TREFI COAL PROJECT
GEOLOGICAL REPORT
1980

GULF CANADA RESOURCES INC.
COAL DIVISION

TREFI COAL PROJECT

GEOLOGICAL REPORT

1980

PREFACE

This report presents the findings of a reconnaissance investigation of the Trefi Coal Property in Northeastern British Columbia

STATEMENT OF QUALIFICATIONS

I, Brian Patrick Flynn, obtained my Bachelor of Science Degree (Geology) at the University of Natal, South Africa, in 1971.

I worked two years prior, and one year after graduation in base metal exploration in South Africa, and since 1976 have been involved in the mapping and exploration of coal, first with the British Columbia Ministry of Mines and Petroleum Resources (1976-1977) and since 1978 with Gulf Canada Resources Inc.

I have supervised mapping and drilling programs, both diamond and rotary, in the Peace River, Groundhog and Naniamo coalfields of British Columbia and as well as having supervised the evaluation of coal lands in Alberta.

The reconnaissance investigation of the Trefi Coal Property licences, both in the field and off the property was conducted under my supervision.

Brian P. Flynn

Project Supervisor

TREFI COAL PROJECT - GEOLOGICAL REPORT

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GULF CANADA RESOURCES INC.

TREFI COAL PROJECT - GEOLOGICAL REPORT

1980

COAL LICENCE NUMBERS

5840-6038 Inclusive

6046-6079 Inclusive

6144-6159 Inclusive

NTS MAP No. 93 0 16

93 0 9

93 P 12

93 P 5

LATITUDES BETWEEN 55° 23 and 55° 58

LONGITUDES BETWEEN 121° 30 and 122° 30

GULF CANADA RESOURCES INC.

Dr. J.E. HUGHES - CONSULTING GEOLOGIST

C.C. McFALL - CONSULTING GEOLOGIST

MAY 1981

4.0 GEOLOGY PAGE NO.

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FIGURES IN TEXT

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PR-TREFI 8014)A Gulf Canada Resources

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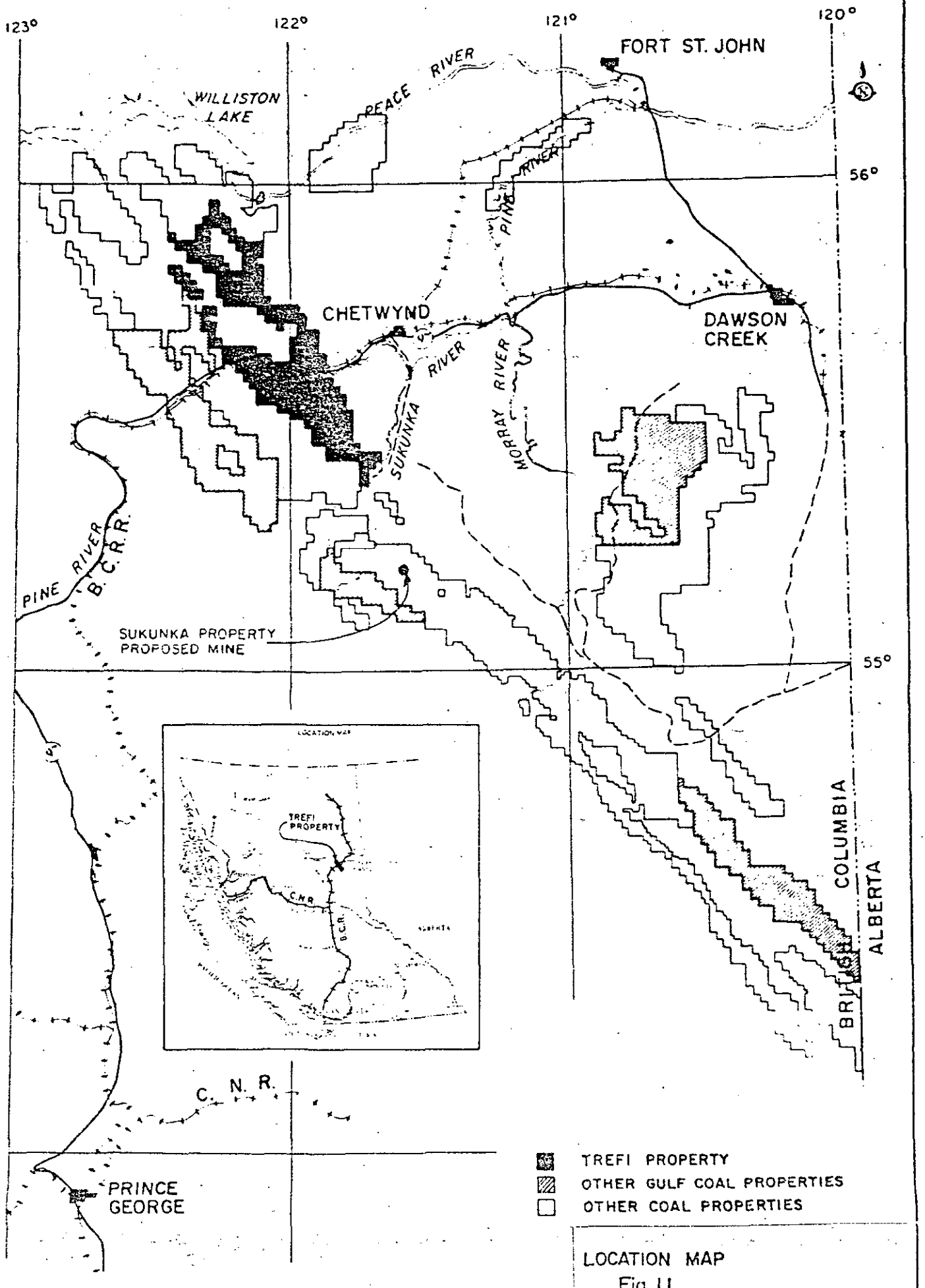
Appendix XI Geophysical Logs } see PR-Trefi. 80(3)A

1.0 SUMMARY


123°
122°
121°
120°
FORT ST. JOHN
PEACE RIVER
WILLISTON LAKE
PINE RIVER
56°
CHETWYND
DAWSON CREEK
SUKUNKA RIVER
MURRAY RIVER
PINE RIVER
B.C.R.R.
SUKUNKA PROPERTY
PROPOSED MINE
55°
LOCATION MAP
TREFI PROPERTY
C.N.R.
B.C.R.
ALBERTA
BRITISH COLUMBIA
C. N. R.
PRINCE GEORGE
TREFI PROPERTY
OTHER GULF COAL PROPERTIES
OTHER COAL PROPERTIES
LOCATION MAP
Fig. 1.1
DWG No. 8001

1.1 LOCATION

The Trefi Coal Property is located in the outer Foothills of the Rocky Mountains, northeastern British Columbia and is centered 27 Km west of the Town of Chetwynd.

1.2 ACCESS

The property straddles the B.C.R. railway line and is situated approximately 910 Km and 860 Km from the ports of Prince Rupert and Roberts Bank respectively.

1.3 LICENCES

The property comprises 249 licences covering 76 313 hectares.

REPRESENTATIVE COLUMNAR SECTIONS

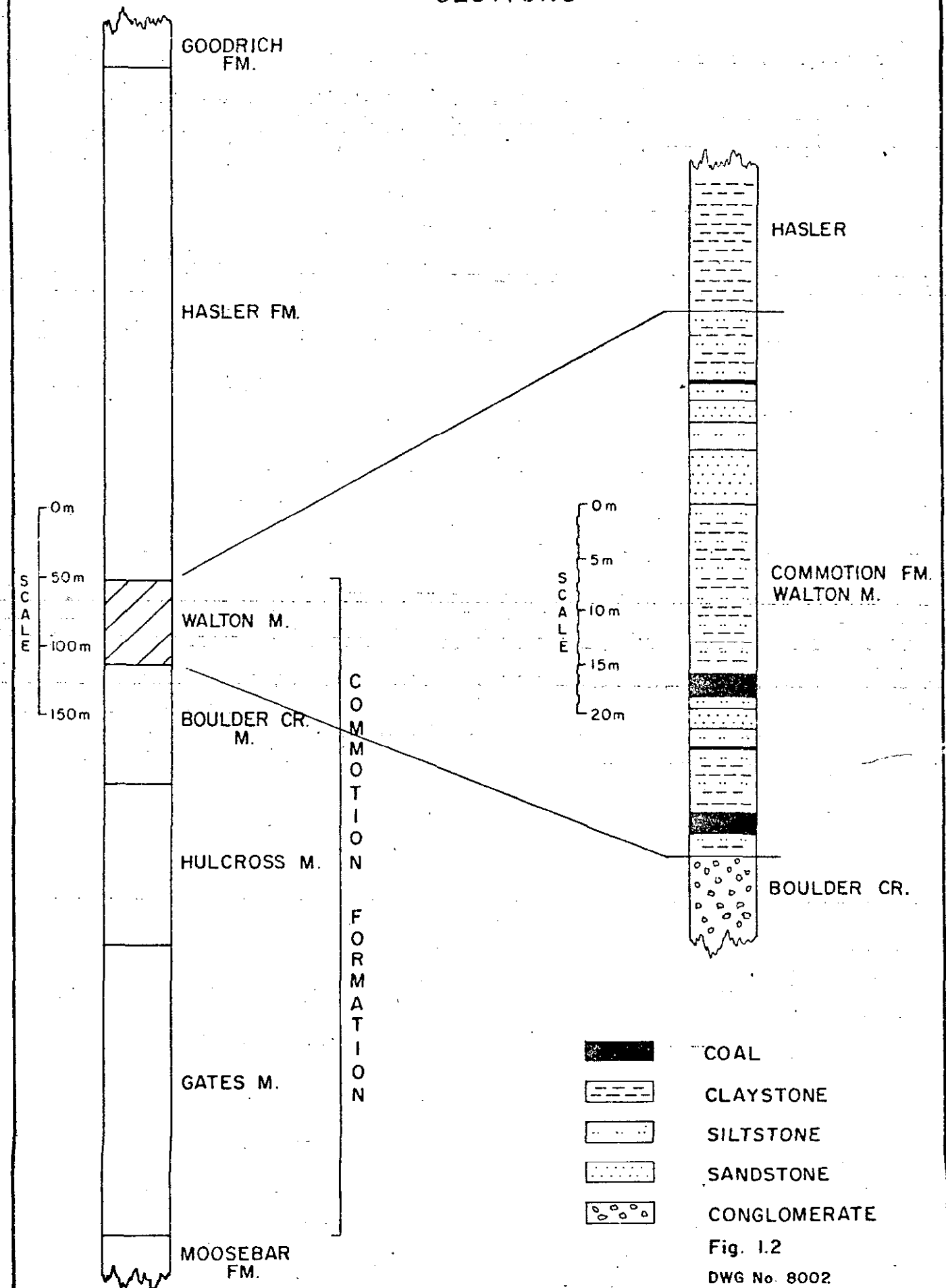


Fig. 1.2

DWG No. 8002

1.4 OWNERSHIP

Gulf Canada Resources	90%
Dr. J.E. Hughes	10%
	100% interest

Gulf Canada Resources Inc. is the operator.

1.5 GEOLOGY

The licences cover Cretaceous sediments of the Gething, Commotion, Hasler and Cruiser Formations with the upper 60 to 88 metres of the Commotion being the target for coal exploration.

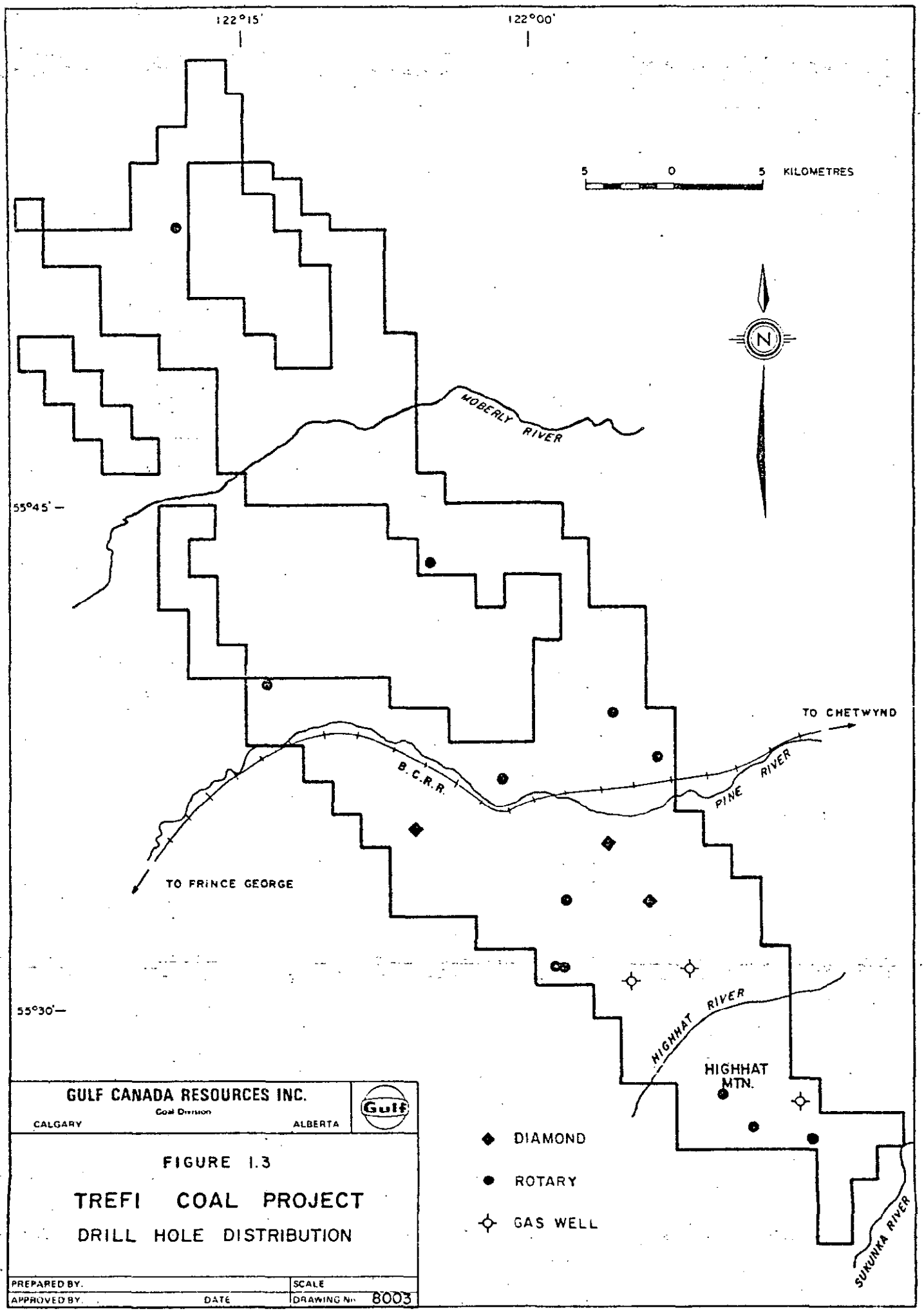


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FIGURE 1.3

TREFI COAL PROJECT

DRILL HOLE DISTRIBUTION

PREPARED BY.	SCALE
APPROVED BY. DATE	DRAWING No. 8003

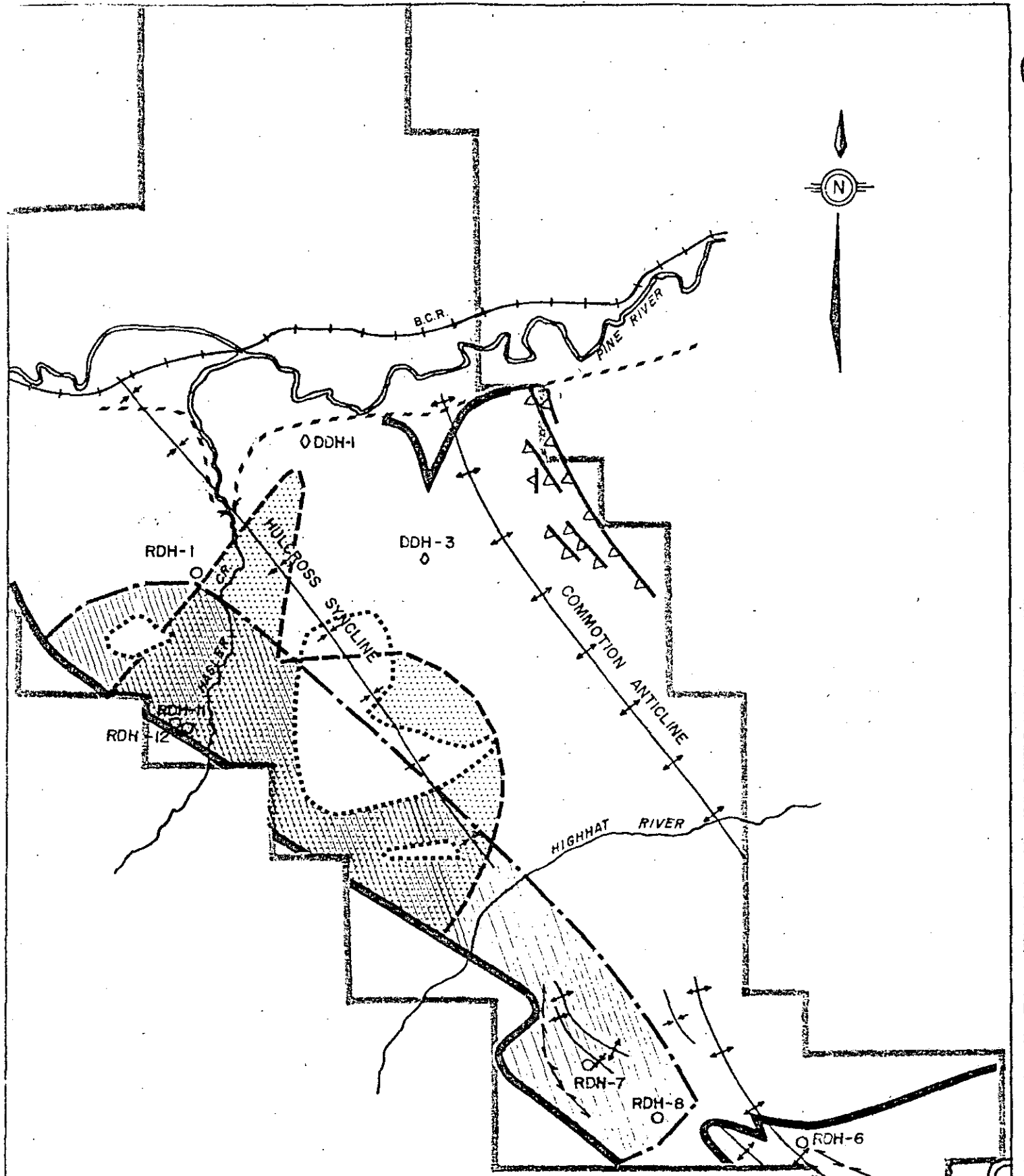
(1)

1.6 EXPLORATION

To date exploration comprises reconnaissance geological mapping, three diamond and 12 rotary drill holes. Field activities commenced April 12, 1980 and terminated September 11, 1980.

1.7 EXPLORATION RESULTS

Drilling results indicate that two coal seams, named, in ascending order, the Highhat and Caron seams, are correlated over a limited area confined to the licences south of the Pine River. The Highhat seam attains a maximum thickness of 2.68 m gross (1.74 metres net) while the Caron seam reaches a thickness of 2.70 m gross. (A net calculation, for this intersection, was not feasible from the gas well log on which it was observed).



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CALGARY ALBERTA

Fig. 1.4

TREFI COAL PROJECT

DELINEATION OF RESOURCE AREA AND DISTRIBUTION OF COAL BEARING WALTON MEMBER

PREPARED BY:

SCALE

DRAWING No. 8004

(1)

1.8 IN-SITU INFERRED RESOURCES

The coal resources of the Trefi property occur within the Highhat and Caron seams in a limited area along the southwestern edge of the licences in the South Pine Area.

Total in-situ inferred resources calculated from both seams, for thicknesses in excess of 1 metre, are in the order of 208 million tonnes to a depth of 600 metres. Of this amount, 126.2 million tonnes occurs in seam thicknesses greater than 1.5 metres. The bulk of the coal is mineable by under ground methods only.

CLEAN COAL PRODUCTS

a.d.b.

	A1 Metallurgical	A2 Thermal	B Thermal
Yield	37.03	51.00	72.22
Ash	7.66	22.30	17.95
Moisture	0.96	0.82	0.88
V.M.	25.60	22.71	23.45
V.M. dmmf	27.39	-	27.46
F.C.	65.78	54.11	57.72
Calorific Value Cal/gm	-	6,282	6,696
BTU/lb.	-	11,308	12,054
F.S.I.	5	-	-
S.	0.5	0.46	0.47
Sp. G.	1.35	1.49	1.43

Product A1 Caron Seam

A2 Caron Middlings + thermal from Highhat - weighted average (seam thickness; Sp. G.; yield)

B1 Thermal Clean Coal Product Caron and Highhat - weighted average (seam thickness; Sp. G.; yield)

Figure 1.5: Clean coal analyses on seams of the Walton Member.

(1)

1.8 IN-SITU INFERRED RESOURCES

The coal resources of the Trefi property occur within the Highhat and Caron seams in a limited area along the southwestern edge of the licences in the South Pine Area.

Total in-situ inferred resources calculated from both seams, for thicknesses in excess of 1 metre, are in the order of 208 million tonnes to a depth of 600 metres. Of this amount, 126.2 million tonnes occurs in seam thicknesses greater than 1.5 metres. The bulk of the coal is mineable by under ground methods only.

CLEAN COAL PRODUCTS

a.d.b.

	A1 Metalurgical	A2 Thermal	B Thermal
Yield	37.03	51.93	70.44
Ash	7.66	21.69	17.99
Moisture	0.96	0.82	0.88
V.M.	25.60	22.71	23.35
V.M. dmmf	27.39	–	27.35
F.C.	65.78	54.70	57.78
Calorific Value Cal/gm	–	6,346	6,696
BTU/lb.	–	11,424	12,053
F.S.I.	5	–	–
S.	0.5	0.46	0.47
Sp. 6.	1.35	1.48	1.43

Product A1 — Caron Seam

A2 — Caron Middlings + thermal from Highhat — weighted average

B1 — Thermal Clean Coal Product Caron and Highhat – weighted average.

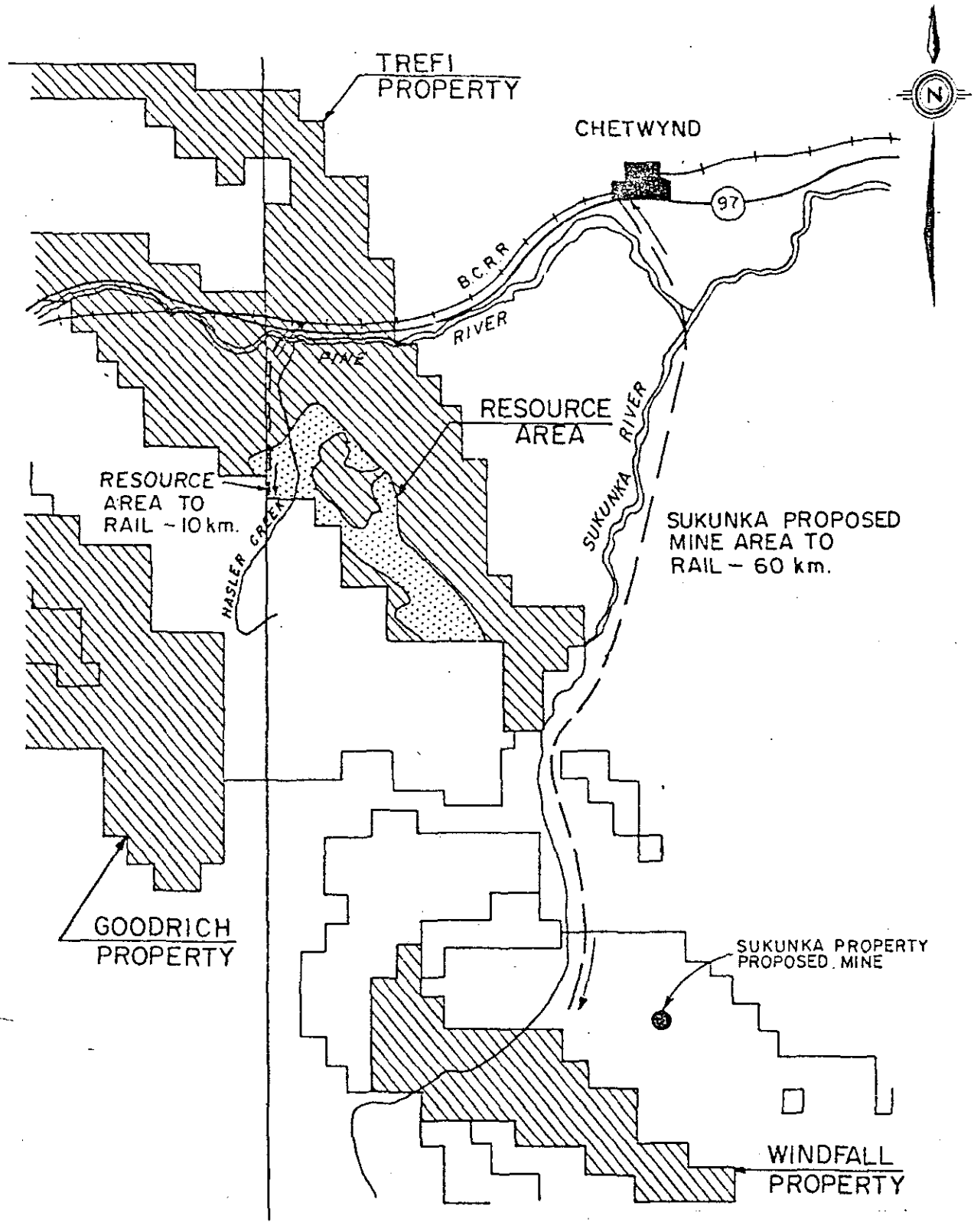
Figure 1.5: Clean coal analyses on seams of the Walton Member.

(1)

1.9 COAL QUALITY

Coal from the Highhat and Caron seams is of medium volatile bituminous rank. Preliminary analyses indicate that a 18% ash thermal coal product with a calorific value of 6696 Cal/gm (12,054 BTU/lb) can be produced by combining both seams. A 72.22% yield may be obtained.

Alternatively the data indicate that, by cutting the 3/8 X 28 coal at 1.4 Sp. G. and the 28 X 100 mesh coal at 1.6, a metallurgical product with an F.S.I. of 5 and an ash of 7.66% could be produced from the Caron seam. In addition to this metallurgical product, a thermal product with an ash of 22.71% and calorific value of 6,282 Cal/gm (11,308 BTU/lb) could be produced by combining the remaining fractions of the Caron seam to an 25.6% ash with an 18% ash clean coal product from the Highhat seam. Yields would in the order of 37% for the metallurgical product and 51% for the thermal product.



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CALGARY ALBERTA

Gulf

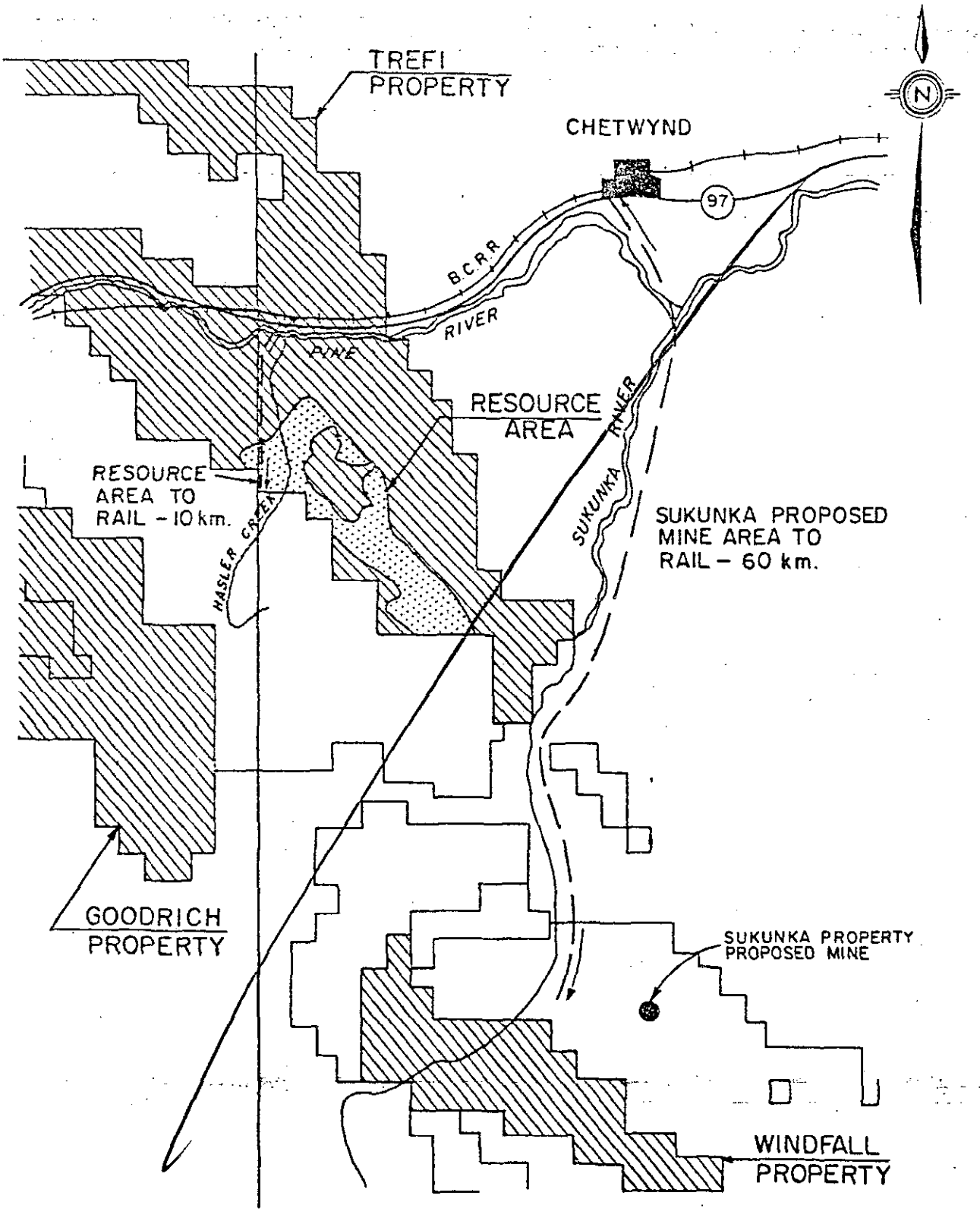
ACCESS TO RAIL
Fig. 1.6

PREPARED BY:	SCALE
APPROVED BY: DATE:	DRAWING No. 8006

1.9 COAL QUALITY

Coal from the Highhat and Caron seams is of medium volatile bituminous rank. Preliminary analyses indicate that a 18% ash thermal coal product with a calorific value of 6696 Cal/gm (12,053 BTU/lb) can be produced by combining both seams. A 70% yield may be obtained.

Alternatively the data indicate that, by cutting the coal of the Caron seam at Sp. G. of I.6, a metallurgical product with an F.S.I. of 5 and an ash of 7.66% could be produced. In addition to this metallurgical product, a thermal product with an ash of 21.69% and calorific value of 6346 Cal/gm (11424 BTU/lb) could be produced by combining the remaining fractions of the Caron seam to an 25.6% ash with an 18% ash clean coal product from the Highhat seam. Yields would in the order of 37% for the metallurgical product and 52% for the thermal product.



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ACCESS TO RAIL
Fig. 1.6

PREPARED BY	SCALE
APPROVED BY	DATE: DRAWING No. 8006

1.10 ACCESS FROM RESOURCE AREA TO RAIL

The northern portion of the Resource Area lies approximately 10 kilometres south of the B.C.R. railway line along the Hasler Creek Valley.

2.0 INTRODUCTION

2.1 LOCATION

The Trefi Coal Property is situated on the outer foothills of the Rocky Mountains centered approximately 27 Km. west of the town of Chetwynd, northeastern British Columbia. See figure 2.1 and 2.2.

The property extends northwest - southeast from the Sukunka River in the south to just south of Williston Lake in the north and encompasses an area of 76, 313 hectares. The Pine River divides the property into two blocks, designated the north pine and south pine blocks. The John Hart highway and the BCR railway line which are located in the Pine River Valley connect Prince George with the Peace River Area.

