

826/7

Lodgepole

CAR 426

LP-D-101

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pt. 4 of 6

826/7
Lodgepole

TRENCH SAMPLES TAKEN
IN SUMMER 1977 BY FRANK
AND TED.

THERE IS A STRAT. SECTION.

14M

CROWS NEST RESOURCES ANALYSIS REPORT

AREA: LODGEPOLE

HOLE NO. LP-D-101

DATE: October 19, 1978

ANALYST: Ken McCullough

LAB NO.	SAMPLE NO.	SEAM	INTERVAL (METRES)	FRACTION	% AIR DRY MOIST	% RESID. MOIST.	% ASH d.b.	% V.M.	% F.C.	F.S.I.	% YIELD	
78-237	4		57.9 - 59.4	RAW		.08	6.18			6½	~~X~~	
				1.4 FLOAT								
				1.4 SINK								
				1.5 FLOAT		1.14	3.68	21.25		6½	88.32	
				1.5 SINK							11.68	
				1.6 FLOAT								
				1.6 SINK								
78-238	5		59.4 - 60.2	RAW		.40	25.98			5½	~~X~~	
				1.4 FLOAT								
				1.4 SINK								
				1.5 FLOAT		.57	6.06	20.50		6	63.47	
				1.5 SINK							36.53	
				1.6 FLOAT								
				1.6 SINK								
78-239	6		60.2 - 60.5	RAW		.11	87.90			0	~~X~~	
				1.4 FLOAT								
				1.4 SINK								
				1.5 FLOAT								
				1.5 SINK								
				1.6 FLOAT								
				1.6 SINK								

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78-240	7		84.55 - 86.20	RAW		.04	48.18			1	X
				1.4 FLOAT							
				1.4 SINK							
				1.5 FLOAT		.67	6.48	20.84		8	27.19
				1.5 SINK							72.81
				1.6 FLOAT							
				1.6 SINK							
78-241	8		96.10 - 97.80	RAW		.37	41.99			4	X
				1.4 FLOAT							
				1.4 SINK							
				1.5 FLOAT		.41	9.20	19.44		7½	43.42
				1.5 SINK							56.58
				1.6 FLOAT							
				1.6 SINK							
78-242	9		113.88 - 118.47	RAW		.42	20.72			4½	X
				1.4 FLOAT							
				1.4 SINK							
				1.5 FLOAT		.63	7.88	19.79		6	67.73
				1.5 SINK							32.27
				1.6 FLOAT							
				1.6 SINK							

CROWS NEST RESOURCES ANALYSIS REPORT

AREA: LODGEPOLEHOLE NO. Lp-D-101 DATE: Oct. 19/78ANALYST: Ken McCullough

LAB NO.	SAMPLE NO.	SEAM	INTERVAL (METRES)	FRACTION	% AIR DRY MOIST	% RESID. MOIST.	% ASH d.b.	% V.M.	% F.C.	F.S.I.	% YIELD	
78-234	10		118.47 - 119.15	RAW		.33	16.08			1½	~~X~~	
				1.4 FLOAT								
				1.4 SINK								
				1.5 FLOAT		.45	10.31	17.70		1½	73.39	
				1.5 SINK							26.61	
				1.6 FLOAT								
				1.6 SINK								
78-244	11		121.5 - 122.9	RAW		.34	20.89			4	~~X~~	
				1.4 FLOAT								
				1.4 SINK								
				1.5 FLOAT		.27	9.63	18.35		5	67.58	
				1.5 SINK							32.42	
				1.6 FLOAT								
				1.6 SINK								
78-245	12		180.72 - 182.58	RAW		.36	20.15			1	~~X~~	
				1.4 FLOAT								
				1.4 SINK								
				1.5 FLOAT		.71	8.71	17.35		2	55.44	
				1.5 SINK							44.56	
				1.6 FLOAT								
				1.6 SINK								

CROWS NEST RESOURCES ANALYSIS REPORT

AREA: LODGEPOLE

HOLE NO. LP-D-101

DATE: Oct. 19, 1978

ANALYST: Ken McCullough

LAB NO.	SAMPLE NO.	SEAM	INTERVAL (METRES)	FRACTION	% AIR DRY MOIST	% RESID. MOIST.	% ASH d.b.	% V.M.	% F.C.	F.S.I.	% YIELD
78-246	13		182.58 - 184.28	RAW		.31	17.08			1	X
				1.4 FLOAT							
				1.4 SINK							
				1.5 FLOAT		.56	7.32	18.05		1	48.64
				1.5 SINK							51.36
				1.6 FLOAT							
				1.6 SINK							
78-247	14		184.28 - 185.93	RAW		.54	21.74			2½	X
				1.4 FLOAT							
				1.4 SINK							
				1.5 FLOAT		1.31	6.35	19.01		3	58.52
				1.5 SINK							41.48
				1.6 FLOAT							
				1.6 SINK							
78-248	15		185.93 - 187.45	RAW		.44	25.49			1½	X
				1.4 FLOAT							
				1.4 SINK							
				1.5 FLOAT		1.13	9.02	17.89		2	49.97
				1.5 SINK							50.03
				1.6 FLOAT							
				1.6 SINK							

CROWS NEST RESOURCES ANALYSIS REPORT

AREA: LODGEPOLE

HOLE NO. LP-D-101 DATE: Oct. 19/78

ANALYST: Ken McCullough

LAB NO.	SAMPLE NO.	SEAM	INTERVAL (METRES)	FRACTION	% AIR DRY MOIST	% RESID. MOIST.	% ASH d.b.	% V.M.	% F.C.	F.S.I.	% YIELD
78-249	16		187.45 - 188.98	RAW		.47	28.87			1½	X
				1.4 FLOAT							
				1.4 SINK							
				1.5 FLOAT		1.51	8.54	19.35		2½	54.40
				1.5 SINK							45.60
				1.6 FLOAT							
				1.6 SINK							
78-250	17		188.98 - 190.50	RAW		.33	27.57			1	X
				1.4 FLOAT							
				1.4 SINK							
				1.5 FLOAT		1.19	9.01	18.44		1½	38.77
				1.5 SINK							61.23
				1.6 FLOAT							
				1.6 SINK							
78.251	18		190.50 - 192.02	RAW		.41	28.70			1	X
				1.4 FLOAT							
				1.4 SINK							
				1.5 FLOAT		1.22	10.61	22.86		1½	32.64
				1.5 SINK							67.36
				1.6 FLOAT							
				1.6 SINK							

CROWS NEST RESOURCES ANALYSIS REPORT

AREA: LODGEPOLEHOLE NO. LP-D-101DATE: Oct. 19, 1978ANALYST: Ken McCullough

LAB NO.	SAMPLE NO.	SEAM	INTERVAL (METRES)	FRACTION	% AIR DRY MOIST	% RESID. MOIST.	% ASH d.b.	% V.M.	% F.C.	F.S.I.	% YIELD	
78-252	19		192.02 192.94	RAW		.41	24.82			1	~~X~~	
				1.4 FLOAT								
				1.4 SINK								
				1.5 FLOAT		1.07	10.84	17.38		1½	57.98	
				1.5 SINK							42.02	
				1.6 FLOAT								
				1.6 SINK								
78-253	20		192.94 - 194.16	RAW		.30	33.27			1	~~X~~	
				1.4 FLOAT								
				1.4 SINK								
				1.5 FLOAT		.96	12.31	17.50		1	31.84	
				1.5 SINK							68.16	
				1.6 FLOAT								
				1.6 SINK								
78-262	21		324.85 - 325.63	RAW		.44	45.13			1	~~X~~	
				1.4 FLOAT								
				1.4 SINK								
				1.5 FLOAT		.75	17.26	18.41		3½	23.21	
				1.5 SINK							76.79	
				1.6 FLOAT								
				1.6 SINK								

CROWS NEST RESOURCES ANALYSIS REPORT

AREA: LODGEPOLE

HOLE NO. LP-D101

DATE: Oct. 19/78

ANALYST: Ken McCullough

LAB NO.	SAMPLE NO.	SEAM	INTERVAL (METRES)	FRACTION	% AIR DRY MOIST	% RESID. MOIST.	% ASH d.b.	% V.M.	% F.C.	F.S.I.	% YIELD
78.263	22		325.63 - 326.14	RAW		.30	32.55			1	X
				1.4 FLOAT							
				1.4 SINK							
				1.5 FLOAT		.69	14.31	18.16		3	35.10
				1.5 SINK						64.90	
				1.6 FLOAT							
				1.6 SINK							
78.264	23		326.14 - 326.64	RAW		.33	18.69			1	X
				1.4 FLOAT							
				1.4 SINK							
				1.5 FLOAT		.66	15.79	17.82		1½	70.58
				1.5 SINK						29.42	
				1.6 FLOAT							
				1.6 SINK							
78-265	24		326.64 - 327.36	RAW		.31	41.37			1	X
				1.4 FLOAT							
				1.4 SINK							
				1.5 FLOAT		.67	15.63	17.06		1	15.19
				1.5 SINK						84.81	
				1.6 FLOAT							
				1.6 SINK							

CROWS NEST RESOURCES ANALYSIS REPORT

AREA: LODGEPOLE

HOLE NO. LP-D-101 DATE: Oct. 19/78

ANALYST: Ken McCullough

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LODGEPOLE

DRILL HOLE: LP-D 101

GEOPHYSICAL TOPS vs LOGGED TOPS

September, 1978

BPB COAL LITHOLOGY LOG			LITHOLOGY DESCRIPTION	IN-FIELD EXAMINATION (marker blocks)		
INTERVAL		TH (m)		INTERVAL		TH (m)
from	to			from	to	
0	15.4	15.4	CASING	0	15.8	15.8
15.4	15.7	0.3	SANDSTONE			
15.7	16.1	0.4	SILTSTONE	15.8	15.9	0.1
			SANDSTONE	15.9	17.9	2.0
16.1	16.7	0.6	SHALE			
16.7	17.4	0.7	SILTSTONE			
17.4	17.7	0.3	SHALY COAL	17.9	18.1	0.2
17.7	18.0	0.3	SHALE	18.1	18.3	0.2
18.0	18.5	0.5	SILTSTONE			
18.5	20.2	1.7	SHALE, silty			
20.2	21.1	0.9	SANDSTONE	18.3	20.7	2.4
21.1	21.5	0.4	SILTSTONE	20.7	21.0	0.3
21.5	22.0	0.5	SHALE	21.0	21.6	0.6
22.0	24.3	2.3	SANDSTONE	21.6	24.0	2.4
24.3	24.7	0.4	SHALE			
24.7	25.4	0.7	SILTSTONE			
			SHALE w/ minor COAL	24.0	25.6	1.6
25.4	25.6	0.2	SHALY COAL	25.6	26.1	0.5
25.6	25.9	0.3	SILTSTONE			
25.9	26.8	0.9	SHALE	26.1	27.6	1.5
26.8	29.4	2.6	SILTSTONE	27.6	28.9	1.3
			SHALE, silty	28.9	29.6	0.7
29.4	30.2	0.8	SANDSTONE	29.6	30.3	0.7
30.2	32.4	2.4	SILTSTONE	30.3	30.7	0.4
32.4	34.4	2.0	SHALE	30.7	34.8	4.1
34.4	34.8	0.4	SILTSTONE			
34.8	36.2	1.4	SANDSTONE			
36.2	39.6	3.4	SILTSTONE	34.8	38.5	3.7
39.6	41.5	1.9	SHALE	38.5	41.8	3.3
41.5	41.7	0.2	COAL, shaly	41.8	42.0	0.2
41.7	42.1	0.4	SHALE	42.0	42.4	0.4

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LODGEPOLE
DRILL HOLE: LP-D 101
GEOPHYSICAL TOPS vs LOGGED TOPS

September, 1978

BPB COAL LITHOLOGY LOG			LITHOLOGY DESCRIPTION	IN-FIELD EXAMINATION (marker blocks)		
INTERVAL		TH (m)		INTERVAL		TH (m)
from	to			from	to	
42.1	43.0	0.9	COAL	42.4	43.3	0.9
43.0	43.5	0.5	SHALE	43.3	43.8	0.5
43.5	44.1	0.6	COAL, shaly	43.8	44.2	0.4
44.1	45.3	1.2	SHALE	44.2	45.5	1.3
45.3	46.0	0.7	COAL, shaly	45.5	46.1	0.6
			SHALE, silty	46.1	47.2	1.1
46.0	47.0	1.0	SILTSTONE			
			SHALE, silty w/ SS & SLTST	47.2	50.4	3.2
47.0	49.1	2.1	SANDSTONE			
49.1	50.3	1.2	SILTSTONE			
50.3	54.4	4.1	SHALE, silty	50.4	54.9	4.5
			SHALE and COAL	54.9	57.9	3.0
54.4	55.2	0.8	COAL, shaly			
55.2	56.4	1.2	SHALE			
56.4	56.7	0.3	COAL			
56.7	57.1	0.4	COAL, shaly			
57.1	58.3	1.2	COAL	57.9	60.2	2.3
58.3	59.0	0.7	SHALE, carbonaceous	60.2	60.4	0.2
59.0	59.8	0.8	COAL	60.4	60.5	0.1
59.8	60.3	0.5	SILTSTONE			
60.3	61.2	0.9	SANDSTONE			
61.2	62.3	1.1	SILTSTONE			
62.3	63.0	0.7	SANDSTONE			
63.0	63.3	0.3	SILTSTONE			
63.3	64.2	0.9	SANDSTONE			
64.2	64.7	0.5	SILTSTONE			
64.7	67.3	2.6	SANDSTONE	60.5	67.4	6.9
67.3	67.6	0.3	SHALE	67.4	67.7	0.3
67.6	68.0	0.4	SILTSTONE	67.7	68.0	0.3
68.0	70.5	2.5	SANDSTONE	68.0	70.6	2.6
70.5	73.4	2.9	SANDSTONE and SLTST interbedded	70.6	73.5	2.9

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LODGEPOLE
 DRILL HOLE: LP-D 101
GEOPHYSICAL TOPS vs LOGGED TOPS
 September, 1978

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BPB COAL LITHOLOGY LOG			LITHOLOGY DESCRIPTION	IN-FIELD EXAMINATION (marker blocks)		
INTERVAL		TH (m)		INTERVAL		TH (m)
from	to			from	to	
73.4	74.0	0.6	SHALE	73.5	74.0	0.5
74.0	74.3	0.3	COAL w/ Shale partings	74.0	74.4	0.4
74.3	74.9	0.6	SHALY COAL	74.4	74.8	0.4
74.9	75.4	0.5	SHALE	74.8	75.4	0.6
			SILTSTONE	75.4	84.6	9.2
75.4	84.6	9.2	SILTSTONE and Shales interbedded			
84.6	84.9	0.3	SHALY COAL			
84.9	85.1	0.2	SHALE			
85.1	85.5	0.4	COAL	84.6	86.2	1.6
85.5	85.9	0.4	SHALE			
85.9	86.5	0.6	COALY SHALE, silty	86.2	86.3	0.1
86.5	93.0	6.5	SANDSTONE			
93.0	96.1	3.1	SILTSTONE & SS interbeds	86.3	96.1	9.8
96.1	96.5	0.4	SHALY COAL			
96.5	96.9	0.4	SHALE			
			COAL ZONE (broken down into detail)	96.1	97.8	1.7
96.9	97.7	0.8	COAL			
97.7	102.5	4.8	SILTSTONE			
102.5	103.4	0.9	SANDSTONE			
103.4	108.1	4.7	SILTSTONE			
108.1	108.4	0.3	SHALE			
108.4	110.5	2.1	SILTSTONE	97.8	110.6	12.8
110.5	111.1	0.6	SANDSTONE	110.6	111.4	0.8
111.1	113.3	2.2	SILTSTONE	111.4	113.8	2.4
113.3	113.7	0.4	SHALE	113.8	113.9	0.1
			COAL ZONE (broken down into detail)	113.9	119.2	5.3
113.7	114.1	0.4	SHALY COAL			
114.1	114.7	0.6	SHALE			
114.7	115.3	0.6	SHALY COAL			

