

OPEN FILE

Cx-Thames Creek 50(1)A

GEOLOGICAL REPORT OF THAMES CREEK

B.C. COAL LICENCES 6175-6183

NEWCASTLE LAND DISTRICT

92F7

by

Allister Raymond Peach

Project Geologist

ESSO RESOURCES CANADA LIMITED

DATE COMPLETED: NOVEMBER 13, 1980

ESSO MINERALS CANADA-COAL

DATE SUBMITTED: OCTOBER 30, 1981

237-4TH AVENUE S.W.

CALGARY, ALBERTA

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

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2. Lithological Descriptions - Drillholes 1980
3. Geophysical Logs - Drillholes 1980

Introduction

On July 30, 1980, Esso Resources Canada Limited was granted coal licences on a property called Thames Creek. The property is located about eight kilometres west of the settlement of Bowser on the east central coast of Vancouver Island (Map 1). The property covers an area of 1828 hectares and was considered to be an outlier of the most southern portion of the Cumberland Coalfield. Access to the property was by way of Bowser Roads controlled by the provincial government.

Following the issue of licences, an exploration program was conducted in November of 1980 to investigate the coal potential of the property. The exploration included a drilling program consisting of three (3) holes totalling 300 metres, a geophysical logging program and subsequent reclamation. The drillholes, 15 cm in diameter, were completed using a combination of air hammer and rotary drilling methods. Geophysical logs employed on the program were a coal combination sonde including gamma ray, long space density and caliper, focused electric log and a dipmeter. Only one (1) hole was logged during the program due to the lack of coal-bearing sediments in two (2) of the holes. Access, drill hole and geology reference is on Map 2.

Due to the limited area and the lack of coal-bearing strata delineated through the exploration program, it was concluded that the Thames Creek property was of no interest as an economic coal mining prospect and that all licences should be surrendered as of July 30, 1981.

124°48'

124°40'

49°29'