2.2 HISTORY

The original concept, on which acquisition of the licences comprising the Trefi property is based, was brought to Gulf Canada Resources Inc. by Dr. John Hughes, Consulting Geologist, in the latter part of 1979. The concept was based on, a number of coal

DETAILED REPORT

SECTIONS 2.0 to 8.0

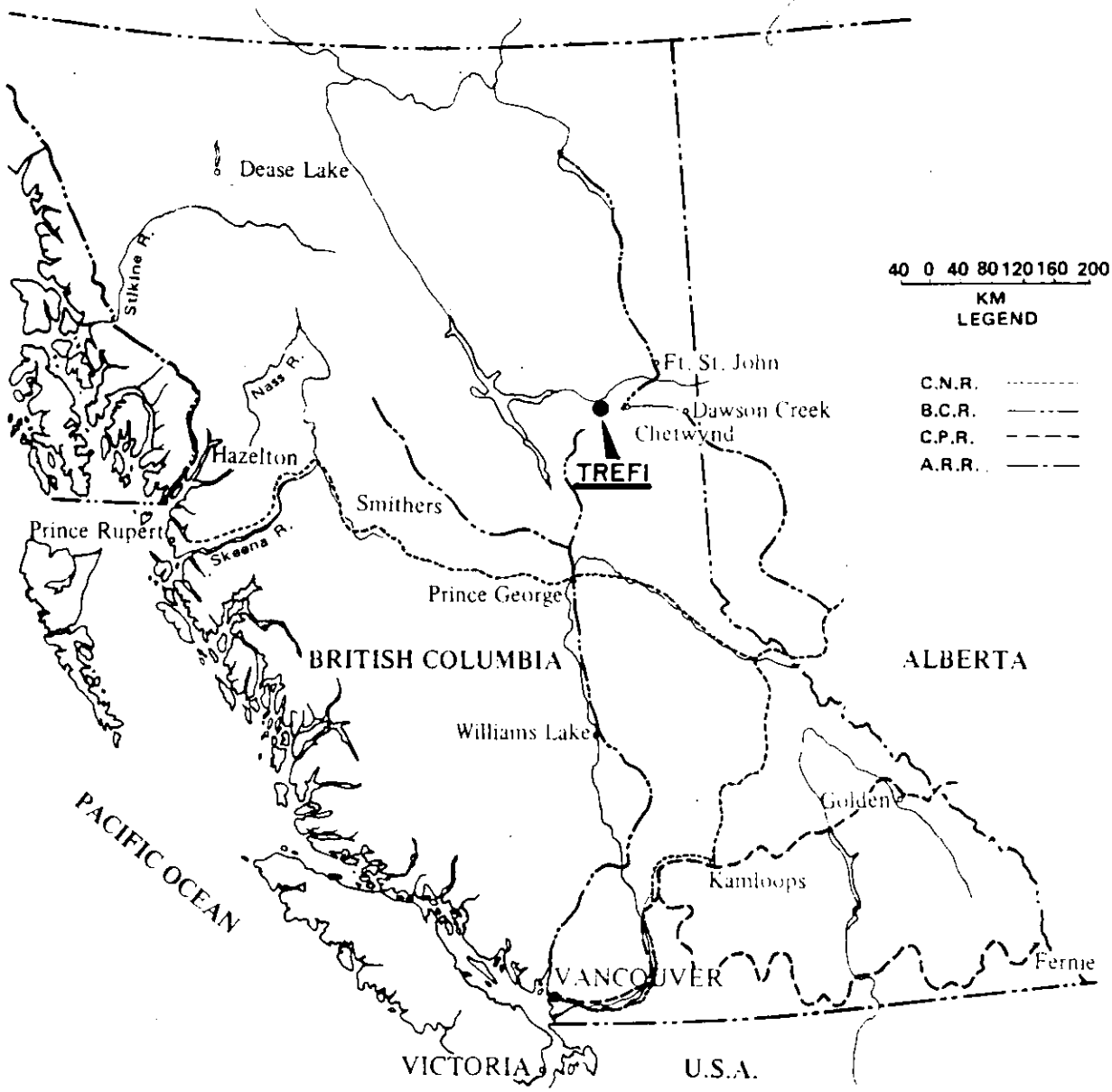

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FIGURE 2.1

TREFI COAL PROJECT

LOCATION MAP

PREPARED BY:	SCALE
APPROVED BY: DATE: 2.1981	DRAWING No. 8007

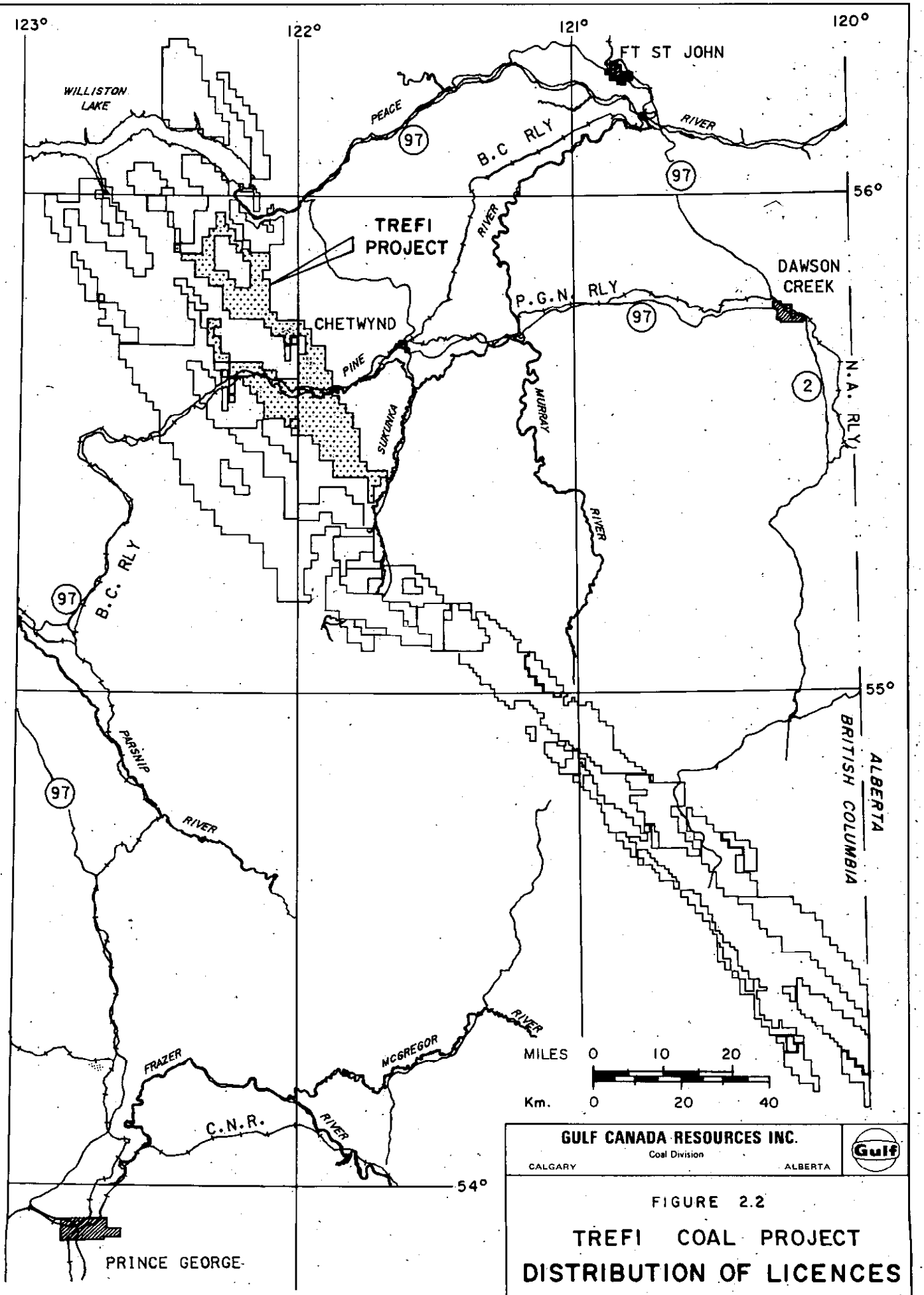

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FIGURE 2.2

TREFI COAL PROJECT
DISTRIBUTION OF LICENCES

PREPARED BY:	SCALE
APPROVED BY: DATE: MAR. 1981	DRAWING No. 8008

intersections in gas wells Skelly Getty CS Commotion 93-P-12/a-23-D, and 93-P-12/ c-29-C inside the licences, Quasar et al. Oetco 93-P-15/c-28-I south of the licences, and, on geological studies done in the area by Dr. Hughes during the period 1954 to 1960 (Hughes 1967).

Dr. Hughes recognized the existance of a coal bearing unit in the upper portion of the Commotion Formation. The coal licences applied for by Gulf Canada Resources Inc., and Dr. Hughes, reflected the distribution of this coal bearing unit which in this report, has been designated the Walton Member.

2.3 COAL LICENCES

The Trefi property comprises 249 licences covering an area of 76,313 hectares. A table of licences and their geographic location are reproduced in Appendix 1 and are illustrated in Figure 2.3 and drawing 8026.

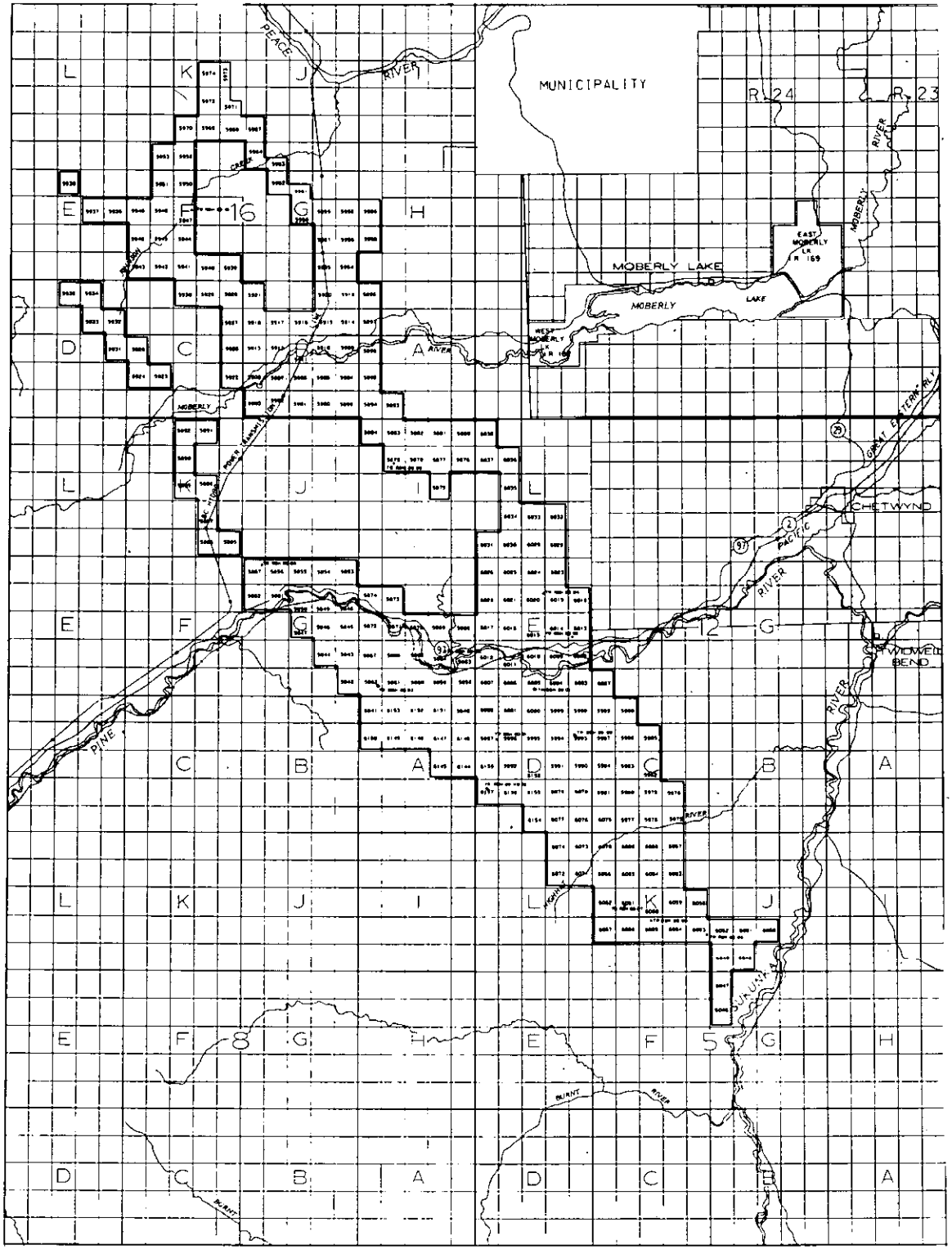

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FIGURE 2.3

TREFI COAL PROJECT

LICENCE MAP

PREPARED BY:	SCALE
APPROVED BY: DATE	DRAWING No. 8009

Three separate applications for licence were made to the British Columbia Government; 199 licences were applied for in October 10, 1979, 34 licences on January 23, 1980 and 16 licences on March 6, 1980. These three blocks were subsequently issued on March 1, 1980, March 24, 1980 and August 16, 1980 respectively.

2.4 OWNERSHIP

On October 9, 1979 Gulf Canada Resources Inc., entered into an agreement with Dr. Hughes whereby Gulf Canada Resources Inc. holds a 90% interest in the property and Dr. J.E. Hughes, a 10% interest, with Gulf Canada Resources Inc., acting as operator.

2.5 ACCESS

The property is dissected by the Pine River Valley in which the paved John Hart Highway and British Columbia Railway line are located, both of which connect Prince George in the Southwest with the Dawson Creek - Fort St. John area, to the east and northeast respectively. The town of Chetwynd lies 27 Km. east of the center of the licences and provided a base for exploration activities in the area.

Access to the southern portion of the property is along a gas well road, which connects with the Sukunka all weather gravel road, and also via the Hasler Cr and West Coast Transmission Gas Plant roads. The northern portion of the property is accessible along the Moberly Valley via a gas well road and a number of logging roads, which connect the paved highway between Chetwynd and Fort St. John. Forestry, logging, gas well, power transmission and pipeline service roads provide good access to the remainder of the property.

The licences are located approximately 860 and 910 rail kilometers from the ports of Vancouver and Prince Rupert respectively. Figure 2.1.

2.6 BIOPHYSICAL ENVIRONMENT

The property is situated in the Rocky Mountain Foothills physiographic region within the Pine, Moberly and Peace River watersheds. Relief is in the order of 900 metres with the valleys ranging in elevation from 600 to 800 metres and the ridges from 1000 to 1520 metres.

In the Pine and Moberly River valleys, vegetation of the Boreal white spruce zone has developed over variable soils. Some land in both valleys has been cleared for pasture and/or forage production.

These valleys have moderate to high capability for ungulate production and include important winter range on which moose, deer and elk from surrounding areas depend. They have only limited potential for waterfowl production.

On the uplands adjoining these valleys, subalpine vegetation of the subalpine Engelmann spruce - subalpine fir zone is present. In these areas soil types which are susceptible to erosion occur. Streams in the area have moderate to high capability for sportfish production. The most abundant sport species are Arctic grayling and mountain whitefish; Dolly Varden, rainbow trout and northern pike are present but less abundant.

3.0 EXPLORATION

3.10 PROGRAM OBJECTIVES

The objectives of the 1980 exploration program were threefold;

firstly to document the distribution of coal seam development within the Walton Member of the Commotion Formation;

secondly to determine the coal quality of discovered seams and

thirdly to delineate areas of resource potential with respect to extraction by underground mining or open pit mining methods.

3.20 INTRODUCTION

Prior to the 1980 exploration program data on the distribution of coal within the Walton Member of the Commotion Formation was poor to non-existant and all existing information, to that date, was derived from the geophysical logs of two gas wells; Skelly Getty CS Commotion 93-P-12/a-23-D and 93-P-13/c-29-C, approximately 5.5 Km apart in the south portion of the licences and Quasar et al Oetco 93-P-15/c-28-I, 21 Kilometres south of the

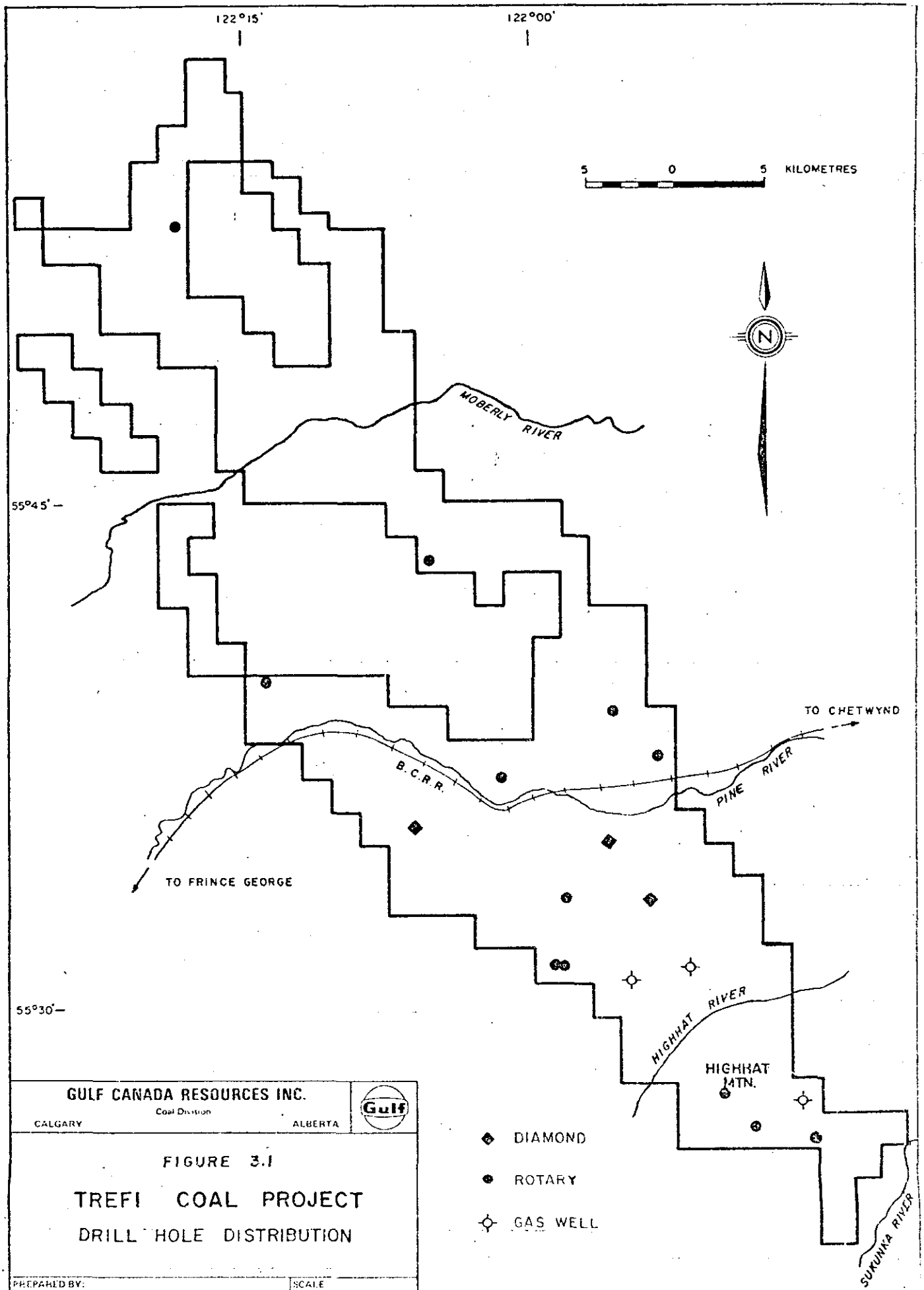

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FIGURE 3.1

TREFI COAL PROJECT

DRILL HOLE DISTRIBUTION

PREPARED BY: SCALE

APPROVED BY: DATE DRAWING No. 8010

above two well and outside the licence boundaries. These gas wells, together with geological maps compiled by Dr. Hughes from his earlier work on the Pine River Valley area, and later aerial photographic interpretation of the stratigraphy and structure of the area formed the framework on which the 1980 program was conceived.

For the most part the Walton Member is buried beneath younger formations and where either structure or valley cuts bring the Member close to surface, dense tree cover and the natural recessive nature of the unit result in very poor exposure over the property.

To provide the most cost effective evaluation of the potential of the 72,314 hectares of land, the exploration program, which spanned the period April 12 to September 11, 1980 was subdivided into two phases. The first phase comprised helicopter supported diamond drilling of 3 holes, south of the Pine River, in which HQ core was cut. The diamond drilling was closely followed by a second phase of road supported rotary drilling and geological mapping. A total of 12 rotary holes, 6 north of the the Pine River and 6 to the south were drilled. Figure 3.1.

A total of 3178.2 metres were drilled, of which 640.1 were by diamond drill and 2538.1 by rotary drill.

3.3 CARTOGRAPHY

See Appendix IX.

3.4 FIELD CAMP

Personnel for both phases of the program were housed in motel accommodation in the town of Chetwynd, and transported to the licence area by helicopter or truck. Meals for project personnel were taken in local restaurants.

3.5. Phase I - DIAMOND DRILLING

Phase I spanned the period April 12 to May 15 and was supervised in the field by Mr. G. Singhai, Consulting Geologist. The objectives of this phase were to; obtain data on the stratigraphy of the Walton Member to control and direct later rotary drilling; provide coal samples of seams intersected for preliminary coal quality testing, and to determine the distribution of coals within a limited area surrounding the discovery gas well Skelly Getty CS Commotion 93-P-12/a-23-D See Figure 3.1.

Three holes were drilled for a total of 640.1 m using a Long Year Super 38. All holes were geophysically logged with Gamma Ray, Neutron, Side Wall Density, Caliper and Focused Beam Resistivity Logs.

All core from the drill holes was logged and secured in 0.76 metre core boxes which will be sent to the B.C. Ministry of Mines Core Storage facility at Charlie Lake as per the Ministry of Mines request. Coal seams in excess of 0.5 metres were logged in detail, bagged, labelled and sent to Cyclone Engineering Sales Ltd. in Edmonton for analysis.

3.6 PHASE II GEOLOGICAL MAPPING AND ROTARY DRILLING

Phase II, which comprised more widespread rotary drilling, and follow-up geological mapping commenced June 1980, and terminated in early September 1981 upon completion of drilling.

3.6.1 GEOLOGICAL MAPPING

Geological mapping commenced in early June 1980, and continued through the drilling phase to late August 1980. Helicopter support was necessary, especially in the north, however, roads were used extensively to provide access in the south and central portions of the property.

The program utilized two mapping teams with each team comprising a geologist and assistant, and one team of two senior geological assistants. For the most part mapping was continuous during the period June to August 1980, however, a slow down was experienced during the rotary drilling operations when personnel alternated between geological mapping and rig duties.

The bulk of the mapping was concentrated in the areas south and immediately north of the Pine River. Traversing,from a point half way between the Pine and Moberly Rivers to the northern extremity of the licences, was light and the included geological maps for this area have been generalized to some extent.

Mapping was done on 1:25,000 topographic maps with altimeters and aerial photographs providing control. Where 1:10,000 maps were available, south of the Pine River, data was recorded on the 1:10,000 maps and later transferred to the 1:25,000 map sheets. To provide consistency within this report, geological maps covering the entire property at a scale of 1:25,000 only, are included and cross sections at a 1:25,000 scale are also provided. It should be noted that while the 1:25,000 base topographic maps are in the

Imperial System of measurement, the report and all data presented on the topographic base maps are in the metric system. Although this did present some problems in compiling the data, the transfer of data on 1:10,000 metric maps covering the licences in succeeding years will be made easier.

Geological mapping was hampered by the relatively thick forest cover, and poor exposures especially of the Walton Member. No coal exposures worthy of trenching were located.

3.6.2 ROTARY DRILLING

The rotary drill aspect of Phase II commenced on July 1, 1980 and terminated on September 11, 1980 after 12 holes varying in depth from 90 to 399 and totalling 2538.1 metres were drilled. For location of drill holes see Figure 3.1 and drawing 8026.

A total of 8.32 metres was cored across two seams in TR RDH 8012 to obtain coal samples for analysis. The mechanism for coring control was by drill hole twinning, with TR RDH 8012 being located a few metres from the previously drilled TR RDH 8011.

3.7 RECLAMATION

See Appendix VIII.

A truck mounted Schramm T685H was contracted for drilling operations, and all holes were geophysically logged with Gamma Ray, Neutron, Side Wall Density, Caliper, Focused Beam Resistivity and in some cases directional logs. Appendix X.

Drill holes were in all cases located along existing access roads and the rig was supplied by truck, with some crew changes being made by helicopter where sites were located in the northern portion of the licences.

3.8 PROPERTY MANAGEMENT AND CONTRACTORS

The 1980 coal exploration program was managed by B.P. Flynn (Project Supervisor) of Gulf Canada Resources. Phase 1, Diamond Drilling operations were supervised in the field by G. Singhai of Sanghai Engineering International Ltd, while Phase II Rotary Drilling was supervised by C. McFall, Consulting Geologist. Geological mapping was supervised by V. Odegaard, Gulf Canada Resources Inc. The report was compiled by B. Flynn, J. Hughes, and C. McFall with assistance from B. Maine and A. Rahmani.

The following professional and technical personnel contributed to the project.

M. Duford	-	Consulting Geologist
T. Trowell	-	Geologist
K. Babcock	-	Geological Assistant
H. Wishart	-	Geological Assistant
C. Nissila	-	Geological Assistant
G. Farquharson	-	Geological Assistant
C. Opekar	-	Geological Assistant
M. Ariss	-	Geological Assistant
M. Miller	-	Bookkeeper

The following is a list of suppliers and service companies used during the project.

NAME	ADDRESS
Hardy & Associates	221 - 8 St. S.E. Calgary, Alta.T2E 6J5 Tel. (403) 248-4331
Singhai Engineering	562 Clearwater Dr. Richmond, B.C.
C. Carew McFall	25600 LaLanne Court Los Altos Hill California 94022 Tel. (415) 941-7212
J.E. Hughes	4155 Long View Drive Victoria, B.C. Tel. (604) 477-4228
Westcan Electronics	P.O. Box 4011, Station 'C' Calgary, Alta. T2T 2M9 Tel. (403) 243-0405
Neville Crosby	872 Richard St. Vancouver, B.C. V6B 3A7
Petrocraft Products	940 - 11th Ave. S.W. Calgary, Alta. T2R OE7
Ribtor Mfg.	318 - 11th Ave. S.E. Calgary, Alta. T2G OY2 Tel. (403) 262-6994
Safety Supply Canada	Head Office: 214 King St. E Toronto, Ontario M5A 1J8 Tel. 364-3234
Nova Photo	620 - 8th Ave. S.W. Calgary, Alta. T2P 1G4 Tel. (403) 266-6222
Techline	727 Johnson Street Victoria, B.C. V8W 1M9 Tel. (604) 382-8855
Maple Leaf Helicopters	R.R. #2, Penno Road Hwy. 97N Kelowna, B.C. V1Y 7R1 Tel. (604) 765-1520

NAME	ADDRESS
Cascade Motel	Motel Village - 16th Avenue N.W. Calgary, Alta.
The Palliser	Calgary, Alberta
The Highlander	1818 - 16th Avenue S.W. Calgary, Alta. T2M OL8 Tel. (403) 289-1961
J.M. Duford	Consultant
Visa Truck Rentals	11410 - 100 St. Grande Prairie, Alta. Tel. (403) 532-0636
Minchuk Leasing	5011 - 11 St. S.E. Calgary, Alta. T2M 1M7 Tel. (403) 287-1122
B.C. Telephones	
Little Giant Products Ltd.	Box 454 Chetwynd, B.C. VOC 1JO Tel. (604) 788-9380
Northern Metallic	9729 - 17th Street Dawson Creek, B.C. V1G 4B2 Tel. (604) 782-5595
A.G.T.	
King Truck Rentals	
Accurate Stamp & Seal	916 Centre St. North Calgary, Alta. T2E 2P7 Tel. (403) 269-6501
Bowmac Truck Rentals	1154 West Broadway Vancouver, B.C. V6H 1G5 Tel. (604) 251-1591
Link Chetwynd Hardware	P.O. Box 990 Chetwynd, B.C. VOC 1JO Tel. (604) 788-2373
Calgary Copier	#150 - 2912 Memorial Dr. S.E. Calgary, Alta Tel. (403) 248-4112

NAME	ADDRESS
Caldraft	615 - 8th Ave. S.W. Calgary, Alta.T2P 1H1
Allied Supplies	4505 - 4507 - 1st St. S.E. Calgary, Alta. T2G 2L2
Brocks Enterprises Ltd.	(Westend Texaco) P.O. Box 113 Chetwynd, B.C. V0C 1J0
Centurion Truck Repair	Box 1619 Chetwynd, B.C. V0C 1J0
Peace Country Rentals	8703 - 101st Ave. Fort St. John, B.C. V1J 2A5 Tel. (604) 788-9505
Stagecoach Inn	P.O. Box 927 Chetwynd, B.C. V0C 1J0 5418 South Access Road
Loomis (Courier)	
Strider Express	P.O. Box 1327 Chetwynd, B.C. V0C 1J0
Pacific Western (Courier)	
Pinecone Motor Inn	4220 Hart Ave. Chetwynd, B.C. V0C 1J0
B.D.C. Ltd. Courier	P.O. Box 4091, Terminal 'A' Toronto, Ontario M5W 1H8
Ken's Air Tech Services Ltd.	No. 4, 5915 - 49 Street S.E. Calgary, Alta. T2C 2A8 Tel. (403) 279-4066
Northland Storage	Box 355 Chetwynd, B.C. V0C 1J0 Tel. (604) 788-9992
W.&J. Schilling (Slashers)	Box 325 Chetwynd, B.C. V0C 1J0 Tel. (604) 788-2645

NAME	ADDRESS
Baroid of Canada	1500, 840 - 7th Ave. S.W. Calgary, Alta. T2P 3G2 Tel. (403) 263-8740
Acadia Drilling	c/o #202, 25 - 10th Ave. South Cranbrook, B.C. V1C 2M9
Tortor Trucking	Box 1359 Chetwynd, B.C. V0C 1J0
Wabi Trucking	Box 124 Chetwynd, B.C. V0C 1J0
O.E. Gerstel Transport	P.O. Box 55 Chetwynd, B.C. V0C 1J0 Tel. (604) 788-2462
Smith International	9405 - 51st Avenue South West Edmonton, Alta. T6E 4W8 Tel. (403) 436-6930
Altawest Pressure Cement	P.O. Box 4545 South Edmonton, Alta. T6E 5G4 Tel. (403) 433-7468
Cyclone Engineering	9751 - 51 Avenue Edmonton, Alta. T6E 4Z5 Tel. (403) 436-1385
Roke Oil	516 Moraine Road N.E. Calgary, Alta T2A 2P2 Tel. (403) 273-5553
Norweld Supply	Box 448 Chetwynd, B.C. V0C 1J0 Tel. (604) 788-9162
Okanagan Helicopters	4391 Agar Drive Richmond, B.C. V7B 1A5
R.R. Lake General Contractors Ltd.	3131 Kingsway Vancouver, B.C. Tel. (604) 437-0438
Schafer Safety Service Ltd.	10212 - 93rd Avenue Fort St. John, B.C. V1J 5A7 Tel. (604) 785-6153

NAME	ADDRESS
Westlope Contracting Corp.	P.O. Box 906 Chetwynd, B.C. VOC 1JO Tel. (604) 788-9352
Beaver Lumber Co. Ltd.	P.O. Box 90 Chetwynd, B.C. VOC 1JO Tel. (604) 788-2204
USS Oilwell Supply Co. Ltd.	603 7th Ave. S.W. Calgary, Alta. T2P 2T5
Pryndik Bit & Supply Ltd.	Box 6928 Fort St. John, B.C. Tel. (604) 785-2723
Cubex Ltd.	919A - 46th Ave. S.E. Calgary, Alta. T2G 2A5
Imperial Oil Ltd.	P.O. Box 1600 Don Mills, Ontario M3C 2V4
Chetwynd Petroleums Ltd.	P.O. Box 6 Chetwynd, B.C. VOC 1JO Tel. (604) 788-2258
Romac Auto Services Ltd.	632 - 11th Ave. P.O. Box #13 Dawson Creek, B.C.

4.0 GEOLOGY

4.1 INTRODUCTION

The property is located in the Outer Foothills structural belt, which is characterized by discontinuous folds and faults (Hughes, 1967). It is bounded to the west by the strongly faulted and folded Inner Foothills belt and to the east by Plains.

The licences are underlain by the Cretaceous Bullhead and Fort St. John Groups with the Hasler and Goodrich Formations forming the main exposures. A table of formations is presented on Table 4.1. The two main coal bearing units of the Peace River Coalfield, the Gething Formation and Gates Member, are exposed on the property, however, the aerial extent of the exposures of these formation are minor and for the most part they occur at depth.

The bulk of the exploration activities were directed to exploring the upper 50 to 90 metres of the Commotion Formation, which was known to be coal bearing from geophysical logs run in gas wells on the property. This upper coal bearing unit of the Commotion Formation was field named the Walton Member to distinguish it from the Boulder Creek,

TABLE 4.1

TABLE OF FORMATIONS

AGE		GROUP	FORMATION		DESCRIPTION
CRETACEOUS	UPPER	FORT St. JOHN	DUNVEGAN		Sandstone, shale, siltstone, minor conglomerate, few thin coal seams.
			CRUISER		Thickness: 160 - 260 m. Claystone, siltstone, minor thin sandstone; marine.
	LOWER		GOODRICH		Thickness: 170 - 260 m. Sandstone, some conglomerate, siltstone, claystone.
			HASLER		Thickness: 210 - 340 m Claystone, siltstone, thin sandstone; marine.
			COMMOTION	WALTON MEMBER	Thickness: 51 - 80 m Siltstone, sandstone, claystone, carbonaceous claystone, COAL
				BOULDER CREEK MEMBER	Thickness: 84 - 109 m Sandstone, conglomerate, siltstone, some claystone.
				HULCROSS MEMBER	Thickness 96 - 114 m Siltstone interbedded with claystones; marine.
				GATES MEMBER	Thickness 87 - 220 m Sandstone, siltstone, claystone, some conglomerate, COAL.
			MOOSEBAR		Thickness: 400 - 450 m. Claystone, siltstone, marine.
		BULLHEAD	GETHING		Thickness: 490 - 570 m Sandstone, siltstone, claystone, carbonaceous claystone, COAL.

