65.35
D.M.M.F. BASIS	-	26.99	73.01

COMPONENT NO.	INTERVAL	AIR DRIED BASIS	WT%	ASH%	MOIST VOL.	F.C.	S.	F.S.I.
77-6022	49.32-54.44							
1.5 FLOAT	93.80	7.00	.80	25.10	67.10	.28	7.0	
1.5 SINK	6.20	36.03						
TOTAL	100.00	8.80						

DRY BASIS	7.06	25.30	67.64
D.M.M.F. BASIS	-	26.70	73.30

PROJECT: SAXON AREA: EAST  
 DATE SAMPLED: 4/ 8/77 DATE ANALYSED: 8/10/77  
 DRILL HOLE #: SD 7715 SEAM: 1U  
 LAB COMPOSITE #: 77-R034 WT. RFC. 7.80

DENTSON COAL DATA

COMPOSITE DESCRIPTION	209.63-211.85	MINING SECTION	209.63-211.85
INTERVAL			
THICKNESS	2.22		2.22
TOP	20		20
COAL/COAL-ROCK	2.08/ 2.08		2.08/ 2.08
DRILL CORE RECOVERY	100.00%		100.00 %
ESTIMATED YIELD	91.00		

WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0
SIZE			
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SECS
CONTRIBUTION	66.2	19.4	5.3

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
	90.90		

MOISTURE	ASH	VOLATILE	F.C.
.70	8.30	18.80	72.20
	8.36	18.93	72.71
		19.93	80.07

SULPHUR	.46
PHOSPHORUS	.006
S.P.G.	1.370
F.S.I.	4.5
HARDGROVE	*****

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.40		
ASH	11.80	11.85	
VOLATILE	18.30	18.37	19.84
F.C.	69.50	69.78	80.16

F.S.I.	3.5
SULPHUR	.42

SP.G. (-3/8 MESH)	1.40
PHOSPHOROUS	.019

DRILL HOLE #: SD 7715 SEAM: 1U

FLOAT SINK ANALYSES  
 SIZE 3/8 X 28 REL. WEIGHT 73.80

SP.G.	WT%	ASH%	CUM. FLOATS	WT%	ASH%	CUM. SINKS	WT%	ASH%	F.S.I.	CUM FSI
1.40	54.10	6.50	54.10	6.50	45.90	20.13	5.5	5.5		
1.50	28.60	12.10	82.70	8.44	17.30	33.41	1.5	4.5		
1.54	7.00	21.00	89.70	9.42	10.30	41.84	1.0	4.0		
1.60	3.00	27.30	92.70	10.00	7.30	47.82	1.0	4.0		
1.80	3.90	36.50	96.60	11.07	3.40	60.80	1.0	3.5		
***	3.40	40.80	100.00	12.76	*****	*****				3.0

SIZE 28 X 100 REL. WEIGHT 20.60

SP.G.	WT%	ASH%	CUM. FLOATS	WT%	ASH%	CUM. SINKS	WT%	ASH%	F.S.I.	CUM FSI
1.40	72.20	4.20	72.20	4.20	27.80	24.48	8.0	8.0		
1.50	11.90	13.00	84.10	5.45	15.90	33.07	1.5	7.0		
1.60	6.80	19.20	90.90	6.47	9.10	43.43	1.0	5.5		
1.76	3.20	28.50	94.10	7.22	5.90	51.53	1.0	5.0		
1.90	2.10	34.20	96.20	7.81	3.80	61.10	1.0	5.0		
***	3.80	61.10	100.00	9.84	*****	*****				4.5

FROTH FLOTATION  
 SIZE 100 X 0 REL. WEIGHT 5.60

TIME	WT%	ASH%	CUM. FLOATS	WT%	ASH%	F.S.I.	CUM FSI
45	73.70	8.00	73.70	8.00	5.5	5.5	
90	13.20	15.00	86.90	9.06	2.5	5.0	
135	7.00	26.10	93.90	10.33	2.0	4.5	
180	1.90	44.00	95.80	11.00	1.5	4.5	
225	4.70	44.50	100.00	12.41	1.0	3.5	

DRILL HOLE #: SD 7715 SEAM: 1U

FLUIDITY		DILATATION	
START TEMP.	456.0	SOFT TEMP.	418.0
FINAL TEMP.	500.0	SOLID TEMP.	*****
MAX. FLUIDITY TEMP.	484.0	MAX. CONTRACTION	24.0
MAX. FLUIDITY (DDPM)	3.0	MAX. DILATATION	*****
MAX. FLUIDITY (LOG)	.477	G. FACTOR	*****

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-R034	INTERVAL	209.63-211.85	AIR DRIED BASIS		
	WT%	ASH%	MOIST VOL.	F.C.	S.	F.S.I.
1.5 FLOAT	68.20	6.50	.60	18.80	74.10	.42 4.5
1.5 SINK	31.80	28.20				
TOTAL	100.00	13.40				
DRY BASIS	6.54		18.91	74.55		
D.M.M.F. BASIS			19.66	80.34		

PROJECT: SAXON  
 DATE SAMPLED: 4/ 8/77  
 DRILL HOLE #: SD 7715  
 LAB COMPOSITE #: 77-8035 WT. REC. 3.00

APFA: FAST  
 DATE ANALYSED: 9/10/77  
 SEAM: 1L

DENISON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION
INTERVAL : 217.76-218.71	217.76-218.71
THICKNESS :	.95
OTP :	.19
COAL/COAL+POCK :	.90/ .90
DRILL CORF RECOVERY :	100.00%
ESTIMATED YIELD :	91.00

WARNOCK HERSEY ANALYSSES

SIMULATED PRODUCT	1/8 X 2R	28 X 100	100 X 0
CUTPOINT CONTRIBUTION	SP.G. 1.54 71.3	SP.G. 1.76 16.1	135 SECS 5.2

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.60		
ASH	9.20	9.26	
VOLATILE	18.40	18.51	19.58
F.C.	71.80	72.23	80.42
SULPHUR	.51		
PHOSPHORUS	.004		
SP.G.	1.360		
F.S.I.	6.5		
HARDGROVE	*****		

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.40		
ASH	11.80	11.95	
VOLATILE	19.20	19.28	20.85
F.C.	68.60	68.88	79.15
F.S.I.	5.5		
SULPHUR	.50		
SP.G. (-3/8 MESH)	1.38		
PHOSPHOROUS	.018		

DRILL HOLE #: SD 7715 SEAM: 1L

FLOAT/SINK ANALYSSES

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	CUM. F.S.I.	FSI
3/8 X 2R	76.70				
SP.G.	WT% ASH	WT% ASH	WT% ASH	WT% ASH	F.S.I.
1.54	93.00	10.20	93.00	10.20	7.00
****	7.00	42.40	100.00	12.45	*****
					5.0
					4.5

SIZE REL. WEIGHT

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	CUM. F.S.I.	FSI
28 X 100	17.90				
SP.G.	WT% ASH	WT% ASH	WT% ASH	WT% ASH	F.S.I.
1.78	89.70	8.20	89.70	8.20	10.30
****	10.30	39.80	100.00	11.45	*****
					7.5
					6.0

FROTH FLOTATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	CUM. F.S.I.	FSI
100 X 0	5.40				
TIME	WT% ASH	WT% ASH	WT% ASH	F.S.I.	FSI
45	82.80	8.80	82.80	8.80	5.5
90	10.00	19.20	92.80	9.92	3.0
135	2.90	22.50	95.70	10.30	1.0
180	2.90	27.50	98.60	10.81	1.0
225	1.40	41.80	100.00	11.24	1.0

DRILL HOLE #: SD 7715 SEAM: 1L

FLUIDITY	DILATATION
START TEMP.	450.0
FINAL TEMP.	504.0
MAX. FLUIDITY TEMP.	482.0
MAX. FLUIDITY (DDPM)	9.0
MAX. FLUIDITY (LOG)	.954
SOFT TEMP.	412.0
SOLID TEMP.	490.0
MAX. CONTRACTION	27.0
MAX. DILATATION	-7.0
G. FACTOR	.871

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-8035	INTERVAL	217.76-218.71
		AIR DRIED BASIS	
		WT% ASH	MOIST VOL. F.C.
1.5 FLOAT	87.70	9.90	.50 19.80 69.80
1.5 SINK	12.30	19.66	.54 6.5
TOTAL	100.00	11.10	
DRY BASIS	9.95	19.90	70.15
D.M.M.F. BASIS	-	21.23	78.77



PROJECT: SAXON ARFAIFAST  
 DATE SAMPLED: 4/ 8/77 DATE ANALYSFD: 9/10/77  
 DRILL HOLE #: 50 7715 SEAM: 2  
 LAB COMPOSITE #: 77-R036-78 WT. REC. 13.50

DENISON COAL DATA

COMPOSITE DESCRIPTION	INTERVAL	MINING SECTION
	186.04-191.70	186.04-191.70
THICKNESS	5.66	5.66
DIP	14	14
COAL/COAL+ROCK	4.58/ 5.48	4.58/ 5.48
DRILL CORF RECOVERY	69.00%	76.00 %
ESTIMATED YIELD	50.00	

WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0
SIZE			
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SECS
CONTRIBUTION	41.0	19.6	6.5

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
	67.18		

MOISTURE	ASH	VOLATILE	F.C.
.80	7.10	19.40	72.70
7.16	19.56	73.29	20.40
			79.60

SULPHUR	PHOSPHORUS	S.P.G.	F.S.I.	HARDGROVE
.54	.014	1.360	6.5	*****

HEAD ANALYSIS - COMPOSITE RAW COAL

MOISTURE	ASH	VOLATILE	F.C.
.90	29.70	16.90	52.90
	29.85	16.98	53.17
			78.61

F.S.I.	SULPHUR
1.0	.36

SP. GR. (-1/8 MESH)	PHOSPHOROUS
1.56	.027

DRILL HOLE #: 50 7715 SEAM: 2

FLOAT/SINK ANALYSIS  
 SIZE REL. WEIGHT  
 3/8 X 28 71.90

SP.G.	WT%	ASH%	CUM. WT%	FLOATS WT%	ASH%	CUM. SINKS WT%	ASH%	F.S.I.	CUM FSI
1.40	29.40	4.80	29.40	4.80	70.60	50.43	7.5	7.5	
1.50	23.30	8.40	42.70	6.39	47.30	71.14	5.5	6.5	
1.54	4.40	21.20	47.10	7.53	42.90	76.24	1.0	6.0	
1.60	.40	28.60	47.50	7.68	42.50	76.71	1.0	6.0	
1.80	4.60	38.90	52.10	9.99	37.90	81.30	1.0	5.5	
****	37.90	81.30	100.00	37.02	*****			2.0	

SIZE REL. WEIGHT  
 28 X 100 20.90

SP.G.	WT%	ASH%	CUM. WT%	FLOATS WT%	ASH%	CUM. SINKS WT%	ASH%	F.S.I.	CUM FSI
1.40	78.60	3.60	78.60	3.60	21.40	33.15	8.5	8.5	
1.50	8.00	13.30	86.60	4.50	13.40	44.99	1.5	8.0	
1.60	3.90	22.40	90.50	5.27	9.50	54.27	1.0	7.5	
1.76	3.20	33.00	93.70	6.21	6.30	65.07	1.0	7.0	
1.90	1.90	39.30	95.60	6.87	4.40	76.20	1.0	7.0	
****	4.40	76.20	100.00	9.92	*****			5.0	

FPOTH FLOATATION

SIZE REL. WEIGHT	WT%	ASH%	CUM. WT%	FLOATS WT%	ASH%	F.S.I.	FSI
100 X 0 7.20							
TIME	45	64.70	6.40	64.70	6.40	5.5	5.5
	90	17.50	17.90	82.20	8.85	3.0	5.0
	135	8.70	30.60	90.90	10.93	1.0	4.5
	180	5.30	42.60	96.20	12.67	1.0	4.5
	225	3.80	68.30	100.00	14.79	*****	4.0

DRILL HOLE #: 50 7715 SEAM: 2

FLUIDITY

START TEMP.	450.0	SOFT TEMP.	416.0
FINAL TEMP.	501.0	SOLID TEMP.	488.0
MAX. FLUIDITY TEMP.	493.0	MAX. CONTRACTION	30.0
MAX. FLUIDITY (DDPH)	4.0	MAX. DILATION	-12.0
MAX. FLUIDITY (LOG)	.402	G. FACTOR	.843

DILATATION

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-R036	INTERVAL	186.04-189.34
		AIR DRIED BASIS	
	WT%	ASH%	MOIST VOL.
1.5 FLOAT	75.90	7.90	.60
1.5 SINK	24.10	40.68	19.60
TOTAL	100.00	14.80	71.90
		F.S.I.	.44
		S. F.S.I.	7.0

DRY BASIS	7.95	19.72	72.33
D.M.M.F. BASIS	-	20.74	79.26

COMPONENT NO.	77-R037	INTERVAL	189.34-190.19
		AIR DRIED BASIS	
	WT%	ASH%	MOIST VOL.
1.5 FLOAT	1.60	14.44	1.20
1.5 SINK	98.40	82.18	20.80
TOTAL	100.00	81.10	63.24
		F.S.I.	.68
		S. F.S.I.	8.5

DRY BASIS	14.98	21.05	63.97
D.M.M.F. BASIS	-	23.46	76.54

COMPONENT NO.	77-R038	INTERVAL	190.19-191.70
		AIR DRIED BASIS	
	WT%	ASH%	MOIST VOL.
1.5 FLOAT	83.40	5.30	1.40
1.5 SINK	16.60	42.05	21.10
TOTAL	100.00	11.40	72.20
		F.S.I.	.55
		S. F.S.I.	8.0

DRY BASIS	5.38	21.40	73.23
D.M.M.F. BASIS	-	22.10	77.90

PROJECT: SAKON AREA: EAST  
 DATE SAMPLED: 4/ 5/77 DATE ANALYSED: 9/10/77  
 DRILL HOLE #: 50 7715 SFAM: 4  
 LAB COMPOSITE #: 77-8039-41 WT. REC. 14.70

## DENISON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION	
	125.50-132.32	125.59-132.32
INTERVAL		
THICKNESS	6.73	6.73
DIP	20	20
COAL/COAL+POCK	6.04/ 6.28	6.04/ 6.28
DRILL CORE RECOVERY	74.00%	74.00 %
ESTIMATED YIELD	75.00	

## WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0
SIZE			
CUTPOINT	SP.G. 1.94	SP.G. 1.76	135 SECS
CONTRIBUTION	43.8	24.9	6.5

YIELD	AIR DRIED		D.M.M.F.
	75.20	DRY BASIS	
MOISTURE	.70		
ASH	6.10	6.14	
VOLATILE	20.30	20.44	21.24
F.C.	72.90	73.41	78.76
SULPHUR	.43		
PHOSPHOROUS	.024		
S.P.G.	1.330		
F.S.I.	6.5		
HARDGROVE	*****		

## HFAN ANALYSIS - COMPOSITE RAW COAL

MOISTURE	AIR DRIED		D.M.M.F.
	.50	DRY BASIS	
ASH	20.00	20.10	
VOLATILE	19.40	19.50	22.72
F.C.	60.10	60.40	77.20
F.S.I.	4.0		
SULPHUR	.38		
SP.G. (-3/8 MESH)	1.46		
PHOSPHOROUS	.028		

DRILL HOLE #: 50 7715

SEAM: 4

FLOAT SINK ANALYSES  
3/8 X 28

SP.G.	WT%	ASH%	CUM. FLOATS		CUM. SINKS		F.S.I.	FSI
			WT%	ASH%	WT%	ASH%		
1.40	55.90	4.80	55.90	4.80	44.10	54.87	6.5	6.5
1.50	74.00	13.10	62.90	5.72	37.10	62.75	1.5	6.0
1.54	3.50	22.10	66.40	6.59	33.60	66.99	1.0	6.0
1.60	2.80	28.20	69.20	7.46	30.80	70.51	1.0	6.0
1.80	8.60	39.40	75.80	10.24	24.20	79.00	1.0	5.0
****	24.20	79.00	100.00	26.88	*****	*****	*****	3.0

## 28 X 100

SP.G.	WT%	ASH%	CUM. FLOATS		CUM. SINKS		F.S.I.	FSI
			WT%	ASH%	WT%	ASH%		
1.40	77.20	3.50	77.20	3.50	22.80	32.60	7.5	7.5
1.50	94.30	11.40	88.50	4.35	13.50	47.21	1.5	7.0
1.60	3.90	19.60	90.40	5.01	9.60	58.42	1.0	7.0
1.76	1.80	30.30	92.20	5.50	7.80	64.92	1.0	7.0
1.90	1.50	42.30	93.70	6.09	6.30	70.30	1.0	7.0
****	6.30	70.30	100.00	10.14	*****	*****	*****	5.5

## FROTH FLOTATION

SIZE	REL. WEIGHT		CUM. FLOATS		F.S.I.	CUM
	100 X 0	7.00	WT%	ASH%		
TIME	WT%	ASH%	WT%	ASH%	F.S.I.	CUM
45	61.30	5.00	61.30	5.00	5.5	5.5
90	22.50	11.00	83.80	6.61	3.0	5.5
135	9.10	20.00	92.90	7.92	1.0	5.0
180	3.80	34.10	96.70	8.95	1.0	5.0
225	3.30	57.00	100.00	10.54	1.0	4.5

DRILL HOLE #: 50 7715

SFAM: 4

## FLUIDITY

## DILATATION

START TEMP.	456.0	SOFT TEMP.	408.0
FINAL TEMP.	498.0	SOLID TEMP.	486.0
MAX. FLUIDITY TEMP.	480.0	MAX. CONTRACTION	28.0
MAX. FLUIDITY (DDPM)	3.5	MAX. DILATATION	-22.0
MAX. FLUIDITY (LOG)	.544	G. FACTOR	.579

## 1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-8039	INTERVAL	125.59-125.79
		AIR DRIED BASIS	
	WT%	ASH%	MOIST VOL.
1.5 FLOAT	26.10	6.30	.80
1.5 SINK	73.90	67.19	68.60
TOTAL	100.00	51.30	.88

DRY BASIS	6.35	24.50	69.15
D.M.M.F. BASIS	-	25.51	74.49

COMPONENT NO. 77-8040 INTERVAL 125.79-126.05

	WT%	ASH%	MOIST VOL.	F.C.	S.	F.S.I.
1.5 FLOAT	*****	*****	*****	*****	*****	*****
1.5 SINK	*****	*****	*****	*****	*****	*****
TOTAL	100.00	72.80				

COMPONENT NO. 77-8041 INTERVAL 126.05-132.32

	WT%	ASH%	MOIST VOL.	F.C.	S.	F.S.I.
1.5 FLOAT	57.10	5.60	1.40	22.00	71.00	.45
1.5 SINK	42.90	40.10				7.0
TOTAL	100.00	20.40				

DRY BASIS	5.68	22.31	72.01
D.M.M.F. BASIS	-	23.15	76.85

COAL ANALYSIS PREPARED BY  
 WARNOCK HERSEY PROFESSIONAL SERVICES LTD  
 SIGNED:

PROJECT: SAXON  
DATE SAMPLED: 4/ 8/77  
DRILL HOLE #: 7715  
LAR COMPOSITE #1

AREA: EAST  
DATE ANALYSED: 0/ 0/ 0  
SFAM: 5  
WT. REC. 2.50

DENISON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION	
INTERVAL	77.59-78.51	
THICKNESS	0.	.92
DIP		21
COAL/COAL+ROCK	0. / 0.	.85/ .85
DRILL CORE RECOVERY	0. %	100.00 %
ESTIMATED YIELD	*****	

WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0
SIZE			
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SECS

DRILL HOLE #: 7715 SFAM: 5

DENISON COAL LIMITED

DRILL HOLE #: 7715 SFAM: 5

FLUIDITY	DILATATION
START TEMP. *****	SOFT TEMP. *****
FINAL TEMP. *****	SOLID TEMP. *****
MAX. FLUIDITY TEMP. *****	MAX. CONTRACTION *****
MAX. FLUIDITY (DDPM) *****	MAX. DILATATION *****
MAX. FLUIDITY (LOG) *****	G. FACTOR *****

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-8042	INTERVAL	77.59-78.51	AIR DRIED BASIS			
	WT% ASH%	MOIST VOL.	F.C.	S.	F.S.I.		
1.5 FLOAT	82.40	5.40	.90	22.00	71.70	.59	7.5
1.5 SINK	17.40	22.64					
TOTAL	100.00	8.40					

DRY BASIS	5.45	22.20	72.35
D.W.M.F. BASIS	-	22.95	77.05

PROJECT: Saxon  
DATE SAMPLED: 0/ 0/ 0  
DRILL HOLE #: 7715  
LAB COMPOSITE #:

AREA: EAST  
DATE ANALYSED: 0/ 0/ 0  
SEAM: 7  
WT. REC. 0.

DEWISON COAL DATA

COMPOSITE DESCRIPTION		MINING SECTION
INTERVAL		53.33-54.54
THICKNESS	0.	1.21
DIP		20
COAL/COAL+POCK	0. / 0.	1.09/ 1.13
DRILL CORE RECOVERY	0. %	0. %
ESTIMATED YIELD	*****	

WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT			
SIZE	3/8 X 20	20 X 100	100 X 0
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SECS

DRILL HOLE #: 7715

SEAM: 7

FLUIDITY

DILATATION

START TEMP.	*****	SOFT TEMP.	*****
FINAL TEMP.	*****	SOLID TEMP.	*****
MAX. FLUIDITY TEMP.	*****	MAX. CONTRACTION	*****
MAX. FLUIDITY (DDPH)	*****	MAX. DILATATION	*****
MAX. FLUIDITY (LOG)	*****	G. FACTOR	*****

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-8045	INTERVAL	53.33-54.54
		AIR DRIED BASIS	
	WT% ASH	MOIST VOL.	F.C. S. F.S.T.
1.5 FLOAT	69.20	4.50	.60 22.60 72.30 .64 8.5
1.5 SINK	30.80	63.77	
TOTAL	100.00	22.60	
DRY BASIS	4.53	22.74	72.74
D.M.W.F. BASIS	-	23.34	76.66

PROJECT: SAXON  
 DATE SAMPLED: 4/ 8/77  
 DRILL HOLE #: 7715  
 LAB COMPOSITE #:

ADFA:FAST  
 DATE ANALYSED: 0/ 0/ 0  
 SFAM: 10  
 WT. REC. 9.80

## DENISON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION	
INTERVAL	42.07-43.70	
THICKNESS	0.	1.63
DTP		18
COAL/COAL-ROCK	0. / 0.	1.25/ 1.54
DRILL CORE RECOVERY	0. %	100.00 %
ESTIMATED YIELD	*****	

## WARNOCK HERSBY ANALYSIS

SIMULATED PRODUCT	7/8 X 28	28 X 100	100 X 0
SIZE			
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SECS

DRILL HOLE #: 7715

SFAM: 10

## DENISON COAL LIMITED

DRILL HOLE #: 7715

SFAM: 10

## FLUIDITY

## DILATATION

START TEMP.	*****	SOFT TEMP.	*****
FINAL TEMP.	*****	SOLID TEMP.	*****
MAX. FLUIDITY TEMP.	*****	MAX. CONTRACTION	*****
MAX. FLUIDITY (DDPM)	*****	MAX. DILATATION	*****
MAX. FLUIDITY (LOG)	*****	G. FACTOR	*****

## 1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-R043	INTERVAL	42.07-42.29			
AIR DRIED BASIS						
	WT%	ASH%	MOIST	VOL. F.C.	S.	F.S.I.
1.5 FLOAT	22.10	5.80	.70	22.80	70.70	.69 9.0
1.5 SINK	77.90	74.66				
TOTAL	100.00	61.00				

DRY BASIS	5.84	22.96	71.20
D.M.M.F. BASIS	-	23.81	76.19

COMPONENT NO.	77-R044	INTERVAL	42.29-43.70			
AIR DRIED BASIS						
	WT%	ASH%	MOIST	VOL. F.C.	S.	F.S.I.
1.5-FLOAT	43.30	7.00	.80	23.68	69.20	.76 9.0
1.5 SINK	56.70	71.55				
TOTAL	100.00	43.60				

DRY BASIS	7.06	23.19	69.76
D.M.M.F. BASIS	-	24.27	75.73

PROJECT: Saxon AREA: SOUTH  
 DATE SAMPLED: 6/ 8/77 DATE ANALYSED: 9/10/77  
 DRILL HOLE #: 50 7716 SEAM: 1  
 LAB COMPOSITE #: 77-R414-17 WT. REC. 9.13

## DENISON COAL DATA

COMPOSITE DESCRIPTION	INTERVAL	MINING SECTION
	181.90-188.70	181.90-188.70
THICKNESS	6.80	6.80
GIP	46	46
COAL/COAL+ROCK	4.30/ 4.72	4.30/ 4.72
DRILL CORP RECOVERY	56.00%	56.00 %
ESTIMATED YIELD	65.00	

## WARNOCK HERSEY ANALYSIS

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0
SIZE			
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SECS
CONTRIBUTION	40.0	17.7	6.2

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
	63.90		
MOISTURE	1.10		
ASH	7.80	7.89	
VOLATILE	23.50	23.76	25.16
F.C.	67.60	68.35	74.84
SULPHUR	.42		
PHOSPHORUS	.002		
S.P.G.	1.310		
F.S.I.	7.0		
HARDGROVE	*****		

## HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.80		
ASH	30.40	30.65	
VOLATILE	17.70	17.84	22.72
F.C.	51.10	51.51	77.28
F.S.I.	3.5		
SULPHUR	.69		
SP.GR. (-3/8 MESH)	1.60		
PHOSPHOROUS	.003		

DRILL HOLE #: 50 7716

SEAM: 1

FLOAT SINK ANALYSIS  
3/8 X 28 66.30

SP.G.	WT%	ASH%	WT%	ASH%	WT%	ASH%	F.S.I.	FSI
1.40	44.60	5.50	48.40	5.50	51.40	61.07	7.5	7.5
1.50	9.90	14.50	58.40	7.01	41.60	72.04	1.0	7.0
1.54	1.90	22.10	60.70	7.49	39.70	74.43	1.0	7.0
1.60	1.70	24.30	62.00	7.95	38.00	76.68	1.0	7.0
1.80	2.30	34.40	64.30	8.89	35.70	79.40	1.0	6.5
****	35.70	79.40	100.00	34.06	*****	*****		3.0

SIZE REL. WEIGHT  
28 X 100 24.90

SP.G.	WT%	ASH%	WT%	ASH%	WT%	ASH%	F.S.I.	FSI
1.40	46.80	4.70	46.80	4.70	53.20	43.87	8.0	8.0
1.50	13.70	9.30	60.50	5.74	39.50	59.87	2.5	7.5
1.60	7.10	14.90	67.60	6.70	32.40	64.84	1.0	7.0
1.76	3.60	20.30	71.20	7.39	28.80	70.41	1.0	7.0
1.90	2.60	27.20	73.80	8.09	26.20	74.70	1.0	6.5
****	26.20	74.70	100.00	25.54	*****	*****		4.5

## FROTH FLOATATION

SIZE REL. WEIGHT  
100 X 0 8.80

TIME	WT%	ASH%	WT%	ASH%	F.S.I.	FSI
45	35.30	11.10	35.30	11.10	7.0	7.0
90	20.10	15.70	55.40	12.77	3.0	7.0
135	15.50	20.90	70.00	14.55	2.0	6.5
180	11.90	32.30	82.00	17.10	1.0	5.5
225	17.20	52.90	100.00	23.26	1.0	4.0

DRILL HOLE #: 50 7716

SEAM: 1

## FLUIDITY

L/L41A110.

START TEMP.	420.0	SOFT TEMP.	383.0
FINAL TEMP.	498.0	SOLID TEMP.	471.0
MAX. FLUIDITY TEMP.	448.0	MAX. CONTRACTION	26.0
MAX. FLUIDITY (DDPH)	40.0	MAX. DILATATION	13.0
MAX. FLUIDITY (LOG)	1.778	G. FACTOR	.967

## 1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-R416	INTERVAL	181.90-186.34
		AIR DRIED BASIS	
	WT%	ASH%	MOIST VOL.
1.5 FLOAT	30.90	10.70	.70 24.40 64.20
1.5 SINK	69.10	65.98	.45 6.0
TOTAL	100.00	48.90	

DRY BASIS	10.78	24.57	64.65
D.M.M.F. BASIS	-	26.70	73.30

COMPONENT NO.	77-R417	INTERVAL	186.34-188.70
		AIR DRIED BASIS	
	WT%	ASH%	MOIST VOL.
1.5 FLOAT	86.40	6.70	1.00 24.30 68.00
1.5 SINK	13.60	24.35	.37 7.5
TOTAL	100.00	9.10	

DRY BASIS	6.77	24.55	68.69
D.M.M.F. BASIS	-	25.79	74.21

PROJECT: SAGOM APFA: SOUTH  
 DATE SAMPLED: 6/ 8/77 DATE ANALYSED: 14/10/77  
 DRILL HOLE #: SD 7716 SFAM: 2  
 LAB COMPOSITE #: 77-8419-20 WT. REC. 12.66

DENISON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION
INTERVAL : 146.00-154.00	146.00-154.00
THICKNESS : 8.90	8.90
DIP : 51	51
COAL/COAL+ROCK : 5.23/ 5.40	5.23/ 5.60
DRILL CORF RECOVERY : 43.00%	43.00 %
ESTIMATED YIELD : 75.00	

WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT	1/8 X 28	28 X 100	100 X 0
SIZE			
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SECS
CONTRIBUTION	38.9	17.7	6.6
YIELD	AIR DRIED 63.20	DRY BASIS	D.M.M.F.
MOISTURE	.70		
ASH	7.10	7.15	
VOLATILE	24.80	24.97	26.35
F.C.	67.40	67.68	73.65
SULPHUR	.34		
PHOSPHORUS	.025		
S.P.G.	1.700		
F.S.I.	7.5		
HARGROVE	*****		

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.70		
ASH	33.70	33.94	
VOLATILE	17.80	17.93	23.88
F.C.	47.80	48.14	76.12
F.S.I.	5.0		
SULPHUR	.30		
SP.G. (-3/8 MESH)	1.56		
PHOSPHOROUS	.020		

DRILL HOLE #: SD 7716 SEAM: 2

FLOAT SINK ANALYSES  
 SIZE REL. WEIGHT  
 3/8 X 28 49.30

SP.G.	WT%	ASH%	CUM. FLOATS	WT%	ASH%	CUM. SINKS	WT%	ASH%	F.S.I.	FSI
1.54	56.10	7.80	56.10	7.80	43.90	81.30	7.0	7.0		7.0
****	43.90	81.30	100.00	40.07	*****					3.5

SIZE REL. WEIGHT  
 28 X 100 22.30

SP.G.	WT%	ASH%	CUM. FLOATS	WT%	ASH%	CUM. SINKS	WT%	ASH%	F.S.I.	FSI
1.76	79.20	6.60	79.20	6.60	20.80	73.00	8.0	8.0		8.0
****	20.80	73.00	100.00	20.41	*****					6.0

FROTH FLOATATION  
 SIZE REL. WEIGHT  
 100 X 0 8.40

TIME.	WT%	ASH%	CUM. FLOATS	WT%	ASH%	F.S.I.	FSI
45.	41.40	7.00	41.60	7.00	7.5	7.5	
90.	24.00	14.60	65.60	9.78	5.5	7.5	
135.	13.40	26.50	79.00	12.62	4.0	7.0	
180.	8.30	45.80	87.30	15.77	1.0	6.0	
225.	12.70	62.70	100.00	21.73	*****	5.5	

DRILL HOLE #: SD 7716 SEAM: 2

FLUIDITY	DILATATION
START TEMP. 417.0	SOFT TEMP. 380.0
FINAL TEMP. 501.0	SOLID TEMP. 468.0
MAX. FLUIDITY TEMP. 468.0	MAX. CONTRACTION 26.0
MAX. FLUIDITY (DDPM) 156.0	MAX. DILATATION 31.0
MAX. FLUIDITY (LOG) 2.193	G. FACTOR 1.009

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-8418	INTERVAL	146.00-147.96
			AIR DRIED BASIS
			WT% ASH% MOIST VOL. F.C. S. F.S.I.
1.5 FLOAT	84.10	6.10	.60 24.60 68.70 .43 7.5
1.5 SINK	15.90	44.46	
TOTAL	100.00	12.20	

DRY BASIS	6.14	24.75	69.11
D.M.M.F. BASIS	-	25.86	74.14

COMPONENT NO.	77-8419	INTERVAL	147.96-148.51
			AIR DRIED BASIS
			WT% ASH% MOIST VOL. F.C. S. F.S.I.
1.5 FLOAT	*****		
1.5 SINK	*****		
TOTAL	100.00	84.40	

COMPONENT NO.	77-8420	INTERVAL	148.51-154.90
			AIR DRIED BASIS
			WT% ASH% MOIST VOL. F.C. S. F.S.I.
1.5 FLOAT	77.40	7.80	.80 23.90 67.50 .34 6.5
1.5 SINK	22.60	34.79	
TOTAL	100.00	13.90	

DRY BASIS	7.46	24.09	68.04
D.M.M.F. BASIS	-	25.54	74.46

PROJECT: Saxon  
 DATE SAMPLED: 4/ 9/77  
 DRILL HOLE #: SD 7714  
 LAR COMPOSITE #: 77-8421 WT. PFC. 5.36

APFA: SOUTH  
 DATE ANALYSED: 14/10/77  
 SEAM: 3

DENISON COAL DATA

COMPOSITE DESCRIPTION	INTERVAL	MINING SECTION
INTERVAL	102.07-103.60	102.07-103.60
THICKNESS	1.53	1.53
DTP	37	37
COAL/COAL ROCK	1.0R/ 1.24	1.0R/ 1.24
DRILL CORE RECOVERY	100.00%	100.00 %
ESTIMATED YIELD	64.00	

WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0
SIZE	3/8 X 28	28 X 100	100 X 0
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SECS
CONTRIBUTION	38.5	19.6	6.9

YIELD	AIR DRIED	DRY BASIS	D.M.H.F.
YIELD	65.00		

MOISTURE	ASH	VOLATILE	F.C.
MOISTURE	.60	7.34	
ASH	24.80	24.95	26.30
VOLATILE	67.38	67.71	73.70

SULPHUR	PHOSPHORUS	S.P.G.	F.S.I.	HARDGROVE
SULPHUR	.56			
PHOSPHORUS	.035			
S.P.G.	1.340			
F.S.I.	8.0			
HARDGROVE	*****			

WFO ANALYSTS - COMPOSITE RAW COAL

MOISTURE	ASH	VOLATILE	F.C.
MOISTURE	.80	28.40	28.63
ASH	28.40	19.40	19.56
VOLATILE	51.40	51.81	75.18

F.S.I.	SULPHUR
F.S.I.	4.5
SULPHUR	.46

SP.GR. (-3/8 MFSH)	PHOSPHOROUS
SP.GR. (-3/8 MFSH)	1.57
PHOSPHOROUS	.040

DRILL HOLE #: SD 7716

SEAM: 3

FLOAT SINK ANALYSIS  
 3/8 X 28

SP.G.	WT%	ASH%	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
1.40	47.40	5.90	47.40	52.60	54.68	8.0
1.50	6.60	14.80	54.00	68.99	64.98	3.5
1.54	2.20	14.00	56.20	74.42	67.34	2.0
1.60	1.50	27.90	57.70	79.95	69.74	1.0
1.80	2.20	40.70	60.20	93.31	70.50	1.0
****	39.80	70.50	100.00	33.66	*****	3.5

28 X 100

SP.G.	WT%	ASH%	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
1.40	60.50	4.10	60.50	39.50	30.63	9.0
1.50	12.20	8.80	72.70	48.89	40.30	6.0
1.60	5.90	12.90	78.60	54.49	47.97	4.0
1.76	3.90	16.40	82.50	60.01	55.00	4.0
1.90	1.80	34.10	84.30	64.61	57.40	1.0
****	15.70	57.40	100.00	14.58	*****	1.0

FROTH FLOATATION  
 100 X 0

TIME	WT%	ASH%	CUM. FLOATS	CUM. SINKS
45	66.20	9.40	66.20	9.40
90	15.40	27.00	81.60	12.72
135	7.00	41.00	88.60	14.96
180	5.50	44.30	94.10	16.67
225	5.90	59.30	100.00	19.14

DRILL HOLE #: SD 7716

SEAM: 3

FLUIDITY	DILATATION
START TFMP.	420.0
FINAL TFMP.	507.0
MAX.FLUIDITY TEMP.	471.0
MAX.FLUIDITY (DDPH)	555.0
MAX.FLUIDITY (LOG)	2.744
SOFT.TFMP.	379.0
SOLID.TEMP.	467.0
MAX.CONTRACTION	26.0
MAX.DILATATION	54.0
G.FACTOR	1.038

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-8421	INTERVAL	102.07-103.60
		AIR DRIED BASIS	
	WT%	ASH%	MOIST VOL. F.C.
1.5 FLOAT	53.60	7.10	.70 25.20 67.00
1.5 SINK	46.40	49.99	.56 8.0
TOTAL	100.00	27.00	
DRY BASIS	7.15	25.38	67.47
D.M.H.F. BASIS	-	26.73	73.27



PROJCT: SAYON APFA: SOUTH
DATE SAMPLED: 6/ 8/77 DATE ANALYSED: 14/10/77
DRILL HOLE #: SD 7716 SFAM: 4
1AR COMPOSITE #: 77-R422-2A WT. REC. 38.66

DENISON COAL DATA

Table with columns: COMPOSITE DESCRIPTION, INTERVAL, THICKNESS, DIP, COAL/COAL-ROCK, DRILL CORF RECOVERY, ESTIMATED YIELD. Rows include Mining Section 31.84-44.65.

WARNOCK HERSEY ANALYSES

Table with columns: SIMULATED PRODUCT, SIZE, CUTPOINT, CONTRIBUTION, AIR DRIED, DRY BASIS, D.M.M.F., YIELD, MOISTURE, ASH, VOLATILE, F.C., SULPHUR, PHOSPHORUS, S.P.G., F.S.I., HADROGROVF.

HEAD ANALYSIS - COMPOSITE RAW COAL

Table with columns: MOISTURE, ASH, VOLATILE, F.C., F.S.I., SULPHUR, SP.GR. (1-3/P MFSH), PHOSPHOROUS.

DRILL HOLE #: SD 7716 SEAM: 4

FLOAT SINK ANALYSES
SIZE RFL. WEIGHT
3/8 X PA 72.40

Table with columns: SP.G., WT% ASH%, WT% ASH%, WT% ASH%, F.S.I., FSI. Rows for sizes 1.40, 1.50, 1.5A, 1.60, 1.76, 1.80, 1.90.

SIZE RFL. WEIGHT
28 X 100 20.30

Table with columns: SP.G., WT% ASH%, WT% ASH%, WT% ASH%, F.S.I., FSI. Rows for sizes 1.40, 1.50, 1.60, 1.76, 1.80, 1.90.

FROTH FLOTTATION

Table with columns: SIZE RFL. WEIGHT, TIME, WT% ASH%, WT% ASH%, WT% ASH%, F.S.I., FSI. Rows for sizes 100 X 0, 45, 90, 135, 180, 225.

DRILL HOLE #: SD 7716 SEAM: 4

Table with columns: FLUIDITY, DILATATION, START TEMP., SOFT TEMP., FINAL TEMP., SOLID TEMP., MAX. FLUIDITY TEMP., MAX. CONTRACTION, MAX. FLUIDITY (NDPM), MAX. DILATATION, MAX. FLUIDITY (LOG), G.FACTOR.

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT% ASH%, MOIST VOL., F.C., S, F.S.I., DRY BASIS, D.M.M.F. BASIS.

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT% ASH%, MOIST VOL., F.C., S, F.S.I., DRY BASIS, D.M.M.F. BASIS.

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT% ASH%, MOIST VOL., F.C., S, F.S.I., DRY BASIS, D.M.M.F. BASIS.

DRILL HOLE #: SD 7716 SEAM: 4

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT% ASH%, MOIST VOL., F.C., S, F.S.I., DRY BASIS, D.M.M.F. BASIS.

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT% ASH%, MOIST VOL., F.C., S, F.S.I., DRY BASIS, D.M.M.F. BASIS.

PROJECT: SAXON  
DATE SAMPLED: 16/ 8/77  
DRILL HOLE #: 50 7717  
1/8 COMPOSITE #: 77-8429 WT. PFC. 8.95

APFATSOUTH  
DATE ANALYSED: 15/10/77  
SEAM: 5

DENISON COAL DATA

COMPOSITE DESCRIPTION	INTERVAL	MINING SECTION
	296.70-299.25	296.70-299.25
THICKNESS	2.55	2.55
DIP	62	62
COAL/COAL+POCK	1.01/ 1.20	1.01/ 1.20
DRILL CORE RECOVERY	96.00%	96.00 %
ESTIMATED YIELD	61.00	

WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT	3/8 X PR	28 X 100	100 X 0
SIZE	SP.G. 1.54	SP.G. 1.76	135 SECS
CUTOFF	43.1	16.9	4.0
CONTRIBUTION			

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
	64.00		
MOISTURE	.60		
ASH	7.30	7.34	
VOLATILE	26.10	26.26	27.71
F.C.	66.00	66.40	72.29
SULPHUR	.42		
PHOSPHORUS	.021		
S.P.G.	1.310		
F.S.I.	8.0		
HARDGROVE	*****		

MEAN ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.60		
ASH	28.40	28.83	
VOLATILE	70.00	20.16	25.70
F.C.	50.60	51.01	74.30
F.S.I.	6.0		
SULPHUR	.60		
SP.GR. (-3/8 MESH)	1.57		
PHOSPHORUS	.018		

DRILL HOLE #: 50 7717 SEAM: 5

FLOAT SINK ANALYSES  
SIZE 3/8 X 28 PEL. WEIGHT 71.30

SP.G.	WT%	ASH%	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
1.40	52.00	5.70	52.00	5.70	48.00	63.09
1.50	6.60	15.40	58.60	6.79	41.40	70.70
1.54	1.90	19.10	60.50	7.18	39.50	73.18
1.60	1.60	26.40	62.10	7.67	37.90	75.15
1.80	2.40	37.50	64.50	8.78	35.50	77.70
****	35.50	77.70	100.00	33.25	*****	5.5

SIZE 28 X 100 PEL. WEIGHT 22.00

SP.G.	WT%	ASH%	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
1.40	54.60	4.00	54.60	4.00	45.40	37.97
1.50	13.70	9.10	68.30	5.02	31.70	50.45
1.60	7.30	15.00	75.60	5.99	24.40	61.05
1.76	1.20	19.90	76.80	6.20	23.20	63.18
1.90	3.70	28.30	80.50	7.22	19.50	69.80
****	19.50	69.80	100.00	19.42	*****	7.0

FROTH FLOTTATION  
SIZE 100 X 0 PEL. WEIGHT 6.70

TIME	WT%	ASH%	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
45	44.70	7.80	44.70	7.80	8.0	8.0
90	10.40	19.50	55.10	10.01	5.0	8.0
135	5.00	34.60	60.10	12.05	2.0	8.0
180	8.10	49.40	68.20	16.49	1.0	7.0
225	31.80	73.70	100.00	34.68	*****	6.0

DRILL HOLE #: 50 7717 SEAM: 5

FLUIDITY	DILATATION
START TEMP. 414.0	SOFT TEMP. 371.0
FINAL TEMP. 501.0	SOLID TEMP. 466.0
MAX. FLUIDITY TEMP. 468.0	MAX. CONTRACTION 26.0
MAX. FLUIDITY (DOPM) 470.0	MAX. DILATATION 108.0
MAX. FLUIDITY (LOG) 2.672	G. FACTOR 1.074

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-8429	INTERVAL	296.70-299.25
		AIR DRIED BASIS	
		WT% ASH% MOIST VOL. F.C.	S. F.S.I.
1.5 FLOAT	57.20	6.90	.60 27.30 65.20 .70 8.5
1.5 SINK	42.80	60.64	
TOTAL	100.00	29.90	
DRY BASIS	6.94	27.46	65.59
D.M.M.F. BASIS	-	28.91	71.09

PROJECT: SAXON  
 DATE SAMPLED: 16/ 8/77  
 DRILL HOLE #: 7717  
 LAB COMPOSITE #:

AREA: SOUTH  
 DATE ANALYSED: 0/ 0/ 0  
 SEAM: 7  
 WT. REC. 4.30

## DENISON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION	
INTERVAL :	174.30-176.80	
THICKNESS :	0.	2.50
RIP :		78
COAL/COAL+POCK :	0. / 0.	.52/ .52
DRILL CORE RECOVERY :	0. %	0. %
ESTIMATED YIELD :	*****	

## WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT SIZE	3/8 X 28	28 X 100	100 X 0
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SECS

DRILL HOLE #: 7717

SEAM: 7

DRILL HOLE #: 7717

SEAM: 7

## FLUIDITY

## DILATATION

START TEMP. *****	SOFT TEMP. *****
FINAL TEMP. *****	SOLID TEMP. *****
MAX.FLUIDITY TEMP.*****	MAX.CONTRACTION *****
MAX.FLUIDITY(DOPM)*****	MAX.DILATATION *****
MAX.FLUIDITY(LOG) *****	G.FACTOR *****

## 1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-8428	INTERVAL	174.30-176.80			
		AIR DRIFT BASIS				
	WT% ASH%	MOIST VOL.	F.C.	S.	F.S.I.	
1.5 FLOAT	82.00 3.30	.80	28.00	67.90	.66 8.5	
1.5 SINK	18.00 39.97					
TOTAL	100.00 9.90					
DRY BASIS	3.33	28.23	69.45			
D.M.M.F. BASIS	-	28.84	71.16			

PROJECT: SAKON  
 DATE SAMPLED: 14/ 8/77  
 DRILL HOLE #: 7717  
 LAB COMPOSITE #:

APFA: SOUTH  
 DATE ANALYSED: 0/ 0/ 0  
 SEAM: 10  
 WT. RFC: 5.20

## DENISON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION	
INTERVAL	146.25-147.85	
THICKNESS	0.	1.60
ATP		78
COAL/COAL+ROCK	0. / 0.	.33/ .33
DRILL CORE RECOVERY	0. %	100.00 %
ESTIMATED YIELD	90.00	

## WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT  
 SIZE 3/8 X 28 28 X 100 100 X 0  
 CUTPOINT

DRILL HOLE #: 7717

SEAM: 10

DENISON COAL LIMITED

PAGE: 3

DRILL HOLE #: 7717

SEAM: 10

RECIPIENT

LILFA 10.

START TEMP.	*****	SOFT TEMP.	*****
FINAL TEMP.	*****	SOLID TEMP.	*****
MAX. FLUIDITY TEMP.	*****	MAX. CONTRACTION	*****
MAX. FLUIDITY (DRPM)	*****	MAX. DILATATION	*****
MAX. FLUIDITY (LOG)	*****	G. FACTOR	*****

## 1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-8427	INTERVAL	146.25-147.85			
AIR DRIED BASIS						
	WT%	ASH	MOIST	VOL.	F.C.	S. F.S.I.
1.5 FLOAT	90.20	6.20	.90	26.40	66.50	.65 7.0
1.5 SINK	9.80	25.59				
TOTAL	100.00	8.10				
DRY BASIS	6.76		26.64	67.10		
D.M.M.F. BASIS	-		27.86	72.14		

PROJECT: SAXON APFA: SOUTH
DATE SAMPLED: 12/ 2/77 DATE ANALYSED: 07/ 07/ 80
DRILL HOLE #: SD 771A SEAM: 4U
LAR COMPOSITE #: 77-8331-70 WT. RFC. 38.40

DENISON COAL DATA

Table with columns: COMPOSITE DESCRIPTION, MINING SECTION, THICKNESS, etc. Values include 34.46-45.54, 11.88, 7.80/ 8.35, 98.00 %

WARNOCK HERSEY ANALYSES

Table with columns: SIMULATED PRODUCT, SIZE, CONTRIBUTION, YIELD, etc. Values include 53.6, 18.7, 6.3, 78.60, 7.36, 27.07, 72.93

WFAO ANALYSIS - COMPOSITE RAW COAL

Table with columns: MOISTURE, ASH, VOLATILE, F.C., S.P.I., SULPHUR, etc. Values include 16.90, 17.00, 23.34, 26.82, 73.18, 7.0, .32, 1.40, .012

DRILL HOLE #: SD 771A SEAM: 4U

FLOAT SINK ANALYSIS

Table with columns: SIZE, REL. WEIGHT, CUM. FLOATS, CUM. SINKS, F.S.I., FSI. Values include 20.50, 72.70, 62.80, 37.20, 46.96, 8.0, 8.0

SIZE REL. WEIGHT

Table with columns: SIZE, REL. WEIGHT, CUM. FLOATS, CUM. SINKS, F.S.I., FSI. Values include 20.50, 79.70, 79.70, 20.30, 37.79, 8.5, 8.5

FROTH FLOATATION

Table with columns: SIZE, REL. WEIGHT, CUM. FLOATS, CUM. SINKS, F.S.I., FSI. Values include 6.80, 81.00, 81.00, 81.00, 8.22, 6.0, 7.5

DRILL HOLE #: SD 771A SEAM: 4U

Table with columns: FLUIDITY, DILATATION, START TEMP., etc. Values include 420.0, 501.0, 465.0, 310.0, 2.491, 380.0, 471.0, 30.0, 8.0, .942

GVF REPORT DRILL HOLE SD7718 SEAM 4

Table with columns: DEPTH FROM TO, SAMPLE NO., SPG, ASH WT%. Values include 3200, 3252, 10, 2.45, 80.7, 3252, 3298, 20, 2.45, 78.3, etc.

GVF REPORT DRILL HOLE SD7718 SEAM 4

Table with columns: DEPTH FROM TO, SAMPLE NO., SPG, ASH WT%. Values include 4098, 4118, 300, 1.29, 4.4, 4118, 4132, 310, 1.31, 5.0, etc.

PROJECT: SATON APPALACHIAN
DATE SAMPLED: 12/ 7/77 DATE ANALYSED: 0/ 0/ 0
DRILL HOLE #: SD 7718 SEAM: 4L
LAB COMPOSITE #: 77-R3AR-92 WT. RFG. 5.50

DENTSON COAL DATA

Table with columns: COMPOSITE DESCRIPTION INTERVAL, MINING SECTION, THICKNESS, DIP, COAL/COAL SHOCK, DRILL CORE RECOVERY, ESTIMATED YIELD.

WARNOCK MERSEY ANALYSES

Table with columns: SIMULATED PRODUCT SIZE, CUTPOINT CONTRIBUTION, AIR DRIED, DRY BASIS, D.M.M.F.

Table with columns: AIR DRIED, DRY BASIS, D.M.M.F. for Moisture, Ash, Volatile, F.C.

Table with columns: Moisture, Ash, Volatile, F.C., Sulphur, Phosphorus, F.S.I., Hardgrove.

HEAD ANALYSIS - COMPOSITE RAW COAL

Table with columns: AIR DRIED, DRY BASIS, D.M.M.F. for Moisture, Ash, Volatile, F.C.

Table with columns: F.S.I., Sulphur, Sp.gr., Phosphorus.

DRILL HOLE #: SD 7718 SFAM: 4L

FLOAT SINK ANALYSES
SIZE REL. WEIGHT
3/8 X 28 77.20

Table with columns: SP.G., WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI.

SIZE REL. WEIGHT
2R X 100 16.90

Table with columns: SP.G., WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI.

FROTH FLOTATION

Table with columns: SIZE REL. WEIGHT, TIME, WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI.

DRILL HOLE #: SD 7718 SEAM: 4L

Table with columns: FLUIDITY, DILATION, START TEMP., FINAL TEMP., MAX.FLUIDITY TEMP., MAX.FLUIDITY (DDPM), MAX.FLUIDITY (LOG), SOFT.TEMP., SOLID.TEMP., MAX.CONTRACTION, MAX.DILATATION, G.FACTOR.

RYE REPORT DRILL HOLE 748 SEAM 40

Table with columns: DEPTH FROM TO, SAMPLE NO., SPG, ASH WT%.

PROJECT: SAGON ARFA: SOUTH  
 DATE SAMPLED: 4/ 8/77 DATE ANALYSED: 11/5/10/77  
 DRILL HOLE #: SD 7720 SEAM: 2  
 LAB COMPOSITE #: 77-8431 WT. RFC. 2.78

DENISON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION	
	INTERVAL	
INTERVAL	281.10-281.96	280.47-281.96
THICKNESS	.86	1.49
RIP	12	12
COAL/COAL+POCK	.85/.85	1.50/1.50
DRILL CORE RECOVERY	100.00%	100.00 %
ESTIMATED YIELD	72.00	

WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT	MINING SECTION		
	3/8 X 28	28 X 100	100 X 0
SIZE	SP.G. 1.54	SP.G. 1.76	135 SECS
CUTPOINT	73.6	15.1	5.3
CONTRIBUTION			
YIELD	AIR DRIED 94.00	DRY BASIS	D.M.M.F.
MOISTURE	.50		
ASH	6.10	6.13	
VOLATILE	24.10	24.22	25.30
F.C.	69.30	69.65	74.70
SULPHUR	.41		
PHOSPHORUS	.033		
S.P.G.	1.280		
F.S.I.	7.5		
HARDGROVE	*****		

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.70		
ASH	8.20	8.26	
VOLATILE	23.20	23.36	24.81
F.C.	67.90	68.38	75.19
F.S.I.	7.0		
SULPHUR	.39		
SP.G. (-3/8 MESH)	1.34		
PHOSPHOROUS	.030		

DRILL HOLE #: SD 7720 SEAM: 2

FLOAT SINK ANALYSIS

SIZE	REL. WEIGHT		CUM. FLOATS		CUM. SINKS		F.S.I.	FSI
3/8 X 28	WT%	ASH%	WT%	ASH%	WT%	ASH%		
	1.54	95.10	6.90	95.10	6.90	4.90	29.60	7.5
	****	4.90	29.60	100.00	8.01	*****		1.0

SIZE REL. WEIGHT

SIZE	REL. WEIGHT		CUM. FLOATS		CUM. SINKS		F.S.I.	FSI
28 X 100	WT%	ASH%	WT%	ASH%	WT%	ASH%		
	1.76	88.90	7.50	88.90	7.50	11.10	22.50	7.5
	****	11.10	22.50	100.00	9.17	*****		1.5

FROTH FLOTATION

SIZE	REL. WEIGHT		CUM. FLOATS		CUM. SINKS		F.S.I.	FSI
100 X 0	WT%	ASH%	WT%	ASH%	WT%	ASH%		
	49.	73.70	5.80	73.70	5.80	7.5	7.5	
	90.	15.80	14.70	89.50	7.37	4.0	7.0	
	135.	5.30	29.20	94.80	8.59	3.0	7.0	
	180.	1.70	45.80	96.50	9.25	1.0	7.0	
	225.	3.50	49.80	100.00	10.67	1.0	6.5	

DRILL HOLE #: SD 7720 SEAM: 2

FLUIDITY

	DATA	AV. UN
START TEMP.	417.0	SOFT TEMP. 390.0
FINAL TEMP.	501.0	SOLID TEMP. 476.0
MAX. FLUIDITY TEMP.	465.0	MAX. CONTRACTION 26.0
MAX. FLUIDITY (DDPM)	102.0	MAX. DILATATION 15.0
MAX. FLUIDITY (LOG)	2.009	G. FACTOR .974

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-8430	INTERVAL	280.47-281.10
		AIR DRIED BASIS	
	WT%	ASH%	MOIST VOL. F.C. S. F.S.I.
1.5 FLOAT	59.80	9.20	.80 19.90 70.10 .52 2.5
1.5 SINK	40.20	51.24	
TOTAL	100.00	26.10	
DRY BASIS	9.27	20.06	70.67
D.M.M.F. BASIS	-	21.30	78.70

COMPONENT NO.	77-8431	INTERVAL	281.10-281.96
		AIR DRIED BASIS	
	WT%	ASH%	MOIST VOL. F.C. S. F.S.I.
1.5 FLOAT	88.50	6.10	.70 23.50 69.70 .42 8.0
1.5 SINK	11.50	18.27	
TOTAL	100.00	7.50	
DRY BASIS	6.14	23.67	70.19
D.M.M.F. BASIS	-	24.70	75.30

PROJECT: SAKM  
 DATE SAMPLED: 4/ 9/77  
 DRILL HOLE #: SD 7720  
 IAR COMPOSITE #: 77-8046 WT. RFC. 4.40

APPROXIMATE  
 DATE ANALYSED: 29/ 9/77  
 SEAM: 3

DEFINSON COAL DATA

COMPOSITE DESCRIPTION INTERVAL : 244.40-245.84 MINING SECTION 244.40-245.84

THICKNESS : 1.44  
 DTP : 22  
 COAL/CLAY RATIO : 1.24/ 1.33  
 DRILL CORE RECOVERY : 88.00%  
 ESTIMATED YIELD : 80.00

WARNOCK HERSEY ANALYSES

STIMULATED PRODUCT

SIZE	1/8 X 28	28 X 100	100 X 0
OUTPUT	SP.G. 1.54	SP.G. 1.76	135 SECS
CONTRIBUTION	58.9	15.8	4.9

YIELD AIR DRIED 79.60 DRY BASIS D.M.M.F.

MOISTURE .80  
 ASH 8.00  
 VOLATILE 22.60  
 F.C. 68.60

SULPHUR .57  
 PHOSPHORUS .015  
 S.P.G. 1.340  
 F.S.I. 7.5  
 HARDGROVE \*\*\*\*\*

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.60		
ASH	17.00	17.10	
VOLATILE	21.80	21.93	25.05
F.C.	60.60	60.97	74.95
F.S.I.	6.5		
SULPHUR	.54		
SP.G. (-3/8 MESH)	1.44		
PHOSPHOROUS	.012		

DRILL HOLE #: SD 7720 SEAM: 3

FLOAT SINK ANALYSIS

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	CUM.
1/8 X 28	77.20			
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.
1.40	52.60 5.40	92.60 5.40	47.40 33.52	7.5
1.50	18.40 13.50	71.00 7.50	29.00 46.71	3.0
1.60	5.30 23.10	76.30 8.58	23.70 51.38	1.0
1.80	4.10 30.00	80.40 9.68	19.60 55.86	1.0
1.80	10.40 39.10	90.80 13.05	9.20 74.80	1.0
****	9.20 74.80	100.00 16.73	*****	5.5

SIZE REL. WEIGHT

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	CUM.
28 X 100	17.70			
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.
1.40	68.10 4.40	68.10 4.40	31.90 28.82	8.5
1.50	12.50 13.60	80.60 5.83	19.40 38.63	2.0
1.60	4.30 22.20	84.90 6.66	15.10 43.31	1.0
1.76	4.60 28.00	89.50 7.75	10.50 50.02	1.0
1.90	5.00 33.00	94.50 9.09	5.50 65.50	1.0
****	5.50 65.50	100.00 12.19	*****	7.0

FROTH FLOTATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM.
100 X 0	5.10		
TIME	WT% ASH%	WT% ASH%	F.S.I.
45	85.00 9.80	85.00 9.80	5.5
90	8.40 23.10	93.40 11.00	3.0
135	1.90 26.20	95.30 11.30	2.0
180	1.90 29.70	97.20 11.66	1.0
225	2.80 41.90	100.00 12.51	1.0

DRILL HOLE #: SD 7720 SEAM: 3

FLUIDITY

START TEMP.	444.0	SOFT TEMP.	396.0
FINAL TEMP.	501.0	SOLID TEMP.	479.0
MAX. FLUIDITY TEMP.	480.0	MAX. CONTRACTION	28.0
MAX. FLUIDITY (DDPH)	20.0	MAX. DILATATION	7.0
MAX. FLUIDITY (LOG)	1.301	G. FACTOR	.946

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO. 77-8046 INTERVAL 244.40-245.84

AIR DRIED BASIS

	WT%	ASH%	MOIST VOL.	F.C.	S.	F.S.I.
1.5 FLOAT	72.00	8.70	.60	23.50	67.20	.61
1.5 SINK	28.00	42.63				7.5
TOTAL	100.00	18.20				

DRY BASIS 8.75 23.64 67.61  
 D.M.M.F. BASIS - 25.16 74.84



PROJECT: SAYON AREA: SOUTH
DATE SAMPLED: 4/ 8/77 DATE ANALYSED: 10/10/77
DRILL HOLE #: 50 7720 SEAM: 4
LAB COMPOSITE #: 77-R047-54 WT. REC. 71.70

DEWISON COAL DATA

Table with columns: COMPOSITE DESCRIPTION, INTERVAL, THICKNESS, QTP, COAL/COAL+ROCK, DRILL CORF RECOVERY, ESTIMATED YIELD, MINING SECTION, WT. REC.

WARNOCK HERSEY ANALYSES

Table with columns: SIMULATED PRODUCT, CUTPOINT CONTRIBUTION, YIELD, AIR DRIED, DRY BASIS, D.M.M.F., MOISTURE, ASH, VOLATILE, F.C., SULPHUR, PHOSPHORUS, F.S.I., HARDENOVE

HEAD ANALYSIS - COMPOSITE RAW COAL

Table with columns: AIR DRIED, DRY BASIS, D.M.M.F., MOISTURE, ASH, VOLATILE, F.C., F.S.I., SULPHUR, SP.GR. (-3/8 MESH), PHOSPHORUS

DRILL HOLE #: 50 7720 SEAM: 4

FLOAT SINK ANALYSES

Table with columns: SIZE, REL. WEIGHT, SP.G., WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI

SIZE REL. WEIGHT

Table with columns: SIZE, REL. WEIGHT, SP.G., WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI

FROTH FLOTATION

Table with columns: SIZE, REL. WEIGHT, TIME, WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI

DRILL HOLE #: 50 7720 SEAM: 4

Table with columns: FLUIDITY, DILATION, START TEMP., FINAL TEMP., MAX. FLUIDITY TEMP., MAX. FLUIDITY (NDPH), MAX. FLUIDITY (LOG), SOFT. TEMP., SOLID. TEMP., MAX. CONTRACTION, MAX. DILATATION, G. FACTOR

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S. F.S.I., 1.5 FLOAT, 1.5 SINK, TOTAL, DRY BASIS, D.M.M.F. BASIS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S. F.S.I., 1.5 FLOAT, 1.5 SINK, TOTAL, DRY BASIS, D.M.M.F. BASIS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S. F.S.I., 1.5 FLOAT, 1.5 SINK, TOTAL, DRY BASIS, D.M.M.F. BASIS

Table with columns: DRY BASIS, D.M.M.F. BASIS

DRILL HOLE #: 50 7720 SEAM: 4

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S. F.S.I., 1.5 FLOAT, 1.5 SINK, TOTAL, DRY BASIS, D.M.M.F. BASIS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S. F.S.I., 1.5 FLOAT, 1.5 SINK, TOTAL, DRY BASIS, D.M.M.F. BASIS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S. F.S.I., 1.5 FLOAT, 1.5 SINK, TOTAL, DRY BASIS, D.M.M.F. BASIS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S. F.S.I., 1.5 FLOAT, 1.5 SINK, TOTAL, DRY BASIS, D.M.M.F. BASIS

Table with columns: DRY BASIS, D.M.M.F. BASIS

DENISON COAL LIMITED

PAGE: 5

DRILL HOLE #: SD 7720

SEAM: 4

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-8054	INTERVAL	196.24-196.65				
			AIR DRIED BASIS				
	WT%	ASH%	MOIST	VOL.	F.C.	S.	F.S.I.
1.5 FLOAT	22.20	8.40	.70	24.70	66.20	.78	8.5
1.5 SINK	77.80	71.77					
TOTAL	100.00	57.70					
DRY BASIS		8.46		24.87	66.67		
D.M.M.F. BASIS		-		26.41	73.59		

COAL ANALYSIS PREPARED BY  
WARNOCK HERSEY PROFESSIONAL SERVICES LTD  
SIGNED:

PROJECT: SAXON APFA: SOUTH
DATE SAMPLED: 6/ 8/77 DATE ANALYSED: 15/10/77
DRILL HOLE #: SD 7721 SFAM: 1
(LAR COMPOSITE #: 77-R432-34 WT. REC. 9.85

DENISON COAL DATA

Table with columns: COMPOSITE DESCRIPTION INTERVAL, THICKNESS, COAL/COAL+ROCK, DRILL COMP RECOVERY, FSTW&TFD YIFLO, MINING SECTION 111.84-116.30, 111.84-116.30

WARNOCK HERSEY ANALYSES

Table with columns: SIMULATED PRODUCT SIZE, CUTPOINT, CONTRIBUTION, AIR DRIED, DRY BASIS, D.M.M.F.

Table with columns: MOISTURE, ASH, VOLATILE, F.C., SULPHUR, PHOSPHORUS, S.P.G., F.S.I., HARDGROVE

HEAR ANALYSIS - COMPOSITE RAW COAL

Table with columns: MOISTURE, ASH, VOLATILE, F.C., F.S.I., SULPHUR, S.P.G. (-3/8 MESH), PHOSPHORUS

DRILL HOLE #: SD 7721 SEAM: 1

FLOAT SINK ANALYSES

Table with columns: SIZE 3/8 X 28, REL. WEIGHT 75.40, CUM. FLOATS, CUM. SINKS, SP.G., WT%, ASH%, F.S.I., FSI

SIZE 28 X 100, REL. WEIGHT 18.70

Table with columns: CUM. FLOATS, CUM. SINKS, SP.G., WT%, ASH%, F.S.I., FSI

FROTH FLOTATION

Table with columns: SIZE 100 X 0, REL. WEIGHT 5.90, TIME, WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI

DRILL HOLE #: SD 7721 SEAM: 1

Table with columns: FLUIDITY, DILATATION, START TEMP., FINAL TEMP., MAX. FLUIDITY TEMP., MAX. FLUIDITY (DDPM), MAX. FLUIDITY (LOG), SOFT TEMP., SOLID TEMP., MAX. CONTRACTION, MAX. DILATATION, G.FACTOR

1.5 FLOAT/SINK ANALYSIS OF SFAM COMPONENTS

Table for component 77-R432: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S., F.S.I., 1.5 FLOAT, 1.5 SINK, TOTAL, DRY BASIS, D.M.M.F. BASIS

Table for component 77-R433: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S., F.S.I., 1.5 FLOAT, 1.5 SINK, TOTAL, DRY BASIS, D.M.M.F. BASIS

Table for component 77-R434: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S., F.S.I., 1.5 FLOAT, 1.5 SINK, TOTAL, DRY BASIS, D.M.M.F. BASIS

COAL ANALYSIS PREPARED BY WARNOCK HERSEY PROFESSIONAL SERVICES LTD SIGNED:

PROJECT: SAXON APFAISOUTH
DATE ANALYSED: 16/10/77
DRILL HOLE #: 5D 7721 SEAM: 2
LAB COMPOSITE #: 77-8437-38 WT. RFC. 29.37

DEWISON COAL DATA

Table with 2 columns: COMPOSITE DESCRIPTION and MINING SECTION. Rows include INTERVAL, THICKNESS, RTP, CMM/COAL+ROCK, DRILL CORR RECOVERY, ESTIMATED YIELD.

WARNOCK HERSEY ANALYSES

Table with 4 columns: SIMULATED PRODUCT SIZE, OUTPUT, CONTRACTION. Rows include 3/8 X 20, 28 X 100, 100 X 0.

Table with 4 columns: YIELD, AIR DRIED, DRY BASIS, D.M.M.F. Rows include MOISTURE, ASH, VOLATILE, F.C., SULPHUR, PHOSPHORUS, S.P.G., F.S.I., HARDGROVE.

HFAD ANALYSIS - COMPOSITE RAW COAL

Table with 4 columns: AIR DRIED, DRY BASIS, D.M.M.F. Rows include MOISTURE, ASH, VOLATILE, F.C., F.S.I., SULPHUR, SP.GR. (-3/8 MESH), PHOSPHOROUS.

DRILL HOLE #: 5D 7721 SEAM: 2

FLOAT SINK ANALYSES

Table with 10 columns: SIZE, REL. WEIGHT, WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI. Rows include 3/8 X 20.

SIZE REL. WEIGHT

Table with 10 columns: SIZE, REL. WEIGHT, WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI. Rows include 28 X 100.

FROTH FLOTATION

Table with 8 columns: SIZE, REL. WEIGHT, TIME, WT%, ASH%, CUM. FLOATS, CUM. F.S.I., FSI. Rows include 100 X 0.

DRILL HOLE #: 5D 7721 SEAM: 2

Table with 4 columns: FLUIDITY, DILATATION, SOFT TEMP., SOLID TEMP., MAX. FLUIDITY TEMP., MAX. CONTRACTION, MAX. FLUIDITY (DDPM), MAX. DILATATION, MAX. FLUIDITY (LOG), G. FACTOR.

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

Table with 8 columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S. F.S.I. Rows include 77-8435, 79.02-79.20.

Table with 4 columns: DRY BASIS, D.M.M.F. BASIS, WT%, ASH%. Rows include 77-8435, 79.02-79.20.

Table with 8 columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S. F.S.I. Rows include 77-8436, 79.20-79.60.

Table with 4 columns: DRY BASIS, D.M.M.F. BASIS, WT%, ASH%. Rows include 77-8436, 79.20-79.60.

Table with 8 columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S. F.S.I. Rows include 77-8437, 79.60-81.27.

Table with 4 columns: DRY BASIS, D.M.M.F. BASIS, WT%, ASH%. Rows include 77-8437, 79.60-81.27.

DRILL HOLE #: 5D 7721 SEAM: 2

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

Table with 8 columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S. F.S.I. Rows include 77-8438, 81.27-87.74.

Table with 4 columns: DRY BASIS, D.M.M.F. BASIS, WT%, ASH%. Rows include 77-8438, 81.27-87.74.

PROJECT: SAKON  
 DATE SAMPLED: 6/ 8/77  
 DRILL HOLE #: SD 7721  
 L&R COMPOSITE #: 77-8439-41

APPA: SOUTH  
 DATE ANALYSED: 16/10/77  
 SEAM: 3  
 WT. REC. 7.22

DENISON COAL DATA

COMPOSITE DESCRIPTION INTERVAL	36.68-39.37	MINING SECTION 36.68-39.37
THICKNESS	2.69	2.69
RIP	35	35
COAL/COAL+ROCK	1.61/ 2.20	1.61/ 2.20
DRILL CORE RECOVERY	71.00%	71.00 %
ESTIMATED YIELD	60.00	

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SIMULATED PRODUCT SIZE	3/8 X 28	28 X 100	100 X 0
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SECS
CONTRIBUTION	36.3	18.5	6.1

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
YIELD	60.90		
MOISTURE	.40		
ASH	8.70	8.77	
VOLATILE	25.90	26.11	27.90
F.C.	64.60	65.12	72.10
SULPHUR	.62		
PHOSPHORUS	.074		
SP.G.	1.320		
F.S.I.	7.5		
MARAGROVE	*****		

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.40		
ASH	33.10	33.37	
VOLATILE	19.20	19.35	25.80
F.C.	46.90	47.28	74.12
F.S.I.	7.0		
SULPHUR	.50		
SP.G. (-3/8 MESH)	1.61		
PHOSPHORUS	.027		

DRILL HOLE #: SD 7721

SEAM: 3

FLOAT SINK ANALYSIS

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	CUM FST
3/8 X 28	49.90				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	CUM FST
1.40	40.70 6.40	40.30 6.40	59.70 59.00	8.0	8.0
1.50	9.20 17.70	49.50 8.50	50.50 66.63	1.5	7.5
1.54	2.50 23.20	52.00 9.21	48.00 68.89	1.0	7.5
1.60	4.10 30.10	56.10 10.73	43.90 72.51	1.0	7.0
1.80	7.30 42.00	63.40 14.33	36.60 78.60	1.0	6.5
****	36.60 78.60	100.00 37.86	*****		2.0

SIZE REL. WEIGHT

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	CUM FST
28 X 100	23.00				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	CUM FST
1.40	54.80 3.90	54.80 3.90	45.20 34.03	9.0	9.0
1.50	13.80 10.30	68.60 5.19	31.40 44.45	7.5	8.0
1.60	4.40 15.70	73.00 5.82	27.00 49.14	5.0	8.0
1.74	7.60 21.20	80.60 7.27	19.40 60.08	1.5	7.5
1.90	3.30 31.70	83.90 8.23	16.10 65.90	1.0	7.0
****	16.10 65.90	100.00 17.52	*****		5.0

FROTH FLOTATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM
100 X 0	7.10		
TIME	WT% ASH%	WT% ASH%	F.S.I.
45	61.60 8.20	61.60 8.20	7.5
90	14.80 26.20	76.40 11.69	3.0
135	9.70 41.40	86.10 15.03	1.0
180	5.90 59.30	92.00 17.87	1.0
225	8.00 71.80	100.00 22.19	4.0

DRILL HOLE #: SD 7721

SEAM: 3

FLUIDITY

DILATATION

START TEMP.	420.0	SOFT TEMP.	377.0
FINAL TEMP.	495.0	SOLID TEMP.	467.0
MAX. FLUIDITY TEMP.	465.0	MAX. CONTRACTION	27.0
MAX. FLUIDITY (DDPH)	117.0	MAX. DILATATION	56.0
MAX. FLUIDITY (LOG)	2.068	G-FACTOR	1.038

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	INTERVAL	AIR DRIED BASIS	F.S.I.
77-8439	36.68-39.00		
		WT% ASH% MOIST VOL. F.C.	S. F.S.I.
1.5 FLOAT	65.10 8.70	.80 26.30 64.20	.69 8.0
1.5 SINK	36.90 51.39		
TOTAL	100.00 23.60		

DRY BASIS	8.77	26.51 64.72
D.M.M.F. BASIS	-	28.32 71.68

COMPONENT NO.	INTERVAL	AIR DRIED BASIS	F.S.I.
77-8440	38.00-38.22		
		WT% ASH% MOIST VOL. F.C.	S. F.S.I.
1.5 FLOAT	4.30 12.30	.80*****	.76 7.5
1.5 SINK	95.70 72.91		
TOTAL	100.00 70.30		

DRY BASIS	9.69	26.24 64.08
D.M.M.F. BASIS	-	28.25 71.75

COAL ANALYSIS PREPARED BY

SIGNED:

PROJ: FORTISAXON
DATE SAMPLED: 4/ 8/77
DRILL HOLE #: SD 7722
SEAM: 4
DATE ANALYSED: 11/0/77

DEWISON COAL DATA

Table with columns: COMPOSITE DESCRIPTION, INTERVAL, THICKNESS, etc. Values include 21.72-34.42, 10.37, 8.50/ 8.94, etc.

WARNOCK HERSEY ANALYSES

Table with columns: SIMULATED PRODUCT, SIZE, CONTRIBUTION, YIELD, AIR DRIED, DRY BASIS, etc. Values include 28 x 100, 100 x 0, 69.10, etc.

HEAD ANALYSIS - COMPOSITE RAW COAL

Table with columns: MOISTURE, ASH, VOLATILE, F.C., P.S.I., SULPHUR, SP.G., PHOSPHOROUS. Values include 1.00, 26.40, 23.30, etc.

DRILL HOLE #: SD 7722 SEAM: 4

FLOAT SINK ANALYSIS

Table with columns: SIZE, REL. WEIGHT, SP.G., WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI. Values include 28 x 100, 19.10, 1.40, etc.

SIZE REL. WEIGHT

Table with columns: SIZE, REL. WEIGHT, SP.G., WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI. Values include 28 x 100, 19.10, 1.40, etc.

FROTH FLOTATION

Table with columns: SIZE, REL. WEIGHT, TIME, WT%, ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI. Values include 100 x 0, 4.60, 45, etc.

DRILL HOLE #: SD 7722 SEAM: 4

FLUIDITY

Table with columns: START TEMP., FINAL TEMP., MAX. FLUIDITY TEMP., MAX. FLUIDITY (NDPM), MAX. FLUIDITY (LOG), SOFT. TEMP., SOLID. TEMP., MAX. CONTRACTION, MAX. DILATATION, G. FACTOR. Values include 426.0, 498.0, 467.0, etc.

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S. F.S.I. Values include 77-8055, 21.72-22.51, 17.10, etc.

Table with columns: DRY BASIS, D.M.M.F. BASIS. Values include 12.49, 25.78, 28.61, etc.

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S. F.S.I. Values include 77-8056, 22.51-23.74, 62.60, etc.

Table with columns: DRY BASIS, D.M.M.F. BASIS. Values include 10.28, 26.81, 29.15, etc.

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S. F.S.I. Values include 77-8057, 23.74-30.57, 90.50, etc.

Table with columns: DRY BASIS, D.M.M.F. BASIS. Values include 5.65, 26.71, 27.91, etc.

DRILL HOLE #: SD 7722 SEAM: 4

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S. F.S.I. Values include 77-8058, 30.57-32.30, 27.40, etc.

Table with columns: DRY BASIS, D.M.M.F. BASIS. Values include 6.67, 27.27, 28.69, etc.

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S. F.S.I. Values include 77-8059, 32.30-32.90, 27.40, etc.

Table with columns: DRY BASIS, D.M.M.F. BASIS. Values include 10.60, 24.52, 26.59, etc.

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S. F.S.I. Values include 77-8060, 32.90-34.42, 79.70, etc.

Table with columns: DRY BASIS, D.M.M.F. BASIS. Values include 5.35, 27.88, 29.01, etc.

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT%, ASH%, MOIST VOL., F.C., S. F.S.I. Values include 77-8061, 34.42-34.78, 30.00, etc.

Table with columns: DRY BASIS, D.M.M.F. BASIS. Values include 12.69, 26.28, 29.07, etc.

COAL ANALYSIS PREPARED BY WARNOCK HERSEY PROFESSIONAL SERVICES LTD SIGNED:

DEFECT: SAYON AREA: SOUTH
DATE SAMPLED: 4/ 8/77 DATE ANALYSED: 0/ 0/ 0
DRILL HOLE #: 50 7723 SEAM: 4
LAB COMPOSITE #: 77-0042-66 WT. REC. 29.60

DENISON COAL DATA

Table with columns: COMPOSITE DESCRIPTION, INTERVAL, THICKNESS, DIP, COAL/COAL+ROCK, DRILL CORP RECOVERY, ESTIMATED YIELD. Values for 51.88-62.68 and 51.88-62.68 mining sections.

WARNOCK HERSEY ANALYSES

Table with columns: SIMULATED PRODUCT, SIZE, CUTPOINT, CONTRIBUTION. Values for 3/8 X 28, 28 X 100, 100 X 0.

Table with columns: YIELD, MOISTURE, ASH, VOLATILE, F.C., SULPHUR, PHOSPHORUS, S.P.R., F.S.I., HADDOGRAVE. Values for AIR DRIED and DRY BASIS.

HEAD ANALYSIS - COMPOSITE RAW COAL

Table with columns: MOISTURE, ASH, VOLATILE, F.C., F.S.I., SULPHUR, S.P.R., PHOSPHOROUS. Values for AIR DRIED and DRY BASIS.

DRILL HOLE #: 50 7723 SEAM: 4

FLOAT SINK ANALYSES

Table with columns: SIZE, REL. WEIGHT, WT% ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI. Values for 3/8 X 28.

SIZE REL. WEIGHT

Table with columns: SIZE, REL. WEIGHT, WT% ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI. Values for 28 X 100.

FROTH FLOTATION

Table with columns: SIZE, REL. WEIGHT, TIME, WT% ASH%, CUM. FLOATS, CUM. SINKS, F.S.I., FSI. Values for 100 X 0.

DRILL HOLE #: 50 7723 SEAM: 4

FLUIDITY DILATATION

Table with columns: START TEMP., FINAL TEMP., MAX. FLUIDITY TEMP., MAX. FLUIDITY (DDPM), MAX. FLUIDITY (LOG), SOFT TEMP., SOLID TEMP., MAX. CONTRACTION, MAX. DILATATION, G. FACTOR.

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT% ASH%, MOIST VOL., F.C., S. F.S.I. Values for 77-0062.

Table with columns: DRY BASIS, D.M.M.F. BASIS. Values for 77-0062.

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT% ASH%, MOIST VOL., F.C., S. F.S.I. Values for 77-0063.

Table with columns: DRY BASIS, D.M.M.F. BASIS. Values for 77-0063.

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT% ASH%, MOIST VOL., F.C., S. F.S.I. Values for 77-0064.

Table with columns: DRY BASIS, D.M.M.F. BASIS. Values for 77-0064.

DRILL HOLE #: 50 7723 SEAM: 4

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT% ASH%, MOIST VOL., F.C., S. F.S.I. Values for 77-0065.

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT% ASH%, MOIST VOL., F.C., S. F.S.I. Values for 77-0066.

Table with columns: DRY BASIS, D.M.M.F. BASIS. Values for 77-0066.

PROJECT: SATH  
 DATE SAMPLED: 6/ 8/77  
 DRILL HOLE #: 5D 7724  
 LAR COMPOSITE #: 77-8442 WT. RFC. 5.45

APFASOUTH  
 DATE ANALYSED: 17/10/77  
 SFAM: 1

## DENISON COAL DATA

COMPOSITE DESCRIPTION	206.68-209.74	MINING SECTION	206.68-209.74
INTERVAL			
THICKNESS	3.06		3.06
ATP	39		39
COAL/COAL+POCK	2.22/ 2.38		2.22/ 2.38
DRILL CORE RECOVERY:	64.00%		64.00 %
ESTIMATED YIELD	78.00		

## WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0
SIZE			
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SECS
CONTRIBUTION	54.5	20.4	6.7

YIELD	ATP DRIED	DRY BASIS	D.M.M.F.
	81.60		
MOISTURE	.60		
ASH	8.08	8.05	
VOLATILE	25.30	25.45	27.08
F.C.	66.10	66.50	72.92
SULPHUR	.33		
PHOSPHORUS	.004		
S.P.G.	1.330		
F.S.I.	6.5		
HARDGRAVE	*****		

## HEAD ANALYSIS - COMPOSITE RAW COAL

	ATP DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.80		
ASH	16.50	16.63	
VOLATILE	21.80	21.98	25.86
F.C.	68.90	61.39	74.94
F.S.I.	5.5		
SULPHUR	.33		
SP.GR. (-3/8 MESH)	1.43		
PHOSPHOROUS	.00%		

DRILL HOLE #: 5D 7724

SEAM: 1

FLOAT SINK ANALYSIS  
 SIZE REL. WEIGHT  
 3/8 X 28 66.00

SP.G.	WT%	ASH%	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
1.40	65.40	6.10	65.40	6.10	34.60	39.69
1.80	14.20	17.10	79.60	8.06	20.40	55.41
1.84	3.00	21.00	82.60	8.53	17.40	61.34
1.80	3.30	24.90	85.90	9.16	14.10	64.87
1.80	1.70	33.20	87.60	9.63	12.40	74.90
****	12.40	74.90	100.00	17.72	*****	4.5

SIZE REL. WEIGHT  
 28 X 100 23.60

SP.G.	WT%	ASH%	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
1.40	46.50	4.10	46.50	4.10	53.50	19.68
1.80	25.80	8.50	72.30	5.67	27.70	30.08
1.80	10.00	13.50	82.30	6.62	17.70	39.45
1.76	4.30	14.80	86.60	7.13	13.40	46.72
1.90	2.60	24.80	89.20	7.64	10.80	52.00
****	16.80	52.00	100.00	12.43	*****	6.0

FROTH FLOTATION  
 SIZE REL. WEIGHT  
 100 X 0 7.70

TIME	WT%	ASH%	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
45	51.10	7.50	51.10	7.50	7.0	7.0
90	24.20	14.00	75.30	9.59	4.0	6.5
135	11.80	23.10	87.10	11.42	2.0	6.0
180	6.70	36.20	93.80	13.19	1.0	5.5
225	6.20	54.80	100.00	15.77	*****	5.0

DRILL HOLE #: 5D 7724

SEAM: 1

## FLUIDITY

## DILATATION

START TEMP.	470.0	SOFT TEMP.	372.0
FINAL TEMP.	498.0	SOLID TEMP.	466.0
MAX. FLUIDITY TEMP.	465.0	MAX. CONTRACTION	24.0
MAX. FLUIDITY (RPM)	157.0	MAX. DILATATION	18.0
MAX. FLUIDITY (LOG)	2.196	G. FACTOR	.984

## 1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO. 77-8442 INTERVAL 206.68-209.74

	WT%	ASH%	MOIST VOL.	F.C.	S.	F.S.I.
1.5 FLOAT	75.00	6.60	.80	25.30	65.30	.40 6.5
1.5 SINK	25.00	47.80				
TOTAL	100.00	16.90				

DRY BASIS	6.65	25.50	65.83
D.M.M.F. BASIS	-	28.97	71.03



PROJECT: Saxon AREA: SOUTH  
 DATE SAMPLED: 4/ 8/77 DATE ANALYSED: 18/10/77  
 DRILL HOLE #: 50 7774 SFAM: 2  
 LAB COMPOSITE #: 77-R447-45 WT. REC. 4.67

DENISON COAL DATA

COMPOSITE DESCRIPTION	INTERVAL	MINING SECTION	
	192.58-195.74	192.58-195.74	
THICKNESS		3.16	3.16
DIP		15	35
COAL/COAL ROCK	2.24/ 2.68	2.24/ 2.68	
DRILL CORE RECOVERY		47.00%	43.00 %
ESTIMATED YIELD		70.00	

WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0
SIZE			
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SFCS
CONTRIBUTION	32.5	15.3	6.2
YIELD	AIR DRIED 54.00	DRY BASIS	D.M.M.F.
MOISTURE	.70		
ASH	8.00	8.06	
VOLATILE	26.00	26.18	27.87
F.C.	65.30	65.76	72.13
SULPHUR	.37		
PHOSPHORUS	.011		
S.P.G.	1.330		
F.S.I.	7.0		
HARDGROVE	*****		

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.90		
ASH	35.30	35.62	
VOLATILE	18.30	18.47	25.24
F.C.	45.50	45.91	74.76
F.S.I.	3.5		
SULPHUR	.32		
SP.G. (-3/8 WFSH)	1.41		
PHOSPHORUS	.014		

DRILL HOLE #: 50 7774 SFAM: 2

FLOAT SINK ANALYSIS  
 SIZE PFL. WEIGHT  
 3/8 X 28 71.40

SP.G.	WT%	ASH%	CUM. WT%	FLOATS	CUM. WT%	SINKS	F.S.I.	FSI
1.54	45.50	8.30	45.50	8.30	54.50	67.10	6.0	6.0
****	54.50	67.10	100.00	40.35	*****	*****		2.0

SIZE REL. WEIGHT

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
28 X 100	21.00				
SP.G.	WT%	ASH%	WT%	ASH%	F.S.I.
1.76	72.70	7.30	72.70	7.30	27.30
****	27.30	59.20	100.00	21.47	*****
					5.0

FROTH FLOTATION  
 SIZE REL. WEIGHT  
 100 X 0 7.60

TIME	WT%	ASH%	CUM. WT%	FLOATS	CUM. WT%	F.S.I.	FSI
45	54.30	9.90	54.30	9.90	7.5	7.5	
90	18.10	23.80	72.40	13.38	2.5	7.0	
135	9.40	37.30	81.80	16.12	1.5	7.0	
180	7.30	55.20	89.10	19.33	1.0	6.0	
225	10.90	72.90	100.00	25.17	*****	4.5	

DRILL HOLE #: 50 7774 SFAM: 2

FLUIDITY GELATINITY

START TEMP.	414.0	SOFT TEMP.	378.0
FINAL TEMP.	407.0	SOLID TEMP.	469.0
MAX. FLUIDITY TEMP.	459.0	MAX. CONTRACTION	26.0
MAX. FLUIDITY (ODPM)	150.0	MAX. DILATION	33.0
MAX. FLUIDITY (LOG)	2.176	G. FACTOR	1.013

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-R443	INTERVAL	192.58-193.23
		AIR DRIED BASIS	
	WT%	ASH%	MOIST VOL. F.C. S. F.S.I.
1.5 FLOAT	77.10	3.00	1.00 28.50 67.50 .61 8.5
1.5 SINK	22.90	40.55	
TOTAL	100.00	11.60	

DRY BASIS	3.03	28.79	68.18
D.M.M.F. BASIS	-	29.36	70.64

COMPONENT NO.	77-R444	INTERVAL	193.23-193.66
		AIR DRIED BASIS	
	WT%	ASH%	MOIST VOL. F.C. S. F.S.I.
1.5 FLOAT	6.90	10.90	.90 25.40 62.90 .55 6.5
1.5 SINK	93.10	64.18	
TOTAL	100.00	60.50	

DRY BASIS	10.90	25.63	63.47
D.M.M.F. BASIS	-	27.91	72.09

COMPONENT NO.	77-R445	INTERVAL	193.66-195.74
		AIR DRIED BASIS	
	WT%	ASH%	MOIST VOL. F.C. S. F.S.I.
1.5 FLOAT	72.30	7.70	.80 26.90 64.70 .32 6.5
1.5 SINK	27.70	49.22	
TOTAL	100.00	19.20	

DRY BASIS	7.76	27.02	65.22
D.M.M.F. BASIS	-	28.73	71.27

COAL ANALYSIS PREPARED BY  
 WARNOCK HERSEY PROFESSIONAL SERVICES LTD  
 SIGNED:

PROJECT: SAYON  
 DATE SAMPLED: 6/ 9/77  
 DRILL HOLE #: SD 7724  
 LAB COMPOSITE #: 77-8446 WT. RFC. 5.72

APFA: SMITH  
 DATE ANALYSIS: 18/10/77  
 SEAM: 3

DENISON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION
INTERVAL : 148.06-149.87	148.06-149.87
THICKNESS :	1.81 1.81
DTP :	25 25
COAL/COAL ROCK :	1.32/ 1.63 1.32/ 1.63
DRILL CORE RECOVERY :	79.00% 79.00 %
ESTIMATED YIELD :	68.00

WAPROCK HERSEY ANALYSES

SIMULATED PRODUCT	7/8 X 28	28 X 100	100 X 0
SIZE			
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SECS
CONTRIBUTION	43.4	18.7	6.2

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
	68.30		

MOISTURE	ASH	VOLATILE	F.C.
.60	5.10	27.70	66.60
	5.13	27.87	67.00
		28.87	71.13

SULPHUR	PHOSPHORUS	S.P.G.	F.S.I.	HARDGROVE
.78	.014	1.240	9.0	*****

HEAD ANALYSIS - COMPOSITE RAW COAL

MOISTURE	ASH	VOLATILE	F.C.
.90	26.90	20.50	51.70
	27.14	20.69	52.17
		25.84	74.16

F.S.I.	SULPHUR
7.0	.97

SP.G. (-3/8 MESH)	PHOSPHORUS
1.45	.023

DRILL HOLE #: SD 7724 SEAM: 3

FLOAT SINK ANALYSES  
 SIZE REL. WEIGHT  
 3/8 X 28

SP.G.	WT%	ASH%	CUM. WT%	FLOATS WT%	ASH%	CUM. SINKS WT%	ASH%	F.S.I.	FSI
1.40	58.80	4.40	58.80	4.40	41.20	66.70	7.0	7.0	
1.50	3.10	16.80	61.90	5.02	38.10	70.31	4.0	7.0	
1.64	.80	18.20	62.70	5.19	37.30	71.43	2.5	7.0	
1.60	1.50	29.20	64.20	5.75	35.80	73.20	1.0	7.0	
1.80	3.60	41.90	67.80	7.67	32.20	74.70	1.0	7.0	
****	32.20	76.70	100.00	29.90	*****	*****	4.0	4.0	

SIZE REL. WEIGHT  
 28 X 100

SP.G.	WT%	ASH%	CUM. WT%	FLOATS WT%	ASH%	CUM. SINKS WT%	ASH%	F.S.I.	FSI
1.40	66.40	3.10	66.40	3.10	33.60	44.71	8.5	8.5	
1.50	6.50	7.90	72.90	3.53	27.10	53.54	7.5	8.5	
1.60	4.30	12.90	77.20	4.05	22.80	61.20	7.0	8.5	
1.76	2.20	23.40	79.40	4.59	20.60	65.24	2.5	8.5	
1.90	1.90	30.20	81.30	5.18	18.70	68.80	1.5	8.5	
****	18.70	68.80	100.00	17.08	*****	*****	7.5	7.5	

FROTH FLOTATION

SIZE	REL. WEIGHT	CUM. FLOATS	CUM. SINKS			
100 X 0	7.20					
YIELD	WT%	ASH%	F.S.I.	FSI		
45	61.30	7.20	41.30	7.20	8.0	8.0
90	16.60	19.70	77.90	9.86	5.0	8.0
135	8.30	41.30	86.20	12.89	2.0	8.0
180	6.10	63.90	92.30	16.26	1.0	7.5
260	7.70	74.20	100.00	20.72	*****	7.0

DRILL HOLE #: SD 7724 SEAM: 3

FLUIDITY	DILATATION
START TEMP. 417.0	SOFT TEMP. 371.0
FINAL TEMP. 498.0	SOLID TEMP. 467.0
MAX. FLUIDITY TEMP. 465.0	MAX. CONTRACTION 28.0
MAX. FLUIDITY (DDPM) 490.0	MAX. DILATATION 124.0
MAX. FLUIDITY (LOG) 2.690	G. FACTOR 1.078

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-8446	INTERVAL	148.06-149.87
		AIR DRIED BASIS	
		WT%	ASH%
1.5 FLOAT	61.30	5.30	.80
1.5 SINK	38.70	56.98	27.60
TOTAL	100.00	25.30	66.30
			F.S.I. 8.5
DRY BASIS	5.34	27.82	66.83
D.M.M.F. BASIS	-	28.86	71.14

PROJECT: SAXON  
 DATE SAMPLED: 0/ 0/ 0  
 DRILL HOLE #: 7724  
 LAB COMPOSITE #:

APFA: SOUTH  
 DATE ANALYSED: 0/ 0/ 0  
 SEAM: 3L  
 WT. RFC: 0.

DRILL HOLE #: 7724

SEAM: 3L

DENTSON COAL DATA

COMPOSITE DESCRIPTION INTERVAL	MINING SECTION	
THICKNESS	0.	0.
OTP		
COAL/COAL+ROCK	0. / 0.	0. / 0.
DRILL CORP RECOVERY	0. %	0. %
ESTIMATED YIELD	*****	

WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT SIZE	3/8 X 28	28 X 100	100 X 0
CUTPOINT			

DRILL HOLE #: 7724

SEAM: 3L

FLUIDITY

DILATATION

START TEMP.	*****	SOFT TEMP.	*****
FINAL TEMP.	*****	SOLID TEMP.	*****
MAX. FLUIDITY TEMP.	*****	MAX. CONTRACTION	*****
MAX. FLUIDITY (DDM)	*****	MAX. DILATATION	*****
MAX. FLUIDITY (LOG)	*****	G. FACTOR	*****

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-R447	INTERVAL	153.48-154.01		
		AIR DRIED BASIS			
WT%	ASH%	MOIST VOL.	F.C.	S.	F.S.I.
1.5 FLOAT	57.20	5.70	70.28	20.65	40.96
1.5 SINK	42.80	38.41			
TOTAL	100.00	19.70			

OPY BASIS	5.74	28.40	65.86
0. M.M.F. BASIS	-	29.54	70.46

PROJECT: S&XON APFA: SOUTH
DATE SAMPLED: 6/ 8/77 DATE ANALYSED: 18/10/77
DRILL HOLE #: SD 7724 SEAM: 4
1.4R COMPOSITE #: 77-8448-51 WT. REC. 27.94

DENISON COAL DATA

Table with columns: COMPOSITE DESCRIPTION, MINING SECTION, THICKNESS, DIP, COAL/COAL+ROCK, DRILL CORE RECOVERY, ESTIMATED YIELD. Values include 128.00-136.88, 128.00-136.88, 8.88, 25, 6.89/ 8.04, 82.00%, 71.00.

WARNOCK HERSEY ANALYSES

Table with columns: SIMULATED PRODUCT SIZE, CUTPOINT, CONTRIBUTION, YIELD, AIR DRIED, DRY BASIS, D.M.M.F., MOISTURE, ASH, VOLATILE, F.C., SULPHUR, PHOSPHOROUS, S.P.G., F.S.I., HADGROVE. Values include 3/8 X 28, 28 X 100, 100 X 0, 48.6, 73.40, 70, 6.50, 27.40, 65.40, .34, .014, 1.290, 7.5, 6.0, .96, 1.44, .017.

HEAD ANALYSIS - COMPOSITE RAW COAL

Table with columns: AIR DRIED, DRY BASIS, D.M.M.F., MOISTURE, ASH, VOLATILE, F.C., F.S.I., SULPHUR, S.P.G., PHOSPHOROUS. Values include .80, 21.00, 23.80, 54.40, 6.0, .96, 1.44, .017.

DRILL HOLE #: SD 7724 SEAM: 4

FLOAT SINK ANALYSIS
SIZE REL. WEIGHT
3/8 X 28 72.50

Table with columns: SP.G., WTR, ASH%, CUM. FLOATS, CUM. SINKS, CUM. FST. Values include 1.40, 54.90, 5.00, 54.90, 5.00, 45.10, 50.23, 7.5, 7.5.

SIZE REL. WEIGHT
28 X 100 20.60

Table with columns: SP.G., WTR, ASH%, CUM. FLOATS, CUM. SINKS, CUM. FST. Values include 1.40, 74.50, 3.40, 74.50, 3.40, 25.50, 31.08, 8.0, 8.0.

FROTH FLOTATION

Table with columns: SIZE REL. WEIGHT, CUM. FLOATS, CUM. SINKS, CUM. FST. Values include 100 X 0, 6.90, 45, 69.10, 6.90, 68.10, 6.90, 7.5, 7.5.

DRILL HOLE #: SD 7724

SEAM: 4

FLUIDITY

DILATATION

Table with columns: START TEMP., FINAL TEMP., MAX. FLUIDITY TEMP., MAX. FLUIDITY (NDPM), MAX. FLUIDITY (LOG), SOFT TEMP., SOLID TEMP., MAX. CONTRACTION, MAX. DILATATION, G.FACTOR. Values include 417.0, 492.0, 445.0, 252.0, 2.401, 367.0, 463.0, 27.0, 58.0, 1.044.

DRILL HOLE #: SD 7724

SEAM: 4

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WTR, ASH%, MOIST VOL., F.C., S. F.S.I. Values include 77-8451, 130.14-136.88, 1.5 FLOAT 73.30, 6.10, .80, 27.40, 65.70, .89, 8.5.

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WTR, ASH%, MOIST VOL., F.C., S. F.S.I. Values include 77-8448, 128.00-128.62, 1.5 FLOAT 73.30, 6.10, .80, 27.40, 65.70, .89, 8.5.

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WTR, ASH%, MOIST VOL., F.C., S. F.S.I. Values include 77-8452, 136.88-137.44, 1.5 FLOAT 1.80, 9.70, 1.00, 27.50, 61.80, .66, 8.5.

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WTR, ASH%, MOIST VOL., F.C., S. F.S.I. Values include 77-8449, 128.62-129.16, 1.5 FLOAT .70, 4.10, .90, 28.70, 64.40, .70, 9.0.

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WTR, ASH%, MOIST VOL., F.C., S. F.S.I. Values include 77-8453, 137.44-137.67, 1.5 FLOAT 46.60, 6.00, .90, 28.70, 64.40, .70, 9.0.

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WTR, ASH%, MOIST VOL., F.C., S. F.S.I. Values include 77-8450, 129.16-130.14, 1.5 FLOAT 44.70, 10.00, .70, 26.10, 63.20, .45, 7.5.

PROJECT: SAYON  
 DATE SAMPLED: 7/ 8/77  
 DRILL HOLE #: 50 7724  
 LAB COMPOSITE #: 77-8474 WT. PFC. 4.02

APFA: SOUTH  
 DATE ANALYSED: 19/10/77  
 SFAM: 10

DEFINSON COAL DATA

COMPOSITE DESCRIPTION	INTERVAL	MINING SECTION
	52.54-53.84	52.54-53.84
THICKNESS	1.30	1.30
GTP	35	35
COAL/COAL+POCK	1.07/ 1.07	1.07/ 1.07
DRILL CORF RECOVERY:	100.00%	100.00 %
ESTIMATED YIELD	90.00	

WARNOCK HERSEY ANALYSES

COMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SECS
CONTRIBUTION	58.0	26.3	9.0

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
	93.30		
MOISTURE	.40		
ASH	4.90	4.93	
VOLATILE	28.50	28.67	29.70
F.C.	66.00	66.40	70.30
SULPHUR	.65		
PHOSPHORUS	.060		
S.P.G.	1.290		
F.S.I.	8.0		
HARDGROVE	*****		

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	1.00		
ASH	8.30	8.38	
VOLATILE	26.50	26.77	28.53
F.C.	64.20	64.85	71.47
F.S.I.	7.5		
SULPHUR	.63		
SP.G. (1-3/8 WFSH)	1.33		
PHOSPHORUS	.054		

DRILL HOLE #: 50 7724

SEAM: 10

FLOAT SINK ANALYSIS  
 SIZE 3/8 X 28 RFL. WEIGHT 42.40

SP.G.	WT%	ASH%	CUM. WT%	FLOATS ASH%	CUM. SINKS WT%	ASH%	F.S.I.	FSI
1.40	84.80	4.70	84.80	4.70	15.20	34.07	7.5	7.5
1.50	6.90	13.60	91.70	5.37	8.30	58.47	7.0	7.5
1.60	1.20	17.00	92.90	5.52	7.10	65.42	2.5	7.5
1.60	.80	18.00	93.70	5.63	6.30	71.44	2.0	7.5
1.80	1.00	28.20	94.70	5.84	5.30	79.60	1.0	7.5
****	5.30	70.60	100.00	9.77	*****	*****		7.0

SIZE 28 X 100 RFL. WEIGHT 28.20

SP.G.	WT%	ASH%	CUM. WT%	FLOATS ASH%	CUM. SINKS WT%	ASH%	F.S.I.	FSI
1.40	65.80	2.70	65.80	2.70	34.20	11.61	8.5	8.5
1.50	21.30	5.70	87.10	3.43	12.90	21.37	7.5	8.5
1.60	4.40	8.10	91.50	3.66	8.50	28.24	6.5	8.5
1.70	1.70	10.80	93.20	3.79	6.80	32.60	5.0	8.5
1.90	1.90	13.00	95.10	3.97	4.90	40.20	5.0	8.5
****	4.90	40.20	100.00	5.75	*****	*****	1.0	8.0

FROTH FLOTATION

SIZE	RFL. WEIGHT	CUM. WT%	FLOATS ASH%	CUM. SINKS WT%	ASH%	F.S.I.	FSI
100 X 0	9.40						
TIME	WT%	ASH%	CUM. WT%	ASH%	F.S.I.	FSI	
45	76.20	4.80	76.20	4.80	7.5	7.5	
90	15.20	12.40	91.40	6.06	6.0	7.5	
135	4.30	27.50	95.70	7.03	2.5	7.5	
180	1.80	48.50	97.50	7.79	1.0	7.5	
225	2.50	60.80	100.00	9.12	*****	7.0	

DRILL HOLE #: 50 7724

SEAM: 10

FLUIDITY

START TEMP.	405.0	SOFT TEMP.	359.0
FINAL TEMP.	492.0	SOLID TEMP.	463.0
MAX. FLUIDITY TEMP.	453.0	MAX. CONTRACTION	26.0
MAX. FLUIDITY (DDPM)	1910.0	MAX. DILATATION	97.0
MAX. FLUIDITY (LOG)	3.281	G. FACTOR	1.079

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-8476	INTERVAL	52.54-53.84
		AIR DRIED BASIS	
1.5 FLOAT	86.50	4.90	.60 28.20 66.30 .67 7.5
1.5 SINK	13.50	21.94	
TOTAL	100.00	7.20	
DRY BASIS		4.93	28.37 66.70
D.M.M.F. BASIS		-	29.38 70.62

PROJECT: Saxon AREA: SOUTH
DATE SAMPLED: 17/ 8/77 DATE ANALYSED: 18/10/77
DRILL HOLE #: 50 7725 SPAN: 1
LAB COMPOSITE #: 77-R455-57 WT. REC. 14.7%

DENTSON COAL DATA

Table with columns: COMPOSITE DESCRIPTION, INTERVAL, MINING SECTION, THICKNESS, etc.

WAPROCK HERSCHEY ANALYSES

Table with columns: SIMULATED PRODUCT, SIZE, CUTPOINT, CONTRIBUTION, AIR DRIED, DRY BASIS, D.M.M.F., etc.

HEAD ANALYSIS - COMPOSITE RAW COAL

Table with columns: AIR DRIED, DRY BASIS, D.M.M.F., etc.

DRILL HOLE #: 50 7725 SEAM: 1

FLOAT/SINK ANALYSES

Table with columns: SIZE, REL. WEIGHT, CUM. FLOATS, CUM. SINKS, etc.

SIZE REL. WEIGHT

Table with columns: SIZE, REL. WEIGHT, CUM. FLOATS, CUM. SINKS, etc.

FROTH FLOATATION

Table with columns: SIZE, REL. WEIGHT, CUM. FLOATS, CUM. SINKS, etc.

DRILL HOLE #: 50 7725 SEAM: 1

Table with columns: FLUIDITY, DILATATION, STAPT TEMP., SOFT. TEMP., etc.

1.5% FLOAT/SINK ANALYSIS OF SFAM COMPONENTS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, etc.

PROJECT: S6YON APFAINSOUTH
DATE SAMPLED: 17/ 8/77 DATE ANALYSED: 18/10/77
DRILL HOLE #: 50 7725 SEAM: 2
LAB COMPOSITE #: 77-8458-61 WT. REC. 29.36

DENISON COAL DATA

Table with columns: COMPOSITE DESCRIPTION, INTERVAL, THICKNESS, DIP, COAL/COAL ROCK, DRILL CORE RECOVERY, ESTIMATED YIELD. Values include 70.26-77.68, 7.42, 31, 5.12/ 5.30, 98.00%, 80.00.

WARNOCK HERSEY ANALYSES

Table with columns: SIMULATED PRODUCT, SIZE, OUTPUT, CONTRIBUTION, YIELD, MOISTURE, ASH, VOLATILE, F.C., SULPHUR, PHOSPHORUS, S.P.R., F.S.I., HARDGROVE. Values include 3/8 X 28, 28 X 100, 100 X 0, 63.70, 8.0, 8.10, 23.20, 67.90, 0.38, 0.15, 1.710, 5.5, \*\*\*\*\*.

HEAD ANALYSIS - COMPOSITE RAW COAL

Table with columns: MOISTURE, ASH, VOLATILE, F.C., F.S.I., SULPHUR, SP.GR. (-3/8 MESH), PHOSPHORUS. Values include 8.0, 8.10, 23.20, 67.90, 7.0, 0.36, 1.43, 0.15.

DRILL HOLE #: 50 7725 SEAM: 2

Table with columns: FLUIDITY, DILATATION, START TEMP., FINAL TEMP., MAX.FLUIDITY TEMP., MAX.FLUIDITY (DDPM), MAX.FLUIDITY (LOG), SOFT TEMP., SOLID TEMP., MAX.CONTRACTION, MAX.DILATATION, R.FACTOR.

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT% ASH, WT% ASH, MOIST VOL., F.C., S, F.S.I. Values include 77-8461, 70.26-71.62, 86.40, 7.00, 9.90, 23.30, 68.80, 0.46, 7.0.

Table with columns: DRY BASIS, D.M.M.F. BASIS. Values include 7.06, 23.51, 69.42, 24.71, 75.29.

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT% ASH, WT% ASH, MOIST VOL., F.C., S, F.S.I. Values include 77-8460, 71.62-73.08, 86.40, 7.00, 9.90, 23.30, 68.80, 0.46, 7.0.

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT% ASH, WT% ASH, MOIST VOL., F.C., S, F.S.I. Values include 77-8459, 73.08-74.61, 86.40, 7.00, 9.90, 23.30, 68.80, 0.46, 7.0.

Table with columns: DRY BASIS, D.M.M.F. BASIS. Values include 7.06, 23.51, 69.42, 24.71, 75.29.

DRILL HOLE #: 50 7725 SEAM: 2

FLOAT SINK ANALYSIS SIZE REL. WEIGHT

Table with columns: SP.G., WT% ASH, WT% ASH, CUM. FLOATS, CUM. SINKS, CUM. F.S.I., FSI. Values include 1.40, 51.80, 6.40, 51.80, 6.40, 48.20, 75.48, 7.0, 7.0.

SIZE REL. WEIGHT

Table with columns: SP.G., WT% ASH, WT% ASH, CUM. FLOATS, CUM. SINKS, CUM. F.S.I., FSI. Values include 1.40, 66.40, 4.20, 66.40, 4.20, 33.60, 54.82, 9.0, 9.0.

FROTH FLOTATION

Table with columns: SIZE REL. WEIGHT, WT% ASH, WT% ASH, CUM. FLOATS, CUM. SINKS, CUM. F.S.I., FSI. Values include 100 X 0, 6.90, 45, 36.50, 8.40, 76.50, 8.40, 7.0, 7.0.

DRILL HOLE #: 50 7725 SEAM: 2

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, WT% ASH, WT% ASH, MOIST VOL., F.C., S, F.S.I. Values include 77-8458, 74.61-77.68, 87.40, 6.50, 9.90, 24.60, 68.00, 0.33, 7.0.

Table with columns: DRY BASIS, D.M.M.F. BASIS. Values include 6.56, 24.82, 68.62, 26.06, 73.94.

PROJECT: Saxon  
 DATE SAMPLED: 17/ 8/77  
 DRILL HOLE #: SD 7725  
 LAB COMPOSITE #: 77-8462

APFA: SOUTH  
 DATE ANALYSED: 18/10/77  
 SEAM: 3  
 WT. REC. 7.70

DEMISON COAL DATA

COMPOSITE DESCRIPTION	INTERVAL	MINING SECTION
	34.76-37.70	34.76-37.70
THICKNESS	2.94	2.94
STD	2R	2R
COAL/CLAY/ROCK	1.9R/ 2.60	1.9R/ 2.60
DRILL CORE RECOVERY	70.00%	70.00 %
ESTIMATED YIELD	55.00	

WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT SIZE	1/8 X 2R	2R X 100	100 X 0
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SECS
CONTRIBUTION	27.1	14.9	5.6
YIELD	AIR DRIED 47.60	DRY BASIS	D.M.M.F.
MOISTURE	.80		
ASH	8.60	8.67	
VOLATILE	24.60	24.80	26.37
F.C.	66.00	66.53	73.63
SULPHUR	.80		
PHOSPHORUS	.866		
%P.S.	1.370		
F.S.I.	8.0		
HARDNESS	*****		

WFA ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.80		
ASH	37.00	37.30	
VOLATILE	16.70	16.83	22.93
F.C.	45.50	45.87	77.07
F.S.I.	4.0		
SULPHUR	.56		
SP.GR. (-3/8 MESH)	1.40		
PHOSPHORUS	.879		

DRILL HOLE #: SD 7725

SEAM: 3

FLOAT SINK ANALYSES  
 SIZE REL. WEIGHT  
 3/8 X 2R 72.00

SP.G.	WT%	ASH%	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
1.40	29.20	6.30	29.20	4.30	70.80	58.20
1.50	6.70	18.20	35.90	8.41	64.50	62.11
1.64	2.10	24.40	38.00	9.70	62.40	63.38
1.80	4.60	30.50	42.60	11.62	57.80	66.00
1.80	16.80	45.00	59.40	21.12	41.00	74.60
****	41.00	74.60	100.00	43.05	*****	3.0

SIZE REL. WEIGHT  
 2R X 100 19.60

SP.G.	WT%	ASH%	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
1.40	55.40	4.30	55.40	4.30	44.60	36.36
1.50	11.20	10.60	66.60	5.36	33.40	45.00
1.60	3.70	17.60	70.30	5.94	30.10	49.01
1.76	6.10	23.80	76.40	7.37	24.00	54.16
1.90	5.80	32.70	82.20	9.17	18.20	61.00
****	18.20	61.00	100.00	18.60	*****	6.0

FROTH FLOTATION  
 SIZE REL. WEIGHT  
 100 X 0 8.40

TIME	WT%	ASH%	CUM. FLOATS	F.S.I.	FSI
45	25.20	8.80	25.20	8.80	7.5
90	24.00	14.00	49.20	11.34	6.5
135	17.20	22.80	66.40	14.31	4.5
180	15.60	35.40	82.00	18.32	3.0
225	18.00	50.20	100.00	24.06	1.5

DRILL HOLE #: SD 7725

SEAM: 3

FLOTATION

START TEMP.	423.0	SOFT TEMP.	385.0
FINAL TEMP.	501.0	SOLID TEMP.	471.0
MAX. FLUIDITY TEMP.	471.0	MAX. CONTRACTION	29.0
MAX. FLUIDITY (ORPH)	61.0	MAX. DILATATION	44.0
MAX. FLUIDITY (LOG)	1.785	G. FACTOR	1.021

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-8462	INTERVAL	34.76-37.70				
		AIR DRIED BASIS					
		WT% ASH% MOIST VOL. F.C.	S. F.S.I.				
1.5 FLOAT	37.90	8.30	1.00	23.90	66.80	.74	8.0
1.5 SINK	62.10	56.29					
TOTAL	100.00	38.10					
DRY BASIS		8.3R		24.14	67.47		
D.M.M.F. BASIS		-		25.59	74.41		



PROJECT: Saxon  
 DATE SAMPLED: 11/ 8/77  
 DRILL HOLE #: 7725  
 LAB COMPOSITE #:

AREA: SOUTH  
 DATE ANALYSED: 0/ 0/ 0  
 SEAM: GETH  
 WT. REC. 7.90

## DENISON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION	
INTERVAL	208.06-210.54	
THICKNESS	0.	2.48
DTP		28
COAL/COAL+ROCK	0. / 0.	2.06/ 2.18
DRILL CORE RECOVERY	0. %	0. %
ESTIMATED YIELD	*****	

## WARNOCK HERSEY ANALYSIS

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0
SIZF			
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SECS

DRILL HOLE #: 7725

SEAM: GETH

## DENISON COAL LIMITED

DRILL HOLE #: 7725

SEAM: GETH

FLUIDITY

DILATA. 10..

START TEMP.	*****	SOFT TEMP.	*****
FINAL TEMP.	*****	SOLID TEMP.	*****
MAX. FLUIDITY TEMP.	*****	MAX. CONTRACTION	*****
MAX. FLUIDITY (DDPM)	*****	MAX. DILATATION	*****
MAX. FLUIDITY (LOG)	*****	G. FACTOR	*****

## 1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO.	77-8454	INTERVAL	208.06-210.54			
AIR DRIED BASIS						
	WTR	ASH%	MOIST VOL.	F.C.	S.	F.S.I.
1.5 FLOAT	72.00	4.50	.90	22.90	71.70	.47 5.0
1.5 SINK	28.00	50.21				
TOTAL	100.00	17.70				

DRY BASIS	4.54	23.11	72.35
D.M.M.F. BASIS	-	23.78	76.22

PROJECT: SAISON AREA: SOUTH  
 DATE SAMPLED: 7/ 8/77 DATE ANALYSED: 0/ 0/ 0  
 DRILL HOLE #: SD 7726 SEAM: 1  
 LAB COMPOSITE #: 77-R265-R0 WT. RFG. 15.00

DEWISON COAL DATA

COMPOSITE DESCRIPTION	INTERVAL	MINING SECTION
	757.9R-362.16	357.9R-362.16
THICKNESS	4.18	4.18
GIP	18	18
COAL/COAL ROCK	3.55/ 3.98	3.55/ 3.98
DRILL CORE RECOVERY	95.00%	95.00 %
ESTIMATED YIELD	75.00	

WARNOCK HFRSIFY ANALYSES

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0
SIZE	SP.G. 1.54	SP.G. 1.76	135 SECS
CUTPOINT CONTRIBUTION	49.6	18.6	7.3

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
	75.50		
MOISTURE	.40		
ASH	9.70	9.34	
VOLATILE	20.30	20.38	21.72
F.C.	70.00	70.28	78.28
SULPHUR	.38		
PHOSPHORUS	.002		
S.P.C.	0.		
F.S.I.	4.5		
HARDGROVE	*****		

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.60		
ASH	22.10	22.23	
VOLATILE	18.40	18.51	21.89
F.C.	58.90	59.26	78.11
F.S.I.	2.5		
SULPHUR	.35		
SP.G. (-1/2 MFSH)	1.45		
PHOSPHORUS	.005		

DRILL HOLE #: SD 7726 SEAM: 1

FLOAT SINK ANALYSES  
 SIZE REL. WEIGHT  
 3/8 X 28 70.80

SP.G.	WT%	ASH%	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
1.40	48.70	4.40	48.70	6.40	51.30	43.38
1.50	16.20	13.90	64.90	8.27	35.10	56.99
1.54	5.10	20.70	70.00	9.18	30.00	63.14
1.40	4.10	27.10	74.10	10.17	25.90	68.87
1.80	5.80	34.10	79.90	11.91	20.10	78.90
****	20.10	78.90	100.00	25.37	*****	7.0

SIZE REL. WEIGHT  
 28 X 100 21.10

SP.G.	WT%	ASH%	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
1.40	61.60	4.30	61.60	4.30	38.40	30.95
1.50	17.10	10.80	78.70	5.71	21.30	47.13
1.60	4.70	18.50	83.40	6.43	16.60	55.23
1.76	4.60	26.50	88.00	7.68	12.00	66.25
1.90	1.70	31.40	89.70	7.94	10.30	72.00
****	10.30	72.00	100.00	14.53	*****	3.5

FRONT FLOATATION  
 SIZE REL. WEIGHT  
 100 X 0 7.60

TIME	WT%	ASH%	CUM. FLOATS	CUM
45	86.10	9.40	86.10	9.40
90	7.30	24.00	93.40	10.54
135	2.70	40.40	96.10	11.38
180	1.30	80.20	97.40	12.03
225	2.60	77.30	100.00	13.73

DRILL HOLE #: SD 7726 SEAM: 1

FLUIDITY	DILATATION
START TEMP. 441.0	SOFT TEMP. 403.0
FINAL TEMP. 489.0	SOLID TEMP. *****
MAX. FLUIDITY TEMP. 468.0	MAX. CONTRACTION 24.0
MAX. FLUIDITY (DDPH) 4.0	MAX. DILATATION *****
MAX. FLUIDITY (LOG) .602	G. FACTOR *****

GVE REPORT DRILL HOLE SD7726 SEAM 1

DEPTH FROM	DEPTH TO	SAMPLE NO.	SPG	ASH WTS
35735	35758	10	2.59	80.8
35758	35777	20	2.51	83.5
35777	35798	30	2.31	73.3
35798	35824	40	1.41	18.5
35824	35868	50	1.37	10.2
35868	35892	60	1.46	19.5
35892	35906	70	1.40	14.2
35906	35930	80	1.36	9.3
35930	35960	90	1.33	8.7
35960	35984	100	2.39	73.1
35984	35988			
35988	35996	110	1.70	55.0
35996	36030	120	1.42	19.8
36030	36056	130	1.35	11.2
36056	36078	140	1.39	13.6
36078	36100	150	1.51	35.0
36100	36108	160	2.29	69.0
36108	36152	170	1.40	12.9
36152	36176	180	1.33	7.6
36176	36199	190	1.31	8.8
36199	36216			
36216	36234	200	2.28	65.8
36234	36280	210	2.55	91.7
36280	36352	220	2.54	96.7

PROJECT: Saxon  
 DATE SAMPLED: 7/ 8/77  
 DRILL HOLE #: 50 7724  
 IAR COMPONENT #: 77-8463-6A WT. PFC. 24.22

APPROXIMATE DATE ANALYSIS: 18/10/77  
 SFAM: 2

DENISON COAL DATA

COMPOSITE DESCRIPTION	INTERVAL	MINING SECTION
THICKNESS	333.76-340.28	333.76-340.28
ATP	4.52	6.52
COAL/COAL+ROCK	1R	1R
DRILL CORE RECOVERY	5.27/ 6.29	5.27/ 6.29
ESTIMATED YIELD	98.00%	98.00 %
	72.00	

WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0
SIZE			
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SECS
CONTRIBUTION	47.4	18.1	6.2
YIELD	AIR DRIED 71.70	DRY BASIS	D.M.M.F.
MOISTURE	.40		
ASH	6.90	6.94	
VOLATILE	23.00	24.04	25.28
F.C.	68.40	69.01	74.72
SULPHUR	.38		
PHOSPHORUS	.011		
S.P.G.	1.300		
F.S.I.	7.0		
MARSHBONE	*****		

HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.90		
ASH	29.40	29.67	
VOLATILE	18.10	18.25	23.22
F.C.	51.60	52.07	76.78
F.S.I.	4.0		
SULPHUR	.41		
SP.G. (-3/8 MESH)	1.55		
PHOSPHORUS	.013		

DRILL HOLE #: 50 7726 SFAM: 2

FLOAT/SINK ANALYSES

SIZE	RFL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	CSI
3/8 X 28	72.00				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	CSI
1.40	58.40 5.50	58.60 5.50	41.40 77.18	7.0	7.0
1.50	6.10 15.70	64.70 6.44	35.30 81.94	1.0	6.5
1.54	1.10 19.60	65.80 6.68	34.20 83.94	1.0	6.5
1.60	1.20 25.00	67.00 7.01	33.00 86.09	1.0	6.5
1.80	1.50 33.30	68.50 7.50	31.50 88.60	1.0	6.0
****	31.50 89.60	100.00 33.10	*****		3.5

SIZE RFL. WEIGHT

SIZE	RFL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	CSI
28 X 100	70.50				
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	CSI
1.40	80.70 3.70	80.70 3.70	19.30 57.77	9.0	9.0
1.50	3.20 10.20	83.90 3.95	16.10 67.22	4.5	8.5
1.60	2.50 13.60	86.40 4.23	13.60 77.08	2.0	8.0
1.75	.70 19.00	87.10 4.35	12.90 80.23	1.0	8.0
1.90	.40 31.20	87.50 4.47	12.50 81.80	1.0	8.0
****	12.50 81.80	100.00 14.14	*****		6.0

FROTH FLOTTATION

SIZE	RFL. WEIGHT	CUM. FLOATS	CUM. SINKS	F.S.I.	CSI
100 X 0	7.90				
TIME	WT% ASH%	WT% ASH%	WT% ASH%	F.S.I.	CSI
45	67.00 6.80	67.00 6.80	7.5 7.5		
90	9.10 18.00	76.10 8.14	4.5 7.0		
135	7.20 22.30	83.30 10.23	2.0 7.0		
180	4.80 27.30	88.10 12.79	1.0 6.5		
225	11.90 27.50	100.00 20.49	*****		5.0

DRILL HOLE #: 50 7726 SFAM: 2

FLUIDITY		DILATATION	
START TEMP.	429.0	SOFT. TEMP.	390.0
FINAL TEMP.	504.0	SOLID. TEMP.	473.0
MAX. FLUIDITY TEMP.	475.0	MAX. CONTRACTION	28.0
MAX. FLUIDITY (NDPM)	31.0	MAX. DILATATION	5.0
MAX. FLUIDITY (LOG)	1.491	G.FACTOR	.937

1.5 FLOAT/SINK ANALYSIS OF SFAM COMPONENTS

COMPONENT NO.	INTERVAL	AIR DRIED BASIS	WT% ASH%	MOIST VOL.	F.C.	S. F.S.I.
77-8463	333.76-335.00					
1.5 FLOAT	82.70	6.90	.70	22.90	69.60	.47 8.0
1.5 SINK	17.30	29.34				
TOTAL	100.00	10.70				

DRY BASIS	WT% ASH%	MOIST VOL.	F.C.	S. F.S.I.
6.85	23.06	70.09		
D.M.M.F. BASIS	-	24.18	75.82	

COMPONENT NO. 77-8464 INTERVAL 335.00-335.97

WT% ASH%	MOIST VOL.	F.C.	S. F.S.I.
1.5 FLOAT*****			
1.5 SINK*****			
TOTAL	100.00	82.80	

COMPONENT NO. 77-8465 INTERVAL 335.97-338.81

WT% ASH%	MOIST VOL.	F.C.	S. F.S.I.	
1.5 FLOAT	84.70	6.90	.70 22.60 69.90	.26 6.5
1.5 SINK	15.30	27.72		
TOTAL	100.00	10.80		

DRY BASIS	WT% ASH%	MOIST VOL.	F.C.	S. F.S.I.
6.85	22.76	70.39		
D.M.M.F. BASIS	-	23.91	76.09	

DRILL HOLE #: 50 7726 SFAM: 2

1.5 FLOAT/SINK ANALYSIS OF SFAM COMPONENTS

COMPONENT NO.	INTERVAL	AIR DRIED BASIS	WT% ASH%	MOIST VOL.	F.C.	S. F.S.I.
77-8466	338.81-340.28					
1.5 FLOAT	84.40	4.80	.70	23.70	70.80	.36 8.0
1.5 SINK	15.60	23.39				
TOTAL	100.00	7.70				

DRY BASIS	WT% ASH%	MOIST VOL.	F.C.	S. F.S.I.
4.83	23.87	71.30		
D.M.M.F. BASIS	-	24.67	75.33	

PROJECT: SAKON
DATE SAMPLED: 7/ 8/77
DRILL HOLE #: SD 7726
LAB COMPOSITE #: 77-R284-03 WT. REC. 3.00

RENTON COAL DATA

Table with columns: COMPOSITE DESCRIPTION, INTERVAL, MINING SECTION, and values for parameters like moisture, ash, and yield.