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LODGEPOLE
DRILL HOLE: LP-D 101
GEOPHYSICAL TOPS vs LOGGED TOPS

September, 1978

BPB COAL LITHOLOGY LOG			LITHOLOGY DESCRIPTION	IN-FIELD EXAMINATION (marker blocks)		
INTERVAL		TH (m)		INTERVAL		TH (m)
from	to			from	to	
115.3	116.8	1.5	COAL			
116.8	117.2	0.4	SHALY COAL			
117.2	117.9	0.7	COAL			
117.9	118.2	0.3	SHALY COAL			
118.2	119.0	0.8	COAL			
119.0	119.8	0.8	SILTSTONE			
			SHALE	119.2	119.8	0.6
119.8	120.5	0.7	COALY SHALE	119.8	120.5	0.7
120.5	121.3	0.8	SHALE...minor coal	120.5	121.1	0.6
121.3	121.8	0.5	COALY ZONE	121.1	121.8	0.7
121.8	122.2	0.4	COAL			
122.2	122.6	0.4	SHALY COAL			
122.6	123.2	0.6	COAL	121.8	123.2	1.4
123.2	126.3	3.1	SHALE...w/ minor coal	123.2	126.2	3.0
126.3	126.7	0.4	SHALY COAL	126.2	126.5	0.3
126.7	127.7	1.0	COALY SHALE	126.5	127.6	1.1
127.7	128.1	0.4	SHALE	127.6	128.0	0.4
			SANDSTONE	128.0	130.6	2.6
128.1	131.6	3.5	SILTSTONE	130.6	131.5	0.9
131.6	132.8	1.2	SHALE	131.5	132.3	0.8
132.8	133.4	0.6	SILTSTONE			
133.4	143.4	10.0	SANDSTONE	132.3	143.5	11.2
143.4	144.2	0.8	SHALE	143.5	144.3	0.8
144.2	147.4	3.2	SANDSTONE ...shaly in places	144.3	146.8	2.5
			SHALE	146.8	149.0	2.2
147.4	149.4	2.0	SILTSTONE	149.0	149.5	0.5
			SANDSTONE	149.5	161.2	11.7
			SILTSTONE	161.2	162.6	1.4
149.4	170.8	21.4	SANDSTONE	162.6	170.7	8.1
170.8	180.7	9.9	SHALE	170.7	180.2	9.5
			COAL ZONE	180.2	194.2	14.0

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LODGEPOLE

DRILL HOLE: LP-D 101

GEOPHYSICAL TOPS vs LOGGED TOPS

September, 1978

BPB COAL LITHOLOGY LOG			LITHOLOGY DESCRIPTION	IN-FIELD EXAMINATION (marker blocks)		
INTERVAL		TH (m)		INTERVAL		TH (m)
from	to			from	to	
180.7	181.7	1.0	COAL			
181.7	182.2	0.5	SHALY COAL			
182.2	186.8	4.6	COAL			
186.8	188.4	1.6	SHALY COAL			
188.4	189.7	1.3	COAL			
189.7	190.1	0.4	SHALY COAL			
190.1	191.0	0.9	COAL			
191.0	192.1	1.1	SHALY COAL...sandy...?			
192.1	192.8	0.7	COAL			
192.8	193.9	1.1	SHALY COAL			
193.9	194.4	0.5	Carbonaceous SHALE			
194.4	196.0	1.6	SILTSTONE			
196.0	196.8	0.8	SHALE			
196.8	197.7	0.9	SILTSTONE			
197.7	202.0	4.3	SHALE, silty	194.2	204.2	10.0
			CLAY...FAULT GOUGE	204.2	205.2	1.0
202.0	206.8	4.8	SANDSTONE	205.2	207.5	2.3
206.8	207.4	0.6	SILTSTONE			
207.4	207.8	0.4	SANDSTONE			
207.8	210.3	2.5	SILTSTONE	207.5	210.2	2.7
210.3	222.8	12.5	SANDSTONE	210.2	231.9	21.7
222.8	224.2	1.4	SILTSTONE			
224.2	232.3	8.1	SANDSTONE			
232.3	233.2	0.9	SHALE	231.9	233.4	1.5
233.2	251.4	18.2	SANDSTONE	233.4	251.1	17.7
			SHALE	251.1	251.4	0.3
251.4	251.7	0.3	SILTSTONE			
251.7	255.0	3.3	SANDSTONE	251.4	254.7	3.3
255.0	256.3	1.3	SHALE	254.7	256.0	1.3
256.3	264.1	7.8	SANDSTONE, silty and shaly in places	256.0	263.4	7.4

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DRILL HOLE: LP-D 101

DRILL HOLE: LP-D 101
GEOPHYSICAL TOPS vs LOGGED TOPS

September, 1978

BPB COAL LITHOLOGY LOG			LITHOLOGY DESCRIPTION	IN-FIELD EXAMINATION (marker blocks)		
INTERVAL		TH (m)		INTERVAL		TH (m)
from	to			from	to	
264.1	264.5	0.4	COAL	263.4	264.0	0.6
264.5	266.0	1.5	SHALE	264.0	266.3	2.3
266.0	270.1	4.1	SANDSTONE	266.3	269.8	3.5
			SHALE w/ fine grain SS	269.8	272.0	2.2
270.1	272.1	2.0	SILTSTONE w/ fine grain SS			
272.1	296.7	24.6	SANDSTONE	272.0	296.9	24.9
269.7	298.5	1.8	SILTSTONE & Sandstone	296.9	300.4	3.5
298.5	300.8	2.3	SILTSTONE			
300.8	319.0	18.2	SANDSTONE	300.4	318.5	18.1
319.0	320.5	1.5	SHALE	318.5	322.4	3.9
320.5	321.0	0.5	CARBONACEOUS SHALE			
321.0	322.0	1.0	SILTSTONE			
322.0	325.6	3.6	SANDSTONE	322.4	324.9	2.5
325.6	328.8	3.2	COAL ZONE	324.9	328.3	3.4
328.8	364.8	36.0	SANDSTONE	328.3	362.6	34.3
364.8	368.8	4.0	SHALE, sandy and silty	362.6	368.8	6.2
TD				TD		

Golder Associates'
Hardness Code

Field Estimation of Hardness

R5	Requires many blows of geological hammer to break.
R4	Requires a few blows of geological hammer to break.
R3	Breaks under single blow of geological hammer.
R2	0.5 cm indentations with sharp end of geological pick. Too hard to cut by hand into triaxial specimen.
R1	Crumbles under firm blows of geological pick.
S5	May be broken in the hand with difficulty.
S4	Indented by fingernail.
S3	Cannot be moulded in fingers.
S2	Moulded with strong pressure of fingers.
S1	Easily moulded with fingers.

Rock Quality Designation

The Rock Quality Designation or "RQD" is the total length of solid core pieces exceeding 10 cm. in length divided by the run length. RQD is usually expressed as a percentage, with the histogram shaded from the left.

All fractures, natural and mechanical, are considered in the calculation, and core lengths are measured from the centre of the fracture along the core axis.

CORE & COAL CORE DESCRIPTION

HOLE PARTICULARS

LOCATION	Ref Meridian 117°; 5 464 647.60 m N 663 806.01 m E		
ELEVATION	1931.8m ASL	HOLE BEARING (AZ°)	110°
TOTAL DEPTH	368.8 m	HOLE ANGLE (°)*	61°

PROJECT	LODGEPOLE
AREA	WEST RIDGE: SOUTH SLOPE

DATE	BEGIN	1978-08-26
	END	1978-09-09

HOLE No.	LP - D	OF 21
	101	

LOGGING

LOGS RUN	FE, Gamma, LSD, Neutron
LOGGED BY	Neutron, Cal. BRD. Verticality BPP
OTHER TESTS	

COAL CORING PERFORMANCE

CORE DIAMETER	HQ
CORE RECOVERED	
LENGTH CORED	
CORE RECOVERY	%

EXAMINATION

LOG USED	
No. OF SEAMS SAMPLED	8
EXAMINER (S)	JH, DWF, AN
DATE	

BOX No	DEPTH AT TOP OF BOX	DEPTH		TH	LITHO DESCRIPTION		BEDDING ANGLE (°)	SEAM DESIG	SAMPLE No.	ANALYTICAL DATA						REMARKS†	
		FROM	TO		MAIN	AMPLIFIED (INCLUDE COAL RECOVERY FOR EACH SEAM)				MOIST %		ASH % d.b.	V.M. % a.d.b.	F.C. % a.d.b.	F.S.I.		% Yield
										a.r.b.	residual						
						NOTE: Top 15.8 m (52 feet) drilled with tri-cone rock bit... surface casing set; cored interval begins at ~15.8 m										Flow of Water Yes ☐ or Gas? No ☐ Indicate Depth	
1	15.8	15.8	15.9	0.1	SLTST	very fine grain; black; core is badly broken										R4; RQD: 29	
		15.9	17.1	1.2	SS	very fine grain; grey to dark; calcite infillings in fractures	75									R4	
		17.1	17.4	0.3	SS	very fine grain to fine grain; grey to dark grey	70									R4; RQD: 32	
		17.4	17.5	0.1	SS	very fine grain; dark grey; core is badly broken										R4	
		17.5	17.6	0.1	SS	fine grain; white grey to dark grey; cross-bedded	70									R4	
		17.6	17.7	0.1	SS	fine grain; dark grey to black	80									R4	
		17.7	17.9	0.2	SS	fine grain; dark grey to black; core is badly broken	90									R4	
		17.9	18.0	0.1	COAL	bright; friable; badly crushed											
		18.0	18.1	0.1	SH/COAL	interbedded; black; core is badly broken										R3	
		18.1	18.3	0.2	SHALE	black; minor calcite infillings										R3	
		18.3	18.4	0.1	SS	very fine grain; black to grey; calcite infillings in fractures											
		18.4	19.0	0.6	SS	very fine grain; black to grey; massive										R4; RQD: 71	
		19.0	19.2	0.2	SS	fine grain; interbedded white grey to black; cross-bedded; lower half interval of core is broken; slickensided surfaces	90									R4	
		19.2	20.0	0.8	SS	very fine grain; black to grey; calcite infillings in fractures											
2	20.0	20.0	20.7	0.7	SS	very fine grain; black to grey; calcite infillings in fractures										R4; RQD: 63	
		20.7	21.0	0.3	SLTST	very fine grain; black; grading to a black shale at bottom of interval; unit not as hard as sandstone interval above it										R3	

UNITS USED: m (ft)

* : MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE AXIS

† : R &/OR S — GOLDR ASSOCIATES HARDNESS CODE

• RQD — ROCK QUALITY DESIGNATION (%)

HOLE No.	LP - D
	101

CORE & COAL CORE DESCRIPTION

PROJECT	LODGEPOLE	HOLE No.	LP - D
AREA	WEST RIDGE - SOUTH SLOPE	CONTINUED	101

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BOX No	DEPTH AT TOP OF BOX	DEPTH		TH	LITHO DESCRIPTION		READING ANGLE (°)	SEAM DESIG	SAMPLE No	ANALYTICAL DATA							REMARKS †
		FROM	TO		MAIN	AMPLIFIED (INCLUDE COAL RECOVERY FOR EACH SEAM)				MOIST %		ASH % d.b.	VM % a.d.b.	FC % a.d.b.	F.S.I.	Yield	
										o.c.b.	residual						
		21.0	21.1	0.1	SHALE	black; with minor very thin coaly bands (ie, ≤ 0.01 m thick) R3	80										Flow of Water Yes ☐ or Gas? No ☐ Indicate Depth
		21.1	21.6	0.5	SHALE	black; minor coaly debris; pyrite infilling in fractures											R3
		21.6	21.6	0.1	SHALE	black; minor coaly debris; core is badly broken and rubbly											
		21.6	23.0	1.4	SS	fine grain; grey to black; calcareous cement; cross-bedded; very minor coaly debris throughout											R4
		23.0	24.0	1.0	SS	fine grain; grey to black; calcareous cement; calcite infillings in fractures; cross-bedded											R4; ROD: 63
3	24.0	24.0	24.4	0.4	SHALE	black; very minor coaly debris throughout; calcareous cement; calcite infillings in fractures											R4
		24.4	24.5	0.1	SH/COAL	interbedded; coaly units ≤ 0.02 m thick											
		24.5	25.6	1.1	SHALE	black; minor coaly debris; calcareous cement; minor pyrite infillings in fractures; calcite infillings in fractures											R3; ROD: 51
		25.6	26.1	0.5	SH/COAL	interbedded; black; coal core at top of interval is badly crushed; coaly intervals are ≤ 0.10 m thick; calcareous cement											R3
		26.1	26.7	0.6	SHALE	with minor coal; black; calcareous cement; calcite infillings in fractures; core is badly broken											R4; ROD: 35
		26.7	27.6	0.9	SHALE	with minor coaly debris; black; calcareous cement; core is continuous except for a 0.13 m rubble interval 0.47 m below top of unit											R3
4	28.1	27.6	28.9	1.3	SILTST	very fine grain; black; calcite infillings in fractures; calcareous cement											R3
		28.9	29.1	0.2	SHALE	dark brown to black; core is badly broken and rubbly											R3
		29.1	29.6	0.5	SHALE	black; core is badly broken and rubbly											ROD: 0
		29.6	30.3	0.7	SS	fine grain; grey to beige; calcareous cement; calcite infilling in fractures; unit is softer and more silty at top of interval											
		30.3	30.7	0.4	SILTST	fine grain; grey to black; calcareous cement; core is broken and rubbly											R3; ROD: 59

UNITS USED: m (ft)

1-R&/OR S - GOLDER ASSOCIATES HARDNESS CODE

▲ ANGLE MEASURED FROM CORE AXIS

•ROD - ROCK QUALITY DESIGNATION (%)

HOLE No.	LP - D
CONTINUED	101

CORE & COAL CORE DESCRIPTION

PROJECT	LODGEPOLE
AREA	WEST RIDGE - SOUTH SLOPE

HOLE No.	LP - D
CONTINUED	101

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BOX No.	DEPTH AT TOP OF BOX	DEPTH		TH	LITHO DESCRIPTION		SECCING ANGLE (°)	SEAM DESIG	SAMPLE No.	MOIST %		ANALYTICAL DATA				F.S.I.	Yield	REMARKS ¹
		FROM	TO		MAIN	AMPLIFIED (INCLUDE COAL RECOVERY FOR EACH SEAM)				a.r.b.	residual	ASH % d.b.	V.M. % a.d.b.	FC % a.d.b.				
5	32.14	30.7	32.9	2.2	SHALE	black; calcareous cement; calcite infilling in fractures; minor coaly debris within interval; R4; RQD: 41												Flow of Water Yes ☐ or Gas? No ☐ Indicate Depth
		32.9	33.5	0.6	SHALE	with coal; black; % of coaly debris increases with depth												R3
		33.5	34.8	1.3	SHALE	with coal; black; coal bands 40.02 m thick												R3; RQD: 48
		34.8	35.1	0.3	SLTST	fine grain; black; minor pyrite along fracture planes; minor coaly debris within interval												R3
6	36.3	35.1	36.4	1.3	SLTST	fine grain; black; minor coaly debris throughout interval	70											R3; RQD: 73
		36.4	37.4	1.0	SLTST	fine grain; black; slightly calcareous cement; evidence of slickensiding near base of interval												
		37.4	38.0	0.6	SLTST	fine grain; black; slightly calcareous cement; minor coaly debris throughout interval												R3; RQD: 62
		38.0	38.5	0.5	SLTST	fine grain; black; small fractures infilled with calcite												R3
		38.5	39.0	0.5	SHALE	black; small fractures infilled with calcite; slightly calcareous cement; core is broken and rubbly												
		39.0	39.9	0.9	SHALE	black; small fractures infilled with calcite; slightly calcareous cement												R3; RQD: 51
		39.9	40.1	0.2	SHALE	black; iron staining along fractures; core is broken and rubbly												R3
7	40.2	40.1	40.8	0.7	SHALE	black; core is broken and rubbly												
		40.8	41.1	0.3	SHALE	black; slickensided surface abundant...core is pulverized												
		41.1	41.6	0.5	SHALE	black; small fractures infilled with calcite; slightly calcareous cement; core is broken and rubbly												R3; RQD: 27
		41.6	41.8	0.2	SHALE	black												
		41.8	42.0	0.2	COAL													
		42.0	42.3	0.3	SHALE													R3
		42.3	42.3	0.1	COAL STRINGER													

UNITS USED: m & ft

 1 - R&/OR 5 - GOLDER ASSOCIATES HARDNESS CODE
 - RQD - ROCK QUALITY DESIGNATION (%)