Hulcross and Gates Members of the Commotion Formation. See Figure 4.1. The Walton Member is recognizable as a distinctive unit in the majority of drill holes, however, because of the recessive nature of the unit, it is not readily distinguishable in the outcrop.

The majority of reconnaissance field mapping was done south of the Pine River and in a 25 Km wide band immediately north of the River where drilling results indicated the Walton Member to be coal bearing.

The shallow dipping, to horizontal, strata within the predominantly broad open folds limits the section exposed on much of the property to the recessive weathering Hasler Formation and the overlying resistant Goodrich Formation. Most of the mapping was therefore confined to the tracing of the Hasler-Goodrich contact.

The limited exposures of the other Formations compounded by dense tree cover resulted in limited examination of the stratigraphy of these units and the stratigraphy descriptions to follow were taken from holes drilled during the program, gas well logs and litrature available on the area, supplemented by some field observations.

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

SHEET NO.: 9 of 15

HOLE NO.: TR-DDH -8001 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: Gyan Singhai CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	Box 48	2.47		142.47						Conglomerate - with thin interbeds of sandstone and grit, pebble size 1mm to 5mm, rounded to sub-rounded pebbles of quartzite, quartz, dark grey and medium grey chert. Sandstone bands are cross-bedded, occasional coalified plant fragments. Upper contact is gradational, lower contact is sharp.
	145.21	0.40								as above
	Box 49	0.26			145.60	3.13	3.13			as above
		2.45		145.60						Sandstone coarse-grained, with occasional pebbles of quartzite and dark grey chert and siltstone scattered throughout upper section faint cross-bedding.
	148.32	0.25								as above
	Box 50	2.80								as above
	151.52	0.10								as above
	Box 51	2.89			154.09	8.49	8.49			as above
	Box 52									
	154.57	1.07		154.09	155.16	1.07	1.07			Conglomerate - interbeds of coarse grained sandstone sub-rounded to rounded pebbles of chert (grey), quartzite, siltstone, size 1mm. to 5mm. - lower contact is sharp BCA 90° and sharp upper contact also at 90°.
			0.08	155.16	155.24	0.08	0.08			Core Loss

4.2 DETAILED STRATIGRAPHY

4.2.1 GETHING FORMATION

The Gething Formation is the oldest of the Formation exposed on the property and consists of fine to coarse grained sandstones, siltstones, claystones, carbonaceous claystones and coal. The Formation is exposed in the extreme west, north of the Moberly River (West Moberly Coal Licences) where it varies in thickness from 490 to 570 metres

4.2.1.1 COAL

The Gething Formation was not drilled during the 1980 program and all data available on the distribution and thickness of coal seams occurring within the Formation was derived from geological traveses of the West Moberly Licences.

Seams encountered along creek traveses ranged in thickness from a few centimetres to a maximum recorded thickness of 3.05 metres, with only two seams, the above mentioned seam and a 1.2 metre seam being in excess of 1 metre.

4.2.2 MOOSEBAR FORMATION

The Moosebar Formation, a recessive marine unit consists of thinly interbedded and interlaminated dark grey, rubbly weathering claystones and silstones. It varies in thickness from 400 to 450 metres and is exposed primiarly within the west Moberly Licences. The contact with the underlying Gething Formation is considered disconformable (Hughes 1967).

4.2.3 GATES MEMBER - COMMOTION FORMATION

The Gates Member of the Commotion Formation comprises sandstone, siltstones, claystones, carbonaceous claystones, and some coal. Approximately 80% of the Member was drilled in TR RDH 8005, and, although the Member is the main coal bearing unit south of the Peace River Coalfield, only thin seams, all less than 1.0 metre thick, were intersected. Downhole problems prevented the hole being terminated in Moosebar Formation.

Exposures of the Gates Member occur in the northern portion of the property where thrust faulting has brought the S.E. strata to the surface. The Member is only 87 metres thick in the lower canyon of the Peace River but attains a thickness of 221 metres in Skelly Getty CS Commotion 93-P-12/a-23-D, well located in the south of the property. The member conformably overlies the Moosebar Formation.

4.2.3.1 COAL

A 2.44 metre seam was intersected at 1102 metres below surface in the Discovery Well, however, TR RDH 8005, which effectively penetrated most of the Gates Formation did not intersect coal seams of significant thickness.

4.2.4 HULCROSS MEMBER - COMMOTION FORMATION

The Hulcross Member is a recessive marine siltstone-claystone sequence varying in thickness from 94 to 114 metres, where it was intersected in TR RDH 8005 and Skelly Getty 93-P-12/a-23-D respectively. The Member conformably overlies the Gates Member and is in turn conformably overlain by the Boulder Creek Member.

4.2.5 BOULDER CREEK MEMBER - COMMOTION FORMATION

The Boulder Creek Member can typically be divided into 3 units designated Lower, Middle and Upper Units.

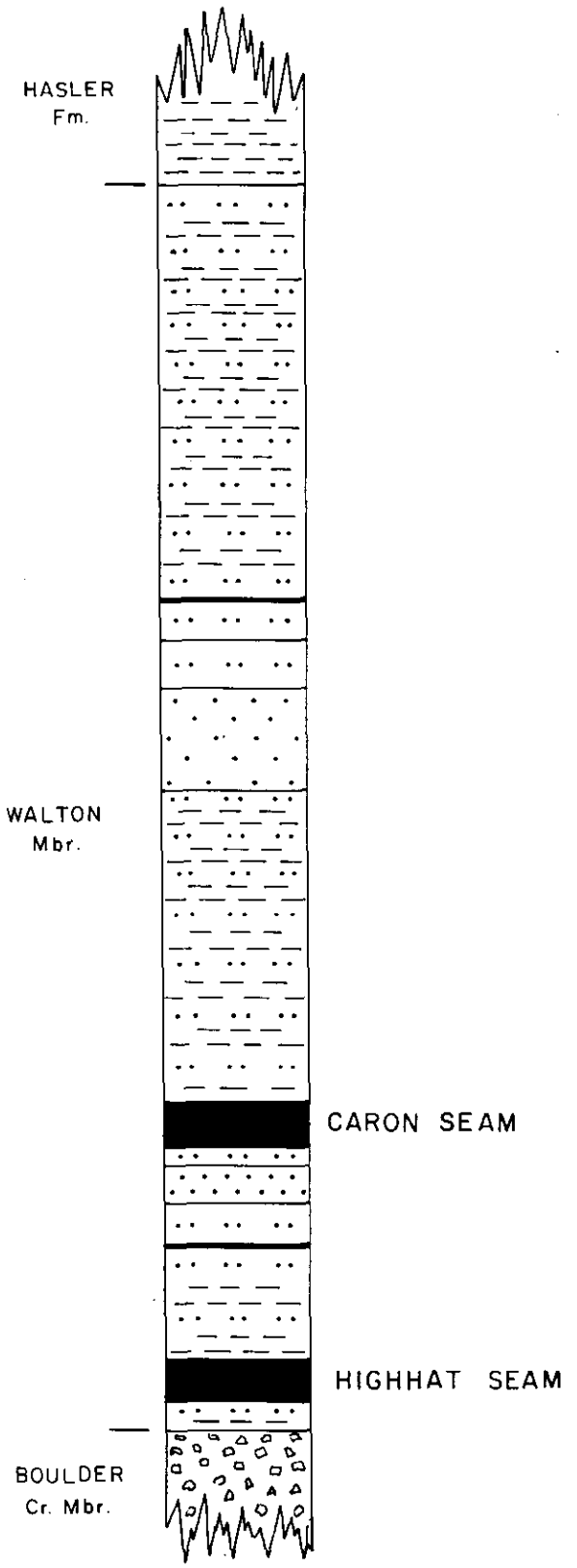
The lower resistant, cliff forming sandstone-conglomerate unit, approximately 27 metres in thickness has a gradational contact with the underlying Hulcross Member and coarsens upward with the top few metres being either a pebble congomerate or resistant sandstone in most exposures.

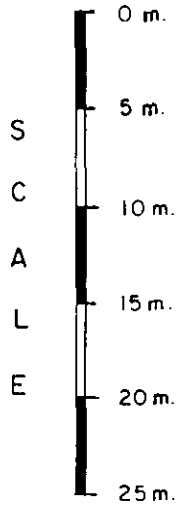
Intersections in drill holes and gas wells, south of the Pine give a thickness of 84 to 109 metres.

The middle unit is composed of interbedded sandstone, siltstone and minor claystone which is variable in thickness, ranging from 10 to 39 metres.

The upper resistant, cliff forming sandstone - conglomeratic unit has an approximate thickness of 45 metres. A thin coal seam was intersected near the top of the unit in a number of drill holes.

The majority of holes drilled during the program were terminated in the upper conglomeratic unit which provided an excellent marker for this purpose. The log of this unit was also used as a datum line for coal seam correlations. TR RDH 8005 and TR RDH 8006 drilled the entire thickness of the Member.





GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

FIGURE 4.2
TREFI COAL PROJECT
GENERALIZED COLUMNAR SECTION
WALTON MEMBER

PREPARED BY:	SCALE
APPROVED BY: DATE:	DRAWING No. 8012

4.2.6 WALTON MEMBER - COMMOTION FORMATION

The Walton Member, named for convenience after Walton Creek, and previously known as Member IV (Hughes, 1967), was proven by exploratory drilling to be distinctive and recognisable, on geophysical logs, over most of the property. Figure 4.2.

Over the central part of the property the upper conglomeratic unit of the Boulder Creek Member provides an excellent marker for defining the base of the poorly exposed Walton Member. At the north of the property in drill hole TR RDH 8010 the geophysical character of the conglomeratic unit makes destinction between the two members very difficult. A similar lack of definition is noted in the south of the property at hole TR RDH 8006.

The upper contact with the overlying Hasler Formation siltstones and claystones is conformable and while distinctive on geophysical logs is very poorly exposed and difficult to map.

Outcrop of the recessive Walton sediments is minimal with the best exposures occurring in a road cut along a gas well service road to the east of the Commotion Creek road at the eastern extremity of the property.

The Member comprises sandstone, siltstone, claystone, carbonaceous claystone, coal and occasional conglomeratic sandstone. Figure 4.2. Coal seam development occurs predominantly in the lower one-third of the Member. Interbedded claystone siltstone and channel sandstones comprise the upper two thirds of the Member.

South of the Pine River the Member varies from 60 to 88 metres averaging 68 metres with the thickest section of 88 metres (TR RDH 8006) being recorded in the extreme south of the property. North of the Pine River it varies from 51 to 65 metres averaging 54 metres in thickness.

4.2.6.1 COAL

Prior to the 1980 drilling program, data on the coals of the Walton Member were derived from gas wells both on and off the property. Two seams,

2.7 and 1.37 metres thick were intersected at a depth of 725.4 and 737.1 metres in Skelly Getty CS Commotion 93-P-12/a-23-D (Discovery Well) at the head waters of Goodrich Creek. Twenty-one Km south of this well and outside the licences, two 0.9 metre seams at 1240 and 1243.5 metres and one 1.2 metre seam at 1261 metres, were intersected in Quasar et al Oetco 93-P-5/c-28-I (not shown in maps). Logs from Skelly Getty CS Commotion 93-P-12/c-29-C approximately 5.5 Km east of the "Discovery Well" indicated no coal of any significance and this well defines the easterly limit of coal development.

The 1980 rotary and diamond drilling program demonstrated that the occurrence of these two seams is restricted to the South Pine Area. Thin coals and carbonaceous zones do occur north of the Pine River but appear discontinuous and difficult to correlate.

Most of the coal seam development occurs within the basal one third of the Member, and while a third thin seam is correlatable between a number of holes, only the two seams intersected in the

"Discovery Well" are of possible economic interest. These two seams have been labelled in ascending order, the Highhat and Caron seams. Drawings 8083 and 8084.

4.2.6.1.1 HIGHHAT SEAM

The Highhat seam occurs at the base of the Member and either lies directly on the upper conglomeratic unit of the Boulder Creek Member or within one metre of the contact. The seam varies from a few centimetres to a maximum gross thickness of 2.68 metres containing 1.74 metres of coal. The limits of the seam are defined by TR RDH 8006 in the south, TR RDH 8003 and Skelly Getty 93-P-12/c-29-C in the east, TR RDH 8005 in the northeast and TR RDH 8003 in the northwest. See drawings 8058, 8059, 8060. The term "limits of the seam" denotes the seam is either absent or very thin and uncorrelatable.

4.2.6.1.2 CARON SEAM

The upper, Caron seam, occurs within 11 to 19 metres of the base of the unit and varies in thickness from a few centimetres to a maximum

thickness of 2.70 metres gross, in the Discovery Well (an accurate net calculation was not possible from the gas well log). The seam underlies most of the northwestern portion of the South Pine area. The seam thins to the east and north and the present limits are defined by TR RDH 8007 in the south, TR RDH 8003 and Skelly Getty CS Commotion 93-P-12/c-29-C in the east, TR RDH 8004 in the northeast and TR RDH 8002 in the northwest. See Drawings 8058, 8059, 8069.

4.2.7 HASLER FORMATION

The marine Hasler Formation consists of thinly interbedded and interlaminated grey siltstones and claystones and varies in thickness from approximately 340 metres in the southern portion of the property to approximately 200 metres along the western edge and 240 metres in the Moberly River area. The lower contact with the underlying Walton Member, although not seen during mapping, is well defined on geophysical logs. The upper contact with overlying Goodrich is mapped at the first sandstone in excess of 0.5 metres.

The Hasler Formation is well exposed in Hasler Creek and to a lesser extent in the smaller tributary streams of the Pine River and in the Highhat Mountain area.

4.2.8 GOODRICH FORMATION

The Goodrich Formation comprises sandstones, occasional conglomeratic sandstones, siltstones, claystones and a few thin coals. The Formation varies in thickness from approximately 260 metres along the southwestern edge of the licences and thins northwards and eastwards to a minimum of approximately 110 metres. The lower portion of the Formation is characterized by a number of cliff forming sandstones, which become increasingly thicker from the base upwards. The contact with the underlying Hasler Formation is defined as the first sandstone in excess of 0.5 metres.

The Hasler-Goodrich contact was for the most part traceable throughout the property and was used as a marker during mapping to control the overall structure as related to the underlying Walton Member. Good exposures of the basal sandstones can be seen in cliff faces along Hasler Creek and in the Highhat Mountain area where the sandstones cap the recessive underlying Hasler sediments forming flat topped mountain masses.

4.2.9 CRUISER FORMATION

The Cruiser Formation conformably overlies the Goodrich Formation and consists of thinly intebedded and interlaminated grey claystone and siltstone similar to the Hasler sequence. The Formation varies in thickness from 160 to 260 metres, and is conformably overlain by the Dunvegan Formation.

4.2.10 DUNVEGAN FORMATION

The Dunvegan is the youngest Formation in the property occurring primarily within the property boundaries south of the Pine River. The lower portion of the Formation comprises interbedded sandstone, siltstone and claystone, but the main part of the Dunvegan is composed of sandstones from 2.4 to 12 metres thick, separated by siltstone claystone sequences up to 24 metres thick (Hughes 1967). Only the lower sequence is extensively exposed on the property.

The Dunvegan Formation was only examined in a cusory manor during mapping operations.

4.3 STRUCTURE

4.3.1 INTRODUCTION

The dominant structures within the licences are the Hulcross Syncline, Commotion, Alvin and Pete anticlines and the Moberly Thrust Fault. (See geological map).

Structures of the Outer Foothills have a characteristic pattern: broad, open synclines with wide axial zones within which the strata are flat lying or have low dips. The anticlines are relatively narrow over one quarter to one eighth the width of the synclines, and exhibits various fold forms and amplitudes. The eastern limbs of the anticlines are freqently bounded by faults.

The tectonic mode is disjunctive, and internal deformation of the strata is localized along the anticlinal crest, their steep east limbs, or within the associated faults zones. Structural movement decreases from the Peace, to the Pine and Sukunka areas. To the southwest anticlines decrease in amplitude and the faults decrease in displacement.

The Hulcross syncline, which dominates the structure of the property has an elongate trapezoid outline, contained by the northwest and north northwest trend of adjacent structures. The syncline is about 70 Km long, and at its greatest width, the intercept across the Pine Valley is about 15 Km. It adjoins the Pine River anticlinorium to the West of the licences and the common limb dips about 24° to 32° to the northeast, decreasing in a flexure against the flat beds of the syncline. The strata in the east limb of the syncline dip 10° to the southwest at the contraflexure.

North of the Moberly Valley the Carbon thrust transects the east limb of the Hulcross syncline. (West Moberly licences). The thrust overides successive formations of the Fort St. John Group northward.

The Hulcross syncline narrows to the southeast, and is closed about Latitude 55°30 , by the convergence of the Pine River and Commotion anticlines. The synclinal axis plunges northeast. The fold amplitudes of the Commotion anticline and related

Two areas were delineated on the isopach map on the basis of consistency of dip. One area covers the northwesterly dipping limb of the Hulcross syncline and the other, the horizontal to sub-horizontal strata immediately to the east. An average regional dip of 21° to 25° was determined for the western area and the eastern area is considered essentially horizontal.

The specific gravity of raw coal was obtained from analyses of both seams in one drill hole (TR RDH 8012) and is 1.67 and 1.48 for the Highhat and Caron seam respectively. No attempt was made to adjust the specific gravity for core loss as the recovery was 95% and 87% for the Highhat and Caron respectively.

Volume calculations were made for each seam in the western and eastern areas by planimetering the areas between consecutive isopach lines; for thicknesses greater than 1 metre and multiplying by the average thickness of the values of boundary isopach lines. To correct for the regional dip in the western area, the planimetered areas were multiplied by the cosecant of the dip, prior to the volume calculation.

Volumes for both areas were multiplied by the specific gravities for the respective seams and summed to obtain the total in-situ inferred resource.

folding of this trend, decreases southward. The Moberly Thrust fault trends obliquely across the general structure north of the Moberly River where Hulcross and Boulder Creek sediments have been thrust over Hasler and Goodrich strata. South of the Moberly River the thrust swings to the southeast. The continuity of the thrust to the Pine River is presently not indicated on the maps, but, rather a number of distinct thrusts faults are interpreted. Further mapping may prove the Moberly thrust to be continuous to the area northeast of the Highhat Mountain.

The Alvin anticline has a moderate amplitude, and brings up Commotion beds on its east flank and core. The anticline terminates in a southeast plunge, outlined by the Boulder Creek and Walton beds which outcrop along Alvin Creek. The east front of the anticline is modified by folds and faults, (not investigated in field work). Similar structures continue on the same southeast trend to a junction with the Commotion anticline.

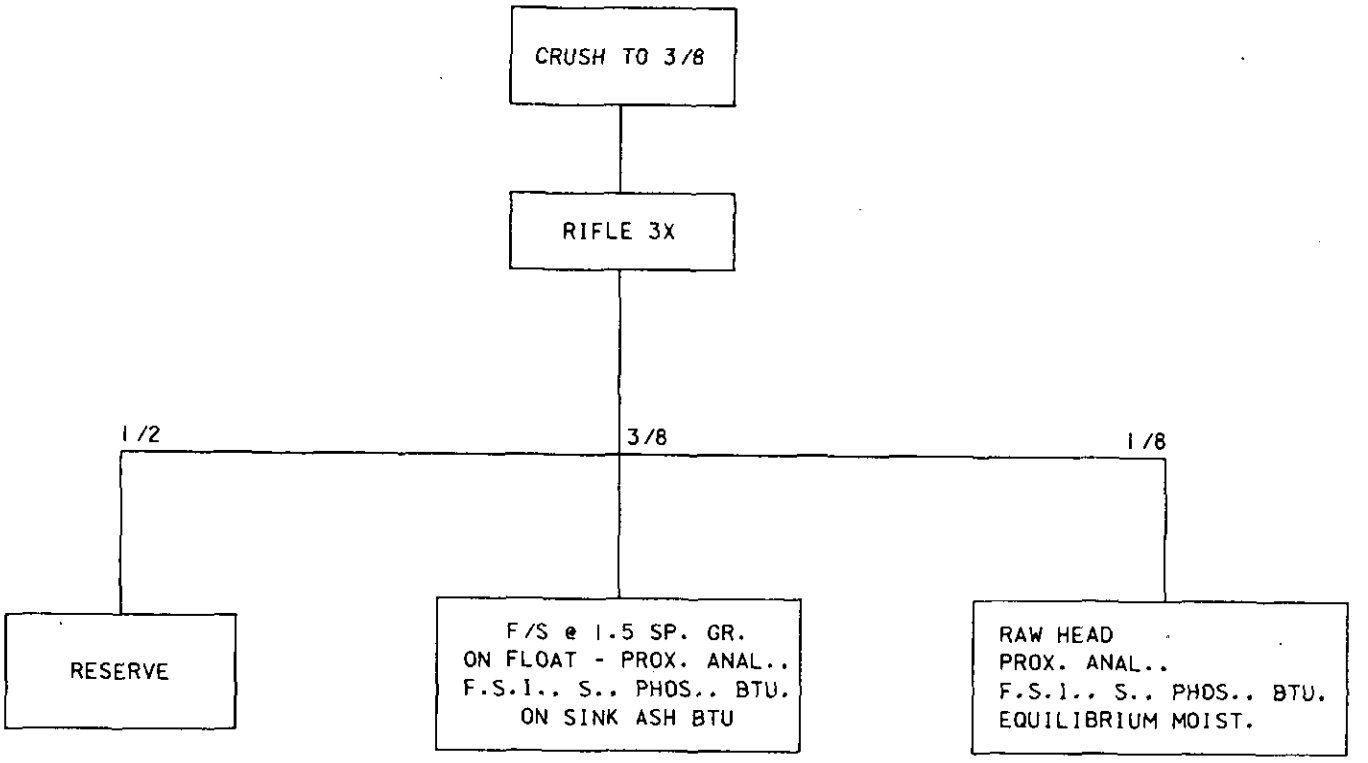
6.1 PROCEDURES

A total of four samples were taken for analysis. Two samples, from the Caron seam, were selected outside the defined resource area and one sample each from the Caron and Highhat seams within the resource area.

The two samples outside the resource area were taken from core cut during the diamond drill phase (TR RDH 8001 and TR RDH 8002) whereas the samples within the resource area were obtained by coring across the coal seam in the twinned drill hole TR RDH 8012.

Two flow sheets are represented in Figure 6.1 and Figure 6.2. The samples taken from outside the resource area were from intersections of the Caron seam with a thickness of less than 1 metre and the analytical procedures are as represented in Figure 6.1. Further testing is not deemed necessary due to the thinness of the seam. Samples of the Caron and Highhat seams within the resource area were subjected to the analytical procedures detailed in Figure 6.2.

FIG. 6.1
TREFI COAL ANALYSIS FLOW SHEET
FOR SEAMS LESS THAN 1 METRE



DWG. NO. 8016

The Commotion anticline trends southeast, oblique to the prevailing structural pattern for most of the Outer Foothills south of the Moberly River. The anticline has a broad crest with low dips, evident in exposures of the Boulder Creek and Walton Members at the Pine Valley.

The Pete anticline trends north-south and has Upper Commotion beds exposed units core.

4.3.2 SOUTH PINE AREA

Coal development of economic interest, as delineated by the 1980 drilling program, is confined to the area south of the Pine River, and, more particularily along the southwest boundary of the licences. As this will be the focus of continued exploration, the structure of the area is decribed in more detail.

The dominant structural feature of the property, the Hulcross syncline, is continuous into the South Pine Area, but closes out just north of Highhat Mountain, as does the Commotion anticline.

South of Highhat Creek no single structure is dominant but rather a number of low amplitude folds which become more crumpled and strongly folded towards the extreme south. Thrust faulting accompanies this increased deformation.

The average regional dip of the southwest limb of the Hulcross syncline is in the order of 21° to the northeast rapidly flattening to 5° or less across the broad indistinct synclinal axis before gently rising to form the Commotion anticline. The northeastern limb of the anticline is cut by a number of discontinuous thrust faults. The Moberly Thrust fault may be continuous into this area from the Moberly River area, however further mapping along the trend is required.

Exposures of the Walton sediments are confined to the up turned southwestern limb of the Hulcross syncline and to the core of the structure as marked by the Commotion strata near the mouth of Goodrich Creek in the Pine River Valley. The thickness of the overlying Hasler through to Dunvegan sediments increases rapidly due to structure in the west and topography in the Goodrich Creek area in

the east. These formations form the dominant exposures over most of the area north of the Highhat River.

South of the Highhat River low amplitude folds expose Hasler Formation silts and clays over a broad area with isolated arrosional remanents of the lower Goodrich sandstones capping Highhat Mountain and the hill to the north.

A northwest trending shear zone with minimal displacement is interpreted just west of Highhat Mountain. (Cross Section 10 000). At its northern extremity, the shear zone begins to swing northeast and it is possible that the fault is continuous between Highhat Mountain and the hill immediately to the north and may extend to the Highhat River. Further while the fault is presently shown as a shear zone, vertical movement along the fault is possible and this area should be examined in detail.

In the extreme south the amplitude of the folds increases and over thrusting of the sediments to the east has taken place.

5.0 INFERRED RESOURCES

5.1 RESOURCE MAGNITUDE

The resources of the property occur within the Highhat and Caron seams of the Walton Member within the South Pine Area. Coal bearing Gates Member and Gething Formation are noted on the oil and gas well logs in the South Pine Area but the depths to these coals, over 900 metres for the Gates and 1300 metres for the Gething, precludes their inclusion in the resource figures in the South Pine Area.

Insufficient data is presently available on the Gething coals in the West Moberley Block on which to base a resource calculation.

In-situ inferred resources figures for the Walton Member in the South Pine Area were calculated for two seam thickness classifications, 1 to 1.49 metres and 1.5 metres and greater, for both the Caron and Highhat seams to a depth of cover of 600 metres. The base of the Walton Member, and in most cases, the base of the Highhat seam, was taken as the datum.

Employing the above parameters, a total resource of 202.5 million tonnes in seams greater than 1 metre lie within the resource area delineated on Drawings 8065, 8066 8067. Of this 202.5 million tonnes, 122.0 million tonnes occur in seams in excess of 1.5 metres. Because most of the total resource lies at depths in excess of 60 metres, (Drawings 8061, 8062, 8063, 8064) coal extraction will in all probability, be by underground methods and hence the in-situ inferred resource 122.0 million tonnes in seams in excess of 1.5 metres is of most significance. The following table summarizes the inferred resources by seam and thickness classification:

THICKNESS CLASSIFICATION	IN-SITU INFERRED RESOURCE (million tonnes)	
	Caron Seam	Highhat Seam
1 to 1.49 metres	24.5	56
1.5 metres and greater	59.0	63
Total in-situ inferred resource in seams 1 metre and greater	83.5	119.0

See Appendix VI for detailed calculations.

5.2 ACCESS TO RESOURCES AREA

The northern portion of the resource area lies approximately 10 kilometers south of the B.C.R. railway line along the Hasler Cr. Valley.

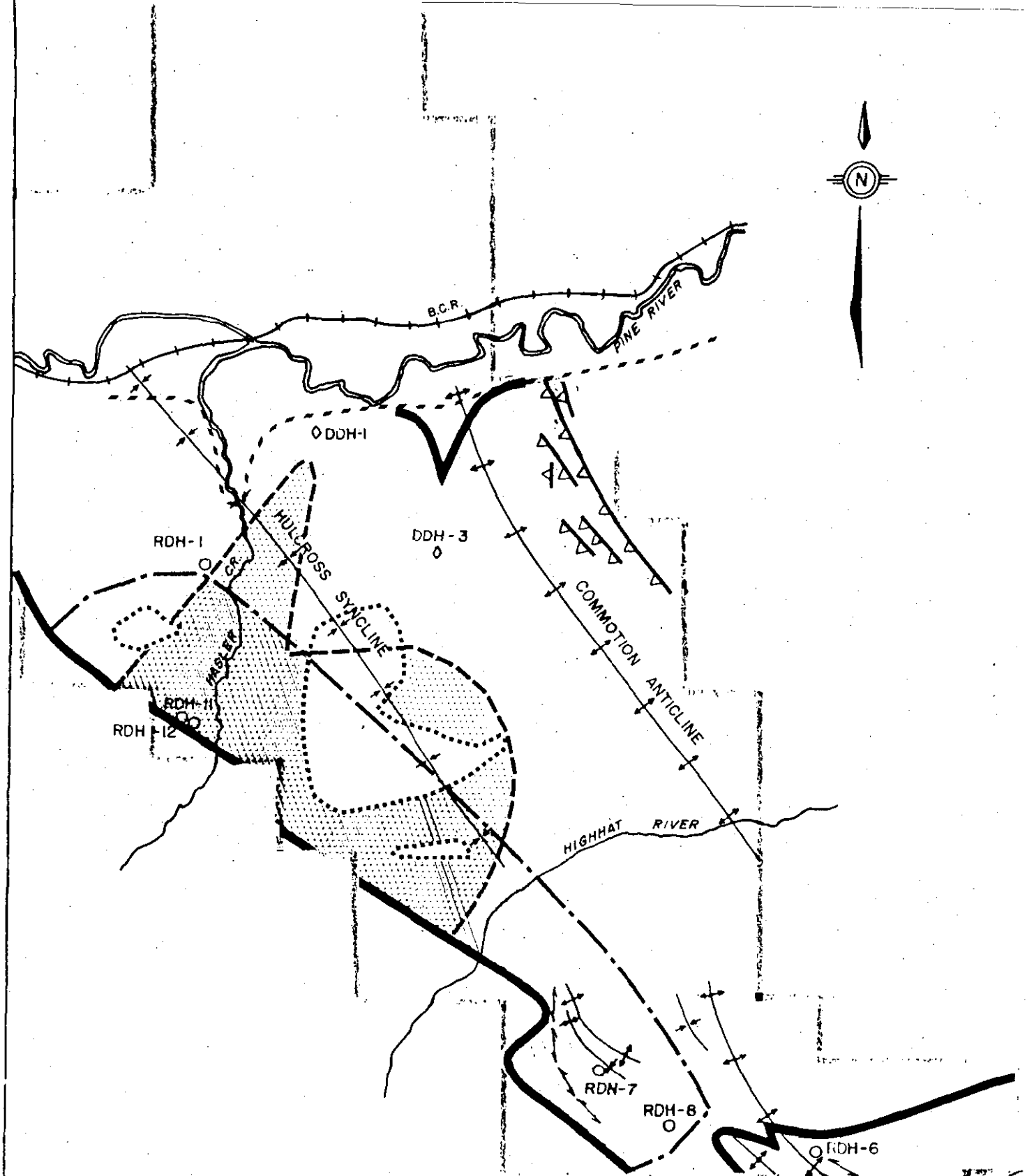


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Fig. 5.1

TREFI COAL PROJECT

DELINEATION OF RESOURCE AREA AND DISTRIBUTION OF COAL BEARING WALTON MEMBER

PREPARED BY:	SCALE 8015
APPROVED BY: DATE:	DRAWING No.

- CARON SEAM IN EXCESS OF 1m.
- HIGHHAT SEAM IN EXCESS OF 1m.
- 600 m. OF COVER
- WALTON MEMBER
- QUATERNARY
- ANTICLINE / SYNCLINE
- THRUST FAULT / SHEER

5.3 RESOURCE CALCULATION PROCEDURES AND PARAMETERS

Resources figures for the Trefi property were calculated from the seam isopach maps constructed for the Highhat and Caron seams, using a total of 11 holes as control.