WARNOCK HERSEY ANALYSES

Table showing simulated product analysis for sizes 3/8 x 28, 28 x 100, and 100 x 0, including moisture, ash, and volatile content.

HEAD ANALYSIS - COMPOSITE RAW COAL

Table showing head analysis for composite raw coal, including moisture, ash, volatile, and sulfur content.

DRILL HOLE #: SD 7726 SEAM: 3

FLOAT SINK ANALYSES
SIZE PFL. WEIGHT
3/8 X 28 73.00

Table showing float and sink analysis for size 3/8 x 28, including specific gravity, weight, and percentage of floats and sinks.

SIZE PFL. WEIGHT
28 X 100 70.00

Table showing float and sink analysis for size 28 x 100, including specific gravity, weight, and percentage of floats and sinks.

FROTH FLOTATION

Table showing froth flotation results for size 100 x 0, including time, weight, and percentage of floats and sinks.

DRILL HOLE #: SD 7726 SEAM: 3

PLASTICITY

Table showing plasticity characteristics including start temp, final temp, softening point, and maximum fluidity.

GVE REPORT DRILL HOLE SD7726 SEAM 3

Table showing GVE report data including depth from, sample no., SPG, and ash wt% for various sample depths.

PROJECT: Saxon ALFA SOUTH DATE ANALYSED: 19/10/77 DRILL HOLE #: SD 7726 SEAM: 4

DEMISON COAL DATA

Table with columns: COMPOSITE DESCRIPTION, INTERVAL, THICKNESS, DTP, COAL/COAL-ROCK, CRTLI CORR RECOVERY, ESTIMATED YIELD. Values include 235.24-244.40, 11.36, 20, 9.50/10.49, 95.00%, 71.00.

MAPROCK HERSEY ANALYSES

Table with columns: SIMULATED PRODUCT SIZE, CUTPOINT CONTRIBUTION, YIELD, MOISTURE, ASH, VOLATILE, F.C., SULPHUR, PHOSPHORUS, S.P.G., F.S.I., HARDNESS. Values include 7/8 X 28, 28 X 100, 100 X 0, 45.0, 71.90, 0.70, 7.50, 26.60, 65.20, 0.35, 0.015, 1.300, 7.5, \*\*\*\*\*.

HEAD ANALYSIS - COMPOSITE RAW COAL

Table with columns: AIR DRIED, DRY BASIS, D.M.M.F. Values include 0.90, 23.50, 21.00, 54.60, 5.0, 0.30, 1.40, 0.015.

DRILL HOLE #: SD 7726

SEAM: 4

FLUIDITY

DILATATION

Table with columns: START TEMP, FINAL TEMP, MAX FLUIDITY TEMP, MAX FLUIDITY (DPPM), MAX FLUIDITY (LOG), SOFT TEMP, SOLID TEMP, MAX CONTRACTION, MAX DILATATION, G FACTOR. Values include 426.0, 501.0, 477.0, 114.0, 2.057, 384.0, 477.0, 28.0, 15.0, 0.968.

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, Wt%, Ash%, Moist Vol., F.C., S, F.S.I., DRY BASIS, D.M.M.F. BASIS. Values include 77-RA67, 234.78-234.93, 21.60, 4.30, 78.40, 70.24, 100.00, 56.00, 4.34, 26.94, 68.72, 27.72, 72.28, 77-RA68, 234.93-235.24, 2.40, 5.20, 97.60, 68.72, 100.00, 67.20, 9.26, 25.98, 64.75, 27.90, 72.10.

FLOAT SINK ANALYSES SIZE PFL. WEIGHT 3/8 X 28 68.90

Table with columns: SP.G., Wt%, Ash%, CUM. FLOATS, Wt%, Ash%, CUM. SINKS, Wt%, Ash%, F.S.I., FSI. Values include 1.40, 54.00, 4.90, 54.00, 4.90, 46.00, 56.95, 8.0, 8.0, 1.50, 9.20, 15.40, 43.30, 6.44, 36.70, 67.48, 3.0, 7.5, 1.54, 2.00, 24.10, 45.30, 6.98, 34.70, 69.98, 1.5, 7.0, 1.60, 2.00, 29.30, 48.10, 7.90, 31.90, 73.55, 1.0, 7.0, 1.80, 5.40, 37.00, 73.50, 10.04, 26.50, 81.00, 1.0, 6.0, \*\*\*\* 26.50, 81.00, 100.00, 28.84, \*\*\*\*.

SIZE PFL. WEIGHT 28 X 100 73.80

Table with columns: SP.G., Wt%, Ash%, CUM. FLOATS, Wt%, Ash%, CUM. SINKS, Wt%, Ash%, F.S.I., FSI. Values include 1.40, 69.40, 3.70, 59.40, 3.70, 30.40, 39.09, 8.0, 8.0, 1.50, 10.80, 11.50, 40.40, 4.75, 19.60, 52.74, 3.5, 7.5, 1.60, 2.00, 20.50, 40.20, 5.28, 16.80, 58.12, 2.0, 7.5, 1.76, 2.00, 28.90, 86.10, 6.07, 13.90, 64.27, 1.0, 7.5, 1.90, 1.20, 35.80, 87.30, 6.48, 12.70, 66.90, 1.0, 7.5, \*\*\*\* 12.70, 66.90, 100.00, 14.16, \*\*\*\*.

FROTH FLOATATION SIZE PFL. WEIGHT 100 X 0 7.30

Table with columns: TIME, Wt%, Ash%, CUM. FLOATS, Wt%, Ash%, F.S.I., FSI. Values include 45, 65.30, 7.20, 45.30, 7.20, 7.5, 7.5, 90, 12.40, 20.20, 77.90, 9.30, 4.0, 7.5, 135, 10.40, 45.70, 88.30, 13.50, 1.5, 7.0, 180, 4.58, 52.90, 92.80, 15.50, 1.0, 6.5, 225, 7.20, 68.40, 100.00, 19.30, \*\*\*\*, 5.5.

DRILL HOLE #: SD 7726

SEAM: 4

1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

Table with columns: COMPONENT NO., INTERVAL, AIR DRIED BASIS, Wt%, Ash%, Moist Vol., F.C., S, F.S.I., DRY BASIS, D.M.M.F. BASIS. Values include 77-9470, 236.28-236.44, 1.5 FLOAT 12.70, 8.60, 1.5 SINK 87.30, 73.55, 100.00, 65.70, 8.45, 26.36, 64.99, 28.13, 71.87, 77-9471, 236.64-242.87, 1.5 FLOAT 82.20, 6.20, 1.5 SINK 17.80, 39.78, 100.00, 12.00, 6.24, 25.78, 67.98, 27.03, 72.97, 77-9472, 242.87-243.31, 1.5 FLOAT 42.70, 5.60, 1.5 SINK 57.30, 44.52, 100.00, 27.90, 5.63, 27.36, 67.00, 28.55, 71.45, 77-9473, 243.31-245.16, 1.5 FLOAT 27.90, 7.00, 1.5 SINK 72.10, 64.70, 100.00, 48.60, 7.05, 26.38, 66.57, 27.82, 72.18.

DRILL HOLE #: SD 7726

SEAM: 4

## 1.5 FLOAT/SINK ANALYSIS OF SEAM COMPONENTS

COMPONENT NO. 77-8474 INTERVAL 245.16-246.22

AIR DRIED BASIS

	WT%	ASH%	MOIST	VOL.	F.C.	S.	F.S.I.
1.5 FLOAT	80.80	5.10	.70	25.80	68.40	.51	7.0
1.5 SINK	19.20	65.00					
TOTAL	100.00	16.60					

DRY BASIS	5.14	25.98	68.88
D.M.M.F. BASIS	-	26.94	73.06

COMPONENT NO. 77-8475 INTERVAL 246.22-246.60

AIR DRIED BASIS

	WT%	ASH%	MOIST	VOL.	F.C.	S.	F.S.I.
1.5 FLOAT	21.30	7.70	.80	24.90	66.60	.60	7.5
1.5 SINK	78.70	67.17					
TOTAL	100.00	54.50					

DRY BASIS	7.76	25.10	67.14
D.M.M.F. BASIS	-	26.55	73.45

COAL ANALYSIS PREPARED BY  
WARNOCK HERSEY PROFESSIONAL SERVICES LTD

SIGNED:

PROJECT: SAKON  
 DATE SAMPLED: 7/ 8/77  
 DRILL HOLE #: 5D 7726  
 LAB COMPOSITE #: 77-8700-10 WT. RFC. 6.60

APFA: SOUTH  
 DATE ANALYSED: 0/ 0/ 0  
 SEAM: 5

## DENISON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION	
INTERVAL	196.32-198.30	196.32-198.30
THICKNESS	1.98	1.98
BIT	32	32
COAL/COAL+ROCK	1.40/ 1.68	1.40/ 1.68
DRILL CORP RECOVERY	100.00%	100.00 %
ESTIMATED YIELD	76.00	

## WARNOCK HERSEY ANALYSES

SIMULATED PRODUCT	1/8 X 28	28 X 100	100 X 0
SIZE	28 X 100	100 X 0	
CUTPOINT	SP.G. 1.54	SP.G. 1.76	135 SFCS
CONTRIBUTION	54.0	17.0	5.0
YIELD	AIR DRIED 76.00	DRY BASIS	D.M.M.F.
MOISTURE	.70		
ASH	4.40	4.43	
VOLATILE	24.80	25.98	26.71
F.C.	69.10	69.59	73.29
SULPHUR	.78		
PHOSPHORUS	.015		
S.P.G.	n.		
F.C.T.	4.5		
WARRANTY	*****		

## HEAD ANALYSIS - COMPOSITE RAW COAL

	AIR DRIED	DRY BASIS	D.M.M.F.
MOISTURE	.80		
ASH	21.60	21.77	
VOLATILE	21.80	21.98	26.21
F.C.	55.80	56.25	73.79
F.C.T.	7.0		
SULPHUR	.73		
SP.G. (-3/8 MESH)	1.39		
PHOSPHOROUS	.010		

DRILL HOLE #: 5D 7726 SEAM: 5

## FLOAT SINK ANALYSES

SIZE	REL. WEIGHT	CUM. FLOATS		CUM. SINKS		F.C.I.	FSI
3/8 X 28	75.10						
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	WT% ASH%	F.C.I.	FSI	
1.40	66.50 3.80	66.50 3.80	33.50 64.70	8.5	8.5		
1.50	4.50 14.40	71.00 4.47	29.00 79.61	5.0	8.0		
1.54	.00 16.70	71.00 4.62	28.10 74.40	5.0	8.0		
1.60	1.10 21.30	73.00 4.88	27.00 76.56	4.5	8.0		
1.80	1.50 40.20	74.50 5.59	25.50 78.70	3.5	8.0		
****	25.50 78.70	100.00 24.23	*****		6.5		

## SIZE REL. WEIGHT

SIZE	REL. WEIGHT	CUM. FLOATS		CUM. SINKS		F.C.I.	FSI
PR X 100	19.50						
SP.G.	WT% ASH%	WT% ASH%	WT% ASH%	WT% ASH%	F.C.I.	FSI	
1.40	73.10 3.00	73.10 3.00	26.90 35.54	9.0	9.0		
1.50	6.80 7.00	79.90 3.34	20.10 45.20	8.0	9.0		
1.60	4.60 10.30	84.50 3.72	15.50 55.56	7.5	8.5		
1.76	2.60 16.40	87.10 4.10	12.90 63.45	5.0	8.5		
1.90	1.40 26.90	88.50 4.46	11.50 67.90	3.5	8.5		
****	11.50 67.90	100.00 11.75	*****		8.0		

## PROTH FLOATION

SIZE	REL. WEIGHT	CUM. FLOATS		CUM. SINKS		F.C.I.	FSI
100 X 0	5.40						
TIME	WT% ASH%	WT% ASH%	F.C.I.	FSI			
45	82.00 6.50	82.00 6.50	7.5	7.5			
90	8.60 31.10	90.60 8.84	4.5	7.5			
135	2.30 47.50	92.90 9.79	3.5	7.5			
180	2.30 63.90	95.20 11.10	1.0	7.5			
225	4.80 77.50	100.00 14.29	*****	7.0			

## DENISON COAL LIMITED

DRILL HOLE #: 5D 7726

SEAM: 5

## FLUIDITY

## DILATATION

STARTY TEMP.	420.0	SOFT TEMP.	378.0
FINAL TEMP.	498.0	SOLID TEMP.	476.0
MAX.FLUIDITY TEMP.	459.0	MAX.CONTRACTION	28.0
MAX.FLUIDITY (NONP)	118.0	MAX.DILATATION	52.0
MAX.FLUIDITY (LOG)	2.502	G.FACTOR	1.035

## GVF REPORT

DRILL HOLE 5D7726

SEAM 5

DEPTH FROM	DEPTH TO	SAMPLE NO.	SPG	ASH WT%
19575	19604	10	2.56	81.7
19604	19632	20	1.83	51.5
19632	19644	30	1.38	15.4
19644	19674	40	1.30	9.6
19674	19710	50	1.35	14.3
19710	19717	60	1.29	10.7
19717	19726	70	1.67	54.3
19726	19734	80	1.40	23.3
19734	19749	90	2.33	72.9
19749	19755	100	1.44	18.8
19755	19766	110	1.65	41.6
19766	19801	120	1.27	5.2
19801	19830	130	1.39	15.4
19830	19837	140	2.30	67.7
19837	19851	150	2.54	82.6
19851	19904	160	2.67	84.3

PROJECT: SAKOM  
 DATE SAMPLED: 7/ 8/77  
 DRILL HOLE #: SD 7726  
 LAB COMPOSITE #: 77-R314-20 WT. REC. 2.00

ANALYST: SOUTH  
 DATE ANALYSED: 0/ 0/ 0  
 SFAM: 10

DRILL HOLE #: SD 7726 SEAM: 10

FLOAT SINK ANALYSIS  
 SIZE REL. WEIGHT  
 3/8 X 28 77.00

SP.G.	WT%	ASH%	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
1.40	87.30	4.20	87.30	4.20	12.70	23.70
1.50	6.70	14.20	94.00	4.91	6.00	34.30
1.54	2.70	15.00	96.70	5.19	3.30	50.09
1.60	1.10	19.40	97.80	5.35	2.20	65.44
1.80	.40	32.30	98.20	5.44	1.80	72.80
****	1.80	72.80	100.00	6.48	*****	8.0

SIZE REL. WEIGHT  
 28 X 100 18.70

SP.G.	WT%	ASH%	CUM. FLOATS	CUM. SINKS	F.S.I.	FSI
1.40	78.40	3.20	78.40	3.20	21.60	17.74
1.50	10.60	7.40	89.00	3.70	11.00	27.70
1.60	4.70	9.60	93.70	4.00	6.30	41.20
1.76	2.00	17.70	95.70	4.28	4.30	52.13
1.90	1.20	24.30	96.90	4.53	3.10	62.90
****	3.10	62.90	100.00	6.34	*****	8.0

FROTH FLOTATION  
 SIZE REL. WEIGHT  
 100 X 0 4.30

TIME	WT%	ASH%	WT%	ASH%	F.S.I.	FSI
45	69.40	5.60	69.40	5.60	7.5	7.5
90	12.20	11.00	81.60	6.41	7.0	7.5
135	10.20	14.70	91.80	7.39	6.0	7.5
180	4.10	37.60	95.90	8.62	2.0	7.5
240	4.10	66.40	100.00	10.99	1.0	7.5

NEWISON COAL DATA

COMPOSITE DESCRIPTION	MINING SECTION
INTERVAL: 159.96-160.96	159.96-160.96
THICKNESS: 1.00	1.00
OTP: 35	35
COAL/COAL+ROCK: .83/ .83	.83/ .83
DRILL CORE RECOVERY: 100.00%	100.00 %
ESTIMATED YIELD: 90.00	

WARNOCK HERSEY ANALYSIS

SIMULATED PRODUCT	3/8 X 28	28 X 100	100 X 0
SIZE	SP.G. 1.54	SP.G. 1.76	135 SECS
CUTPOINT			
CONTRIBUTION	74.4	17.9	3.9

YIELD	AIR DRIED	DRY BASIS	D.M.M.F.
	96.20		

MOISTURE	ASH	VOLATILE	F.C.
.60	5.20	26.70	67.50
	5.23	26.86	67.91
		27.85	72.15

SULPHUR	PHOSPHORUS	F.S.T.	HARDENGE
.48	.074	8.0	*****

WFAO ANALYSIS - COMPOSITE RAW COAL

MOISTURE	ASH	VOLATILE	F.C.
.60	7.30	26.10	66.00
	7.34	26.26	66.40
		27.72	72.28

F.S.T.	SULPHUR	SP.G. (-3/8 MESH)	PHOSPHORUS
8.0	.61	1.30	.071

DRILL HOLE #: SD 7726 SEAM: 10

FLUIDITY

START TEMP.	402.0	SOFT TEMP.	366.0
FINAL TEMP.	402.0	SOLID TEMP.	464.0
MAX. FLUIDITY TEMP.	450.0	MAX. CONTRACTION	27.0
MAX. FLUIDITY (NDPH)	2000.0	MAX. DILATATION	82.0
MAX. FLUIDITY (LOG)	3.320	G. FACTOR	1.063

GYF REPORT DRILL HOLE SD7726 SEAM 10

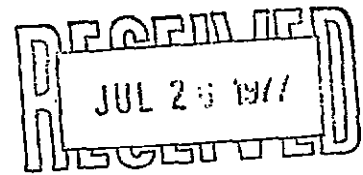
DEPTH FROM	DEPTH TO	SAMPLE NO.	SPG	ASH WT%
15918	15967	10	2.57	82.3
15967	15996	20	2.61	84.1
15996	16009	30	1.38	13.1
16009	16028	40	1.33	8.5
16028	16042	50	1.32	6.3
16042	16074	60	1.32	4.1
16074	16096	70	1.32	4.3
16096	16108	80	2.55	84.9
16108	16161	90	2.61	84.2
16161	16187	100	2.51	82.8





**Warnock Hersey Professional Services Ltd.**

1423 D 45th Avenue N.E. Calgary Alberta T2E 2P3 Tel.264-9120



DENISON MINES LTD.

Report

of

WASHABILITY STUDY

Adit Sample 77 - 1 - 1

Submitted, July 18, 1977.

A handwritten signature in cursive script that reads "John Kay".

John Kay, C. Eng., M. Inst. F.,  
Manager of Laboratory.

**Warnock Hersey Professional Services Ltd.**

CLIENT - Denison Mines Ltd.

Sample I.D. - Adit Sample 77 - 1 - 1

Lab No. - 77 - 5424 and 77 - 6001

ATTRITION TESTING

<u>Screen size</u>		<u>Weight % Before</u>	<u>Weight % After</u>
<u>Passing</u>	<u>Retained On</u>		
-	4"	5.2	--
4"	2"	11.2	2.9
2"	1"	11.9	5.9
1"	½ "	15.2	9.8
½ "	¼ "	15.9	13.6
¼ "	8 M	9.9	11.1
8 M	28 M	19.0	29.9
28 M	0	11.7	26.8
TOTAL -		<u>100.0</u>	<u>100.0</u>

# Warnock Hersey Professional Services Ltd.

CLIENT - Denison Mines Ltd.

Sample Identification - Adit Sample 77 - 1 - 1

Lab No. - 77 - 5424

## RAW COAL SIZE / ASH DISTRIBUTION (Before Attrition)

<u>Size</u>		<u>Elementary</u>		<u>Cumulative</u>	
<u>Passing</u>	<u>Retained On</u>	<u>Wt %</u>	<u>Ash %</u>	<u>Wt %</u>	<u>Ash %</u>
4"	2"	16.4	32.5	16.4	32.5
2"	1"	11.9	20.7	28.3	27.5
1"	½"	15.2	22.5	43.5	25.8
½"	¼"	15.9	26.4	59.4	25.9
¼"	8M	9.9	27.0	69.3	26.1
8M	28M	19.0	22.2	88.3	25.2
28M	100M	10.4	16.6	98.7	24.3
100M	0	1.3	17.3	100.0	24.2
TOTAL -		100.0	24.2		

# Warnock Hersey Professional Services Ltd.

CLIENT - Denison Mines Ltd.,

Sample Identification - Adit Sample 77 - 1 - 1

Lab No. - 77 - 6001

## RAW COAL SIZE / ASH DISTRIBUTION (After Attrition)

<u>Size</u>		<u>Elementary</u>		<u>Cumulative</u>	
<u>Passing</u>	<u>Retained On</u>	<u>Wt %</u>	<u>Ash %</u>	<u>Wt %</u>	<u>Ash %</u>
4"	2"	2.9	29.0	2.9	29.0
2"	1"	5.9	27.3	8.8	27.9
1"	½"	9.8	26.3	18.6	27.0
½"	¼"	13.6	28.2	32.2	27.5
¼"	8M	11.1	28.3	43.3	27.7
8M	28M	29.9	22.2	73.2	25.5
28M	100M	14.0	16.4	87.2	24.0
100M	0	12.8	11.8	100.0	22.4
TOTAL -		100.0	22.4		

**Warnock Hersey Professional Services Ltd.**

Client - Denison Mines Ltd.

Sample I. D. - Adit Sample 77 - 1 - 1

Lab. No. - 77 - 6001

Relative Contribution and Ash %

in

CLEAN COAL PRODUCT

(After Attrition)

<u>Size</u>	<u>Weight % Yield</u>	<u>Ash %</u>	<u>Separation</u>
4" x 2"	2.0	11.3	1.55
2" x 1"	4.0	10.1	1.55
1" x ½"	6.9	9.4	1.55
½" x ¼"	9.6	8.5	1.55
¼" x 8 M	7.7	8.0	1.55
8M x 28 M	22.6	6.8	1.55
28M x 100 M	11.9	5.6	1.80 Float
100 M x 0	12.5	10.6	90 sec. froth
<hr/>			
TOTAL -	77.2	8.1	

# Warnock Hersey Professional Services Ltd.

CLIENT - Denison Mines Ltd.,

Sample Identification - Adit Sample 77 - 1 - 1

Lab. No. - 77 - 6001 (After Attrition)

Footage -

	CLEAN - Coal Product	
<u>As Analyzed Basis</u>		
Moisture % ( Inherent ) -	0.6	
Ash % -	8.0	
Volatile Matter % -	19.7	
Fixed Carbon % -	71.7	
Total -	100.0	
Sulphur % -	0.29	
FSI -	5½	
Btu per lb. -	--	
<del>Equilibrium Moisture %</del> Phosphorous	2.27	
Hardgrove Grindability -	95.5	
Specific Gravity ( 20 mesh ) -	--	
<u>Dry Basis</u>		
Ash % -	8.1	
Volatile % -	19.2	
Btu per lb. -	--	
<u>Dry, Ash - Free Basis</u>		
Volatile % -	20.9	
Btu per lb. -	--	

Wt. % Yield - 77.1%



**Warnock Hersey Professional Services Ltd.**

1423 D 45th Avenue N.E. Calgary Alberta T2E 2P3 Tel 264-9120 276 - 9138

REPORT OF: Mineral Analysis of Ash

FILE NO. 780 - 0176

AT Calgary Laboratory

DATE July 19, 1977.

PROJECT:

REPORT NO.

REPORTED TO: Denison Mines Ltd.,

ORDER NO. 780 - 0176

Sample Identification - Adit Sample 77 - 1 - 1 Lab No. - 77 - 6001  
(After Attrition)

ANALYSIS %

SiO <sub>2</sub> -	56.6	Na <sub>2</sub> O -	1.1
Al <sub>2</sub> O <sub>3</sub> -	21.0	K <sub>2</sub> O -	0.48
SO <sub>3</sub> -	4.3	MgO -	2.8
P <sub>2</sub> O <sub>5</sub> -	1.3	CaO -	9.1
TiO <sub>2</sub> -	0.24	Fe <sub>2</sub> O <sub>3</sub> -	3.4
V <sub>2</sub> O <sub>5</sub> -	--	Mn <sub>3</sub> O <sub>4</sub> -	less than 0.01

ASH FUSION TEMPERATURE - °F

	<u>Oxidizing atm.</u>	<u>Reducing atm.</u>
Initial Deformation -	2417	2297
Spherical Temperature -	2460	2326
Hemispherical -	2532	2383
Fluid Temperature -	2571	2494



# Warnock Hersey Professional Services Ltd.

CLIENT - Denison Mines Ltd.

Sample Identification - Adit Sample 77 - 1 - 1

Lab No. - 77 - 6001 (After Attrition)

## Ultimate Analysis

	<u>As Analysed</u>	<u>Dry Basis</u> *
Moisture % -	(0.51) - - -	- - -
Ash % -	8.13	8.17
Carbon % -	82.35	82.77
Hydrogen % -	4.40	4.36
Nitrogen % -	0.97	0.97
Sulphur % -	0.27	0.27
Oxygen % -	3.88	3.46
Total -	100.00	100.00

\* The oxygen and hydrogen in this column does not include the oxygen and hydrogen of the sample moisture.

**Warnock Hersey Professional Services Ltd.**

CLIENT: Denison Mines Ltd.

Sample Identification - Adit Sample 77 - 1 - 1

Lab. No.: 77 - 6001 Comp. (After Attrition)

Job. No.: 780 - 0176

FLUIDITY

GIESLER PLASTICITY

	<u>DDPM</u>	<u>TEMP °C</u>
START	1	456
MAXIMUM	20	486
FINAL	1	495
	RANGE	39



Warnock Hersey Professional Services Ltd.

1423 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel 264 9120

Sample Identification Denison Mines Ltd. - Adit 77 - 1 - 1  
Lab. No. (s) 77 - 5424 (Before Attrition)

Size fraction 4" x 2"  
Wt % of head sample 16.4

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	8.2	4.2	8½	8.2	4.2		100.0	32.5	
1.30	1.35	27.9	5.4	5½	36.1	5.1		91.8	35.0	
1.35	1.40	17.0	9.3	3	53.1	6.5		63.9	48.0	
1.40	1.45	8.0	13.1	1	61.1	7.3		46.9	62.0	
1.45	1.50	6.8	14.9	1	67.9	8.2		38.9	72.0	
1.50	1.55	0.9	15.6	1	68.8	8.3		32.1	83.9	
1.55	1.60	1.0	21.8	1	69.8	8.5		31.2	85.9	
1.60	1.80	0.6	22.4	1	70.4	8.6		30.2	88.0	
1.80	2.00	0.9	27.3	1	71.3	8.8		29.6	89.4	
2.00		28.7	91.3	0	100.0	32.5		28.7	91.3	
TOTAL-		100.0	32.5							



Warnock Hersey Professional Services Ltd.

1423 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel 264-9120

Sample Identification Denison Mines Ltd. - Adit 77 - 1 - 1  
Lab. No. (s) 77 - 5424 (Before Attrition)

Size fraction 2" x 1"  
Wt % of head sample 11.9

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	6.3	3.4	8½	6.3	3.4		100.0	20.7	
1.30	1.35	38.9	5.6	4	45.2	5.3		93.7	21.9	
1.35	1.40	20.9	10.0	1	66.1	6.8		54.8	33.5	
1.40	1.45	7.4	13.6	1	73.5	7.5		33.9	48.0	
1.45	1.50	3.9	17.3	1	77.4	8.0		26.5	57.6	
1.50	1.55	2.9	18.8	1	80.3	8.4		22.6	64.5	
1.55	1.60	2.4	22.0	1	82.7	8.8		19.7	71.3	
1.60	1.80	2.2	24.4	1	84.9	9.2		17.3	78.1	
1.80	2.00	0.4	24.6	1	85.3	9.2		15.1	85.9	
2.00		14.7	87.6	0	100.0	20.7		14.7	87.6	
TOTAL -		100.0	20.7							



Sample Identification Denison Mines Ltd. - Adit 77 - 1 - 1 Size fraction 1" x 1/2"  
Lab. No. (s) 77 - 5424 (Before Attrition) Wt % of head sample 15.2

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	<del>Sulphur</del> F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	5.5	3.0	9	5.5	3.0		100.0	22.5	
1.30	1.35	38.9	5.3	4 1/2	44.4	5.0		94.5	23.7	
1.35	1.40	19.2	10.1	1	63.6	6.6		55.6	36.5	
1.40	1.45	8.7	14.4	1	72.3	7.5		36.4	50.5	
1.45	1.50	3.8	18.5	1	76.1	8.0		27.7	61.8	
1.50	1.55	1.8	20.1	1	77.9	8.3		23.9	68.7	
1.55	1.60	1.5	23.1	1	79.4	8.6		22.1	72.6	
1.60	1.80	2.6	27.7	1	82.0	9.2		20.6	76.2	
1.80	2.00	1.2	41.5	1	83.2	9.7		18.0	83.2	
2.00		16.8	86.2	0	100.0	22.5		16.8	86.2	
TOTAL -		100.0	22.5							



Sample Identification Denison Mines Ltd. - Adit 77 - 1 - 1 Size fraction 1/2" x 1/4"  
Lab. No. (s) 77 - 5424 (Before Attrition) Wt % of head sample 15.9

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	<del>Sulphur</del> F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	13.3	3.1	8 1/2	13.3	3.1		100.0	26.4	
1.30	1.35	30.8	5.7	3	44.1	4.9		86.7	29.9	
1.35	1.40	16.8	10.2	1	60.9	6.4		55.9	43.3	
1.40	1.45	7.2	14.9	1	68.1	7.3		39.1	57.5	
1.45	1.50	2.9	19.4	1	71.0	7.8		31.9	67.1	
1.50	1.55	1.7	20.1	1	72.7	8.1		29.0	71.9	
1.55	1.60	1.0	24.2	1	73.7	8.3		27.3	75.1	
1.60	1.80	2.3	32.4	1	76.0	9.0		26.3	77.0	
1.80	2.00	2.0	48.3	1	78.0	10.0		24.0	81.3	
2.00		22.0	84.3	0	100.0	26.4		22.0	84.3	
TOTAL -		100.0	26.4							



Warnock Hersey Professional Services Ltd.

1423 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel 264-9120

Sample Identification Denison Mines Ltd. - Adit 77 - 1 - 1  
Lab. No. (s) 77 - 5424 (Before Attrition)

Size fraction 1/4" x 8M  
Wt % of head sample 9.9

Specific Gravity

FLOAT AND SINK ANALYSIS %

Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	19.3	3.2	9	19.3	3.2		100.0	27.0	
1.30	1.35	26.8	5.4	3 1/2	46.1	4.5		80.7	32.6	
1.35	1.40	14.6	10.1	1	60.7	5.8		53.9	46.2	
1.40	1.45	6.1	14.8	1	66.8	6.7		39.3	43.4	
1.45	1.50	3.0	19.2	1	69.8	7.2		33.2	67.8	
1.50	1.55	1.2	22.5	1	71.0	7.4		30.2	72.6	
1.55	1.60	0.9	26.8	1	71.9	7.7		29.0	74.7	
1.60	1.80	2.4	36.2	1	74.3	8.6		28.1	76.2	
1.80	2.00	2.2	52.1	1	76.5	9.9		25.7	80.0	
2.00		23.5	82.6	0	100.0	27.0		23.5	82.6	
TOTAL -		100.0	27.0							



Warnock Hersey Professional Services Ltd.

1423 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel 264-9120

Sample Identification Denison Mines Ltd. Adit - 77 - 1 - 1  
Lab. No. (s) 77 - 5424 (Before Attrition)

Size fraction 8M x 28M  
Wt % of head sample 19.0

Specific Gravity

FLOAT AND SINK ANALYSIS %

Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	35.5	3.0	9	35.5	3.0		100.0	22.2	
1.30	1.35	20.0	4.9	7 1/2	55.5	3.7		64.5	32.7	
1.35	1.40	10.0	9.5	2 1/2 & 1 1/2	65.5	4.6		44.5	45.2	
1.40	1.45	4.2	12.3	2 1/2 & 2	69.7	5.0		34.5	55.6	
1.45	1.50	2.7	14.8	1 & 1	72.4	5.4		30.3	61.6	
1.50	1.55	2.8	19.1	1	75.2	5.9		27.6	66.1	
1.55	1.60	0.8	24.1	1	76.0	6.1		24.8	71.4	
1.60	1.80	2.2	34.0	1	78.2	6.9		24.0	73.0	
1.80	2.00	2.8	48.8	1	81.0	8.3		21.8	77.0	
2.00		19.0	81.1	0	100.0	22.2		19.0	81.1	
TOTAL -		100.0	22.2							



Wamock Hersey Professional Services Ltd.

1423 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel 264 9120

Sample Identification Denison Mines Ltd. - Adit 77 - 1 - 1

Size fraction 28 M x 100 M

Lab. No. (s) 77 - 5424 (Before Attrition)

Wt % of head sample 10.4

Specific Gravity

FLOAT AND SINK ANALYSIS %

Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	<del>Sulphur</del> F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	34.5	2.4	9	34.5	2.4		100.0	17.1	
1.30	1.35	16.8	3.4	9	51.3	2.7		65.5	24.9	
1.35	1.40	10.2	5.6	8	61.5	3.2		48.7	32.3	
1.40	1.45	10.2	7.7	7½	71.7	3.8		38.5	39.4	
1.45	1.50	1.5	10.5	5½	73.2	4.0		28.3	50.8	
1.50	1.55	6.1	18.5	4½	79.3	5.1		26.8	53.1	
1.55	1.60	0.5	19.0	4½	79.8	5.2		20.7	63.3	
1.60	1.80	2.5	20.0	4½	82.3	5.6		20.2	64.4	
1.80	2.00	1.5	20.0	1	83.8	6.1		17.7	70.6	

TOTAL - 100.0 17.1



Wamock Hersey Professional Services Ltd.

1423 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel 264-9120

Sample Identification Denison Mines Ltd. - Adit 77 - 1 - 1

Size fraction 100 M x 0 FROTH

Lab. No. (s) 77 - 5424 (Before Attrition)

Wt % of head sample 1.3

FROTH

~~FLOAT AND SINK ANALYSIS %~~

TIME (Sec.)	Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
			Weight	Ash	<del>Sulphur</del> F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
Final Froth			64.0	7.1	9	64.0	7.1		100.0	18.4	
45 Sec.			19.4	20.4	5½	83.4	10.2		36.0	38.5	
90 Sec.			7.2	46.3	1½	90.6	13.1		16.6	59.6	
135 Sec. i			4.7	65.0	½	95.3	15.6		9.4	69.8	
180 Sec. (Tails)			4.7	74.6	0	100.0	18.4		4.7	74.6	

TOTAL - 100.0 18.4



**Wamock Hersey Professional Services Ltd.**

1423 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel:264-9120

Sample Identification Denison Mines Ltd. Adit 77 - 1 - 1

Size fraction 4" x 2"

Lab. No. (s) 77 - 6001 (After Attrition)

Wt % of head sample 2.9

Specific Gravity

FLOAT AND SINK ANALYSIS %

<u>Sink</u>	<u>Float</u>	<u>Elementary</u>			<u>Cumulative Float</u>			<u>Cumulative Sink</u>		
		<u>Weight</u>	<u>Ash</u>	<u>Sulphur</u> F.S.I.	<u>Weight</u>	<u>Ash</u>	<u>Sulphur</u>	<u>Weight</u>	<u>Ash</u>	<u>Sulphur</u>
	1.30									
1.30	1.35	9.1	6.0	3	9.1	6.0		100.0	29.0	
1.35	1.40	27.2	9.1	1½	36.3	8.3		90.9	31.3	
1.40	1.45	16.9	12.7	1	53.2	9.7		63.7	40.8	
1.45	1.50	6.4	15.3	1	59.6	10.3		46.8	50.9	
1.50	1.55	8.0	18.7	1	67.6	11.3		40.4	56.5	
1.55	1.60	5.5	21.5	1	73.1	12.1		32.4	65.9	
1.60	1.80	5.9	23.5	1	79.0	12.9		26.9	74.9	
1.80	2.00	--	--	--	79.0	12.9		21.0	89.4	
2.00		21.0	89.4	0	100.0	29.0		21.0	89.4	
TOTAL -		100.0	29.0							



**Wamock Hersey Professional Services Ltd.**

1423 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel:264-9120

Sample Identification Denison Mines Ltd. Adit 77 - 1 - 1

Size fraction 2" x 1"

Lab. No. (s) 77 - 6001 (After Attrition)

Wt % of head sample 5.9

Specific Gravity

FLOAT AND SINK ANALYSIS %

<u>Sink</u>	<u>Float</u>	<u>Elementary</u>			<u>Cumulative Float</u>			<u>Cumulative Sink</u>		
		<u>Weight</u>	<u>Ash</u>	<u>Sulphur</u> F.S.I.	<u>Weight</u>	<u>Ash</u>	<u>Sulphur</u>	<u>Weight</u>	<u>Ash</u>	<u>Sulphur</u>
1.30	1.35	17.6	5.7	2½	17.6	5.7		100.0	27.3	
1.35	1.40	26.1	8.7	2	43.7	7.5		82.4	31.9	
1.40	1.45	11.8	12.5	1½	55.5	8.6		56.3	42.7	
1.45	1.50	5.5	16.2	1½	61.0	9.2		44.5	50.7	
1.50	1.55	6.7	18.3	1½	67.7	10.1		39.0	55.5	
1.55	1.60	4.6	20.8	1	72.3	10.8		32.3	63.3	
1.60	1.80	5.2	24.1	1	77.5	11.7		27.7	70.3	
1.80	2.00	0.5	28.4	1	78.0	11.8		22.5	81.0	
2.00		22.0	82.2	0	100.0	27.3		22.0	82.2	
TOTAL -		100.0	27.3							



Warnock Hersey Professional Services Ltd.  
1423 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel 264 9120

Sample Identification Denison Mines Ltd. - Adit 77 - 1 - 1 Size fraction 1" x 1/2"  
Lab. No. (s) 77 - 6001 (After Attrition) Wt % of head sample 9.8

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	3.0	5.9	6 1/2	3.0	5.9				
1.30	1.35	28.1	6.0	2 1/2	31.1	6.0	100.0	26.3		
1.35	1.40	24.2	9.8	1	55.3	7.7	97.0	27.0		
1.40	1.45	8.0	14.0	1	63.3	8.5	68.9	35.5		
1.45	1.50	3.7	17.3	1	67.0	8.9	44.7	49.4		
1.50	1.55	3.2	18.6	1	70.2	9.4	36.7	57.1		
1.55	1.60	2.8	21.4	1	73.0	9.8	33.0	61.6		
1.60	1.80	3.4	25.0	1	76.4	10.5	29.8	66.2		
1.80	2.00	0.8	30.7	1	77.2	10.7	27.0	70.9		
TOTAL		100.0	26.3				23.6	77.5		



Warnock Hersey Professional Services Ltd.  
1423 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel 264-9120

Sample Identification Denison Mines Ltd. - Adit 77 - 1 - 1 Size fraction 1/2" x 1/4"  
Lab. No. (s) 77 - 6001 (After Attrition) Wt % of head sample 13.6

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	9.2	4.8	6 1/2	9.2	4.8	100.0	28.2		
1.30	1.35	31.7	6.0	2	40.9	5.7	90.8	30.6		
1.35	1.40	19.2	10.3	1	60.1	7.2	59.1	43.8		
1.40	1.45	6.3	14.9	1	66.4	7.9	39.9	60.0		
1.45	1.50	2.0	18.3	1	68.4	8.2	33.6	68.4		
1.50	1.55	2.0	19.0	1	70.4	8.5	31.6	71.6		
1.55	1.60	1.3	22.9	1	71.7	8.8	29.6	75.1		
1.60	1.80	2.1	27.7	1	73.8	9.3	28.3	77.5		
1.80	2.00	1.0	39.4	1	74.8	9.7	26.2	81.5		
2.00		25.2	83.2	0	100.0	28.2	25.2	83.2		
TOTAL -		100.0	28.2							





Warnock Hersey Professional Services Ltd.

1423 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel 264 9120

Sample Identification Denison Mines Ltd - Adit 77 - 1 - 1

Size fraction 1/4" x 8 M

Lab. No. (s) 77 - 6001 (After Attrition)

Wt % of head sample 11.1

Specific Gravity

FLOAT AND SINK ANALYSIS %

Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	18.2	4.1	7 1/2	18.2	4.1		100.0	28.3	
1.30	1.35	27.5	6.6	1 1/2	45.7	5.6		81.8	33.7	
1.35	1.40	14.5	9.1	1	60.2	6.4		54.3	47.4	
1.40	1.45	6.2	15.8	1	66.4	7.3		39.8	61.4	
1.45	1.50	1.9	20.1	1	68.3	7.7		33.6	69.8	
1.50	1.55	1.5	21.5	1	69.8	8.0		31.7	72.8	
1.55	1.60	0.6	25.2	1	70.4	8.1		30.2	75.3	
1.60	1.80	2.1	32.1	1	72.5	8.8		29.6	76.4	
1.80	2.00	1.6	46.4	1	74.1	9.6		27.5	79.7	
2.00		25.9	81.8	0	100.0	28.3		25.9	81.8	
Total -		100.0	28.3							



Warnock Hersey Professional Services Ltd.

1423 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel 264-9120

Sample Identification Denison Mines Ltd. - Adit 77 - 1 - 1

Size fraction 8 M x 28 M

Lab. No. (s) 77 - 6001 (After Attrition)

Wt % of head sample 29.9

Specific Gravity

FLOAT AND SINK ANALYSIS %

Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	41.8	3.5	9	41.8	3.5		100.0	22.2	
1.30	1.35	17.1	7.5	2	58.9	4.7		58.2	35.6	
1.35	1.40	9.0	11.5	1	67.9	5.6		41.1	47.3	
1.40	1.45	4.2	15.8	1	72.1	6.2		32.1	57.3	
1.45	1.50	1.6	19.7	1	73.7	6.5		27.9	63.5	
1.50	1.55	1.8	20.1	1	75.5	6.8		26.3	66.2	
1.55	1.60	0.5	26.5	1	76.0	6.9		24.5	69.6	
1.60	1.80	2.0	34.9	1	78.0	7.6		24.0	70.5	
1.80	2.00	1.7	45.3	1	79.7	8.4		22.0	73.7	
2.00		20.3	76.1	1	100.0	22.2		20.3	76.1	
TOTAL -		100.0	22.2							

Sample Identification Denison Mines Ltd - Adit 77 - 1 - 1 Size fraction 1/2" x 8 M  
 Lab. No. (s) 77 - 6001 (After Attrition) Wt % of head sample 11.1

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	19.2	4.1	7 1/2	19.2	4.1		100.0	28.3	
1.30	1.35	27.5	6.6	7 1/2	46.7	5.6		81.8	33.7	
1.35	1.40	24.5	9.1	7	60.2	6.4		54.3	47.4	
1.40	1.45	6.2	15.8	7	66.4	7.3		39.8	61.4	
1.45	1.50	3.9	20.1	7	68.3	7.7		33.6	69.8	
1.50	1.55	1.5	21.5	7	69.8	8.0		31.7	72.8	
1.55	1.60	0.6	25.2	7	70.4	8.1		30.2	75.3	
1.60	1.80	2.7	32.1	7	72.5	8.8		29.6	76.4	
1.80	2.00	1.6	46.4	7	74.1	9.6		27.5	79.7	
2.00		25.9	81.8	0	100.0	28.3		25.9	81.8	
Total -		100.0	28.3							

 Warnock Hershey Professional Services Ltd.  
 1423 D 45th Avenue NE, Calgary Alberta T2E 2P3 Tel:264-9120

Sample Identification Denison Mines Ltd. - Adit 77 - 1 - 1 Size fraction 8 M x 28 M  
 Lab. No. (s) 77 - 6001 (After Attrition) Wt % of head sample 29.9

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	41.8	3.5	9	41.8	3.5		100.0	22.2	
1.30	1.35	17.1	7.5	2	58.9	4.7		58.2	35.6	
1.35	1.40	9.0	11.5	1	67.9	5.6		41.1	47.3	
1.40	1.45	4.2	15.8	1	72.1	6.2		32.1	57.3	
1.45	1.50	1.6	19.7	1	73.7	6.5		27.9	63.5	
1.50	1.55	1.9	20.1	1	75.5	6.8		26.3	66.2	
1.55	1.60	0.5	26.5	1	76.0	6.9		24.5	69.6	
1.60	1.80	2.0	34.9	1	78.0	7.6		24.0	70.5	
1.80	2.00	1.7	45.3	1	79.7	8.4		22.0	73.7	
2.00		20.3	76.1	1	100.0	22.2		20.3	76.1	
TOTAL -		100.0	22.2							

**Wamock Hersey Professional Services Ltd.**

1423 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel 264-9120

Sample Identification Denison Mines Ltd. - Adit 77 - 1 - 1 Size fraction 28 M x 100 MLab. No. (s) 77 - 6001 (After Attrition) Wt % of head sample 14.0

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	38.9	2.9	9	38.9	2.9		100.0	16.4	
1.30	1.35	19.6	4.4	8½	58.5	3.4		61.1	25.0	
1.35	1.40	13.3	7.0	6	71.8	4.1		41.5	34.7	
1.40	1.45	5.3	7.9	4½	77.1	4.3		28.2	47.7	
1.45	1.50	2.2	14.7	1½	79.3	4.7		22.9	56.9	
1.50	1.55	2.3	16.4	1½	81.6	4.9		20.7	61.2	
1.55	1.60	0.4	19.9	1½	82.0	5.0		18.4	67.1	
1.60	1.80	2.9	21.1	1½	84.9	5.6		18.0	68.1	
1.80	2.00	1.8	34.7	1	86.7	6.2		15.1	77.2	
2.00		13.3	82.9	1	100.0	16.4		13.3	82.9	
TOTAL -		100.0	16.4							

**Wamock Hersey Professional Services Ltd.**

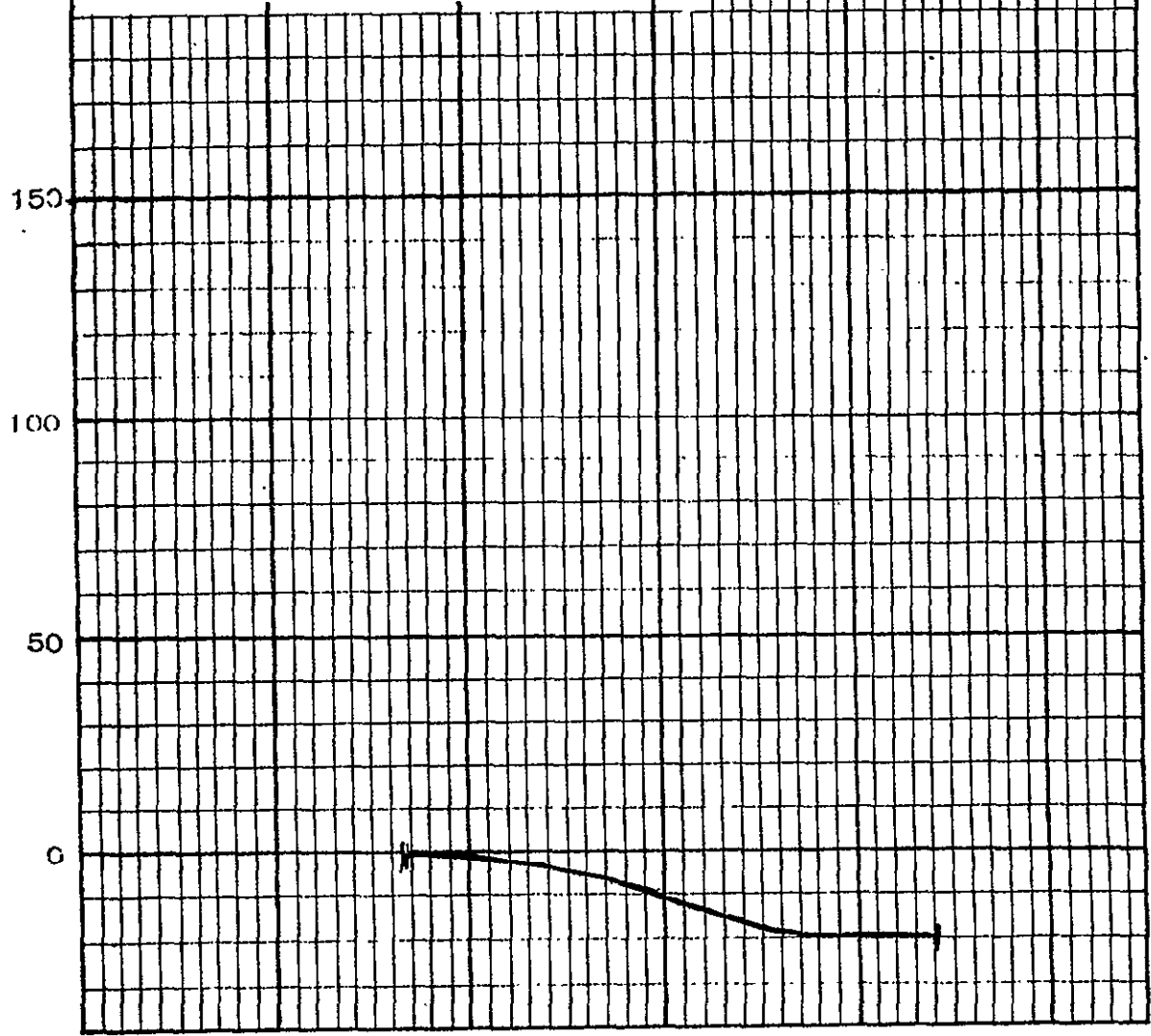
1423 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel 264-9120

Sample Identification Denison Mines Ltd. Adit 77 - 1 - 1 Size fraction 100 M x 0 FROTHLab. No. (s) 77 - 6001 (After Attrition) Wt % of head sample 12.8

Specific Gravity		FROTH FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	TIME (Sec.)									
	Final Froth	74.2	6.5	8	74.2	6.5		100.0	11.8	
	45 sec.	18.1	18.6	7	92.3	8.9		25.8	27.2	
	90 sec.	5.1	42.0	2½	97.4	10.6		7.7	47.5	
	135 sec.	1.6	57.0	1	99.0	11.4		2.6	58.8	
	180 sec (tails)	1.0	60.4	1	100.0	11.8		1.0	60.4	
TOTAL -		100.0	11.8							

% Lab. No. 77 - 6001 Date: July 18, 1977

300 Client: Denison Mines Ltd.  
Sample I. D.: Adit Sample 77-1-1  
Starting Temperature °C: 370°C  
Softening Temperature °C: 403°C  
250 Max. Dilatation Temp. °C: ---  
Contraction %: 19% @ 480°C  
Dilatation %: ---  
Final Temperature °C: ---  
200 G. Factor: ---



Warnock Hersey Professional Services Ltd.

RUHR DILATCMETER TEST

Date
Drawn



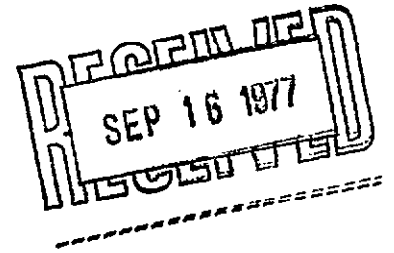
**Warnock Hersey Professional Services Ltd.**

1423 D. 45th Avenue N.E. Calgary Alberta T2E 2P3 Tel: ~~264-9128~~ 276 - 9138

DENISON MINES LTD.

Report

of



WASHABILITY STUDY

Addit Sample 77 - 2 - 2

Submitted, September 12, 1977

John Kay, C. Eng., M. Inst. F.,  
Manager of Laboratory

I N D E X

Bulk Sample 77 - 2 - 2

	Page
I. Screen Analysis	
Attrition Test .....	1
Raw Coal Size / Ash Distribution .....	2
Clean Coal Size / Yield / Ash .....	3
II. Product Coal	
Clean Coal Analysis .....	4
Mineral Analysis of Ash .....	5
Ash Fusion Temperature .....	5
Ultimate Analysis .....	6
Giesler Plasticity .....	7
RUHR Dilatometer Test .....	8
III. Float / Sink Data	
After Attrition	
2 " X 1 " .....	9
1 " X ½ " .....	10
½ " X ¼ " .....	11
¼ " X 8 M .....	12
8 M X 28 M .....	13
28 M X 100 M .....	14
100 M X 0 M: Froth Flotation .....	15
Before Attrition	
2 " X 1 " .....	16
1 " X ½ " .....	17
½ " X ¼ " .....	18

# Warnock Hersey Professional Services Ltd.

CLIENT - Denison Mines

Sample I. D. Bulk # 77 - 2 - 2

Lab. No. - 77 - 6031 B

## ATTRITION TEST

<u>SIZE</u>	<u>WT. % BEFORE</u>	<u>WT. % AFTER</u>
4 " x 2 "	5.6	0.6
2 " x 1 "	8.6	1.4
1 " x ½ "	16.0	3.3
½ " x ¼ "	19.3	9.9
¼ " x 8 M	14.0	13.2
8 M x 28 M	21.6	33.0
28 M x 0 M	14.9	38.6
	<hr/>	<hr/>
	100.0	100.0

**Warnock Hersey Professional Services Ltd.**

CLIENT - Denison Mines Ltd.

Sample I.D. - Bulk # 77 - 2 - 2

Lab. No. - 77 - 6031 B

RAW COAL SIZE / ASH DISTRIBUTION

<u>SIZE</u>	<u>WT. %</u>	<u>DRY ASH %</u>	<u>CUM. WT. %</u>	<u>CUM ASH %</u>
2 " x 1 "	2.0	27.1	2.0	27.1
1 " x ½ "	3.3	36.1	5.3	32.7
½ " x ¼ "	9.9	30.0	15.2	30.9
¼ " x 8 M	13.2	24.5	28.4	27.9
8 M x 28 M	33.0	13.1	61.4	20.0
28 M x 100 M	20.5	8.9	81.9	17.2
100 M x 0 M	18.1	8.9	100.0	15.7
TOTAL -	100.0	15.7		



# Warnock Hersey Professional Services Ltd.

Client - Denison Mines Ltd.

Sample I.D. - Bulk # 77 - 2 - 2

Lab. No. - 77 - 6031 B

## CLEAN COAL SIZE / YIELD / ASH

<u>SIZE</u>	<u>WT. % YIELD</u>	<u>ASH %</u>	<u>SEPARATION</u>
2" x 1"	1.3	12.1	1.55 ft.
1" x ½"	1.5	11.0	1.55
½" x ¼"	5.2	10.0	1.55
¼" x 8 M	8.5	9.5	1.55
8 x 28 M	23.4	7.1	1.55
28 x 100 M	19.9	7.7	1.80 ft.
100 x 0 Froth	17.6	7.8	90 sec. Froth
	<hr/>	<hr/>	
	77.4	8.0	

# Warnock Hersey Professional Services Ltd.

CLIENT - Denison Mines Ltd.

Sample Identification - ADIT SAMPLE 77 - 2 - 2

lab. No. - 77 - 6028 (77 - 6031 B)

## CLEAN COAL ANALYSIS

### Air Dried Basis

Moisture %	0.6
Ash %	7.6
Volatile Matter %	19.2
Fixed Carbon %	72.6
TOTAL -	<u>100.0</u>

Sulphur %	0.41
F.S.I.	5
H.G.I.	118.6
Phosphorous %	0.006
Btu / lb	14,322

### Dry Basis

Ash %	7.6
Volatile Matter %	19.3
Btu / lb	14,414

### Dry, Ash - Free Basis

Volatile Matter %	20.9
Btu /lb	15,605

Yield	77.4%
-------	-------



# Warnock Hersey Professional Services Ltd.

1423 D 45th Avenue N.E. Calgary Alberta T2E 2P3 Tel. ~~264-9120~~ 276 - 9138

REPORT OF: Mineral Analysis of Ash

FILE NO. 780 - 0191

AT Calgary Laboratory

DATE Sept. 12/77

PROJECT:

REPORT NO. A0 186

REPORTED TO: Denison Mines Ltd.

ORDER NO. 780 - 0191

Sample Identification - Adit Sample 77.2 - 2

Lab. No. 77 - 6028

### ANALYSIS %

SiO <sub>2</sub>	60.5	Na <sub>2</sub> O	0.30
Fe <sub>2</sub> O <sub>3</sub>	7.6	K <sub>2</sub> O	0.49
Al <sub>2</sub> O <sub>3</sub>	19.4	P <sub>2</sub> O <sub>5</sub>	0.34
Mn <sub>3</sub> O <sub>4</sub>	0.01	So <sub>3</sub>	2.0
CaO	6.7	TiO <sub>2</sub>	1.1
MgO	1.5		

### ASH FUSION TEMPERATURE

	<u>Oxidizing atm.</u>	<u>Reducing atm.</u>
Initial Deformation -	2455	2250
Spherical Temperature -	2495	2350
Hemispherical -	2550	2430
Fluid Temperature	2590	2540

**Warnock Hersey Professional Services Ltd.**

CLIENT - Denison Mines Ltd.

Sample Identification - 77 - 2 - 2

Lab. No. - 77 - 6028

ULTIMATE ANALYSIS

		<u>As Determined</u>	<u>Dry Basis</u> *
MOISTURE % -	(0.73)	-	-
ASH % -		7.55	7.61
CARBON % -		83.00	83.61
HYDROGEN % -		4.47	4.42
NITROGEN % -		0.97	0.98
SULFUR % -		0.46	0.46
OXYGEN % -		3.55	2.92
TOTAL -		<u>100.0</u>	<u>100.0</u>

\* The oxygen and hydrogen in these columns do not include the oxygen and hydrogen of the sample moisture.

**Warnock Hersey Professional Services Ltd.**

CLIENT - Denison Mines Ltd.

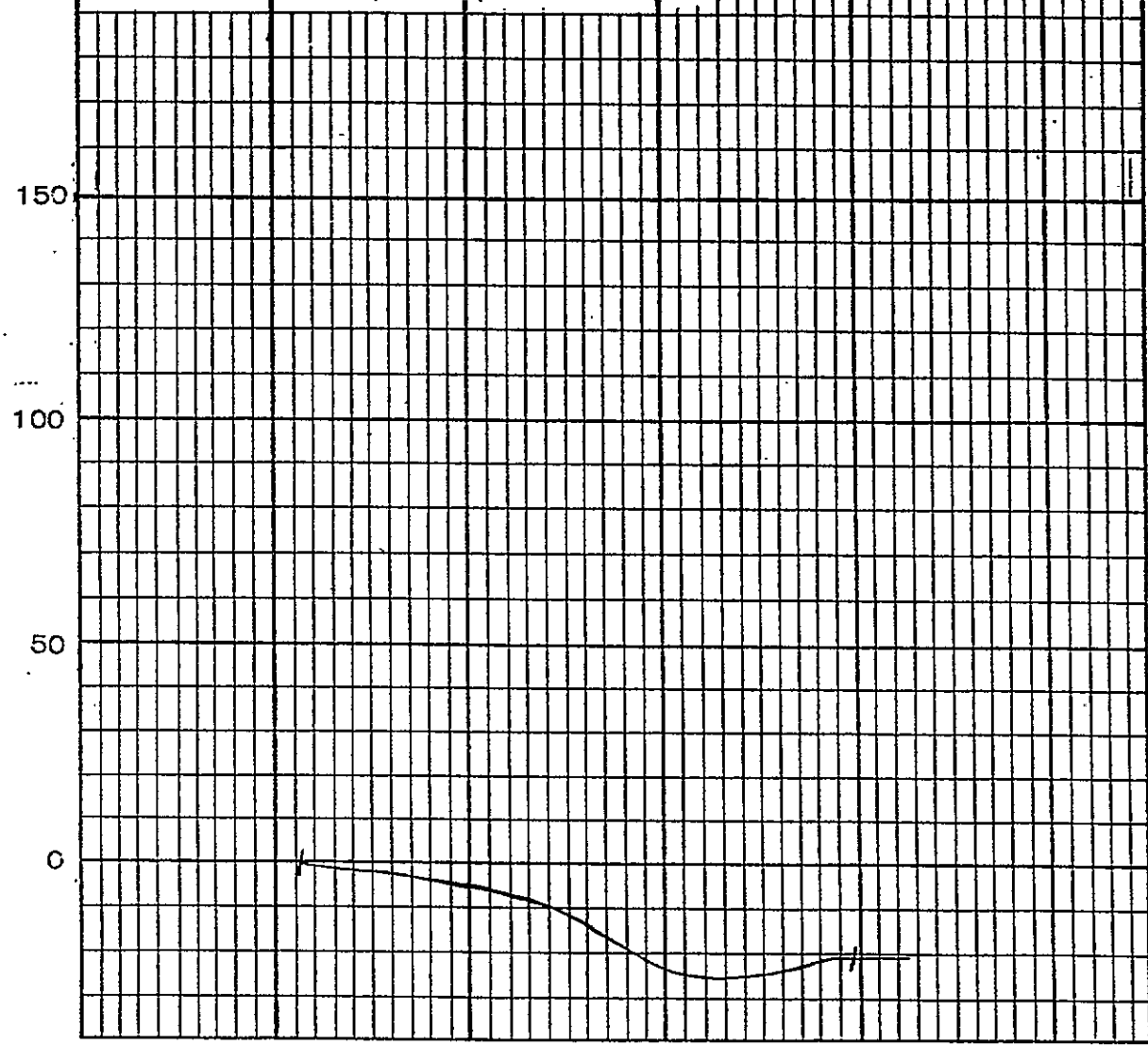
SAMPLE I.D. - Bulk # 77 -2 - 2

LAB. No. - 77 - 6028

GEISLER PLASTICITY

<u>Lab. No.</u>		<u>DDPM</u>	<u>TEMP °C</u>
77 - 6028	START	1	462 °
	MAXIMUM	3	489 °
	FINAL	1	504 °
		RANGE	42 °

% Lab. No. 77 - 6028 Date: Aug. 17. 77.  
 300 Client: Denison Mines Ltd.  
 Sample I. D.: Clean Coal Adit 77-2-2  
 Starting Temperature °C: 360°  
 Softening Temperature °C: 414°  
 250 Max. Dilatation Temp. °C: 489°  
 Contraction %: 25%  
 Dilatation %: -22%  
 Final Temperature °C: \_\_\_\_\_  
 200 G. Factor: 0.452



Warnock Hersey Professional Services Ltd.

RUHR DILATCMETER TEST

Date

Drawn



Warnock Hersey Professional Services Ltd.  
 1423 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel 264-9128 276 - 9138

After Attrition  
 Sample Identification Denison Saxon Bulk 77 - 2 - 2 Size fraction 2" X 1"  
 Lab. No. (s) 77 - 6031 B Wt % of head sample 2.0

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F. S. I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	11.4	2.8	9	11.4	2.8		100.0	27.1	
1.30	1.35	7.0	7.0	4½	18.4	4.4		88.6	30.2	
1.35	1.40	5.5	9.4	4	23.9	5.5		81.6	32.2	
1.40	1.45	23.5	13.6	3	47.4	9.5		76.1	33.8	
1.45	1.50	7.0	16.2	2	54.4	10.4		52.6	42.9	
1.50	1.55	11.4	20.4	1½	65.8	12.1		45.6	47.0	
1.55	1.60	4.9	23.1	1½	70.7	12.9		34.2	55.9	
1.60	1.80	5.7	33.4	1	76.4	14.4		28.3	61.3	
1.80	2.00	7.3	54.7	0	83.7	17.9		23.6	68.1	
2.00		16.3	74.1	nd	100.0	27.1		16.3	74.1	
TOTAL -		100.0	27.1							



Warnock Hersey Professional Services Ltd.  
 1423 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel 264-9128 276 - 9138

After Attrition  
 Sample Identification Denison Saxon Bulk 77 - 2 - 2 Size fraction 1" X ½"  
 Lab. No. (s) 77 - 6031 B Wt % of head sample 3.3

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F. S. I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	18.0	2.7	9	18.0	2.7		100.0	36.1	
1.30	1.35	6.1	6.4	2	23.1	3.5		82.0	43.4	
1.35	1.40	3.0	11.2	2½	26.1	4.4		76.9	45.8	
1.40	1.45	6.8	14.6	2	32.9	6.5		73.9	47.3	
1.45	1.50	4.1	18.9	1½	37.0	7.9		67.1	50.6	
1.50	1.55	8.8	24.1	1	45.8	11.0		63.0	52.6	
1.55	1.60	4.6	29.9	1	50.4	12.7		54.2	57.3	
1.60	1.80	12.9	39.5	1	63.3	13.2		49.6	59.8	
1.80	2.00	15.4	56.6	0	78.7	25.7		38.7	65.9	
2.00		21.3	74.4	nd	100.0	36.1		21.3	74.4	
TOTAL -		100.0	36.1							



Wamock Hersey Professional Services Ltd.  
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Sample Identification Denison Saxon Bulk 77 - 2 - 2 After Attrition Size fraction 1/4" X 3/8"  
Lab. No. (s) 77 - 6031 B Wt % of head sample 9.8

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	<del>Sulphur</del> F.S.I.	Weight	Ash	Sulphur	Weight	Ash	<del>Sulphur</del> Sulphur
	1.30	21.2	2.8	9	21.2	2.8		100.0	30.0	
1.30	1.35	9.5	6.1	2 1/2	30.7	3.8		78.8	37.4	
1.35	1.40	2.8	10.9	1 1/2	33.5	4.4		69.3	41.6	
1.40	1.45	7.5	14.9	1	41.0	6.3		66.5	42.9	
1.45	1.50	3.6	20.4	1	44.6	7.5		59.0	46.5	
1.50	1.55	7.5	25.1	1	52.1	10.0		55.4	48.2	
1.55	1.60	7.6	30.5	1	59.7	12.6		47.9	51.8	
1.60	1.80	14.1	41.6	1	73.8	18.2		40.3	55.8	
1.80	2.00	11.1	56.2	0	84.9	23.1		26.2	63.5	
2.00		15.1	68.9	nd	100.0	30.0		15.1	68.9	
TOTAL -		100.0	30.0							



Wamock Hersey Professional Services Ltd.  
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Sample Identification Denison Saxon Bulk 77 - 2 - 2 After Attrition Size fraction 1/4" X 3/8"  
Lab. No. (s) 77 - 6031 B Wt % of head sample 13.2

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	<del>Sulphur</del> F.S.I.	Weight	Ash	Sulphur	Weight	Ash	<del>Sulphur</del> Sulphur
	1.30	29.0	3.1	8 1/2	29.0	3.1		100.0	24.5	
1.30	1.35	12.4	6.5	2	41.4	4.1		71.0	33.2	
1.35	1.40	2.0	10.8	1 1/2	43.4	4.4		58.6	38.8	
1.40	1.45	10.6	15.9	1 1/2	54.0	6.7		56.6	39.8	
1.45	1.50	2.4	20.6	1	56.4	7.3		46.0	45.4	
1.50	1.55	7.7	25.9	1	64.1	9.5		43.6	46.7	
1.55	1.60	3.5	30.7	1	67.6	10.6		35.9	51.2	
1.60	1.80	9.3	42.4	1	76.9	14.4		32.4	53.4	
1.80	2.00	15.8	51.7	0	92.2	20.6		23.1	57.8	
2.00		7.8	69.9	nd	100.0	24.5		7.8	69.9	
TOTAL -		100.0	24.5							





**Wamock Hersey Professional Services Ltd.**

1423 D 45th Avenue NE Calgary Alberta T2L 2P3 Tel: 276-9138

Sample Identification Denison Saxon Bulk 77 - 2 - 2 After Attrition Size fraction 8 N X 28 N  
Lab. No. (s) 77 - 6031 B Wt % of head sample 33.0

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	<del>SO<sub>2</sub></del> F.S.I.	Weight	Ash	Sulphur	Weight	Ash	<del>SO<sub>2</sub></del> Sulphur
	1.30	37.1	3.6	8%	37.1	3.6		100.0	13.1	
1.30	1.35	9.7	6.3	3	46.8	4.2		62.9	18.7	
1.35	1.40	7.0	9.4	2½	53.8	4.8		53.2	20.9	
1.40	1.45	7.4	10.0	1½	61.2	5.5		46.2	22.7	
1.45	1.50	4.3	16.7	1½	65.5	6.2		38.8	25.1	
1.50	1.55	5.3	18.4	1	70.8	7.1		34.5	26.1	
1.55	1.60	3.1	22.3	1	73.9	7.8		29.2	27.5	
1.60	1.80	9.1	23.7	1	83.0	9.5		26.1	28.2	
1.80	2.00	15.0	28.9	0	98.0	12.5		17.0	30.6	
2.00		2.0	43.0	nd	100.0	13.1		2.0	43.0	
TOTAL -		100.0	13.1							

15



**Wamock Hersey Professional Services Ltd.**

1423 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel: 276-9138

Sample Identification Denison Saxon Bulk 77 - 2 - 2 Size fraction 28 X 100  
Lab. No. (s) 77 - 6031 B Wt % of head sample 20.5

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	<del>SO<sub>2</sub></del> F.S.I.	Weight	Ash	Sulphur	Weight	Ash	<del>SO<sub>2</sub></del> Sulphur
	1.30	40.0	2.7	9	40.0	2.7		100.0	8.9	
1.30	1.35	19.2	4.9	7½	59.2	3.4		60.0	13.0	
1.35	1.40	3.1	7.4	3½	62.3	3.8		40.8	16.8	
1.40	1.45	10.4	9.2	3	72.7	4.4		37.7	17.5	
1.45	1.60	5.3	11.0	2½	78.0	4.8		27.3	20.7	
1.60	1.55	17.7	14.1	2	85.7	5.7		22.0	23.0	
1.55	1.60	3.8	22.1	2	89.5	6.4		14.3	27.8	
1.60	1.80	7.5	23.7	1	97.0	7.7		10.5	29.9	
1.80	2.00	2.0	32.5	1	99.0	8.2		3.0	45.5	
2.00		1.0	71.4	nd	100.0	8.9		1.0	71.4	
TOTAL -		100.0	8.9							



Wamock Hersey Professional Services Ltd.

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After Attrition

Sample Identification Denison Saxon Bulk 77 - 2 - 2 Size fraction 100 X 0
Lab. No. (s) 77 - 6031 B Wt % of head sample 18.1

Table with columns: Specific Gravity, TIME (sec.), Elementary (Weight, Ash, Sulphur), Cumulative Float (Weight, Ash, Sulphur), Cumulative Sink (Weight, Ash, Sulphur). Rows include Final Froth, 45 sec., 90 sec., 135 sec., 180 sec. (Tails), and TOTAL.

15.



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Before Attrition

Sample Identification Denison Saxon Adtt 77 - 2 - 2 Size fraction 2" x 1"
Lab. No. (s) 77 - 6031 A Wt % of head sample 14.2

Table with columns: Specific Gravity, Sink, Float, Elementary (Weight, Ash, Sulphur), Cumulative Float (Weight, Ash, Sulphur), Cumulative Sink (Weight, Ash, Sulphur). Rows show specific gravity intervals from 1.30 to 2.00 and a TOTAL row.

16.



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Sample Identification Denston Saxon Adtt 77 - 2 - 2 Before attrition Size fraction 1" X 1/2"  
 Lab. No. (s) 77 - 6031 A Wt % of head sample 16.0

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	<del>Sulphur</del> F.S.I.	Weight	Ash	Sulphur	Weight	Ash	<del>Sulphur</del> Sulphur
	1.30	26.3	2.8	9	26.3	2.6	100.0	19.9		
1.30	1.35	19.6	5.3	.3	45.9	3.8	73.7	26.1		
1.35	1.40	5.1	10.3	2 1/2	51.0	4.4	54.1	33.7		
1.40	1.45	9.3	15.2	2	60.3	6.1	49.0	36.1		
1.45	1.50	4.8	21.8	1 1/2	65.1	7.2	39.7	41.0		
1.50	1.55	8.2	26.0	1	71.3	8.9	34.9	43.6		
1.55	1.60	5.2	31.4	1	76.5	10.4	28.7	47.5		
1.60	1.80	11.3	40.8	1	87.8	14.6	23.5	51.0		
1.80	2.00	8.6	55.4	0	96.4	18.0	12.2	60.5		
2.00		3.6	72.6	nd	100.0	19.9	3.6	72.6		
TOTAL -		100.0	19.9							

17.



Warnock Hersey Professional Services Ltd.

1423 D 45th Avenue N.E. Calgary Alberta T2E 2P3 Tel. 264-9126 276 - 9138

Sample Identification Denston Saxon Adtt 77 - 2 - 2 Before Attrition Size fraction 1/2" X 1/4"  
 Lab. No. (s) 77 - 6031 A Wt % of head sample 19.3

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	<del>Sulphur</del> F.S.I.	Weight	Ash	Sulphur	Weight	Ash	<del>Sulphur</del> Sulphur
	1.30	31.1	4.2	9	31.1	4.2	100.0	18.8		
1.30	1.35	19.1	6.1	2 1/2	50.2	4.9	68.9	25.4		
1.35	1.40	5.7	10.7	1 1/2	55.9	5.5	49.8	32.9		
1.40	1.45	9.6	15.4	1	65.5	7.0	44.1	35.7		
1.45	1.50	3.9	20.9	1	69.4	7.7	34.5	41.4		
1.50	1.55	5.6	25.6	1	75.0	9.1	30.6	44.0		
1.55	1.60	3.7	30.8	1	78.7	10.1	25.0	48.1		
1.60	1.80	10.1	40.5	1	88.8	13.6	21.3	51.1		
1.80	2.00	7.6	55.5	0	96.4	16.9	11.2	60.7		
2.00		3.6	71.8	nd	100.0	18.8	3.6	71.8		
TOTAL -		100.0	18.8							

# Warnock Hersey Professional Services Ltd.

CLIENT - Denison Mines Ltd.

Sample I.D. - Adit 77 - 1 - 3

Lab. No. - 77 - 9226

## ATTRITION TEST - SCREEN ANALYSIS

	<u>Before Attrition</u>	<u>After Attrition</u>
+ 4 "	6.8	0.0
4 x 2 "	15.6	7.3
2 x 1 "	16.5	4.9
1 x ½ "	9.5	9.1
½ x ¼ "	12.1	11.7
¼ " x 8 M	10.5	10.4
8 x 28 M	20.7	34.4
28 M x 0	8.3	22.2
	<hr/>	<hr/>
	100.0	100.0

# Warnock Hersey Professional Services Ltd.

CLIENT - Denison Mines Ltd.

Sample I.D. - 77 - 1 - 3 Adit

Lab. No. - 77 - 9226 A (After Attrition)

## RAW COAL SIZE / ASH DISTRIBUTION

<u>Size</u>	<u>Wt. %</u>	<u>Dry Ash %</u>	<u>Cum. Wt. %</u>	<u>Cum. Ash %</u>
4 x 2 "	7.3	52.9	7.3	52.9
2 x 1 "	4.9	43.5	12.2	49.1
1 x ½ "	9.1	37.1	21.3	44.0
½ x ¼ "	11.7	31.8	33.0	39.7
¼ " x 8 M	10.4	26.9	43.4	36.6
8 x 28 M	34.4	14.8	77.8	27.0
28 x 100 M	13.2	11.9	91.0	24.8
100 x 0	9.0	11.8	100.0	23.6
<u>TOTAL</u>	<u>100.0</u>	<u>23.6</u>		

# Warnock Hersey Professional Services Ltd.

CLIENT - Denison Mines Ltd.

Sample I.D. - Adit 77 - 1 - 3

Lab. No. - 77 9226 A (After Attrition)

## RELATIVE CONTRIBUTION TO CLEAN COAL PRODUCT

<u>SIZE</u>	<u>WT. %</u>	<u>DRY ASH %</u>	<u>SEPARATION</u>
4 x 2 "	2.9	13.3	1.55 Float
2 x 1 "	2.6	13.0	1.55 Float
1 x ½ "	5.7	13.3	1.55 Float
½ x ¼ "	8.0	12.9	1.55 Float
¼ " x 8 M	7.7	11.6	1.55 Float
8 x 28 M	29.4	7.6	1.55 Float
28 x 100 M	12.1	7.4	1.80 Float
100 x 0	8.8	10.6	90 sec. Froth
	<hr/>	<hr/>	
TOTAL	77.2	9.7	

# Warnock Hersey Professional Services Ltd.

CLIENT - Denison Mines Ltd.

Sample I.D. - Adit 77 - 1 - 3

Lab. No. - 77 - 9226 A (After Attrition)

## CLEAN COAL PRODUCT ANALYSIS %

### Air Dried Basis

Moisture	0.6
Ash	10.1
Volatile Matter	21.3
Fixed Carbon	68.0
<hr/>	
TOTAL	100.0

Sulphur	0.39
F.S.I.	5
Btu / lb	13,834
H.G.I.	
Phosphorous	

### Dry Basis

Ash	10.2
Volatile Matter	21.5
Btu / lb	13,920

### Dry Ash Free Basis

Volatile Matter	23.9
Btu / lb	15,502

Yield	77.2 %
-------	--------

Lab. No. 77-9226 A Date: Oct. 19/77

Client: Denison Mines Ltd.

Sample I. D.: Adit 77 - 1 - 3

Starting Temperature °C: 340°

Softening Temperature °C: 495°

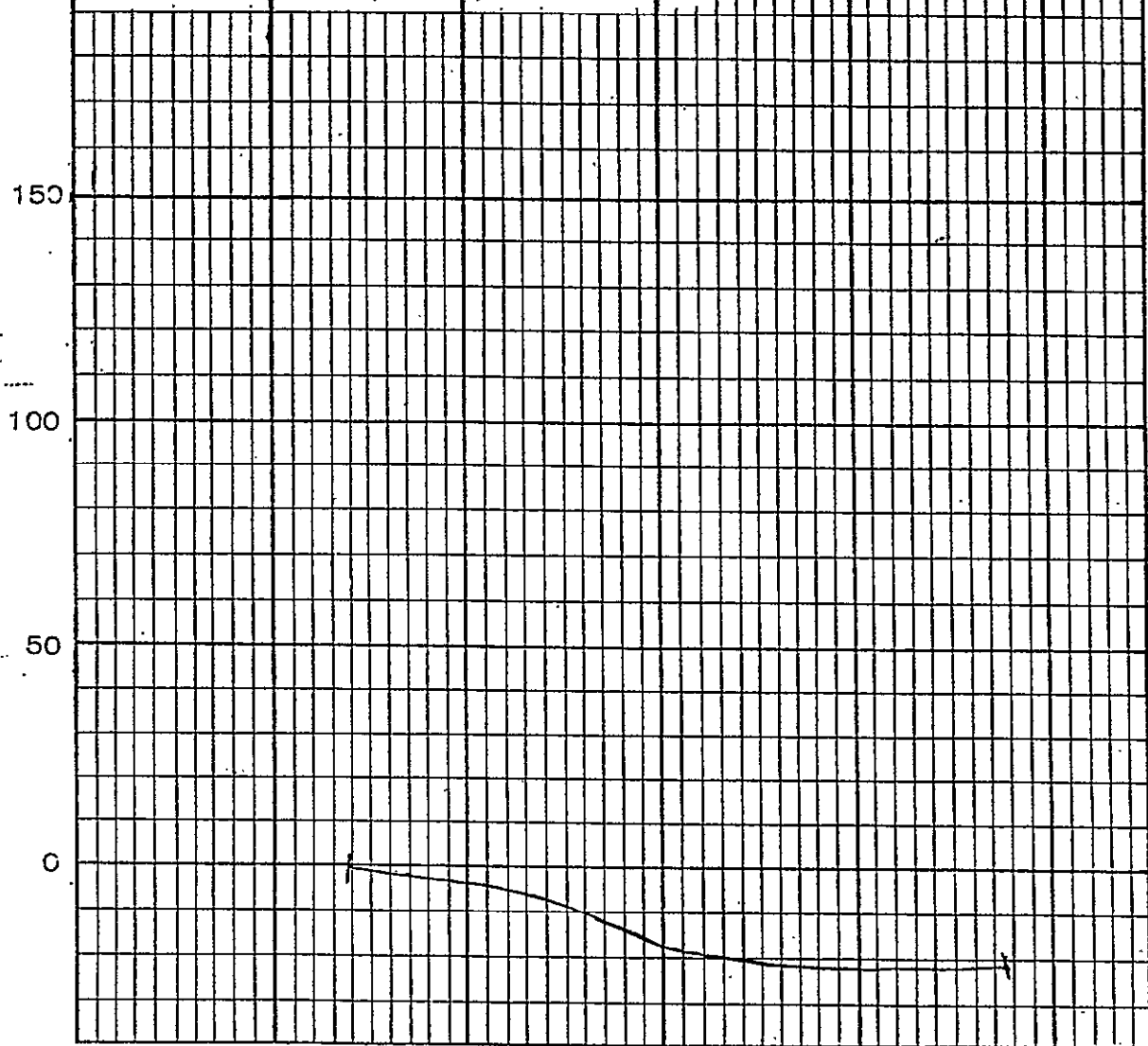
Max. Dilatation Temp. °C: \_\_\_\_\_

Contraction %: 23 %

Dilatation %: \_\_\_\_\_

Final Temperature °C: \_\_\_\_\_

G. Factor: \_\_\_\_\_



Warnock Hersey Professional Services Ltd.

RUHR DILATCMETER TEST.

Date

Drawn





Warnock Hersey Professional Services Ltd.

1423 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel: 264-9120 276 - 9138

Sample Identification Denison Bulk 77 - 1 - 3 After Attrition Size fraction 4" x 2"  
 Lab. No. (s) 77 - 9226 A Wt % of head sample 7.3

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Subst F.S.I.	Weight	Ash	Subst	Weight	Ash	Subst
	1.30	NIL	-	-	-	-	-	-	-	-
1.30	1.35	2.1	6.3	4%	2.1	6.3		100.0	52.9	
1.35	1.40	23.4	11.4	1%	25.5	11.0		97.9	53.9	
1.40	1.45	5.9	14.6	1%	31.4	11.6		74.5	67.2	
1.45	1.50	4.2	16.7	1	35.6	12.2		68.6	71.8	
1.50	1.55	4.0	22.6	1	39.6	13.3		64.4	75.3	
1.55	1.60	5.5	27.1	1	45.1	15.0		60.4	78.8	
1.60	1.80	-	-	-	45.1	15.0		54.9	84.0	
1.80	2.00	1.5	56.2	0	46.6	16.3		54.9	84.0	
2.00		53.4	84.8	0	100.0	52.9		53.4	84.8	
TOTAL		100.0	52.9							



Warnock Hersey Professional Services Ltd.

1423 D 45th Avenue N.E. Calgary Alberta T2E 2P3 Tel: 264-9120 276 - 9138

Sample Identification Denison Bulk 77 - 1 - 3 After Attrition Size fraction 2" x 1"  
 Lab. No. (s) 77 - 9226 A Wt % of head sample 4.9

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Subst F.S.I.	Weight	Ash	Subst	Weight	Ash	Subst
	1.30	0.7	4.7	7%	0.7	4.7		100.0	43.5	
1.30	1.35	11.1	5.9	3%	11.8	5.8		99.3	43.8	
1.35	1.40	21.2	10.8	1	33.0	9.0		88.2	48.5	
1.40	1.45	6.7	15.1	1	39.7	10.0		67.0	60.5	
1.45	1.50	8.9	19.4	1	48.6	11.8		60.3	65.5	
1.50	1.55	4.6	25.6	1	53.2	13.0		51.4	73.5	
1.55	1.60	4.3	27.4	1	57.5	14.0		48.8	78.2	
1.60	1.80	1.7	29.3	1	59.2	14.5		42.5	83.4	
1.80	2.00	1.5	52.0	1	60.7	15.4		40.8	85.6	
2.00		39.3	86.9	0	100.0	43.5		39.3	86.9	
TOTAL		100.0	43.5							



Warnock Hersey Professional Services Ltd.

1423 D 45th Avenue NE, Calgary Alberta T2E 2P3 Tel: 264-9120 276 - 9138

Sample Identification Denison Bulk 77 - 1 - 3 After Attrition Size fraction 1" x 1/2"  
 Lab. No. (s) 77 - 9226 A Wt % of head sample 9.1

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	2.3	4.2	5	2.3	4.2	100.0	37.1		
1.30	1.35	12.2	6.6	1 1/2	14.5	6.2	97.7	37.8		
1.35	1.40	20.8	11.0	1 1/2	35.3	9.0	85.5	42.3		
1.40	1.45	11.9	15.4	1 1/2	47.2	10.6	64.7	52.4		
1.45	1.50	10.0	20.7	1 1/2	57.2	12.4	52.8	60.7		
1.50	1.55	5.1	22.9	1	62.3	13.3	42.8	70.0		
1.55	1.60	4.1	31.3	1	66.4	14.4	37.7	76.4		
1.60	1.80	2.2	35.9	1	68.6	15.1	33.6	81.9		
1.80	2.00	1.3	47.0	1	69.9	15.7	31.4	85.2		
2.00		30.1	86.8	0	100.0	37.1	30.1	86.8		
TOTAL		100.0	37.1							



Warnock Hersey Professional Services Ltd.

1423 D 45th Avenue NE, Calgary Alberta T2E 2P3 Tel: 264-9120 276 - 9138

Sample Identification Denison Bulk 77 - 1 - 3 After Attrition Size fraction 1/2" x 1/4"  
 Lab. No. (s) 77 - 9226 A Wt % of head sample 11.7

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	4.2	4.0	8	4.2	4.0	100.0	31.8		
1.30	1.35	16.6	6.6	2	20.8	6.1	95.8	33.1		
1.35	1.40	15.8	10.2	1	36.6	7.9	79.2	38.7		
1.40	1.45	17.4	15.5	1	54.0	10.3	63.4	45.8		
1.45	1.50	8.4	20.6	1	62.4	11.7	46.0	57.2		
1.50	1.55	6.1	25.0	1	68.5	12.9	37.6	65.4		
1.55	1.60	3.3	31.0	1	71.8	13.7	31.5	73.3		
1.60	1.80	3.9	37.0	1	75.7	14.9	28.2	78.2		
1.80	2.00	1.8	49.5	1	77.5	15.7	24.3	84.5		
2.00		22.5	87.3	0	100.0	31.8	22.5	87.3		
TOTAL		100.0	31.8							



Wamock Hersey Professional Services Ltd.  
 1423 D 45th Avenue NE. Calgary Alberta T2E 2P3 Tel: 264-9120 276 - 9138

Sample Identification Denison Bulk 77 - 1 - 3 After Attrition Size fraction 1/2" x 8 M  
 Lab. No. (s) 77 - 9226 A Wt % of head sample 10.4

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	17.9	4.8	8	17.9	4.8		100.0	26.9	
1.30	1.35	12.9	7.2	1 1/2	30.8	6.5		82.1	31.8	
1.35	1.40	13.8	10.8	1 1/2	44.6	7.2		69.2	36.4	
1.40	1.45	17.2	15.2	1	61.8	9.4		55.4	42.8	
1.45	1.50	7.4	20.6	1	69.2	10.6		38.2	55.2	
1.50	1.55	5.0	25.0	1	74.2	11.6		30.8	63.5	
1.55	1.60	2.8	31.0	1	77.0	12.3		25.8	70.9	
1.60	1.80	3.7	37.3	1	80.7	13.4		23.0	75.8	
1.80	2.00	1.9	50.1	1	82.6	14.2		19.3	83.2	
2.00		17.4	86.8	0	100.0	26.9		17.4	86.8	
TOTAL		100.0	26.9							



Wamock Hersey Professional Services Ltd.  
 1423 D 45th Avenue NE. Calgary Alberta T2E 2P3 Tel: 264-9120 276 - 9138

Sample Identification Denison Bulk 77 - 1 - 3 After Attrition Size fraction 8 x 28 M  
 Lab. No. (s) 77 - 9226 A Wt % of head sample 34.4

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	36.2	3.4	9	36.2	3.4		100.0	14.8	
1.30	1.35	19.3	6.2	8	55.5	4.4		63.8	21.2	
1.35	1.40	9.8	9.4	3	65.3	5.1		44.5	27.7	
1.40	1.45	12.5	13.2	1 1/2	77.8	6.4		34.7	32.9	
1.45	1.50	5.2	18.3	1 1/2	83.0	7.2		22.2	44.0	
1.50	1.55	2.6	20.6	1	85.6	7.6		17.0	51.8	
1.55	1.60	1.8	27.4	1	87.4	8.0		14.4	57.5	
1.60	1.80	2.9	32.2	1	90.3	8.8		12.8	61.8	
1.80	2.00	1.7	39.5	1	92.0	9.3		9.7	70.6	
2.00		8.0	77.2	0	100.0	14.8		8.0	77.2	
TOTAL		100.0	14.8							



Warnock Hersey Professional Services Ltd.

1423 D 45th Avenue N.E. Calgary Alberta T2E 2P3 Tel 254-9120 276 - 9138

Sample Identification Denison Bulk 77 - 1 - 3 After Attrition  
Lab. No. (s) 77 - 9226 A

Size fraction 28 x 100 M  
Wt % of head sample 13.2

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	37.6	3.8	9	37.6	3.8		100.0	11.9	
1.30	1.35	17.7	4.9	8	55.3	4.2		62.4	16.8	
1.35	1.40	9.3	6.4	7	64.6	4.5		44.7	21.5	
1.40	1.45	14.6	9.9	3½	79.2	5.5		35.4	25.5	
1.45	1.50	3.1	16.6	1	82.3	5.9		20.8	36.4	
1.50	1.55	4.4	14.8	1	86.7	6.3		17.7	39.9	
1.55	1.60	0.9	25.2	1	87.6	6.5		13.3	48.2	
1.60	1.80	4.0	25.8	1	91.6	7.4		12.4	49.9	
1.80	2.00	3.1	41.0	1	94.7	8.5		8.4	61.4	
2.00		5.3	73.3	0	100.0	11.9		5.3	73.3	
TOTAL		100.0	11.9							



Warnock Hersey Professional Services Ltd.

1423 D 45th Avenue N.E. Calgary Alberta T2E 2P3 Tel 254-9120 276 - 9138

Sample Identification Denison Bulk 77 - 1 - 3 After Attrition  
Lab. No. (s) 77 - 9226 A

Size fraction 100 Mx 0  
Wt % of head sample 9.0

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
Final Froth		49.1	6.2	8½	49.1	6.2		100.0	11.8	
45 sec.		37.6	11.7	8	86.7	8.6		50.9	17.2	
90 sec.		11.0	26.2	3	97.7	10.6		13.3	32.8	
135 sec.		1.5	61.8	1	99.2	11.3		2.3	84.6	
180 sec.		0.8	69.9	0	100.0	11.8		0.8	69.9	
TOTAL		100.0	11.8							



Wornock Hersey Professional Services Ltd.

1423 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel 264-9120 276 - 9138

Sample Identification Denison Bulk 77 - 1 - 3 Before Attrition Size fraction 4 x 2 "  
 Lab. No. (s) 77 - 9226 B Wt % of head sample 15.6

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	<del>Sulfur</del> F.S.I.	Weight	Ash	<del>Sulfur</del>	Weight	Ash	<del>Sulfur</del>
	1.30	0.8	5.7	7	0.8	5.7		100.0	55.8	
1.30	1.35	8.8	6.0	6	9.6	6.0		99.2	56.2	
1.35	1.40	6.5	10.8	1½	16.1	7.9		90.4	61.1	
1.40	1.45	9.1	12.8	1½	25.2	9.7		83.9	65.0	
1.45	1.50	9.4	16.4	1	28.6	10.5		74.8	71.4	
1.50	1.55	9.0	25.5	1	37.6	14.1		71.4	74.0	
1.55	1.60	1.7	26.9	1	39.3	14.6		62.4	81.0	
1.60	1.80	1.0	28.4	1	40.3	15.0		60.7	82.5	
1.80	2.00	0.4	42.8	1	40.7	15.2		59.7	83.4	
2.00		59.3	83.7	0	100.0	55.8		59.3	83.7	
TOTAL		100.0	55.8							



Wornock Hersey Professional Services Ltd.

1423 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel 264-9120 276 - 9138

Sample Identification Denison Bulk 77 - 1 - 3 Before Attrition Size fraction 2 x 1 "  
 Lab. No. (s) 77 - 9226 B Wt % of head sample 16.5

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	<del>Sulfur</del> F.S.I.	Weight	Ash	<del>Sulfur</del>	Weight	Ash	<del>Sulfur</del>
	1.30	7.8	6.0	8	7.8	6.0		100.0	27.5	
1.30	1.35	15.2	6.5	3½	23.0	6.3		92.2	29.3	
1.35	1.40	27.4	10.9	1½	50.4	8.8		77.0	33.8	
1.40	1.45	13.0	15.6	1½	63.4	10.2		49.6	46.5	
1.45	1.50	6.3	20.0	1	69.7	11.1		36.6	57.5	
1.50	1.55	6.7	24.1	1	76.4	12.2		30.3	65.3	
1.55	1.60	2.3	27.8	1	78.7	12.7		23.6	76.9	
1.60	1.80	1.6	32.8	1	80.3	13.1		21.3	82.2	
1.80	2.00	0.9	45.9	1	81.2	13.4		19.7	86.3	
2.00		18.8	88.2	0	100.0	27.5		18.8	86.2	
TOTAL		100.0	27.5							



Wamock Hersey Professional Services Ltd.

1423 D 45th Avenue NE. Calgary Alberta T2E 2P3 Tel 264-9128 x 276 - 9138

Sample Identification Denison Bulk 77 - 1 - 3 Before Attrition Size fraction 1 x 1/2"  
 Lab. No. (s) 77 - 9226 B Wt % of head sample 9.5

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F. S. I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	6.7	4.7	9	6.7	4.7		100.0	24.3	
1.30	1.35	18.4	6.7	3 1/2	25.1	6.2		93.3	25.7	
1.35	1.40	24.5	11.0	1 1/2	49.6	8.6		74.9	30.4	
1.40	1.45	15.8	16.3	1 1/2	65.4	10.4		50.4	39.8	
1.45	1.50	7.2	20.8	1	72.6	11.4		34.6	50.5	
1.50	1.55	5.7	26.0	1	78.3	12.5		27.4	58.3	
1.55	1.60	3.1	30.6	1	81.4	13.2		21.7	66.8	
1.60	1.80	3.3	37.2	1	84.7	14.1		18.6	72.8	
1.80	2.00	2.0	47.4	1	86.7	14.9		15.3	80.5	
2.00		13.3	85.5	0	100.0	24.8		13.3	85.5	
TOTAL		100.0	24.3							



Wamock Hersey Professional Services Ltd.

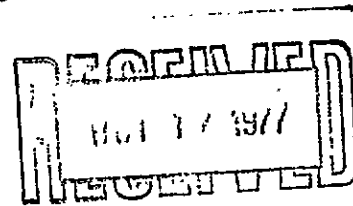
1423 D 45th Avenue NE. Calgary Alberta T2E 2P3 Tel 264-9128 x 276 - 9138

Sample Identification Denison Bulk 77 - 1 - 3 Before Attrition Size fraction 1/2 x 1/2"  
 Lab. No. (s) 77 - 9226 B Wt % of head sample 12.1

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F. S. I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	17.0	4.5	8 1/2	17.0	4.5		100.0	23.8	
1.30	1.35	14.3	7.1	3 1/2	31.3	5.7		83.0	27.7	
1.35	1.40	19.5	11.1	1 1/2	50.8	7.8		68.7	32.0	
1.40	1.45	16.8	18.5	1 1/2	67.6	10.4		49.2	40.3	
1.45	1.50	5.5	20.1	1	73.1	11.2		32.4	51.6	
1.50	1.55	6.2	25.7	1	79.3	12.3		26.9	58.0	
1.55	1.60	2.1	30.6	1	81.4	12.8		20.7	67.7	
1.60	1.80	4.1	36.8	1	85.5	13.9		18.6	71.9	
1.80	2.00	1.7	53.9	1	87.2	14.7		14.5	81.9	
2.00		12.8	85.6	0	100.0	23.8		12.8	85.6	
TOTAL		100.0	23.8							

**Warnock Hersey Professional Services Ltd.**

1423 D 45th Avenue N.E. Calgary Alberta T2E 2P3 Tel ~~264-9120~~ 276 - 9138



DENISON MINES LTD.

Report

of

WASHABILITY STUDY

Adit Sample 77 - 2 - 4

Submitted, October 12, 1977

A handwritten signature in black ink, appearing to read "John Kay". The signature is stylized and somewhat cursive.

John Kay, C. Eng., M. Inst. F.  
Manager of Laboratory

I N D E X

Bulk Sample 77 - 2 - 4

	Page
I. Screen Analysis	
Attrition Test.....	1
Raw Coal Size / Ash Distribution.....	2
Relative Contribution-Clean Coal Size / Ash....	3
II. Product Coal	
Clean Coal Analysis.....	4
RUHR Dilatometer Test .....	5
Gieseler Plasticity.....	6
III. Float / Sink Data	
After Attrition	
4 " x 2 ".....	7
2 " x 1 ".....	8
1 " x ½ ".....	9
½ " x ¼ ".....	10
¼ " x 8 M.....	11
8 x 28 M.....	12
28 M x 100.....	13
100 M x 0.....	14
Before Attrition	
4 " x 2 ".....	15
2 " x 1 ".....	16
1 " x ½ ".....	17
½ " x ¼ ".....	18



# Warnock Hersey Professional Services Ltd.

CLIENT - Denison Mines Ltd.

Sample I.D. - Adit 77 - 2 - 4

Lab. No. - 77 - 9211

## ATTRITION TEST

<u>SIZE</u>	<u>Wt. % Before</u>	<u>Wt. % After</u>
+ 4 "	0.8	0.4
4 " x 2 "	5.0	2.8
2 " x 1 "	9.7	5.4
1 " x ½ "	11.4	4.4
½ " x ¼ "	13.5	12.0
¼ " x 1/8 "	11.0	12.6
8 x 28 M	27.2	39.0
28 M x 0	21.4	23.4
	<hr/>	<hr/>
TOTAL	100.0	100.0

**Warnock Hersey Professional Services Ltd.**

CLIENT - Denison Mines Ltd.

Sample I.D. - Adit 77 - 2 - 4

Lab. No. - 77 - 9211 A (After Attrition)

RAW COAL SIZE / ASH DISTRIBUTION

<u>SIZE</u>	<u>Wt. %</u>	<u>Dry Ash %</u>	<u>Cum. Wt. %</u>	<u>Cum. Ash %</u>
4 " x 2 "	3.2	9.4	3.2	9.4
2 " x 1 "	5.4	9.8	8.6	9.6
1 " x ½ "	4.4	7.9	13.0	9.1
½ " x ¼ "	12.0	7.1	25.0	8.1
¼ " x 1/8 "	12.6	6.5	37.6	7.6
8 x 28 M	39.0	5.9	76.6	6.7
28 x 100 M	15.1	4.3	91.7	6.3
100 M x 0	8.3	4.9	100.0	6.2
TOTAL	100.0	6.2		

**Warnock Hersey Professional Services Ltd.**

CLIENT - Denison Mines Ltd.

Sample I.D. - Adit 77 - 2 - 4

Lab. No. - 77 - 9211 A

RELATIVE CONTRIBUTION - CLEAN COAL SIZE/ ASH

<u>SIZE</u>	<u>Wt. % Yield</u>	<u>Dry Ash %</u>	<u>Separation</u>
4 "x2"	3.2	8.5	1.55 float
2" x 1 "	5.1	7.7	1.55 float
1 " x ½ "	4.2	6.3	1.55 float
½ " x ¼ "	11.5	5.3	1.55 float
¼ " x 8 M	12.1	4.4	1.55 float
8 x 28 M	37.2	3.7	1.55 float
28 x 100 M	14.5	3.1	1.80 float
100 M x 0	8.2	4.6	90 sec froth
TOTAL	96.0	4.5	

# Warnock Hersey Professional Services Ltd.

CLIENT - Denison Mines Ltd.

Sample I.D. - Adit 77 - 2 - 4

Lab. No. - 77 - 9211 A

## Clean Coal Analysis %

### Air Dried Basis

Moisture -	0.6
Ash -	4.8
Volatile Matter -	22.5
Fixed Carbon -	72.1
Total	<u>100.0</u>

Sulphur -	0.36
F.S.I. -	7½
H.G.I. -	85.1
Phosphorous -	
Btu / lb. -	14,847

### Dried Basis

Ash -	4.8
Volatile Matter -	22.7
Btu / lb. -	14,943

### Dry Ash Free Basis

Volatile Matter -	23.8
Btu / lb. -	15,694

Yield	96.0 %
-------	--------

Lab. No. 77-9211A Date: Oct. 9/77

Client: Denison Mines Ltd.

Sample I. D.: Clean Coal Bulk Sample

Starting Temperature °C: 330

Softening Temperature °C: 390

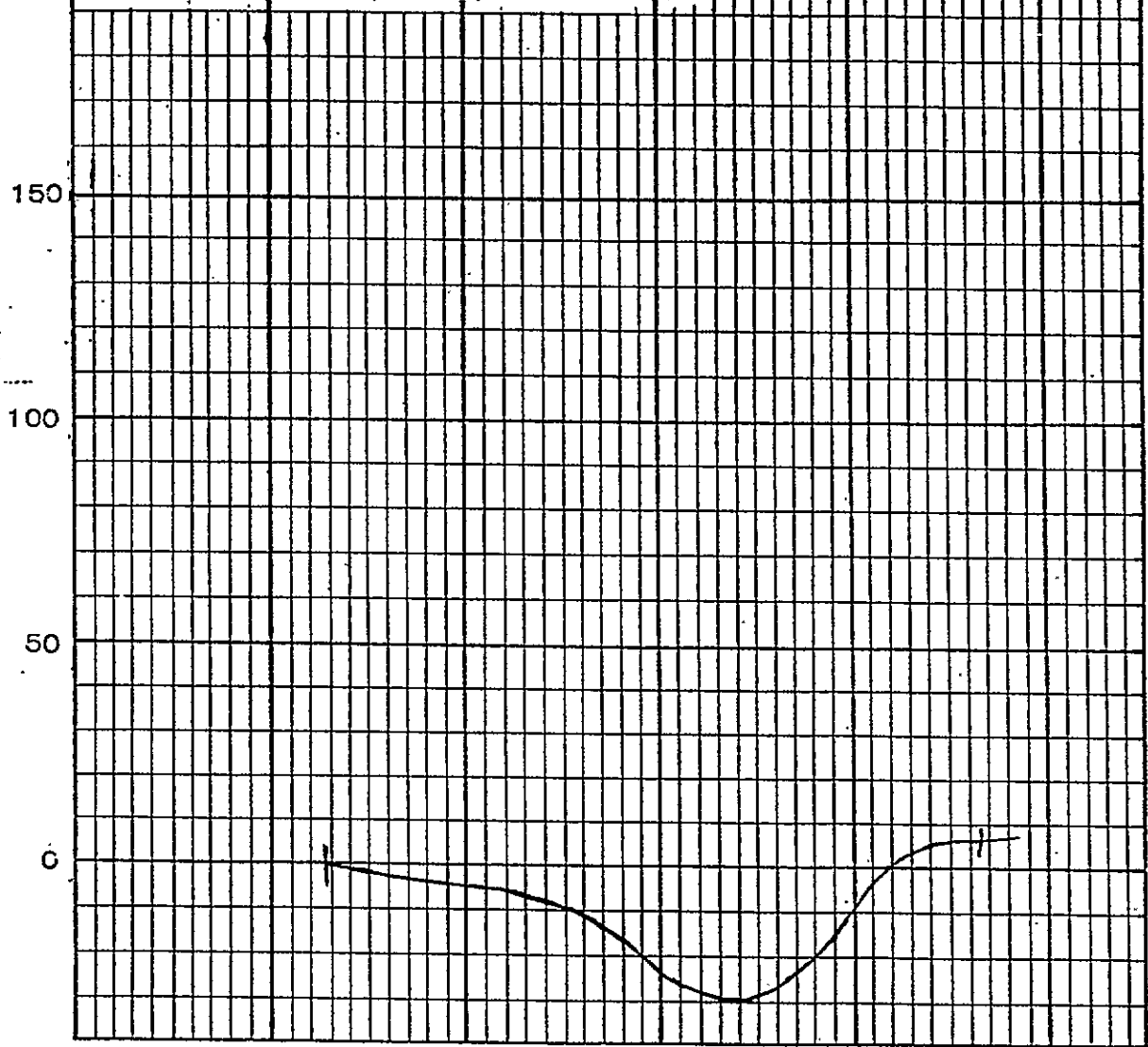
Max. Dilatation Temp. °C: 480

Contraction %: 30 %

Dilatation %: 6 %

Final Temperature °C: \_\_\_\_\_

G. Factor: 0.935



Warnock Hersey Professional Services Ltd.

RUHR DILATCMETER TEST

Date

Drawn



**Warnock Hersey Professional Services Ltd.**

1423 D 45th Avenue N.E. Calgary Alberta T2E 2P3 Tel. 264-9120 276 - 9138

REPORT OF:	Gieseler Plasticity	FILE NO.	780 - 0241
AT	Calgary Laboratory	DATE	Oct. 11/77
PROJECT:		REPORT NO.	A0 209
REPORTED TO:	Denison Mines Ltd. Suite # 1500 444 - 5 Avenue S.W. Calgary, Alberta	ORDER NO.	780 - 0241

ATT: M. DUFORD

We report hereunder, the following analysis results for Gieseler Plasticity for one coal sample received by us on September 28, 1977.

<u>LAB. NO.</u>		<u>DDPM</u>	<u>TEMP<sup>o</sup>C</u>
77 - 9211 A	START	1	441 <sup>o</sup>
	MAXIMUM	18	471 <sup>o</sup>
	FINAL	1	501 <sup>o</sup>
		RANGE	60 <sup>o</sup>

Submitted, October 11, 1977

John Kay, C. Eng., M. Inst. F.  
Manager of Laboratory

JK/kc



Warnock Hersey Professional Services Ltd.

1423 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel 264-9120 276 - 9138

Sample Identification Dentson Adit 77 - 2 - 4 After AttritionSize fraction 4" x 2"Lab. No. (s) 77 - 9211 AWt % of head sample 3.2Specific GravityFLOAT AND SINK ANALYSIS %

<u>Sink</u>	<u>Float</u>	<u>Elementary</u>			<u>Cumulative Float</u>			<u>Cumulative Sink</u>		
		<u>Weight</u>	<u>Ash</u>	<u>Sulphur</u>	<u>Weight</u>	<u>Ash</u>	<u>Sulphur</u>	<u>Weight</u>	<u>Ash</u>	<u>Sulphur</u>
	1.30	20.9	4.0	7	20.9	4.0		100.0	9.4	
1.30	1.35	34.1	6.0	3½	55.0	5.2		79.1	10.8	
1.35	1.40	7.4	7.9	2½	62.4	5.6		45.0	14.4	
1.40	1.45	18.1	13.2	1	28.5	7.1		37.6	15.7	
1.45	1.50	20.0	13.9	1	98.5	8.5		21.5	17.6	
1.50	1.55	nil	-	-	98.5	8.5		1.5	66.7	
1.55	1.60	nil	-	-	98.5	8.5		1.5	66.7	
1.60	1.80	nil	-	-	98.5	8.5		1.5	66.7	
1.80	2.00	nil	-	-	98.5	8.5		1.5	66.7	
2.00		1.5	66.7	0	100.0	9.4		1.5	66.7	
	TOTAL	100.0	9.4							



Warnock Hersey Professional Services Ltd.

1423 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel 264-9120 276 - 9138

Sample Identification Dentson Adit 77 - 2 - 4 After AttritionSize fraction 2" x 1"Lab. No. (s) 77 - 9211 AWt % of head sample 5.4Specific GravityFLOAT AND SINK ANALYSIS %

<u>Sink</u>	<u>Float</u>	<u>Elementary</u>			<u>Cumulative Float</u>			<u>Cumulative Sink</u>		
		<u>Weight</u>	<u>Ash</u>	<u>Sulphur</u>	<u>Weight</u>	<u>Ash</u>	<u>Sulphur</u>	<u>Weight</u>	<u>Ash</u>	<u>Sulphur</u>
	1.30	33.4	3.9	7	33.4	3.9		100.0	9.8	
1.30	1.35	29.7	5.7	2½	63.1	4.7		66.6	12.8	
1.35	1.40	12.6	10.4	1	75.7	5.7		36.9	18.5	
1.40	1.45	10.5	14.4	1	86.2	6.7		24.3	22.6	
1.45	1.50	5.2	16.6	1	91.4	7.3		13.8	28.9	
1.50	1.55	2.9	19.6	1	94.3	7.7		8.6	36.4	
1.55	1.60	1.7	24.2	1	96.0	8.0		5.7	44.9	
1.60	1.80	1.4	31.4	1	97.4	8.3		4.0	53.7	
1.80	2.00	0.6	38.8	1	98.0	8.5		2.6	65.7	
2.00		2.0	73.8	0	100.0	9.8		2.0	73.8	
	TOTAL	100.0	9.8							



Wamock Hersey Professional Services Ltd.

1423 D 45th Avenue N.E. Calgary Alberta T2E 2P3 Tel 264-9230 276 - 9138

Sample Identification Dentson Adit 77 - 2 - 4 After Attrition Size fraction 1" x 1/2"  
 Lab. No. (s) 77 - 9211 A Wt % of head sample 4.1

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Subbur F.S.I.	Weight	Ash	Subbur	Weight	Ash	Subbur
	1.30	54.7	4.0	7	54.7	4.0		100.0	7.9	
1.30	1.35	23.0	6.1	2 1/2	77.7	4.6		45.3	12.7	
1.35	1.40	7.6	10.4	1	85.3	5.1		22.3	19.4	
1.40	1.45	5.2	14.8	1	90.5	5.7		14.7	24.1	
1.45	1.50	3.9	18.1	1	94.4	6.2		9.5	29.2	
1.50	1.55	1.0	19.7	1	95.4	6.3		5.6	36.9	
1.55	1.60	2.0	23.2	1	97.4	6.7		4.6	40.7	
1.60	1.80	1.1	33.8	1	98.5	7.0		2.6	53.6	
1.80	2.00	0.2	44.4	1	98.7	7.1		1.5	68.1	
2.00		1.3	71.7	0	100.0	7.9		1.3	71.7	
TOTAL		100.0	7.9							



Wamock Hersey Professional Services Ltd.

1423 D 45th Avenue N.E. Calgary Alberta T2E 2P3 Tel 264-9230 276 - 9138

Sample Identification Dentson Adit 77 - 2 - 4 After Attrition Size fraction 1/2" x 1/2"  
 Lab. No. (s) 77 - 9211 A Wt % of head sample 12.0

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Subbur F.S.I.	Weight	Ash	Subbur	Weight	Ash	Subbur
	1.30	71.7	3.8	7 1/2	71.7	3.8		100.0	7.1	
1.30	1.35	13.3	6.6	1 1/2	85.0	4.2		28.3	15.4	
1.35	1.40	5.3	9.8	1	90.3	4.6		15.0	23.2	
1.40	1.45	2.9	14.2	1	93.2	4.9		9.7	30.6	
1.45	1.50	2.1	19.7	1	95.3	5.2		6.8	37.6	
1.50	1.55	0.5	21.0	1	95.8	5.3		4.7	45.5	
1.55	1.60	0.9	25.0	1	96.7	5.4		4.2	48.5	
1.60	1.80	1.2	34.3	1	97.9	5.8		3.3	54.8	
1.80	2.00	0.7	42.2	1	98.6	6.1		2.1	66.6	
2.00		1.4	78.8	0	100.0	7.1		1.4	78.8	
TOTAL		100.0	7.1							





Warnock Hersey Professional Services Ltd.

1123 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel 264-4130

276 - 9138

Sample Identification Denison Adit 77 - 2 - 4 After Attrition  
 Lab. No. (s) 77 - 9211 A

Size fraction 1/2" x 8 M  
 Wt % of head sample 12.6

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	71.6	3.2	8	71.6	3.2		100.0	6.5	
1.30	1.35	16.5	6.2	2 1/2	88.1	3.8		28.4	14.9	
1.35	1.40	4.8	9.3	1	92.9	4.0		11.9	27.0	
1.40	1.45	2.0	13.1	1	94.9	4.2		7.1	39.0	
1.45	1.50	1.0	20.0	1	95.9	4.4		5.1	49.1	
1.50	1.55	0.3	20.3	1	96.2	4.4		4.1	56.2	
1.55	1.60	0.4	27.5	1	96.6	4.5		3.8	59.1	
1.60	1.80	0.8	37.1	1	97.4	4.8		3.4	62.8	
1.80	2.00	0.7	45.2	1	98.1	5.1		2.6	70.7	
2.00		1.9	80.1	0	100.0	6.5		1.9	80.1	
TOTAL		100.0	6.5							

11.



Warnock Hersey Professional Services Ltd.

1123 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel 264-4130 276 - 9138

Sample Identification Denison Adit 77 - 2 - 4 After Attrition  
 Lab. No. (s) 77 - 9211 A

Size fraction 8 M x 28 M  
 Wt % of head sample 39.0

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	67.6	2.3	8	67.6	2.3		100.0	5.9	
1.30	1.35	20.2	5.3	4 1/2	87.8	3.0		32.4	13.4	
1.35	1.40	4.0	9.1	2 1/2	91.8	3.3		12.2	26.7	
1.40	1.45	2.2	12.6	1 1/2	94.0	3.5		8.2	35.3	
1.45	1.50	0.8	19.1	1	94.8	3.6		6.0	43.6	
1.50	1.55	0.6	21.4	1	95.4	3.7		5.2	47.4	
1.55	1.60	0.8	26.8	1	96.2	3.9		4.6	50.8	
1.60	1.80	1.0	36.5	1	97.2	4.2		3.8	55.8	
1.80	2.00	1.1	38.8	1	98.3	4.6		2.8	62.8	
2.00		1.7	78.3	0	100.0	5.9		1.7	78.3	
TOTAL		100.0	5.9							

11



Warnock Hersey Professional Services Ltd.

1423 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel 264-9120 276 - 9138

Sample Identification Denison Adit 77 - 2 - 4 After Attrition Size fraction 28 M x 100  
 Lab. No. (s) 77 - 9211 A Wt % of head sample 15.1

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	66.5	2.1	8½	66.5	2.1		100.0	4.3	
1.30	1.35	14.5	3.6	7½	81.0	2.4		33.5	8.7	
1.35	1.40	6.8	5.0	6	87.8	2.6		19.0	12.6	
1.40	1.45	4.7	6.3	5	92.5	2.8		12.2	16.8	
1.45	1.50	2.1	9.2	4	93.8	2.9		7.5	23.5	
1.50	1.55	1.3	15.6	1½	95.9	3.1		6.2	25.3	
1.55	1.60	0.4	20.1	1½	96.3	3.2		4.1	33.3	
1.60	1.80	1.6	23.1	1	97.9	3.5		3.7	34.7	
1.80	2.00	1.0	30.2	1	98.9	3.7		2.1	43.5	
2.00		1.1	55.6	0	100.0	4.3		1.1	55.6	
TOTAL		100.0	4.3							

61



Warnock Hersey Professional Services Ltd.

1423 D 45th Avenue NE, Calgary Alberta T2E 2P3 Tel 264-9120 276 - 9138

Sample Identification Denison Adit 77 - 2 - 4 After Attrition Size fraction 100 M x 0  
 Lab. No. (s) 77 - 9211 A Wt % of head sample 8.3

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	Final Froth	90.2	3.5	8	90.2	3.5		100.0	4.9	
	45 sec.	5.3	12.7	4	95.5	4.0		9.8	17.6	
	90 sec.	3.7	19.3	3½	99.2	4.6		4.5	23.5	
	135 sec.	0.3	38.1	1	99.5	4.7		0.8	42.7	
	180 sec.	0.5	45.5	1	100.0	4.9		0.5	45.5	
TOTAL		100.0	4.9							

Sample Identification Denison Adit 77 - 2 - 1 Before attrition Size fraction 4" x 2"  
 Lab. No. (s) 77 - 9211 B Wt % of head sample 5.8

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulfur F.S.I.	Weight	Ash	Sulfur	Weight	Ash	Sulfur
	1.30	67.1	4.1	7½	67.1	4.1		100.0	5.6	
1.30	1.35	16.3	6.5	5	83.4	4.6		32.9	8.7	
1.35	1.40	8.5	10.6	3	91.9	5.1		16.6	10.8	
1.40	1.45	8.1	11.0	1½	100.0	5.6		8.1	11.0	
	TOTAL	100.0	5.6							

15.



Sample Identification Denison Adit 77 - 2 - 4 Before Attrition Size fraction 2" x 1"  
 Lab. No. (s) 77 - 9211 B Wt % of head sample 9.7

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulfur	Weight	Ash	Sulfur	Weight	Ash	Sulfur
	1.30	56.7	3.9	7½	56.7	3.9		100.0	6.4	
1.30	1.35	25.0	5.8	5	81.7	4.5		43.3	9.8	
1.35	1.40	8.5	10.3	2½	90.2	5.0		18.3	15.2	
1.40	1.45	3.6	14.0	2	93.8	5.4		9.8	19.4	
1.45	1.50	2.9	17.1	1½	96.7	5.7		6.2	22.5	
1.50	1.55	1.2	18.1	1	97.9	5.9		3.3	27.3	
1.55	1.60	0.9	22.3	1	98.8	6.0		2.1	32.6	
1.60	1.80	-	-	-	98.8	6.0		1.2	40.2	
1.80	2.00	0.6	24.3	1	99.4	6.1		1.2	40.2	
2.00		0.6	56.2	0	100.0	6.4		0.6	56.2	
	TOTAL	100.0	6.4							

16



Wamock Hersey Professional Services Ltd.

1423 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel: (403) 276-9138

Sample Identification Denison Adit 77 - 2 - 4 Before Attrition Size fraction 1" x 1/2"  
 Lab. No. (s) 77 - 9211 B Wt % of head sample 11.5

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	67.6	5.0	7 1/2	67.6	5.0		100.0	8.4	
1.30	1.35	15.7	6.4	2 1/2	83.3	5.3		32.4	15.4	
1.35	1.40	5.4	10.0	2	88.7	5.6		16.7	23.9	
1.40	1.45	3.7	13.8	1 1/2	92.4	5.9		11.3	30.6	
1.45	1.50	2.1	18.6	1 1/2	94.5	6.2		7.6	38.7	
1.50	1.55	1.0	20.9	1	95.5	6.3		5.5	46.4	
1.55	1.60	0.8	27.0	1	96.3	6.5		4.5	52.1	
1.60	1.80	0.9	33.9	1	97.2	6.7		3.7	57.5	
1.80	2.00	1.0	43.0	1	98.2	7.1		2.8	65.1	
2.00		1.8	77.4	0	100.0	8.4		1.8	77.4	
TOTAL		100.0	8.4							

17.



Wamock Hersey Professional Services Ltd.

1423 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel: (403) 276-9138

Sample Identification Denison Adit 77 - 2 - 4 Before Attrition Size fraction 1/2" x 1/4"  
 Lab. No. (s) 77 - 9211 B Wt % of head sample 13.5

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	74.2	7.5	7 1/2	74.2	7.5		100.0	10.4	
1.30	1.35	12.4	8.8	2	86.6	7.7		25.8	18.7	
1.35	1.40	4.9	10.7	1	90.9	7.8		13.4	27.8	
1.40	1.45	1.9	14.7	1	92.8	8.0		9.1	35.9	
1.45	1.50	1.6	20.0	1	94.4	8.2		7.2	41.5	
1.50	1.55	0.8	21.2	1	95.2	8.3		5.6	47.6	
1.55	1.60	0.8	23.5	1	96.0	8.4		4.8	52.0	
1.60	1.80	1.1	37.2	1	97.1	8.8		4.0	56.8	
1.80	2.00	1.0	39.4	1	98.1	9.1		2.9	64.2	
2.00		1.9	77.2	0	100.0	10.4		1.9	77.2	
TOTAL		100.0	10.4							

18.

**Warnock Hersey Professional Services Ltd.**

1423 D 45th Avenue N.E. Calgary Alberta T2E 2P3 Tel. 264-9120

276 - 9138  
**RECEIVED**  
OCT 17 1977  
**REGISTERED**

DENISON MINES LTD.

Report

of.

WASHABILITY STUDY

Adit Sample 77 - 4 - 5

Submitted, October 12, 1977



John Kay, C. Eng., M. Inst. F.  
Manager of Laboratory

I N D E X

Bulk Sample 77 - 4 - 5

	Page
I. Screen Analysis	
Attrition Test.....	1
Raw Coal Size / Ash Distribution.....	2
Relative Contribution-Clean Coal Size / Ash....	3
II. Product Coal	
Clean Coal Analysis.....	4
RUHR Dilatometer Test .....	5
Gieseler Plasticity.....	6
III. Float / Sink Data	
After Attrition	
4 " x 2 ".....	7
2 " x 1 " .....	8
1 " x ½ " .....	9
½ " x ¼ ".....	10
¼ " x 8 M.....	11
8 x 28 M .....	12
28 M x 100.....	13
100 M x 0.....	14
Before Attrition	
4 " x 2 " .....	15
2 " x 1 ".....	16
1 " x ½ ".....	17
½ " x ¼ " .....	18

# Warnock Hersey Professional Services Ltd.

CLIENT - Denison Mines Ltd.

Sample Identification - Adit 77 - 4-5

Lab. No. - 77 - 9089

## ATTRITION TEST

<u>SIZE</u>	<u>WT. % BEFORE</u>	<u>WT. % AFTER</u>
+ 4 "	4.4	-
4" x 2 "	3.7	4.8
2 " x 1 "	8.1	1.8
1 " x ½ "	10.9	6.7
½ " x ¼ "	5.3	4.3
¼ " x 8 M	17.0	14.7
8 M x 28 M	34.0	42.9
28 M x 0	16.6	24.8
	<hr/>	<hr/>
Total -	100.0	100.0

# Warnock Hersey Professional Services Ltd.

CLIENT - Denison Mines Ltd.

Sample Identification - Adit 77 - 4 - 5

Lab. No. - 77 - 9089 A (After Attrition)

## RAW COAL SIZE/ ASH DISTRIBUTION

<u>SIZE</u>	<u>Wt. %</u>	<u>Dry Ash %</u>	<u>Cum. Wt. %</u>	<u>Cum. Ash %</u>
4 " x 2 "	4.8	54.0	4.8	54.0
2 " x 1 "	1.8	49.8	6.6	52.8
1 " x ½ "	6.7	49.0	13.3	50.9
½ " x ¼ "	4.3	42.9	17.6	49.0
¼ " X 8 M	14.7	37.1	32.3	43.6
8 x 28 M	42.9	20.5	75.2	30.4
28 M x 100	17.9	10.6	93.1	26.6
100 M x 0	<u>6.9</u>	<u>10.7</u>	100.0	25.5
Total	100.0	25.5		



# Warnock Hersey Professional Services Ltd.

CLIENT - Denison Mines Ltd.

Sample Identification - Adit 77 - 4 - 5

Lab. No. - 77 - 9089 A (After Attrition)

## RELATIVE CONTRIBUTION - CLEAN COAL SIZE / ASH

<u>SIZE</u>	<u>WT. % Yield</u>	<u>Dry Ash %</u>	<u>Separation</u>
4 " x 2 "	1.6	15.2	1.55 float
2 " x 1 "	0.5	12.1	1.55 float
1 " x ½ "	2.3	11.6	1.55 float
½ " x ¼ "	1.8	9.9	1.55 float
¼ " x 8 M	7.7	8.5	1.55 float
8 x 28 M	31.7	6.0	1.55 float
28 x 100 M	16.4	5.7	1.80 float
100 M x 0	6.8	9.6	90 sec. Fro
Total	68.8	7.2	

# Warnock Hersey Professional Services Ltd.

CLIENT - Denison Mines Ltd.