▲ ANGLE MEASURED FROM CORE AXIS

HOLE No.	LP - D
CONTINUED	101

CORE & COAL CORE DESCRIPTION

PROJECT	LODGEPOLE
AREA	WEST RIDGE - SOUTH SLOPE

HOLE No.	LP - D
CONTINUED	101

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BOX No.	DEPTH AT TOP OF BOX	DEPTH		TH	LITHO DESCRIPTION		BEDDING ANGLE (°)	SEAM DESIG	SAMPLE No.	MOIST %		ANALYTICAL DATA					REMARKS ¹
		FROM	TO		MAIN	AMPLIFIED (INCLUDE COAL RECOVERY FOR EACH SEAM)				a.r.b.	residual	ASH % d.b.	V.M. % a.d.b.	F.C. % a.d.b.	F.S.I.	Yield	
		42.3	42.4	0.1	SHALE												Flow of Water Yes [] or Gas? No [] Indicate Depth
		42.4	42.4	0.1	COAL	dull											
		42.4	42.4	0.1	COAL	banded											
		42.4	42.5	0.1	SHALE												
		42.5	42.5	0.1	SHALY COAL				1	0.52		5.78	21.84		8	66.63	
		42.5	42.7	0.2	COAL	bright; hard											
		42.7	42.9	0.2	COAL	bright to bright banded											
		42.9	42.9	0.1	COAL	dull banded											
		42.9	43.3	0.4	COAL	bright; friable; separation with shale below is good											
		43.3	43.5	0.2	SHALE												
		43.5	43.5	0.1	COAL-SHALE-COAL STRINGER				2	0.19		79.96			0		
		43.5	43.8	0.3	SHALE												
		43.8	43.9	0.1	COAL												
		43.9	44.0	0.1	COALY SHALE				3	0.47		10.62	22.24		8.5	43.32	
		44.0	44.1	0.1	COAL	banded; hard											
		44.1	44.2	0.1	COAL	dull banded to dull; lower interval may be shaly(?)											
8	44.2	44.2	45.6	1.4	SHALE	black with minor coal stringers											
		45.6	45.7	0.1	COAL	recovered only 0.08 m											
		45.7	46.2	0.5	SH/COAL	recovered only 0.36m; observed litho and thickness: Th(m) Description				NOTE: Samples 1 and 3 quality data is based on washed coal at S.G.: 1.5 Sample 2 quality data is based on the raw sample							
						0.08 Coal											
						0.04 Shale											
						0.20 Coal											
						0.02 Shale											
						0.02 Coal											
		46.2	47.2	1.0	SHALE	dark grey; calcareous cement; increasing silty material at base of unit	70										R3
9	48.6	47.2	50.4	3.2	SHALE	silty interbedded with fine grain sandstone and siltstone; grey; core very solid											R3; RQD: 80

UNITS USED: m [] ft []

1-R&ORS - GOLDER ASSOCIATES HARDNESS CODE

▲ ANGLE MEASURED FROM CORE AXIS

*RQD - ROCK QUALITY DESIGNATION (%)

HOLE No.	LP - D
CONTINUED	101

CORE & COAL CORE DESCRIPTION

PROJECT	LODGEPOLE
AREA	WEST RIDGE - SOUTH SLOPE

HOLE No.	LP - D
CONTINUED	101

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BOX No.	DEPTH AT TOP OF BOX	DEPTH		TH	LITHO DESCRIPTION		BEDDING ANGLE (°)	SEAM DESIG.	SAMPLE No.	MOIST %		ANALYTICAL DATA					Yield	REMARKS
		FROM	TO		MAIN	AMPLIFIED (INCLUDE COAL RECOVERY FOR EACH SEAM)				o.c.b.	residual	ASH % d.b.	V.M. % a.d.b.	FC % a.d.b.	F.S.I.			
10	52.7	50.4	54.9	4.5	SHALE	somewhat silty; dark grey to black; 0.3 m core broken into larger fragments at 52.8 m; fractured core at 53.3 m; 100% recovery												Flow of Water Yes ☐ or Gas? No ☐ Indicate Depth ROD: 70; R3
		54.9	56.4	1.5	SH/COAL	recovered/cut: 0.40m/1.5m: 27% recovery; upper portion shale - then coal			NOTE: Samples 4 & 5 quality data is based on washed coal at S.G. 1.5									
		56.4	57.9	1.5	COAL/SH	recovered/cut: 0.30m/1.50m: 20% recovery; mainly shale; carbonaceous; few coal fragments recovered in upper part of interval												
		57.9	58.0	0.1	COAL	recovered/cut: 0.14m/0.10m: 140% recovery; large fragments; some may belong to previous core cut (?); coal is bright banded												
		58.0	58.4	0.4	COAL	recovered/cut: 0.20m/0.40m: 50% recovery; bright; broken			4		1.14	3.68	21.25		6.5	88.32		
		58.4	58.8	0.4	COAL	recovered/cut: 0.40m/0.40m = 100%; bright; soft; small fragments to pulverized												
11	59.1	58.8	59.4	0.6	COAL	recovered/cut: 0.60m/0.60m = 100% recovery; sheared to pulverized; 0.03 m harder coal in lower half; bright												
		59.4	60.2	0.8	COAL	recovered/cut: 0.80m/0.80m = 100% recovery; bright(?); sheared with some slightly harder thin sections			5		0.57	6.06	20.50		6.0	63.47		
		60.2	60.4	0.2	SHALE	carbonaceous			6		0.11	37.90			0			
		60.4	60.5	0.1	COAL													
12	62.5	60.5	64.0	3.5	SS	fine grain; grey to black; core is broken and rubbly											ROD: 18; R3-4	
		64.0	65.5	1.5	SS	as above			NOTE: Sample 6 quality data is based on the raw sample								R3	
13	66.3	65.5	67.4	1.9	SS	fine grain; grey to black; calcareous cement; calcite infilling in fractures; cross-bedded	70										ROD: 85; R3	
		67.4	67.5	0.1	SHALE	with minor coaly debris; black; slickensided surfaces; core is rubbly and broken												
		67.5	67.7	0.2	SHALE	black; calcareous cement; minor coaly debris within interval												
		67.7	68.0	0.3	SLTST	very fine grain; black; calcareous cement												
		68.0	70.6	2.6	SS	fine grain; dark grey; calcareous cement; calcite infilling of fractures; laminations present												

UNITS USED: m & ft

† R&ORS - GOLDR ASSOCIATES HARDNESS CODE

*ROD - ROCK QUALITY DESIGNATION (%)

▲ ANGLE MEASURED FROM CORE AXIS

HOLE No.	LP - D
CONTINUED	101

CORE & COAL CORE DESCRIPTION

PROJECT	LODGEPOLE
AREA	WEST RIDGE - SOUTH SLOPE

HOLE No	LP - D
CONTINUED	101

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BOX No	DEPTH AT TOP OF BOX	DEPTH		TH	LITHO DESCRIPTION		DIPPING ANGLE (°)	SEAM DESIG	SAMPLE No.	ANALYTICAL DATA							REMARKS ¹	
		FROM	TO		MAIN	AMPLIFIED (INCLUDE COAL RECOVERY FOR EACH SEAM)				MOIST %		ASH %		V.M. %	FC %	F.S.I.		Yield
										a.r.b.	residual	d.b.	a.d.b.	a.d.b.				
cont.		68.0	70.6	2.6	SS	at 69.22 - 69.95 m depth core is disturbed; slickensided; badly broken; RQD: 21												Flow of Water Yes ☐ or Gas? No ☐ Indicate Depth
		70.6	70.7	0.1	SLTST													
14	70.7	70.7	71.6	0.9	SLTST	fine grain; dark grey to black; very homogeneous; solid core	80											
		71.6	73.6	2.0	SLTST/SS	siltstone and fine grain sandstone interbedded; fine grain; dark grey with light grey sandstone laminations												R3; RQD: 93
		73.6	73.6	0.0	COAL	STRINGER												
		73.6	74.0	0.4	SHALE	black; hard												
		74.0	74.2	0.2	COAL	banded												
		74.2	74.3	0.1	SHALE	black; hard												
		74.3	74.5	0.2	COAL	with minor black shale partings												
		74.5	74.6	0.1	SHALE	coaly												
		74.6	74.8	0.2	COAL	sheared with thin shale partings												
15	74.9	74.8	75.4	0.6	SHALE	with two minor coal stringers												
16	79.2	75.4	84.6	9.2	SLTST	fine grain; dark grey to black; interbedded with fine grain sandstone; very homogeneous; solid core • 2 joints in close proximity at 77.7 m at 10° to core axis	85											R3; RQD: 87
17	83.4					• joint at 79.0 m at 12° to core axis												
		84.6	85.0	0.4	COAL	recovery: 50%; sheared to pulverized; bright												
		85.0	85.6	0.6	COAL	recovery: 42%; coal and shale fragments; shale is slickensided; coal is dull			7		0.67	6.48	20.84		8	27.19		
		85.6	86.2	0.6	COAL	recovery: 23%; flaky and sheared; very soft; shiny												
		86.2	86.3	0.1	SHALE	black; hard; silty												
										NOTE: Sample 7 quality data is based on washed coal at S.G. : 1.5								
18	88.2	86.3	96.1	9.8	SLTST/SH	siltstone and fine grain - medium grain sandstone interbedded; fine grain; dark grey with light grey sandstone laminations												R3; RQD: 55
19	92.1					• at 87.2m - 88.0m ..disturbance..broken core;												
20	96.0					10 prominent fractures in this interval; measured from core axis: 1 set is at 40°;												

UNITS USED: m ☐ ft ☐1 - R&ORS - GOLDER ASSOCIATES HARDNESS CODE
• RQD - ROCK QUALITY DESIGNATION (%)

▲ ANGLE MEASURED FROM CORE AXIS

HOLE No	LP - D
CONTINUED	101

CORE & COAL CORE DESCRIPTION

PROJECT	LODGEPOLE
AREA	WEST RIDGE - SOUTH SLOPE

HOLE No.	LP - D
CONTINUED	101

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OF 21

BOX No.	DEPTH AT TOP OF BOX	DEPTH		TH	LITHO DESCRIPTION		BEDDING ANGLE (°)	SEAM DESIGN	SAMPLE No.	ANALYTICAL DATA						REMARKS
		FROM	TO		MAIN	AMPLIFIED (INCLUDE COAL RECOVERY FOR EACH SEAM)				MOIST %	ASH %	V.M. %	F.C. %	F.S.I.	Yield	
...	cont.	86.3	96.1	9.8	SLTST/SS	1 set is at 20°; 1 fracture lies w along core axis; 1 fracture at 88° • at 89.2 m - 89.8 m ... 5 joints at 10° to core axis • at 92.1 m ... 1 joint ... broken core • at 93.3 - 93.9 m ... 3 joints at 10° to core axis ... broken core • at 94.3 m ... joint at 10° • at 95.7 m ... minor movement ... slickensided surfaces										Flow of Water Yes ☐ or Gas? No ☐ Indicate Depth
		96.1	97.8	1.7	COAL	recovery: 91% Th(m) Description 0.30 Shale and coal fragments 0.15 Coal; dull 0.05 Shale; carbonaceous 0.12 Coal; dull banded 0.14 Shale; hard; slickensided; black 0.05 Shaly Coal 0.18 Coal; flaky; soft; bright; sheared 0.04 Coaly Shale 0.34 Coal; bright banded; hardness S5 0.33 recovered 0.17 m only; coal; dull banded			8	0.41	9.20	19.44		7.5	43.42	
						NOTE: separation with floor → GOOD			NOTE	Sample 8 quality data is based on washed coal at S.G. = 1.5						RQD: 12
		97.8	99.3	1.5	SLTST	fine grain; grey to black; core is broken and rubbly										
		99.3	99.8	0.5	SLTST	fine grain; grey to black										
		99.8	99.9	0.1	COAL STRINGER											
21	100.3	99.9	100.6	0.7	SLTST	fine grain; grey to black • at 99.4 m shale stringer; slickensided; sheared to flakes • at 99.5 m joint at 30° to core axis • in total: interval has 9 joints										R3
		100.6	102.9	2.3	SLTST	as above • at 100.6 m ... disturbance ... broken core • at 100.8 m ... coaly shale ... sheared ... flaky ... 0.03 m thick • at 102.1 m ... broken core	70									
		102.9	103.5	0.6	SLTST	fine grain; grey to black; very badly broken core; • at 103.2 m ... clay ... brown ... soft ... 0.03 m thick										
		103.5	104.3	0.8	SHALE	black; silty; slickensided; core broken into 0.02 - 0.04 m thick intervals; slickensided planes at 60° - 78° to core axis										RQD: 0

UNITS USED: m & ft

1 HR/OR S - GOLDR ASSOCIATES HARDNESS CODE

*RQD -- ROCK QUALITY DESIGNATION (%)

▲ ANGLE MEASURED FROM CORE AXIS

HOLE No.	LP - D
CONTINUED	101

CORE & COAL CORE DESCRIPTION

PROJECT	LODGEPOLE
AREA	WEST RIDGE - SOUTH SLOPE

HOLE No.	LP - D
CONTINUED	101

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BOX No.	DEPTH AT TOP OF ROD	DEPTH		TH	LITHO DESCRIPTION		RECORDING ANGLE (°)	SEAM DESIGN	SAMPLE No.	ANALYTICAL DATA						REMARKS		
		FROM	TO		MAIN	AMPLIFIED (INCLUDE COAL RECOVERY FOR EACH SEAM)				MOIST %		ASH %	VM %	FC %	F.S.I.		Yield	
22	104.4	104.3	110.6	6.3	SLTST	fine grain; dark grey to light grey; laminated with thin, fine grain, sandstone beds											Flow of Water Yes? or Gas? No? Indicate Depth	
23	108.5					• at 107.6m - 108.8 m ... interval is somewhat shaly • at 106.6 m - 106.7 m ... 0.10 m coal • at 105.5 m	75										R3	
		110.6	111.4	0.8	SS	fine grain; grey; minor fractures infilled with calcite											R4	
24	112.8	111.4	113.8	2.4	SLTST	fine grain; dark grey; with fine grain, thin sandstone laminations; more shaly at bottom of interval											ROD: 100	
		113.8	113.9	0.1	SHALE	black; carbonaceous; good separation with roof of coal seam				NOTE	Sample 9 quality data is based on washed coal at S.G. 1.5						ROD: 0; R2	
25	118.2	113.9	119.2	5.3	COAL	Recovered/Cut: 3.80/5.27 m : 72% recovery												
						<u>Th(m)</u> <u>Cut</u> <u>Lost</u> 0.40 0.15 Coal; lost core probably in mid interval; recovered 0.25 m 0.80 0.30 Coal: 0.13m Coal; dull; flaky 0.12m Shale; slickensided 0.25m Coal; shiny; flaky; sheared 0.70 0.12 Coal; lost core probably at top of interval 0.48m Coal; bright to bright-banded; good core but FRAGILE; soft and pyritic at top of interval 0.02m Shale 0.08m Coal; bright 1.50 0.20 0.05m Coal; bright banded; hard 0.15m Coal; bright banded; fragile 0.80m Coal; banded to bright banded; soft; fragile; crumbles to small fragments; good core 0.30m Coal; crushed; pulverized at base of unit 1.60 0.68 Coal; lost core probably at top of interval. lower segment of core relatively solid 0.05m Coal; fragments 0.08m Coal; dull banded 0.15m Coal; dull banded to banded 0.03m Coal; pulverized core 0.07m Coal; dull banded 0.03m Coal 0.02m Shale												
									9		0.63	7.88	19.79		6.0	67.73		

UNITS USED: m ☐ ft ☐

1:R&OR S — GOLDER ASSOCIATES HARDNESS CODE

▲ ANGLE MEASURED FROM CORE AXIS

•ROD — ROCK QUALITY DESIGNATION (%)

HOLE No.	LP - D
CONTINUED	101

FILE No BA-212

CORE & COAL CORE DESCRIPTION

PROJECT	LODGEPOLE
AREA	WEST RIDGE - SOUTH SLOPE

HOLE No.	LP - D
CONTINUED	101

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BOX No	DEPTH AT TOP OF BOX	DEPTH		TH	LITHO DESCRIPTION		BEDDING ANGLE (°)	SEAM DESIGN	SAMPLE No	ANALYTICAL DATA							REMARKS*
		FROM	TO		MAIN	AMPLIFIED (INCLUDE COAL RECOVERY FOR EACH SEAM)				MOIST % o.r.b. residual	ASH % d.b.	VM % a.d.b.	FC % a.d.b.	F.S.I.	Yield		
cont	115.0	119.2		COAL	Th(m) Cut Lost												

UNITS USED: m & ft

1:RA/ORS - GOLDER ASSOCIATES HARDNESS CODE

▲ ANGLE MEASURED FROM CORE AXIS

*RQD -- ROCK QUALITY DESIGNATION (%)