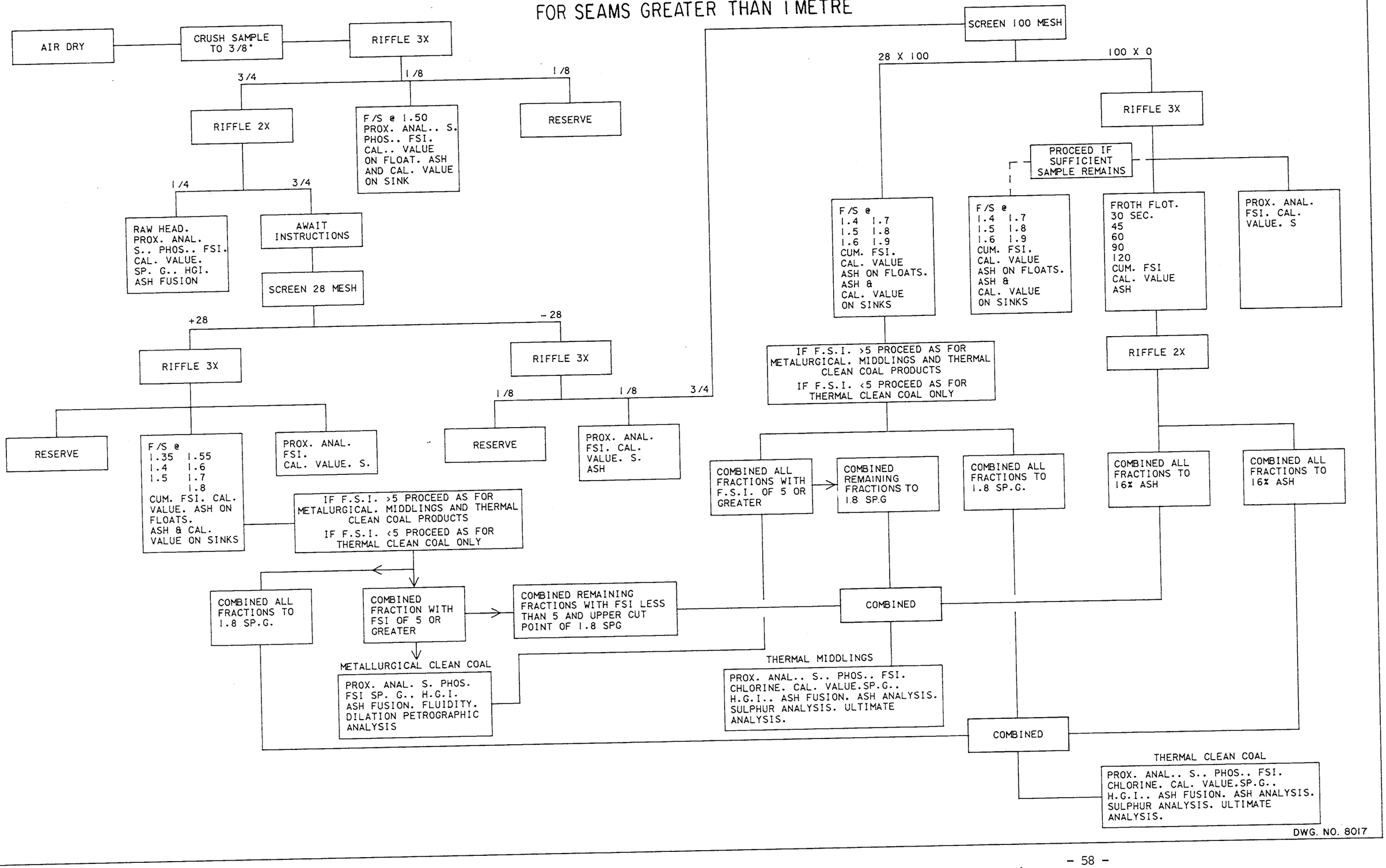
The following parameters and procedures were used to derive the in-situ inferred resource potential; Coal seams thicknesses used to construct the isopachs were, with one exception, the total seam thicknesses intersected in each drillhole. The exception is the Highhat seam intersection in TR RDH 8006 where only the upper 1.34 of a 2.68 coal zone was used.

Tonnages were calculated for both seams with thicknesses greater than 1 metre and the area encompassed by the 1 metre isopach and isopachs with values greater than 1 metre, is referred to as the "Resource Area".

Within the "Resource Area" a further, possibly more meaningful calculation, was made for both seams with thicknesses of 1.5 metres and greater.

FIG·6·2

TREFI COAL ANALYSIS FLOW SHEET FOR SEAMS GREATER THAN 1 METRE



DWG. NO. 8017

[205.377]8|P060.CHT.1

The washability results of the Caron seam, when reviewed, showed the possibility of producing more than one clean coal product and the remainder of the flow sheet was designed to produce the following products:

a) Metallurgical and Middlings Thermal.

b) Thermal

The quality and washability characteristics of the Highhat seam are such that the only a thermal clean coal product was produced. The limiting parameters in determining the end products were an F.S.I. of 5 or greater for the metallurgical product. A cut point of 1.8 specific gravity in the +28 mesh and 28 X 100 fractions and 16% maximum ash in the 100 X 0 fractions, were selected as limiting criteria for the Middlings and Thermal clean coal products.

6.2 RESULTS

Coal occurring in the Walton Member is of medium volatile rank.

The results of the Proximate analysis of the raw coal for both seams is reproduced on Table 6.1 and detailed coal seam logs appear in Appendix IV. Coal quality data appears in Appendix V.

Both seams were examined on a multi product basis and the values of the metallurgical and thermal middlings products for the Caron seam and the thermal products for both the Highhat and Caron seams appear in Tables 6.2, 6.3 and 6.4 respectively.

A number of combinations are possible, however, two alternatives were examined and presented in Tables 6.5, 6.6 and 6.7.

A metallurgical coal with an ash of 7.66%; V.M. of 25.6%, FSI of 5 and 37.03% yield can be produced together with a thermal product comprising a combination of the middlings from the Caron seam and the clean coal product of the Highhat seam. Such a thermal coal would have a BTU value of 11,308 at 22.30% ash with a yield of 51.00%.

Alternatively a thermal product only could be produced from both seams with a BTU value of 12,054; ash of 17.95% ash with a overall yield of 72.22%.

As only one sample of each seam was tested, the above results can only be considered as a guide to the quality, washability characteristics and utilization of the Trefi coals.

Both seams were examined on a multi product basis and the values of the metallurgical and thermal middlings products for the Caron seam and the thermal products for both the Highhat and Caron seams appear in Tables 6.2, 6.3 and 6.4 respectively.

A number of combinations are possible, however, two alternatives were examined and presented in Tables 6.5, 6.6 and 6.7.

A metallurgical coal with an ash of 7.66%; V.M. of 25.6%, FSI of 5 and 37.03% yield can be produced together with a thermal product comprising a combination of the middlings from the Caron seam and the clean coal product of the Highhat seam. Such a thermal coal would have a BTU value of 11424 at 21.69% ash with a yield of 51.93%.

Alternatively a thermal product only could be produced from both seams with a BTU value of 12053; ash of 17.99% ash with a overall yield of 70.44%.

As only one sample of each seam was tested, the above results can only be considered as a guide to the quality, washability characteristics and utilization of the Trefi coals.

COAL SAMPLE DATA

Sample No.	Drill Hole	Seam	Intersection
0001	TR RDH 8001	Caron	170.28-171.16m
0002	TR RDH 8002	Caron	215.78-216.26m
01349	TR RDH 8012	Caron	107.42-109.52m
01350	TR RDH 8012	Highhat	120.85-122.47m

Samples 0001 and 0002 analysized according to Figure 6.1

Samples 01349 and 01350 analysized according to Figure 6.2

TABLE 6.1

HEAD ANALYSIS

	Caron	Highhat
Ash	24.81	43.14%
Moisture	1.13	1.10
V.M.	21.85	18.30
V.M. dmmf	28.80	28.86
F.C.	51.21	37.46
Fuel Ratio	2.34	2.05
Calorific Value Cal/gm	6024	4331
BTU/16	10,844	7796
S.	0.44	0.27
Sp. G.	1.48	1.67
FSI	2.	1.

1. The values are based on one sample for each seam.

TABLE 6.1

HEAD ANALYSIS

	Caron	Highhat
Ash	24.81	43.14%
Moisture	1.13	1.10
V.M.	21.85	18.30
V.M. dmmf	28.80	28.86
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BTU/16	10.844	7796
S.	0.44	0.27
Sp. G.	1.48	1.67
FSI	2.	1.

1. The values are based on one sample for each seam.

TABLE 6.2

METALLURGICAL CLEAN COAL

adb

	Caron Seam
Yield	37.03%
Ash	7.66
Moisture	0.96
V.M.	25.60
V.M. dmmf	27.39
F.C.	65.78
S.	0.50
F.S.I.	5
Sp. G.	1.35

TABLE 6.3

MIDDLINGS

	Caron Seam
Yield	47.01%
Ash	25.66
Mositure	0.80
V.M.	23.07
F.C.	50.47
Calorific Value Cal/gm	5925.
BTU/lb	10,665
Sp. G.	1.52
S	0.46

TABLE 6.2

METALLURGICAL CLEAN COAL

adb

	Caron Seam
Yield	37.03%
Ash	7.66
Moisture	0.96
V.M.	25.60
V.M. dmmf	27.39
F.C.	65.78
S.	0.50
F.S.I.	5
Sp. G.	1.35

TABLE 6.3

MIDDLINGS

	Coran Seam
Yield	47.01%
Ash	25.66
Mositure	0.80
V.M.	23.07
F.C.	50.47
Calorific Value Cal/gm	5925.
BTU/lb	10,751
Sp. G.	1.52
S	0.46

TABLE 6.4

THERMAL CLEAN COAL

CARON AND HIGHHAT SEAMS

		Caron	Highhat
Yield		84.03%	56.85%
Ash		17.71	18.41
Moisture		0.90	0.85
V.M.		23.98	22.42
V.M. dmmf		28.06	26.29
F.C.		57.41	58.32
Calorific Value	Cal/gm	6,697	6,669
	BTU/lb	12,055	12,051
F.S.I.		3	1.5
Sp. G.		1.42	1.45
HGI		53	59.
S		0.50	0.43

TABLE 6.4

THERMAL CLEAN COAL

CARON AND HIGHHAT SEAMS

		Caron	Highhat
Yield		84.03%	5685
Ash		17.71	18.41
Moisture		0.90	0.85
V.M.		23.98	22.42
V.M. dmmf		28.06	26.29
F.C.		57.41	58.32
Calorific Value	Cal/gm	66.87	6696
	BTU/lb		
F.S.I.		3	1.5
Sp. G.		1.42	1.45
HGI		53	59.
S		0.50	0.43

TABLE 6.5

METALLURGICAL CLEAN COAL PRODUCT

CARON SEAM ONLY

	adb
Yield	37.03%
Ash	7.66
Moisture	0.96
V.M.	25.60
V.M. dmmf	27.39
F.C.	65.78
S.	0.50
F.S.I.	5
Sp. G.	1.35

Table 6.6

AVE. THERMAL PRODUCT

MIDDLINGS FROM CARON AND TOTAL CLEAN COAL

FROM HIGHHAT SEAMS

	adb
Yield	51.00%
Ash	22.30
Moisture	0.82
V.M.	22.77
F.C.	54.11
Calorific Value Cal/gm	6,282
BTU/lb	11,308
Sp.G.	1.49
S	0.46

Weighted average

TABLE 6.5

METALLURGICAL CLEAN COAL PRODUCT

CARON SEAM ONLY

	adb
Yield	37.03%
Ash	7.66
Moisture	0.96
V.M.	25.60
V.M. dmmf	27.39
F.C.	65.78
S.	0.50
F.S.I.	5
Sp. G.	1.35

Table 6.6

AVE. THERMAL PRODUCT

MIDDLINGS FROM CARON AND TOTAL CLEAN COAL

FROM HIGHHAT SEAMS

		adb
Yield		51.93%
Ash		21.69
Moisture		0.82
V.M.		22.71
F.C.		54.70
Calorific Value	Cal/gm	6346
	BTU/lb	11424
Sp.G.		1.48
S		0.46

TABLE 6.7

AVE. THERMAL CLEAN COAL PRODUCT

CARON AND HIGHHAT SEAMS

adb

Yield		72.22
Ash		17.95
M.		0.88
V.M.		23.45
V.M. dmmf		27.46
F.C.		57.72
Fuel Ratio		2.46
Calorific Value	Cal/gm	6,695
	BTU/lb	12,054
Sp. G.		1.43
S		0.47

Weighted by seam thickness; Sp.G. and Yield

TABLE 6.7

AVE. THERMAL CLEAN COAL PRODUCT

CARON AND HIGHHAT SEAMS

adb

Yield		70.44
Ash		17.99
M.		0.88
V.M.		23.35
V.M. dmmf		27.35
F.C.		57.78
Fuel Ratio		2.47
Calorific Value	Cal/gm	6696
	BTU/lb	12053
Sp. G.		1.43
S		0.47

Weighted Average

7.0 RECOMMENDATIONS

The results of the 1980 exploration infer a resource potential of 204.8 million tonnes in seams in excess of 1 metre occurring in a relatively limited area, south of the Pine River. Drilling north of the Pine either did not intersect coal or relatively thin coals, none in excess of 1 metre were present. The following recommendations are made with respect to the licences:

a) A total of 124 licences, the majority of which lie north of the Pine River, should be allowed to lapse. See Figure 7.1; Drawing 8027 and Appendix VII

b) At present there are only 3 drill holes and one gas well in the Resource Area and further drilling will be required to prove up the continuity of both seams.

c) Within the Resource Area, quality data is available for each seam in only one drill hole and both seams should be cored in each hold for analysis in the 1981 program.

d) TR RDH 8002 experienced excessive water problems and it is thought that the hole did not TD in the Boulder Creek although some conglomerate was intersected near TD. The possible presence of the Highhat seam in this area should be examined.

e) The area immediately west of Highhat Mountain where a shear zone was inferred during the 1980 mapping should be mapped in detail. Control on this break is poor and the fault could continue to the northwest, immediately north of Highhat Mountain and have vertical movement.

f) A total of 6 licences should be applied for south of TR RDH 8008 and 8006 to cover potential resources in that area.

93-P-5/F 61, 62, 71, 72

93-P-5/F 81, 82, 91, 92

93-P-5/F 83, 84, 93, 94

93-P-5/K 1, 2, 11, 12

93-P-5/K 3, 4, 13, 14

93-P-5/K 5, 6, 15, 16

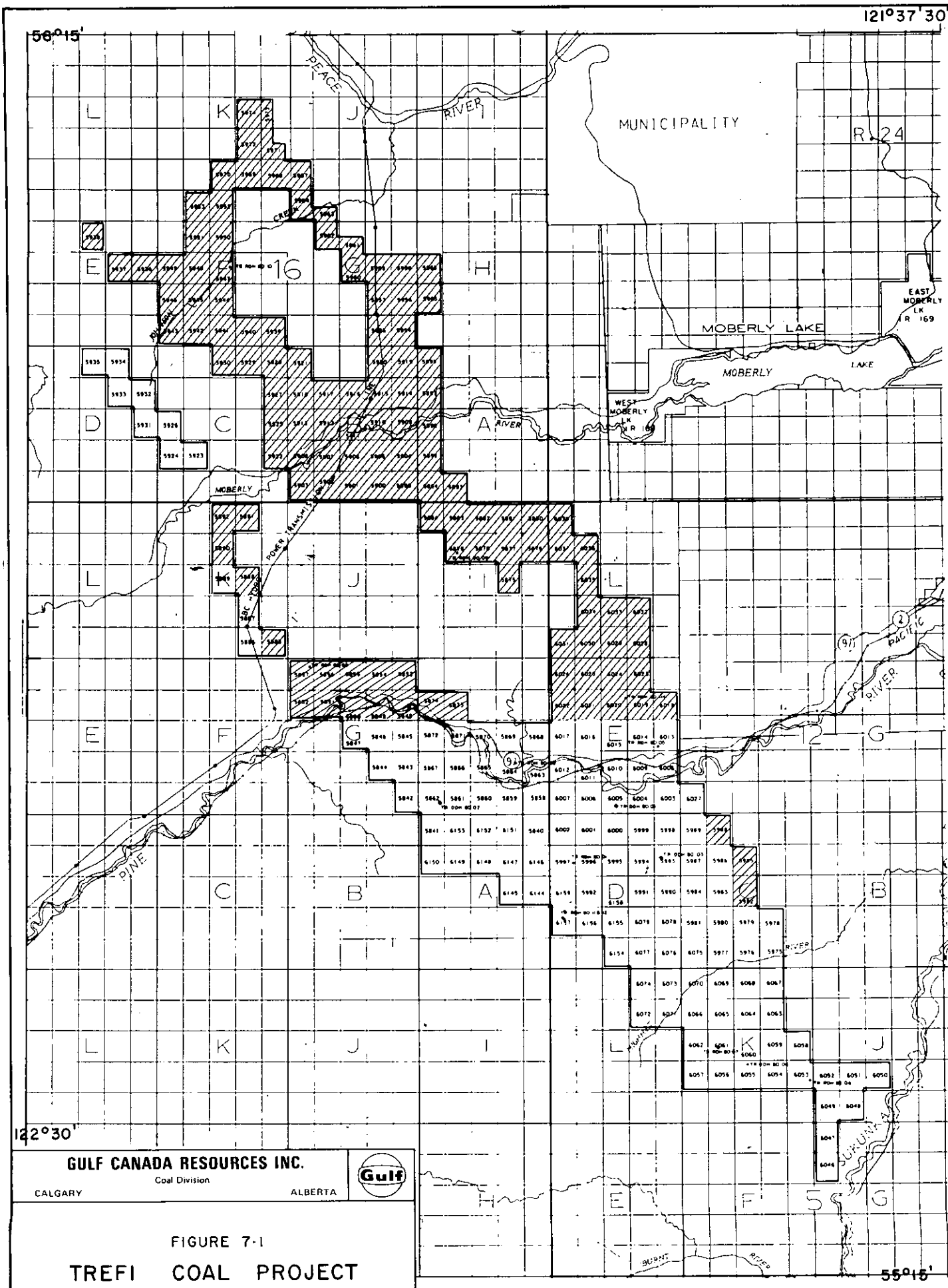

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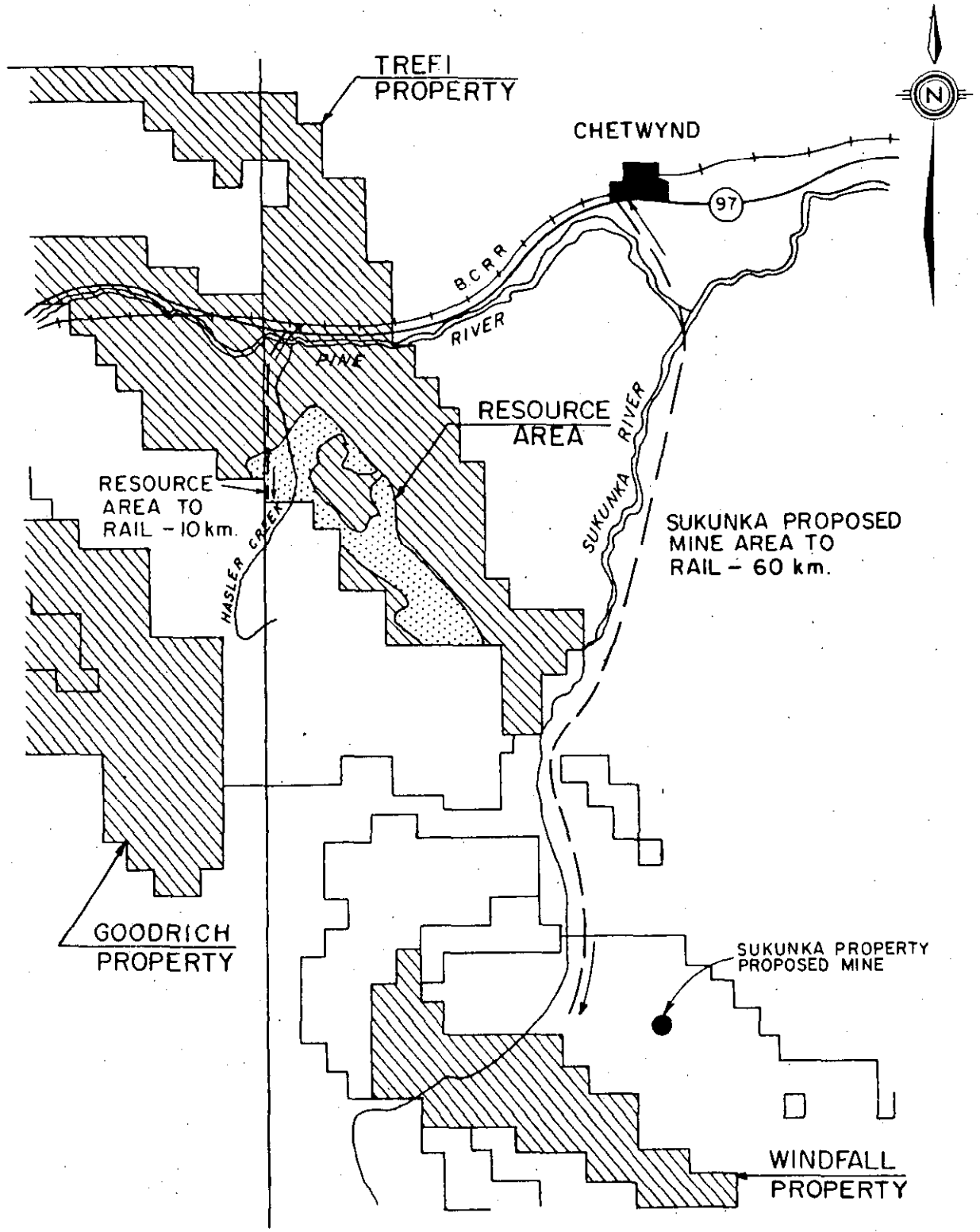
FIGURE 7-1

TREFI COAL PROJECT
LICENCES TO BE RETAINED

PREPARED BY:	SCALE
APPROVED BY:	DATE: MAY 5, 81 DRAWING No: 8018



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COMPARISON OF ACCESS ROUTES

Fig. 7.2

PREPARED BY:	SCALE
APPROVED BY: DATE:	DRAWING No. 8019

8.0 SELECTED BIBLIOGRAPHY

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1979 - Peace, Moberly and Pine areas, Northeast British Columbia; Geology of the Commotion Formation and Coal Prospects (93-0, 93-P).

Scott 1968 - Lower Cretaceous Bullhead and Fort St. John Groups, between Smoky and Peace Rivers, Rocky Mountain Foothills Alberta and British Columbia, Geol. Surv. Can., Bull. 152.

APPENDIX 1

LEGAL DESCRIPTION OF LICENCES

APPENDIX I

Legal Description of the

Trefi Coal Licences

Map Sheet	Block	Units	Hectares	Licence No.
93-0-16	A	7, 8, 17, 18	292	5893
		9, 10, 19, 20	292	5894
		29, 30, 39, 40	292	5895
		49, 50, 59, 60	292	5896
		69, 70, 79, 80	291	5897
		89, 90, 99, 100	291	5898
93-0-16	B	1, 2, 11, 12	292	5899
		3, 4, 13, 14	292	5900
		5, 6, 15, 16	292	5901
		7, 8, 17, 18	292	5902
		9, 10, 19, 20	292	5903
		21, 22, 31, 32	292	5904
		23, 24, 33, 34	292	5905
		25, 26, 35, 36	292	5906
		27, 28, 37, 38	292	5907
		29, 30, 39, 40	292	5908
		41, 42, 51, 52	292	5909
		43, 44, 53, 54	292	5910
		45, 46, 55, 56	292	5911
		47, 48, 57, 58	292	5912
		49, 50, 59, 60	292	5913
		61, 62, 71, 72	291	5914
		63, 64, 73, 74	291	5915
		65, 66, 75, 76	291	5916
		67, 68, 77, 78	291	5917
		69, 70, 79, 80	291	5918
		81, 82, 91, 92	291	5919
		83, 84, 93, 94	291	5920
		89, 90, 99, 100	291	5921
93-0-16	C	21, 22, 31, 32	292	5922
		27, 28, 37, 38	292	5923
		29, 30, 39, 40	292	5924
		41, 42, 51, 52	292	5925
		49, 50, 59, 60	292	5926
		61, 62, 71, 72	291	5927
		81, 82, 91, 92	291	5928
		83, 84, 93, 94	291	5929
		85, 86 95, 96	291	5930

Map Sheet	Block	Units	Hectares	Licence No.
93-0-16	D	41, 42, 51, 52	292	5931
		61, 62, 71, 72	291	5932
		63, 64, 73, 74	291	5933
		83, 84, 93, 94	291	5934
		85, 86, 95, 96	291	5935
93-0-16	E	41, 42, 51, 52	291	5936
		43, 44, 53, 54	291	5937
		65, 66, 75, 76	291	5938
93-0-16	F	1, 2, 11, 12	291	5939
		3, 4, 13, 14	291	5940
		5, 6, 15, 16	291	5941
		7, 8, 17, 18	291	5942
		9, 10, 19, 20	291	5943
		25, 26, 35, 36	291	5944
		27, 28, 37, 38	291	5945
		29, 30, 39, 40	291	5946
		45, 46, 55, 56	291	5947
		47, 48, 57, 58	291	5948
		49, 50, 59, 60	291	5949
		65, 66, 75, 76	291	5950
		67, 68, 77, 78	291	5951
		85, 86, 95, 96	291	5952
		87, 88, 97, 98	291	5953
93-0-16	G	1, 2, 11, 12	291	5954
		3, 4, 13, 14	291	5955
		21, 22, 31, 32	291	5956
		23, 24, 33, 34	291	5957
		41, 42, 51, 52	291	5958
		43, 44, 53, 54	291	5959
		45, 46, 55, 56	291	5960
		65, 66	146	5961
		67, 68, 77, 78	291	5962
		87, 88	146	5963
		89, 90, 99, 100	291	5964
93-0-16	H	29, 30, 39, 40	291	5965
		49, 50, 59, 60	291	5966
93-0-16	J	9, 10, 19, 20	291	5967
93-0-16	K	1, 2, 11, 12	291	5968
		3, 4, 13, 14	291	5969
		5, 6, 15, 16	291	5970
		21, 22, 32	218	5971
		23, 24, 33, 34	290	5972
		42, 52	145	5973
		43, 44, 53, 54	290	5974

Map Sheet	Block	Units	Hectares	Licence No.
93-0-9	A	41, 42, 51, 52	293	6144
		43, 44, 53, 54	293	6145
		61, 62, 71, 72	293	6146
		63, 64, 73, 74	293	6147
		65, 66, 75, 76	293	6148
		67, 68, 77, 78	293	6149
		69, 70, 79, 80	293	6150
		83, 84, 93, 94	293	6151
		85, 86, 95, 96	293	6152
		87, 88, 97, 98	293	6153
		81, 82, 91, 92	293	5840
		89, 90, 99, 100	293	5841
93-0-9	G	1, 2, 11, 12	293	5842
		21, 22, 31, 32	293	5843
		23, 24, 33, 34	293	5844
		41, 42, 51, 52	293	5845
		43, 43, 53, 54	293	5846
		45, 46, 55, 56	293	5847
		61, 62, 71, 72	293	5848
		63, 64, 73, 74	293	5849
		65, 66, 75, 76	293	5850
		67, 68, 77, 78	293	5851
		69, 70, 79, 80	293	5852
		81, 82, 91, 92	293	5853
		83, 84, 93, 94	293	5854
		85, 86, 95, 96	293	5855
		87, 88, 97, 98	293	5856
		89, 90, 99, 100	293	5857
93-0-9	H	1, 2, 11, 12	293	5858
		3, 4, 13, 14	293	5859
		5, 6, 15, 16	293	5860
		7, 8, 17, 18	293	5861
		9, 10, 19, 20	293	5862
		21, 22, 31, 32	293	5863
		23, 24, 33, 34	293	5864
		25, 26, 35, 36	293	5865
		27, 28, 37, 38	293	5866
		29, 30, 39, 40	293	5867
		41, 42, 51, 52	293	5868
		43, 44, 53, 54	293	5869
		45, 46, 55, 56	293	5870
		47, 48, 57, 58	293	5871
		49, 50, 59, 60	293	5872
		67, 68, 77, 78	293	5873
		69, 70, 79, 80	293	5874

Map Sheet	Block	Units	Hectares	Licence No.
93-O-9	I	43, 44, 53, 54	292	5875
		61, 62, 71, 72	292	5976
		63, 64, 73, 74	292	5877
		65, 66, 75, 76	292	5878
		67, 68, 77, 78	292	5879
		81, 82, 91, 92	292	5880
		83, 84, 93, 94	292	5881
		85, 86, 95, 96	292	5882
		87, 88, 97, 98	292	5883
		89, 90, 99, 100	292	5884
93-O-9	K	1, 2, 11, 12	292	5885
		3, 4, 13, 14	292	5886
		23, 24, 33, 34	292	5887
		43, 44, 53, 54	292	5888
		45, 46, 55, 56	292	5889
		65, 66, 75, 76	292	5890
		83, 84, 93, 94	292	5891
		85, 86, 95, 96	292	5892
93-P-12	C	3, 4, 13, 14	294	5975
		5, 6, 15, 16	294	5976
		7, 8, 17, 18	294	5977
		23, 24, 33, 34	293	5978
		25, 26, 35, 36	293	5979
		27, 28, 37, 38	293	5980
		29, 30, 39, 40	293	5981
		45, 46, 55, 56	293	5982
		47, 48, 57, 58	293	5983
		49, 50, 59, 60	293	5984
		65, 66, 75, 76	293	5985
		67, 68, 77, 78	293	5986
		69, 70, 79, 80	293	5987
		87, 88, 97, 98	293	5988
		89, 90, 99, 100	293	5989
		9, 10, 19, 20	294	6075
93-P-12	D	41, 42, 51, 52	293	5990
		43, 44, 53, 54	293	5991
		47, 48, 57, 58	293	5992
		61, 62, 71, 72	293	5993
		63, 64, 73, 74	293	5994
		65, 66, 75, 76	293	5995
		67, 68, 77, 78	293	5996
		69, 70, 79, 80	293	5997
		81, 82, 91, 92	293	5998
		83, 84, 93, 94	293	5999
		85, 86, 95, 96	293	6000
		87, 88, 97, 98	293	6001
		89, 90, 99, 100	293	6002

Map Sheet	Block	Units	Hectares	Licence No.
93-P-12	D	5, 6, 15, 16	294	6154
		25, 26, 35, 36	293	6155
		27, 28, 37, 38	293	6156
		29, 30, 39, 40	293	6157
		45, 46, 55, 56	293	6158
		49, 50, 59, 60	293	6159
		1, 2, 11, 12	294	6076
		3, 4, 13, 14	294	6077
		21, 22, 31, 32	293	6078
		23, 24, 33, 34	293	6079
93-P-12	E	1, 2, 11, 12	293	6003
		3, 4, 13, 14	293	6004
		5, 6, 15, 16	293	6005
		7, 8, 17, 18	293	6006
		9, 10, 19, 20	293	6007
		21, 22, 31, 32	293	6008
		23, 24, 33, 34	293	6009
		25, 26, 35, 36	293	6010
		27, 28, 37, 38	293	6011
		29, 30, 39, 40	293	6012
		41, 42, 51, 52	293	6013
		43, 44, 53, 54	293	6014
		45, 46, 55, 56	293	6015
		47, 48, 57, 58	293	6016
		49, 50, 59, 60	293	6017
		61, 62, 71, 72	293	6018
		63, 64, 73, 74	293	6019
		65, 66, 75, 76	293	6020
		67, 68, 77, 78	293	6021
		69, 70, 79, 80	293	6022
		83, 84, 93, 94	293	6023
		85, 86, 95, 96	293	6024
		87, 88, 97, 98	293	6025
		89, 90, 99, 100	293	6026
93-P-12	F	9, 10, 19, 20	293	6027
93-P-12	L	3, 4, 13, 14	292	6028
		5, 6, 15, 16	292	6029
		7, 8, 17, 18	292	6030
		9, 10, 19, 20	292	6031
		23, 24, 33, 34	292	6032
		25, 26, 35, 36	292	6033
		27, 28, 37, 38	292	6034
		47, 48, 57, 58	292	6035
		67, 68, 77, 78	292	6036
		69, 70, 79, 80	292	6037
		89, 90, 99, 100	292	6038

Map Sheet	Block	Units	Hectares	Licence No.
93-P-12	D	5, 6, 15, 16	294	6154
		25, 26, 35, 36	293	6155
		27, 28, 37, 38	293	6156
		29, 30, 39, 40	293	6157
		45, 46, 55, 56	293	6158
		49, 50, 59, 60	293	6159
		1, 2, 11, 12	294	6076
		3, 4, 13, 14	294	6077
		21, 22, 31, 32	293	6078
		23, 24, 33, 34	293	6079
93-P-12	E	1, 2, 11, 12	293	6003
		3, 4, 13, 14	293	6004
		5, 6, 15, 16	293	6005
		7, 8, 17, 18	293	6006
		9, 10, 19, 20	293	6007
		21, 22, 31, 32	293	6008
		23, 24, 33, 34	293	6009
		25, 26, 35, 36	293	6010
		27, 28, 37, 38	293	6011
		29, 30, 39, 40	293	6012
		41, 42, 51, 52	293	6013
		43, 44, 53, 54	293	6014
		45, 46, 55, 56	293	6015
		47, 48, 57, 58	293	6016
		49, 50, 59, 60	293	6017
		61, 62, 71, 72	293	6018
		63, 64, 73, 74	293	6019
		65, 66, 75, 76	293	6020
		67, 68, 77, 78	293	6021
		69, 70, 79, 80	293	6022
		83, 84, 93, 94	293	6023
		85, 86, 95, 96	293	6024
		87, 88, 97, 98	293	6025
		89, 90, 99, 100	293	6026
93-P-12	F	9, 10, 19, 20	293	6027
93-P-12	L	3, 4, 13, 14	292	6028
		5, 6, 15, 16	292	6029
		7, 8, 17, 18	292	6030
		9, 10, 19, 20	292	6031
		23, 24, 33, 34	292	6032
		25, 26, 35, 36	292	6033
		27, 28, 37, 38	292	6034
		47, 48, 57, 58	292	6035
		67, 68, 77, 78	292	6036
		69, 70, 79, 80	292	6037
		89, 90, 99, 100	292	6038