83

82

81

80

79

78

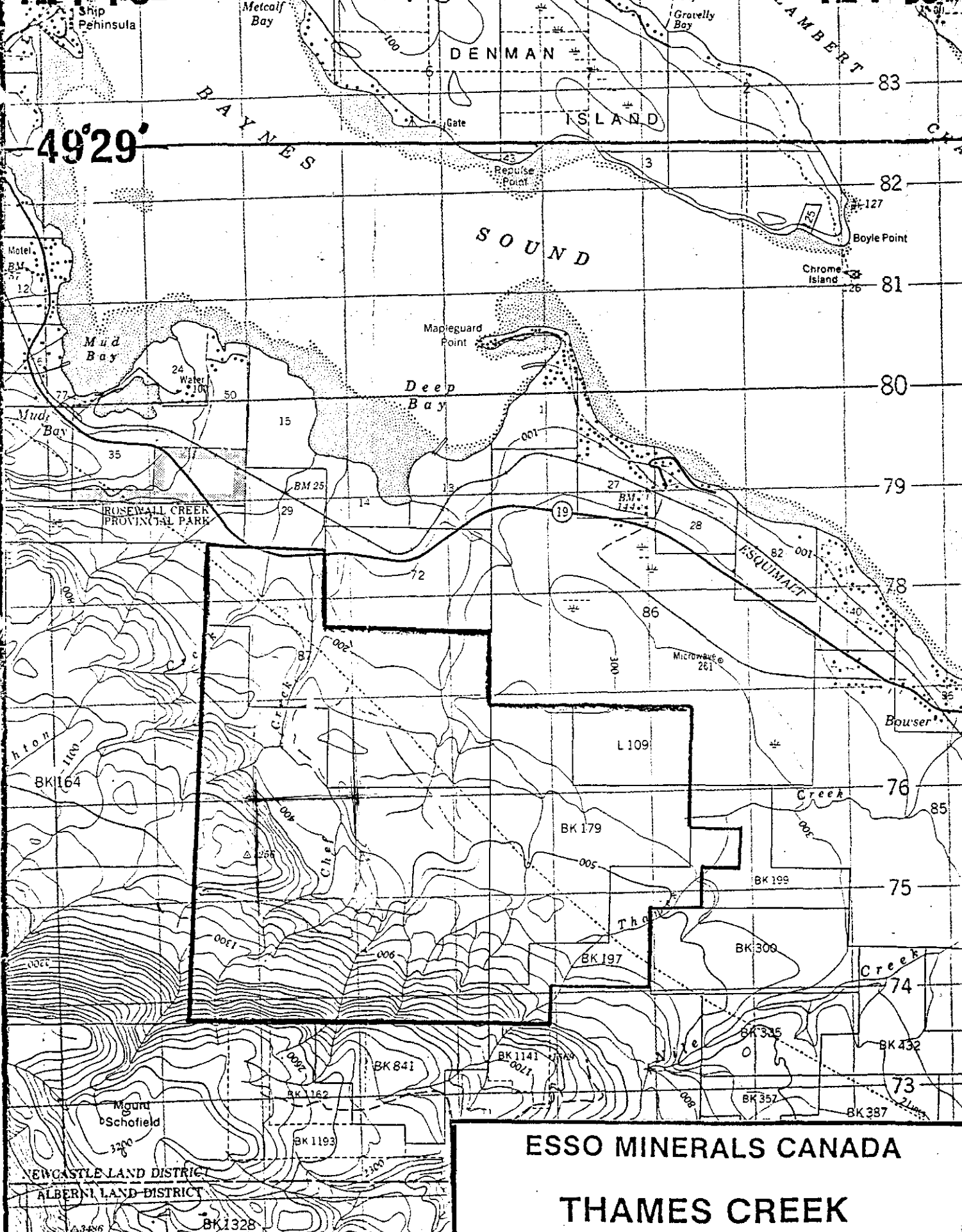
77

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75

74

73



ROSEWALL CREEK PROVINCIAL PARK

ESSO MINERALS CANADA

THAMES CREEK

MAP 1

Scale 1:50,000 Echelle

49°23'

NEWCASTLE LAND DISTRICT
ALBERNI LAND DISTRICT

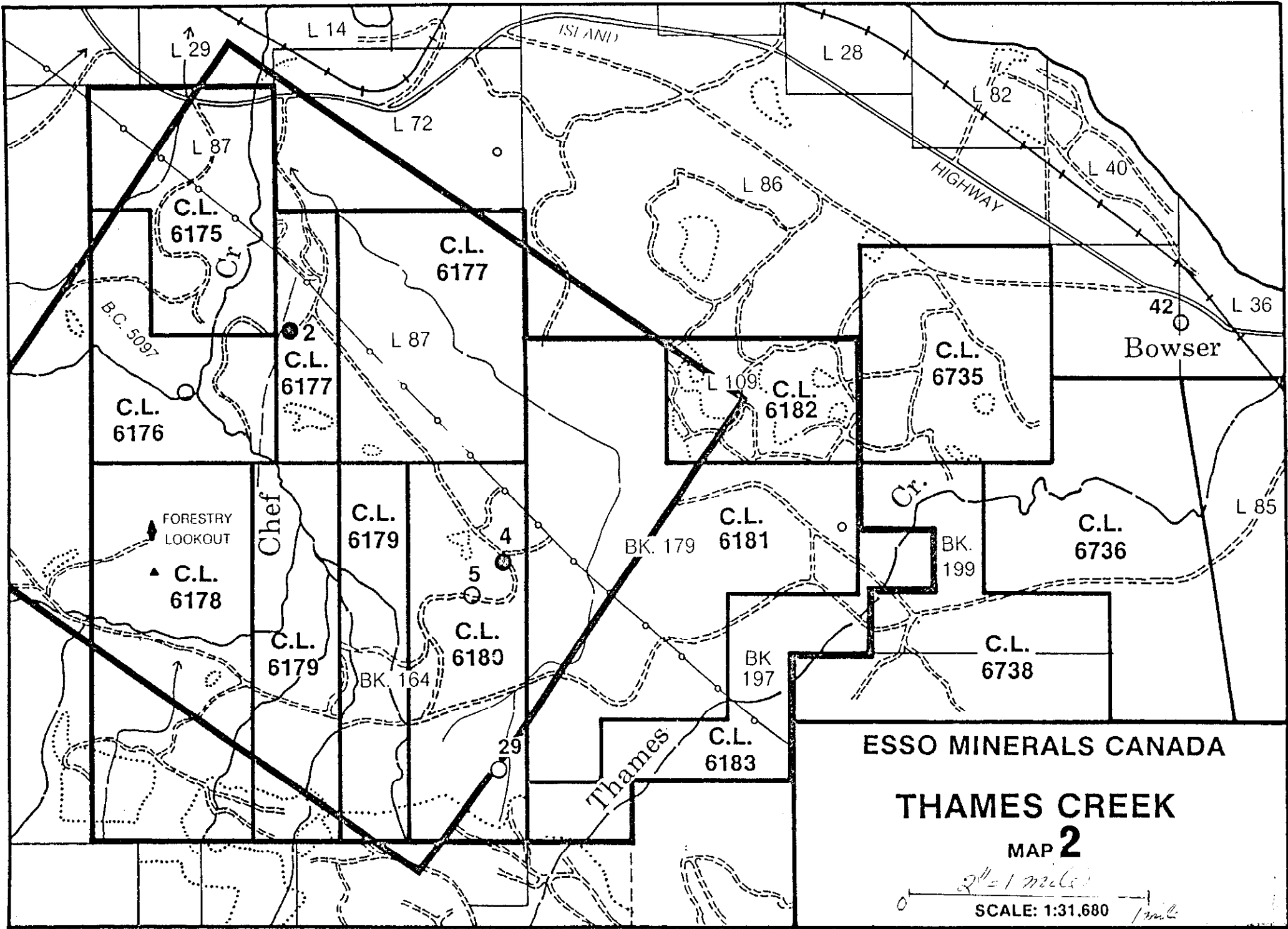
Geology

The Thames Creek property lies in the most southern part of the Cumberland Coalfield. There is little exposure on the property due to thick glacial sediments. Outcrop occurs along Chef Creek and its tributary system. For outcrop description see Appendix I.