HOLE No.	LP - D
CONTINUED	101

CORE & COAL CORE DESCRIPTION

PROJECT	LODGEPOLE	HOLE No	LP - D
AREA	WEST RIDGE - SOUTH SLOPE	CONTINUED	101

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OF 23

BOX No	DEPTH AT TOP OF BOX	DEPTH		TH	LITHO DESCRIPTION		BEDDING ANGLE (°)	SEAM DESIGN	SAMPLE No.	ANALYTICAL DATA						Yield	REMARKS
		FROM	TO		MAIN	AMPLIFIED (INCLUDE COAL RECOVERY FOR EACH SEAM)				MOIST %	ASH %	VM %	FC %	F.S.I.			
cont...		126.5	127.1	0.6	SH/COAL	Th(m) Description 0.30 Shale 0.10 Coal; sheared											Flow of Water Yes ☐ or Gas? No ☐ Indicate Depth
		127.1	127.6	0.5	SH/COAL	recovered/cut: 0.40m/0.50m = 80% recovered Th(m) Description 0.07 Shale; slickensided 0.14 Coal 0.05 Shale 0.02 Coal 0.12 Shale											RQD: 16
		127.6	128.0	0.4	SHALE	black; somewhat disturbed at base of interval											
		128.0	130.6	2.6	SS	fine grain to very fine grain; grey • at 128.0 - 129.2 m ... 4 - 5 fractures running at 15° to core axis and intersecting one another	90										
28	130.6	130.6	131.5	0.9	SLTST	fine grain; grey at base of interval... joint at 10° to core axis											R3
		131.5	132.3	0.8	SHALE	grey to black: ... silty • at ~ 132m: disturbed; sheared; 0.05m of very soft shale and/or clay											
29	135.6	132.3	138.7	6.4	SS	fine grain at top of interval but primarily medium grain; grey to off-white; laminated	85 - 90										R4
30	138.7	138.7	142.3	3.6	SS	coarse grain; grey-almost salt and pepper; very hard; lightly laminated - a few joints almost parallel to or at 10° angle to core axis at 140.3 - 140.8 m; including silt and coal fragments fractured at 140.7m; 2 cm of coal at 140.8m; last 50 cm of core is broken into 2 to 5 cm long pieces	78										R4; RQD: 60
		142.3	143.5	1.2	SS	same sandstone as above - this interval highly fractured especially the upper half - includes traces of coal; initial 30 cm of core is very broken into fragments of varying sizes											
		143.5	144.3	0.8	SHALE	very homogeneous; no bedding; black; broken into larger fragments; there appear to be 3 joint systems: 1st nearly parallel with core (5-10°); 2nd at 35°; 3rd at 140°											R3; RQD: 0
		144.3	144.7	0.4	SS&SHALE	this interval is a part of a thrust of sandstone into the upper shale unit - fractured; calcite and clay filled											

UNITS USED: m, ft, in

1: RA/OR 5 - GOLDER ASSOCIATES HARDNESS CODE

• RQD - ROCK QUALITY DESIGNATION (%)

▲ ANGLE MEASURED FROM CORE AXIS

HOLE No	LP - D
CONTINUED	101

CORE & COAL CORE DESCRIPTION

PROJECT	LORGEPOLE
AREA	WEST RIDGE - SOUTH SLOPE

HOLE No.	LP - D
CONTINUED	101

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OF 21

BOX No.	DEPTH AT TOP OF BOX	DEPTH		TH	LITHO DESCRIPTION		BEDDING ANGLE 1°	SEAM DESIG	SAMPLE No.	ANALYTICAL DATA						Yield	REMARKS 1
		FROM	TO		MAIN	AMPLIFIED (INCLUDE COAL RECOVERY FOR EACH SEAM)				MOIST %	ASH %	VM %	FC %	F.S.I.			
										a.r.b.	residual	d.b.	a.d.b.	a.d.b.			
31	142.6	144.7	145.2	0.5	SS	medium grain; lightly laminated; grey; including 2 calcite filled joints (at 13')	70										Flow of Water Yes ☐ or Gas? No ☐ Indicate Depth
		145.2	145.7	0.5	SHALE	disturbed; stressed interval; shale mixed with sandstone; core fragmented RQD=0											
32	146.2	145.7	146.8	1.1	SHALE/SS	silty shale interbedded with sandstone - more sandstone to the end of the interval	72										R3; RQD: 50
		146.8	149.0	2.2	SHALE	black or dark grey; overall quite broken core, breaking caused by 2 or 3 fracture systems one at 20', other ?; also along bedding at 148.3 to 148.5m the shale is very sheared, almost flaky... fault plane?											R3; RQD: 0-3
33	149.3	149.0	149.5	0.5	SILTST/SS	siltstone grading quickly into sandstone											
34	153.4	149.5	154.8	5.3	SS	medium grain; lightly laminated; in places crossbedded; a few joints: calcite sealed over-all; the core is fairly solid; more broken at 154.7-154.9m and at 153.4-153.9m at 151.2m, 15 cm zone of fine multidirectional calcite filled fractures-fine, web-like - (stress); similar feature at 153.9 - 154.1 m	75										R4; RQD: 30
		154.8	155.5	0.7	SS	same sandstone as above; more disturbed and broken; slickensided; initial 15 cm almost "mylonized"											
		155.5	157.0	1.5	SS	this interval obviously a fault zone; rock is very broken to crushed; core is a form of fragments of very small size - the rock is saturated with water; bedding is rapidly changing; 70 cm of core was lost	72 40										RQD: 0
		157.0	157.4	0.4	SS	very sheared; fractured; bedding	40										
		157.4	158.1	0.7	SS	fairly solid core at 157.7 to 158m; the bedding turns; last 10 cm very broken											
		158.1	158.3	0.2	SS	shaly similar to sheared sandstone from 157 - 157.4 m; very soft; at 158.3 m change to solid rock bedding	60										
		158.3	159.1	0.8	SS	laminated; disturbed; bedding at 158.6 m; at the end an abrupt change of bedding	46 65 40										RQD: 0
		159.1	159.3	0.2	SS	20 cm of more solid sandstone											
		159.3	159.5	0.2	SHALE	silty very sheared; slickensided; almost flaky	35										

UNITS USED: m & ft

1-8/ORS - GOLDER ASSOCIATES HARDNESS CODE

*RQD - ROCK QUALITY DESIGNATION (%)

▲ ANGLE MEASURED FROM CORE AXIS

HOLE No.	LP - D
CONTINUED	101

CORE & COAL CORE DESCRIPTION

PROJECT	LODGEPOLE	HOLE No.	LP - D
AREA	WEST RIDGE - SOUTH SLOPE	CONTINUED	101

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OF 21

BOX No.	DEPTH AT TOP OF BOX	DEPTH		TH	LITHO DESCRIPTION		RECORDING ANGLE (°)	SEAM DESIGN	SAMPLE No.	ANALYTICAL DATA						Yield	REMARKS
		FROM	TO		MAIN	AMPLIFIED (INCLUDE COAL RECOVERY FOR EACH SEAM)				MOIST %	ASH %	VM %	FC %	F.S.I.			
		159.5	161.0	1.5	SS	upper part somewhat disturbed; lower broken into larger pieces at 160.2 m	22										Flow of Water Yes ☐ or Gas? No ☐ Indicate Depth
35	160.2	161.9	161.2	0.2	SS	fine grainy; broken into small fragments (disturbed)											
36	161.0	161.2	162.6	1.4	SLTST	calcareous; with shale interbeds; occasional carby fragments; some calcite filled fractures; transitional below; Joints: 30° - calcite and slicks; 33° - bedding plane; Rec. 1.0m/1.34m = 75%	33										R3: RQD: 0
37	164.5	162.6	165.3	2.7	SS	fine grained; calcareous; carbonaceous; with well developed bedding defined by carbonaceous material; occasional calcite filled fractures; shaley zones; abrupt below; Joints: 20°, 50° - bedding plane; sheared zone 163.18 - 163.28 m Rec. 100%	50										R3-4: RQD: 37
38	168.4	165.3	170.7	5.4	SS	medium grained; moderately calcareous; moderate bedding defined by carbonaceous material; some disturbance of bedding; abrupt below; joints ± 27° - calcite and slicks; 55° - bedding plane 60° - calcite; Rec. 100%; broken zone 166.67 - 166.87 m	55										R4: RQD: 28
39	172.2	170.7	175.5	4.8	SHALE	silty at top; becoming very carbonaceous after first meter, with numerous shear zones with sheared and broken core between 173.10 - 175.46m; no bedding; transitional below; Joints: 20°, 0°; Rec. 14.0m/4.76m = 85%											R3: RQD: 11
40	176.2	175.5	180.1	4.6	SHALE	homogeneous; silty with occasional very carbonaceous and coaly zones; these appear to control shearing; slicked in part; no bedding; Rec. 4.5m/4.75m = 95%; Joints: 60° - bedding plane?											R3: RQD: 40
41	180.2			0.1	COAL	sheared; broken Recovery: ↑											
				0.3	SHALE	carbonaceous; broken; slickensided 0.7m/1.0m = 70%											
	180.7			0.3	COAL	sheared; broken to powdery											
	181.2	MARKER	BLOCK						12	0.71	8.71	17.35		2.0	55.44		
				0.3	COAL	dull; sheared; broken Recovery: ↓											
				0.4	COAL	sheared; powdery; shaly? 1.2m/1.4m = 86%											
				0.5	COAL	dull; sheared; powdery											
	182.6	MARKER	BLOCK														

UNITS USED: m & ft

1:R&/OR S — GOLDER ASSOCIATES HARDNESS CODE
•RQD — ROCK QUALITY DESIGNATION (%)

▲ ANGLE MEASURED FROM CORE AXIS

HOLE No. LP - D
CONTINUED 101

CORE & COAL CORE DESCRIPTION

PROJECT	LODGEPOLE	HOLE No.	LP - D
AREA	WEST RIDGE - SOUTH SLOPE	CONTINUED	101

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OF 21

BOX No	DEPTH AT TOP OF BOX	DEPTH		TH	LITHO DESCRIPTION		BEDDING ANGLE (°)	SEAM DESIG	SAMPLE No	ANALYTICAL DATA						REMARKS ¹	
		FROM	TO		MAIN	AMPLIFIED (INCLUDE COAL RECOVERY FOR EACH SEAM)				MOIST %		ASH % d.b.	V.M. % a.d.b.	F.C. % a.d.b.	F.S.I.		% Yield
										a.c.b.	residual						
				1.6	COAL	sheared: powdery: shaly?			13		0.56	7.32	18.03		1.0	48.64	Flow of Water Yes ☐ or Gas? No ☐ Indicate Depth
		184.3	MARKER	BLOCK													
				0.7	COAL	sheared											
						Recovery 3.1m/3.3m = 94%											
42				0.3	COAL	sheared: shaly			14		1.31	6.35	19.01		3.0	58.52	
				0.1	SHALE	broken											
				0.4	COAL	sheared: broken to powdery											
		185.9	MARKER	BLOCK													
				0.1	COAL	dull: sheared: powdery											
				0.1	COAL	shaly: powdery			15		1.13	9.02	17.89		2.0	49.97	
				0.8	COAL	sheared: powdery											
				0.4	COAL	sheared											
		187.4	MARKER	BLOCK													
				0.2	COAL	sheared: broken to powdery											
				0.1	SHALE	broken											
				0.6	COAL	sheared: broken			16		1.51	8.54	19.35		2.5	54.40	
				0.1	SHALE	broken											
				0.6	COAL	sheared: broken: powdery											
		189.0	MARKER	BLOCK													
				0.1	SHALE	sheared: carbonaceous											
				0.2	COAL	sheared: powdery			17		1.19	9.01	18.44		1.5	38.77	
43				0.6	COAL	shaly: sheared											
		190.5	MARKER	BLOCK													
				0.5	COAL	sheared											
				0.1	COAL	sheared and powdery: shaley											
				0.1	SHALE	carbonaceous: sheared			18		1.22	10.61	22.86		1.5	32.64	
						Recovery 1.0m/1.5m = 67%											

UNITS USED: m (ft)

1-R&OR S - GOLDER ASSOCIATES HARDNESS CODE

*RQD - ROCK QUALITY DESIGNATION (%)

▲ ANGLE MEASURED FROM CORE AXIS

HOLE No. LP - D
CONTINUED 101

FILE No BA-212

NOTE: LODGEPOLE LP - D 101 (180.1 - 194.4 m)

because the core (consisting of coal and shale) in the interval 180.1 m (top of Box 41) to 194.4 m (top of Box 44) was badly broken, sheared and pulverized, it was not possible to determine the core recovery per litho unit; it is for the same reason that depth intervals were not derived per litho unit*, it should be noted, therefore, that:

- o the figures in the "TH" column are RECOVERED THICKNESSES as observed & measured in the core boxes

$$o \% \text{ RECOVERY} = \frac{\text{Length of core recovered between marker blocks (m)}}{\text{Core cut between marker blocks (m)}} \times 100\%$$

* APPROX depths were determined when interval was subject to sampling

D. W. Fietz
October 26/78

CORE & COAL CORE DESCRIPTION

PROJECT	LODGEPOLE	HOLE No.	LP - D
AREA	WEST RIDGE - SOUTH SLOPE	CONTINUED	101

PAGE 14
OF 21

BOX No.	DEPTH AT TOP OF BOX	DEPTH		TH	LITHO DESCRIPTION		BEDDING ANGLE (°)	SEAM DESIG.	SAMPLE No.	ANALYTICAL DATA						REMARKS
		FROM	TO		MAIN	AMPLIFIED (INCLUDE COAL RECOVERY FOR EACH SEAM)				MOIST %	ASH %	VM %	FC %	F.S.I.	Yield	
				0.2	COAL	powdery										Flow of Water or Gas? Yes ☐ No ☐ Indicate Depth
				0.1	SHALE	carbonaceous; broken			18							
	192.0	MARKER	BLOCK													
				0.9	COAL	broken to powdery	Recovery .9m/0.9m = 100%		19	1.07	10.84	17.38		1.5	57.98	
	192.9	MARKER	BLOCK													
				0.1	SHALE	carbonaceous; broken; sheared										
				0.3	COAL	sheared; powdery	Recovery									
				0.2	COAL	very shaly; broken stick	1.2m/1.3m = 92%		20	0.96	12.31	17.50		1.0	31.84	R2
				0.1	COAL	shaly; sheared; broken										
				0.3	COAL	sheared; powdery										
				0.2	COAL	very shaly; broken; sheared										
	194.2	MARKER	BLOCK													R3
				0.1	SHALE	carbonaceous	Recovery 0.1m/0.3m = 33%									
44	194.4	194.4	202.8	8.4	SHALE	silty with siltstone interbeds; poorly bedded; transitional below; broken shear zones at: 197.86 - 198.16m, 201.57 - 201.67m; carbonaceous fragments; jointing: at 35°, 28°, 58° (bedding plane), 20° (3); recovery: 100%		65?								RQD: 75; R3
45	197.3															
46	202.6															
		202.8	204.2	1.4	SHALE	as above: broken core; jointing at 20°, 70° (bedding plane)										RQD: 0
		204.2	205.2	1.0	CLAY	sandy; numerous sub angular rock fragments; FAULT GOUGE										S2
47	206.2	205.2	207.5	2.3	SS	grey; medium to fine grain; mod bedded with small scale cross-bedding with right way up; slightly calcite cement; interbedded with occasional minor shale beds; contacts abrupt below; jointing: at 25° (3); at 68° (4...bedding plane); Recovery: 100%		65								RQD: 19; R4
48	209.9	207.5	210.2	2.7	SILTST	with very fine grain sandstone interbedded; moderate fine bedding; small scale cross-bedding; traces of carbonaceous material; abrupt below:		70								RQD: 45; R4

UNITS USED: m, ft

1: R&OR S — GOLDER ASSOCIATES HARDNESS CODE
RQD — ROCK QUALITY DESIGNATION (%)