Map Sheet	Block	Units	Hectares	Licence No.
93-P-5	G	69, 70, 79, 80	294	6046
		89, 90, 99, 100	294	6047
93-P-5	J	7, 8, 17, 18	294	6048
		9, 10, 19, 20	294	6049
		25, 26, 35, 36	294	6050
		27, 28, 37, 38	294	6051
		29, 30, 39, 40	294	6052
93-P-5	K	21, 22, 31, 32	294	6053
		23, 24, 33, 34	294	6054
		25, 26, 35, 36	294	6055
		27, 28, 37, 38	294	6056
		29, 30, 39, 40	294	6057
		41, 42, 51, 52	294	6058
		43, 44, 53, 54	294	6059
		45, 46, 55, 56	294	6060
		47, 48, 57, 58	294	6061
		49, 50, 59, 60	294	6062
		63, 64, 73, 74	294	6063
		65, 66, 75, 76	294	6064
		67, 68, 77, 78	294	6065
		69, 70, 79, 80	294	6066
		83, 84, 93, 94	294	6067
		85, 86, 95, 96	294	6068
		87, 88, 97, 98	294	6069
		89, 90, 99, 100	294	6070
93-P-5	L	61, 62, 71, 72	294	6071
		63, 64, 73, 74	294	6072
		81, 82, 91, 92	294	6073
		83, 84, 93, 94	294	6074

BF/jc
81-02-25

APPENDIX II

SUMMARY OF DIAMOND AND ROTARY DRILL HOLE RESULTS

DRILL HOLE DATA - TREFI COAL PROJECT

DRILL HOLE #	SURF. ELEV.	TOP of KCmw depth	TOP of KCmw elev.	TOP of KCmb depth	TOP of KCmb elev.	TOTAL DEPTH	OTHER FM. TOPS depth	OTHER FM. TOPS elev.		COAL INTERCEPTS C = Caron H = Highhat	APPARENT Coal Thickness	TRUE COAL Thickness
TR RDH 80 01	775.0	228.0	547.0	305.2	469.8	317.0			C	286.14–286.94	0.80	0.80
										294.65–295.08	0.43	0.43
									H	304.02–304.94	0.92	0.92
TR RDH 80 02	698.0	323.8	374.2	374.3	323.7	382.0				338.82–339.25	0.43	0.43
										343.30–343.93	0.63	0.63
										376.76–377.63	0.87	0.87
TR RDH 80 03	893.0	174.0	719.0	227.7	665.3	244.0				215.65–216.23	0.58	0.57
TR RDH 80 04	787.0	36.2	749.8	101.3	685.7	105.5				88.25– 88.75	0.50	0.50
										100.05–100.70	0.65	0.65
TR RDH 80 05	733.0			13.3	719.7	399.0	122.3 KCmh	610.7		245.80–246.10	0.30	0.30
							216.5 KCmg	516.5		268.25–269.15	0.90	0.90
							381.3 KM ?	351.7				
TR RDH 80 06	1060.0	6.2	1053.8	94.0	966.0	247.0	142.5KCmh	917.5		NO SIGNIFICANT COAL		
TR RDH 80 07	1213.0	134.5	1078.5	190.7	1022.3	201.5				156.30–156.49	0.19	0.19
										183.97–184.54	0.57	0.57
									H	188.53–190.50	1.97	1.94
TR RDH 80 08	1095.0	88.2	1006.8	148.5	946.5	171.5				145.59–148.30	2.71	2.68

DRILL HOLE DATA - TREFI COAL PROJECT

DRILL HOLE #	SURF. ELEV.	TOP of KCmw depth	TOP of KCmw elev.	TOP of KCmb depth	TOP of KCmb elev.	TOTAL DEPTH	OTHER FM. TOPS depth	OTHER FM. TOPS elev.		COAL INTERCEPTS C = Caron H = Highhat	APPARENT Coal Thickness	TRUE COAL Thickness
TR RDH 80 09	911.0	36.2	874.8	85.8	825.2	90.0				79.63– 80.34	0.71	0.71
										85.25– 85.81	0.56	0.56
TR RDH 80 10	914.0	41.0	873.0	93.0	821.0	120.5				NO COAL		
TR RDH 80 11	832.0	58.8	773.4	126.1	705.9	131.5			C	108.98–111.20	2.22	2.20
										116.10–116.82	0.72	0.71
									H	122.55–124.48	1.93	1.91
TR RDH 80 12	831.0			124.0	707.0	128.6			C	107.42–109.52	2.10	2.07
										114.41–115.03	0.62	0.62
									H	120.85–122.47	1.62	1.56
TR DDH 80 01	710.0	124.0	586.0	186.7	523.3	198.4			C	170.28–171.16	0.88	0.88
										180.55–180.75	0.20	0.20
										193.70–193.95	0.25	0.25
TR DDH 80 02	926.0	171.2	754.8	227.1	698.9	222.3				195.15–195.65	0.50	0.48
										214.93–215.44	0.51	0.48
TR DDH 80 03	808.0	144.8	663.2	212.8	595.2	219.4				162.10–162.40	0.30	0.30
										201.10–201.30	0.20	0.20
"DISCOVERY GAS WELL" Skelly Getty CS–Commotion 93–P–12/a–23–D	1264.0	672.0	592.0	740.0	524.0	3901.1	824.0 KCmh 938.0 KCmg 1159.0 KM	440.0 326.0 105.0	C H	725.60–728.30 733.50–734.60 737.16–738.53	2.70 1.10 1.37	2.70 1.10 1.37
Skelly Getty CS - Commotion 93–P–12/c–29–C	1242.0	550.0	692.0	625.0	617.0	3594.0	748.0 KCmh 854.0 KCmg 1083.0 KM	494.0 388.0 159.0		NO SIGNIFICANT COAL		

APPENDIX III

DESCRIPTIVE DIAMOND DRILL HOLE LOGS

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

SHEET NO.: 1 of 7

HOLE NO.: TR RDH-8012 ELEV. COLLAR: TOTAL DEPTH: 128.6m (422 ft.) DATE BEGUN:

PROJECT: TREFI BEARING: CORE SIZE: 3" DATE COMPL.:

CO. ORD.: 55°31'31"N, 121°59'04"W HOLE ANGLE: Vert. LOGGED BY: J.M. Duford, J.W. Innis CONTRACTOR: Ken's Air TECH ed out to

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	Box 1 107.5 (352.7)									
				107.42	107.69	0.27				Core Loss - Coal
				107.69		0.065				Coal C-4 (dull banded)
					107.78	0.025	0.09			Coal C-4
				107.78	107.785	0.005	0.005			Claystone - (thin coal bands)
				107.785		0.04				Coal C-3
					107.835	0.01	0.05			Coal C-3
				107.835	107.84	0.005	0.005			Claystone
				107.84		0.075				Coal C-2
						0.03				Coal C-2
						0.03				Coal C-4
						0.04				Coal C-4
					108.075	0.06	0.23			Coal C-1 - with two very thin claystone bands horizontally and two vertically - band less than 0.5cm.
				108.075	108.12	0.045	0.044			Claystone - numerous bright coal bands and disseminated bright coal.
				108.12		0.045				Coal C-6 Note: Called bone coal in coal analysis
						0.01				Coal C-5
					108.195	0.02	0.07			Coal C-5 - with claystone blebs
				108.195	108.215	0.02	0.02			Carbonaceous Claystone - very thin bright coal bands.
				108.215	108.285	0.07	0.07			Coal C-6 - with occasional very thin, bright bands.
					0.865					Note: Bone coal in analysis.
				108.285	108.32	0.035	0.034			Carbonaceous Claystone
				108.32	108.36	0.04	0.04			Claystone - with numerous bright bands up to 1mm
				108.36		0.035				Carbonaceous Claystone - with two 0.5cm bright coal bands
						0.02				As above - with numerous bright bands

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

HOLE NO.: TR RDH-8012 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: JMD – JWI CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
						0.04				As above - with occasional coaly wisps
					108.50	0.045	0.14			As above - occasional coaly wisps
				108.50		0.05				Coal C-4 - occasional claystone bands
					108.60	0.05	0.10			Coal C-4 - without claystone
	108.5 (356)			108.60		0.05				Coal C-4
						0.02				Coal C-5
						0.04				Coal C-4
						0.01				Coal C-5 - with almost conchoidal fracture. Vitrain bands with pronounced cleat.
						0.035				Coal C-5 - again with "chert-like" fracture
						0.025				As above
						0.035				Bone Coal Note: C-6 in analysis
						0.015				Coal C-5 - (no trace of vitrain)
						0.015				As above
						0.105				Bone Coal - very consistent character. Note: C-6 in analysis
						0.01				Coal C-5
						0.0375				Coal C-5 - "chert-like" fracture
						0.01				Coal C-5 - slightly sheared
					0.6875					
						0.0175				Coal C-5 - occasional bright bands; slightly sheared and broken.
						0.0125				Coal C-4 - slightly sheared.
						0.02				Coal C-4
						0.0175				As above
						0.025				Bone Coal - with occasional thin bituminous bands and claystone blebs. (Note: C-6 in analysis.)
						0.05				Coal C-4
						0.03				As above
						0.02				Coal C-3
					109.21	0.01	0.60			Coal C-5

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

SHEET NO.: 3 of 7

HOLE NO.: TR RDH-8012 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: JMD - JWI CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
				109.21	109.22	0.01	0.01			Carbonaceous Claystone - with thin bituminous bands
				109.22		0.025				Coal C-3 - with 1mm claystone bands
					109.275	0.03	0.05			Coal C-4
				109.275	109.295	0.02	0.02			Carbonaceous Claystone - with vitrain bands, slightly sheared.
				109.295	109.305	0.01	0.01			Coal C-1
				109.305		0.03				Carbonaceous Claystone - with numerous bituminous coal bands.
					109.375	0.04	0.07			As above - but very friable
				109.375	109.39	0.015				Coal C-2 - with numerous marcasite blebs along fracture
				109.39		0.07				Coal C-3 - with numerous claystone bands
						0.04				Coal C-1
					109.52	0.02	0.14			Coal C-1 - with numerous claystone bands
				109.52	109.54	0.02				Carbonaceous Claystone - with numerous, very thin, vitrain bands.
				109.54		0.02				Sandstone - fine grained, interlaminated vitrain (thin) all in marensite in thin blebs
										As above
					109.605	0.045	0.08			Sandstone - medium coarse-grained, very thin vitrain bands and coal material in bottom 1cm., lower contact irregular, hard grained.
80°				109.605		0.59				Siltstone - medium grey, with laminated (light grey sandstone). Soft sediment deformation apparent in places - laminates are discontinuous. Very well preserved leaf fossil (broad-leaf).
						0.06				Gradational between laminated above and non-laminated below
					110.395	0.14	0.78			Siltstone - medium grey, non-laminated

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

HOLE NO.: TR RDH-8012 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: JMD - JWI CONTRACTOR:

BCA	BOX / MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
				110.395	110.44	0.045	0.044			Claystone - silty, occasional sandstone laminates
				110.44	110.45	0.01	0.01			Coal C-1
	Box 2									
				110.45	110.495	0.045	0.044			Carbonaceous Claystone - with vitrain bands
				110.495		0.035				Coal C-5 - (with very low ash)
					110.59	0.06	0.09			Coal C-5 - with claystone, thin and discontinuous
				110.59	110.64	0.02	0.02			Carbonaceous Claystone - very thin vitrain filaments
				110.61	110.72	0.11	0.11			Claystone - (carbonaceous) with several 1mm vitrain bands, increasingly silty towards the base, dark grey.
75°				110.72	111.025	0.305	0.30			Siltstone - with claystone laminates at top, with sandstone laminates and occasional thin beds at base (coarsening downward). Some coaly carbonaceous bands.
				111.025		0.34				Sandstone, medium-grained, few siltstones, laminates, and interbeds coarsening downward, some coaly wisps, light grey (siltstone is medium grey) beds are upright.
					111.550		0.52			As above - medium grey, broken core at base, few coaly wisps, light grey.
										END OF FIRST CORING RUN

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

HOLE NO.: TR RDH -8012 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: JMD - JWI CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	Box 3 119.5 (392)									
46° 75°	Above, relatively steep BCA is likely a product of local sedimentary variation soft sediment deformation - gradual change in altitude over 3.0cm.									
				119.38	119.60	0.22	0.21			Sandstone - fine-grained, fining downward, is inter-laminate siltstone. Sandstone is light grey, thin bedded, siltstone medium grey to medium brown. Beds upright (minor cross-laminated). Proportion of siltstone increased downwards.
				119.60		0.295				Siltstone - medium grey, in several green/brown blebs and bands and several discontinuous, fine-grained, sand-stone laminates.
					120.10	0.205	0.48			Siltstone - medium dark grey brown, fining downward.
				120.10		0.235				Claystone -dark grey with few very thin vitrain filaments and plant impressions with listric surface. More carbonaceous (black) towards base.
					120.40	0.065	0.29			As above - very carbonaceous
				120.40	120.44	0.04	0.04			Sandstone - fine grained, light grey, intermixed with clay-stone.
				120.44	120.505	0.65	0.06			Coal C-5 - (dull) poorly developed cleat. Claystone, very carbonaceous, somewhat broken and sheared, few coal bands (thin filaments to 0.5cm.).
				120.55		0.16				
						0.14				As above - not as broken, but sheared surfaces lined with very thin calcite coating.
					120.85	0.045	0.33			As above - with more vitrain bands
				120.85	120.925	0.075	0.972			Core Loss - Coal
				120.925		0.03				Coal C-5
						0.08				Coal C-4

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80

HOLE NO.: TR RDH-8012 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: JMD - JWI CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	LITHOLOGICAL UNIT TO	LITHOLOGICAL UNIT APPAR. THK.	LITHOLOGICAL UNIT TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
						0.05				Coal C-4
						0.07				Coal C-4 - moderate developed cleat
					121.22	0.065	0.28			Coal C-4
				121.22	121.23	0.01	0.01			Claystone - vitrinite bands
				121.23		0.08				Coal C-5
					121.46	0.155	0.23			Coal C-5 - virtually no cleat, very thin filaments of claystone towards base.
				121.46		0.035				Claystone -very carbonaceous, with numerous 1mm coal bands.
					121.53	0.03	0.06			Claystone - very carbonaceous and friable (broken core)
				121.53	121.555	0.025	0.024			Coal C-5
				121.555		0.13				Claystone - very carbonaceous with listric surfaces and vitrinite bands (7mm) moderately broken. Claystone very coaly in coal flecks throughout.
	121.6 (399)									
						0.14				Claystone - very carbonaceous, with calcite on some shear surfaces, vitrinite filaments throughout.
					121.845	0.02	0.28			As above
				121.845		0.095				Coal C-5 - calcite filled fractures, few very thin claystone filaments.
						0.18				Coal C-4 - moderate cleat
						0.08				Coal C-5 - moderate cleat
	Box 4									
						0.05				Coal C-4 - moderate cleat to occasional calcite
						0.08				Coal C-5
						0.04				Coal C-5

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P-141A(10-80)

SHEET NO.: 7 of 7

HOLE NO.: TR RDH-8012 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: JMD - JWI CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
					122.47	0.10	0.60			Coal C-3 - few claystone filaments in bottom 4cm - increasing towards base.
				122.47	122.57	0.10	0.10			Claystone, silty, dark grey, with few coaly wisps at top (filament to 0.5 cm.).
75°				122.57	122.580	0.01	0.01			Coal C-1
				122.58		0.03				Siltstone - clayed, dark grey with thin filaments of vitrain.
						0.455				Siltstone - medium grey, laminated with very fine-grained sandstone, core breaks on listric surfaces, few coaly filaments.
					123.56	0.495	0.95			Siltstone - medium grey, occasional claystone, laminates and coaly filaments, becoming more clayey towards base.
				123.56	123.66	0.10	0.10			Sandstone - fine-grained, dark grey, occasional granules; coaly wisps and plant fragments, also quite clayey.
				123.66	123.715	0.055	0.053			Claystone - dark grey to black, listric surfaces
				123.715	123.825	0.11				Sandstone - very clayey at top with 3cm., pebble/granular band at base, few plant impressions, become very clayey also below pebble band.
	124.1									

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

SHEET NO.: 1 of 15

HOLE NO.: TR-DDH-8001 | ELEV. COLLAR: 726m (2380 ft.) | TOTAL DEPTH: 198.32m (650.5 ft.) | DATE BEGUN: April 23, 1980

PROJECT: TREFI - PHASE I | BEARING: Vertical Hole | CORE SIZE: HQ | DATE COMPL.: April 27, 1980

CO. ORD.: 55°33'36"N, 121°58'35"W | HOLE ANGLE: | LOGGED BY: Gyan Singhai | CONTRACTOR: Acadia Drilling

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
				0						
		6.40			6.40	6.40				Overburden. No core; casing.
90°	Box 1	0.68		6.40	7.08	0.68	0.68			Sandstone - light grey to dark grey; interbeds of claystone; cross-bedded; core is fractured; BCA 90° at 6.95m.
		2.00		7.08						Siltstone - dark grey, with interbeds of sandstone.
	8.23									
		0.19			9.27	2.19	2.19			as above
90°		0.77		9.27						Sandstone - light grey to medium grey, with interbedded claystone and very fine grained sandstone cross-bedded, soft sediment deformation at the upper contact BCN 0° at 8.63m.
	Box 2									
90°		1.59			11.63	2.36	2.36			as above
		0.42		11.63						Siltstone - dark grey, thin interbeds of very fine grained sandstone.
	11.28									
		0.85			12.90	1.27	1.27			as above
	Box 3									
90°		0.74		12.90						Siltstone - medium to dark grey with interbeds of claystone argillaceous.
	14.33									
		2.20								as above
	Box 4									
		0.76								as above
	17.38									
		0.40			17.00	4.10	4.10			as above

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

HOLE NO.: TR-DDH-8001 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: Gyan Singhai CONTRACTOR:

BCA	BOX / MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
		1.74		17.00						Siltstone dark grey, with thin interbeds of sandstone, which are medium grey and fine grained.
	Box 5									
	20.45	2.30			21.04	4.04	4.04			as above
90°		0.56		21.04						Siltstone - medium grey, occasional cross-bedded, soft sediment depositional deformation - mud cracks, polygonal, occasional claystone interbedded (± 2cm thick).
	Box 6									
	21.34	0.43								as above
	23.47	2.02								as above
	Box 7	0.47								as above
	26.25	2.54								as above
	Box 8	0.33								as above
	29.57	2.74								as above
90°	Box 9	0.18								as above
	32.62	2.78								as above
	Box 10	0.08								as above
	34.45	1.68								as above
	Box 11	1.13								as above
		0.38								as above

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

HOLE NO.: TR-DDH-8001 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: Gyan Singhai CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	35.98									
		2.55								as above
	Box 12									
		0.10								as above
	38.72									
		2.26								as above - broken core. 39.65m to 40.22m interval
	Box 13									
90°		0.45								as above
	41.77									
		2.41								as above - siltstone bands vary from 2cm to 10cm thick
	Box 14									
		0.57								as above
	44.81									
		2.31								as above
	Box 15									
		0.67								as above
	47.87									
		2.23								as above
	Box 16									
		0.21			50.12	29.08	29.08			as above
90°		0.65		50.12						Siltstone - dark grey to medium grey, thin interbeds (up to 5cm thick) of fine grained sandstone. Sandstone is cross-bedded. Some soft sediment depositional deformation.
	50.91									
		2.06								as above
	Box 17									
		0.81								as above
	53.90									
		2.17								as above

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

SHEET NO.: 4 of 15

HOLE NO.: TR-DDH -8001 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: Gyan Singhai CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	Box 18									
		1.01								as above
	57.01									
		1.83								as above
	Box 19									
		1.29			59.94	9.82	9.82			as above
	60.06									
		1.55		59.94						Siltstone - fine grained, dark grey to medium grey, cross-bedded, thin interbeds of claystone, occasional mud cracks.
90°										
	Box 20									
		1.48								as above
	63.11									
		1.48								as above
	Box 21									
		1.55								as above
	66.16									
		1.40								as above
	Box 22									
		1.60								as above
	69.20	0.38			70.74	10.80	10.80			
		0.68		70.74						Siltstone - dark grey, with thin interbeds of sandstone (light to medium grey, cross-bedded) fractured core 69.20 to 79.34m.
	Box 23									
		0.99								as above
	71.34									
		0.95								as above
	72.26									
		0.73								as above
	Box 24									
90°		2.28								as above

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

SHEET NO.: 5 of 15

HOLE NO.: TR-DDH-8001 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: Gyan Singhai CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	75.30									
		0.64								as above
	Box 25									
90°		2.08								as above - fractured core.
	78.35									
		0.30								as above - fractured.
	Box 26									
		2.53								as above - intact.
	81.40									
90°		0.38								as above
	Box 27									
		2.73								as above
	84.45									
		0.13								as above
	Box 28									
		2.90								as above
	87.50									
	Box 29									
90°		2.93								as above
	Box 30									
		0.09								as above
	90.55									
		2.79								as above
	Box 31									
90°		0.20								as above
	93.60									
		2.44								as above
	Box 32									
		0.50								as above
	96.65									
90°		1.90								as above - badly broken core from 98.1m to 98.85m.

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

SHEET NO.: 6 of 15

HOLE NO.: TR-DDH-8001 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: Gyan Singhai CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	Box 33									
		0.97								as above
	99.70									
		2.05								as above
	Box 34									
		0.84								as above
	102.74									
		2.04								as above
	Box 35									
0°		1.13								as above
	105.79									
		1.80								as above
	Box 36									
90°		1.17								as above
	108.87									
90°		1.74								as above
	Box 37									
		1.28								as above
	111.89									
		1.57								as above
	Box 38									
90°		1.50								as above
	114.94									
		1.50								as above
	Box 39									
90°		1.59								as above
	117.98									
		1.34								as above
	Box 40									
		1.72			121.15	50.41	50.41			as above
	121.03									

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

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SHEET NO.: 7 of 15

HOLE NO.: TR-DDH -8001 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: Gyan Singhai CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
90°		1.13		121.15						Siltstone - dark grey to medium grey with interbeds of claystone (dark grey, ±2cm thick) cross-bedded some soft sediment depositional deformation.
	Box 41									
		1.74			124.02	2.87	2.87			as above
	124.08									
		1.14		124.02						Top of Commotion Sandstone - light grey, salt and pepper, medium grey, coalified plant material forming thin laminations, occasional thin bands of pebbles (±2cm thick) large scale cross-bedding with parting along cross-bed plane, BCA 74°, very sharp contact with unit above.
	Box 42									
		1.82								as above
	127.13									
		1.07								as above - beginning to coarsen from approximately marker to end of box.
	Box 43									
		0.50			128.55	4.53	4.53			as above - bands of conglomerate contain pebbles of black, grey, white chert, siltstone, sandstone, size of pebbles from 2mm to 2cm.
90°		1.54		128.55	130.09	1.54	1.54			Sandstone - light grey to medium grey, fine grained, thin interbeds of siltstone, occasional cross-bedded, - upper contact with conglomerate is sharp, some soft sediment depositional deformation.
	130.18									
		0.72			130.09					Siltstone - dark grey, occasional very thin interbed of fine grained sandstone.
	Box 44									
		0.82			131.63	1.54	1.54			as above - badly broken core.
			0.60	131.63	132.23	0.60	0.60			Core Loss

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

SHEET NO.: 8 of 15

HOLE NO.: TR-DDH -8001 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: Gyan Singhai CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
		0.90		132.23						Sandstone - light grey, salt and pepper, medium grey, cross-bedding, with thin interbeds of dark grey siltstone.
	132.62									
		1.16								as above
	Box 45									
		1.66			135.95	3.72	3.72			as above
		0.20		135.95						Conglomerate - pebbles sub-rounded to rounded, quartz, black chert, quartzite and sandstone, size 2mm to 5mm upper contact is gradational, lower is sharp.
	135.67									
		0.41			136.56	0.61	0.61			as above
		0.62		136.56						Sandstone - salt and pepper, fine to grit size grains, cross-bedded, occasional thin bands of conglomerate, parting along cross-bedded planes.
	Box 46									
		2.10								as above
	138.87									
		0.82								as above
	Box 47									
		2.24								as above
	142.07									
		0.57			142.29	5.73	5.73			as above
			0.18	142.29	142.47	0.18	0.18			Core Loss

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

HOLE NO.: TR-DDH -8001 ELEV. COLLAR: _____ TOTAL DEPTH: _____ DATE BEGUN: _____

PROJECT: _____ BEARING: _____ CORE SIZE: _____ DATE COMPL.: _____

CO. ORD.: _____ HOLE ANGLE: _____ LOGGED BY: Gyan Singhai CONTRACTOR: _____

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	Box 48	2.47		142.47						Conglomerate – with thin interbeds of sandstone and grit, pebble size 1mm to 5mm, rounded to sub-rounded pebbles of quartzite, quartz, dark grey and medium grey chert. Sandstone bands are cross-bedded, occasional coalified plant fragments. Upper contact is gradational, lower contact is sharp.
	145.21	0.40								as above
	Box 49	0.26			145.60	3.13	3.13			as above
		2.45		145.60						Sandstone coarse-grained, with occasional pebbles of quartzite and dark grey chert and siltstone scattered throughout upper section faint cross-bedding.
	148.32	0.25								as above
	Box 50	2.80								as above
	151.52	0.10								as above
	Box 51	2.89			154.09	8.49	8.49			as above
	Box 52 154.57	1.07		154.09	155.16	1.07	1.07			Conglomerate - interbeds of coarse grained sandstone sub-rounded to rounded pebbles of chert (grey), quartzite, siltstone, size 1mm. to 5mm. - lower contact is sharp BCA 90° and sharp upper contact also at 90°.
			0.08	155.16	155.24	0.08	0.08			Core Loss

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

SHEET NO.: 10 of 15

HOLE NO.: TR-DDH -8001 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: Gyan Singhai CONTRACTOR:

BCA	BOX / MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
90°		1.86		155.24						Sandstone - fine grained, light grey to medium grey, cross-bedded, 16cm band of conglomerate near top of unit.
	Box 53									
		0.04								as above
	157.62									
		0.29			157.43	2.19	2.19			as above
			0.07	157.43	157.50	0.07	0.07			Core Loss
90°		0.29		157.50						Mudstone - dark grey, with very thin stringers of carbonaceous material and coalified plant fragments. - slightly carbonaceous throughout. - badly broken core.
	158.27									
		2.27								as above
	Box 54									
		0.36								as above
	160.67									
		0.50			160.92	3.42	3.42			as above
			0.15	160.92	161.07	0.15	0.15			Core Loss
90°		1.98		161.07						Siltstone - medium grey with interbeds of fine grained, light grey sandstone, and dark grey mudstone. - occasional coalified stringers in mudstone.
	Box 55									
		0.73			163.78	2.71	2.71			as above
		2.01		163.78						Mudstone - dark grey with thin interbeds of sandstone, occasional coalified stringers. - mudstone becomes carbonaceous from 165.41m to 165.99m.

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

HOLE NO.: TR-DDH-8001 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: Gyan Singhai CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	Box 56									
		0.98								as above
	166.77									
		0.56								as above
		0.12			167.45	3.67	3.67			Mudstone - carbonaceous.
			0.01	167.45	167.46	0.01	0.01			Core Loss
		0.08		167.46	167.54	0.08	0.08			Coal - C2 - bright, with blebs of very finegrained pyrite.
		0.83		167.54	168.37	0.83	0.83			Mudstone - medium to dark grey with tiny coalified plant fragments.
		0.29		168.37						Sandstone - light grey, fine grained, untraceable bedding.
	Box 57									
90°		0.87			169.53	1.16	1.16			Sandstone - as above.
			0.09	169.53	169.62	0.09	0.09			Core Loss
		0.28		169.62						Mudstone - dark grey, slightly silty.
	169.81	0.38			170.28	0.66	0.66			as above - carbonaceous, coalified plant fragments.
		0.78		170.28					0001	Coal - C5 - dull coal, carbonaceous claystone bands up to 2cm thick, bright bands 1 to 2mm thick, crystals of pyrite and stringers of fine grained pyrite, slickensided surfaces along fracture plane.
	171.03									
		0.15			171.16	0.88	0.88			Coal - as above - bright bands slightly thicker, up to 5mm.
		0.30		171.16						Mudstone - slightly carbonaceous.

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

HOLE NO.: TR-DDH -8001 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: Gyan Singhai CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	Box 58									
90°		0.18			171.64	0.48	0.48			as above - slightly silty.
90°		1.15		171.64	172.79	1.15	1.15			Sandstone - silty, fine grained, medium gray; calcite along fracture zones.
	172.86									
		0.31		172.79	73.10	0.31	0.31			Siltstone - medium to dark grey.
		0.10		173.10	173.20	0.10	0.10			Mudstone - highly carbonaceous with thin bright coal bands up to 5mm thick.
		0.90		173.20	174.10	0.90	0.90			Mudstone - dark grey, slightly silty, thin interbeds of siltstone.
			0.04	174.10	174.14	0.04	0.04			Core Loss
		0.20		174.14	174.34	0.20	0.20			Coal - C4 - dull bright banded, with bright bands up to 5mm thick, numerous claystone bands throughout.
	Box 59									
		0.26		174.34	174.60	0.26	0.26			Mudstone - dark grey, slightly silty, occasional bright coal stringers (1mm thick) and sandstone bands.
90°		0.95		174.60	175.55	0.95	0.95			Sandstone - fine to medium grained, medium grey, salt and pepper, cross-bedded.
90°		0.21		175.55						Siltstone - dark grey, with thin interbeds of medium grey sandstone, some soft sediment deformation.
	175.91									
		0.76			176.52	0.97	0.97			as above
		0.76		176.52						Mudstone - dark grey.
	Box 60									
		0.30			177.58	1.06	1.06			as above - with occasional bleb of pyrite (fine grained) (pyritized worm burrows?)

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

HOLE NO.: TR-DDH ~8001 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: Gyan Singhai CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
90°		1.29		177.58						Sandstone - light grey to medium grey, with interbeds of siltstone, cross-bedded, some soft sediment deformation.
	178.91									
		0.52			179.39	1.81	1.81			as above
		0.60		179.39	179.99	0.60	0.60			Mudstone - dark grey, broken core.
	Box 61									
		0.26		179.99						Conglomerate sub-rounded to rounded pebbles - quartzite, dark grey chert, sandstone sharp upper and lower contact.
	180.49									
		0.06			180.31	0.32	0.32			as above
			0.24	180.31	180.55	0.24	0.24			Core Loss
		0.35		180.55	180.75	0.20	0.20			Coal - C4 - dull bright banded with bright bands up to 7mm thick, claystone partings and bands up to 3mm thick.
		0.07		180.75	180.82	0.07	0.07			Claystone - highly carbonaceous, bright coal blebs.
		1.04		180.82						Sandstone - light to medium grey, fine to medium grained, cross-bedding, carbonaceous partings.
	182.01									
		1.06								Sandstone - as above.
	Box 62									
90°		0.60			183.58	2.76	2.76			Sandstone - as above.
		1.32		183.58	184.90	1.32	1.32			Siltstone - medium to dark grey, upper part of unit slightly sandy.

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141 A(10-80)

HOLE NO.: TR-DDH-8001 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: Gyan Singhai CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	185.06	0.36		184.90	185.26	0.36	0.36			Siltstone - highly carbonaceous with slightly coalified plant fragments.
		0.47		185.26						Siltstone - medium grey, slightly clayey, some soft sediment depositional deformation.
	Box 63	0.72			186.45	1.19	1.19			as above
		0.25		186.45	186.70	0.25	0.25			Mudstone - carbonaceous, with coalified plant fragments and very thin bright coal stringers.
			0.26	186.70	186.96	0.26	0.26			Core Loss
		0.05		186.96	187.01	0.05	0.05			Coal - C5 - slickensided contact surface (approx. 60° BCA).
		1.10		187.01						Conglomerate - well cemented, sub-rounded to rounded pebbles of grey/black chert, quartzite sandstone, siltstone sandy matrix, size of pebbles range from 1mm to 1cm.
	188.1	0.75								as above
	Box 64	2.29								as above
	191.16	0.64								as above
	Box 65	1.91			193.70	6.69	6.69			as above
		0.26		193.70	193.95	0.25	0.25			Coal - C5 - occasional bright band 2mm thick, breaks in lumps, hard.
		0.26		193.95						Conglomerate - as above.

