TK-Smithers 81(3)A

Smithers Area
Written and
Geophysical logs.

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(03)

TK-Smithers 81(3)A

ENCL 6-1

Smithers Area
Written and Geophysical logs

COPEN FILE

GEOLOGICAL BRANCH
ASSESSMENT REPORT

00 233

ROTARY HOLE NO. TW-81R-101

DATE	June 4-5, 1981
ELEV.	696.31 (UTM)
NORTHING	6,055,182.92
EASTING	622,157.83
TOTAL DEPTH	252.0 m
ANGLE	-90°
AZIMUTH	-
LOGS RUN	GRN, GR-DEN-CAL, DIR.

Sample Depth (m)	Lithology (Chip Samples)
3.048	Overburden
4.572	Overburden
6.096	Missing
7.620	Missing
9.144	sh. - dk. gy., carb., slightly slty.
10.668	sh. - blk., v. carb., minor coal - brittle
12.192	sh. - dk. gy., slightly slty.
13.716	Missing
15.240	sh. med. gy, slightly slty.
16.764	sh. - dk. gy., carb., minor coal
18.488	sh. - dk. gy., slty.
19.812	sh. - blk., carb. coal - dull, brittle, minor FeS_2
21.336	sh. - med. gy., slightly slty.
24.384	Overburden - cavings? or maybe conglomerate

ROTARY HOLE NO. TW 101

Sample Depth (m)	LITHOLOGY
25.908	sltst. - med. gy.
27.432	sh. - dk. gy., slty.
28.956	sh. - dk. gy., slty.
30.480	sh. - dk. gy., carb., minor coal and calcite
32.004	sh. - dk. gy., carb., Fe-stone-brown, minor calcite
33.528	sh. - dk. gy., carb.
35.052	sh. - a/a
36.575	sh. - a/a
38.100	sh. - med. gy., v. slty.
39.624	sh. - med to dk. gy., carb., slightly slty.
41.148	sltst. - med. gy.
42.672	sltst. - a/a, slightly shaley
44.196	sltst. - med gy., shaley
45.720	sh. - dk. gy., carb., slty.
47.244	sh. - a/a
48.768	sh. - a/a, coaly frags.
50.292	sh. - dk. gy., carb., minor coal and FeS_2
51.816	sh. - dk. gy., v.slty.
53.340	sh. - dk. gy., slty, carb.
54.864	sltst. - med. gy., abundant calcite, mnr sh. - blk., carb.
56.388	ss. - f.g. w. mnr. coal and FeS_2
[illegible]	sltst. - med. gy.

ROTARY HOLE NO. TW 101

Sample Depth (m)	LITHOLOGY
59.436	sltst. - med. gy., mnr. coal and FeS_2
60.960	ss. - c.g., green to brown, coal frags. incorporated, calcite frags.
62.484	sltst. - med. gy. w. FeS_2
64.008	sltst. - med. gy.
65.532	sltst. - med. gy. w. coaly fragments
67.056	sltst. - med. gy. to brown, calcite, mnr. coal and pyrite
68.580	sltst. - med. gy.
70.104	sltst. - med gy. to brown
71.628	sltst. - med gy. and Fe-stone-brown, very hard
73.152	sh. - med. gy. w. coaly fragments, slty.
74.676	sh. - dk. gy. slty.
76.200	sh. - a/a, w. v. mnr. coal
77.724	sh. - dk. gy.
79.248	sh. - a/a
80.772	sh. - brown to dk. gy., carb., calcite present
82.295	sh. - dk. gy., carb., mnr. calcite
83.830	sh. - med. gy., calcite, v.mnr. coal
85.344	sh. - a/a
86.868	sh. - med. gy., slty.
88.392	sh. - med. gy., slty, carb. coal
89.916	sh. - med. gy., slty, mnr. coal
91.440	sh. - med. gy., slty, calcite

ROTARY HOLE NO. TW 101

Sample Depth (m)	LITHOLOGY
92.964	sh. - dk. gy., carb., mnr. coal and FeS_2
94.488	sh. - dk. gy., carb.
96.012	sh. - a/a
97.536	sh. - a/a
99.060	sh. - a/a, slty., mnr. coal and pyrite
100.584	sltst. - med. gy.
102.108	sltst. - a/a
103.632	sltst. - a/a with mnr coal and pyrite
105.156	sltst. - med. gy.
106.680	ss. - brown to green, c.g. to v.c.g.
108.204	sltst. - med. gy.
109.728	sltst. - a/a, shaley
111.252	sltst. - a/a
112.776	sltst. - a/a, mnr. coal
114.300	sh. - med.gy., slty. Fe-stone and calcite present
115.824	sh. - med.gy., slty., mnr coal pyrite and calcite
117.348	sh. - med.gy., slty
118.872	sltst. - med.gy.
120.396	ss. - greenish, v.f.g., mnr. sh.
121.920	sltst. - med.gy., shaley, mnr. pyrite, coal, Fe-stone
123.444	sh. - med. gy., slty.
[illegible]	ss. - dk. brown to green with coal bits, v.c.g.

ROTARY HOLE NO. TW 101

Sample Depth (m)	LITHOLOGY
126.492	sh. - med.gy., slty. ss. - v.c.g., lt.brown, calcite present
128.016	sltst. - med.gy., shaley
129.540	sltst. - a/a, calcite
131.064	sltst. - med.gy., w. coaly frags., coal w. pyrite, calcite
132.588	sltst. - a/a, coal w. pyrite
134.112	sltst. - med.gy., shaley
135.636	MISSING
137.160	sh. - dk.gy., carb. w. coal wisps, coal & pyrite
138.684	sltst. - med. gy.
140.208	sltst. - med.gy. to ss. - v.f.g., mnr. coal & pyrite
141.732	ss. - med.gy., f.g. mnr. sltst. - med. gy.
143.256	ss. - v.f.g., med. gy., mnr. coal and pyrite
144.780	sltst. - med.gy.
146.304	sltst. - a/a
147.828	sltst. - a/a
149.352	sltst. a/a
150.876	ss. - lt. gy. - green to brown, med. grain, calcite
152.400	ss. - a/a and sltst. - med.gy. w. coal frags.
153.300	ss. - med.gy., med. grained and Festone - brown, very hard
155.448	ss. - a/a mnr. sh. - dk.gy. and Fe-stone
156.992	ss. - med.gy. to brown w. coaly bits
[illegible]	ss. - a/a w. mnr. sh. - dk. gy. and w. calcite

ROTARY HOLE NO. TW 101

Sample Depth (m)	LITHOLOGY
160.020	ss. - m.g., grey to brown, sh. - dk. gy., mnr. calcite
161.544	MISSING
163.068	ss. - a/a w. mnr. sh. - a/a and calcite
164.592	ss - a/a w. mnr. sh. - a/a
166.116	ss. - m.g., green -gy. to dk.gy., mnr. sh.-dk.gy., v.mnr. calcite
167.640	ss. - a/a sh. - dk. gy., slty., coaly frags.
(551.8 - 553.4') 168.189 - 168.676	COAL SAMPLE
169.164	MISSING
170.688	sh. - dk. gy. to blk, v. carb.
172.212	sh. - dk. gy., carb., w. coalified plant remains
173.736	sh. - a/a, mnr. pyrite
175.260	sh. - dk. gy., carb.
176.784	sh. - a/a w. coal - dull and pyrite
178.303	sh. - a/a slty. ss. - lt. green - gray, m.g.
179.832	sh. - dk.gy. to blk., carb.
181.356	sh. - dk.gy. to brown w. coalififed plant fragments, calcite
182.880	ss. - lt. green gray to med. gy., m. to c.g., mnr. sh. - a/a
184.404	ss. - a/a, sh. - med.gy. & slty to blk. and carb., calcite
185.928	sh. - dk.gy to blk., carb. w. coalified plant remains, ss. - a/a
187.452	sh. - a/a v. carb., mnr. ss - a/a
188.976	sltst. - med.gy. w. coalified plant frags., sh-blk.,v.carb.,mnr. ss - a/a
190.500	coal - dull & brittle, sh - dk.brown, carb., mnr. ss - a/a

ROTARY HOLE NO. TW 101

Sample Depth (m)	LITHOLOGY
192.024	Coal - powder, dull
193.548	ss.-med.gy. to lt.brown, m to f.g., mnr. sltst.-med.gy. w. coalified plant frags.
195.072	sltst. - med.gy w. coalified plant frags.
196.596	sltst. - a/a; sh. - dk.gy. to black, v. carb.
198.120	sltst. - a/a and sh. - a/a
199.644	sh. - med.to dk.gy., also brown w.coalified plant frags; mnr.ss-f.g.
201.168	sh. - med.gy. w. coalified plant frags.; ss - med.gy., v.f.g.
202.692	sltst.-med.gy.,; ss.-v.f.g.,med.gy. both w. coalified plant frags.
204.216	sltst.-a/a; sh.-dk.gy. w. coalified plant frags., mnr.ss. - a/a
205.740	sltst. - med.gy. to brown w. coalified plant frags.
207.264	ss. - greenish - gray, f.g. to v.f.g., mnr.calcite
208.788	ss. - green - gray to brown, m.g., w. coal fragments
210.312	ss. - a/a; pebbles - various colours - conglomerate?
211.836	sh.-dk.gy.,to blk., v.carb. w.coalified plant frags.; mnr.ss - a/a
213.360	ss.-med.gy.,f.g.,w. coalified plant remains; calcite; mnr.sltst. - med.gy.
214.884	ss. - green-gray, m.g. to v.f.g., sh.-dk.gy., carb.; coal; calcite
216.408	ss. - a/a; mnr. sh. - a/a; both w. coalified plant frags.
217.932	ss. - green-gray to lt.brown, f.g. to v.f.g.; calcite
219.456	sh. -med.gy.to dk.gy.,slightly slty.w.coalified plant frags.; mnr. ss. - a/a
220.980	sh. - dk.gy. to blk., carb., mnr. coal
222.504	sltst. - med.gy. w. coalified plant frags.
[illegible]	sltst. - med.gy. to brown to v.f.g. ss.

