

K-SHELL-HARVEY CR 12(3)A

APPENDIX III  
(+ ENCLOSURE III)  
BONE HOLE  
DATA  
(LOSS)

401

3 of 4



### APPENDIX THREE

DRILL HOLE : HC-D 101

NOTE: The core of HC-D 101 was logged in the field without the geophysical COAL LITHOLOGY LOG. Minor variances were later noted when the geophysical log was to be matched to the core description\*. The COAL LITHOLOGY LOG, aided by the core description, was independently interpreted for lithology. Lithologies, depth intervals and thicknesses, of the log and core description, were summarized in a tabular format. APPENDIX THREE contains, for drill hole HC-D 101, a

- copy of the core description
- BPB : COAL LITHOLOGY LOG with interpretation of lithology
- tabulation of geophysical tops vs logged tops

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\* in future programs, it is strongly recommended that the core be logged, in the field, using the geophysical COAL LITHOLOGY LOG; this hopefully will eliminate the minor variances and discrepancies.

**OPEN FILE**  
**GEOLOGICAL BRANCH**  
**ASSESSMENT REPORT**

**00 401**

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 &amp; COAL CORE DESCRIPTION

PROJECT	HARVEY CREEK
AREA	S.E. B.C.

DATE	BEGIN	1978-09-17
	END	1978-09-22

HOLE No.	HC - D
	101

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## HOLE PARTICULARS

LOCATION	Ref. Meridian: 117°; 5462224.27m N		
	676467.12m E		
ELEVATION	1425.17 m ASL	HOLE BEARING (AZ) <sup>o</sup>	296
TOTAL DEPTH	247.20 m	HOLE ANGLE (°) <sup>h</sup>	58

## LOGGING

LOGS RUN	BRD; Caliper; Gamma-Density; Neutron-Neutron
LOGGED BY	Vertically BFB
OTHER TESTS	

## COAL CORING PERFORMANCE

CORE DIAMETER	HQ
CORE RECOVERED	
LENGTH CORED	
CORE RECOVERY	%

## EXAMINATION

LOG USED	-
No. OF SEAMS SAMPLED	6
EXAMINER (S)	AN & JL
DATE	

BOX No.	DEPTH AT TOP OF BOX	DEPTH		TH	LITHO DESCRIPTION		RECOVERED ANGLE (°)	SEAM DESIG.	SAMPLE No.	ANALYTICAL DATA							REMARKS <sup>1</sup>
		FROM	TO		MAIN	AMPLIFIED (INCLUDE COAL RECOVERY FOR EACH SEAM)				MOIST %		ASH %	V.M. %	F.C. %	F.S.I.	Yield	
										a.r.b.	residual						
		0	15.2			Surface casing set...drilled with tri-cone rock bit											Flow of Water: Yes <input type="checkbox"/> or Gas? No <input type="checkbox"/> Indicate Depth
1 (15.2)		15.2	23.5	8.3	CONGL	medium grain to coarse grain; rounded; assorted pebbles in sand matrix; cement weathers red-brown...especially on joints; joint systems @: • 28° • 12° (2...iron stained) • 44° (2) • 30°	63 @ 22.0 m										RQD: 66; R3
2 (20.4)																	
		23.5	29.0	5.5	CONGL	as above											RQD: 28; R3
3 (25.0)																	
4 (28.0)		29.0	29.7	0.7	SHALE	silty; homogeneous; abrupt below; joint systems at • 42° • 50° • 12° (clay filled)											RQD: 60; R3
		29.7	30.0	0.3	SS	extremely shaly; disturbed zone; carbonaceous stringers; pyrite clusters; abrupt below; joint systems @ • 22°											RQD: 50; R3
		30.0	36.7	6.7	SS	medium grain to fine grain; poorly bedded; some cross-bedding; mildly calcareous; homogeneous throughout; cement weathers red-brown & develops softer zone along joints; transitional below; joint systems at • 54° (2) • 27° (2) • 70° (5...carbonaceous) • 20° (2) • 60° • 40° • 65° (2) • 10° (clay filled)	70 @ 32.0 m										RQD: 54; R3
5 (33.5)																	
		36.7	37.1	0.5	SS	as above with numerous coaly wisps and stringers											RQD: 0; R3
		37.1	37.4	0.3	SHALE	silty; carbonaceous; broken; transitional below											RQD: 0; R2
		37.4	37.5	0.1	COAL	mixed with clay; sheared											83

UNITS USED: mm (in)

\* : MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE AXIS

\* "bracketed" no. is depth as noted on first marker block in core box

† : R &amp; OR S — GOLDER ASSOCIATES HARDNESS CODE

• RQD — ROCK QUALITY DESIGNATION (%)

HOLE No.	HC - D
	101

## CORE &amp; COAL CORE DESCRIPTION

PROJECT	HARVEY CREEK
AREA	S.E. B.C.

HOLE No.	HC - D
CONTINUED	101

BOX No	DEPTH AT TOP OF BOX	DEPTH		TH	LITHO DESCRIPTION		SEAM DESIG	SAMPLE No	ANALYTICAL DATA						Z	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	a.d.b.	a.d.b.	a.d.b.				
		37.5	37.9	0.4	COAL	powdery; abrupt below RQD: S2											Flow of Water Yes <input type="checkbox"/> or Gas? No <input type="checkbox"/> Indicate Depth
7 (43.0)		37.9	44.1	6.2	SHALE	silty; carbonaceous with very fine grain sandstone interbeds which are cross-bedded and calcareous; disturbed in part with occasional calcite veins; becoming sandy near base; transitional below; joint systems at • 60° (4...carbonaceous) • 60° (4) • 60° (3...carbonaceous and clay filled)											RQD: 61; R3
8 (44.5)		44.1	46.0	1.9	SS	medium grain to fine grain; shaly; disturbed in part with moderately developed bedding; calcareous; joint systems at • 30° (3...calcite infilled) • 10° (2...clay infilled)	72										RQD: 70; R3
		46.0	46.1	0.1	CLAY	coaly; sheared											S3
		46.1	46.3	0.2	COAL	broken to powdery; sheared											
		46.3	46.6	0.3	SHALE	silty; carbonaceous; broken; sheared (?) / abrupt below											RQD: 0; R1
		46.6	47.3	0.7	SS	medium grain to fine grain; poorly bedded; disturbed; abrupt below; calcareous; joint systems at • 33° • 35° (calcite infilled) • 62° (bedding plane...?)	58										RQD: 50; R3
9 (49.4) 10 (54.0)		47.3	54.1	6.8	SHALE	with fine grain sandstone interbeds; more sandy at base; carbonaceous; poorly bedded; broken with some calcite veining; joint systems at • 30° (calcite infilled) • 37° (2...calcite infilled) • 60° (2...clay infilled... bedding plane joint)	60										RQD: 50; R3
		54.1	56.7	2.6	SS	medium grain to fine grain; interbedded with shales; well bedded; calcareous with small scale cross-bedded units; disturbed in part with mud lumps and lode structures; interval 55.2-55.5 m is bioturbated; joint systems at • 20° (clay infilled) • 20° (calcite infilled) • 54° (3...bedding plane joints)	54										RQD: 66; R3
		56.7	64.0	7.3	SS	medium grain; moderate bedding; cross-bedded throughout; trace of carbonaceous material on	70										RQD: 50; R4

UNITS USED: - Ek H2

1: HB/OR S -- GOLDR ASSOCIATES HARDNESS CODE

▲ ANGLE MEASURED FROM CORE AXIS

\* "bracketed" no. is depth as noted on first marker block in core box

• RQD -- ROCK QUALITY DESIGNATION (%)

HOLE No.	HC - D
CONTINUED	101

## CORE &amp; COAL CORE DESCRIPTION

PROJECT	HARVEY CREEK
AREA	S.E. B.C.