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

SHEET NO.: 15 of 15

HOLE NO.: TR-DDH -8001 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: Gyan Singhai CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	194.21									
		0.47								as above
	Box 66									
		2.58								as above
	197.26									
		0.34								as above
	Box 67									
		1.06			198.66	4.71	4.71			as above - pebble size increased to 2cm maximum; very rounded.
	198.78									END OF HOLE

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P-141A(10-80)

SHEET NO.: 1 of 14

HOLE NO.: TR-DDH-8002 ELEV. COLLAR: 955m (3132 ft.) TOTAL DEPTH: 227.34m (745.7 ft.) DATE BEGUN: April 29, 1980

PROJECT: TREFI - PHASE I BEARING: 230° CORE SIZE: HQ DATE COMPL.:

CO. ORD.: 55°35'20"N, 122°06'31"W HOLE ANGLE: -70° LOGGED BY: Gyan Singhai CONTRACTOR: Acadia Drilling

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
				0		30.89				Overburden - No Core 30.8m (101ft) casing
	Box 1									
81°		1.73		30.89						Siltstone - light grey to dark grey, with interbeds of claystone, soft sediment depositional deformation.
	32.62									
		1.42								as abovc
	Box 2									
		1.90								as above
	35.67									
		1.00								as above
	Box 3									
		1.95								as above
	38.72									
		0.82								as above
	Box 4									
		2.16								as above
	41.77									
		0.64								as above
	Box 5									
		2.41								as above
	44.82									
		0.46								as above
	Box 6									
		2.44								as above
	47.86									
		0.46								as above
	Box 7									
		2.50								as above - ground core 12 cm from bottom of unit
	50.91									
		0.41								as above

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

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SHEET NO.: 2 of 14

HOLE NO.: TR-DDH-8002 ELEV. COLLAR: _____ TOTAL DEPTH: _____ DATE BEGUN: _____

PROJECT: _____ BEARING: _____ CORE SIZE: _____ DATE COMPL.: _____

CO. ORD.: _____ HOLE ANGLE: _____ LOGGED BY: Gyan Singhai CONTRACTOR: _____

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	Box 8									
80°		2.49								as above
	53.96									
		0.39								as above
	Box 9									
		2.73								as above
	57.01									
		0.22								as above
	Box 10									
		2.88								as above
	60.06									
		0.06								as above
					59.96	29.07	28.72			
	Box 11									
90°		2.85								as above
	63.11									
		0.04								as above
	Box 12									
		2.93								as above
	Box 13									
		0.21								as above
	66.16									
		2.71								as above
	Box 14									
		0.22								as above
	69.21									
		2.69								as above

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

SHEET NO.: 3 of 14

HOLE NO.: TR-DDH-8002 ELEV. COLLAR: _____ TOTAL DEPTH: _____ DATE BEGUN: _____

PROJECT: _____ BEARING: _____ CORE SIZE: _____ DATE COMPL.: _____

CO. ORD.: _____ HOLE ANGLE: _____ LOGGED BY: Gyan Singhai CONTRACTOR: _____

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	Box 15									
90°		0.41								as above
	72.25									
		2.49								as above
	Box 16									
		0.56								as above
	75.30									
		2.33								as above
	Box 17									
90°		0.54								as above
	78.35									
		2.39								as above
	Box 18									
90°		0.71								as above
	81.40									
		2.17								as above
	Box 19									
		0.86								as above
	84.45									
90°		2.06								as above
	Box 20									
		0.86								as above
90°	87.50									
		2.07								as above
	Box 21									
		1.10								as above
	90.55									
		1.87								as above
	Box 22									
90°		1.10								as above

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

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SHEET NO.: 4 of 14

HOLE NO.: TR-DDH-8002 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: Gyan Singhai CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	93.60									
		1.79								as above
	Box 23									
90°		1.29								as above
	96.65									
		1.63								as above
	Box 24									
		1.41								as above
90°	99.70									
		1.56								as above
	Box 25									
		1.48								as above
90°	102.74									
		1.45								as above
	Box 26									
		1.59								as above
	105.79									
90°		1.33								as above
	Box 27									
		1.70								as abpve
	108.84									
		1.16								as above
	Box 28									
90°		1.89								as above
	111.89									
		0.92								as above
	Box 29									
		2.11								as above
	114.44									
		0.72								as above

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

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SHEET NO.: 5 of 14

HOLE NO.: TR-DDH -8002 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: Gyan Singhai CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	Box 30									
		2.25			117.41	57.45	57.45			as above
	117.99		0.57							Core Loss
		0.55		117.98						Siltstone - medium to dark grey; interbeds of fine to medium salt and pepper type of crossbedded sandstone; soft sediment depositional deformation.
	Box 31									
90°		2.51								as above
	121.03									
		0.40								as above
	Box 32									
		2.68								as above
	124.03									
90°		0.15								as above
	Box 33									
		2.88								as above
	Box 34									
	127.13									
		2.90								as above
	Box 35									
90°		0.16								as above
	130.18									
		2.67								as above
	Box 36									
		0.28								as above
	133.23									
		2.61								as above
	Box 37									
		0.47								as above

GULF CANADA RESOURCES INC. -- COAL DIVISION -- DRILL CORE LOG

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SHEET NO.: 6 of 14

HOLE NO.: TR-DDH -8002 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: Gyan Singhai CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	136.28									
90°		2.34								as above
	Box 38									
		0.68								as above
	139.33									
		2.25								as above - sandstone content increasing
	Box 39									
90°		0.88								as above
	142.38									
		2.04								as above
	Box 40									
		0.96								as above
	145.43									
90°		1.96								as above
	Box 41									
		1.20								as above
	148.48									
		1.71								as above - occasionally sandy
	Box 42									
		1.37								as above
	151.52									
90°		1.59								as above
	Box 43									
		1.51								as above
	154.57									
		1.48								as above
	Box 44									
90°		1.63								as above
	157.62									
		1.21								as above

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

HOLE NO.: TR-DDH-8002 ELEV. COLLAR: _____ TOTAL DEPTH: _____ DATE BEGUN: _____

PROJECT: _____ BEARING: _____ CORE SIZE: _____ DATE COMPL.: _____

CO. ORD.: _____ HOLE ANGLE: _____ LOGGED BY: Gyan Singhai CONTRACTOR: _____

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	Box 45									
90°		1.73								as above
	160.67									
		1.16								as above
	Box 46									
90°		1.93								as above
	163.72									
		0.90			164.77	46.79	46.79			as above
		0.09		164.77						Siltstone - fine to medium grained, medium to light grey, crossbedded,very thin interbeds of claystone and very thin carbonaceous to coaly plant fragments. Some pyrite along laminations.
	Box 47									
		1.65								as above
	166.77									
90°		1.25								as above
	Box 48									
		1.81								as above
	169.82									
		1.14								as above
	Box 49									
90°		0.49			171.20	6.43	6.43			as above - about 6 cm very coarse grained salt and pepper sandstone with occasional pebbles up to 5mm at bottom of unit.
		1.43		171.20	172.63	1.43	1.43			Carbonaceous Claystone - very dark grey, with occasional coalified plant fragments and partings up to 2mm. Less carbonaceous at the bottom of unit.
		0.05		172.63						Sandstone - medium grey to light grey, fine to medium grained, massive.

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

HOLE NO.: TR-DDH -8002 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: Gyan Singhai CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	172.87									
		0.90			173.58	0.95	0.95			as above
	Box 50		0.25	173.58	173.83	0.25	0.25			Core Loss
90°		2.09		173.83						Sandstone - medium grey to light grey - fine to medium grained with occasional bands of salt and pepper coarse grained sandstone with occasional coal stringers of coalified plant fragments and blebs of pyrite. Cross-bedded with occasional interbeds of siltstone. Badly broken core at top of unit (0.27m).
	175.91									
90°		0.68								as above
	Box 51									
		2.12								as above
	178.96									
		0.43			179.15	5.32	5.32			as above - broken at top
		0.07		179.15	179.22	0.07	0.07			Coal - C5 - dull
		0.21		179.22						Sandstone - as above
	179.57									
	Box 52									
		2.58								Sandstone - becomes much coarser grained with band of carbonaceous (7cm) 10 cm from marker.
	182.01									
		0.33								as above

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

HOLE NO.: TR-DDH-8002 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: Gyan Singhai CONTRACTOR:

BCA	BOX / MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	Box 53									
		0.13			182.47	3.25				as above
			0.27	182.47	182.47	0.27	0.27			Core Loss
		0.61		182.74	183.35	0.61	0.61			Conglomerate - with bands of gritty sandstone; pebbles are 1mm to 10mm, sub-rounded to rounded, grey to black chert, sandstone, quartzite and siltstone.
		0.65		183.10	184.00	0.65	0.65			Sandstone - very coarse grained, gritty with thin conglomeratic bands.
	183.69									
		1.11		184.00	185.11	1.11	1.11			Siltstone - dark grey, slightly carbonaceous, with coaly stringers and coalified plant fragments.
	185.06									
		0.19		184.11			0.19			Claystone - very dark grey, with 1mm coaly stringers and carbonaceous material.
	Box 54									
		0.60			185.59	0.79	0.79			as above
		2.18		185.59						Sandstone - light grey to medium grey, fine to coarse grained, salt and pepper, cross-bedded, occasional stringers of coaly material.
	188.11									
		0.08								as above

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

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SHEET NO.: 10 of 14

HOLE NO.: TR-DDH-8002 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: Gyan Singhai CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	Box 55									
		0.75			188.91	3.01	3.01			as above
			0.23	188.91	189.14	0.23	0.23			Core Loss
		1.93		189.14						Sandstone - fine grained dark grey to medium grey, interbedded with siltstone -occasional coalified plant fragments -bottom 14cm of this unit are highly carbonaceous.
	191.16									
		0.04								as above
	Box 56									
		2.40			193.51	4.37	4.37			as above
		0.16		193.51						Carbonaceous Claystone - very dark grey, numerous stringers of bright coal and fragments of coalified plant material.
	194.21									
		0.12								as above
	Box 57									
		0.69			194.48	0.97	0.97			as above
		0.67		194.48	195.15	0.67	0.67			Sandstone - light grey salt and pepper fine to medium grained, occasional coaly strings, slightly silty at bottom of unit.

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

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SHEET NO.: 11 of 14

HOLE NO.: TR-DDH-8002 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: Gyan Singhai CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
90°		0.50		195.15	195.65	0.50	0.50			Coal C3 - dull bright banded, bright bands up to 5mm thick, numerous claystone lenses and laminations up to 2mm thick, trace of pyrite.
		0.29		195.65	195.94	0.29	0.29			Claystone - highly carbonaceous and coal stringers up to 1cm thick.
90°		0.64		195.94						Sandstone - light grey to medium grey, fine grained, slightly silty, cross-bedded.
	Box 58 197.26									
		2.14			198.72	2.78	2.77			as above
		.03		198.72	198.75	0.03	0.03			Coal - C5 - dull, ground core
			0.22	198.75	198.97	0.22	0.22			Core Loss
		.21		198.97	199.18	0.21	0.21			Claystone - highly carbonaceous with numerous stringers(1mm to 10mm).
		0.50		199.18						Siltstone - medium to dark grey, occasional coalified plant fragments.
	Box 59									
		0.14			199.82	0.64	0.64			as above

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

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HOLE NO.: TR-DDH-8002 ELEV. COLLAR: _____ TOTAL DEPTH: _____ DATE BEGUN: _____

PROJECT: _____ BEARING: _____ CORE SIZE: _____ DATE COMPL.: _____

CO. ORD.: _____ HOLE ANGLE: _____ LOGGED BY: Gyan Singhai CONTRACTOR: _____

BCA	BOX / MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
		0.12		199.82						Sandstone - light grey, fine grained salt and pepper, cross-bedded.
	200.30									
		2.63								as above - bright coal stringers 20cm from marker -interbeds of siltstone, occasionally carbonaceous
	Box 60									
		0.29								as above
	203.35									
		0.62			203.48	3.66	3.62			as above
		0.50		203.48	203.98	0.50	0.49			Siltstone - dark grey, interbeds of light grey fine grained sandstone.
			0.54	203.98	204.52	0.54	0.52			Core Loss
		1.15		204.52						Claystone - carbonaceous, badly broken core -numerous stringers of coal, thickness 1.5cm to 2mm.
	Box 61									
		0.15								as above
	206.40									
		1.93			207.75	3.23	3.15			as above - indeterminable bedding
		0.75		207.75						
		0.75		207.75						Sandstone - fine to medium grained, light to medium grey, salt and pepper, massive.
	Box 62									
		0.22								as above

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

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HOLE NO.: TR-DDH -8002 ELEV. COLLAR: _____ TOTAL DEPTH: _____ DATE BEGUN: _____

PROJECT: _____ BEARING: _____ CORE SIZE: _____ DATE COMPL.: _____

CO. ORD.: _____ HOLE ANGLE: _____ LOGGED BY: Gyan Singhai CONTRACTOR: _____

SCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	209.45									
		2.69								as above
	Box 63									
		0.40								as above
	212.50									
75°		1.26			213.07	5.32	5.16			as above - occasional gritty sandstone with coal stringers (3mm) - large scale cross-bedding
		1.20		213.07						Claystone - carbonaceous, occasionally coalified plant frangments.
	Box 64									
		0.55								as above
	215.55									
		0.11			214.93	1.86	1.82			as above
			0.13	214.93	215.06					Core Loss
		0.38		215.06	215.44	0.38	0.48		0002	Coal - C5 - dull - silky lustre, some fusain - appears to be no claystone lensing
		0.08		215.44	215.52	0.08	0.08			Claystone - carbonaceous
		0.02		215.52	215.54	0.02	0.02			Coal - C5
80°		1.64		215.54	217.18	1.64	1.62			Sandstone - light to medium grey, occasional interbeds of siltstone and carbonaceous siltstone, thin bright coal stringers (up to 5mm).

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

SHEET NO.: 14 of 14

HOLE NO.: TR-DDH -8002 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: Gyan Singhai CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	Box 65									
		0.60		217.18	217.78	0.60	0.60			as above
	218.60									
90°		2.27		217.18						as above
	Box 66									
		0.74								as above
	221.65									
		1.40			222.19	4.41	4.41			as above
90°		0.76		222.19	223.95	0.76	0.76			Siltstone - very dark grey, occasional coalified plant frangments.
	Box 67									
		0.65								Claystone - very dark grey, slightly carbonaceous with numerous thin coal stringers (5mm) broken core.
	224.70									
		0.78		223.95	224.38	1.43	1.43			as above
		0.64		224.38	225.02	0.64	0.64			Sandstone - light grey fine to medium grain.
90°		0.71								Siltstone - very dark grey, occasional pebbly bands (up to 10cm thick) cemented in silt.
	Box 68									
		0.60		275.02	226.33	1.31	1.31			as above
		0.30		226.33	226.63	0.30	0.30			Sandstone - medium grey, salt and pepper, becomes pebbly towards bottom, pebbles are rounded to sub-rounded. 1 to 5mm.
	227.74									End of Hole

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

SHEET NO.: 1 of 13

HOLE NO.: TR-DDH-8003 ELEV. COLLAR: TOTAL DEPTH: (717') DATE BEGUN: May 7, 1980

PROJECT: BEARING: CORE SIZE: HQ DATE COMPL.: May 11, 1980

CO. ORD.: 55°33'28"N, 121°53'22"W HOLE ANGLE: LOGGED BY: G. Singhai CONTRACTOR: Acadia Drilling

BCA	BOX / MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
		30.79		0	30.79					Overburden - no core. 101' casing.
	Box 1									
87°		1.54		30.79						Siltstone - dark grey, interbeds of sandstone (fine grained, light grey) occasional cross-bedding, soft sediment depositional deformation (breccia) core is broken.
	32.62									
		0.99								as above
	Box 2									
		1.14								as above
	35.67									
		1.13								as above - badly broken.
	Box 3									
		0.28								as above - badly broken.
	37.50									
11°		0.79								as above - somewhat sandier.
	38.72									
		1.50								as above
	Box 4									
		1.01								as above
	41.77									
82°		1.76								as above
	Box 5									
		1.15								as above
	44.82									
		1.50								as above - broken core.
	Box 6									
		1.21								as above - broken core.
	47.87									
82°		1.36								as above - blocky core.
	Box 7									
		1.30								as above
	50.91									
		1.11								as above - slightly sandy.

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P-141A(10-80)

HOLE NO.: TR-DDH-8003 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: G. Singhai CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	Box 3									
83°		1.81			50.37	19.58	19.43			as above - 4cm pyrite bleb; 15cm from top of box; disseminated pyrite throughout.
	53.96		3.69	50.37	54.06	3.69				Core Loss
		0.96		54.06						Siltstone - light to medium grey, with interbeds of dark grey claystone - cross-bedding, occasionally brecciated (soft sediment deformation).
	Box 9									
		1.82								as above
	57.01									
		0.82								as above
	Box 10									
		1.83								as above - occasional crystals of pyrite.
	60.06									
		0.97								as above
	Box 11									
		1.88			62.34	8.28	8.25			as above
		0.11		62.34						Siltstone - dark grey to medium grey, with interbeds of medium grey fine grained sandstone - cross-bedded sandstone; some soft sediment depositional deformation.
	63.11									
87°		0.71								as above
	Box 12									
		2.25								as above
	66.16									
		0.59								as above
	Box 13									
		2.23								as above - broken core toward bottom of interval.
	69.21									
		0.30								as above - badly broken core.

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

HOLE NO.: TR-DDH-8003 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: G. Singhai CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	Box 14									
		0.76								as above
	71.34									
		0.26			69.55	7.21	7.21			as above
	72.26									
88°		1.46		69.55						Siltstone - dark grey to medium grey; soft sediment depositional deformation.
	Box 15									
		0.88			71.89	2.34	2.34			as above - broken core.
			5.45	71.89	77.34	5.45				Core Loss
		0.14		77.34						Siltstone - dark grey with light grey sandstone interbeds; soft sediment depositional deformation; sandstone interbeds are cross-bedded - badly broken core.
	74.69									
		0.41								as above
	75.30									
		1.16								as above
	Box 16									
85°		1.90								as above
	78.35									
		1.03								as above
	Box 17									
		1.89								as above
	81.40									
		0.98								as above
	Box 18									
		2.21								as above
	84.45									
		0.81								as above

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

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HOLE NO.: TR-DDH-8003 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: G. Singhai CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	Box 19									
		2.30								as above
	87.50									
87°		0.66								as above
	Box 20									
		2.09								as above
	90.55									
		0.72								as above
	Box 21									
85°		1.75								as above - badly broken core.
	93.60									
		0.73								as above
	Box 22									
		1.16								as above
	95.58									
		1.67								as above
	Box 23									
	97.71									
		1.86								as above
	99.70									
81°		0.86								as above
	Box 24									
		2.15								as above
	102.74									
		0.71								as above
	Box 25									
		2.19								as above
	105.79									
78°		0.61								as above
	Box 26									
		1.67								as above
	108.23									
		1.17								as above

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

SHEET NO.: 5 of 13

HOLE NO.: TR-DDH-8003 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: G. Singhai CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	Box 27									
76°		1.87								as above
	111.28									
		0.92								as above - broken at top of interval.
	Box 28									
		2.00								as above
	114.33									
		0.70								as above
	Box 29									
		2.36								as above
	117.38									
81°		0.50								as above
	Box 30									
		2.31								as above
	120.73									
		0.57								as above
	Box 31									
		2.51								as above - some slickensided surfaces.
	123.78									
		0.33			124.24	46.90	46.41			as above
	Box 32									
		2.46		124.24						Siltstone - dark grey to medium grey, with claystone interbeds; soft sediment deformation; slight cross-bedding.
	126.83									
		0.22								as above
	Box 33									
		2.92								as above
	Box 34									
	129.88									
83°		2.89								as above
	Box 35									
		0.16								as above

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

SHEET NO.: 6 of 13

HOLE NO.: TR-DDH -8003 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: G. Singhai CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	132.93									
		2.69								as above
	Box 36									
		0.40								as above
	136.03									
80°		2.38								as above - 4cm pyrite bleb, 20cm from bottom of interval; sandstone interbeds.
	Box 37									
		0.26								as above
	139.02									
90°										
		2.60								as above - within bands of conglomerate and occasional bright coal stringers.
	Box 38									
		0.50								as above
	142.07									
		2.34								as above
	Box 39									
75°		0.74			144.08	20.56	18.38			as above
	145.12									
		2.19		144.08	146.99	2.19	2.12			Sandstone - medium to light grey, coarse to medium grained - occasional thin bands of conglomerate, coaly fragments, stringers, slickensided along the fracture zones - interbeds of siltstone.
			0.31	146.99	147.30	0.31				Core Loss
	Box 40									
		0.97		147.30						Sandstone - as above
	148.17									
		0.60			148.87	1.57	1.34			as above
		1.32		148.87	150.19	1.32	1.30			Siltstone - dark grey, slightly carbonaceous, some disseminated pyrite along fractures.

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80

SHEET NO.: 7 of 13

HOLE NO.: TR-DDH-8003 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: G. Singhai CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
			0.31	150.19	150.50	.31				Core Loss
	Box 41									
		0.30		150.50	150.80	0.30	0.30			Siltstone - medium grey.
		.96		150.80						Sandstone - fine to coarse grained, salt and pepper, occasional pebbles of chert, faint cross-bedding.
	151.37									
88°		1.65								as above
	Box 42									
		1.35								as above - with carbonaceous wisps.
	154.57									
		1.53								as above - lower part of interval contains more pebbles and grit.
	Box 43									
		0.99								as above - gritty and conglomeratic; pebbles rounded to sub-rounded, 2 to 10mm.
	157.32	0.47			157.75	6.95	6.95			
		0.47			157.75	6.95	6.95			as above
		1.00		157.75						Siltstone - with occasional thin bands of sandstone; very dark grey; occasional coalified plant fragments.
	158.84									
		0.09			158.84	1.09	1.08			as above - ground core.
		0.26		158.84						Clyst - highly carbonaceous; very dark grey; slickensided surfaces.
	Box 44									
		1.16			160.26	1.42	1.41			as above - highly carbonaceous with numerous bright coal stringers and coalified plant fragments.
		2.07		160.26						Siltstone - light grey to medium grey, slightly clayey; interbeds of medium gray claystone.
	160.67									
		1.33								as above

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

HOLE NO.: TR-DDH-8003 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: G. Singhai CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	Box 45									
		0.09			161.75	1.49	1.48			as above
		0.35		161.75	162.10	0.35	0.35			Siltstone - highly carbonaceous with numerous thin (1mm) coal stringers.
		0.10		162.10	162.40	0.30	0.30			Coal - C5? - badly broken, numerous thin clyst bands throughout.
			0.93	162.40	163.33	0.93				Core Loss
		0.73		163.33						Siltstone - with interbeds of claystone and carbonaceous material - slickensided along fracture, occasional 1mm coal stringers.
	163.72									
80°		1.41								as above
	Box 46									
		1.42			166.89	3.56	3.52			as above
		0.05		166.89	166.94	0.05	0.05			Carbonaceous clyst- with 1mm thick bright coal stringers.
		0.10		166.94						Siltstone - light to medium grey, fine grained, cross-bedded, some soft sediment depositional deformation.
	166.77									
		1.30								as above
	Box 47									
87°		1.76								as above - highly carbonaceous sections of siltstone towards bottom.
	169.82									
		1.00			171.10	4.16	4.15			as above
	Box 48									
		0.93		171.10	172.03	0.93	0.92			Claystone - dark grey to medium grey; highly carbonaceous in lower part of interval; numerous 1mm thick coal stringers

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

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SHEET NO.: 9 of 13

HOLE NO.: TR-DDH -8003 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: G. Singhai CONTRACTOR:

BCA	BOX / MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
		0.81		172.03						Siltstone - light grey to medium grey, very thin interbeds of claystone, soft sediment depositional deformation.
	172.87									
		0.99								as above
	Box 49									
		2.00								as above
	175.91									
68°		0.89								as above
	Box 50									
		1.99								as above - slickensided along fracture zones.
	178.96									
		0.70			179.41	7.38	5.95			as above - broken core.
	Box 51		0.35	179.41	179.76	0.35				Core Loss
		1.97		179.76						Siltstone - light grey to medium grey, thin interbeds of claystone - occasional thin coal, soft sediment depositional deformation (up to 2mm thick).
	182.01									
50°		0.82								as above
	Box 52									
		2.20								as above
	185.06									
		0.64								as above
	Box 53									
		2.51								as above
	188.11									
65°		0.42								as above
	Box 54									
		1.88			190.20	10.44	8.91			as above

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

HOLE NO.: TR-DDH-8003 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: G. Singhai CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	191.16									
		0.72		190.20			0.68			Sandstone - coarse grained.
		0.30					0.28			as above
	Box 55									
75°		1.58		192.08	192.08	2.60	2.49			as above
	199.06	1.06								Sandstone - siltstone and interbedded claystone.
		0.13								as above
	Box 56									
		0.97			194.96	2.16	2.09			as above
		0.07		194.96	195.03	0.07	0.07			Carbonaceous claystone - with bright coal bands, 5mm thick.
		0.08		195.03	195.11	0.08	0.08			Coal - C4 - with carbonaceous claystone lenses.
15°		0.58		195.11	195.69	0.58				Sandstone - medium to coarse grained; salt and pepper; interbeds of siltstone,cross-bedded.
		0.10		195.69	195.79	0.10	0.10			Coaly claystone - badly broken core.
			0.55	195.79	196.34	0.55				Core Loss
		0.30		196.34	196.64	0.30	0.30			Clyst - slightly carbonaceous, numerous thin bright coal bands.
		0.32		196.64						Sandstone - medium grey to light grey, fine to coarse grained, cross-bedded soft sediment deformation - occasional coalified plant fragments.
	197.26									
		0.22								as above

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

SHEET NO.: 11 of 13

HOLE NO.: TR-DDH -8003 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: G. Singhai CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	Box 57									
90°		0.49			197.67	1.03	1.03			as above
		2.28		197.67						Siltstone - dark grey, slightly carbonaceous, occasional coalified plant fragments.
	200.30									
	Box 58									
		1.15			201.10	3.43	3.43			as above - becomes clayey towards bottom.
		0.20		201.10	201.30	0.20	0.20			Coal and band of carbonaceous claystone - bright coal bands up to 3mm thick; some pyrite along partings.
		0.16		201.30	201.46	0.16	0.16			Siltstone - dark grey.
		0.01		201.46	201.47	0.01	0.01			Coal band - bright.
90°		1.13		201.47						Sandstone - dark grey to light grey; fine grained; slightly silty; occasional bright coal stringers up to 2mm thick.
	203.20									
		0.10								as above - medium grained.
	Box 59									
		0.91			203.61	2.14	2.14			as above
			0.25	203.61	203.86					Core Loss
		1.65		203.86	205.51	1.65	1.65			Siltstone - dark grey, thin sandstone interbeds - badly broken core.
		0.40								Sandstone - dark grey to medium grey, fine grained, untraceable bedding.
	Box 60									
		0.09								as above

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

HOLE NO.: TR-DDH-8003 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: G. Singhai CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
	206.25									
		1.00		205.51	207.00	1.49	1.49			as above - with 3cm bright coal band at bottom of interval.
		0.44		207.00						Claystone - slightly carbonaceous.
90°		0.23								Carbonaceous claystone - numerous bright coal stringers (1mm to 10mm).
		0.23			207.90	0.90	0.90			Carbonaceous claystone - dark grey.
		0.82		207.90						Siltstone - dark grey; interbeds of claystone.
	Box 61									
		0.30								as above
	209.45									
		0.37			209.39	1.49	1.49			as above
			0.47	209.39	209.86	0.47				Core Loss
		0.39		209.86	210.25	0.39	0.39			Clyst - dark grey, highly carbonaceous, numerous bright coal stringers (1mm to 2cm).
			0.08	210.25	210.33					Core Loss
90°		1.59		210.33						Sandstone - dark grey to medium grey, fine grained, interbeds of siltstone, cross-bedded.
	Box 62									
		0.37								as above
	112.50									
		0.46			212.75	2.42	2.42			as above

GULF CANADA RESOURCES INC. – COAL DIVISION – DRILL CORE LOG

P–141A(10-80)

SHEET NO.: 13 of 13

HOLE NO.: TR-DDH -8003 ELEV. COLLAR: TOTAL DEPTH: DATE BEGUN:

PROJECT: BEARING: CORE SIZE: DATE COMPL.:

CO. ORD.: HOLE ANGLE: LOGGED BY: G. Singhai CONTRACTOR:

BCA	BOX MARKER	INTERVAL THK.	CORE LOSS	LITHOLOGICAL UNIT FROM	TO	APPAR. THK.	TRUE THK.	% REC	SAMPLE NO.	DESCRIPTION
		2.05		20.75						Conglomerate - with interbeds of girtstone - pebbles sub-rounded to rounded, chert quartzite, siltstone.
	Box 63									
		0.55								as above
	215.55									
		1.63			216.98	4.23	4.23			as above
		0.73		216.98						Sandstone - very coarse-grained, salt and pepper, cross-bedded.
	Box 64									
		0.72			218.43	1.45	1.45			as above
	218.60									End of Hole

APPENDIX IV

COAL SEAM DATA SHEETS

COAL SEAM DATA SHEET

GULF CANADA RESOURCES INC.
COAL DIVISION

P–267 (12-80)

DENSITY ——— RESISTIVITY ———

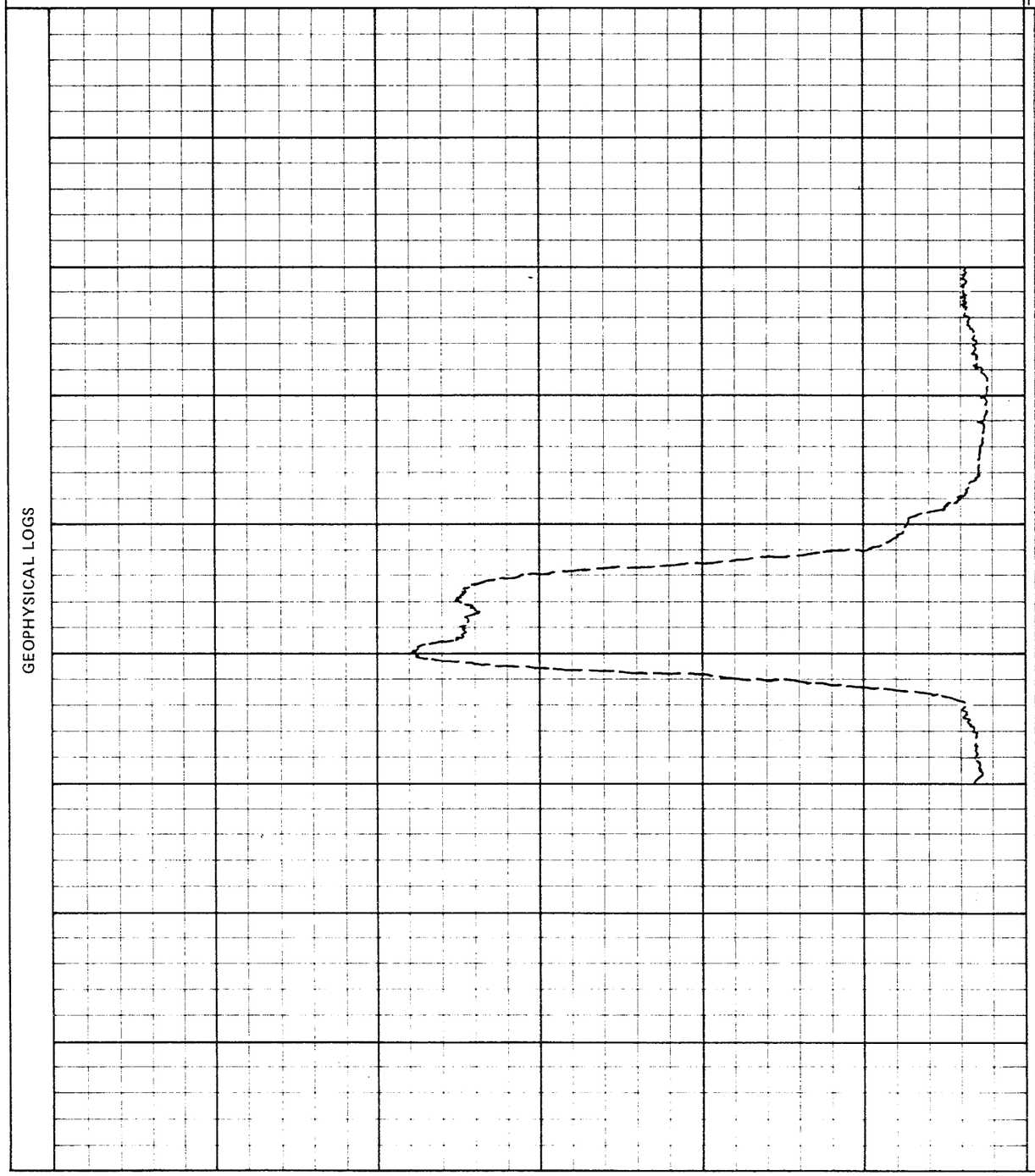
DRILL NO. TR-DDH-8001 SEAM CARON SEAM INTERVAL 170.28 m.-171.16 m.

SCALE 1:20

GEOPHYSICAL LOGS

DENSITY SCALE 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 2.30 2.40 2.50 2.60 2.70 2.80

RESISTIVITY SCALE



SEAM COMP. C 1 2 3 4 5 6	DEPTH	COAL SEAM LOG	INTERVAL ROCK	INTERVAL COAL	% REC.	SAMPLE NUMBER	SAMPLE COMPOS.	PROXIMATE ANALYSIS MOIST	ASH	VM	FC	S'	BTU	FSI
	170.28													
				0.88	100	0001		0.85	11.31	23.19	64.65 ADB	0.63	13,430	
	171.16													
				0.88										

True thickness
0.88 m.