ROTARY HOLE NO. TW 101

Sample Depth (m)	LITHOLOGY
225.552	sh. - dk.gy. to blk., carb.; mnr. coal - dull
227.076	sh. - a/a w. coalified plant frags; mnr. coal - dull
228.600	sh. - med. gy. w. coalified plant frags., slty.
230.124	sltst. - med. gy. to brown w. coalified plant frags.
231.648	sh. - med.gy., slty. grades into med.gy. sltst. and v.f.g. ss.
233.172	sltst. - med.gy to brown; sh - dk.gy.w. coalified plant frags; dull coal
234.696	ss - med.gy., f.g. to v.f.g. to sltst.
236.220	ss - lt. green - gray, m.g. to c.g., w. coalified fragments
237.744	ss - a/a, m.g.
239.268	ss. - lt. green - gray, m.g., more coalified fragments; calcite
240.792	sltst. - med.gy. w. coalified plant frags.; mnr. ss.- a/a
242.316	sltst. - a/a, shaley
243.840	sltst. - med.gy.; ss - lt. green - gray, f.g. to v.f.g.
245.364	ss - lt.gy., v.f.g.
246.888	ss. - a/a; sltst. - med.gy. w. coalified plant frags.
248.412	sltst. - med.gy. to brownish, mnr. coalified plant frags.
249.936	ss - med. gy., f.g., coalified plant frags.
251.460	ss. - a/a, f.g. to m.g.
252	TD

TK-Smithers 81(3)A

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DIRECTIONAL SURVEY

ROKE OIL ENTERPRISES LIMITED

COMPANY: CROWSNEST RESOURCES
GRID:
DATE SURVEYED: JUNE 5, 1981

DRILL HOLE: TW - 81R - 101
LATITUDE:
SURVEY BY: RINCKER

LOCATION: TELKWA PROPERTY
DEPARTURE:
WITNESSED BY: HANDY

FIELD: SMITHERS PROJECT
ELEVATION:
CALCULATIONS BY:

MAGNETIC DECLINATION:
CORRECTION OF:
FOR: GRID:

Number	Cable Depth M	Slant Angle	Slant Angle Bearing	Number	Cable Depth M	Slant Angle	Slant Angle Bearing	Number	Cable Depth	Slant Angle	Slant Angle Bearing
0	0	0.12	-	11	220	9.87	5.9	22			
1	20	0.12	285	12	240	9.12	1.9	23			
2	40	1.55	337.3	13	REPEATS			24			
3	60	2.11	343.3	14	60	2.21	343	25			
4	80	3.93	350.2	15	80	3.90	344.6	26			
5	100	5.66	0.5	16	120	5.99	6.1	27			
6	120	6.03	7	17	180	8.57	4.1	28			
7	140	6.75	2.6	18				29			
8	160	6.95	8.0	19				30			
9	180	8.23	0.2	20				31			
10	200	9.32	3.2	21				32			

ROTARY HOLE NO. TW-81R-102

DATE	June 5, 1981
ELEV.	648 m
NORTHING	6,056,612 N
EASTING	621,600 E
TOTAL DEPTH	35.05 m
ANGLE	-90°
AZIMUTH	-
LOGS RUN	-

Sample Depth (m)	Lithology (Chip Samples)
0 - 35.052	Overburden - Hole abandoned due to inability to penetrate overburden

ROTARY HOLE NO. TW-81R-103

DATE	June 5, 1981
ELEV.	652.5 m
NORTHING	6,056,552 N
EASTING	621,250 E
TOTAL DEPTH	21.6 m
ANGLE	-90°
AZIMUTH	-
LOGS RUN	-

Sample Depth (m)	Lithology (Chip Samples)
	Overburden - Hole abandoned due to inability to case and penetrate overburden

ROKE OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

TK-Smithers 81(3)A

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FILE NO.	
COMPANY	CROWSNEST RESOURCES LTD.
WELL	TW - 81R - 101
LOCATION	TELKWA PROPERTY
FIELD	SMITHERS PROJECT
PROVINCE	BRITISH COLUMBIA
LSD / SEC / TWP / RGE / W__M	
Other Services:	DIR GR-DEN-CAL
Permanent Datum	GROUND LEVEL
Elev.	
Log Measured from	GROUND LEVEL
Above Perm. Datum	
Well Depths Measured from	GROUND LEVEL
K.B.	
CSG	
G.L.	

Run. No.	ONE
Date	5 JUNE 1981
First Reading	242 M
Last Reading	0
Footage Logged	242 M
Depth Reached	242.5 M
Depth Driller	252 M
Casing Roke	12.25 M
Casing Driller	12.2 M
Fluid Type	AIR
Liquid Level	
Min. Diam.	16.5 CM
Rm @	
Operating Time	1½ HOURS
Truck No.	36
Recorded By	RINCKER
Witnessed By	HANDY

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.	125 A	LOG TYPE	NEUTRON/NEUTRON
DIAMETER	3.2 CM	TOOL MODEL NO.	125 A
DETECTOR MODEL NO.		DIAMETER	3.2 CM
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	10 CM	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	2 M	LENGTH	15 CM
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	171
HOIST TRUCK NO.		SPACING	43 CM
INSTRUMENT TRUCK NO.	36	TYPE	AmBe
TOOL SERIAL NO.	008	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED M/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	242 M	0	4	3	100	0	7	3	5000	9L	130

REMARKS LOGGED THROUGH DRILL STEMS OF VARYING THICKNESS

GAMMA RAY	DEPTHS	NEUTRON
GAMMA RAY INCREASES →		NEUTRON INCREASES →
API 7		API 130
0 … 70		1170 … 2470 … 3770

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

TK-Smithers 81(3)A

233 (2)

FILE NO.	
LSD SEC TWP RGE W___M	
COMPANY	CROWSNEST RESOURCES LTD.
WELL	TW - 81R - 101
LOCATION	TELKWA PROPERTY
FIELD	SMITHERS PROJECT
PROVINCE	BRITISH COLUMBIA
Other Services:	DIR, GR-DEN-CAL
Permanent Datum	GROUND LEVEL
Elev.	
Log Measured from	GROUND LEVEL
Above Perm. Datum	
Well Depths Measured from	GROUND LEVEL
K.B.	
CSG	
G.L.	
Run. No.	ONE
Date	5 JUNE 1981
First Reading	251 M
Last Reading	0
Footage Logged	251 M
Depth Reached	251.5 M
Depth Driller	252 M
Casing Roke	12.25 M
Casing Driller	12.2 M
Fluid Type	AIR
Liquid Level	
Min. Diam.	16.5 CM
Rm @	
Operating Time	1½ HOURS
Truck No.	36
Recorded By	RINCKER
Witnessed By	HANDY

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.	125 A	LOG TYPE	NEUTRON/NEUTRON
DIAMETER	3.2 CM	TOOL MODEL NO.	125 A
DETECTOR MODEL NO.		DIAMETER	3.2 CM
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	10 CM	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	2 M	LENGTH	15 CM
GENERAL		SOURCE MODEL NO.	MRC-N-SS-W
		SERIAL NO.	171
HOIST TRUCK NO.		SPACING	43 CM
INSTRUMENT TRUCK NO.	36	TYPE	AmBe
TOOL SERIAL NO.	008	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED M/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	12	4	3	100	0	12	3	5000	13L	180
	12	251	4	3	100	0	12	3	5000	28L	180

REMARKS

GAMMA RAY	DEPTHS	NEUTRON
GAMMA RAY INCREASES →		NEUTRON INCREASES →
API ▸12◂		API ▸180◂
0 — 120		2340 — 4140 — 5940

TK-Smithers 81(3)A

ROKE OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY SIDEWALL DENSILOG CALIPER

FILE NO.

LSD / SEC / TWP / RGE / W ___ M

COMPANY: CROWSNEST RESOURCES LTD.

WELL: TW - 81R - 101

LOCATION: TELKWA PROPERTY

FIELD: SMITHERS PROJECT

PROVINCE: BRITISH COLUMBIA

233 (3)

Other Services: GRN, DIR

Permanent Datum: GROUND LEVEL — Elev.

Log Measured from: GROUND LEVEL — Above Perm. Datum

Well Depths Measured from: GROUND LEVEL

K.B. / CSG / G.L.