Sample Identification - Adit 77 - 4 - 5

Lab. No. - 77 - 9098 A

## CLEAN COAL ANALYSIS

### Air Dried Basis

Moisture -	0.9
Ash -	7.8
Volatile Matter -	22.9
Fixed Carbon -	68.4
Total	<u>100.0</u>
Sulphur -	0.43
F.S.I. -	7
H.G.I. -	85.3
Phosphorous -	
Btu / lb. -	14,217

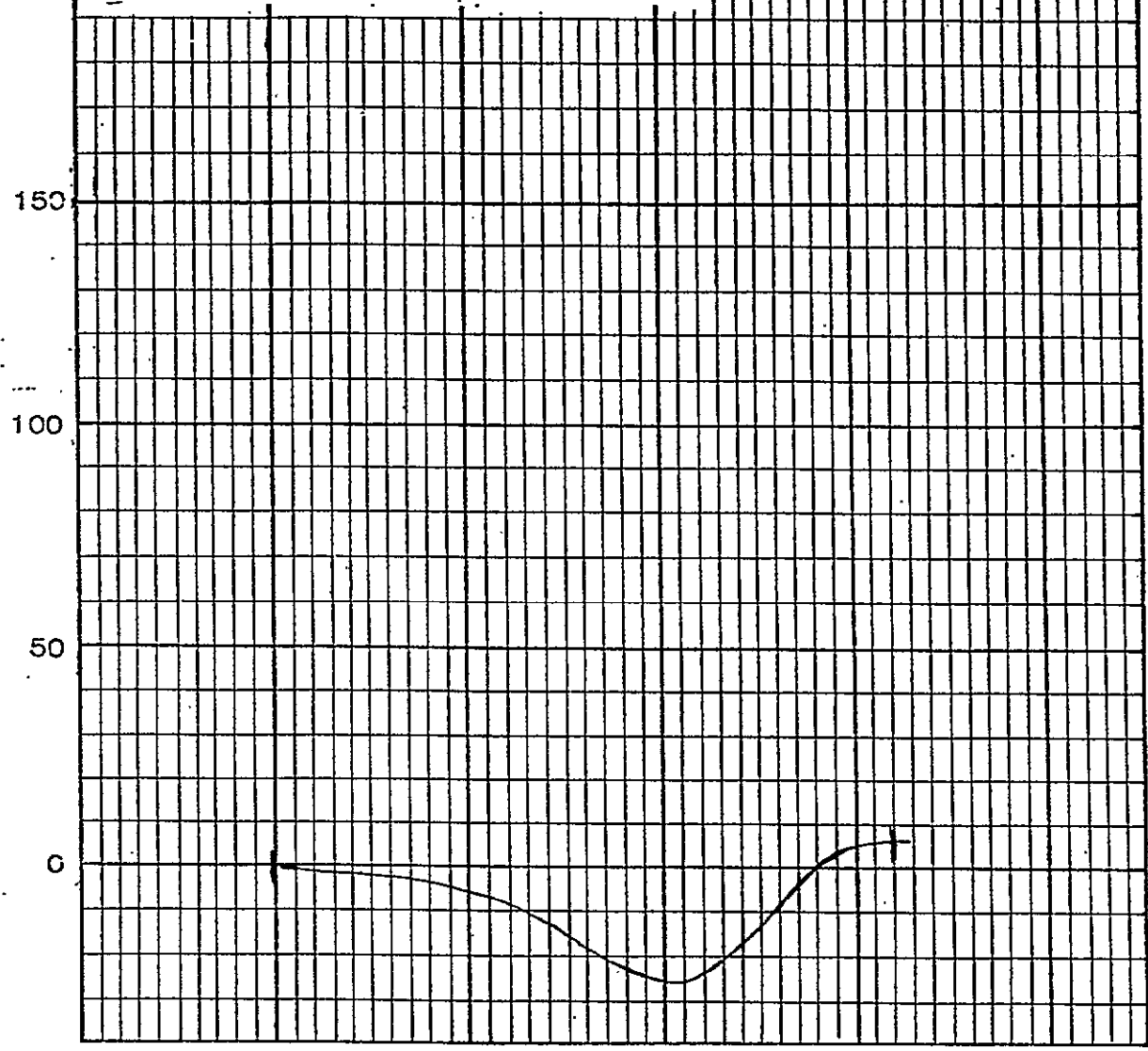
### Dry Basis

Ash -	7.9
Volatile Matter -	23.1
Btu / lb.	14,343

### Dry Ash Free Basis

Volatile Matter -	25.1
Btu / lb. -	15,570
Yield -	68.8 %

% Lab. No. 77 - 9089A Date: Oct. '8/77  
 Client: Denison Mines Ltd.  
 Sample I. D.: Clean Comp. Bulk Sample  
                   77 - 4 - 5  
 Starting Temperature °C: 330°  
 Softening Temperature °C: 390°  
 250 Max. Dilatation Temp. °C: 476°  
 Contraction %: 26 %  
 Dilatation %: 5%  
 Final Temperature °C: \_\_\_\_\_  
 200 G. Factor: 0.937



Warnock Hersey Professional Services Ltd.

RUHR DILATCMETER TEST

Date

Drawn



**Warnock Hersey Professional Services Ltd.**

1423 D 45th Avenue N.E. Calgary Alberta T2E 2P3 Tel: ~~264-9120~~ 276 - 9138

REPORT OF: Gieseler Plasticity

FILE NO. 780 - 0233

AT Calgary Laboratory

DATE October 11, 1977

PROJECT:

REPORT NO. A0 208

REPORTED TO: Denison Mines Ltd.  
Suite # 1500  
444 - 5 Avenue S.W.  
Calgary, Alberta ATT: M. DUFORD

ORDER NO. 780 - 0233

We report hereunder , the following analysis results for Gieseler Plasticity for one coal samples received by us on September 21, 1977.

<u>LAB. NO.</u>		<u>DDPM</u>	<u>TEMP °C</u>
77 - 9089 A	START	1	432 °
	MAXIMUM	20	468 °
	FINAL	1	495 °
			RANGE 63 °

Submitted, October 11, 1977

John Kay, Manager of Laboratory



Wamock Hersey Professional Services Ltd.  
1423 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel 264-9128 276 - 9138

Sample Identification Denison Bulk Adlt 77 - 4 - 5 After Attrition Size fraction 4 " x 2 "  
Lab. No. (s) 77 - 9089 A Wt % of head sample 4.8

Specific Gravity		FLOAT AND SINK ANALYSIS %							
Sink	Float	Elementary			Cumulative Float			Cumulative Sink	
		Weight	Ash	Sulfur F.S.I.	Weight	Ash	Sulfur	Weight	Ash
	1.30	6.5	5.1	4½	6.5	5.1		100.0	54.0
1.30	1.35	9.0	11.2	7½	15.5	8.6		93.5	57.4
1.35	1.40	2.9	13.7	4½	18.4	9.4		84.5	62.4
1.40	1.45	5.9	19.6	5	24.3	11.9		81.6	64.1
1.45	1.50	3.3	21.3	1	27.6	13.0		75.7	67.6
1.50	1.55	5.8	25.6	1	33.4	15.2		72.4	69.7
1.55	1.60	1.9	34.8	1	35.3	16.2		66.6	73.5
1.60	1.80	10.0	32.8	1	45.3	19.9		64.7	74.7
1.80	2.00	2.5	55.6	1	47.8	21.8		54.7	82.3
2.00		52.2	83.6	0	100.0	54.0		52.2	83.6
TOTAL		100.0	54.0						



Wamock Hersey Professional Services Ltd.  
1423 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel 264-9128 276 - 9138

Sample Identification Denison Bulk 77 - 4 - 5 After Attrition Size fraction 2 " x 1 "  
Lab. No. (s) 77 - 9089 A Wt % of head sample 1.8

Specific Gravity		FLOAT AND SINK ANALYSIS %							
Sink	Float	Elementary			Cumulative Float			Cumulative Sink	
		Weight	Ash	Sulfur F.S.I.	Weight	Ash	Sulfur	Weight	Ash
	1.30	14.0	5.4	5	14.0	5.4		100.0	49.8
1.30	1.35	1.8	10.5	5	15.8	6.0		86.0	57.0
1.35	1.40	3.3	12.9	5	19.1	7.2		84.2	58.0
1.40	1.45	4.6	17.7	2½	23.7	9.2		80.9	59.9
1.45	1.50	5.2	22.7	1	28.9	11.6		76.3	62.4
1.50	1.55	0.9	26.0	1	29.8	12.1		71.1	65.3
1.55	1.60	5.8	27.9	1	35.6	14.7		70.2	65.8
1.60	1.80	10.6	34.0	1	46.2	19.1		64.4	69.2
1.80	2.00	5.4	53.6	1	51.6	22.7		53.8	76.2
2.00		48.4	78.7	0	100.0	49.8		48.4	78.7
TOTAL		100.0	49.8						

Sample Identification Denison Bulk 77 - 4 - 5 After Attrition Size fraction 1" x 1/2"  
 Lab. No. (s) 77 - 9089 A Wt % of head sample 6.7

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulfur F.S.I.	Weight	Ash	Sulfur	Weight	Ash	Sulfur
	1.30	18.7	7.0	7	18.7	7.0		100.0	49.0	
1.30	1.35	2.9	9.8	5	21.6	7.4		81.3	58.7	
1.35	1.40	4.3	14.3	3 1/2	25.9	8.5		78.4	60.5	
1.40	1.45	3.8	18.0	1 1/2	29.7	9.7		74.1	63.2	
1.45	1.50	3.7	22.3	1	33.4	11.1		70.3	65.6	
1.50	1.55	1.2	24.4	1	34.6	11.6		66.6	68.0	
1.55	1.60	4.8	30.2	1	39.4	13.9		65.4	68.9	
1.60	1.80	10.0	37.7	1	49.4	18.7		60.6	71.9	
1.80	2.00	7.6	58.2	1	57.0	24.0		50.6	78.7	
2.00		43.0	82.3	0	100.0	49.0		49.0	82.3	
TOTAL		100.0	49.0							



Sample Identification Denison Bulk 77 - 4 - 5 After Attrition Size fraction 1/2" x 1/4"  
 Lab. No. (s) 77 - 9089 A Wt % of head sample 4.3

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulfur F.S.I.	Weight	Ash	Sulfur	Weight	Ash	Sulfur
	1.30	17.0	4.0	7	17.0	4.0		100.0	42.9	
1.30	1.35	10.0	6.7	4	27.0	5.0		83.0	50.9	
1.35	1.40	5.6	12.9	2 1/2	32.6	6.4		73.0	57.0	
1.40	1.45	4.9	18.3	1	37.5	7.9		67.4	60.6	
1.45	1.50	2.9	24.9	1	40.4	9.1		62.5	63.9	
1.50	1.55	2.1	25.5	1	42.5	9.9		59.6	65.8	
1.55	1.60	3.8	31.4	1	46.3	11.7		57.5	67.3	
1.60	1.80	8.1	39.1	1	54.4	15.8		53.7	69.8	
1.80	2.00	34.3	73.4	1	88.7	38.1		45.6	75.3	
2.00		11.3	81.1	0	100.0	42.9		11.3	81.1	
TOTAL		100.0	42.9							



Warnock Hersey Professional Services Ltd.

1423 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel. 264-9128 x 276 - 9138

Sample Identification Denison Bulk 77 - 4 - 5 After Attrition Size fraction 1/2" x 8 M  
 Lab. No. (s) 77 - 9089 A Wt % of head sample 14.7

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	23.2	3.4	8	23.2	3.4		100.0	37.1	
1.30	1.35	13.5	6.4	3 1/2	36.7	4.5		76.8	47.2	
1.35	1.40	5.0	11.7	2 1/2	41.7	5.4		63.3	55.9	
1.40	1.45	4.7	16.6	1	46.4	6.5		58.8	59.7	
1.45	1.50	3.5	23.2	1	49.9	7.7		53.6	63.5	
1.50	1.55	2.3	26.3	1	52.2	8.5		50.1	66.3	
1.55	1.60	2.8	32.1	1	55.0	9.7		47.8	68.2	
1.60	1.80	7.0	40.0	1	62.0	13.1		45.0	70.5	
1.80	2.00	6.5	51.0	1	68.5	16.7		38.0	76.1	
2.00		31.5	81.3	0	100.0	37.1		31.5	81.3	
TOTAL		100.0	37.1							



Warnock Hersey Professional Services Ltd.

1423 D 45th Avenue N.E. Calgary Alberta T2E 2P3 Tel. 264-9128 x 276 - 9138

Sample Identification Denison Adlt 77 - 4 - 5 After Attrition Size fraction 8 M x 28 M  
 Lab. No. (s) 77 - 9089 A Wt % of head sample 42.9

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	50.7	3.3	8 1/2	50.7	3.3		100.0	20.5	
1.30	1.35	10.9	6.6	5 1/2	61.6	3.9		49.3	38.2	
1.35	1.40	4.2	10.4	4	65.8	4.3		38.4	47.2	
1.40	1.45	4.2	15.2	2	70.0	5.0		34.2	51.7	
1.45	1.50	2.6	23.0	1	72.6	5.6		30.0	56.8	
1.50	1.55	1.4	23.6	1	74.0	6.0		27.4	60.0	
1.55	1.60	1.8	31.8	1	75.8	6.6		26.0	62.0	
1.60	1.80	4.6	39.3	1	80.4	8.5		24.2	64.2	
1.80	2.00	4.4	51.7	1	84.8	10.7		19.6	70.1	
2.00		15.2	75.4	0	100.0	20.5		15.2	75.4	
		100.0	20.5							



Warnock Hershey Professional Services Ltd.

1423 D 45th Avenue N.E. Calgary Alberta T2E 2P3 Tel. 264-9128

Sample Identification Denison Adlt 77 - 4 - 5 After Attrition Size fraction 28 M x 100  
 Lab. No. (s) 77 - 9089 A Wt % of head sample 17.9

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	<del>Solids</del>	Weight	Ash	<del>Solids</del>	Weight	Ash	<del>Solids</del>
	1.30	46.9	3.1	9	46.9	3.1	100.0	10.6		
1.30	1.35	22.4	4.0	9	69.3	3.4	53.1	17.2		
1.35	1.40	11.7	6.4	7½	81.0	3.8	30.7	26.8		
1.40	1.45	5.2	11.5	6½	86.2	4.3	19.0	39.4		
1.45	1.50	0.8	18.1	2	87.0	4.4	13.8	50.0		
1.50	1.55	1.4	24.1	1	88.4	4.7	13.0	51.9		
1.55	1.60	0.3	28.9	1	88.7	4.8	11.6	55.3		
1.60	1.80	2.9	32.9	1	91.6	5.7	11.3	56.0		
1.80	2.00	3.1	43.7	1	94.7	7.0	8.4	64.0		
2.00		5.3	75.8	0	100.0	10.6	5.3	75.8		
TOTAL		100.0	10.6							



Warnock Hershey Professional Services Ltd.

1423 D 45th Avenue N.E. Calgary Alberta T2E 2P3 Tel. 264-9128

Sample Identification Denison Adlt 77 - 45 - 5 After Attrition Size fraction 100 M x 0  
 Lab. No. (s) 77 - 9089 A Wt % of head sample 6.9

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	<del>Solids</del>	Weight	Ash	<del>Solids</del>	Weight	Ash	<del>Solids</del>
	Final Froth	85.6	6.8	7½	85.6	6.8	100.0	10.7		
	45 sec.	10.2	22.9	4	95.8	8.5	14.4	34.0		
	90 sec.	2.5	53.2	1	98.3	9.6	4.2	61.0		
	135 sec.	1.0	71.2	0	99.3	10.3	1.7	72.5		
	180 sec.	0.7	74.4	0	100.0	10.7	0.7	74.4		
TOTAL		100.0	10.7							





Warnock Hershey Professional Services Ltd.

1423 D 45th Avenue N.E. Calgary Alberta T2E 2P3 Tel 264-9120 276 - 9138

Sample Identification Denison AdIt 77 - 4 - 5 Before Attrition Size fraction 4 " x 2 "  
 Lab. No. (s) 77 - 9089 B Wt % of head sample 8.1

Specific Gravity		FLOAT AND SINK ANALYSIS %							
Sink	Float	Elementary			Cumulative Float			Cumulative Sink	
		Weight	Ash	Sulphur F. S. I.	Weight	Ash	Sulphur	Weight	Ash
	1.30	13.9	4.0	7	13.9	4.0		100.0	63.9
1.30	1.35	3.2	5.6	6½	17.1	4.3		86.1	73.5
1.35	1.40	3.9	10.2	5	21.0	5.4		82.9	76.1
1.40	1.45	0.1	10.4	1½	21.1	5.4		79.0	79.4
1.45	1.50	2.1	20.0	1	23.2	6.7		78.9	79.5
1.50	1.55	0.6	20.2	1	23.8	7.1		76.8	81.1
1.55	1.60	1.7	27.3	1	25.5	8.4		76.2	81.6
1.60	1.80	1.5	43.2	1	27.0	10.4		74.5	82.8
1.80	2.00	4.8	60.1	1	31.8	17.9		73.0	83.6
2.00		68.2	85.3	0	100.0	63.9		68.2	85.3
	TOTAL	100.0	63.9						

15.



Warnock Hershey Professional Services Ltd.

1423 D 45th Avenue N.E. Calgary Alberta T2E 2P3 Tel 264-9120 276 - 9138

Sample Identification Denison AdIt 77 - 4 - 5 Before Attrition Size fraction 2 " x 1 "  
 Lab. No. (s) 77 - 9089 B Wt % of head sample 8.1

Specific Gravity		FLOAT AND SINK ANALYSIS %							
Sink	Float	Elementary			Cumulative Float			Cumulative Sink	
		Weight	Ash	Sulphur F. S. I.	Weight	Ash	Sulphur	Weight	Ash
	1.30	21.0	4.7	7	21.0	4.7		100.0	44.2
1.30	1.35	3.6	9.2	6½	24.6	5.4		79.0	54.7
1.35	1.40	4.4	12.6	5	29.0	6.5		75.4	56.9
1.40	1.45	4.8	17.1	4	33.8	8.0		71.0	59.6
1.45	1.50	4.7	22.2	2½	38.5	9.7		66.2	62.7
1.50	1.55	1.4	23.0	1½	39.9	10.2		61.5	65.8
1.55	1.60	3.2	29.6	1	43.1	11.6		60.1	66.8
1.60	1.80	8.3	35.6	1	51.4	15.5		58.9	68.9
1.80	2.00	7.5	54.2	1	58.9	20.4		48.6	74.6
2.00		41.1	78.3	0	100.0	44.2		41.1	78.3
	TOTAL	100.0	44.2						



Warnock Hersey Professional Services Ltd.

1423 D 45th Avenue NE Calgary Alberta T2E 2P3 Tel 264-9120 276 - 9138

Sample Identification Denison Adit 77 - 4 - 5 Before Attrition Size fraction 1" x 1/2"  
 Lab. No. (s) 77 9089 B Wt % of head sample 10.9

Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	27.4	4.2	7	27.4	4.2		100.0	37.3	
1.30	1.35	5.2	7.6	5	32.6	4.7		72.6	49.8	
1.35	1.40	6.1	12.2	4	38.7	5.9		67.4	59.0	
1.40	1.45	5.2	17.1	2	43.9	7.2		61.3	57.1	
1.45	1.50	3.6	22.5	1 1/2	47.5	8.4		56.1	60.8	
1.50	1.55	1.6	24.6	1	49.1	8.9		52.5	63.4	
1.55	1.60	4.3	30.6	1	53.4	10.7		50.9	64.7	
1.60	1.80	8.1	37.2	1	61.5	14.2		46.6	67.8	
1.80	2.00	8.8	56.2	1	70.3	19.4		38.5	74.2	
2.00		29.7	79.6	0	100.0	37.3		29.7	79.6	
TOTAL		100.0	37.3							

17.



Warnock Hersey Professional Services Ltd.

1423 D 45th Avenue N.E. Calgary Alberta T2E 2P3 Tel 264-9120 276 - 9138

Sample Identification Denison Adit 77 - 4 - 5 Before Attrition Size fraction 1/2" x 1/4"  
 Lab. No. (s) 77 - 9089 B Wt % of head sample 5.2

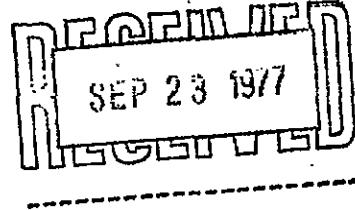
Specific Gravity		FLOAT AND SINK ANALYSIS %								
Sink	Float	Elementary			Cumulative Float			Cumulative Sink		
		Weight	Ash	Sulphur F.S.I.	Weight	Ash	Sulphur	Weight	Ash	Sulphur
	1.30	33.9	4.1	8	33.9	4.1		100.0	33.7	
1.30	1.35	4.5	7.7	3 1/2	38.4	4.5		66.1	48.9	
1.35	1.40	6.9	12.6	3	45.3	5.8		61.6	51.9	
1.40	1.45	4.2	18.1	1 1/2	49.5	6.8		54.7	56.8	
1.45	1.50	3.8	24.1	1 1/2	53.3	8.0		50.5	60.1	
1.50	1.55	1.6	25.6	1 1/2	54.9	8.5		46.7	63.0	
1.55	1.60	4.3	30.8	1	59.2	10.2		45.1	64.3	
1.60	1.80	7.4	40.0	1	66.6	13.5		40.8	67.9	
1.80	2.00	8.2	55.1	1	74.8	18.0		33.4	74.0	
2.00		25.2	80.2	0	100.0	33.7		25.2	80.2	
TOTAL		100.0	33.7							



# BIRTLEY ENGINEERING (CANADA) LTD.

Subsidiary of Great West Steel Industries Ltd.

505 - 50th AVE. S.E. CALGARY, ALBERTA T2G 2B4 PHONE 403 - 253-8273



A REPORT TO DENISON COAL LTD.  
ON THE RESULTS OF WASHABILITY TESTS  
AND PILOT PLANT WASHING OF BULK SAMPLES  
FROM ADITS 76-4-1, LOT 1: 77-1-1: 77-2-2:  
AND 76-4-1, 2ND RESAMPLE  
OF THE SAXON PROJECT.  
CS-0108.....PART 1

August, 1977

Submitted by:

Frank J. Horvat  
Manager

BIRTLEY ENGINEERING (CANADA) LTD.  
Coal Science & Minerals Testing

# TABLE OF CONTENTS

## INTRODUCTION

Pages 1 - 8

## RESULTS

### ADIT 76-4-1 (Lot 1)

WASHABILITY AND PILOT PLANT WASHING

9 - 23

### ADIT 77-1-1

WASHABILITY AND LIBERATION TESTS

24 - 38

PILOT PLANT WASHING

39 - 47

### ADIT 77-2-2 (Lots A to E)

PRELIMINARY ANALYSIS

48 - 57

WASHABILITY

58 - 68

PILOT PLANT WASHING

69 - 77

### ADIT 76-4-1 (2ND RESAMPLE)

WASHABILITY AND PILOT PLANT WASHING

78 - 91



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A REPORT TO DENISON COAL LTD. ON THE RESULTS OF WASHABILITY TESTS  
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77-1-1: 77-2-2: AND 76-4-1, 2ND RESAMPLE OF THE SAXON PROJECT.

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August, 1977

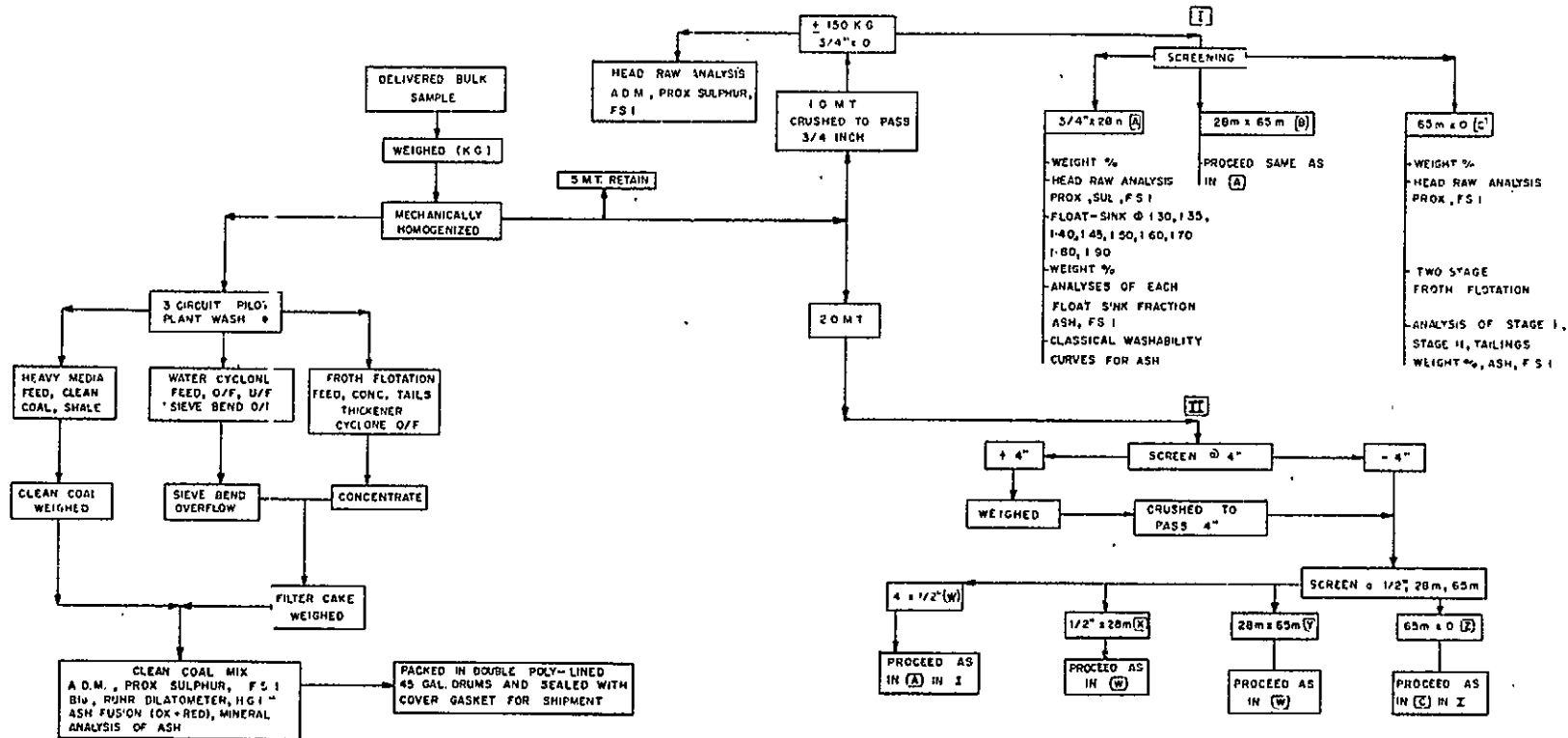
## INTRODUCTION

The 1977 test program followed similar procedures to those outlined for the 1976 Saxon program in our Report No. CS-0099, of December, 1976.

Some additional washability work was requested and these results are tabulated in this report.

The raw and clean coal sample preparation procedures as used in last year's program were strictly followed for this 1977 project.

The pilot plant washing was conducted in exactly the same manner as in the previous year, with a quite rigid requirement for a 7.5% ash clean coal product.



\* ALL PLANT SAMPLES ANALYSED FOR ASH AND F S I

\*\* HARDGROVE GRINDABILITY INDEX

<b>BIRTLEY BIRTLEY ENGINEERING (CANADA) LTD.</b>	
WORK FLOWSHEET FOR DENISON MINES - LTD (MAY 1976)	Date: 18 May 76
	Drawn: Y. Barber

COAL SCIENCE & MINERALS TESTING DIVISION

SPECIAL PROCEDURES FOR HANDLING OF BULK SAMPLES

HEAD RAW PREPARATION

The order of preference for delivery bulk samples is: 1) bulk truck loads. 2) poly-lined jute bags or re-enforced plastic bags. 3) barrels. The coal is dumped onto a steel mixing plate (32' x 60') and subjected to a preliminary mixing by means of a small front end loader and placed in a conical heap in the centre of the plate. (The bucket capacity is about 1 1/2 drums of coal).

Four (4) sampling points (quadrants) are selected along the perimeter of this central pile identified for clarity as Sites #1, #2, #3, #4, (see attached sketch) from which is withdrawn successive bucket loads of coal and placed in "quarter" conical piles relative to the sampling sites. However, to minimize the possibility of bias, on the second sampling pass, coal withdrawn from Site #1 is placed in pile #2, coal withdrawn from Site #2 is placed in pile #3 and so on until the central pile has been transferred into the 4 quartered piles.

Now the coal from the quartered piles is returned to the central location by taking bucket loads successively from piles A, B, C and D to reform the central conical heap. Four (4) sampling sites are relocated and the whole procedure is repeated three (3) more times after which a head raw sample is extracted, by taking small increments from each of the "quartered" piles of such quantity that four (4) increments will fill two (2) - 45 gallon drums using a portable loading hopper. This hopper is designed in such a way that two (2) barrels are filled simultaneously by means of a split chute. The quantity of sample extracted is dependent on the top size of the coal and must conform to ASTM specifications for sampling of coal.

### CLEAN COAL PREPARATION (Clean Mix)

After a preliminary moisture reduction of the heavy media clean coal and the fines filter cake to the desired levels, the products are homogenized as follows:-

The heavy media clean coal is spread in a thin layer on the meticulously clean mixing plate. The filter cake is "seeded" over the surface of the coarse coal by means of the front end loader. This total mass is subjected to a preliminary mixing routine and a central conical heap formed.

From this point on the procedures outlined for homogenizing the raw coal are strictly followed.

From the final four (4) quarters, double poly lined barrels are filled by exactly the same procedure as outlined for the raw coal sample extraction. The coal is tamped into the barrels so that each barrel contains about 180 kg including moisture.

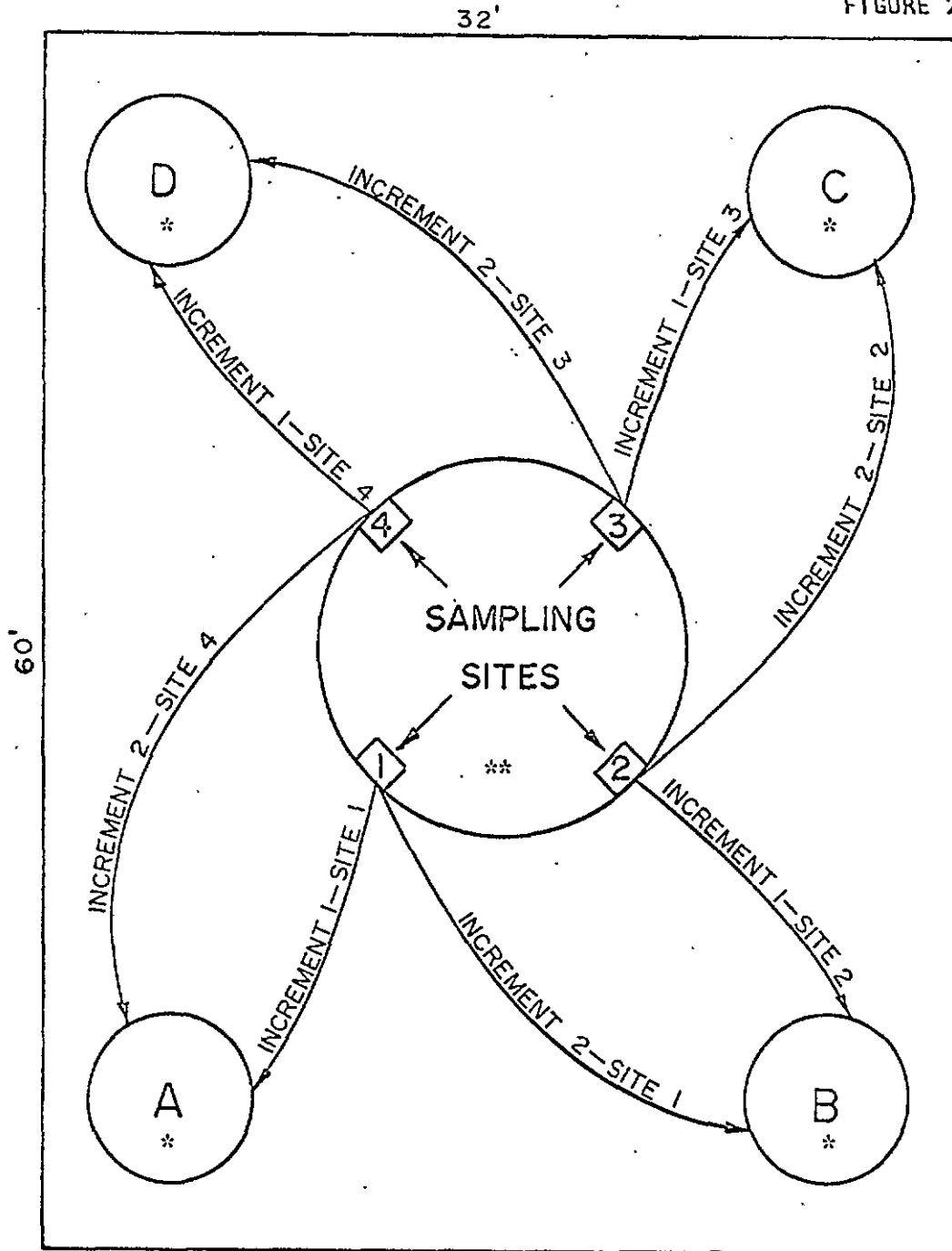
During the barrel filling procedure, a minimum of 60 increments are taken from the bucket load quantities with a small square mouth shovel. Each increment is of such quantity that a minimum of 100 kg of coal are retained for analytical purposes.

Finally the plastic liners are tied off and an identifying tag affixed inside the drum. The lid, with a gasket, is firmly attached to seal the barrel and the barrel is stencilled as to contents and destination.



SCHEMATIC OF RAW AND CLEAN COAL HOMOGENIZATION

FIGURE 2

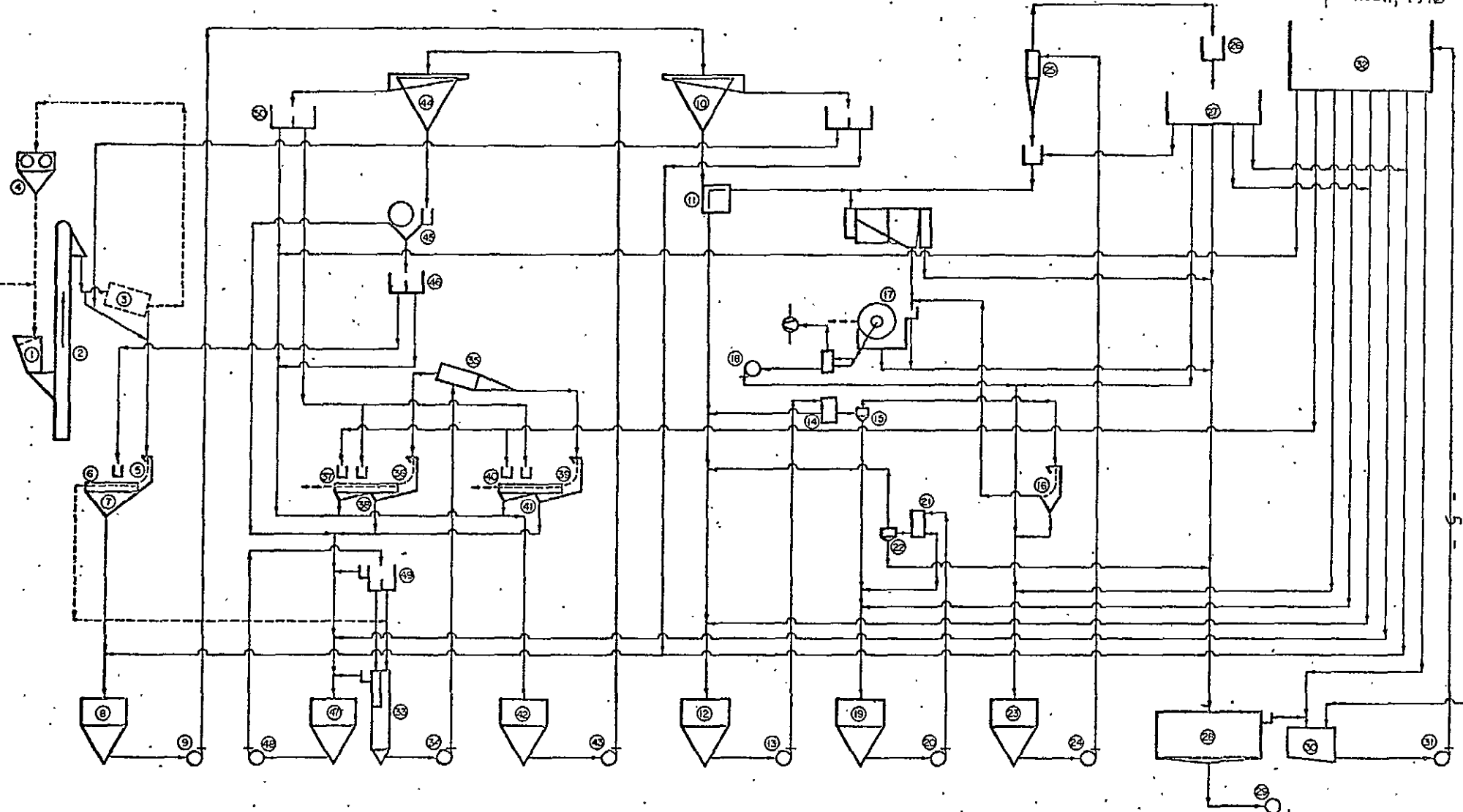


\* "Quarter" Piles

\*\* Central Pile

Continue moving increments until all of the central pile is transferred to the "Quarter" piles A, B, C, and D, i.e. increment 3, site 1 to C, increment 3, site 2 to D, increment 3, site 3 to A, increment 3, site 4 to B etc.

MARCH, 1916



- |                                  |  |  |                                   |                                  |                       |
|----------------------------------|--|--|-----------------------------------|----------------------------------|-----------------------|
| ① Feed Bin                       | ⑩ Settling Cone                        | ⑲ Secondary Water Only Cyclone Feed Tank | ⑳ Head Box                        | ⑳ DSM Cyclone                    | ⑳ Pump                |
| ② Elevator                       | ⑪ Diverter                             | ㉑ Pump                                   | ㉒ Thickener                       | ㉒ Sieve Band                     | ㉒ Settling Cone       |
| ③ Rotary Screen                  | ⑫ Primary Water Only Cyclone Feed Tank | ㉓ Distributor                            | ㉓ Waste Disposal Pump             | ㉓ C.C. Drain and Rinse Screen    | ㉓ Magnetic Separator  |
| ④ Jaw Crusher                    | ⑬ Pump                                 | ㉔ Secondary Water Only Cyclone           | ㉔ Clarified Water Collection Tank | ㉔ Underflow Collector            | ㉔ Splitter Box        |
| ⑤ Sieve Band                     | ⑭ Distributor                          | ㉕ Thickening Cyclone Feed Tank           | ㉕ Clarified Water Pump            | ㉕ Sieve Band                     | ㉕ Correct Medium Tank |
| ⑥ Desliming Screen               | ⑮ Primary Water Only Cyclone           | ㉖ Pump                                   | ㉖ Clarified Water Head Box        | ㉖ Discard Drain and Rinse Screen | ㉖ Pump                |
| ⑦ Underflow Collector            | ⑯ Sieve Band                           | ㉗ Thickening Cyclone                     | ㉗ Cyclone Feed Tank               | ㉗ Underflow Collector            | ㉗ Distribution Box    |
| ⑧ 26M-O Raw Coal Collection Tank | ⑰ Vacuum Filter                        | ㉘ Overflow Distributor                   | ㉘ Pump                            | ㉘ Dilute Medium Tank             | ㉘ Splitter Box        |
| ⑨ Pump                           | ⑱ Filtrate Water Pump                  |  |                                   |                                  |                       |

TEST PLANT FLOWSHEET

FIGURE 3

## PILOT PLANT WASHING

Figure 1 is the flowsheet of the Coal Science & Minerals Testing pilot plant. Raw coal is dumped by a front end loader into a hopper at ground level, which has a heavy 2" square screen installed to ensure that the bucket elevator receiving the feed does not handle oversize material. The 2" oversize coal is crushed manually to pass the 2" screen, but "rock" is collected in barrels and reported as shale of the heavy media circuit. The bucket elevator discharges the minus 2" feed at a rate of 5 to 7 metric tons per hour into a rotary 3/4" screen of the third deck. The 3/4" oversize falls via a chute into a 5" x 8" jaw crusher where it is crushed to minus 3/4" and is recycled through the feed system. The 3/4" x 0 screen underflow is washed with water onto a 28 mesh sieve bend and slot screen for desliming.

The 3/4" x 28 mesh coal is the feed to the 14" DSM Heavy Media cone on the second deck. The slurry of coal and correct medium is pumped to the cyclone from the mixing tube at a pressure of 9 to 10 psi. The overflow and underflow products are discharged onto a common, but split 28 mesh slot screen preceded by a 28 mesh sieve bend where the magnetite is washed off into the correct and dilute medium tanks directly below. Additional clean spray water and baffles across the clean coal stream ensure that a minimum of magnetite is retained on the clean coal product. The clean coal and shale are collected in barrels by means of individual chutes for weighing.

The dilute medium is pumped to a thickening cone on the third deck from where it is fed to a 30" magnetic separator. The recovered magnetite is sluiced back to the correct medium tank. The specific gravity of the medium is monitored manually, using a density meter, and adjusted for loss by adding cyclone grade magnetite directly to the correct medium tank.

The 28 mesh x 0 coal collected in the slimes tank ground level, is pumped to the thickening cone on the third deck. From this point it can be fed directly to the froth circuit, or as is usual, to the two-stage water-only cyclone system.

Coal to the 6" DSM water-only primary cyclone is pumped at a pulp density of 10% to 20% from the cyclone feed tank at a pressure of 20 psi, and a flow rate of 85 Imperial gallons per minute. A mechanically adjustable vortex finder facilitates settings for a desired ash content. The primary cyclone underflow with make-up water is fed to a similarly adjustable secondary 4" unit. The overflow is directed back to the primary cyclone feed tank with the underflow being the waste product.

The waste product is routed to the static thickener while the primary underflow is fed by gravity to a rapped 0.25 mm sieve bend. The sieve bend is the water-only cyclone product at approximately 65 mesh oversize, and directed to the Eimco disc filter for dewatering.

The sieve bend underflow passes by gravity to the thickening cyclone feed tank, from where it is pumped to the 20" - 8" cyclone. This thickening cone serves a dual purpose: 1) it removes undesirable -325 mesh slimes from the flotation feed, 2) it provides a feed of proper density (15% - 25% solids) to the froth cells. The overflow with the -325 mesh slimes flows to the static thickener.

The flotation circuit consists of two (2) Birtley-Humboldt Multi-Wobble Cells in series. Since these cells were installed on September 12th, 1976, there appears to be a marked improvement in tailings ash contents, indicating excellent recovery of froth product. A rotary reagent feeder introduces 4:1 Kerosene:Methylisobutylcarbinol into the circuit at the feed entry point for better conditioning.

The tailings join the water-only cyclone underflow and thickener cone overflow to form the thickener tails. The froth enters the Eimco disc filter and is dewatered along with the sieve bend overflow to form the filter cake or fines product. This and the heavy media clean coal are combined to form the clean coal product or clean mix.

Each circuit is sampled for feed, product and waste in addition to the 0.25 mm sieve bend overflow and underflow, filter cake, thickening cyclone overflow and underflow and analysed for ash content. The primary water-only cyclone overflow product is screened at 65 mesh as the plus 65 mesh figure is used to calculate the yield of the water-only cyclone circuit.

The heavy media clean coal is "drained" of extraneous moisture before being combined and homogenized with the partially dried filter cake. This partial drying is accomplished by spreading the fines product on a pad, heated electrically at 20°C, and reducing the moisture content from 22 - 28% to less than 12%.

ADIT 76-4-1, LOT 1 (MAY, 1977)

LAB. NOS. 8999/9000

WASHABILITY AND PILOT PLANT WASHING RESULTS

CLIENT: DENISON COAL LTD.

SAMPLE: ADIT NO. 76-4-1 Lot No. 1 Bulk Sample

LAB. NO.: 9000

May/77

SIZE AND RAW ANALYSES									
SIZE FRACTION	WT. %	ASH %	R.M.%	V.M.%	F.C.%	S.%	F.S.I.	CUMULATIVE	
								WT.%	ASH %
3/4" x 28M	76.5	19.0	0.4	18.3	62.3	0.47	3 1/2	76.5	19.0
28M x 65M	12.7	15.7	0.5	18.6	65.2	0.47	5 1/2	89.2	18.5
65M x 0	10.8	16.1	0.6	18.9	64.4	0.46	5 1/2	100.0	18.3
HEAD RAW	100.0	18.3	0.4	18.4	62.9	0.47	4	ad1% = 6.0	

WT% + 3/4" (as rec'd) = 35.4% - all crushed to pass 3/4"

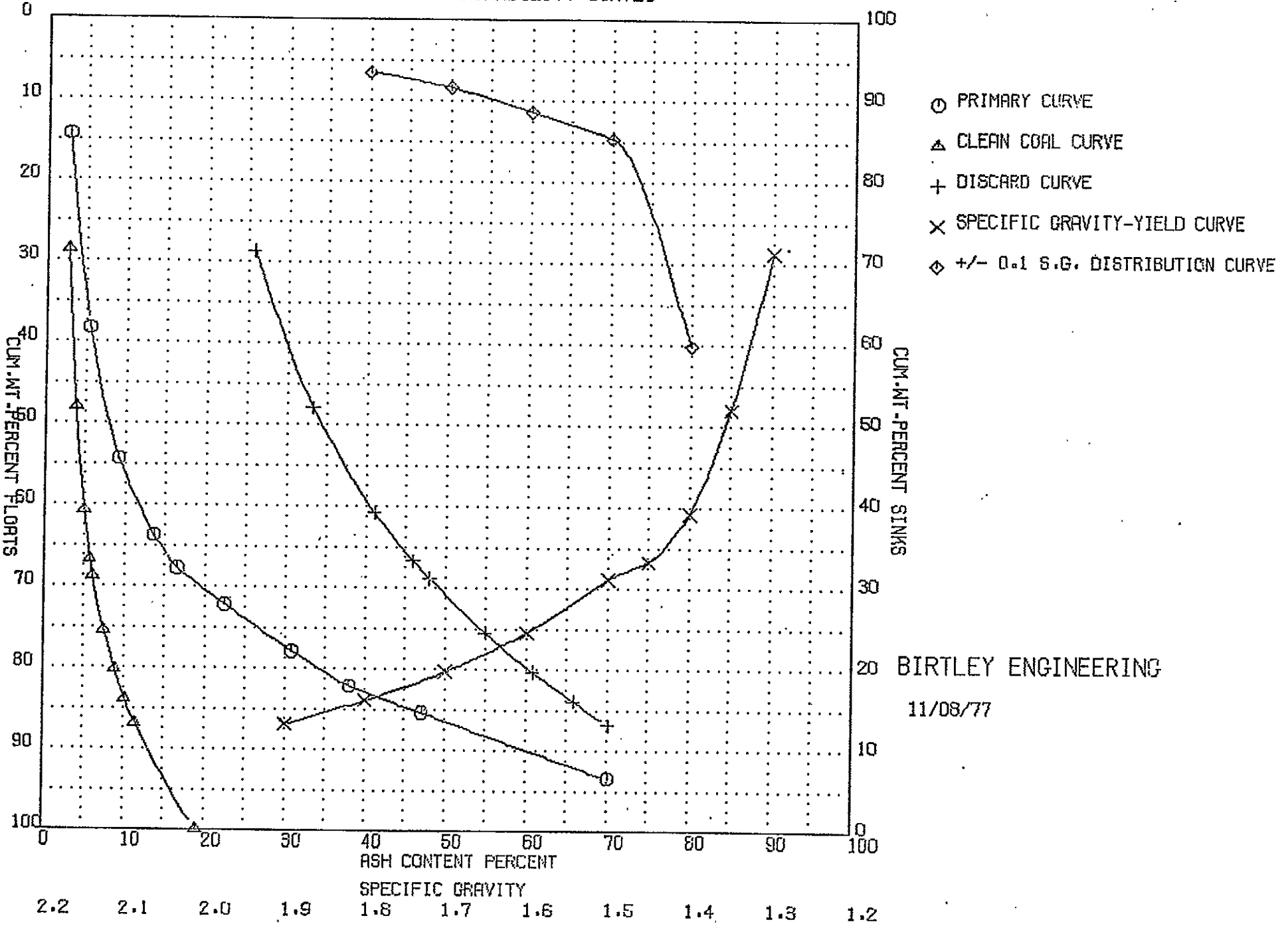
FROTH FLOTATION TEST							
SIZE PRODUCT	.65M x 0			PARAMETERS			
	WT. %	ASH %	F.S.I.	CUMULATIVE		Pulp Density = 10% Dosage = 0.48#/Ton Reagent = 4:1 - K:MIBC Conditioning Time - 1 Minute Stage I & II = 1st & 2nd Min. Froth Conc. @ 1st & 2nd Min.	
			WT. %	ASH %			
STAGE I	81.4	10.9	7	81.4	10.9		
STAGE II	9.9	20.9	3 1/2	91.3	12.0		
TAILS	8.7	54.5	1/2	100.0	15.7		

CLIENT: DENISON COAL LTD.  
 SAMPLE: ADIT NO. 76-4-1 Lot No. 1 Bulk Sample  
 LAB. NO.: 9000 May/77

SINK-FLOAT ANALYSES						
S. G. FRACTION	3/4" x 28M					
	WT. %	ASH %	F.S.I.	CUMULATIVE		
				WT. %	ASH %	F.S.I.
- 1.30	28.7	2.7	9	28.7	2.7	9
1.30 - 1.35	19.3	5.4	4	48.0	3.8	7 1/2
1.35 - 1.40	12.8	9.1	2	60.8	4.9	6 1/2
1.40 - 1.45	5.9	13.6	2	66.7	5.7	6
1.45 - 1.50	2.2	16.5	2	68.9	6.0	6
1.50 - 1.60	6.6	22.4	1 1/2	75.5	7.5	5
1.60 - 1.70	4.8	30.8	1/2	80.3	8.8	5
1.70 - 1.80	3.6	38.0	1/2	83.9	10.1	4 1/2
1.80 - 1.90	3.0	47.1	1/2	86.9	11.4	4 1/2
+ 1.90	13.1	70.1	1/2	100.0	19.1	4

SINK-FLOAT ANALYSES						
S. G. FRACTION	28M x 65M					
	WT. %	ASH %	F.S.I.	CUMULATIVE		
				WT. %	ASH %	F.S.I.
- 1.30	27.9	2.0	9	27.9	2.0	9
1.30 - 1.35	24.0	3.7	8	51.9	2.8	9
1.35 - 1.40	12.7	7.8	2	64.6	3.8	8 1/2
1.40 - 1.45	6.4	12.9	1 1/2	71.0	4.6	8
1.45 - 1.50	4.2	18.1	1 1/2	75.2	5.3	7
1.50 - 1.60	6.4	25.6	1 1/2	81.6	6.9	7
1.60 - 1.70	5.0	34.9	1	86.6	8.6	6 1/2
1.70 - 1.80	3.3	43.7	1/2	89.9	9.8	6 1/2
1.80 - 1.90	2.5	51.0	1/2	92.4	11.0	6
+ 1.90	7.6	70.6	1/2	100.0	15.5	5 1/2





BIRTLEY ENGINEERING  
 11/08/77

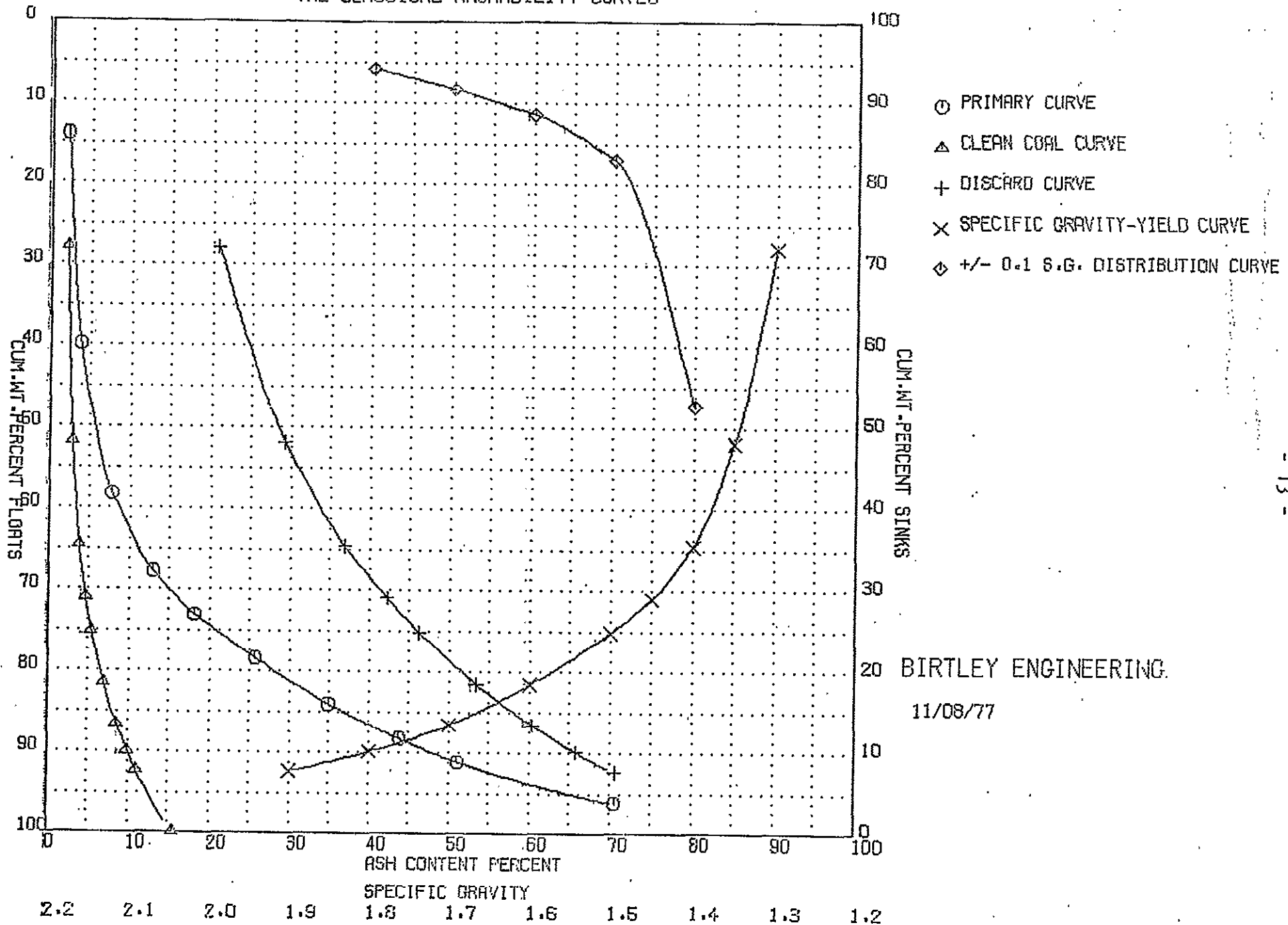
---DTYPE---      ---QTY SQUARE---      ---QTY STKS---      11 11 12

WT	ASHS	ASH	TR	ASHIT	WT	ASHS	ASHS	WT	ASHS	WT	ASHS	WT	ASHS	WT
1	2	2	4	5	6	7	8	9	10	11	12			
1.30	29.70	2.70	.77	.77	28.70	2.70	10.29	21.30	25.66	1.30	0.00			
1.35	10.30	5.40	1.14	1.02	4.00	3.70	17.26	22.50	23.18	1.40	60.20			
1.60	12.80	0.10	1.15	2.98	60.80	4.00	16.00	20.50	41.04	1.50	14.70			
1.45	5.90	13.60	.00	2.74	66.70	5.87	14.28	22.50	25.00	1.60	11.40			
1.50	2.20	16.50	.06	4.15	60.90	6.02	14.92	21.50	47.08	1.70	8.40			
1.60	4.60	22.40	1.18	5.63	75.50	7.45	13.44	24.50	54.07	1.00	6.60			
1.70	4.80	30.00	1.28	7.10	80.30	8.25	11.96	19.50	64.73	1.00	6.00			
1.80	2.60	32.00	1.07	8.47	83.30	10.10	10.60	16.10	65.01	2.00	0.00			
1.90	2.00	47.10	1.41	9.29	85.90	11.38	0.18	23.50	70.10	2.10	0.00			
0.90	12.10	70.10	0.18	19.07	100.00	10.07	0.00	.00	0.00	2.20	0.00			

RTREPLY ENRINPFRING  
11/00/77

PASS 1 10124  
 PASS 2 10 22  
 PASS 3 9 08  
 PASS 4 9100  
 PASS 5 5 00

DENISION COAL LTD ADIT NO 76-4-1 LOT NO 1 LAB NO 9000 28M X 65M  
 THE CLASSICAL WASHABILITY CURVES



BIRTLEY ENGINEERING.  
 11/08/77

--DIRECT--

--CUM FLOATS--

--CUM SINKS-- +0.1 DISTO

S.G.	WT, CUM WT					STAK WT					S.G.	WT
	WT	ASH	ASH TT	ASHTT	WT	ASH	ASH	WT	ASH			
1	2	3	4	5	6	7	8	9	10	11	12	
1.30	27.90	2.00	.56	.56	27.90	2.00	14.93	22.10	20.71	1.30	0.00	
1.35	24.00	3.70	.59	1.45	51.90	2.70	14.04	28.70	29.19	1.40	47.30	
1.40	12.70	7.20	.59	2.44	64.60	3.77	13.05	55.70	36.87	1.50	17.00	
1.45	6.40	12.00	.58	3.26	71.00	4.57	12.23	59.70	42.16	1.60	11.40	
1.50	4.20	18.10	.56	4.02	75.20	5.25	11.47	54.90	46.23	1.70	8.30	
1.60	6.40	25.60	1.44	5.66	81.60	6.04	9.83	78.70	53.41	1.80	5.80	
1.70	5.00	34.90	1.75	7.41	86.60	8.55	8.08	83.20	60.32	1.90	0.00	
1.80	3.30	43.70	1.44	8.85	89.90	9.84	6.64	10.70	66.75	2.00	0.00	
1.90	2.50	51.00	1.78	10.12	92.40	10.96	5.37	7.60	70.60	2.10	0.00	
0.99	7.60	70.60	5.57	15.49	100.00	15.49	0.00	0.00	0.00	2.20	0.00	

RITLEY ENGINEERING  
11/08/77

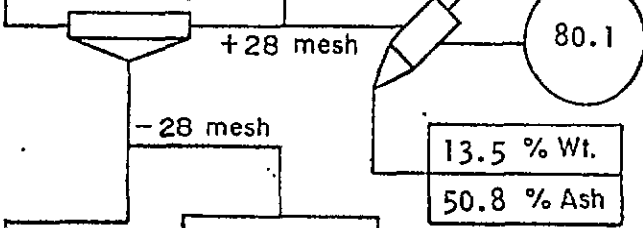
.4	17.7	.4	14.4	4.1	14.4	2.0	14.4	4.0	10.5
.7	12.0	.6	9.6	5.0	9.6	3.0	9.6	6.0	16.6
1.4	8.4	.8	7.1	7.4	7.1	4.0	7.1	9.0	17.7
2.6	6.4	.8	5.8	8.4	5.8	5.0	5.8	10.0	18.3
3.6	5.4	1.1	5.0	9.2	5.0	6.0	5.0	12.0	18.8
5.1	4.3	1.4	3.7	10.7	3.7	8.0	3.7	0.0	0.0
7.0	3.2	1.7	2.7	12.1	2.7	10.0	2.7	0.0	0.0
8.7	2.4	2.0	2.0	13.1	2.0	12.0	2.0	0.0	0.0
10.2	1.0	2.2	1.5	14.1	1.5	14.0	1.5	0.0	0.0
14.1	.0	2.1	0.0	0.0	0.0	175.8	0.0	0.0	0.0
PASS	1	10137							
PASS	2	10 26							
PASS	3	9 99							
PASS	4	9129							
PASS	5	5 00							

-3/4" x 0 Raw Coal

100 % Wt.  
18.4% Ash

67.8% Wt.  
15.8% Ash

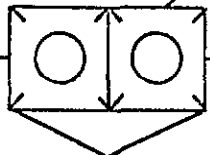
54.3 % Wt.  
7.1 % Ash



32.2 % Wt.  
21.7 % Ash

32.2 % Wt.  
21.7 % Ash

66.7



10.7 % Wt.  
48.1 % Ash

21.5% Wt.  
8.5% Ash

OVERALL YIELD = 75.8% @ 7.5% ash (calculated)

LEGEND:

○ CIRCUIT YIELD %

Wt. WEIGHT %

Ash ASH CONTENT (AIR DRIED)



**BIRTLEY ENGINEERING (CANADA) LTD.**

Title

PLANT BALANCE SHEET  
DENISON COAL LTD.  
ADIT 76-4-1, Lot 1 - Bulk Sample

Date

May 4, 1977

Drawn

BIRTLEY ENGINEERING (CANADA) LTD.

Coal Science & Minerals Testing Div.

DENISON COAL LTD.

BULK WASHING DATA\*

ADIT 76-4-1, Lot 1 XXXX LAB. NO. 8999  
DELIVERY DATE April 28, 1977 DATE OF WASH May 4, 1977  
Raw Coal Analysis: ADM 6.0% ASH% 18.3 FSI 4  
Delivered Bulk Weight 1.120 Metric Tons  
Washed Weight 0.900 Metric Tons

\* All weight and analyses are on Air Dried Basis unless otherwise indicated.

DENISON COAL LTD.

BULK WASHING DATA

HEAVY MEDIUM CIRCUIT

ADIT/~~SEAM~~ NO. 76-4-1, Lot 1 LAB. NO. 8999

1. S. G. of Separation 1.53
2. Feed Ash Content 15.8 % F.S.I. 4
3. Clean Coal Estimated Weight 0.456 M.T.
4. Clean Coal Analysis - Ash 7.1 % F.S.I. 7
5. Reject Estimated Weight 0.154 M.T.
6. Reject Analysis - Ash 50.8 % F.S.I. 1
7. Estimated 3/4" x 28M in Circuit 0.610 M.T. 67.8 Wt. %
8. Yield Clean Coal (Weighted):  $\frac{3}{3+5}$  74.8 %
9. Yield Clean Coal  
(Calculated Ash Balance) -  $\frac{6-2}{6-4}$  80.1 %

DENISON COAL LTD.

BULK WASHING DATA

FROTH FLOTATION CIRCUIT

ADIT/~~XXXX~~NO. 76-4-1, Lot 1 LAB. NO. 8999

1. Reagents: Kerosene:Methylisobutylcarbinol (MIBC) =4:1
2. Feed Pulp Density 100 - 140 g/l 10 - 14 % Solids W/V
3. Sample Analysis:-

	ASH	F.S.I.
FEED	21.7	5
CONC.	8.5	7 1/2
TAILS	48.1	2

4. Impeller Type - Birtley-Humboldt Multi-Wobble.
5. Yield Calculated (Ash Balance) 66.7 %
6. Filter Cake (Sieve Bend 0'Flow & Flotation . Conc.)  
Wt. Recovered 0.119 M.T.
7. Filter Cake - Ash% 8.5 F.S.I. 7 1/2



DENISON COAL LTD.

BULK WASHING DATA

ADIT/~~XXXX~~ 76-4-1, Lot 1 LAB. NO. 8999 DATE OF WASH May 4, 1977

a) Raw Coal

Delivered Weight	=	<u>1.120</u>	M.T.
Ash %	=	<u>18.3</u>	
F.S.I.	=	<u>4</u>	
Estimated Washed Wt.	=	<u>0.900</u>	M.T.

b) Heavy Media Circuit

Estimated Proportion of +28 Mesh in Feed	<u>67.8</u>		
Effective S.G. =	<u>1.53</u>		
Raw Feed	<u>15.8</u>	% Ash	<u>4</u> F.S.I.
Clean Coal	<u>7.1</u>	% Ash	<u>7</u> F.S.I.
Reject	<u>50.8</u>	% Ash	<u>1</u> F.S.I.
Calculated Yield	<u>80.1</u>		
Weighed Yield	<u>74.8</u>		

~~c) Water-Only Cyclone Circuit~~

<del>Raw Feed</del>	<del>_____</del>	<del>% Ash</del>	<del>_____</del>	<del>F.S.I.</del>
<del>Overflow</del>	<del>_____</del>	<del>% Ash</del>	<del>_____</del>	<del>F.S.I.</del>
<del>Underflow</del>	<del>_____</del>	<del>% Ash</del>	<del>_____</del>	<del>F.S.I.</del>
<del>Calculated Yield</del>	<del>_____</del>			
<del>% of +65M in O/F</del>	<del>_____</del>			
<del>Steve Bend Overflow</del>	<del>_____</del>	<del>% Ash</del>	<del>_____</del>	<del>F.S.I.</del>

d) Froth Flotation Circuit

Raw Feed	<u>21.7</u>	% Ash	<u>5</u>	F.S.I.
Concentrates	<u>8.5</u>	% Ash	<u>7 1/2</u>	F.S.I.
Tails	<u>48.1</u>	% Ash	<u>2</u>	F.S.I.
Calculated Yield	<u>66.7</u>			

BULK WASHING DATA

BULK WASHING SUMMARY (cont.)

ADIT/~~SEAM~~ NO. 76-4-1, Lot 1 LAB. NO. 8999

e) Clean Coal Mix Analyses

i) Proximate

ADM% 6.1 RM% 0.5 ASH% 7.7 VM% 19.7 FC% 72.1 S% 0.45 F.S.I. 7  
 BTU/LB. 14,415 H.G.I. 101

ii) Dilatometer

Softening °C 398 Max. Dil. °C 482 Max. Cont. % 23  
 Max. Dil. % 2 G. No. = 0.925

f) Clean Coal Mix Make-Up

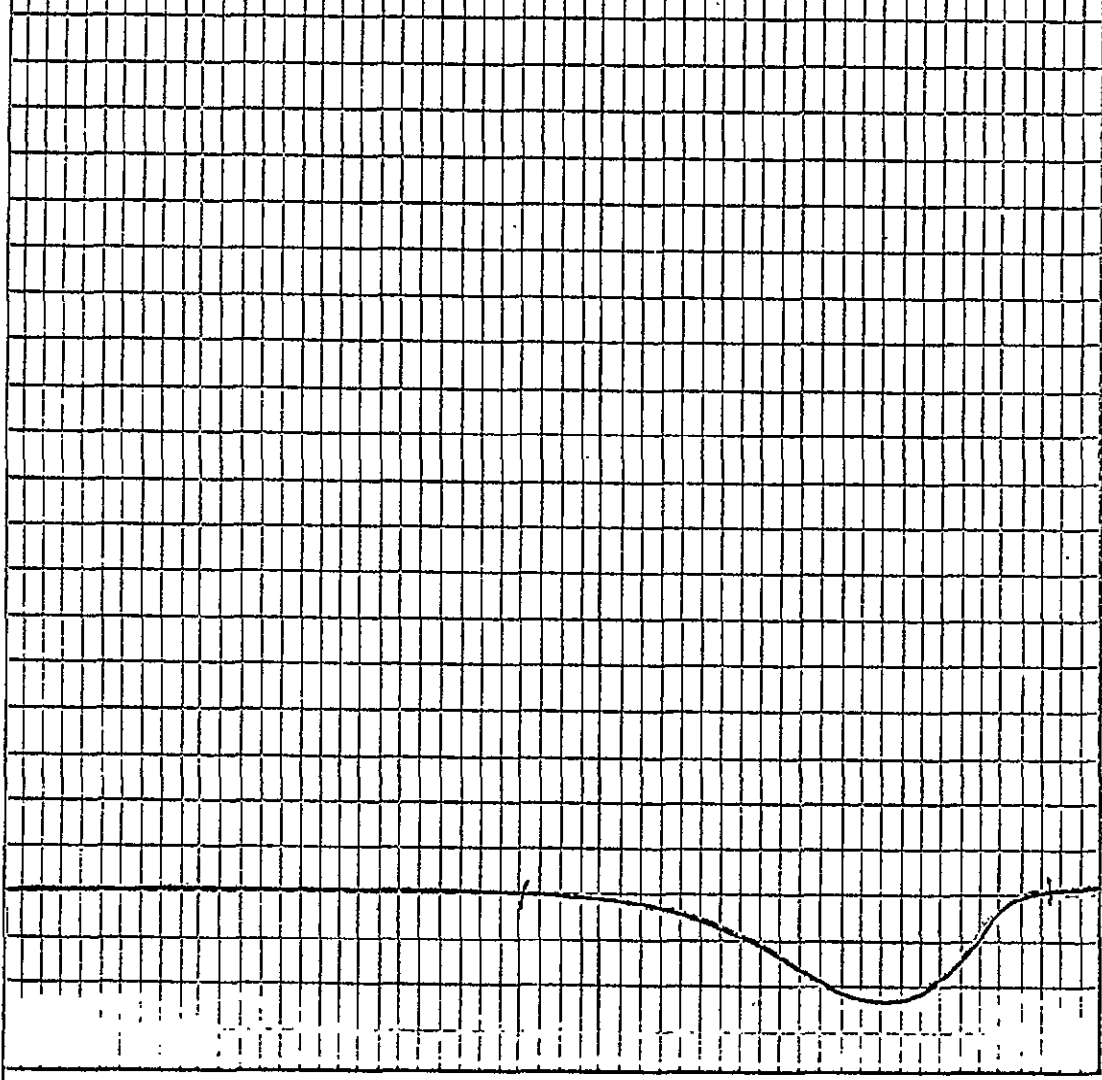
H. M. CLEAN COAL	FINES FILTER CAKE	CLEAN COAL MIX		SHIPPED		IN STOCK	
M.T.	M.T.	BBLS.	M.T.	BBLS.	M.T.	BBLS.	M.T.
0.456	0.119	4	0.575				

g) Ash Fusion Temperatures (°F)

ATMOSPHERE	INITIAL DEFORMATION	SOFTENING	HEMISPHERICAL	FLUID
OXIDIZING	2380	2440	2480	2510
REDUCING	2270	2330	2360	2460

Lab. No. 8999 Date May 11, 1977  
 Client: Denison Coal Limited  
 Sample Identification: 76-4-1 Clean Coal.  
 Starting Temperature °C: 320  
 Softening Temperature °C: 398  
 Max. Dilatation Temp. °C: 482  
 Contraction %: 23  
 Dilatation %: 2  
 Final Temperature °C: \_\_\_\_\_  
 G. Factor: 0.925

%  
300  
250  
200  
150  
100  
50  
0



**BIRTLEY ENGINEERING (CANADA) LTD.**

Title  
**RUHR DILATOMETER TEST**

Date  
\_\_\_\_\_  
 Drawn  
\_\_\_\_\_

CLIENT: DENISON COAL LTD.  
SAMPLE: ADIT 76-4-1  
LAB. NO.: 8999

GIESLER FLUIDITY TESTS

<u>DDPM</u>		<u>TEMPERATURE (°C)</u>
1.0		423
5.9	Maximum	444
1.0		468
	Range	45

CLIENT: DENISON COAL LTD.  
 SAMPLE: ADIT 76-4-1 Lot 1 Bulk Sample  
 LAB. NO.: See Below

May/77

ANALYSIS OF CLEAN COAL

LAB. NO.	MOISTURE	ASH	VOL.	F.C.	S.	F.S.I.	CALC. FACTORS
BARREL NO. 1	0.5	7.7	19.7	72.1	0.45	7	Air Dried Basis
		7.7	19.8	72.5			Dried Basis
BARREL NO. 2	0.5	7.7	19.7	72.1	0.44	6 1/2	a.d.b.
		7.7	19.8	72.5			d.b.
BARREL NO. 3	0.4	7.8	19.7	72.1	0.44	7	a.d.b.
		7.8	19.8	72.4			d.b.
BARREL NO. 4	0.4	7.8	19.7	72.1	0.45	6 1/2	a.d.b.
		7.8	19.8	72.4			d.b.

Lab. NO. Tag. No.	% A.D.L.	R.M.% % Tot. Moist.	% Ash	% VM	% F.C.	% Sul.	FSI	B.T.U. per lb	Calc. Factor
COMP. OF 4 BARRELS	6.1	0.5	7.7	19.7	72.1	0.45	7	14,415	a.d.b.*
		6.6	7.2	18.5	67.7	0.42		13,535	a.r.b.**
			7.7	19.8	72.5	0.45		14,490	d.b.***

- \* Air Dried Basis
- \*\* As Received Basis
- \*\*\* Dry Basis

ADIT 77-1-1

LAB. NOS. 9042/9042X/9042Y

WASHABILITY AND LIBERATION TESTS

CLIENT: DENISON COAL LTD.  
 SAMPLE: BULK SAMPLE: ADIT 77-1-1  
 LAB. NO.: 9042

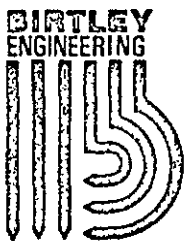
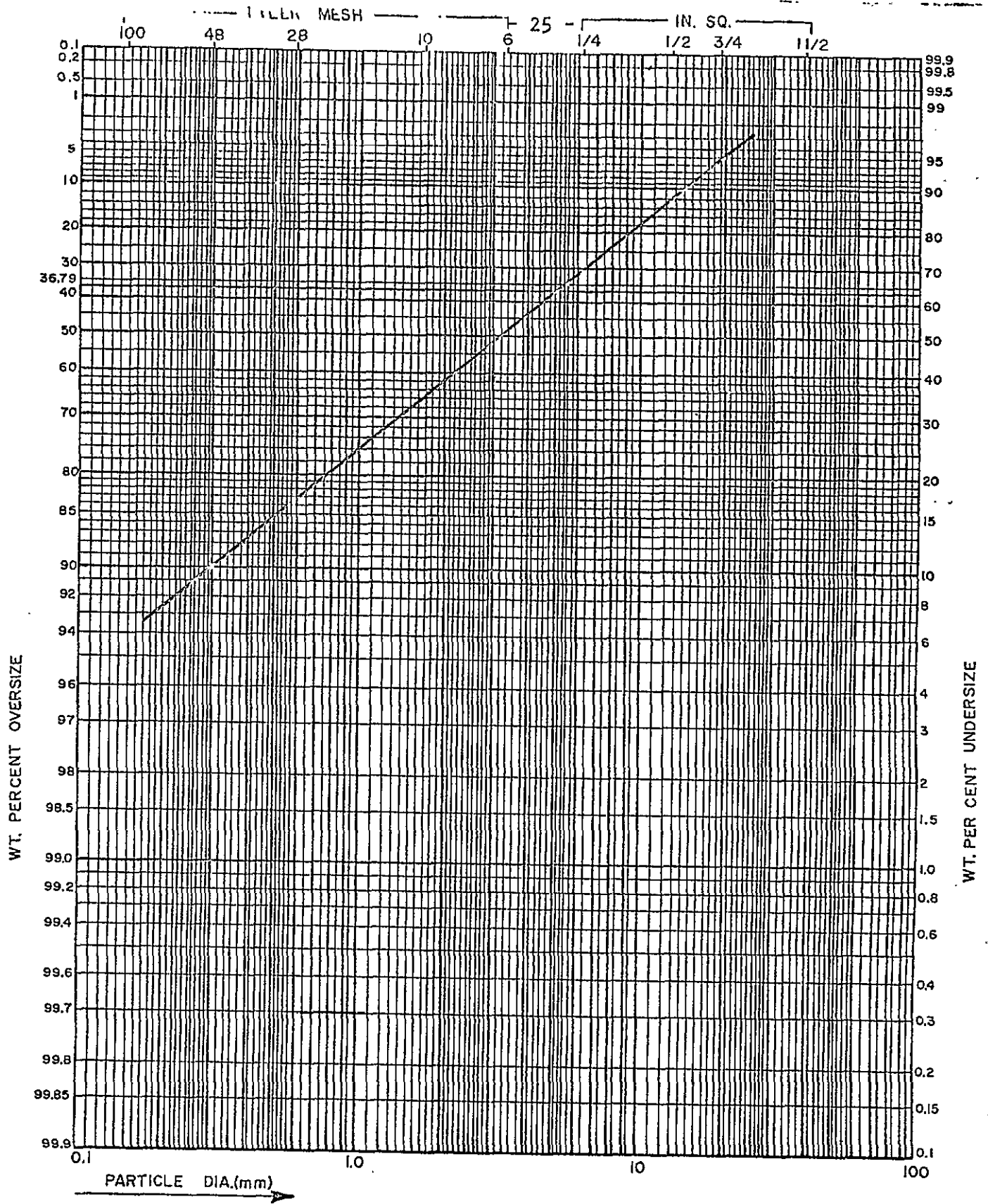
May/77

HEAD RAW ANALYSIS

A.D.L.%	RM.%	ASH%	VM.%	FC.%	S%	F.S.I.	
	% TOT. MOIST.						
2.0	0.8	26.3	16.5	56.4	0.47	4	air dried basis
	2.8	25.8	16.2	55.2	0.46	---	as rec'd basis
		26.5	16.6	56.9	0.47	---	dry basis

SIZE & RAW ANALYSES

SIZE FRACTION	WT.%	PROXIMATE				S%	F.S.I.	CUMULATIVE		
		RM.%	ASH%	VM.%	FC.%			WT.%	ASH%	
3/4"x1/2"	12.2	0.9	29.1	16.1	53.9	0.44	1 1/2	12.2	29.1	adb
	12.2		29.4	16.2	54.4	0.44	---	12.2	29.4	db
1/2"x3/8"	9.9	1.0	29.3	16.0	53.7	0.36	2	22.1	29.2	adb
	9.9		29.6	16.2	54.2	0.36	---	22.1	29.5	db
3/8"x1/4"	9.1	0.8	30.9	15.4	52.9	0.43	1 1/2	31.2	29.7	adb
	9.1		31.1	15.5	53.4	0.43	---	31.2	30.0	db
1/4"x1/8"	17.1	0.7	33.1	15.1	51.1	0.59	2 1/2	48.3	30.9	adb
	17.1		33.3	15.2	51.5	0.59	---	48.3	31.1	db
1/8"x28M	36.2	0.7	24.7	16.7	57.9	0.52	7	84.5	28.2	adb
	36.2		24.9	16.8	58.3	0.52	---	84.5	28.5	db
28x65M	8.3	0.7	18.3	18.3	62.7	0.51	8	92.8	27.4	adb
	8.3		18.4	18.4	63.2	0.51	---	92.8	27.6	db
65Mx0	7.2	0.8	21.3	18.6	59.3	0.52	7	100.0	26.9	adb
	7.2		21.5	18.8	59.7	0.52	---	100.0	27.1	db



Project: HEAD SAMPLE — SAXON ADIT 77-1-1

Client: DENISON COAL LIMITED

Date: MAY, 1977

Title: ROSIN RAMMLER SIZE DISTRIBUTION

Drawn: *JA*



CLIENT: DENISON COAL LTD.

SAMPLE: ADIT 77-1-1

LAB. NO.: 9042

DATE: May, 1977

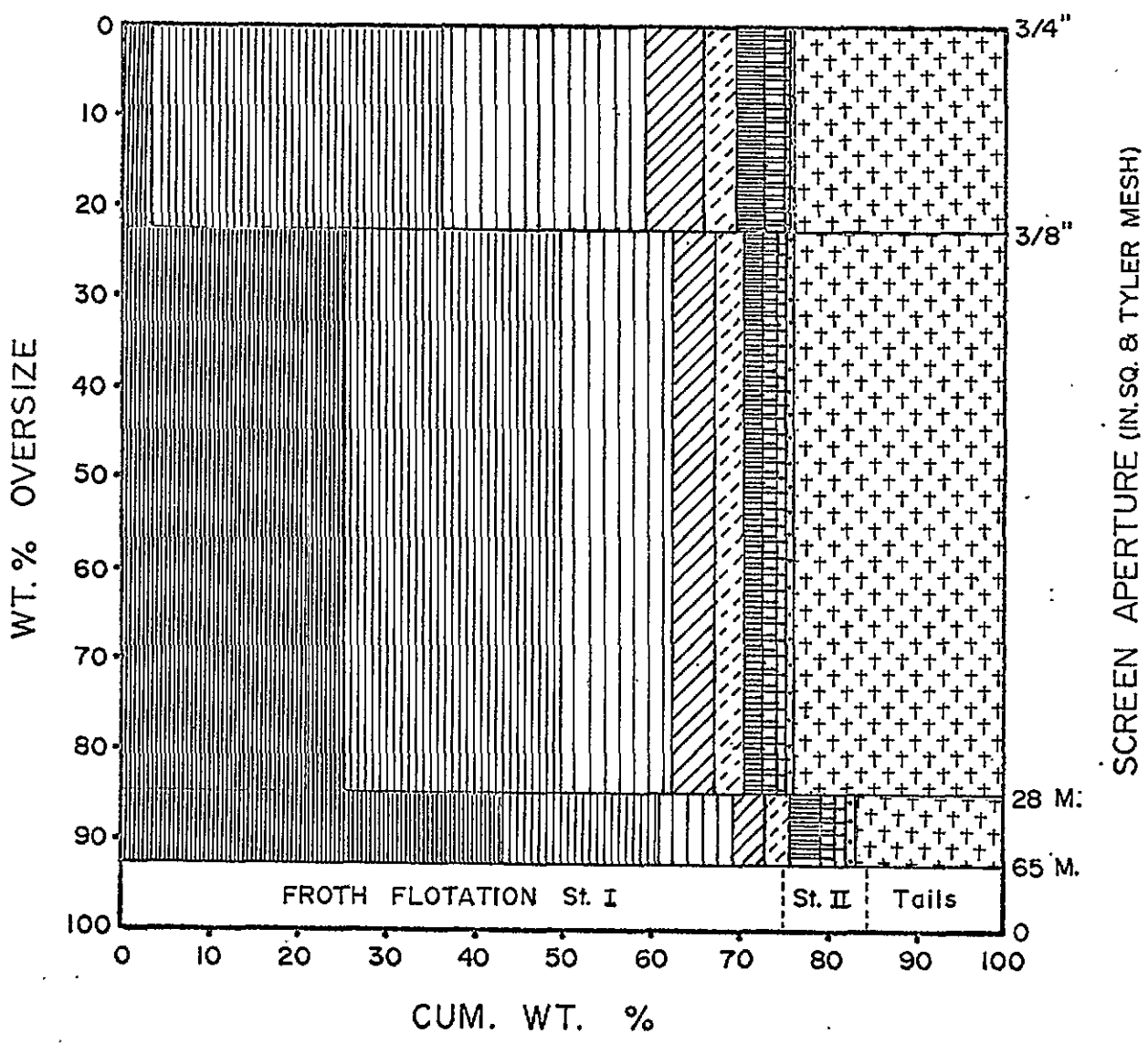
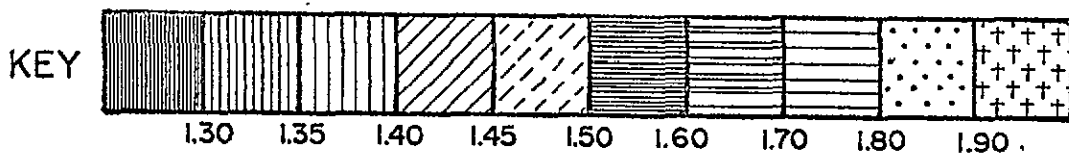
SIZE AND RAW ANALYSES									
SIZE FRACTION	WT. %	ASH %	R.M.%	V.M.%	F.C.%	S.%	F.S.I.	CUMULATIVE	
								WT.%	ASH %
3/4" x 3/8"	22.1	29.2	0.9	16.1	53.8	0.40	2	22.1	29.2
3/8" x 28M	66.4	27.9	0.7	16.1	55.3	0.53	3	84.5	28.2
28M x 65M	8.3	18.3	0.7	18.3	62.7	0.51	8	92.8	27.4
65M x 0	7.2	21.3	0.8	18.6	59.3	0.52	7	100.0	26.9
HEAD RAW	100.0	26.3	0.8	16.5	56.4	0.47	4	%adl=	2.0

calc.

WT.% +3/4" = 24.2 crushed to pass 3/4"

FROTH FLOTATION TEST							
SIZE PRODUCT	65M x 0			CUMULATIVE			PARAMETERS
	WT.%	ASH%	F.S.I.	WT.%	ASH%	F.S.I.	
STAGE I	74.3	9.2	9	74.3	9.2	9	Pulp Density = 10% Dosage = 0.48 lb/T Reagent = 4:1=K:MIBC Conditioning Time = 1 Minute Stage I & II = 1st & 2nd Min. Froth Conc. @ 1st & 2nd Min.
STAGE II	8.7	23.1	5 1/2	83.0	10.7	9	
TAILS	17.0	72.0	N.A.	100.0	21.1	7	

N.A. = non-agglomerating



BIRTLEY ENGINEERING (Canada) LTD.			
CALGARY		ALBERTA	
TITLE	SIZE AND DENSITY DISTRIBUTION DIAGRAM		
CLIENT	DENISON MINES LIMITED		
SAMPLE	Saxon Adit No. 77- -	DATE	May, 1977
LAB NO.	9042	DRWN	A.

Birtley Engineering  
 Subsidiary of Great West Steel Industries

CLIENT: DENISON COAL LTD.

SAMPLE: ADIT 77-1-1

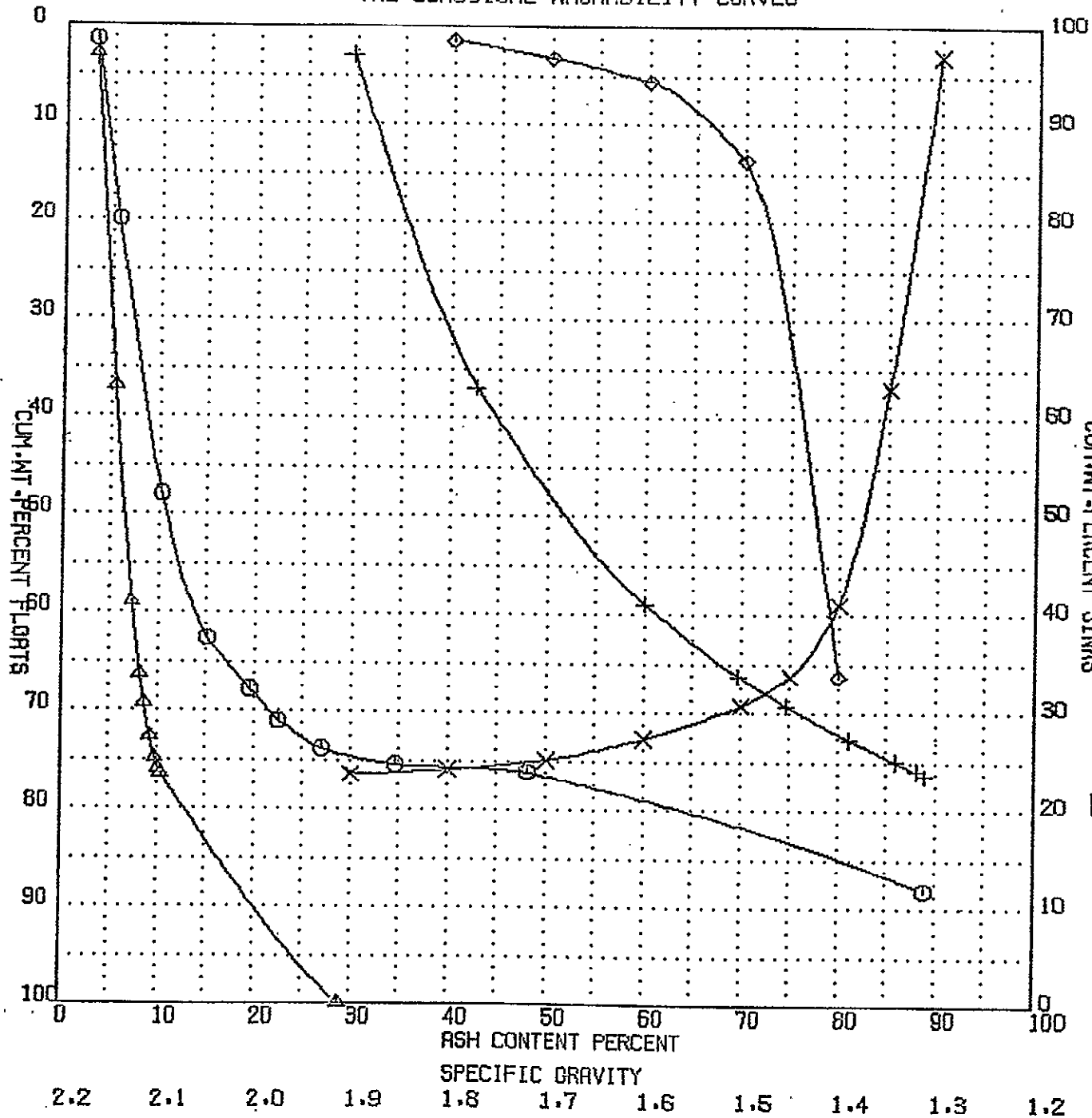
LAB. NO.: 9042

May/77

SINK-FLOAT ANALYSES						
S. G. FRACTION	3/4" x 3/8" (WT.%=22.1)					
	WT. %	ASH %	F.S.I.	CUMULATIVE		
				WT. %	ASH %	F.S.I.
- 1.30	3.0	3.1	9	3.0	3.1	9
1.30 - 1.35	33.9	5.6	4	36.9	5.4	5 1/2
1.35 - 1.40	22.1	10.2	1 1/2	59.0	7.2	3 1/2
1.40 - 1.45	7.3	15.1	1 1/2	66.3	8.1	3
1.45 - 1.50	3.0	19.5	1 1/2	69.3	8.6	2 1/2
1.50 - 1.60	3.4	22.5	1 1/2	72.7	9.2	2 1/2
1.60 - 1.70	2.2	27.0	1 1/2	74.9	9.7	2 1/2
1.70 - 1.80	1.0	34.6	1 1/2	75.9	10.1	2 1/2
1.80 - 1.90	0.5	48.1	1 1/2	76.4	10.3	2 1/2
+ 1.90	23.6	88.9	N.A.	100.0	28.8	2

N.A.= non-agglomerating

DENISON COAL LTD ADIT 77-1-1 3/4 X 3/8 LAB 9042  
 THE CLASSICAL WASHABILITY CURVES



- PRIMARY CURVE
- △ CLEAN COAL CURVE
- + DISCARD CURVE
- × SPECIFIC GRAVITY-YIELD CURVE
- ◇ +/- 0.1 S.G. DISTRIBUTION CURVE

BIRTLEY ENGINEERING  
 14/07/77

--DIRECT--

--CUM FLOATS--

--CUM SINKS-- +-0.1 DISTR

S.G.	WT, CUM WT					SINK WT					S.G.	WT
	WT	ASH	ASH TT	ASHTI	WT	ASH	ASH	WT	ASH			
1	2	3	4	5	6	7	8	9	10	11	12	
1.30	3.00	3.10	.09	.09	3.00	3.10	28.77	27.50	29.66	1.30	0.00	
1.35	33.90	5.60	1.00	1.99	36.90	5.40	26.87	43.10	42.58	1.40	66.30	
1.40	22.10	10.20	2.25	4.25	59.00	7.20	24.61	41.00	60.03	1.50	13.70	
1.45	7.30	15.10	1.10	5.35	66.30	8.07	23.51	33.70	69.77	1.60	5.60	
1.50	3.00	19.50	.59	5.93	69.30	8.56	22.93	30.30	74.68	1.70	3.20	
1.60	3.40	22.50	.77	6.70	72.70	9.21	22.16	27.30	81.18	1.80	1.50	
1.70	2.20	27.00	.59	7.29	74.90	9.74	21.57	25.10	85.92	1.90	0.00	
1.80	1.00	34.60	.55	7.64	75.90	10.06	21.22	24.10	88.05	2.00	0.00	
1.90	.50	48.10	.24	7.88	76.40	10.31	20.98	23.20	88.90	2.10	0.00	
9.99	23.60	88.90	20.08	28.86	100.00	28.86	0.00	0.00	0.00	2.20	0.00	

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14/07/77

.6	19.7	.6	19.4	5.9	19.4	2.0	10.4	4.0	6.7
1.1	16.0	1.1	12.6	8.5	12.6	3.0	12.6	6.0	17.3
2.0	10.4	1.4	8.2	12.0	8.2	4.0	8.2	8.0	18.9
3.0	7.5	1.6	6.7	14.0	6.7	5.0	6.7	10.0	19.4
3.9	6.4	1.7	6.1	14.0	6.1	6.0	6.1	12.0	19.7
4.5	5.8	1.8	5.5	16.2	5.5	8.0	5.5	0.0	0.0
5.4	5.2	1.9	5.0	17.2	5.0	10.0	5.0	0.0	0.0
6.9	4.9	2.0	4.8	17.6	4.8	12.0	4.8	0.0	0.0
9.6	4.8	2.1	4.7	17.8	4.7	14.0	4.7	0.0	0.0
17.8	2.4	5.8	.0	0.0	.0	175.8	.0	0.0	0.0
PASS	1	10171							
PASS	2	10 51							
PASS	3	9118							
PASS	4	9120							
PASS	5	5 80							

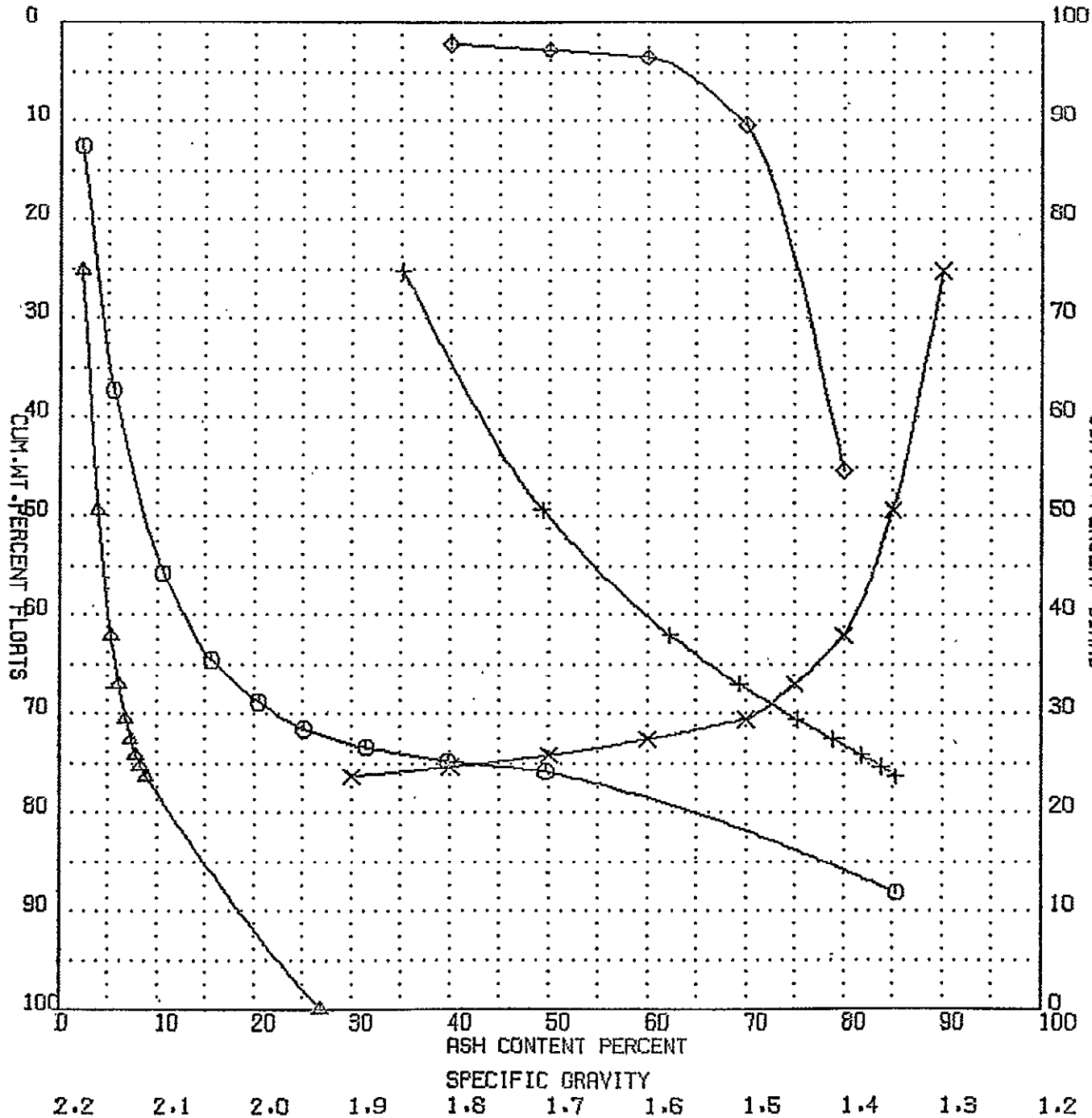
CLIENT: DENISON COAL LTD.  
 SAMPLE: ADIT 77-1-1  
 LAB. NO.: 9042

SINK-FLOAT ANALYSES						
S. G. FRACTION	3/8" x 28M (WT.%=62.4)					
	WT. %	ASH %	F.S.I.	CUMULATIVE		
				WT. %	ASH %	F.S.I.
- 1.30	25.2	2.3	9	25.2	2.3	9
1.30 - 1.35	24.2	5.5	4	49.4	3.9	8 1/2
1.35 - 1.40	12.7	10.6	1 1/2	62.1	5.2	8
1.40 - 1.45	5.0	15.6	1 1/2	67.1	6.0	8
1.45 - 1.50	3.5	20.4	1 1/2	70.6	6.7	7
1.50 - 1.60	2.0	25.1	1 1/2	72.6	7.2	7
1.60 - 1.70	1.6	31.5	1 1/2	74.2	7.8	7
1.70 - 1.80	1.2	39.8	1 1/2	75.4	8.3	7
1.80 - 1.90	1.0	49.7	1	76.4	8.8	7
+ 1.90	23.6	85.3	N.A.	100.0	26.7	4 1/2

SINK-FLOAT ANALYSES						
S. G. FRACTION	28M x 65M (WT.%=8.3)					
	WT. %	ASH %	F.S.I.	CUMULATIVE		
				WT. %	ASH %	F.S.I.
- 1.30	43.0	1.8	9	43.0	1.8	9
1.30 - 1.35	18.3	4.8	7 1/2	61.3	2.7	9
1.35 - 1.40	8.4	9.5	2 1/2	69.7	3.5	9
1.40 - 1.45	4.0	14.2	1 1/2	73.7	4.1	9
1.45 - 1.50	3.2	18.1	1 1/2	76.9	4.7	9
1.50 - 1.60	2.6	25.1	1 1/2	79.5	5.3	9
1.60 - 1.70	1.3	34.2	1 1/2	80.8	5.8	9
1.70 - 1.80	1.2	42.3	1	82.0	6.3	9
1.80 - 1.90	1.0	49.3	1	83.0	6.9	8 1/2
+ 1.90	17.0	78.6	N.A.	100.0	19.1	8

N.A.=non-agglomerating

DENISON COAL LTD ADIT 77-1-1 3/8 X 28M LAB 9042  
 THE CLASSICAL WASHABILITY CURVES



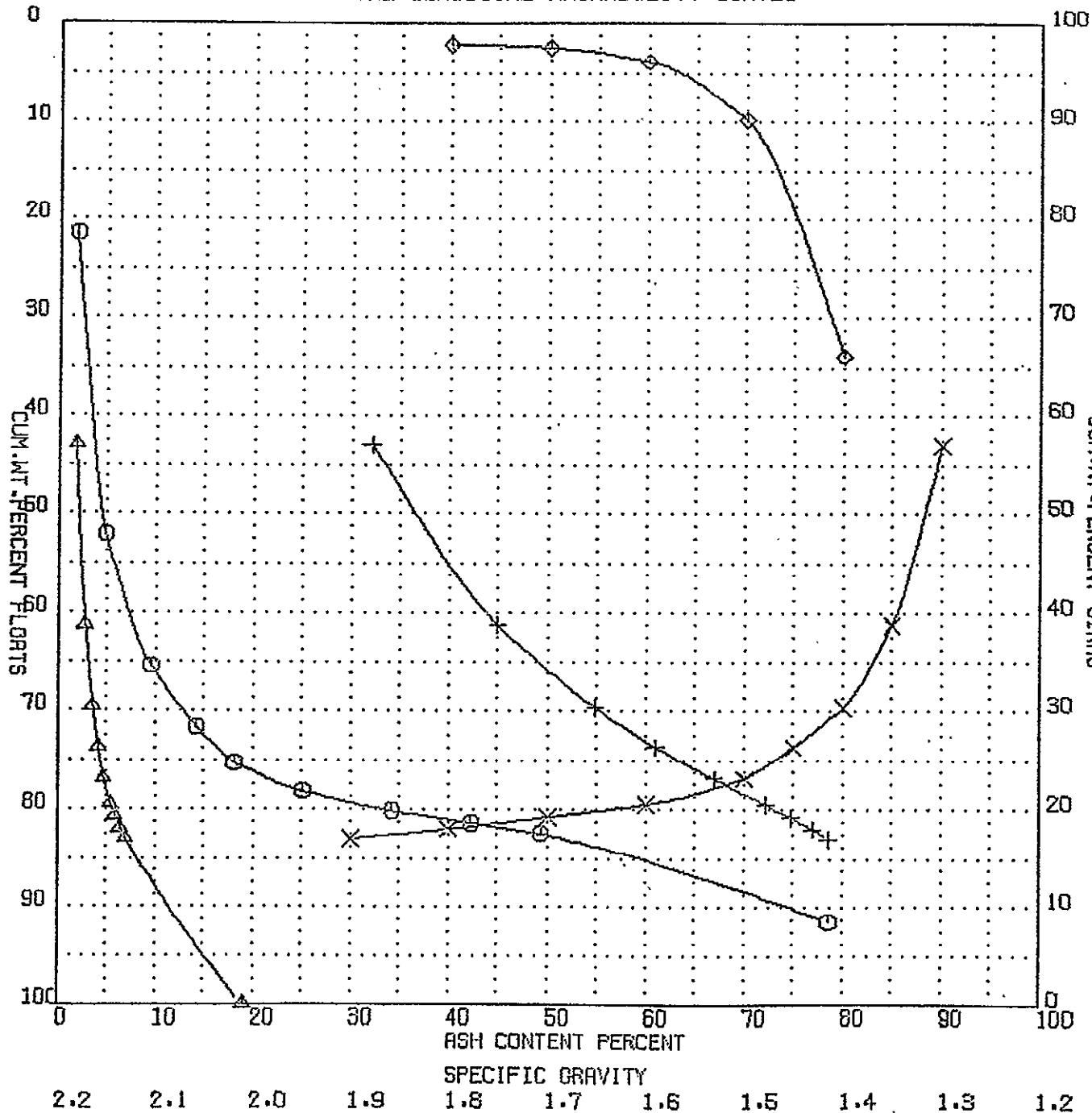
BIRTLEY ENGINEERING

14/07/77





DENISON COAL LTD ADIT 77-1-1 28M X 65M LAB 9042  
 THE CLASSICAL WASHABILITY CURVES



- PRIMARY CURVE
- △ CLEAN COAL CURVE
- + DISCARD CURVE
- × SPECIFIC GRAVITY-YIELD CURVE
- ◇ +/- 0.1 S.G. DISTRIBUTION CURVE

BIRTLEY ENGINEERING  
 14/07/77



CLIENT: DENISON COAL LTD.

SAMPLE: SAXON ADIT 77-1-1

LAB. NO.: 9042X

LIBERATION TESTS

SIZE AND RAW ANALYSES						
SIZE FRACTION	WT.%	ASH%	F.S.I.	CUMULATIVE		
				WT.%	ASH%	
2 x 3/4	1.2	31.1	1 1/2	18.2	31.1	
3/4 x 1/2	9.0	27.5	1 1/2	27.2	29.9	
1/2 x 3/8	6.4	30.0	1 1/2	33.6	29.9	
3/8 x 0	66.4	25.2	5 1/2	100.0	26.8	

WT.% + 2" = 9.5 crushed to pass 2"

SINK-FLOAT ANALYSIS - 2" x 3/8"						
S.G.	WT.%	ASH%	F.S.I.	CUMULATIVE		
				WT.%	ASH%	F.S.I.
-1.30	3.0	2.5	9	3	2.5	9
1.30-1.40	48.5	7.4	3 1/2	51.5	7.1	3 1/2
1.40-1.50	13.1	14.5	2	64.6	8.6	3
1.50-1.60	5.3	19.9	1 1/2	69.9	9.5	2 1/2
1.60-1.80	2.8	28.4	1 1/2	72.7	10.2	2 1/2
1.80-1.90	.3	49.4	1	73.0	10.4	2 1/2
+ 1.90	27.0	88.5	0	100.0	31.5	1 1/2

CLIENT: DENISON COAL LTD.

SAMPLE: SAXON ADIT 77-1-1

LAB. NO.: 9042Y

LIBERATION TESTS

SIZE ANALYSES - +3/8" CRUSHED TO -3/8"						
SIZE FRACTION	WT.%	ASH%	F.S.I.	CUMULATIVE		
				WT.%	ASH%	
-3/8 x 28	90.4	31.9	1 1/2	90.4	31.9	
28 x 65	4.9	29.1	4 1/2	95.3	31.8	
65 x 100	1.9	30.0	4 1/2	97.2	31.7	
100 x 0	2.8	31.6	3	100.0	31.7	

SINK-FLOAT ANALYSIS - -3/8 x 28 M						
S.G.	WT.%	ASH%	F.S.I.	CUMULATIVE		
				WT.%	ASH%	F.S.I.
-1.30	12.1	3.1	9	12.1	3.1	9
1.30-1.40	41.5	7.5	2	53.6	6.5	3 1/2
1.40-1.50	11.0	16.1	1 1/2	64.6	8.1	3
1.50-1.60	3.7	21.4	1 1/2	68.3	8.9	3
1.60-1.80	4.1	28.7	1 1/2	72.4	10.0	3
1.80-2.00	1.3	44.3	1	73.7	10.6	2 1/2
+2.00	26.3	89.4	0	100.0	31.3	1 1/2

FROTH FLOTATION TESTS						
100Mx0						
PRODUCT	WT.%	ASH%	F.S.I.	CUMULATIVE		
				WT.%	ASH%	F.S.I.
Stage I	70.1	14.2	5	70.1	14.2	5
Stage II	4.9	43.7	1 1/2	75.0	16.1	5
Tails	25.0	80.0	0	100.0	30.0	3

Reagent: 4:1 K:MIBC

Dosage: 0.48 lb/T

Conditioning Time - 1 minute

Stage I = 1st min. froth

Stage II = 2nd min. froth

CLIENT: DENISON COAL LTD.  
 SAMPLE: SAXON ADIT 77-1-1  
 LAB. NO.: 9042Y

LIBERATION TESTS

SINK-FLOAT ANALYSES

28M x 65M							65M x 100M						
S.G.	WT.%	ASH%	F.S.I.	CUMULATIVE			S.G.	WT.%	ASH%	F.S.I.	CUMULATIVE		
				WT.%	ASH%	F.S.I.					WT.%	ASH%	F.S.I.
-1.30	29.2	2.0	9 +	29.2	2.0	9	-1.30	27.5	2.3	9 +	27.5	2.3	9
1.30-1.40	31.0	6.4	3	60.2	4.3	8	1.30-1.40	26.8	5.9	3 1/2	54.3	4.1	8 1/2
1.40-1.50	7.7	14.4	2 1/2	67.9	5.4	7 1/2	1.40-1.50	9.1	14.1	1 1/2	63.4	5.5	8
1.50-1.60	2.3	20.7	1	70.2	5.9	7 1/2	1.50-1.60	3.5	21.9	1 1/2	66.9	6.4	7
1.60-1.80	2.2	31.5	1	72.4	6.7	7	1.60-1.80	3.5	32.3	1 1/2	70.4	7.7	7
1.80-2.00	1.4	48.0	1/2	73.8	7.5	7	1.80-2.0	2.5	49.9	1	72.9	9.1	7
+ 2.00	26.2	86.1	0	100.0	28.1	4 1/2	+ 2.00	27.1	85.2	0	100.0	29.7	4 1/2

ADIT 77-2-2

LAB. NOS. 9074/9075/9076/9077/9078

PRELIMINARY ANALYSIS OF LOTS A TO E

CLIENT: DENISON COAL LTD.  
 SAMPLE: LOT 'A' ADIT 77-2-2  
 LAB NO: 9074

DATE: JULY, 1977

SIZE ANALYSIS		
WT% +2" = <u>6.1</u> crushed to -2"		
SIZE FRACTION	WT%	CUMUL. WT%
2" X 3/8"	36.5	36.5
3/8" X 100M	60.1	96.6
100M X 0	3.4	100.0

SINK-FLOAT ANALYSIS: 2" X 3/8"						
S. G. FRACTION	WT%	ASH%	CUMULATIVE			
			WT%	ASH%	F.S.I.	
- 1.40	85.5	3.1	85.5	3.1	8 1/2	
1.40 - 1.50	4.2	15.5	89.7	3.7	8 1/2	
1.50 - 1.60	2.8	20.3	92.5	4.2	8 1/2	
+1.60	7.5	72.0	100.0	9.3	8	

SINK-FLOAT ANALYSIS: 3/8" X 100M						
S. G. FRACTION	WT%	ASH%	CUMULATIVE			
			WT%	ASH%	F.S.I.	
- 1.40	82.2	2.8	82.2	2.8	9	
1.40 - 1.50	4.5	13.7	86.7	3.4	8 1/2	
1.50 - 1.60	5.1	23.5	91.8	4.5	8	
+1.60	8.2	54.2	100.0	8.6	7 1/2	

CLIENT: DENISON COAL LTD.  
 SAMPLE: LOT "A" ADIT 77-2-2  
 LAB. NO.: 9074

DATE: July, 1977

SINK-FLOAT ANALYSIS: 2"X100M (WT.%=96.6 )									
FRACTION	WT.%	RM.%	ASH%	VM.%	FC.%	F.S.I.	CUMULATIVE		
							WT.%	ASH%	F.S.I.
-1.40	83.5	1.4	2.8	20.2	75.6	9	83.5	2.8	9
1.40-1.50	4.4	0.8	14.4	19.2	65.6	3	87.9	3.4	8 1/2
1.50-1.60	4.2	1.1	22.9	17.3	58.7	1 1/2	92.1	4.3	8 1/2
+1.60	7.9	1.1	61.2	11.6	26.1	1/2	100.0	8.8	8

FROTH FLOTATION TEST: 100M x 0 (WT.%=3.4 )									
PRODUCT	WT.%	RM.%	ASH%	VM.%	FC.%	F.S.I.	CUMULATIVE		
							WT.%	ASH%	F.S.I.
STAGE 1	86.8	1.3	5.8	18.6	74.3	8	86.8	5.8	8
STAGE 11	5.2	0.5	16.8	17.1	65.6	2	92.0	6.4	7
TAILS	8.0	0.7	49.6	16.1	33.6	1/2	100.0	9.9	7

Pulp Density = 10%  
 Reagent = 4;1=Kerosene:MIBC  
 Dosage = 0.48 lb/%  
 Conditioning Time = 1 minute  
 Stage 1 = 1st min. froth  
 Stage 11 = 2nd min. froth



CLIENT: DENISON COAL LTD.  
 SAMPLE: LOT "B" ADIT 77-2-2  
 LAB NO: 9075

DATE: July, 1977

SIZE ANALYSIS		
WT% +2" = <u>8.8</u> crushed to -2"		
SIZE FRACTION	WT%	CUMUL. WT%
2" X 3/8"	36.5	36.5
3/8" X 100M	59.5	96.0
100M X 0	4.0	100.0

SINK-FLOAT ANALYSIS: 2" X 3/8"					
S. G. FRACTION	WT%	ASH%	CUMULATIVE		
			WT%	ASH%	F.S.I.
- 1.40	47.0	5.2	47.0	5.2	7
1.40 - 1.50	10.4	16.1	57.4	7.2	6
1.50 - 1.60	9.0	27.3	66.4	9.9	5 1/2
+1.60	33.6	48.9	100.0	23.0	2 1/2

SINK-FLOAT ANALYSIS: 3/8" X 100M					
S. G. FRACTION	WT%	ASH%	CUMULATIVE		
			WT%	ASH%	F.S.I.
- 1.40	58.8	4.1	58.8	4.1	7 1/2
1.40 - 1.50	7.8	16.6	66.6	5.6	6 1/2
1.50 - 1.60	10.4	27.6	77.0	8.5	6
+1.60	23.0	51.0	100.0	18.3	3 1/2

CLIENT: DENISON COAL LTD.  
 SAMPLE: LOT "B" ADIT 77-2-2  
 LAB. NO.: 9075

DATE: July, 1977

SINK-FLOAT ANALYSIS: 2"X100M (WT.%=96.0)

FRACTION	WT.%	RM.%	ASH%	VM.%	FC.%	F.S.I.	CUMULATIVE		
							WT.%	ASH%	F.S.I.
-1.40	54.3	1.6	4.4	19.5	74.5	7 1/2	54.3	4.4	7 1/2
1.40-1.50	8.7	1.1	16.3	18.9	63.7	2 1/2	63.0	6.0	6 1/2
1.50-1.60	9.9	1.6	27.5	16.3	54.6	1/2	72.9	9.0	6 1/2
+1.60	27.1	1.1	50.8	13.3	34.8	1/2	100.0	20.3	3 1/2

FROTH FLOTATION TEST: 100M x 0 (WT.%= 4.0)

PRODUCT	WT.%	RM.%	ASH%	VM.%	FC.%	F.S.I.	CUMULATIVE		
							WT.%	ASH%	F.S.I.
STAGE I	77.8	0.4	9.7	18.5	71.4	5	77.8	9.7	5
STAGE II	6.5	0.6	27.6	16.1	55.7	1	84.3	11.1	4 1/2
TAILS	15.7	0.7	51.1	13.9	34.3	1/2	100.0	17.4	3 1/2

Pulp Density = 10%  
 Reagent = 4;1=Kerosene:MIBC  
 Dosage = 0.48 lb/%  
 Conditioning Time = 1 minute  
 Stage I = 1st min. froth  
 Stage II = 2nd min. froth

CLIENT: DENISON COAL LTD.  
 SAMPLE: LOT "C" ADIT 77-2-2  
 LAB NO: 9076

DATE: July, 1977

SIZE ANALYSIS		
WT% +2" = <u>7.3</u> crushed to -2"		
SIZE FRACTION	WT%	CUMUL. WT%
2" X 3/8"	26.9	26.9
3/8" X 100M	69.4	96.3
100M X 0	3.7	100.0

SINK-FLOAT ANALYSIS: 2" X 3/8"						
S. G. FRACTION	WT%	ASH%	CUMULATIVE			
			WT%	ASH%	F.S.I.	
- 1.40	59.8	4.9	59.8	4.9	6 1/2	
1.40 - 1.50	11.2	16.7	71.0	6.8	5 1/2	
1.50 - 1.60	6.7	26.7	77.7	8.5	5	
+1.60	22.3	53.8	100.0	18.6	3 1/2	

SINK-FLOAT ANALYSIS: 3/8" X 100M						
S. G. FRACTION	WT%	ASH%	CUMULATIVE			
			WT%	ASH%	F.S.I.	
- 1.40	69.9	4.3	69.9	4.3	6	
1.40 - 1.50	10.1	12.5	80.0	5.3	5 1/2	
1.50 - 1.60	4.6	24.8	84.6	6.4	5 1/2	
+1.60	15.4	53.1	100.0	13.6	4 1/2	

CLIENT: DENISON COAL LTD.  
 SAMPLE: LOT "C" ADIT 77-2-2  
 LAB. NO.: 9076

DATE: July, 1977

SINK-FLOAT ANALYSIS: 2"x100M (WT.%= 96.3)									
FRACTION	WT.%	RM.%	ASH%	VM.%	FC.%	F.S.I.	CUMULATIVE		
							WT.%	ASH%	F.S.I.
-1.40	67.1	1.6	4.4	18.9	75.1	6 1/2	67.1	4.4	6 1/2
1.40-1.50	10.4	0.8	14.0	17.9	67.3	2 1/2	77.5	5.7	5 1/2
1.50-1.60	5.2	1.1	25.4	16.6	56.9	1 1/2	82.7	6.9	5
+1.60	17.3	1.0	53.4	11.4	34.2	1/2	100.0	15.0	3 1/2

FROTH FLOTATION TEST: 100M x 0 (WT.%= 3.7)									
PRODUCT	WT.%	RM.%	ASH%	VM.%	FC.%	F.S.I.	CUMULATIVE		
							WT.%	ASH%	F.S.I.
STAGE I	83.8	0.7	8.1	17.9	73.3	5	83.8	8.1	5
STAGE II	6.0	0.8	29.2	15.5	54.5	1 1/2	89.8	9.5	4
TAILS	10.2	0.7	60.0	13.8	25.5	1/2	100.0	14.7	3 1/2

Pulp Density = 10%  
 Reagent = 4;1=Kerosene:MIBC  
 Dosage = 0.48 lb/%  
 Conditioning Time = 1 minute  
 Stage I = 1st min. froth  
 Stage II = 2nd min. froth

CLIENT: DENISON COAL LTD.  
 SAMPLE: LOT "D" ADIT 77-2-2  
 LAB NO: 9077

DATE: July, 1977

SIZE ANALYSIS		
WT% +2" = <u>5.9</u> crushed to -2"		
SIZE FRACTION	WT%	CUMUL. WT%
2" X 3/8"	30.0	30.0
3/8" X 100M	67.3	97.3
100M X 0	2.7	100.0

SINK-FLOAT ANALYSIS: 2" X 3/8"						
S. G. FRACTION	WT%	ASH%	CUMULATIVE			
			WT%	ASH%	F.S.I.	
- 1.40	39.2	7.3	39.2	7.3	4	
1.40 - 1.50	18.2	18.3	57.4	10.8	3	
1.50 - 1.60	13.6	28.3	71.0	14.1	2 1/2	
+1.60	29.0	55.2	100.0	26.0	1 1/2	

SINK-FLOAT ANALYSIS: 3/8" X 100M						
S. G. FRACTION	WT%	ASH%	CUMULATIVE			
			WT%	ASH%	F.S.I.	
- 1.40	54.5	3.8	54.5	3.8	6	
1.40 - 1.50	15.6	16.6	70.1	6.6	4	
1.50 - 1.60	9.9	27.5	80.0	9.2	3 1/2	
+1.60	20.0	61.1	100.0	19.6	3	

CLIENT: DENISON COAL LTD.  
 SAMPLE: LOT "D" ADIT 77-2-2  
 LAB. NO.: 9077

DATE: July, 1977

SINK-FLOAT ANALYSIS: 2"x100M (WT.%= 97.3)									
FRACTION	WT.%	RM.%	ASH%	VM.%	FC.%	F.S.I.	CUMULATIVE		
							WT.%	ASH%	F.S.I.
-1.40	49.7	1.5	5.9	18.9	73.7	5 1/2	49.7	5.9	5 1/2
1.40-1.50	16.4	0.9	17.2	15.7	66.2	1 1/2	66.1	8.7	4
1.50-1.60	11.1	0.8	27.2	13.6	58.4	1	77.2	11.4	3
+1.60	22.8	0.7	53.4	11.4	34.5	1/2	100.0	20.9	2

FROTH FLOTATION TEST: 100M x 0 (WT.%= 2.7)									
PRODUCT	WT.%	RM.%	ASH%	VM.%	FC.%	F.S.I.	CUMULATIVE		
							WT.%	ASH%	F.S.I.
STAGE I	85.3	0.8	10.6	17.4	71.2	3 1/2	85.3	10.6	3 1/2
STAGE II	5.1	0.5	31.3	14.9	53.3	1	90.4	11.8	3 1/2
TAILS	9.6	0.7	66.4	14.0	18.9	1/2	100.0	17.0	2 1/2

Pulp Density = 10%  
 Reagent = 4;1=Kerosene:MIBC  
 Dosage = 0.48 lb/%  
 Conditioning Time = 1 minute  
 Stage I = 1st min. froth  
 Stage II = 2nd min. froth

CLIENT: DENISON COAL LTD.  
 SAMPLE: LOT 'E' ADIT 77-2-2  
 LAB NO: 9078

DATE: July, 1977

SIZE ANALYSIS		
WT% +2" = 5.2 crushed to -2"		
SIZE FRACTION	WT%	CUMUL. WT%
2" X 3/8"	36.9	36.9
3/8" X 100M	59.8	96.7
100M X 0	3.3	100.0

SINK-FLOAT ANALYSIS: 2" X 3/8"						
S. G. FRACTION	WT%	ASH%	CUMULATIVE			
			WT%	ASH%	F.S.I.	
- 1.40	24.4	6.2	24.4	6.2	8	
1.40 - 1.50	6.2	16.2	30.6	8.2	7 1/2	
1.50 - 1.60	6.8	29.8	37.4	12.1	6 1/2	
+1.60	62.6	73.9	100.0	50.8	1 1/2	

SINK-FLOAT ANALYSIS: 3/8" X 100M						
S. G. FRACTION	WT%	ASH%	CUMULATIVE			
			WT%	ASH%	F.S.I.	
- 1.40	42.1	3.8	42.1	3.8	9	
1.40 - 1.50	7.4	16.6	49.5	5.7	9	
1.50 - 1.60	8.7	27.5	58.2	9.0	8 1/2	
+1.60	41.8	61.1	100.0	30.8	4 1/2	

CLIENT: DENISON COAL LTD.  
 SAMPLE: LOT "E" ADIT 77-2-2  
 LAB. NO.: 9078

DATE: July, 1977

SINK-FLOAT ANALYSIS: 2"×100M (WT.%= 96.7)									
FRACTION	WT.%	RM.%	ASH%	VM.%	FC.%	F.S.I.	CUMULATIVE		
							WT.%	ASH%	F.S.I.
-1.40	35.4	0.7	4.3	19.7	75.3	9	35.4	4.3	9
1.40-1.50	6.9	0.5	16.5	16.9	66.1	3 1/2	42.3	6.3	8 1/2
1.50-1.60	8.0	0.7	28.2	14.6	56.5	1 1/2	50.3	9.8	7 1/2
+1.60	49.7	0.8	67.3	12.2	19.7	1/2	100.0	38.4	3 1/2

FROTH FLOTATION TEST: 100M × 0 (WT.%= 3.3 )									
PRODUCT	WT.%	RM.%	ASH%	VM.%	FC.%	F.S.I.	CUMULATIVE		
							WT.%	ASH%	F.S.I.
STAGE I	75.8	0.7	12.6	18.1	68.6	7 1/2	75.8	12.6	7 1/2
STAGE II	5.4	0.5	38.4	14.5	46.6	1	81.2	14.3	7
TAILS	18.8	0.6	73.2	12.6	13.2	N.A.	100.0	25.4	5

Pulp Density = 10%  
 Reagent = 4;1=Kerosene:MIBC  
 Dosage = 0.48 lb/%  
 Conditioning Time = 1 minute  
 Stage I = 1st min. froth  
 Stage II = 2nd min. froth



ADIT 77-2-2  
LAB. NO. 9080

WASHABILITY RESULTS OF COMPOSITE OF LOTS A TO E

CLIENT: DENISON COAL LTD.