P–267 (12-80)

COAL SEAM DATA SHEET

GULF CANADA RESOURCES INC.
COAL DIVISION

DENSITY ——— RESISTIVITY ———

DRILL NO. TR RDH 8012 SEAM CARON SEAM INTERVAL 107.42 m – 109.52 m

SCALE 1 : 20

DENSITY SCALE 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 2.30 2.40 2.50 2.60 2.70 2.80

RESISTIVITY SCALE

GEOPHYSICAL LOGS

SEAM COMP. C 1 2 3 4 5 6	DEPTH	COAL SEAM LOG	INTERVAL ROCK	INTERVAL COAL	% REC.	SAMPLE NUMBER	SAMPLE COMPOS.	PROXIMATE ANALYSIS MOIST	ASH	VM	FC	S'	BTU	FSI
	107.42			(0.27)										
			0.01	0.375										
	108.08		0.09											
			0.09	0.03										
			0.215		87	0.1349		1.13	24.81	21.85	ADB 52.21	0.44	10,844	
	108.50			0.28										
			0.035	0.03										
			0.105	0.125										
			0.025											
			0.01	0.165										
			0.09	0.01										
	109.52			0.145										
			0.67	1.43										

2.10m

True thickness
2.07 m

P–267 (12-80)

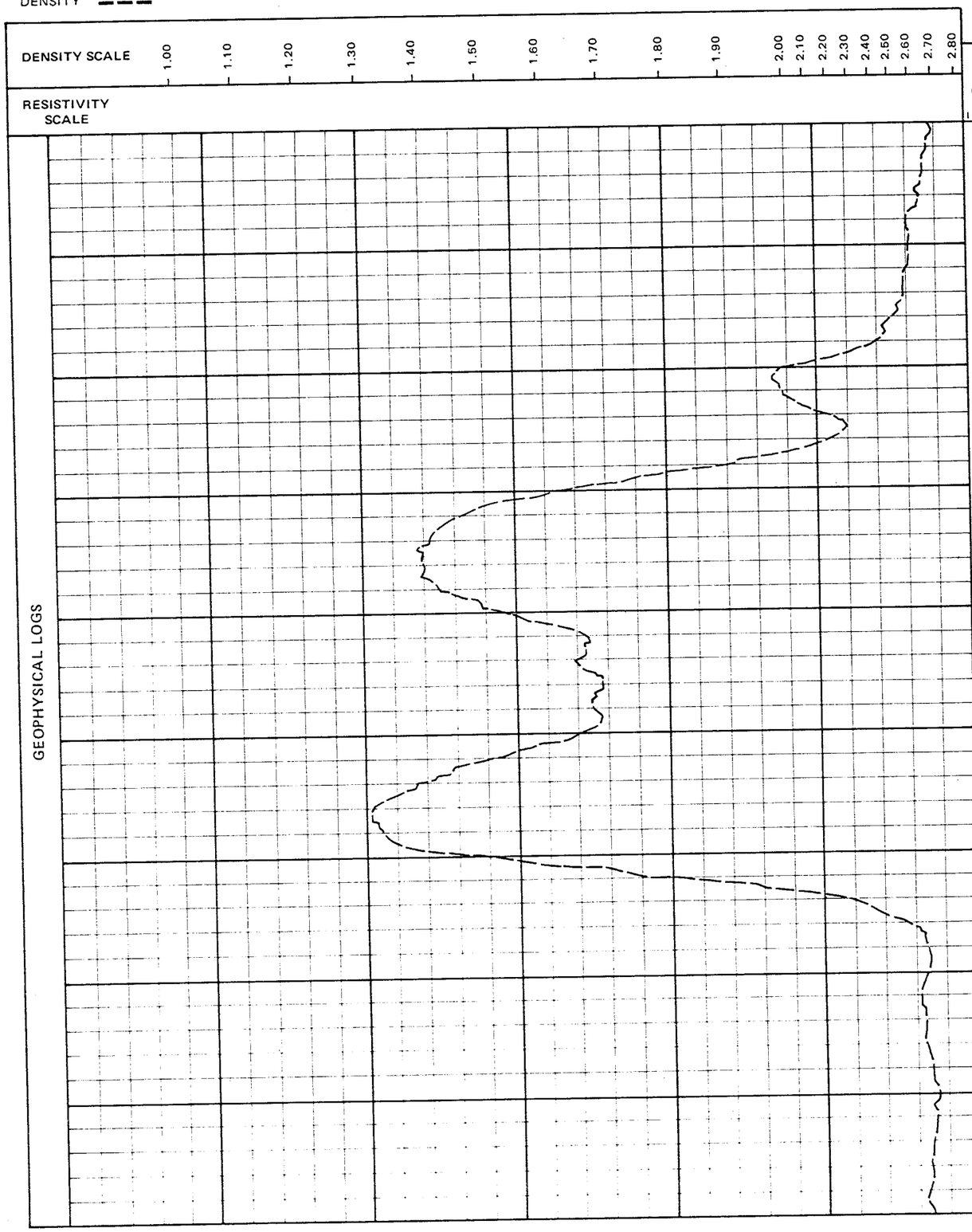
COAL SEAM DATA SHEET

GULF CANADA RESOURCES INC.
COAL DIVISION

DENSITY ——— RESISTIVITY ———

DRILL NO. TR RDH 8012 SEAM HIGHHAT SEAM INTERVAL 120.85m – 122.47m

SCALE 1:20



DEPTH	COAL SEAM LOG	INTERVAL ROCK	INTERVAL COAL	% REC.	SAMPLE NUMBER	SAMPLE COMPOS.	PROXIMATE ANALYSIS MOIST	ASH	VM	FC	S'	BTU	FSI
120.85		———	(0.075)		———								
			0.540										
		0.065	0.025	95	01350		1.10	43.14	18.30	ADB 37.46	0.27	7,796	
		0.290											
			0.625										
122.47		0.355	1.265		———								
		1.62m True thickness 1.56m.											

COAL SEAM DATA SHEET

GULF CANADA RESOURCES INC.
COAL DIVISION

P–267 (12-80)

DENSITY ——— RESISTIVITY ———

DRILL NO. TR-DDH 8002 SEAM _____ SEAM INTERVAL 214.93 m. - 215.44 m.

SCALE 1:40

DENSITY SCALE 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 2.30 2.40 2.50 2.60 2.70 2.80

RESISTIVITY SCALE

GEOPHYSICAL LOGS

SEAM COMP. C 1 2 3 4 5 6	DEPTH	COAL SEAM LOG	INTERVAL ROCK	INTERVAL COAL	% REC.	SAMPLE NUMBER	SAMPLE COMPOS.	PROXIMATE ANALYSIS MOIST	ASH	VM	FC	S'	BTU	FSI
	214.93			(0.13)								ADB		
				0.38	75	0002		1.41	14.58	23.24	60.77	0.35	12,780	
	215.44													

True thickness
0.48 m.

DIRECTIONAL SURVEY

680

ROKE OIL ENTERPRISES LIMITED

COMPANY: GULF CANADA RESOURCES INC. GRID: _____ DATE SURVEYED: 3 JULY 1980

DRILL HOLE: TR-RDH-80-01 LATITUDE: _____ SURVEY BY: ROBERTSON

LOCATION: TREFI PROPERTY DEPARTURE: _____ WITNESSED BY: MCFALL

FIELD: CHETWYND ELEVATION: _____ CALCULATIONS BY: _____

MAGNETIC DECLINATION: _____ CORRECTION OF: _____ FOR: _____ GRID: _____

Number	Cable Depth	Slant Angle	Slant Angle Bearing	Number	Cable Depth	Slant Angle	Slant Angle Bearing	Number	Cable Depth	Slant Angle	Slant Angle Bearing
0	00	1.27	15.9	11	90	*1.83 1.68	000.9 003.3	22	145	2.21	003.1
1	CASING TO 8.5M 10	1.73	348.0	12	95	1.24	-----	23	150	2.04	002.0
2	15	2.10	347.3	13	100	1.83	17.3	24	155	1.28	UNABLE TO OBTAIN STEADY READING
3	30	* 1.84 3.02	337.9 340.7	14	105	*2.38 1.87	53.6 8.7	25	160	1.65	-----
4	45	2.46	343.7	15	110	2.21	009.6	26	165	2.23	32.1
5	60	2.07	351.7	16	115	2.40	17.7	27	180	*3.15 3.35	38.6 38.1
6	65	1.64	349.8	17	120	1.67	327.6	28	195	3.16	48.2
7	70	2.02	346.4	18	125	1.84	-----	29	210	3.37	54.1
8	75	0.11	211.9	19	130	2.02	34.7	30	225	3.72	43.7
9	80	1.65	330.1	20	135	*1.83 0.78	19.2 325.5	31	229	3.91	28.6
10	85	1.64	348.5	21	140	2.02	-----	32			

* REPEAT READINGS

DIRECTIONAL SURVEY

ROKE OIL ENTERPRISES LIMITED

COMPANY: GULF CANADA RESOURCES INC. GRID: _____ DATE SURVEYED: 6 JULY 1980

DRILL HOLE: TR-RDH-80-01 LATITUDE: _____ SURVEY BY: ROBERTSON

LOCATION: TREFI PROPERTY DEPARTURE: _____ WITNESSED BY: MCFALL

FIELD: CHETWYND ELEVATION: _____ CALCULATIONS BY: _____

MAGNETIC DECLINATION: _____ CORRECTION OF: _____ FOR: _____ GRID: _____

BEARINGS ARE FROM MAGNETIC NORTH SLANT ANGLE IS FROM VERTICAL RUN AFTER HOLE WAS DEEPENED

Number	Cable Depth	Slant Angle	Slant Angle Bearing	Number	Cable Depth	Slant Angle	Slant Angle Bearing	Number	Cable Depth	Slant Angle	Slant Angle Bearing
0	00	0.55	001.7	11	150	2.61	12.5	22	315	07.78	018.0
	~~CASING TO 8.5M~~										
1	10	1.40	205.3	12	165	2.79	23.5	23			
2	15	2.31	331.3	13	180	* 2.57 3.17	38.4 39.5	24			
3	30	2.41	344.2	14	195	3.34	32.5	25			
4	45	3.02	345.8	15	210	3.53	77.3	26			
5	60	* 2.19 1.91	346.3 349.1	16	225	3.90	54.0	27			
6	75	2.64	346.6	17	240	* 4.27 5.39	53.4 91.6	28			
7	90	2.44	003.1	18	255	6.12	35.0	29			
8	105	2.62	007.3	19	270	6.12	35.0	30			
9	120	* 1.75 2.62	005.5 069.6	20	285	5.75	29.6	31			
10	135	1.87	017.0	21	300	* 5.75 7.41	14.5 18.6	32			

DIRECTIONAL SURVEY

ROKE OIL ENTERPRISES LIMITED

COMPANY: GULF CANADA RESOURCES INC. GRID: _____ DATE SURVEYED: 9 JULY 1980

DRILL HOLE: TR-RDH-80-02 LATITUDE: _____ SURVEY BY: ROBERTSON

LOCATION: TREFI PROPERTY DEPARTURE: _____ WITNESSED BY: MCFALL

FIELD: CHETWYND ELEVATION: _____ CALCULATIONS BY: _____

MAGNETIC DECLINATION: _____ CORRECTION OF: _____ FOR: _____ GRID: _____

Number	Cable Depth	Slant Angle	Slant Angle Bearing	Number	Cable Depth	Slant Angle	Slant Angle Bearing	Number	Cable Depth	Slant Angle	Slant Angle Bearing
0	00	1.12	095.6	11	150	1.16	078.4	22	315	8.39	174.0
	~~CASING TO 6.5 M~~										
1	10	1.26	261.1	12	165	3.38	156.4	23	330	8.36	171.8
2	15	1.37	092.0	13	180	* 3.13 2.43	150.1 139.0	24	345	7.98	173.1
3	30	1.73	106.4	14	195	3.92	148.2	25	360	* 6.86 6.86	208.2 180.0
4	45	1.72	111.6	15	210	3.17	109.8	26	375	7.42	191.7
5	60	* 1.83 1.34	120.3 117.9	16	225	3.92	170.7	27			
6	75	2.28	118.6	17	240	* 4.27 4.29	162.4 166.7	28			
7	90	2.27	098.2	18	255	4.85	155.9	29			
8	105	3.58	168.8	19	270	4.84	154.8	30			
9	120	* 2.59 2.83	140.9 142.1	20	285	5.95	168.0	31			
10	135	3.57	138.6	21	300	* 8.34 7.62	183.6 175.3	32			

* REPEAT READINGS

DIRECTIONAL SURVEY

ROKE OIL ENTERPRISES LIMITED

COMPANY: GULF CANADA RESOURCES INC. GRID: _____ DATE SURVEYED: 11 JULY 1980

DRILL HOLE: TR-80-03 LATITUDE: _____ SURVEY BY: ROBERTSON

LOCATION: TREFI PROPERTY DEPARTURE: _____ WITNESSED BY: MCFALL

FIELD: CHETWYND ELEVATION: _____ CALCULATIONS BY: _____

MAGNETIC DECLINATION: _____ CORRECTION OF: _____ FOR: _____ GRID: _____

BEARINGS ARE FROM MAGNETIC NORTH SLANT ANGLE IS FROM VERTICAL

Number	Cable Depth	Slant Angle	Slant Angle Bearing	Number	Cable Depth	Slant Angle	Slant Angle Bearing	Number	Cable Depth	Slant Angle	Slant Angle Bearing
0	00	01.86	342.2	11	165	14.71	205.7	22			
	~~CASING TO 11.5M~~										
1	15	03.67	257.4	12	180	* 16.90 17.10	209.0 207.6	23			
2	30	04.43	248.5	13	195	18.80	228.0	24			
3	45	06.26	219.4	14	210	19.80	207.8	25			
4	60	* 08.60 08.27	217.7 221.2	15	225	20.94	204.8	26			
5	75	09.20	227.4	16	240	22.61	221.3	27			
6	90	10.50	213.7	17				28			
7	105	10.87	210.6	18				29			
8	120	* 13.04 12.53	212.0 224.5	19				30			
9	135	13.69	208.3	20				31			
10	150	13.08	208.8	21				32			

* REPEAT READINGS

DIRECTIONAL SURVEY

ROKE OIL ENTERPRISES LIMITED

COMPANY: GULF CANADA RESOURCES INC. GRID: _____ DATE SURVEYED: 15 JULY 1980

DRILL HOLE: TR-RDH-80-04 LATITUDE: _____ SURVEY BY: ROBERTSON

LOCATION: TREFI PROPERTY DEPARTURE: _____ WITNESSED BY: MCFALL

FIELD: CHETWYND ELEVATION: _____ CALCULATIONS BY: _____

MAGNETIC DECLINATION: _____ CORRECTION OF: _____ FOR: _____ GRID: _____

Number	Cable Depth	Slant Angle	Slant Angle Bearing	Number	Cable Depth	Slant Angle	Slant Angle Bearing	Number	Cable Depth	Slant Angle	Slant Angle Bearing
0	00	0.19	STEADY READING UNOBTAINABLE	11				22			
1	15	0.50	261.0	12				23			
2	30	0.50	019.0	13				24			
3	45	1.97	070.5	14				25			
4	60	2.62	071.6	15				26			
5	75	1.85	STEADY READING UNOBTAINABLE	16				27			
6	90	3.41	107.0	17				28			
7	103	5.16	178.7	18				29			
8				19				30			
9				20				31			
10				21				32			

DIRECTIONAL SURVEY

ROKE OIL ENTERPRISES LIMITED

COMPANY: GULF CANADA RESOURCES INC. GRID: _____ DATE SURVEYED: JULY 1980

DRILL HOLE: TR-RDH-80-07 LATITUDE: _____ SURVEY BY: ROBERTSON

LOCATION: TREFI PROPERTY DEPARTURE: _____ WITNESSED BY: MCFALL

FIELD: CHETWYND ELEVATION: _____ CALCULATIONS BY: _____

MAGNETIC DECLINATION: _____ CORRECTION OF: _____ FOR: _____ GRID: _____

Number	Cable Depth	Slant Angle	Slant Angle Bearing	Number	Cable Depth	Slant Angle	Slant Angle Bearing	Number	Cable Depth	Slant Angle	Slant Angle Bearing
0	00	1.44	197.7	11	165	7.82	230.6	22			
1	15	0.65	331.0	12	180	7.83	209.8	23			
2	30	* 2.07 2.27	249.6 255.2	13	195	8.48	229.3	24			
3	45	5.80	243.4	14	200	8.06	223.6	25			
4	60	7.82	256.9	15				26			
5	75	8.03	226.4	16				27			
6	90	* 7.84 8.05	240.4 244.2	17				28			
7	105	8.07	231.1	18				29			
8	120	7.83	235.8	19				30			
9	135	8.24	226.1	20				31			
10	150	* 7.05 7.05	227.8 225.9	21				32			

* REPEAT READINGS

DIRECTIONAL SURVEY

ROKE OIL ENTERPRISES LIMITED

COMPANY: GULF CANADA RESOURCES INC. GRID: _____ DATE SURVEYED: 21 JULY 1980

DRILL HOLE: TR-RDH-80-08 LATITUDE: _____ SURVEY BY: ROBERTSON

LOCATION: TREFI PROPERTY DEPARTURE: _____ WITNESSED BY: MCFALL

FIELD: CHETWYND ELEVATION: _____ CALCULATIONS BY: _____

MAGNETIC DECLINATION: _____ CORRECTION OF: _____ FOR: _____ GRID: _____

Number	Cable Depth	Slant Angle	Slant Angle Bearing	Number	Cable Depth	Slant Angle	Slant Angle Bearing	Number	Cable Depth	Slant Angle	Slant Angle Bearing
0	00	0.11	052.3	11	165	5.99	129.5	22			
1	15	2.03	083.3	12				23			
2	30	3.48	150.8	13				24			
3	45	4.72	152.9	14				25			
4	60	4.32	166.3	15				26			
5	75	3.50	173.1	16				27			
6	90	4.71	140.0	17				28			
7	105	4.33	154.3	18				29			
8	120	5.16	191.6	19				30			
9	135	5.17	150.9	20				31			
10	150	5.15	106.6	21				32			

DIRECTIONAL SURVEY

ROKE OIL ENTERPRISES LIMITED

COMPANY: GULF CANADA RESOURCES INC. GRID: _____ DATE SURVEYED: 24 JULY 1980

DRILL HOLE: TR-RDH-80-09 LATITUDE: _____ SURVEY BY: ROBERTSON

LOCATION: TREFI PROPERTY DEPARTURE: _____ WITNESSED BY: MCFALL

FIELD: CHETWYND ELEVATION: _____ CALCULATIONS BY: _____

MAGNETIC DECLINATION: _____ CORRECTION OF: _____ FOR: _____ GRID: _____

Number	Cable Depth	Slant Angle	Slant Angle Bearing	Number	Cable Depth	Slant Angle	Slant Angle Bearing	Number	Cable Depth	Slant Angle	Slant Angle Bearing
0	00	0.50	003.8	11				22			
1	15	0.83	336.2	12				23			
2	30	* 2.92 3.59	338.7 354.0	13				24			
3	45	4.75	001.8	14				25			
4	60	* 5.60 5.21	026.7 006.2	15				26			
5	75	6.81	012.4	16				27			
6	88	8.04	013.8	17				28			
7				18				29			
8				19				30			
9				20				31			
10				21				32			

* REPEAT READINGS

DIRECTIONAL SURVEY

ROKE OIL ENTERPRISES LIMITED

COMPANY: GULF CANADA RESOURCES INC. GRID: _____ DATE SURVEYED: 26 JULY 1980

DRILL HOLE: TR-RDH-80-11 LATITUDE: _____ SURVEY BY: ROBERTSON

LOCATION: TREFI PROPERTY DEPARTURE: _____ WITNESSED BY: MCFALL

FIELD: CHETWYND ELEVATION: _____ CALCULATIONS BY: _____

MAGNETIC DECLINATION: _____ CORRECTION OF: _____ FOR: _____ GRID: _____

Number	Cable Depth	Slant Angle	Slant Angle Bearing	Number	Cable Depth	Slant Angle	Slant Angle Bearing	Number	Cable Depth	Slant Angle	Slant Angle Bearing
0	00	2.20	036.8	11				22			
1	CASING TO 7.0 M 15	3.30	163.7	12				23			
2	30	4.60	183.4	13				24			
3	45	* 6.61 6.82	238.1 213.0	14				25			
4	60	7.85	222.6	15				26			
5	75	9.68	210.4	16				27			
6	90	10.29	236.4	17				28			
7	105	* 10.78 10.91	223.4 221.2	18				29			
8	120	12.38	197.8	19				30			
9	130	13.61	192.8	20				31			
10				21				32			

* REPEAT READINGS

DIRECTIONAL SURVEY

ROKE OIL ENTERPRISES LIMITED

COMPANY: GULF CANADA RESOURCES INC. **GRID:** _____ **DATE SURVEYED:** September 20, 1980

DRILL HOLE: TR-RDH-80-12 **LATITUDE:** _____ **SURVEY BY:** SIM

LOCATION: _____ **DEPARTURE:** _____ **WITNESSED BY:** DUFORD

FIELD: TREFI **ELEVATION:** _____ **CALCULATIONS BY:** _____

MAGNETIC DECLINATION: _____ **CORRECTION OF:** _____ **FOR:** _____ **GRID:** _____

Number	Cable Depth	Slant Angle	Slant Angle Bearing	Number	Cable Depth	Slant Angle	Slant Angle Bearing	Number	Cable Depth	Slant Angle	Slant Angle Bearing
0	0	½	S-20-E	11	110	15°	S-16-W	22			
1	10	3°	S-4-W	12	120	17°	S-19-W	23			
2	20	4.5°	S-0	13	125	16°	S-19-W	24			
3	30	6°	S-10-W	14				25			
4	40	7°	S-20-W	15				26			
5	50	9°	S-27-W	16				27			
6	60	10°	S-30-W	17				28			
7	70	13°	S-27-W	18				29			
8	80	13°	S-27-W	19				30			
9	90	16°	S-25-W	20				31			
10	100	15°	S-18-W	21				32			

APPENDIX V

COAL QUALITY DATA

GULF CANADA RESOURCES INCORPORATED

PROJECT: Trefi

SAMPLE: TR-DDH-80-01, 0001

DATE: May 23, 1980

TABLE 1. ANALYSIS OF HEAD SAMPLE

	AIR-DRY BASIS	DRY BASIS
PROXIMATE ANALYSIS		
ASH %	11.31	11.41
MOISTURE %	0.85	-
VOLATILE MATTER %	23.19	23.39
FIXED CARBON %	64.65	65.20
CALORIFIC VALUE (CAL./GM)	7,460	7,525
(B.T.U./LB)	13,430	13,550
SULPHUR %	0.63	0.64
PHOSPHOROUS %	0.13	0.13
F.S.I.	2½	
EQUILIBRIUM MOISTURE %	1.26	

Cyclone Er Sales Ltd.

GULF CANADA RESOURCES INCORPORATED

PROJECT: Trefi

SAMPLE: TR-DDH-80-01, 0001

DATE: May 23, 1980

TABLE 2. ANALYSIS OF FLOAT PRODUCT @ 1.5

YIELD % 84.33

	AIR-DRY BASIS	DRY BASIS
PROXIMATE ANALYSIS		
ASH %	5.39	5.42
MOISTURE %	0.58	-
VOLATILE MATTER %	24.11	24.25
FIXED CARBON %	69.92	70.33
CALORFIC VALUE (CAL./GM)	8,045	8,090
(B.T.U. /LB.)	14,480	14,560
SULPHUR %	0.53	0.53
PHOSPHOROUS %	0.09	0.09
F.S.I.	3	

Cyclone Engineering Sales Ltd.

GULF CANADA RESOURCES INCORPORATED

PROJECT: Trefi

SAMPLE: TR-DDH-80-01, 0001

DATE: May 23, 1980

TABLE 3. ANALYSIS OF SINK PRODUCT @ 1.5

	AIR-DRY BASIS
YIELD %	15.67
ASH %	42.75
CALORIFIC VALUE (CAL./GM.)	4,250
(B.T.U./LB.)	7,650

Cyclone Engineering Sales Ltd.

GULF CANADA RESOURCES INCORPORATED

PROJECT: Trefi

SAMPLE: TR-DDH-80-02, 0002

DATE: May 23, 1980

TABLE 1. ANALYSIS OF HEAD SAMPLE

	AIR-DRY BASIS	DRY BASIS
PROXIMATE ANALYSIS		
ASH %	14.58	14.79
MOISTURE %	1.41	-
VOLATILE MATTER %	23.24	23.57
FIXED CARBON %	60.77	61.64
CALORIFIC VALUE (CAL./GM)	7,100	7,200
(B.T.U./LB)	12,780	12,960
SULPHUR %	0.35	0.36
PHOSPHOROUS %	0.18	0.18
F.S.I.	2	
EQUILIBRIUM MOISTURE %	1.81	

Cyclone Engineering Sales Ltd.

GULF CANADA RESOURCES INCORPORATED

PROJECT: Trefi

SAMPLE: TR-DDH-80-02, 0002

DATE: May 23, 1980

TABLE 2. ANALYSIS OF FLOAT PRODUCT @ 1.5

YIELD % 76.78

	AIR-DRY BASIS	DRY BASIS
PROXIMATE ANALYSIS		
ASH %	5.85	5.89
MOISTURE %	0.65	-
VOLATILE MATTER %	25.76	25.93
FIXED CARBON %	67.74	68.18
CALORFIC VALUE (CAL./GM)	7,865	7,915
(B.T.U. /LB.)	14,160	14,250
SULPHUR %	0.41	0.41
PHOSPHOROUS %	0.10	0.10
F.S.I.	3	

Cyclone Engineering Sales Ltd.

GULF CANADA RESOURCES INCORPORATED

PROJECT: Trefi

SAMPLE: TR-DDH-80-02, 0002

DATE: May 23, 1980

TABLE 3. ANALYSIS OF SINK PRODUCT @ 1.5

	AIR-DRY BASIS
YIELD %	23.22
ASH %	44.57
CALORIFIC VALUE (CAL./GM.)	4,600
(B.T.U./LB.)	8,280

Cyclone Engineering Sales Ltd.

GULF CANADA RESOURCES INC.

PROJECT: TREFI

SAMPLE: TR 8012, 01349

TABLE 1. - ANALYSIS OF HEAD SAMPLE

	Air-Dry Basis	Dry Basis
PROXIMATE ANALYSIS:		
Ash %	24.81	25.09
Moisture %	1.13	-
Volatile Matter %	21.85	22.10
Fixed Carbon %	52.21	52.81
CALORIFIC VALUE: (CAL./gm.)	6,024	6,093
(B.T.U./lb.)	10,844	10,968
SULPHUR %	0.44	0.45
PHOSPHOROUS %	0.08	0.08
SPECIFIC GRAVITY	1.48	1.49
FREE SWELLING INDEX	2	
HARDGROVE GRINDABILITY INDEX	57	
EQUILIBRIUM MOISTURE %	1.5	

CYCLONE ENGINEERING SALES LTD.

FILE: S1-316

SAMPLE: 3

DATE: Nov. 21, 1980

GULF CANADA RESOURCES INC.

PROJECT: TREFI

SAMPLE: TR 8012, 01349

CONFIDENTIAL

TABLE 1. - ANALYSIS OF HEAD SAMPLE (cont'd)

FUSIBILITY OF ASH:

	Reducing Atmosphere	Oxidizing Atmosphere
Initial Deformation Temp.	1290	1300°C
Softening Temp.	1310	1320
Hemispherical Temp.	1340	1350
Fluid Temp.	1380	1400

CYCLONE ENGINEERING SALES LTD.

FILE: S1-316

SAMPLE: 3

DATE: Nov. 21, 1980

GULF CANADA RESOURCES INC.

PROJECT: Trefi

SAMPLE: TR 8012, 01349

TABLE 2. SIZE CONSIST

Size	Wt. %
3/8" x 28 m.	86.16
28 m. x 100 m.	8.99
100 m. x 0	4.85
	100.00

CYCLONE ENGINEERING SALES LTD.

File: S1-316

Sample: 3

Date: Dec. 23, 1980

GULF CANADA RESOURCES INC.

PROJECT: TREFI

SAMPLE: TR 8012, 01349

TABLE 3. ANALYSIS OF 3/8" x 28 MESH SIZE FRACTION

3a. RAW SAMPLE ANALYSIS

	Air-Dry Basis	Dry Basis
PROXIMATE ANALYSIS:		
Ash %	26.46	26.66
Moisture %	0.76	-
Volatile Matter %	21.85	22.02
Fixed Carbon %	50.93	51.32
CALORIFIC VALUE: (CAL./gm.)	5,835	5,879
(B.T.U./lb.)	10,503	10,583
SULPHUR %	0.46	0.46
FREE SWELLING INDEX	1½	

CYCLONE ENGINEERING SALES LTD.

File: S1-316

Sample: 3

Date: Nov. 21, 1980

GULF CANADA RESOURCES INC.

PROJECT: Trefi

SAMPLE: TR 8012, 01349

TABLE 3. ANALYSIS OF 3/8" x 28 MESH SIZE FRACTION

3b. FLOAT-SINK ANALYSIS (a.d.b.)

	Fractional			Cumulative			
Sp. Gr.	Yield %	Ash %	BTU/lb.	Yield %	Ash %	BTU/lb.	FSI
- 1.35	17.14	4.87	14,459	17.14	4.87	14,459	7
1.35 - 1.40	18.18	9.13	13,629	35.32	7.06	14,032	5
1.40 - 1.50	17.00	16.85	12,373	52.32	10.24	13,493	3½
1.50 - 1.55	7.73	23.93	10,940	60.05	12.00	13,164	3
1.55 - 1.60	8.54	27.38	10,273	68.59	13.92	12,804	3
1.60 - 1.70	9.60	32.28	9,227	78.19	16.17	12,365	2½
1.70 - 1.80	5.47	42.38	7,549	83.66	17.89	12,050	2
+ 1.80	16.34	67.35	3,420	100.00	25.97	10,640	-

CYCLONE ENGINEERING SALES LTD.

File: S1-316

Sample: 3

Date: Nov. 21/80

GULF CANADA RESOURCES INC.

PROJECT: TREFI

SAMPLE: TR 8012, 01349

TABLE 4. ANALYSIS OF 28 MESH X 0 SIZE FRACTION

	Air-Dry Basis	Dry Basis
PROXIMATE ANALYSIS:		
Ash %	22.50	22.68
Moisture %	0.80	-
Volatile Matter %	23.22	23.41
Fixed Carbon %	53.48	53.91
CALORIFIC VALUE: (CAL./gm.)	6,441	6,493
(B.T.U./lb.)	11,594	11,687
SULPHUR %	0.46	0.46
FREE SWELLING INDEX	2½	

CYCLONE ENGINEERING SALES LTD.

File: SI-316

Sample: 3

Date: Nov. 21, 1980

GULF CANADA RESOURCES INC.

PROJECT: Trefi

SAMPLE: TR 8012, 01349

TABLE 5. ANALYSIS OF 28 MESH X 100 MESH SIZE FRACTION (a.d.b.)

	FRACTIONAL			CUMULATIVE			
Sp. Gr.	Yield %	Ash %	BTU/lb.	Yield %	Ash %	BTU/lb.	FSI
- 1.40	43.90	5.03	14,485.	43.90	5.03	14,485.	8
1.40 - 1.50	14.25	16.28	12,628.	58.15	7.79	14,030.	6½
1.50 - 1.60	15.20	22.00	11,506.	73.35	10.73	13,507.	5
1.60 - 1.70	8.76	29.60	9,898.	82.11	12.75	13,122.	4½
1.70 - 1.80	3.00	42.74	7,785.	85.11	13.80	12,934.	4
1.80 - 1.90	2.04	49.80	6,268.	87.15	14.65	12,778.	3½
+ 1.90	12.85	70.71	3,002.	100.00	21.85	11,522.	--

CYCLONE ENGINEERING SALES LTD.

File: SI-316

Sample: 3

Date: Dec . 23, 1980

GULF CANADA RESOURCES INC.

PROJECT: Trefi

SAMPLE: TR 8012, 01349

TABLE 6. ANALYSIS OF 100 MESH X 0 SIZE FRACTION

6a. RAW SAMPLE ANALYSIS

	Air-Dry Basis	Dry Basis
PROXIMATE ANALYSIS:		
Ash %	22.23	22.40
Moisture %	0.78	-
Volatile Matter %	24.08	24.27
Fixed Carbon %	52.91	53.33
CALORIFIC VALUE:		
Cal./gm.	6,249.	6,298.
B.T.U./lb.	11,248.	11,336.
SULPHUR %	0.42	0.42
FREE SWELLING INDEX	2½	

CYCLONE ENGINEERING SALES LTD.

File: S1-316

Sample: 3

Date: Dec. 23, 1980

GULF CANADA RESOURCES INC.

PROJECT: Trefi

SAMPLE: TR 8012, 01349

TABLE 6. ANALYSIS OF 100 MESH X 0 SIZE FRACTION

6.b FROTH FLOTATION (a.d.b.)

	FRACTIONAL			CUMULATIVE			
Time	Yield %	Ash %	BTU/lb.	Yield %	Ash %	BTU/lb.	FSI
30 seconds	79.09	14.89	12,396.	79.09	14.89	12,396.	4½
30 - 45	6.85	24.21	10,935.	85.94	15.63	12,280.	4
45 - 60	2.72	32.00	9,276.	88.66	16.13	12,187.	3½
60 - 90	2.20	48.79	5,987.	90.86	16.93	12,037.	3
90 - 120	-	-	-	-	-	-	-
Tailings	9.14	72.94	2,417.	100.00	22.05	11,158.	-

CYCLONE ENGINEERING SALES LTD.

File: S1-316

Sample: 3

Date: Dec. 23, 1980

GULF CANADA RESOURCES INC.