Run. No.	ONE
Date	5 JUNE 1981
First Reading	251 M
Last Reading	0
Footage Logged	251 M
Depth Reached	251.5 M
Depth Driller	252 M
Casing Roke	12.25 M
Casing Driller	12.2 M
Fluid Type	AIR
Liquid Level	
Min Diam.	16.5 CM
Operating Time	1½ HOURS
Truck No.	36

Recorded By: R.TINCKER — Witnessed By: HANDY

GENERAL				GAMMA RAY				SIDEWALL DENSILOG			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED M/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV.L OR R	API G.R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV.L OR R	CPS/DIV
1	0	251	6	3	100	0	12	0.5	5000	0.46R	64.02

REMARKS: DEN TOOL #554AS
CAL TOOL #587

LEGEND

- CONGLOMERATE
- SANDSTONE - COARSE GRAINED/ - MEDIUM GRAINED
- SANDSTONE - FINE GRAINED
- SILTSTONE
- SHALE
- MUDSTONE
- CARB. SHALE
- COAL
- IGNEOUS ROCKS

ENCL 6-2

ROTARY HOLE NO. TW -81R-104

DATE	June 8-9, 1981
ELEV.	767.52 (UTM)
NORTHING	6,054,097.81
EASTING	621,352.79
TOTAL DEPTH	152.4 m
ANGLE	-90°
AZIMUTH	-
LOGS RUN	GRN, GR-DEN-CAL, FBL, DIR

Sample Depth (m)	Lithology (Chip Samples)
1.524 - 6.096	Overburden
7.620	sltst. - med. gy. to brown
9.144	very little sample ss. - green, f.g.
10.668	ss. - a/a
12.009 - 13.320	COAL SAMPLE
13.716	ss. - med. gy., v.f.g.
15.240	ss. - green w. interbedded gray, v.f.g., abundant Fe-stone
16.764	ss. - green, v.f.g., w. coal and pyrite clasts
18.488	ss. - greenish - gray, v.f.g., w. coal clasts
19.812	sh. - med.to dk.gy.,slty.,carb.w.abund.coalified plant frags.
20.391 - 21.549	COAL SAMPLE
23.409 - 25.817	COAL SAMPLE
27.432	MISSING
28.956	sltst.-med.gy. sh - med.to dk.gy., slty.,v. mnr. coal

ROTARY HOLE NO. TW 104

Sample Depth (m)	LITHOLOGY
30.480 - 32.004	MISSING
33.528	ss. - med.gy., v.f.g., w. coalified plant frags.
35.052	ss. - f.g. to v.f.g.; med. gy. to green-gray to brown
36.575	sltst. - med. gy., mnr. ss. - f.g., med. gy.
38.100	ss. - green, f.g.; sltst. - med.gy. to brown
39.624	MISSING
41.148	ss. - f.g.to v.f.g.,med.gy. to green-gy.; sltst. - med.gy.to brown
42.672	sltst. - med.gy.; mnr. coal
44.196 - 45.720	MISSING Coal
47.244	sh. - med. gy., slty.
48.768	sltst. - med. gy., Fe-stone
50.292 - 54.864	MISSING Coal
56.388	sh. - dk.gy., carb.; coal - dull, brittle
57.912 - 59.436	MISSING
60.960	sh. - brown to dk.gy., abund. coalified plant frags.
62.484	sh. - dk.gy. to blk.,slty.,abund.coalified plant frags.
64.008 - 67.056	MISSING Coal
68.580	coal - dull, brittle, some bright bands
70.104	MISSING Coal
71.628	ss. - green, f.g. and sltst. - med. gy.
73.152	MISSING
74.676	sltst. - med. gy.; coal - dull, brittle

ROTARY HOLE NO. TW 104

Sample Depth (m)	LITHOLOGY
76.200	sltst. - med. gy., mnr. coal
77.724	MISSING
79.248	coal - dull to shiny; mnr. sltst.
80.772 - 83.830	MISSING
85.344	sh. - brown with abund.plant frags.,mnr.sltst. - med.gy., coal
86.868 - 89.916	MISSING
91.440	ss. - med. gy., f.g. to v.f.g.
92.964 - 97.536	MISSING
99.060	sh. - med. gy. to brown, slty.
100.584 - 103.632	MISSING
105.156	sh. - a/a
106.680 - 111.252	MISSING
112.776	ss. - gray, slightly green, f.g. to v.f.g.
114.300 - 115.824	MISSING
117.348	ss. - a/a to sltst. - med. gy.
118.872	sltst. - med. gy. to brown, mnr. sh. - blk, carb.
120.396	MISSING
121.920	sltst. - a/a; ss. - green - gray, f.g.
123.444	ss. - med. gy., v.f.g.
124.968	MISSING
126.492	sh. - med. gy. to brown, slty.
128.016 - 129.540	MISSING

ROTARY HOLE NO. TW 104

Sample Depth (m)	LITHOLOGY
131.064	sh. - med. gy. to brown, slty.
132.588	MISSING
134.112	sh. - a/a
135.636	sh. - a/a sltst. - med. gy.
137.160 - 138.684	MISSING
140.208	sh. - a/a sltst. - a/a
141.732	MISSING
143.256	sh. - a/a w. v. mnr. coal and pyrite
144.780	sltst. - med. gy. to brown
146.304	sltst. - med. gy., calcite, mnr. coal
147.828 - 149.352	MISSING
150.876	sltst. - a/a
152.4	T.D.

TK-Smithers 81(3)A

233

DIRECTIONAL SURVEY

ROKE OIL ENTERPRISES LIMITED

COMPANY: CROWSNEST RESOURCES
GRID:
DATE SURVEYED: JUNE 9, 1981.

DRILL HOLE: TW - 81R - 104
LATITUDE:
SURVEY BY: RINCKER

LOCATION: TELKWA PROPERTY
DEPARTURE:
WITNESSED BY: HANDY

FIELD: SMITHERS PROJECT
ELEVATION:
CALCULATIONS BY:

MAGNETIC DECLINATION:
CORRECTION OF:
FOR: GRID:

Number	Cable Depth M	Slant Angle	Slant Angle Bearing	Number	Cable Depth M	Slant Angle	Slant Angle Bearing	Number	Cable Depth	Slant Angle	Slant Angle Bearing
0	0	0.12	-	11	REPEATS			22			
1	15	0.44	140.0	12	60	4.26	137.4	23			
2	30	1.54	144.4	13	120	7.67	202.2	24			
3	45	2.63	135.9	14				25			
4	60	4.37	126.5	15				26			
5	75	5.47	155.6	16				27			
6	90	5.65	161.5	17				28			
7	105	7.85	170.6	18				29			
8	120	7.51	203.9	19				30			
9	135	8.23	201.6	20				31			
10				21				32			

ROKE

ROKE ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO.	
LOG NO.	
RUN NO.	ONE
DATE	19 - 08 - 78
WELL	16-08-29-28-W4
LOCATION	1010 NSW BRIDGEWATER
FIELD	BRIDGEWATER
PROVINCE	ALBERTA
COMPANY	CONSOLIDATED DEVONIAN LTD.

233

Recorded By: A.CLYNES
Witnessed By: A.GOFF

Bit Size	7.875	Type Fluid in Hole	FRESH
Depth Driller	1010	Max. Rec. Temp.	32 C
Depth Logger	1008	Equipment Location	2 CHESTER
Top Log Int.	SURFACE	Recorded By	A.CLYNES
Bottom Log Int.	1008	Witnessed By	A.GOFF
Casing - Driller	8.625 @ 0		
Casing - Logger	8.625 @ 0		
Bit Type	7.875 HTC		
Type Fluid	FRESH		
Density	8.4		
Viscosity	50		
pH	8.5		
Fluid Loss	8.0		
Source of Sample	FLOWLINE		
Rm @ Meas. Temp.	0.75 @ 32 C		
Rmf @ Meas. Temp.	0.60 @ 32 C		
Rmc @ Meas. Temp.	1.00 @ 32 C		
Source: Rmf / Rmc	MEASURED / CALCULATED		
Rm @ BHT	0.37 @ 77 C		
Time Since Circ.	5 HRS		
Max. Rec. Temp.	77 C		
Equipment - Location	2 CHESTER		
Recorded By	A.CLYNES		
Witnessed By	A.GOFF		

Remarks: Rmf Estimated

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.	112 A	LOG NO.	
SONDE	3.2 CO	TOOL MODEL NO.	123 A
DETECTOR MODEL NO.		DIAMETER	3.2 CO
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	12 CO	TYPE	PROPORTIONAL
DISTANCE TO SOURCE	2 M	LENGTH	12 CO
		SOURCE MODEL NO.	MAX-250-W
GENERAL		SERIAL NO.	1 C
SONDE TRACK NO.	35	STRENGTH	44 CO
INSTRUMENT TRACK NO.		TYPE	Audio
TOOL SERIAL NO.	005	STRENGTH	4 CO,003

LOGGING DATA

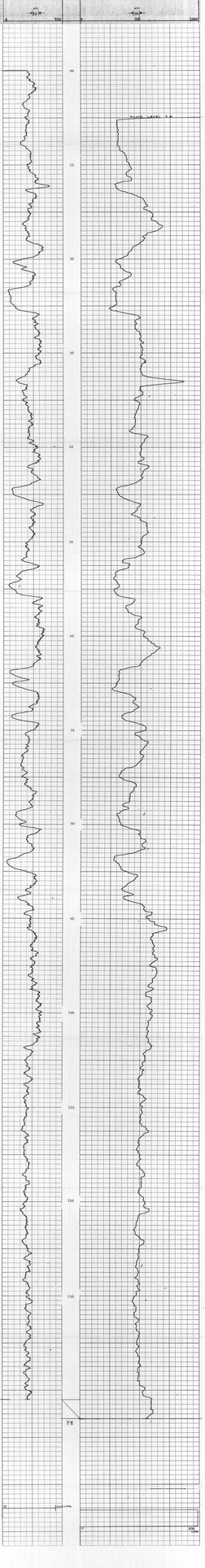
GENERAL					GAMMA RAY				NEUTRON			
RUN NO.	TOP	BOTTOM	SPEED F/MIN	F.C. TIME CONST.	SENS. SET.	API & UNITS PER DIV.	F.C. SEC.	SENS. SETTING	ZERO CO.	API & UNITS PER DIV.		
1	0	143	4	3	100	0	13	3	5000	0	50	

REMARKS:

GAMMA RAY | Depth | NEUTRON

GAMMA RAY-INCREASES → API 0 — 150

NEUTRON-INCREASES → API 0 — 100



TK-Smithers 81(3)A

ROKE

GAMMA RAY
SIDEWALL DENSILOG
CALIPER

OIL ENTERPRISES LTD. CALGARY, ALBERTA

233 (5)

FILE NO.	
LSD	
SEC	
TWP	
RGE	
W ___ M	
COMPANY	CROWSNEST RESOURCES LTD.
WELL	TW - 81R - 104
LOCATION	TELKWA PROPERTY
FIELD	SMITHERS PROJECT
PROVINCE	BRITISH COLUMBIA
Other Services:	GRN, DIR, FBL
Permanent Datum	GROUND LEVEL
Log Measured from	GROUND LEVEL
Well Depths Measured from	GROUND LEVEL
Elev.	
Above Perm. Datum	
K.B.	
CSG	
G.L.	