HOLE No	HC - D
CONTINUED	101

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 % a.r.b. residual	ASH % a.d.b.	V.M. % a.d.b.	F.C. % a.d.b.	F.S.I.	Yield		
cont...		56.7	64.0	7.3	SS	bedding; broken with weathering on joints reducing rock hardness to S4; calcareous; transitional below; increasing carbonaceous material in lower 0.4 m of interval; joint systems at • 20° (2) • 25° (2) • 60° (4...bedding plane)											Flow of Water Yes or Gas? No Indicate Depth
		64.0	64.4	0.4	COAL	dull; shaly stringers; broken											RQD: 0; S5
		64.4	64.9	0.5	SHALE	carbonaceous; broken; abrupt below											RQD: 0; S2
13(64.6)		64.9	65.0	0.1	COAL	bright; trace of pyrite on cleat											RQD: 0; S5
		65.0	65.5	0.5	SHALE	coaly stringers; carbonaceous; pyritic towards base											RQD: 0; R3
		65.5	65.7	0.2	COAL	dull with bright bands; slickensided in places pyritic; broken											RQD: 0; S4
		65.7	66.0	0.3	SHALE	silty; calcareous; carbonaceous in part; abrupt below											RQD: 40; R3
		66.0	67.3	1.3	COAL	Recovered m/Cut m = 1.1 m/1.3 m x 100% = 85% Recovery			1	1.09	10.08	31.10		5.5	46.06		RQD: 0; S3
					Recovered	Description											
					0.10	Coal; dull; sheared; powdery											
					0.03	Shale; carbonaceous; sheared											
					0.03	Shale; carbonaceous; broken											
					0.10	Coal; dull with bright bands; broken stick											
					0.20	Shale; carbonaceous; sheared; broken stick											
					0.18	Coal; dull; sheared; broken to powdery											
					0.04	Shale; sheared											
					0.15	Coal; dull with bright; broken; powdery											
					0.10	Shale; carbonaceous; broken to powdery											
					0.10	Coal; dull with bright; broken to powdery											
					0.06	Shale; carbonaceous; coaly stringers; broken											
		67.3	67.4	0.1	SHALE	carbonaceous; sheared; broken stick											RQD: 0; S3
		67.4	67.5	0.1	COAL	dull; carbonaceous stringers; broken to powdery											RQD: 0; S3
		67.5	68.2	0.7	SLTST	shaly; slickensided in part; broken stick; some calcite veins with coaly stringers; joint											RQD: 0; R3

UNITS USED: m (ft)  
 \* "bracketed" no. is depth as noted on first marker block in core box  
 1-5 R&OR S — GOLDBER ASSOCIATES HARDNESS CODE  
 -RQD — ROCK QUALITY DESIGNATION (%)

▲ ANGLE MEASURED FROM CORE AXIS

HOLE No	HC - D
CONTINUED	101

## CORE &amp; COAL CORE DESCRIPTION

PROJECT	HARVEY CREEK
AREA	S.E. B. C.

HOLE No.	HC - D
CONTINUED	101

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. %	F.C. %	F.S.I	% Yield	
cont...		67.5	68.2	0.7	SLTST	system at 20° (calcite infilled)										Flow of Water: Yes <input type="checkbox"/> or Gas? No <input type="checkbox"/>
		68.2	68.4	0.2	SHALE	with coal; mixed; broken to powdery										Indicate Depth RQD: 52; R1
		68.4	73.1	4.7	SLTST	shaly; carbonaceous with minor fine grain sandstone zone; poorly bedded; transitional below; joint systems at 35° (2)										RQD: 52; R3
14(68.9)						20°										
		73.1	75.8	2.7	SLTST	shaly; medium grain; sandstone interbeds; disturbed in part; poorly bedded with shale clasts; transitional below; joint systems at 35° (2)										RQD: 60; R3
15(73.8)																
		75.8	90.3	14.5	SS	moderate to well bedded with well developed cross-bedded units; carbonaceous material defining bedding; homogeneous throughout unit with scattered pebbles near base; abrupt below; weathered zones with hardness of S3 along joints; broken zone at 82.3 - 85.8 m; joint systems at 65° (numerous); bedding plane joint	65									RQD: 10; R3
16(76.8)						20°										
17(80.8)						35°										
18(85.0)																
19(89.0)																
		90.3	91.0	0.7	CONGL	well rounded with medium size pebbles; heterogeneous; abrupt below										RQD: 90; R4
		91.0	96.0	5.0	SHALE	silty; minor fine grain sandstone beds; moderately bedded with some small scale cross-bedding; becomes sandier at base; trace of carbonaceous material; transitional below; joint systems at 55°	65									RQD: 44; R3
20(93.6)						30°										
		96.0	96.1	0.1	CONGL	sandy matrix; poorly sorted; abrupt below medium										RQD: 90; R4
		96.1	103.0	6.9	SS	medium grain; moderately bedded with well developed cross-beds; bedding defined by carbonaceous material in part; abrupt below; hardness to R1 at joints										RQD: 10; R3
21(97.8)																
22(101.7)																
		103.0	103.2	0.2	SLTST	shaly; fine grain; sandstone interbeds; well bedded; carbonaceous; abrupt below	67									RQD: 0; R3
		103.2	106.3	3.1	SS	medium grain; moderately bedded with well developed cross-beds; bedding defined by carbonaceous material in part; abrupt below; hardness to R1 at joints; joint systems at 25° (3)										RQD: 10; R3
23(104.9)																

UNITS USED: mm ft

1:88/ORS - GOLDER ASSOCIATES HARDNESS CODE

▲ ANGLE MEASURED FROM CORE AXIS

\* "bracketed" no. is depth as noted on first marker block in core box

\* RQD - ROCK QUALITY DESIGNATION (%)

HOLE No.	HC - D
CONTINUED	101

## CORE &amp; COAL CORE DESCRIPTION

PROJECT	HARVEY CREEK
AREA	S.E. B. C.

HOLE No.	HC - D
CONTINUED	101

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 %	V.M. %	F.C. %	F.S.I	% Yield	
										a.r.b.	residual	a.d.b.	a.d.b.	B.d.b.			
		106.3	106.4	0.1	SHALE	with coal; mixed; broken to powdery RQD:0; S3											Flow of Water Yes <input type="checkbox"/> or Gas? No <input type="checkbox"/> Indicate Depth
		106.4	106.6	0.2	SS	carbonaceous with coaly wisps; abrupt below											RQD: 0; S3
		106.6	106.8	0.2	SHALE	silty; 0.03 m coal at base of interval	80										S3
		106.8	107.9	1.1	SS	fine grain; becoming medium grain at base; occasional subangular shale clasts; moderately bedded with some calcite infilled veins											RQD: 20; R3
24	(109.5)	107.9	112.1	4.2	SS	as above but core is broken; S3 hardness along fractures; joint systems at • 20° (calcite infilled)											RQD: 20; R3
25	(112.5)	112.1	112.9	0.8	SS	medium grain; poorly bedded; homogeneous; weathers to S2 on joints; occasional coaly stringers; joint systems at • 8° (2) • 0° • 50° (2) • 60° (4)											RQD: 0; R3
		112.9	113.4	0.5	COAL	bright with dull; pulverized; sheared; abrupt below		5	2	1.21	6.92	28.17		2	63.91		RQD: 0; S1
		113.4	113.7	0.3	SHALE	homogeneous; pyritic on joints; becomes S3 on joints; joint systems at • 65° • 25°											RQD: 0; R2
26	(116.4)	113.7	117.5	3.8	SLTST	with fine grain sandy interbeds; poorly bedded with moderately developed cross-bedding; joint systems at • 66° (6...clay infilled) • 34° (3...clay infilled) • 61° (4...clay infilled) • 61° (carbonaceous)	72										RQD: 66; R2
		117.5	118.3	0.8	COAL	bright with dull; well developed cleat; broken; pulverized in part with some clay		4	17	0.34	12.43	22.82		2.5	50.27		RQD: 0; S5
27	(121.0)	118.3	121.0	2.7	SHALE	core is broken; clay on joints; pyritic; becomes sandier at base of interval joint systems at • 61° (clay infilled) • 20° (pyritic) • 18° (clay infilled)											RQD: 20; R2
		121.0	122.0	1.0	SLTST	with fine grain sandstone interbeds; becomes sandier below; poorly bedded with some cross-bedding; abrupt below; some calcite veining; joint systems at • 12° (4...clay infilled)											RQD: 20; R3

UNITS USED: m ☐ ft ☐

1:R&amp;OR S — GOLDR ASSOCIATES HARDNESS CODE

▲ ANGLE MEASURED FROM CORE AXIS

\* "bracketed" no. is depth as noted — RQD — ROCK QUALITY DESIGNATION (%)  
on first marker block in core box

HOLE No.	HC - D
CONTINUED	101



## CORE &amp; COAL CORE DESCRIPTION

PROJECT	HARVEY CREEK
AREA	S. E. B. C.