▲ ANGLE MEASURED FROM CORE AXIS

HOLE No. LP - D
CONTINUED 101

FILE No BA-212

CORE & COAL CORE DESCRIPTION

PROJECT	LODGEPOLE
AREA	WEST RIDGE - SOUTH SLOPE

HOLE No.	LP - D
CONTINUED	101

BOX No.	DEPTH AT TOP OF BOX	DEPTH		TH	LITHO DESCRIPTION		SEAM DESIG.	SAMPLE No.	ANALYTICAL DATA					Yield	REMARKS
		FROM	TO		MAIN	AMPLIFIED (INCLUDE COAL RECOVERY FOR EACH SEAM)			MOIST %	ASH %	V.M. %	F.C. %	F.S.I.		
									a.r.b.	residual	d.b.	a.d.b.	a.d.b.		
core	207.5	210.2	2.7	SLTST	jointing: at 20° (2); 70° (3) bedding plane; Recovery: 86%										Flow of Water Yes ☐ or Gas? No ☐ Indicate Depth
42	214.0	216.7	6.5	SS	grey; medium to fine grain; moderately bedded in parts; carbonaceous with numerous coaly stringers; calcareous cement in places; fault breccia at 216.0 m depth; jointing: 27° (5) with some calcite infilling	40 at top 60 at base									ROD: 20; R4
	216.7	217.6	0.9	SS	as above; very broken core										ROD: 0
	217.6	218.2	0.6	SS	as above... poorly bedded; jointing: 25°, 45° (2); 20° (calcite filled)										ROD: 60
50	218.2	218.8	0.6	SS	grey; medium grain to coarse grain; occasional grit size bands; trace carbonaceous stringers; poorly bedded; jointing at: 20° (2), 40°, 68° (2... may be bedding plane); occasional shale inter-clasts; abrupt below										ROD: 50; R3
	218.8	219.1	0.3	SS	grey; fine grain; with siltstone interbeds; well bedded defined by carbonaceous layers; abrupt below	70									R3
51	221.9	222.3	3.2	SS	grey; medium grain; mod well bedded; homogeneous throughout; carbonaceous in part; transitional below; jointing at 20° (3), 70° (5) bedding plane; Recovery 100%	70									ROD: 73; R3
	222.3	222.8	0.5	SS	grey; medium grain to coarse grain, with numerous clasts; occasional coaly stringers; grain size becoming more coarse at base; abrupt below	65									ROD: 40; R4
	222.8	222.9	0.1	SHALE	black; with coarse grain sandstone interbeds; disturbed; trace of slickensides; Recovery: 100%										ROD: 100
	222.9	225.3	2.4	SS	very fine grain; shaly; grey to black; broken to powdery; with 0.05m soft clay at base; Recovery 57%										ROD: 12
52	226.2	226.6	1.3	SS	grey; medium grain; carbonaceous; very broken; transitional below; jointing at 20° (6)										ROD: 0; R3
53	230.2	230.7	4.1	SS	grey; medium grain to coarse grain; poorly bedded; occasional carby stringers toward base; homogeneous with minor scattered shaly clasts throughout; transitional below at 227.12 - 227.22 m; is weathered along joints; soft; broken zone at 227.42 - 227.82 m; recovery 100%; jointing at 20°, 70° (5) bedding plane	70									ROD: 44; R3

UNITS USED: m & ft

1:R&OR S - GOLDER ASSOCIATES HARDNESS CODE

▲ ANGLE MEASURED FROM CORE AXIS

*ROD - ROCK QUALITY DESIGNATION [%]

HOLE No.	LP - D
CONTINUED	101

CORE & COAL CORE DESCRIPTION

PROJECT	LOGGEPOL
AREA	WEST RIDGE - SOUTH SLOPE

HOLE No.	LP - D
CONTINUED	101

BOX No.	DEPTH AT TOP OF BOX	DEPTH		TH	LITHO DESCRIPTION		BEDDING ANGLE (°)	SEAM DESIG	SAMPLE No	MOIST %		ANALYTICAL DATA				Yield	REMARKS
		FROM	TO		MAIN	AMPLIFIED (INCLUDE COAL RECOVERY FOR EACH SEAM)				a.r.b.	residual	ASH % d.b.	VM. % a.d.b.	FC % a.d.b.	F.S.I.		
		230.7	231.8	1.1	SS	as above; broken; with occasional carbonaceous zones; abrupt below; RQD: 46; R3											Flow of Water Yes ☐ or Gas? No ☐ Indicate Depth
		231.8	231.9	0.1	CONGL	sub-angular; shaly pebbles in sandy matrix; carbonaceous at base; some slickensided surfaces											
		231.9	233.4	1.5	SHALE	silty to carbonaceous; black; becoming increasingly sheared at base; Recovery: 57%											RQD: 0; R1-3
		233.4	234.7	1.3	SS	fine grain; grey; carbonaceous stringers; poorly bedded; broken due to jointing; Recovery 36%											RQD: 8; R3
54	234.7	234.7	235.3	0.6	SS	medium grain; grey; numerous carbonaceous stringers; transitional below; broken; Recovery 100%											RQD: 16
		235.3	238.1	2.8	SS	grey; medium grain to fine grain; moderately bedded; occasional minor carbonaceous wisps; shale clasts; abrupt below; jointing: at 25° 10' (2...calcite infilled); 70° (2...bedding plane); Recovery: 100%	70										RQD: 67; R3
		238.1	238.9	0.8	SS	grey; fine grain; with interbedded shales; well bedded with minor carbonaceous layers; zone of large shale clasts at base; transitional below; Recovery: 100%; jointing at 70° (5...bedding plane); 25° 30'	70										RQD: 96; R3
55	238.9	238.9	239.3	0.4	SS	grey; medium grain; carbonaceous in part; with occasional shaly clasts; poorly bedded											RQD: 0; R3
56	242.7	239.3	244.1	4.8	SS	grey; medium grain; occasional carbonaceous partings; with moderate to poor bedding; transitional below; slickensided surfaces present along partings; scattered small shaly clasts; jointing at 28° (3...calcite infilled); 70° (5...bedding plane)	70										RQD: 66; R3
		244.1	245.4	1.3	SS	as above; broken; Recovery 100%											RQD: 0
57	246.9	245.4	251.1	5.7	SS	grey; medium grain; homogeneous with occasional carbonaceous partings; no bedding; broken by numerous joints; Recovery 100%; jointing at 25° with calcite and gypsum(?) infilling; 45° with calcite and gypsum(?) infilling											RQD: 17; R3
		251.1	251.2	0.1	SHALE	grey-black; very homogeneous; with minor calcite infilled fractures											RQD: 0; R3
		251.2	251.4	0.2	SHALE	silty; carbonaceous; minor coaly stringers; slickensided; abrupt below											RQD: 65; R3

UNITS USED: m, ft

1 - R&ORS - GOLDER ASSOCIATES HARDNESS CODE

- RQD - ROCK QUALITY DESIGNATION (%)

▲ ANGLE MEASURED FROM CORE AXIS

HOLE No.	LP - D
CONTINUED	101

CORE & COAL CORE DESCRIPTION

PROJECT	LODGEPOLE
AREA	WEST RIDGE - SOUTH SLOPE

HOLE No.	LP - D
CONTINUED	101

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OF 21...

BOX No	DEPTH AT TOPO BOX	DEPTH		TH	LITHO DESCRIPTION		BEDDING ANGLE (°)	SEAM DESIG	SAMPLE No	ANALYTICAL DATA							REMARKS*
		FROM	TO		MAIN	AMPLIFIED (INCLUDE COAL RECOVERY FOR EACH SEAM)				MOIST %		ASH % d.b.	V.M. % a.d.b.	F.C. % a.d.b.	F.S.I.	Yield	
										a.e.b.	residual						
		251.4	252.3	0.9	SS	grey; medium grain to fine grain; numerous shaly clasts; jointing at 35°...calcite infilled; RQD: 84; R4											Flow of Water Yes ☐ or Gas? ☐ Indicate Depth
		252.3	253.1	0.8	SS	grey; numerous shale interbeds and clasts; coaly stringers; broken; sheared zone											RQD: 0; R2
		253.1	253.4	0.3	SS	grey; medium to coarse grain; occasional minor carbonaceous stringers; Recovery 100%; jointing at 30°, 52°, 50° (carbonaceous infilling)											RQD: 50; R4
		253.4	253.5	0.1	SHALE	carbonaceous; sheared; broken; coaly stringers											
		253.5	254.7	1.2	SS	grey; medium grain to coarse grain; abrupt below; occasional carbonaceous stringers; Recovery 100%; jointing at 30° (4...calcite infilled), 45° (2...bedding plane?)											RQD: 59; R4
59	255.0	254.7	256.0	1.3	SHALE	grey; silty in parts; sheared throughout; slickensided at base with soft calcite infilling											RQD: 0
		256.0	257.8	1.8	SS	grey; medium grain to coarse grain; numerous carbonaceous stringers; very broken with numerous sheared surfaces; calcite infilled joints; Recovery: 100%											RQD: 0; R2
60	258.5	257.8	259.5	1.7	SS	grey; medium to coarse grain; moderate bedding defined by carbonaceous stringers; broken with numerous joints and slickensided surfaces; Recovery 100%; jointing at 30° (2...slickensided)	10										RQD: 41; R3
		259.5	259.8	0.3	SS	as above; very broken	25										
		259.8	260.0	0.2	SHALE	silty; very sheared											RQD: 0; R1
		260.0	260.3	0.3	SS	grey; medium grain; numerous carbonaceous stringers; calcite infilled joints											RQD: 0
		260.3	260.5	0.2	SHALE	sheared; broken											
61	262.2	260.5	263.0	2.5	SS	grey; medium grain; carbonaceous stringers; broken by numerous joints several of which show weathering R2 hardness; recovery: 100%	80										RQD: 0; R3
		263.0	263.4	0.4	SS	grey; fine grain; broken; carbonaceous stringers sheared at top											RQD: 0; R2
		263.4	264.0	0.6	COAL	dull with bright bands; sheared; broken; Recovery: 80%											RQD: 0; S3

UNITS USED: m & ft

1:R&ORS - GOLDER ASSOCIATES HARDNESS CODE

•RQD - ROCK QUALITY DESIGNATION (%)

▲ ANGLE MEASURED FROM CORE AXIS

HOLE No.	LP - D
CONTINUED	101

CORE & COAL CORE DESCRIPTION

PROJECT	LODGEPOLE
AREA	WEST RIDGE - SOUTH SLOPE

HOLE No.	LP - D
CONTINUED	101

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OF 21

BOX No	DEPTH AT TOP OF BOX	DEPTH		TH	LITHO DESCRIPTION		BEDDING ANGLE (°)	SEAM DESIG	SAMPLE No	ANALYTICAL DATA							REMARKS ¹	
		FROM	TO		MAIN	AMPLIFIED (INCLUDE COAL RECOVERY FOR EACH SEAM)				MOIST %		ASH %	VM %	FC %	F.S.I	Yield		
		264.0	266.0	2.0	SHALE	carbonaceous; with coaly stringers; abrupt below; sheared with numerous listric surfaces; Recovery 80%												Flow of Water Yes ☐ or Gas? No ☐ Indicate Depth
62	266.7	266.0	269.8	3.8	SS	grey; medium grain; very carbonaceous with numerous carby stringers and coaly wisps; broken with slickensided surfaces; numerous joints; transitional below; recovery 100%; jointing at 22° (5...with carbonaceous material), 45° (3), 80° (2...bedding plane..?)												R3
63	271.0	269.8	272.0	2.2	SHALE	with interbedded medium grain-fine grain; sandstone; moderately well bedded; abrupt below; contains 2 shear zones at 269.81 - 269.91m, 271.00 - 271.50 m; recovery 90%	85											RQD: 17; R3
		272.0	274.4	2.4	SS	grey; medium grain; poorly bedded with numerous large shaly clasts; carbonaceous stringers defining bedding; broken by numerous joints; Recovery 100%; jointing at 65° (7...slickensided bedding plane), 20° (4...with carbonaceous material)	65											RQD: 29; R3
64	274.8	274.4	279.2	4.8	SS	grey; medium grain to coarse grain; carbonaceous; poorly bedded; transitional below; broken with joints; occasional weathered zones R2; jointing at 20° (4...calcite infilled in part), 50° (4...slickensided); shear zone: 276.95 - 277.15m slickensided in part; 100% Recovery	70											RQD: 23; R3
65	278.9																	
66	283.2	279.2	287.1	7.9	SS	grey; medium grain; occasional carbonaceous stringers; mod. bedded; broken in part with softer weathered zone along joints 285.3 - 285.45m; jointing at 20° (12), 75° (6...bedding planes); Recovery 100%	75											RQD: 27; R3
67	287.1	287.1	294.2	7.1	SS	grey; medium grain; occasional carbonaceous blebs; mod bedded; some fractures infilled with calcite	70											RQD: 29; R3-
68	291.9					some fractures infilled with pyritic material; broken; broken with softer weathered material at 288.35 - 288.85 m depth; jointing at 34° (5), 8°, 70°, (10...bedding plane..?), 16° (3), 25°												
69	295.2	294.2	296.9	2.7	SS	grey; medium grain; occasional carbonaceous stringers at bottom of interval; transitional below; in part, core is broken with softer weathered zone at 294.2 - 294.6 m depth; good bedding; jointing at 18°, 8° (2), 80° (1)... bedding plane)	80											RQD: 4; R3
		296.9	297.1	0.2	SLTST/SS	interbed; grey; fine grain - medium grain; carbonaceous at top of interval with minor coaly particles; abrupt below; jointing at 0°	50											RQD: 0; R3

UNITS USED: m, ft

1: R4/OR 5 - GOLDER ASSOCIATES HARDNESS CODE

• RQD - ROCK QUALITY DESIGNATION (%)

▲ ANGLE MEASURED FROM CORE AXIS

HOLE No.	LP - D
CONTINUED	101

CORE & COAL CORE DESCRIPTION

PROJECT	LODGEPOLE
AREA	WEST RIDGE - SOUTH SLOPE

HOLE No	LP - D
CONTINUED	101

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Of 21

BOX No	DEPTH AT TOP OF BOX	DEPTH		TH	LITHO DESCRIPTION		BEDDING ANGLE (°)	SEAM DESIG	SAMPLE No	ANALYTICAL DATA							REMARKS 1
		FROM	TO		MAIN	AMPLIFIED (INCLUDE COAL RECOVERY FOR EACH SEAM)				MOIST %		ASH %	VM %	FC %	F.S.I	% Yield	
										a.r.b.	residual	d.b.	a.d.b.	a.d.b.			
70	299.0	297.1	300.4	3.3	SLTST/SS	very fine grain; dark grey to black; shaly in places; occasional carbonaceous blebs; some fractures infilled with chert (?); mod. bedding, cross-bedded in portions; core is badly broken; slickensided; jointing at 85° (9... bedding plane) 15°, 74° (3... chert. filled)	85										Flow of Water Yes ☐ or Gas? No ☐ Indicate Depth
		300.4	300.6	0.2	SS	as above; but very badly broken											RQD: 20; R3
		300.6	300.7	0.1	SHALE	carbonaceous; silty; pyrite blebs <0.01 m in diameter throughout											RQD: 0
		300.7	303.3	2.6	SS	fine grain; dark grey to black; occasional carbonaceous blebs; good bedding; broken with softer weathered material at 302.63 - 302.87m depth; cross-bedded; very minor goaly debris at base of interval; jointing at 80° (9... bedding plane), 10°, 0°	70 80										RQD: 0; S5
71	303.3	303.3	307.4	4.1	SS	medium grain; moderately bedded; broken; with weathered zones at 303.78 - 303.91 m, at 305.9-306.05 m; both are S2 in hardness. Recovery 90%; jointing at 74° (7... bedding plane), 10° (3), 26° (4)	74										RQD: 7; R3
72	307.0																
73	311.0	307.4	318.5	1.1	SS	medium grain to coarse grain; mod to poorly bedded; with occasional carbonaceous stringers; abrupt below; some calcite infilling of fractures; some pyrite and quartz infilling of fractures; Recovery 95%; jointing at 10° (5... calcite/quartz/pyrite infilling; trace of slickensiding), 30° (6... pyrite infilling in some), 80° (9... bedding plane)	80										RQD: 69; R4
74	315.5																
		318.5	319.7	1.2	SHALE	carbonaceous; black; homogenous with some very poorly defined beddings; trace of slickensiding											RQD: 20; R4
75	319.7	319.7	322.4	2.7	SHALE	carbonaceous at base; black; slickensided and broken at 320.00 - 320.18 in depth; light colored shale clasts showing stress...? MYLONITE; abrupt below; jointing at 55° (6... carbonaceous...? bedding plane)											RQD: 11; R3
76	322.4	322.4	324.9	2.5	SS	carbonaceous; no bedding planes evident; homogeneous throughout; abrupt below numerous slickensided surfaces; broken by jointing; minor calcite veining; jointing at 55° (5... carbonaceous), 25° (4); both are slickensided											RQD: 0; R4

UNITS USED: m ☒ ft ☐

1: R&/OR S — GOLDER ASSOCIATES HARDNESS CODE

▲ ANGLE MEASURED FROM CORE AXIS

• RQD — ROCK QUALITY DESIGNATION (%)