From reconnaissance mapping and drillhole data, three stratigraphic units have been recognized (Map 3).

The most prominent stratigraphic unit on the property is the Karmutsen Formation of the Vancouver Group. This formation consists of volcanic rocks (predominantly basalt and andesite) which are dark to moderate green in color. The rocks occur primarily as lava flows, with the occurrence of pillow lava features at outcrop 1. The Karmutsen Formation was the basal unit in drillholes 2 and 4 while large boulders of andesite (4 metres in thickness) thought to be near the basement rock were encountered in drillhole 5. The Karmutsen Formation is considered to be of the middle to late Triassic period (Dalmage et al, 1973).

The Comox Formation of the Nanaimo Group underlies the central portion of the property and occurs in outcrop along Chef Creek (Map 3). This formation consists primarily of moderate grey arkosic to lithic sandstone with thin pebble conglomerate beds near the basal portion. The sandstone is medium sorted, although the basal portion (≈ 10 metres thick) is poorly sorted and contains the conglomerate. The sandstone is resistant and weathers buff color with brown, iron-stained flecks.



ESSO MINERALS CANADA

THAMES CREEK

MAP 2

2" = 1 mile

SCALE: 1:31,680



Thickness of the unit is about 101 metres as determined from lithological description of drillhole 2 (Appendix 2).

The Comox Formation unconformably overlies the Karmutsen Formation (Muller & Jeletsky 1970) and the contact can be seen at outcrop 8.

Bedding orientation of the unit trends 135° to 152° with dips of 5° to 14° to the northeast. A dipmeter log (Appendix 3) of drillhole 2 depicts the dip to range from 10° to 30° to the northeast.

No coal was observed in outcrop or intersected in the course of the drilling.

The Comox Formation in the Cumberland Coalfield has been placed in upper Santonian age of the Upper Cretaceous period (Muller & Jeletsky 1970).

The Haslam Formation does not occur in outcrop and is assumed to underlie a small portion of the central area of the property (Map 3). The only occurrence of this unit was found in drillhole 2 where a sequence of 48 metres was intersected. This formation consists of moderate and dark grey shale.

Muller and Jeletsky (1970) state that the contact between the Comox and Haslam Formations may be sharp or gradational. The contact for this occurrence is considered to be sharp but conformable.

Bedding orientation of this unit is variable as shown in the dipmeter log of drillhole 2 and ranges from 0° to 40° with east or west trending dips of 5° to 20°. The Haslam Formation has been placed in upper Santonian - lower Campanian age of the Upper Cretaceous period (Muller & Jeletsky, 1970).

The outlier of Nanaimo Group sediments is considered to be preserved in a graben structure (see cross-section Map 3) that occurred during post-Cretaceous block faulting (Muller & Jeletsky 1970). The only surficial evidence of faulting is inferred from outcrops along Chef Creek. The fault system that trends northwesterly on the west side of the map area has been taken from existing geological data (Muller, 1977).

Drilling Specifications

The drilling rig used during the course of the exploration on the Thames Creek property was owned by Ken's Drilling Limited of Brentwood Bay, British Columbia. The specifications for the equipment used are listed below.

Canadian Pneumatic T-650 W

- 450 C.F.M. at 250 P.S.I.
- 36,000 inch pounds of rotary torque
- 30,000 pounds pull down capacity
- Drill-Thru casing hammer model 662
- Combination down hole hammer and rotary drilling system.

List of Expenditures

Drilling	14,495.00
Drilling bits	456.00
Fuel	1,096.00
Drilling Miscellaneous	237.00
Logging	2,831.00
Accommodation	1,397.00
Rental Vehicles	887.00
Rental Vehicle Repairs	552.00
Travel	448.00
Reclamation	600.00
	<hr/>
	\$22,999.00

Conclusion

The exploration program has defined a small outlier of Comox Formation and Haslam Formation 8 kilometres west of the settlement of Bowser. The occurrence of Nanaimo Group sediments are probably the result of preservation in a graben structure.

Due to the limited areal extent and the absence of coal in the Comox Formation, this outlier is considered to be of no interest with regards to coal exploration and the property called Thames Creek, B.C. Coal Licences 6175-6183, will be surrendered as of July 30, 1981.

References

Dolmage, Campbell and Associates

1973:

Report on Reserves and Mining
Costs of the Comox Coalfield,
Vancouver Island;

B.C. Dept. Mines Open File

CX-COMOX-73(6)A

Muller, J.E. and Jelitzky, J.A.