HOLE No.	HC - D
CONTINUED	101

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OF 12

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	
										a.r.b.	residual						
		122.0	122.5	0.5	SHALE	homogeneous; abrupt below; RQD: 20%; R3 hardness											Flow of Water? Yes <input type="checkbox"/> or Gas? No <input type="checkbox"/> Indicate Depth
28(125.6)		122.5	126.2	3.7	SHALE	trace of carbonaceous material; pyritic; homogeneous; broken core; conchoidal fracture; abrupt below; joint systems at • 15° (pyritic) • 65° (clay infilled) • 20°											RQD: 52; R2
		126.2	127.8	1.6	SLTST	with fine grain sandstone interbeds; moderately bedded with some cross-bedding; calcareous; transitional below; lower 0.7 m broken; joint systems at • 38° • 10°	65										RQD: 65; R3
		127.8	129.2	1.4	SHALE	silty; homogeneous; carbonaceous; some slicken-siding; joint systems at • 34°											RQD: 65; R3
		129.2	129.3	0.1	SHALE	sheared; carbonaceous											RQD: 0; S2
		129.3	130.1	0.8	COAL	Recovered (m)/Cut (m): 0.75/0.84 m x 100% = 89% recovery											RQD: 0; S1
					Recovered												
					Th	Description			3		1.24	4.62	29.10		2.5	61.88	
					0.70	coal; sheared; broken & powdery											
					0.05	shale; sheared											
29(130.2)		130.1	131.7	1.6	COAL	Recovered(m)/Cut(m): 1.47/1.56m x 100% = 94% recovery											
					Recovered												
					Th	Description											
					0.13	shale; sheared; carbonaceous; broken			4		1.08	7.73	26.64		2.5	38.29	RQD: 0; R1
					0.12	coal; dull with bright; broken; sheared											RQD: 0; S1
					0.30	shale and coal; mixed; sheared											RQD: 0; S1
					0.20	coal; dull with bright; broken											RQD: 0; S1
					0.50	coal; dull; broken to powdery											RQD: 0; R1
					0.22	coal; dull; broken to powdery											RQD: 0; S1
		131.7	134.6	2.9	COAL	Recovered(m)/Cut(m): 1.15/2.90 m x 100% = 40% recovery											RQD: 0; S1
					Recovered												
					Th	Description			5		1.07	8.05	27.68		2	69.27	
30(134.6)					0.40	coal; dull; broken to powdery											
					0.20	coal; dull; sheared; broken stick											
					0.55	coal; dull; sheared											

UNITS USED: m ( ) ft ( )  
 \* "bracketed" no. is depth as noted on first marker block in core box  
 † R&OR S — GOLDR ASSOCIATES HARDNESS CODE  
 -RQD — ROCK QUALITY DESIGNATION (%)

▲ ANGLE MEASURED FROM CORE AXIS

HOLE No.	HC - D
CONTINUED	101

## CORE &amp; COAL CORE DESCRIPTION

PROJECT	HARVEY CREEK
AREA	S. E. B. C.

HOLE No	HC - D
CONTINUED	101

BOX No	DEPTH AT TOP OF BOX	DEPTH		TH	LITHO DESCRIPTION		SEAM DESIGN	SAMPLE No.	ANALYTICAL DATA						Yield	REMARKS 1
		FROM	TO		MAIN	AMPLIFIED (INCLUDE COAL RECOVERY FOR EACH SEAM)			MOIST %	%	ASH %	V.M. %	P.C. %	F.S.I.		
									a.s.b.	residual	a.d.b.	a.d.b.	a.d.b.			
		134.6	135.7	1.1	COAL	Recovered(m)/Cut(m): 1.23/1.07 m x 100% = 115% recovery										Flow of Water: Yes <input type="checkbox"/> or Gas? No <input type="checkbox"/> Indicate Depth
					Recovered			6		0.90	8.33	27.25		3	31.70	
					Th	Description										
					0.15	coal; shaly; sheared										
					0.30	coal; sheared; powdery										RQD: 0; S1
					0.30	clay & coal mixed										RQD: 0; R3
					0.18	shale; silty										
					0.30	coal; dull with bright broken to powdery										RQD: 0; S1
		135.7	136.6	0.9	COAL	Recovered(m)/Cut(m): 1.21/0.91m x 100% = 133% recovery		7		1.12	7.81	26.46		2.5	52.94	
					Recovered											
					Th	Description										
					0.15	shale; silty; carbonaceous; slickensided										RQD: 0; R3
					0.40	coal; dull; broken										RQD: 0; S1
					0.10	shale; sheared										RQD: 0; S1
					0.40	coal; dull with bright; broken to powdery										RQD: 0; S5
					0.16	shale; carbonaceous; sheared; broken										RQD: 0; R1
31(137.8)		136.6	137.8	1.2	COAL	Recovered(m)/Cut(m): 0.74/1.21m x 100% = 61% recovery										
					Recovered											
					Th	Description										
					0.24	shale; carbonaceous; sheared; broken		8		1.22	7.19	27.49		3	35.18	RQD: 0; R1
					0.50	coal; broken to powdery; dull; sheared										
		137.8	138.7	0.9	COAL	Recovered(m)/Cut(m): 1.44/0.9 x 100% = 160% recovery										
					Recovered											
					Th	Description										
					0.10	coal; broken										RQD: 0; R1
					0.40	shale; carbonaceous; sheared broken stick		9		1.14	78.93			0		RQD: 0; R1
					0.15	shale & coal; mixed; sheared										RQD: 0; S2
					0.09	shale; sheared; broken										
					0.30	coal; dull & bright; broken to powdery										RQD: 0; R1
					0.40	coal; dull; broken to powdery										RQD: 0; R1
		138.7	140.2	1.5	COAL	Recovered(m)/Cut(m): 0.77/1.54 x 100% = 50% recovery		10		1.13	7.09	27.15		3	54.56	

UNITS USED: m ☐ ft ☐

1:RB/OR S - GOLDER ASSOCIATES HARDNESS CODE

A ANGLE MEASURED FROM CORE AXIS

\* "bracketed" no. is depth as noted  
on first marker block in core box

\*RQD -- ROCK QUALITY DESIGNATION (%)

HOLE No	HC - D
CONTINUED	101

## CORE &amp; COAL CORE DESCRIPTION

PROJECT	HARVEY CREEK
AREA	S. E. B. C.

HOLE No	HC - D
CONTINUED	101

BOX No	DEPTH AT TOP OF BOX	DEPTH		TH	LITHO DESCRIPTION		RECOVERED 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	
										a.r.b.	residual						
cont...		138.7	140.2	1.5	COAL	Recovered Th Description 0.05 shale; broken 0.35 coal; dull; sheared; broken 0.10 shale; sheared 0.20 coal; powdery; sheared 0.07 shale; broken			10								Flow of Water Yes <input type="checkbox"/> or Gas? No <input type="checkbox"/> Indicate Depth
		140.2	141.7	1.5	COAL	Recovered(m)/Cut(m): 1.07/1.53 x 100% = 70% recovery Recovered Th Description 0.12 shale; sheared; coaly stringers 0.28 coal; broken to powdery 0.14 shale; carbonaceous; sheared 0.40 coal; dull; broken to powdery 0.13 coal; shaly; sheared			11	1.20	6.71	26.55		2.5	47.49	RQD: 0; R1 RQD: 0; R1 RQD: 0; S2 RQD: 0; R1 RQD: 0; S1	
32(141.7)		141.7	142.6	0.9	COAL	Recovered(m)/Cut(m): 0.50/0.92 x 100% = 54% recovery Recovered Th Description 0.50 coal; shaly; broken to powdery			12	1.10	8.61	22.72		2	58.00	RQD: 0; S1	
		142.6	142.7	0.1	SHALE	sheared										RQD: 0; S1	
		142.7	142.8	0.1	COAL	dull; powdery										RQD: 0; S1	
		142.8	142.9	0.1	SHALE	sheared										RQD: 0; S1	
		142.9	143.0	0.1	COAL	powdery										RQD: 0; S1	
33(146.9)		143.0	147.9	4.9	SHALE	carbonaceous; fractured; slickensided in part; transitional below; joint systems at • 20° (2..calcite infilled)										RQD: 0; R2	
		147.9	150.0	2.1	SS	medium grain to fine grain; moderately bedded with some cross-bedding; carbonaceous in part; abrupt below; joint systems at: • 65° • 35° (clay infilled)										RQD: 20; R3	
34(150.0)		150.0	153.0	3.0	SHALE	sandy in part; fractured and sheared throughout; bedding disturbed; becomes S2 when wet; shear zone....??	80									RQD: 0; R1	
		153.0	154.4	1.4	SS	medium grain; fractured; poorly bedded; sheared; becoming shaly towards base; transitional below										RQD: 0; R2	
35(154.5)		154.4	154.5	0.1	SHALE	carbonaceous; sheared										RQD: 0; S5	