Run. No.	ONE
Date	9 JUNE 1981
First Reading	141 M
Last Reading	0
Footage Logged	141 M
Depth Reached	141.5 M
Depth Driller	152.4 M
Casing Roke	8.25 M
Casing Driller	8.2 M
Fluid Type	WATER
Liquid Level	5 M
Min. Diam.	16.5 CM
Operating Time	2 HOURS
Truck No.	36
Recorded By	RINCKER
Witnessed By	HANDY

GENERAL				GAMMA RAY				SIDEWALL DENSILOG			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED M/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G.R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	CPS/DIV
1	0	141	6	3	100	0	12	0.5	5000	0.46R	64.02

REMARKS
DEN TOOL #554AS
CAL TOOL #587

CALIPER DIAMETER – CM
15 20 25 30 35

TW-81R-104

BULK DENSITY (GRAMS/CC)

DEPTHS

GAMMA RAY API
0 12 120

LEGEND

CONGLOMERATE
SANDSTONE - COARSE GRAINED/ - MEDIUM GRAINED
SANDSTONE - FINE GRAINED
SILTSTONE
SHALE
MUDSTONE
CARB. SHALE
COAL
IGNEOUS ROCKS

ROKE

233

DETAIL SECTIONS

ENCL 6-3

TK-Smithers 81(3)A

ROTARY HOLE NO. TW-81R-105

DATE	June 9-10, 1981
ELEV.	860.33 (UTM)
NORTHING	6,052,692.33
EASTING	621,675.54
TOTAL DEPTH	176.0 m
ANGLE	-90°
AZIMUTH	-
LOGS RUN	GRN, GR-DEN-CAL, FBL, DIR

Sample Depth (m)	Lithology (Chip Samples)
0 - 3.048	Overburden
4.572	MISSING
6.096	sh. - med. gy., slty.
7.620	sltst. - med. gy. to brown
9.144	sltst. - a/a sh. - dk.gy.
10.668	sltst. - med. gy.
12.192	sltst. - med. to dk. gy.
13.716	sh. - dk. gy.
15.240	sh. - med. gy., slty., mnr. coal
16.764	sh. - med. gy. to brown
18.488	Fe-stone
19.812	MISSING
21.336	sh. - med. gy., slty.
22.860	sh. - med. gy. to brown, slty.
[illegible]	sltst. - med. gy.

ROTARY HOLE NO. TW 105

Sample Depth (m)	LITHOLOGY
25.908	sltst. - dk.green - gy.,pyrite, mnr.coal; very little sample
27.432	ss. - dk. green to gy., v.f.g.
28.956	MISSING
30.480	sltst. - med. gy.
32.004	ss. - v.f.g., green to dk. gy., Fe-stone
33.528	sh. - dk.gy., abund. plant frags.
34.564 - 35.326	COAL SAMPLE
36.241 - 38.222	COAL SAMPLE
39.624	MISSING
41.148	sh. - a/a sltst. - lt.gy.
42.672	sh. - dk.gy., slty. sltst. - lt.gy., Fe-stone
44.196	ss. - m.g. to c.g. mnr. sh - a/a, mnr. coal and Fe-stone
45.720	sltst. - med. gy., Fe-stone
47.244	sltst. - med. gy., ss. - green, v.f.g., calcite
48.768	sltst. - med. to dk.gy., Fe-stone
50.292	sltst. - a/a, Fe-stone
51.816	sltst. - green - gray
53.340	sltst. - med. gy., shaley
54.864	sltst. - med.gy. ss. - v.f.g., green-gray, mnr. Fe-stone
56.388	ss. - a/a mnr. sltst. - a/a and Fe-stone
57.912	ss - f.g., green - gray
59.436	ss - a/a; abundant Fe-stone

ROTARY HOLE NO. TW 105

Sample Depth (m)	LITHOLOGY
60.960	ss. - f.g.,green-gray, mnr. sltst. - med.gy., Fe-stone
62.484	sh. - dk.gy., carb., plant frags.
64.008	sh. - dk.gy., slty.
65.532	sltst. - dk.gy., mnr. Fe-stone
67.056	sh. - med. gy., abund. plant frags.
68.580	MISSING
70.104	sltst. - med. gy. to lt. brown.
71.628	sltst. - med. gy.
73.152	sh. - med. gy. mnr. ss. - lt.gy., f.g., mnr. Fe-stone
74.676	ss. - f.g., lt.gy., mnr. Fe-stone
76.200	sltst. - med. gy., Fe-stone
77.724	sltst. - to v.f.g. ss., med. gy., Fe-stone
79.248	sh. - dk.gy., slty. ss. - f.g., lt.gy., Fe-stone
80.772	sltst. - med.gy. ss. - a/a, Fe-stone
82.295	sh. - dk.g., abund.plant frags.,mnr.ss. - f.g.,green-gy., v.mnr.coa
83.830	ss. - v.f.g., green-gray, w. sltst. - med.gy.
85.344	sh. - dk.gy., slty.
86.868	sltst. - med.gy.
88.392	MISSING
89.916	sh. - dk.gy., slty., mnr. coal
91.440	sltst. - med. to dk. gy., Fe-stone
92.964	sltst. - med.gy., shaley

ROTARY HOLE NO. TW 105

Sample Depth (m)	LITHOLOGY
94.488 - 99.700	COAL SAMPLE
100.584	sh. - med.gy. to blk.,carb.w.abund.plant frags., mnr. coal
102.108	MISSING
103.632	sh. - med.gy., slty.
105.156	sh. - a/a
106.680.	sh. - a/a sltst. - med.gy., mnr. ss.- lt.gy., f.g., Fe-stone
108.204	ss. - green-gray, f.g. sltst. - med.gy.
109.728	ss. - a/a, sltst. - a/a, Fe-stone
111.252	ss. - med. gy., v.f.g.
112.776	ss. - lt.gy., f.g., sltst. - med.gy., Fe-stone
114.300	ss. - a/a, Fe-stone
115.824	ss. - a/a, sltst. - med.gy., Fe-stone
117.348	sltst. - med.gy., ss.- green-gray, f.g. to v.f.g.,mnr. Fe-stone
118.872	sltst. - a/a, ss. - a/a, Fe-stone, mnr. coal
120.396	ss. - lt.gy., f.g. sh - dk.gy., Fe-stone
121.920	ss. - med.gy., f.g. sltst. - med. to dk.gy., Fe-stone
123.444	ss. - a/a sltst. - a/a, Fe-stone
124.968	ss. - a/a sltst. - a/a, mnr. Fe-stone
126.492	ss. - lt.gy. - green, f.g. to v.f.g., sltst. - med.gy., mnr. coal
128.016	coal - dull and brittle, mnr. sltst. - dk.gy.
129.540	sh. - med.gy., mnr. coal, Fe-stone
131.064	sh. - a/a. Fe-stone, mnr. coal mnr. ss. - lt.gy.,f.g.,calcite

ROTARY HOLE NO. TW 105

Sample Depth (m)	LITHOLOGY
132.588	sh. - dk.gy.,carb., coal - dull,brittle mnr.ss. - lt.gy.,f.g.
134.112	MISSING
135.636	coal - powder
137.160	sh. - dk.gy., carb., coal - dull, brittle
138.684	sh. - dk.gy. to brown, abund. coalified plant frags.
140.208	sh. - a/a, mnr. coal
141.732	MISSING
143.256	sh. - a/a, mnr. coal
144.780	sh. - dk.gy. sltst. - med.gy., mnr. ss. - med.to lt.gy., f.g.
146.304	MISSING
147.828	sh. - dk. gy. sltst. - med.gy., Fe-stone, mnr. coal
149.352	sltst. - med.gy., Fe-stone
150.876	sltst. - a/a, mnr. ss. - med.gy. f.g., Fe-stone
152.400	sltst. - a/a, mnr. Fe-stone
153.300	sltst. - a/a, mnr. ss. - lt.gy., f.g., mnr. Fe-stone, mnr. coal
155.448	sh. - med.gy., slty., mnr. Fe-stone
156.992	sh. - a/a
158.496	sh. - med.gy. to brown, slty.
160.020	sltst. - med.gy.
161.544	sltst. - a/a mnr. Fe-stone
163.068	sltst. - a/a
164.592	sltst. - a/a Fe-stone, mnr. calcite

ROTARY HOLE NO. TW 105

Sample Depth (m)	LITHOLOGY
166.116	very little sample sltst. - med.gy., ss. - lt.gy. v.f.g. to f.g.
167.640	sltst. - a/a
169.164	sltst. - a/a, mnr. Fe-stone
170.688	sltst. - med.gy., shaley, Fe-stone
172.212	sh. - med.gy., slty., Fe-stone
173.736	sh. - a/a
175.260	sh. - a/a
176.	T.D.