1970:

Geology of the Upper Cretaceous
Nanaimo Group, Vancouver Island
and Gulf Islands, British
Columbia; Geol. Surv Can., Paper
69-25

Muller, J.E.

1977:

Geology of Vancouver Island:
Geol. Surv. Can. Open File 463

Statement of Author's Academic and Professional Qualifications

I, Allister Raymond Peach, received a Bachelor of Science degree from the University of New Brunswick on May 19, 1977. The degree consisted of a major in Geology with curriculum concentration on Stratigraphy and Sedimentary Geology.

My professional qualifications include 2 years and 5 months, commencing May 1977, as a Testhole Geologist with the Carboniferous Drilling Project, a federal-provincial project exploring for coal in the Pennsylvanian age strata of New Brunswick. Since October of 1979 I have been employed as a geologist with Esso Minerals Canada. My experience with E.M.C. includes coal exploration in the west central foothills of Alberta and on Vancouver Island in British Columbia.

Allister Raymond Peach
Allister Raymond Peach

APPENDIX 1

THAMES CREEK

Reconnaissance Field Notes

- O.C. 1 Vancouver Group - Andesite, pillow lavas. In small creek on east side of road before intersection.
- O.C. 2 Vancouver Group - Andesite, lavas in creek. Creek runs very straight in gorge about 4.0 feet wide. May be a fault down the creek. Creek is bearing at 70°. May be minor fault associated with main one in the area.
- O.C. 3 Vancouver Group - Andesite, lavas. Same lithology as O.C. 1 and 2. Runs for a long stretch in the creek.
- O.C. 4 Vancouver Group - Andesite volcanics.
- O.C. 5 Vancouver Group - Andesite volcanics.
- O.C. 6 No sandstones in creek bed upstream from the junction of these two creeks. The Comox formation is either downstream or below the thick till cover in the area.
- O.C. 7 Vancouver Group - Volcanics. Good outcrop in creek bed. Extends 30 feet laterally and is 10 feet in width.

O.C. 8 Comox Formation - No orientation. Large outcrop of massive medium-grained sandstone. Color is medium grey with reddish brown iron stained flecks; weathering a buff color. Contact between Comox and basement is between 7 and 8. Same type of sandstone as encountered as Okay Mountain. Volcanics along the edge of the sandstone shows the edge of the contact.

The outcrop extends up to 500 feet downstream and forms a canyon down Chef Creek.

O.C. 9 Comox Formation/Vancouver Group - The sandstone extends downstream to this point and beyond. Seems to be dipping 0° to 5° to the N.E. Sandstone is only 100 feet thick at this point and some of the basement is showing through in the creek bottom. More of Comox outcrops in the higher hillside above. In places the sandstone is almost conglomeritic with several scattered pebbles.

No fault here but rather appears to be a high point in the basement.

O.C. 10 Comox Formation - Sandstone same as all the way from outcrop 7. Orientation is $55^{\circ}/7^{\circ}$. May be shallower dip than found.

O.C. 11 Comox Formation - Located downstream from O.C. 10. Same lithology as 10. Good outcrop. Orientation $45^{\circ}/5^{\circ}$.

O.C. 12 Comox Formation - Large massive cliff-forming sandstone.

O.C. 13 Comox Formation - Same litho as O.C. 12 found in huge cliffs.
Orientation 62°/14°.

O.C. 14 Comox Formation - Same lithology as 12 and 13. No orientation possible.

APPENDIX 2

THAMES CREEK #2

Lithological Description

<u>Depth (ft.)</u>	<u>Lithology</u>
0-20	Brown sand and gravel
20-40	Brown sand
40-50	Brown sand and boulders
50-60	Blue-gray sand and clay
60-74	Blue-gray sand, clay, and boulders
74-125	Medium gray shale
125-231	Dark gray shale
231-285	Very light gray medium grained sandstone
285-575	Light gray fine to medium grained sandstone with conglomerate layers
575-585	Light to medium green volcanic (andesite?)
	Basement

176 metres

THAMES CREEK #4

Lithological Description

<u>Depth (ft.)</u>	<u>Lithology</u>
0-20	Brown sand and gravel
20-81	Blue-gray clay and gravel
81-155	Gravel
155-173	Fractural green andesite
173-184	Dark green volcanic (andesite)
T.D.	BASEMENT

56 meters

THAMES CREEK #5

Lithological Description

<u>Depth (ft.)</u>	<u>Lithology</u>
0-20	Glacial till, clay
20-40	Glacial till, sand, boulders
40-100	Glacial till, gravel
100-120	Clay
120-160	Glacial till, gravel
160-180	Glacial till, sand, and gravel
180-236	Glacial till, gravel
236-246	Volcanic boulder - andesite
246-260	Clay and gravel

T.D. Hole had to be skidded due to large boulders of volcanics
(andesite)