SAMPLE: ADIT NO. 77-2-2, Composite of lots A, B, C, D & E

LAB. NO.: 9080

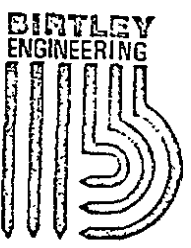
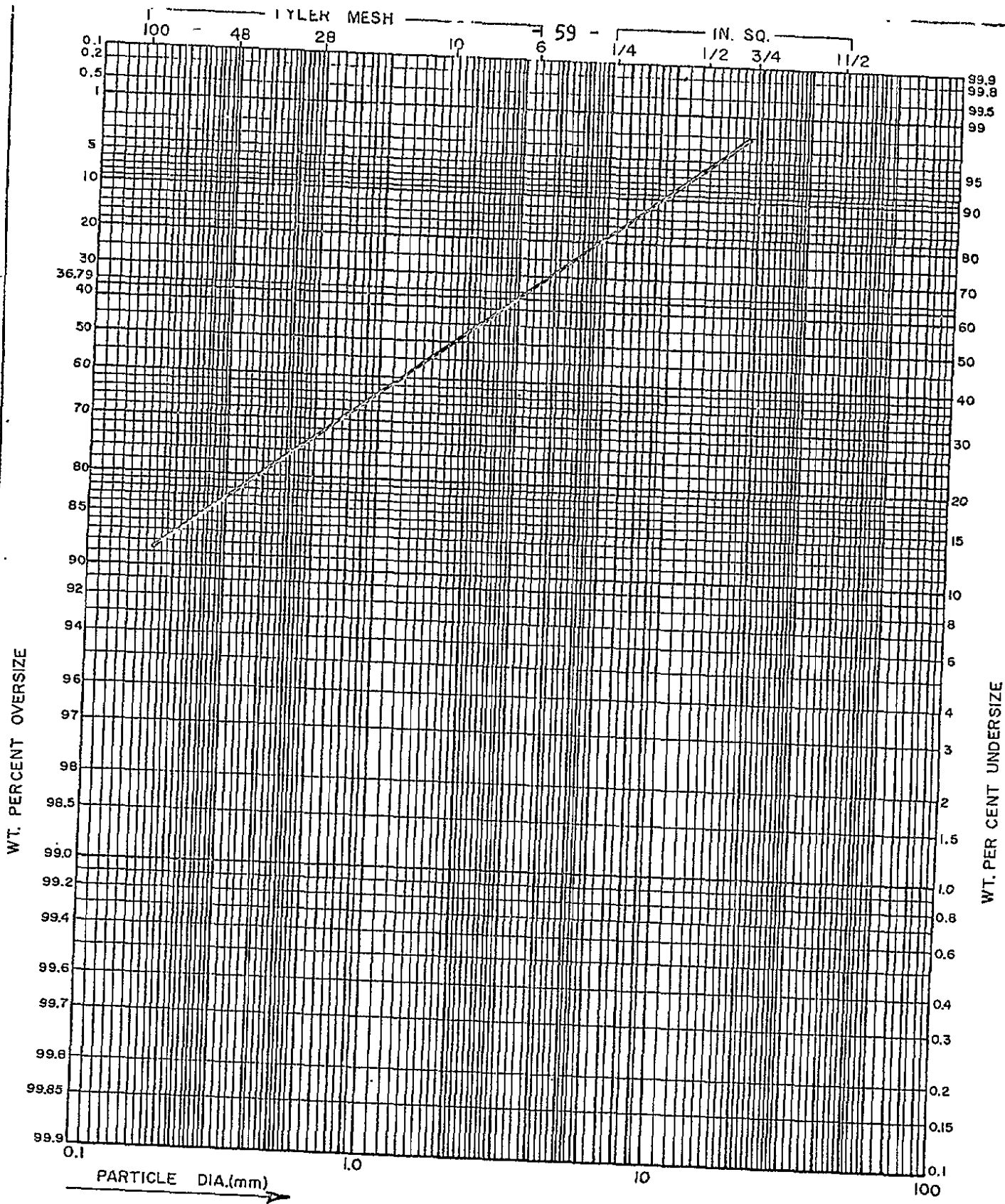
DATE: July, 1977

HEAD RAW ANALYSIS

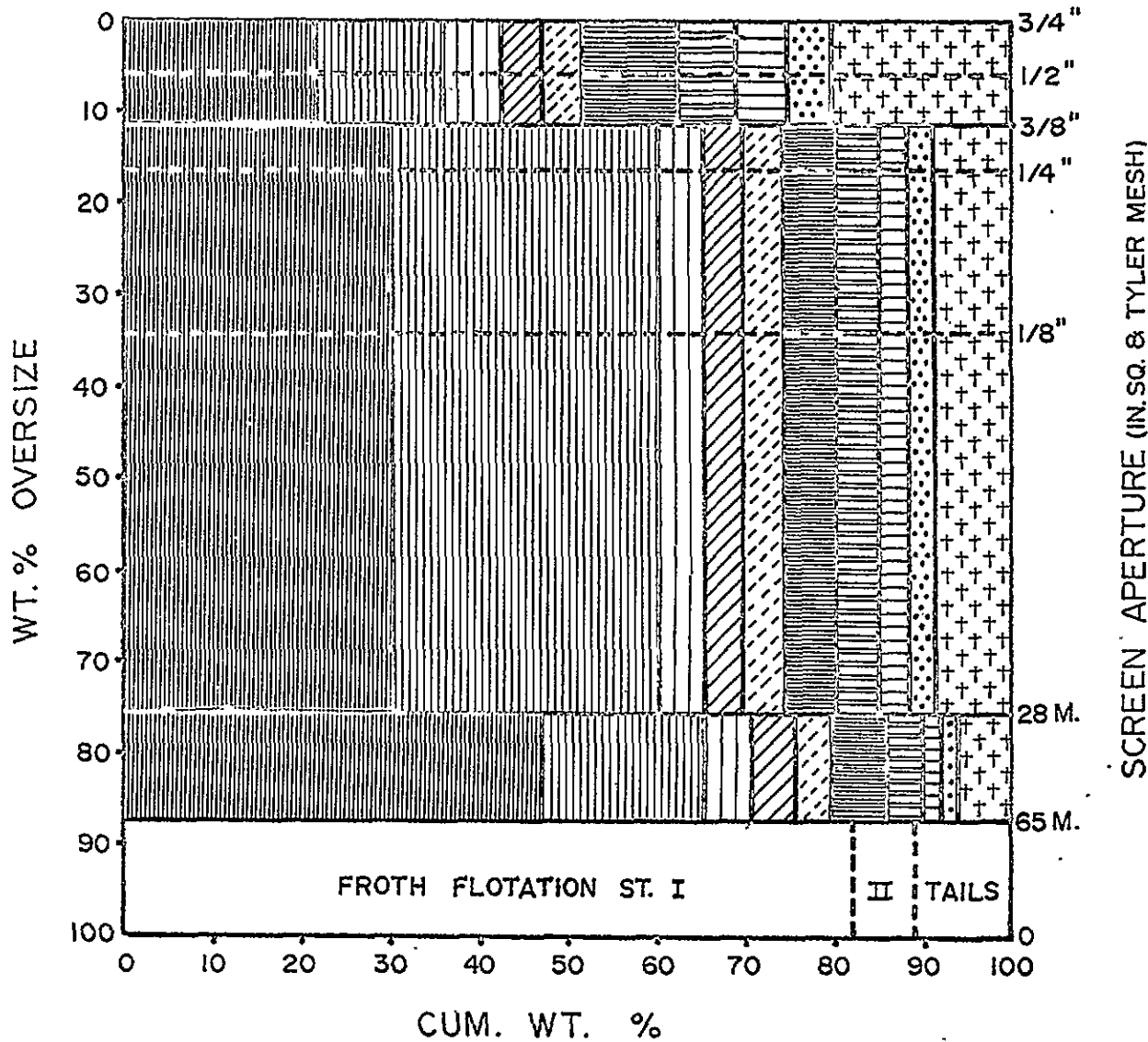
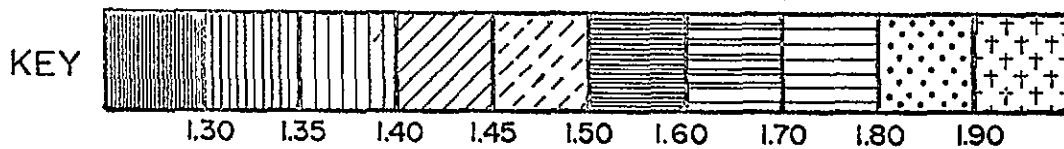
A.D.L.%	RM.% TOT.MOIST.%	ASH%	VM.%	FC.%	S%	F.S.I.	REMARKS
2.3	0.8	19.5	17.0	62.7	0.40	4	air dried basis
	3.1	19.1	16.6	61.2	0.39	--	as rec'd basis
		19.7	17.1	63.2	0.40	--	dry basis

SIZE & RAW ANALYSES

SIZE FRACTION	WT.%	PROXIMATE				S%	F.S.I.	CUMULATIVE		
		RM.%	ASH%	VM.%	FC.%			W.T.%	ASH%	
3/4"x1/2"	6.5	0.9	32.8	15.6	50.7	0.31	1 1/2	6.5	32.8	adb
			33.1	15.7	51.2	0.31	--			db
1/2" x3/8"	5.2	0.9	28.7	15.8	54.6	0.33	2 1/2	11.7	31.0	adb
			29.0	15.9	55.1	0.33	--			db
3/8"x1/4"	5.4	0.8	27.5	16.1	55.6	0.40	3 1/2	17.1	29.9	adb
			27.7	16.2	56.1	0.40	--			db
1/4"x1/8"	16.3	0.8	22.9	16.3	60.0	0.40	3 1/2	33.4	26.5	adb
			23.1	16.4	60.5	0.40	--			db
1/8"x28M	42.6	0.8	15.8	17.0	66.4	0.39	5	76.0	20.5	adb
			15.9	17.1	67.0	0.39	--			db
28Mx65M	11.1	1.0	13.1	17.3	68.6	0.39	6 1/2	87.1	19.5	adb
			13.2	17.5	69.3	0.39	--			db
65Mx0	12.9	1.0	14.0	17.9	67.1	0.47	6	100.0	18.1	adb
			14.1	18.1	67.8	0.47	--			db



<b>BIRTLEY ENGINEERING</b>	Project: SAXON ADIT NO. 77-2-2	
	Client: DENISON COAL LTD.	Date: JULY, 1977
	Title: ROSIN RAMMLER SIZE DISTRIBUTION	Drawn: A.



BIRTLEY ENGINEERING (Canada) LTD.			
CALGARY		ALBERTA	
TITLE	SIZE AND DENSITY DISTRIBUTION DIAGRAM		
CLIENT	DENISON COAL LTD.		
SAMPLE	ADIT 77-2-2	DATE	JULY, 1977
LAB NO.	9080	DRWN	J.

Birtley Engineering  
 Subsidiary of Great West Steel Industries

CLIENT: DENISON COAL LTD.

SAMPLE: ADIT NO. 77-2-2

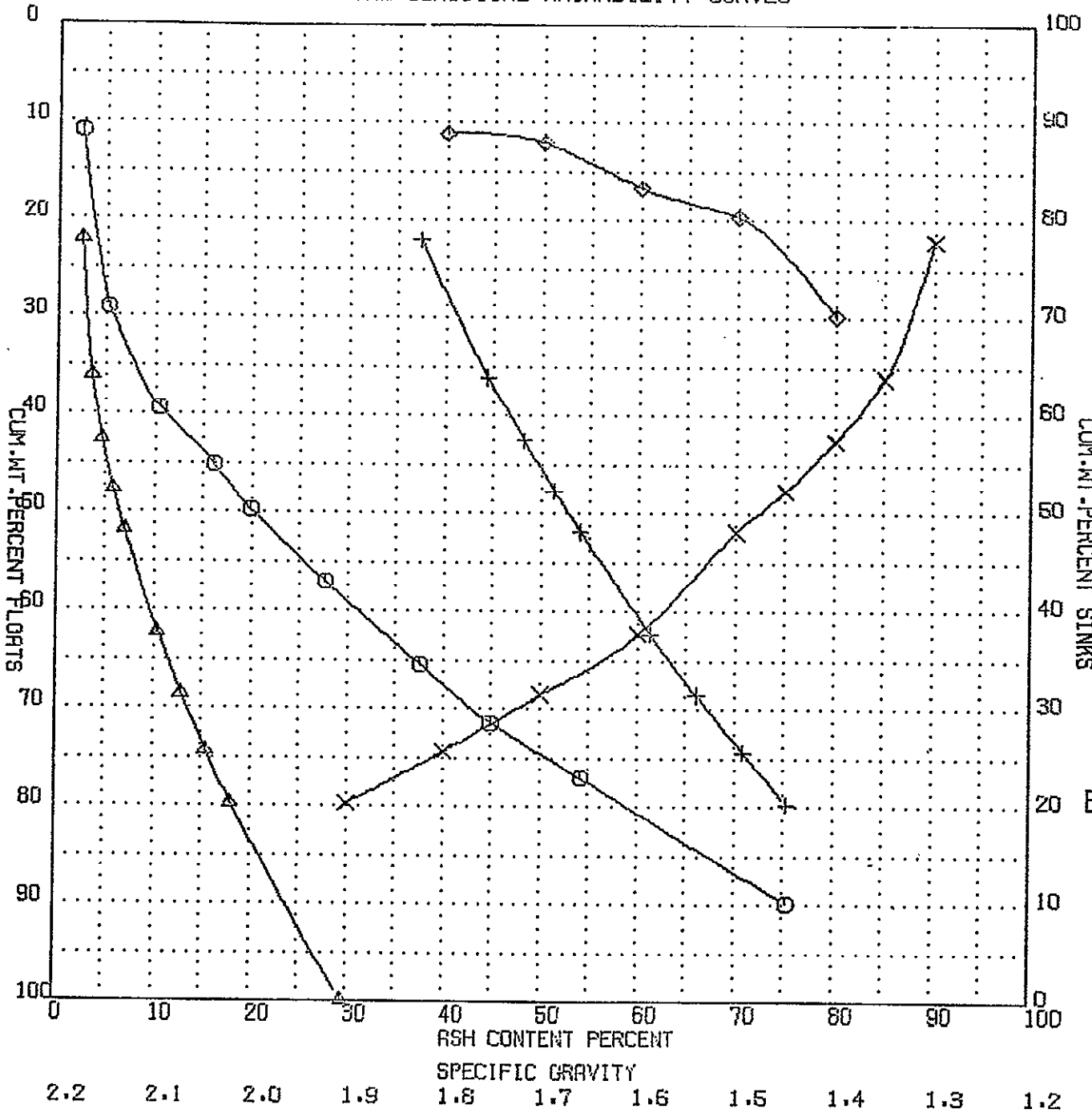
LAB. NO.: 9080

DATE: July, 1977

CALC. SIZE AND RAW ANALYSES, a.d.b.								
SIZE FRACTION	WT.%	ASH%	RM.%	VM.%	FC.%	F.S.I.	CUMULATIVE	
							WT.%	ASH%
3/4"x3/8"	11.7	31.0	0.9	15.7	52.4	2	11.7	31.0
3/8"x28M	64.3	18.6	0.8	16.7	63.9	4	76.0	20.5
28Mx65M	11.1	13.1	1.0	17.3	68.6	6 1/2	87.1	19.5
65Mx0	12.9	14.0	1.0	17.9	67.1	6	100.0	18.8
+ 3/4"	8.5%*							

\*crushed to pass 3/4" and included in above size analysis

SINK-FLOAT ANALYSES										
	3/4"x3/8" (WT%=11.7)					3/8"x28M (WT%= 64.3)				
S.G.	WT.%	ASH%	CUMULATIVE			WT.%	ASH%	CUMULATIVE		
			WT.%	ASH%	F.S.I.			WT.%	ASH%	F.S.I.
-1.30	22.1	2.4	22.1	2.4	9	30.4	2.2	30.4	2.2	9
1.30-1.35	14.1	5.2	36.2	3.5	8	29.7	5.7	60.1	3.9	7 1/2
1.35-1.40	6.4	10.4	42.6	4.5	7 1/2	4.9	9.3	65.0	4.3	7
1.40-1.45	5.1	16.1	47.7	5.8	7	4.3	15.3	69.3	5.0	6 1/2
1.45-1.50	4.2	19.9	51.9	6.9	7	4.2	20.7	73.5	5.9	6 1/2
1.50-1.60	10.4	27.7	62.3	10.4	5	6.5	27.7	80.0	7.7	5 1/2
1.60-1.70	6.3	37.5	68.6	12.9	4 1/2	4.5	36.8	84.5	9.2	5 1/2
1.70-1.80	5.8	44.9	74.4	15.4	4	3.8	47.3	88.3	10.9	5
1.80-1.90	5.4	54.2	79.8	18.0	3	3.2	54.5	91.5	12.4	5
+1.90	20.2	75.3	100.0	29.6	2	8.5	71.0	100.0	17.4	4



BIRTLEY ENGINEERING

11/08/77

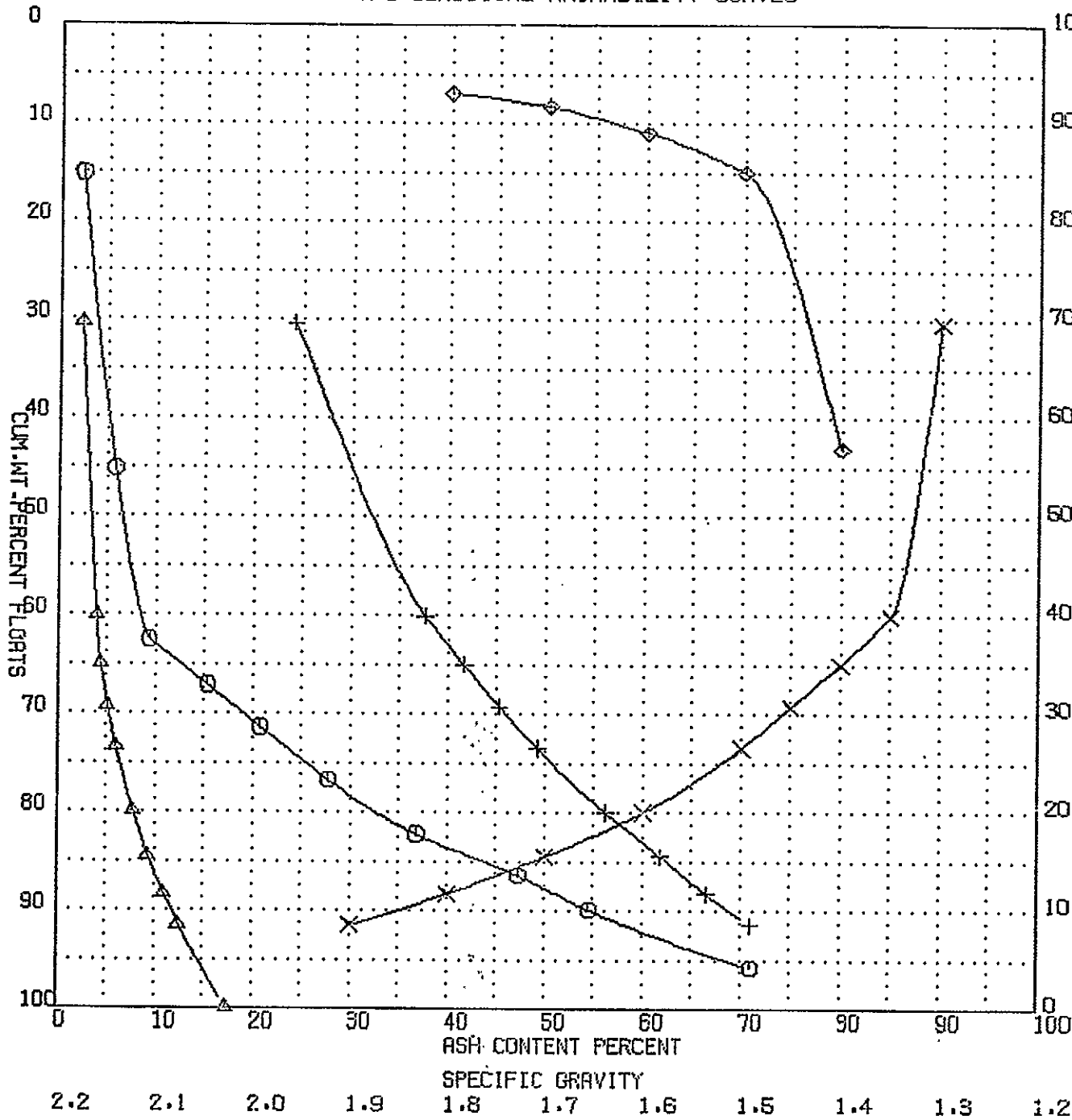
--DIRECT--                      --CUM FLOATS--                      --CUM SINKS--                      +.0.1 DISTO

S.G.	WTs CUM WT>					SINK WT					S.G.	WT>
	WT>	ASH>	ASH TT	ASH TT	WT>	ASH>	ASH>	WT>	ASH>			
1	2	3	4	5	6	7	8	9	10	11	12	
1.30	22.10	2.40	.63	.53	22.10	2.40	20.04	27.50	37.28	1.30	0.00	
1.35	16.10	5.20	.73	1.26	36.20	3.40	20.31	27.00	44.27	1.40	29.00	
1.40	6.40	10.40	.47	1.93	42.60	4.53	27.64	27.40	48.16	1.50	19.70	
1.45	5.10	15.10	.22	2.75	47.70	5.77	26.82	29.70	51.28	1.60	16.70	
1.50	4.20	19.00	.04	3.59	51.90	6.01	25.98	29.70	54.02	1.70	12.10	
1.60	15.40	27.70	2.98	6.47	62.30	10.38	23.10	27.70	61.28	1.80	11.20	
1.70	6.31	37.50	2.36	8.83	60.60	12.87	20.74	31.40	66.06	1.90	0.00	
1.80	5.30	44.00	2.40	11.43	74.40	15.27	19.14	35.40	70.85	2.00	0.00	
1.90	5.40	54.20	2.23	14.36	79.80	18.00	15.21	20.50	75.30	2.10	0.00	
2.00	25.20	75.30	15.91	29.57	100.00	29.57	0.00	0.00	0.00	2.20	0.00	

RTOTLEY ENGINEERING  
31/08/77

0.5	17.0	0.5	15.6	7.5	10.6	2.0	10.6	4.0	14.0
1.0	14.0	0.7	12.9	3.0	12.9	2.0	12.9	4.0	16.1
2.0	12.1	0.9	11.5	0.6	11.5	4.0	15.5	8.0	16.7
3.0	11.0	1.2	10.5	10.7	10.5	5.0	15.5	10.0	17.6
4.0	10.0	1.4	9.6	10.0	9.6	6.0	9.6	12.0	17.8
5.5	8.6	2.1	7.5	12.3	7.5	0.0	7.5	0.0	0.0
7.5	6.0	2.6	6.3	13.0	6.3	10.0	6.3	0.0	0.0
9.0	5.7	3.1	5.1	14.2	5.1	12.0	5.1	0.0	0.0
10.0	4.6	3.4	4.0	15.1	4.0	14.0	4.0	0.0	0.0
15.1	2.0	5.9	0.0	0.0	0.0	175.5	0.0	0.0	0.0

PASS 1 10145  
 PASS 2 10 56  
 PASS 3 9 76  
 PASS 4 9120  
 PASS 5 5 00



- PRIMARY CURVE
- △ CLEAN COAL CURVE
- + DISCARD CURVE
- × SPECIFIC GRAVITY-YIELD CURVE
- ◇ +/- 0.1 S.G. DISTRIBUTION CURVE

BIRTLEY ENGINEERING  
 11/08/77



--DIRECT--

--CUM FLOATS--

--CUM SINKS-- +0.1 DISTO

S.G.	WT>	ASH>	ASH>	ASH>	ASH>	ASH>	ASH>	ASH>	ASH>	S.G.	WT>
1	2	3	4	5	6	7	8	9	10	11	12
1.30	35.40	2.20	.27	.67	36.40	2.20	16.71	29.20	24.01	1.30	0.00
1.35	26.70	5.70	1.29	2.36	60.10	3.23	15.02	20.20	37.23	1.40	43.10
1.40	4.90	9.30	.26	2.82	65.00	4.33	14.56	25.20	41.20	1.50	15.00
1.45	4.30	15.30	.26	3.48	69.30	5.21	12.90	20.20	45.20	1.40	11.00
1.50	4.20	21.70	.27	4.34	73.50	5.91	12.03	24.20	49.10	1.70	8.31
1.60	4.50	27.70	1.20	6.15	80.00	7.44	11.23	20.20	56.16	1.80	7.00
1.70	4.50	36.00	1.26	7.80	84.50	9.23	9.58	15.20	61.78	1.90	0.00
1.80	3.80	47.30	1.40	9.60	88.30	10.87	7.73	11.20	66.49	2.00	0.00
1.90	3.20	54.50	1.74	11.34	91.50	12.40	6.04	8.20	71.00	2.10	0.00
9.00	3.50	71.00	6.24	17.38	100.00	17.38	0.00	0.00	0.00	2.21	0.00

PIRTLEY ENGINEERING  
11/08/77

4	17.0	4	13.0	4.0	12.0	2.0	12.0	4.0	11.4
1.1	11.0	2.0	8.0	7.0	8.0	3.0	0.0	6.0	17.0
1.9	7.5	0.0	7.0	0.0	7.0	4.0	7.0	2.0	17.8
3.1	6.4	1.0	6.1	0.1	6.1	5.0	6.1	10.0	12.2
4.1	5.7	1.2	5.3	0.0	5.3	6.0	5.3	12.0	18.6
5.5	4.7	1.5	4.0	11.2	4.0	2.0	4.0	0.0	0.0
7.4	3.6	1.0	3.1	12.4	3.1	10.0	3.1	0.0	0.0
9.5	2.7	2.2	2.3	13.2	2.3	12.0	2.3	0.0	0.0
10.9	2.0	2.5	1.7	14.2	1.7	14.0	1.7	0.0	0.0
14.2	0.0	2.5	0.0	0.0	0.0	175.8	0.0	0.0	0.0
PASS	1	10	17						
PASS	2	10	20						
PASS	3	9	03						
PASS	4	9	100						
PASS	5	5	20						

CLIENT: DENISON COAL LTD.

SAMPLE: ADIT NO. 77-2-2

LAB. NO.: 9080

DATE: July, 1977

SINK-FLOAT ANALYSIS					
28M x 65M (WT%=11.1)					
S.G.	WT. %	ASH%	CUMULATIVE		
			WT. %	ASH%	F.S.I.
-1.30	47.2	1.4	47.2	1.4	9
1.30-1.35	17.9	4.6	65.1	2.3	9
1.35-1.40	5.4	8.3	70.5	2.7	9
1.40-1.45	4.7	13.5	75.2	3.4	8 1/2
1.45-1.50	4.3	18.2	79.5	4.2	8
1.50-1.60	6.1	25.7	85.6	5.7	7 1/2
1.60-1.70	3.9	35.0	89.5	7.0	7 1/2
1.70-1.80	2.4	44.0	91.9	8.0	7 1/2
1.80-1.90	1.8	51.9	93.7	8.8	7 1/2
+1.90	6.3	71.0	100.0	12.7	7

FROTH FLOTATION TEST						
65M x 0 (P.D.=10%)						
PRODUCT	WT. %	ASH%	F.S.I.	CUMULATIVE		
				WT. %	ASH%	F.S.I.
STAGE 1	81.8	7.9	6 1/2	81.8	7.9	6 1/2
STAGE 11	6.9	21.3	2 1/2	88.7	8.9	6
TAILS	11.3	58.7	N.A.	100.0	14.6	5 1/2

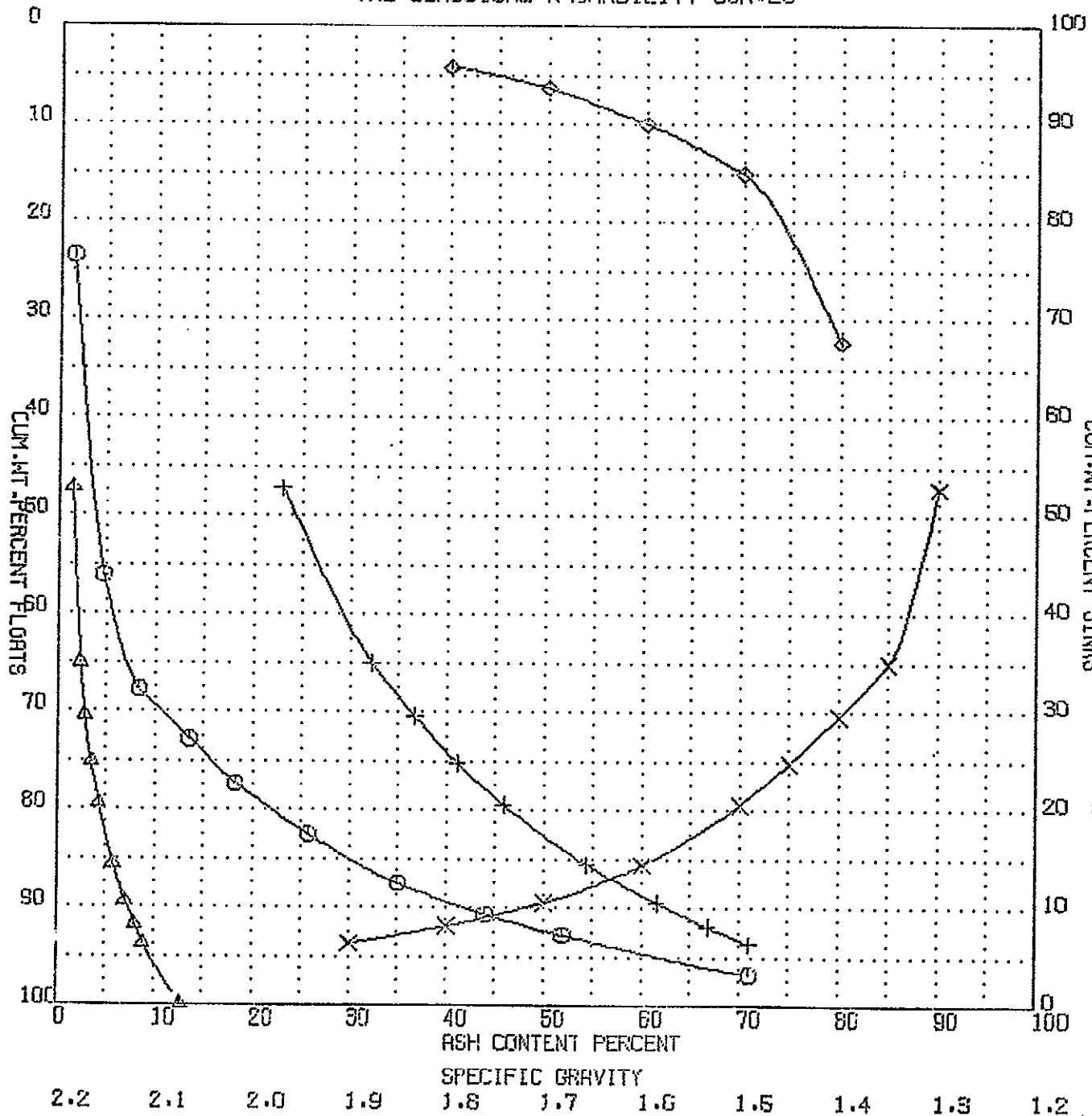
Reagent = 4:1=Kerosene:MIBC

Dosage = 0.48 lb/T

Conditioning time = 1 minute

Stage 1 and 11 = 1st & 2nd froth concentrate @ 1st & 2nd min.

N.A. = non-agglomerating



- PRIMARY CURVE
- △ CLEAN COAL CURVE
- + DISCARD CURVE
- × SPECIFIC GRAVITY-YIELD CURVE
- ◇ +/- 0.1 S.G. DISTRIBUTION CURVE

BIRTLEY ENGINEERING  
 11/08/77

DEFINITION: COAL LTO ADIT NO 77-2-2 LAYERS 2180 2200 V 65

--DIRECT--			--CUM FLOATS--			--CUM SINKS--			--0.1 DISTO		
S.G.	WT>	ASH>	WT>	ASH>	WT>	WT>	ASH>	WT>	ASH>	S.G.	WT>
1	2	3	4	5	6	7	8	9	10	11	12
1.30	47.20	1.40	.66	.66	47.20	1.40	12.09	53.50	22.29	1.30	0.00
1.35	17.90	4.60	.02	1.48	65.10	2.29	11.26	64.80	32.27	1.40	32.30
1.40	6.40	8.20	.45	1.93	70.50	2.74	10.81	69.50	36.45	1.50	15.10
1.45	4.70	13.50	.43	2.57	75.20	3.41	10.18	64.50	41.04	1.60	10.00
1.50	4.30	18.20	.78	3.35	79.50	4.21	9.40	60.50	45.03	1.70	6.30
1.60	6.10	25.70	1.57	4.92	85.60	5.74	7.83	54.20	54.36	1.80	4.20
1.70	2.90	35.00	1.57	6.28	89.50	7.32	6.46	50.50	61.55	1.90	0.00
1.80	2.40	44.00	1.56	7.34	91.90	7.99	5.41	45.10	66.76	2.00	0.00
1.90	1.80	51.00	.03	8.27	93.70	8.93	4.47	40.50	71.00	2.10	0.00
2.00	4.31	71.00	4.47	12.75	100.00	12.75	0.00	0.00	0.00	2.20	0.00

BIRLEY ENGINEERING  
11/28/77

1.3	15.2	2	50.4	4.6	10.4	2.0	10.4	4.0	13.5
1.9	8.2	5	7.0	6.5	7.0	2.0	7.0	6.0	17.0
1.7	0.4	6	5.0	7.2	5.0	4.0	5.0	3.0	12.0
2.7	5.4	7	5.0	8.2	5.0	5.0	5.0	10.0	19.7
3.6	4.5	8	4.1	9.2	4.1	6.0	4.1	12.0	19.2
5.1	3.5	11	2.9	10.0	2.9	8.0	5.0	0.0	0.0
7.0	2.5	14	2.1	12.2	2.1	10.0	2.1	0.0	0.0
8.2	1.0	16	1.4	13.4	1.4	12.0	1.4	8.0	0.0
10.4	1.4	19	1.3	14.2	1.3	14.0	1.3	0.0	0.0
14.2	.6	25	.0	0.0	.0	175.8	.0	0.0	0.0
BASS	1	10120							
BASS	2	10 22							
BASS	2	9 36							
BASS	4	9120							
BASS	5	5 80							

WASHABILITY RESULTS

ADIT 77-1-3

LAB. NO. 9344

CLIENT: DENISON COAL LTD.

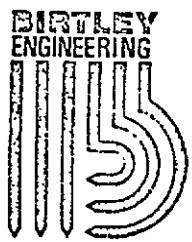
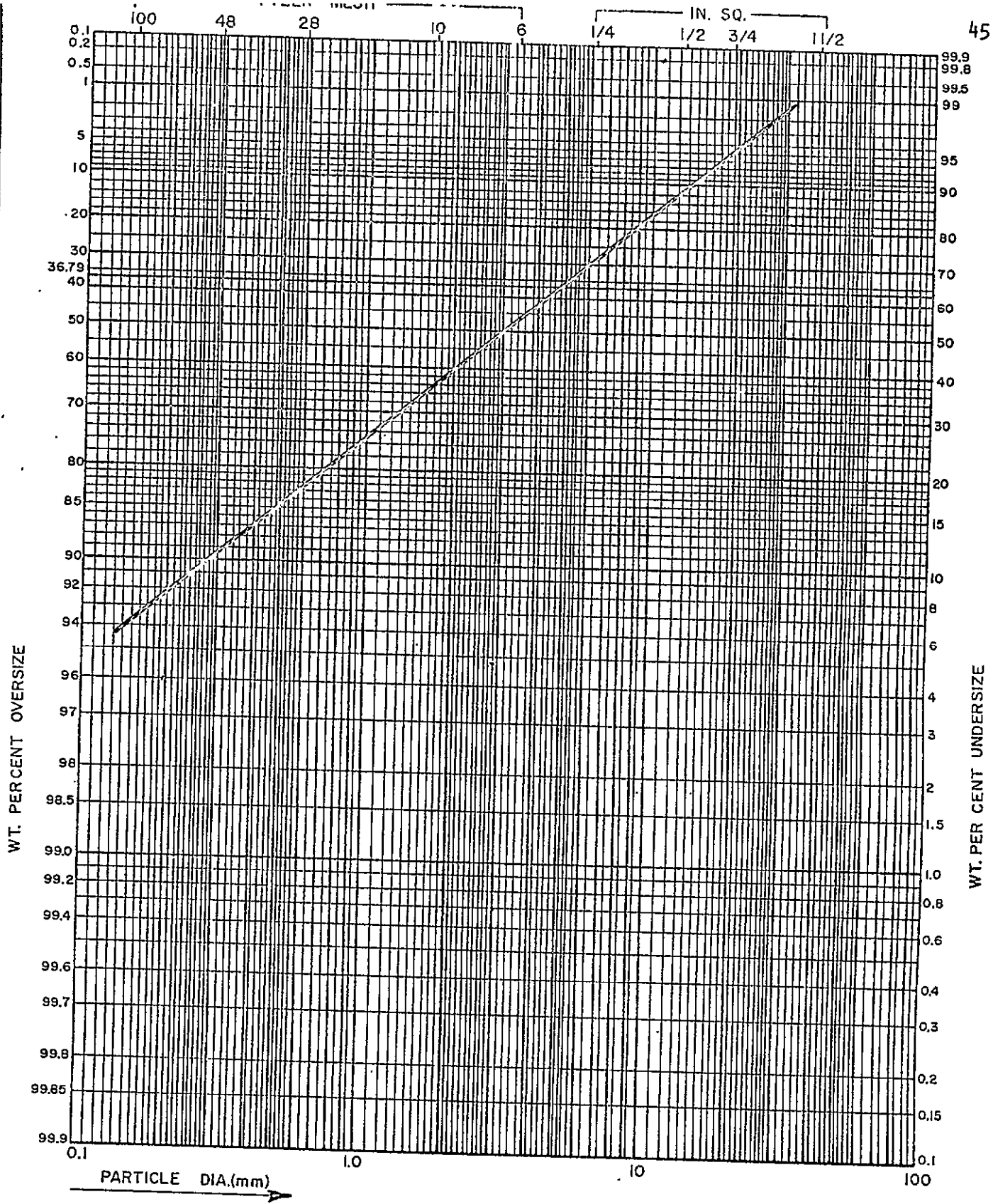
SAMPLE: ADIT 77-1-3

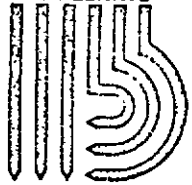

LAB. NO.: 9344

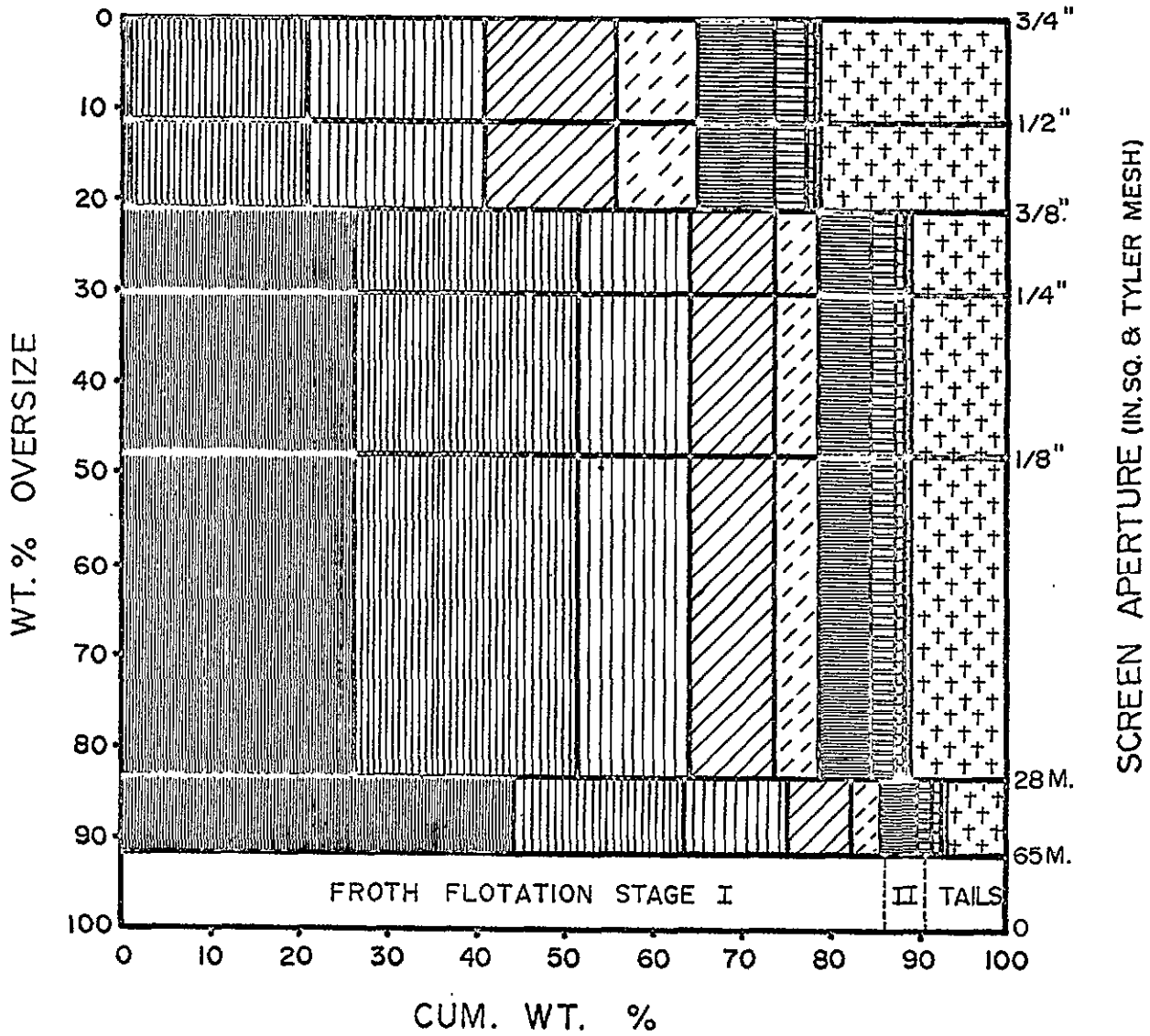
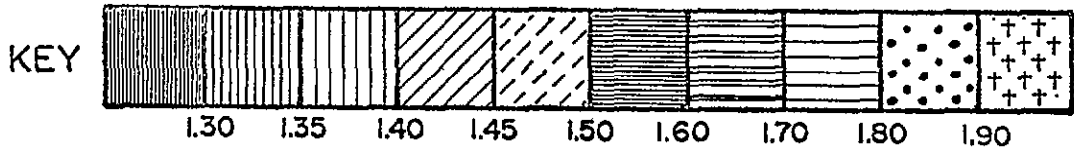
DATE: September, 1977

HEAD RAW ANALYSIS							
A.D.L.%	RM.% TOT.MOIST.%	ASH%	VM.%	FC.%	S%	F.S.I.	REMARKS
2.3	0.6	21.3	19.1	59.0	0.39	4	air dried basis
	2.9	20.8	18.7	57.6	0.38	--	as rec'd basis
		21.5	19.2	59.3	0.39	--	dry basis

SIZE & RAW ANALYSES										
SIZE FRACTION	WT.%	PROXIMATE				S%	F.S.I.	CUMULATIVE		
		RM.%	ASH%	VM.%	FC.%			W.T.%	ASH%	
3/4"x1/2"	11.4	1.3	31.1	17.5	50.1	0.29	1	11.4	31.1	adb
	11.4		31.5	17.7	50.8	0.29	--	11.4	31.5	db
1/2" x3/8"	10.0	1.3	28.1	17.6	52.4	0.31	1	21.4	30.0	adb
	10.0		29.1	17.8	53.1	0.31	--	21.4	30.4	db
3/8"x1/4"	8.6	1.3	27.3	17.8	53.6	0.37	1	30.0	29.2	adb
	8.6		27.7	18.0	54.3	0.37	--	30.0	29.6	db
1/4"x1/8"	18.0	1.2	20.5	18.7	59.6	0.43	2 1/2	48.0	25.9	adb
	18.0		20.7	18.9	60.4	0.44	--	48.0	26.3	db
1/8"x28M	35.4	1.3	16.5	20.4	61.8	0.46	7	83.4	21.9	adb
	35.4		16.7	20.7	62.6	0.47	--	83.4	22.2	db
28Mx65M	8.6	1.2	13.1	21.4	64.3	0.51	8	92.0	21.1	adb
	8.6		13.3	21.7	65.0	0.52	--	92.0	21.4	db
65Mx0	8.0	1.2	15.1	21.3	62.4	0.53	7 1/2	100.0	20.6	adb
	8.0		15.3	21.6	63.1	0.54	--	100.0	20.9	db



<b>BIRTLEY ENGINEERING</b> 	<b>Project:</b> ADIT NO. 77-1-3 BULK SAMPLE	
	<b>Client:</b> DENISON COAL LTD.	<b>Date:</b> SEPT., 1977
	<b>Title:</b> ROSIN RAMMLER SIZE DISTRIBUTION	
		<b>Drawn:</b> 



BIRTLEY ENGINEERING (Canada) LTD. CALGARY ALBERTA			
TITLE	SIZE AND DENSITY DISTRIBUTION DIAGRAM		
CLIENT	DENISON COAL LTD.		
SAMPLE	ADIT 77-1-3	DATE	SEPT., 1977
LAB NO.	9344	DRWN	<i>[Signature]</i>

Birtley Engineering  
 Subsidiary of Great West Steel Industries



CLIENT: DENISON COAL LTD.

SAMPLE: ADIT 77-1-3

LAB. NO.: 9344

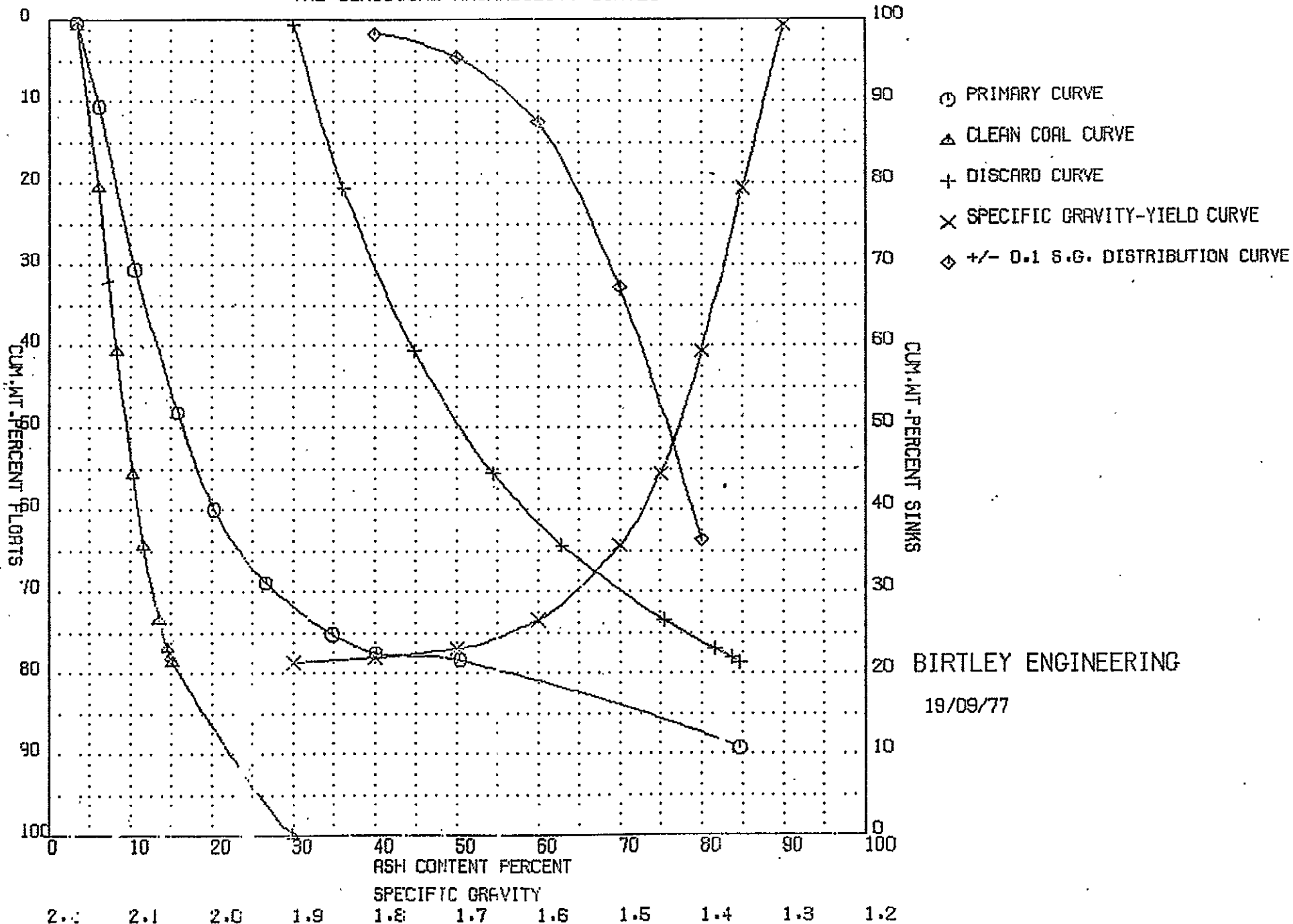
DATE: September, 1977

CALC. SIZE AND RAW ANALYSES, a.d.b.								
SIZE FRACTION	WT.%	ASH%	RM.%	VM.%	FC.%	F.S.I.	CUMULATIVE	
							WT.%	ASH%
3/4"x3/8"	21.4	30.0	1.3	17.5	51.2	1	21.4	30.0
3/8"x28M	62.0	19.2	1.3	19.5	60.0	5	83.4	21.9
28Mx65M	8.6	13.1	1.2	21.4	64.3	8	92.0	21.1
65Mx0	8.0	15.1	1.2	21.3	62.2	7 1/2	100.0	20.6
+ 3/4" *								

\* 23.7% crushed to pass 3/4" and included in above size analysis

SINK-FLOAT ANALYSES										
S.G.	3/4"x3/8" (WT%= 21.4)					3/8"x28M (WT%= 62.0)				
	WT.%	ASH%	CUMULATIVE			WT.%	ASH%	CUMULATIVE		
			WT.%	ASH%	F.S.I.			WT.%	ASH%	F.S.I.
-1.30	0.7	3.3	0.7	3.3	9	25.8	3.0	25.8	3.0	9
1.30-1.35	19.9	6.1	20.6	6.0	4	25.5	6.6	51.3	4.8	8 1/2
1.35-1.40	20.1	10.5	40.7	8.2	2	12.4	10.7	6.37	5.9	8
1.40-1.45	14.9	15.8	55.6	10.3	1 1/2	9.8	15.4	73.5	7.2	7 1/2
1.45-1.50	8.8	20.2	64.4	11.6	1 1/2	4.8	18.9	78.3	7.9	7
1.50-1.60	9.1	26.6	73.5	13.5	1 1/2	5.7	25.8	84.0	9.1	7
1.60-1.70	3.5	34.8	77.0	14.4	1 1/2	3.0	34.2	87.0	10.0	6 1/2
1.70-1.80	1.1	40.1	78.1	14.8	1 1/2	1.1	37.4	88.1	10.3	6
1.80-1.90	0.6	50.4	78.7	15.1	1 1/2	0.7	49.0	88.8	10.6	5 1/2
+1.90	21.3	84.6	100.0	29.9	1	11.2	82.8	100.0	18.7	5

DENISION COAL LTD ADIT 77-1-3 LAB NO 9344 3/4 X 3/8  
 THE CLASSICAL WASHABILITY CURVES

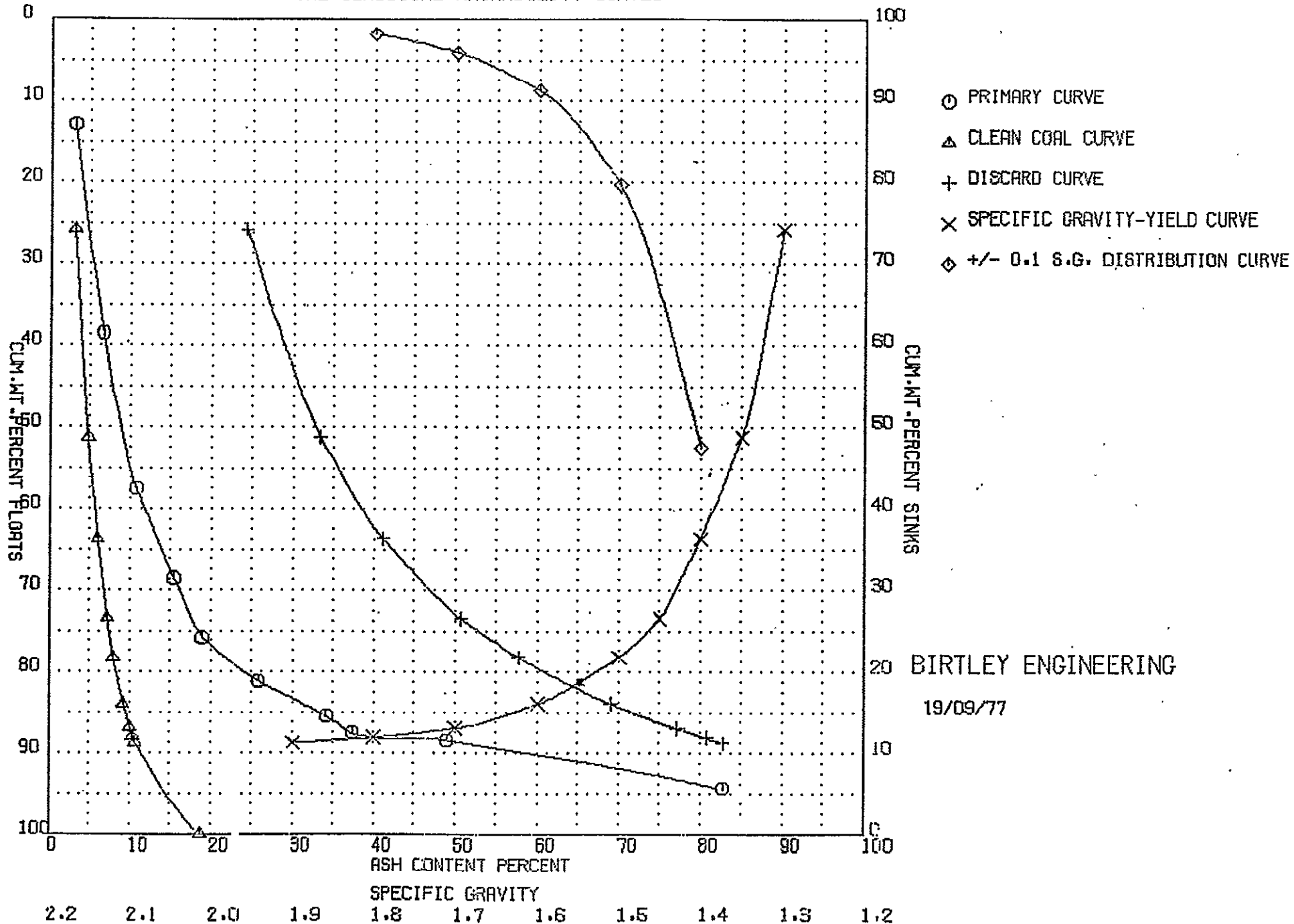


BIRTLEY ENGINEERING

19/09/77



DENISION COAL LTD ADIT 77-1-3 LAB NO 9344 3/8 X 28M  
 THE CLASSICAL WASHABILITY CURVES



BIRTLEY ENGINEERING  
 19/09/77

--DIRECT--

--CUM FLOATS--

--CUM SINKS-- +-.0.1 DISTO

S.G.	WT> CUM WT>				SINK WT				S.G.	WT>	
	WT>	ASH>	ASH TT	ASHTT	WT>	ASH>	ASH>	WT>			ASH>
1	2	3	4	5	6	7	8	9	10	11	12
1.30	25.80	3.00	.77	.77	25.80	3.00	17.95	74.20	24.19	1.30	0.00
1.35	25.50	6.60	1.48	2.46	51.30	4.79	16.27	48.70	33.40	1.40	52.50
1.40	12.40	10.70	1.23	3.78	63.70	5.94	14.94	36.20	41.16	1.50	20.30
1.45	0.80	15.40	1.51	5.29	73.50	7.20	13.43	26.50	50.69	1.60	8.70
1.50	4.80	18.90	.01	6.20	78.30	7.92	12.52	21.70	57.72	1.70	4.10
1.60	5.70	25.80	1.47	7.67	84.00	9.13	11.05	16.00	69.09	1.80	1.80
1.70	3.00	34.20	1.03	8.70	87.00	10.00	10.03	13.50	77.14	1.90	0.00
1.80	1.10	37.40	.41	9.11	88.10	10.34	9.62	11.00	80.81	2.00	0.00
1.90	.70	49.00	.24	9.45	88.80	10.64	9.27	11.20	82.80	2.10	0.00
2.00	11.20	82.80	9.27	18.72	100.00	18.72	0.00	0.00	0.00	2.20	0.00

BIRTLEY ENGINEERING  
19/09/77

.6	17.4	.6	14.8	4.8	14.8	2.0	14.8	4.0	9.5
1.3	12.3	1.0	9.7	6.7	9.7	3.0	9.7	6.0	15.9
2.1	8.5	1.2	7.3	8.2	7.3	4.0	7.3	8.0	18.3
3.1	6.3	1.4	5.3	10.1	5.3	5.0	5.3	10.0	19.2
3.8	4.8	1.6	4.3	11.5	4.3	6.0	4.3	12.0	19.6
5.2	3.8	1.8	3.2	13.8	3.2	8.0	3.2	0.0	0.0
6.8	2.9	2.0	2.6	15.4	2.6	10.0	2.6	0.0	0.0
7.5	2.5	2.1	2.4	16.2	2.4	12.0	2.4	0.0	0.0
9.8	2.3	2.1	2.2	16.6	2.2	14.0	2.2	0.0	0.0
16.6	1.1	3.7	0.0	0.0	0.0	17.5	8.0	0.0	0.0
PASS	1	10159							
PASS	2	10 31							
PASS	3	9117							
PASS	4	9120							
PASS	5	5 80							

CLIENT: DENISON COAL LTD.

SAMPLE: ADIT NO. 77-1-3

LAB. NO.: 9344

DATE: September, 1977

SINK-FLOAT ANALYSIS					
28M x 65M (WT%= 8.6)					
S.G.	WT.%	ASH%	CUMULATIVE		
			WT.%	ASH%	F.S.I.
-1.30	44.0	1.7	44.0	1.7	9
1.30-1.35	19.2	5.7	63.2	2.9	9
1.35-1.40	12.0	9.7	75.2	4.0	8 1/2
1.40-1.45	6.6	13.4	81.8	4.8	8 1/2
1.45-1.50	3.6	18.0	85.4	5.3	8 1/2
1.50-1.60	4.1	25.4	89.5	6.2	8
1.60-1.70	1.9	34.9	91.4	6.8	8
1.70-1.80	1.3	43.1	92.7	7.3	8
1.80-1.90	0.7	49.4	93.4	7.7	8
+1.90	0.6	78.6	100.0	12.3	8

FROTH FLOTATION TEST						
65M x 0 (P.D.=10%)						
PRODUCT	WT.%	ASH%	F.S.I.	CUMULATIVE		
				WT.%	ASH%	F.S.I.
STAGE I	85.9	8.7		85.9	8.7	8
STAGE II	4.6	20.9		90.5	9.3	8
TAILS	9.5	66.2		100.0	14.7	7 1/2

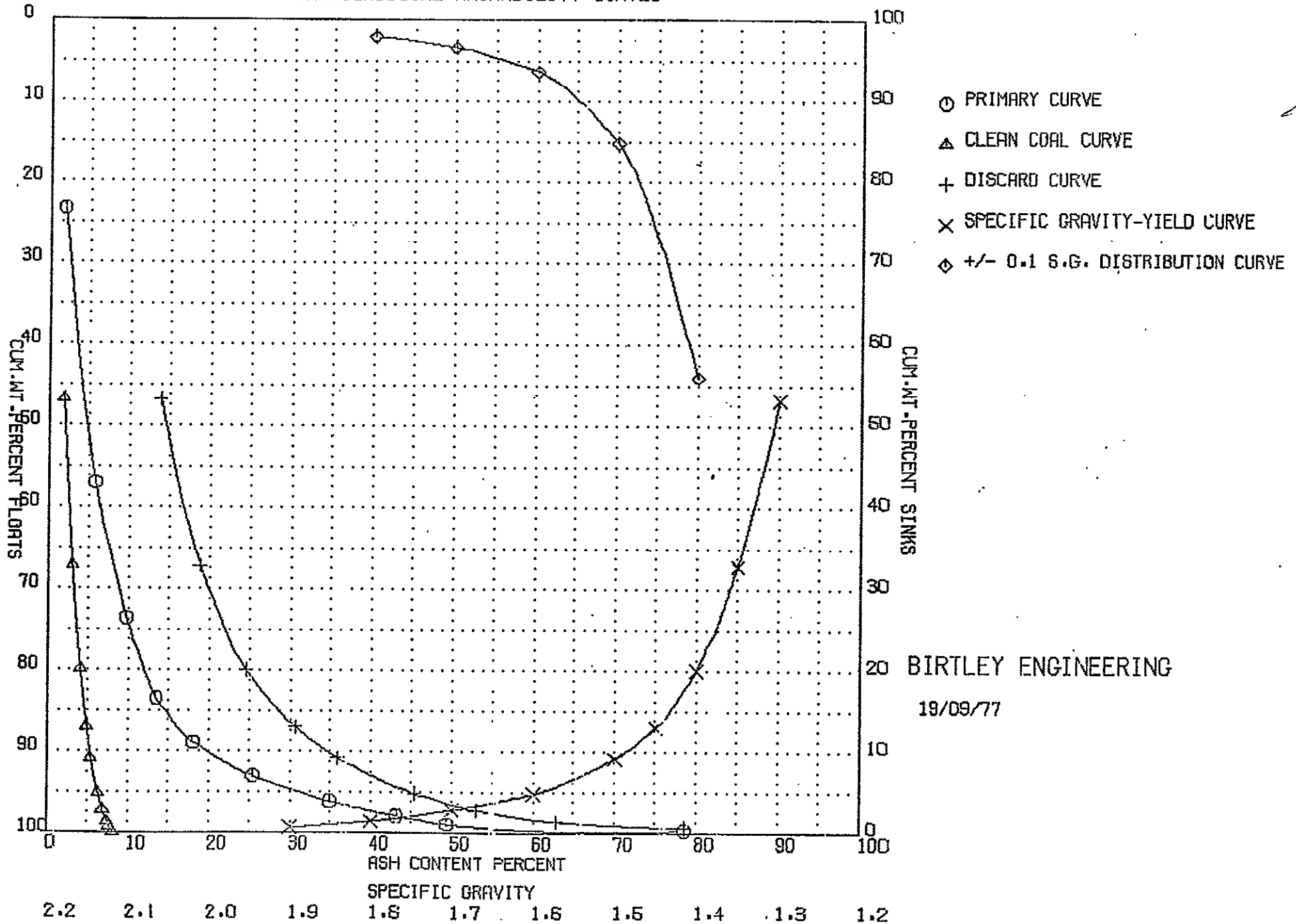
Reagent = 4:1=Kerosene:MIBC

Dosage = 0.48 lb/T

Conditioning time = 1 minute

Stage I and II = 1st &amp; 2nd froth concentrate @ 1st &amp; 2nd min.

DENISION COAL LTD ADIT 77-1-3 LAB NO 9344 28M X 65M  
 THE CLASSICAL WASHABILITY CURVES



BIRTLEY ENGINEERING

19/09/77



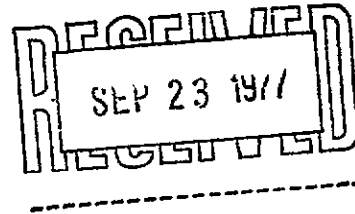




# BIRTLEY ENGINEERING (CANADA) LTD.

Subsidiary of Great West Steel Industries Ltd.

505 - 50th AVE. S.E. CALGARY, ALBERTA T2G 2B4 PHONE 403 - 253-8273



A REPORT TO DENISON COAL LTD.  
ON THE RESULTS OF WASHABILITY TESTS  
AND PILOT PLANT WASHING OF BULK SAMPLES  
FROM ADITS 77-2-4, 77-4-5, AND 77-1-3  
OF THE SAXON PROJECT.

CS-0108.....PART 2

September, 1977

Submitted by:

Frank J. Horvat  
Manager

BIRTLEY ENGINEERING (CANADA) LTD.  
Coal Science & Minerals Testing

# TABLE OF CONTENTS

## INTRODUCTION

See Report CS-0108, Part 1

## RESULTS

### ADIT 77-2-4

WASHABILITY RESULTS	Pages	1 - 11
PILOT PLANT WASHING RESULTS		12 - 22

### ADIT 77-4-5

WASHABILITY RESULTS		23 - 33
PILOT PLANT WASHING RESULTS		34 - 43

### ADIT 77-1-3

WASHABILITY RESULTS		44 - 54
PILOT PLANT WASHING RESULTS		55 - 64

WASHABILITY RESULTS

ADIT 77-2-4

LAB. NO. 9293

CLIENT: DENISON COAL LTD,

SAMPLE: ADIT 77-2-4

LAB. NO.: 9293

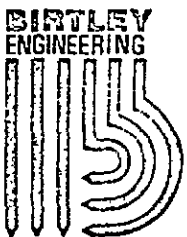
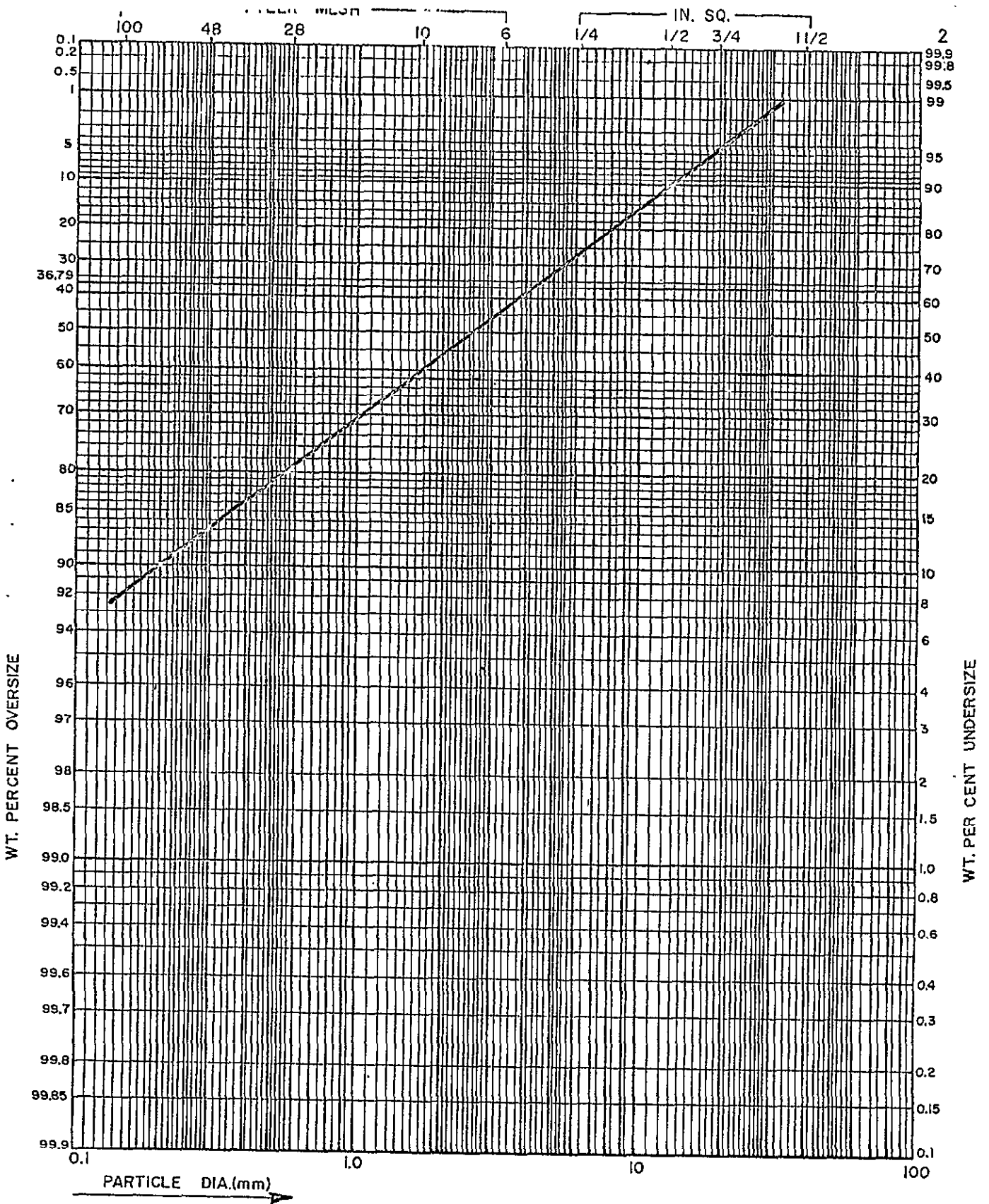
DATE: August, 1977

HEAD RAW ANALYSIS

A.D.L.%	RM.% TOT.MOIST.%	ASH%	VM.%	FC.%	S%	F.S.I.	REMARKS
2.2	1.7	8.5	22.1	67.7	0.35	7 1/2	air dried basis
	3.9	8.3	21.6	66.2	0.34	--	as rec'd basis
		8.6	22.5	68.9	0.36	--	dry basis

SIZE & RAW ANALYSES

SIZE FRACTION	WT.%	PROXIMATE				S%	F.S.I.	CUMULATIVE		
		RM.%	ASH%	VM.%	FC.%			W.T.%	ASH%	
3/4" x 1/2"	10.6	1.6	9.9	20.7	67.8	0.36	4 1/2	10.6	9.9	adb
	10.7		10.1	21.0	68.9	0.37	--	10.7	10.1	db
1/2" x 3/8"	8.8	1.8	10.3	21.6	66.3	0.44	5	19.4	10.1	adb
	8.7		10.5	22.0	67.5	0.45	--	19.4	10.3	db
3/8" x 1/4"	7.5	1.8	9.1	21.5	67.6	0.35	5 1/2	26.9	9.8	adb
	7.5		9.3	21.9	68.8	0.36	--	26.9	10.0	db
1/4" x 1/8"	17.3	1.9	9.2	21.7	67.2	0.35	5 1/2	44.2	9.6	adb
	17.3		9.4	22.1	68.5	0.36	--	44.2	9.8	db
1/8" x 28M	35.5	0.7	7.3	22.1	69.9	0.36	7 1/2	79.7	8.6	adb
	35.6		7.4	22.3	70.3	0.36	--	79.8	8.7	db
28M x 65M	11.1	1.2	6.8	22.7	69.3	0.40	8	90.8	8.3	adb
	11.0		6.9	23.0	70.1	0.40	--	90.8	8.5	db
65M x 0	9.2	1.1	8.8	22.8	67.3	0.44	7 1/2	100.0	8.4	adb
	9.2		8.9	23.1	68.0	0.44	--	100.0	8.5	db



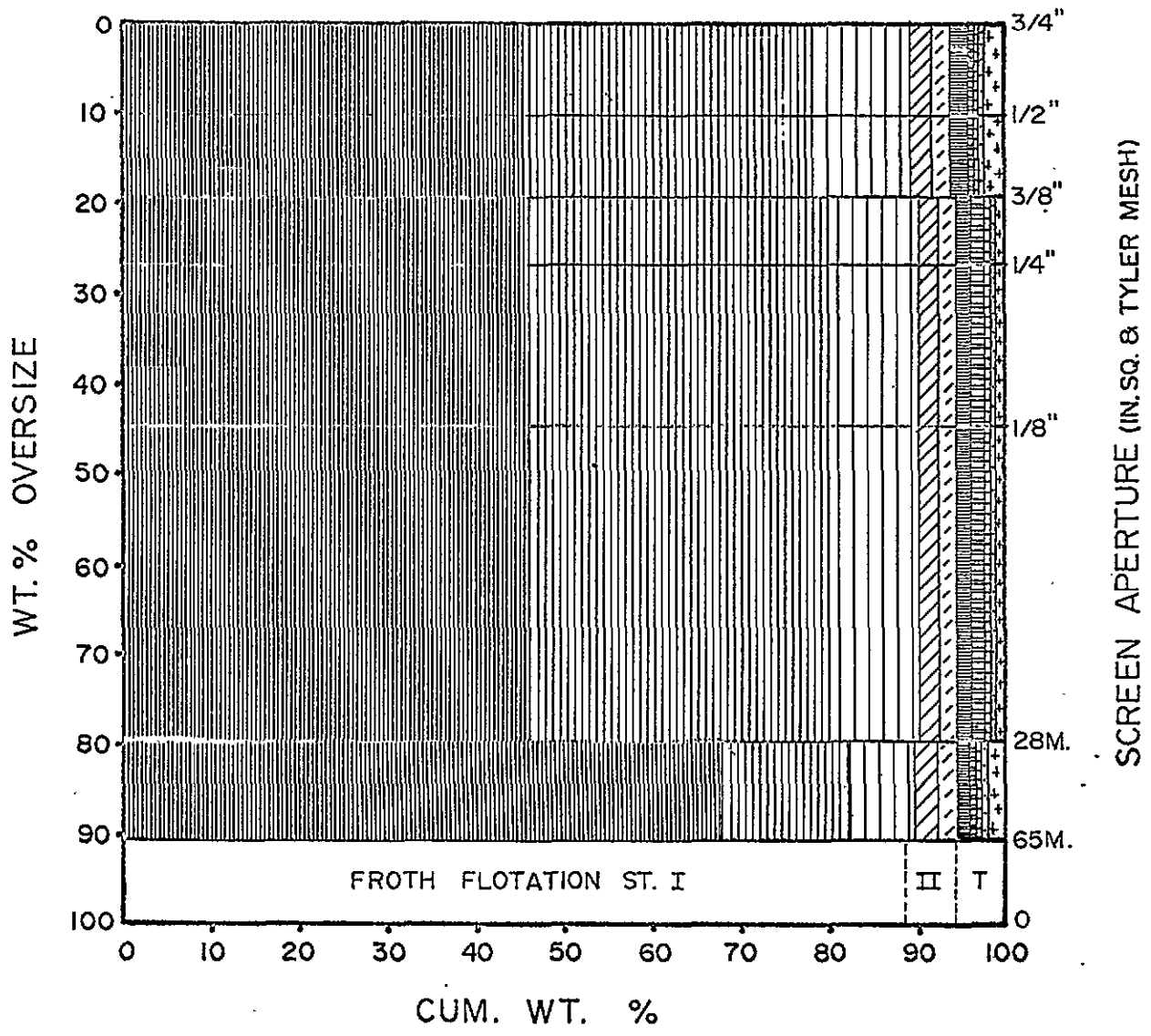
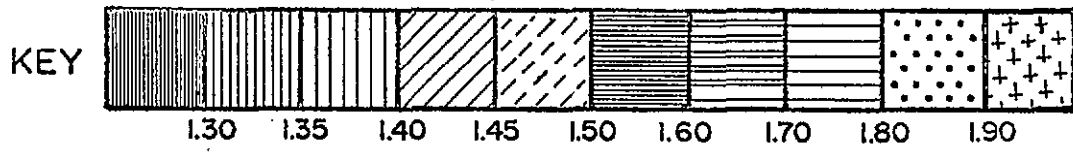
Project: SAXON .ADIT 77-2-4

Client: DENISON COAL LTD.

Title: ROSIN RAMMLER SIZE DISTRIBUTION

Date: AUG., 1977

Drawn: *J.*



BIRTLEY ENGINEERING (Canada) LTD.			
CALGARY		ALBERTA	
TITLE	SIZE AND DENSITY DISTRIBUTION DIAGRAM		
CLIENT	DENISON COAL LTD.		
SAMPLE	ADIT 77-2-4	DATE	AUG, 1977
LAB NO.	9293	DRWN	A.

Birtley Engineering  
Subsidiary of Great West Steel Industries

CLIENT: DENISON COAL LTD.

SAMPLE: ADIT 77-2-4

LAB. NO.: 9293

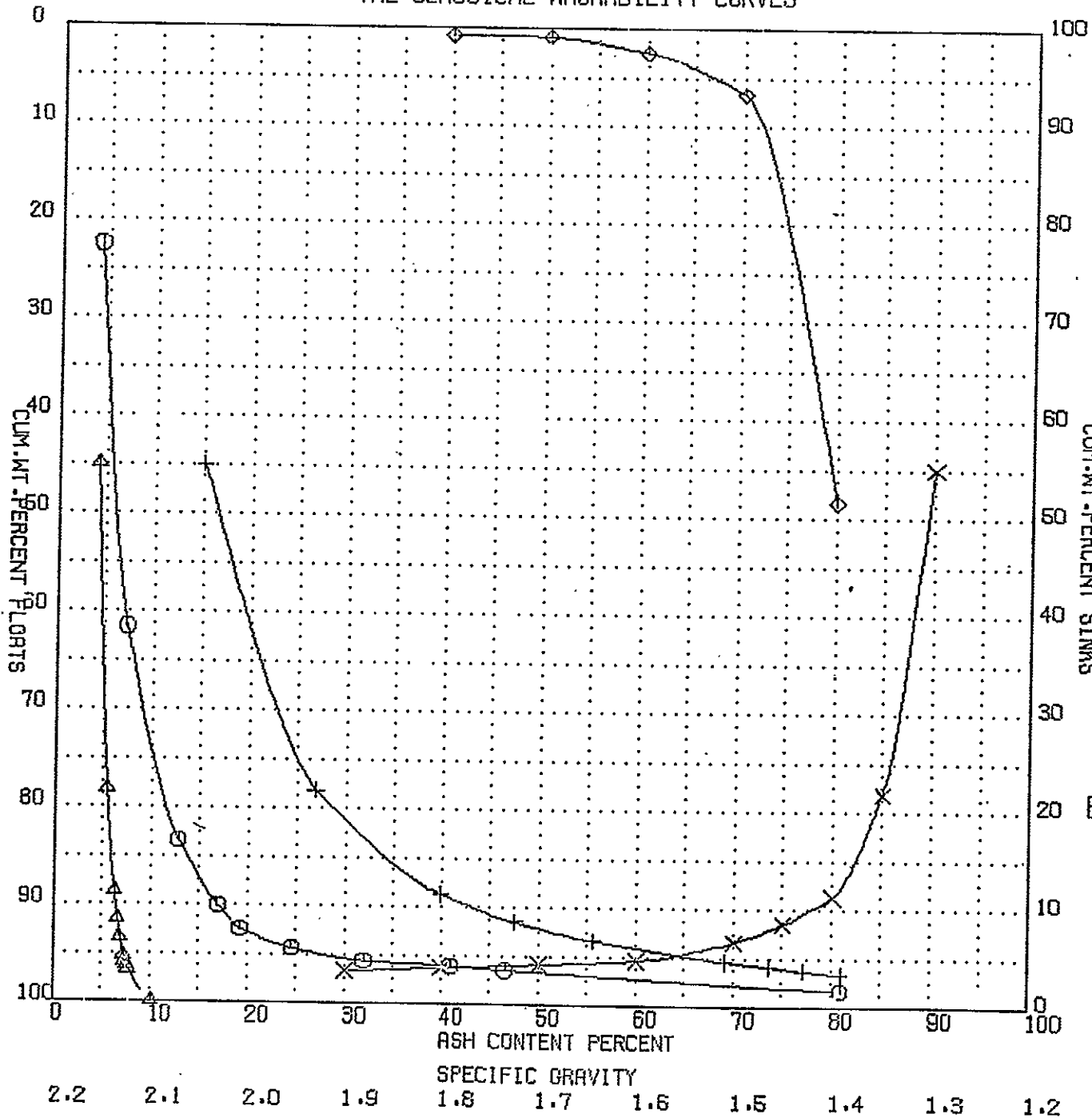
DATE: August, 1977

CALC. SIZE AND RAW ANALYSES, a.d.b.								
SIZE FRACTION	WT.%	ASH%	RM.%	VM.%	FC.%	F.S.I.	CUMULATIVE	
							WT.%	ASH%
3/4"x3/8"	19.4	10.1	1.7	21.1	67.1	5	19.4	10.1
3/8"x28M	60.3	8.1	1.2	21.9	68.8	6	79.7	8.6
28Mx65M	11.1	6.8	1.2	22.7	69.3	8	90.8	8.4
65Mx0	9.2	8.8	1.1	22.8	67.3	7 1/2	100.0	8.4
+ 3/4"*								

\* 20.3% crushed to pass 3/4" and included in above size analysis

SINK-FLOAT ANALYSES										
S.G.	3/4"x3/8" (WT%= 19.4)					3/8"x28M (WT%= 60.3)				
	WT.%	ASH%	CUMULATIVE			WT.%	ASH%	CUMULATIVE		
			WT.%	ASH%	F.S.I.			WT.%	ASH%	F.S.I.
-1.30	45.0	4.1	45.0	4.1	8	46.0	3.2	46.0	3.2	8
1.30-1.35	33.2	7.2	78.2	5.4	7 1/2	33.9	5.9	79.9	4.3	7 1/2
1.35-1.40	10.5	12.8	88.7	6.3	7	9.7	10.7	89.6	5.0	7 1/2
1.40-1.45	2.8	16.9	91.5	6.6	7	2.7	14.9	92.3	5.3	7 1/2
1.45-1.50	1.9	19.2	93.4	6.9	7	1.9	19.0	94.2	5.6	7 1/2
1.50-1.60	2.0	24.5	95.4	7.2	7	2.0	23.4	96.2	6.0	7 1/2
1.60-1.70	0.5	31.9	95.9	7.4	6 1/2	1.1	29.3	97.3	6.2	7
1.70-1.80	0.4	40.9	96.3	7.5	6 1/2	0.6	37.9	97.9	6.4	7
1.80-1.90	0.4	46.5	96.7	7.7	6	0.4	44.6	98.3	6.6	6 1/2
+1.90	3.3	80.9	100.0	10.1	5	1.7	79.7	100.0	7.8	6

DENISON COAL LTD ADIT 77-2-4 LAB NO 9293 3/4 X 3/8  
 THE CLASSICAL WASHABILITY CURVES



- PRIMARY CURVE
- △ CLEAN COAL CURVE
- + DISCARD CURVE
- × SPECIFIC GRAVITY-YIELD CURVE
- ◇ +/- 0.1 S.G. DISTRIBUTION CURVE

BIRTLEY ENGINEERING

19/09/77



-- DIRECT --

-- CUM FLOATS --

-- CUM SINKS --

-- 4-0.1 DISTO

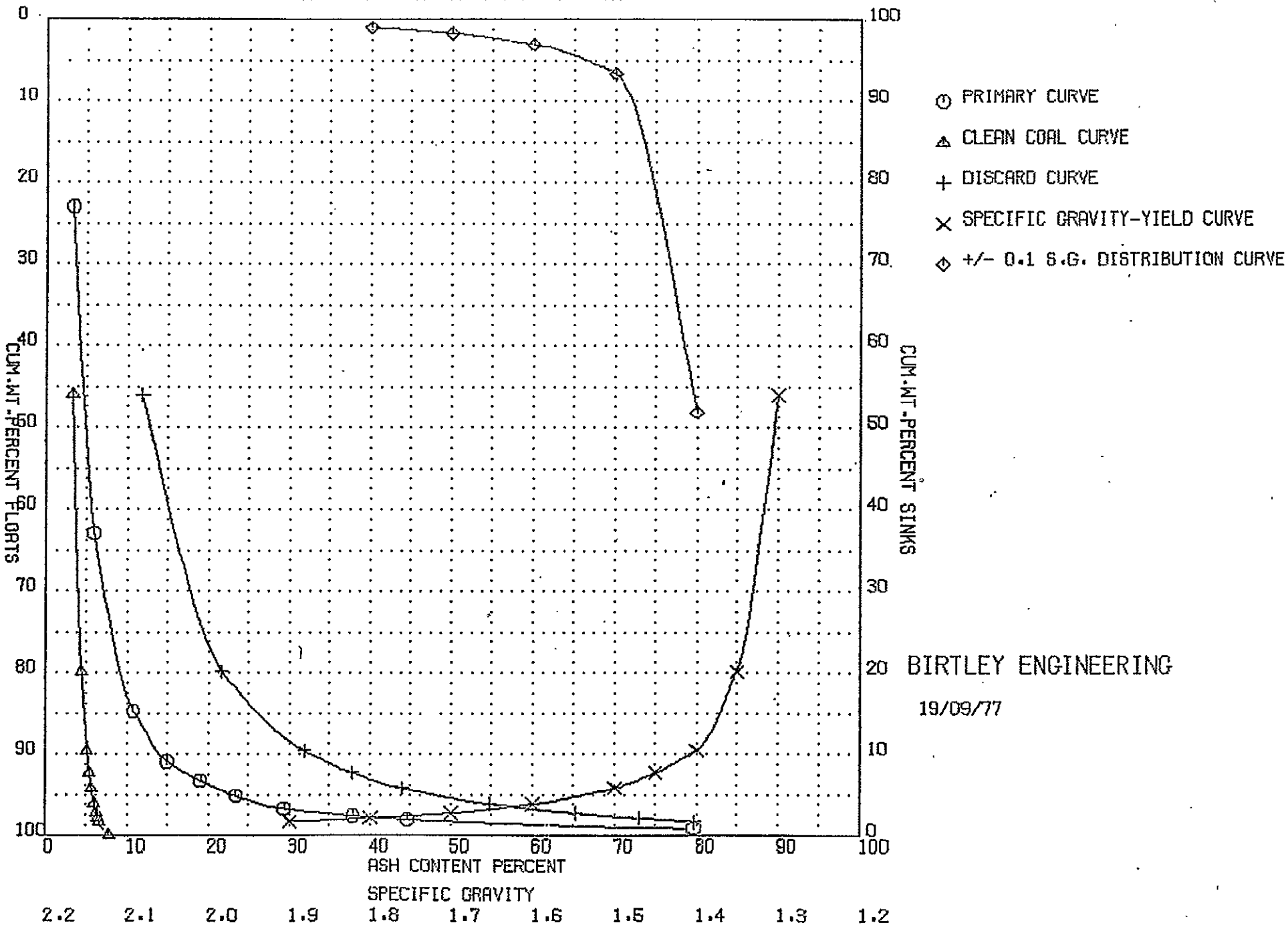
S.G.	WT> CUM WT>					SINK WT					S.G.	WT>
	WT>	ASH>	ASH TT	ASH TT	WT>	ASH>	ASH>	WT>	ASH>			
1	2	3	4	5	6	7	8	9	10	11	12	
1.30	45.00	4.10	1.25	1.85	65.00	4.10	8.24	55.00	14.98	1.40	0.00	
1.35	33.20	7.20	2.29	6.24	70.20	5.42	5.85	21.90	26.34	1.40	43.40	
1.40	19.50	12.80	1.24	5.58	88.70	6.29	4.51	11.20	39.88	1.50	6.70	
1.45	2.80	16.90	.27	6.05	91.50	6.51	4.03	8.50	47.45	1.60	2.50	
1.50	1.90	19.20	.26	6.42	93.40	6.87	3.67	6.40	55.59	1.70	.90	
1.60	2.00	24.50	.29	6.91	95.40	7.24	3.18	4.20	69.10	1.80	.80	
1.70	.50	31.90	.16	7.07	95.90	7.37	3.02	4.10	73.64	1.90	0.00	
1.80	.40	40.90	.16	7.23	96.30	7.51	2.86	3.70	77.18	2.00	0.00	
1.90	.40	46.50	.19	7.42	96.70	7.67	2.67	3.20	80.90	2.10	0.00	
9.99	5.30	80.90	2.27	10.09	100.00	10.09	0.00	.00	0.00	2.20	0.00	

HIRTLEY ENGINEERING  
19/09/77

.4	15.5	.9	11.6	3.6	11.0	2.0	11.0	4.0	10.3
1.4	7.7	1.1	4.4	5.4	4.4	3.0	4.4	6.0	18.7
2.6	3.3	1.3	2.3	8.0	2.3	4.0	2.3	8.0	19.5
3.4	2.0	1.3	1.7	9.5	1.7	5.0	1.7	10.0	19.8
3.8	1.5	1.4	1.3	11.1	1.3	6.0	1.3	12.0	19.8
4.9	1.1	1.4	.9	13.0	.9	8.0	.9	0.0	0.0
6.4	.9	1.5	.8	14.7	.8	10.0	.8	0.0	0.0
8.2	.8	1.5	.7	15.4	.7	12.0	.7	0.0	0.0
9.3	.7	1.5	.7	16.2	.7	14.0	.7	0.0	0.0
16.2	.3	2.0	.0	0.0	.0	175.8	.0	0.0	0.0

- PASS 1 19153
- PASS 2 10 11
- PASS 3 9131
- PASS 4 9120
- PASS 5 5 20

DENISON COAL LTD ADIT 77-2-4 LAB NO 9293 3/8 X 28M  
 THE CLASSICAL WASHABILITY CURVES



BIRTLEY ENGINEERING

19/09/77

--DIRECT--

--CUM FLOATS--

--CUM SINKS-- +0.1 DISTO

S.G.	WT>		CUM WT>		SINK WT		WT>		ASH>		S.G.	WT>
	WT>	ASH>	ASH	TT	ASH	WT>	ASH>	ASH>	WT>	ASH>		
1	2	3	4	5	6	7	8	9	10	11	12	
1.30	46.00	3.20	1.47	1.47	46.00	3.20	6.35	54.00	11.76	1.30	0.00	
1.35	33.90	5.90	2.00	3.47	79.90	4.35	4.35	20.10	21.65	1.40	48.20	
1.40	9.70	10.70	1.44	4.51	89.60	5.03	3.31	10.40	31.87	1.50	6.60	
1.45	2.70	14.90	1.40	4.91	92.30	5.32	2.91	7.70	37.82	1.60	3.10	
1.50	1.90	19.00	1.36	5.27	94.20	5.60	2.55	5.80	43.98	1.70	1.70	
1.60	2.00	23.40	1.47	5.74	96.20	5.97	2.08	3.00	54.82	1.80	1.00	
1.70	1.10	29.30	1.32	6.06	97.30	6.23	1.76	2.70	65.21	1.90	0.00	
1.80	1.60	37.90	1.23	6.29	97.90	6.43	1.53	2.10	73.01	2.00	0.00	
1.90	1.40	44.60	1.18	6.47	98.30	6.58	1.35	1.70	79.70	2.10	0.00	
2.00	1.70	79.70	1.05	7.82	100.00	7.82	0.00	0.00	0.00	2.20	0.00	

BIRTLEY ENGINEERING

19/09/77

1.6	15.4	1.4	10.8	2.4	10.8	2.0	18.2	4.0	10.4
1.2	7.4	1.9	4.0	4.3	4.0	3.0	4.0	6.0	18.7
2.1	3.1	1.0	2.1	6.4	2.1	4.0	2.1	8.0	19.4
3.0	1.8	1.1	1.5	7.6	1.5	5.0	1.5	10.0	19.7
3.8	1.4	1.1	1.2	8.8	1.2	6.0	1.2	12.0	19.8
4.7	1.0	1.2	.8	11.0	.8	8.0	.8	0.0	0.0
5.9	.7	1.2	.5	13.0	.5	10.0	.5	0.0	0.0
7.6	.5	1.3	.4	14.6	.4	12.0	.4	0.0	0.0
8.9	.4	1.3	.3	15.9	.3	14.0	.3	0.0	0.0
15.9	.2	1.6	.0	0.0	.0	175.8	.0	0.0	0.0

PASS 1 10152  
 PASS 2 10 9  
 PASS 3 9135  
 PASS 4 9120  
 PASS 5 5 40

CLIENT: DENISON COAL LTD.

SAMPLE: ADIT 77-2-4

LAB. NO.: 9293

DATE: August, 1977

SINK-FLOAT ANALYSIS					
28M x 65M (WT%=11.1)					
S.G.	WT.%	ASH%	CUMULATIVE		
			WT.%	ASH%	F.S.I.
-1.30	67.6	1.7	67.6	1.7	9
1.30-1.35	14.5	5.8	82.1	2.4	8 1/2
1.35-1.40	7.0	10.0	89.1	3.0	8 1/2
1.40-1.45	3.1	13.7	92.2	3.4	8
1.45-1.50	2.4	16.8	94.6	3.7	8
1.50-1.60	1.5	24.5	96.1	4.0	8
1.60-1.70	0.7	33.6	96.8	4.2	8
1.70-1.80	0.3	42.2	97.1	4.3	8
1.80-1.90	0.2	50.5	97.3	4.4	8
+1.90	2.7	72.1	100.0	6.2	8

FROTH FLOTATION TEST						
65M x 0 (P.D.=10%)						
PRODUCT	WT.%	ASH%	F.S.I.	CUMULATIVE		
				WT.%	ASH%	F.S.I.
STAGE 1	88.4	4.8		88.4	4.8	8
STAGE 11	5.4	14.3		93.8	5.3	7 1/2
TAILS	6.2	58.1		100.0	8.6	7 1/2

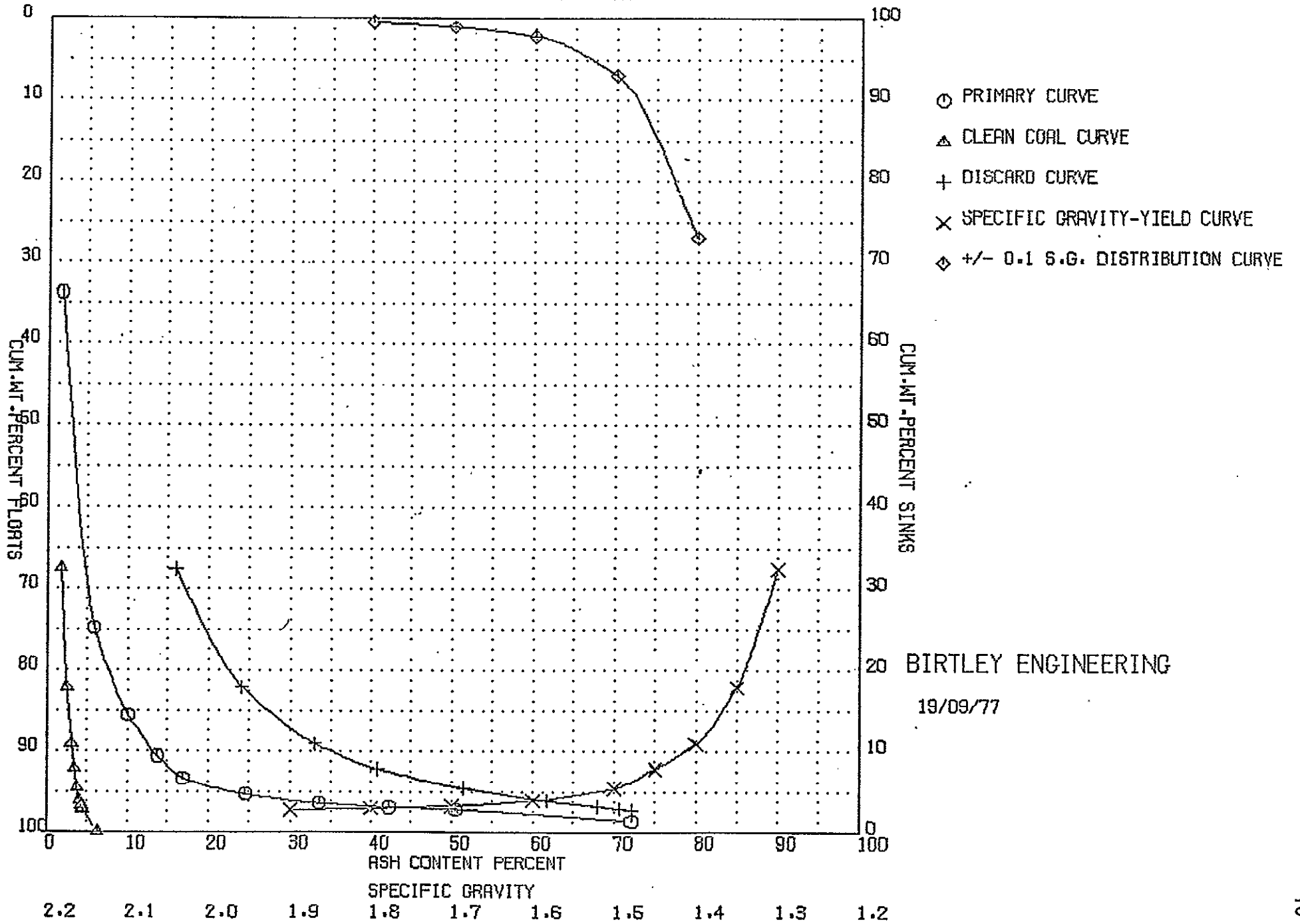
Reagent = 4:1=Kerosene:MIBC

Dosage = 0.48 lb/T

Conditioning time = 1 minute

Stage 1 and 11 = 1st &amp; 2nd froth concentrate @ 1st &amp; 2nd min.

DENISION COAL LTD ADIT 77-2-4 LAB NO 9293 28M X 65M  
 THE CLASSICAL WASHABILITY CURVES



BIRTLEY ENGINEERING  
 19/09/77



WASHABILITY RESULTS

ADIT 77-4-5

LAB. No. 9315

CLIENT: DENISON COAL LTD.

SAMPLE: ADIT 77-4-5

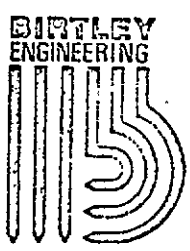
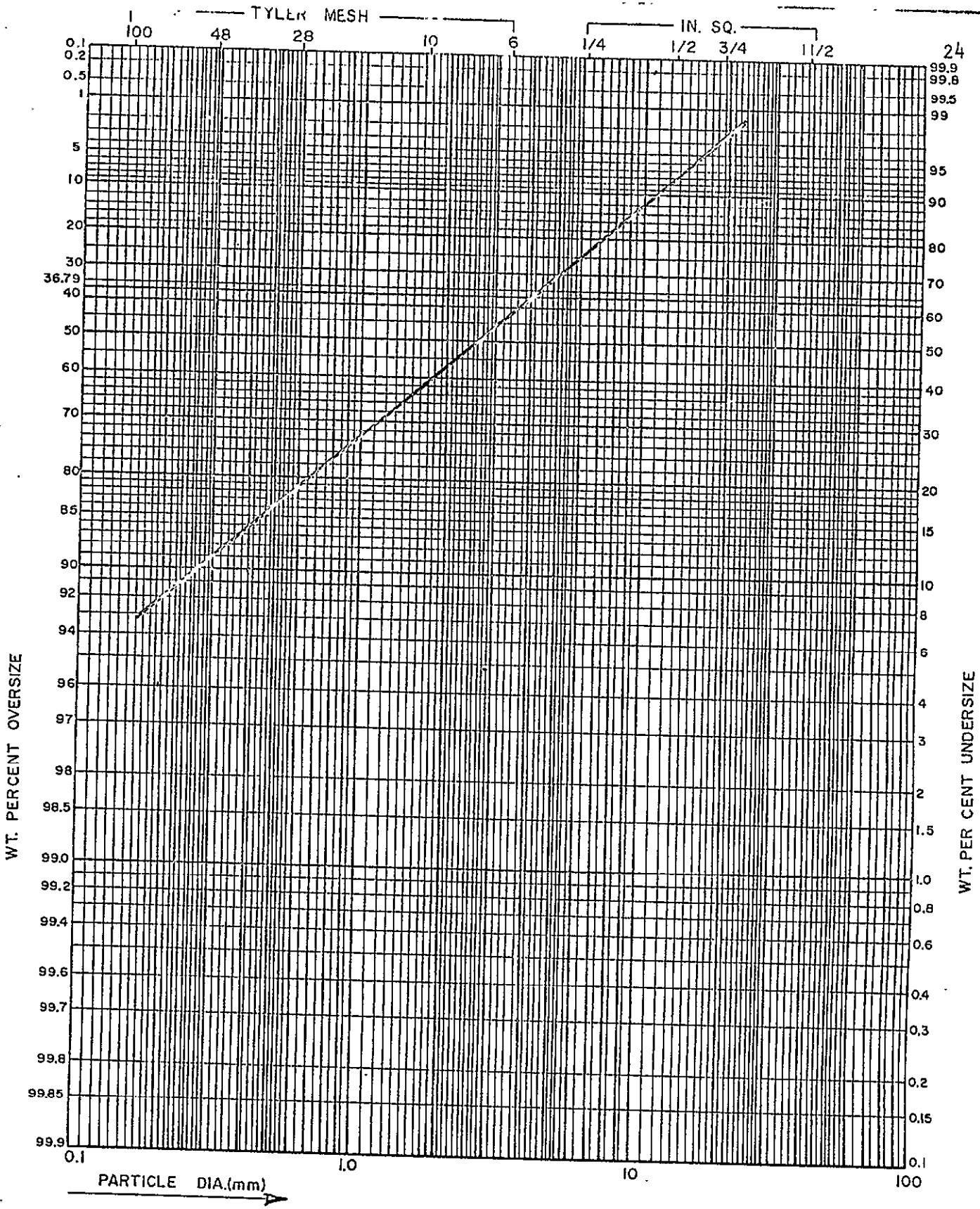
LAB. NO.: 9315

DATE: August, 1977

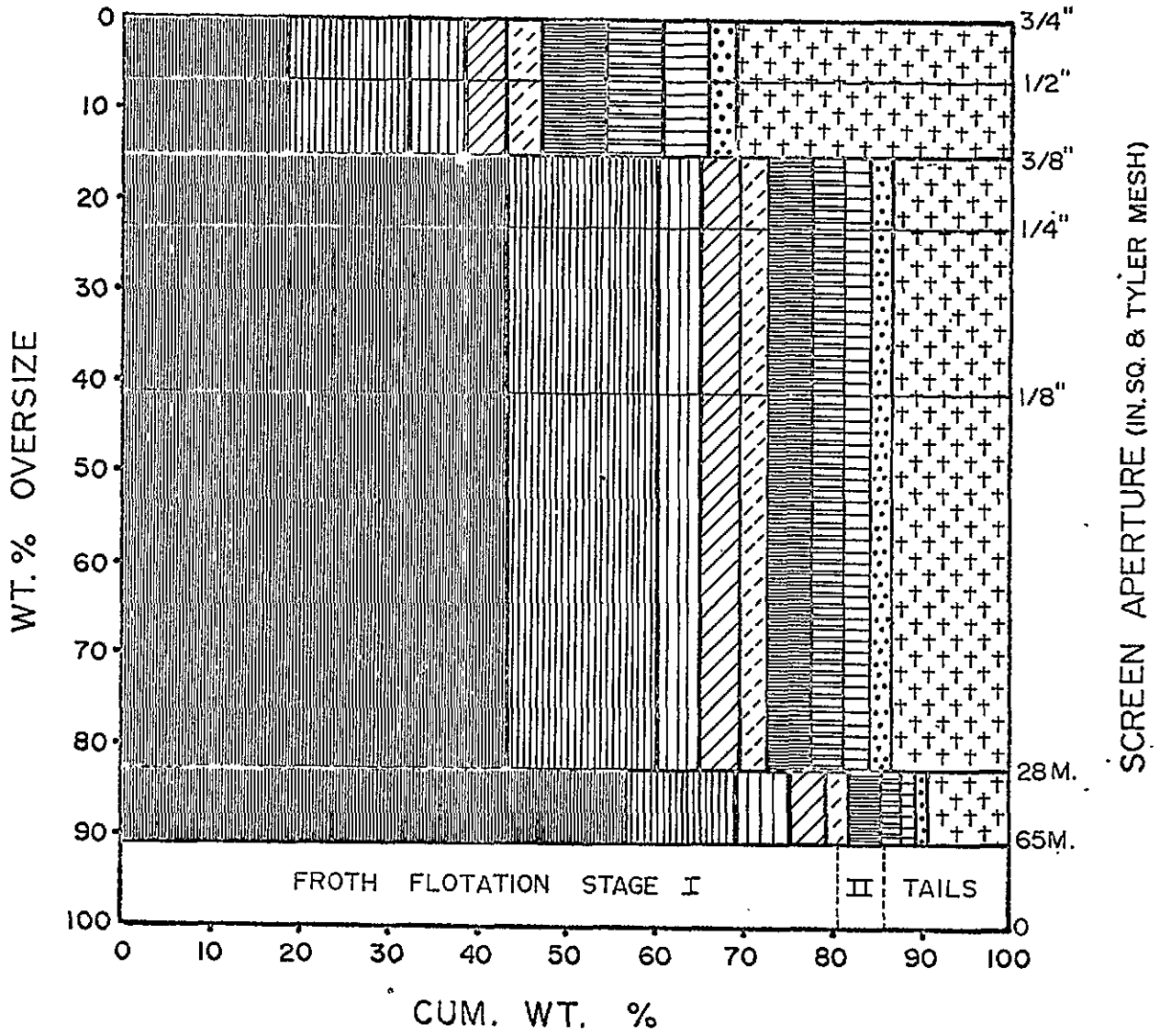
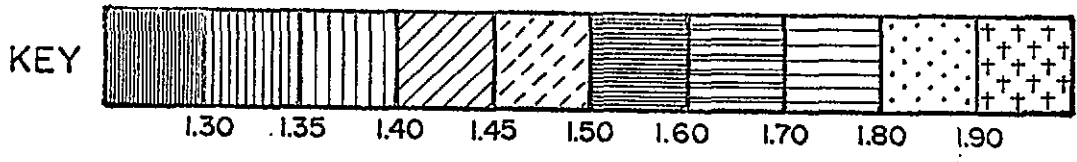
HEAD RAW ANALYSIS							
A.D.L.%	RM.% TOT.MOIST.%	ASH%	VM.%	FC.%	S%	F.S.I.	REMARKS
2.6	0.9	23.4	21.6	54.1	0.43	6	air dried basis
	3.5	22.8	21.0	52.7	0.42	--	as rec'd basis
		23.6	21.8	54.6	0.43	--	dry basis

SIZE & RAW ANALYSES										
SIZE FRACTION	WT.%	PROXIMATE				S%	F.S.I.	CUMULATIVE		
		RM.%	ASH%	VM.%	FC.%			W.T.%	ASH%	
3/4"x1/2"	7.2	0.9	39.7	18.1	41.3	0.25	1 1/2	7.2	39.7	adb
	7.2		40.1	18.3	41.6	0.25	--	7.2	40.1	db
1/2" x3/8"	7.9	0.8	36.3	18.6	44.3	0.31	2	15.1	37.9	adb
	7.9		36.6	18.8	44.6	0.31	--	15.1	38.3	db
3/8"x1/4"	8.1	0.8	32.3	19.3	47.6	0.35	2 1/2	23.2	36.0	adb
	8.1		32.6	19.5	47.9	0.35	--	23.2	36.3	db
1/4"x1/8"	18.2	0.8	24.7	21.9	52.6	0.41	6	41.4	31.0	adb
	18.2		24.9	22.1	53.0	0.41	--	41.4	31.3	db
1/8"x28M	41.5	0.8	18.0	22.5	58.7	0.45	7	82.9	24.5	adb
	41.5		18.1	22.7	59.2	0.45	--	82.9	24.7	db
28Mx65M	8.3	1.1	14.4	23.0	61.5	0.45	7 1/2	91.2	23.6	adb
	8.3		14.6	23.3	62.1	0.46	--	91.2	23.8	db
65Mx0	8.8	1.2	16.3	22.9	59.6	0.58	6 1/2	100.0	22.9	adb
	8.8		16.5	23.2	60.3	0.59	--	100.0	23.1	db





Project: SAXON ADIT 77-4-5		Date: AUG. 77
Client: DENISON COAL LTD.		Drawn: <i>A.</i>
Title: ROSIN RAMMLER SIZE DISTRIBUTION		



BIRTLEY ENGINEERING (Canada) LTD. CALGARY ALBERTA			
TITLE		SIZE AND DENSITY DISTRIBUTION DIAGRAM	
CLIENT		DENISON COAL LTD.	
SAMPLE	ADIT 77-4-5	DATE	AUG., 1977
LAB NO.	9315	DRWN	J.

Birtley Engineering  
 Subsidiary of Great West Steel Industries

CLIENT: DENISON COAL LTD.

SAMPLE: ADIT 77-4-5

LAB. NO.: 9315

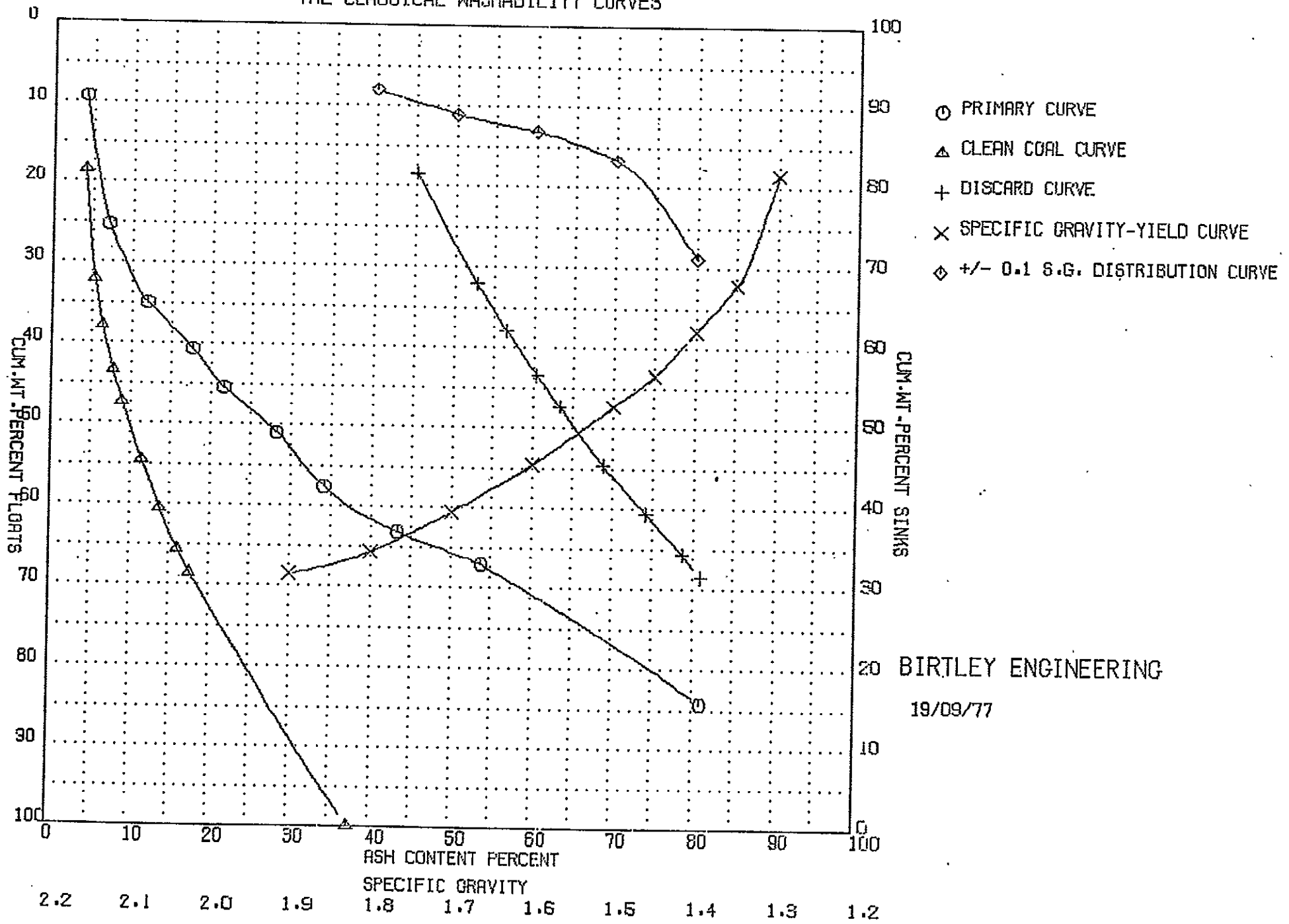
DATE: August, 1977

CALC. SIZE AND RAW ANALYSES, a.d.b.								
SIZE FRACTION	WT.%	ASH%	RM.%	VM.%	FC.%	F.S.I.	CUMULATIVE	
							WT.%	ASH%
3/4"x3/8"	15.1	37.9	0.8	18.4	42.9	1 1/2	15.1	37.9
3/8"x28M	67.8	21.5	0.8	22.0	55.7	6 1/2	82.9	24.5
28Mx65M	8.3	14.4	1.1	23.0	61.5	7 1/2	91.2	23.6
65Mx0	8.8	16.3	1.2	22.9	59.6	7	100.0	22.9
+ 3/4" *								

crushed to pass 3/4" and included in above size analysis

SINK-FLOAT ANALYSES										
S.G.	3/4"x3/8" (WT%=15.1)					3/8"x28M (WT%=67.8)				
	WT.%	ASH%	CUMULATIVE			WT.%	ASH%	CUMULATIVE		
			WT.%	ASH%	F.S.I.			WT.%	ASH%	F.S.I.
-1.30	18.5	4.0	18.5	4.0	7 1/2	43.3	3.3	43.3	3.3	8 1/2
1.30-1.35	13.6	7.0	32.1	5.3	6 1/2	17.0	6.3	60.3	4.1	8
1.35-1.40	5.8	11.9	37.9	6.3	6 1/2	4.7	11.8	65.0	4.7	7 1/2
1.40-1.45	5.6	17.6	43.5	7.7	6 1/2	4.4	16.5	69.4	5.4	7 1/2
1.45-1.50	3.9	21.6	47.4	8.9	5 1/2	3.0	22.3	72.4	6.1	7 1/2
1.50-1.60	7.2	28.2	54.6	11.4	5 1/2	4.6	28.6	77.0	7.5	7 1/2
1.60-1.70	6.0	34.1	60.6	13.7	4 1/2	4.0	36.5	81.0	8.9	7 1/2
1.70-1.80	5.1	43.3	65.7	16.0	4	2.9	44.0	83.9	10.1	7 1/2
1.80-1.90	2.9	53.7	68.6	17.6	3 1/2	2.4	51.1	86.3	11.3	7
+1.90	31.4	81.0	100.0	37.5	1 1/2	13.7	78.4	100.0	20.5	6 1/2

DENISON COAL LTD ADIT 77-4-5 LAB NO 9315 3/4 X 318  
 THE CLASSICAL WASHABILITY CURVES



BIRTLEY ENGINEERING  
 19/09/77

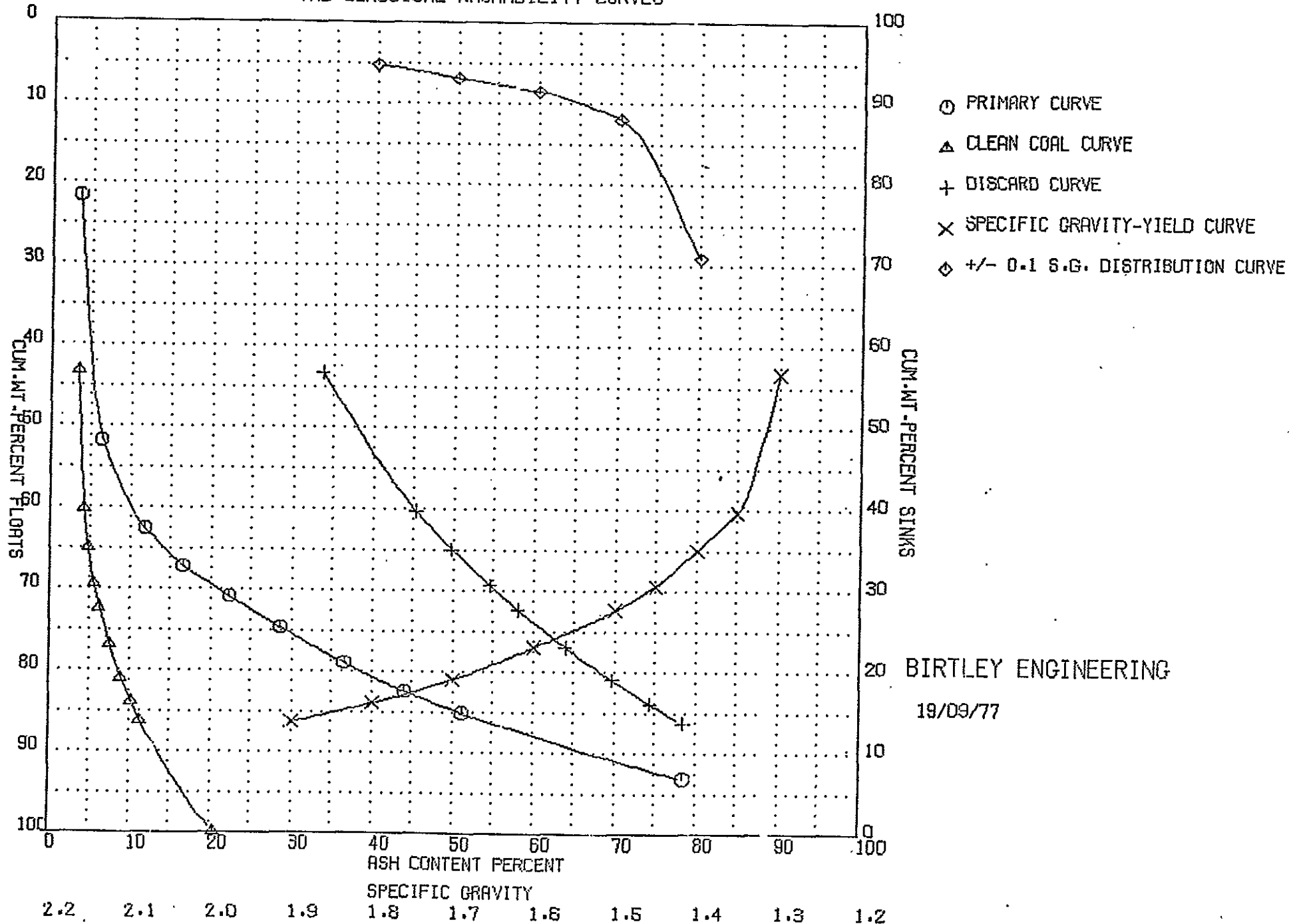
--DIRECT--                      --CHM FLOATS--                      --CHM SINKS--                      +-0.1 DISTR

S.G.	WT> CHM WT>				SINK WT				S.G.	WT>	
	WT>	ASH>	ASH TT	ASHTT	WT>	ASH>	ASH>	WT>			ASH>
1	2	3	4	5	6	7	8	9	10	11	12
1.30	18.50	4.00	.74	.74	18.50	4.00	36.75	81.50	45.09	1.30	0.00
1.35	17.60	7.00	.05	1.69	32.10	5.27	35.79	67.00	52.72	1.40	28.90
1.40	5.80	11.90	.69	2.38	37.90	6.29	35.10	62.70	56.53	1.50	16.70
1.45	5.60	17.60	.09	3.37	43.50	7.74	34.12	56.50	60.39	1.60	13.20
1.50	3.90	21.60	.04	4.21	47.40	8.88	33.28	52.40	63.26	1.70	11.10
1.60	7.20	28.20	2.03	6.24	54.60	11.43	31.25	45.40	68.82	1.80	8.00
1.70	6.00	34.10	2.05	8.29	60.60	13.67	29.20	39.40	74.11	1.90	0.00
1.80	5.10	43.30	2.21	10.49	65.70	15.97	26.99	34.30	78.69	2.00	0.00
1.90	2.90	53.70	1.06	12.05	68.60	17.57	25.43	31.40	81.00	2.10	0.00
9.99	31.40	81.00	25.43	37.49	100.00	37.49	0.00	0.00	0.00	2.20	0.00

BIRTLEY ENGINEERING  
19/09/77

0.8	18.2	0.8	16.3	9.0	16.3	2.0	14.3	4.0	14.2
1.4	14.9	1.1	13.6	10.5	13.6	3.0	13.6	6.0	16.7
2.4	13.0	1.3	12.4	11.3	12.4	4.0	12.4	8.0	17.4
3.5	11.0	1.5	11.3	12.1	11.3	5.0	11.3	10.0	17.8
4.3	10.9	1.8	10.5	12.7	10.5	6.0	10.5	12.0	18.4
5.6	9.9	2.3	9.1	13.2	9.1	8.0	9.1	0.0	0.0
6.8	8.5	2.7	7.9	14.2	7.9	10.0	7.9	0.0	0.0
8.7	7.4	3.2	6.9	15.7	6.9	12.0	6.9	0.0	0.0
10.7	6.6	3.5	6.3	16.2	6.3	14.0	6.3	0.0	0.0
16.2	5.1	7.5	0.0	0.0	0.0	175.8	0.0	0.0	0.0
PASS	1	10153							
PASS	2	10 66							
PASS	3	9 71							
PASS	4	9120							
PASS	5	5 80							

DENISION COAL LTD ADIT 77-4-5 LAB NO 9315 3/8 X 28M  
 THE CLASSICAL WASHABILITY CURVES



BIRTLEY ENGINEERING

19/09/77



CLIENT: DENISON COAL LTD.

SAMPLE: ADIT 77-4-5

LAB. NO.: 9315

DATE: August, 1977

SINK-FLOAT ANALYSIS					
28M x 65M (WT%= 8.3)					
S.G.	WT. %	ASH%	CUMULATIVE		
			WT. %	ASH%	F.S.I.
-1.30	56.4	2.5	56.4	2.5	8 1/2
1.30-1.35	13.0	6.4	69.4	3.2	8 1/2
1.35-1.40	5.9	11.4	75.3	3.9	8
1.40-1.45	3.8	15.9	79.1	4.4	8
1.45-1.50	2.6	21.0	81.7	5.0	8
1.50-1.60	3.1	27.8	84.8	5.8	8
1.60-1.70	2.2	36.3	87.0	6.6	7 1/2
1.70-1.80	1.9	43.5	88.9	7.4	7 1/2
1.80-1.90	1.6	56.0	90.5	8.2	7 1/2
+1.90	9.5	76.9	100.0	14.8	7 1/2

FROTH FLOTATION TEST						
65M x 0 (P.D.=10%)						
PRODUCT	WT. %	ASH%	F.S.I.	CUMULATIVE		
				WT. %	ASH%	F.S.I.
STAGE I	80.5	8.3		80.5	8.3	7 1/2
STAGE II	5.4	20.1		85.9	9.0	7 1/2
TAILS	14.1	59.1		100.0	16.1	7

Reagent = 4:1=Kerosene:MIBC

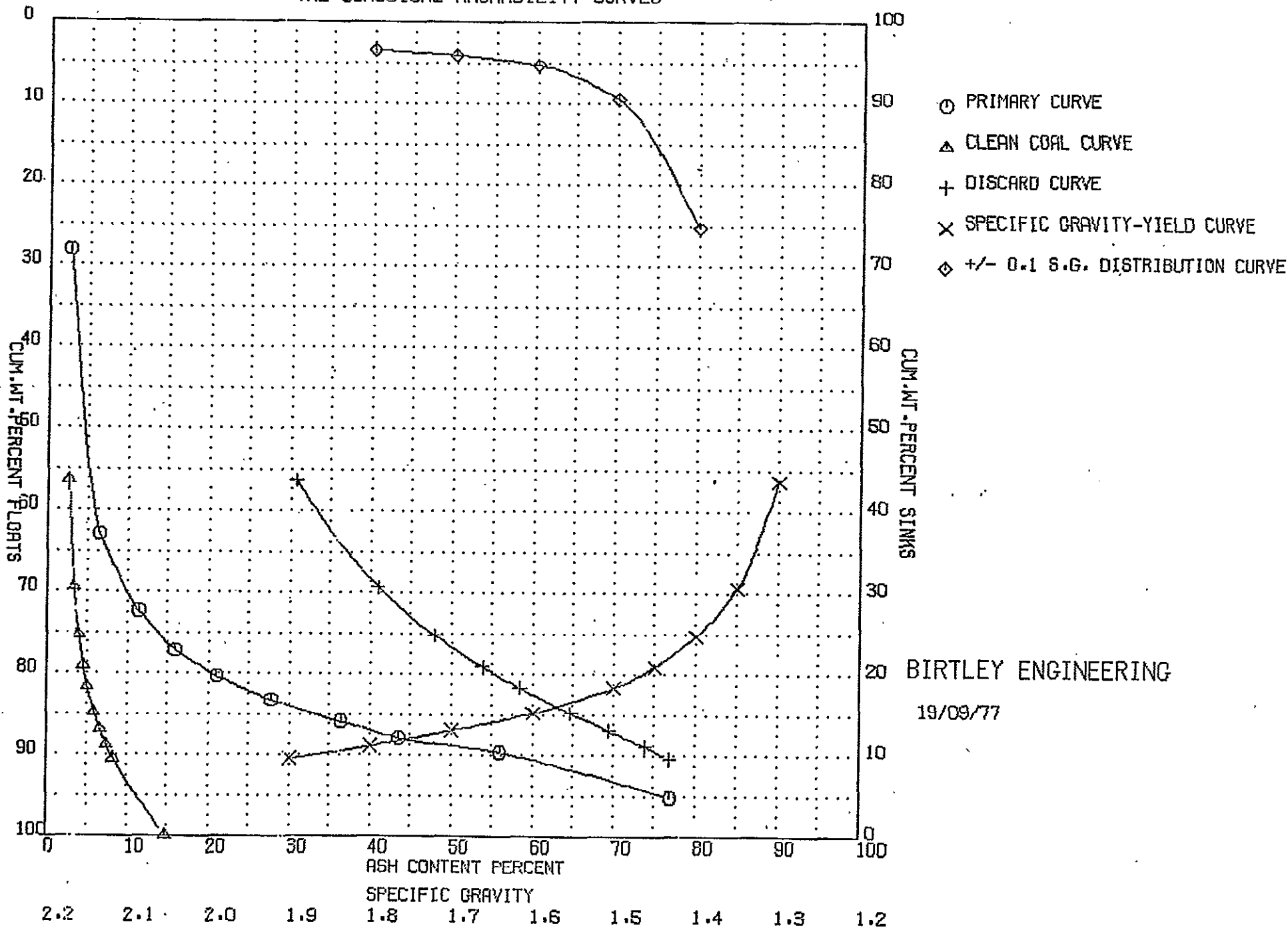
Dosage = 0.48 lb/T

Conditioning time = 1 minute

Stage I and II = 1st &amp; 2nd froth concentrate @ 1st &amp; 2nd min.