UNITS USED: m ( ) ft ( )

1:RB/OR 5 — GOLDR ASSOCIATES HARDNESS CODE

▲ ANGLE MEASURED FROM CORE AXIS

\* "bracketed" no. is depth as noted  
 † RQD — ROCK QUALITY DESIGNATION (%)  
 on first marker block in core box

HOLE No	HC - D
CONTINUED	101

## CORE &amp; COAL CORE DESCRIPTION

PROJECT	HARVEY CREEK
AREA	S.E. B.C.

HOLE No.	HC - D
CONTINUED	101

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
		154.5	154.6	0.1	CLAY	with coal bits; powdery	RQD: 0; S1											Flow of Water or Gas? Yes <input type="checkbox"/> No <input type="checkbox"/> Indicate Depth
		154.6	155.1	0.5	SHALE	sheared; broken												RQD: 0; R1
		155.1	155.2	0.1	COAL	with clay mixed; broken; powdery												RQD: 0; S3
		155.2	155.6	0.4	SHALE	sheared; carbonaceous stringers												RQD: 0; S3
		155.6	157.8	2.2	COAL	Recovered(m)/Cut(m): 2.22/2.24 x 100% = 99% recovery												
36	157.6					Recovered	Description											
					0.40	coal; shaly; broken to powdery		2	13	0.48	8.31	23.76		2	60.98		RQD: 0; S3	
					0.60	coal; dull; broken to powdery											RQD: 0; R1	
					0.62	shale; coaly; broken											RQD: 0; R1	
					0.80	coal; dull; broken to powdery											RQD: 0; R1	
		157.8	158.2	0.4	SHALE	sheared; broken											RQD: 0; S3	
		158.2	160.9	2.7	SHALE	silty with minor fine grain sandstone interbeds; calcareous; trace of plant fragments; abrupt below; joint system at 20°												RQD: 35; R3
		160.9	161.1	0.2	SHALE	carbonaceous; sheared												RQD: 0; R1
		161.1	167.7	6.6	SHALE	silty; very fine grain sandstone interbeds; moderately bedded; some cross-bedding; calcareous; disturbed in part with lode structures; becomes finely interbedded near base; abrupt below; occasional quartz-filled tension cracks at 20°												RQD: 64; R3
37	162.2																	
38	166.7																	
		167.7	168.3	0.6	SHALE	and coal interbedded sheared; broken to powdery												RQD: 0; S2
		168.3	168.9	0.6	SHALE	silty; carbonaceous; slickensided												RQD: 0; R2
		168.9	169.9	1.0	SLTST	shaly; sandy in part; broken; poorly bedded; transitional below; joint system at 10° (3...calcite infilled)												RQD: 10; R3
		169.9	173.2	3.3	SHALE	silty; very poorly bedded; homogeneous throughout; slightly calcareous; minor slickensiding; becomes more carbonaceous toward base; abrupt below; joint system at 34° (calcite infilled)												RQD: 86; R3
39	172.8																	
		173.2	173.5	0.3	SS	fine grain; well bedded; calcareous; calcite-filled tension cracks		70										RQD: 86; R3

UNITS USED: mm, ft

1:RA/OR S — GOLDR ASSOCIATES HARDNESS CODE

▲ ANGLE MEASURED FROM CORE AXIS

\* "bracketed" no. is depth as noted  
on first block in core box

\* RQD — ROCK QUALITY DESIGNATION (%)

HOLE No.	HC - D
CONTINUED	101

## CORE &amp; COAL CORE DESCRIPTION

PROJECT	HARVEY CREEK
AREA	S.E. B. C.

HOLE No.	HC - D
CONTINUED	101

BOX No	DEPTH AT TOP OF BOX	DEPTH		TH	LITHO DESCRIPTION		SEAM 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				
		173.5	174.9	1.4	SHALE	carbonaceous; minor silty interbeds; poorly bedded; sheared in part														Flow of Water Yes <input type="checkbox"/> or Gas? No <input type="checkbox"/> Indicate Depth
40 (174.4)		174.9	175.9	1.0	COAL	Recovered(m)/Cut(m): 0.89/0.95 x 100% = 94% recovery Recovered Th Description 0.13 coal: dull; broken 0.13 coal: shaly; broken stick 0.30 shale: carbonaceous with coaly stringers; sheared in part 0.10 coal: dull; broken stick 0.07 shale: carbonaceous 0.16 coal: bright with dull; stick			14	0.46	12.83	24.15		1.51	1.85				RQD: 0; R2 RQD: 0; R2 RQD: 0; R3 RQD: 0; R1 RQD: 0; R1 RQD: 0; R1	
		175.9	177.4	1.5	COAL	Recovered(m)/Cut(m): 1.2/1.53 x 100% = 78% recovery Recovered Th Description 0.12 coal: dull; stick 0.14 shale: carbonaceous with coaly stringers 0.10 shale and coal; mixed; broken 0.23 shale: coaly 0.30 coal: dull; broken stick 0.24 shale: coaly 0.07 coal: dull; broken			15	0.35	15.47	22.71		2	28.22				RQD: 0; R1 RQD: 0; R3 RQD: 0; R1 RQD: 0; R3 RQD: 0; R1 RQD: 0; R4 RQD: 0; R1	
		177.4	179.2	1.8	COAL	Recovered(m)/Cut(m) = 1.65/1.78 x 100% = 93% recovery Recovered Th Description 0.30 coal: dull with bright; broken to powdery 0.10 shale: carbonaceous; broken 0.20 coal: shaly; broken to powdery 0.50 coal: dull with bright; broken 0.20 coal: dull; broken 0.15 shale: carbonaceous; broken stick 0.20 coal: dull; powdery			16	0.34	6.86	25.30		2	35.06				RQD: 0; R1	
41 (178.9)		179.2	179.5	0.3	SHALE	sheared powdery														RQD: 0; R1
		179.5	181.1	1.6	SHALE	silty; carbonaceous with occasional minor siltstone interbeds; fractured; traces of slickensiding														RQD: 0; R3
		181.1	182.7	1.6	SHALE	with sandstone zones; moderately bedded; fractures with some slickensiding; becoming sandier below	72													RQD: 0; R2

UNITS USED: m & ft  
 \* "bracketed" no. is depth as noted on first block in core box  
 1: R&/OR S - GOLDR ASSOCIATES HARDNESS CODE  
 RQD - ROCK QUALITY DESIGNATION (%)

▲ ANGLE MEASURED FROM CORE AXIS

HOLE No.	HC - D
CONTINUED	101



## CORE &amp; COAL CORE DESCRIPTION

PROJECT	HARVEY CREEK
AREA	S. E. B. C.