ROKE OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY
SIDEWALL DENSILOG
CALIPER

Te-Smithers 81(3)A

FILE NO. 233

COMPANY	CROWSNEST RESOURCES LTD.
WELL	TW - 81R - 105
LOCATION	TELKWA PROPERTY
FIELD	SMITHERS PROJECT
PROVINCE	BRITISH COLUMBIA
Permanent Datum	GROUND LEVEL
Log Measured from	GROUND LEVEL
Well Depths Measured from	GROUND LEVEL
Other Services:	GRN FBL

Run No.	ONE
Date	10 JUNE 1981
First Reading	143 M
Last Reading	0
Footage Logged	143 M
Depth Reached	143.5 M
Depth Driller	176 M
Casing Roke	5.25 M
Casing Driller	
Fluid Type	WATER
Liquid Level	39 M
Min. Diam.	16.5 CM
Operating Time	2 HOURS
Truck No.	36
Recorded By	R.TINCKER
Witnessed By	HANDY

GENERAL				GAMMA RAY				SIDEWALL DENSILOG			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED M/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV.L OR R	API G.R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV.L OR R	CPS/DIV
1	0	143	6	3	100	0	12	0.5	5000	0.46R	64.02

REMARKS DEN TOOL #554AS
CAL TOOL #587

LEGEND

- CONGLOMERATE
- SANDSTONE - COARSE GRAINED/ - MEDIUM GRAINED
- SANDSTONE - FINE GRAINED
- SILTSTONE
- SHALE
- MUDSTONE
- CARB. SHALE
- COAL
- IGNEOUS ROCKS

ROKE

GAMMA RAY NEUTRON LOG

FILE NO.	100
LOG NO.	100
RUN NO.	1
WELL	COMPANY: CONSORTIUM 1 LTD.
	TOWN: CALGARY PROVINCE: ALBERTA
LOCATION	SECTION: 36 TWP.: 23 RGE.: 1 W5
FIELD	PROTOCOL: BOUTIER CONSTRUCTION
	Measured from: Ground Level
	Elevation: 2,233
	Drilling Measured from: Ground Level
	Elevation: 2,233
	Permanent Datum: Ground Level
	Elevation: 2,233

233

Recorded By: LEVERS
Witnessed By: BOYER

Date	1-2-82
Time	1:00
Depth Driller	1,000
Depth Logger	1,000
Bottom Log Int.	1,000
Top Log Int.	0
Casing Driller	8 5/8 @ 0
Casing Logger	8 5/8 @ 0
Bit Size	7 7/8
Type Fluid in Hole	WATER
Dens.	
Visc.	
pH	
Fluid Loss	
Source of Sample	
Rm @ Meas. Temp.	
Rmf @ Meas. Temp.	
Rmc @ Meas. Temp.	
Source: Rmf / Rmc	
Rm @ BHT	
Time Since Circ.	
Max. Rec. Temp.	
Equip. Location	
Recorded By	
Witnessed By	

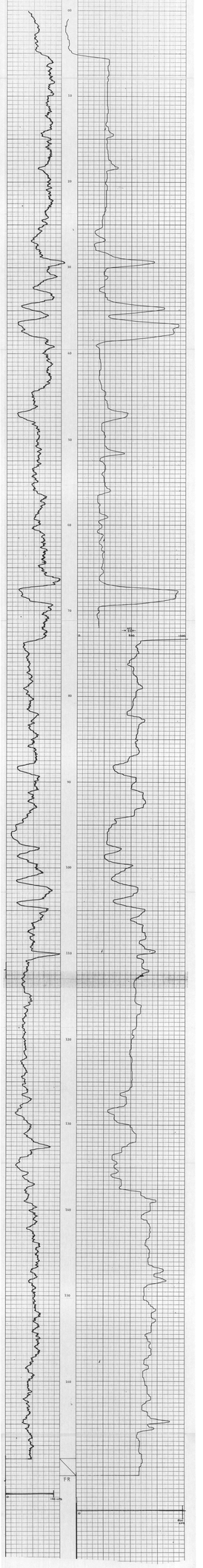
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	100	RUN NO.	
TOOL MODEL NO.	3.5 X	CASE SIZE	NEUTRON/NEUTRON
STANDOFF	1.2 OD	TOOL MODEL NO.	3.5 X
DETECTOR MODEL NO.		DETECTOR MODEL NO.	1.2 OD
TYPE	SC-D011LLLA11001	DETECTOR MODEL NO.	
LENGTH	10 OD	TYPE	PROPORTIONAL
DISTANCE TO SOURCE	2 0	LENGTH	11 OD
		SOURCE MODEL NO.	MSC-N-55 W
GENERAL:		SERIAL NO.	1
MAST TRUCK NO.		STATION	11 10
INSTRUMENT TRUCK NO.	30		Audio
TOOL SERIAL NO.	006	STRENGTH	5 0.0 0.0

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	CHANGE FROM	TO	SPEED IN MIN.	T.C. IN SEC.	SENS.	ZERO	APIS/IN. UNITS	T.C.	SENS.	ZERO	APIS/IN. UNITS
1	0	12	6	1	100	0	12	1	1000	0	100
	12	1,15	6	1	100	0	12	1	1000	0	50

REMARKS:



TR-Smithers 81(2)A

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FOCUSED BEAM LOG 5 CM 20 CM

FILE NO. 233 (9)

COMPANY CRANBERRY RESOURCES LTD.

WELL TV - 81R - 105

LOCATION TELKWA PROPERTY

FIELD SMITHERS PROJECT

PROVINCE BRITISH COLUMBIA

Other Services GR-NEU-CAL

Permanent Datum GROUND LEVEL

Log Measured From GROUND LEVEL

Drl. Depths Measured From GROUND LEVEL

Run No.	ONE
Date	10 JUNE 1981
First Reading	143 M
Last Reading	39 M
Footage Logged	104 M
Depth Reached	143.5 M
Depth Driller	3.76 M
Casing Driller	5.76 M
Fluid Type	WATER
Fluid Level	39 M
Max. Chart	16.5 CM
Operating Time	45 MIN
Truck No.	36
Recorded By	R.TUCKER
Witnessed By	BARRY

Remarks FBL # 7 CURRENT RANGE HIGH MUDFISH RESISTANCE 500 OHMS
7 ELECTRODE SONDE 20 CM BEAM WIDTH 100 CM ARRAY
PRIMARY 10 OHM/DIV SECONDARY 40 OHM/DIV

RESISTIVITY (OHM-METERS)	Depths	RESISTIVITY (OHM-METERS)
SECONDARY SCALE 0 – 400	0 / 520	PRIMARY SCALE 100 – 200 / 920 – 1320

Remarks FBL # 7 CURRENT RANGE HIGH MUDFISH RESISTANCE 500 OHMS
5 ELECTRODE SONDE 500 CM BEAM WIDTH CM ARRAY
PRIMARY 10 OHM/DIV SECONDARY 50 OHM/DIV

RESISTIVITY (OHM-METERS)	Depths	RESISTIVITY (OHM-METERS)
SECONDARY SCALE 0 – 500	0 / 650	PRIMARY SCALE 100 – 200 / 1150 – 1650

DETAIL SECTIONS

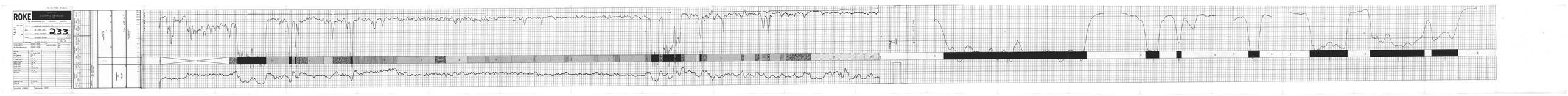
ENCL 6-4

TK-Smithers 81(3)A

ROTARY HOLE NO. TW-81R-106

DATE	June 11-12, 1981
ELEV.	852.0m
NORTHING	6,052,050 N
EASTING	621,800 E
TOTAL DEPTH	62.5 m
ANGLE	-90°
AZIMUTH	-
LOGS RUN	-

Sample Depth (m)	Lithology (Chip Samples)
0 - 62.484	Overburden - Abandoned due to inability to reach bedrock (case overburden)


ROKE
233

TK-Smithers 81(3)A

ROKE OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO.

COMPANY CROWSNEST RESOURCES LTD.

WELL TW - 81R - 107

LOCATION TELKWA PROPERTY

FIELD SMITHERS PROJECT

PROVINCE BRITISH COLUMBIA

233 (11)

LSD

SEC

TWP

RGE

W____M

Other Services: DIR GR-DEN-CAL

Permanent Datum GROUND LEVEL Elev.

Log Measured from GROUND LEVEL Above Perm. Datum

Well Depths Measured from GROUND LEVEL

K.B.

CSG

G.L.

Run. No.	ONE
Date	13 JUNE 1981
First Reading	194 M
Last Reading	0
Footage Logged	194 M
Depth Reached	194.5 M
Depth Driller	198 M
Casing Roke	7 M
Casing Driller	7 M
Fluid Type	AIR/WATER
Liquid Level	159 M
Min. Diam.	16.5 CM
Rm @	
Operating Time	1¼ HOURS
Truck No.	36

Recorded By RINCKER Witnessed By HANDY

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.	125 A	LOG TYPE	NEUTRON/NEUTRON
DIAMETER	3.2 CM	TOOL MODEL NO.	125 A
DETECTOR MODEL NO.		DIAMETER	3.2 CM
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	10 CM	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	2 M	LENGTH	15 CM
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	171
HOIST TRUCK NO.		SPACING	43 CM
INSTRUMENT TRUCK NO.	36	TYPE	AmBe
TOOL SERIAL NO.	008	STRENGTH	3 CURIES

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED M/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	158	4	3	100	0	12	3	10000	0	500
	159	194	4	3	100	0	12	3	1000	0	50

REMARKS

GAMMA RAY	DEPTHS	NEUTRON
GAMMA RAY INCREASES →		NEUTRON INCREASES →
API 12		API 500
0 — 120		0 — 5000 — 10,000

ROKE
OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY NEUTRON LOG

TK-Smithers 81(3)A

233 (13)

FILE NO.	
COMPANY	CROWSNEST RESOURCES LTD.
WELL	TM - 81R - 107
LOCATION	TELKWA PROPERTY
FIELD	SMITHERS PROJECT
PROVINCE	BRITISH COLUMBIA
LSD / SEC / TWP / RGE	W___M
Other Services:	GR-DEN-CAL
Permanent Datum	GROUND LEVEL Elev.
Log Measured from	GROUND LEVEL ___ Above Perm. Datum
Well Depths Measured from	GROUND LEVEL
K.B. / CSG / G.L.	