79 meters

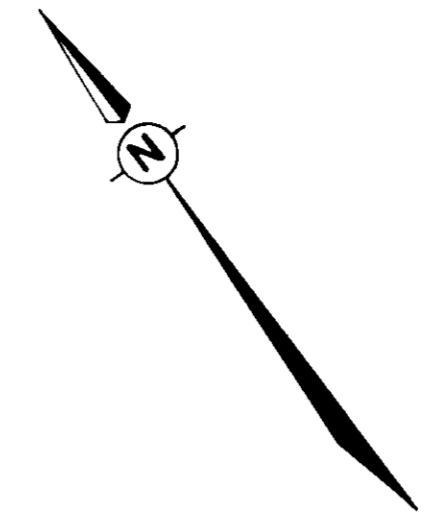
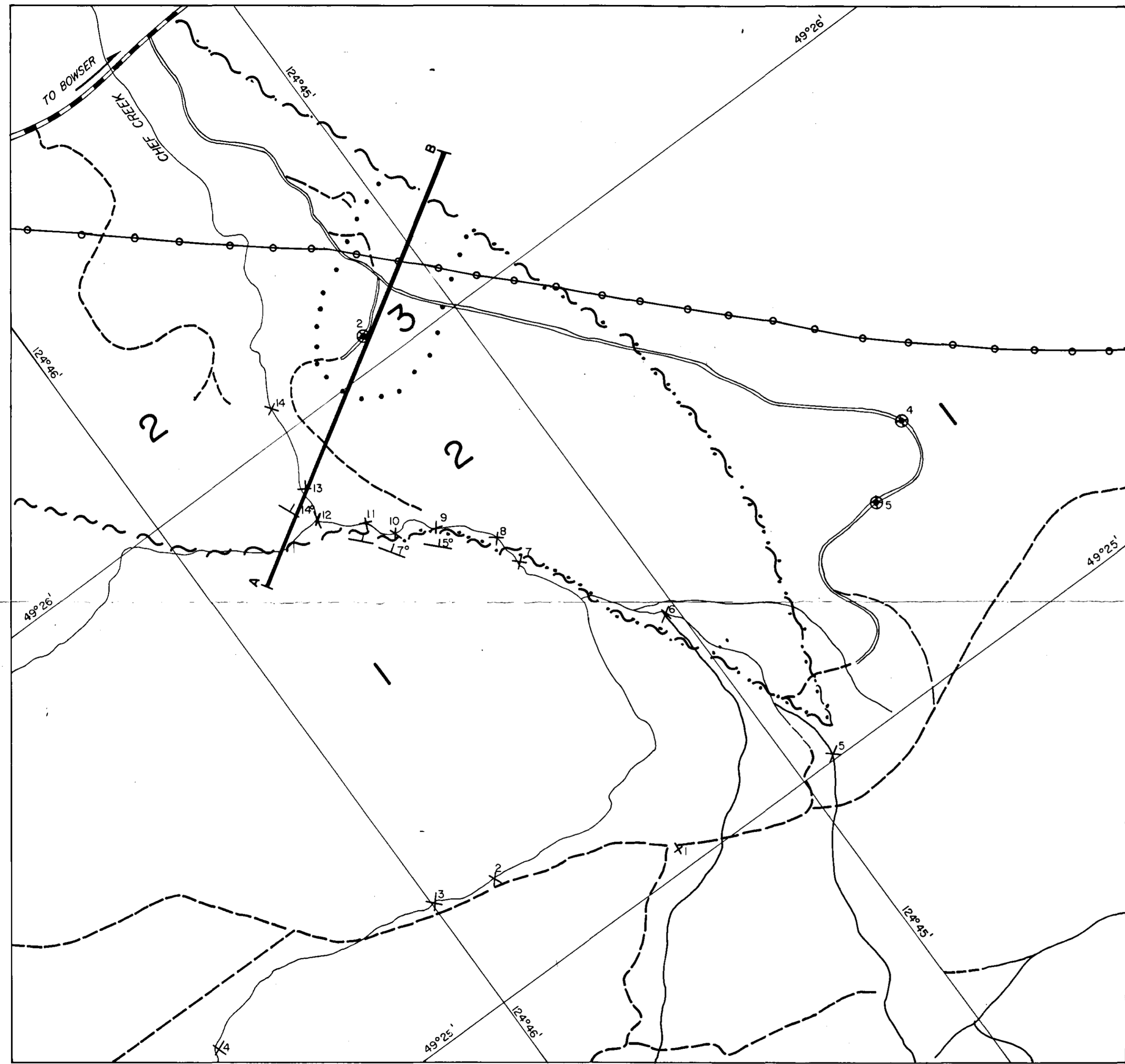
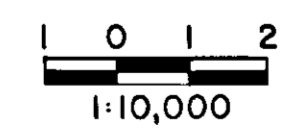