HOLE No	LP - D
CONTINUED	101

CORE & COAL CORE DESCRIPTION

PROJECT	LODGEPOLE
AREA	WEST RIDGE - SOUTH SLOPE

HOLE No.	LP - D
CONTINUED	101

BOX No.	DEPTH AT TOP OF BOX	DEPTH		TH	LITHO DESCRIPTION		SEAM DESIG	SAMPLE No.	ANALYTICAL DATA						REMARKS ¹
		FROM	TO		MAIN	AMPLIFIED (INCLUDE COAL RECOVERY FOR EACH SEAM)			MOIST %	ASH %	VM %	FC %	F.S.I.	% Yield	
		324.9	325.0	0.1	SHALE	carbonaceous; slickensided; broken; RQD: 0; R2									Flow of Water Yes ☐ or Gas? No ☐ Indicate Depth
				0.1	COAL	shaly; very broken and sheared									
				0.1	COAL	shaly; very broken and sheared		21	0.75	17.26	18.41		3.5	23.21	
				0.2	COAL	shaly; very broken and sheared									
				0.1	COAL	dull; broken Recovery 1.0m/1.2m = 83%									
				0.1	COAL	dull; very sheared		22	0.69	14.31	18.16		3.0	35.10	
				0.3	COAL	dull; shaly in part; broken									
		326.1			MARKER BLOCK										
				0.3	COAL	dull; broken Recovery 0.9m/1.3m = 69%		23	0.66	15.79	17.82		1.5	70.58	
				0.1	COAL	dull; sheared; powdery									
				0.3	COAL	with shaly interbeds; sheared and broken		24	0.67	15.63	17.06		1.0	15.19	
				0.2	COAL	"soupy"; as above; powdery									
		327.4			MARKER BLOCK										
				0.1	COAL	as above Recovery 0.7m/0.9m = 77%									
77	327.6			0.3	COAL	dull; sheared; broken		25	1.00	17.12	18.51		3.0	39.02	
				0.3	COAL	shaly; sheared; broken to powdery									
78	331.7	328.3	347.2	8.9	SS	medium grain; grey; homogeneous; very poorly defined bedding in part; extremely broken and jointed, but does form "stick core"; in zones of weathering core becomes very soft...S4; numerous slickensiding on joint surfaces with frequent calcite fracture infillings especially from 336.5 m and downwards; weathered zones at 331.53 - 333.95m, 334.58 - 334.98 m, 336.2 - 336.5 m, 342.2 - 343.4 m; jointing at 45° & 20° (both are calcite infilled in part with some slickensiding); 80° ... bedding plane; Recovery 100%	80								RQD: 10; R4
79	336.0														
80	337.7														
81	343.5														
82	347.2														
83	351.6	347.2	356.4	9.2	SS	medium grain; dark grey; quite homogeneous (no lamination); overall little solid core; this interval is disturbed in the following positions:									

UNITS USED: m & ft

† - R&/OR S - GOLDER ASSOCIATES HARDNESS CODE

• RQD - ROCK QUALITY DESIGNATION (%)

▲ ANGLE MEASURED FROM CORE AXIS

HOLE No.	LP - D
CONTINUED	101

CORE & COAL CORE DESCRIPTION

PROJECT	LODGEPOLE
AREA	WEST RIDGE - SOUTH SLOPE

HOLE No.	LP - D
CONTINUED	101

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OF 21

BOX No	DEPTH AT TOP OF BOX	DEPTH		TH	LITHO DESCRIPTION		BEDDING ANGLE (°)	SEAM DESIG	SAMPLE No	MOIST %		ANALYTICAL DATA					REMARKS†
		FROM	TO		MAIN	AMPLIFIED (INCLUDE COAL RECOVERY FOR EACH SEAM)						ASH % d.b.	V.M. % a.d.b.	F.C. % a.d.b.	F.S.I.	Yield	
										o.r.b.	residual						
cont. ...	347.2	356.4	9.2	SS	● at 347.9m: 5 cm thick zone-very sheared; flaky to pulverized; shale-like material angled at 60° to the hole			fault									Flow of Water Yes ☐ or Gas? No ☐ Indicate Depth
84 355.1					● at 348.4 to 348.8m: zone of powdery, soaked sand with fragments of sandstone in the lower part of the segment (below this is solid sandstone)			fault zone									when the sandstone is solid R-3-4 Else where it is softer as a result of tect disturbance
					● at 352.3 to 352.9m: very broken to sheared core; upper 25 cm: shale, slickensided												
					● solid, good core (sandstone) down to 353.9m; at 354m: 20 cm very fragmented core												RQD: 10
					● at 354.8 - 355.2 m: very broken, fragmented, almost flaky sandstone												
					● 355.6 - 356.1m, very fractured; easy breaking, soft, semi-soaked zone of sandstone (core still holding together)												
	356.4	357.2	0.8	SS	zone of weathered, pulverized sandstone with a mix of sand and clay-including some small fragments of sandstone			fault zone									
	357.2	357.6	0.4	SS	fine grained; broken												
	357.6	357.9	0.3	SS	very fine grain; appears shaly; very slickensided; breaking into shiny somewhat flaky fragments			fault zone									
	357.9	361.3	3.4	SS	fine grain; grey - most of the core quite broken except somewhat more solid positions at 358.5-358.7m; at 359.3-360.2m and at 360.6 - 361.0m depth, the core is fragmented but has more regular, larger pieces; very sheared zones are at: 358.8-359.0m, small fragments, to powdery; 359.2-359.3m, almost flaky; 360.4-360.6m, very broken to crushed; 361.1-361.3m, shale-very slickensided, breaking into larger flaky fragments	60											
	361.3	361.4	0.1	SS	very fine grain	58											
	361.4	362.6	1.2	SS	fine grain, slightly laminated, with some thin calcite infilled fractures at 15°, 68°, 133° and along the bedding planes												
	362.6	368.8	6.2	SHALE	interbedded with a few thin sandstone layers; the core is quite broken or sheared; intensive slickensiding; flaky at 363.8 - 365.1 m (almost powdery)												RQD: 0 shales S2-S1
	368.8				END OF THE HOLE												

UNITS USED: m (ft)

 1:R&OR S - GOLDER ASSOCIATES HARDNESS CODE
 •RQD -- ROCK QUALITY DESIGNATION (%)

▲ ANGLE MEASURED FROM CORE AXIS

HOLE No.	LP - D
CONTINUED	101

FILE No 8A-712

LP-D-102

CROWS NEST RESOURCES ANALYSIS REPORT

AREA: Lodgepole

HOLE NO. LP-D-102

DATE: January 24, 1979

ANALYST: Bernie

LAB NO.	SAMPLE NO.	SEAM	INTERVAL (METRES)	FRACTION	% AIR DRY MOIST	% RESID. MOIST.	% ASH d.b.	% V.M.	% F.C.	F.S.I.	% YIELD
78 374	1		42.6 - 46.6	RAW		.88	31.32			4	X
				1.4 FLOAT							
				1.4 SINK							
				1.5 FLOAT			5.61	22.97		6½	39.76
				1.5 SINK							60.24
				1.6 FLOAT							
				1.6 SINK							
78 375	2		90.0 - 90.9	RAW		.96	33.65			6	X
				1.4 FLOAT							
				1.4 SINK							
				1.5 FLOAT			6.03	22.78		8	64.71
				1.5 SINK							35.29
				1.6 FLOAT							
				1.6 SINK							
78 376	3		107.9 - 108.8	RAW		1.01	82.27			0	X
				1.4 FLOAT							
				1.4 SINK							
				1.5 FLOAT							
				1.5 SINK							
				1.6 FLOAT							
				1.6 SINK							

CROWS NEST RESOURCES ANALYSIS REPORT

AREA: Lodgepole

HOLE NO. LP-D-102

DATE: January 24, 1979

ANALYST: Bernie

LAB NO.	SAMPLE NO.	SEAM	INTERVAL (METRES)	FRACTION	% AIR DRY MOIST	% RESID. MOIST.	% ASH d.b.	% V.M.	% F.C.	F.S.I.	% YIELD
78 377	4		109.7 - 110.9	RAW		.80	3.95			5½	X
				1.4 FLOAT							
				1.4 SINK							
				1.5 FLOAT			2.84	22.03		5½	89.28
				1.5 SINK							10.72
				1.6 FLOAT							
				1.6 SINK							
				RAW							X
				1.4 FLOAT							
				1.4 SINK							
				1.5 FLOAT							
				1.5 SINK							
				1.6 FLOAT							
				1.6 SINK							
				RAW							X
				1.4 FLOAT							
				1.4 SINK							
				1.5 FLOAT							
				1.5 SINK							
				1.6 FLOAT							
				1.6 SINK							

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LODGEPOLE

DRILL HOLE: LP-D 102

GEOPHYSICAL TOPS vs LOGGED TOPS

September, 1978

BFB COAL LITHOLOGY LOG			LITHOLOGY DESCRIPTION	IN-FIELD EXAMINATION (marker blocks)		
INTERVAL		TH (m)		INTERVAL		TH (m)
from	to			from	to	
0	18.0	18.0	CASING	0	18.0	18.0
			SILTSTONE	18.0	19.6	1.6
18.0	32.7	14.7	SANDSTONE	19.6	35.2	16.4
32.7	32.9	0.2	COAL			
32.9	34.1	1.2	SANDSTONE			
34.1	34.3	0.2	COAL			
34.3	34.7	0.4	SHALY COAL			
34.7	35.4	0.7	COAL			
			SILTSTONE	35.2	36.3	1.1
35.4	36.3	0.9	SHALY COAL			
			SANDSTONE	36.3	41.8	5.5
36.3	36.6	0.3	SILTSTONE			
36.6	37.2	0.6	COALY SHALE			
37.2	39.2	2.0	SILTSTONE			
39.2	39.6	0.4	Coaly SHALE			
39.6	40.8	1.2	SANDSTONE			
40.8	41.1	0.3	COALY SHALE			
41.1	41.8	0.7	SILTSTONE			
41.8	42.8	1.0	SANDSTONE			
42.8	44.3	1.5	SILTSTONE			
			SHALE	41.8	42.6	0.8
44.3	45.2	0.9	COAL	42.6	46.6	4.0
45.2	45.7	0.5	SHALY COAL			
45.7	46.3	0.6	COAL			
46.3	48.5	3.1	SHALE & SILTSTONE interbedded	46.6	50.5	3.9
48.5	48.8	0.3	COALY SHALE			
48.8	49.4	0.6	SILTSTONE			
49.4	49.7	0.3	COAL			
49.7	50.3	0.6	SILTSTONE			
50.3	51.4	1.1	SHALE			
			SANDSTONE	50.5	52.5	2.0

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LODGEPOLE
DRILL HOLE: LP-D 102
GEOPHYSICAL TOPS vs LOGGED TOPS

September, 1978

BPB COAL LITHOLOGY LOG			LITHOLOGY DESCRIPTION	IN-FIELD EXAMINATION (marker blocks)		
INTERVAL		TH (m)		INTERVAL		TH (m)
from	to			from	to	
51.4	51.9	0.5	SILTSTONE			
51.9	52.1	0.2	COALY SHALE			
52.1	56.5	4.4	SILTSTONE w/ sandy intervals	52.5	56.2	3.7
56.5	57.5	1.1	SHALE	56.2	57.3	1.1
			SILTSTONE	57.3	58.0	0.7
				58.0	59.8	1.8
57.5	62.0	4.5	SANDSTONE			
62.0	62.6	0.6	SILTSTONE	59.8	62.5	2.7
62.6	64.1		SHALE	62.5	63.1	0.6
			SHALE, silty	63.1	72.4	9.3
64.1	64.6	0.5	SANDSTONE			
64.6	65.2	0.6	SHALE			
65.2	66.1	0.9	SILTSTONE			
66.1	68.0	1.9	SANDSTONE			
68.0	68.8	0.8	SHALE			
68.8	69.9	1.1	SANDSTONE			
69.9	72.4	2.5	SILTSTONE			
72.4	85.9	13.5	SANDSTONE	72.4	85.7	13.3
			SHALE, silty	85.7	90.0	4.3
85.9	90.2	4.3	SILTSTONE			
90.2	91.2	1.0	COAL	90.0	90.9	0.9
			SHALE	90.9	91.3	0.4
			SILTSTONE	91.3	99.4	8.1
			SHALE	99.4	100.0	0.6
91.2	99.9	8.7	SANDSTONE			
99.9	100.2	0.3	SILTSTONE	100.0	100.2	0.2
100.2	100.7	0.5	SHALY COAL			
			SHALE	100.2	102.0	1.8
100.7	101.8	1.1	COALY SHALE			
101.8	102.2	0.4	SILTSTONE			
102.2	102.6	0.4	COALY SHALE			

1978
 — LODGEPOLE —
 DRILL HOLE: LP-D 102
 GEOPHYSICAL TOPS vs LOGGED TOPS

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September, 1978

BPB COAL LITHOLOGY LOG			LITHOLOGY DESCRIPTION	IN-FIELD EXAMINATION (marker blocks)		
INTERVAL		TH (m)		INTERVAL		TH (m)
from	to			from	to	
102.6	107.7	1.1	SANDSTONE/SILTSTONE	102.0	104.5	2.5
			SILTSTONE	104.5	106.4	0.9
			SHALE	106.4	107.9	1.5
107.7	108.0	0.3	COALY SHALE	107.9	108.8	0.9
			NO CORE RECOVERED	108.8	109.7	0.9
108.0	109.1	1.1	SANDSTONE			
109.1	113.0	3.9	COAL ZONE	109.7	112.6	2.9
			SHALE	112.6	114.6	2.0
113.0	116.2	3.2	SILTSTONE, w/ Sandstone			
116.2	118.0	1.8	SANDSTONE	114.6	115.2	0.6
BOTTOM OF LOGGED INTERVAL			COAL	115.2	115.5	0.3
			SHALE	115.5	115.8	0.3
			SILTSTONE	115.8	119.3	3.5
			SANDSTONE	119.3	121.7	2.4
			SHALE	121.7	126.5	4.8
					TD	

Golder Associates'
Hardness Code

Field Estimation of Hardness

R5	Requires many blows of geological hammer to break.
R4	Requires a few blows of geological hammer to break.
R3	Breaks under single blow of geological hammer.
R2	0.5 cm indentations with sharp end of geological pick. Too hard to cut by hand into triaxial specimen.
R1	Crumbles under firm blows of geological pick.
S5	May be broken in the hand with difficulty.
S4	Indented by fingernail.
S3	Cannot be moulded in fingers.
S2	Moulded with strong pressure of fingers.
S1	Easily moulded with fingers.

Rock Quality Designation

The Rock Quality Designation or "RQD" is the total length of solid core pieces exceeding 10 cm. in length divided by the run length. RQD is usually expressed as a percentage, with the histogram shaded from the left.

All fractures, natural and mechanical, are considered in the calculation, and core lengths are measured from the centre of the fracture along the core axis.