DENISION COAL LTD ADIT 77-4-5 LAB NO 9315 28M X 65M  
 THE CLASSICAL WASHABILITY CURVES



BIRTLEY ENGINEERING

19/09/77

--DIRECT--

--CUM FLOATS--

--CUM SINKS-- +-.0.1 DISTO

S.G.	WT> CUM WT>				SINK WT				S.G.	WT>	
	WT>	ASH>	ASH TT	ASH TT	WT>	ASH>	ASH>	WT>			ASH>
1	2	3	4	5	6	7	8	9	10	11	12
1.30	56.40	2.50	1.41	1.41	56.40	2.50	13.34	43.60	30.60	1.30	0.00
1.35	13.00	6.40	.93	2.24	69.40	3.23	12.51	30.60	40.89	1.40	25.30
1.40	5.90	11.40	.47	2.91	75.30	3.87	11.84	24.70	47.93	1.50	9.50
1.45	3.80	15.90	.40	3.52	79.10	4.45	11.23	20.00	53.75	1.60	5.30
1.50	2.60	21.00	.55	4.06	81.70	4.98	10.69	18.70	58.41	1.70	4.10
1.60	3.10	27.80	.66	4.93	84.80	5.81	9.83	15.50	64.65	1.80	3.50
1.70	2.20	36.30	.80	5.73	87.00	6.58	9.03	13.00	69.45	1.90	0.00
1.80	1.90	43.50	.83	6.55	88.90	7.37	8.20	11.50	73.89	2.00	0.00
1.90	1.60	56.00	.90	7.45	90.50	8.23	7.31	9.50	76.90	2.10	0.00
9.99	9.50	76.90	7.31	14.75	100.00	14.75	0.00	0.00	0.00	2.20	0.00

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.5	14.4	.5	8.7	6.1	8.7	2.0	8.7	4.0	14.9
1.3	7.4	.6	6.1	8.2	6.1	3.0	6.1	6.0	18.1
2.3	5.5	.9	4.0	9.6	4.9	4.0	4.9	8.0	18.9
3.2	4.6	.9	4.2	10.8	4.2	5.0	4.2	10.0	19.2
4.2	3.9	1.0	3.7	11.7	3.7	6.0	3.7	12.0	19.3
5.6	3.4	1.2	3.0	12.9	3.0	8.0	3.0	0.0	0.0
7.3	2.8	1.3	2.6	13.9	2.6	10.0	2.6	0.0	0.0
8.7	2.4	1.5	2.2	14.8	2.2	12.0	2.2	0.0	0.0
11.2	2.1	1.6	1.9	15.4	1.9	14.0	1.9	0.0	0.0
15.4	1.0	2.0	0.0	0.0	0.0	175.8	0.0	0.0	0.0
PASS	1	10148							
PASS	2	10 24							
PASS	3	9 92							
PASS	4	9120							
PASS	5	5 80							



ETUDE V - P.V. N° 50

CA 152 u

SAXON BLEND 1976

ETUDE DE LA VALEUR D'USAGE EN COKEFACTION  
D'UN CHARBON CANADIEN  
POUR LA SOCIETE USINOR (COKERIE DE DUNKERQUE)

Essais en four 400 kg

Juin 1977

## I. INTRODUCTION

La société USINOR nous a demandé d'étudier en four 400 kg la valeur d'usage en cokéfaction du charbon "Canadien", susceptible d'être approvisionné par la cokerie de Dunkerque.

Le programme des essais a été établi après concertation entre les responsables de la cokerie et la Station de Marienau. Il s'agissait essentiellement d'examiner les possibilités d'incorporation du Canadien dans le mélange courant de la cokerie, en substitution au charbon "Polonais".

L'étude comprend cinq points ou essais, totalisant dix cuissons en four à paroi mobile.

## II. PROGRAMME ET DEROULEMENT DES ESSAIS

### II.1. Formules enfournées.

La quantité de charbon Canadien disponible ayant été limitée, il a fallu se contenter d'une substitution partielle au Polonais. A titre de référence, nous avons enfourné le mélange courant de la cokerie, en pratiquant trois taux différents de charbon Polonais. Les formules testées ont été les suivantes :

Repère :	1	2	3	4	5
Canadien	-	-	-	25	35
Polonais	30	50	70	25	15
U.S. (W. Va.)	45	30	20	30	30
Australien (QLD)	25	20	10	20	20

La proportion globale de charbon Polonais + Canadien est la même, soit 50 %, pour les mélanges 2, 4 et 5, mais les proportions respectives des deux charbons varient d'une formule à l'autre.

Il était initialement prévu d'adopter les taux de Polonais de 50, 60 et 70 %, mais nous avons préféré élargir l'intervalle de variation pour conférer aux résultats une meilleure sensibilité. De plus, nous n'avons pas jugé nécessaire de faire l'essai avec 10 % de Canadien car les résultats obtenus aux taux d'incorporation plus élevés étaient déjà meilleurs que ceux relatifs aux mélanges de référence.

### II.2. Préparation des mélanges et conditions des essais en four.

Les charbons ont été broyés en mélange à un degré de finesse caractérisé par un passant de 75-80 % au tamis de 2 mm (module AFNOR n° 34).

L'humidité des charges a été ajustée à 7 % et nous avons incorporé 0,2 % de gasoil à la pâte à coke. Pour l'essai n° 3, le degré de finesse mesuré était plus élevé que celui des autres charges mais nous ne pensons pas que la qualité du coke ait pu s'en trouver affectée de manière sensible, sinon par un effet bénéfique sur l'indice M 40.

Les essais en four 400 kg ont été réalisés comme à l'habitude à raison de deux enfournements par point. Le niveau thermique des piédroits a été réglé à 1 120°C, en cellule de 450 mm de largeur.

La densité de chargement s'est établie vers 800 kg/m<sup>3</sup>, compte tenu de l'addition d'huile. Dans ces conditions, les durées de cuisson à 900°C et à 1 000°C ont été respectivement de l'ordre de 15 h et de 16 h.

Les défournements ont eu lieu lorsque la température mesurée à coeur du saumon atteignait 1 050°C.

### II.3. Essais sur les cokes.

Le coke a été criblé mécaniquement sur notre station de criblage, puis séché avant de faire l'objet des essais de résistance IRSID et MICUM.

### II.4. Présentation des résultats.

Les principaux résultats de l'étude sont récapitulés dans le tableau 1.

Le tableau 2 fait état des caractéristiques de laboratoire des stocks de charbon.

Les conditions de cuisson sont portées dans le tableau 3, tandis que les résultats détaillés des essais en four 400 kg sont rassemblés dans le tableau 4.

Les figures 1 et 2 présentent les réflectogrammes des charbons.

Les figures 3 et 4 illustrent les variations des indices IRSID et des indices MICUM en fonction respectivement du pourcentage de Polonais dans le mélange de référence, et du pourcentage de Canadien dans les formules d'essais à 50 % de Polonais + Canadien.

## III. EXAMEN DES RESULTATS ET COMMENTAIRES

### III.1. Caractéristiques de laboratoire des charbons.

Les lots des charbons Australien, U.S. et Polonais utilisés pour ces essais, présentent les caractéristiques habituellement mesurées sur les approvisionnements correspondants de la cokerie de Dunkerque.

L'Australien et l'U.S. sont deux charbons gras à coke dont les propriétés plastiques se complètent judicieusement. Le constituant australien est de rang plus élevé, mais il est moins gonflant que l'U.S. et sa fluidité est très faible. Il est vrai que l'Australien est riche

en inertinite. L' U.S. est en revanche très fluide et très gonflant; le réflectogramme laisse apparaître une certaine quantité de charbon de haut rang qui confère sans doute à l'U.S. sa température de resolidification assez élevée. Les caractéristiques du Polonais sont plus typiques des gras à coke B avec un indice de matières volatiles de 30,2 % sur pur, un pouvoir réflecteur de la vitrinite de 1,05 % et des propriétés plastiques intermédiaires entre celles de l'Australien et celles de l'U.S..

Le charbon Canadien n'est pas homogène ; son réflectogramme révèle la présence de deux populations dont les PRV respectifs sont en moyenne de 1,07 % et de 1,30 % environ. Nous avons mesuré sur l'échantillon global un indice MV de 26,5 % sur pur et un PRV moyen de 1,14 %. Les propriétés plastiques du charbon sont assez réduites, avec une dilatation Arnou de + 6 % et une fluidité maximum de 74° d'arc/mm . Le Canadien renferme d'ailleurs autant d'inertinite que l'Australien et les deux charbons ne contiennent pratiquement pas d'exinite.

### III.2. Résistance mécanique du coke.

#### a) Mélanges de référence (sans Canadien).

L'augmentation du pourcentage de charbon Polonais provoque un accroissement de la fissuration du M 40, plus accusé par l'indice I 40 que par l'indice M 40 (figure 3).

Les indices de résistance à l'abrasion I 10 et M 10 sont moins bons pour le taux d'incorporation médian de Polonais (50 %). Etant donné que les écarts restent dans les limites de la dispersion des résultats, nous avons admis que la cohésion du coke diminuait très progressivement en fonction du pourcentage d'addition de Polonais (figure 3). Nous en avons déduit les caractéristiques mécaniques "théoriques" du coke correspondant à un taux d'addition de 50 % de Polonais :

	M 40	:	77,5
(1)	M 10	:	7,8
	I 40	:	48,4
	I 10	:	23,9

L'indice I 20 donne lieu aux mêmes observations faites sur l'indice I 10.

#### b) Incorporation du Canadien.

Nous pouvons examiner l'influence de l'addition de Canadien comparativement aux résultats "théoriques" obtenus sur le mélange de référence contenant 50 % de Polonais .

La substitution partielle du charbon Canadien au Polonais s'accompagne d'une amélioration des indices de résistance mécanique du coke (figure 4). La cohésion s'améliore progressivement lorsque le taux d'addition de Canadien augmente.

Les indices de résistance à la fragmentation marquent un maximum que l'on peut imputer à un effet de dispersion. En tout état de cause, l'extrapolation des courbes permet, à condition de consentir une certaine imprécision\*, de déterminer les valeurs des indices de résistance mécanique correspondant à une incorporation de 50 % de Canadien (sans Polonais) :

	M 40	:	79,8
(2)	M 10	:	7,2
	I 40	:	49,4
	I 10	:	20,8

La comparaison des deux groupes de résultats (1) et (2) permet de comparer les valeurs d'usages respectives du Canadien et du Polonais, et de conclure que les propriétés cokéfiantes du premier constituant sont meilleures que celles du second charbon.

Il est néanmoins recommandé d'introduire le Canadien dans une pâte à coke renfermant par ailleurs un ou plusieurs composants bien fluides.

### III.3. Autres résultats.

Les résultats relatifs à la productivité, à la poussée et au retrait latéral n'appellent pas d'observations particulières. Les écarts observés d'un essai à l'autre restent dans les limites de la dispersion (tableau 1).

La pression maximum équivalente dépasse tout juste le seuil de danger de 200 mbar dans l'essai n° 2. La densité de chargement réalisée étant relativement élevée (800 kg/m<sup>3</sup>), le mélange ne présenterait aucun risque en cokerie.

## IV. CONCLUSIONS

Cette courte série d'essais a fourni l'occasion d'apprécier la valeur d'usage en cokéfaction d'un charbon canadien, comparativement au charbon polonais couramment utilisé dans le mélange courant de la cokerie de Dunkerque.

Dans les conditions adoptées, la valeur d'usage du Canadien s'est avérée supérieure à celle du Polonais, malgré les propriétés plastiques réduites du premier charbon.

Il y aura toujours lieu, malgré tout, d'incorporer le constituant canadien dans une pâte à coke présentant une fluidité moyenne suffisante.

*G. Prudhon*

G. PRUDHON

\*Rappelons qu'il ne nous a pas été possible de faire un essai à 50 % de Canadien parce que la quantité de charbon disponible était insuffisante.



TABLEAU 1Incorporation de Canadien à la pâte à cokeRécapitulation des principaux résultats

Référence de l'essai	1	2	3	4	5	
Canadien (%)	-	-	-	25	35	
Polonais (%)	30	50	70	25	15	
U.S. (W.Va.) (%)	45	30	20	30	30	
Australien (QLD) (%)	25	20	10	20	20	
Humidité (%)	7,2	6,9	7,2	7,1	7,0	
Granulométrie	< 2 mm (%)	78,7	76,1	82,8	74,6	77,6
	< 0,5 mm (%)	36,2	36,1	41,4	33,0	37,5
Densité de chargement (kg/m <sup>3</sup> )	770	800	800	800	820	
Durée de cuisson à 900°C (h)	15,1	14,5	15,3	14,8	15,4	
Productivité (kg/m <sup>2</sup> .h)	23,2	25,0	24,0	24,4	24,2	
Pression maxi. équiv. (mbar)	78	208	108	116	122	
Retrait latéral (mm)	5,5	7,9	6,6	4,7	8,9	
Coke	> 80 mm (%)	44,2	46,3	49,7	46,1	44,8
	> 60 mm (%)	56,1	63,9	63,5	62,3	59,0
	> 40 mm (%)	93,7	92,4	92,5	92,5	92,9
M 40	79,9	77,1	77,0	79,9	79,4	
M 10	7,6	8,2	7,8	7,7	7,3	
I 40	52,8	48,1	46,7	49,8	48,9	
I 20	74,1	72,2	73,7	74,9	75,5	
I 10	23,8	25,1	23,6	22,8	22,0	

TABLEAU 2

## Caractéristiques de laboratoire des charbons

Origine des charbons	AUSTRALIEN	U. S. (W. Va)	POLONAIS	CANADIEN
Référence du stock Calibre	A 6 Fines	US 9 Fines	PO 21 Fines	CND 1 Fines
Taux de cendres (%)	10,3	7,4	8,0	8,1
Indice MV { sur sec { sur pur	20,9	25,8	27,8	24,4
	23,3	27,9	30,2	26,5
Indice de gonflement	8 1/2	9	8	8
Indice d'agglutination CFB	80,5	85,0	81,7	78,5
Dilatometre Chévenard (2°C/mm), { contraction (%) { gonflement (%)	21	28	23	20
	54	236	97	46
Dilatometre Arnu (3°C/mm) { contraction (%) { dilatation (%)	27	31	27	24
	+23	+165	+66	+6
Plastometre Gieseler - ADAMEL { fluidité maximum (°d'arc/mm) { temp. correspondante (°C)	15	8 640	2 730	74
	479	466	459	471
Temp. de resolidification (°C)	511	507	501	507
Pouvoir réflecteur moyen de la vitrinite ( $\lambda = 546$ nm) (%)	1,34	1,22	1,05	1,14
Ecart-type (%)	0,08	0,13	0,10	0,16
Composition macérale, sur pur,				
vitrinite (%)	63,4	78,7	67,9	64,3
exinite (%)	-	1,6	6,8	0,5
inertinite (%)	36,6	19,7	25,3	35,2

Tableau : 3

Conditions des essais en four 400 kg.

Référence	Formule	Technique d'enfournement	N° de cuisson	CARACTERISTIQUES DES MELANGES											CONDITIONS DE CARBONISATION					
				Humidité %	Cendres %	Indice MV/sec	Indice gonflé	Gonflé Cheven. %	< 0,2 mm %	< 0,5 mm %	< 1 mm %	< 2 mm %	< 3,15 mm %	< 5 mm %	Densité de charge sur sec	Temp. de piédroit °C	Largueur de cellule mm	Durée cuisson à 900°C h	Durée de séjour h	Temp. finale du coke °C
1	25 % Australien 45 % U.S. (W.Va) 30 % Polonais (0,2 % gasoil)	Humide par gravité	Po240	7,2	8,1	24,8	8 1/2	21	13,5	36,0	56,8	78,3	88,2	96,7	0,79	1 120	455,5	14,9	17,4	1 050
			Po241	7,3	7,8	24,7	8 1/2	21	12,9	36,4	58,4	79,2	88,8	96,4	0,75	1 116	455,5	15,3	18,3	1 050
			Moy.	7,2	7,9	24,7	8 1/2	21	13,2	36,2	57,6	78,7	88,5	96,5	0,77	1 118	455,5	15,1	17,8	1 050
2	20 % Australien 30 % U.S. (W.Va) 50 % Polonais (0,2 % gasoil)	idem	Po229	7,1	8,2	25,8	7 1/2	23	9,5	34,3	55,0	75,0	85,4	94,0	0,79	1 125	455,5	14,3	16,4	1 050
			Po230	6,8	7,9	25,7	7 1/2	23	15,2	38,0	58,4	77,2	86,3	94,7	0,81	1 125	455,5	14,8	17,4	1 050
			Moy.	6,9	8,0	25,7	7 1/2	23	12,3	36,1	56,7	76,1	85,8	94,3	0,80	1 125	455,5	14,5	16,9	1 050
3	10 % Australien 20 % U.S. (W.Va) 70 % Polonais (0,2 % gasoil)	idem	Po233	7,2	7,6	26,3	8	24	16,4	39,9	61,4	80,7	88,6	97,0	0,80	1 125	455,5	15,4	18,1	1 050
			Po234	7,2	7,4	25,9	8	22	17,7	42,9	65,8	85,0	92,2	97,8	0,81	1 123	455,5	15,2	18,0	1 050
			Moy.	7,2	7,5	26,1	8	23	17,0	41,4	63,6	82,8	90,4	97,4	0,80	1 124	455,5	15,3	18,0	1 050
4	20 % Australien 30 % U.S. (W.Va) 25 % Polonais 25 % Canadien (0,2 % gasoil)	idem	Po227	7,3	8,2	24,3	8	21	12,3	33,6	54,9	76,5	87,3	97,2	0,80	1 121	455,5	14,6	16,7	1 050
			Po228	7,0	8,0	24,3	8	21	13,3	32,4	51,5	72,7	85,4	96,9	0,80	1 122	455,5	15,1	17,7	1 050
			Moy.	7,1	8,1	24,3	8	21	12,8	33,0	53,2	74,6	86,3	97,0	0,80	1 121	455,5	14,8	17,2	1 050
5	20 % Australien 30 % U.S. (W.Va) 15 % Polonais 35 % Canadien (0,2 % gasoil)	idem	Po225	7,0	8,1	24,0	8	21	14,8	37,3	58,0	77,5	86,7	94,8	0,82	1 124	455,5	15,2	18,1	1 050
			Po226	7,0	8,5	24,3	8	21	14,9	37,8	58,6	77,8	86,9	94,7	0,82	1 120	455,5	15,6	18,5	1 050
			Moy.	7,0	8,3	24,1	8	21	14,8	37,5	58,3	77,6	86,8	94,7	0,82	1 022	455,5	15,4	18,3	1 050

Référence	Formule	Technique d'enfour- nement	PRODUCTIVITE Kg./ (m <sup>3</sup> h)		PRESSION EQUIVAL. MAXIMUM (m bar)	RETRAIT LATERAL (mm)	CARACTERISTIQUES DU COKE											
			à 900°C	corrigée à 1000°C			>100 mm %	>80 mm %	>60 mm %	>40 mm %	>20 mm %	0-10 mm %	Densité en vrac	M10	M40	I 10	I 20	I 40
1	25 % Australien 45 % U.S. (W.Va) 30 % Polonais (0,2 % gasoil)	Humide par gravité	24,1	23,1	59	7,6	8,9	43,8	57,5	93,3	96,2	3,2	388	7,7	78,6	23,1	75,0	52,8
			22,3	21,5	97	3,5	9,8	44,6	54,8	94,0	96,9	2,5	388	7,5	81,2	24,5	73,2	52,8
			23,2	22,3	78	5,5	9,3	44,2	56,1	93,7	96,5	2,9	388	7,6	79,9	23,8	74,1	52,8
2	20 % Australien 30 % U.S. (W.Va) 50 % Polonais (0,2 % gasoil)	idem	25,1	24,0	160	2,7	9,9	45,7	63,4	92,1	95,1	4,2	384	8,6	77,1	26,6	70,6	45,3
			24,9	23,9	256	13,2	9,9	46,9	64,3	92,7	96,1	3,2	398	7,8	77,2	23,7	73,8	51,0
3	10 % Australien 20 % U.S. (W.Va) 70 % Polonais (0,2 % gasoil)	idem	23,7	22,6	120	7,0	11,1	50,0	64,4	93,1	95,6	3,7	391	7,6	76,8	23,9	73,4	46,7
			24,3	23,2	97	6,2	9,5	49,5	62,7	92,0	94,4	5,0	409	8,0	77,3	23,3	74,0	46,8
			24,0	22,9	108	6,6	10,3	49,7	63,5	92,5	95,0	4,4	400	7,8	77,0	23,6	73,7	46,7
4	20 % Australien 30 % U.S. (W.Va) 25 % Polonais 25 % Canadien (0,2 % gasoil)	idem	25,0	24,0	137	5,0	10,8	48,3	63,5	94,4	97,1	2,3	391	7,9	79,2	23,7	74,1	49,6
			23,8	23,1	96	4,5	8,6	44,0	61,2	90,6	94,2	5,5	-	7,5	80,6	22,0	75,7	50,0
5	20 % Australien 30 % U.S. (W.Va) 15 % Polonais 35 % Canadien (0,2 % gasoil)	idem	24,6	23,9	85	9,7	10,8	41,0	56,3	92,2	96,0	3,4	413	7,4	78,7	21,8	75,4	47,9
			23,9	23,6	159	8,2	10,0	48,6	61,8	93,7	97,1	2,6	402	7,3	80,2	22,3	75,6	50,0
			24,2	23,7	122	8,9	10,4	44,8	59,0	92,9	96,5	3,0	407	7,3	79,4	22,0	75,5	48,9

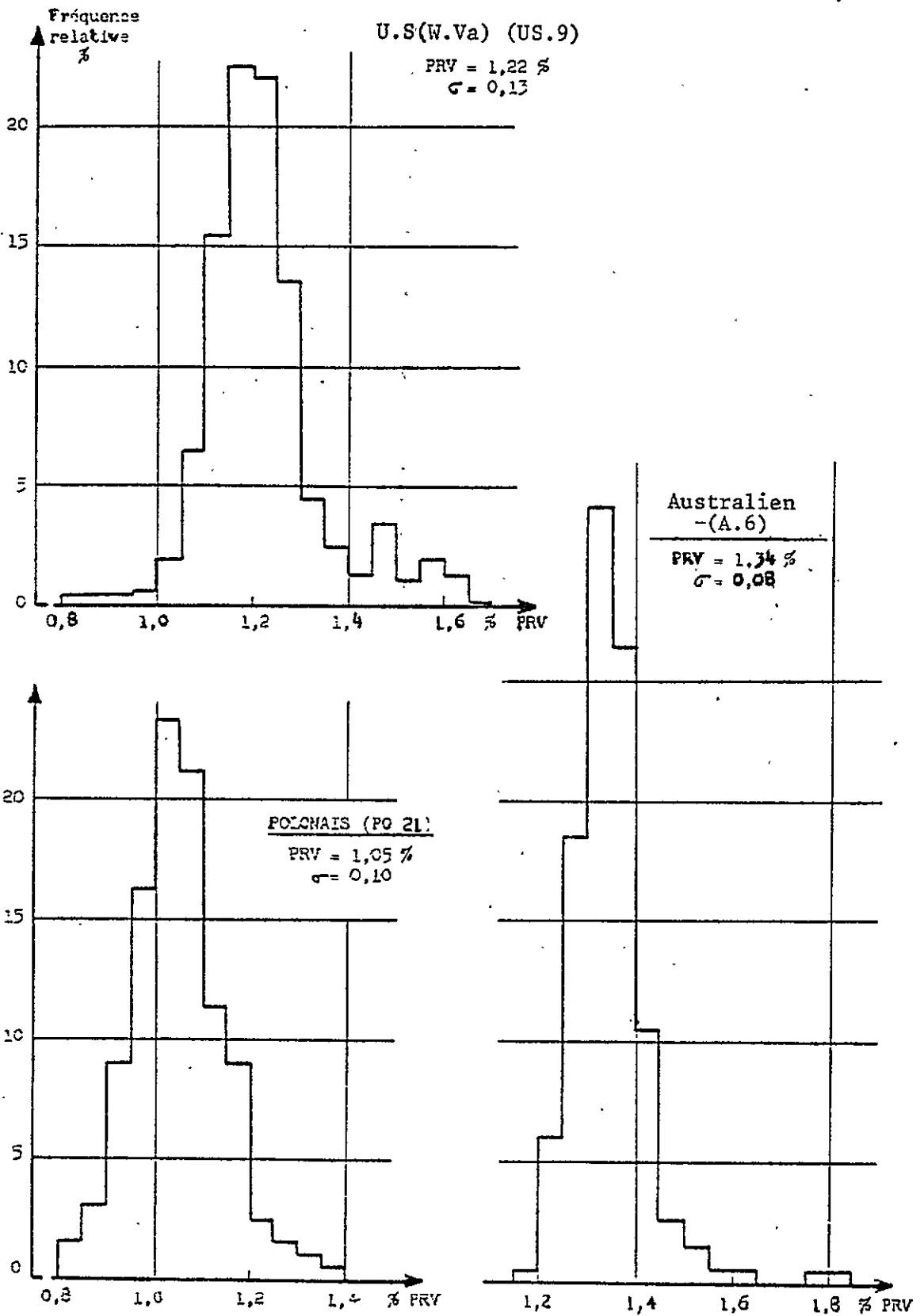


Figure 1 : Réflectogrammes des charbons de référence

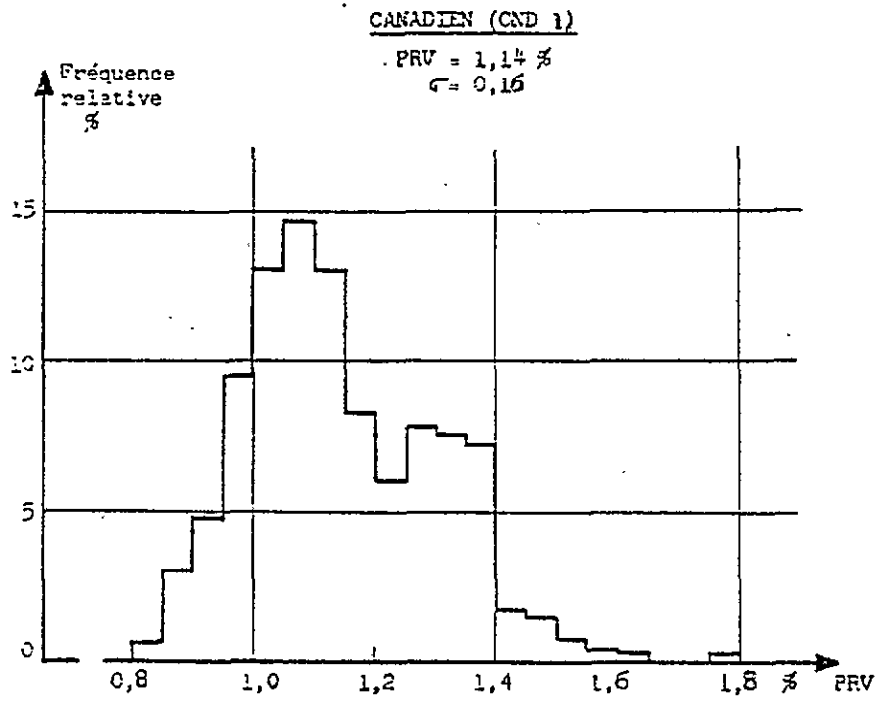


Figure 2 : Réfectogramme du charbon "Canadien".

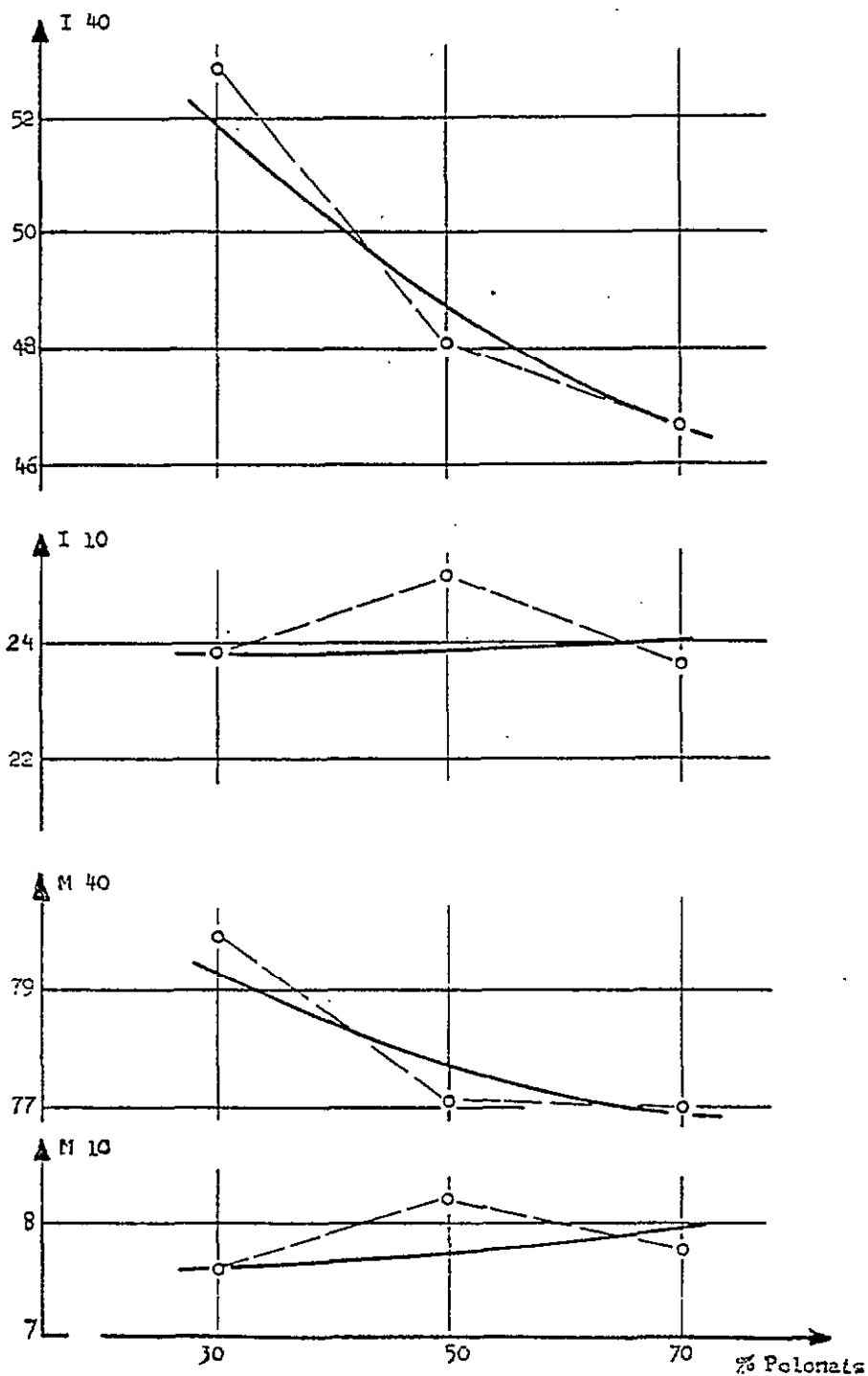


Figure 3 : Variation des indices IRSID et MICUH en fonction de la proportion de Polonais dans le mélange de référence.

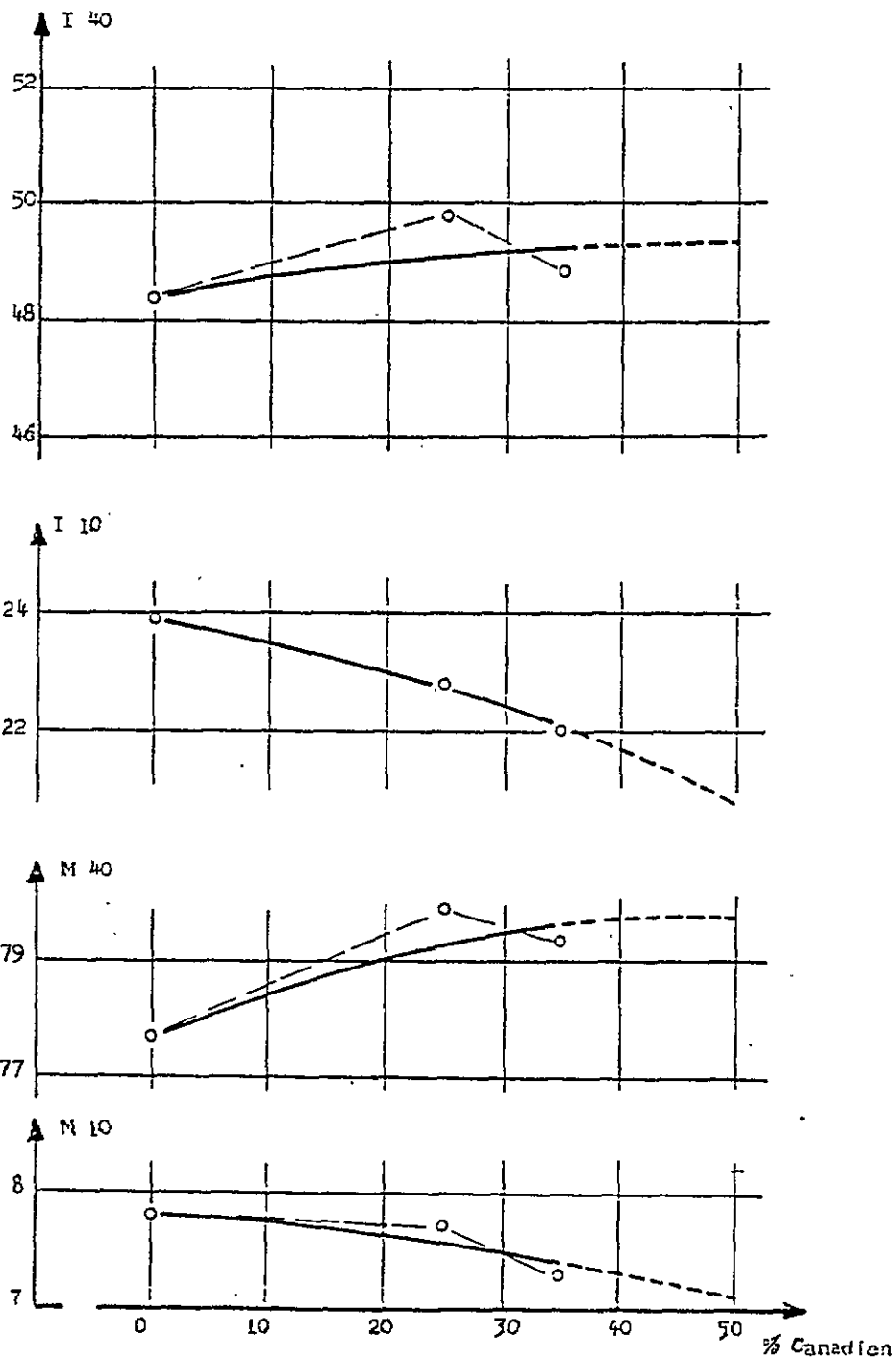


Figure 4 : Variation des indices IRSID et MICUM en fonction de la proportion de Canadien dans le mélange (l'addition totale Canadien + Polonais est constante = 50 %).



P 093/77/GPr/el - GD 323 - CA 152e

1977-1-1 SAXON ADIT.

ESSAIS DE COKEFACTION EN FOUR 400 KG

POUR LA SOCIETE USINOR (Dunkerque)

(Complément au PV V/50 - CA 152e de juillet 1977)

I. INTRODUCTION.

A la demande de la société USINOR, nous avons complété l'étude du charbon Canadien effectuée au mois de juin dernier en enfournant dans des conditions identiques, les deux formules de mélange ci-dessous,

40 % Polonais	40 % Polonais
30 % U.S. (W.Va.)	30 % U.S. (W.Va.)
30 % Australien (QLD)	30 % Canadien

en vue de comparer le charbon australien (Q.L.D.) et le charbon Canadien.

II. CONDITIONS DES ESSAIS.

II.1. Qualité des charbons.

La cokerie de Dunkerque nous a fait parvenir un nouveau lot de chacun des quatre constituants. Nous avons utilisé effectivement le second lot de charbon Canadien puisque le premier stock était épuisé. Toutefois, nous avons employé les stocks de Polonais, U.S(W.Va) et Australien qui avaient servi aux essais du mois de juin. Cette mesure a été prise pour gagner du temps et éviter de différer les essais de plusieurs semaines. Nous avons néanmoins analysé les nouveaux stocks d'Australien et de U.S(W.Va) au laboratoire.

Les caractéristiques de laboratoire des charbons sont portées dans le tableau 1.

Les deux stocks d'U.S(W.Va) sont pratiquement identiques, tandis que le second lot d'Australien présente des propriétés plastiques un peu meilleures que celles du premier lot, peut-être en raison d'une teneur en vitrinite plus élevée.

Le nouveau stock de Canadien offre des caractéristiques nettement différentes de celles du stock utilisé en juin. La teneur en matières volatiles est plus faible (26,5 → 21,7 sur pur), le pouvoir réflecteur est plus élevé (1,14 → 1,32 %), et les propriétés plastiques ont un peu diminué. Ces différences s'interprètent sans aucun doute d'après les réflectogrammes

présentés sur la figure 1. Le premier lot de Canadien (CND 1) n'était pas homogène et renfermait deux populations, alors que le second lot (CND 2) est homogène et correspond semble-t'il à la population de plus haut rang contenue dans le premier stock.

Il faut évidemment s'attendre que les propriétés cokéfiantes du second stock de Canadien soient différentes de celles du premier stock.

## II. 2. Cuissons en four 400 kg.

Nous avons effectué les cuissons en four 400 kg dans les mêmes conditions que celles qui avaient été adoptées en juin dernier.

Les résultats détaillés des essais en four 400 kg sont portés dans le tableau 2.

On peut noter un écart important sur la densité de chargement entre les deux formules, pour lequel nous n'avons pas trouvé d'explication. Cela pourrait avantager l'Australien.

## III. RESULTATS ET CONCLUSION.

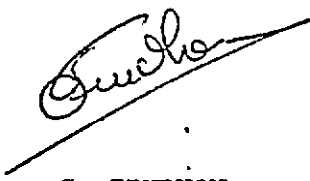
Les résultats relatifs à la poussée, au retrait latéral et à la productivité n'appellent pas d'observation particulière.

Le tableau suivant résume les résultats des contrôles mécaniques des cokes :

Charbon étudié	80 mm %	40 mm %	M 40	M 10	I 10	I 20	I 40
Australien (QLD)	50,8	91,2	78,7	8,5	24,3	72,4	48,4
Canadien	42,4	91,6	78,0	8,0	24,2	73,2	47,2

Les chiffres précédents conduisent à conclure que le Canadien est un peu moins favorable que l'Australien en ce qui concerne la résistance à la fragmentation, et qu'il est en revanche un peu plus favorable à la résistance à l'abrasion, malgré une densité de chargement relativement faible.

Les différences observées entre les deux formules sur les indices de résistance mécanique, et jugées sur un seul point de comparaison, ne sont sans doute pas significatives.



TABEAU 1

CARACTERISTIQUES DE LABORATOIRE DES CHARBONS

Origine des charbons	Australien*		U.S.(W.Va)*		Polonais	Canadien	
Référence du stock Calibre	A. 6 fines	A. 7 fines	U.S.9 fines	U.S.10 fines	PO 21 fines	CND 2 fines	
Taux de cendres (%)	10,3	9,0	7,4	8,4	8,0	7,9	
Indice MV {	sur sec	20,9	21,5	25,8	27,5	27,8	20,0
	sur pur	23,3	23,6	27,9	28,0	30,2	21,7
Indice de gonflement	8 1/2	9	9	9	8	7	
Indice d'agglutination CFB	80,5	82,8	85,0	84,8	81,7	77,2	
Dilatometre Chévenard (2°C/mm)							
{ contraction (%)	21	21	28	23	23	19	
{ gonflement (%)	54	80	236	231	97	23	
Dilatometre Arnou (3°C/mm)							
{ contraction (%)	27	27	31	30	27	21	
{ dilatation (%)	+ 23	+ 50	+ 165	+ 170	+ 66	- 10	
Plastometre Gieseler ADAMEL							
{ fluidité maximum (°d'arc/mm)	15	270	8 640	8 640	2 730	31	
{ temp. correspondante (°C)	479	479	466	466	459	480	
Température de resolidification (°C)	511	510	507	507	501	510	
Pouvoir réflecteur moyen de la vitrinite (λ = 546 nm) (%)	1,34	1,31	1,22	1,18	1,05	1,32	
Ecart-type (%)	0,08	0,07	0,13	0,11	0,10	0,10	
Composition macérale, sur pur,							
Vitrinite (%)	63,4	68,7	78,7	75,2	67,9	58,6	
Exinite (%)	0	0	1,6	4,5	6,8	0	
Inertinite (%)	36,6	31,3	19,7	20,3	25,3	41,4	

\* Les stocks A. 6 et US 9 ont été utilisés pour les essais en four 400 kg.

TABLEAU 2

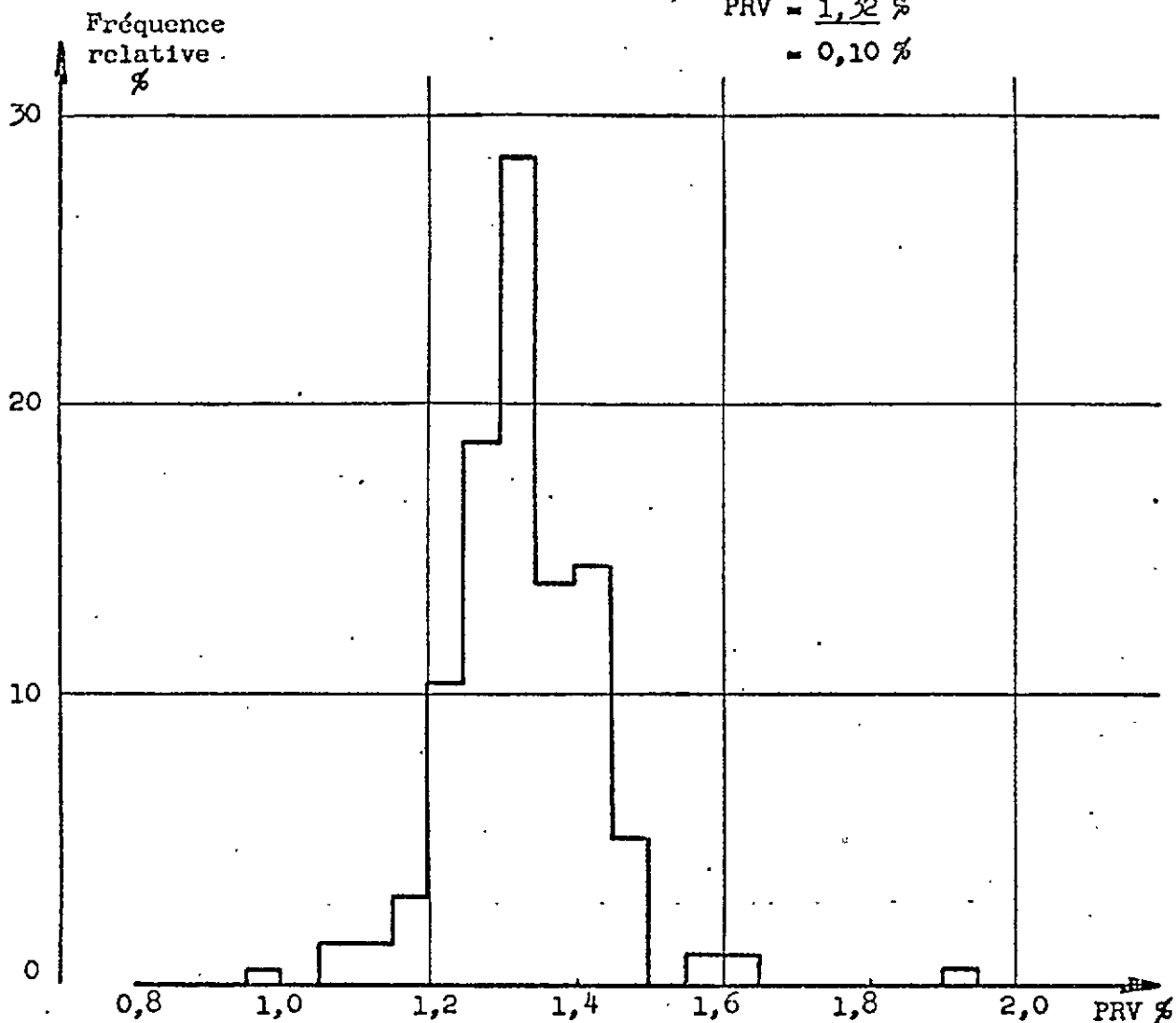
RESULTATS DES ESSAIS EN FOURS 400 KG

Formule de mélange	40 % Polonais 30 % U.S. (W.Va) 30 % Australien (0,2 % gasoil)	40 % Polonais 30 % U.S. (W.Va) 30 % Canadien (0,2 % gasoil)				
Numéro de cuisson	PC 244! Pa 3616!	Moy.	PC 245! Pa 3617!	Moy.		
<u>Propriétés du mélange :</u>						
Taux de cendres sur sec (%)	8,3!	7,9!	8,1!	7,2!	7,5!	7,3!
Indice MV	sur sec	24,4!	24,7!	24,5!	24,5!	24,5!
	sur pur	26,6!	26,8!	26,7!	26,4!	26,5!
Gonflement Chévenard (%)	79	76	77	69	68	68
Indice de gonflement	8	8	8	7 1/2	7 1/2	7 1/2
Humidité (%)	7,0!	7,1!	7,0!	7,5!	7,5!	7,5!
Granulométrie	5 mm (%)	92,8!	95,0!	93,9!	94,5!	95,0!
	3,15 mm (%)	84,1!	87,5!	85,8!	86,0!	87,2!
	2 mm (%)	75,3!	78,8!	77,0!	77,3!	78,4!
	1 mm (%)	56,5!	59,6!	58,0!	60,1!	61,4!
	0,5 mm (%)	37,5!	38,1!	37,8!	38,7!	39,2!
	0,2 mm (%)	11,8!	10,7!	11,2!	10,9!	11,0!
Densité de chargement (kg/m <sup>3</sup> )	810	790	800	760	720	740
<u>Conditions de cokéfaction :</u>						
Largeur de cellule (mm)	455,5!	467,2!	461,3!	455,5!	467,2!	461,3!
Durée de cuisson à 900°C (h)	15,9!	16,4!	16,1!	14,3!	14,5!	14,4!
Durée de séjour (h)	19,5!	20,7!	20,1!	16,7!	19,2!	17,9!
Temp. finale du coke (°C)	1 050	1 045	1 047	1 050	1 050	1 050
<u>Résultats des essais de cuisson :</u>						
Pression maximum équivalente (mbar)	63	117	90	84	71	77
Retrait latéral (mm)	9,8!	3,7!	6,7!	6,8!	3,8!	5,3!
Capacité spécifique d'enfournement, corrigée à 1 000°C (kg/m <sup>2</sup> .h)	21,7!	20,8!	21,2!	22,8!	21,3!	22,0!
<u>Propriétés mécaniques du coke :</u>						
Granulométrie	100 mm (%)	18,6!	14,2!	16,4!	7,0!	9,6!
	80 mm (%)	51,0!	50,7!	50,8!	42,4!	42,4!
	60 mm (%)	79,7!	78,1!	78,9!	74,1!	75,3!
	40 mm (%)	91,4!	91,1!	91,2!	91,8!	91,5!
	20 mm (%)	94,2!	94,0!	94,1!	95,3!	94,7!
	0-10 mm (%)	5,1!	5,4!	5,2!	4,0!	4,7!
Résistance mécanique	M 40	79,0!	78,5!	78,7!	77,3!	78,8!
	M 10	8,4!	8,6!	8,5!	7,6!	8,4!
	I 40	49,2!	47,7!	48,4!	44,1!	50,3!
	I 20	72,7!	72,1!	72,4!	73,7!	72,8!
	I 10	24,6!	24,1!	24,3!	23,7!	24,7!

CANADIEN (CND 2)

PRV = 1,32 %

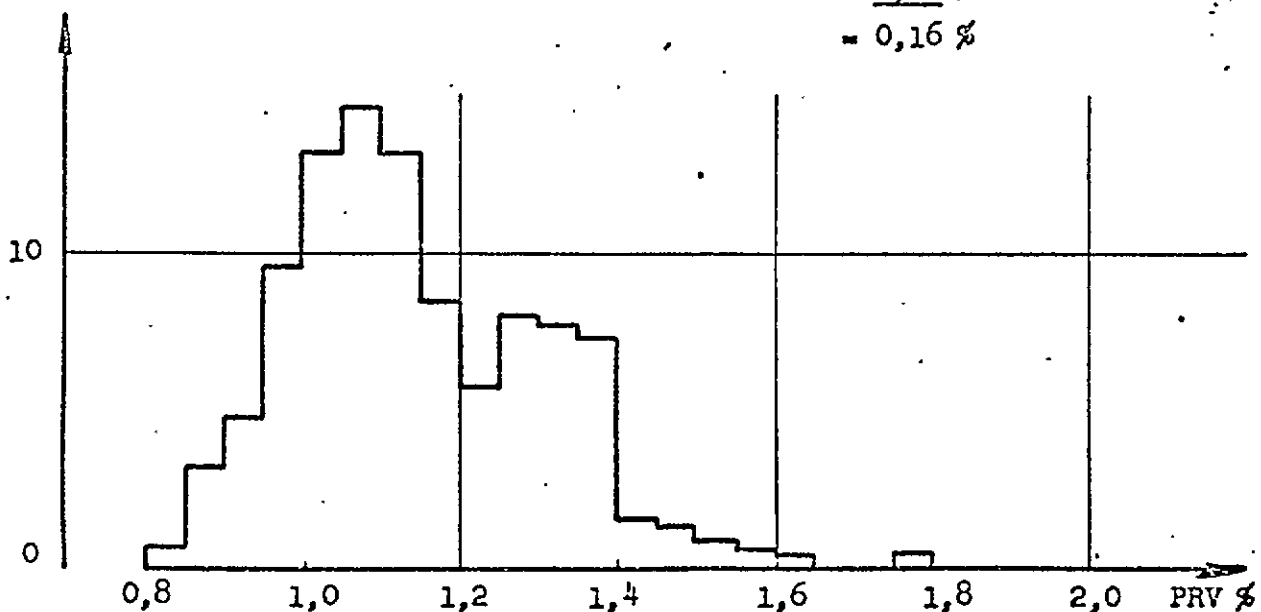
= 0,10 %



CANADIEN (CND 1)

PRV = 1,14 %

= 0,16 %



RECEIVED  
MONTAN  
ESSEN

TEST REPORT

Semi-Industrial Coking Test on Saxon Coal 76-4-1

Dr. G. Bracht

**MC**

June 1977

**MONTAN-  
CONSULTING GMBH  
ESSEN · GERMANY**

Saxon Coal Project

In our test report April 1977 we had stated that alterations of the tested Adit samples owing to oxidation were not excluded, and that coking tests with fresh, non-oxidized samples could lead to better results. Therefore, it was agreed with Denison to repeat the coking test 76-4-1 with a new coking coal to be placed again at our disposal.

The test results of the coal we received the 18th of May, 1977 are specified on table 1. They show an extremely good correspondence of all parameters of sample 76-4-1 tested in March, 1977 as you can also see from enclosures 1 to 3. Also the coking tests in the semi-technical test oven have led to absolutely comparable results which are specified on table 2 and represented on encl. 4 and 5. It has to be considered, however, that the graph of encl. 4 (dependence of  $M_{40}$  on volatile matter) is only applicable on Ruhr coals and cannot be applied to coals of other sources without fail. For that reason we have calculated the  $M_{40}$ -results into "stability" and then plotted them on the Bethlehem-Steel-graph (dependence between stability and vitrinite reflectance) see encl. 5. According to this, the results are in the expected range.

In summary we can say that there is no difference between the results obtained from tests carried out in March and May on separated samples and semi-technical coking tests.



Essen, 6.6.1977  
Dr.Br/K

S A X O N - COAL 76-4-1

Size analysis

> 10	mm	-	0	%
10 - 7	mm	-	0.9	%
7 - 5	mm	-	2.4	%
5 - 3.15	mm	-	8.2	%
3.15 - 2	mm	-	10.8	%
2 - 1	mm	-	22.9	%
1 - 0.5	mm	-	18.3	%
< 0.5	mm	-	36.5	%
Moisture		-	3.1	%
Ash		-	8.2	% dry
Volatile Matter		-	21.4	% d.a.f.
Sulphur		-	0.37	% dry
Phosphorus		-	0.070	% dry
Swelling Index		-	6	
Dilatometer Test				
Softening Temp.		-	392	°C
Solidification T.		-	467	°C
Contraction		-	28	%
Dilatation		-	-2	%
G-Value		-	0.908	
Max. Fluidity		-	3	DDPM
Softening Temp.		-	474	°C
Temp. of max.		-	489	°C
Fluidity				
Solidification T.		-	504	°C
Maceral Group Analysis				
Vitrinite		-	54	Vol.-%
Exinite		-	0	Vol.-%
Inertinite		-	40	Vol.-%
Minerals		-	6	Vol.-%
Reflectance		-	Anlage	
$\bar{R}_m$		-	1.35	%
Hardgrove-Index		-	115	°H

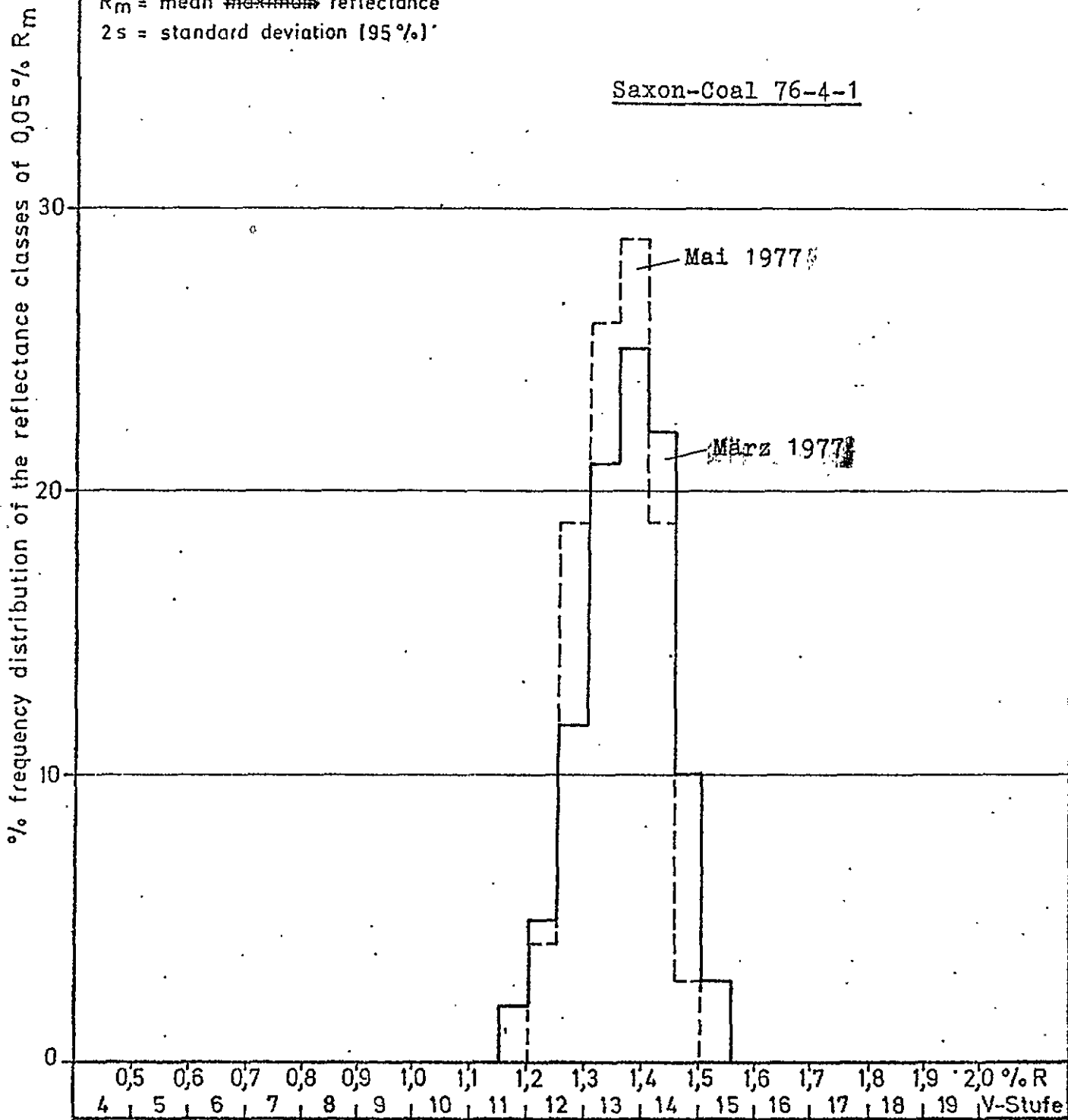


Determination of coal rank by measuring the mean resp. maximum reflectance (546 nm) of vitrinites

Measuring Point:	Horizon No.:	Sample No.:
$\bar{R}_m = 1.35; (1.37)$	$2s = 0.12; (0.15)$	

$\bar{R}_m$  = mean ~~maximum~~ reflectance  
 $2s$  = standard deviation [95 %]

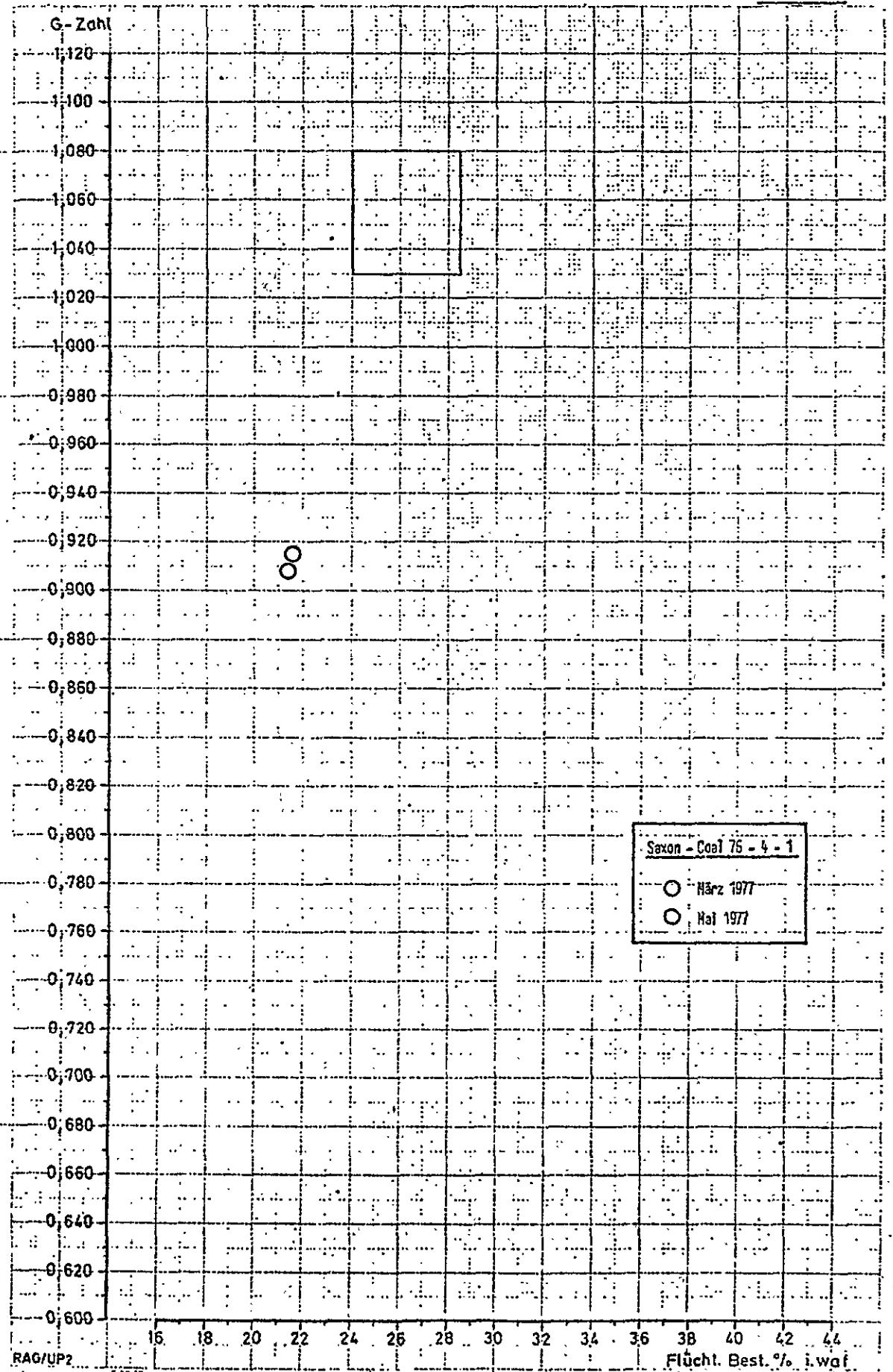
Saxon-Coal 76-4-1



100 readings, oil immersion, 1/4 cm<sup>2</sup> = 1 Vol.-%, V-class = % R · 10

ranges of the mean resp. maximum reflectance of:

Mean reflectance range	Vol.-%	Volatile matter d.a.f. of the proximate analysis (ash dry <8%)
< 0,65 %	correspond about	> 40 %
0,65 - 0,90 %	"	35 - 28 %
0,90 - 1,20 %	"	28 - 19 %
1,15 - 1,65 %	"	19 - 14 %
1,60 - 2,00 %	"	14 - 10 %
1,90 - 2,45 %	"	"



DDPM

30 000

10 000

5 000

1 000

500

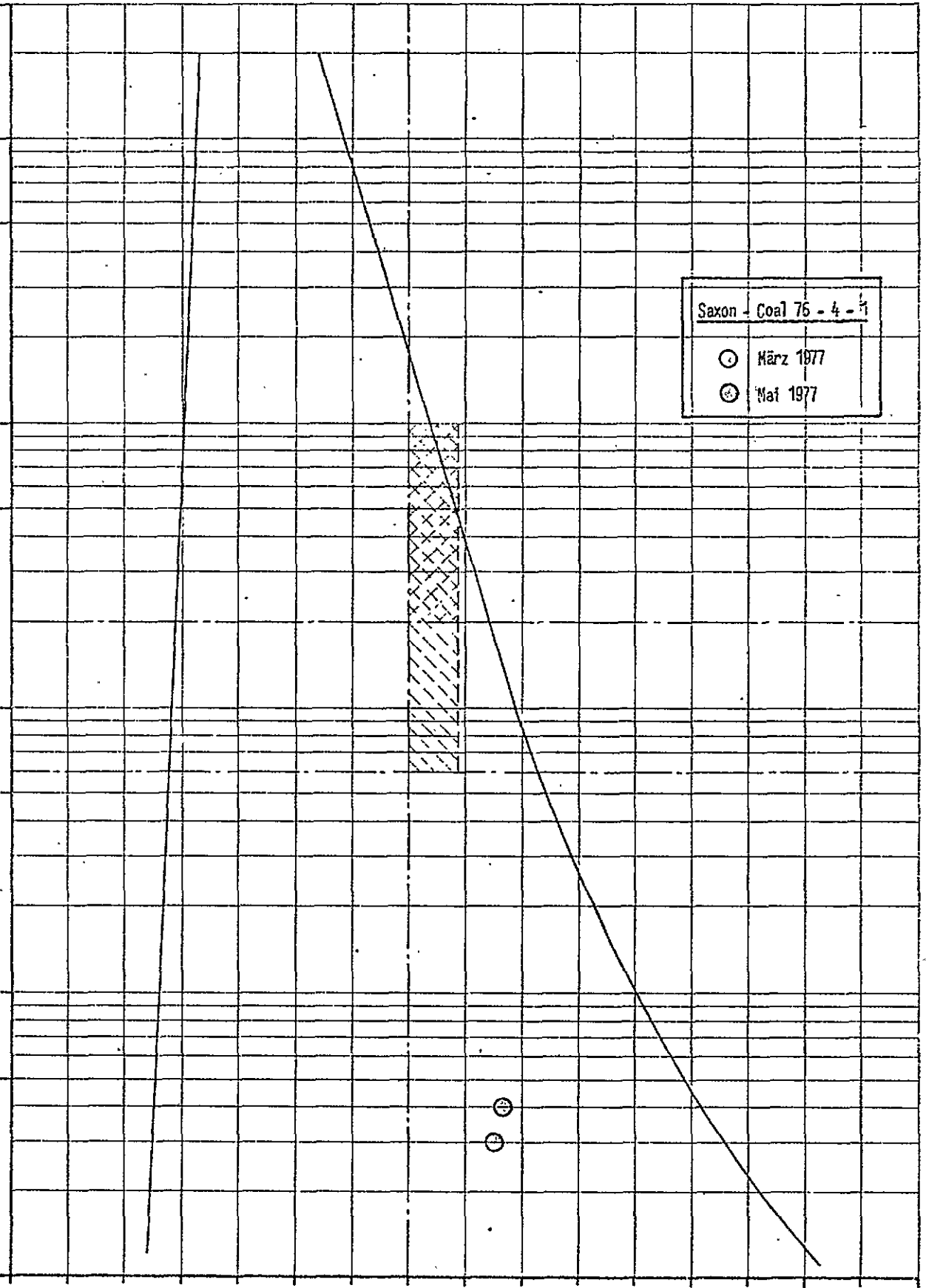
100

50

10

5

1



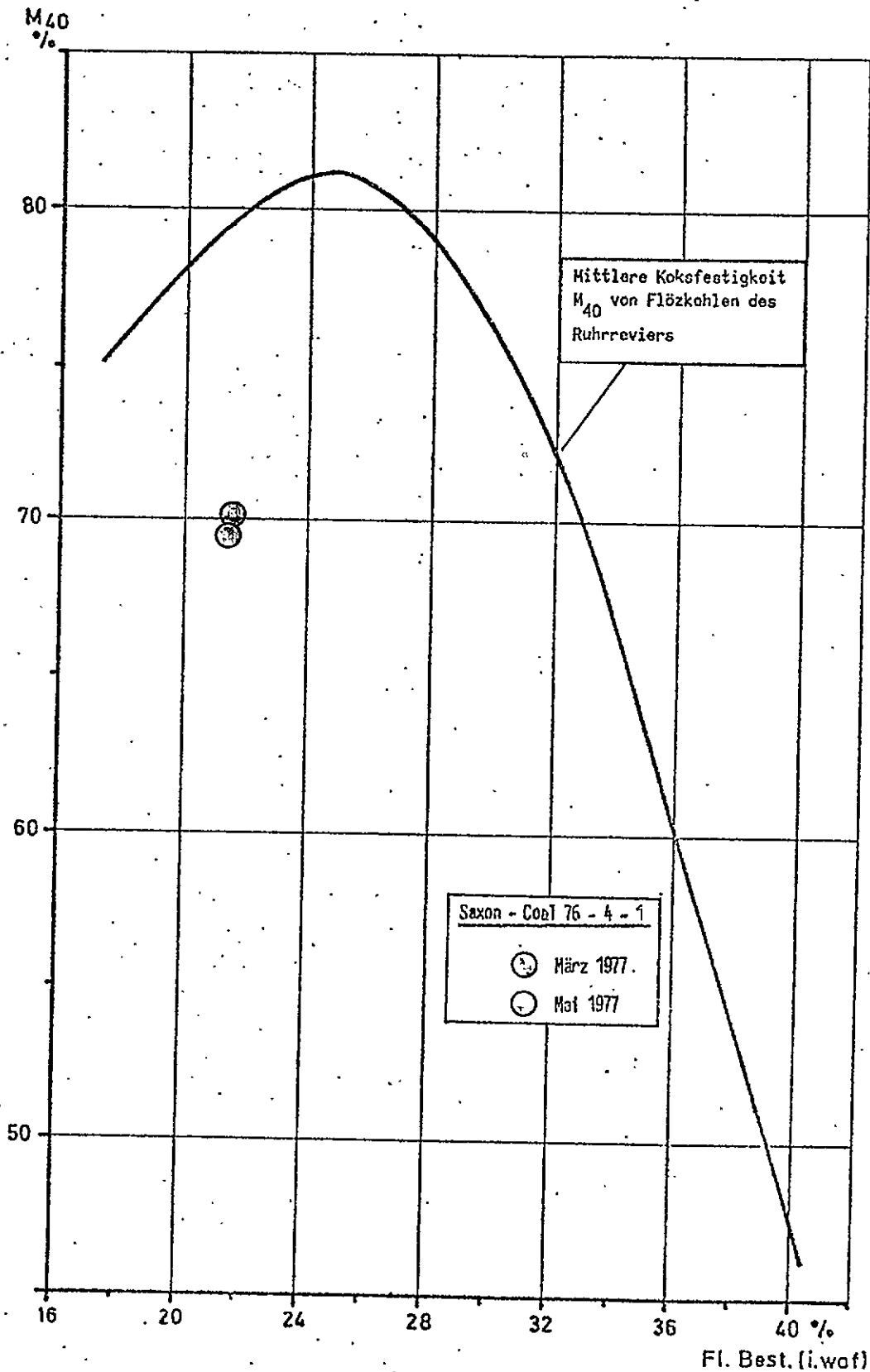
0,6 0,7 0,8 0,9 1,0 1,1 1,2 1,3 1,4 1,5 1,6 1,7 1,8 1,9 2,0 %  $\bar{R}_m$



Essen, 6.6.1977  
Dr.Br/K

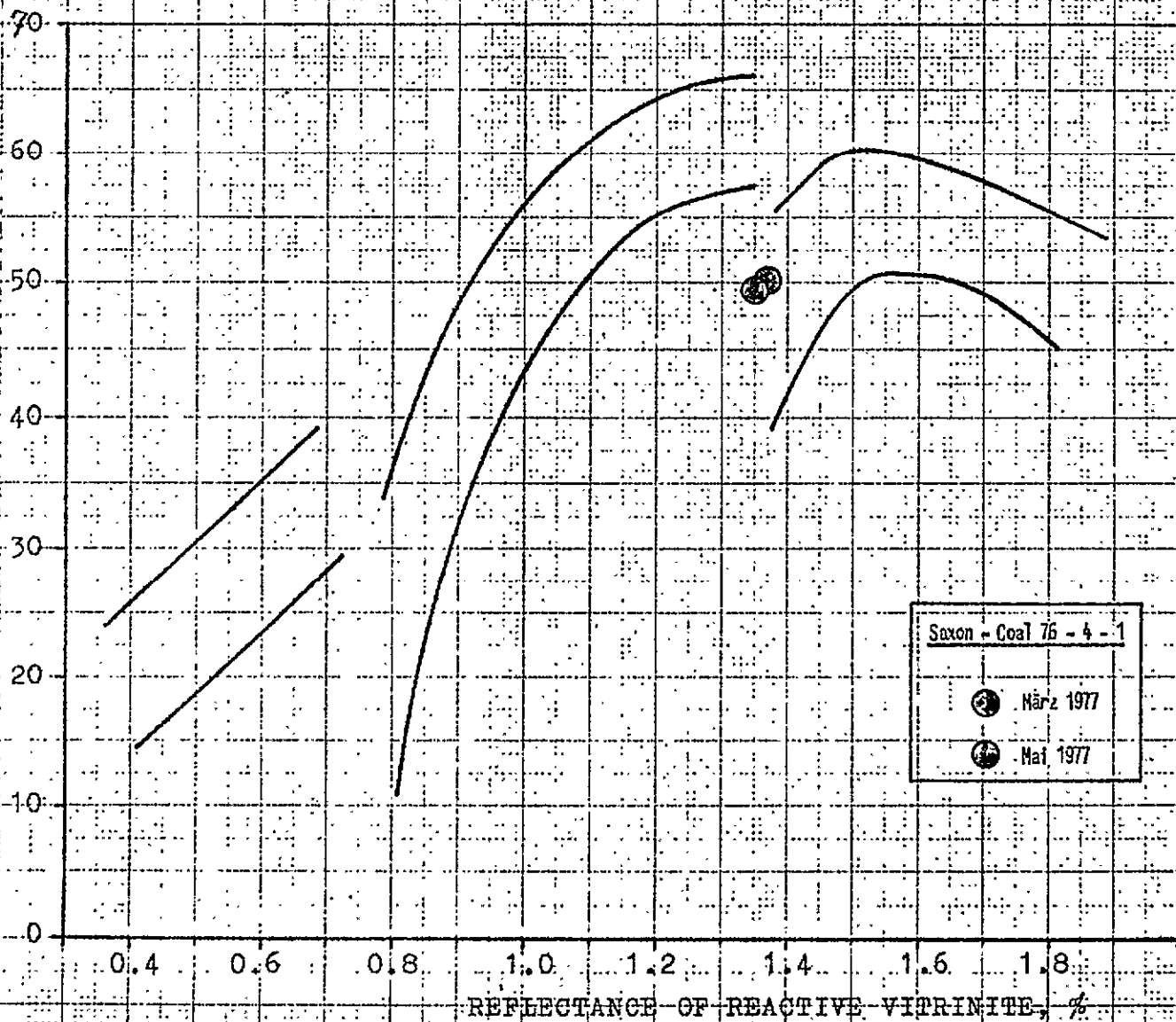
Results of Coking Tests

Signification of sample	Saxon 76-4-1		
Gas oil	-	0.2	%
Moisture content	-	10.0	%
Bulk density (moist.)	-	797	kg/m <sup>3</sup>
Bulk density (dry)	-	717	kg/m <sup>3</sup>
Heating flue temp.	-	1250	°C
Oven centre final temp.	-	1015	°C
Coking progress (350 - 550 °C)	-	3.2	K/min.
Coking period	-	19.0	h
Coke yield	-	80.7	%
Lump coke			
> 100 mm	-	46.4	%
> 80 mm	-	60.4	%
> 60 mm	-	78.4	%
> 40 mm	-	88.9	%
> 20 mm	-	91.6	%
Breeze			
< 10 mm	-	7.9	%
Strength (ISO)			
80 mm	-	2.2	%
60 mm	-	20.6	%
40 mm	-	69.4	%
20 mm	-	83.6	%
Abrasion			
10 mm	-	15.4	%
Ash	-	9.8	% dry
Volatile matter	-	0.2	% d.a.f.
Sulphur	-	0.39	% dry
True relative density	-	1.92	g/cm <sup>3</sup>
Apparent rel. density	-	1.00	g/cm <sup>3</sup>
Porosity	-	47.9	%
Reactivity	-	0.159	cm <sup>3</sup> .g <sup>-1</sup> .s <sup>-1</sup>



DISCONTINUOUS RELATIONSHIP BETWEEN  
REACTIVE VITRINITE REFLECTANCE AND COKE STRENGTH

ASTM COKE TUMBLER STABILITY, %



Saxon - Coal 76 - 4 - 1  
 ● März 1977  
 ● Mai 1977

REFLECTANCE OF REACTIVE VITRINITE, %

T E S T R E P O R T

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Semi-Industrial Coking Test on Saxon Coal 77-1-1

Dr. Günther Bracht

**MC**

August 1977

**MONTAN-  
CONSULTING GMBH  
ESSEN · GERMANY**



Essen, 4. 8. 1977  
Dr.Br/K/E

TEST REPORT

Semi-technical coking test with Saxon coal from adit 77-1-1

Denison Coal Limited has forwarded on waybill number 014-2895-5555 cleaned (washed) coal from adit 77-1-1 of Saxon East for coking tests.

The test results on the coal sample we received the 21st of June, 1977 are specified in Encl. 1 and show an extensive agreement with nearly all parameters of the coal sample from adit 76-4-1 tested in May 1977 (also to be seen from the Graphs from 1.1 to 1.3).

		<u>77-1-1</u>	<u>76-4-1</u>
Ash	% dry	7.8	8.2
Volatile Matter	% d.a.f.	20.6	21.4
Sulphur	% dry	0.36	0.37
Phosphorus	% dry	0.047	0.070
Swelling-Index		5 1/2	6
Dilatation	%	-3	-2
G-Value		0.889	0.908
Max. Fluidity	DDPM	7	3
Vitrinites	%	51	54
Exinites	%	0	0
Inertinites	%	44	40
Minerals	%	5	6
Reflectance	%	1.38	1.35

Also the carbonization in a semi-technical test oven has led to comparable results which are specified in Encl. 2 and 2.1 and plotted on the Graphs 2.2 and 2.3.

		<u>77-1-1</u>	<u>76-4-1</u>
Coke Yield	% dry	81.3	80.7
Strength (M 40)	%	70.7	69.4
Abrasion (M 10)	%	15.4	15.4
Stability	%	52.5	49.5

In the whole we can say, there is no difference between the results of these tests and those carried out in May 1977 as also between the semi-technical coking tests.

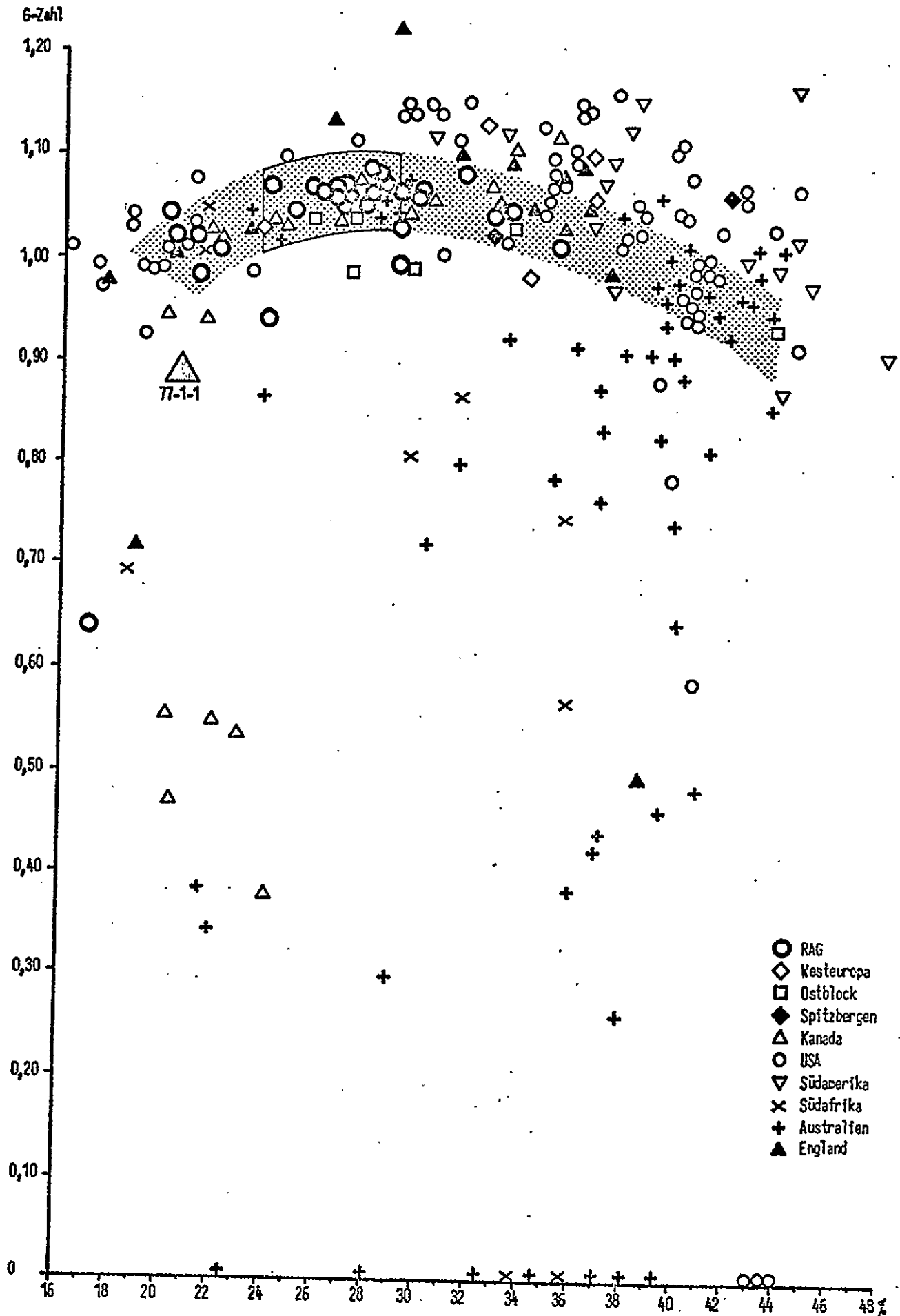


Saxon-Coal-Project / 77-1-1

Size analysis			
	> 10	mm	- 0 %
10	- 6.3	mm	- 2.0 %
6.3	- 3.15	mm	- 15.1 %
3.15	- 2	mm	- 8.1 %
2	- 1	mm	- 27.4 %
1	- 0.5	mm	- 18.2 %
0.5	- 0.2	mm	- 15.7 %
	< 0.2	mm	- 13.5 %
Moisture	-	3.0	%
Ash	-	7.8	% dry
Volatile Matter	-	20.6	% d.a.f.
Sulphur	-	0.36	% dry
Phosphorus	-	0.047	% dry
Swelling-Index	-	5 1/2	
Dilatometer Test			
Softening Temp.	-	392	°C
Solidification T.	-	478	°C
Contraction	-	26	%
Dilatation	-	3	%
G-Value	-	0.889	
Max. Fluidity	-	7	DDPM
Softening Temp.	-	468	°C
Temp. of max.			
Fluidity	-	498	°C
Solidification T.	-	516	°C
Maceral Group Analysis			
Vitrinite	-	51	Vol.-%
Exinite	-	0	Vol.-%
Inertinite	-	44	Vol.-%
Minerals	-	5	Vol.-%
Reflectance			
$\bar{R}_m$	-	1.38	%
Hardgrove-Index	-	68	°H



Koksbildungsvermögen G von Kohlen verschiedener Provenienzen



DDPM

30 000

10 000

5 000

1 000

500

100

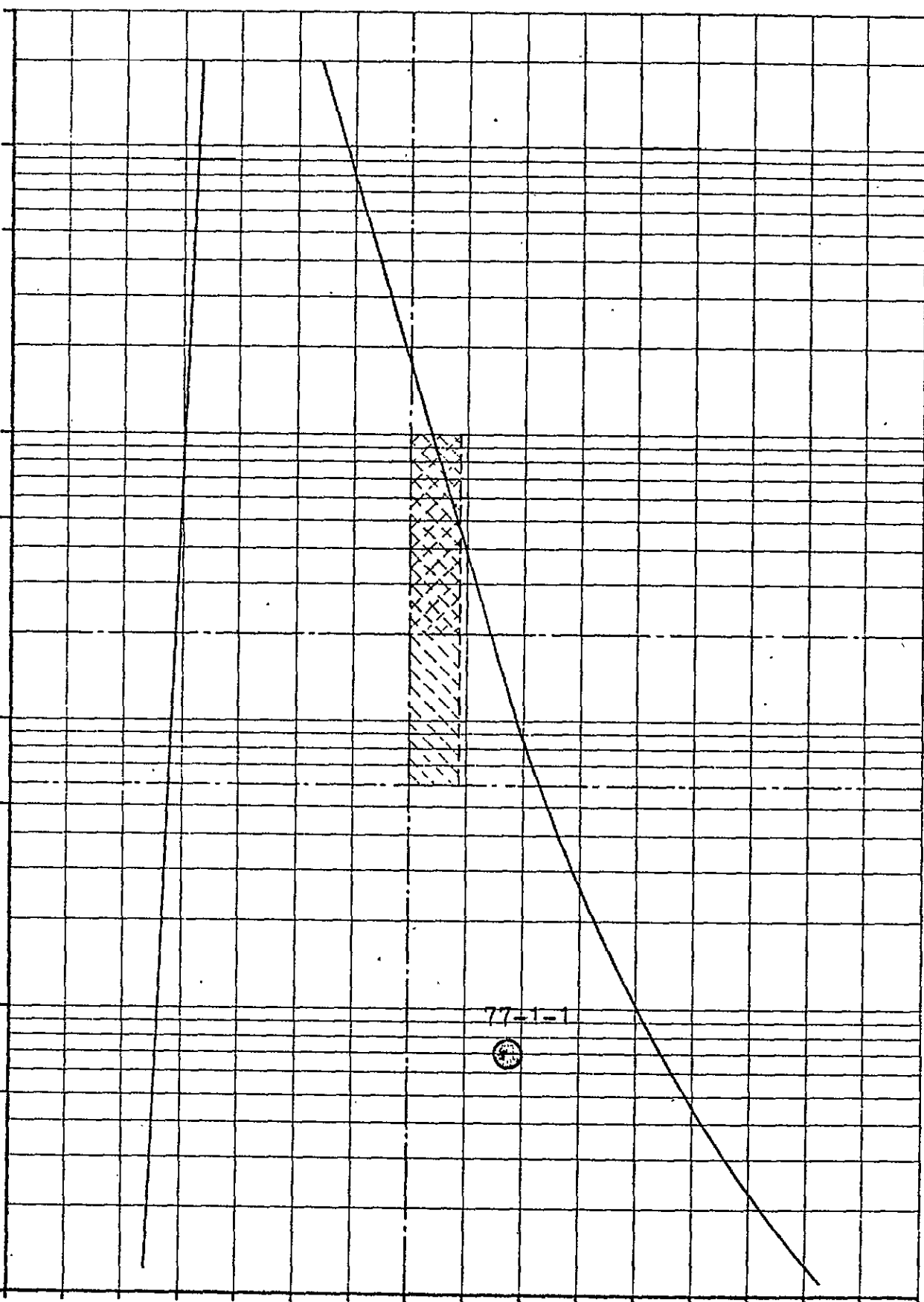
50

10

5

1

0,6 0,7 0,8 0,9 1,0 1,1 1,2 1,3 1,4 1,5 1,6 1,7 1,8 1,9 2,0 %  $\bar{R}_m$

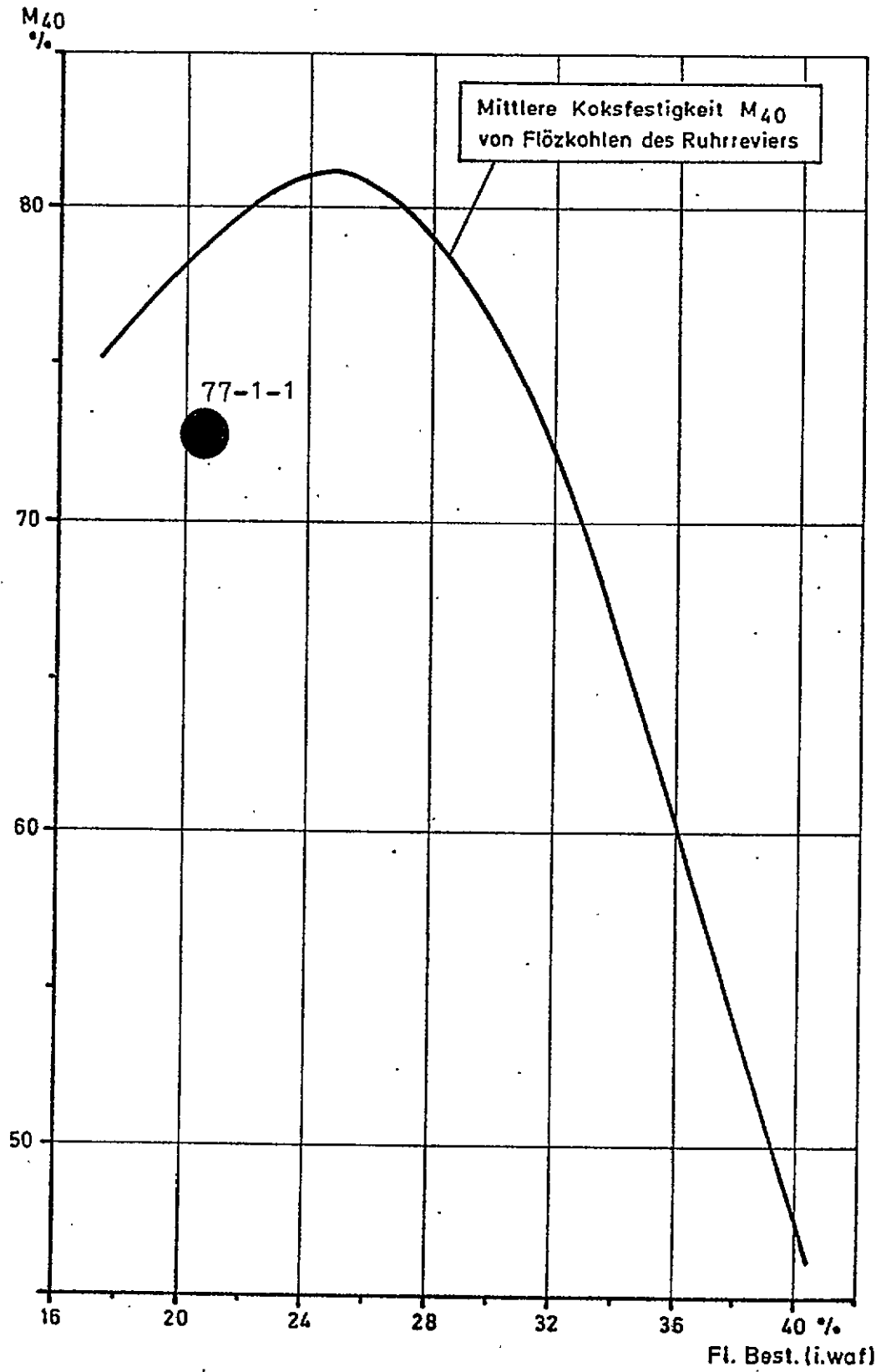


Results of Coking TestsSignification of sample77-1-1

Moisture content	-	10.0	%
Gas oil	-	0.2	%
Bulk density (moist.)	-	816	kg/m <sup>3</sup>
Bulk density (dry)	-	734	kg/m <sup>3</sup>
Heating flue temp.	-	1250	°C
Oven centre final temp.	-	1015	°C
Coking progress (350 - 550 °C)	-	3.2	°C/min.
Coking period	-	18.75	h
Coke yield (dry)	-	81.3	%
Coke production	-	31.8	kg/m <sup>3</sup> /h
Lump coke			
> 100 mm	-	58.5	%
> 80 mm	-	65.9	%
> 60 mm	-	80.8	%
> 40 mm	-	91.1	%
> 20 mm	-	94.3	%
Breeze			
< 10 mm	-	5.2	%
Strength (ISO)			
80 mm	-	1.8	%
60 mm	-	20.8	%
40 mm	-	70.7	%
20 mm	-	88.1	%
Abrasion			
10 mm	-	15.4	%

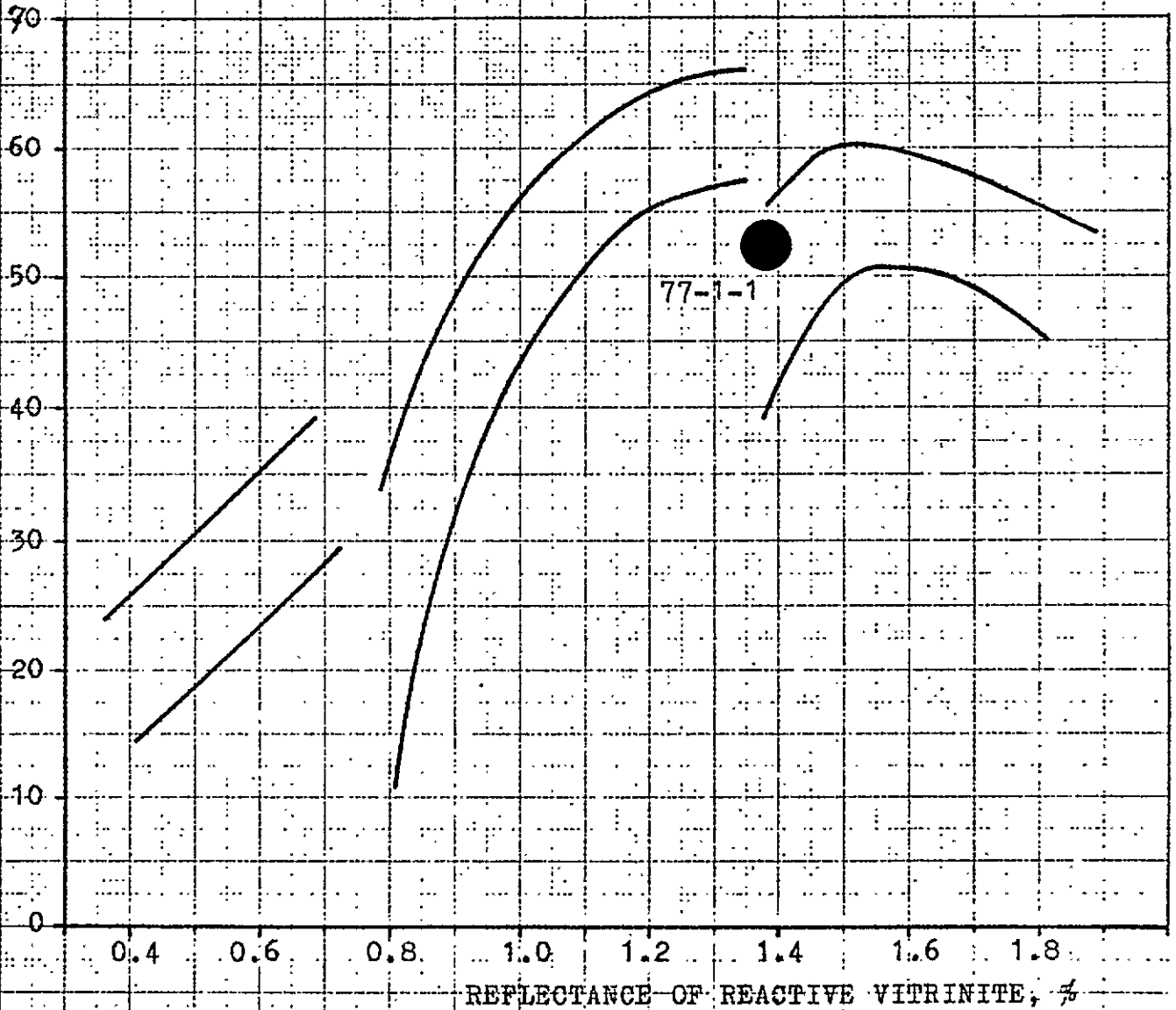
Results of Coking TestsSignification of sample 77-1-1

Ash	-	9.2	% dry
Volatile Matter	-	0.24	% dry
Volatile Matter	-	0.26	% d.a.f.
Sulphur	-	0.33	% dry
True relative density	-	1.91	%
Apparent rel. density	-	0.97	%
Porosity	-	49.2	%
Reactivity	-	0.101	cm <sup>3</sup> · g <sup>-1</sup> · s <sup>-1</sup>
Grindability			
3 - 2 mm	-	1079	mkp/kg
3 - 1 mm	-	763	mkp/kg



DISCONTINUOUS RELATIONSHIP BETWEEN  
REACTIVE VITRINITE REFLECTANCE AND COKE STRENGTH

ASTM COKE TUMBLER STABILITY, %





T E S T R E P O R T

Semi-Industrial Coking Tests on Saxon Coal

MC

MONTAN-  
CONSULTING GMBH  
ESSEN · GERMANY



Ein Unternehmen der  
RUHRKOHLE AG

T E S T R E P O R T

Semi-Industrial Coking Tests on Saxon Coal

Dr. G. Bracht

Essen, April 1977

Dr. R. Kutzner

Saxon Coal Project

Report on tests carried out on 1976 adit samples.

As arranged, Denison dispatched to Montan Consulting fairly large amounts of cleaned sample material which simulated coking-coal composition and which was derived from the bulk samples successfully obtained from the adits 76-4-1, 76-4-2 and 76-4-4. The samples received on March 3, 1977, were prepared during March 1977 for coking tests and put through the semi-industrial pilot oven at Bergbau-Forschung (cf. Page 3) using a test program drawn up by MC (Annexe 1).

First of all the coals scheduled for the tests were tested individually by MC and then in the specified mixtures. The results are listed in Annexes 2 to 2.14. By comparison with the 1 kg samples previously dispatched by Denison and tested by MC, the results of the dilatometer test and the fluidity measurements were distinctly better, but did not attain the values stated by Denison.

The results of these coking tests, which have been listed in Annexes 3 and 4, can and should be used for achieving a better characterization of the coking properties of these coals. As anticipated, the best coke strength values and the lowest abrasion figure were obtained from coking the adit samples 76-4-4 by themselves. With a figure of  $1.14 \% \bar{R}_m$ , this coal from the aspect of coal rank is an optimal coal and has the relatively best maceral composition, i.e. the maximum vitrinite content and the minimum inertinite content.

Since the quality of this sample comes nearest to the average quality of the planned output from the Saxon deposit, these results can be used as a first step in assessing the deposit. According to this, the use of this coal for the production of metallurgical coke is just possible if coked by itself.

However, it would be necessary to put up with strength values in the lower range of the limit (around 70 % of ISO 40) that is still acceptable for metallurgical coke.

Roughly the same results were achieved when a mixture of 30 % Saxon coal and 70 % high-volatile blend coal from the Ruhr (Blend C) or from the USA (Blend E) was coked.

By reducing the high-volatile blend coal to 50 % (Blend F), it was possible to achieve distinct improvements. The coke thus produced is found to have strength properties ( $\geq$  74 % ISO 40) that are adequate for a metallurgical coke. If the Saxon coal is blended with 70 % medium-volatile coking-coal from the Ruhr (Blend D), it is possible to achieve very good strength values (over 77 % ISO 40), as generally demanded for metallurgical coke by the European steelmills.

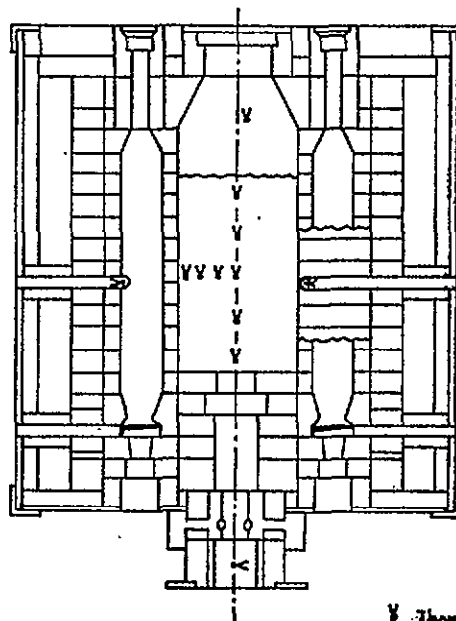
Summing up, it should be noted that, while the present results do not completely fulfil the expectations attached to the Saxon coal, they do produce the proof, however, that this coal when used as a blend coal in conjunction with high-and medium-volatile coking-coals of other provenance is capable of yielding a qualitatively satisfactory-to-good metallurgical coke.

Since oxidative changes in the tested samples cannot be ruled out, and in fact were even probable, it is possible that tests carried out later on with fresh, non-oxidized samples will yield better results.

### Description of the Pilot Coke Oven

The oven used for the coking tests has a chamber width of 450 mm, a filling height of 700 mm and a length of 1000 mm between the doors. It is heated with coke oven gas by means of three heating flues in each wall. The air is preheated by metal heat exchangers. In contrast to the industrial oven the heating flue temperature is measured in the heating flue itself (see Fig.). In order to achieve bulk density values comparable to those usual in industrial practice, the oven is charged from a height of about 4 m from the oven floor. Furthermore, in the case of moist charges some light heating oil is added. Years of experience show that this does not adversely affect the quality of the coke.

The coke strength values (M40) are about 1 - 2 points lower as compared with those obtained in the industrial coke oven; the abrasion values (M10) are about 1 - 2 points higher.



V. thermo-elements (thermocouples)

Specification of Samples

Saxon	76 - 4 - 1		
Saxon	76 - 4 - 2		
Saxon	76 - 4 - 4		
Coal Mountain		(USA)	
Coking coal Lohberg		(RAG)	
Coking coal Hugo		(RAG)	
Mixture A	-	50.0 %	Saxon 76 - 4 - 1
		25.0 %	Saxon 76 - 4 - 2
		25.0 %	Saxon 76 - 4 - 4
Mixture B	-	25.0 %	Saxon 76 - 4 - 1
		37.5 %	Saxon 76 - 4 - 2
		37.5 %	Saxon 76 - 4 - 4

Specification of Tests

sample/mixture	S a x o n			C	D	E	F	G
	4-1	4-2	4-4					
Saxon 76-4-1 %	100	-	-	-	-	-	-	-
Saxon 76-4-2 %	-	100	-	-	-	-	-	-
Saxon 76-4-4 %	-	-	100	-	-	-	-	-
Mixture A %	-	-	-	30	30	30	-	-
Mixture B %	-	-	-	-	-	-	50	50
Mountain %	-	-	-	-	-	70	50	-
Lohberg %	-	-	-	70	-	-	-	25
Hugo %	-	-	-	-	70	-	-	25

S A X O N - COAL - PROJECT

Signification of sample	Saxon 76-4-1	Saxon 76-4-2	Saxon 76-4-4	Moun- tain	Loh- berg	Hugo	Mixture C	Mixture D	Mixture E	Mixture F	Mixture G
ER-No.	32	34	36	154	155	156	179	180	195	194	181
Date - 1977 -	4.3.	4.3.	4.3.	14.3.	14.3.	14.3.	15.3.	15.3.	16.3.	16.3.	15.3.
<b>Size analysis</b>											
> 10 mm	5.0	7.5	5.8	31.1	1.7	0.6	0	0.4	0.4	0.2	0.6
10 - 6.3 mm	8.1	10.7	7.2	11.7	12.0	4.3	2.7	4.9	3.3	2.5	3.7
6.3 - 3.15 mm	19.8	19.5	13.0	18.4	23.3	11.7	12.6	12.1	16.3	15.9	14.3
3.15 - 2 mm	7.9	7.5	5.9	5.1	8.0	4.9	6.9	5.9	8.7	9.3	8.1
2 - 1 mm	26.0	22.0	21.4	12.8	23.0	17.8	27.6	19.0	27.5	28.7	25.1
1 - 0.5 mm	16.0	12.5	15.4	7.0	11.0	19.0	19.6	17.6	16.7	17.2	17.4
0.5 - 0.2 mm	11.5	10.2	15.0	6.3	8.7	21.2	15.5	20.9	14.1	13.9	16.3
< 0.2 mm	5.7	10.1	16.3	7.6	12.3	20.5	15.1	19.2	13.0	12.3	14.5
Moisture	0.8	1.5	1.5	5.8	1.8	1.4	1.2	1.0	1.3	0.8	1.1
Ash	8.5	7.7	8.5	7.1	5.8	8.9	6.7	9.1	7.5	7.7	8.1
Volatile Matter	19.8	27.5	24.0	32.3	31.9	24.4	28.5	23.7	29.7	28.3	26.0
Volatile Matter	21.6	29.8	26.2	34.8	33.9	26.8	30.5	26.1	32.1	30.6	28.3
Sulphur	0.45	0.34	0.38	0.86	1.01	0.95	0.84	0.77	0.69	0.61	0.68
Phosphorus	0.059	0.027	0.033	0.008	0.021	0.023	0.026	0.030	0.018	0.023	0.037
Swelling Index	4 1/2	6 1/2	7 1/2	8	7 1/2	8	7 1/2	8	7 1/2	7 1/2	7
Dilatometer Test											
Softening Temp.	422	370	389	358	370	379	380	386	364	371	383
Solidification T.	491	458	460	455	443	464	457	457	449	464	461
Contraction	31	32	32	27	30	27	31	25	26	31	30
Dilatation	-3	73	38	174	76	102	35	65	110	57	44
G-Value	0.915	1.043	1.007	1.095	1.040	1.062	1.005	1.038	1.069	1.034	1.017
Max. Fluidity	4	415	54	22200	2100	610	1060	225	2800	685	234
Softening Temp.	477	444	462	423	435	447	441	453	432	435	444
Temp. of max.											
Fluidity	498	480	489	465	471	480	471	492	468	474	483
Solidification T.	513	510	510	510	504	>510	507	>510	510	510	510
<b>Maceral Group Analysis</b>											
Vitrinite	52	48	59	61	59	62	59	58	59	57	51
Exinite	1	6	3	14	13	9	13	7	13	9	11
Inertinite	41	39	31	20	23	23	24	30	21	27	32
Minerals	6	7	7	5	5	6	4	5	7	7	6
Reflectance	Anlage	1	2	3	4	5	6	7	8	9	10
R <sub>m</sub>	%	1.37	1.06	1.14	0.94	0.96	1.18	1.02	1.18	0.96	1.01
Hardgrove-Index	°H	120	85	100	72	63	68	74	96	79	81

Determination of coal rank by measuring the mean resp. maximum reflectance (546 nm) of vitrinites

Measuring Point:

Horizon No.:

Sample No.: 32

$\bar{R}_m = 1.37$

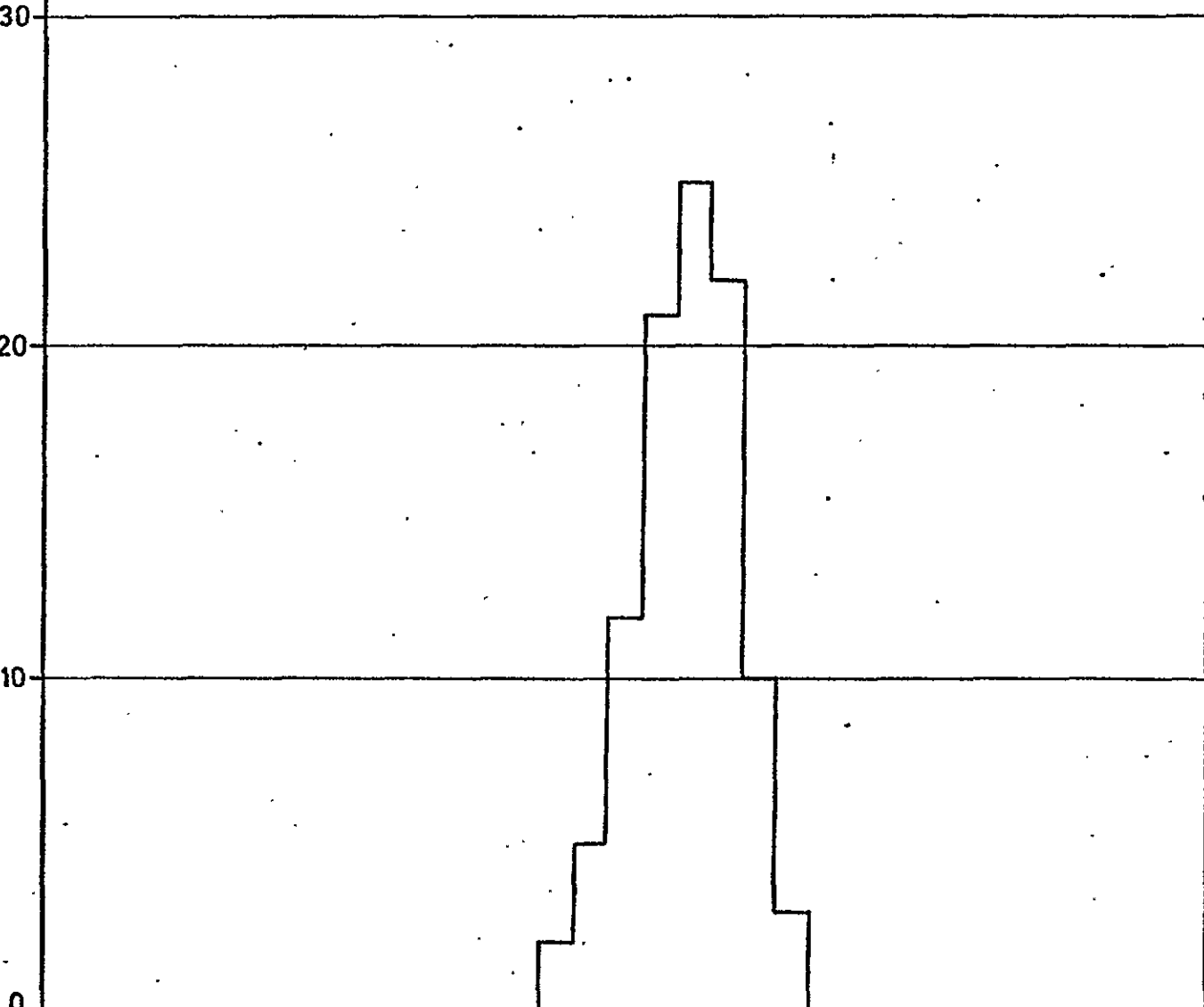
$2s = 0.15$

$\bar{R}_m$  = mean maximum reflectance

$2s$  = standard deviation (95%)

Saxon-Coal 76-4-1

% frequency distribution of the reflectance classes of 0,05%  $\bar{R}_m$



0,5 0,6 0,7 0,8 0,9 1,0 1,1 1,2 1,3 1,4 1,5 1,6 1,7 1,8 1,9 2,0 % R  
 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | V-Stufe

100 readings, oil immersion, 1/4 cm<sup>2</sup> = 1 Vol.-%, V-class = % R · 10

ranges of the mean resp. maximum reflectance of:									
< 0,65% correspond about					> 40% volatile matter d.a.f. of the proximate analysis (ash dry <8%)				
0,65 - 0,90 %	..	..	40 - 35 %	..	..	..	..	..	..
0,90 - 1,20 %	..	..	35 - 28 %	..	..	..	..	..	..
1,15 - 1,65 %	..	..	28 - 19 %	..	..	..	..	..	..
1,60 - 2,00 %	..	..	19 - 14 %	..	..	..	..	..	..
1,90 - 2,45 %	..	..	14 - 10 %	..	..	..	..	..	..

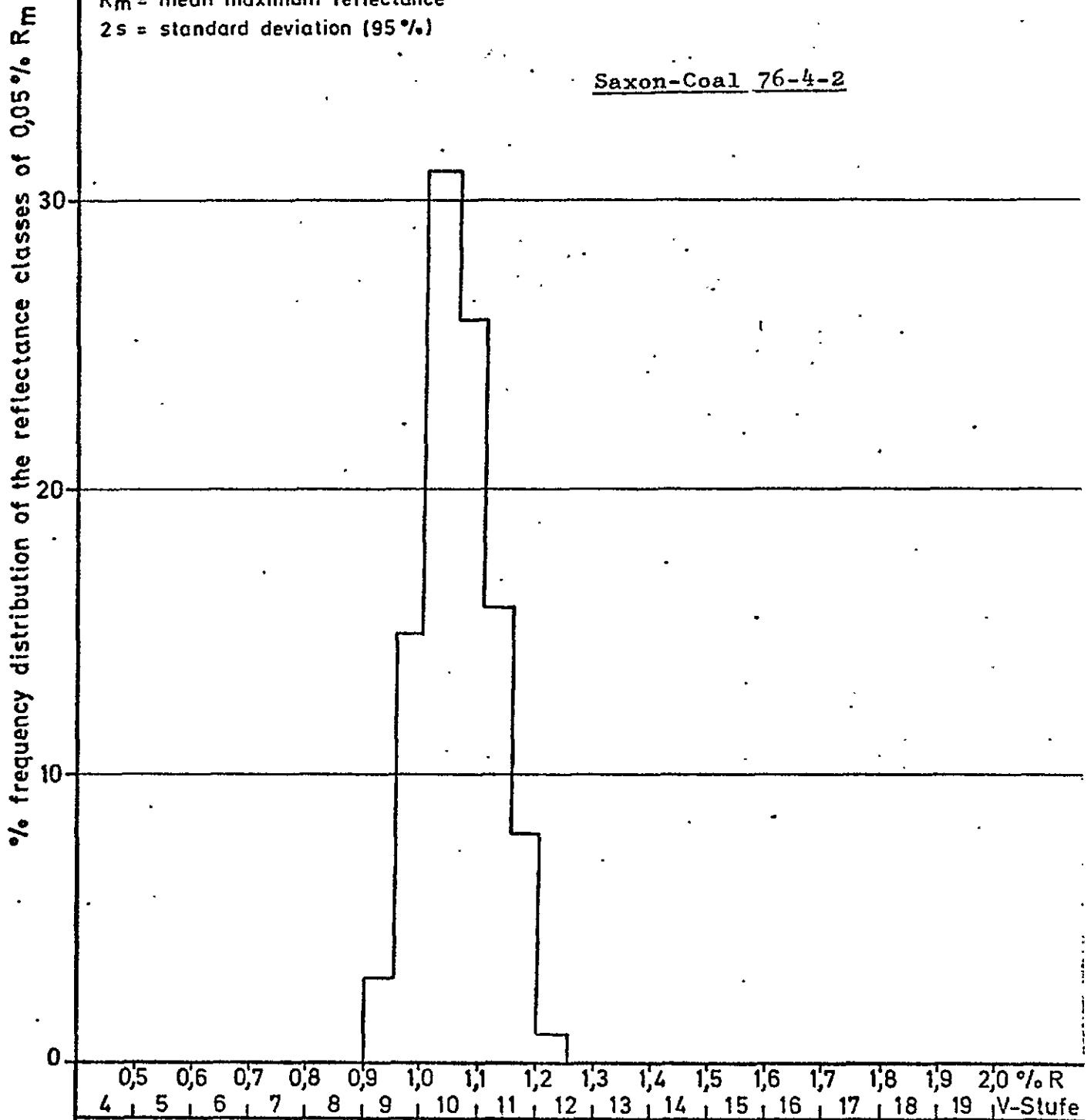


Determination of coal rank by measuring the mean resp. maximum reflectance (546 nm) of vitrinites

Measuring Point:	Horizon No.:	Sample No.: 34
$\bar{R}_m = 1.06$	$2s = 0.12$	

$\bar{R}_m$  = mean maximum reflectance  
 $2s$  = standard deviation (95%)

Saxon-Coal 76-4-2



100 readings, oil immersion, 1/4 cm<sup>2</sup> = 1 Vol.-%, V-class = % R · 10

ranges of the mean resp. maximum reflectance of:

< 0,65% correspond about		> 40% volatile matter d.a.f. of the proximate analysis (ash dry <8%)	
0,65 - 0,90 %	.. ..	40 - 35 %	.. ..
0,90 - 1,20 %	.. ..	35 - 28 %	.. ..
1,15 - 1,65 %	.. ..	28 - 19 %	.. ..
1,60 - 2,00 %	.. ..	19 - 14 %	.. ..
1,90 - 2,45 %	.. ..	14 - 10 %	.. ..