HOLE No.	HC - D
CONTINUED	101

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OF 12

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	
										a.r.b.	residual	a.d.b.	a.d.b.	a.d.b.		
42 (182.9)		182.7	185.0	2.3	SS	medium grain to coarse grain with occasional shaly clasts and interbeds; poorly bedded; broken; joint systems at $\bullet 34^{\circ}$ (2)										Flow of Water Yes <input type="checkbox"/> or Gas? No <input type="checkbox"/> Indicate Depth <input type="checkbox"/> RQD: 0; R3
43 (186.1)		185.0	190.3	5.3	SS	coarse grain; moderately bedded; subangular; lithic; trace of glauconite; transitional below; trace of carbonaceous stringers on bedding; joint systems at $\bullet 16^{\circ}$ (2) $\bullet 20^{\circ}$										RQD: 49; R4
44 (189.3)																
45 (195.5)		190.3	202.4	12.1	SS	fine grain; dirty; poorly bedded; homogeneous throughout; joint systems at $\bullet 20^{\circ}$ $\bullet 35^{\circ}$ (2) $\bullet 0^{\circ}$ (2) $\bullet 25^{\circ}$ (2)	80									@ 190.3 to 196.6 m: RQD: 49; R4 @ 196.6 to 202.4 m: RQD: 80; R4
46 (196.9)																
		202.4	202.6	0.2	SHALE	silty; carbonaceous; abrupt below										RQD: 0; R2
		202.6	206.2	3.6	SS	fine grain; moderately bedded; homogeneous throughout; abrupt below; joint systems at $\bullet 10^{\circ}$ $\bullet 25^{\circ}$ (2)										RQD: 58; R3
		206.2	206.4	0.2	SHALE	carbonaceous; silty...becoming sandy toward base; abrupt below										RQD: 0; R2
		206.4	210.5	4.1	SS	fine grain; moderate bedding; homogeneous throughout; abrupt below; joint systems at $\bullet 10^{\circ}$ $\bullet 20^{\circ}$ (2)										RQD: 70; R3
		210.5	227.2	16.7	SHALE	interbedded with sandstone; fine grain; well bedded with some small scale cross-bedding; sandstone varies in thickness 0.01 to 0.20 m; boundaries between units sharp with some minor disturbance; fractured...some infilled with calcite; joint systems at $\bullet 15^{\circ}$ (2 calcite infilled)										RQD: 0; S4 SS units: R3
		227.2	232.7	5.5	SHALE	as above; but with fewer sandstone units; junctions between units more disturbed; fractured and broken										RQD: 0; S4
55 (232.8)		232.7	239.9	7.2	SHALE	occasional silty interbeds; poorly bedded; disturbed with bioturbation fractures; R3; RQD: 10%; occasional calcite filled veins at $0^{\circ}$ ; joint systems at $\bullet 0^{\circ}$ (calcite infilled) $\bullet 20^{\circ}$ (calcite infilled)										
56 (236.8)																
57 (239.9)																
		239.9	240.3	0.4	SS	fine grain; well bedded with some minor cross-beds; abrupt below; joint system at $\bullet 0^{\circ}$ (calcite infilled)	72									

UNITS USED: mm (in)

1: RA/OR S — GOLDR ASSOCIATES HARDNESS CODE

▲ ANGLE MEASURED FROM CORE AXIS

\* "bracketed" no. is depth as noted \*RQD — ROCK QUALITY DESIGNATION (%)  
on first marker block in core box

HOLE No.	HC - D
CONTINUED	101

PROJECT	HARVEY CREEK
AREA	S. E. R. C.

HOLE No.	HC - D
CONTINUED	101

[illegible]

1:RB/OR 5 — GOLDR ASSOCIATES HARDNESS CODE  
•RQD — ROCK QUALITY DESIGNATION (%)

HOLE No.	HC - D
CONTINUED	101









1978  
HARVEY CREEK  
DRILL HOLE: HC-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	
0	15.0	15.0	CASING	0	15.2	15.2
15.0	28.2	13.2	CONGLOMERATE	15.2	29.0	13.8
28.2	30.0	1.8	SHALE	29.0	29.7	0.7
30.0	30.3	0.3	SANDSTONE; shaly	29.7	30.0	0.3
30.3	36.5	6.2	SANDSTONE	30.0	37.1	7.1
36.5	36.9	0.4	SHALE	37.1	37.4	0.3
36.9	37.5	0.6	COAL and Clay	37.4	37.5	0.1
37.5	37.9	0.4	COAL	37.5	37.9	0.4
37.9	43.6	5.7	SHALE	37.9	44.1	6.2
43.6	45.1	1.5	SANDSTONE	44.1	46.0	1.9
45.1	45.8	0.7	COAL and Clay	46.0	46.1	0.1
45.8	46.0	0.2	COAL	46.1	46.3	0.2
46.0	46.4	0.4	SHALE	46.3	46.6	0.3
46.4	47.7	1.3	SANDSTONE	46.6	47.3	0.7
47.7	52.8	5.1	SHALE w/ SS interbeds	47.3	54.1	6.8
52.8	55.6	2.8	SANDSTONE w/ SH interbeds	54.1	56.7	2.6
55.6	63.6	8.0	SANDSTONE	56.7	63.6	6.9
63.6	64.0	0.4	SANDSTONE...carbonaceous	63.6	64.0	0.4
64.0	64.4	0.4	SHALE			
64.4	64.7	0.3	COAL, shaly	64.0	64.4	0.4
64.7	65.1	0.4	SHALE	64.4	64.9	0.5
65.1	65.2	0.1	COAL	64.9	65.0	0.1
65.2	65.7	0.5	SHALE, coaly stringers	65.0	65.5	0.5
65.7	66.0	0.3	COAL	65.5	65.7	0.2
66.0	66.3	0.3	SHALE	65.7	66.0	0.3
66.3	66.9	0.6	COAL	66.0	66.3	0.3
			SHALE	66.3	66.6	0.3
			COAL	66.6	67.0	0.4
66.9	67.5	0.6	SHALE	67.0	67.2	0.2
			COAL	67.2	67.3	0.1
			SHALE	67.3	67.4	0.1



1978  
HARVEY CREEK  
DRILL HOLE: HC-D 101  
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	
67.5	67.6	0.1	COAL	67.4	67.5	0.1
67.6	67.9	0.3	SILTSTONE	67.5	68.2	0.7
67.9	68.3	0.4	SHALY COAL	68.2	68.4	0.2
68.3	71.9	3.6	SHALE w/ Siltstone interbeds			
71.9	75.5	3.6	SILTSTONE w/ Shale interbeds	68.4	75.8	7.4
75.5	85.3	9.8	SANDSTONE	75.8	90.3	14.5
85.3	86.0	0.7	SILTSTONE			
86.0	89.9	3.9	SANDSTONE			
89.9	90.8	0.9	CONGLOMERATE	90.3	91.0	0.7
90.8	93.4	2.6	SHALE, silty	91.0	96.0	5.0
93.4	95.9	2.5	SILTSTONE, shaly			
95.9	96.0	0.1	CONGLOMERATE	96.0	96.1	0.1
96.0	102.6	6.6	SANDSTONE	96.1	103.0	6.9
102.6	103.3	0.7	SILTSTONE	103.0	103.2	0.2
103.3	106.3	3.0	SANDSTONE	103.2	106.3	3.4
106.3	106.6	0.3	SHALE w/ Coal	106.3	106.4	0.1
			SANDSTONE	106.4	106.6	0.2
			SHALE, silty w/ 0.03m coal at base of interval	106.6	106.8	0.2
106.6	108.2	1.6	SANDSTONE			
108.2	109.3	1.1	SILTSTONE			
109.3	112.7	3.4	SANDSTONE	106.8	112.9	6.1
112.7	113.3	0.6	COAL	112.9	113.4	0.5
			SHALE	113.4	113.7	0.3
113.3	116.9	3.6	SILTSTONE	113.7	117.5	3.8
116.9	117.9	1.0	COAL	117.5	118.3	0.8
117.9	120.6	2.7	SHALE, w/ minor Siltstone interbeds	118.3	121.0	2.7
120.6	121.8	1.2	SILTSTONE	121.0	122.0	1.0
121.8	126.1	4.3	SHALE, w/ minor Siltstone interbeds	122.0	126.2	4.2
126.1	127.8	1.7	SILTSTONE	126.2	127.8	1.6