CORE & COAL CORE DESCRIPTION

PROJECT	LODGEPOLE
AREA	WEST RIDGE - NORTH SLOPE

DATE	BEGIN	1978-09-11
	END	1978-09-21

HOLE No.	LP - D
	102

 P. 1
 OF 5

HOLE PARTICULARS

LOCATION	Ref. Meridian 117°; 5465071.98m N		
	664449.30 m E		
ELEVATION	2086.6m ASL	HOLE BEARING (AZ°)	110°
TOTAL DEPTH	126.5 m	HOLE ANGLE (°)*	65°

LOGGING

LOGS RUN	CAMMA-DENSITY, NEUTRON, BRD
LOGGED BY	RPR
OTHER TESTS	

COAL CORING PERFORMANCE

CORE DIAMETER	HQ
CORE RECOVERED	
LENGTH CORED	
CORE RECOVERY	%

EXAMINATION

LOG USED	-
No. OF SEAMS SAMPLED	3
EXAMINER (S)	JH, JF, DW
DATE	

BOX No	DEPTH AT TOP OF BOX	DEPTH		TH	LITHO DESCRIPTION		BEDDING ANGLE (°)	SEAM DESIG.	SAMPLE No.	ANALYTICAL DATA							REMARKS ¹
		FROM	TO		MAIN	AMPLIFIED (INCLUDE COAL RECOVERY FOR EACH SEAM)				MOIST %		ASH % d.b.	V.M. % a.d.b.	F.C. % a.d.b.	F.S.I.	% Yield	
										a.r.b.	residual						
1	18.0	0	18.0		CASING												Flow of Water Yes ☐ or Gas? No ☐ Indicate Depth RQD: 0
		18.0	19.6	1.6	SLTST	broken core, dark grey to black;	85										
		19.6	35.2	15.6	SS	initial 3.5 m fine to medium gray, somewhat laminated; coarse grain to very coarse grain; salt and pepper, core broken to 30 m; the core is very broken from 33.5 to 35.1 m * joint at 33m : 15°	80										R4
2	21.6																
3	24.8																
4	29.7																
5	33.1																
		35.2	36.3	1.1	SLTST	fine grain; black; somewhat shaly at mid interval; at base grading to very fine grain sandstone											
6	39.2	36.3	41.8	5.5	SS	fine grain; with siltstone interbeds; at 39.8 m depth, calcite infilled fractures parallel to core axis NOTE: interval 33.5 - 37.5 m ... RQD: 0 37.5 - 38.1 m ... RQD: 50 38.1 - 39.2 m ... RQD: 0 39.2 - 41.1 m ... RQD: 50 * jointing at 15° to core axis										R3	
		41.8	42.6	0.8	SHALE	carbonaceous at base; black; broken core; recovery: 38%											
		42.6	46.6	4.0	COAL	recovery: recovered/cut: 0.37m/4.0m = 9% NOTE: there was severe circulation problems on this hole below the drilled depth of 34 m * that core recovered: 44.3 - 46.3 m ?			1	0.88	5.61	22.97			39.76	6.5	
7	46.6	46.6	50.5	3.9	SHALE	and siltstone interbedded; more shaly at 48.5 - 50 m depth; coal stringer at 48.8 - 48.9 m depth											NOTE: All quality data is based on washed coal @ S.G. = 1.5 RQD: 10 R3
8	51.3	50.5	52.5	2.0	SS	very fine grain; dark grey; grading to siltstone at base of interval											
9	54.9	52.5	56.2	3.7	SLTST	fine grain; dark grey; with minor sandy intervals throughout interval from 53.7 - 54.9m; core is broken into larger polygonal fragments ... breaking along joint systems at 17° 55° 8° (to the 17° system)											RQD: 18

UNITS USED: mm, ft

* : MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE AXIS

1 : R & OR S - GOLDER ASSOCIATES HARDNESS CODE

* RQD - ROCK QUALITY DESIGNATION (%)

HOLE No.	LP - D
	102

CORE & COAL CORE DESCRIPTION

PROJECT	LODGEPOLE
AREA	WEST RIDGE - NORTH SLOPE

HOLE No.	LP - D
CONTINUED	102

PAGE 2
OF 5

BOX No.	DEPTH AT TOP OF BOX	DEPTH		TH	LITHO DESCRIPTION		BLOWING ANGLE (°)	SEAM DESIG	SAMPLE No.	MOIST %		ANALYTICAL DATA				REMARKS
		FROM	TO		MAIN	AMPLIFIED (INCLUDE COAL RECOVERY FOR EACH SEAM)				a.r.b.	residual	ASH % d.b.	V.M. % a.d.b.	FC % a.d.b.	F.S.I.	
..	cont.	52.5	56.2	0.7	SLTST	jointing planes are weathered and iron stained										Flow of Water Yes ☐ or Gas? No ☐ Indicate Depth
		56.2	56.3	0.1	SHALE	black; sheared to pulverized; contains minor coaly debris										RQD: 0
		56.3	57.3	1.0	SHALE	silty; black; contains minor coaly debris; slickensided; joints: 5°										RQD: 73; R3
		57.3	58.0	0.7	SLTST	olive grey; fine grain; calcitic cement; calcite infilling in fractures										RQD: 50
10	58.0	58.0	59.8	1.8	SHALE	black; sandy intervals; calcite cement; calcite infilling in fractures; minor coaly debris; increasing sand content near base of interval; joints: 85° ... (10) Bedding Plane?										RQD: 80; R3
		59.8	62.2	2.4	SLTST	grey; very fine grain; iron stained along fractures; calcite infilling along fractures; core badly broken from: 60.2 - 60.5 m 61.9 - 62.2 m some good cross-bedding; joints: 35° (5) 10° 75° (4) calcite										RQD: 40; R3
11	62.2	62.2	62.5	0.3	SLTST	grey; very fine grain; iron stained along fractures; badly broken										
		62.5	63.1	0.6	SHALE	black; slickensided; core badly broken and rubbly; core contains coaly debris										
12	65.9	63.1	72.4	9.3	SHALE	silty; grey; very fine grain; calcareous cement										RQD: 30; R3
13	70.0					calcite infilling in fractures; iron stain in fractures; jointing: parallel to axis 18° to axis 35° to axis (calcite) core broken: 67.6 - 67.8 m 69.9 - 70.2 m										
		72.4	73.9	1.5	SS	grey; fine grain; good cross-bedding; bedding defined by laminations of 85°; joints 85° ... (7)	85									
14	73.9					bedding plane joints; joint 40°; calcitic cement										
		73.9	74.9	1.0	SS	As above; joint system @ 18° ... 2, 1 is calcite filled; at 74.7m, ... 04m silty soft shale	85									
		74.9	76.3	1.4	SS	fine to medium grained laminated brown/dark grey; calcitic cement; calcite infilled fractures; core badly broken and rubbly	75									RQD: 10; R3

UNITS USED: m ☐ ft ☐

1: R&/OR S — GOLDR ASSOCIATES HARDNESS CODE

• RQD — ROCK QUALITY DESIGNATION (%)

▲ ANGLE MEASURED FROM CORE AXIS

HOLE No.	LP - D
CONTINUED	102

CORE & COAL CORE DESCRIPTION

PROJECT	LODGEPOLE
AREA	WEST RIDGE - NORTH SLOPE

HOLE No.	LP - D
CONTINUED	102

PAGE...3
OF...5...

BOX No	DEPTH AT TOP OF BOX	DEPTH		TH	LITHO DESCRIPTION		BEDDING ANGLE (°)	SEAM DESIG	SAMPLE No	ANALYTICAL DATA					REMARKS†		
		FROM	TO		MAIN	AMPLIFIED (INCLUDE COAL RECOVERY FOR EACH SEAM)				MOIST %		ASH %	V.M. %	FC %		F.S.I.	% Yield
										a.r.b.	residual	d.b.	a.d.b.	a.d.b.			
15	77.5	76.3	79.3	3.0	SS	fine grain; grey to beige; calcitic cement; calcite infilling in some fractures; bedding laminations well defined by colour contrast; iron staining in some fractures; joint systems • 28° (2) • 0° (3) very minor carbonaceous material	75										Flow of Water Yes ☐ or Gas? No ☐ Indicate Depth
		79.3	80.2	0.9	-SS	medium to fine grain; grey to buff; calcitic cement; calcite infills; joint system at • 10° (calcite infilling) • 80° (2)	80										RQD: 100; R3
		80.2	80.50	0.3	SS	As above; core badly broken											
16	81.6	80.5	82.3	1.8	SS	fine to medium grain; grey; calcitic cement; calcite infilling in some fractures; minor coaly debris; strong and very homogeneous; joint system at • 10° (calcite infilling) • 25°	60 90										RQD: 93; R3
		82.3	84.7	2.4	SS	As above but core is much more broken											RQD: 11; R3
		84.7	85.5	0.8	SS	fine to medium grain; grey; calcite infilling and iron stained along fracture surfaces; core badly broken to rubble; increasing coaly debris to base of interval											RQD: 0; R3
17	85.5	85.5	85.7	0.2		As above											
		85.7	88.4	2.7	SHALE	silty; beige to grey; core very badly broken except for upper 0.6 m; occasional sandy lamination; jointing at 0°											
		88.4	88.8	0.4	SHALE	black; iron stained on fractures; core badly broken; minor coaly debris at base of interval											RQD: 0
18	88.8	88.8	89.2	0.4	SHALE	black; calcite infilled fractures; minor coaly debris; joint system @ 15° ... calcite infilled											RQD: 25; R3
		89.2	90.0	0.8	SHALE	as above, but extremely broken and rubble											
		90.0	90.9	0.9	COAL	recovery% = recovered/cut = .33m/0.9m = 37% of the coal recovered, upper 0.17m bright, banded coal; coal core appears intact; Lower 0.16 m is ground and pulverized			2	0.96		6.03	22.78		8	64.71	
										NOTE: All quality data is based on washed coal at S.G.: 1.5							
		90.9	91.3	0.4	SHALE	black; carbonaceous in lower half; grading to sandy at top of interval											RQD: 25; R3

UNITS USED: m ☐ ft ☐† R&R/S — GOLDER ASSOCIATES HARDNESS CODE
• RQD — ROCK QUALITY DESIGNATION (%)

▲ ANGLE MEASURED FROM CORE AXIS

HOLE No.	LP - D
CONTINUED	102

CORE & COAL CORE DESCRIPTION

PROJECT	LODGEPOLE
AREA	WEST RIDGE - NORTH SLOPE

HOLE No	LP - D
CONTINUED	102

 PAGE 4
OF 5

BOX No	DEPTH AT TOP OF BOX	DEPTH		TH	LITHO DESCRIPTION		BEDDING ANGLE (°)	SEAM DESIG	SAMPLE No	ANALYTICAL DATA					F.S.I.	% Yield	REMARKS
		FROM	TO		MAIN	AMPLIFIED (INCLUDE COAL RECOVERY FOR EACH SEAM)				MOIST %		ASH %	V.M. %	F.C. %			
										a.t.b.	residual	d.b.	a.d.b.	a.d.b.			
19	93.2	91.3	96.1	4.8	SLTST	very fine grain; grey; iron stained along fractures; calcitic cement and calcite infilling along fractures; occasional sandy laminations and sandstone-siltstone interbeds; joint systems at: 10° (3) 40° (3...some calcite infilled) at 93.3 - 94.4 m: soft, pilable, clay	80									Flow of Water: Yes ☐ or Gas? No ☐ Indicate Depth RQD: 32; R3	
20	96.7	96.1	97.4	1.3	SLTST	very fine grain; beige to grey; calcitic cement; core is extremely broken and rubbly										RQD: 0; R3	
		97.4	99.4	2.0	SLTST	grading to shaly at base of interval; calcitic cement; calcite infilling in some fractures; some fractures have surfaces that are iron stained jointing at: 50° 20° (iron stained..2) slickensides along some joints										RQD: 51; R3	
		99.4	100.0	0.6	SHALE	black; badly broken; minor carbonaceous debris near base of interval											
		100.0	100.2	0.2	COAL	Recovered: 0.12/0.2 = 60%; dull; minor bright bands; minor pyritic inclusions										R3	
21	100.2	100.2	102.0	1.8	SHALE	black; lower 0.5 m of interval grading to silty; at 101.2 m, 0.1 m coaly and carbonaceous material badly broken and crushed; at 101.5 - 101.7 m core broken and badly slickensided; calcite cement and infilling; joints at 40° 75° (?..bedding plane)										RQD: 15; R3	
22	104.3	102.0	104.5	2.5	SS/SLTST	interbedded; very fine grain to fine grain; beige to grey; calcitic cement; calcite infilling in some fractures; some fractures, iron stained; good bedding laminations; joint systems at 30° (calcite infilled) 10° 75° (6..?Bedding plane)	75									RQD: 37; R3	
		104.5	106.4	1.9	SLTST	shaly; grading to shale at top of interval; beige to grey; calcitic cement; calcite infilling of fractures; lower 0.4 m badly broken; joint systems at 80° (7..?Bedding plane) 70° (2)										RQD: 0; R3	
		106.4	107.9	1.5	SHALE	black; minor carbonaceous material; minor slickensides; core broken										RQD: 11	

UNITS USED: m ☐ ft ☐
 1-4 & OR 5 - GOLDER ASSOCIATES HARDNESS CODE
 *RQD - ROCK QUALITY DESIGNATION (%)

▲ ANGLE MEASURED FROM CORE AXIS

HOLE No	LP - D
CONTINUED	102

CORE & COAL CORE DESCRIPTION

PROJECT	LODGEPOLE
AREA	WEST RIDGE - NORTH SLOPE

HOLE No.	LP - D
CONTINUED	102

PAGE 5
OF 5

BOX No.	DEPTH AT TOP OF BOX	DEPTH		TH	LITHO DESCRIPTION		RECORDING ANGLE (°)	SEAM DESIG.	SAMPLE No.	ANALYTICAL DATA							REMARKS
		FROM	TO		MAIN	AMPLIFIED (INCLUDE COAL RECOVERY FOR EACH SEAM)				MOIST %	ASH %	V.M. %	F.C. %	F.S.I.	% Yield		
		107.9	108.8	0.9	SHALE	coaly; core recovered/core cut = 0.8m/0.9m = 89% recovery; core badly broken; rubbly; slicken-sided			3	1.01	82.27			0		Flow of Water Yes ☐ or Gas? No ☐ Indicate Depth RQD: 0	
		108.8	109.7	0.9		No recovery (may be coal?)											
23	109.7	109.7	110.9	1.2	COAL	core recovered/core cut = 1.0m/1.2m = 83% recovery: 0.30m: sheared & pulverized 0.14m: soft, sheared, pulverized 0.20m: sheared, pulverized, soft 0.23m: sheared, soft, (banded?) 0.13m: pulverized, sheared, soft			4	0.80	2.84	22.03		5.5	89.28		
		110.9	112.6	1.7	COAL ?	note on marker block: "soft coal", no recovery											
		112.6	114.6	2.0	SHALE	black; minor silty intervals at 114.3m, 0.1m soft, pliable clay/shale; core badly broken; joint systems at • 30° (4) • 75° (4...bedding planes)										RQD: 5; R3	
		114.6	115.2	0.6	SS	very fine grain; grey; calcareous cement; calcite infilling in fractures; minor carbonaceous debris; core broken; joint systems at • 20° • 30°											
		115.2	115.5	0.3	COAL	shaly; core recovered/core cut = 0.13m/0.30m = 43% recovery; core badly broken to pulverized											
24	115.7	115.5	115.8	0.3	SHALE	black; minor coaly debris										RQD: 60; R3	
		115.8	119.3	3.5	SLTST	very fine grain; dark grey to black; calcareous cement; calcite infilling in some fractures; iron stained on some fracture surfaces; joint systems at • 05° (3) & some calcite filling • 85° (6...bedding planes?) recovery at 117.7-118.9m is badly broken (0.15m core recovered)										RQD: 10; R3	
25	121.1	119.3	121.7	2.4	SS	very fine grain to fine grain; grey to off-white; calcareous cement; calcite infilling in fractures; good cross-bedding; upper 0.4 m of core homogeneous; joint systems at: • 80° (9...some calcite infilling; bedding plane joints (?)) • 10° (calcite infilled)										RQD: 77; R3	
		121.7	126.5	4.8	SHALE	black; minor carbonaceous debris; core badly broken and rubbly, especially from 123.4-126.5m											
		END OF HOLE				(abandoned due to poor hole conditions)											
Sept. 21/78 DWF																	

UNITS USED: m ☐ ft ☐

1-RA/OR S - GOLDR ASSOCIATES HARDNESS CODE

•RQD - ROCK QUALITY DESIGNATION (%)

▲ ANGLE MEASURED FROM CORE AXIS

HOLE No.	LP - D
CONTINUED	102

FILE No SA-212

K. SHELL-LOGGERS 71(2)A

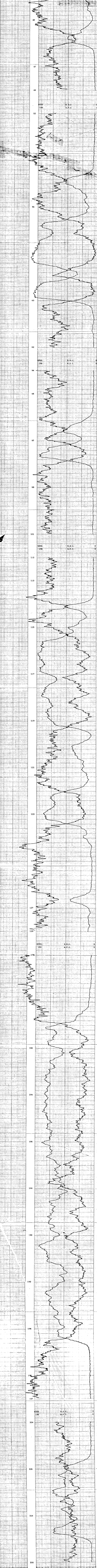
LITHOLOGY LOGS.

ENCLOSURE 2 AND 4

1974

426

5 of 6



	8.000	g/cm ³	
	120	g/cm ³	
	COAL BULK DENSITY		
	g/cm ³		
DEPTH	GAMMA RAY		

BOREHOLE 11-2-107

AREA COALBUSH A.C.

CLIENT SA. TEL. (COALBUSH) P.A.