TABLE OF FORMATIONS

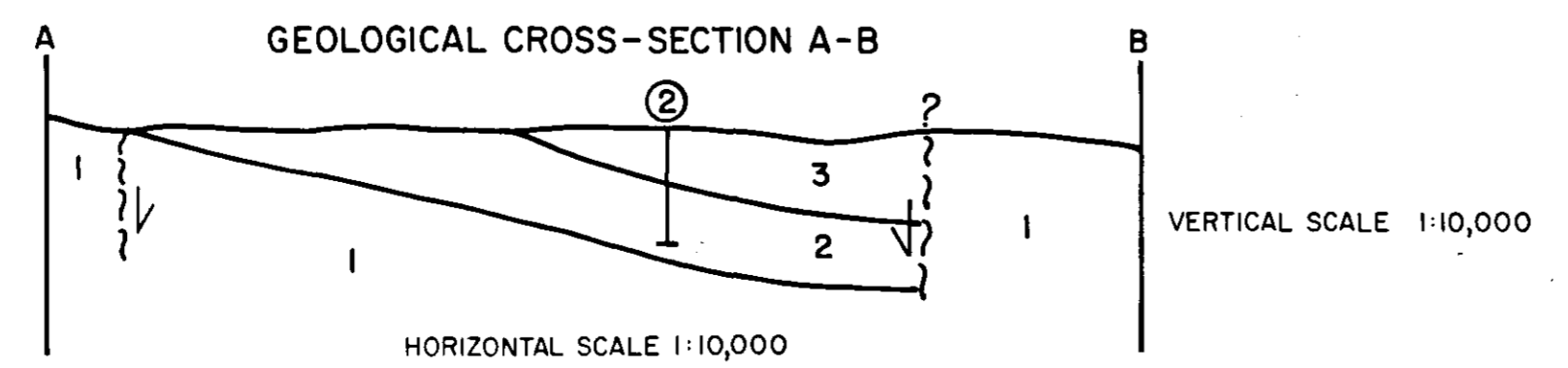
MID TO LATE CRETACEOUS	3	NANAIMO GROUP	
		HASLAM FORMATION	DARK GREY SHALE (observed only in drillhole)
	2	COMOX FORMATION	LIGHT GREY QUARTZOSE-LITHIC SANDSTONE · THIN (≈10 m) CONGLOMERATE BASAL UNIT
LATE TRIASSIC	1	VANCOUVER GROUP -	KARMUTSEN FORMATION
			BASALTIC TO ANDESITIC VOLCANIC ROCKS

- X 9 OUTCROP
- ∠ 6° BEDDING-DIP
- ⊙ DRILLHOLE
- CONTACT (assumed)
- ~~~~~ FAULT
- == PAVED ROAD
- SECONDARY ROAD
- - - TRAIL OR OVERGROWN ROAD
- ~~~~~ STREAM
- POWERLINE



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Cx-Thames Creek (2)*A *1



ESSO RESOURCES CANADA LIMITED
COAL DEPARTMENT
THAMES CREEK
GEOLOGICAL MAP

JULY, 1981

92-F-7

Cx-Thames Creek (023)B *1



FOCUSSED ELECTRIC LOG

BOREHOLE #2

CLIENT ESSO MINERALS CANADA

AREA THAMES CREEK

COUNTRY CANADA

DATE LOGGED 13/11/80

DEPTH SCALE 200:1

1 of 2 LOGS

BOREHOLE DATA

PERMANENT DATUM GROUND LEVEL

ELEVATION OF P.O. GROUND LEVEL

MEASUREMENTS FROM B.P.B. DRILLER

DEPTH REACHED 177 GL

CASING SIZE 1 6" TO 1 1/2" 2" TO

BIT SIZES 1 3" TO 4" TO

CASING SIZES 1 2" TO

NATURE FLUID DATA WATER QUIK FOAM

SG

LEVEL

MISCELLANEOUS

B.H.T. 1

WITNESS

OPERATION DATA

FIRST READING 177m

LAST READING 23m

INTERVAL LOGGED 154m

UNIT - TRUCK No. 24/42

ENGINEER D. M.

EQUIPMENT AND RECORDING DATA

LOG	EQUIPMENT		LOG TAPE	TAPING		PANEL		CAL COEFF	DEPTHS		
	SONDE	SOURCE		RECORD SPEED	DIRECT REPLAY	SPEED	T.C. SECS		FROM	TO	INTERVAL
FE	105	-	Y	5m/M	D	5m/M	.3	-	177	23	154m