Run No.	ONE
Date	13 JUNE 1981
First Reading	185 M
Last Reading	0
Footage Logged	185 M
Depth Reached	185.5 M
Depth Driller	198 M
Casing Roke	7 M
Casing Driller	7 M
Fluid Type	AIR/WATER
Liquid Level	159 M
Min. Diam.	16.5 CM
Rm @	
Operating Time	1½ HOURS
Truck No.	36
Recorded By	RINCKER
Witnessed By	HANDY

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.	125 A	LOG TYPE	NEUTRON/NEUTRON
DIAMETER	3.2 CM	TOOL MODEL NO.	125 A
DETECTOR MODEL NO.		DIAMETER	3.2 CM
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	10 CM	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	2 M	LENGTH	15 CM
GENERAL		SOURCE MODEL NO.	MRC-N-SS-W
HOIST TRUCK NO.		SERIAL NO.	171
INSTRUMENT TRUCK NO.	36	SPACING	43 CM
TOOL SERIAL NO.	008	TYPE	AmBe
		STRENGTH	3 CURIES

LOGGING DATA

RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED M/MIN	GR T.C. SEC.	GR SENS SETTINGS	GR ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	N T.C. SEC.	N SENS SETTINGS	N ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	0	185 M	4	3	100	0	7	3	5000	5L	130

REMARKS: LOGGED THROUGH DRILL STEMS OF VARYING THICKNESS

GAMMA RAY	DEPTHS	NEUTRON
GAMMA RAY INCREASES → API 7		NEUTRON INCREASES → API 130
0 — 70		650 — 1950 — 3250

ENCL 6-5

ROTARY HOLE NO. TW-81R-107

DATE	June 12-13, 1981
ELEV.	760.61 (UTM)
NORTHING	6,054,078.42
EASTING	619,773.98
TOTAL DEPTH	198.0 m
ANGLE	-90°
AZIMUTH	–
LOGS RUN	GRN, GR-DEN-CAL, DIR

Sample Depth (m)	Lithology (Chip Samples)
0 - 18.488	Overburden
19.412	sh. - blk., carb.
21.062 - 28.346	COAL SAMPLE 7 BAGS
28.956	sltst. - med. to dk. gy.
30.480	sltst. - med. gy., calcite
32.004	sltst. - a/a
33.528	sltst. - a/a, sh. - med. gy., mnr. Fe-stone
35.052	coal - powder
36.575	sh. - dk.gy., carb. w. abund. coalified plant frags.
38.100	sh. - a/a
39.624	sh. - a/a
41.148	sltst. - med.gy. to brownish
42.672	sltst. - med.gy. w. coalified plant frags.
44.196	ss. - f.g., greenish - gy., w. coalified plant frags.

ROTARY HOLE NO. TW 107

Sample Depth (m)	LITHOLOGY
45.720	ss. - f.g., greenish - gy., w. coalified plant frags.
47.244	sh. - dk.gy., carb.
48.768	sh. - a/a
50.292	sh. - a/a
51.816	sh. - med.gy.
53.340	sltst. - med.gy., mnr. coalified plant frags.
54.864	sltst. - med.gy., sh. - dk.gy., slty.
56.388	sh. - dk.gy. Fe-stone
57.912	sh. - a/a
59.436	sh. - a/a, sltst. - med.gy.
60.960	sh. - a/a, sltst. - a/a
62.484	sh. - a/a
64.008	sh. - a/a
65.532	sh. - a/a
67.056	sh. - a/a,-slty.
68.580	sh. - lt.gy. to dk. gy., slty.
70.104	sltst. - med.gy.
71.628	sltst. - med.gy. to brownish
73.152	Fe-stone, sltst. - a/a
74.676	sh. - brown w. coalified plant frags., mnr. coal
76.200	sh. - med.gy.
77.724	ss. - v.f.g., green - gy.

ROTARY HOLE NO. TW 107

Sample Depth (m)	LITHOLOGY
79.248	ss. - dk. to lt.gy. and brown, v.f.g. to f.g.
80.772	ss. - lt.gy., f.g.
82.295	ss. - med.gy., v.f.g.
83.830	sltst. - med.gy.
85.344	sltst. - a/a
86.868	sh. - med.gy., slty., mnr. Fe-stone
88.392	sh. - a/a, mnr. Fe-stone
89.916	sltst. - med.gy.
91.440	sltst. - a/a, shaley
92.964	sh. - med.gy., Fe-stone
94.488	sh. - a/a, slty.
96.012	sltst. - med.gy., Fe-stone
97.536	sltst. - a/a
99.060	sh. - med.gy., slty.
100.584	sh. - a/a
102.108	sltst. - med.gy. to brown, mnr.ss. -f.g.,med.gy.,abund.calcite
103.632	sh. - med.gy., slightly slty.
105.156	sh. - a/a
106.680	sltst. - med.gy. to brownish, abund. calcite
108.204	sltst. - dk.gy., shaley
109.728	sltst. - a/a
111.252	sh. - med.gy., slty.

ROTARY HOLE NO. TW 107

Sample Depth (m)	LITHOLOGY
112.776	sltst. - dk.gy.
114.300	sltst. - med.gy., shaley
115.824	sltst. - a/a
117.348	sltst. - a/a
118.872	sltst. - a/a mnr. Fe-stone
120.396.	sltst. - a/a abund. Fe-stone
121.920	sltst. - a/a, Fe-stone
123.444	sh. - med.gy., slty.
124.968	sh. - a/a Fe-stone
126.492	sltst. - med.gy., Fe-stone
128.016	sltst. - med.gy., shaley
129.540	sltst. - lt. to med. gy.
131.064	sltst. - med.gy.
131.369 - 133.320	COAL SAMPLE 2 BAGS
134.112	coal w. abund. pyrite
134.478 - 139.385	COAL SAMPLE 3 BAGS
140.208	sh. - med.gy., slty.
141.732	sltst. - med.gy., sh. - dk.gy. slty.
143.256	ss. - dk.gy., v.f.g., coal frags. incorporated
144.780	coal - dull
146.304	sltst. - dk.gy., coaly
147.828	Sltst. - brown

ROTARY HOLE NO. TW 107

Sample Depth (m)	LITHOLOGY
149.352	sltst. - blk., chips of various colours
150.876	sh. - blk. carb.
152.400	sltst. - med. gy.
153.300	sltst. - lt.gy., Fe-stone, mnr. calcite, mnr. coal
155.448	sltst. - lt.gy. sh. - dk.gy., coaly bands
156.992	sltst. - med.gy.
158.496	sh. - med.gy., slty. mnr coalified plant frag.
160.020	MISSING
161.544	coal - dull, sh. - a/a
163.068	coal - dull, sh. - med. to dk.gy. sltst. - med.gy. to brown
164.592	sltst. - a/a, Fe-stone, mnr. coal
166.116	MISSING
167.640	sltst. - med.gy. to brown sh. - dk.gy to brown, carb.
169.164	sh. - brown to dk.gy., slty.
170.688	sh. - a/a
172.212	sh. - lt.to dk. brown w. coalified plant frags.
173.736	sh. - a/a
175.260	volcanics - pink - brown, mnr. sh. - a/a
176.784	MISSING
178.308	volcanics - red sh. - a/a
179.832	volcanics - green and pink - brown
181.356	volcanics - a/a

ROTARY HOLE NO. TW 107

Sample Depth (m)	LITHOLOGY
182.880	volcanics - ink - brown, mnr. green
184.404	volcanics - red, green
185.928	volcanics - red - brown
187.452	volcanics - a/a
188.976	volcanics - pink, lots of quartz
190.500	volcanics - red-brown, green
192.024	volcanics - pink, a lot of white quartz
193.548	volcanics - dk.red - brown
195.072	volcanics - a/a

DIRECTIONAL SURVEY

BO[illegible]L ENTERPRISES LIMITED

COMPANY: CROWSNEST RESOURCES
GRID:
DATE SURVEYED: JUNE 13, 1981.

DRILL HOLE: TW - 81R - 107
LATITUDE:
SURVEY BY: RINCKER

LOCATION: TELKWA PROPERTY
DEPARTURE:
WITNESSED BY: HANDY

FIELD: SMITHERS PROJECT
ELEVATION:
CALCULATIONS BY:

MAGNETIC DECLINATION:
CORRECTION OF:
FOR: GRID:

Number	Cable Depth M	Slant Angle	Slant Angle Bearing	Number	Cable Depth M	Slant Angle	Slant Angle Bearing	Number	Cable Depth	Slant Angle	Slant Angle Bearing
0	0	0.11	-	11	180	5.63	134.7	22			
1	15	0.17	258	12	190	5.65	141.3	23			
2	45	0.11	164.1	13				24			
3	60	0.16	76.7	14	REPEATS			25			
4	75	1.54	97	15	60	0.14	117	26			
5	90	2.43	96.9	16	135	4.88	116.5	27			
6	105	3.51	144.2	17	180	5.62	135.1	28			
7	120	4.30	117.5	18				29			
8	135	4.90	126.7	19				30			
9	150	5.46	123.4	20				31			
10	165	5.63	132.5	21				32			

ROKE

CONSOLIDATED
OIL WELL SERVICES, INC.