Determination of coal rank by measuring the mean resp. maximum reflectance (546 nm) of vitrinites

Measuring Point:

Horizon No:

Sample No.: 36

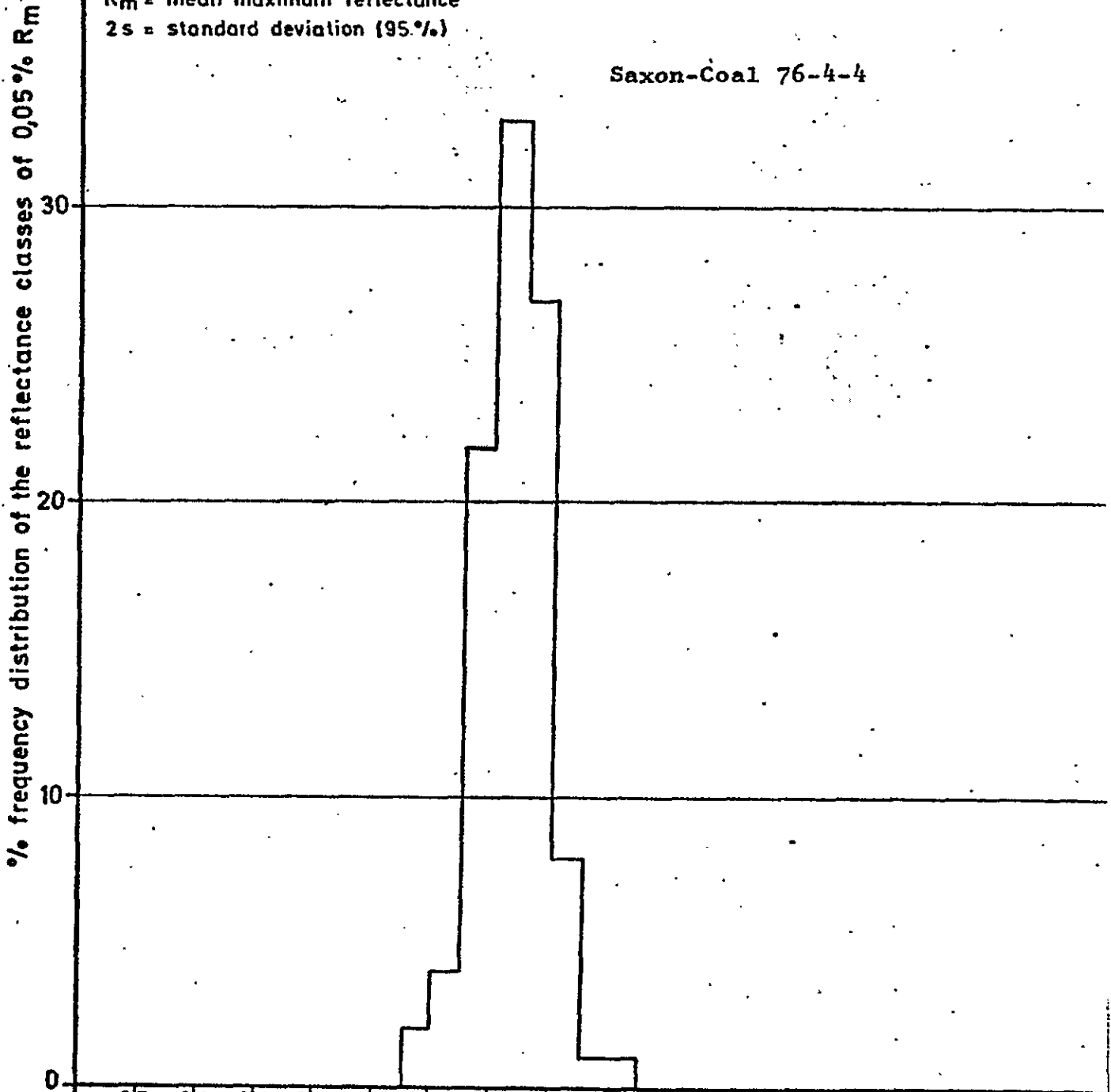
$\bar{R}_m = 1.14$

$2s = 0.12$

$\bar{R}_m$  = mean maximum reflectance

$2s$  = standard deviation (95.%)

Saxon-Coal 76-4-4



0,5 0,6 0,7 0,8 0,9 1,0 1,1 1,2 1,3 1,4 1,5 1,6 1,7 1,8 1,9 2,0 % R  
4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 V-Stufe

100 readings, oil immersion, 1/4 cm<sup>2</sup> = 1 Vol.-%, V-class = % R · 10

ranges of the mean resp. maximum reflectance of:

< 0,65 %	correspond about	> 40 %	volatile matter d.o.f. of the proximate analysis (ash dry < 8 %)
0,65 - 0,90 %	" "	40 - 35 %	" " " " " "
0,90 - 1,20 %	" "	35 - 28 %	" " " " " "
1,15 - 1,65 %	" "	28 - 19 %	" " " " " "
1,60 - 2,00 %	" "	19 - 14 %	" " " " " "
1,90 - 2,45 %	" "	14 - 10 %	" " " " " "

Determination of coal rank by measuring the mean resp. maximum reflectance (546 nm) of vitrinites

Measuring Point:

Horizon No.:

Sample No.: 154

$\bar{R}_m = 0.94$

$2s = 0.15$

$\bar{R}_m$  = mean maximum reflectance

$2s$  = standard deviation (95%)

Coal Mountain

% frequency distribution of the reflectance classes of 0,05%  $\bar{R}_m$

30  
20  
10  
0

0,5 0,6 0,7 0,8 0,9 1,0 1,1 1,2 1,3 1,4 1,5 1,6 1,7 1,8 1,9 2,0 % R  
4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 V-Stufe

100 readings, oil immersion, 1/4 cm<sup>2</sup> = 1 Vol.-%, V-class = % R · 10

ranges of the mean resp. maximum reflectance of:

< 0,65 %	correspond about	> 40 %	volatile matter	d.o.f. of the proximate analysis	(ash dry < 8 %)
0,65 - 0,90 %	" "	40 - 35 %	" "	" "	" "
0,90 - 1,20 %	" "	35 - 28 %	" "	" "	" "
1,15 - 1,65 %	" "	28 - 19 %	" "	" "	" "
1,60 - 2,00 %	" "	19 - 14 %	" "	" "	" "
1,90 - 2,45 %	" "	14 - 10 %	" "	" "	" "

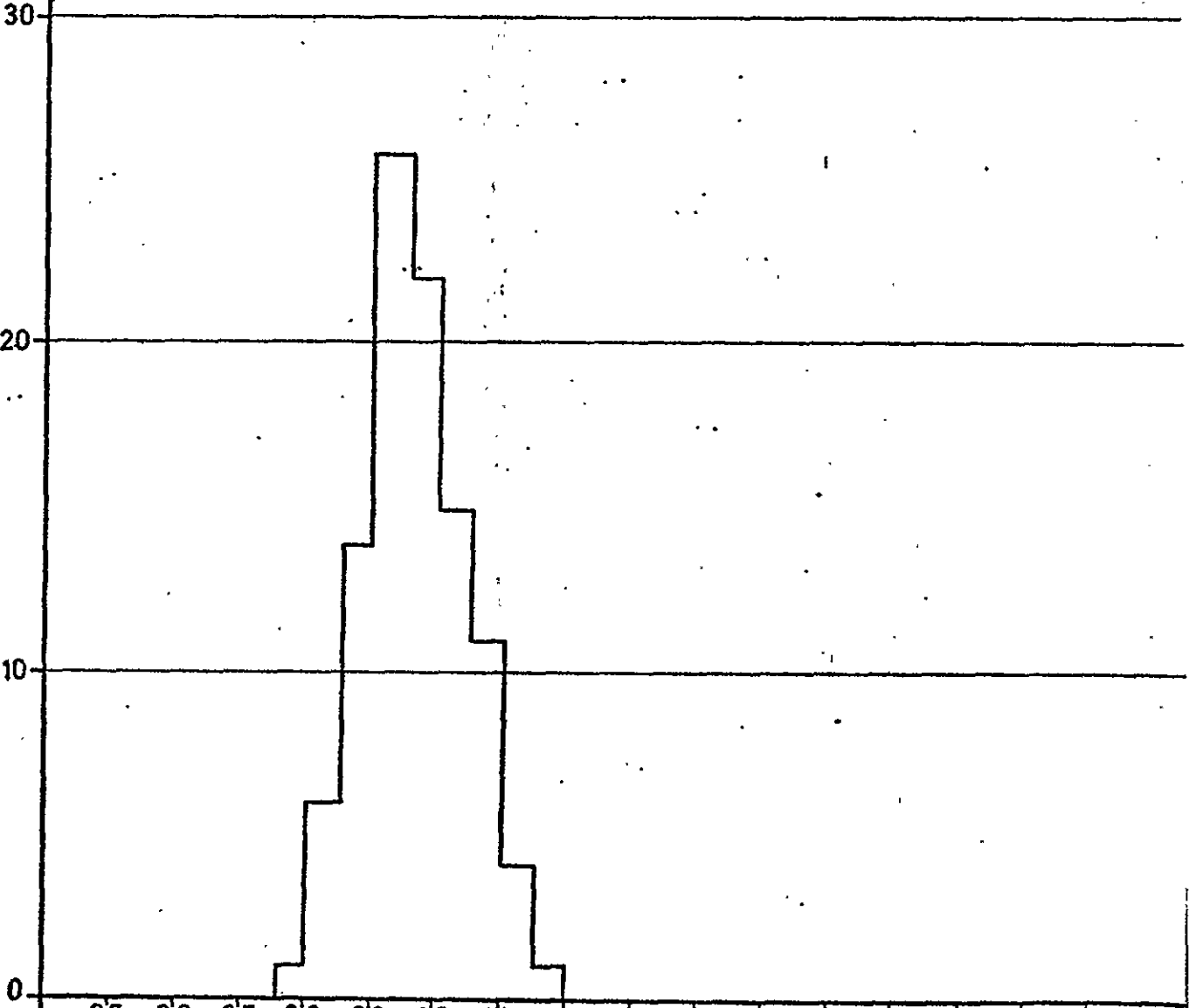
Determination of coal rank by measuring the mean resp. maximum reflectance (546 nm) of vitrinites

Measuring Point:	Horizon No.:	Sample No.: 155
$\bar{R}_m = 0.96$	$2s = 0.16$	

$\bar{R}_m$  = mean maximum reflectance  
 $2s$  = standard deviation (95%)

Kokskohle Lohberg

% frequency distribution of the reflectance classes of 0,05% R<sub>m</sub>



0,5 0,6 0,7 0,8 0,9 1,0 1,1 1,2 1,3 1,4 1,5 1,6 1,7 1,8 1,9 2,0 % R<sub>m</sub>  
 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 V-Stufe

100 readings, oil immersion, 1/4 cm<sup>2</sup> = 1 Vol.-%, V-class = % R · 10

ranges of the mean resp. maximum reflectance of:										
< 0,65 %	correspond about	> 40 %	volatile matter d.a.f. of the proximate analysis (ash dry <8 %)							
0,65 - 0,90 %	" "	40 - 35 %	" "	"	"	"	"	"	"	"
0,90 - 1,20 %	" "	35 - 28 %	" "	"	"	"	"	"	"	"
1,15 - 1,65 %	" "	28 - 19 %	" "	"	"	"	"	"	"	"
1,60 - 2,00 %	" "	19 - 14 %	" "	"	"	"	"	"	"	"
1,90 - 2,45 %	" "	14 - 10 %	" "	"	"	"	"	"	"	"



Determination of coal rank by measuring the mean resp. maximum reflectance (546 nm) of vitrinites

Measuring Point:

Horizon No.:

Sample No.: 179

$\bar{R}_m = 1.02$

$2s = 0.29$

$\bar{R}_m$  = mean maximum reflectance  
 $2s$  = standard deviation (95%)

Mischung C

% frequency distribution of the reflectance classes of 0,05% R<sub>m</sub>

30  
20  
10  
0

0,5 0,6 0,7 0,8 0,9 1,0 1,1 1,2 1,3 1,4 1,5 1,6 1,7 1,8 1,9 2,0 % R  
 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 V-Stufe

100 readings, oil immersion, 1/4 cm<sup>2</sup> = 1 Vol.-%, V-class = % R · 10

ranges of the mean resp. maximum reflectance of:

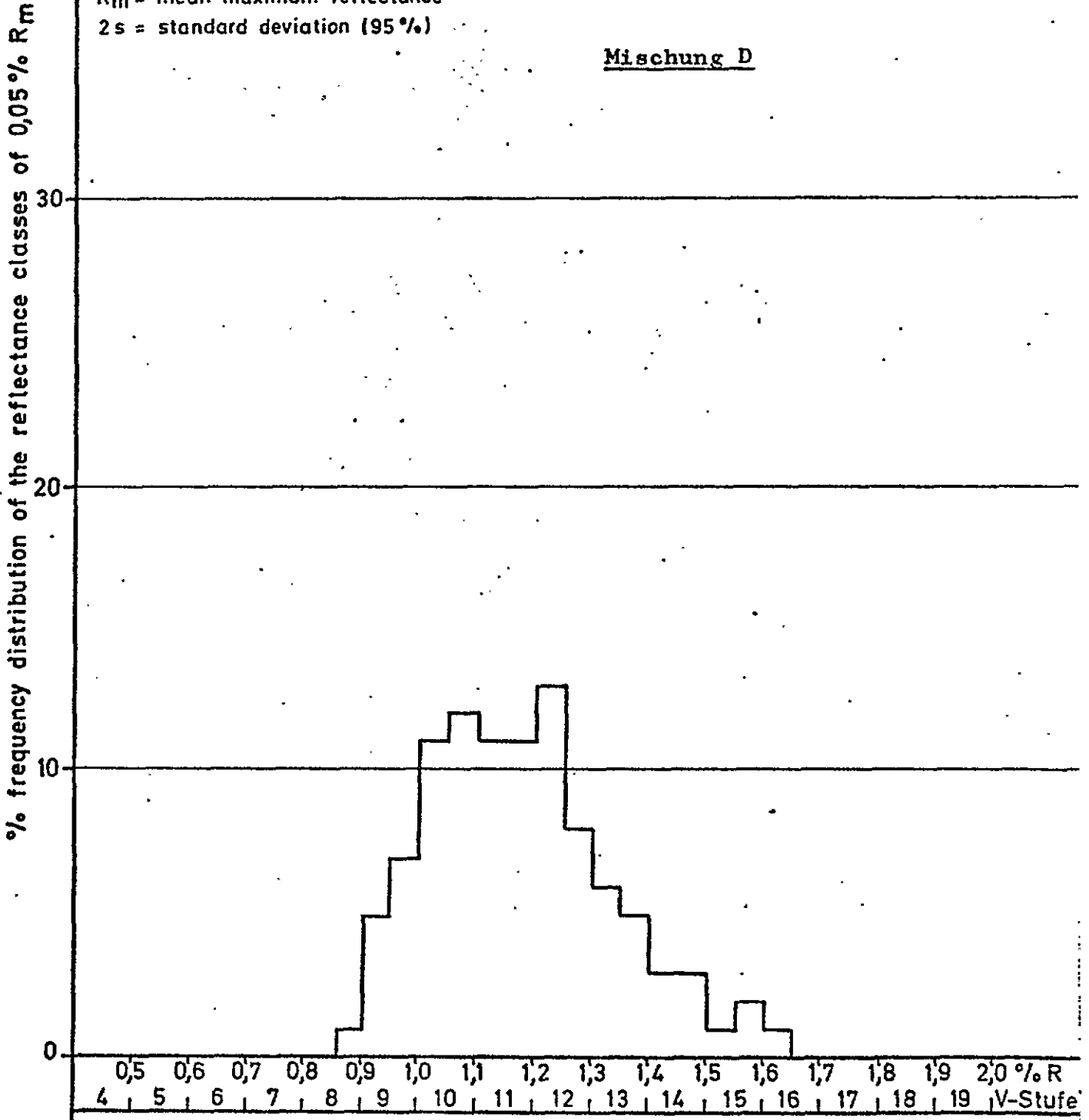
< 0,65 %	correspond about	> 40 %	volatile matter d.o.f. of the proximate analysis (ash dry < 8%)
0,65 - 0,90 %	" "	40 - 35 %	" " " " " "
0,90 - 1,20 %	" "	35 - 28 %	" " " " " "
1,15 - 1,65 %	" "	28 - 19 %	" " " " " "
1,60 - 2,00 %	" "	19 - 14 %	" " " " " "
1,90 - 2,45 %	" "	14 - 10 %	" " " " " "

Determination of coal rank by measuring the mean resp. maximum reflectance (546 nm) of vitrinites

Measuring Point:	Horizon No.:	Sample No.: 180
$\bar{R}_m = 1.18$	$2s = 0.32$	

$\bar{R}_m$  = mean maximum reflectance  
 $2s$  = standard deviation (95%)

Mischung D



100 readings, oil immersion, 1/4 cm<sup>2</sup> = 1 Vol.-%, V-class = % R · 10

ranges of the mean resp. maximum reflectance of:				> 40% volatile matter d.a.f. of the proximate analysis (ash dry <8%)						
< 0,65%	correspond about									
0,65 - 0,90%	"	"	40 - 35%	"	"	"	"	"	"	"
0,90 - 1,20%	"	"	35 - 28%	"	"	"	"	"	"	"
1,15 - 1,65%	"	"	28 - 19%	"	"	"	"	"	"	"
1,60 - 2,00%	"	"	19 - 14%	"	"	"	"	"	"	"
1,90 - 2,45%	"	"	14 - 10%	"	"	"	"	"	"	"



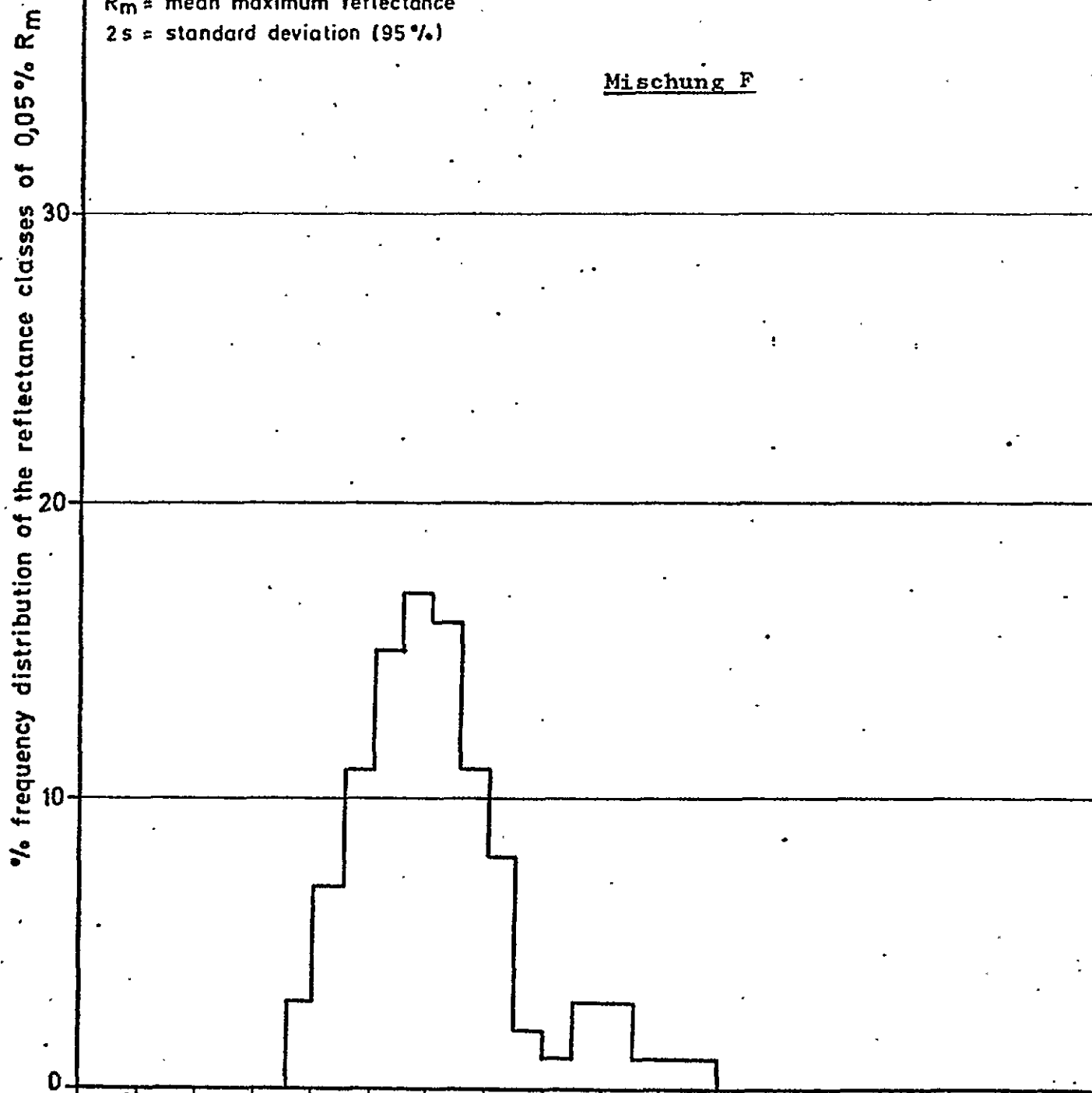


Determination of coal rank by measuring the mean resp. maximum reflectance (546 nm) of vitrinites

Measuring Point:	Horizon No.:	Sample No.: 194
$\bar{R}_m = 1.01$	$2s = 0.28$	

$\bar{R}_m$  = mean maximum reflectance  
 $2s$  = standard deviation (95%)

Mischung F



0,5 0,6 0,7 0,8 0,9 1,0 1,1 1,2 1,3 1,4 1,5 1,6 1,7 1,8 1,9 2,0 %R  
 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 V-Stufe

100 readings, oil immersion, 1/4 cm<sup>2</sup> = 1 Vol.-%, V-class = % R · 10

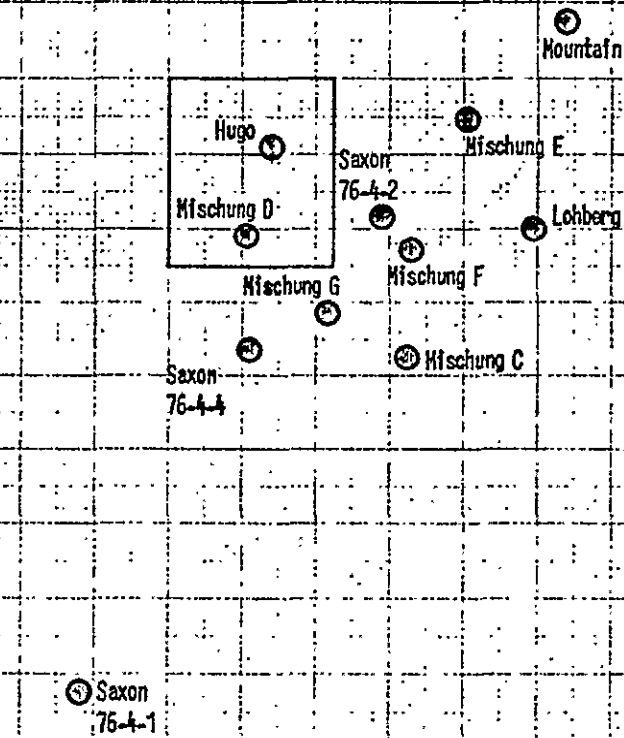
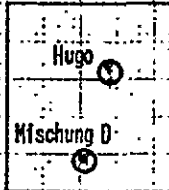
ranges of the mean resp. maximum reflectance of:			
< 0,65 %	correspond about	> 40 %	volatile matter d.a.f. of the proximate analysis (ash dry <8%)
0,65 - 0,90 %	.. ..	40 - 35 %	.. ..
0,90 - 1,20 %	.. ..	35 - 28 %	.. ..
1,15 - 1,65 %	.. ..	28 - 19 %	.. ..
1,60 - 2,00 %	.. ..	19 - 14 %	.. ..
1,90 - 2,45 %	.. ..	14 - 10 %	.. ..



G-Zahl

1,200  
1,180  
1,160  
1,140  
1,120  
1,100  
1,080  
1,060  
1,040  
1,020  
1,000  
0,980  
0,960  
0,940  
0,920  
0,900  
0,880  
0,860  
0,840  
0,820  
0,800  
0,780  
0,760  
0,740  
0,720  
0,700

16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 %  
Flücht. Best. (i.waf)



DDPM

30 000

10 000

5 000

1 000

500

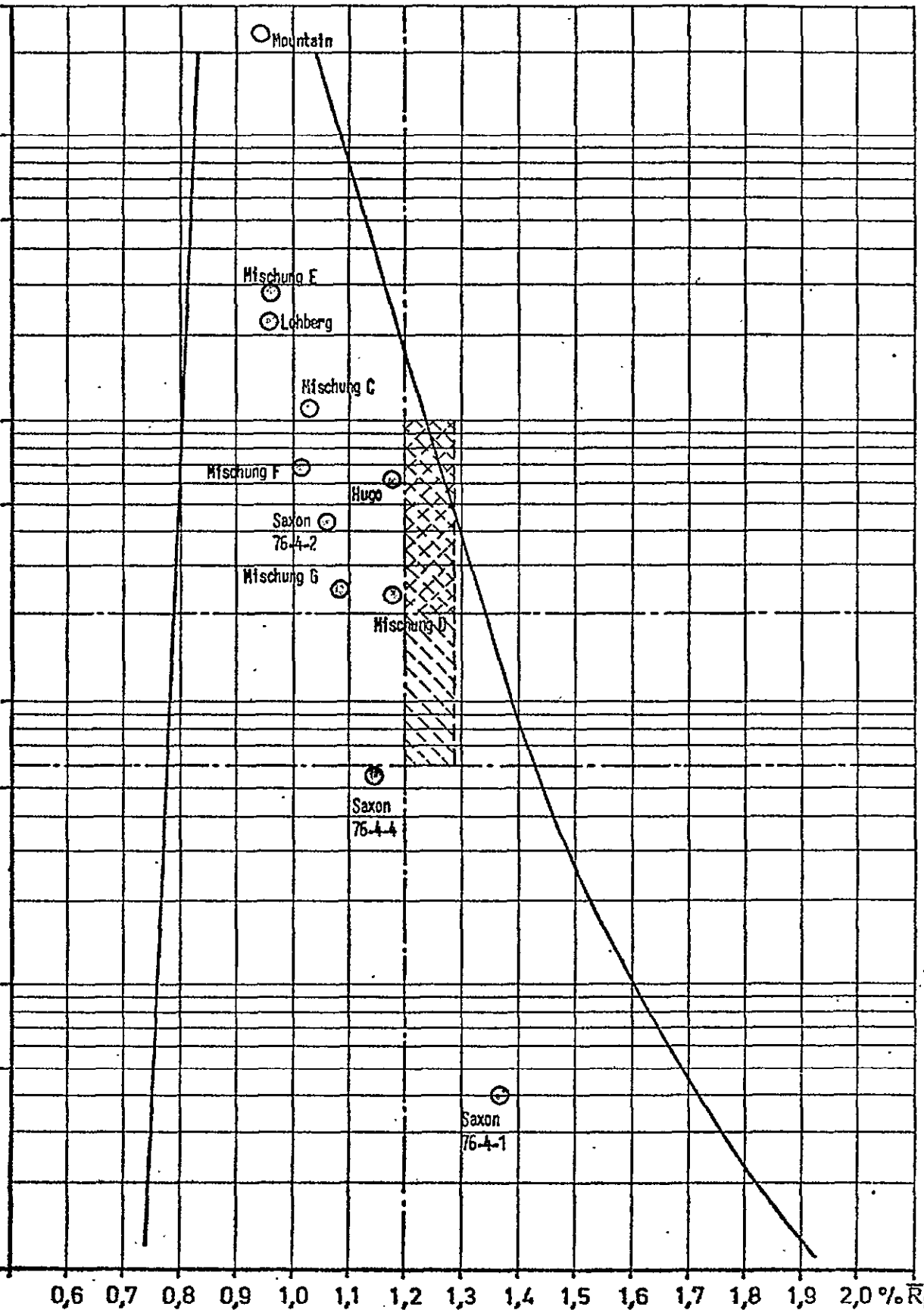
100

50

10

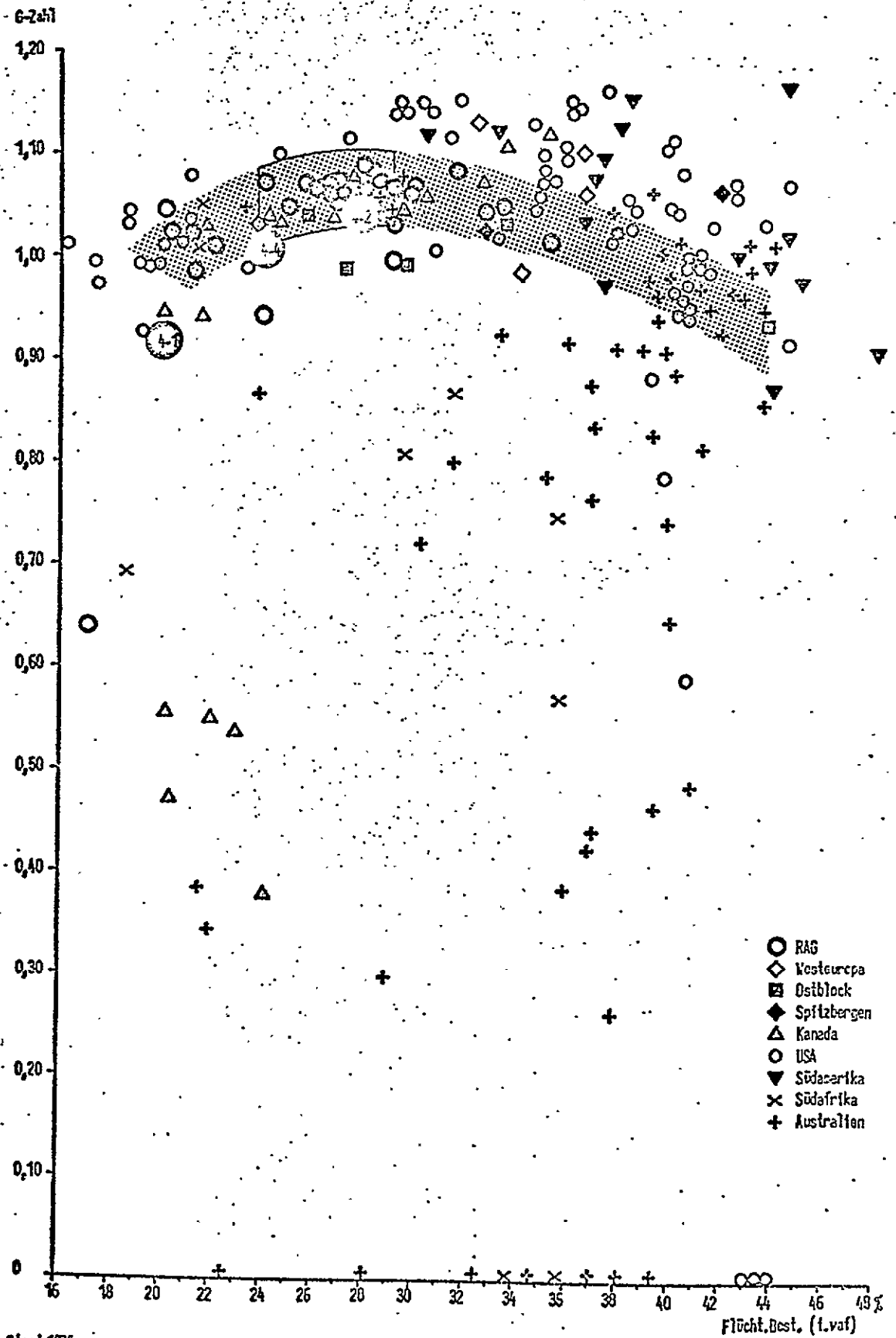
5

1



0,6 0,7 0,8 0,9 1,0 1,1 1,2 1,3 1,4 1,5 1,6 1,7 1,8 1,9 2,0 %  $\bar{R}_m$

Cokability G of coals of different sources



Stand 1976

Results of Coking Tests (250 kg oven)

Signification of sample		Saxon 76-4-1	Saxon 76-4-2	Saxon 76-4-4	Mixture C	Mixture D	Mixture E	Mixture F	Mixture G	
Saxon 76-4-1	%	100	-	-	15	15	15	12.5	12.5	
Saxon 76-4-2	%	-	100	-	7.5	7.5	7.5	18.75	18.75	
Saxon 76-4-4	%	-	-	100	7.5	7.5	7.5	18.75	18.75	
Mountain	%	-	-	-	-	-	70	50	-	
Lohberg	%	-	-	-	70	-	-	-	25	
Hugo	%	-	-	-	-	70	-	-	25	
Gas oil	%	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	
Moisture content	%	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Bulk density (moist.)	kg/m <sup>3</sup>	800	816	797	790	771	759	762	784	
Bulk density (dry)	kg/m <sup>3</sup>	720	734	717	711	694	683	686	706	
Heating flue temp.	°C	1250	1250	1250	1250	1250	1250	1250	1250	
Oven centre final temp.	°C	1000	1010	1005	1010	1005	1010	1005	1005	
Coking progress (350 - 550 °C)	°C/min	2.8	3.0	3.3	3.3	3.7	3.2	3.6	3.8	
Coking period	h	19.0	19.0	19.0	18.5	18.5	18.0	18.25	18.5	
Coke yield	% i. yf	80.7	75.8	77.5	74.5	77.8	73.8	74.8	76.3	
Coke production	kg/m <sup>3</sup> /h	30.6	29.1	29.2	28.7	29.2	28.0	28.1	28.9	
Lump coke										
> 100	mm	%	50.4	49.6	49.7	56.8	61.7	60.2	55.4	56.1
> 80	mm	%	63.0	65.2	65.0	70.2	74.4	69.3	65.1	68.4
> 60	mm	%	78.3	78.8	82.0	82.0	88.0	84.7	82.0	82.5
> 40	mm	%	89.1	93.5	93.3	93.7	95.5	93.9	93.4	94.0
> 20	mm	%	92.5	97.1	96.5	97.3	97.5	97.0	96.6	96.7
Breeze										
< 10	mm	%	7.1	2.4	3.0	2.0	1.9	2.5	2.1	2.7
Strength (ISO)										
80	mm	%	2.3	4.0	2.2	2.3	6.4	6.4	5.4	4.9
60	mm	%	20.5	19.4	22.0	26.4	35.9	28.3	32.2	29.8
40	mm	%	70.1	66.8	69.7	70.2	77.4	71.8	74.0	74.0
20	mm	%	85.7	86.4	88.2	88.1	88.8	86.4	88.0	88.6
Abrasion										
10	mm	%	13.3	11.1	10.2	10.1	9.6	11.8	10.6	10.1

Test Results of Coko

Signification of sample		Saxon 76-4-1	Saxon 76-4-2	Saxon 76-4-4	Mixture C	Mixture D	Mixture E	Mixture F	Mixture G	
Saxon	76 - 4 - 1	%	100	-	-	15	15	15	12.5	12.5
Saxon	76 - 4 - 2	%	-	100	-	7.5	7.5	7.5	18.75	18.75
Saxon	76 - 4 - 4	%	-	-	100	7.5	7.5	7.5	18.75	18.75
Mountain		%	-	-	-	-	70	50	-	-
Lohberg		%	-	-	-	70	-	-	-	25
Hugo		%	-	-	-	-	70	-	-	25
Ash		% dry	10.0	9.9	11.2	8.6	11.1	10.3	10.1	9.9
Volatile matter		% dry	0.13	0.15	0.18	0.20	0.14	0.09	0.16	0.16
Volatile matter		% d.a.f.	0.14	0.17	0.20	0.22	0.16	0.10	0.18	0.18
Sulphur		% dry	0.44	0.33	0.35	0.70	0.69	0.60	0.56	0.64
True relative density		g/cm <sup>3</sup>	1.93	1.91	1.93	1.92	1.94	1.93	1.93	1.93
Apparent rel. density		g/cm <sup>3</sup>	0.93	0.93	0.88	0.88	0.91	0.81	0.85	0.89
Porosity		%	51.8	51.3	54.4	54.8	53.1	58.0	56.0	53.9
Reactivity		cm <sup>3</sup> · g <sup>-1</sup> · s <sup>-1</sup>	0.131	0.105	0.138	0.129	0.104	0.071	0.104	0.140

REPORT OF ANALYSIS

Saxon Project Feasibility Report  
October 1977

Lab: NKK

<u>ANALYSES OF COAL</u>		<u>GRINDABILITY</u>	
PROXIMATE ANALYSES (db)		Hardgrove Index	
Adit No.	76-4-1	SAPOZHNIKOV PLASTOMETER	
Ash	8.1		
Volatile Matter	20.8		
Fixed Carbon	71.1		
F.S.I.	6.5		
Sulphur	0.48		
Phosphorous Moisture			
GROSS CALORIFIC VALUE (db)			
Btu per pound	8022		
GIESELER PLASTOMETER		DILATOMETER	
Softening Temp.	448		
Max. Fluid. Temp.	472		
Solid. Temp.	495		
Melting Range			
Max. Fluidity	96		

DRUM TESTS

Blend	DI	DI	DI	DI	DI	DI
	30/50	30/25	30/15	150/50	150/25	150/15
Straight	16.4	85.8	91.6	4.6	68.2	78.4
Blendability Adit 76-4-1 (20%) Serro (10%) Pittston MV (15%) Saraji (10%) Blackwater (10%) Lemington(23%) Yubari (10%) Oil Coke (2%)	25.9	85.8	91.1	6.3	65.8	75.1

PETROGRAPHIC DATA

<u>VITRINOID TYPES</u>		<u>PETROGRAPHIC COMPOSITION</u>		<u>PETROGRAPHIC INDICES</u>	
TYPE	PERCENT				
		Reactive Components			
		Total Vitrinoid	71.3		
		Reactive Semi-Fusinoids (1/3)	2.8		
		Exinoid + Resinoid	0.5		
		Total Reactive Components	74.6	Mean Reflectance	1.49
		Inert Components		Balance Index	
14	80	Inert Semi-Fusinoids (2/3)	5.7	Strength Index	
15	7	Micrinoids	5.4	Stability Index	
16	13	Fusinoids	10.2		
		Mineral Matter	4.1		
		Total Inert Components	25.4		



REPORT OF ANALYSIS

Saxon Project Feasibility Report  
October 1977

Lab: NKK

<u>ANALYSES OF COAL</u>		<u>GRINDABILITY</u>	
PROXIMATE ANALYSES (db)		Hardgrove Index	
Adit No. 76-4-4		SAPOZHNIKOV PLASTOMETER	
Ash	8.1		
Volatile Matter	25.2		
Fixed Carbon	66.7		
F.S.I.	7.5		
Sulphur	0.36		
Phosphorous			
Moisture			
GROSS CALORIFIC VALUE (db)			
Btu per pound	7918		
GIESELER PLASTOMETER		DILATOMETER	
Softening Temp.	427		
Max. Fluid. Temp.	467		
Solid. Temp.	495		
Melting Range			
Max. Fluidity	96		

DRUM TESTS

Blend	DI	DI	DI	DI	DI	DI
	30/50	30/25	30/15	150/50	150/25	150/15
Straight	18.9	89.9	91.5	7.2	66.2	76.2
Blendability Adit 76-4-4 (20%) Serro (10%) Pittston MV (15%) Saraji (10%) Blackwater (19%) Lemington (23%) Yubari (10%) Oil Coke (2%)	25.1	85.9	91.3	9.5	67.7	75.5

PETROGRAPHIC DATA

<u>VITRINOID TYPES</u>		<u>PETROGRAPHIC COMPOSITION</u>		<u>PETROGRAPHIC INDICES</u>	
TYPE	PERCENT				
11	33	Reactive Components		Mean Reflectance	1.24
12	60	Total Vitrinoid	71.2	Balance Index	
13	7	Reactive Semi-Fusinoids (1/3)	1.6	Strength Index	
		Exinoid + Resinoid	0.5	Stability Index	
		Total Reactive Components	73.3		
		Inert Components			
		Inert Semi-Fusinoids (2/3)	3.2		
		Micrinoids	4.7		
		Fusinoids	14.7		
		Mineral Matter	4.1		
		Total Inert Components	26.7		

REPORT OF ANALYSIS

Saxon Project Feasibility Report  
October 1977

Lab: NKK

<u>ANALYSES OF COAL</u>	<u>GRINDABILITY</u>
PROXIMATE ANALYSES (db)	Hardgrove Index
Adit No. Alberta	SAPOZHNIKOV PLASTOMETER
Ash	
Volatile Matter	
Fixed Carbon	
F.S.I.	
Sulphur	
Phosphorous	
Moisture	
GROSS CALORIFIC VALUE (db)	
Btu per pound	
GIESELER PLASTOMETER	DILATOMETER
Softening Temp.	
Max. Fluid. Temp.	
Solid. Temp.	
Melting Range	
Max. Fluidity	

DRUM TESTS

Blend	DI 30/50	DI 30/25	DI 30/15	DI 150/50	DI 150/25	DI 150/15
Straight	24.5	83.8	90.2	3.9	61.5	73.3
Blendability Adit Alberta (20%) Serro (10%) Pittston MV (15%) Saraji (10%) Blackwater (19%) Lemington (23%) Yubari (10%) Oil Coke (2%)	19.9	85.7	91.0	4.4	65.2	74.4

PETROGRAPHIC DATA

<u>VITRINOID TYPES</u>		<u>PETROGRAPHIC COMPOSITION</u>	<u>PETROGRAPHIC INDICES</u>
TYPE	PERCENT		
		Reactive Components	Mean Reflectance
		Total Vitrinoid	Balance Index
		Reactive Semi-Fusinoids (1/3)	Strength Index
		Exinoid + Resinoid	Stability Index
		Total Reactive Components	
		Inert Components	
		Inert Semi-Fusinoids (2/3)	
		Micrinoids	
		Fusinoids	
		Mineral Matter	
		Total Inert Components	

REPORT OF ANALYSIS

Saxon Project Feasibility Report  
October 1977

Lab: Kobe Steel

ANALYSES OF COAL

PROXIMATE ANALYSES (db)

Adit No.	76-4-1
Ash	8.0
Volatile Matter	20.0
Fixed Carbon	72.0
F.S.I.	6
Sulphur	0.46
Phosphorous	0.0146
Moisture	

GROSS CALORIFIC VALUE (db)

Btu per pound

GIESELER PLASTOMETER

Softening Temp.	445
Max. Fluid. Temp.	472
Solid. Temp.	490
Melting Range	45
Max. Fluidity	6 ddmp

GRINDABILITY

Hardgrove Index

SAPOZHNIKOV PLASTOMETER

Plastometer	(mm)
X.1	14
Y.1	14

DILATOMETER

T1 - Soft. Temp.	419
T2 - Max. Cont. Temp.	458
T3 - Max. Dil. Temp.	488
Max. Contraction	25%
Max. Dilatation	10%

DRUM TESTS

Blend	DI	DI	DI	DI	DI	DI
	30/50	30/25	30/15	150/50	150/25	150/15
Straight	40.5	92.3	95.4	19.0	81.4	85.8
Blendability with Takashima (Domestic coal) 70%	24.3	84.0	92.1	4.9	64.7	78.7

PETROGRAPHIC DATA

PETROGRAPHIC COMPOSITION

VITRINOID TYPES

TYPE	PERCENT
14	14.6
15	43.9
16	35.4
17	4.9
18	1.2

Reactive Components	
Total Vitrinoid	72.0
Reactive Semi-Fusinoids (1/3)	3.2
Exinoid + Resinoid	0
Total Reactive Components	75.2
Inert Components	
Inert Semi-Fusinoids (2/3)	6.5
Micrinoids	11.8
Fusinoids	2.9
Mineral Matter	3.6
Total Inert Components	24.8

PETROGRAPHIC INDICES

Mean Reflectance	1.58
Balance Index	
Strength Index	
Stability Index	

REPORT OF ANALYSIS

Saxon Project Feasibility Report  
October 1977

Lab: Kobe Steel

ANALYSES OF COAL

PROXIMATE ANALYSES (db)

Adit No. 76-4-4  
Ash 7.9  
Volatile Matter 24.1  
Fixed Carbon 68.0  
F.S.I. 6.5  
Sulphur 0.38  
Phosphorous 0.0050  
Moisture

GROSS CALORIFIC VALUE (db)

Btu per pound

GIESELER PLASTOMETER

Softening Temp. 422  
Max. Fluid. Temp. 460  
Solid. Temp. 488  
Melting Range 66  
Max. Fluidity 86

GRINDABILITY

Hardgrove Index

SAPOZHNIKOV PLASTOMETER

Plastometer	(mm)
X.1	18
Y.1	21

DILATOMETER

T1 - Soft. Temp.	394
T2 - Max. Cont. Temp.	440
T3 - Max. Dil. Temp.	475
Max. Contraction	21%
Max. Dilatation	53%

DRUM TESTS

Blend	DI	DI	DI	DI	DI	DI
	30/50	30/25	30/15	150/50	150/25	150/15
Straight	42.0	93.2	95.6	17.0	81.4	85.6
Blendability with Takashima (Domestic coal) 70%	22.4	77.2	90.8	2.7	48.3	73.5

PETROGRAPHIC DATA

PETROGRAPHIC COMPOSITION

Reactive Components	73.8
Total Vitrinoid	
Reactive Semi-Fusinoids (1/3)	3.0
Exinoid + Resinoid	---
Total Reactive Components	76.8
Inert Components	
Inert Semi-Fusinoids (2/3)	6.1
Micrinoids	11.0
Fusinoids	2.6
Mineral Matter	3.5
Total Inert Components	23.2

VITRINOID TYPES

TYPE	PERCENT
10	0.9
11	6.6
12	53.8
13	32.1
14	5.7
15	0.9

PETROGRAPHIC INDICES

Mean Reflectance  
Balance Index  
Strength Index  
Stability Index

REPORT OF ANALYSIS

Saxon Project Feasibility Report  
October 1977

Lab: Nippon Steel

ANALYSES OF COAL

PROXIMATE ANALYSES (db)

Adit No. 76-4-1  
Ash 8.0  
Volatile Matter 20.1  
Fixed Carbon  
F.S.I. 7.5  
Sulphur 0.44  
Phosphorous  
Moisture 1.1

GROSS CALORIFIC VALUE (db)

Btu per pound

GIESELER PLASTOMETER

Softening Temp. 457  
Max. Fluid. Temp. 483  
Solid. Temp. 504  
Melting Range  
Max. Fluidity 5/0.70

GRINDABILITY

Hardgrove Index

SAPOZHNIKOV PLASTOMETER

DILATOMETER

T1 - Soft. Temp. 403

Contraction 460/10%  
Dilatation 478/-7%

DRUM TESTS

Blend	DI 30/50	DI 30/25	DI 30/15	DI 150/50	DI 150/25	DI 150/15
100% Adit 76-4-1			95.0			
30% Adit 76-4-1 70% Ashibetsu			92.0			
* 15% Adit 76-4-1 6% Utmann 6% Smoky 20% Pittston 10% Balmer 15% Wollondilly 10% Masco 18% Hokkaido			--	84.8		
* Same blend with 25% Balmer, 0% Saxon			--	84.4		

PETROGRAPHIC DATA

PETROGRAPHIC COMPOSITION

VITRINOID TYPES

TYPE PERCENT

Reactive Components  
Total Vitrinoid  
Reactive Semi-Fusinoids (1/3)  
Exinoid + Resinoid  
Total Reactive Components  
Inert Components  
Inert Semi-Fusinoids (2/3)  
Micrinoids  
Fusinoids  
Mineral Matter  
Total Inert Components

PETROGRAPHIC INDICES

Mean Reflectance  
Balance Index  
Strength Index  
Stability Index

REPORT OF ANALYSIS

Saxon Project Feasibility Report  
October 1977

Lab: Nippon Steel

ANALYSES OF COAL

PROXIMATE ANALYSES (db)

Adit No.	76-4-4
Ash	7.7
Volatile Matter	24.6
Fixed Carbon	
F.S.I.	7.5
Sulphur	0.36
Phosphorous	
Moisture	1.3

GROSS CALORIFIC VALUE (db)

Btu per pound

GIESELER PLASTOMETER

Softening Temp.	436
Max. Fluid. Temp.	472
Solid. Temp.	500
Melting Range	
Max. Fluidity	65/1.81

GRINDABILITY

Hardgrove Index

SAPOZHNIKOV PLASTOMETER

DILATOMETER

T1 - Soft. Temp.	394
Contraction	439/20%
Dilatation	472/43%

DRUM TESTS

Blend	DI	DI	DI	DI	DI	DI
	30/50	30/25	30/15	150/50	150/25	150/15
100% Adit 76-4-4			94.1			
30% Adit 76-4-4 70% Ashibetsu			87.2			
* 15% Adit 76-4-4 6% Itmann 6% Smoky 20% Pittston 10% Balmer 15% Wollondilly 10% Masco 18% Hokkaido			--	84.3		
* Same blend 25% Balmer, 0% Saxon			--	84.4		

PETROGRAPHIC DATA

PETROGRAPHIC COMPOSITION

Reactive Components  
 Total Vitrinoid  
 Reactive Semi-Fusinoids (1/3)  
 Exinoid + Resinoid  
 Total Reactive Components  
 Inert Components  
 Inert Semi-Fusinoids (2/3)  
 Micrinoids  
 Fusinoids  
 Mineral Matter  
 Total Inert Components

PETROGRAPHIC INDICES

Mean Reflectance  
 Balance Index  
 Strength Index  
 Stability Index

VITRINOID TYPES

TYPE	PERCENT
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REPORT OF ANALYSIS

Saxon Project Feasibility Report  
October 1977

Lab: Sumitomo

ANALYSES OF COAL

PROXIMATE ANALYSES (db)

Adit No. 76-4-1  
Ash 7.8  
Volatile Matter 19.6  
Fixed Carbon 71.4  
F.S.I. 7.5  
Sulphur .33  
Phosphorous  
Moisture 1.2

GROSS CALORIFIC VALUE (db)

Btu per pound

GIESELER PLASTOMETER

Softening Temp. 451  
Max. Fluid. Temp. 474  
Solid. Temp. 498  
Melting Range  
Max. Fluidity 6 ddpm

GRINDABILITY

Hardgrove Index

SAPOZHNIKOV PLASTOMETER

DILATOMETER

T1 - Soft. Temp. 403  
T2 - Init. Dil. Temp. 449  
T3 - Solidif. Temp. 478  
Contraction 23%  
Dilatation -4.5%

DRUM TESTS

Blend	DI 30/50	DI 30/25	DI 30/15	DI 150/50	DI 150/25	DI 150/15
Straight	38.8	92.0	94.8			84.9
Blendability with Akabira (domestic) 60% (sample) 40%	34.1	89.3	94.3			84.2
Blendability with Akabira 20% Wollondilly 55% Sample 25%	45.0	90.6	93.8			82.6

PETROGRAPHIC DATA

PETROGRAPHIC COMPOSITION

VITRINOID TYPES

TYPE PERCENT

Reactive Components  
Total Vitrinoid 63.1  
Reactive Semi-Fusinoids (1/3) 4.8  
Exinoid + Resinoid 0.3  
Total Reactive Components 68.2  
Inert Components  
Inert Semi-Fusinoids (2/3) 9.7  
Micrinoids 15.3  
Fusinoids 3.4  
Mineral Matter 3.4  
Total Inert Components 31.8

PETROGRAPHIC INDICES

Mean Reflectance 1.44  
Balance Index  
Strength Index  
Stability Index

REPORT OF ANALYSIS

Saxon Project Feasibility Report  
October 1977

Lab: Sumitomo

ANALYSES OF COAL

PROXIMATE ANALYSES (db)

Adit No. 76-4-4  
Ash 7.6  
Volatile Matter 24.0  
Fixed Carbon 67.0  
F.S.I. 7.5  
Sulphur 0.26  
Phosphorous  
Moisture 1.4

GROSS CALORIFIC VALUE (db)

Btu per pound

GIESELER PLASTOMETER

Softening Temp. 426  
Max. Fluid. Temp. 468  
Solid. Temp. 495  
Melting Range  
Max. Fluidity 74 ddpm

GRINDABILITY

Hardgrove Index

SAPOZHNIKOV PLASTOMETER

DILATOMETER

T1 - Soft. Temp. 364  
T2 - Init. Dil. Temp. 405  
T3 - Solidif. Temp. 442  
  
Contraction 23%  
Dilatation 42.5%

DRUM TESTS

Blend	DI	DI	DI	DI	DI	DI
	30/50	30/25	30/15	150/50	150/25	150/15
Straight: 100% 76-4-4	37.7	91.2	94.6			84.9
40% 76-4-4 60% Akabira	15.6	78.4	91.3			77.2
25% 76-4-4 20% Akabira 55% Wollondilly	41.8	89.1	92.8			81.2

PETROGRAPHIC DATA

PETROGRAPHIC COMPOSITION

VITRINOID TYPES

TYPE PERCENT

Reactive Components  
Total Vitrinoid 70.3  
Reactive Semi-Fusinoids (1/3) 4.1  
Exinoid + Resinoid 0.2  
Total Reactive Components 74.6  
  
Inert Components  
Inert Semi-Fusinoids (2/3) 8.4  
Micrinoids 11.3  
Fusinoids 2.5  
Mineral Matter 3.2  
Total Inert Components 25.4

PETROGRAPHIC INDICES

Mean Reflectance 1.22  
Balance Index  
Strength Index  
Stability Index



REPORT OF ANALYSIS

Saxon Project Feasibility Report  
October 1977

Lab: Nisshin

ANALYSES OF COAL

PROXIMATE ANALYSES (db)

Adit No. 76-4-1  
Ash 8.2  
Volatile Matter 20.2  
Fixed Carbon  
F.S.I. 4  
Sulphur 0.46  
Phosphorous 0.056  
Moisture

GROSS CALORIFIC VALUE (db)

Btu per pound

GIESELER PLASTOMETER

Softening Temp. 442  
Max. Fluid. Temp. 479  
Solid. Temp. 503  
Melting Range 61  
Max. Fluidity 4.8 ddpm

GRINDABILITY

Hardgrove Index 118

SAPOZHNIKOV PLASTOMETER

DILATOMETER

T1 - Soft Temp. 397  
T2 - Init. Dil. Temp. 460  
T3 - Solidif. Temp. 494  
Contraction 33.3%  
Dilatation -20.0%

DRUM TESTS

Blend	DI 30/50	DI 30/25	DI 30/15	DI 150/50	DI 150/25	DI 150/15
Straight	25.9		92.5	14.6		81.2
Blendability: 40% 76-4-1 60% Liddell	20.4		91.6	7.0		86.0

PETROGRAPHIC DATA

PETROGRAPHIC COMPOSITION

VITRINOID TYPES

TYPE	PERCENT
14	15.2
15	47.1
16	13.7

Reactive Components	
Total Vitrinoid	76.0
Reactive Semi-Fusinoids (1/3)	3.2
Exinoid + Resinoid	--
Total Reactive Components	79.2
Inert Components	
Inert Semi-Fusinoids (2/3)	6.5
Micrinoids	8.1
Fusinoids	2.5
Mineral Matter	3.7
Total Inert Components	20.8

PETROGRAPHIC INDICES

Mean Reflectance	1.54
Balance Index	
Strength Index	
Stability Index	

REPORT OF ANALYSIS

Saxon Project Feasibility Report  
October 1977

Lab: Nisshin

ANALYSES OF COAL

PROXIMATE ANALYSES (db)

Adit No. 76-4-4

Ash 7.9

Volatile Matter 24.3

Fixed Carbon

F.S.I. 6

Sulphur 0.35

Phosphorous 0.031

Moisture

GROSS CALORIFIC VALUE (db)

Btu per pound

GIESELER PLASTOMETER

Softening Temp. 416

Max. Fluid. Temp. 462

Solid. Temp. 496

Melting Range 80

Max. Fluidity 60.0 ddpm

GRINDABILITY

Hardgrove Index 96

SAPOZHNIKOV PLASTOMETER

DILATOMETER

T1 - Soft. Temp. 378

T2 - Init. Dil. Temp. 445

T3 - Solidif. Temp. 485

Contraction 36.7%

Dilatation 1.7%

DRUM TESTS

Blend	DI	DI	DI	DI	DI	DI
	30/50	30/25	30/15	150/50	150/25	150/15
Straight	18.7		92.3	10.7		81.0
Blendability:	25.2		92.2	9.6		80.4
40% 76-4-4						
60% Liddell						

PETROGRAPHIC DATA

<u>VITRINOID TYPES</u>		<u>PETROGRAPHIC COMPOSITION</u>		<u>PETROGRAPHIC INDICES</u>	
TYPE	PERCENT				
11	5.7	Reactive Components			
		Total Vitrinoid	71.8		
		Reactive Semi-Fusinoids (1/3)	3.0		
		Exinoid + Resinoid	0.7		
		Total Reactive Components	75.5	Mean Reflectance	1.29
12	28.7	Inert Components		Balance Index	
		Inert Semi-Fusinoids (2/3)	6.0	Strength Index	
		Micrinoids	8.6	Stability Index	
13	37.4	Fusinoids	6.5		
		Mineral Matter	3.4		
		Total Inert Components	24.5		

REPORT OF ANALYSIS

Saxon Project Feasibility Report  
October 1977

Lab: Nisshin

ANALYSES OF COAL

PROXIMATE ANALYSES (db)

Adit No. S.E. B.C.	
Ash	10.0
Volatile Matter	21.3
Fixed Carbon	
F.S.I.	6
Sulphur	0.30
Phosphorous	
Moisture	

GROSS CALORIFIC VALUE (db)

Btu per pound

GIESELER PLASTOMETER

Softening Temp.	435
Max. Fluid. Temp.	460
Solid. Temp.	492
Melting Range	67
Max. Fluidity	8.0 ddpm

GRINDABILITY

Hardgrove Index 100

SAPOZHNIKOV PLASTOMETER

DILATOMETER

T1 - Soft. Temp.	398
T2 - Init. Dil. Temp.	454
T3 - Solidif. Temp.	486

Contraction 32%  
Dilatation -12.0%

DRUM TESTS

Blend	DI 30/50	DI 30/25	DI 30/15	DI 150/50	DI 150/25	DI 150/15
Straight	30.0		92.3	16.0		81.1
Blendability: 40% S.E. B.C. 60% Liddell	30.7		87.0	9.9		72.5

PETROGRAPHIC DATA

PETROGRAPHIC COMPOSITION

VITRINOID TYPES

TYPE	PERCENT
------	---------

12	3.9
13	18.1
14	18.1
15	15.6
16	7.8
17	1.3

Reactive Components

Total Vitrinoid 64.8

Reactive Semi-Fusinoids (1/3) 3.3

Exinoid + Resinoid -

Total Reactive Components 68.1

Inert Components

Inert Semi-Fusinoids (2/3) 6.7

Micrinoids 12.2

Fusinoids 8.7

Mineral Matter 4.3

Total Inert Components 31.9

PETROGRAPHIC INDICES

Mean Reflectance 1.46

Balance Index

Strength Index

Stability Index

REPORT OF ANALYSIS

Saxon Project Feasibility Report  
October 1977

Lab: Kawasaki

ANALYSES OF COAL

PROXIMATE ANALYSES (db)

Adit No. 76-4-1  
Ash 8.2  
Volatile Matter 19.8  
Fixed Carbon 72.0  
F.S.I. 7.5  
Sulphur 0.45  
Phosphorous  
Moisture

GROSS CALORIFIC VALUE (db)

Btu per pound

GIESELER PLASTOMETER

Softening Temp. 437  
Max. Fluid. Temp. 467  
Solid. Temp. 486  
Melting Range  
Max. Fluidity 6 ddpm

GRINDABILITY

Hardgrove Index

SAPOZHNIKOV PLASTOMETER

DILATOMETER

T1 - Soft. Temp. 414  
T2 - Max. Cont. Temp. 454  
T3 - Max. Colat. Temp. 492  
Max. Contraction 20%  
Max. Dilatation 16%

DRUM TESTS

	Blend	DI 30/50	DI 30/25	DI 30/15	DI 150/50	DI 150/25	DI 150/15
100%	76-4-1			92.0			
40%	76-4-1, 60% Yubari			93.4			
40%	76-4-1, 60% Newdell			92.4			

PETROGRAPHIC DATA

PETROGRAPHIC COMPOSITION

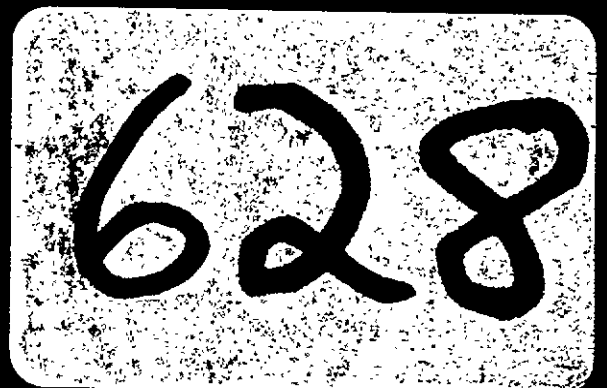
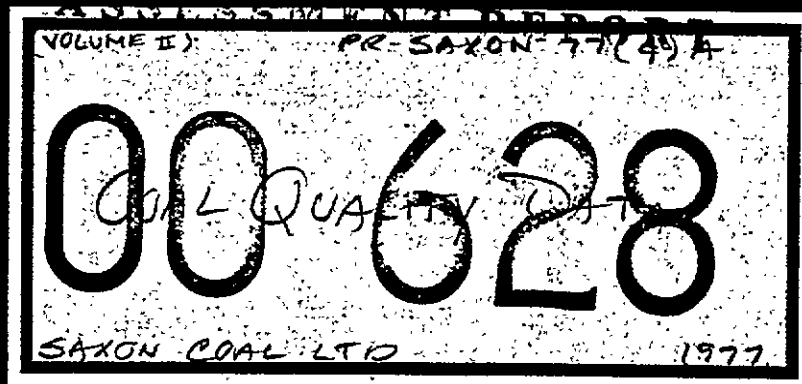
Reactive Components  
Total Vitrinoid  
Reactive Semi-Fusinoids (1/3)  
Exinoid + Resinoid  
Total Reactive Components  
Inert Components  
Inert Semi-Fusinoids (2/3)  
Micrinoids  
Fusinoids  
Mineral Matter  
Total Inert Components

VITRINOID TYPES

TYPE PERCENT

PETROGRAPHIC INDICES

Mean Reflectance  
Balance Index  
Strength Index  
Stability Index



PART FOUR

QUALITY

PART FOUR

QUALITY

CONTENTS

	<u>PAGE</u>
4.1 SUMMARY OF COAL AND COKE QUALITY	4-1
4.2 INTRODUCTION	4-1
4.3 COAL QUALITY	4-2
431 DRILL CORE ANALYSES	4-2
.1 Procedures	4-2
.2 Results of the Drill Core Analyses	4-2
432 VARIATIONS IN COAL QUALITY BY SEAM	4-4
433 COMPUTER SIMULATIONS OF PRODUCT QUALITY	4-14
4.4 COKING QUALITY	4-18
441 TEST RESULTS	4-18
442 FLUIDITY AND DILATATION	4-21
.1 Fluidity	4-21
.2 Dilatation	4-21

#### 4.1 SUMMARY OF COAL AND COKE QUALITY

Based on the present mining schemes, the average quality of the product coal from the Saxon Project in any of the planned mining periods will fall within the following ranges:

Total Moisture	6.0	± 1.0%
Inherent Moisture	0.8	± 1.0%
Ash	7.5	± 0.2%
Volatiles	22.5	± 1.2%
Fixed Carbon	69.2	± 1.2%
Sulphur	0.44	± 0.03%
Phosphorous	0.016	± 0.003%
F.S.I.	6½	± ½

The coke tests results which are discussed in the following sections have indicated consistently good blending and coking characteristics for the Saxon coals. In particular, the tests from France have indicated that Saxon coal is better than Polish coal and is roughly equivalent in quality to a low volatile Australian coal; the German tests have indicated that Saxon coals will produce very good coke when blended with medium volatile Ruhr coal; and the Japanese tests have shown that the coal is as good or better than comparable western Canadian coking coals.

#### 4.2 INTRODUCTION

A large number of analyses have now been completed on the Saxon coals from both drill hole and adit samples. During the 1977 program only samples that were at least 50% recovered were subjected to detailed analysis. In addition, five new adits were sampled and adit 76-4-1 was resampled to obtain more washability data and a check on its coking characteristics. Selected samples from the drill core and all of the adit samples have now been sent to Germany, Japan, and France for local analysis and tests of their coking characteristics. The core analyses and the detailed washability studies for the adit samples were carried out largely by Warnock-Hersey Professional Services Ltd. in Calgary, and the preliminary washability studies and clean coal analyses were done by Birtley Engineering and Testing Limited, also in Calgary. The detailed results of these tests are presented in Volume III.



## 4.3 COAL QUALITY

### 431 DRILL CORE ANALYSES

#### .1 Procedures

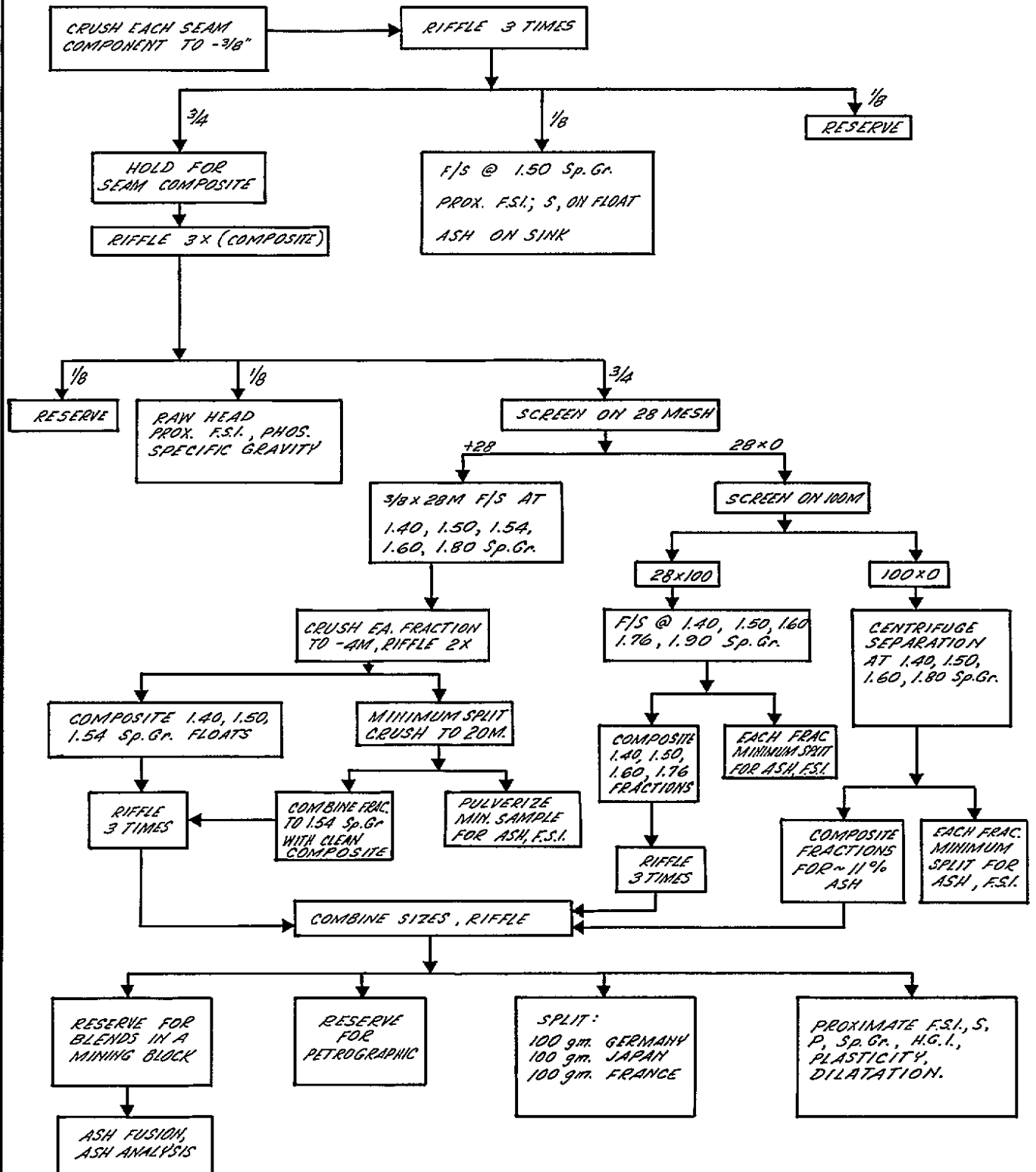
Samples of coal from the drill core were taken in geological increments and shipped to the laboratory for 1.5 specific gravity sink/float analysis. After these analyses had been reported they were studied and composite intervals were selected for a more comprehensive sink/float analysis to provide a simulated clean coal product as outlined on the analytical flow sheet diagram on the following page.

For the 1977 program, the cut points for the preparation of simulated product were changed from 1.60 to 1.54 for the -3/8 x 28 mesh material, and to 1.76 from 1.80 for the 28 mesh x 100 mesh material. Ninety seconds was retained for the froth floatation cut point. The lowering of these cut points resulted in a somewhat better clean coal ash for most seams. It should also be noted, however, that the froth floatation product also appeared to improve in the 1977 results and this anomaly has not been explained as the procedures were ostensibly the same in both years.

In comparing drill core results from 1971 and 1972 with later results, it is also important to note that in those early years the lab procedure was to cut the product to a nominal 7% ash, varying the cut points are required.

#### .2 Results of the Drill Core Analyses

The detailed results of the drill core analyses are presented in Volume III of this report and the summary data is presented by seam and area in the tables 4-1 through 4-11 in this section. In these tables the analyses have been grouped by the years in which the work was done so that the effect of changing cut points is not obscured. The following brief summary of the average ash analysis for each seam during each exploration program illustrates this effect:



---

SAXON EAST

SEAM	YEAR	AVERAGE ASH %	COMMENT
1	1977	7.02	About the same
	1976	6.94	
2	1977	6.95	About 1% better in 1977
	1976	7.80	
4	1977	6.30	More than 1% better in 1977, probably represents more points in Block II
	1976	8.00	

SAXON SOUTH

1	1977	7.86	About 1% better in 1977
	1976	9.09	
2	1977	6.85	About 0.5% better in 1977
	1976	7.24	
3	1977	8.35	About the same in 1977
	1976	8.40	
4	1977	6.50	About 0.8% better in 1977
	1976	7.32	

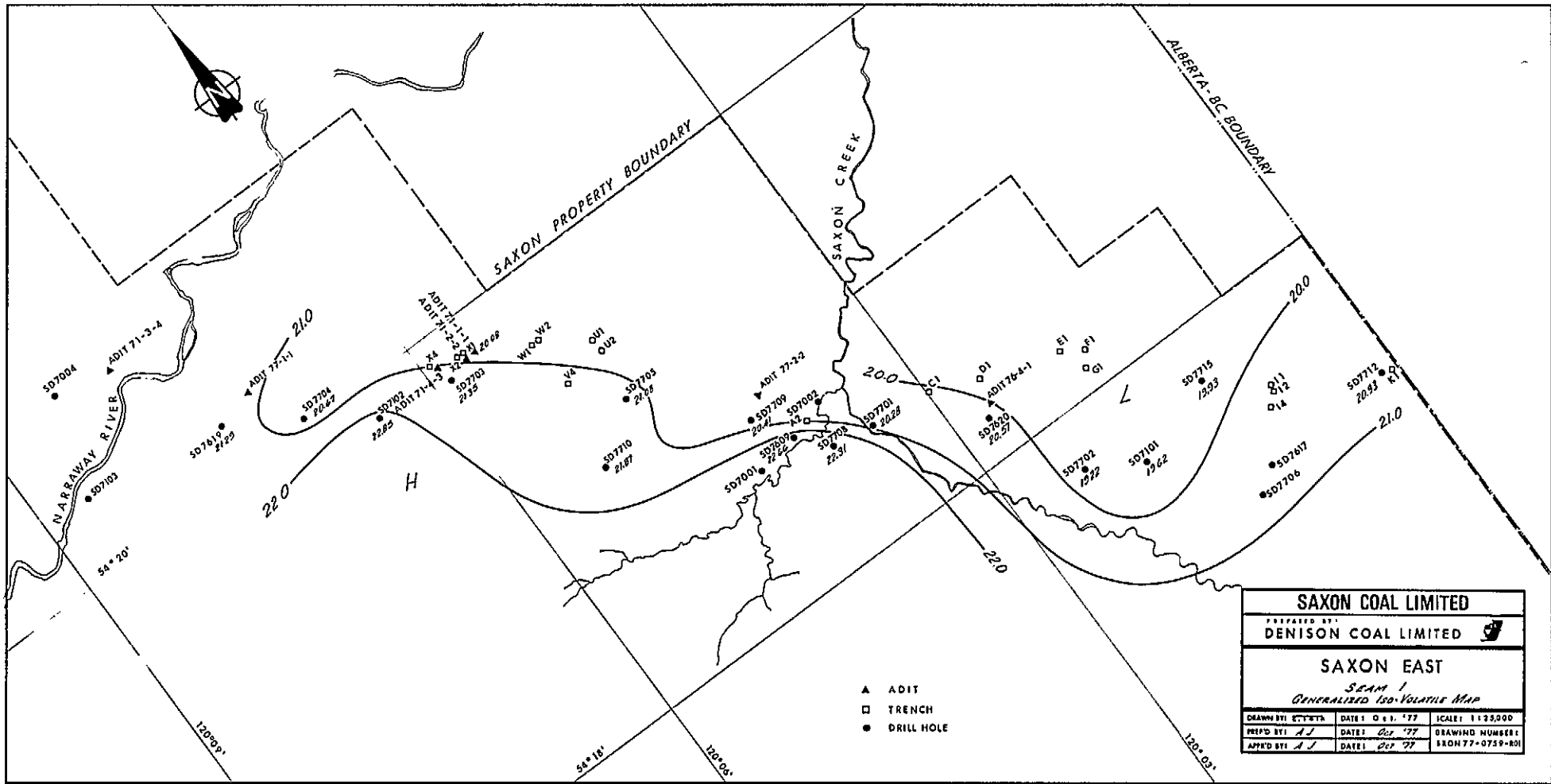
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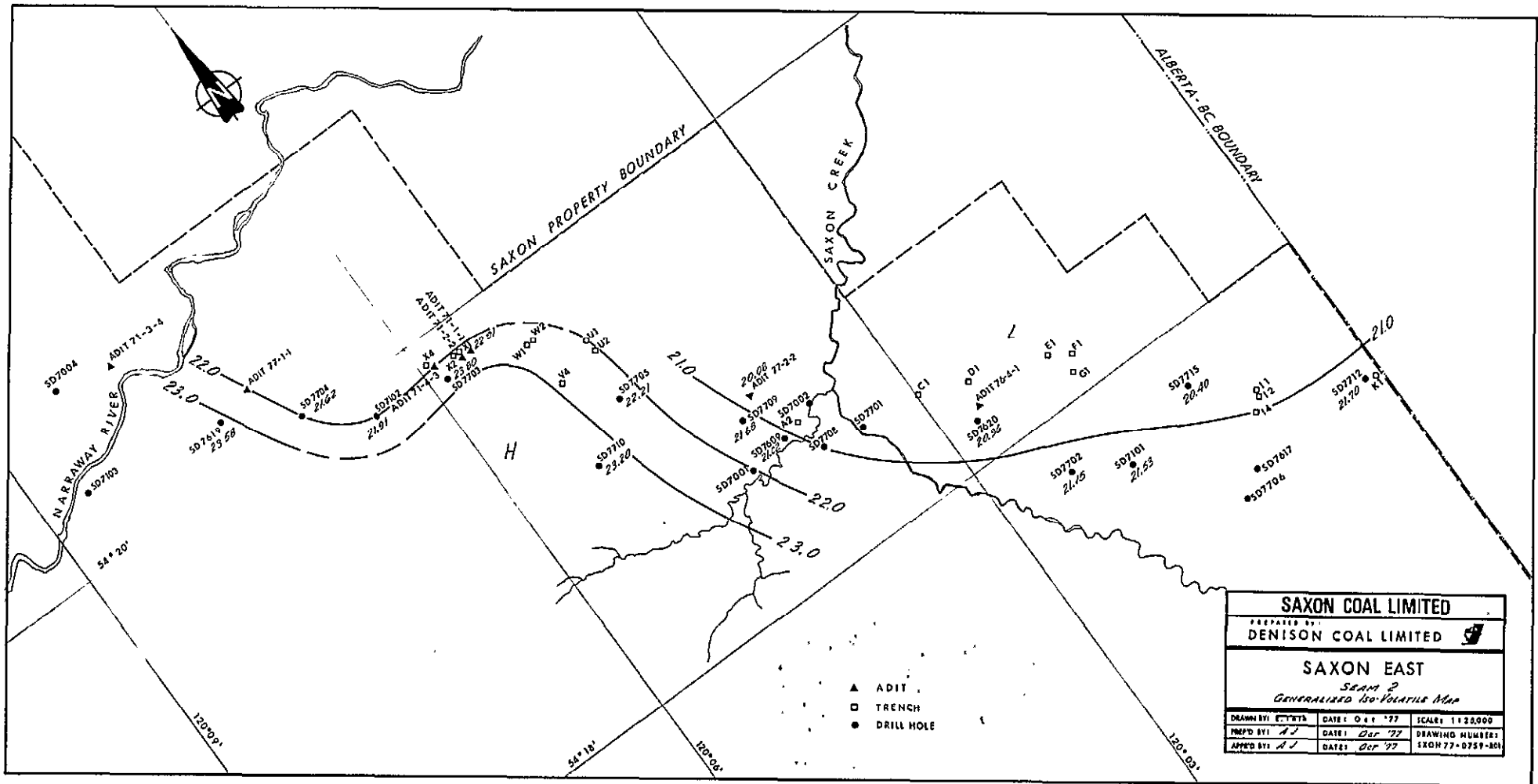
The average dry mineral matter free volatile content of the coals does not appear to have been significantly changed, indicated that the 1977 results are consistent with the 1976 results except for the lower ash in the simulated product.

The only component of the coal quality which has sufficient variation to require detailed comment is the volatile matter of the seam. Generalized iso-volatile maps (dry mineral matter free basis) have been prepared for seams 1, 2, and 4 in Saxon East and seams 1, 2, 3, and 4 in Saxon South and are presented on the pages following.

These maps show that there is a significant difference between the volatiles in Saxon South and Saxon East. Those in Saxon East are relatively consistent between seams and average about 21 - 22% dmmf volatiles with each seam having a 2 - 3% range. On the other hand, those at Saxon South have, on the average, dmmf volatiles from about 25% to 27% with each seam having a 5 to 6% range within it.

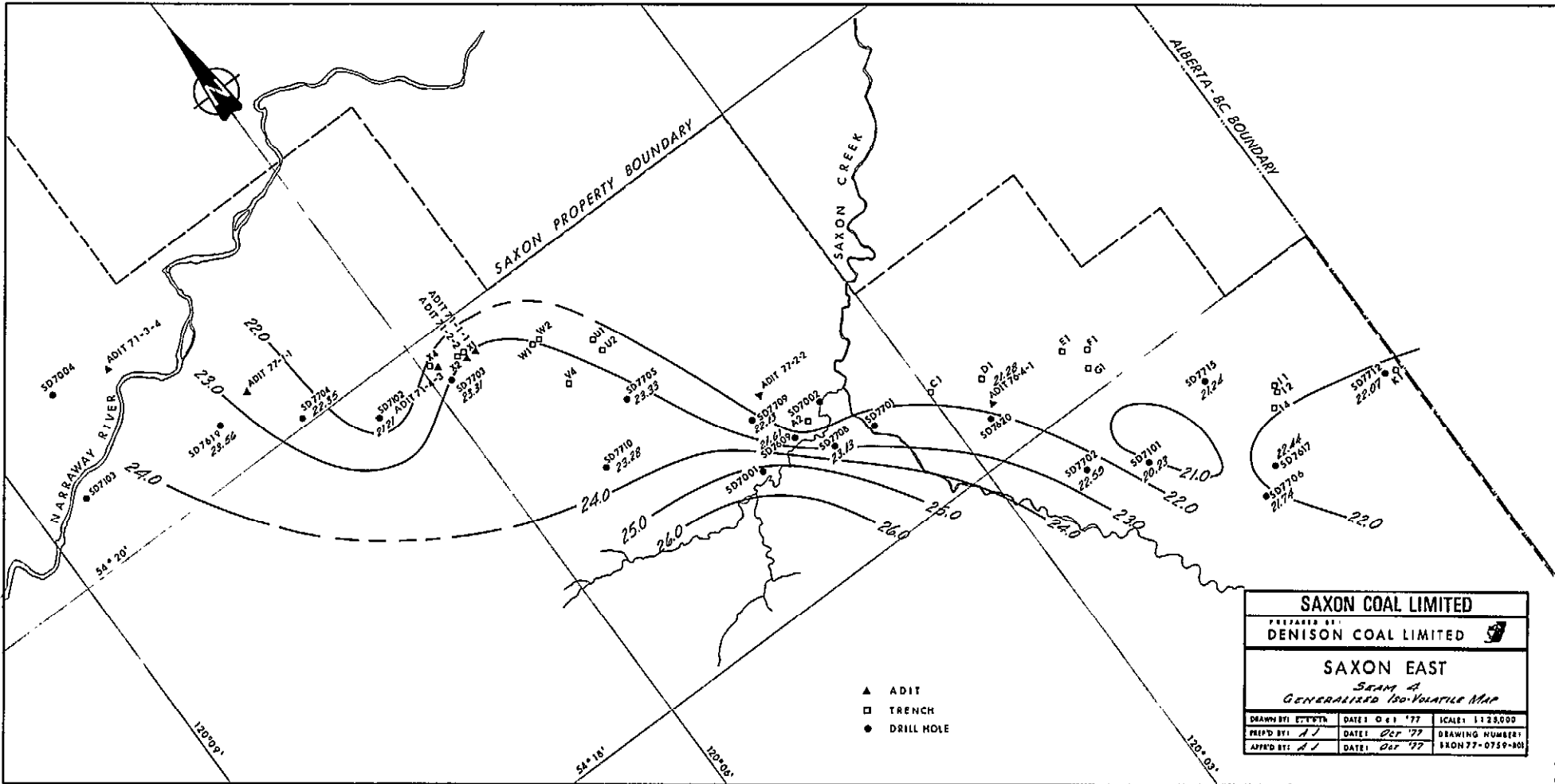
On considering these maps in more detail important trends can be identified. In all cases in Saxon East, seams in Block I are about 2% lower in volatile content than those in Block II. In Saxon South, the trends are even more pronounced. The seams in the Saxon South pit have volatiles about 4 to 5% lower than those on the west flank of the north pit, and about 2% lower than on the east flank of the north pit anticline. These differences should be carefully considered during the ultimate mine design as scheduling of production from each area should be done so as to keep the clean coal product as consistent as possible, or at least to keep the changes gradual. The present plan, with open pit production starting from the North Pit (high volatiles) when the underground production is from Block I (low volatiles) is a good example of this type of schedule. However, it appears that the scheduling of the start-up of the South Pit may have to be changed as the calculations for the present clean coal production schedule indicate that the dmmf volatile content will increase as much as 1.5% between Period 3 (21.9%) and Period 4 (23.4%). Otherwise, the present mining schedule appears to accommodate these variations quite well.





<b>SAXON COAL LIMITED</b>		
PREPARED BY: <b>DENISON COAL LIMITED</b>		
<b>SAXON EAST</b> SEAM 2 GENERALIZED ISO-POLARIS MAP		
DRAWN BY: <i>STREETS</i>	DATE: <i>Oct '77</i>	SCALE: 1:20,000
PREP BY: <i>AJ</i>	DATE: <i>Oct '77</i>	DRAWING NUMBER:
APP'D BY: <i>AJ</i>	DATE: <i>Oct '77</i>	EXON 77-0759-201

- ▲ ADIT
- TRENCH
- DRILL HOLE



- ▲ ADIT
- TRENCH
- DRILL HOLE

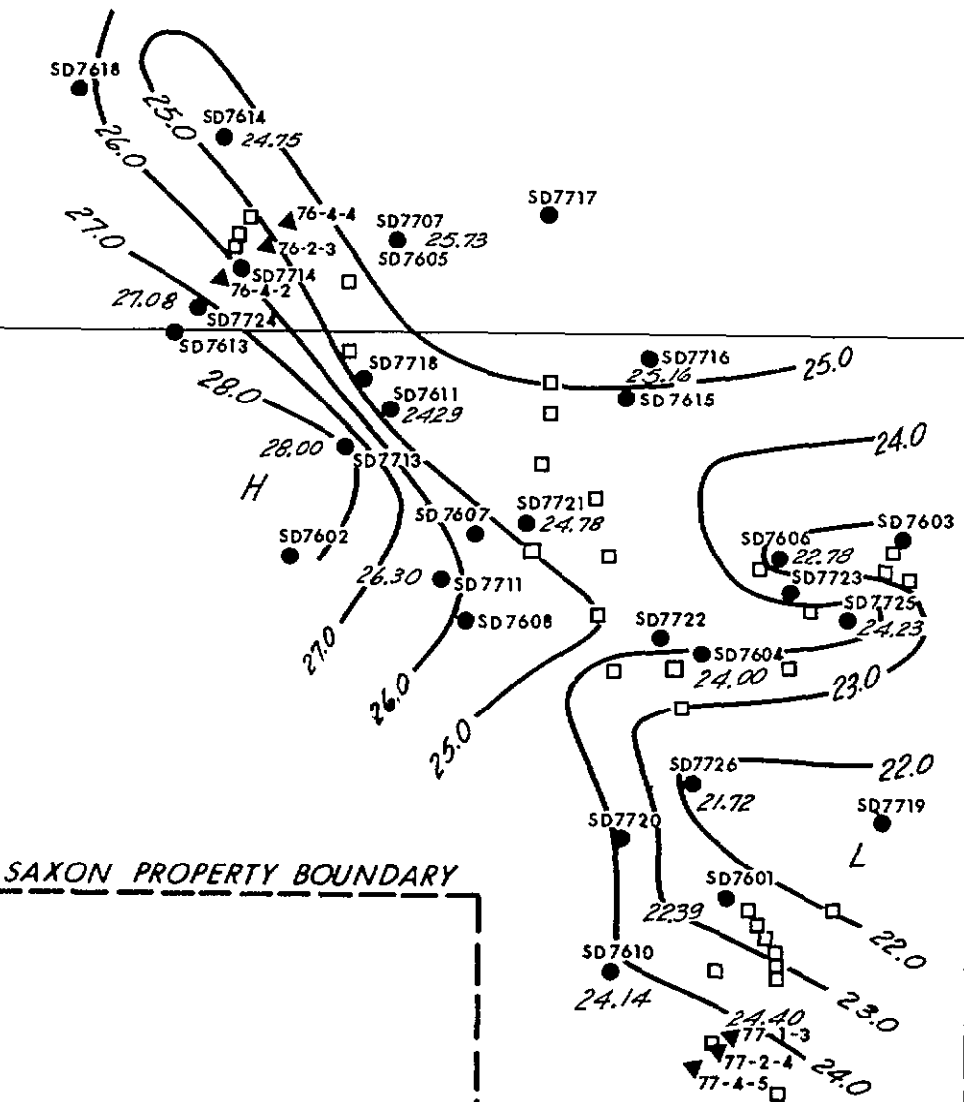
<b>SAXON COAL LIMITED</b>		
PREPARED BY: <b>DENISON COAL LIMITED</b>		
<b>SAXON EAST</b>		
<i>SEAM A</i>		
<i>GENERALIZED ISO-VOLATILE MAP</i>		
DRAWN BY: ETT/KTB	DATE: 06 '77	SCALE: 1:25000
PREP'D BY: A/J	DATE: 06 '77	DRAWING NUMBER:
APP'D BY: A/J	DATE: 06 '77	SKON 77-0759-801

54°15'



54°13'

120°03'



ALBERTA - B.C. BOUNDARY

SAXON PROPERTY BOUNDARY

### SAXON COAL LIMITED

PREPARED BY:  
**DENISON COAL LIMITED**



### SAXON SOUTH

*SEAM 1  
Generalized Iso-Volatile Map*

DRAWN BY: E.T.G.Y.R.	DATE: Oct. '77	SCALE: 1: 25,000
PROP'D BY: A.J.	DATE: Oct. '77	DRAWING NUMBER:
APP'D BY: A.J.	DATE: Oct. '77	SXON 77-0760-001



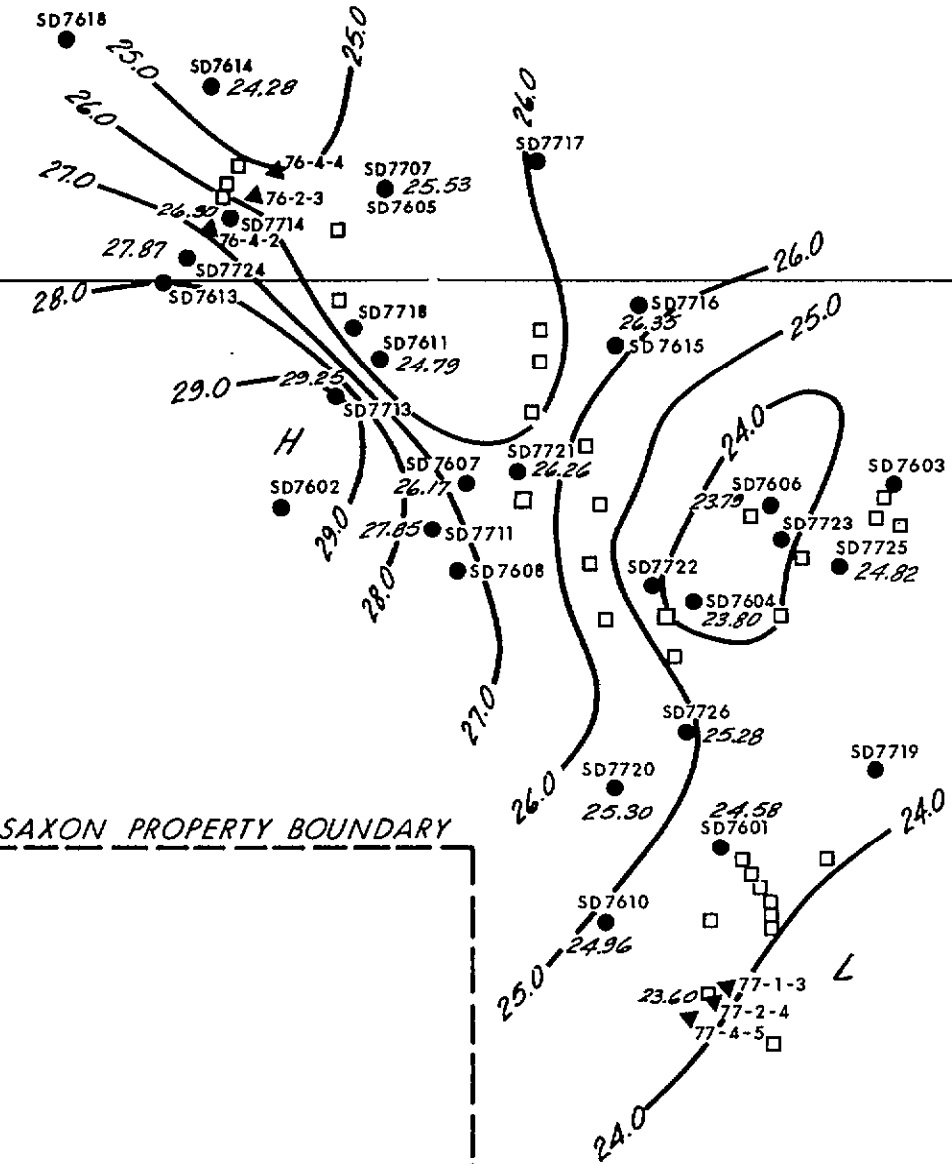
54°15'

54°13'



SAXON PROPERTY BOUNDARY

ALBERTA - B.C. BOUNDARY



- ▲ ADIT
- TRENCH
- DRILL HOLE

### SAXON COAL LIMITED

PREPARED BY:  
**DENISON COAL LIMITED**



### SAXON SOUTH

SEAM 2

Generalized Iso-Volatile Map

DRAWN BY: E.T.G.T.N.	DATE: Oct. '77	SCALE: 1: 25,000
PREP'D BY: A.J.	DATE: Oct. '77	DRAWING NUMBER:
APP'D BY: A.J.	DATE: Oct. '77	SXON 77-0760-R01

120°03'

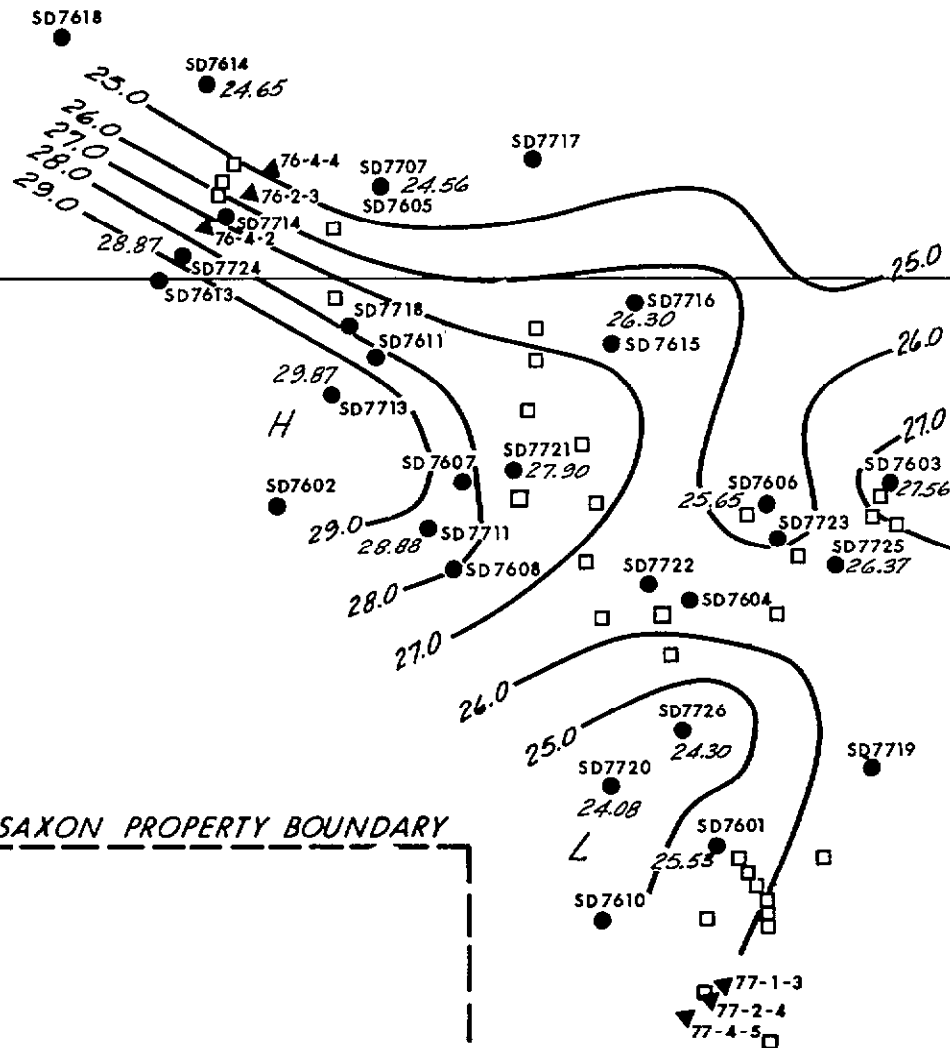
54°15'

54°13'



SAXON PROPERTY BOUNDARY

ALBERTA - B.C. BOUNDARY



- ▲ ADIT
- TRENCH
- DRILL HOLE

### SAXON COAL LIMITED

PREPARED BY:  
**DENISON COAL LIMITED**



### SAXON SOUTH

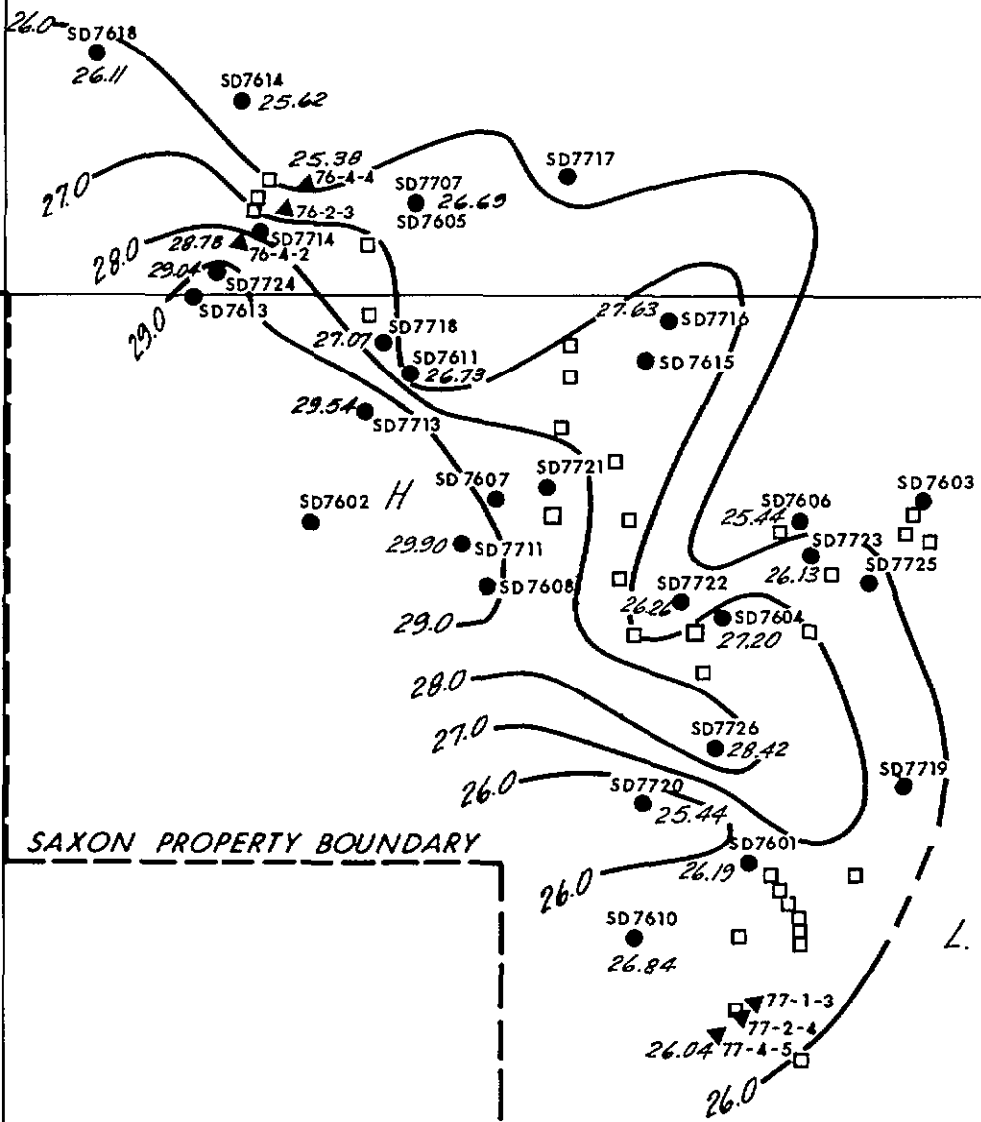
SEAM 3  
*Generalized Iso-Volatile Map*

DRAWN BY: E.T.SYK	DATE: Oct. '77	SCALE: 1:25,000
PREP'D BY: A.J.	DATE: Oct. '77	DRAWING NUMBER:
APP'D BY: A.J.	DATE: Oct. '77	SRON 77-Q760-R01

120°03'

54°15'

54°13'



SAXON PROPERTY BOUNDARY

ALBERTA - B.C. BOUNDARY

120°03'

- ▲ ADIT
- TRENCH
- DRILL HOLE

<b>SAXON COAL LIMITED</b>		
PREPARED BY: <b>DENISON COAL LIMITED</b>		
<b>SAXON SOUTH</b> <i>Seam A</i> <i>Generalized Iso-Volatile Map</i>		
DRAWN BY: E. T. G. T. N.	DATE: Oct. '77	SCALE: 1: 25,000
PREP'D BY: A. J.	DATE: Dec. '77	DRAWING NUMBER:
APPR'D BY: A. J.	DATE: Dec. '77	SNON 77-0760-R01

TABLE 4-1

Simulated Product Analysis  
from drill core and adits

Saxon Project Feasibility Report  
October 1977

Saxon East		<u>Seam 1</u>						
Year	Drill hole or Adit	Residual Moisture	Ash	Volatile Matter	Fixed Carbon	Sulphur	Phos.	F.S.I.
1977	SD 7620	.90	6.10	19.60	73.40	.29	.009	6.0
	SD 7701	.70	6.40	19.70	73.20	.28	.008	5.5
	SD 7701	.60	7.90	19.20	72.30	.49	.007	6.0
	SD 7702	.80	6.30	18.40	74.50	.46	.004	4.5
	SD 7702	.70	6.30	19.20	73.80	.45	.005	7.0
	SD 7703	.80	5.60	20.40	73.20	.24	.019	6.0
	SD 7703	.70	6.40	20.10	72.80	.43	.003	7.5
	SD 7704	.60	7.10	19.60	72.70	.24	.280	6.0
	SD 7704	.60	7.10	20.00	72.30	.42	.004	5.5
	SD 7705	.80	4.30	22.70	72.20	.54	.032	9.0
	SD 7705*	.60	5.60	20.20	73.60	.26	.020	7.5
	SD 7705	.70	6.80	19.50	73.00	.42	.006	7.0
	SD 7708*	.80	7.00	21.10	71.10	.33	.014	7.0
	SD 7709	.80	6.60	20.40	72.20	.33	.017	5.0
	SD 7709	.60	7.40	19.40	72.60	.52	.006	6.0
	SD 7710	1.40	6.40	22.30	69.90	.38	.018	7.5
	SD 7710	1.00	8.20	20.50	70.30	.45	.006	5.5
	SD 7712	.70	9.10	20.20	70.00	.67	.007	6.5
	SD 7712	.60	8.70	19.70	71.00	.58	.005	4.0
	SD 7715	.70	8.30	18.80	72.20	.46	.006	4.5
SD 7715	.60	9.20	18.40	71.80	.51	.004	6.5	
A 7711	<u>.60</u>	<u>7.70</u>	<u>19.00</u>	<u>72.70</u>	<u>.33</u>		<u>7.5</u>	
Avg.		.74	7.02	19.92	72.30	.41	.022	6.3
Prior to 1976	SD 7101	.93	6.92	18.62	73.53	.34		8.5
	SD 7102	<u>.54</u>	<u>6.96</u>	<u>20.89</u>	<u>71.61</u>	<u>.23</u>		<u>7.0</u>
Avg.		.73	6.94	19.75	72.57	.28		7.8
1976	SD 7609	.70	7.60	21.40	70.30	.56		8.0
	SD 7619	<u>.60</u>	<u>6.00</u>	<u>20.40</u>	<u>73.00</u>	<u>.49</u>		<u>7.5</u>
Avg.		.65	6.80	20.90	71.65	.52		7.8

\* 1977, less than 70% core recovery.

TABLE 4-2

Simulated Product Analysis  
from drill core and adits

Saxon Project Feasibility Report  
October 1977

Saxon East		<u>Seam 2</u>						
Year	Drill hole or Adit	Residual Moisture	Ash	Volatile Matter	Fixed Carbon	Sulphur	Phos.	F.S.I.
1977	SD 7620*	.90	8.70	19.60	70.80	.36	.015	6.5
	SD 7620*	.90	6.10	20.10	72.90	.32	.016	7.0
	SD 7702*	1.10	6.50	20.60	71.80	.48	.013	6.5
	SD 7702*	1.00	5.10	20.30	73.60	.42	.006	7.5
	SD 7703*	.70	8.10	22.30	68.90	.38	.043	8.0
	SD 7704*	.80	6.20	20.60	72.40	.36	.018	7.0
	SD 7705	1.00	5.80	21.20	72.00	.51	.020	6.5
	SD 7709	.70	8.10	20.40	70.80	.42	.004	4.0
	SD 7710*	.80	6.00	22.10	71.10	.40	.016	8.0
	SD 7712	.70	8.30	20.40	70.60	.46	.025	7.0
	SD 7715*	.80	7.10	19.40	72.70	.54	.014	6.5
	A 7722	<u>.90</u>	<u>7.40</u>	<u>19.00</u>	<u>72.70</u>	<u>.39</u>		<u>6.5</u>
Avg.		.85	6.95	20.50	71.69	.42	.017	6.8
1976	SD 7609	.70	9.00	19.70	70.60	.54		6.0
	SD 7619	<u>.80</u>	<u>6.60</u>	<u>22.40</u>	<u>70.20</u>	<u>.60</u>		<u>7.0</u>
Avg.		.75	7.80	21.05	70.40	.57		6.5
Prior to 1976	SD 7101	.87	6.71	20.42	72.00	.36		8.0
	SD 7102	1.05	9.48	20.25	69.22	.21		8.0
	Adit 2	<u>.50</u>	<u>6.87</u>	<u>21.69</u>	<u>70.94</u>	<u>.50</u>		<u>8.5</u>
Avg.		.81	7.69	20.79	70.72	.36		8.2

\* 1977, less than 70% core recovery.

TABLE 4-3

Simulated Product Analysis  
from drill core and aditsSaxon Project Feasibility Report  
October 1977

Saxon East		<u>Seam 3</u>						
Year	Drill hole or Adit	Residual Moisture	Ash	Volatile Matter	Fixed Carbon	Sulphur	Phos.	F.S.I.
1977	SD 7708	.70	6.00	20.80	72.50	.60	.013	8.0
Prior to								
1976	Adit 3	.68	5.36	22.55	71.40	.49		7.5
	Adit 4	<u>.72</u>	<u>8.34</u>	<u>21.94</u>	<u>69.00</u>	<u>.80</u>		<u>9.0</u>
	Avg.	.70	6.85	22.25	70.20	.65		8.3

Table 4-4

Simulated Product Analysis  
from drill core and adits

Saxon East		<u>Seam 5</u>						
Year	Drill hole or Adit	Residual Moisture	Ash	Volatile Matter	Fixed Carbon	Sulphur	Phos.	F.S.I.
1977	SD 7702	.80	4.60	21.70	72.90	.59	.034	8.5
Prior to								
1976	SD 7101	1.16	6.57	20.18	72.09	.60		8.5
	SD 7101	<u>.87</u>	<u>8.67</u>	<u>20.72</u>	<u>89.74</u>	<u>.48</u>		<u>9.0</u>
	Avg.	1.02	7.62	20.45	80.92	.54		8.8

TABLE 4-5

Simulated Product Analysis  
from drill core and adits

Saxon Project Feasibility Report  
October 1977

Saxon East		Seam 4						
Year	Drill hole or Adit	Residual Moisture	Ash	Volatile Matter	Fixed Carbon	Sulphur	Phos.	F.S.I.
1977	SD 7702*	1.10	5.10	21.60	72.20	.33	.040	6.5
	SD 7703*	1.00	5.10	22.30	71.60	.37	.050	7.0
	SD 7704	.80	8.70	20.90	69.60	.47	.035	7.5
	SD 7704	1.20	4.10	22.20	72.50	.38	.038	7.5
	SD 7705	1.20	6.70	22.00	70.10	.37	.022	6.0
	SD 7706*	.80	6.90	20.60	71.70	.35	.018	5.5
	SD 7708*	.80	5.40	22.10	71.70	.25	.025	5.0
	SD 7709	.80	8.00	20.80	70.40	.42	.036	3.5
	SD 7710*	.90	5.50	22.20	71.40	.28	.019	8.0
	SD 7712	.80	7.70	20.80	70.70	.44	.016	6.0
	SD 7715	<u>.70</u>	<u>6.10</u>	<u>20.30</u>	<u>72.90</u>	<u>.43</u>	<u>.024</u>	<u>6.5</u>
Avg.		.92	6.30	21.44	71.34	.37	.029	6.5
1976	A 76-4-1	.50	8.10	20.10	71.30	.48		7.5
	SD 7617	.80	8.60	21.00	69.60	.48		5.5
	SD 7609	.80	8.90	20.20	70.10	.45		4.5
	SD 7619	<u>.70</u>	<u>6.40</u>	<u>22.40</u>	<u>70.50</u>	<u>.47</u>		<u>8.0</u>
Avg.		.70	8.00	20.93	70.38	.47		6.5
Prior to 1976	SD 7001	.37	4.74	25.35	69.54	.30		6 - 7
	SD 7101	1.02	7.51	19.12	72.35	.46		6.5
	SD 7102	<u>.69</u>	<u>6.96</u>	<u>20.15</u>	<u>72.20</u>	<u>.43</u>		<u>7.0</u>
Avg.		.69	6.40	21.54	71.36	.40		6.5

\* 1977, less than 70% core recovery.

TABLE 4-6

Simulated Product Analysis  
from drill core and adits

Saxon Project Feasibility Report  
October 1977

Saxon South Seam 1

Year	Drill hole or Adit	Residual Moisture	Ash	Volatile Matter	Fixed Carbon	Sulphur	Phos.	F.S.I.
1977	SD 7707*	.90	7.00	24.20	67.90	.35	.008	8.5
	SD 7711	.90	8.20	24.50	66.40	.42	.005	7.0
	SD 7713	.60	4.60	29.90	67.90	.36	.003	8.5
	SD 7716*	1.10	7.80	23.50	67.60	.42	.002	7.0
	SD 7721*	.80	10.50	22.70	66.00	.32	.004	4.0
	SD 7724*	.60	8.00	25.30	66.10	.33	.004	6.5
	SD 7725	.60	8.20	22.27	68.50	.39	.003	6.0
	SD 7726	.40	9.30	20.30	70.00	.38	.002	4.5
	A 7713	<u>.07</u>	<u>7.30</u>	<u>22.70</u>	<u>69.00</u>	<u>.41</u>	—	<u>7.5</u>
Avg.		.66	7.86	23.93	67.71	.38	.004	6.6
1976	SD 7601	.70	8.40	21.00	69.90	.46		7.0
	SD 7604	.80	8.50	22.40	68.30	.42		7.5
	SD 7606	1.00	9.40	21.10	68.50	.40		6.0
	SD 7606	.90	10.60	21.40	67.10	.41		4.0
	SD 7610	.40	9.30	22.50	67.80	.50		7.0
	SD 7611	.70	9.50	22.50	67.30	.41		7.0
	SD 7614	<u>.50</u>	<u>7.90</u>	<u>23.30</u>	<u>68.30</u>	<u>.57</u>		<u>7.0</u>
	Avg.		.71	9.09	22.03	68.17	.45	

\* 1977, less than 70% core recovery.



TABLE 4-7

Simulated Product Analysis  
from drill core and aditsSaxon Project Feasibility Report  
October 1977

Saxon South		Seam 2						
Year	Drill hole or Adit	Residual Moisture	Ash	Volatile Matter	Fixed Carbon	Sulphur	Phos.	F.S.I.
1977	SD 7707	.80	5.70	24.30	69.20	.35	.011	8.0
	SD 7711	.90	7.20	26.10	65.80	.38	.014	7.0
	SD 7713	.60	5.70	27.80	65.90	.30	.014	7.5
	SD 7714	.80	6.70	24.80	67.70	.31	.024	7.5
	SD 7716	.70	7.10	24.80	67.40	.34	.025	7.5
	SD 7720	.50	6.10	24.10	69.30	.41	.033	7.5
	SD 7721	.70	7.20	24.70	67.40	.36	.009	7.5
	SD 7724*	.70	8.00	26.30	65.30	.37	.011	7.0
	SD 7725	.80	8.10	23.20	67.90	.38	.015	5.5
	SD 7726	.60	6.90	23.90	68.60	.38	.011	7.0
	A 7724	<u>.60</u>	<u>6.70</u>	<u>22.40</u>	<u>70.30</u>	<u>.41</u>		<u>7.5</u>
Avg.		.70	6.85	24.76	67.70	.36	.017	7.2
1976	SD 7601	.80	8.20	23.00	68.00	.52		7.5
	SD 7604	.80	6.80	22.50	69.90	.34		6.5
	SD 7606	1.30	7.40	22.30	69.00	.47		6.5
	SD 7607	1.00	7.00	24.60	67.40	.43		7.0
	SD 7610	.70	6.90	23.60	68.80	.47		7.5
	SD 7611	.80	7.40	23.30	68.50	.38		7.5
	SD 7614	<u>.80</u>	<u>7.00</u>	<u>22.90</u>	<u>69.30</u>	<u>.35</u>		<u>7.5</u>
Avg.		.88	7.24	23.17	68.70	.42	--	7.1

\* 1977, less than 70% core recovery.

TABLE 4-8

Simulated Product Analysis  
from drill core and adits

Saxon Project Feasibility Report  
October 1977

Saxon South		Seam 3						
Year	Drill hole or Adit	Residual Moisture	Ash	Volatile Matter	Fixed Carbon	Sulphur	Phos.	F.S.I.
1977	SD 7707*	.80	7.70	23.10	68.40	.61	.015	7.0
	SD 7711	.80	9.60	26.60	63.00	.74	.016	8.5
	SD 7713*	.50	11.60	27.10	60.80	.82	.012	7.0
	SD 7716	.60	7.30	24.80	67.30	.56	.035	8.0
	SD 7720	.80	8.00	22.60	68.60	.57	.015	7.5
	SD 7721	.80	8.70	25.90	64.60	.62	.034	7.5
	SD 7724	.60	5.10	27.70	66.60	.78	.014	8.0
	SD 7725	.80	8.60	24.60	66.00	.80	.066	8.0
	SD 7726	<u>.50</u>	<u>8.60</u>	<u>22.80</u>	<u>68.10</u>	<u>.73</u>	<u>.009</u>	<u>7.5</u>
Avg.		.68	8.35	25.02	65.93	.69	.024	7.7
1976	SD 7601	.90	9.20	23.60	66.30	.37		7.5
	SD 7603	.70	6.10	26.10	67.00	.67		7.0
	SD 7606	1.00	9.00	23.80	66.20	.68		7.5
	SD 7614	<u>.80</u>	<u>9.30</u>	<u>22.90</u>	<u>67.00</u>	<u>.67</u>		<u>7.5</u>
Avg.		.85	8.40	24.10	66.62	.59		7.4

\* 1977, less than 70% core recovery.

TABLE 4-9

Simulated Product Analysis  
from drill core and adits

Saxon Project Feasibility Report  
October 1977

Saxon South		Seam 4						
Year	Drill hole or Adit	Residual Moisture	Ash	Volatile Matter	Fixed Carbon	Sulphur	Phos.	F.S.I.
1977	SD 7707*	1.10	5.50	25.40	68.00	.60	.016	8.5
	SD 7707*	1.50	6.40	25.70	66.40	.30	.018	7.0
	SD 7711	.90	6.60	28.10	64.40	.29	.012	7.5
	SD 7711	.90	7.10	28.40	63.60	.66	.004	8.0
	SD 7713	.80	6.60	27.80	64.80	.33	.017	7.5
	SD 7713	.60	5.30	28.20	65.90	.67	.006	8.0
	SD 7716	.70	6.90	26.00	66.40	.30	.010	7.5
	SD 7718	.80	7.30	25.40	66.50	.37	.010	8.0
	SD 7718	.60	5.10	24.20	70.10	.75	.004	7.5
	SD 7720	.80	5.80	24.20	69.20	.35	.018	7.5
	SD 7722	.90	6.40	24.80	67.90	.30	.019	8.0
	SD 7723	.90	6.90	24.60	67.60	.38	.018	7.5
	SD 7724	.70	6.50	27.40	65.40	.34	.014	7.5
	SD 7726	.70	7.50	26.60	65.20	.35	.015	7.5
	A 7745	<u>.80</u>	<u>7.70</u>	<u>24.40</u>	<u>67.10</u>	<u>.47</u>		<u>8.0</u>
Avg.		.84	6.50	26.08	66.56	.43	.013	7.7
1976	SD 7601	.80	7.60	24.60	67.00	.64		7.5
	SD 7604	.90	6.90	25.60	66.60	.47		6.5
	SD 7606	1.30	7.20	23.80	67.70	.37		7.0
	SD 7606	.90	6.80	25.80	66.50	.42		8.0
	SD 7610	.70	7.40	25.20	66.70	.41		7.0
	SD 7611	.90	7.10	25.10	66.90	.36		7.5
	SD 7614	1.00	7.40	24.00	67.60	.34		6.5
	SD 7618	.90	7.50	24.50	67.10	.55		7.5
	A 7642	.60	7.40	27.00	65.00	.43		7.5
	A 7644	<u>.60</u>	<u>7.90</u>	<u>23.80</u>	<u>67.70</u>	<u>.41</u>		<u>7.5</u>
Avg.		.86	7.32	24.94	66.88	.44		7.3

\* 1977, less than 70% core recovery.

TABLE 4-10

Simulated Product Analysis  
from drill core and adits  
Saxon Project Feasibility Report  
October 1977

Saxon South		<u>Seam 5</u>						
Year	Drill hole or Adit	Residual Moisture	Ash	Volatile Matter	Fixed Carbon	Sulphur	Phos.	F.S.I.
1977	SD 7717	.60	7.30	26.10	66.00	.62	.021	8.0
	SD 7726	<u>.70</u>	<u>4.40</u>	<u>25.80</u>	<u>69.10</u>	<u>.78</u>	<u>.015</u>	<u>8.5</u>
	Avg.	.65	5.85	25.95	67.55	.70	.018	8.3
1976	SD 7601	.90	8.20	25.00	65.90	.44		6.5
	SD 7608	.90	8.70	25.40	65.00	.57		8.0
	SD 7615	<u>1.00</u>	<u>6.40</u>	<u>25.30</u>	<u>67.30</u>	<u>.66</u>		<u>8.0</u>
	Avg.	.93	7.77	25.23	66.07	.56		7.5

Table 4-11

Simulated Product Analysis  
from drill core and adits

Saxon South		<u>Seam 10</u>						
Year	Drill hole or Adit	Residual Moisture	Ash	Volatile Matter	Fixed Carbon	Sulphur	Phos.	F.S.I.
1977	SD 7724	.60	4.90	28.50	66.00	.65	.060	8.0
	SD 7726	<u>.60</u>	<u>5.20</u>	<u>26.70</u>	<u>67.50</u>	<u>.68</u>	<u>.034</u>	<u>8.0</u>
	Avg.	.60	5.05	27.60	66.75	.67	.047	8.0
1976	SD 7601	1.10	6.30	27.60	65.00	.67		7.5
	SD 7615	<u>.80</u>	<u>5.80</u>	<u>25.50</u>	<u>67.90</u>	<u>.71</u>		<u>7.5</u>
	Avg.	.95	6.05	26.55	66.45	.69		7.5

Estimates of clean coal product quality have been determined by simulating mining schedules prepared for each period, using both the open pit reserves and the underground production schedules. To do this, the underground coal production was estimated for the corresponding open pit periods from Montan Consulting's clean coal production schedule. During each period the production from each mine was assigned to various representative drill hole and adit washability data sets depending on a data set's proximity to the actual area being mined. Drill holes with less than 70% recovery were not considered.

The drill holes and adits selected were first adjusted so that their size consist was roughly equivalent to that expected in a mining situation. The washability curves were then adjusted according to the yields which were assigned and have been discussed in part two of this volume. If the estimated yield was different from the reported lab yield, the washability curves were adjusted to provide the estimated yield at a cut point of 1.54 (or 1.60 for 1976 data points) for the +28 mesh (Heavy media cyclone) portion of the coal and 1.76 (or 1.80 for 1976 data points) for the 28 mesh x 100 mesh (water cyclone) portion of the feed. The adjustment and blending of these data sets assumed that the frothed coal would contain 10% ash.

Once the data sets had been assigned to mining areas and adjusted, they were input into the computer washplant simulator along with their assigned tonnages. The computer then randomly selected blocks of coal represented by each drill core and adit in quantities roughly equivalent to the amount of coal mined from one seam at any one time. The size of these blocks was based on probable mining parameters for each of the underground and open pit areas. These blocks were accumulated until 1/50 of the periods' total production was reached. The random selection process was repeated 50 times, hence generating 50 possible combinations of drill and adit data sets. The washability and quality data for 25 of these combinations were then individually blended and cut to theoretically produce 7.5% ash in the product.

The variation in product quality was tested in two basic ways. First the final product ash was specified at exactly 7.5% and the cut points were determined to arrive at that ash. Then the cut points were fixed for each period based on computer simulator runs at 7.5% ash and the ash was allowed to vary. These cases represent extreme limits of variation in product coal quality within one period since the seam and areas mined are randomly selected and, secondly, the cut points are not varied within one period. In actual practice specific gravity cut points are adjusted to major variations in plan feed coal and this would have the tendency to increase the yield and maintain the quality of the product coal.

Tables which demonstrate the clean coal quality and its standard deviation for each period are presented on the following pages. These tables indicate the average value for each parameter in a period and its standard deviation calculated on the 25 mixes that were selected in that period. In the first set (table 4-12) the ash is fixed at 7.5% and in the second set (table 4-13) the cut points are fixed at pre-determined values for each period as has been previously discussed. It will be noted that in some periods, when the ash is fixed the average ash for the period is below 7.5%. This is due to the fact that in some random mining selections the coal was too clean to produce 7.5% ash at the highest cut points that were allowed (1.90 for each of the cyclone circuits). This indicates that some monitoring of the production schedule may be necessary to keep the plant operating efficiently as cut points this high are not practical.

TABLE 4-12  
CLEAN COAL QUALITY AND VARIATION BY PERIOD AT SPECIFIED ASH

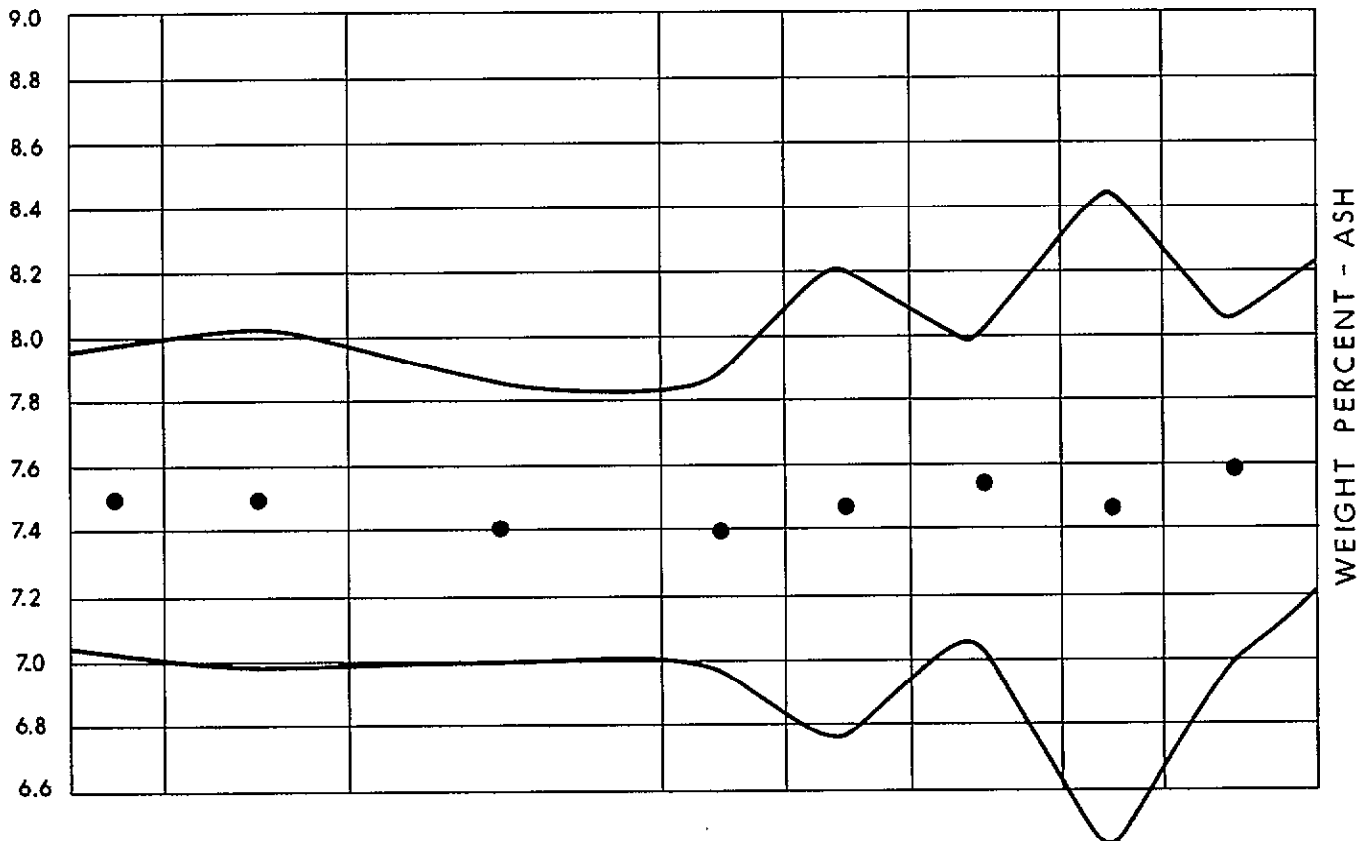
SAXON PROJECT FEASIBILITY REPORT OCTOBER 1977																
DENISON COAL LTD																
TOTAL (STATISTICS) TABLE																
PERIOD -	STAND AVF. DEV		STAND AVF. DEV		STAND AVE. OFV		STAND AVF. DEV		STAND AVE. DEV		STAND AVF. DEV		STAND AVE. DEV		STAND AVF. DEV	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTL ***	
PROD-NRY	.042	.004	.183	.019	.345	.036	.179	.014	.150	.019	.145	.011	.151	.019	.208	PROD-NRY .175*****
PROD-S&F	.064	.004	.192	.020	.363	.038	.188	.015	.154	.020	.152	.011	.159	.020	.219	PROD-S&F .184*****
YFLD %	69.374		68.795		67.441		70.235		64.976		71.522		70.537		70.169	YFLD % 68.877
AIR DRY BASIS																
MOISTURE	.91	.16	.85	.13	.79	.11	.80	.09	.81	.15	.85	.17	.82	.13	.78	MOISTURE .89 .14
ASH	7.50	.00	7.50	.00	7.50	.00	7.50	.00	7.50	.00	7.50	.00	7.50	.00	7.45	ASH 7.47 .15
VOLATILES	23.64	1.21	22.70	1.10	21.91	.81	23.44	.98	22.24	1.11	21.61	.72	22.43	.88	21.92	VOLATILES 22.48 1.20
F.C.	67.96	1.10	68.95	1.02	69.81	.82	68.27	.97	69.44	1.13	70.07	.82	69.44	1.00	69.85	F.C. 68.22 1.23
SULPHUR	.42	.08	.43	.07	.44	.06	.42	.05	.42	.05	.46	.07	.45	.09	.45	SULPHUR .44 .07
PHOSPHORUS	.014	.004	.012	.004	.017	.005	.014	.003	.014	.003	.021	.005	.016	.004	.017	PHOSPHORUS .016 .005
FSI WTD AVG	6.9	.4	6.7	.5	6.6	.5	7.0	.5	6.6	.6	6.4	.5	6.7	.5	6.4	FSI WTD AVG 6.7 .6
DRY BASIS																
ASH	7.57	.02	7.56	.02	7.57	.04	7.55	.02	7.56	.05	7.61	.13	7.48	.23	7.54	ASH 7.56 .11
VOLATILES	23.85	1.19	22.89	1.09	22.08	.82	23.62	.98	22.42	1.12	21.79	.76	22.61	.88	22.10	VOLATILES 22.67 1.21
F.C.	68.58	1.18	69.54	1.10	70.35	.83	68.83	.99	70.07	1.14	70.59	.83	69.90	.91	70.38	F.C. 69.77 1.22
CALCULATED																
D.M.M.F. BASIS																
VOLATILES	25.19	1.31	24.14	1.20	23.25	.90	24.94	1.08	23.63	1.23	22.93	.83	23.80	.96	23.26	VOLATILES 23.89 1.33
F.C.	74.81	1.31	75.86	1.20	76.75	.90	75.06	1.08	76.37	1.23	77.07	.83	76.20	.96	76.74	F.C. 74.11 1.33
CMT POINTS																
????????	1.57	.05	1.53	.05	1.56	.05	1.58	.06	1.54	.07	1.64	.09	1.65	.15	1.60	???????? 1.50 .09
????????	1.76	.05	1.74	.05	1.78	.06	1.76	.05	1.75	.07	1.84	.05	1.82	.06	1.82	???????? 1.78 .07
YIELD BASED ON DRY PRODUCT TONNES / MINED TONNES																

TABLE 4-13  
CLEAN COAL QUALITY AND VARIATION BY PERIOD AT SPECIFIED CUT POINTS

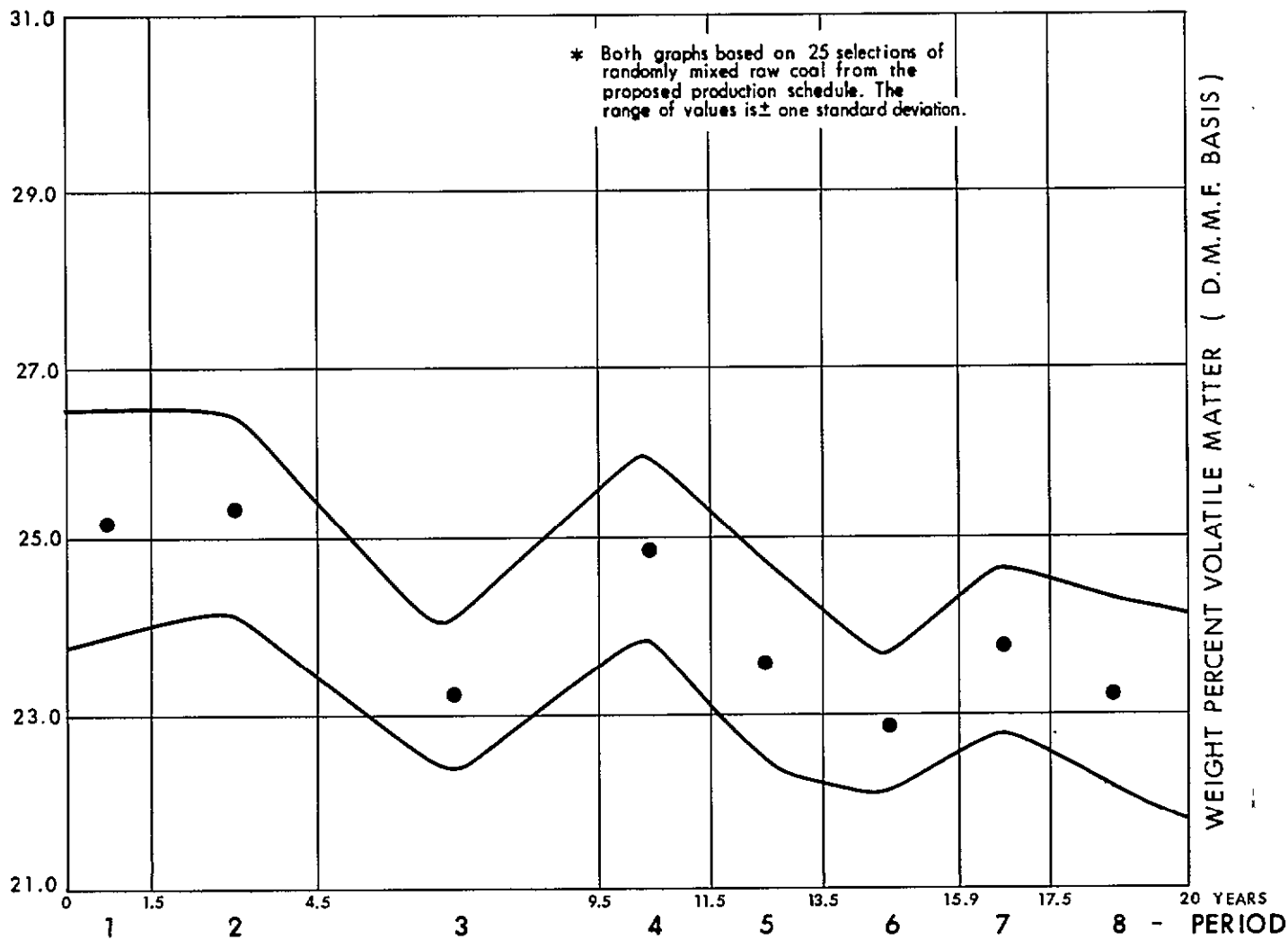
DENISON COAL LTD		SAXON PROJECT FEASIBILITY REPORT OCTOBER 1977																DENISON COAL LTD	
TOTAL (STATISTICS) TABLE																		TOTAL (STATISTICS) TABLE	
PERIOD	STAND AVE. DEV		STAND AVE. DEV		STAND AVE. DEV		STAND AVE. DEV		STAND AVE. DEV		STAND AVE. DEV		STAND AVE. DEV		STAND AVE. DEV		STAND AVE. DEV		
	1	25	1	25	1	25	1	25	1	25	1	25	1	25	1	25	1	25	
DDDD-NDY	.042	.004	.184	.015	.344	.034	.179	.013	.151	.013	.145	.009	.153	.016	.209	.018	DDDD-NDY	.174*****	
DDDD-CALF	.044	.004	.193	.016	.362	.036	.188	.014	.159	.014	.153	.009	.161	.017	.220	.019	DDDD-CALF	.186*****	
YIELD %	69.474		69.701		67.352		70.192		66.392		71.662		71.677		70.717		YIELD %	69.173	
AID DRY BASIS																			
MOISTURE	.91	.14	.85	.14	.78	.10	.80	.09	.83	.15	.84	.17	.80	.12	.78	.09	MOISTURE	.82	
ASH	7.91	.45	7.61	.50	7.42	.43	7.40	.48	7.45	.71	7.54	.49	7.44	1.05	7.54	.54	ASH	7.47	
VOLATILES	21.63	1.20	22.71	1.14	21.92	.92	23.46	1.04	22.26	1.18	21.61	.78	22.43	.91	21.91	.98	VOLATILES	22.40	
F.C.	67.95	1.20	68.09	.88	69.88	.85	68.35	.77	69.46	.93	69.99	.79	69.33	1.15	69.78	1.20	F.C.	68.21	
SULPHUR	.42	.08	.43	.07	.44	.06	.42	.05	.42	.05	.44	.07	.46	.09	.45	.06	SULPHUR	.44	
PHOSPHORUS	.014	.007	.012	.004	.017	.005	.014	.003	.013	.003	.021	.004	.016	.004	.017	.004	PHOSPHORUS	.015	
FSI WTD AVG	6.0	.7	6.7	.6	6.7	.5	7.0	.6	6.6	.8	6.4	.5	6.7	.7	6.4	.7	FSI WTD AVG	6.7	
NDY BASIS																			
ASH	7.58	.44	7.57	.58	7.48	.43	7.45	.49	7.51	.69	7.62	.49	7.51	1.06	7.61	.54	ASH	7.54	
VOLATILES	23.85	1.18	22.91	1.15	22.10	.83	23.65	1.05	22.44	1.19	21.80	.82	22.62	.92	22.08	.99	VOLATILES	22.68	
F.C.	68.47	1.29	69.42	.94	70.42	.46	68.91	.78	70.04	.93	70.48	.69	69.88	1.16	70.31	1.18	F.C.	69.70	
CALCULATED																			
D.M.H.F. BASIS																			
VOLATILES	25.19	1.31	24.16	1.20	23.26	.89	24.94	1.00	23.64	1.23	22.94	.86	23.82	.95	23.26	1.09	VOLATILES	23.90	
F.C.	74.81	1.31	75.84	1.20	76.74	.89	75.06	1.00	76.36	1.23	77.06	.86	76.18	.95	76.74	1.09	F.C.	76.10	
CUT POINTS																			
	1.57	.0	1.52	.00	1.54	.00	1.55	.00	1.52	.00	1.53	.00	1.63	.00	1.59	.00		1.57	
	1.74	.00	1.79	.00	1.76	.00	1.73	.00	1.73	.00	1.80	.00	1.79	.00	1.81	.00		1.79	
YIELD BASED ON "NDY" PRODUCT TONNES / MINED TONNES																			



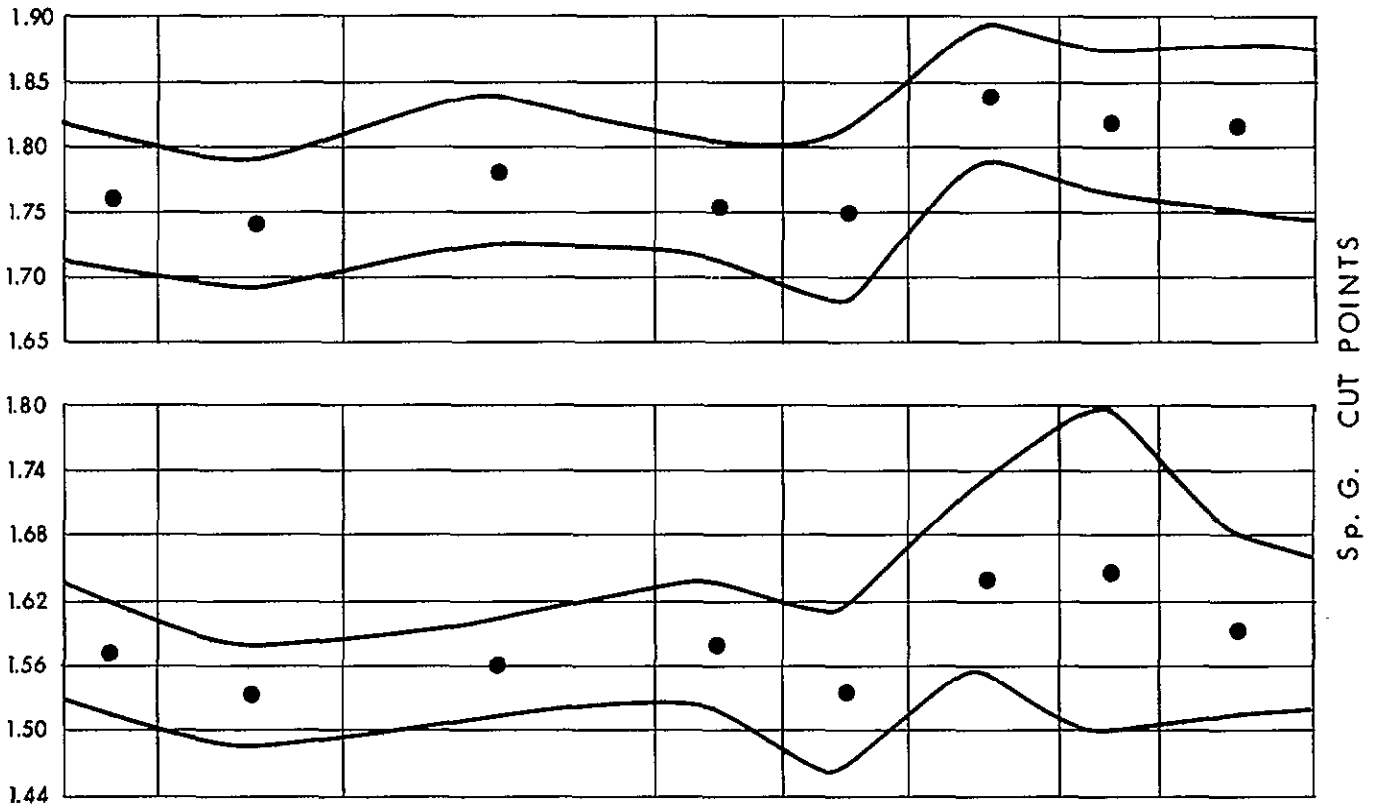
\* VARIATION IN ASH BY PERIOD — FOR SPECIFIED CUT POINTS



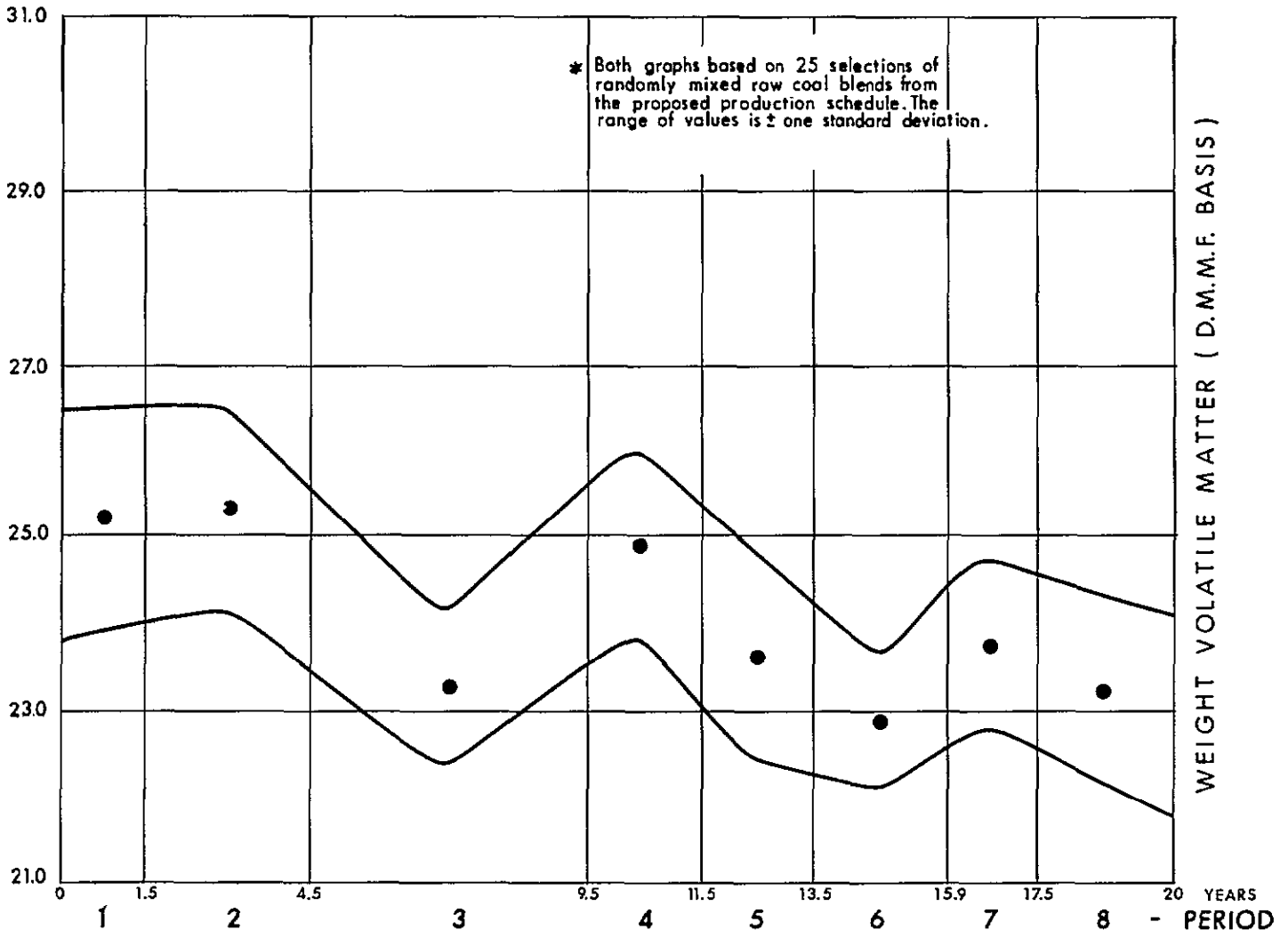
\* VARIATION IN VOLATILE MATTER (D.M.M.F BASIS) BY PERIOD FOR SPEC. CUT POINTS



\* VARIATION IN CUT POINTS BY PERIOD FOR SPECIFIED ASH 7.50%



\* VARIATION IN VOLATILE MATTER (D.M.M.F BASIS) BY PERIOD FOR SPECIFIED ASH 7.50%



#### 4.4 COKING QUALITY

##### 441 TEST RESULTS

The results of the coke tests done in Japan, Germany, France, and Canada during 1976 and 1977 are summarized in Tables 4-14 and 4-15 on the pages following this section. Similar tests were done in 1972 in Canada and have been reported previously. All of the reported results for the 1976 and 1977 test work are presented in Volume III.