ADDITIONAL SONDES RUN

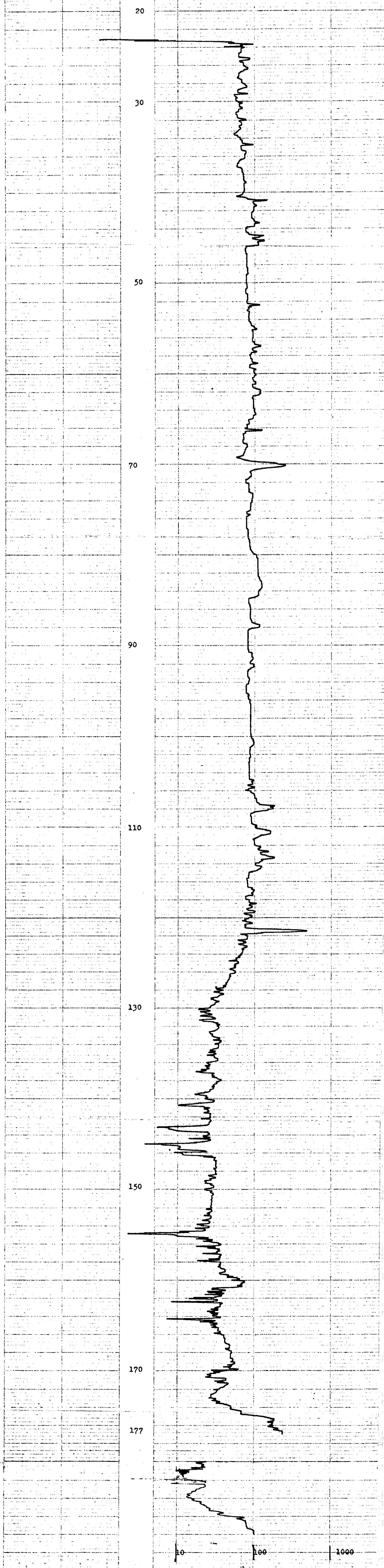
SONDE	LOG	GENERAL SCALE LOG	DETAIL SCALE LOG
101	CCS	200:1	20:1
208	DIP	-	-

REMARKS

REFER TO ADDITIONAL HEADINGS

FOCUSSED ELECTRIC LOG

OHM-METERS 5 100 1000 5000



DEPTH 5 OHM-METERS 5000

FOCUSSED ELECTRIC LOG



BOREHOLE #2
CLIENT ESSO MINERALS CANADA

AREA THAMES CREEK
COUNTRY CANADA



Co-Thames Creek 80(3)h #1

BOREHOLE THAMES CREEK #2
CLIENT ESSO MINERALS CANADA

AREA THAMES CREEK
COUNTRY CANADA
DATE LOGGED 13/11/80

DEPTH SCALE 200.1
2 OF 2 LOGS

COAL LITHOLOGY LOG

SONDE TYPE: COAL COMBINATION SONDE
LOG SUITE: GAMMA RAY, L.S. DENSITY, CALIPER

BOREHOLE DATA
PERMANENTIALUM 3700ND LEVEL
ELEVATION OF P.D. 87.1
MAGNETIC CORRECTION 0.1
DEPTH REACHED 176m
CASING SHOE 176m
BIT SIZES: 1 6" TO 7", 2 4" TO 4", 3 3" TO 3", 4 2" TO 2", 5 1" TO 1"

FLUID DATA
NATURE WATER
SG
LEVEL
VISCOSITY
BHT
OPERATION DATA
FIRST READING 176m
LAST READING 176m
INTERVAL LOGGED 24/42
UNIT-TRUCK NO. 24/42
ENGINEER D. MACKENZIE
WITNESS

EQUIPMENT AND RECORDING DATA

COAL COMBINATION SONDE		EQUIPMENT		TAPING		PANEL		CAL COEFF		DEPTHS			SEAM LOG RUN
LOG	SONDE	SOURCE	CALIBRATOR	LOG TAPED	RECORD SPEED	DIRECT/REPLAY	SPEED	TC SECS	NORM	FROM	TO	INTERVAL	
CCS	101	5822											
GAMMA RAY			292	Y	9m/M	D	9m/M	1	-	1.5	176	13	164
L.S. DENSITY			598.5	Y	9m/M	D	9m/M	1	7.3	-	177	13	164
CALIPER		SIDEWALL POSITION		Y	9m/M	D	9m/M	3	-	-	177	13	164

COAL QUALITY/SEAM THICKNESS LOG INTERVALS (Refer to relevant log)