FIELD	
COUNTY	LINCOLN
STATE	KANSAS
LOCATION	SEC. 30, TWP. 14S, RGE. 10W
WELL	233
COMPANY	LEBSACK OIL PRODUCTION, INC.
DATE	7-11-83

Run No.	ONE
Date	7-11-83
Depth Driller	3400
Depth Logger	3398
Bottom Log Interval	3398
Top Log Interval	0
Casing Driller	8 5/8 @ 0
Casing Logger	8 5/8 @ 0
Bit Size	7 7/8
Type Fluid in Hole	GEL CHEM
Density	9.2
Viscosity	45
Max. Rec. Temp.	90
Equipment Number	1
Location	HAYS
Recorded By	D. HAMMERSCHMIDT
Witnessed By	MR. DAVID PRIDE

Run No.	Tool Type	Serial No.	Type	Size	Depth Top	Depth Bottom	Open Hole Time	Max. Rec. Temp.
1	D-N	1484	N	6	1000	3400	12	90
1	D-N	1484	N	6	1000	3400	12	90

Run No.	Tool Type	Serial No.	Type	Size	Depth Top	Depth Bottom	Open Hole Time	Max. Rec. Temp.
1	D-N	1484	N	6	1000	3400	12	90

REMARKS: ZERO TOTAL STRAIGHT
ALL DATA FIELD PRINT

Scale

CALIPER
DIAMETER - CD

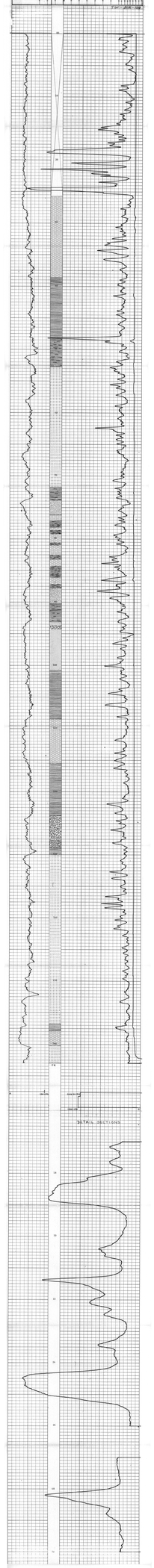
20 10 15 - 20 10

GAMMA RAY
API
0 — 100

1" = 1.0E - 10.0

BULK DENSITY
APPARENT

1" = 1.0E - 10.0



CONSOLIDATED
OIL WELL SERVICES, INC.
P.O. BOX 884
HAYS, KANSAS 67601
913 625-5620

ROKE

ROKE ENTERPRISES LTD. CALGARY ALBERTA

GAMMA RAY NEUTRON LOG

FILE NO.	
LOG NO.	1
RUN NO.	ONE
DATE	16 - OCT - 1979
LOCATION	TEXAS INDUSTRY
FIELD	BERRIEDALE
Province/State/Country	ALBERTA
Well Name/Number/Legal Description	233
Surface Hole Location	
Bottom Hole Location	
Elevation	
Permanent Datum	
Log Measured From	
Drilling Measured From	
Date	
Run No.	
Depth Driller	
Depth Logged	
Top Log Interval	
Bottom Log Interval	
Casing Driller	
Casing Logged	
Bit Size	
Type Fluid in Hole	
Density	
Viscosity	
pH	
Fluid Loss	
Source of Sample	
Rm @ Measured Temp.	
Rmf @ Measured Temp.	
Rmc @ Measured Temp.	
Source of Rmf / Rmc	
Rm @ BHT	
Time Since Circulation	
Time Since Log Stopped	
Max. Rec. Temp.	
Equipment Location	
Recorded By	
Witnessed By	

COMPANY CHEMICAL ESTATES LTD.

233

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	
TOOL MODEL NO.	510 A	LOG CODE	NEUTRON/NEUTRON
SOURCE	3.2 (C)	TOOL MODEL NO.	523 A
DETECTOR MODEL NO.		SPACING	14.2 (C)
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	18 (in)	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	3 (")	LENGTH	15 (in)
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	
ASSIST TRACK NO.	10	SPAN	4.5 (C)
INSTRUMENT TRACK NO.		UNITS	Amps
TOOL SERIAL NO.	006	STRENGTH	5 (CS.DS)

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	TRACK NO.	SPEED (ft/min)	T.C. (sec)	SENS. SETTINGS	SPL N. UNITS (cc/ 1.96 in)	PER CM (in)	DEC.	SENS. SETTINGS	SPL N. UNITS (cc/ 1.96 in)	PER CM (in)
1	10	16	3	100	0			5500	0	130

REMARKS: LOGGED THROUGH 3 IN ULL PIPE OF VARY ING THICKNESSES

GAMMA RAY | Depth | NEUTRON

GAMMA RAY INCREASES — AFT. FWD.

NEUTRON INCREASES — AFT. FWD.

0 — 10 — 15.0 — 15.5

00 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170

F.R.

0 — 100 C.P.S.

0 — 1000 C.P.S.

ROKE

GAMMA RAY NEUTRON LOG

FILE NO.	
LOG NO.	
RUN NO.	ONE
DATE	OCTOBER 8, 1980
WELL	06-08-061-25W5
LOCATION	1100 SOUTH 1100 WEST
FIELD	GORDONDALE
PROVINCE	BRITISH COLUMBIA
COMPANY	ROKE RESOURCES LTD. CALGARY, ALBERTA

Permanent Datum: GROUND LEVEL
Log Measured From: KB
Drilling Measured From: KB

Elev. K.B.	
Elev. D.F.	
Elev. G.L.	2184
Date	OCT 8 1980
Run No.	ONE
Depth-Driller	1100
Depth-Logger	1098
Bottom Log Interval	1096
Top Log Interval	SURFACE
Casing-Driller	9 5/8 @ 24
Casing-Logger	9 5/8 @ 24
Bit Size	8 3/4
Type Fluid in Hole	WATER
Dens.	
Visc.	
pH	
Fluid Loss	
Source of Sample	
Rm @ Meas. Temp.	
Rmf @ Meas. Temp.	
Rmc @ Meas. Temp.	
Source: Rmf / Rmc	
Rm @ BHT	
Time Since Circ.	
Max. Rec. Temp.	
Equip. Location	
Recorded By	A. LEITZ
Witnessed By	MR. GOOD

233

Flowing Gas

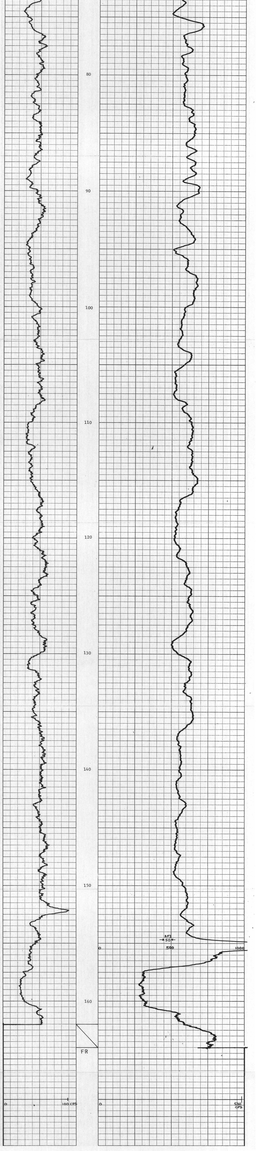
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.	121 A	TOOL MODEL NO.	NEUTRON/NEUTRON
DIAMETER	3.2 CM	TOOL MODEL NO.	121 A
DETECTOR MODEL NO.		DIAMETER	3.2 CM
TYPE	SCINTILLATOR	DETECTOR MODEL NO.	
LENGTH	18 CM	TYPE	PROPORTIONAL
DISTANCE TO SOURCE	2 M	LENGTH	18 CM
		SOURCE MODEL NO.	MSC-R-20-W
GENERAL		STRENGTH	5 CI
MAST TRACK NO.		DETAIL	42 CM
INSTRUMENT TRACK NO.	36	TYPE	Amlite
TOOL SERIAL NO.	008	STRENGTH	4.5 K.EU

LOGGING DATA

GENERAL										GENERAL										NEUTRON					
PLOT	SPEED		SPEED		T.C.	SENS	ZERO	ATT. R. A. UNITS		T.C.	SENS	ZERO	ATT. N. UNITS												
MIN	FROM	TO	IN/MIN	MIN	SECS	BETTER	SET L.H.S.	PER LHS DIV.	DIV.	SECS	BETTER	SET L.H.S.	PER LHS DIV.												
5	0	115	6	5	100		0	12	5	5	10000	0	100												
	115	166	6	5	100		0	12	5	5	1000	0	50												

REMARKS:



ENCL 6-6

ROTARY HOLE NO. TW 81R-108

DATE	June 14-15, 1981
ELEV.	842.0 m
NORTHING	6,052,175 N
EASTING	618,040 E
TOTAL DEPTH	169.8 m
ANGLE	- 90°
AZIMUTH	-
LOGS RUN	GRN, GR-DEN-CAL, DIR

Sample Depth (m)	Lithology (Chip Samples)
0 - 25.908	Overburden
27.432	sltst. - med. gy.
28.956	sltst. - green - gy.
30.480	sltst. - a/a
32.004	sltst. - med. gy.
33.528	sltst. - green - gy.
35.052	sltst. - med. gy.
36.575	sh. - med.gy., slty.
38.100	sltst. - med. gy.
39.624	sh. - med.gy., slty.
41.148	sh. - a/a
42.672	sh. - a/a
44.196	sh. - a/a
45.720	sh. - a/a
[illegible]	sh. - dk.gy. slty.