The interpretation of coke test results is somewhat difficult as each steel mill or country uses somewhat different criteria to establish the appropriateness of a coking coal in its blending scheme. One of the most unequivocal methods of evaluating a coking coal is therefore to determine how a coal blend behaves in the test oven when that particular coal replaces a known coal in varying proportions in the blend. A number of the tests that have been done on the Saxon coals are interesting in this regard. In France, for example, a Saxon coal blend was substituted for Polish coking coal and found to be superior to it and coal from adit 77-1-1 was used to replace a low volatile Australian coal and it turned out to be approximately equivalent to it despite an anomalously low charge density in the Saxon test run which has not been satisfactorily explained.

Tests done in Japan have also indicated that the Saxon coals from adits 76-4-1 and 76-4-2 were good blending coals, although adit 76-4-1 from the underground mine area was superior to the other sample from the open pit. This was to be expected as adit 76-4-1 had a lower volatile content. The wide variety of blend tests that were done in Japan and the consistently good results that were obtained are a very encouraging indication of the value of the Saxon coals.

The results of the tests done in Germany were somewhat more ambiguous than those done in Japan and France as the blend tests were done without particular reference to blend substitution. The 1976 test results did, however, indicate that the Saxon coals could be coked on their own as they have nearly optimum proportions of reactive and inert material. However the German tests indicated that the resulting coke strength (as measured by ISO 40) would only be just within the accepted limits for blast furnace operation (ISO 40 = 70%). On the other hand, very good results (ISO 40 = 77%) were obtained by blending Saxon coal with medium volatile coking coal from the Ruhr.

Preliminary results from the 1977 tests, which are not included in Volume III as they have not yet been formally received, also indicate that Saxon coals make acceptable blends with Germany's Lohberg coal.

.1 Fluidity

Most drill cores were analyzed for fluidity during 1977 and in addition a study of fluidity decay in drill core samples from the Saxon project was started. The results of the latter study are not yet available, however, the average apparent fluidity of the Saxon coals has been calculated by averaging the logarithm of the fluidity measurements for each seam in both Saxon East and Saxon West. The results of these calculations are presented in the following table:

	SEAM	AVERAGE LOG. OF MAXIMUM FLUIDITY	ANTILOG OF AVERAGE MAXIMUM FLUIDITY
SAXON EAST	1	0.95	9.0 ddpm
	2	0.84	7.0 ddpm
	4	0.65	4.5 ddpm
SAXON SOUTH	1	1.89	78 ddpm
	2	1.81	65 ddpm
	3	2.15	141 ddpm
	4	2.06	114 ddpm

As expected, these analyses indicate that the higher volatile coals from Saxon South are more fluid than the lower volatile coals from Saxon East.

.2 Dilatation

Ruhr dilatometer tests were also done on the significant core samples from the 1977 exploration program. The results of these tests appear to be somewhat more erratic than the fluidity results although anomalous values were also obtained in those measurements. Both the fluidity and dilatometer test results are presented in the analytical appendix in Volume III. The following table is a summary of those results:

	SEAM	AVERAGE CONTRACTION	AVERAGE DILATION
SAXON EAST	1	21.10%	0.35%
	2	24.18%	-3.50%
	4	21.55%	-7.25%
SAXON SOUTH	1	25.38%	43.83%
	2	25.56%	21.00%
	3	26.63%	50.88%
	4	26.50%	35.93%

The trend of these results is similar to those for fluidity where the better results are obtained from the higher volatile coals.

VOLUME III.

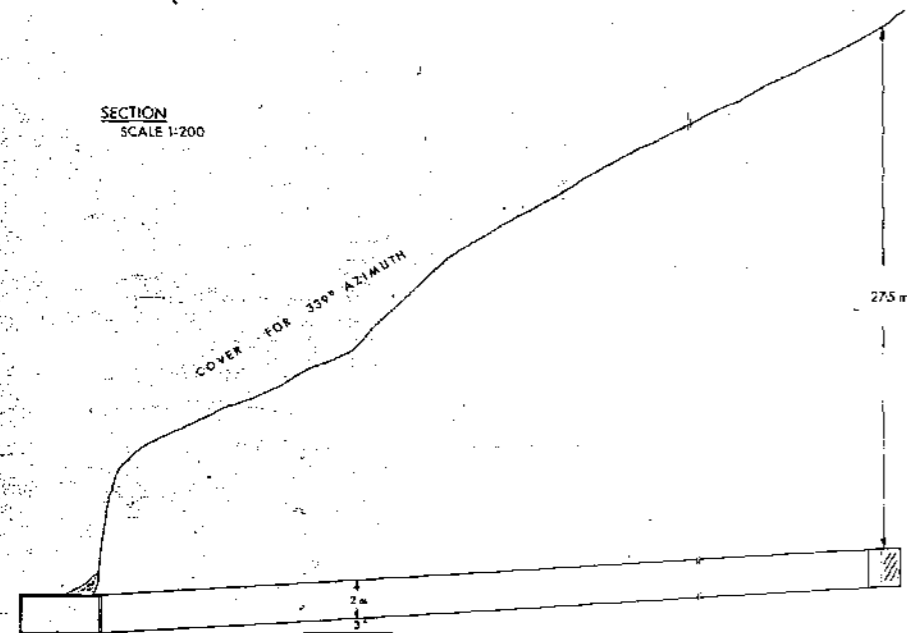
PR-SAXON 77(B)A.

ADITS AND TRENCHES  
EAST AND SOUTH  
SAXON.

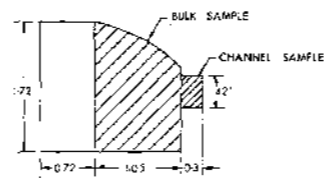
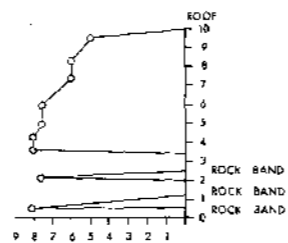
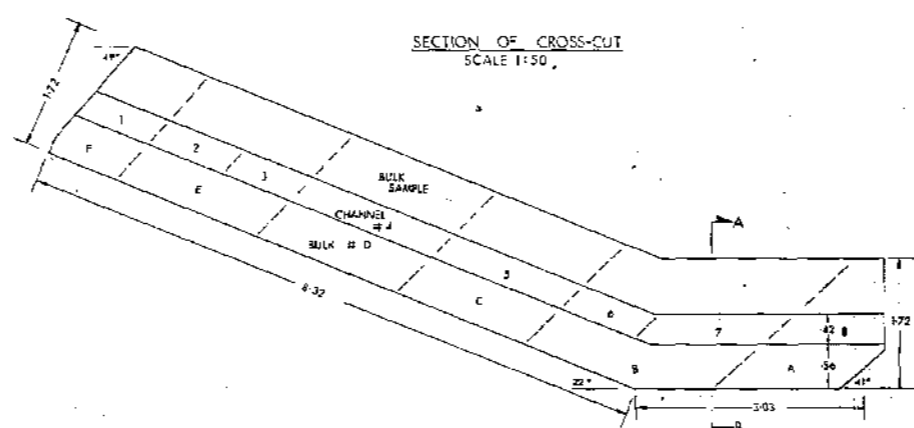
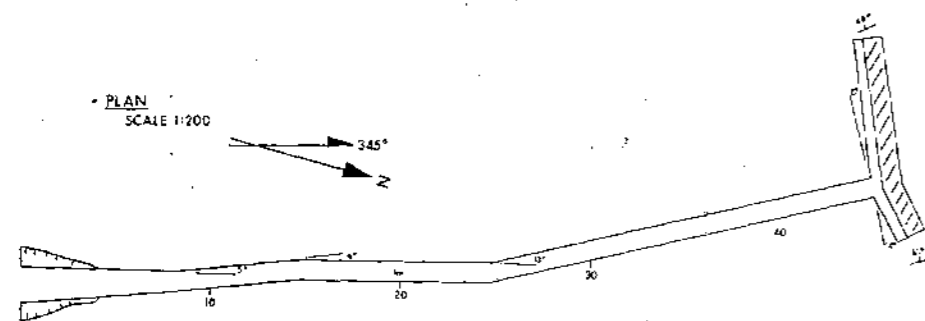
BOOK 2 OF 7

DENISON MINES LTD.

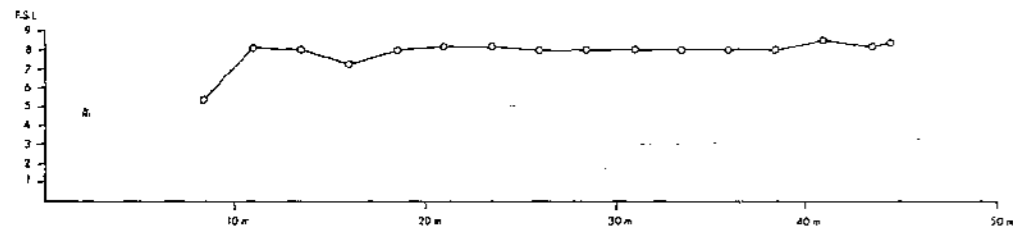
1977.



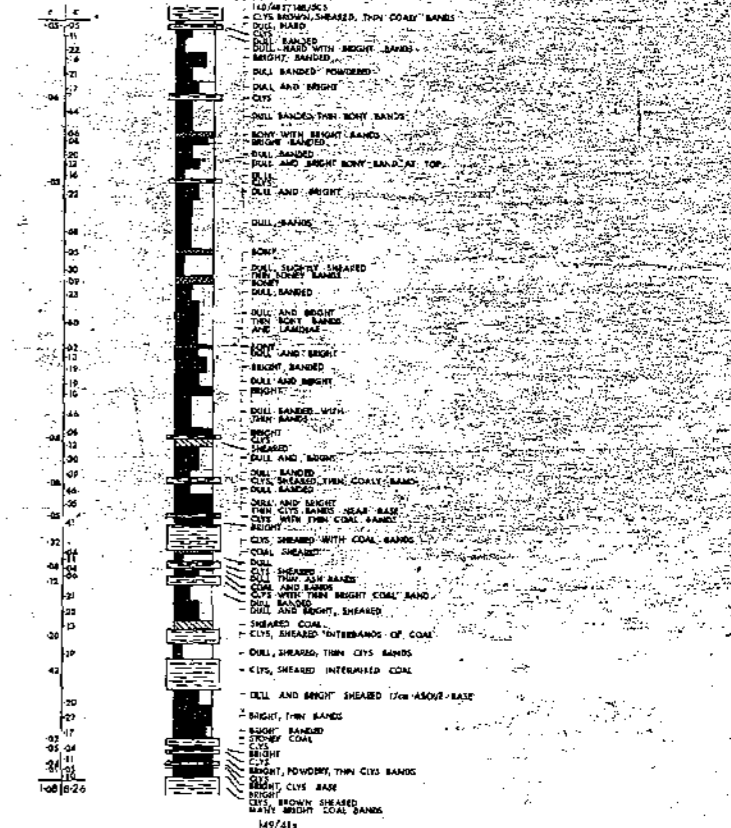
PORTAL COORDINATES 6012826.6 N 694618.6 E  
ELEVATION 1699.6 m



SECTION A-B



BULK	F.S.L.	CHANNEL
BULK F 5 BARRELS	3	CHANNEL #1 1 BARREL
BULK E 10 BARRELS	6	CHANNEL #2 1 BARREL
BULK D 10 BARRELS	6	CHANNEL #3 1 BARREL
BULK D 10 BARRELS	7.5	CHANNEL #4 2 BARRELS
BULK C 9 BARRELS	8.0	CHANNEL #5 2 BARRELS
BULK B 11 BARRELS	7.5	CHANNEL #6 1 BARREL
BULK A 5 BARRELS	8.0	CHANNEL #7 1 BARREL



GEOLOGICAL SECTION OF CROSS-CUT  
SCALE 1:50

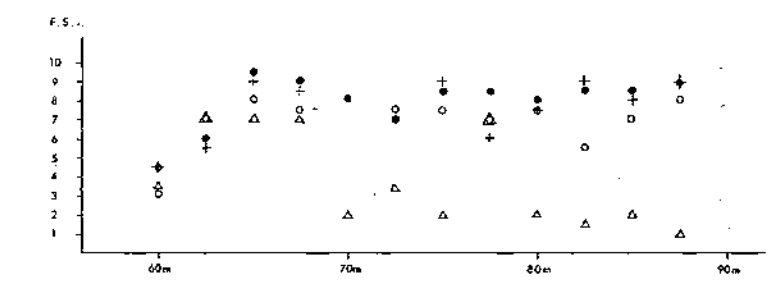
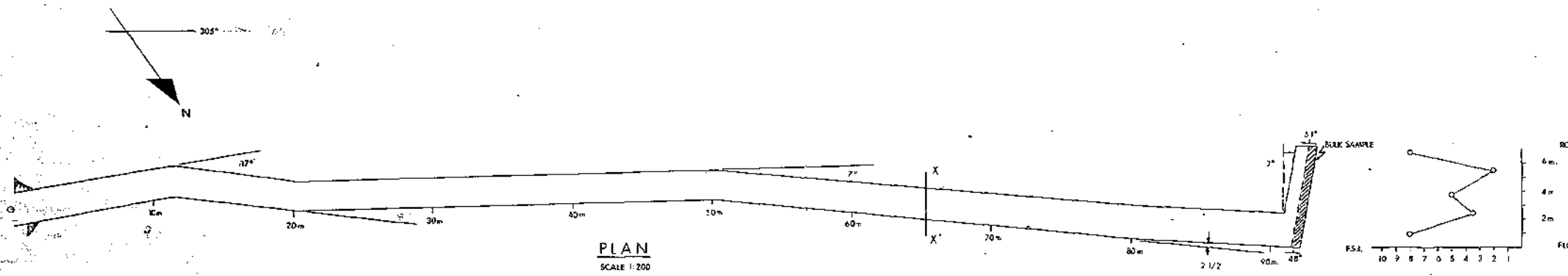
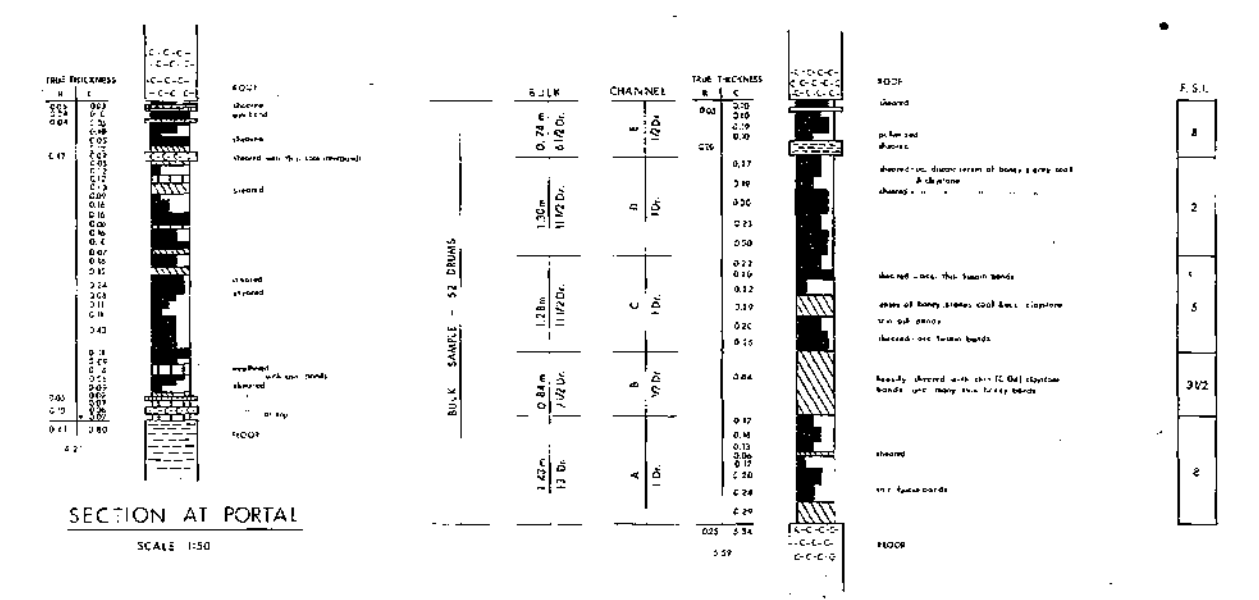
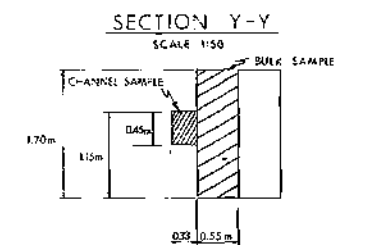
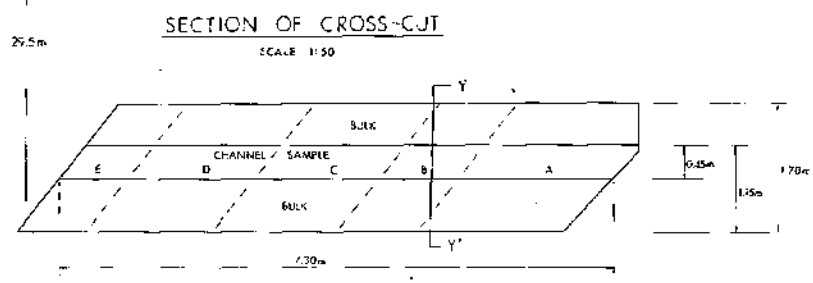
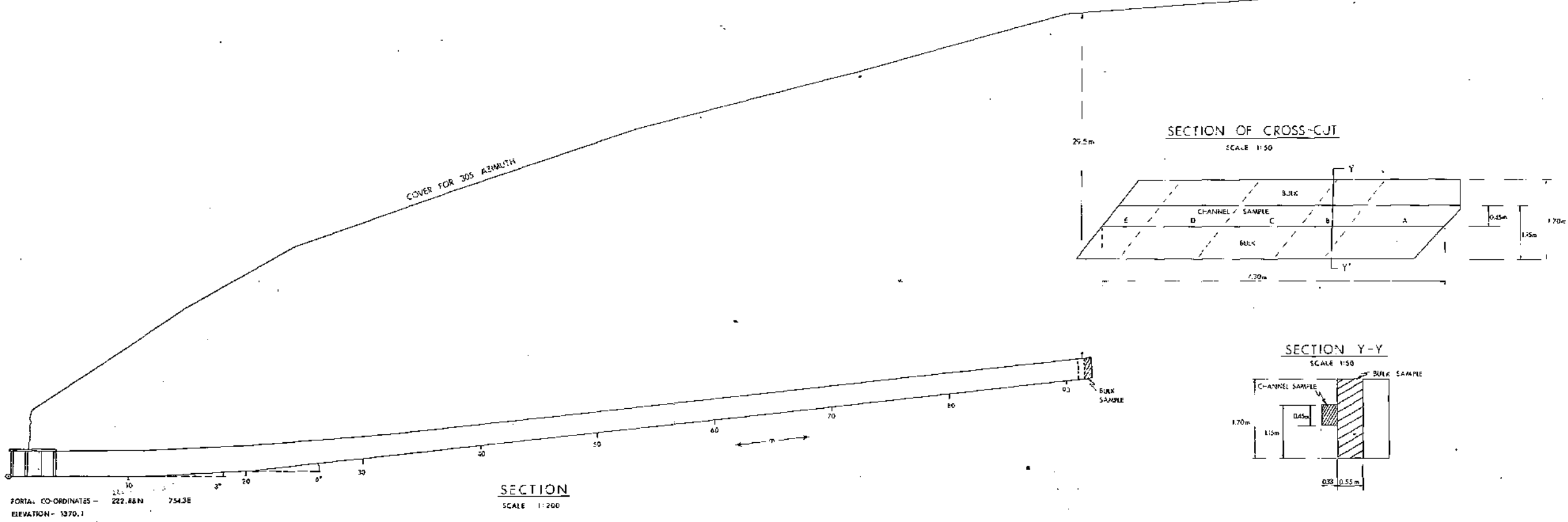
SCALE 1:400/1:100

NO.	DESCRIPTION	BY	DATE
REVISIONS			

PREPARED BY  
**DENISON COAL LIMITED**  
SAXON SOUTH

ADIT 77-4-5

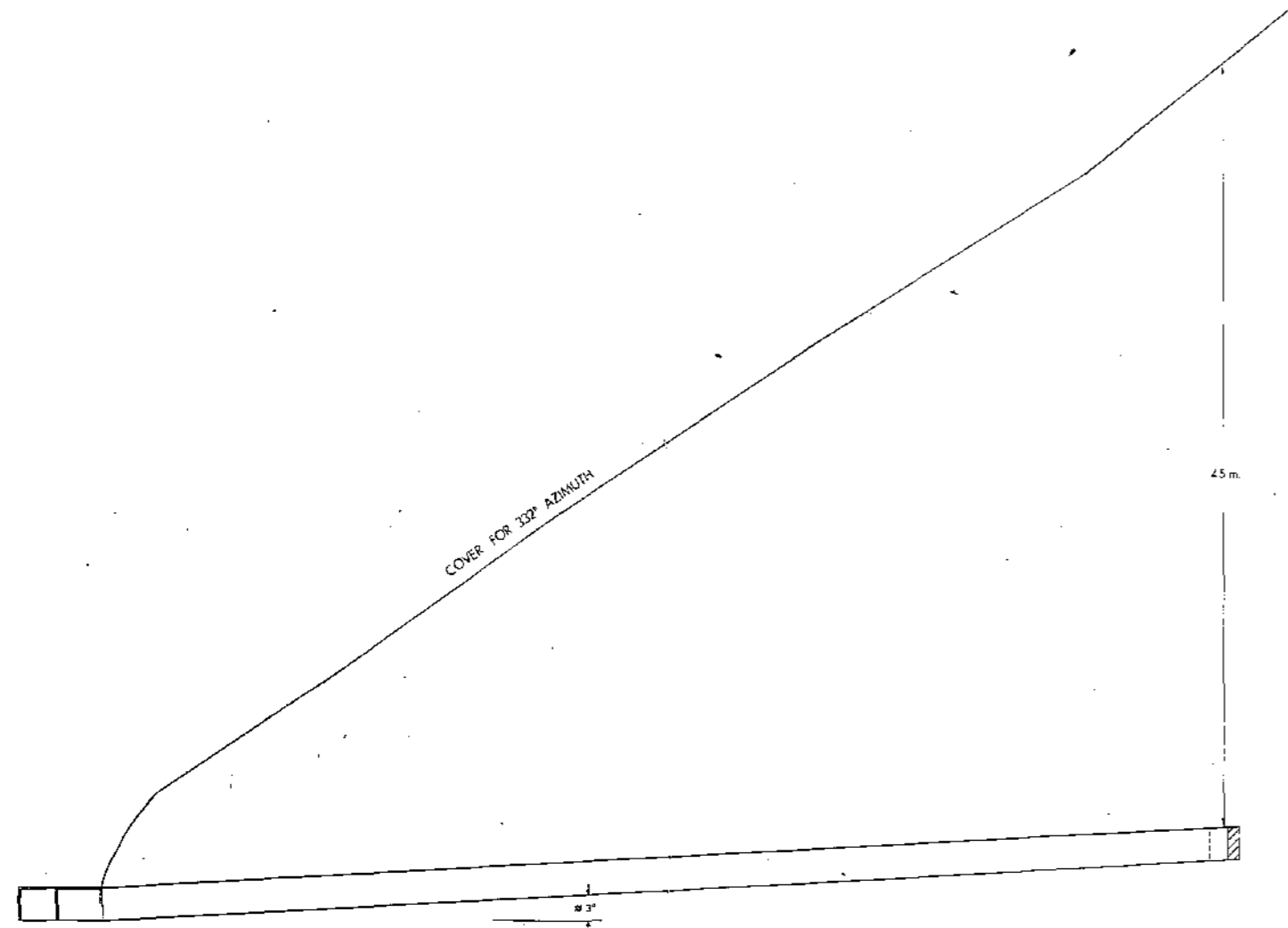
DRAWN BY: J.W.K.	DATE: SEPT. 77	SCALE: 1:200 & 1:50
PREP'D BY: G.P.G.	DATE: AUG. 77	DRAWING NUMBER:
APPR'D BY: G.P.G.	DATE: OCT. 77	SXON77-0761-RO1



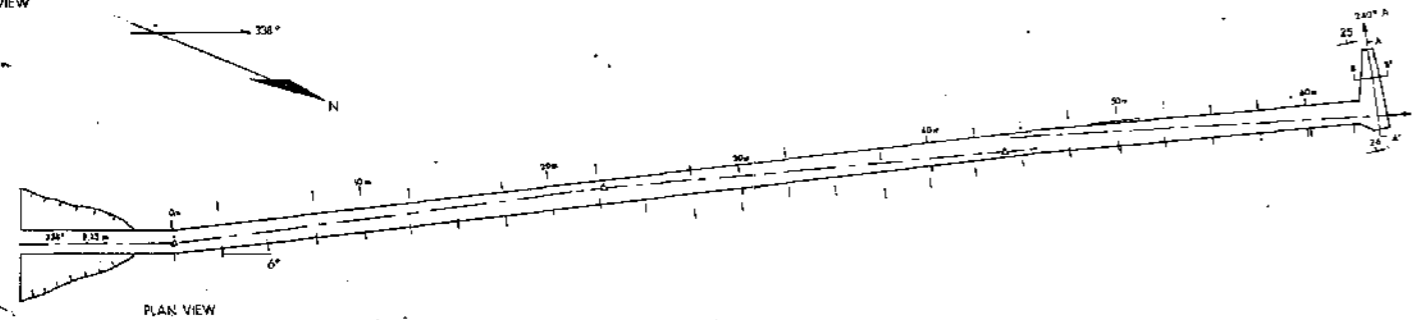
**SCALE 1:400/1:100**

NO.	DESCRIPTION	BY	DATE
<b>REVISIONS</b>			
<b>SAXON COAL LIMITED</b>			
PREPARED BY <b>DENISON COAL LIMITED</b> SAXON EAST			
<b>ADIT 77-2-4</b>			
DRAWN BY: J.W.K.	DATE: AUG 77	SCALE: 1:200	
PREP. BY: J.W.K.	DATE: AUG 77	DRAWING NUMBER:	
APPR. BY: G.P.C.	DATE: OCT 77	SKN 77-077-001	

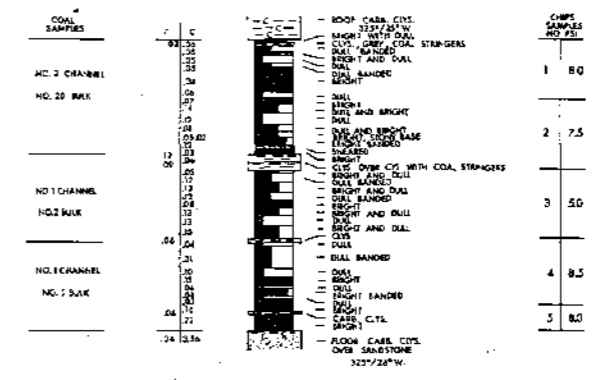
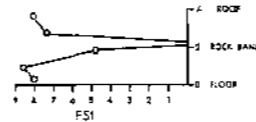
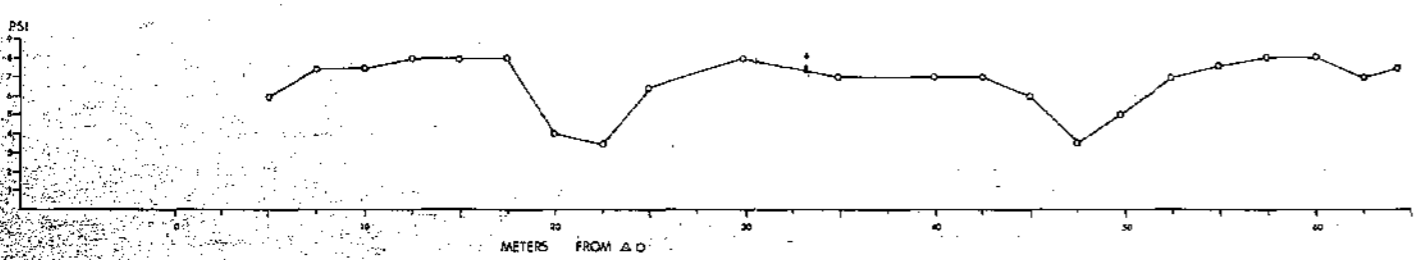




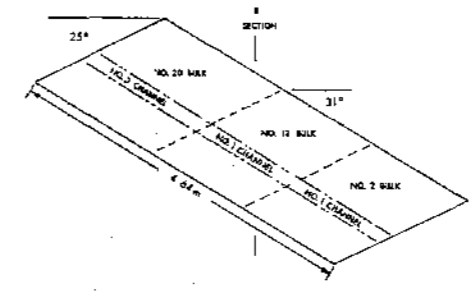
PROFILE VIEW  
 PORTAL COORDINATES  
 ONSLOWVILLE BY  
 STATION 8  
 MASTS 2.4m



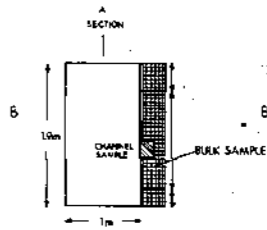
PLAN VIEW



GEOLOGIC SECTION OF CROSS-CUT 1:50



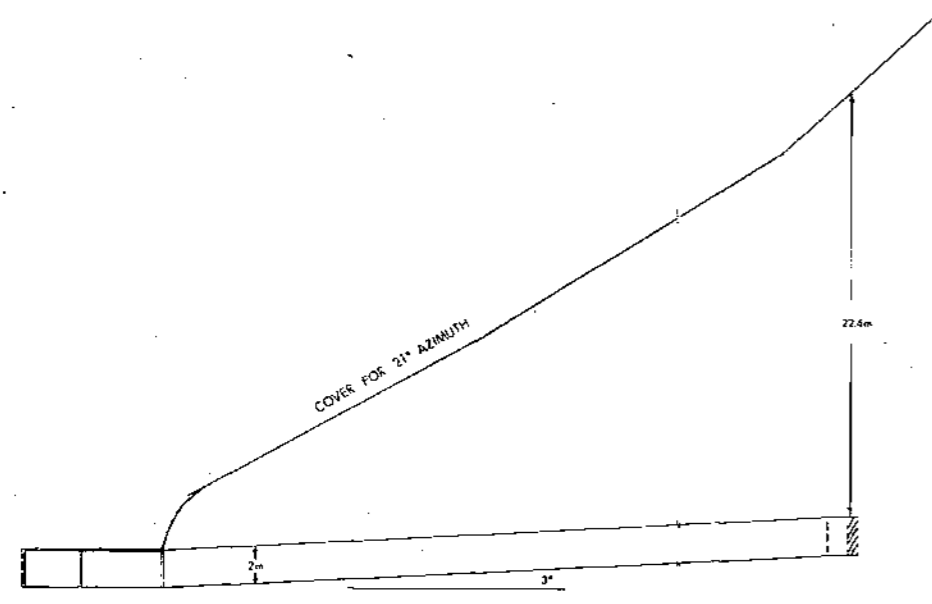
CROSS SECTION A-A'  
1:50



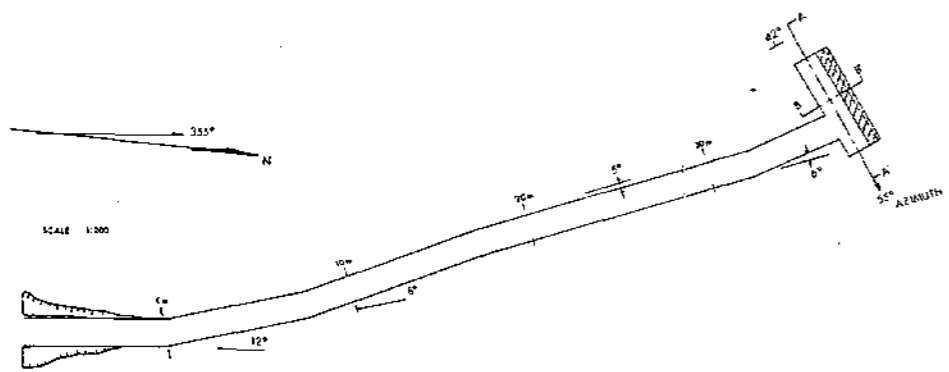
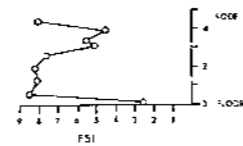
CROSS SECTION B-B'  
1:50

SCALE 1:400/1:100

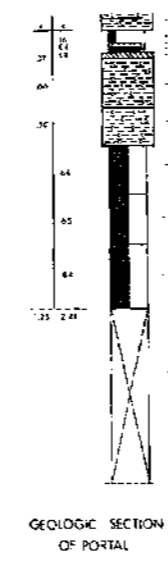
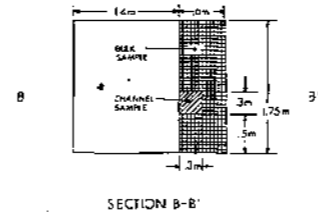
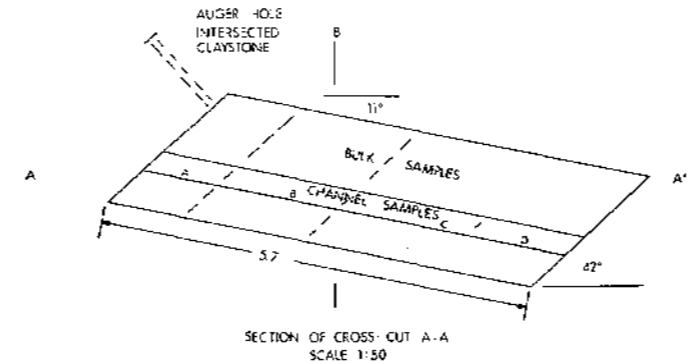
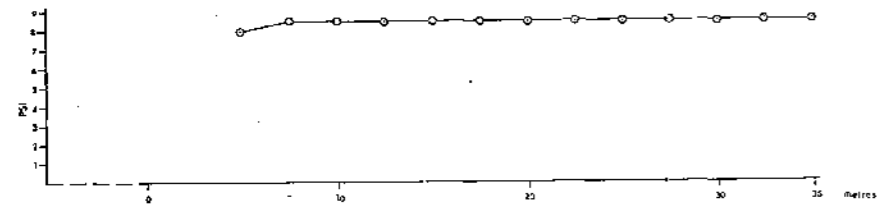
NO.	DESCRIPTION	BY	DATE
REVISIONS			
SAXON COAL LIMITED			
PREPARED BY DENISON COAL LIMITED SAXON SOUTH			
ADIT 77-1-3			
DRAWN BY: J.W.C.	DATE: AUG-27	SCALE: 1:50	
PREP'D BY: J.C.	DATE: AUG-27		
APPRO'D BY: G.P.C.	DATE: OCT-27		



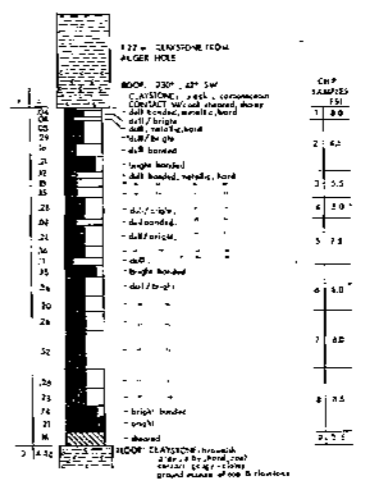
PORTAL COORDINATES  
6812707 N  
674733 E  
1287 m. elev.



SCALE 1:200

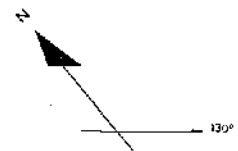


CREAMLINE SAMPLE	BULK SAMPLE
A	A <sub>1</sub> - A <sub>2</sub>
ONE DRUM	5 DRUMS
0.13 m	0.83 m
TAG NOS. 25	TAG NOS. 83-146
1.21 m	1.21 m
B	B <sub>1</sub> - B <sub>2</sub>
TWO DRUMS	13 DRUMS
1.21 m	2.1 m
	TAG NOS. 147-180
C	
ONE DRUMS	
1.36 m	
TAG NOS. 29-40	CB <sub>1</sub> - CB <sub>24</sub>
2.48 m	
	24 DRUMS
	2.48 m
D	
ONE & ONE HALF DRUMS	
0.2 m	
TAG NOS. 181-190	

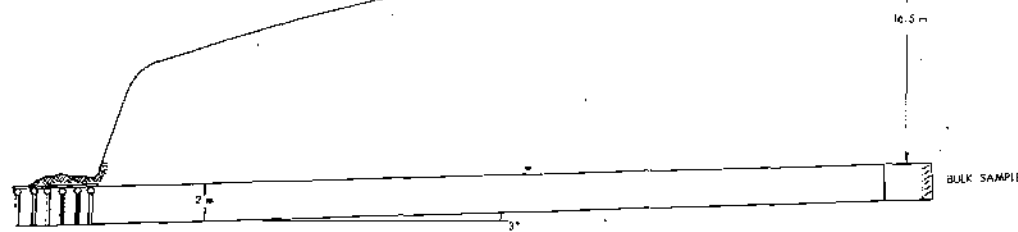


SCALE: 1:400/1:100

NO.	DESCRIPTION	BY	DATE
REVISIONS			
<b>SAXON COAL LIMITED</b>			
PREPARED BY: DENISON COAL LIMITED SAXON SOUTH			
<b>ADIT 77-2-2</b>			
DRAWN BY: J.W.K.	DATE: AUG. 77	SCALE: 1:200- 1:50	
PREP'D BY: J.P.	DATE: AUG. 77	DRAWING NUMBER:	
APP'D BY: C.P.C.	DATE: OCT. 77	SXON 77-0761 -R01	



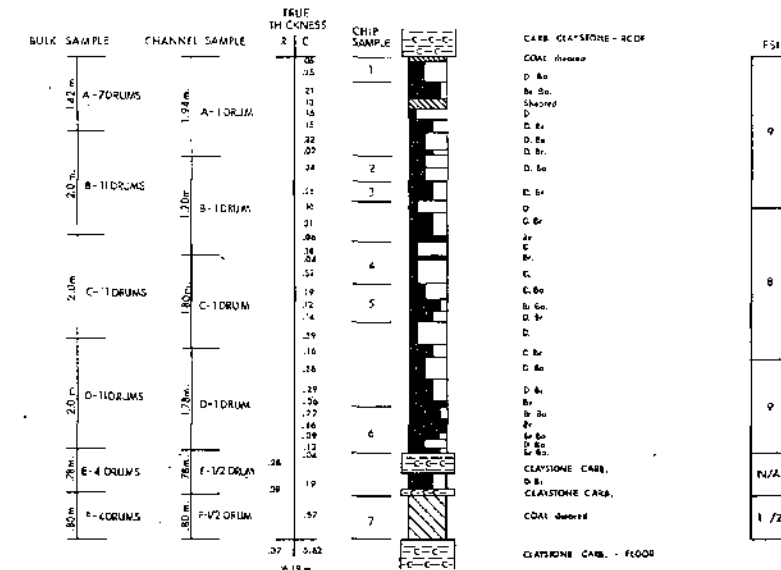
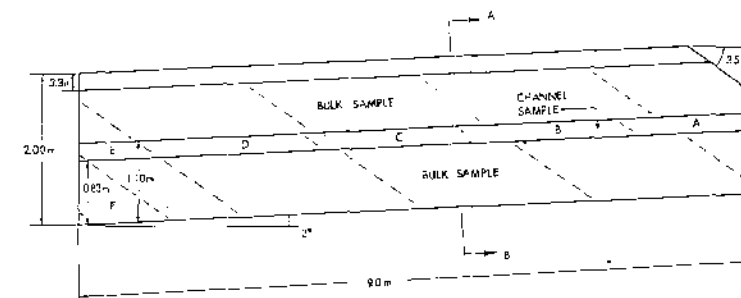
SECTION  
SCALE 1:200  
130° AZIMUTH



PORTAL CO-ORDINATES - 6024721.0 N 687257.2 E

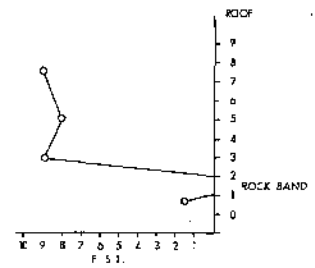
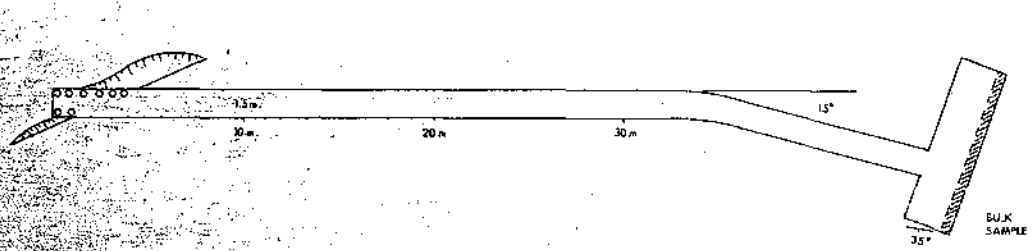
ELEVATION - 1216.8

SECTION OF CROSS-CUT  
SCALE 1:50



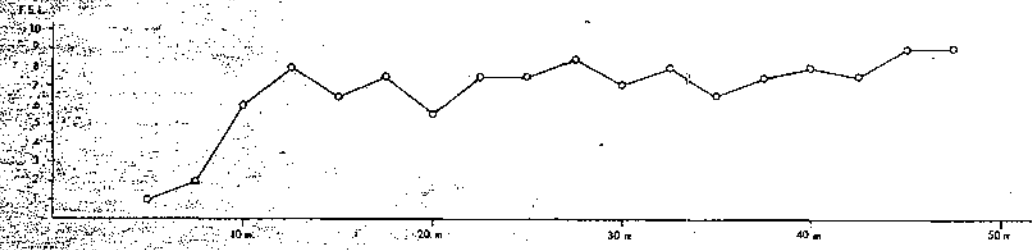
GEOLOGIC SECTION OF CROSS-CUT  
SCALE 1:50

PLAN  
SCALE 1:200

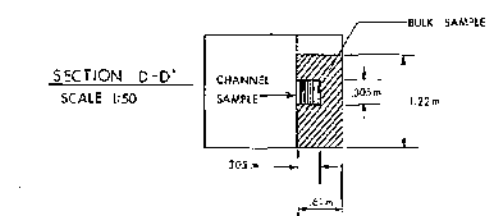
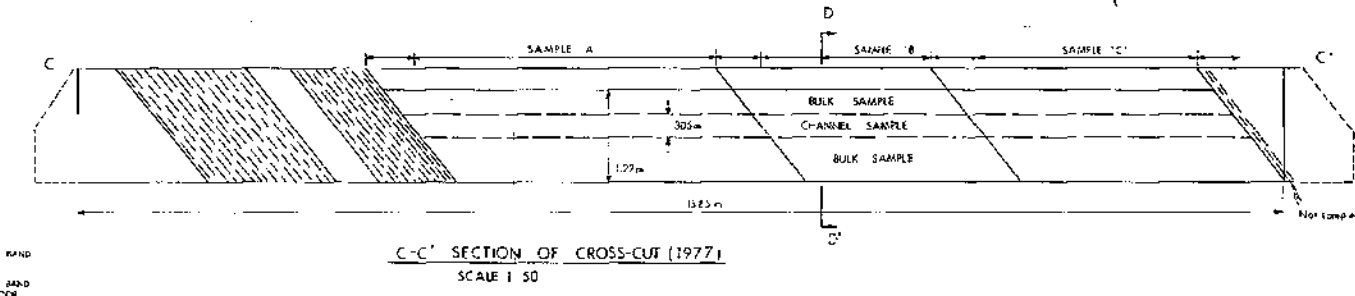
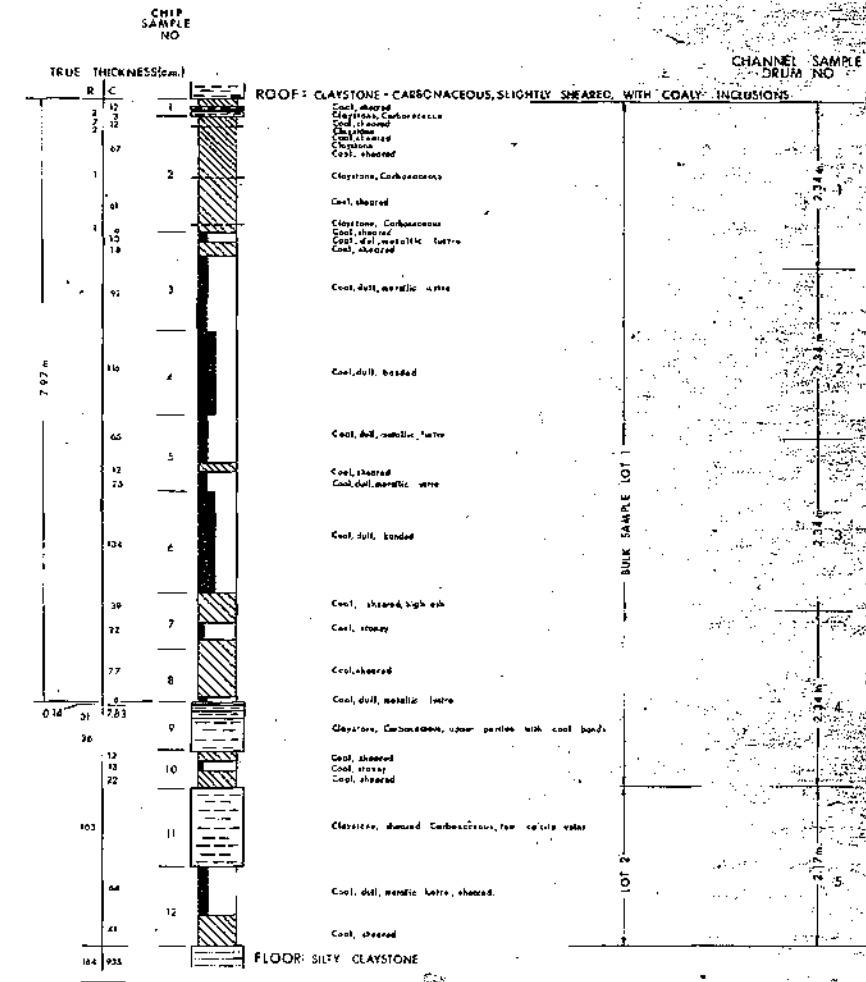
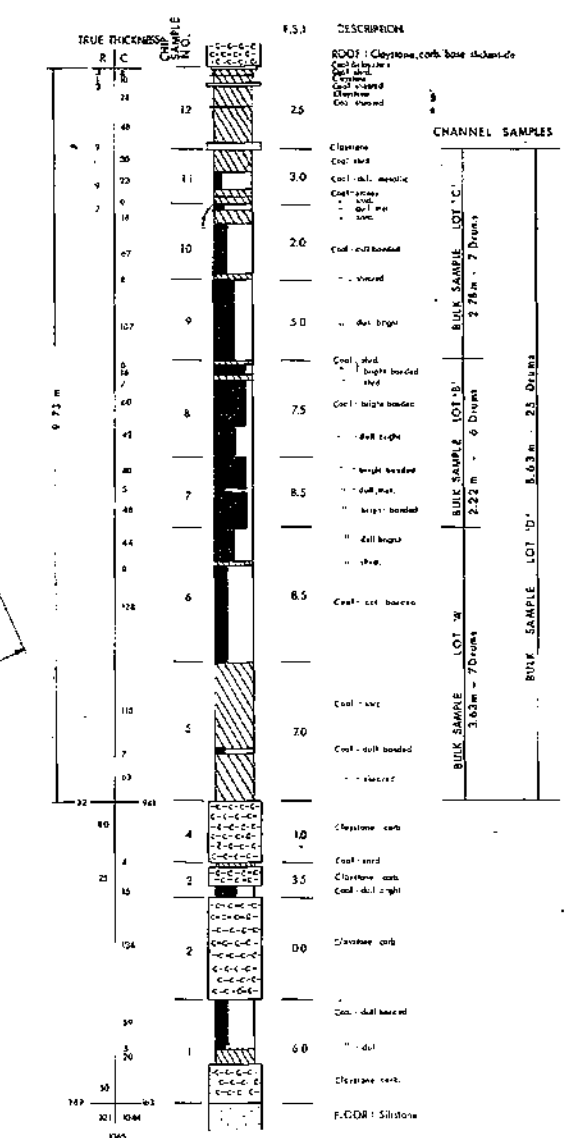
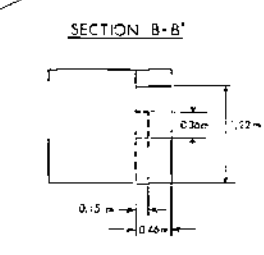
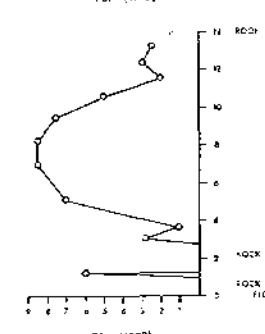
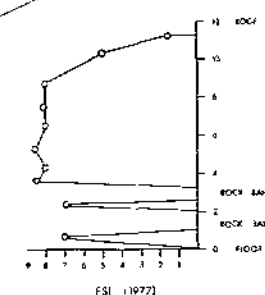
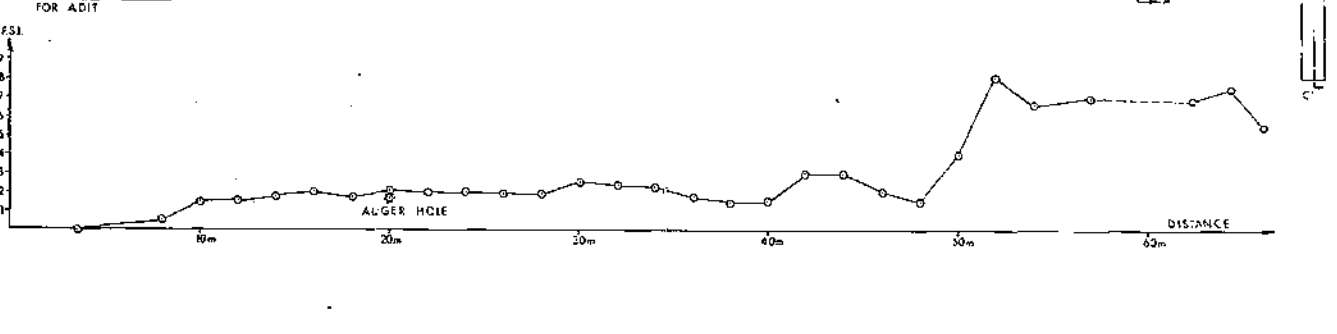
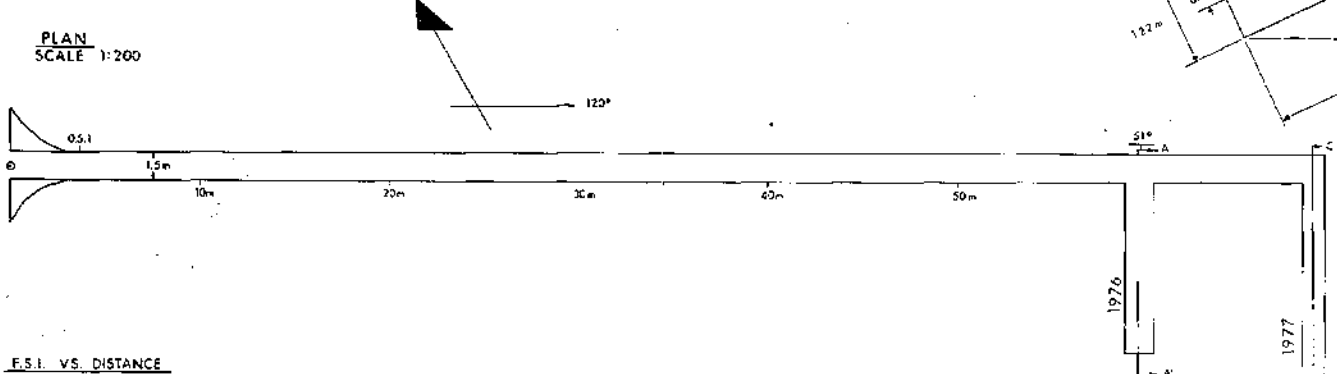
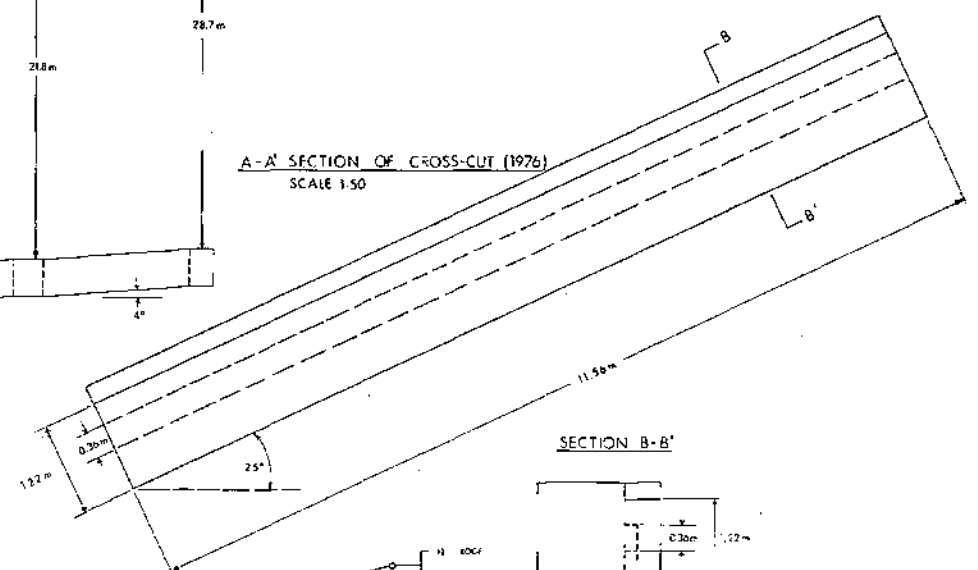
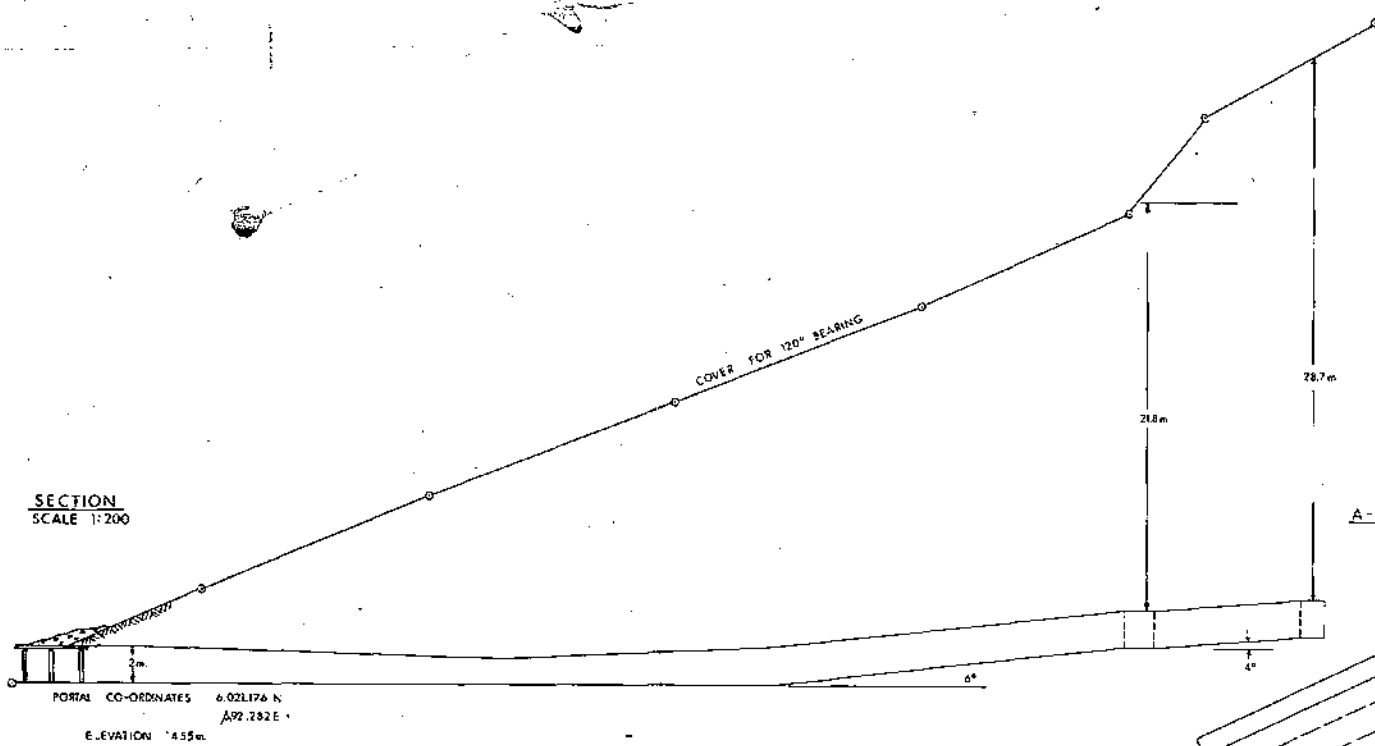


SECTION A-B

SCALE 1:400/1:100



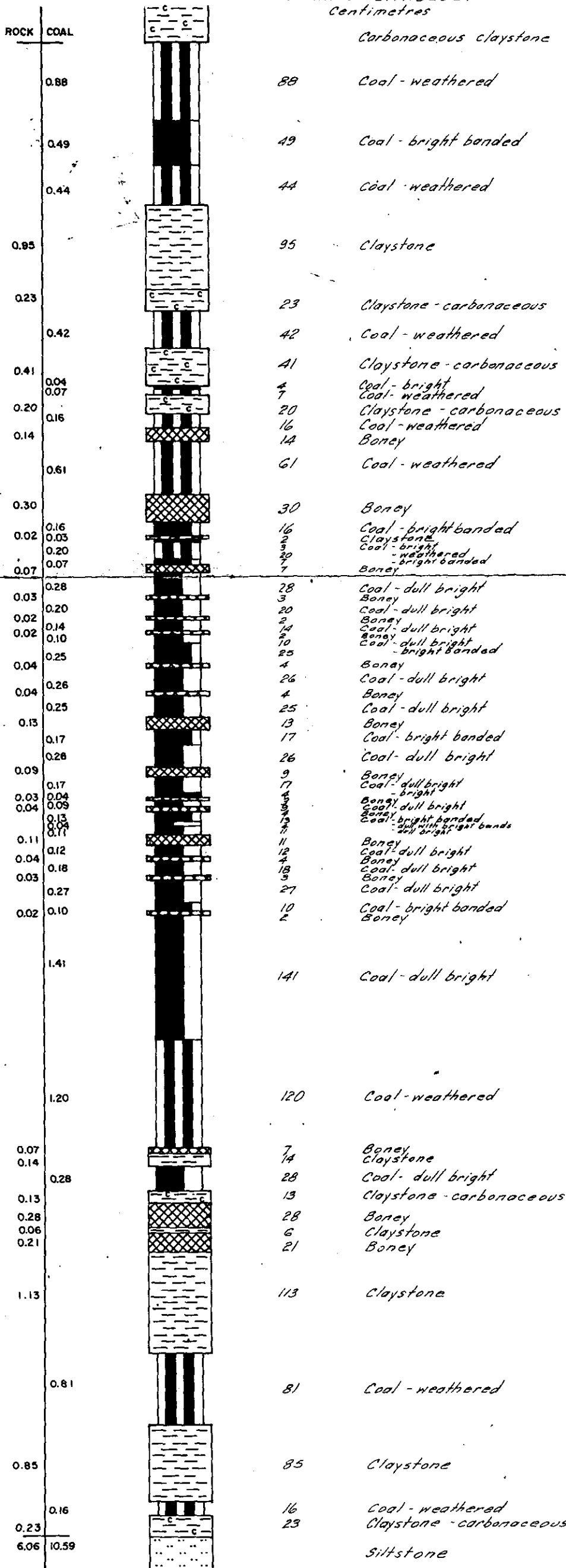
NO.	DESCRIPTION	BY	DATE
REVISIONS			
<b>SAXON COAL LIMITED</b>			
PREPARED BY: <b>DENISON COAL LIMITED</b> SAXON EAST			
ADIT 77-1-1			
DRAWN BY: J.W.K.	DATE: MAY 4, 77	SCALE: 1:200-1:50	
PREP BY: J.W.K.	DATE: MAY 77	DRAWING NUMBER:	
APP'D BY: G.P.G.	DATE: OCT. 77	SKON 77-0739-00	



SCALE 1:400/1:100

NO.	DESCRIPTION	BY	DATE
REVISIONS			
SAXON COAL LIMITED			
PREPARED BY: DENISON COAL LIMITED SAXON EAST			
ADIT 76-4-1 RESAMPLED 1977			
DRAWN BY: C.A.M.	DATE: DEC, 1976	SCALE: 1:200 / 1:50	
PREP'D BY: MANDOWSKI PALLOTT	DATE: NOV., 1976	DRAWING NUMBER:	
APPR'D BY: [Signature]	DATE: Dec 76	SXON 76-0710-001	

THICKNESS LITHOLOGY  
Centimetres

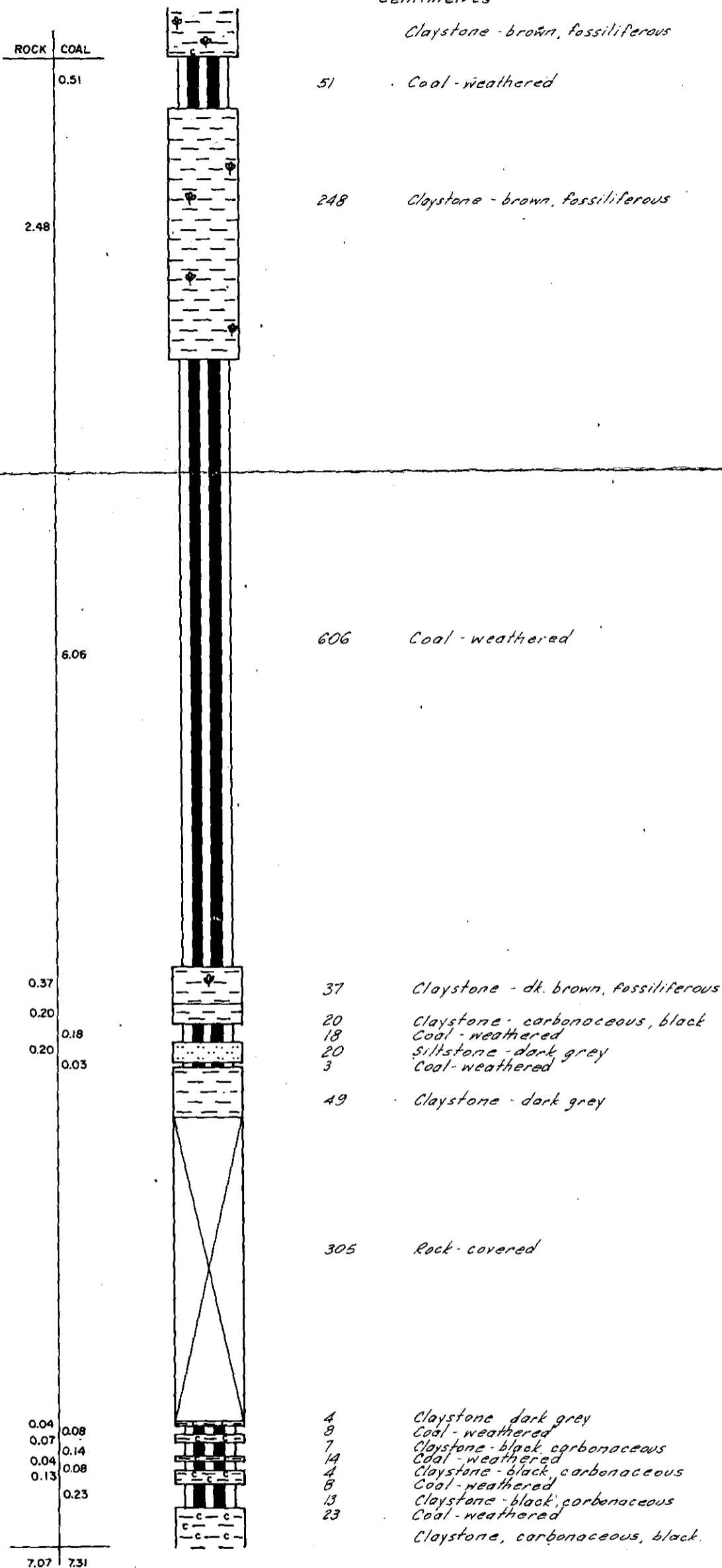


SAXON COAL LIMITED

1977 SAXON SOUTH  
TRENCH SECTION A-1  
SEAM 4

DRAWN BY J.W.K. DATE AUG. 1977 SCALE 1:50  
APPROVED BY G.P.G. DRAWING No. SXON 77-0751-R01

THICKNESS LITHOLOGY  
Centimetres



TOTAL THICKNESS = 14.38 m

<b>SAXON COAL LIMITED</b>		
1977 SAXON TRENCH SECTION W-1 SEAM I		
DRAWN BY J.W.K.	DATE AUG, 1977	SCALE 1:50
APPROVED BY G.P.G.	DRAWING No. SXON 77-0751-R01	

THICKNESS LITHOLOGY  
Centimetres

ROCK	COAL
	0.65
0.00	0.65 m



Claystone, grey  
65 Coal-sheared  
4 Claystone-grey

379 Rock-covered

3.37

337 Coal-weathered

0.01	0.25
0.02	0.14
0.39	
0.04	
0.42	3.80

1 Claystone, brown  
25 Coal, weathered  
2 Claystone, brown  
14 Coal, weathered  
39 Claystone, black, carbonaceous  
4 Coal, weathered.

284 Rock, covered

	0.45
0.28	0.04
0.02	0.04
0.30	0.53

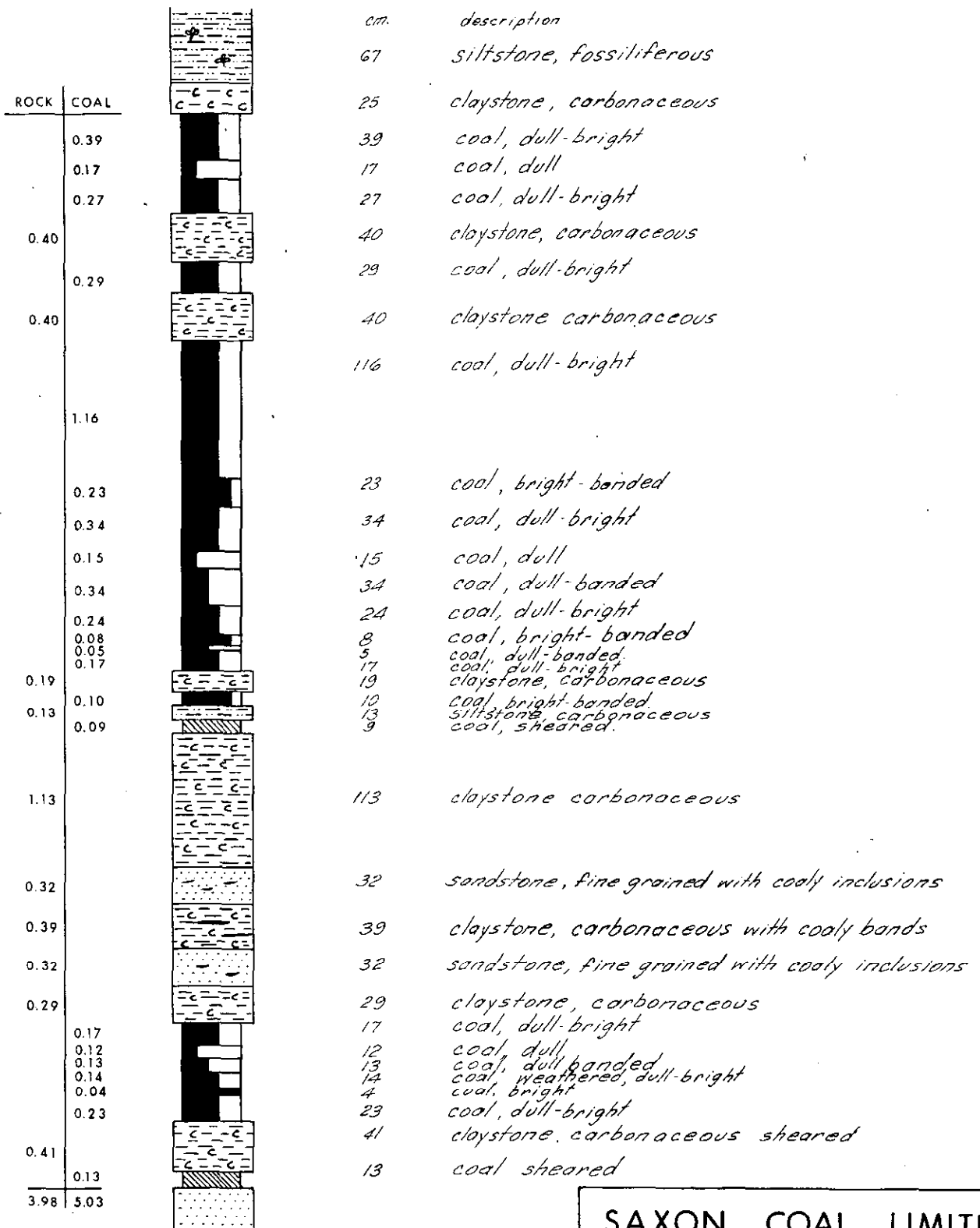
45 Coal, weathered  
28 Claystone, dark grey  
4 Coal, weathered  
2 Sandstone, medium grained, black, carbonaceous  
4 Coal, weathered  
8 Claystone, carbonaceous, black  
Sandstone, medium grained.

SAXON COAL LIMITED

1977 SAXON  
TRENCH SECTION X-1  
SEAM 1

DRAWN BY J.W.K.	DATE AUG. 1977	SCALE 1:50
APPROVED BY G.P.G.	DRAWING No. SXON 77-0751-R01	

THICKNESS LITHOLOGY  
CENTIMETERS

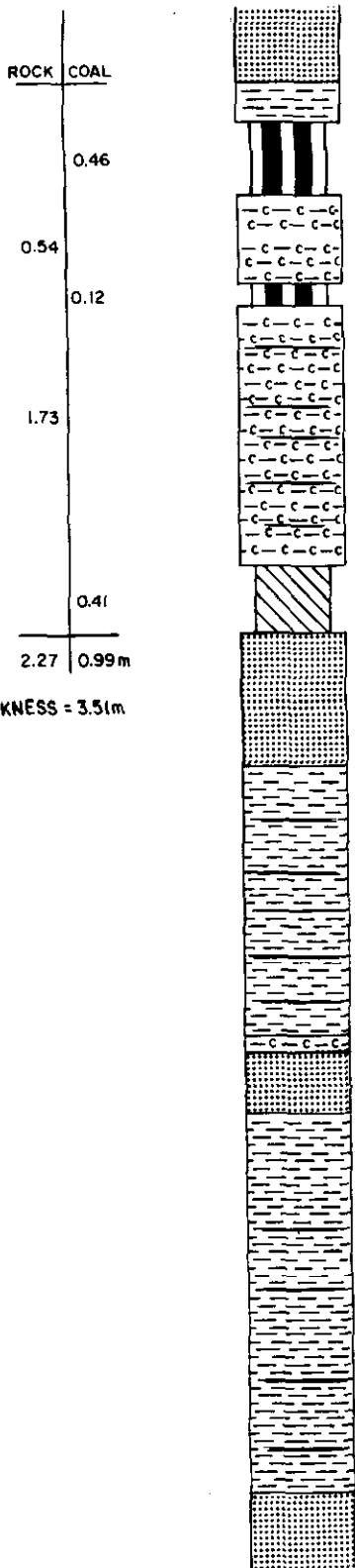


TOTAL THICKNESS = 9.01 m.

<b>SAXON COAL LIMITED</b>		
<b>1977 SAXON EAST TRENCH SECTION C-1 SEAM 1</b>		
DRAWN BY J.W.K.	DATE AUG. 1977	SCALE 1:50
APPROVED BY G.P.G.	DRAWING NO SXON77-0751-R01	



THICKNESS LITHOLOGY  
Centimetres



25 Sandstone, medium grained

46 Claystone - brown

54 Coal - weathered

12 Claystone - carbonaceous, black

173 Coal - weathered

41 Claystone - carbonaceous with thin coal bands

87 Coal - sheared

176 Sandstone - fine grained brown

9 Claystone brown with thin coal bands and plant fossils.

39 Claystone, carbonaceous

39 Sandstone, fine grained, brown

252 Claystone grey with a few thin coal bands, fossiliferous

Sandstone, medium grained

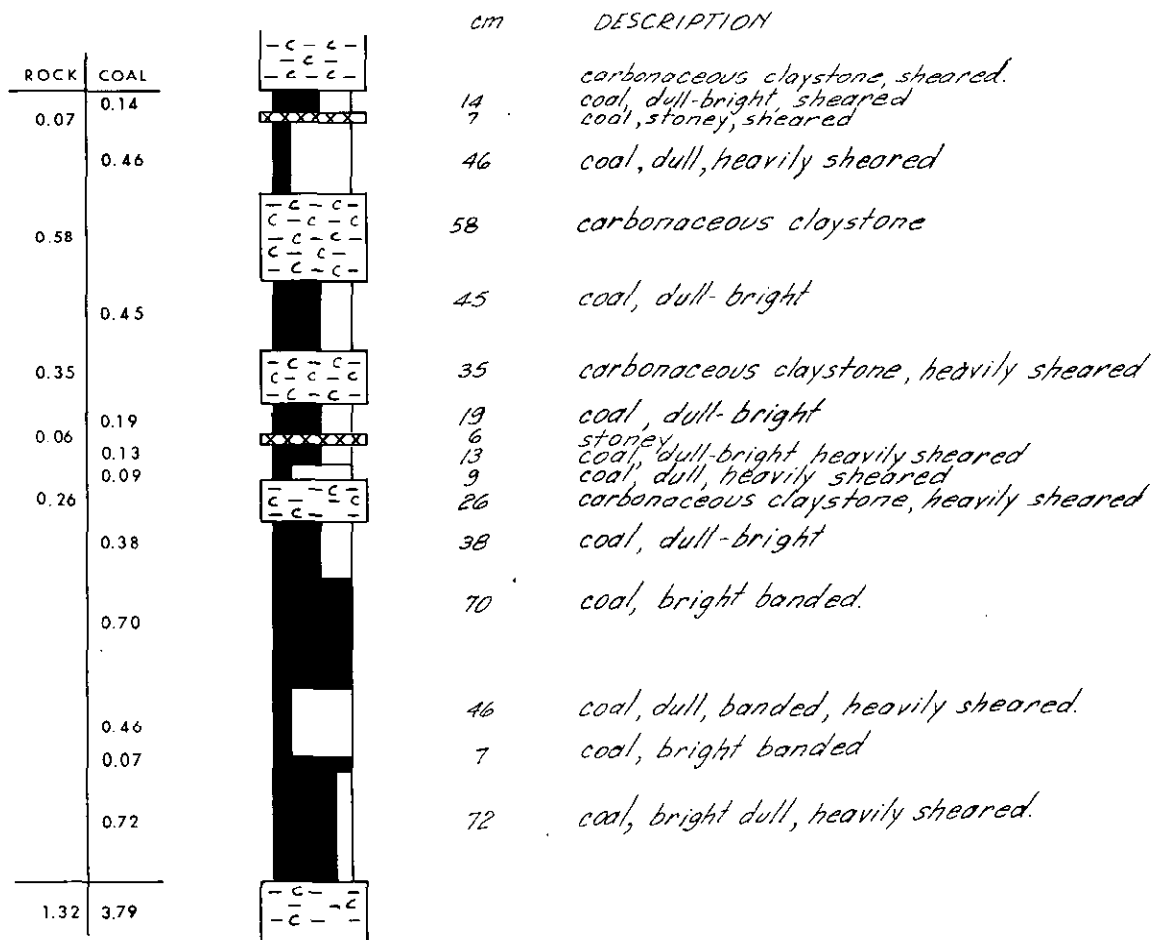
TOTAL THICKNESS = 3.51m

SAXON COAL LIMITED

1977 SAXON  
TRENCH SECTION I-1  
SEAM 1

DRAWN BY J.W.K.	DATE AUG. 1977	SCALE 1:50
APPROVED BY G.P.G.	DRAWING NO SXON77-0751-R01	

THICKNESS LITHOLOGY  
CENTIMETRES



TOTAL THICKNESS = 5.11 m.

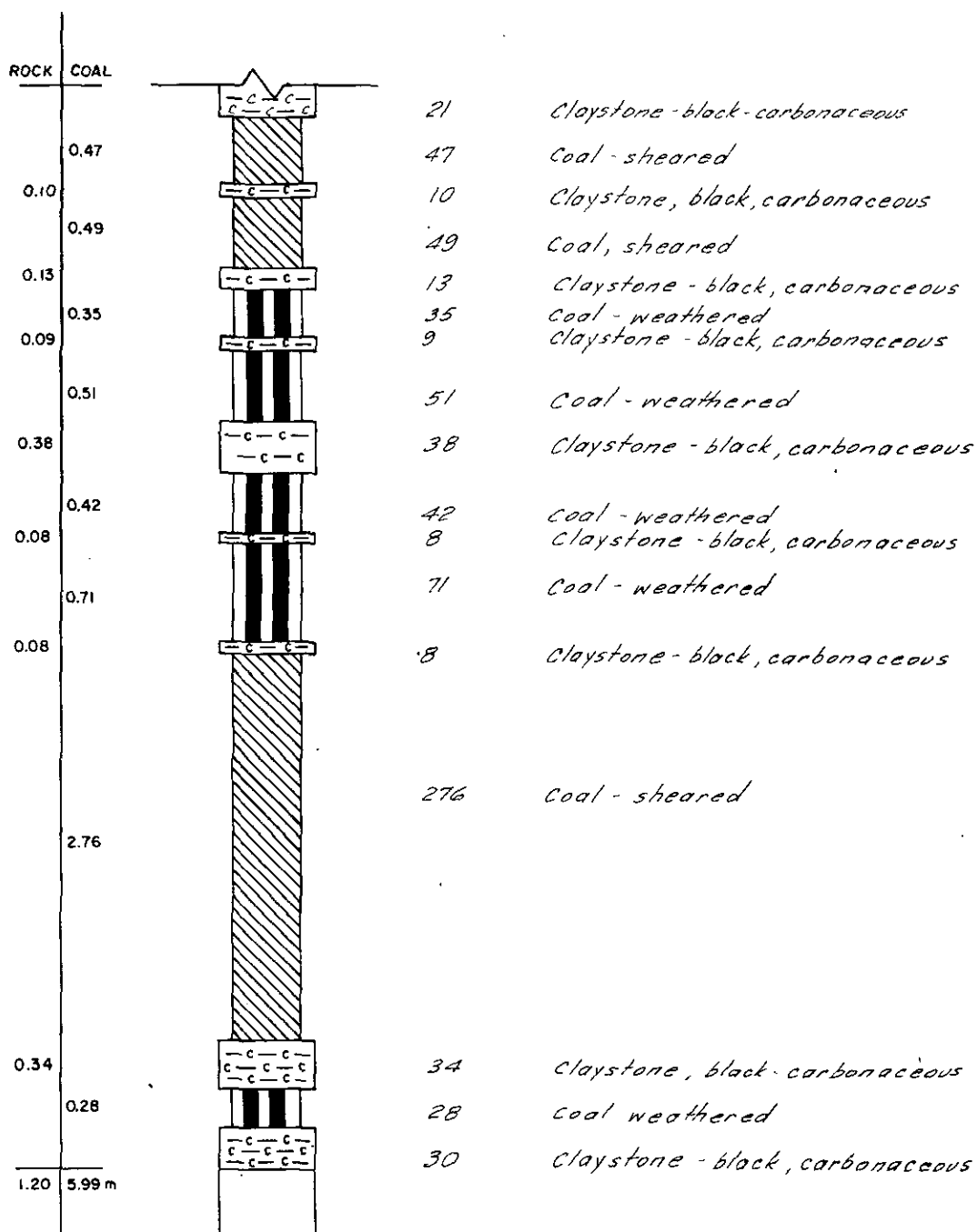
STRIKE AND DIP OF SEAM 300 / 51°

BEARING OF TRENCH 253°

PLUNGE OF TRENCH 0°

<b>SAXON COAL LIMITED</b>		
<b>1977 SAXON EAST TRENCH SECTION A-1 SEAM 5</b>		
DRAWN BY J.W.K.	DATE AUG. 1977	SCALE 1:50
APPROVED BY G.P.G.	DRAWING NO SXON77-0751-R01	

THICKNESS LITHOLOGY  
Centimetres



TOTAL THICKNESS = 9.41 m

SAXON COAL LIMITED

1977 SAXON  
TRENCH SECTION I-4  
SEAM 4

DRAWN BY J.W.K.	DATE AUG. 1977	SCALE 1:50
APPROVED BY G.P.G.	DRAWING NO. SXON77-0751-R01	

THICKNESS LITHOLOGY

ROCK COAL

0.42

Coal & rock

0.63

Claystone

0.52

Coal, weathered

0.38

Claystone, carbonaceous

0.28

Coal, dull, bright

1.18

0.03

0.77

0.15

Poor

0.12

0.10

0.30

0.05

Bright banded

0.60

0.02

0.25

Dull banded

0.19

0.84

0.03

0.52

0.21

0.42

0.15

Dull

0.29

0.29

0.13

0.24

0.14

0.17

0.49

0.52

0.58

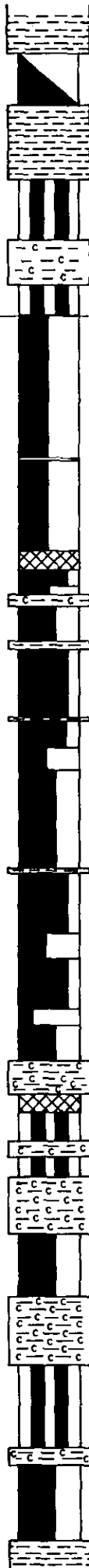
0.68

0.13

0.67

3.57

8.99



SAXON COAL LIMITED

1977 SAXON SOUTH  
TRENCH SECTION A-2  
SEAM 4

DRAWN BY J.W.K.

DATE AUG. 1977

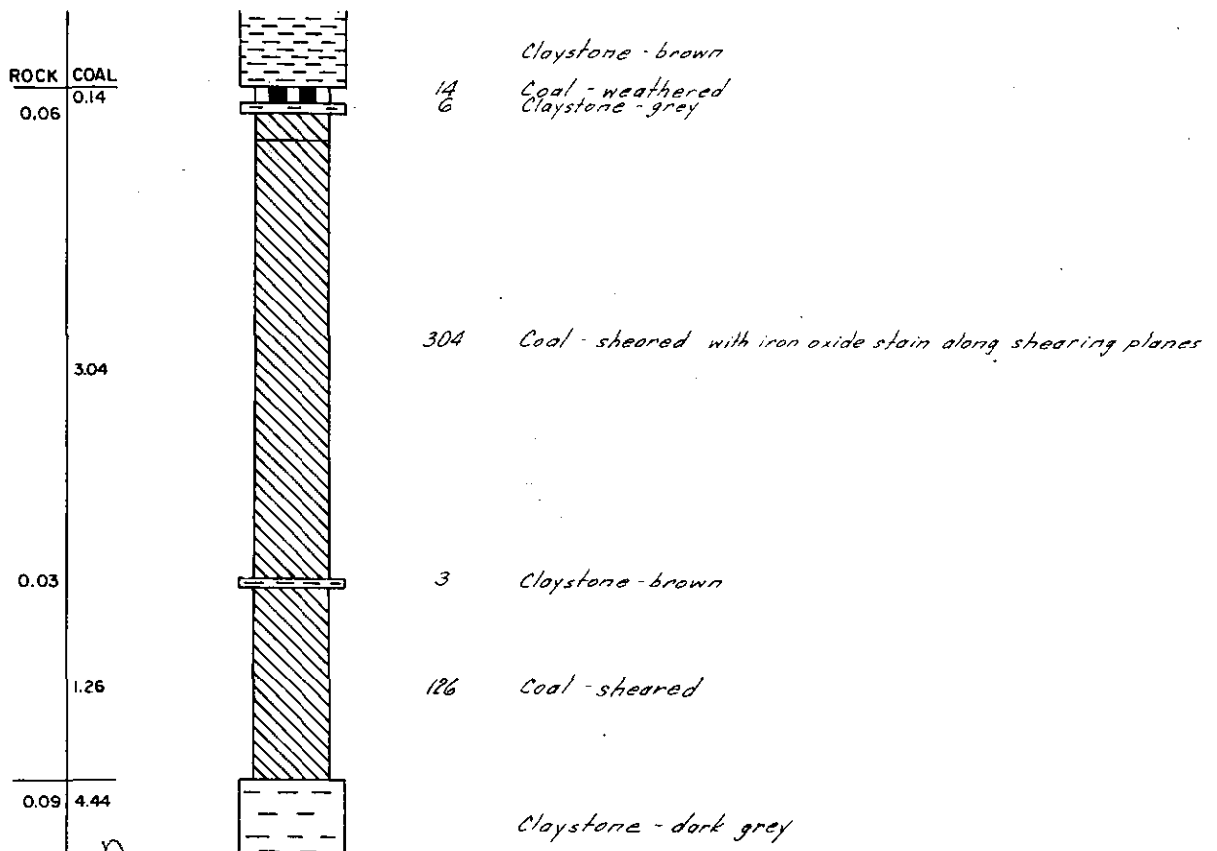
SCALE 1:50

APPROVED BY

G.P.G.

DRAWING No. SXON-77-0751-R01

THICKNESS LITHOLOGY  
Centimetres



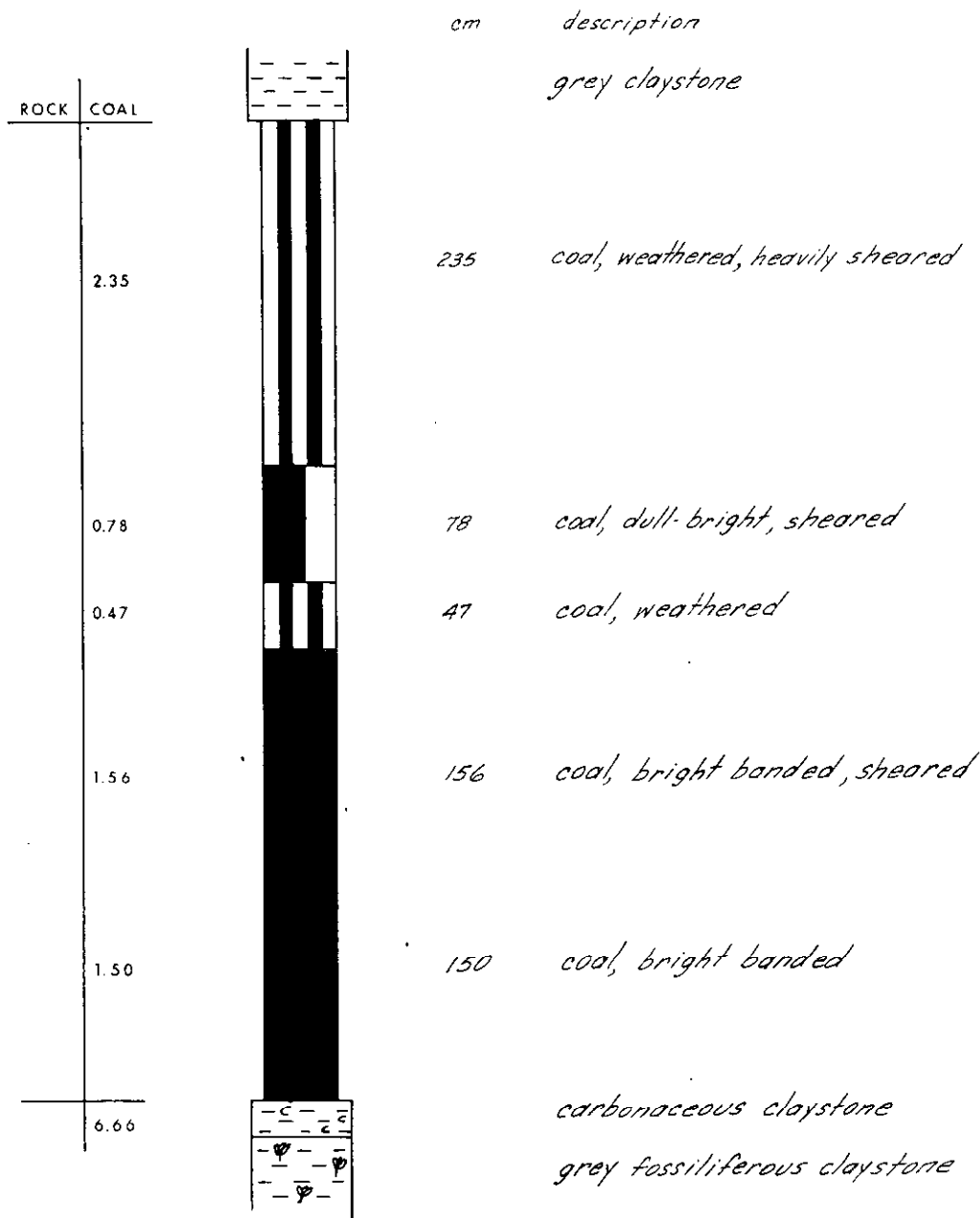
↑  
believed to be  
true thickness

SAXON COAL LIMITED

1977 SAXON  
TRENCH SECTION V-4  
SEAM 4

DRAWN BY	J.W.K.	DATE	AUG. 1977	SCALE	1:50
APPROVED BY	GPG	DRAWING NO.	SXON 77-0751-R01		

THICKNESS LITHOLOGY  
CENTIMETRES



TOTAL THICKNESS = 6.66 m.

STRIK AND DIP OF SEAM 298 / 50°

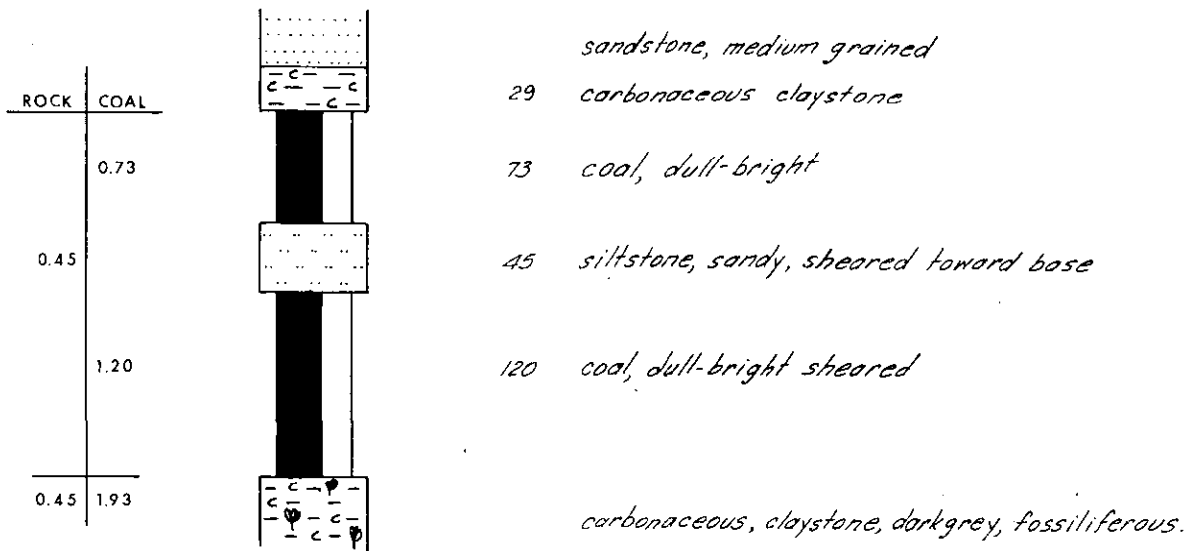
BEARING OF TRENCH 235°

PLUNGE OF TRENCH 0°

<b>SAXON COAL LIMITED</b>		
<b>1977 SAXON EAST TRENCH SECTION A-2 SEAM 4</b>		
DRAWN BY J.W.K.	DATE AUG. 1977	SCALE 1:50
APPROVED BY G.P.G.	DRAWING NO SXON77-0751-R01	

THICKNESS LITHOLOGY  
CENTIMETRES

cm description



TOTAL THICKNESS = 2.38 m.

STRIKE AND DIP OF SEAM 298 / 50° W

BEARING OF TRENCH 234°

PLUNGE OF TRENCH 0°

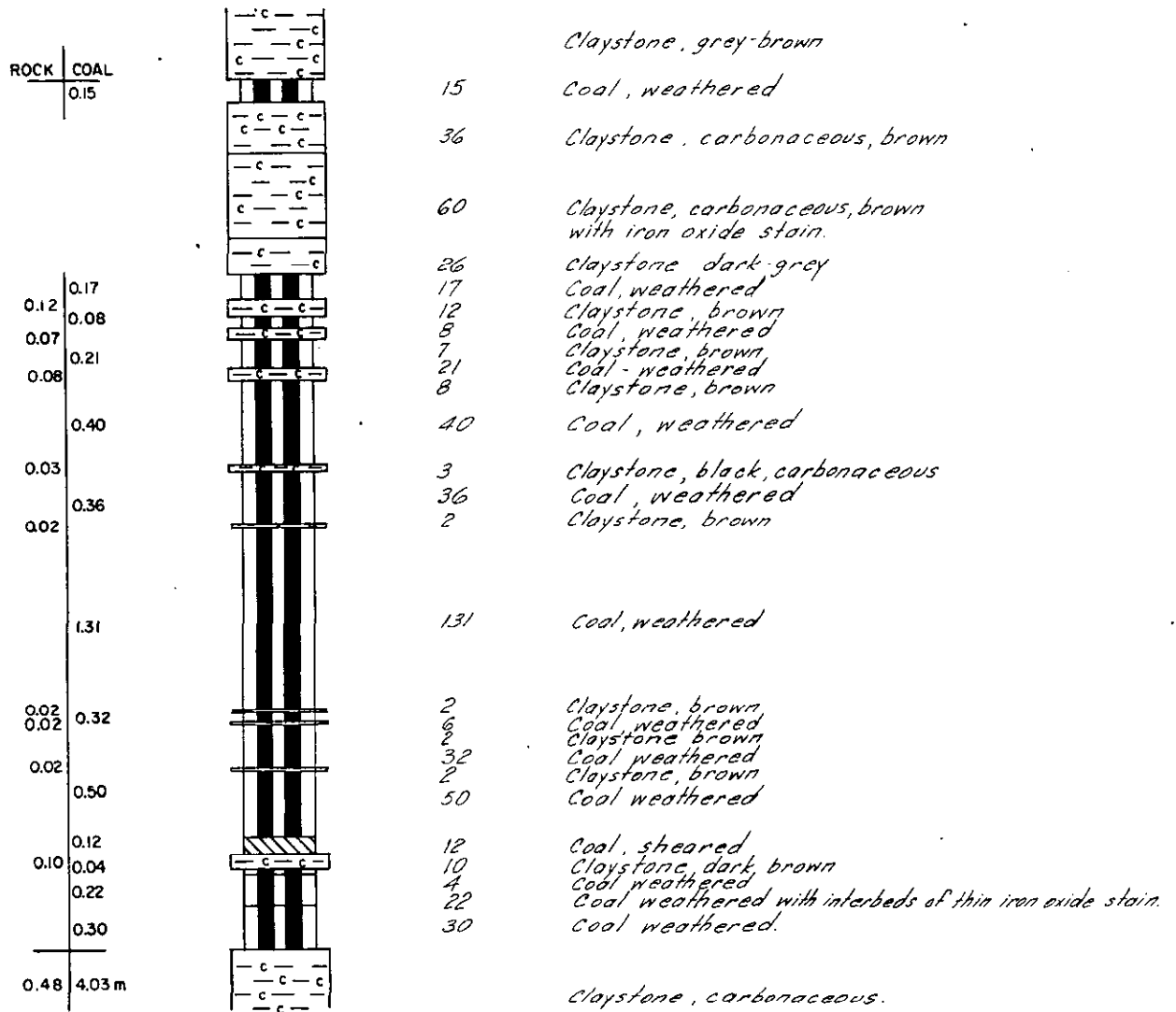
SAXON COAL LIMITED

1977 SAXON EAST  
TRENCH SECTION A-3  
SEAM 3

DRAWN BY J.W.K. DATE AUG. 1977 SCALE 1:50

APPROVED BY GPC DRAWING NO. SXON 77-0751-R01

THICKNESS LITHOLOGY  
Centimetres.



SAXON COAL LIMITED

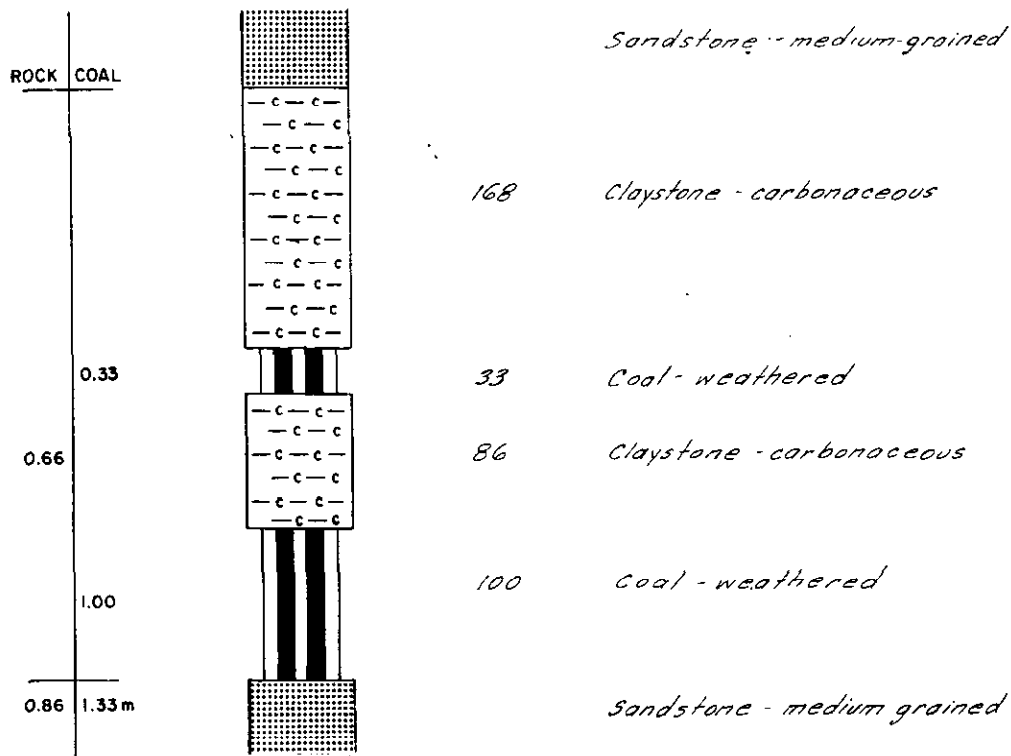
1977 SAXON  
TRENCH SECTION X-2  
SEAM 2

DRAWN BY J.W.K. DATE AUG. 1977 SCALE 1:50

APPROVED BY G.P.G. DRAWING NO SXON77-0751-R01



THICKNESS LITHOLOGY  
Centimetres



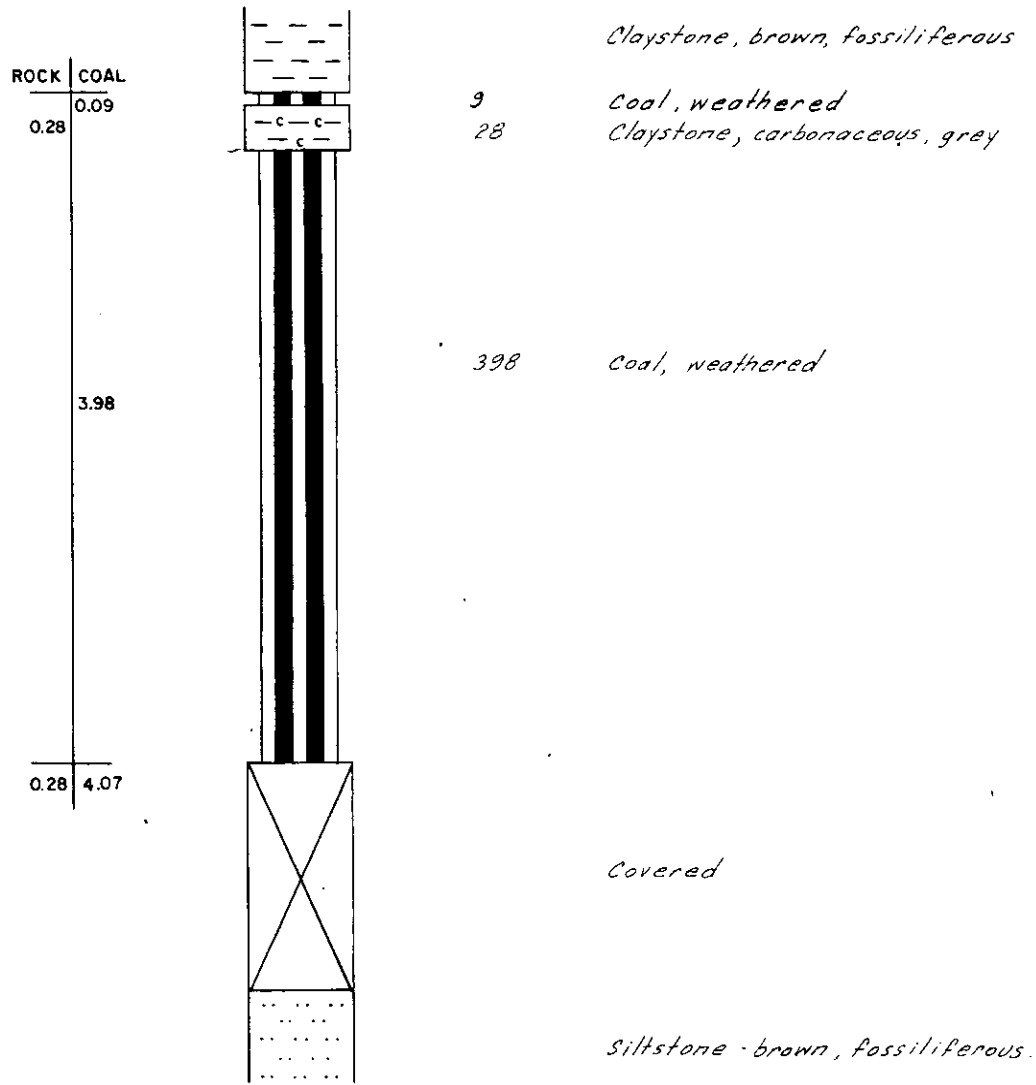
SAXON COAL LIMITED

1977 SAXON  
TRENCH SECTION I-2  
SEAM 2

DRAWN BY J.W.K. DATE AUG. 1977 SCALE 1:50

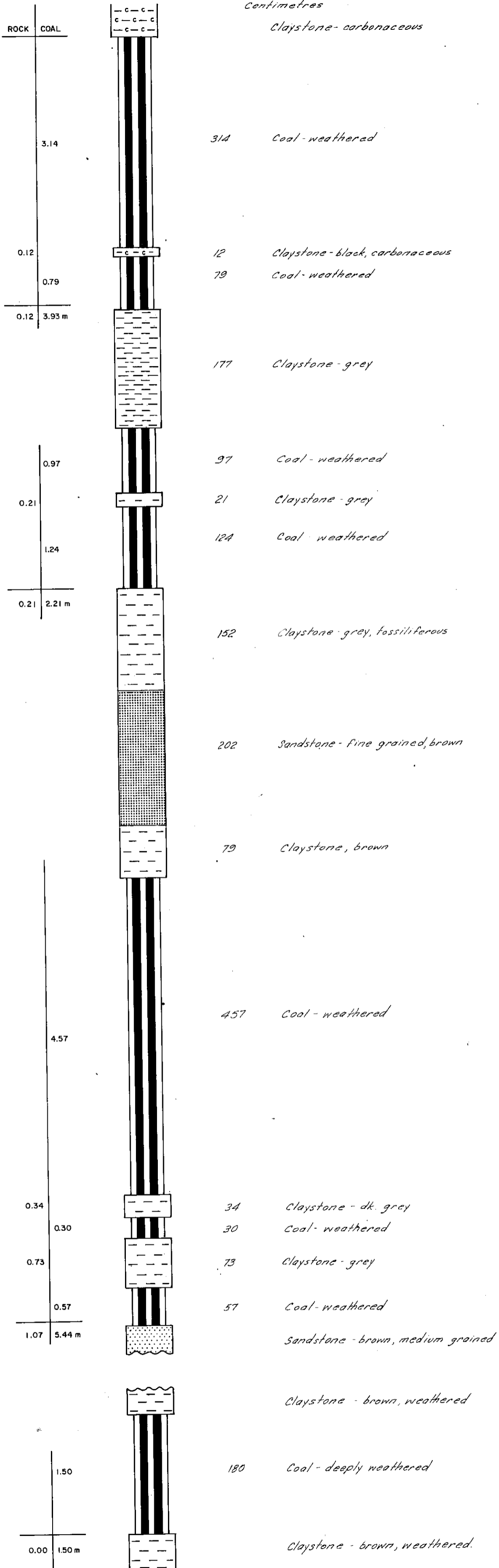
APPROVED BY G.P.G. DRAWING NO SXON77-0751-R01

THICKNESS LITHOLOGY  
Centimetres



<b>SAXON COAL LIMITED</b>					
<b>1977 SAXON TRENCH SECTION W-2 SEAM 2</b>					
DRAWN BY	J.W.K.	DATE	AUG. 1977	SCALE	1:50
APPROVED BY	C.C.C.	DRAWING NO.	SXON 77-0751	REV.	001

THICKNESS LITHOLOGY  
Centimetres

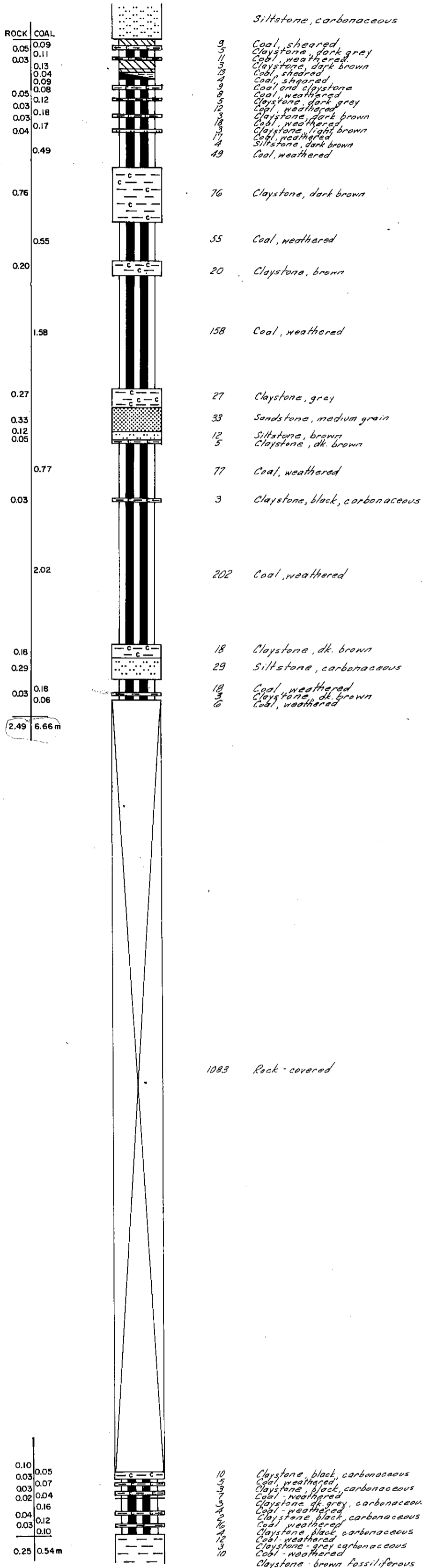


SAXON COAL LIMITED

1977 SAXON  
TRENCH SECTION F-1  
SEAMS 1&2

DRAWN BY J.W.K.	DATE AUG. 1977	SCALE 1:50
APPROVED BY G.P.G.	DRAWING No. SXON 77-0751-R01	

THICKNESS LITHOLOGY  
Centimetres



2.49 6.66 m

0.10 0.05  
0.03 0.07  
0.03 0.04  
0.02 0.16  
0.04 0.12  
0.03 0.10  
0.25 0.54 m

<b>SAXON COAL LIMITED</b>		
1977 SAXON TRENCH SECTION E-1 SEAM 1		
DRAWN BY J.W.K.	DATE AUG. 1977	SCALE 1:50
APPROVED BY G.P.G.	DRAWING No. SXON 77-0751-R01	

PR - SAXON 77 (3)A

VOLUME 1 - PART C.  
GEOPHYSICAL  
LOGS  
BOOK 214

628



VOLUME II

PR-SAXON 7.7 (6) A

# RESERVES DATA

SAXON COAL LTD.