1978  
HARVEY CREEK  
DRILL HOLE: HC-D 101  
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	
127.8	129.2	1.4	SHALE	127.8	129.3	1.5
129.2	129.7	0.5	COAL	129.3	130.1	0.8
			SHALE	130.1	130.3	0.2
			COAL	130.3	130.4	0.1
129.7	130.6	0.9	SHALE, w/ Coal	130.4	130.7	0.3
130.6	132.3	1.7	COAL	130.7	134.6	3.9
132.3	133.4	1.1	SHALY COAL			
133.4	134.4	1.0	SHALE			
			COAL, shaly	134.6	134.7	0.1
			COAL	134.7	134.9	0.2
134.4	135.2	0.8	CLAY and COAL	134.9	135.4	0.5
135.2	135.6	0.4	COAL	135.4	135.7	0.3
135.6	136.0	0.4	SHALE	135.7	135.8	0.1
			COAL	135.8	136.0	0.2
			SHALE	136.0	136.1	0.1
136.0	136.7	0.7	COAL	136.1	136.4	0.3
			SHALE	136.4	136.9	0.5
			COAL	136.9	137.8	0.9
136.7	138.1	1.4	SHALY COAL			
138.1	138.8	0.7	SHALE	137.8	138.2	0.4
			COAL	138.2	138.7	0.5
			SHALE	138.7	138.8	0.1
138.8	139.9	1.1	COAL	138.8	139.5	0.7
			SHALE	139.5	139.7	0.2
			COAL	139.7	140.1	0.4
139.9	140.3	0.4	SHALE	140.1	140.4	0.3
140.3	141.1	0.8	COAL	140.4	140.8	0.4
141.1	141.6	0.5	SHALE	140.8	141.0	0.2
141.6	142.6	1.0	COAL	141.0	142.6	1.6
142.6	142.8	0.2	SHALY COAL	142.6	143.0	0.4
142.8	148.2	5.4	SHALE, silty	143.0	147.9	4.9

1978  
HARVEY CREEK  
DRILL HOLE: HC-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	
148.2	150.2	2.0	SANDSTONE w/ Shale interbed	147.9	150.0	2.1
150.2	151.4	1.2	SHALE	150.0	153.0	3.0
151.4	153.4	2.0	SILTSTONE			
			SANDSTONE	153.0	154.4	1.4
153.4	155.4	2.0	SHALE	154.4	154.5	0.1
155.4	156.1	0.7	SHALY COAL	154.5	156.1	1.6
156.1	156.4	0.3	COAL	156.1	156.4	0.3
156.4	156.8	0.4	SHALE	156.4	157.0	0.6
156.8	157.8	1.0	COAL	157.0	157.8	0.8
157.8	160.2	2.4	SHALE	157.8	167.7	9.9
160.2	160.7	0.5	SANDSTONE			
160.7	163.1	2.4	SILTSTONE			
163.1	164.5	1.4	SHALE, silty			
164.5	165.4	0.9	SILTSTONE			
165.4	165.8	0.4	SHALE			
165.8	167.6	1.8	SILTSTONE			
167.6	168.0	0.4	COALY SHALE	167.7	168.3	0.6
168.0	168.9	0.9	SHALE	168.3	168.9	0.6
			SILTSTONE	168.9	169.9	1.0
168.9	169.9	1.0	SANDSTONE			
169.9	170.5	0.6	SHALE			
170.5	171.4	0.9	SANDSTONE			
171.4	174.3	2.9	SHALE	169.9	173.2	3.3
			SANDSTONE	173.2	173.5	0.3
174.3	175.4	1.1	SILTSTONE			
			SHALE	173.5	174.9	1.4
			COAL	174.9	175.2	0.3
			SHALE	175.2	175.5	0.3
175.4	175.9	0.5	COAL, w/ minor Shale partings	175.5	176.0	0.5
175.9	176.6	0.7	SHALE	176.0	176.6	0.6
			COAL	176.6	177.0	0.4

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HARVEY CREEK  
DRILL HOLE: HC-D 101  
GEOPHYSICAL TOPS vs LOGGED TOPS

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September, 1978

BPP COAL LITHOLOGY LOG			LITHOLOGY DESCRIPTION	IN-FIELD EXAMINATION (marker blocks)		
INTERVAL		TH (m)		INTERVAL		TH (m)
from	to			from	to	
176.6	177.1	0.5	SHALY COAL			
			SHALE	177.0	177.3	0.3
177.1	177.5	0.4	COAL	177.3	177.7	0.4
177.5	177.9	0.4	SHALE	177.7	177.8	0.1
177.9	178.4	0.5	COAL	177.8	178.8	1.0
178.4	178.8	0.4	SHALE	178.8	178.9	0.1
178.8	179.2	0.4	COAL	178.9	179.2	0.3
179.2	182.2	3.0	SHALE	179.2	182.7	3.5
182.2	183.6	1.4	SANDSTONE			
183.6	183.9	0.3	SHALE			
183.9	184.3	0.6	SILTSTONE			
184.3	184.5	0.2	SHALE			
184.5	186.1	1.6	SANDSTONE			
186.1	186.6	0.5	SILTSTONE			
186.6	194.9	8.3	SANDSTONE			
194.9	195.3	0.4	SILTSTONE			
195.3	211.0	15.7	SANDSTONE	182.7	210.9	28.2
211.0	239.1	28.1	SHALE w/ minor Siltstone & Sandstone interbeds	210.9	239.9	29.0
239.1	240.0	0.9	SILTSTONE			
240.0	241.0	1.0	SANDSTONE	239.9	240.3	0.4
241.0	247.2	6.2	SHALE	240.3	247.2	6.9
TD				TD		

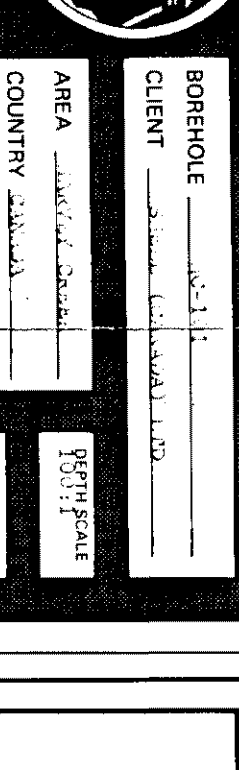






401 3/4  
HE-D 101

④



**COAL LITHOLOGY LOG**

BOREHOLE \_\_\_\_\_

CLIENT \_\_\_\_\_

AREA \_\_\_\_\_

COUNTRY \_\_\_\_\_

DATE LOGGED \_\_\_\_\_

BOREHOLE DATA

ESTIMATED DEPTH \_\_\_\_\_

ESTIMATED DIAMETER \_\_\_\_\_

ESTIMATED WEIGHT \_\_\_\_\_

ESTIMATED VOLUME \_\_\_\_\_

ESTIMATED DENSITY \_\_\_\_\_

ESTIMATED CALIBER \_\_\_\_\_

FLUID DATA

WATER \_\_\_\_\_

WATER TEMPERATURE \_\_\_\_\_

WATER PRESSURE \_\_\_\_\_

WATER FLOW RATE \_\_\_\_\_

WATER FLOW DIRECTION \_\_\_\_\_

WATER FLOW VELOCITY \_\_\_\_\_

WATER FLOW PRESSURE \_\_\_\_\_

WATER FLOW TEMPERATURE \_\_\_\_\_

WATER FLOW DENSITY \_\_\_\_\_

WATER FLOW CALIBER \_\_\_\_\_

COAL COMBINATION

COAL TYPE \_\_\_\_\_

COAL COMBINATION \_\_\_\_\_

SONDE \_\_\_\_\_

LOG SUE \_\_\_\_\_

GAMMA RAY \_\_\_\_\_

U.S. DENSITY \_\_\_\_\_

CALIBER \_\_\_\_\_

EQUIPMENT AND RECORDING DATA											
COAL COMBINATION SONDE				TAPING				CAL CORP		DEPTHS	
LOG	EQUIPMENT	SONDE	SOURCE	CALIBRATOR	LOG TAPED	RECORDING SPEED	DIRECT OF REFLECT	FEED SEC	NORM	FROM	TO
GAMMA RAY	129	3710	AP1	y	9	d	9	1	1.49	245	0
GAMMA RAY	129	3710	AP1	y	9	d	9	1	1.49	245	0
DENSITY	129	3710	AP1	y	9	d	9	1	1.49	245	0
CALIBER	129	3710	AP1	y	9	d	9	1	1.49	245	0

					INTERVALS		


B PB COAL LITHOLOGY LOG													
CALIBRATION DATA													
JIG No 01		VALUE 30.0		2" DIAM.		JIG CAL DATE 78/08/24		VALUE 3710SDU		g/cm <sup>3</sup>		2 ms 580 cps	
JIG MARKY SUOMON AT ABOVE VALUE						JIG No 118		SPAN 0.013		NORM SW = 7.42		7 ms 953 cps	



REN
Char
Date
Depth
Type



K-SHELL-HAGNEY CR. 8(10)A

APPENDIX II  
REPORT ON  
GENDER  
SURVEY.