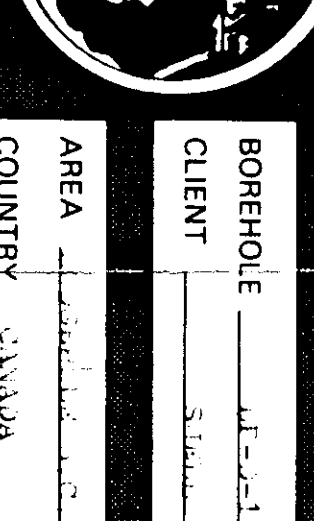
COUNTRY CANADA

COAL QUALITY LOG

L.P.D. - 102
K. SHELL - L285-PRC 78(3)A

⑦
426 5/6

ENCLOSURE 4

	BOREHOLE _____ CLIENT _____ AREA _____ COUNTRY _____ DATE LOGGED _____	DEPTH SCALE 10' — 100'
COAL LITHOLOGY LOG	BOREHOLE DATA PERMANENT LOCATION _____ ELEVATION OF F.O. _____ LOGGING METHOD _____ LOGGING SPEED _____ LOGGING TIME _____ LOGGING DATE _____ LOGGING TIME _____ LOGGING DATE _____ LOGGING TIME _____ LOGGING DATE _____	LOG SUITE: GAMMA RAY CALIPER
SONDE TYPE: COAL COMBINATION SONDE	SONDE DATA NATURE _____ LEVEL _____ VISCOSITY _____ B.H.T. _____	OPERATION DATA LAST READING _____ ANTENNA LOGGED _____ UNIT TRUCK No. _____ ENGINEER _____ WITNESS _____

EQUIPMENT AND RECORDING DATA																
COAL COMBINATION SONDE																
LOG	EQUIPMENT	TAPING	PANEL	CAL	DEPTHS	SEAM LOG RUN										
SONDE	SOURCE	CALIBRATOR	LOG TAPED	RECORD DIRECT/REPLAY	SPEED	SEC	NORM	FROM	TO	INTERVAL						
GAMMA RAY	129	300A21	Y	9	d	9	1	1.43	118	0	118	Y				
LS DENSITY	100002	3710	Y	9	d	9	1/3	7.42	119	0	119	Y				
CALIPER	SIDEWALL POSITION															
COAL QUALITY/SEAM THICKNESS LOG INTERVALS (Refer to relevant log)																
FROM	115	93	53											INTERVAL TOTAL		
TO	107	88	30													
INTERVAL	8	5	23											36		
ADDITIONAL SONDES RUN					REMARKS											
SONDE	LOG	GENERAL SCALE LOG	DETAIL SCALE LOG	REFER TO ADDITIONAL HEADINGS	(COAL LOGS) THROUGH DRILL RODS											
09	N-N	100	1		THICKNESS 2m/min OVER COAL											
					SEAM CALIPER = 48sec.											
					L.S.D. T.C. = 1sec.											

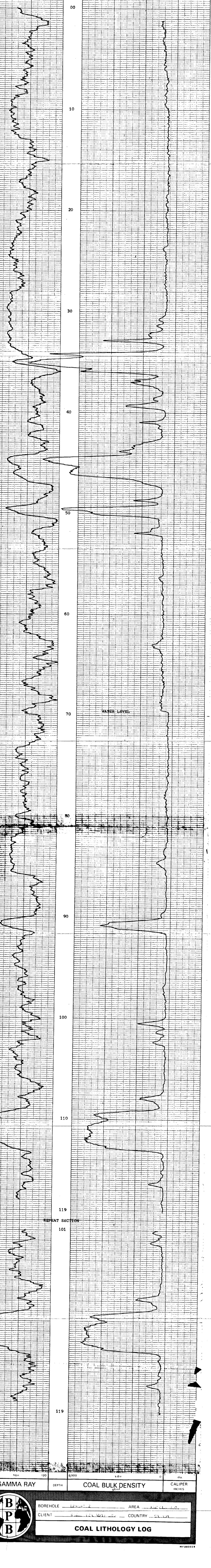
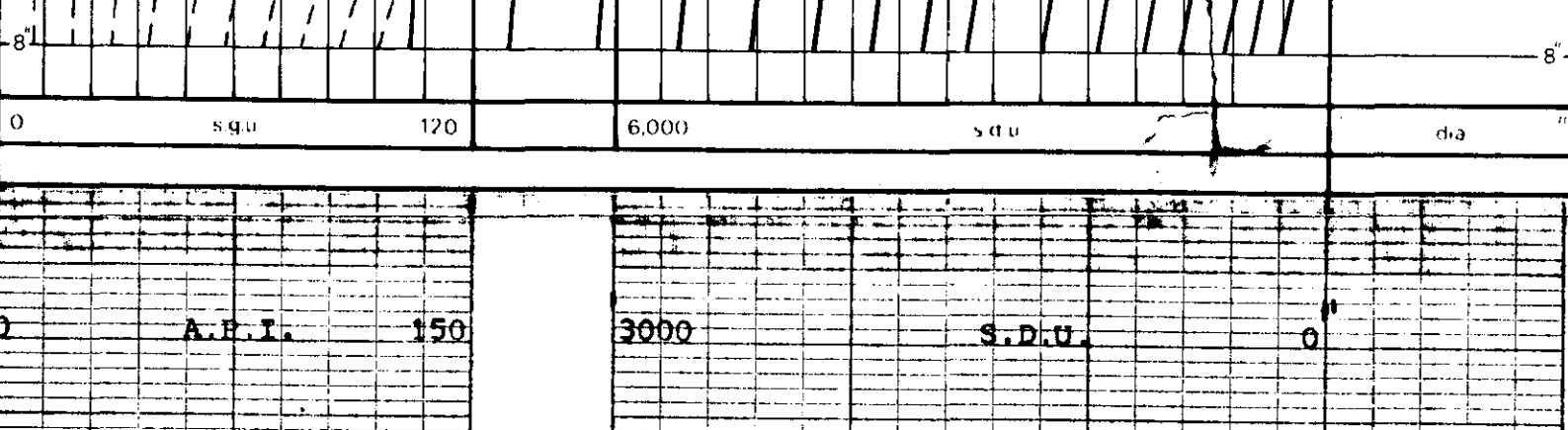
B PB COAL LITHOLOGY LOG

CALIBRATION DATA

JIG No. 01	VALUES (1) 100 2" DIAM	JIG CAL DATE 7/1/08/316 VALUE 3710 SDU @	g/cm ³	ins	cms
JIG MARK SHOWN AT ABOVE VALUE =		JIG No. 111	SPAN 0 126	NORM	SDU @ 7.42

GAMMA RAY	DEPTH	COAL BULK DENSITY	CALIPER
		g/cm ³	INCHES

HOLE SIZE CORRECTION DATA



GAMMA RAY	DEPTH	COAL BULK DENSITY	CALIPER
		g/cm ³	INCHES



BOREHOLE _____	AREA _____
CLIENT _____	COUNTRY _____

COAL LITHOLOGY LOG

MY 880074

0.01 LOG

[illegible]

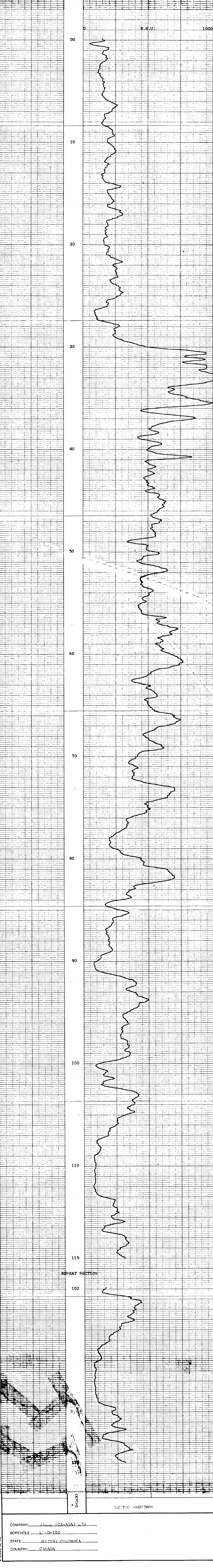
Rm @ Meas
Rmf @ Meas
Rmc @ Meas

Source Rm1	Rmc								
Rm1 @ BH1		④	⑦	④	⑦				
Rm1 @ BH1		④	⑦	④	⑦				
Rmc @ BH1		④	⑦	④	⑦				

Logging Data							
Log	Depth		Speed	T.C.	Norm	Spinning	Source No.
	From	To					
SEA	119	0	9	1	0.74	9	Amber

NO LOGGED THROUGH DRILL RODS.

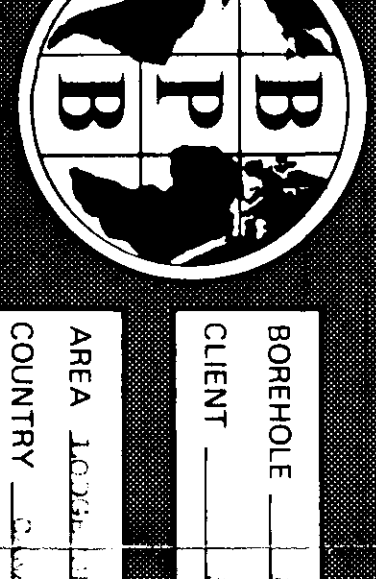
	MONTHS	NEUTRON-NEUTRON
	100 1	



Witness

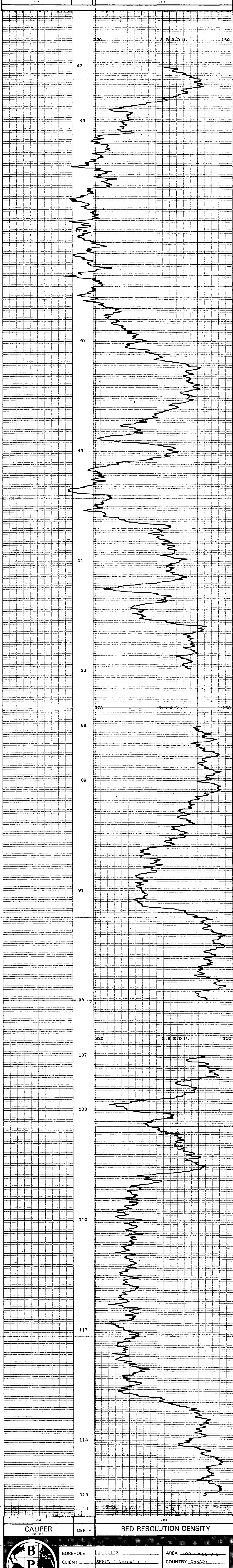
—

K-SHELL LOGSHEET 7/13/94



BOREHOLE	LP-9-102	DEPTH SCALE	27.1
CLIENT	SHELL (CANADA) LTD.	COUNTRY	CANADA
AREA	LOOSEBOLT B.O.	DATE LOGGED	7/8/94
LOG			
SEAM THICKNESS			
SEAM			
THICKNESS			
LOG			
SONDE TYPE			
COAL COMBINATION			
SONDE			
LOG SUITE			
CALIPER			
BR. DENSITY			

B P B SEAM THICKNESS LOG

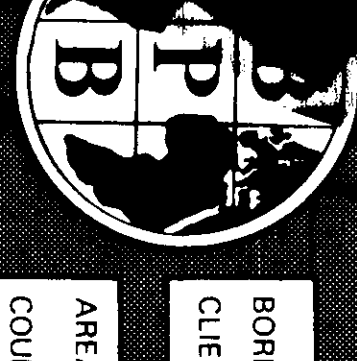


CALIPER	INCHES	DEPTH	BED RESOLUTION DENSITY
B P B			
BOREHOLE		LP-9-102	
CLIENT		SHELL (CANADA) LTD.	
AREA		LOOSEBOLT B.O.	
COUNTRY		CANADA	
SEAM THICKNESS LOG			

426 5/6

ENC 4

K. SHEW - LODGE POLE - 78 (3/19)



BOREHOLE LE-0102
CLIENT SIBEL (CANADA) LTD.

AREA LODGEPOLE, B.C.
COUNTRY CANADA

DATE LOGGED 7/8/79

DEPTH SCALE
20.1
OF 100S

BOREHOLE DATA
REFER TO LITHOLOGY LOG

OPERATION DATA
REFER TO LITHOLOGY LOG

EQUIPMENT AND RECORDING DATA

COAL COMBINATION SOURCE

LOG
TANG
LOG RECORDING SPEED
GAMMA RAY
S.D.U. 3000
A.P.I. 150
S.D.U. 3000
A.P.I. 150

COAL QUALITY LOG

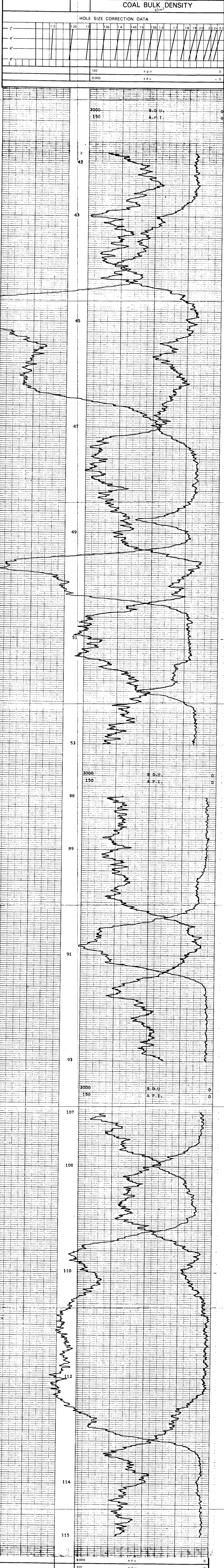
SONDE TYPE

COAL COMBINATION
SONDE

LOG SUITE:
GAMMA RAY

S.D. DENSITY

B P B COAL QUALITY LOG



COAL BULK DENSITY

GAMMA RAY

DEPTH



BOREHOLE LE-0102
CLIENT SIBEL (CANADA) LTD.

AREA LODGEPOLE, B.C.
COUNTRY CANADA

COAL QUALITY LOG

426 5/6
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ENC 4

BOREHOLE

CLIENT

DATE LOGGED

11-10-72

11-10-72

11-10-72

AREA

COUNTRY

DEPTH SCALE

11-10-72

11-10-72

11-10-72

COAL LITHOLOGY LOG

BOREHOLE DATA

PERMANENT DATUM

ELEVATION OF P.D.

WATER BEING FROM

DEPTH REACHED

CASING SHOE

CASING SIZES

LOG

LOG

LOG

LOG

LOG

LOG

SONDE TYPE

COAL COMBINATION

SONDE

LOG SUITE

GAMMA RAY

LS DENSITY

CALIPER

WITNESS

ENGINEER

UNIT TRACK NO.

INTERVAL LOGGED

LAST READING

FIRST READING

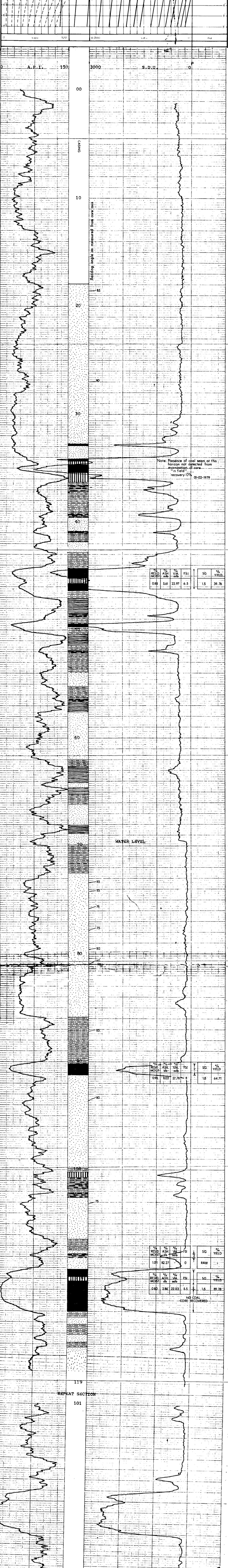
EQUIPMENT AND RECORDING DATA													
COAL COMBINATION SONDE			TAPING				PANEL		CAL COEFF	DEPTHS		SEAM LOG RUN	
LOG	SONDE	SOURCE	CALIBRATOR	LOG TAPED	RECORD/DIRECT SPEED	REPLAY	SPEED	TC SECS	NORM	FROM	TO	INTERVAL	
GAMMA RAY	129		100A P.I.	y	9	d	9	1	1.43	119	0	119	y
LS DENSITY		100mc2	3710	y	9	d	9	1/3	7.42	119	0	119	y
CALIPER	SIDEWALL POSITION												
COAL QUALITY/SEAM THICKNESS LOG INTERVALS (Refer to relevant log)													
FROM		115		93		53		INTERVAL TOTAL + 36					
TO		107		88		30							
INTERVAL		8		5		23							
ADDITIONAL SONDES RUN							REMARKS						
SONDE	LOG	GENERAL SCALE LOG	DETAIL SCALE LOG	REFER TO ADDITIONAL HEADINGS			100A P.I. PERMANENT DRILL RODS P.D. SLOWED TO 2m/min OVER CLAL SEAMS. GAMMA R.C. = 4sec. L.S.D. P.C. = 1sec.						
09	N-N	100	1										

B PB COAL LITHOLOGY LOG

CALIBRATION DATA											
JIG No 01	VALUE 30.00	2" DIAM	JIG CAL DATE 7/10/82	VALUE 3710	SDU	g/m ³	g/m ³	g/m ³	g/m ³	g/m ³	g/m ³
JIG MARK SHOWN AT ABOVE VALUE -			JIG No 111	SPAN 0	026	NORM	7	42			

GAMMA RAY	DEPTH	COAL BULK DENSITY	CALIPER
		g/cm ³	INCHES

HOLE SIZE CORRECTION DATA											
2"	120	125	130	135	14	145	15	155	16	17	18
4"	19	20	22	24	30						
6"											
8"											



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