1977

TABLE 2-1

SAXON SOUTH RESERVES  
North Pit (Unoxidized)  
Period A

Saxon Project Feasibility Report  
October 1977

Seam No.	Avg. Seam Thickness (m)	Total Seam Volume (m <sup>3</sup> )	Seam S.G.	In Place Raw Coal (Tonnes)	Mined Raw Coal (Tonnes)	Avg. Yield (%)	Clean Coal (Dry) (Tonnes)	Plant Feed (Tonnes)	Plant Feed Volume (m <sup>3</sup> )	Plant Feed S.G.
10	Not Mined									
5	1.44	22,000	1.47	32,340	26,195	77.9	20,396	34,362	21,903	1.57
4	8.73	944,900	1.52	1,436,248	1,163,361	71.1	826,657	1,221,224	791,670	1.54
3	1.78	281,100	1.54	432,894	350,644	65.9	231,080	435,069	266,066	1.64
2	6.33	639,300	1.44	920,592	745,680	76.2	567,969	799,672	542,375	1.47
1	3.63	26,900	1.51	40,619	32,901	71.0	23,360	36,863	23,590	1.56
Totals		1,914,200	1.50	2,862,693	2,318,781	72.0	1,669,462	2,527,190	1,645,604	1.54



TABLE 2-2

SAXON SOUTH RESERVES  
North Pit (Unoxidized)  
Period B

Saxon Project Feasibility Report  
October 1977

Seam No.	Avg. Seam Thickness (m)	Total Seam Volume (m <sup>3</sup> )	Seam S.G.	In Place Raw Coal (Tonnes)	Mined Raw Coal (Tonnes)	Avg. Yield (%)	Clean Coal (Dry) (Tonnes)	Plant Feed (Tonnes)	Plant Feed Volume (m <sup>3</sup> )	Plant Feed S.G.
10	Not Mined									
5	1.80	69,000	1.47	101,430	82,158	82.4	67,738	102,651	65,205	1.57
4	8.66	1,582,500	1.52	2,405,400	1,948,374	71.4	1,391,778	2,046,065	1,326,230	1.54
3	1.75	676,600	1.54	1,041,964	843,991	65.9	556,393	1,050,683	641,997	1.64
2	5.97	2,870,600	1.44	4,133,664	3,348,268	76.9	2,574,199	3,605,324	2,442,030	1.48
1	3.61	1,677,700	1.51	2,533,327	2,051,995	71.8	1,472,561	2,296,381	1,470,022	1.56
Totals		6,876,400	1.49	10,215,785	8,274,786	73.3	6,062,669	9,101,104	5,945,484	1.53

TABLE 2-3

SAXON SOUTH RESERVES  
North Pit (Unoxidized)  
Period C

Saxon Project Feasibility Report  
October 1977

Seam No.	Avg. Seam Thickness (m)	Total Seam Volume (m <sup>3</sup> )	Seam S.G.	In Place Raw Coal (Tonnes)	Mined Raw Coal (Tonnes)	Avg. Yield (%)	Clean Coal (Dry) (Tonnes)	Plant Feed (Tonnes)	Plant Feed Volume (m <sup>3</sup> )	Plant Feed S.G.
10	1.28	17,500	1.36	23,800	19,278	90.0	17,350	26,587	17,497	1.52
5	1.31	59,900	1.47	88,053	71,323	80.8	57,560	95,768	59,630	1.61
4	7.19	2,249,500	1.52	3,419,240	2,769,584	71.2	1,971,271	2,936,841	1,898,121	1.55
3	2.15	1,089,700	1.54	1,678,138	1,359,292	67.8	921,286	1,630,247	1,005,819	1.62
2	5.76	3,517,000	1.44	5,150,880	4,172,213	77.6	3,237,916	4,504,204	3,048,275	1.48
1	3.89	2,487,000	1.51	3,755,370	3,041,850	74.8	2,273,843	3,383,637	2,169,828	1.56
Totals		9,480,600	1.49	14,115,540	11,433,540	74.2	8,479,226	12,577,284	8,199,170	1.53

TABLE 2-4

SAXON SOUTH RESERVES  
North Pit (Unoxidized)  
Period D

Saxon Project Feasibility Report  
October 1977

Seam No.	Avg. Seam Thickness (m)	Total Seam Volume (m <sup>3</sup> )	Seam S.G.	In Place Raw Coal (Tonnes)	Mined Raw Coal (Tonnes)	Avg. Yield (%)	Clean Coal (Dry) (Tonnes)	Plant Feed (Tonnes)	Plant Feed Volume (m <sup>3</sup> )	Plant Feed S.G.
10	1.17	19,200	1.36	26,112	21,151	90.0	19,036	29,924	19,540	1.53
5	1.38	187,900	1.47	276,213	223,733	76.8	171,742	296,524	185,286	1.60
4	8.52	3,478,500	1.52	5,287,320	4,282,729	72.1	3,089,259	4,500,993	2,916,796	1.54
3	1.64	808,200	1.54	1,244,628	1,008,149	64.2	646,731	1,271,603	774,394	1.64
2	5.74	3,409,000	1.44	4,908,960	3,976,258	77.4	3,078,499	4,293,758	2,905,609	1.48
1	4.15	2,684,000	1.51	4,052,840	3,282,800	71.5	2,346,679	3,628,551	2,331,199	1.56
Totals		10,586,800	1.49	15,796,073	12,794,820	73.1	9,351,946	14,021,353	9,132,824	1.54

TABLE 2-5

## SAXON SOUTH RESERVES

North Pit (Oxidized)  
Period ASaxon Project Feasibility Report  
October 1977

Seam No.	Total Seam Volume (m <sup>3</sup> )	Seam S.G.	In Place Raw Coal (Tonnes)	Mined Raw Coal (Tonnes)	Avg. Yield (%)	Clean Coal (Dry) (Tonnes)
10	Not Mined					
5	28,900	1.47	42,483	34,411	79.1	27,207
4	475,900	1.52	723,368	585,929	71.6	419,307
3	104,200	1.54	160,468	129,979	66.9	86,992
2	No Oxidized Coal					
1	10,500	1.51	15,855	12,843	70.0	8,990
Totals	619,500	1.52	942,174	763,161	71.1	542,496

TABLE 2-6

SAXON SOUTH RESERVESNorth Pit (Oxidized)  
Period BSaxon Project Feasibility Report  
October 1977

Seam No.	Total Seam Volume (m <sup>3</sup> )	Seam S.G.	In Place Raw Coal (Tonnes)	Mined Raw Coal (Tonnes)	Avg. Yield (%)	Clean Coal (Dry) (Tonnes)
10	No Oxidized Coal					
5	No Oxidized Coal					
4	175,400	1.52	266,608	215,952	70.9	153,195
3	53,400	1.54	82,236	66,611	67.2	44,775
2	400,900	1.44	145,296	117,690	78.2	92,035
1	18,100	1.51	27,331	22,138	76.6	16,964
Totals	347,800	1.50	521,471	422,391	72.7	306,969

TABLE 2-7

SAXON SOUTH RESERVES  
North Pit (Oxidized)  
Period C

Saxon Project Feasibility Report  
October 1977

Seam No.	Total Seam Volume (m <sup>3</sup> )	Seam S.G.	In Place Raw Coal (Tonnes)	Mined Raw Coal (Tonnes)	Avg. Yield (%)	Clean Coal (Dry) (Tonnes)
10	8,100	1.36	11,016	8,923	90.0	8,031
5	30,500	1.47	44,835	36,316	80.4	29,184
4	441,600	1.52	671,232	543,698	72.6	394,778
3	103,800	1.54	159,852	129,480	67.2	87,010
2	142,400	1.44	285,056	166,095	79.5	131,985
1	81,700	1.51	123,367	99,927	80.1	80,040
Totals	808,100	1.50	1,215,358	984,439	74.3	731,028

TABLE 2-8

SAXON SOUTH RESERVES  
North Pit (Oxidized)  
Period D

Saxon Project Feasibility Report  
October 1977

Seam No.	Total Seam Volume (m <sup>3</sup> )	Seam S.G.	In Place Raw Coal (Tonnes)	Mined Raw Coal (Tonnes)	Avg. Yield (%)	Clean Coal (Dry) (Tonnes)
10	No Oxidized Coal					
5	29,500	1.47	43,365	35,126	81.6	28,666
4	72,700	1.52	110,504	89,508	69.5	62,200
3	No Oxidized Coal					
2	No Oxidized Coal					
1	No Oxidized Coal					
Totals	102,200	1.51	153,869	124,634	72.9	90,866

TABLE 2-9

SAXON SOUTH RESERVES  
 South Pit (Unoxidized)  
 Period I

Saxon Project Feasibility Report  
 October 1977

Seam No.	Avg. Seam Thickness (m)	Total Seam Volume (m <sup>3</sup> )	Seam S.G.	In Place Raw Coal (Tonnes)	Mined Raw Coal (Tonnes)	Avg. Yield (%)	Clean Coal (Dry) (Tonnes)	Plant Feed (Tonnes)	Plant Feed Volume (m <sup>3</sup> )	Plant Feed S.G.
10	1.10	23,100	1.36	31,416	25,447	90.00	22,902	36,674	23,814	1.54
1	4.13	10,300	1.51	15,553	12,598	75.00	9,448	13,931	8,949	1.56
Total		33,400	1.41	46,969	38,045	85.00	32,350	50,605	32,763	1.54



TABLE 2-10

SAXON SOUTH RESERVES  
 South Pit (Unoxidized)  
 Period 2

Saxon Project Feasibility Report  
 October 1977

Seam No.	Avg. Seam Thickness (m)	Total Seam Volume (m <sup>3</sup> )	Seam S.G.	In Place Raw Coal (Tonnes)	Mined Raw Coal (Tonnes)	Avg. Yield (%)	Clean Coal (Dry) (Tonnes)	Plant Feed (Tonnes)	Plant Feed Volume (m <sup>3</sup> )	Plant Feed S.G.
10	1.22	102,500	1.36	139,400	112,914	90.0	101,623	157,829	103,441	1.53
5	1.63	223,700	1.47	328,839	266,360	79.3	211,249	339,728	214,546	1.58
4	10.15	1,981,200	1.52	3,011,424	2,439,253	67.3	1,642,330	2,543,603	1,652,204	1.54
3	1.86	209,300	1.54	322,322	261,081	72.0	187,953	321,238	196,877	1.63
<b>Total</b>		2,516,700	1.51	3,801,985	3,079,608	69.6	2,143,155	3,362,398	2,167,068	1.55

TABLE 2-11

SAXON SOUTH RESERVES  
 South Pit (Unoxidized)  
 Period 3

Saxon Project Feasibility Report  
 October 1977

Seam No.	Avg. Seam Thickness (m)	Total Seam Volume (m <sup>3</sup> )	Seam S.G.	In Place Raw Coal (Tonnes)	Mined Raw Coal (Tonnes)	Avg. Yield (%)	Clean Coal (Dry) (Tonnes)	Plant Feed (Tonnes)	Plant Feed Volume (m <sup>3</sup> )	Plant Feed S.G.
5	1.26	175,300	1.47	257,691	208,730	78.6	164,094	283,107	175,801	1.61
4	8.99	1,882,300	1.52	2,861,096	2,317,488	68.1	1,577,370	2,429,421	1,575,541	1.54
3	1.95	555,000	1.54	854,700	692,307	73.4	508,427	844,462	518,711	1.63
2	4.74	1,652,500	1.44	2,379,600	1,927,476	88.6	1,708,479	2,113,853	1,423,242	1.49
1	4.26	861,700	1.51	1,301,167	1,053,945	68.6	722,852	1,162,082	779,899	1.49
Total		5,126,800	1.49	7,654,254	6,199,946	75.5	4,681,222	6,832,925	4,473,194	1.53

TABLE 2-12

SAXON SOUTH RESERVES  
 South Pit (Unoxidized)  
 Period 4

Saxon Project Feasibility Report  
 October 1977

Seam No.	Avg. Seam Thickness (m)	Total Seam Volume (m <sup>3</sup> )	Seam S.G.	In Place Raw Coal (Tonnes)	Mined Raw Coal (Tonnes)	Avg. Yield (%)	Clean Coal (Dry) (Tonnes)	Plant Feed (Tonnes)	Plant Feed Volume (m <sup>3</sup> )	Plant Feed S.G.
5	1.31	167,000	1.47	245,490	198,847	78.4	155,847	266,998	166,248	1.61
4	8.91	1,760,800	1.52	2,676,416	2,167,897	68.2	1,478,722	2,273,545	1,474,270	1.54
3	2.13	553,600	1.54	852,544	690,561	73.5	507,859	829,507	511,574	1.62
2	4.79	1,487,100	1.44	2,141,424	1,734,553	87.1	1,510,937	1,900,525	1,305,140	1.46
1	3.82	1,417,800	1.51	2,140,878	1,734,111	70.3	1,219,039	1,932,529	1,238,608	1.56
Total		5,386,300	1.50	8,056,752	6,525,969	74.7	4,872,404	7,203,104	4,695,840	1.53

TABLE 2-13

SAXON SOUTH RESERVESSaxon Pit (Oxidized)  
Period 2\*Saxon Project Feasibility Report  
October 1977

Seam No.	Total Seam Volume (m <sup>3</sup> )	Seam S.G.	In Place Raw Coal (Tonnes)	Mined Raw Coal (Tonnes)	Avg. Yield (%)	Clean Coal (Dry) (Tonnes)
10	52,300	1.36	71,128	57,614	90.0	51,852
5	47,500	1.47	69,825	56,558	79.2	44,804
4	276,700	1.52	420,584	340,673	68.6	233,619
3	36,700	1.54	56,518	45,780	76.0	34,792
2	8,100	1.44	11,664	9,448	90.0	8,503
Totals	421,300	1.49	629,719	510,073	73.2	373,570

\* Saxon Pit Period 1 - no oxidized coal

TABLE 2-14

SAXON SOUTH RESERVES  
 South Pit (Oxidized)  
 Period 3

Saxon Project Feasibility Report  
 October 1977

Seam No.	Total Seam Volume (m <sup>3</sup> )	Seam S.G.	In Place Raw Coal (Tonnes)	Mined Raw Coal (Tonnes)	Avg. Yield (%)	Clean Coal (Dry) (Tonnes)
10	6,100	1.36	8,296	6,720	90.0	6,048
5	6,800	1.47	9,996	8,097	78.0	6,315
4	114,100	1.52	173,432	140,480	69.0	96,931
3	18,000	1.54	27,720	22,453	76.0	17,064
2	101,300	1.44	145,872	118,156	92.3	109,079
1	75,500	1.51	114,005	92,344	68.0	62,794
Totals	321,800	1.49	479,321	388,250	76.8	298,231

TABLE 2-15

SAXON SOUTH RESERVES  
 South Pit (Oxidized)  
 Period 4

Saxon Project Feasibility Report  
 October 1977

Seam No.	Total Seam Volume (m <sup>3</sup> )	Seam S.G.	In Place Raw Coal (Tonnes)	Mined Raw Coal (Tonnes)	Avg. Yield (%)	Clean Coal (Dry) (Tonnes)
4	31,200	1.52	47,424	38,413	69.0	26,505
3	23,800	1.54	36,652	29,688	76.0	22,563
2	48,400	1.44	69,696	56,454	90.0	50,808
1	41,100	1.51	62,061	50,269	68.0	34,183
Totals	144,500	1.49	215,833	174,824	76.7	134,054

TABLE 2-16  
SAXON SOUTH OPEN PIT  
 Total Volumes by Cross-Section  
 Saxon Project Feasibility Report  
 October 1977

South Pit

X Section No.	Planimeter Readings*		Planimeter Function	Pit Volume** (M <sup>3</sup> )
	#1	#2		
X7703	1.14	1.17	4039	466,504
X7704	5.36	5.19	"	2,122,495
X7705	12.74	13.04	"	5,206,271
X7706	20.70	20.88	"	8,397,081
X7707	54.71	54.67	"	22,089,291
X7708	59.14	59.20	"	23,898,763
X7709	62.92	62.71	"	25,370,979
X7710	50.80	50.85	"	20,528,218
X7711	44.79	44.31	"	17,993,745
X7712	26.98	27.00	"	10,901,261
X7713	9.62	9.59	"	3,879,460
X7714	5.77	5.83	"	<u>2,342,620</u>
TOTAL				143,196,688

\* Planimeter reading 1 & 2 were averaged then multiplied by the planimeter function to obtain volume

\*\* The pit volume calculated includes all material from surface to the base of the pit

TABLE 2-17  
SAXON SOUTH OPEN PIT  
 Total Volumes by Cross-Section  
 Saxon Project Feasibility Report  
 October 1977

North Pit

X Section No.	Planimeter Readings*		Planimeter Function	Pit Volume** (M <sup>3</sup> )
	#1	#2		
X7703	2.98	2.94	4039	1,195,544
X7704	4.56	4.67	"	1,863,999
X7705	8.44	8.40	"	3,400,838
X7706	12.00	12.11	"	4,869,015
X7707	3.97	3.86	"	1,581,269
X7708	3.83	3.98	"	1,577,230
X7709	5.28	5.34	"	2,144,709
X7710	10.63	10.38	"	4,242,970
X7711	19.87	19.84	"	8,019,435
X7712	25.25	25.06	"	10,160,105
X7713	31.52	31.61	"	12,749,104
X7714	40.05	39.46	"	16,057,045
X7715	45.65	45.88	"	18,484,484
X7716	43.51	43.12	"	17,494,929
X7717	41.20	41.21	"	16,642,700
X7718	41.41	41.33	"	16,709,343
X7719	48.21	48.65	"	19,560,877
X7720	56.30	56.06	"	22,691,102
X7721	68.72	69.11	"	27,713,599
X7722	75.35	76.16	"	30,597,445
X7723	75.36	74.95	"	30,355,105
X7724	55.14	55.38	"	22,319,514
X7725	34.67	34.71	"	14,011,291
X7726	19.72	19.45	"	7,910,382
X7727	9.64	9.74	"	3,913,791
X7728	4.84	4.69	"	<u>1,924,584</u>

TOTAL 318,190,409

\* Planimeter reading 1 & 2 were averaged then multiplied by the planimeter function to obtain volume

\*\* The pit volume calculated includes all material from surface to the base of the pit



TABLE 2-18

SAXON SOUTH OPEN PIT  
Total Volumes by Cross-Section  
Saxon Project Feasibility Report  
October 1977

North Pit - Extension X

X Section No.	Planimeter Readings*		Planimeter Function	Pit Volume** (M <sup>3</sup> )
	#1	#2		
X7728	12.41	12.39	3969	4,921,560
X7729	19.14	19.00	"	7,568,883
X7730	19.42	19.18	"	7,660,170
X7731	15.89	15.95	"	6,318,648
X7732	12.60	12.49	"	4,979,111
X7733	7.54	7.60	"	3,004,533
X7734	4.45	4.44	"	1,764,221
X7735	2.41	2.43	"	960,498
X7736	1.23	1.21	"	486,203
X7737	.21	.20	"	<u>81,364</u>
TOTAL				37,745,191

\* Planimeter reading 1 & 2 were averaged then multiplied by the planimeter function to obtain volume

\*\* The pit volume calculated includes all material from surface to the base of the pit

(VOLUME III)

PR-SAYON 77 (6) A

# RESERVES DATA

DENISON MINES LTD.

1977

PART THREE

RESERVES

PART THREE

RESERVES

CONTENTS

	<u>PAGE</u>
3.1 SUMMARY OF TOTAL SAXON COAL RESERVES	3-1
311 RESERVE SUMMARY	3-1
3.2 CRITERIA AND METHODS FOR RESERVE CALCULATIONS	3-3
321 INTRODUCTION	3-3
322 MINING THICKNESSES	3-3
.1 Open Pit Mine Areas	3-3
.2 Underground Mine Areas	3-3
323 MINING THICKNESS - AREAS OF INFLUENCE	3-3
.1 Open Pit Mine Areas	3-3
.2 Underground Mine Areas	3-4
324 DEPTH OF OXIDATION	3-4
325 YIELDS AND SPECIFIC GRAVITIES	3-4
.1 Determination of Estimated Yield	3-4
.2 Yields - Saxon East	3-5
.21 Confidence Level 1	3-5
.22 Confidence Level 2	3-5
.23 Confidence Level 3	3-5
.3 Yields - Saxon South	3-5
.31 Confidence Level 1	3-5
.32 Confidence Level 2	3-6
.33 Confidence Level 3	3-6

	<u>PAGE</u>
.4 Yields from Specific Gravity Data	3-6
.41 Head Ash Versus Specific Gravity	3-6
.42 Head Ash Versus Yield	3-10
.5 Calculation of Yields from Mining Sections with Core Loss	3-10
.6 Calculation of Specific Gravities	3-10
.7 Assignment of Specific Gravities	3-11
.71 Saxon East	3-11
.72 Saxon South	3-12
.8 Comments	3-12
326 RAW COAL IN PLACE	3-14
327 GEOLOGICAL AND MINING FACTORS	3-14
.1 Open Pit Factors	3-14
.2 Underground Factors	3-14
.21 Mine Layout Losses	3-14
.22 Mining Losses	3-15
.23 Geological Factor - Faulting	3-15
328 OUT-OF-SEAM DILUTION AND PLANT FEED	3-15
.1 Open Pit Dilution	3-15
.11 Plant Feed Specific Gravity	3-16
.12 Plant Feed Volume	3-16
.13 Plant Feed Strip Ratio	3-16
329 METHODS OF CALCULATION	3-17
.1 Sequence of Calculations	3-17
.2 Out-of-Seam Dilution	3-17
.3 Plant Efficiency and Product Clean Coal	3-18

	<u>PAGE</u>
3.3 OPEN PIT MINE RESERVES - SAXON SOUTH	3-19
331 SUMMARY OF OPEN PIT RESERVES	3-19
332 SOUTH PIT RESERVES	3-21
333 NORTH PIT RESERVES	3-24
334 NORTH PIT EXTENSION RESERVES	3-27
335 ADDITIONAL RESERVES - SAXON SOUTH	3-30
3.4 UNDERGROUND RESERVES - SAXON EAST AND SAXON WEST	3-32
341 SUMMARY OF UNDERGROUND RESERVES	3-32
.1 Basis of Calculation	3-32
.2 Total Underground Reserves	3-32
342 SAXON EAST, SOUTH OF THE NARRAWAY RIVER	3-33
.1 Case I - Reserves for Planned Mining Areas	3-34
.2 Case II - Reserves Accessible from One Shaft Near Section 7721	3-34
.3 Case III - Geological Reserves to a Depth of 500 Metres	3-34
.4 Comments	3-35

### 3.1 SUMMARY OF TOTAL SAXON COAL RESERVES

#### 311 RESERVE SUMMARY

In those areas of the Saxon property which have been explored with some drilling, trenching and adit driveage, in addition to geological mapping, in place raw coal reserves totalling 468.5 million tonnes have been outlined. An additional exploration potential of 260 million tonnes has been estimated for the Saxon West area where only geological mapping has been done to date. Reserves have only been calculated to a nominal depth of 500 metres.

From portions of the total in place reserve that are located in Saxon East and are amenable to hydraulic mining, and those in Saxon South which can be mined by open pit methods, areas have been selected for mine planning which encompass 150.5 million tonnes of this in place reserve and could provide about 76.0 million tonnes of clean product coal.

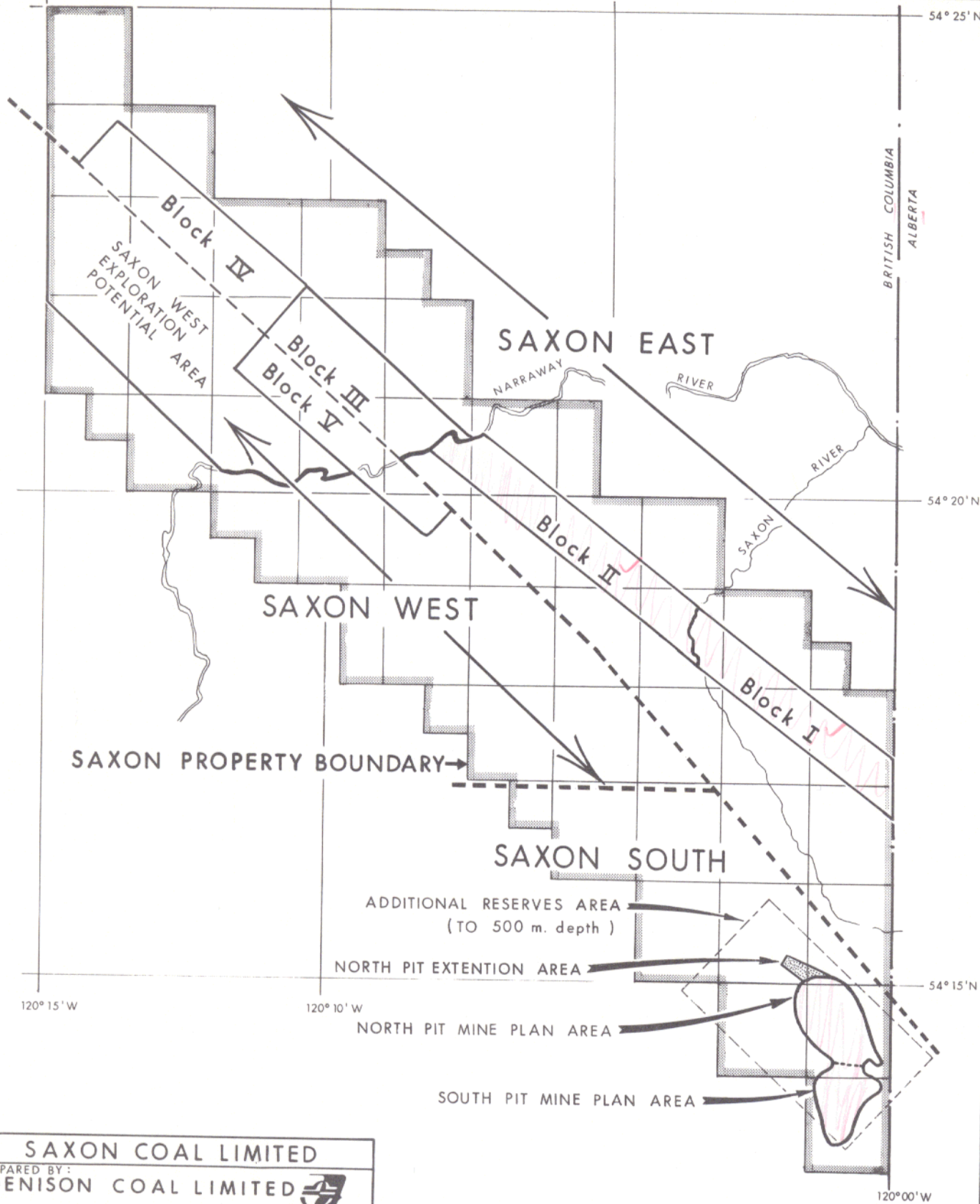
The total coal reserve for the Saxon property is summarized in table 3-1 on the following page. The reserve block areas which are used in this table are also summarized on map SXON 75-0588-R02 which follows it. These reserve areas are based primarily on blocks that are defined by a combination of geological structure, topography, and mine planning. The primary areas of interest are Blocks I and II in Saxon East, and pit areas in Saxon South which contain all of the reserves that provide the basis for the present feasibility study.

In the Saxon South area, sufficient reserves have been defined to provide 40.5 million tonnes of clean coal at a stripping ratio of 7.64 cubic metres of overburden to one tonne of plant feed coal. Of this amount, 37.3 million tonnes are available from proposed mine areas and 3.2 million tonnes from the North Pit Extension at essentially the same stripping ratios.

In the Saxon East area, 35.5 million tonnes of clean coal are available from the proposed mining areas, and, although this is adequate for the proposed mine production schedule, some optimization of the mine plans will probably be necessary before they are finalized. In any case, there is no doubt that there are more than sufficient reserves to meet the requirements of the present study.

54° 25' N

BRITISH COLUMBIA  
ALBERTA



SAXON PROPERTY BOUNDARY

SAXON EAST

SAXON WEST

SAXON SOUTH

ADDITIONAL RESERVES AREA  
(TO 500 m. depth)

NORTH PIT EXTENTION AREA

NORTH PIT MINE PLAN AREA

SOUTH PIT MINE PLAN AREA

SAXON COAL LIMITED

PREPARED BY:  
DENISON COAL LIMITED   
CALGARY ALBERTA

RESERVE BLOCK AREAS



BLOCK I & II CONTAIN, No.1 & No. 2  
HYDRAULIC MINE PLANS AND CASE 1,  
PLUS ALTERNATE RESERVES-CASES 2 & 3.

DRAWN BY: E.T.O.F.H.	DATE: OCT., 77	SCALE: 1: 100,000
APPROVED BY: G.P.G.	DRAWING NO: SXON 75 - 0588 - R02	



TABLE 3-1

## SUMMARY OF TOTAL SAXON COAL RESERVES

Saxon Project Feasibility Report  
October 1977

RESERVE AREA	RESERVE BLOCK **MINE PLAN AREA	SEAMS IN RESERVE	TYPE OF MINING	IN PLACE RAW COAL (TONNES x 10 <sup>6</sup> )	MINED RAW COAL (TONNES x 10 <sup>6</sup> )	EST. YIELD (%)	EST. DRY <sup>1</sup> CLEAN COAL (TONNES x 10 <sup>6</sup> ) UNOXIDIZED ONLY	ESTIMATED <sup>2</sup> DRY CLEAN COAL FROM MINE PLANS* (TONNES x 10 <sup>6</sup> )
			O.P.= OPEN PIT U.G.= UNDERGROUND					
	South Pit*	10,5,4,3,2,1	O.P.	20.9	15.8	74.0	11.7	11.7
	North Pit*	10,5,4,3,2,1	O.P.	45.8	34.8	73.4	25.6	25.6
SAXON	North Pit Extension	10,5,4,3,2,1	O.P.	5.6	4.1	76.9	3.2	
SOUTH	Reserves to 500 m Excluding Pits	10,5,4,3,2,1	O.P./U.G.	106.4	72.3	70.0	50.6	
TOTAL				178.7	127.0	71.7	91.1	37.3
SAXON EAST <sup>3</sup> (SOUTH OF NARRA-WAY RIVER)	BLOCK I U.G. MINE 1*	4,2	U.G.	30.7	19.7	66.1	13.0	12.3
	U.G. MINE 2*	4,2	U.G.	38.9	24.8	68.3	17.0	16.2
	ADDITIONAL RESERVES	4,2,1	U.G.	42.2	27.0	71.6	19.3	
NARRA-WAY RIVER)	BLOCK II U.G. MINE 1*	4,1	U.G.	14.2	9.1	80.8	7.4	6.9
	ADDITIONAL RESERVES	4,2,1	U.G.	64.3	41.2	71.6	29.5	
TOTAL				190.3	121.8	70.8	86.2	35.5
SAXON (NORTH OF N. RIVER)	BLOCK III	2,1	U.G.	53.7	31.2	54.5	18.6	
	BLOCK IV	4	U.G.	19.3	10.8	59.5	6.4	
TOTAL				73.0	42.0	59.5	25.0	
SAXON WEST	BLOCK V	1	U.G.	26.5	15.7	59.5	9.3	
	EXPLORATION POTENTIAL AREA	Not Known	U.G.	260.0 <sup>4</sup>				
TOTAL				286.5	15.7	59.5	9.3	
PROPERTY GRAND TOTAL				468.5	306.5		211.6	72.8

- Estimated dry clean coal is approximately equal to product coal. No allowance is made for losses due to plant inefficiency or added moisture, both of which compensate for each other.
- Estimated dry clean coal from mine planning areas equivalent to those prepared by Monenco Pacific Ltd. in Volume VI and Montan Consulting in Volume I. Saxon East clean coal reserves (South of Narraway River) have been further reduced by applying an additional factor of 0.95 for losses due to small faults.
- Saxon East reserves are based on Case I only. See text.
- Not included in property grand total.

## 3.2 CRITERIA AND METHODS FOR RESERVE CALCULATIONS

### 321 INTRODUCTION

The discussion of reserve calculation criteria will be restricted to the reserve calculations made in Blocks I and II at Saxon East which contain the planned Number 1 and Number 2 underground mines, and to Saxon South which contains the planned north and south open pit mines. The remaining Saxon East reserves in Blocks III and IV and the reserves of Saxon West were not explored further in 1977. As a result, the reserves presented for these areas have been taken directly from the Saxon Project Preliminary Feasibility Report 1976, which explains the criteria and methods of calculation used in arriving at those reserves.

### 322 MINING THICKNESSES

#### .1 Open Pit Mine Areas

The minimum true thickness that could be selectively mined as waste or raw coal was assessed at 1.0 metres in areas of less than 30° dip, and 1.5 metres in areas of greater than 30° dip. These criteria were used in estimating the mining section thickness values and core or adit sample intervals.

#### .2 Underground Mine Areas

A minimum true seam thickness of three metres was accepted in underground areas provided that the weighted average seam thickness for the particular mining block was four metres or more. This minimum selection was made on the basis that Montan Consulting had indicated that a seam thickness of around four metres was required and it was felt that the cost of locally mining into areas down to three metres thick would be more than compensated for by the better results that could be obtained in the areas where the seams are greater than four metres thick. This parameter is consistent with that used in the preliminary studies in 1976.

### 323 MINING THICKNESS - AREAS OF INFLUENCE

#### .1 Open Pit Mine Areas

Isopachs of mining thickness were made for all seams at Saxon South (see Volume III Appendix 1.6). The isopach thickness increments were then transferred to individual seams on each of the Saxon South geological cross-sections.

## .2 Underground Mine Areas

After the mining sections had been defined for each data point at Saxon East (adit, drill holes and trenches) they were located on the structure contour maps for seams 1, 2, and 4 (see Volume III Appendix 1.4). These values were then interpolated along strike such that mining section thickness values were obtained for each geological cross-section at each point where an interpolation point crossed the section. In the cases where this resulted in two or more interpolation points on a section, each interpolation point was given a zone of influence extending half way to the next point on the section. Due to relative scarcity of deep-hole information, it was not possible to prepare isopach maps for Saxon East. The cross-section grid and assigned mining section thickness values are shown on the aforementioned structure contour maps.

*where are the geol cross sections ✓ only 8-1977  
use 78 X-sections*

### 324 DEPTH OF OXIDATION

It was estimated that oxidized coal would be found at the surface to a vertical depth of 15 metres in all reserve areas at Saxon. This assessment was made after evaluating raw F.S.I. results from shallow drill intersections and particularly from assessing raw F.S.I. values from advancing adit faces in relationship to the topographic profile (see Volume III Appendix 1.7). The average depth of oxidation for all adits was found to be 13.4 metres, including adit 77-2-4 which was anomalously oxidized to a depth of 48 metres due to the proximity of a small creek.

### 325 YIELDS AND SPECIFIC GRAVITIES

#### .1 Determination of Estimated Yield

In addition to adit samples which were used as primary control points for assigning yield to seams, product clean coal yields have been determined for most 1976 and 1977 core intersections within the Saxon East reserve area and also for the majority of core intersections within the Saxon South area. Mining sections which were not considered were those for which no laboratory composite data and no bed resolution density logs were available. The reliability of product yield and coal quality depends upon the reliability of samples which are available for testing. To incorporate those data points within which the core recovery was less than 90%, evaluation of core loss, detailed analysis of bed resolution density (B.R.D.) logs, and estimations of yields from calculated specific gravities were undertaken (see following section). As all drill core yields are based on cutting the  $-3/8 \times 28$  mesh material at a specific gravity of 1.54, and the  $28 \times 100$  mesh material at 1.76, the estimated yields relate to this base. These methods are

summarized for each area below and in tables 3-2 and 3-3.

Despite the fact that various confidence levels have been assigned to the process of determining yields for each data point, depending on the amount of data available, as outlined in the subsections below, it should be noted that all yields that have been estimated by these procedures are considered to have a relatively high level of confidence. Individual estimations are not likely to be more than 5% in error and the overall yield for a seam is probably within  $\pm 2\%$ . In the process of developing these methods of adjustment it was possible to test the procedures against new data coming from the laboratory and in all cases the predicted yields were acceptably close to the reported laboratory yields.

## .2 Yields - Saxon East

### .21 Confidence Level 1

Laboratory yields were used for mining sections which had 90% or more core recovery and for which the mining section is equivalent to the composite section. Only minor adjustments were made when checks against yields determined from calculated specific gravities indicated that this was appropriate.

### .22 Confidence Level 2

This confidence level is comprised of all mining sections with between 70 and 90% core recovery, mining sections of greater than 90% core recovery for which mining section is not equal to the composite section, and mining sections with between 50 to 70% core recovery which lie near high core recovery (90%) sections or adits. Yield determinations were based on detailed comparison of B.R.D. and, where possible, long-spacing density (L.S.D.) logs with those from high core recovery sections and on yields obtained from the calculated specific gravities.

### .23 Confidence Level 3

For mining sections with less than 70% core recovery which do not lie near high recovery (90%) mining sections or adits, the evaluation of yield was based primarily on calculated specific gravities with some adjustments made on the basis of detailed comparison of B.R.D. (and L.S.D.) logs with those from adjacent holes.

## .3 Yields - Saxon South

### .31 Confidence Level 1

Mining sections with 90% or more core recovery and for which the mining section was equivalent to the composite section

have had their laboratory yields mathematically adjusted to account for core loss by estimating the yield of the lost core portion based on an assessment of the quality of that portion. This estimate was combined with the yield of the recovered portion (see section 325.5 below), and resulted in very minor adjustments.

#### .32 Confidence Level 2

Yields for mining sections with core recoveries between 70 and 90% were based mainly on mathematically adjusted laboratory yields as mentioned above (see also section 325.5). Further adjustments were made on the basis of detailed comparisons of B.R.D. logs with those from nearby sections which had good core recovery and, if necessary, with yields determined from calculated specific gravities. Mining sections which had core recoveries of over 90% but which were not exactly equivalent to the sampled section are included in this confidence level.

#### .33 Confidence Level 3

For mining sections with less than 70% core recovery or those for which no laboratory composite data was available, yields were based primarily on those obtained from the calculated specific gravities wherever they were available and/or B.R.D. log comparisons. Mathematically adjusted yields were used only as a rough guide in these cases as the quality of the lost core portion was very difficult to assess.

#### .4 Yields from Specific Gravity Data

In the Saxon area it has been determined that yields can be reasonably estimated for most seams by first calculating the head ash from a well-documented relationship between specific gravity and head ash and then converting the head ash so calculated to a yield using a formula which is based on 22 carefully studied drill core data sets. This formula was checked and found to be reasonably reliable for the 12 adit data sets which are available for the Saxon property.

#### .41 Head Ash Versus Specific Gravity

A total of 651 data points have been measured for both ash and specific gravity for the Saxon project. These measurements indicate that there is good correlation between ash and specific gravity that can be represented by the following exponential equation:

$$\text{specific gravity} = 1.2486 e^{0.00826 \times \text{ash}}$$

$$\text{the correlation coefficient} = 0.9778$$

TABLE 3-2

SAXON SOUTH

## Comparison of Yields

Saxon Project Feasibility Report  
October 1977

DRILL HOLE NO.	SEAM NO.	% CORE RECOVERY OF MINING SECTION (CALCULATED)	% LAB YIELD COMPOSITE CLEAN COAL	ASSIGNED YIELD	CONFIDENCE LEVEL	FOOTNOTES
7601	1	77	71.9	72	2	
	2	100	68.3	84	2	a)
	3	100	54.1	55	1	
	4	100	65.6	66	1	
	5	100	59.9	80	2	a) b)
	10	100	88.4	90	1	
7603	3	75	84.0	80	2	a) b)
7604	1	79	82.9	72	2	
	2	89	71.2	83	2	a)
	3	81	**	70	3	
	4	90	62.4	65	1	
7606	1	91	77.8	76	1	
	2	83	61.9	73	2	
	3	25	**	65	3	
	4	77	66.9	63	2	
	5	58	**	73	3	
7607	1	76	81.1	70	2	
	2	67	78.1	80	3	
	3	70	69.6	60	2	
	4	97	81.0	79	2	a)
7608	5	82	80.0	80	2	
	10	100	**	90	3	c)
7610	1	58	69.5	75	3	
	2	93	67.5	70	1	
	3	2	**	80	3	
	4	63	74.5	64	3	a)
7611	1	73	74.5	78	2	
	2	88	78.2	80	2	
	3	28	**	60	3	
	5	53	**	75	3	
7613	5	94	**	70	3	
	10	36	**	90	3	c)
7614	1	53	59.0	73	3	
	2	39	89.4	85	3	
	3	88	66.8	65	2	
	4	81	74.9	75	2	
7615	4	48	**	55	3	
	5	83	88.0	88	2	
	10	70	94.8	90	2	
7618	4	88	71.0	65	2	a)
	5	57	**	60	3	
7707	1	35	79.8	76	3	
	2	83	85.4	85	2	
	3	43	53.0	65	3	
	4	44	84.4	84	3	
	5	72	**	63	3	
	10	87	**	90	3	c)

TABLE 3-2 (Continued)

DRILL HOLE NO.	SEAM NO.	% CORE RECOVERY OF MINING SECTION (CALCULATED)	% LAB YIELD COMPOSITE CLEAN COAL	ASSIGNED YIELD	CONFIDENCE LEVEL	FOOTNOTES
7711	1	73	67.3	72	2	
	2	96	78.5	79	2	a)
	3	91	60.5	60	1	b)
	4	98	80.2	80	1	
7713	2	96	90.0	88	1	
	4	78	72.5	73	2	
7714	2	96	86.3	86	1	
7716	1	56	63.9	65	3	
	2	43	63.2	75	3	
	4	86	72.9	68	2	
7717	5	96	64.0	61	1	b)
7718	4	96	76.2	76	1	
7720	3	88	79.6	80	2	
	4	85	70.6	74	2	
7721	1	68	81.8	78	3	
	2	98	79.7	80	1	
	3	71	60.9	60	2	
7722	4	87	69.1	80	2	a)
7723	4	84	64.5	62	2	
7724	1	77	81.6	78	2	
	2	43	54.0	70	3	
	3	77	68.3	68	2	
	4	82	73.4	71	2	
	10	100	93.3	90	1	
7725	1	82	82.6	81	2	
	2	98	63.7	80	2	a)
	3	70	47.6	55	2	
7726	1	95	75.5	75	1	
	2	98	71.7	72	1	
	3	91	80.3	80	1	
	4	97	71.9	71	1	
	5	100	76.0	76	1	
	10	100	96.2	90	1	c)
TRENCH B3	3			76	3	d)

a) For these samples the laboratory composite does not correspond exactly to the mining section due to re-evaluation of the sections subsequent to sampling.

b) No detailed bed resolution density log available.

c) Not a mining section.

d) Calculated from geological trench log.

\*\* No composite taken.

Note: Adit data points were used without adjustment and were considered to have level 1 confidence.

TABLE 3-3

SAXON EAST  
Comparison of Yields

Saxon Project Feasibility Report  
October 1977

DRILL HOLE NO.	SEAM NO.	% CORE RECOVERY OF MINING SECTION (CALCULATED)	% LAB YIELD COMPOSITE CLEAN COAL	ASSIGNED YIELD	CONFIDENCE LEVEL
7609	1	60	76.4*	75	2
	2	84	67.6*	63	2
	4	100	68.6*	75	2
7619	1	61	90.2	94	2
	2	71	72.0*	70	2
	4	8	86.9*	75	3
7620	1	69	71.4	74	2
	2	51	66.5	68	3
7701	1	38	88.5*	81	3
	2	23	**	50	3
7702	1	75	90.5	85	2
	2	24	79.3*	70	3
	4	32	85.5	65	3
7703	1	56	91.0	90	3
	2	64	65.7*	70	3
	4	53	94.9	73	2
7704	1	85	91.9*	77	2
	2	87	62.7	68	2
	4	80	74.5*	70	2
7705	1	67	92.5*	83	2
	2	43	86.3	80	3
	4	100	78.9	79	1
7706	4	56	78.0*	70	2
7708	1	56	86.2*	78	2
	2	7	**	63	3
	4	54	86.5	70	3
7709	1	92	82.5	83	1
	2	82	68.2	68	2
	4	82	81.8	70	2
7710	1	80	55.2	65	2
	2	30	77.1	63	3
	4	30	69.0	79	3
7712	1	100	84.4	84	1
	2	93	52.0	55	1
	4	92	82.1	82	1
7715	1	100	90.9	91	1
	2	76	67.1	50	2
	4	74	75.2	75	2

\* For these samples the laboratory composite does not correspond exactly to the mining section due to re-evaluation of the sections subsequent to sampling.

\*\* No composite taken.

Note: Adit data points were used without adjustment and were considered to have level 1 confidence.



#### .42 Head Ash Versus Yield

Twenty-two drill core samples that had more than 90% recovery were used to establish a relationship between head ash and the clean coal yield of Saxon coals. This relationship was defined by a straight line regression as follows:

$$\begin{aligned} \% \text{ clean coal yield} &= 104.65586 - 1.41574 \times (\text{head ash}) \\ \text{the correlation coefficient} &= 0.9852 \end{aligned}$$

Subsequent work with more data sets indicates that an exponential or logarithmically based curve might be more appropriate for this relationship. However, the above equation is accurate enough for the present purpose as these yields based on calculated specific gravities were used only as a guide at confidence levels 2 and 3.

#### .5 Calculation of Yields from Mining Sections with Core Loss

Where yields were adjusted to account for core loss, the following procedure was used:

using the estimates:

$$\begin{aligned} \text{Lost rock specific gravity} &= 2.2 \\ \text{Lost coal specific gravity} &= 1.30-1.40 \\ \text{Yield of lost coal} &= 90\% \end{aligned}$$

then,

$$\begin{aligned} &\frac{\text{Coal Loss} \times \text{Coal Specific Gravity} \times 0.9}{(\text{Coal Loss} \times \text{Coal Specific Gravity}) + (\text{Rock Loss} \times \text{Rock Specific Gravity})} \\ &= \text{Yield of Lost Portion} \end{aligned}$$

and,

$$\begin{aligned} &(\text{Yield of Lost Portion} \times \% \text{ Core Loss}) \times (\text{Lab. Yield} \times \% \text{ Core Recovery}) \\ &= \text{Calculated or Adjusted Yield} \end{aligned}$$

#### .6 Calculation of Specific Gravities

Specific gravities (s.g.'s) have been calculated for each mining section greater than 2 metres thick which; a) possesses detailed long-spacing density (L.S.D.) logs, and b) has been logged with no rods in the hole so that the geophysical log response is a true reflection of the coal and rock within the mining section. On this basis estimates of mining section s.g.'s were calculated from the L.S.D. logs by the measurement of incremental specific gravities, the limits of which were defined

by points of inflection along the coal seam trace on the printed log. The values for these incremental s.g.'s were measured from the density graticule scale found at the top of each detailed L.S.D. log. These incremental s.g.'s were then weighted by their thicknesses (between inflection points) and averaged to give the L.S.D. estimated specific gravity. These L.S.D. estimated specific gravities were then adjusted to calculated specific gravities by the relationship:

$$\text{Calculated S.G.} = -0.8142 + 1.5828 (\text{L.S.D. estimated S.G.})$$

This correction procedure was determined by relating specific gravities obtained from laboratory analysis to estimates of specific gravities from L.S.D. logs for the composite sections of core intervals that were more than 90% recovered. The seventeen composite sections used were made up of a large number of component samples whose individual specific gravities had been measured in the laboratory. The specific gravity used for each composite was the average of the component specific gravities within that composite, weighted on the basis of the thickness of each increment. These composite s.g.'s were plotted against specific gravities estimated from those portions of the L.S.D. logs which were equivalent to the composite sections. That is, core loss, and any parts of the mining sections which were not composited were omitted.

The comparison of L.S.D. estimated specific gravities from seams greater than 2 metres thick with actual laboratory analyses showed a linear relationship as expressed by the above formula. This relationship had a correlation coefficient of 0.8737 which is not particularly good, but allows the method to be used as back-up to other procedures for yield estimations that have already been mentioned.

For seams less than 2 metres thick, no relationship was established. This reflects the inherent limitation in logging techniques when the order of magnitude of the feature being measured approaches that of the spacing between source and detector in the tool. It was also not possible to use this method of estimating specific gravity (and hence yield) for mining sections which were badly caved in the drill hole, and those which had been logged through the rods for which no correction parameters were available.

## .7 Assignment of Specific Gravities

### .71 Saxon East

Within the Saxon East reserve area, yields have been assigned to cross-sections on an "area of influence" basis. That is, for any given mining section, those cross-sections nearest to a particular data point have the yield of that data

point. Only in three instances do any cross-sections have more than one yield and in these cases one yield has been used for the above drainage portion and another for the below drainage portion.

The specific gravities assigned to cross-sections have usually been calculated from the yields by averaging the yields for adjacent data points, provided they are numerically close, or the sections have had their specific gravity determined from only one yield data point. The distributions of yields and specific gravities by cross-section are illustrated in Drawing 77-0742-R02, for seams 1, 2, and 4. (See Volume III Appendix 1.4).

## .72 Saxon South

In the Saxon South area, yields have been assigned to cross-sections by interpolation between data points. For all but seam 10, two or three lines of interpolation were established across the length of the area; one along the northeastern flank and either one or two along the southwestern flank of the structure. The yields were assigned to cross-sections by interpolation between established data points (adit or drill holes) and then the interpolated points in the cross-section were either averaged or first averaged for each flank of the structure and then averaged again for the entire section so that each section was finally assigned only one yield for each seam of each pit. For seam 10 however, only one yield has been used for the entire area as the seam is small and very clean.

Seam specific gravities were calculated by averaging the yields assigned to those cross-sections which bisected the pit area and then converting the average yield to an average specific gravity using the equations previously discussed. Yields per cross-section by seam and seam specific gravities are listed in table 3-4 on the following page.

## .8 Comments

The above relationships have been used to relate head ash, specific gravity, yields, and calculated specific gravities in various ways, with a full understanding that the relationships are dependent primarily on the coal from different seams being similar in terms of the ash distribution and separating characteristics. For this reason, caution has been used in applying these formulas and, in particular, they have not been used unless a bed resolution density log or other satisfactory logging information was available to indicate that the seam characteristics were similar to other seam intersections in the area for which reliable data was also available.

TABLE 3 -4

SAXON SOUTH

## Yields Assigned to Cross-Sections

Saxon Project Feasibility Report  
October 1977

CROSS-SECTION	SEAM 1		SEAM 2		SEAM 3		SEAM 4		SEAM 5	
	North Pit	South Pit	North Pit	South Pit	North Pit	South Pit	North Pit	South Pit	North Pit	South Pit
7701	75		84		72		66		74	
7702	75		84		72		66		74	
7703		68		88		76		69		74
7704		68		90		76		69		75
7705		68		92		76		69		76
7706		68		94		76		69		77
7707	81	69	80	96	68	76	63	69	73	78
7708	81	72	80	89	68	72	63	68	73	79
7709	81	72	80	82	68	67	63	66	73	80
7710	81	74	80	76	68	71	63	67	73	79
7711	81	75	80	74	68	76	63	68	73	77
7712	78	75	80	72	68	80	67	71	73	76
7713	76	75	75	72	72	80	68	74	74	75
7714	74	75	76	72	71	80	67	74	74	75
7715	73		76		70		68		75	
7716	73		75		69		73		76	
7717	71		76		68		71		77	
7718	71		76		67		70		79	
7719	70		76		66		71		81	
7720	70		77		65		71		82	
7721	69		77		64		70		84	
7722	70		78		63		72		82	
7723	70		78		62		73		79	
7724	71		79		62		73		77	
7725	73		80		63		74		75	
7726	74		81		63		75		73	
7727	74		82		63		76		71	
7728	75		83		63		76		70	
7729		76		83		64		78		66
7730		77		83		64		78		65
7731		77		83		65		79		65
7732		77		83		65		79		65
7733		77		82		66		74		65
7734		76		81		66		72		64
7735		76		81		67		72		64
7736		75		83		66		72		63
7737		74		84		65		73		63
7738		73		85		65		73		62
7739		73		85		65		71		62
7740		73		85		65		70		62
7741		73		85		65		68		61
7742		73		85		65		67		61
7743		73		85		65		65		60
7744		73		85		65		65		60
7745		73		85		65		65		60
Assigned Average S.G. of All Seams	1.51		1.44		1.54		1.52		1.47	

For seam 10 all cross-sections have been assigned a yield of 90% and the corresponding seam specific gravity is 1.36.

\* = Yield, beyond present pit limits.

The tonnages of raw coal in place were obtained at Saxon East and South by accumulating individual increments of mining section thickness times length on all of the related cross-sections and multiplying by the cross-section spacing to obtain volume. The volumes were then multiplied by specific gravities to obtain the amount of raw coal in place.

## 327 GEOLOGICAL AND MINING FACTORS

.1 Open Pit Factors

The geological confidence factor applied to in place raw coal in the Saxon South mine plan areas was .9 and .85 in the additional reserves area (to a 500 metre depth). A total of 28 diamond drill holes, 6 adits and 28 trenches have been placed in the general pit areas, with an average horizontal drill hole spacing of approximately 400 metres. This spacing would further reduce to approximately 300 metres between data points if trench and adit data points were also considered. The above mentioned spacing combined with comprehensive geological surface information have placed the reserve at a high confidence level. Sufficient geological exploration work has been done on the Saxon South pits such that only a limited amount of additional drilling would be required prior to a program of development drilling.

In the Saxon South open pit reserve areas, a mining factor of 0.90 was used to account for pit losses. In the area of additional reserves, to a depth of 500 metres, this factor was reduced to 0.80 on the basis that it can be estimated that some of that coal would be mined as open pit coal, at a factor of 0.9 while other parts could only be accessed by underground mines with a lower extraction factor. It is recognized that for the additional reserves the factor used can only be a rough guide as mining plans are not being considered for those areas at this time.

.2 Underground Factors

In order to have reserve calculations that are comparable to those derived by Montan Consulting in their studies based on preliminary data, the same factors that Montan Consulting used were also employed initially by Denison in calculating the underground coal reserves.

.21 Mine Layout Losses

The in place reserves were first factored by 80 percent to allow for a 20% loss due to the allowance that had to be made

for coal left in pillars, unextractable corners, and variations in the conditions of the coal strata such as washouts, facies changes, and local thinning. Montan advised that the geologically controlled portion of this factor could be estimated at about 5%.

.22 Mining Losses

A further factor of 80 percent was applied to the coal remaining after layout losses had been considered. This factor allows for a loss of 20% of the coal being mined in a panel for such events as premature caving, coal left in the gob area, and other mining problems.

.23 Geological Factor - Faulting

As the factors applied by Montan Consulting did not allow for additional losses and as the geological field work had identified small faults in a number of instances, it was considered prudent to make some allowance for lost production in anticipation of these small and relatively unpredictable problems. For this reason, an additional 95% factor was applied to the underground clean coal reserves to give an estimate of net clean coal reserves.

It should be noted that no factor was applied to make allowance for the larger identified fault in Saxon East as the appropriate deductions had been made in the reserve calculations. The net effect of the 5 percent allowance for faulting and the 5 percent deduction for changes in strata conditions which has been provided for in the mine layout factor, is that approximately a 10 percent reduction in reserves has been made for geological conditions; which is similar to the 10% factor that was used in the open pit.

328 OUT-OF-SEAM DILUTION AND PLANT FEED

.1 Open Pit Dilution

For the open pit calculations, 0.30 metres of rock at an assumed specific gravity of 2.2 were included with the mining section of each seam prior to applying the mining and geological factors. Consequently those factors were applied to a coal seam whose specific gravity and total available tonnage of in place material had been increased to allow for the dilution. This was done as it was assumed that most mining losses take place from spillage in loading and haulage and the out-of-seam dilution will be lost in proportion to its presence in the mining section, along with the coal. The same reasoning applies to the losses due to geological factors. As they represent coal which will not be

mined, they also represent a proportion of out-of-seam dilution which will stay in the pit,

On this basis, the following formula was used to adjust the tonnage of mined coal to provide tonnes of plant feed for each seam in each mining period,

Plant Feed ie.

$$\frac{\text{(coal seam tonnes + out-of-seam dilution tonnes)}}{\text{}} = \text{mined raw coal} \times \frac{(1 + (.3 \times 2.2))}{(T_c \times SG_c)}$$

where: .3 = out-of-seam dilution

2.2 = out-of-seam specific gravity

T<sub>c</sub> = weighted average coal seam thickness

SG<sub>c</sub> = coal seam specific gravity

and mined raw coal = (coal in place x 0.81) tonnes

#### .11 Plant Feed Specific Gravity

The plant feed specific gravity was then calculated by the following formula:

$$\text{S.G. Plant Feed} = \frac{T_c \times S.G_c + T_{OD} \times S.G_{OD}}{T_c + T_{OD}}$$

where: T<sub>c</sub> = weighted average coal thickness

SG<sub>c</sub> = coal seam specific gravity

T<sub>OD</sub> = out-of-seam dilution thickness .3m

SG<sub>OD</sub> = out-of-seam dilution specific gravity 2.2

#### .12 Plant Feed Volume

Plant feed volume was calculated by dividing the total plant feed tonnage by the specific gravity of plant feed.

#### .13 Plant Feed Strip Ratio

To obtain the plant feed stripping ratio, the total pit volumes were calculated by summing the product of the cross-section areas and the distances between cross-sections for all of the sections in each pit. Once this had been done, the ratios were calculated for each of the North, South and North Extension pits using the following formula:

$$\text{Plant Feed Strip Ratio} = \frac{\text{Total pit Volume} - \text{Plant feed Volume}}{\text{Plant feed Tonnage}}$$

### .1 Sequence of Calculations

Both the open pit and underground reserves were calculated by the cross-section method rather than planimetry. In the open pit areas isopach maps of seam mining thickness (Appendix 1.6 Volume III) were prepared in plan and the thickness data was projected from these plans into the cross-sections. Once the thickness data was on the sections, the lengths of each thickness increment for a seam in each mining period were measured and the in place reserve was calculated from this data by multiplying by the 100 metre section interval and the assigned specific gravity for that seam. Subsequently, the geological and mining factors were applied to obtain the quantity of mined raw coal. This was then reduced for each seam in each section by multiplying by the estimated yield to give the amount of clean coal. The plant feed calculations were done separately as described in the preceding sections.

In the Saxon East area, the reserve calculations were done in a manner somewhat similar to the open pit calculations except that isopach maps for mining thickness were not available and the thicknesses used in each section were interpolated from nearby data points, and where two interpolated points occurred on one section, the influence of each point was considered to extend half way to the other point. The Saxon East reserves were calculated by levels rather than mining periods, and no allowance was made for out-of-seam dilution. The calculation of clean coal reserves was therefore a straightforward sequential reduction by applying the mining layout factor, mining loss factor, and as mentioned previously, the geological factor for small faults, then the estimated yield to give the amount of net clean coal.

### .2 Out-of-Seam Dilution

At Saxon East no allowance was made for out-of-seam dilution as it is not possible to accurately estimate the amount of material that will fall, when it will fall during the mining cycle, or how much of it would stay in the gob area and how much would be flumed to the plant. As Montan Consulting had assured us that the conveyors were sized to handle extra material, we assumed that an amount of rock equivalent to the transported out-of-seam dilution would be removed by the rotary breaker before the coal enters the plant. The same basic assumption is made for the open pit coal as the plant feed tonnage was only obtained to provide data for the stripping ratio calculations. The clean coal was based on the estimated yield being applied to the mined raw coal on the assumption that the out-of-seam dilution would be carried out of the pit in the trucks but that it too would be



essentially removed at the Rotary Breaker.

### .3 Plant Efficiency and Product Clean Coal

In both the open pit and underground clean coal reserve calculations, no allowance was made for losses in plant efficiency or for moisture that would be included in the saleable product coal. This procedure was followed since it is not possible to predict the effect of plant efficiency on the individual seams, but overall losses due to plant efficiency are in the order of 3 to 5%. This balances almost exactly, and certainly within the accuracy of our estimates of theoretical plant yield, with the 5% moisture that is "added" to the dry coal to give saleable product coal. The figures presented in the various reserve tables for dry clean coal may therefore be considered to be close approximations of the amount of product coal that is available from these mining areas.

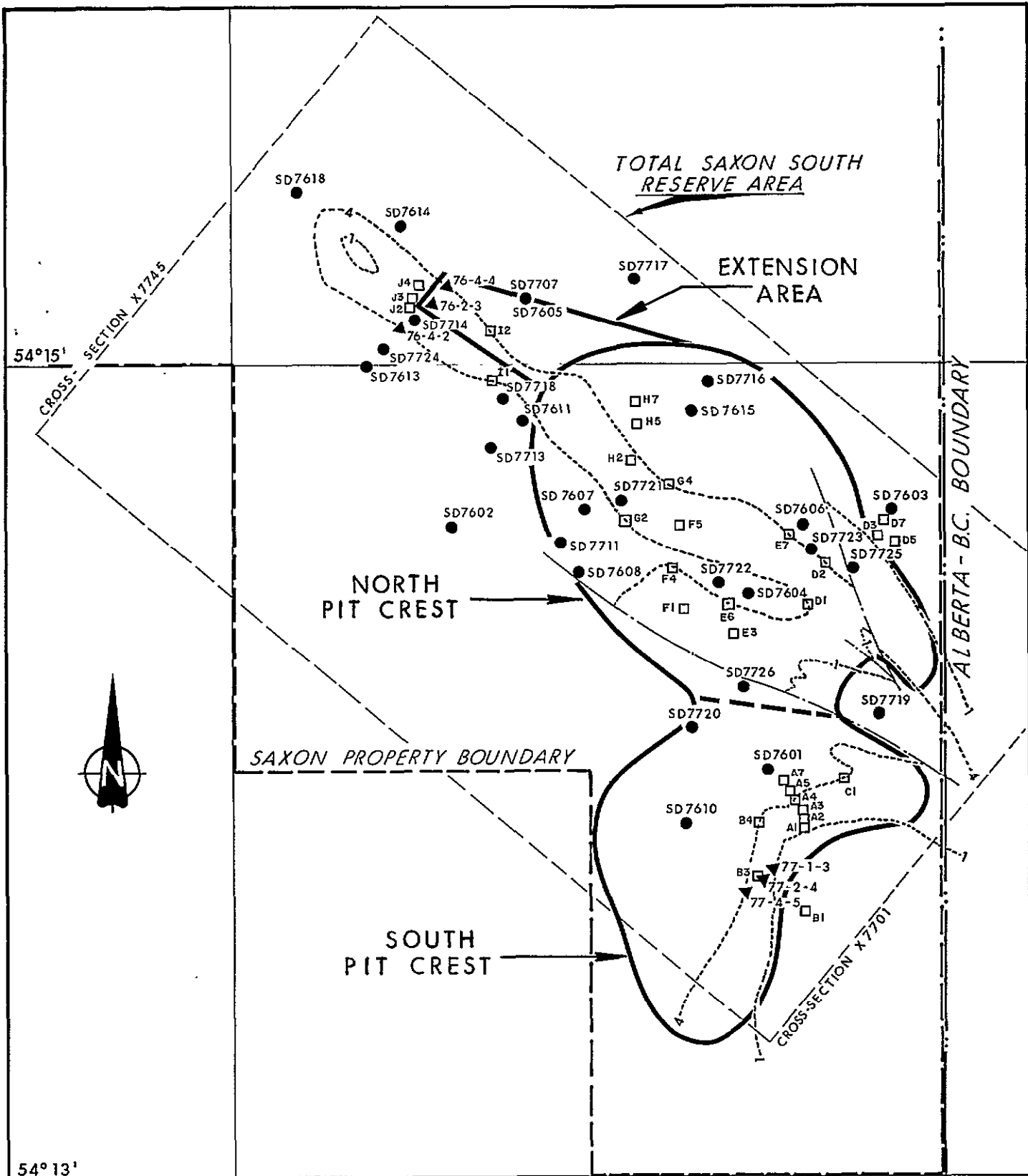
### 3.3 OPEN PIT MINE RESERVES - SAXON SOUTH

#### 331 SUMMARY OF OPEN PIT MINE RESERVES

The Saxon South reserve area contains two open pit mines, namely the North and South pits, which are the subject of the mine planning in Volume VI of this report. Reserve assessments of these two pits have been made, including a possible extension of the North pit and a reserve for the areas extending beyond the proposed pits to 500 metre depth has been calculated for the entire Saxon South area. These reserves are summarized on the following table and are schematically located on the map on the following page.

Reserve Area	In Place Raw Coal (Tonnes x 10 <sup>6</sup> ) (Oxidized and Unoxidized)	Mined Raw Coal (Tonnes x 10 <sup>6</sup> ) (Unoxidized Only)	Avg. Yield (%)	Clean Coal (Dry Tonnes) x 10 <sup>6</sup> (Unoxidized Only)	Plant Feed Strip Ratio
South Pit	20.9	15.8	74.0	11.7	7.56
North Pit	45.8	34.8	73.4	25.6	7.67
North and South Pit	66.7	50.6	73.7	37.3	7.64
North Pit Extension	5.6	4.1	76.9	3.2	7.68
North, South and North Extension Pits, Total	72.3	54.7	74.0	40.5	7.64
500 Metre Reserve	106.4	72.3		Not Calculated	
Total Reserve	178.7	127.0		40.5	7.64

In regard to the above table, it should be noted that in Volume VI, Monenco Pacific Limited have calculated a 38.6 million tonne reserve of clean coal at a plant feed ratio of 7.84 to 1 for the combined north and south pits. This assessment was based on calculations from preliminary geological data and is in close agreement to the final results presented here.



54°15'

54°13'

120°03'

- ▲ ADIT
- TRENCH
- DRILL HOLE
- - - COAL SEAM
- FAULT

### SAXON COAL LIMITED

PREPARED BY - DENISON COAL LIMITED



### SAXON SOUTH SCHEMATIC EXPLORATION DATA POINTS AND RESERVE AREAS

DRAWN BY: E. TOTH	DATE: Oct. '77	SCALE: 1: 25,000
PREP'D BY: G.P.G.	DATE: Oct '77	DRAWING NUMBER: SXON 77-0760-R01
APPR'D BY: G.P.G.	DATE: Oct '77	

The following is a summary of key results or averages that were obtained and/or used in the calculations for the reserves in the three open pits:

Average aggregate coal seam thickness	22.6 m
Average coal seam specific gravity	1.49
Average percentage of oxidized coal compared to the total in place raw coal reserve	6.9%
Combined geological and mining factors applied to in place raw coal to obtain mined raw coal	.81
Average yield applied to mined raw coal to obtain clean coal	74.0%
Average weight percentage of out-of-seam dilution in the plant feed	9.0%
Average plant feed specific gravity	1.58

A comprehensive discussion of reserve parameters and procedures for calculation has been previously presented in section 3.2 of this volume. More detailed reserves tables for each reserve area at Saxon South are presented in the following sections.

The South Pit reserves total 11.7 million tonnes of unoxidized clean coal at an overall plant feed strip ratio of 7.56 to one. This reserve forms 31.5% of the total clean coal from the combined open pit mine plans. The reserves of the South Pit were broken into four production periods (periods 1 - 4). The reserves for these periods are presented individually in Volume III Appendix and the periods are illustrated on the geological cross-sections in Volume III Appendix . The following tables summarize the total reserves by seam of unoxidized and oxidized coal for all periods.

TABLE 3 - 5

SAXON SOUTH RESERVES  
South Pit (Unoxidized)  
Summary

Saxon Project Feasibility Report  
 October 1977

Seam No.	Avg. Seam Thickness (m)	Total Seam Volume (m <sup>3</sup> )	Seam S.G.	In Place Raw Coal (Tonnes)	Mined Raw Coal (Tonnes)	Avg. Yield (%)	Clean Coal (Dry) (Tonnes)	Plant Feed (Tonnes)	Plant Feed Volume (m <sup>3</sup> )	Plant Feed S.G.
10	1.20	125,600	1.36	170,816	138,361	90.0	124,525	194,503	127,255	1.53
5	1.42	566,000	1.47	832,020	673,937	78.8	531,190	889,833	556,595	1.60
4	9.37	5,624,300	1.52	8,548,936	6,924,638	67.9	4,698,422	7,246,569	4,702,015	1.54
3	2.01	1,317,900	1.54	2,029,566	1,643,949	73.3	1,204,239	1,995,207	1,227,162	1.63
2	4.76	3,139,600	1.44	4,521,024	3,662,029	87.9	3,219,419	4,014,378	2,728,382	1.47
1	3.99	2,289,800	1.51	3,457,598	2,800,654	69.7	1,951,339	3,108,542	2,027,456	1.53
<b>Total</b>		<b>13,063,200</b>	<b>1.50</b>	<b>19,559,960</b>	<b>15,843,568</b>	<b>74.0</b>	<b>11,729,131</b>	<b>17,449,032</b>	<b>11,368,865</b>	<b>1.53</b>

Plant Feed Strip Ratio = Total Pit Volume\* - Plant Feed Volume + Plant Feed Tonnes

$$= \frac{143,196,688 - 11,368,865}{17,449,032}$$

$$= 7.56$$

$$= 7.56$$

\* See Volume 3 Appendix

TABLE 3 - 6

SAXON SOUTH RESERVES  
 South Pit (Oxidized)  
 Summary

Saxon Project Feasibility Report  
 October 1977

Seam No.	Total Seam Volume (m <sup>3</sup> )	Seam S.G.	In Place Raw Coal (Tonnes)	Mined Raw Coal (Tonnes)	Avg. Yield (%)	Clean Coal (Dry) (Tonnes)
10	58,400	1.36	79,424	64,334	90.0	57,900
5	54,300	1.47	79,821	64,655	79.1	51,119
4	422,000	1.52	641,440	519,566	68.7	357,055
3	78,500	1.54	120,890	97,921	76.0	74,419
2	157,800	1.44	227,232	184,058	91.5	168,390
1	116,600	1.51	176,066	142,613	68.0	96,977
<b>Totals</b>	<b>887,600</b>	<b>1.49</b>	<b>1,324,873</b>	<b>1,073,147</b>	<b>75.1</b>	<b>805,860</b>

The North Pit reserves total 25.6 million tonnes of clean coal (unoxidized) at an overall plant feed ratio of 7.67 to one. This reserve forms 68.5% of the total clean coal reserve from the combined open pit mine plans. The reserves of the North Pit are broken into five production periods by Monenco Pacific Limited in Volume VI, namely:

Surface to A,  
A to B,  
B to C,  
C to D,  
D to E

which corresponded to Periods A, B, C, and D in this geological volume. Periods C-D, D-E were combined to form Period D since no data on the relative proportions of raw coal to be mined in these periods were available at the time of calculation. The reserves for Periods A, B, C, and D are presented separately in Volume III Appendix 2122 and the periods are illustrated on the geological cross-sections in Volume III Appendix 1.3. The following tables summarize the total unoxidized and oxidized coal obtained from all periods by seams.



TABLE 3-7

**SAXON SOUTH RESERVES**  
**North Pit (Unoxidized)**  
**Summary**

Saxon Project Feasibility Report  
 October 1977

Seam No.	Avg. Seam Thickness (m)	Total Seam Volume (m <sup>3</sup> )	Seam S.G.	In Place Raw Coal (Tonnes)	Mined Raw Coal (Tonnes)	Avg. Yield (%)	Clean Coal (Dry) (Tonnes)	Plant Feed (Tonnes)	Plant Feed Volume (m <sup>3</sup> )	Plant Feed S.G.
10'	1.22	36,700	1.36	49,912	40,429	90.0	36,386	56,511	37,037	1.53
5	1.46	338,800	1.47	498,036	403,409	78.7	317,436	529,305	332,024	1.59
4	8.21	8,255,400	1.52	12,548,208	10,164,048	71.6	7,278,965	10,705,123	6,932,817	1.54
3	1.87	2,855,600	1.54	4,397,624	3,562,076	66.1	2,355,490	4,387,602	2,688,276	1.63
2	5.85	10,495,900	1.44	15,114,096	12,242,419	77.3	9,458,583	13,202,958	8,938,289	1.48
1	3.94	6,875,600	1.51	10,382,156	8,409,546	72.7	6,116,443	9,345,432	5,994,639	1.56
Totals		28,858,000	1.49	42,990,032	34,821,927	73.4	25,563,303	38,226,931	24,923,082	1.53

$$\begin{aligned}
 \text{Plant Feed Strip Ratio} &= \text{Total Pit Volume}^* - \text{Plant Feed Volume} \div \text{Plant Feed Tonnes} \\
 &= \frac{318,190,409 - 24,923,082}{38,226,931} \\
 &= 7.67
 \end{aligned}$$

\* See Volume 3 Appendix

TABLE 3 - 8

SAXON SOUTH RESERVES  
North Pit (Oxidized)  
 Summary

Saxon Project Feasibility Report  
 October 1977

Seam No.	Total Seam Volume (m <sup>3</sup> )	Seam S.G.	In Place Raw Coal (Tonnes)	Mined Raw Coal (Tonnes)	Avg. Yield (%)	Clean Coal (Dry) (Tonnes)
10	8,100	1.36	11,016	8,923	90.0	8,031
5	88,900	1.47	130,683	105,853	80.4	85,057
4	1,165,600	1.52	1,771,712	1,435,086	71.7	1,029,480
3	261,400	1.54	402,556	326,070	67.1	218,777
2	243,300	1.44	350,352	283,785	78.9	224,020
1	110,300	1.51	166,553	134,908	78.6	105,994
Totals	1,877,600	1.51	2,832,872	2,294,625	72.8	1,671,359

The clean coal reserves from the two planned open pits totalled 37.3 million tonnes, which is slightly short of the 38.6 million tonnes of clean coal planned for the twenty year mine life. An attempt to account for this shortage was made by extending the north eastern part of the North Pit to the 1600 metre elevation commencing at section 7726 and continuing it out past the Northern Pit limit to where it surfaced above Saxon Creek on section 7737. This preliminary pit outline is referred to as the North Pit Extension and is illustrated on the cross-sections previously mentioned. This reserve area was calculated separately and found to contain 3.2 million tonnes of clean coal at a raw coal strip ratio of 7.68, and combined with the planned pits gave a total of 40.5 million tonnes of clean coal at a 7.64 plant feed strip ratio. The total unoxidized and oxidized coal reserves for the North Extension area are presented by seam on the following tables.

TABLE 3 - 9

SAXON SOUTH RESERVES  
North Extension X (Unoxidized)  
Summary

Saxon Project Feasibility Report  
October 1977

Seam No.	Avg. Seam Thickness (m)	Total Seam Volume (m <sup>3</sup> )	Seam S.G.	In Place Raw Coal (Tonnes)	Mined Raw Coal (Tonnes)	Avg. Yield (%)	Clean Coal (Dry) (Tonnes)	Plant Feed (Tonnes)	Plant Feed Volume (m <sup>3</sup> )	Plant Feed S.G.
10	Not Mined (Insufficient thickness)									
5	Not Mined (Insufficient thickness)									
4	8.78	1,560,600	1.52	2,372,112	1,921,411	77.1	1,484,688	2,016,433	1,307,278	1.54
3	2.05	424,900	1.54	654,346	530,020	64.5	341,697	640,826	394,535	1.62
2	4.64	951,000	1.44	1,369,440	1,109,246	82.8	917,909	1,218,816	820,114	1.49
1	3.44	474,500	1.51	716,495	580,361	76.5	443,929	654,102	417,864	1.57
Totals		3,411,000	1.49	5,112,393	4,141,038	76.9	3,188,223	4,530,177	2,939,791	1.54

$$\begin{aligned}
 \text{Plant Feed Strip Ratio} &= \frac{\text{Total Pit Volume}^* - \text{Total Plant Feed Volume}}{\text{Plant Feed Tonnes}} \\
 &= \frac{37,745,191 - 2,939,791}{4,530,177} \\
 &= 7.68
 \end{aligned}$$

\* See Volume 3 Appendix

TABLE 3 - 10

SAXON SOUTH RESERVES  
North Extension X (Oxidized)  
Summary

Saxon Project Feasibility Report  
October 1977

Seam No.	Total Seam Volume (m <sup>3</sup> )	Seam S.G.	In Place Raw Coal (Tonnes)	Mined Raw Coal (Tonnes)	Avg. Yield (%)	Clean Coal (Dry) (Tonnes)
4	233,100	1.52	354,312	286,993	76.8	220,452
3	55,700	1.54	85,778	69,480	65.3	45,403
2	60,000	1.44	86,400	69,984	82.2	57,527
Totals	348,800	1.51	526,490	426,457	75.8	323,382

The Saxon South reserve area contains a total of 106.3 million tonnes of coal in place to a vertical depth of 500 metres excluding those areas that lie within the three open pit areas previously discussed and excluding areas of uncertain geology. This reserve calculation was based on unoxidized coal only and open pit reserve thickness criteria were used in establishing the minimum acceptable seam thickness. A geological factor of .85 and mining factor of .8 were applied to the in place raw coal reserve to obtain an estimated mined raw coal reserve of 72.3 million tonnes. Further work in the form of deep drilling and subsequent mining evaluations will be required to more accurately assess the actual geological and mining factors that should be applied to this reserve. The table of the following page summarizes the 500 metre reserves by seam.

TABLE 3-11

SAXON SOUTH  
Reserves to 500 Metre Vertical Depth  
Excluding Pit Reserves (unoxidized)

Saxon Project Feasibility Report  
October 1977

Seam No.	Avg. Seam Thickness (m)	Total Seam Volume (m <sup>3</sup> )	Seam S.G.	In Place Raw Coal (Tonnes)	Mined Raw Coal (Tonnes)
10	1.22	784,400	1.36	1,066,784	725,413
5	1.49	632,200	1.47	929,334	631,947
4	7.58	31,341,800	1.52	47,639,536	32,394,884
3	1.76	7,389,100	1.54	11,379,214	7,737,865
2	4.04	16,510,500	1.44	23,775,120	16,167,082
1	3.39	14,294,400	1.51	21,584,544	16,477,490
		70,952,400		106,374,532	72,334,681

### 3.4 UNDERGROUND RESERVES - SAXON EAST AND SAXON WEST

#### 341 SUMMARY OF UNDERGROUND RESERVES

##### .1 Basis of Calculation

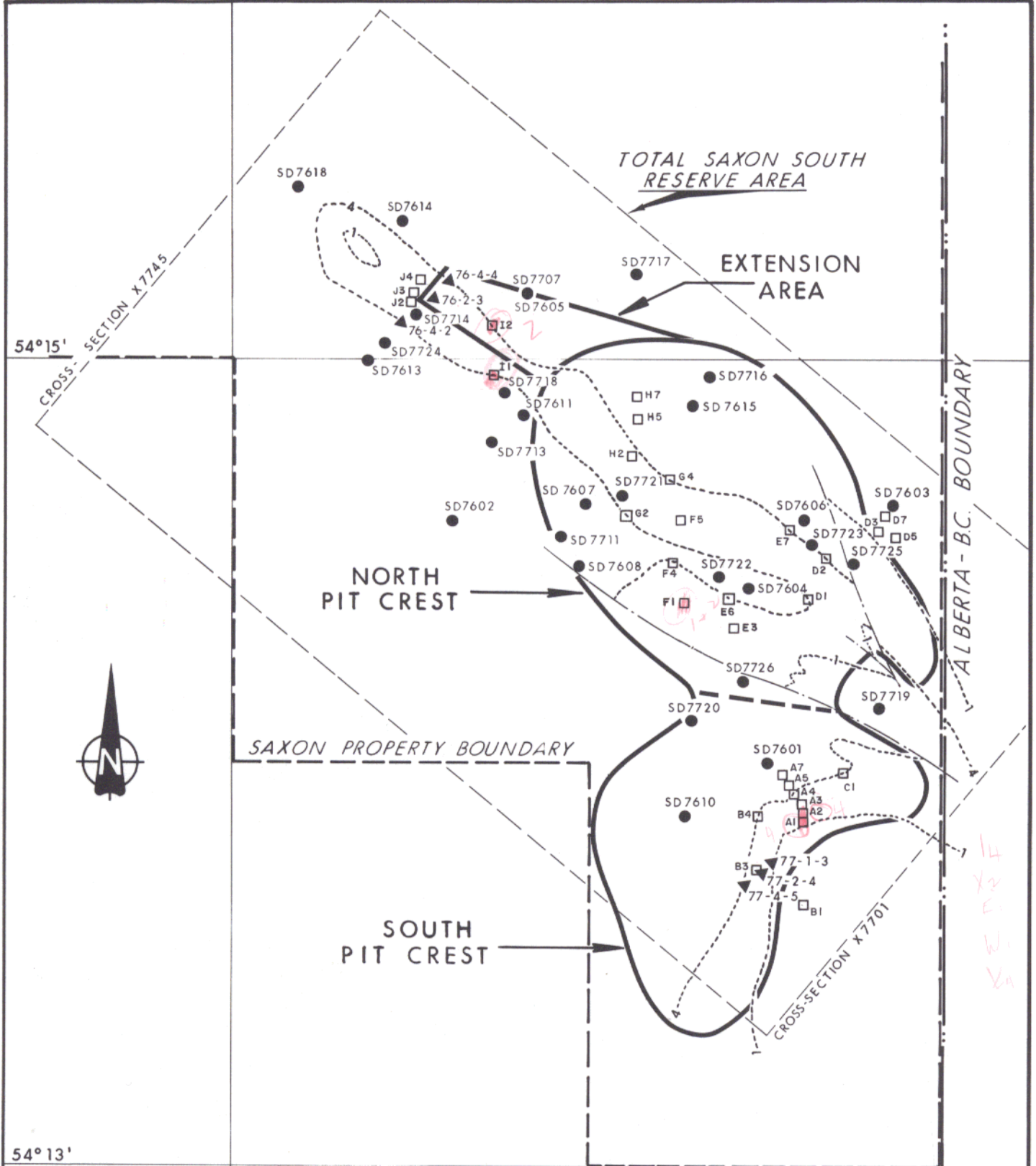
During 1977, exploration for underground reserves was restricted to the Saxon East area south of the Narraway River, where previous exploration had established that the best reserve and mining potential existed. Most holes were extended to intersect the entire coal-bearing sequence of the Gates Formation and it has therefore been possible to calculate reserves for seams 1 and 2 in Block I which were not included in the 1976 preliminary report.

The map on the following page outlines the reserve block areas and summarizes the adit and drill hole and trench data points which have been used to establish the reserves and coal quality for Saxon East, south of the Narraway River. More detailed maps are presented with the data tables and in the appendices. As no new calculations were made for Saxon West or Saxon East, north of the Narraway, the reserve data for these areas has been simply extracted from the 1976 report and details of those calculations are not repeated here.

##### .2 Total Underground Reserves

The reserves for Mines I and II, which were calculated on essentially the same basis as they were for the mines as laid out in Volume IV of this report, total 83.8 million tonnes of coal in place from which it is estimated that 35.5 million tonnes of clean coal or product coal may be obtained. An additional 106.5 million tonnes of coal in place or 46.3 million tonnes of clean (product) coal may be available from other parts of the same seams in the Saxon East area south of the Narraway River. In addition, the Saxon East area north of the Narraway and the Saxon West area adjacent to it contain 70.5 and 26.4 million tonnes of coal in place respectively. These reserves could provide 25.0 and 9.3 million tonnes of additional clean coal. In summary, the underground reserves which have been explored by drilling, adit driveage, and trenching total some 287 million tonnes of coal in place in seams greater than 3 metres thick, and could provide about 116 million tonnes of clean coal product if the seams are considered to be mineable without interference with each other. In this regard it should be noted that not all of this coal is necessarily available as mining part of one seam, for example seam 1 in Block I, may preclude mining the corresponding part of an adjacent seam if the interseam distance is less than 20 metres. Exclusion of seam 2 in Block I would result in a reduction of 23.6 million tonnes of mineable coal from the total 121 million tonnes, or 12.9 million tonnes of clean





54°15'

54°13'

120°03'

- ▲ ADIT
- TRENCH
- DRILL HOLE
- COAL SEAM
- FAULT

<b>SAXON COAL LIMITED</b>		
PREPARED BY: <b>DENISON COAL LIMITED</b>		
<b>SAXON SOUTH</b> SCHEMATIC EXPLORATION DATA POINTS AND RESERVE AREAS		
DRAWN BY: E. Toth	DATE: Oct. '77	SCALE: 1: 25,000
PREP'D BY: G.P.G.	DATE: Oct '77	DRAWING NUMBER:
APPR'D BY: G.P.G.	DATE: Oct '77	SXON 77- 0760 - R01

coal from the total 81.8 million tonnes of available clean coal in the Saxon East area south of the Narraway River. Similar deductions do not appear to be necessary north of the Narraway or in Saxon West, so that a total of 68.9 million tonnes of clean coal may be estimated to be available from Saxon East, south of Narraway, and an additional 34.3 million tonnes from Saxon West and Saxon East, north of the Narraway River.

The underground reserves for the planned mine area (Volume IV), its extensions, the Saxon East area north of the Narraway, and Saxon West are summarized in the following table:

	Coal In Place Tonnes x 10 <sup>6</sup>	Net Clean Coal (Product) Tonnes x 10 <sup>6</sup>	Probable Available Clean Coal Tonnes x 10 <sup>6</sup> (Seam 2, Block I omitted)
Saxon East - South of Narraway			
Mine I	44.9	19.3	15.3
Mine II	38.9	16.2	11.1
Additional	106.5	46.3	42.5
Subtotal	190.3	81.8	68.9
Saxon East - North of Narraway			
	70.5	25.0	25.0
Saxon West			
	26.4	9.3	9.3
Subtotal	96.9	34.3	34.3
Totals	287.2	116.1	103.2

#### 342 SAXON EAST, SOUTH OF THE NARRAWAY RIVER

Although the final reserve calculations for the planned mine areas agree almost exactly with the assumptions given to, and results obtained by Montan Consulting (ie. 70% yield, 35.5 million clean tonnes versus 69.7% yield and 35.5 million tonnes). The mine plans presented in Volume IV will almost certainly have to be modified before final designs are started because the yield of clean coal that can be expected from seam 2 in Block I is about 55%, which is much less than the average even though the overall yield for the underground coal reserves is close to what had been expected.



Due to the need to consider alternates, the Saxon East reserves south of the Narraway River have been established for and are presented as three separate cases covering essentially the same area.

Case I may be considered the base case. It was calculated on similar assumptions to the case which has been used for the mine planning (see Volume IV). This layout has one dewatering station on section 7713 at the base of level 2, and assumes that coal would be mined above this in seams 2 and 4 in Block I and above drainage only in seams 1 and 4 in Block II. In addition to this, Case I reserve calculations have been extended to level 3 in both Blocks I and II on the assumption that an additional dewatering station could be placed on section 7736 and the one on section 7713 could be moved one level lower.

Case II reserves have been calculated on the basis that reserves roughly equivalent to those in case I could be accessed by main roads from only one dewatering and pump station near section 7721.

Case III represents the geological reserves calculated to a depth of 500 metres, essentially without deductions for river and stream barriers. These calculations represent the total reserve and it should be clearly understood that the calculation of reserves in Cases I and II are not additional to the geological reserve but that they simply represent alternate mine layout options for extracting coal from this total resource.

#### .1 Case I - Reserves for Planned Mining Areas

Table 3-12 and the maps following it, summarize the reserves in the planned mine areas, as well as the extensions to it down to level three in all seams. It is note-worthy that seam 2 in Block I is complicated by a major fault and that the yields in that area are also particularly low, suggesting that a substitute area should be chosen to improve mining costs for an equivalent amount of coal.

#### .2 Case II - Reserves Accessible from One Shaft Near Section 7721

Table 3-13 and the maps following it summarize the reserves in the Saxon East area south of the Narraway which may be accessible from one shaft located near section 7721. It should be noted that no level 1 is present in Block II as the first underground level there, is equivalent to level 2 in Block I by the time the main road is extended from it to section 7721. Also, level 4 is missing from seam 4 in Block II as it would be complicated by faulting.

#### .3 Case III - Geological Reserves to a Depth of 500 Metres

The Saxon East reserves to a 500 metre depth have been

calculated primarily to provide an estimate of the total coal reserve without regard to any particular scheme for extracting it. The method of calculating these reserves is comparable to that used in 1976. Except for minor cases which are noted in the tables, these reserves have been calculated without reference to safety barriers in the vicinity of Saxon Creek or the Narraway River. These geological reserves are summarized in table 3-14

#### .4 Comments

Although variations still remain to be considered to obtain the optimum mine layout for extracting coal from Blocks I and II in Saxon East, it is clear from the reserve calculations of Cases I, II, and III that far more than sufficient coal reserves are available to satisfy the requirement for two million tonnes per year of clean coal. The structure, average thickness, and estimated yield of clean coal in a number of alternate mining areas is sufficiently similar to that which was assumed by Montan Consulting for seam 2 in Block I, to suggest that there will be no serious cost impact in deleting this coal and replacing it with coal from other areas. In fact, since a 10% allowance has been made by Montan for extra main road driveage due to faulting, then if seam 2 in Block I is omitted from the mine plan, some improvement in mining costs may be possible as this seam is the most severely faulted. Also, selection of any other seam would improve the average clean coal yield and may further reduce development costs. No definitive assessment of these impacts is possible until new mine layouts and all associated cost components have been calculated; however, any negative impact should be relatively minor.

TABLE 3-12

SAXON EAST  
(South of Narraway)  
Underground Reserves

Saxon Project Feasibility Report  
October 1977

## Case I: Reserves For Planned Mining Areas Plus Extensions

a) Planned Mining Area  
- Mine I, as in Montan Report

Block	Seam	Level	Average Thickness	Average Specific Gravity	Coal In Place Tonnes x 10 <sup>6</sup>	Mineable Coal* Tonnes x 10 <sup>6</sup>	Average Estimated Yield	Theoretical Clean Coal Tonnes x 10 <sup>6</sup>	Net Clean Coal** Tonnes x 10 <sup>6</sup>
I	2	D	5.53	1.609	11.937	7.640	55.7	4.258	4.04
I	4	D	9.22	1.461	18.784	12.022	72.7	8.736	8.29
II	1	D	5.55	1.400	8.132	5.204	84.4	4.391	4.17
II	4	D	3.99	1.470	6.040	3.866	75.9	2.935	2.78
Total Mine I					44.893	28.732	70.7	20.320	19.30

b) Planned Mining Area  
- Mine II, as in Montan Report

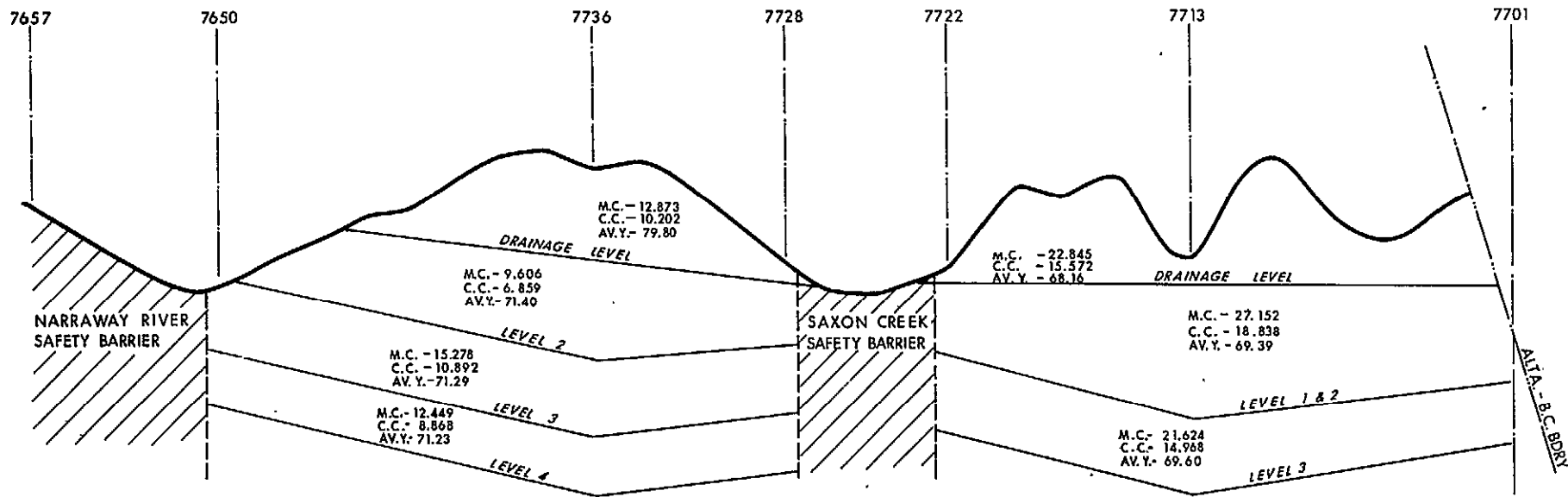
I	2	1 & 2	5.09	1.632	14.264	9.129	58.3	5.320	5.05
I	4	1 & 2	9.70	1.494	24.684	15.798	74.2	11.716	11.13
Total Mine II					38.948	24.927	68.3	17.036	16.18
Total Mines I and II					83.841	53.659	69.6	37.356	35.48

## c) Additional Reserves

I	1	D	4.65	1.420	4.973	3.183	81.0	2.578	2.44
I	1	1 & 2	4.84	1.419	3.477	2.225	81.0	1.802	1.71
I	1	3	5.76	1.442	3.923	2.511	81.0	2.034	1.93
I	2	3	4.97	1.627	10.774	6.896	58.7	4.050	3.84
I	4	3	9.41	1.502	19.087	12.217	72.7	8.884	8.43
II	1	2	5.27	1.464	5.063	3.240	77.0	2.495	2.37
II	1	3	4.96	1.447	7.659	4.902	77.0	3.775	3.58
II	1	4	4.99	1.443	8.698	5.567	76.9	4.286	4.07
II	2	D	4.74	1.498	5.943	3.803	75.6	2.877	2.73
II	2	2	7.17	1.559	7.265	4.649	66.5	3.092	2.93
II	2	3	6.67	1.552	10.751	6.880	66.5	4.574	4.34
II	2	4	6.60	1.550	10.754	6.882	66.6	4.582	4.35
II	4	2	3.62	1.467	2.683	1.717	74.1	1.272	1.20
II	4	3	4.06	1.493	5.462	3.496	72.7	2.543	2.41
Total Additional Reserves					106.512	68.168	71.7	48.844	46.33
Total Case I Reserves					190.353	121.827	70.8	86.200	81.81

\* Layout Losses 20%, Mining Losses 20%, Combined Factor = 0.64

\*\* Reduced by a 5% Additional Geological Factor



**BLOCK 2**  
 TOTAL MINED TONNES - 50.206 × 10<sup>6</sup>  
 TOTAL CLEAN TONNES - 36.821 × 10<sup>6</sup>  
 YIELD - 73.47 %

**BLOCK 1**  
 TOTAL MINED TONNES - 71.621 × 10<sup>6</sup>  
 TOTAL CLEAN TONNES - 49.379 × 10<sup>6</sup>  
 YIELD - 69.05 %

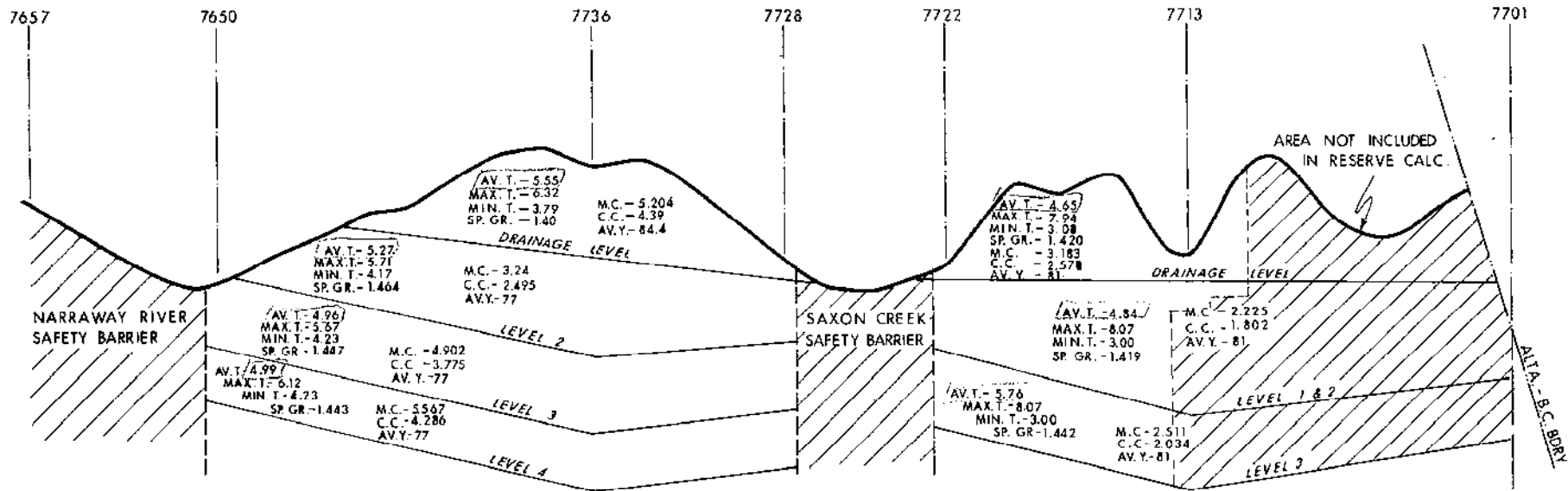
**SEAMS 1, 2 & 4**  
 TOTAL MINED TONNES - 121.827 × 10<sup>6</sup>  
 TOTAL CLEAN TONNES - 86.200 × 10<sup>6</sup>  
 YIELD - 70.89 %

**LEGEND:**

AV. T.	— AVERAGE THICKNESS—METRES
MAX. T.	— MAXIMUM THICKNESS — "
MIN. T.	— MINIMUM THICKNESS — "
SR. GR.	— SPECIFIC GRAVITY
M.C.	— MINED COAL — TONNES × 10 <sup>6</sup>
C.C.	— CLEAN COAL - THEOR. " " "
AV. Y.	— AVERAGE YIELD - %

SAXON COAL LIMITED		
PREPARED BY DENISON COAL LIMITED		
<b>SAXON EAST RESERVES CASE 1 SUMMARY</b>		
DRAWN BY: J.W.K.	DATE: OCT. 77	SCALE:
PREP'D BY: G.J.	DATE: OCT. 77	DRAWING NUMBER:
APP'D BY: G.P.G.	DATE: OCT. 77	SXON77-0762-R01

\* SCHEMATIC-NOT TO SCALE



**BLOCK 2**

TOTAL MINED TONNES -  $18.913 \times 10^6$

TOTAL CLEAN TONNES -  $14.946 \times 10^6$

YIELD - 79.02%

**BLOCK 1**

TOTAL MINED TONNES -  $7.919 \times 10^6$

TOTAL CLEAN TONNES -  $6.414 \times 10^6$

YIELD - 81.0%

**SEAM 1**

TOTAL MINED TONNES -  $26.833 \times 10^6$

TOTAL CLEAN TONNES -  $21.360 \times 10^6$

YIELD - 79.6%

**LEGEND:**

AV. T. - AVERAGE THICKNESS - METRES  
 MAX. T. - MAXIMUM THICKNESS - "  
 MIN. T. - MINIMUM THICKNESS - "  
 SP. GR. - SPECIFIC GRAVITY  
 M.C. - MINED COAL - TONNES  $\times 10^6$   
 C.C. - CLEAN COAL - THEOR. " " "  
 AV. Y. - AVERAGE YIELD - %

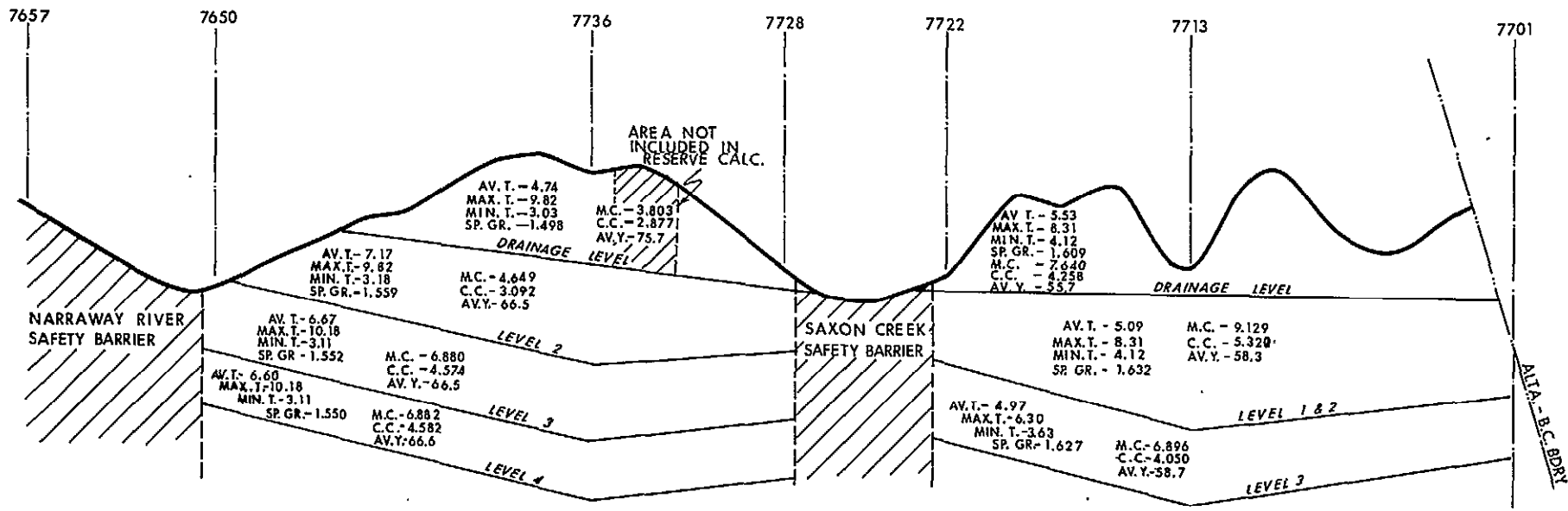
**SAXON COAL LIMITED**

PREPARED BY  
**DENISON COAL LIMITED**

**SAXON EAST RESERVES**  
**CASE 1 - SEAM 1**

DRAWN BY: J.W.K.	DATE: OCT. 77	SCALE:
PREP'D BY: G.J.	DATE: OCT. 77	DRAWING NUMBER:
APPR'D BY: C.S.P.	DATE: OCT. 77	SXON 77-0262-R01

\* SCHEMATIC - NOT TO SCALE



**BLOCK 2**

TOTAL MINED TONNES -  $22.214 \times 10^6$   
 TOTAL CLEAN TONNES -  $15.125 \times 10^6$   
 YIELD - 68.08 %

**BLOCK 1**

TOTAL MINED TONNES -  $23.665 \times 10^6$   
 TOTAL CLEAN TONNES -  $13.628 \times 10^6$   
 YIELD - 58.7 %

**SEAM 2**

TOTAL MINED TONNES -  $45.880 \times 10^6$   
 TOTAL CLEAN TONNES -  $28.753 \times 10^6$   
 YIELD - 62.79 %

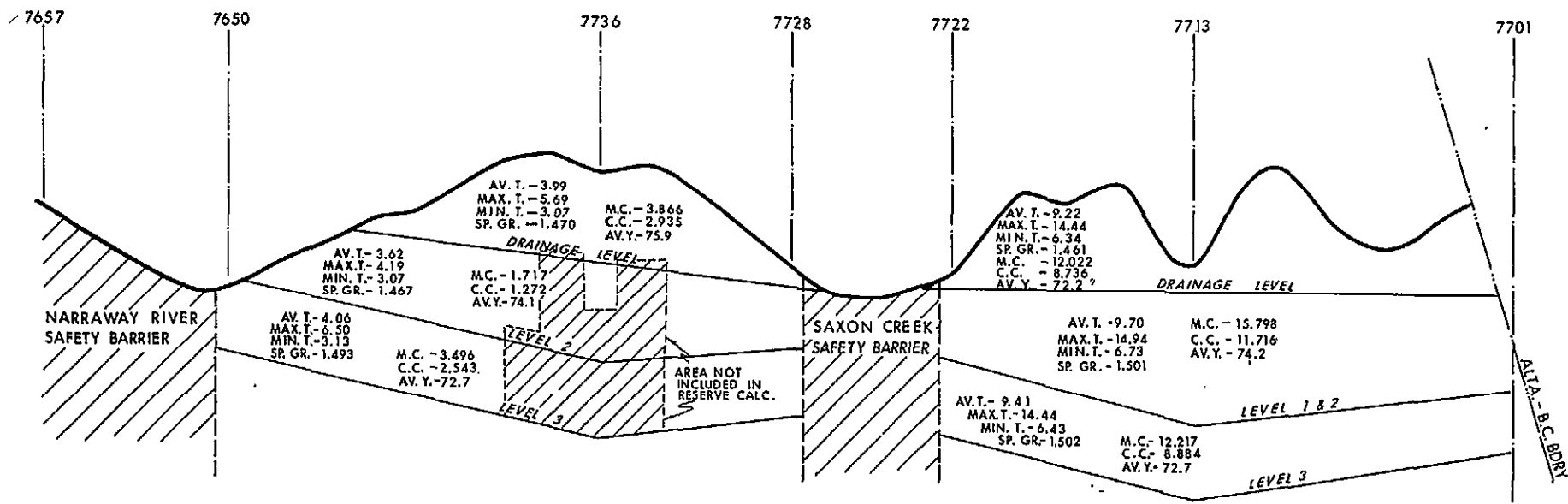
**LEGEND:**

AV. T. — AVERAGE THICKNESS—METRES  
 MAX. T. — MAXIMUM THICKNESS— "  
 MIN. T. — MINIMUM THICKNESS— "  
 SP. GR. — SPECIFIC GRAVITY  
 M. C. — MINED COAL— TONNES  $\times 10^6$   
 C. C. — CLEAN COAL - THEOR. " " "  
 AV. Y. — AVERAGE YIELD— %

<b>SAXON COAL LIMITED</b>		
PREPARED BY <b>DENISON COAL LIMITED</b>		
<b>SAXON EAST RESERVES CASE 1 SEAM 2</b>		
DRAWN BY: J.W.K.	DATE: OCT. 77	SCALE:
PREP'D BY: G.J.	DATE: OCT. 77	DRAWING NUMBER:
APP'D BY: G.P.G.	DATE: OCT. 77	SKON77-0762-R01

\* SCHEMATIC - NOT TO SCALE





**BLOCK 2**

TOTAL MINED TONNES -  $9.079 \times 10^6$   
 TOTAL CLEAN TONNES -  $6.750 \times 10^6$   
 YIELD - 74.35 %

**BLOCK 1**

TOTAL MINED TONNES -  $40.037 \times 10^6$   
 TOTAL CLEAN TONNES -  $29.336 \times 10^6$   
 YIELD - 73.35 %

**SEAM 4**

TOTAL MINED TONNES -  $49.116 \times 10^6$   
 TOTAL CLEAN TONNES -  $36.087 \times 10^6$   
 YIELD - 73.54 %

**LEGEND:**

AV. T.	- AVERAGE THICKNESS - METRES
MAX. T.	- MAXIMUM THICKNESS - "
MIN. T.	- MINIMUM THICKNESS - "
SP. GR.	- SPECIFIC GRAVITY
M.C.	- MINED COAL - : TONNES $\times 10^6$
C.C.	- CLEAN COAL - THEOR " " "
AV. Y.	- AVERAGE YIELD - %

<b>SAXON COAL LIMITED</b>		
PREPARED BY <b>DENISON COAL LIMITED</b>		
<b>SAXON EAST RESERVES CASE 1 SEAM 4</b>		
DRAWN BY: J.W.K.	DATE: OCT. 77	SCALE:
PREP'D BY: G.J.	DATE: OCT. 77	DRAWING NUMBER:
APPRO'D BY: G.P.G.	DATE: OCT. 77	SXON77-0762-R01

\* SCHEMATIC-NOT TO SCALE \*\*

TABLE 3-13

SAXON EAST  
(South of Narraway)  
Underground Reserves

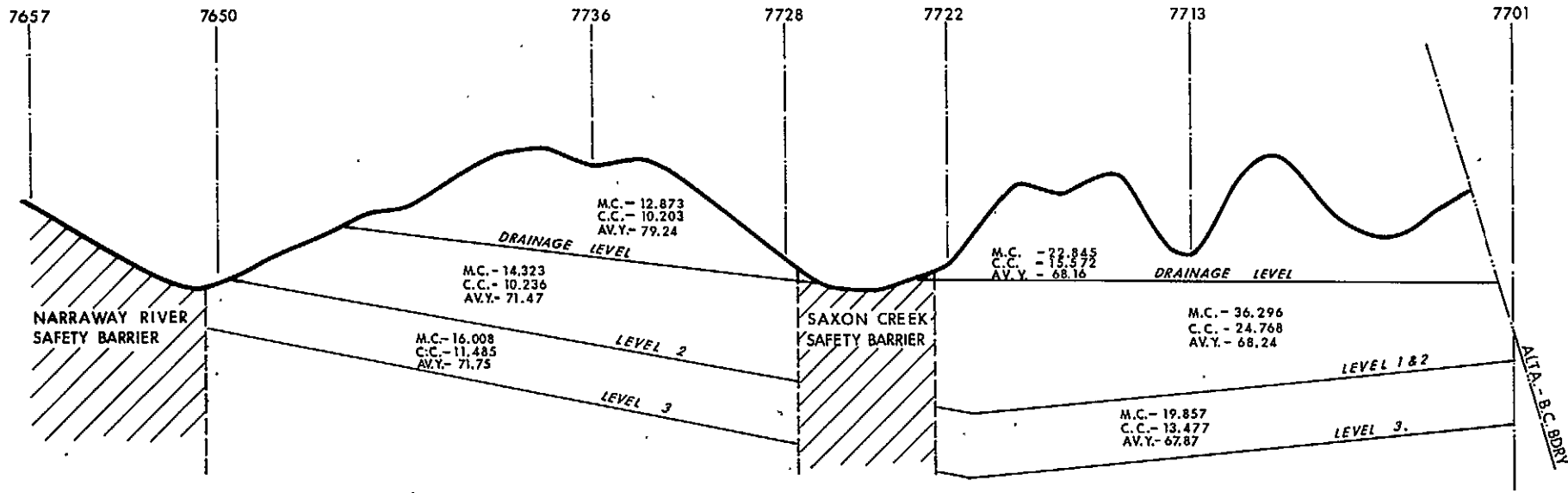
Saxon Project Feasibility Report  
October 1977

Case II: Reserves Accessible From One Shaft Near Section 7721

Block	Seam	Level	Average Thickness	Average Specific Gravity	Coal In Place Tonnes x 10 <sup>6</sup>	Mineable Coal* Tonnes x 10 <sup>6</sup>	Average Estimated Yield	Theoretical Clean Coal Tonnes x 10 <sup>6</sup>	Net Clean Coal** Tonnes x 10 <sup>6</sup>
I	1	D	4.65	1.420	4.973	3.183	81.0	2.578	2.44
I	1	1 & 2	5.48	1.438	7.612	4.872	77.8	3.790	3.60
I	1	3	4.08	1.442	3.169	2.028	77.7	1.576	1.49
I	2	D	5.53	1.609	11.937	7.640	55.7	4.258	4.04
I	2	1 & 2	5.09	1.616	18.489	11.833	68.6	8.119	7.71
I	2	3	5.07	1.623	10.010	6.407	68.7	4.404	4.18
I	4	D	9.22	1.461	18.784	12.022	72.7	8.736	8.29
I	4	1 & 2	9.47	1.501	30.611	19.591	65.6	12.859	12.21
I	4	3	9.63	1.500	17.846	11.422	65.6	7.497	7.12
Total Block I					123.431	78.998	68.1	53.817	51.08
II	1	D	5.55	1.400	8.132	5.204	84.4	4.391	4.17
II	1	2	5.20	1.460	7.504	4.803	77.0	3.698	3.51
II	1	3	4.88	1.446	7.451	4.769	77.8	3.756	3.56
II	2	D	4.74	1.498	5.943	3.803	75.6	2.877	2.73
II	2	2	6.83	1.547	10.183	6.517	66.6	4.339	4.12
II	2	3	6.87	1.547	10.956	7.012	66.5	4.665	4.43
II	4	D	3.99	1.470	6.040	3.866	75.9	2.935	2.78
II	4	2	4.18	1.489	4.692	3.003	73.2	2.199	2.08
II	4	3	4.61	1.501	6.605	4.227	72.5	3.064	2.91
Total Block II					67.506	43.204	73.9	31.924	30.29
Total Case II					190.937	122.202	70.2	85.741	81.37

\* Layout Losses 20%, Mining Losses 20%, Combined Factor = 0.64

\*\* Reduced by a 5% Additional Geological Factor



**BLOCK 2**

TOTAL MINED TONNES -  $43.204 \times 10^6$

TOTAL CLEAN TONNES -  $31.924 \times 10^6$

YIELD - 73.89%

**BLOCK 1**

TOTAL MINED TONNES -  $78.998 \times 10^6$

TOTAL CLEAN TONNES -  $53.817 \times 10^6$

YIELD - 68.12%

**SEAMS 1,2 & 4**

TOTAL MINED TONNES -  $122.202 \times 10^6$

TOTAL CLEAN TONNES -  $85.741 \times 10^6$

YIELD - 70.16%

**LEGEND:**

AV. T. — AVERAGE THICKNESS—METRES  
 MAX. T. — MAXIMUM THICKNESS— "  
 MIN. T. — MINIMUM THICKNESS— "  
 SP. GR. — SPECIFIC GRAVITY  
 M.C. — MINED COAL— TONNES  $\times 10^6$   
 C.C. — CLEAN COAL— THEOR. " " "  
 AV. Y. — AVERAGE YIELD— %

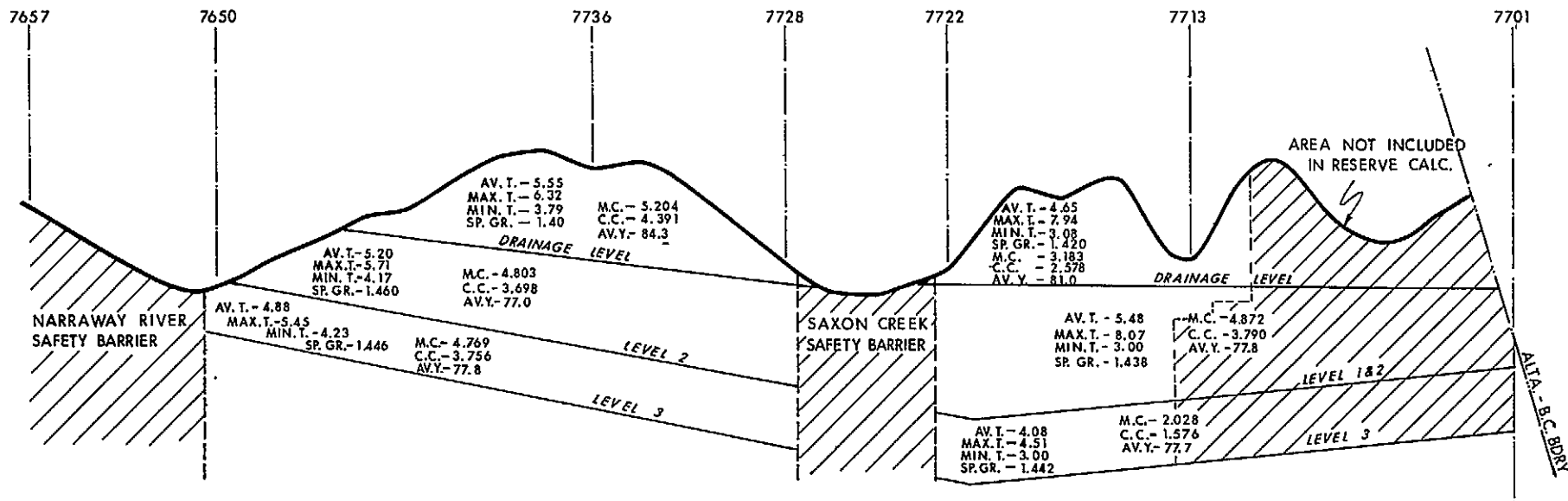
**SAXON COAL LIMITED**

PREPARED BY:  
**DENISON COAL LIMITED**

**SAXON EAST RESERVES  
 CASE 2 SUMMARY**

DRAWN BY: J.W.K.	DATE: OCT. 77	SCALE:
PREP'D BY: G.J.	DATE: OCT. 77	DRAWING NUMBER:
APP'D BY: G.R.C.	DATE: OCT. 77	SKON77-0762-R01

\* SCHEMATIC—NOT TO SCALE



**BLOCK 2**

TOTAL MINED TONNES -  $14.776 \times 10^6$   
 TOTAL CLEAN TONNES -  $11.845 \times 10^6$   
 YIELD - 80.15%

**BLOCK 1**

TOTAL MINED TONNES -  $10.083 \times 10^6$   
 TOTAL CLEAN TONNES -  $7.944 \times 10^6$   
 YIELD - 78.79%

**SEAM 1**

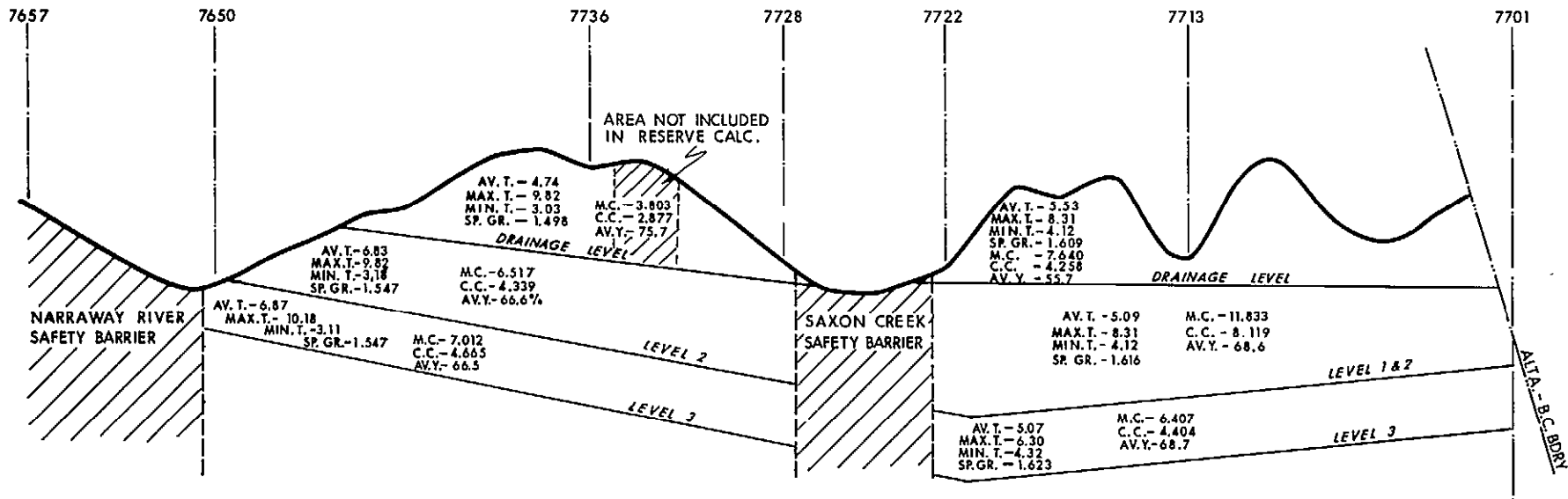
TOTAL MINED TONNES -  $24.859 \times 10^6$   
 TOTAL CLEAN TONNES -  $19.789 \times 10^6$   
 YIELD - 79.60%

**LEGEND:**

AV. T.	— AVERAGE THICKNESS — METRES
MAX. T.	— MAXIMUM THICKNESS — "
MIN. T.	— MINIMUM THICKNESS — "
SP. GR.	— SPECIFIC GRAVITY
M.C.	— MINED COAL — TONNES $\times 10^6$
C.C.	— CLEAN COAL - THEOR. " " "
AV. Y.	— AVERAGE YIELD - %

<b>SAXON COAL LIMITED</b>		
PREPARED BY <b>DENISON COAL LIMITED</b>		
<b>SAXON EAST RESERVES CASE 2 SEAM 1</b>		
DRAWN BY: J.W.K.	DATE: OCT. 77	SCALE:
PREP'D BY: G.J.	DATE: OCT. 77	DRAWING NUMBER:
APP'D BY: G.P.G.	DATE: OCT. 77	5XON77-0762-R01

\* SCHEMATIC - NOT TO SCALE



**BLOCK 2**

TOTAL MINED TONNES -  $17.332 \times 10^6$

TOTAL CLEAN TONNES -  $11.881 \times 10^6$

YIELD - 68.55 %

**BLOCK 1**

TOTAL MINED TONNES -  $25.880 \times 10^6$

TOTAL CLEAN TONNES -  $16.781 \times 10^6$

YIELD - 64.84 %

**SEAM 2**

TOTAL MINED TONNES - 43.212

TOTAL CLEAN TONNES - 28.662

YIELD - 66.33 %

**LEGEND:**

AV. T. — AVERAGE THICKNESS - METRES  
 MAX. T. — MAXIMUM THICKNESS - "  
 MIN. T. — MINIMUM THICKNESS - "  
 SP. GR. — SPECIFIC GRAVITY  
 M. C. — MINED COAL - TONNES  $\times 10^6$   
 C. C. — CLEAN COAL - THEOR. " " "  
 AV. Y. — AVERAGE YIELD - %

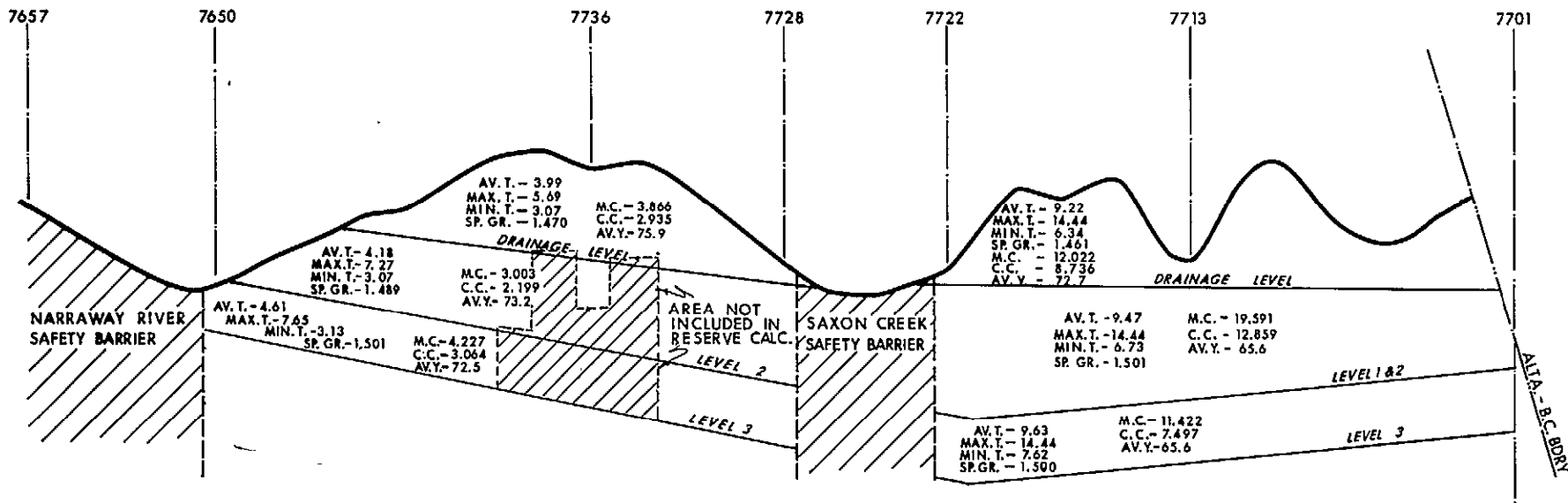
**SAXON COAL LIMITED**

PREPARED BY:  
**DENISON COAL LIMITED**

**SAXON EAST RESERVES**  
**CASE 2 SEAM .2**

DRAWN BY: J. W. K.	DATE: OCT. 77	SCALE:
PREP'D BY: G. J.	DATE: OCT. 77	DRAWING NUMBER:
APP'D BY: G. P. G.	DATE: OCT. 77	SXON77-0762-R01

\* SCHEMATIC - NOT TO SCALE



**BLOCK 2**

TOTAL MINED TONNES -  $11.096 \times 10^6$

TOTAL CLEAN TONNES -  $8.198 \times 10^6$

YIELD - 73.88 %

**BLOCK 1**

TOTAL MINED TONNES -  $43.035 \times 10^6$

TOTAL CLEAN TONNES -  $29.092 \times 10^6$

YIELD - 67.76 %

**SEAM 4**

TOTAL MINED TONNES -  $54.131 \times 10^6$

TOTAL CLEAN TONNES -  $37.290 \times 10^6$

YIELD - 68.89 %

**LEGEND:**

AV. T. - AVERAGE THICKNESS - METRES  
 MAX. T. - MAXIMUM THICKNESS - "  
 MIN. T. - MINIMUM THICKNESS - "  
 SP. GR. - SPECIFIC GRAVITY  
 M. C. - MINED COAL - TONNES  $\times 10^6$   
 C. C. - CLEAN COAL - THEOR. " " "  
 AV. Y. - AVERAGE YIELD - %

**SAXON COAL LIMITED**

PREPARED BY:  
**DENISON COAL LIMITED**

**SAXON EAST RESERVES**  
**CASE 2 SEAM 4**

DRAWN BY: J.W.K.	DATE: OCT. 77	SCALE:
PREP'D BY: G.J.	DATE: OCT. 77	DRAWING NUMBER: SKON77-0762-R01
APP'D BY: C.P.G.	DATE: OCT. 77	

\* SCHEMATIC - NOT TO SCALE

TABLE 3-14

SAXON EAST  
(South of Narraway)  
Underground Reserves

Saxon Project Feasibility Report  
October 1977

Case III: Geological Reserves to 500 Metres

<u>Block</u>	<u>Seam</u>	<u>Level</u>	<u>Average Thickness</u>	<u>Average Specific Gravity</u>	<u>Coal In Place Tonnes x 10<sup>6</sup></u>	<u>Mineable Coal Tonnes x 10<sup>6</sup></u>
I	I	0-500m	5.05	1.430	18.113	11.592
I	2	D	5.53	1.609	11.937	7.640
I	2	1 & 2	5.09	1.632	14.264	9.129
I	2	3*	4.97	1.627	10.774	6.896
I	2	L <sub>3</sub> -500m	4.70	1.599	6.632	4.244
I	4	D	9.22	1.461	18.784	12.022
I	4	1 & 2	9.70	1.494	24.684	15.798
I	4	3*	9.41	1.502	19.087	12.217
I	4	L <sub>3</sub> -500m	8.41	1.527	12.744	8.156
Total Block I					137.019	87.694
II	1	D	5.55	1.400	8.132	5.204
II	1	D-500m	5.59	1.403	38.965	24.937
II	2	0-500m	5.29	1.544	47.860	30.631
II	4	D	3.99	1.470	6.040	3.866
II	4	D-500m	4.11	1.500	27.190	17.402
Total Block II					128.187	82.040
Total Case III					265.206	169.734

\* Some geological reserves are omitted from Block I, Level 3 under Saxon Creek to be consistent with the Case I and Case II calculations where a safety barrier has been left under the plant area.

Note: Yields and amounts of clean coal have not been calculated for Case III.

TABLE 3-15

INFERRED RESERVESSaxon Project Feasibility Report  
October 1977SAXON EAST INFERRED RESERVES - (NORTH OF NARRAWAY)  
CROSS-SECTION METHOD

SEAM	BLOCK	COAL SEAM			AVERAGE INFLUENCE (m)	S.G.	COAL IN PLACE (TONNES x 10 <sup>6</sup> )	GEOLOGICAL FACTORED COAL x 0.85	MINING RECOVERY FACTORED COAL x 0.70	WASH PLANT YIELD (TONNES x 10 <sup>6</sup> ) FACTORED COAL* x 0.70	NET CLEAN COAL YIELD (TONNES x 10 <sup>6</sup> ) 0.85 GEO-MINING FACTOR
		LENGTH (m)	MAP SCALE FACTOR x 50 (m)	AVERAGE THICKNESS (m)							
4	IV (Oxidized)	9.47	473.50	3.36	491	1.45	1.13	0.96	0.67	0.47	0.40
	IV (Unoxidized)	152.80	7,640.00	3.31	495	1.45	18.16	15.44	10.81	7.57	6.43
2	III (Oxidized)	1.30	65.00	4.03	525	1.45	0.20	0.17	0.12	0.08	0.07
	III (Unoxidized)	38.70	1,935.00	4.02	501	1.45	5.65	4.80	3.36	2.35	2.00
1	III (Oxidized)	5.08	254.00	5.98	507	1.45	1.12	0.95	0.67	0.47	0.40
	III (Unoxidized)	229.00	11,450.00	5.40	521	1.45	46.74	39.73	27.82	19.47	16.55
TOTAL							(OXIDIZED)	2.45			0.87
							(UNOXIDIZED)	70.55			24.98

SAXON WEST INFERRED RESERVES  
CROSS-SECTION METHOD

1	V (Oxidized)	0.44	22.00	7.31	500	1.45	0.12	0.10	0.07	0.05	0.04
	V (Unoxidized)	133.80	6,690.00	5.32	511	1.45	26.39	22.43	15.70	10.99	9.34
TOTAL							(OXIDIZED)	0.12			0.04
							(UNOXIDIZED)	26.39			9.34

\* Includes wash plant efficiency factor