401  
4 of 4

APPENDIX FOUR

REPORT ON GEODETIC SURVEY

WORK DONE FROM JUNE 27, 1978 TO JANUARY 31, 1979

HARVEY CREEK PROJECT

KOOTENAY LAND DISTRICT, B.C.

B.C. COAL LICENCES

NOS. 588 TO 594 AND 4090 TO 4103

HELD BY SHELL CANADA RESOURCES LIMITED

OPERATED BY CROWS NEST RESOURCES LIMITED

PART OF NTS 82G/2 & 82G/7

NORTHERN LATITUDE  $49^{\circ}15'$  TO  $49^{\circ}19'$   
WESTERN LONGITUDE  $114^{\circ}32'$  TO  $114^{\circ}36'$

BY

SHELL CANADA RESOURCES LIMITED - SURVEYING DEPARTMENT  
GENERAL SURVEY CONTRACTOR

NORTHWEST SURVEY CORPORATION (YUKON) LIMITED  
SUBCONTRACTOR ON PHOTOGRAMMETRIC MAPPING

1979-05-30

**GEOLOGICAL BRANCH**  
**ASSESSMENT REPORT**

00 401 OPEN FILE

## T A B L E   O F   C O N T E N T S

LAND MAP   SCALE 1:50 000

REPORTS ON GEODETIC SURVEY

SURVEY CONTROL FOR CROWS NEST RESOURCES LIMITED  
FERNIE - SPARWOOD, B.C.

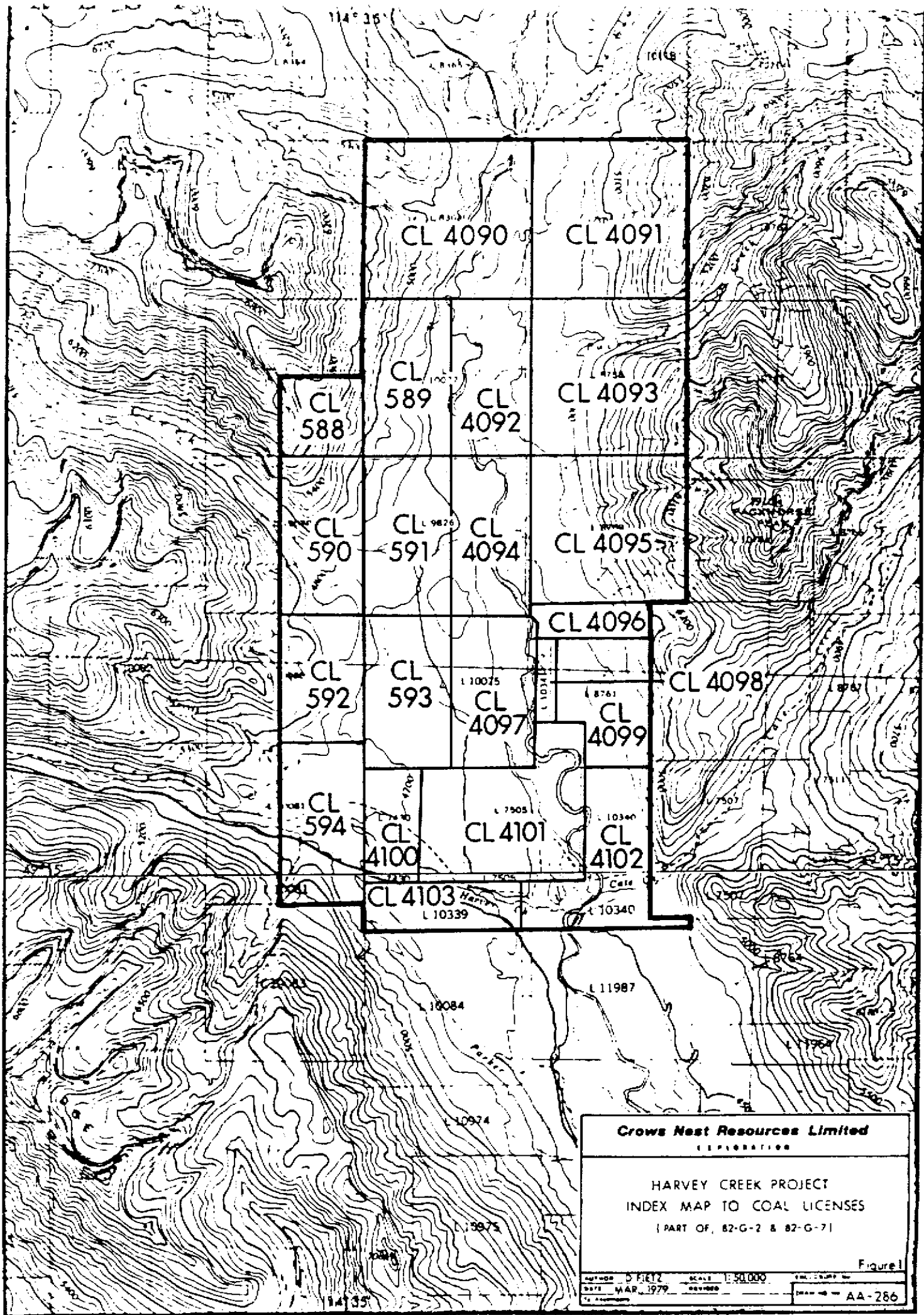
PHOTOGRAMMETRIC MAPPING PROJECT (1978)  
FERNIE - SPARWOOD AREA, S.E. B.C.

TITLE PAGE, TABLE OF CONTENTS, COST ALLOCATIONS AND REFERENCE ONLY

LOCATION SURVEYS  
HARVEY CREEK BLOCK - SPARWOOD AREA - S.E. B.C.

APPLICATION TO EXTEND TERM OF LICENCE (COST STATEMENT)  
B.C. COAL LICENCES 588 TO 594 AND 4090 TO 4103 INCL.





**Crows Nest Resources Limited**  
EXPLORATION

HARVEY CREEK PROJECT  
INDEX MAP TO COAL LICENSES  
(PART OF, 82-G-2 & 82-G-7)

Figure 1

APPROX. 5 FIGS. SCALE 1:50,000  
DATE MAR. 1979  
DRAWN BY AA-286

REPORTS ON GEODETIC SURVEY

WORK DONE FROM JUNE 27, 1978 TO JANUARY 31, 1979

SURVEY CONTROL FOR CROWS NEST RESOURCES LIMITED

FERNIE - SPARWOOD, BRITISH COLUMBIA

PHOTOGRAMMETRIC MAPPING PROJECT (1978)

FERNIE - SPARWOOD AREA - S.E. BRITISH COLUMBIA

COVERING ALL COAL LAND IN S.E. BRITISH COLUMBIA

HELD BY SHELL CANADA RESOURCES LIMITED

OPERATED BY CROWS NEST RESOURCES LIMITED

MORRISSEY FREEHOLD

B.C. COAL LICENCES

264 TO 313 INCL., 365 TO 373 INCL., 408, 412 TO 414 INCL.

490 TO 495 INCL., 588 TO 601, 1299 - 1302 INCL., 4080 TO 4089 INCL., 4090, 4092

KOOTENAY LAND DISTRICT, B.C.