FROM	TO	INTERVAL	TOTAL

ADDITIONAL SONDES RUN

SONDE	LOG	GENERAL SCALE	DETAIL SCALE	LOG
105	FE	200.1	---	---
208	DIP	---	---	---

REMARKS

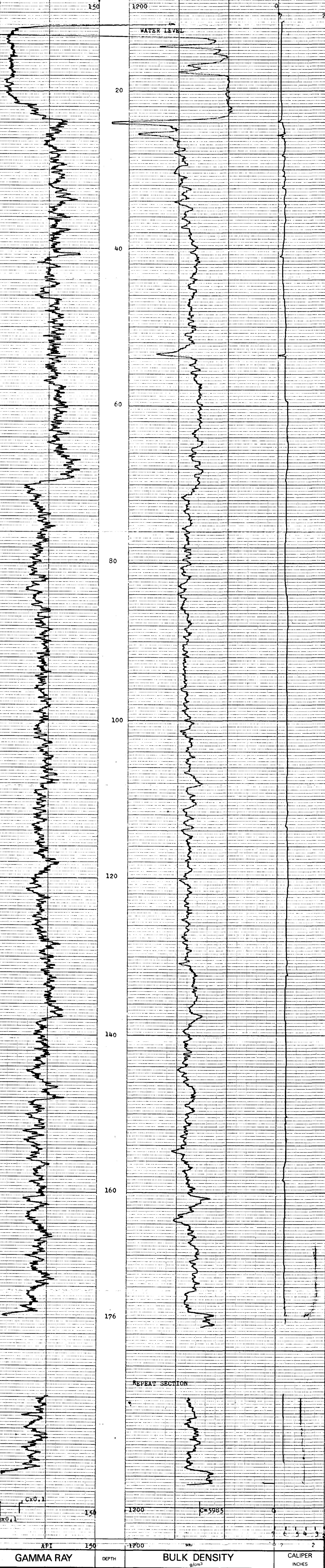
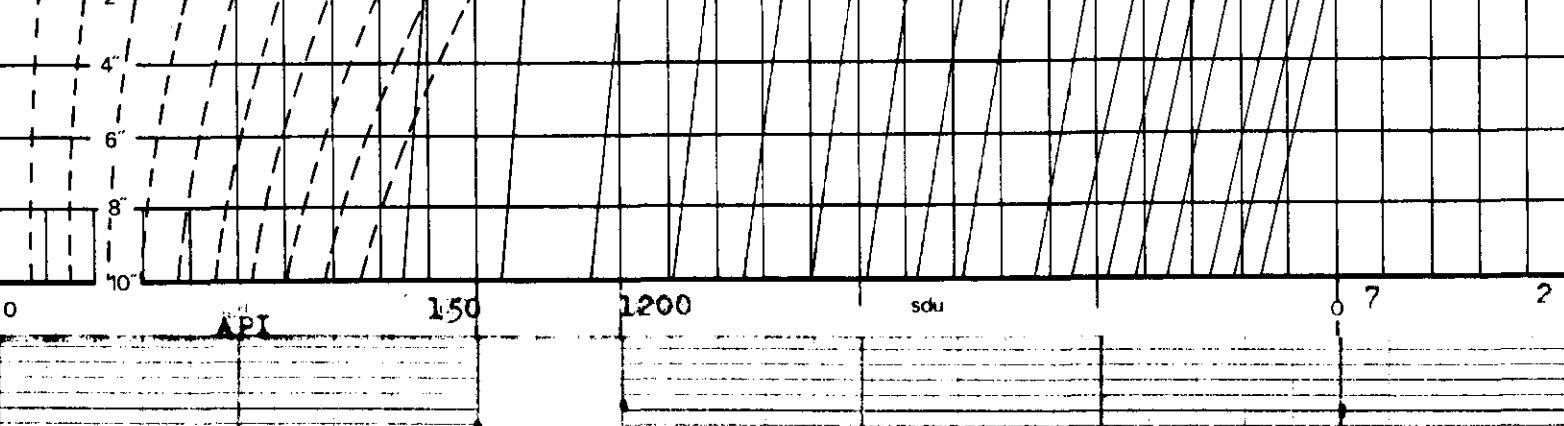
BPB COAL LITHOLOGY LOG

CALIBRATION DATA

JIG No B1 VALUE 2.0 2" DIAM JIG CAL DATE 17/10/80 VALUE 598.5 SDU (a) g/cm³ 7 ins 816 cps
JIG MARK SHOWN AT ABOVE VALUE - 10 JIG No 002 SPAN 6000 NORM SDU (a) g/cm³ 7.3 2 ins 310 cps

GAMMA RAY	DEPTH	BULK DENSITY g/cm ³	CALIPER INCHES
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HOLE SIZE CORRECTION DATA



GAMMA RAY	DEPTH	BULK DENSITY g/cm ³	CALIPER INCHES
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BOREHOLE #2 AREA THAMES CREEK
CLIENT ESSO RESOURCES LTD. COUNTRY CANADA

COAL LITHOLOGY LOG



DIPMETER ANALYSIS

73(1)

(3)

CLIENT---
BOREHOLE---
AREA---
COUNTRY---

ESSO MINERALS
#2
THAMES CREEK
CANADA



COMMENTS.....

INTERPRETATION PARAMETERS

STEP 1.00m.
INTERVAL 2.00m.
SEARCH ANGLE 45°
DECLINATION 22 8° East
DEPTH RANGE 24.() - 176.90m.
DATE PROCESSED 14-JAN-81

AVERAGE BOREHOLE DEVIATION & DIRECTION
ANNOTATED EVERY 20.0m.

LEGEND:

● GOOD (>0.50)
○ FAIR (>0.00)

ROSE DIAGRAMS SEGMENTED EVERY TEN DEGREES,
.1 in. RADIUS/DIP MARKER DISPLAYED