ROTARY HOLE NO. TW 103

Sample Depth (m)	LITHOLOGY
48.768	MISSING
50.292	sh. - lt.gy., mnr. Fe-stone
51.816	sh. - dk.gy. to blk., carb.
53.340	sh. - med.gy.
54.864	volcanics? - predominantly green w. chips of various colours
56.388	volc. - a/a
57.912	volc. - a/a
59.436	volc. - a/a
60.960	volc. - a/a
62.484	volc. - a/a
64.008	volc. - a/a
65.532	volc. - a/a
67.056	volc. - a/a
68.580	volc. - a/a
70.104	volc. - a/a
71.628	volc. - a/a
73.152	sh. - med.gy.
74.676	ss. - f.g., green - gray, calcite cement
76.200	ss. - a/a
77.724	sh. - brown w. coalified plant frags. slty.
79.248	sh. - a/a
80.772	MISSING

ROTARY HOLE NO. TW 108

Sample Depth (m)	LITHOLOGY
82.295	sltst. - med. gy.
83.830	sltst. - a/a w.coalified plant frags., pebbles of various colours
85.344	sh. - dk.gy. w. coalified plant frags.
86.868	sh. - a/a, carb.
88.392	sltst. - med.gy. w. coalified plant frags.
89.916	ss. - f.g.,med.gy.w.blk.specks, pebbles of various colours
91.440	sh. - dk.gy., carb.
92.964	sh. - med.gy.; sltst. - med.gy.
94.488	ss. - f.g., med.gy., w.blk. specks
96.012	ss. - c.g., green, pebbles of various colours - cong?
97.536	ss. - m.g., green - gray
99.060	cong. - pebbles of various colours. (volc?)
100.584	sh. - dk.gy. w. coalified plant frags., carb.
102.108	sh. - a/a
103.632	sh. - dk.gy. to blk., carb.
105.156	sh. - a/a
106.680	sh. - a/a
108.204	sh. - dk.gy., carb. w. coalified plant frags.
109.728	sltst. - med.gy. w. coalified plant frags.
111.252	ss. - f.g., green - gy. w. blk. specks
112.776	ss. - a/a
114.300	sltst. - med.gy.

ROTARY HOLE NO. TW 108

Sample Depth (m)	LITHOLOGY
115.824	ss. - m.g.,green-gray mnr. sltst.-brown,pebbles of various colours
117.348	sltst. - reddish - brown mnr. ss. - a/a
118.872	sltst. - a/a, shaley
120.396	ss. - f.g., red - brown
121.920	sh. - lt.gy. to dk.gy., abund. calcite
123.444	sltst. - dk.gy. w. coalified plant frag.
124.968	cong.? - green plus pebbles of other colours
126.492	cong. - a/a mnr. ss. - m.g., green, calcite cement
128.016	cong. - a/a
129.540	cong. - a/a sh. - dk.gy.
131.064	ss. - f.g., green, calcite
132.588	volcanics - predominatnly green w. chips of various colours
134.112	volcanics - a/a
135.636	volcanics - a/a
137.160	volcanics - a/a
138.684	volcanics - a/a
	MISSING
141.732	volcanics - a/a
143.256	volcanics - a/a
144.780	volcanics - a/a
146.304	volcanics - a/a
147.828	volcanics - a/a

ROTARY HOLE NO. TW 108

Sample Depth (m)	LITHOLOGY
149.352	volcanics - predominantly green w.chips of various colours
150.876	volcanics - a/a
152.400	volcanics - a/a
153.300	volcanics - a/a
155.448	volcanics - a/a
156.992	volcanics - a/a
158.496	sh. - dk.green-gy.,slightly slty.,mnr. volcanics-a/a-w.abund.coalified plant frags
160.020	sh. - a/a w. mnr. volcanics - a/a
161.544	sh. - a/a sltst. - dk.green - gray
163.068	volcanics - predom.green w. chips of various colours
164.592	volcanics - a/a
166.116	volcanics - a/a
167.640	volcanics - a/a
169.164	volcanics - a/a
169.8	T.D.

DIRECTIONAL SURVEY

ROKE ENTERPRISES LIMITED

COMPANY: CROWSNEST RESOURCES
GRID:
DATE SURVEYED: JUNE 15, 1981.

DRILL HOLE: TW - 81R - 108
LATITUDE:
SURVEY BY: RINCKER

LOCATION: TELKWA PROPERTY
DEPARTURE:
WITNESSED BY: HANDY

FIELD: SMITHERS PROJECT
ELEVATION:
CALCULATIONS BY:

MAGNETIC DECLINATION:
CORRECTION OF:
FOR: GRID:

Number	Cable Depth M	Slant Angle	Slant Angle Bearing	Number	Cable Depth M	Slant Angle	Slant Angle Bearing	Number	Cable Depth	Slant Angle	Slant Angle Bearing
0	0	0.15	-	11	160	8.77	25.7	22			
1	15	0.17	-	12				23			
2	30	0.15	271.0	13	REPEATS			24			
3	45	1.43	299.3	14	45	1.53	307.2	25			
4	60	2.42	323.0	15	105	4.89	352.3	26			
5	75	3.16	327.0	16	150	7.29	25.5	27			
6	90	3.92	345.2	17				28			
7	105	4.72	353.4	18				29			
8	120	6.19	9.5	19				30			
9	135	7.48	16.3	20				31			
10	150	7.11	31.3	21				32			

ROTARY HOLE NO. TW-81R-109

DATE	June 16-17, 1981
ELEV.	778.0m
NORTHING	6,053,855 N
EASTING	619,380 E
TOTAL DEPTH	32.9m
ANGLE	-90°
AZIMUTH	-
LOGS RUN	-

Sample Depth (m)	Lithology (Chip Samples)
0 - 30.480	Overburden - Hole abandoned due to deep overburden

LEGEND

CONGLOMERATE

SANDSTONE - COARSE GRAINED/
- MEDIUM GRAINED

SANDSTONE - FINE GRAINED

SILTSTONE

SHALE

MUDSTONE

CARB. SHALE

COAL

IGNEOUS ROCKS

ROTARY HOLE NO. TW-81R-110

DATE	June 18, 1981 June 28-30, 1981
ELEV.	763.0 m
NORTHING	6,058,374 N
EASTING	617,692 E
TOTAL DEPTH	61.6m
ANGLE	-90°
AZIMUTH	-
LOGS RUN	-

Sample Depth (m)	Lithology (Chip Samples)
	Overburden - Hole abandoned due to deep overburden

ROTARY HOLE NO. TW-81R-111

DATE	June 19-27, 1981
ELEV.	787.36 (UTM)
NORTHING	6,057,981.22
EASTING	616,496.55
TOTAL DEPTH	182.9 m
ANGLE	-90°
AZIMUTH	-
LOGS RUN	GRN, GR-DEN-CAL, DIR, FBL

Sample Depth (m)	Lithology (Chip Samples)
0 - 18.488	Overburden
19.812 - 38.100	MISSING
39.624	sltst. - dk. gy.
41.148	sltst. - a/a
42.672	sh. - dk.gy., slty.
44.196	sh. - a/a
45.720	sh. - a/a
47.244	sltst. - brown - gray
48.768	sltst. - lt.gy., Fe-stone
50.292	sltst. - green - gray
51.816	sltst. - a/a
53.340	sltst. - gy. - brown, very hard
54.864	sltst. - med. gy.
56.388	sltst. - green - gray
57.912	sltst. - med. gy.

ROTARY HOLE NO. TW 111

Sample Depth (m)	LITHOLOGY
59.436	sltst. - green - gray
60.960	ss. - f.g., lt. gy.
62.484	ss. - f.g., green - gray
64.008	ss. - a/a Fe-stone
65.532	ss. - v.f.g., lt.gy., Fe-stone
67.056	sltst. - green - gray
68.580	sltst. - med. gy.
70.104	MISSING
71.628	sh. - med.gy., slty.
73.152	sltst. - med.gy., Fe-stone
74.676	sltst. - a/a
76.200	sltst. - a/a
77.724	sltst. - a/a, Fe-stone, mnr. coal and pyrite
79.248	sltst. - a/a, mnr. Fe-stone
80.772	sltst. - a/a
82.295	sltst. - a/a
83.830	sltst. - a/a, mnr. coal and pyrite
85.344	sh. - med.gy., slty.
86.868	sltst. - med.gy.
88.392	sltst. - a/a, mnr. coal and pyrite
89.916	sltst. - a/a
91.440	sltst. - a/a, shaley

ROTARY HOLE NO. TW 111

Sample Depth (m)	LITHOLOGY
92.964	sltst. - med.gy.
94.488	MISSING
96.012	sltst. - a/a
97.536	ss. - v.f.g., green - gray
99.060	ss. - a/a
100.584	ss. - a/a, mnr. Fe-stone
102.108	ss. - a/a
103.632	sltst. - green - gray
105.156	sltst. - med. gy. to brown
106.680	sltst. - a/a
108.204	sltst. - a/a, w. coalified plant fragments
109.728	ss. - green - gray, v.f.g.
111.252	Fe-stone, sltst. - med. gy.
112.776	sltst. - a/a, Fe-stone, coal - dull and brittle
114.300	sh. - med.gy., slty. mnr. Fe-stone
115.824	sltst. - green - gray to med. gray
117.348	sltst. - dk.gy., coal - dull & brittle, mnr. pyrite
118.872	sltst. - med.gy.
120.396	sh. - brown and med.gy.to dk.gy.,slty.; coal - dull and brittle
121.920	sh. - med.gy., slty.
123.444	sh. - med.gy.,slty.to sltst. - med.gy.; both w.coalified plant frags.
124.968	sh. - med.gy., slty.