NTS 82G AND 82J

LAT.  $49^{\circ} 05'$ ; TO  $50^{\circ} 10' N$ , LONG.  $114^{\circ} 30'$  TO  $115^{\circ} 10' W$

BY

SHELL CANADA RESOURCES LIMITED - SURVEYING DEPARTMENT  
GENERAL SURVEY CONTRACTOR

NORTHWEST SURVEY CORPORATION (YUKON) LIMITED  
SUBCONTRACTOR ON PHOTOGRAMMETRIC MAPPING

1979-04-26

## T A B L E   O F   C O N T E N T S

SURVEY CONTROL FOR CROWS NEST RESOURCES LIMITED  
FERNIE - SPARWOOD AREA, B.C.; SCRL 1979

PHOTOGRAMMETRIC MAPPING PROJECT (1978)  
FERNIE - SPARWOOD AREA, S.E. B.C.; SCRL 1979  
INCLUDING ATTACHMENTS

SCHEDULE A  
SCRL ON BEHALF OF CNRL  
REQUEST FOR PROPOSALS FOR AERIAL PHOTOGRAPHY, AEROTRIANGULATION  
AND TOPOGRAPHIC MAPPING IN THE CROWSNEST PASS - FERNIE AREAS  
OF BRITISH COLUMBIA  
INCLUDING ATTACHMENTS  
FIVE 1:50 000 MAPS OUTLINING AREAS OF CONCERN

SCHEDULE B  
GENERAL SPECIFICATION FOR AERIAL PHOTOGRAPHY

SOUTHEASTERN B.C.  
INDEX MAP  
AERIAL PHOTOGRAPHS, GROUND CONTROL SURVEY, PHOTOGRAMMETRIC MAPS  
SCALE 1:100 000

COST STATEMENT  
AND ALLOCATIONS TO PROJECTS AND GROUPS OF LICENCES

CROWS NEST RESOURCES LIMITED - EXPLORATION  
SHELL CANADA RESOURCES LIMITED - SURVEYING

GROUND CONTROL SURVEY AND PHOTOGRAMMETRIC MAPPING  
SOUTHEASTERN BRITISH COLUMBIA

DISTRIBUTION OF AFE Z4670: UNDIVIDED COSTS  
TO PROJECTS AND GROUPS OF LICENCES  
ON THE BASIS OF HOLDING ACREAGES

<u>*HOLDINGS/PROJECTS</u>	<u>AFE</u>	<u>ACREAGE</u>	<u>%</u>	<u>\$ COSTS</u>
NORTH BLOCK=GROUP "NA"	4853A	7,840	8.0	29,440
CENTRAL BLOCK NORTH	4851J	10,264	10.5	38,640
HORESESHOE RIDGE	4851E	6,532	6.7	24,656
LINE CREEK J.V.	4851D	1,854	1.9	6,992
(Central Block Total)		(18,650)	(19.4)	(71,392)
(Group "CA")		( 6,088)	( 6.2)	(22,816)
(Group "CB")		( 8,082)	( 8.6)	(31,648)
(Group "CS")		( 4,480)	( 4.6)	(16,928)
CROWN MOUNTAIN TOTAL	4851Z	6,317	6.5	23,920
(Group #31)		( 3,117)	( 3.2)	(11,776)
(Group #32)		( 3,200)	( 3.3)	(12,144)
CORBIN=GROUP #6	4851Q	1,760	1.8	6,629
(Coal Mountain)		( 640)	( 0.7)	( 2,578)
(Tent Mountain)		( 1,120)	( 1.1)	( 4,051)
MORRISSEY FREEHOLD	4851U	43,200	44.1	162,288
LODGEPOLE=GROUP #104	4851S	3,345	3.4	12,512
LILLYBURT	4851R	6,122	6.3	23,184
HARVEY CREEK TOTAL	4851T	7,307	7.5	27,600
(Group #105 Renewal)		2,992	( 3.1)	11,408
(Remainder)		4,315	( 4.4)	16,192
CABIN CREEK=Group #106	4851V	3,200	3.3	12,144
<u>TOTAL</u>	<u>Z4670</u>	<u>97,741</u>	<u>100.0</u>	<u>368,000</u>
		= 39,556ha		\$3.77/acre
*All B.C. Coal Licences except Morrissey Freehold				\$9.30/ha
1979-01-31	F. Martonhegyi Exploration	D. Poulson Surveying	H. Hofer Finance Analyst	
	J. J. Crabb Manager - Exploration			

REFERENCES

THESE REPORTS COVER IN ONE UNIT ALL B.C. COAL LICENCES IN SOUTH-EASTERN BRITISH COLUMBIA

HELD BY SHELL CANADA RESOURCES LIMITED  
OPERATED BY CROWS NEST RESOURCES LIMITED

TWO SETS WERE FILED WITH

ADMINISTRATOR FOR COAL  
MINISTRY OF ENERGY, MINES & PETROLEUM RESOURCES  
GOVERNMENT OF BRITISH COLUMBIA  
VICTORIA, B.C.

ON APRIL 30, 1979, TO WHOM FURTHER COPIES WILL BE SUPPLIED UPON REQUEST.

CROWS NEST RESOURCES LIMITED

REPORT ON GEODETIC SURVEY

WORK DONE FROM AUGUST 15, 1978 TO SEPTEMBER 30, 1978

LOCATION SURVEY

HARVEY CREEK BLOCK - SPARWOOD AREA - S.E. B.C.

HARVEY CREEK

KOOTENAY LAND DISTRICT, B.C.

B.C. COAL LICENCES 591 AND 589

HELD BY SHELL CANADA RESOURCES LIMITED

OPERATED BY CROWS NEST RESOURCES LIMITED

PART OF NTS 82G/2 & 82G/7

NORTHERN LATITUDE  $49^{\circ} 15'$  TO  $49^{\circ} 19'$   
WESTERN LONGITUDE  $119^{\circ} 32'$  TO  $114^{\circ} 36'$

BY  
SHELL CANADA RESOURCES LTD. - SURVEYING DEPARTMENT  
GENERAL SURVEYING CONTRACTOR

1979-05-28



Geodetic Location (drill holes) Survey for Crows Nest Resources Limited (CNRL - operator) was done on the Harvey Creek Project, Kootenay Land District, Southeastern British Columbia, B.C. Coal Licences 591 and 589 held by Shell Canada Resources Limited (SCRL) from August 15, to September 30, 1978. This work was done under my direction by SCRL - Surveying Department, General Surveying Contractor for CNRL.

I verify that the Contractor is in the commercial surveying business, have full facilities, qualified staff and carried out the work professionally according to prevailing standards. The report given by SCRL Surveying Department is a true account of the work done.

May 31, 1979

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J. J. Crabb, P. Eng.

## INTER-OFFICE CORRESPONDENCE

Date May 7, 1979

To CROWS NEST RESOURCES LIMITED (C.N.R.L.)

From SHELL CANADA RESOURCES LIMITED


Subject LOCATION SURVEYS  
HARVEY CREEK BLOCK - SPARWOOD AREA - S.E. BRITISH COLUMBIA

HC-101 (Drill Hole)	HC-4 (Trench)
HC-1 (Trench)	HC-5 "
HC-2 "	HC-6 "
HC-3 "	HC-7 "

One Drill Hole and seven Trench stations were established in the Harvey Creek Block. The survey originated at Geodetic Station PACKHORSE using the 1978 observed Doppler-Satellite values and backsighting B.C. TOPO Station QUEST for an Azimuth. Conventional traverse was then run to the Harvey Creek work using theodolite and electronic distance measuring equipment.

The results of the survey was reported to C.N.R.L. in tabular and plan form, copies of which are attached. The total cost attributed to the HARVEY CREEK work was \$82,132 including the survey costs.

D.C. Poulson

  
Attachment

DCPsm

HARVEY CREEK BLOCK  
DRILL HOLE AND TRENCH STATIONS  
U.T.M. REFERENCE MERIDIAN - 117°

<u>STATION</u>	<u>NORTHING</u>	<u>EASTING</u>	<u>ELEVATION</u>
HC-101 (Drill Hole)	5462224.27	676467.12	1425.17
HC-1	5462202.04	676541.05	1422.57
HC-2	5462078.25	676508.08	
HC-3	5461981.61	676429.88	
HC-4	5461782.25	676307.81	
HC-5	5461463.61	676084.05	
HC-6	5461412.10	676008.12	
HC-7	5461410.19	675938.02	

"PACKHORSE" (Doppler '78)

	5461757.42	680085.81	2409.2
"QUEST" (B.C.TOPO)	5478304.94	666183.59	

Plan of the Survey of drill hole HC-D101 and access to backhoe trench  
HC-T1 is included in this report as Enclosure 2.