PROJECT: Trefi

SAMPLE: TR 8012, 01349

TABLE 7. SIMULATED PRODUCT: METALLURGICAL CLEAN COAL

7a. CONTRIBUTION BY SIZE FRACTION

Size	Cut Point	Yield %	Contribution
3/8" x 28 m.	1.4	35.32	82.19
28 m. x 100 m.	1.6	73.35	17.81
100 m. x 0	-	-	-
Total		~~38.91~~ 37.03	100.00

CYCLONE ENGINEERING SALES LTD.
File: S1-316
Sample: 3
Date: Mar. 24/81

GULF CANADA RESOURCES INC.

PROJECT: Trefi

SAMPLE: TR 8012, 01349

TABLE 7. SIMULATED PRODUCT: THERMAL CLEAN COAL

7b. ANALYSIS

	Air-Dry Basis	Dry Basis
PROXIMATE ANALYSIS:		
Ash %	17.71	17.87
Moisture %	0.90	-
Volatile Matter %	23.98	24.20
Fixed Carbon %	57.41	57.93
CALORIFIC VALUE: (Cal./gm.)	6,697	6,758
(B.T.U./lb.)	12,055	12,164
CHLORINE %	0.64	0.65
SPECIFIC GRAVITY	1.42	1.42
FREE SWELLING INDEX	3	
HARDGROVE GRINDABILITY INDEX	53	

CYCLONE ENGINEERING SALES LTD.
File: S1-316
Sample: 3
Date: Mar. 24/81

GULF CANADA RESOURCES INC.

PROJECT: Trefi

SAMPLE: TR 8012, 01349

TABLE 7. SIMULATED PRODUCT: THERMAL CLEAN COAL

7b. ANALYSIS (Cont'd)

MINERAL ANALYSIS OF ASH:

SiO_2	48.46
Al_2O_3	21.99
Fe_2O_3	3.52
MgO	2.42
CaO	12.58
Na_2O	0.17
K_2O	1.20
P_2O_5	0.72
TiO_2	0.83
SO_3	5.93

CYCLONE ENGINEERING SALES LTD.
File: S1-316
Sample: 3
Date: Mar. 24/81

GULF CANADA RESOURCES INC.

PROJECT: Trefi

SAMPLE: TR 8012, 01349

TABLE 7. SIMULATED PRODUCT: THERMAL CLEAN COAL

7b. ANALYSIS (Cont'd)

ASH FUSIBILITY:

	Reducing Atm. °C.	Oxidizing Atm. °C.
Initial Deformation Temp.	1,265	1,285
Softening Temp.	1,290	1,310
Hemispherical Temp.	1,305	1,325
Fluid Temp.	1,330	1,345

CYCLONE ENGINEERING SALES LTD.
File: SI-316
Sample: 3
Date: Mar. 24/81

GULF CANADA RESOURCES INC.

PROJECT: Trefi

SAMPLE: TR 8012, 01350

TABLE 7. SIMULATED PRODUCT: THERMAL CLEAN COAL

7b. ANALYSIS (Cont'd)

		Air-Dry Basis	Dry Basis
ULTIMATE ANALYSIS:			
Moisture %		0.85	-
Ash %		18.41	18.57
Carbon %		68.77	69.36
Hydrogen %		4.01	3.95
Nitrogen %		0.85	0.86
Sulphur %	(Pyritic)	0.02	0.02
	(Sulphate)	-	-
	(Organic)	0.41	0.41
Oxygen %		7.53	6.83

CYCLONE ENGINEERING SALES LTD.
File: S1-316
Sample: 4
Date: Mar. 27, 1981

GULF CANADA RESOURCES INC.

PROJECT: Trefi

SAMPLE: TR 8012, 01349

TABLE 8. SIMULATED PRODUCT: THERMAL MIDDLINGS

8a. CONTRIBUTION BY SIZE FRACTION

Size	Cut Point	Yield %	Contribution
3/8" x 28 m.	1.4 - 1.8	48.34	88.60
28 m. x 100 m.	1.6 - 1.8	11.76	2.25
100 m. x 0	60 sec.	88.66	9.15
Total		47.01	100.00

CYCLONE ENGINEERING SALES LTD.
File: S1-316
Sample: 3
Date: Mar. 24/81

GULF CANADA RESOURCES INC.

PROJECT: Trefi

SAMPLE: TR 8012, 01349

TABLE 8. SIMULATED PRODUCT: METALLURGICAL CLEAN COAL

8b. ANALYSIS

	Air-Dry Basis	Dry Basis
PROXIMATE ANALYSIS:		
Ash %	7.66	7.73
Moisture %	0.96	-
Volatile Matter %	25.60	25.85
Fixed Carbon %	65.78	66.42
SULPHUR %	0.50	0.50
PHOSPHOROUS %	0.05	0.05
SPECIFIC GRAVITY	1.35	1.35
FREE SWELLING INDEX	5	
HARDGROVE GRINDABILITY INDEX	58	

CYCLONE ENGINEERING SALES LTD.
File: S1-316
Sample: 3
Date: Mar. 24/81

GULF CANADA RESOURCES INC.

PROJECT: Trefi

SAMPLE: TR 8012, 01349

TABLE 9. SIMULATED PRODUCT: THERMAL MIDDLINGS

9a. ANALYSIS

	Air-Dry Basis	Dry Basis
PROXIMATE ANALYSIS:		
Ash %	25.66	25.87
Moisture %	0.80	-
Volatile Matter %	23.07	23.26
Fixed Carbon %	50.47	50.87
CALORIFIC VALUE: (Cal./gm.)	5,925	5,973
(B.T.U./lb.)	10,665	10,751
CHLORINE %	0.61	0.61
SPECIFIC GRAVITY	1.52	1.52
FREE SWELLING INDEX	1	
HARDGROVE GRINDABILITY INDEX	50	

CYCLONE ENGINEERING SALES LTD.
File: S1-316
Sample: 3
Date: Mar. 24/81

GULF CANADA RESOURCES INC.

PROJECT: Trefi

SAMPLE: TR 8012, 01349

TABLE 9. SIMULATED PRODUCT: THERMAL CLEAN COAL

9a. CONTRIBUTION BY SIZE FRACTION

Size	Cut Point	Yield %	Contribution
3/8" x 28 m.	1.8	83.66	85.78
28 m. x 100 m.	1.8	85.11	9.10
100 m. x 0	60 sec.	88.66	5.12
Total		84.03	100.00

CYCLONE ENGINEERING SALES LTD.
File: S1-316
Sample: 3
Date: Mar. 24/81

GULF CANADA RESOURCES INC.

PROJECT: Trefi

SAMPLE: TR 8012, 01349

TABLE 9. SIMULATED PRODUCT: THERMAL MIDDLINGS

9b. ANALYSIS (Cont'd)

		Air-Dry Basis	Dry Basis
ULTIMATE ANALYSIS:			
Moisture %		0.80	-
Ash %		25.66	25.87
Carbon %		61.00	61.49
Hydrogen %		3.80	3.74
Nitrogen %		0.85	0.86
Sulphur %	(Pyritic)	0.03	0.03
	(Sulphate)	-	-
	(Organic)	0.43	0.43
Oxygen %		8.23	7.58

CYCLONE ENGINEERING SALES LTD.
File: S1-316
Sample: 3
Date: Mar. 27, 1981

GULF CANADA RESOURCES INC.

PROJECT: Trefi

SAMPLE: TR 8012, 01349

TABLE 9. SIMULATED PRODUCT: THERMAL MIDDLINGS

9b. ANALYSIS (Cont'd)

MINERAL ANALYSIS OF ASH:

SiO_2	49.93
Al_2O_3	20.74
Fe_2O_3	3.24
MgO	2.62
CaO	12.03
Na_2O	0.17
K_2O	1.32
P_2O_5	0.40
TiO_2	0.85
SO_3	3.75

CYCLONE ENGINEERING SALES LTD.
File: S1-316
Sample: 3
Date: Mar. 24/81

GULF CANADA RESOURCES INC.

PROJECT: Trefi

SAMPLE: TR 8012, 01349

TABLE 9. SIMULATED PRODUCT: THERMAL MIDDLINGS

9b. ANALYSIS (Cont'd)

ASH FUSIBILITY:

	Reducing Atm. °C.	Oxidizing Atm. °C.
Initial Deformation Temp.	1,240	1,250
Softening Temp.	1,270	1,295
Hemispherical Temp.	1,300	1,320
Fluid Temp.	1,325	1,345

CYCLONE ENGINEERING SALES LTD.
File: S1-316
Sample: 3
Date: Mar. 24/81

GULF CANADA RESOURCES INC.

PROJECT: TREFI

SAMPLE: TR 8012, 01350

TABLE 1. - ANALYSIS OF HEAD SAMPLE

	Air-Dry Basis	Dry Basis
PROXIMATE ANALYSIS:		
Ash %	43.14	43.62
Moisture %	1.10	-
Volatile Matter %	18.30	18.50
Fixed Carbon %	37.46	37.88
CALORIFIC VALUE: (CAL./gm.)	4,331.	4,379
(B.T.U./lb.)	7,796	7,883
SULPHUR %	0.27	0.27
PHOSPHOROUS %	0.04	0.04
SPECIFIC GRAVITY	1.67	1.68
FREE SWELLING INDEX		1
HARDGROVE GRINDABILITY INDEX		57
EQUILIBRIUM MOISTURE %		1.4

B

CYCLONE ENGINEERING SALES LTD.

FILE: S1-316

SAMPLE: 4

DATE: Nov. 21,1980

GULF CANADA RESOURCES INC.

PROJECT: TREFI

SAMPLE: TR 8012, 01350

TABLE 1. - ANALYSIS OF HEAD SAMPLE (cont'd)

FUSIBILITY OF ASH:

	Reducing Atmosphere	Oxidizing Atmosphere
Initial Deformation Temp.	1330	1340°C
Softening Temp.	1370	1390
Hemispherical Temp.	1400	1420
Fluid Temp.	1430	1450

CYCLONE ENGINEERING SALES LTD.

FILE: S1-316

SAMPLE: 4

DATE: Nov. 21, 1980

GULF CANADA RESOURCES INC.

PROJECT: Trefi

SAMPLE: TR 8012, 01350

TABLE 2. SIZE CONSIST

Size	Wt. %
3/8" x 28 m.	89.26
28 m. x 100 m.	7.52
100 m. x 0	3.22
	100.00

CYCLONE ENGINEERING SALES LTD.

File: S1-316

Sample: 4

Date: Dec. 23, 1980

GULF CANADA RESOURCES INC.

PROJECT: TREFI

SAMPLE: TR 8012, 01350

TABLE 3. ANALYSIS OF 3/8" x 28 MESH SIZE FRACTION

3a. RAW SAMPLE ANALYSIS

	Air-Dry Basis	Dry Basis
PROXIMATE ANALYSIS:		
Ash %	43.29	43.67
Moisture %	0.86	-
Volatile Matter %	18.01	18.17
Fixed Carbon %	37.84	38.16
CALORIFIC VALUE: (CAL./gm.)	4,304.	4,341
(B.T.U./lb.)	7,748.	7,815
SULPHUR %	0.31	0.31
FREE SWELLING INDEX	1	

CYCLONE ENGINEERING SALES LTD.

File: S1-316

Sample: 4

Date: Nov. 21, 1980

GULF CANADA RESOURCES INC.

PROJECT: Trefi

SAMPLE: TR 8012, 01350

TABLE 3. ANALYSIS OF 3/8" x 28 MESH SIZE FRACTION

3b. FLOAT-SINK ANALYSIS (a.d.b.)

Sp.Gr.	FRACTIONAL			CUMULATIVE			
	Yield %	Ash %	BTU/lb.	Yield %	Ash %	BTU/lb.	F.S.I.
- 1.35	9.16	6.13	14,024	9.16	6.13	14,024	4½
1.35 - 1.40	11.61	9.85	13,465	20.77	8.21	13,712	2½
1.40 - 1.50	19.09	15.47	12,401	39.86	11.69	13,084	1½
1.50 - 1.55	5.69	24.26	10,957	45.55	13.26	12,818	1½
1.55 - 1.60	3.63	28.28	10,143	49.18	14.37	12,621	1½
1.60 - 1.70	4.90	34.80	9,045	54.08	16.22	12,297	1
1.70 - 1.80	4.17	43.15	7,384	58.25	18.15	11,945	1
+ 1.80	41.75	76.38	2,050	100.00	42.46	7,814	-

CYCLONE ENGINEERING SALES LTD.

FILE: S1-316

SAMPLE: 4

DATE: Nov. 21, 1980

GULF CANADA RESOURCES INC.

PROJECT: TREFI

SAMPLE: TR 8012, 01350

TABLE 4. ANALYSIS OF 28 MESH X 0 SIZE FRACTION

	Air-Dry Basis	Dry Basis
PROXIMATE ANALYSIS:		
Ash %	34.69	34.99
Moisture %	0.86	-
Volatile Matter %	20.46	20.64
Fixed Carbon %	43.99	44.37
CALORIFIC VALUE: (CAL./gm.)	5,050.	5,094.
(B.T.U./lb.)	9,090.	9,169.
SULPHUR %	0.31	0.31
FREE SWELLING INDEX	1	

CYCLONE ENGINEERING SALES LTD.

File: S1-316

Sample: 4

Date: Nov. 21, 1980

GULF CANADA RESOURCES INC.

PROJECT: Trefi

SAMPLE: TR 8012, 01350

TABLE 5. ANALYSIS OF 28 MESH X 100 MESH SIZE FRACTION (a.d.b.)

	FRACTIONAL			CUMULATIVE			
Sp. Gr.	Yield %	Ash %	BTU/lb.	Yield %	Ash %	BTU/lb.	FSI
- 1.40	29.50	6.50	14,202.	29.50	6.50	14,202.	4½
1.40 - 1.50	12.15	13.44	12,910.	41.65	8.52	13,825.	3½
1.50 - 1.60	12.94	18.17	12,137.	54.59	10.81	13,425.	2½
1.60 - 1.70	6.25	30.86	9,536.	60.84	12.87	13,025.	2
1.70 - 1.80	3.71	43.64	7,553.	64.55	14.64	12,711.	2
1.80 - 1.90	3.36	51.08	6,494.	67.91	16.44	12,403.	2
+ 1.90	32.09	74.26	1,906.	100.00	35.00	9,035.	-

CYCLONE ENGINEERING SALES LTD.

File: S1-316

Sample: 4

Date: Dec. 23, 1980

GULF CANADA RESOURCES INC.

PROJECT: Trefi

SAMPLE: TR 8012, 01350

TABLE 6. ANALYSIS OF 100 MESH X 0 SIZE FRACTION

6a. RAW SAMPLE ANALYSIS

	Air-Dry Basis	Dry Basis
PROXIMATE ANALYSIS:		
Ash %	34.19	34.42
Moisture %	0.66	-
Volatile Matter %	20.55	20.69
Fixed Carbon %	44.60	44.89
CALORIFIC VALUE:		
Cal./gm.	5,070.	5,104.
B.T.U./lb.	9,126.	9,187.
SULPHUR %	0.31	0.31
FREE SWELLING INDEX	1	

CYCLONE ENGINEERING SALES LTD.

File: S1-316

Sample: 4

Date: Dec. 23, 1980

GULF CANADA RESOURCES INC.

PROJECT: Trefi

SAMPLE: 8012, 01350

TABLE 6. ANALYSIS OF 100 MESH X 0 SIZE FRACTION

6.b FROTH FLOTATION (a.d.b.)

	FRACTIONAL			CUMULATIVE			
Time	Yield %	Ash %	BTU/lb.	Yield %	Ash %	BTU/lb.	FSI
30 seconds	71.37	23.02	11,201	71.37	23.02	11,201.	1½
30 - 45	6.92	35.10	8,804.	78.29	24.09	10,989.	1½
45 - 60	4.91	48.75	6,698.	83.20	25.54	10,736.	1½
60 - 90							
90 - 120	2.18	69.54	2,303.	85.38	26.67	10,521.	1½
Tailings	14.62	77.48	1,245.	100.00	34.10	9,164.	-

CYCLONE ENGINEERING SALES LTD.

File: S1-316

Sample: 4

Date: Dec. 23, 1980

GULF CANADA RESOURCES INC.

PROJECT: Trefi

SAMPLE: TR 8012, 01350

TABLE 7. SIMULATED PRODUCT: THERMAL CLEAN COAL

7a. CONTRIBUTION BY SIZE FRACTION

Size	Cut Point	Yield %	Contribution
3/8" x 28 m.	1.8	58.25	91.46
28 m. x 100 m.	1.8	64.55	8.54
100 m. x 0	-	-	-
Total		56.85	100.00

CYCLONE ENGINEERING SALES LTD.
File: S1-316
Sample: 4
Date: Mar. 24/81

GULF CANADA RESOURCES INC.

PROJECT: Trefi

SAMPLE: TR 8012, 01350

TABLE 7. SIMULATED PRODUCT: THERMAL CLEAN COAL

7b. ANALYSIS

	Air-Dry Basis	Dry Basis
PROXIMATE ANALYSIS:		
Ash %	18.41	18.57
Moisture %	0.85	-
Volatile Matter %	22.42	22.61
Fixed Carbon %	58.32	58.82
CALORIFIC VALUE: (Cal./gm.)	6,695	6,752
(B.T.U./lb.)	12,051	12,154
CHLORINE %	0.64	0.65
SPECIFIC GRAVITY	1.45	1.45
FREE SWELLING INDEX	1½	
HARDGROVE GRINDABILITY INDEX	59	

CYCLONE ENGINEERING SALES LTD.
File: S1-316
Sample: 4
Date: Mar. 24/81

GULF CANADA RESOURCES INC.

PROJECT: Trefi

SAMPLE: TR 8012, 01350

TABLE 7. SIMULATED PRODUCT: THERMAL CLEAN COAL

7b. ANALYSIS (Cont'd)

MINERAL ANALYSIS OF ASH:

SiO_2	53.16
Al_2O_3	26.39
Fe_2O_3	3.68
MgO	1.21
CaO	6.91
Na_2O	0.08
K_2O	0.72
P_2O_5	0.49
TiO_2	0.97
SO_3	3.43

CYCLONE ENGINEERING SALES LTD.
File: S1-316
Sample: 4
Date: Mar. 24/81

GULF CANADA RESOURCES INC.

PROJECT: Trefi

SAMPLE: TR 8012, 01350

TABLE 7. SIMULATED PRODUCT: THERMAL CLEAN COAL

7b. ANALYSIS (Cont'd)

ASH FUSIBILITY:

	Reducing Atm. °C.	Oxidizing Atm. °C.
Initial Deformation Temp.	1,350	1,365
Softening Temp.	1,385	1,405
Hemispherical Temp.	1,415	1,430
Fluid Temp.	1,450	1,450

CYCLONE ENGINEERING SALES LTD.
File: S1-316
Sample: 4
Date: Mar. 24/81

GULF CANADA RESOURCES INC.

PROJECT: Trefi

SAMPLE: TR 8012, 01349

TABLE 8. SIMULATED PRODUCT: METALLURGICAL CLEAN COAL

8b. ANALYSIS (Cont'd)

GIESELER PLASTICITY TEST:

S.T. ^{o}C.	Max. D.D.P.M. @ ^{o}C.	F.T. ^{o}C.	Temp. Range ^{o}C.
429	19 d.d.p.m. @ 457^{o}	476	47

AUDIBERT-ARNU DILATATION TEST:

S.T. ^{o}C.	Max. Cont. % @ ^{o}C.	Max. Dil. % @ ^{o}C.
376	20% @ 438^{o}	*

*No activity beyond point of maximum contraction.

CYCLONE ENGINEERING SALES LTD.
File: S1-316
Sample: 3
Date: Mar. 24/81

GULF CANADA RESOURCES INC.

PROJECT: Trefi

SAMPLE: TR 8012, 01349

TABLE 8. SIMULATED PRODUCT: METALLURGICAL CLEAN COAL

8b. ANALYSIS (Cont'd)

ASH FUSIBILITY:

	Reducing Atm. °C.	Oxidizing Atm. °C.
Initial Deformation Temp.	1,315	1,330
Softening Temp	1,360	1,385
Hemispherical Temp.	1,385	1,405
Fluid Temp.	1,450	1,450

CYCLONE ENGINEERING SALES LTD.
File: S1-316
Sample: 3
Date: Mar. 24/81

APPENDIX VI

DETAILED RESOURCE CALCULATION TABLES

DETAILED RESOURCE CALCULATIONS

Definitions:

West Area - Regional Dip 21.25°

East Area - Regional dip horizontal to sub-horizontal

Formula:

West Area (area X dip secant) X seam thickness X Sp.G. = tonnes

East Area area X seam thickness X Sp.G. = tonnes

CARON COAL SEAM

AREA	SEAM THICK.	AVE. DIP	SECANT	AREA (m^2)	SEC.X AREA	THICKNESS (m)	VOL (m^3)	S.G.	TONNES
WEST	1.0-1.5	21.25	1.073	882.259	946,663	1.25	1,120,823	1.48	1,632,178
	1.5-2.0	21.25	1.073	1,262,756	1,354,936	1.75	2,209,822	1.48	3,270,536
	2.0-2.5	21.25	1.073	3,036,851	3,258,540	2.25	6,832,913	1.48	10,112,711
	2.5+	21.25	1.073	1,379,814	1,480,540	2.5	3,449,535	1.48	5,105,312
EAST	1.0-1.5	0.0	-	12,357,942	-	1.25	15,447,427	1.48	22,862,193
	1.5-2.0	0.0	-	10,523,663	-	1.75	18,416,410	1.48	27,256,287
	2.0-2.5	0.0	-	3,138,080	-	2.25	7,069,680	1.48	10,463,126
	2.5+	0.0	-	781,922	-	2.5	1,954,805	1.48	2,893,111
							TOTAL		83,595,454

HIGHHAT COAL SEAM

AREA	SEAM THICK.	AVE. DIP	SECANT	AREA (m^2)	SEC.X AREA	THICKNESS (m)	VOL (m^3)	S.G.	TONNES
WEST	1.0-1.5	21.25	1.073	3,376,807	3,623,313	1.25	4,221,008	1.67	7,049,083
	1.5-2.0	21.25	1.073	7,670,989	19,656,601	1.75	13,424,230	1.67	22,418,464
	2.0+	21.25	1.073	1,356,321	1,455,322	2.0	2,712,642	1.67	4,530,112
EAST	1.0-1.5	0.0	-	23,364,061	-	1.25	29,205,076	1.67	48,772,477
	1.5-2.0	0.0	-	11,316,349	-	1.75	19,803,610	1.67	33,072,029
	2.0+	0.0	-	998,148	-	2.0	1,996,296	1.67	3,333,814
							TOTAL		119,175,979

APPENDIX VII

COAL LICENCES TO BE RETAINED

Rental Renewal Date - March 1, 1981

Licence No.	Hectares	Licence No.	Hectares
6027	293	5998	293
6017	293	5997	293
—	—	5996	293
—	—	5995	293
6016	293	5994	293
6015	293	5993	293
6014	293	5992	293
6013	293	5991	293
6012	293	5990	293
6011	293	5989	293
6010	293	5987	293
6009	293	5986	293
6008	293	5984	293
6007	293	—	—
6006	293	5983	293
6005	293	5981	293
6004	293	5980	293
6003	293	5979	293
6002	293	5978	293
6001	293	5977	294
6000	293	5976	294
5999	293	5975	294
20	5860	5935	291
		5934	291
		23	6738

Licence No.	Hectares
5933	291
5932	291
5931	292
5926	292
5924	292
5923	292
5889	292
5887	292
5886	292
5872	293
5871	293
5870	293
5869	293
5868	293
5867	293
5866	293
5865	293
5864	293
5863	293
5862	293
5861	293
5860	293
5859	293
5858	293
24	7021

Licence No.	Hectares
5847	293
5846	293
5845	293
5844	293
5843	293
5842	293
5841	293
5840	293
8	2344

Rental Renewal Date - March 24, 1981

Licence No.	Hectares	Licence No.	Hectares
6079	293	6059	294
6078	293	6058	294
6077	294	6057	294
6076	294	6056	294
6075	294	6055	294
6074	294	6054	294
6073	294	6053	294
6072	294	6052	294
6071	294	6051	294
6070	294	6050	294
6069	294	6049	294
6068	294	6048	294
6067	294	6047	294
6066	294	6046	294
6065	294	14	4116
6064	294		
6063	294		
6062	294		
6061	294		
6060	294		
20	5878		

Rental Renewal Date - August 14, 1981

Licence No.	Hectares
6159	293
6158	293
6157	293
6156	293
6155	293
6154	294
6153	293
6152	293
6151	293
6150	293
6149	293
6148	293
6147	293
6146	293
6145	293
6144	293
16	4689

APPENDIX VIII

RECLAMATION REPORT

RECLAMATION REPORT

This report covers reclamation work carried our on the Trefi Coal Exploration Property during the last two weeks of November 1980 and February 22-23, 1981 and provides a brief outline of the work performed on the sites and recommendtions for future reclamation work.

Item Uses:

a) 3/4 ton, 4 X 4 pick-up truck

b) Portable oxygen - acetylene cutting torch

c) "Explosometer" combustible sniffer

d) Clark 735 bobcat with ripper bucker

e) Case 550 track-mounted front-end loader with bucket and blade

f) Four 25 Kg. sacks of seed mix containing:

Creeping Red Fescue	45%
Timothy	30%
Alsike	25%

g) Six 25 Kg. bags of 46-0-0 fertilizer

h) Cyclone hand seeders

i) Shovels, picks, crow bar, sledge hammer and rakes

- The caving hole was filled using cement removed from the site and then covered with cuttings scraped up with the bobcat.
- The entire area was seeded and fertilized.
- Due to the extent of ground frost, most of the drill cuttings, the erosion channels and some cement remains unaltered.

Recommendations:

- Further reclamation steps should be taken after the spring thaw to upgrade the site to an acceptable condition.

Site TR-RDH-2

This site is located on a grassy clearing adjacent to a small gravel road on the north side of Highway 97. The gravel road exits the highway opposite a viewpoint turnout.

Reclamation Deficiencies:

- The Site is relatively clean except for the cuttings pile (2 m diameter 1 m high), a few pieces of planking, the airphoto markers and the surface casing.
- The debris should be picked up.
- The cuttings pile should be spread out and used to fill a rut created by the drilling rig.

- The surface casing should be cut off a couple of feet below the surface (providing a torch is available) then plugged and covered with soil or cuttings.
- The entire disturbed area should be seeded and fertilized.

Work Performed:

- The pieces of planking and the airphoto marker were removed from the site.
- The drill casing was cut 1.5 feet below the surface and plugged with a log.
- The bobcat was used to spread the cuttings pile into the ruts made by the drill rig and also to cover the plugged drill casing.
- The entire area was seeded and fertilized.

Recommendations:

- A re-inspection is scheduled for 1981 to determine if further reclamation is required.

Site TR-RDH-3

I was unable to locate this site, however, the pipeline road on which the site is reportedly located has been recently widened and contoured and this may have destroyed the site.

Site TR-RDH-4

The site is located on the edge of a logging road which branches off from the Commotion Creek forestry road. It is situated at the based of a vertical headwall cut into shale. On the opposite side of the road a small tributary stream drains into Commotion Creek.

Reclamation Deficiencies:

- The site is relatively clean except for the airphoto markers and the cuttings pile (1 m diameter .5 high). The cuttings pile should be spread out and the airphoto markers removed.
- The entire distrubed area (4-5 m diameter) should be fertilized and seeded although the shaley surface materials from the headwall may hamper revegetation attempts.
- The drillhole is collapsing and poses a serious threat to motorists using the road. Therefore, a below surface plug should be installed and covered with soil before seeding.
- Although this site is realtively close to a small creek, the drainage is along the north ditch of the road into an open area away from the creek. It doesn't appear that any fluids or cuttings from the drillsite have entered the stream.

Work Performed:

- The caving drillhole was plugged with a large rock below the surface.
- The bobcat was used to spread cuttings over the rock and to smooth some small ruts made by the drill rig.
- The airphoto marker was removed.
- The entire area was seeded and fertilized.

Recommendations:

- A re-inspection is scheduled for 1981 to determine if further reclamation is required.

Site TR-RDH-5

This site is located on a bench cut into the toe of a steep headwall on the east side of the Commotion Creek forestry road. The site had been inspected shortly before drilling commenced by Lin Callow (see file note dated 1980 07 15). The headwall above the platform has slopes ranging from 21° to 31° and 40 m high, at its base is a vertical drop of 1.5 m to the drilling platform. This vertical wall is cut down into the shale bedrock.

The soil overlying the shale on the headwall is approximately 1 m thick and composed of silty sand with 40-60% unsorted gravel from pebble to rubble size. Much of the fine material has been washed off the steeply sloping headwall and onto the drilling platform and adjacent ditch. The drilling platform is composed of fine shale particles and forms an effective erosion bar and settling area below the headwall.

Reclamation Deficiencies:

- The site is relatively clean, however, a five gallon pail, and the airphoto marker should be removed.
- The culvert installed for access across the ditch should be removed as well as the erosion bar present in the ditch downslope from the drill site. These structures could cause the road to flood and erode during heavy spring run off.
- The drilling platform should remain largely intact, however, the pile of material pushed up at both ends should be recontoured to its original slope and the platform edge facing the road slightly sloped, back into the hillside. This will improve the erosion effectiveness and settling basin characteristics of the platform.

- The entire area should be seeded and fertilized although revegetation is expected to be slow due to the poor soil quality of the remaining materials. Natural recolonizing species such as aspen, aster and grass have to date established approximately 3-5% cover on the headwall.
- The drill hole is caving in and and should be plugged below the surface and covered with soil (a rock, log or cement plug can be used).

Work Performed:

- The 5 gallon pail and air photo marker was removed from the site.
- The drill hole was plugged below surface with rock and the hole was filled with rock and cuttings.
- A small track-mounted front end loader pushed the overburden piled at each end of the drillsite back towards the platform and recontoured it to the original slope.
- The edge of the platform facing the road was pushed back and resloped to a lesser angle.
- The culvert in the ditch was removed and the ditch was cleaned to allow drainage.

- The cat compacted all distrubed soil by walking over the area repeatedly to lessen erosion of the recontoured slopes.
- The entire area was seeded heavily and fertilized.

Recommendations:

- A re-inspection is scheduled for 1981 to determine if further reclamation is required.

Site TR-RDH-6

This site is located on the north side of a sour road off the B.P. road.

Reclamation Deficiencies:

- There are 2 cuttings piles on site (one 8' X 8' X 1'; the second tapers up a 6' headwall from a depth of 1' at the bottom to 1" at the top and is 8' wide).
- The drill casing is protruding 1.5 feet out of the ground.
- There are two 8 inch wide ruts 3 inches deep and 10 feet long made by the dual rear wheels of the drilling rig.
- Site is clean of debris except for the airphoto marker.

Work Performed:

- The drill casing was cut off at a rock layer 6 inches below the surface and plugged with a log.
- Due to the amount of ground frost, the drill cuttings could not be spread at this time.
- The site was seeded and fertilized.

Recommendations:

- Further reclamation steps should be taken after the spring thaw to upgrade the site to an acceptable condition.

Site TR-RDH-7

This site is located on the south side of the B.P. road in a small clearing just off a bend in the road.

Reclamation Deficiencies:

- The extent of reclamation needed on this hole was hard to determine because of 4 inches of snow cover on the site.
- The drill hole appears to be plugged with cement and a cement flow extends at least 20 feet downslope from the drill hole.
- There is a drill cuttings pile 1 foot high and covering an undetermined area.

- A 6-inch piece of drill casing was embedded into the cuttings pile and it appears to have been cut from the drill hole, although no casing is present in the drill hole.

Work Performed:

- The airphoto marker was removed and the area was seeded and fertilized.

Recommendations:

- Further reclamation work should be attempted after spring thaw.

Site TR-RDH-8

This site is located on the north side of the B.P. road in a 200 foot by 75 foot clearing which has a 35 foot headwall on the north side. The clearing was probably made during the road construction as it has large piles of rock and surface material at the east and west ends of the clearing.

Reclamation Deficiencies:

- The drill hole is plugged with cement to the surface and there is not casing in the hole.
- A small cement flow (30' X 2' X .25") extends downslope from the hole.
- A cuttings pile (12' X 8' X 3') is present next to the drill hole.
- Site is clean of debris.

Work Performed:

- The area was seeded and fertilized.
- Due to the extent of ground frost, the cuttings pile has not been spread.

Recommendations:

- The site should be upgraded using a bobcat to spread the cuttings pile and remove the cement flow after spring thaw.

Site TR-RDH-9

This iste is located on a Loffland oil rig lease at the north end of the drill sump.

Deficiencies:

- The drill cuttings appear to be well spread except for a berm 6 feet in diameter and 6 inches high around the hole.
- A 1 foot piece of drill casing and a large, truck oil filter are embedded into the drill cuttings.
- The surface casing protrudes one foot above ground level.

Work Performed:

- The drill casing was cut off 8 inches below the surface and plugged with a log.
- The airphoto marker and the debris on site was removed.
- The area was seeded and fertilized.

Recommendations:

- A re-inspection is scheduled for 1981 to determine if further reclamation is required.

Site TR-RDH-10

This site is on the east side of a forestry access road to a cut block, at the base of a 25 foot headwall which is eroding badly.

Reclamation Deficiencies:

- There is a large (7' X 5') oil patch caused by the drill rig next to the drill hole.
- The cuttings are well spread (25' diam. X 4") across the road.
- Water and cuttings flowed across the road at an erosion bar 20 downslope from the drillhole. The water then flowed over the bank of the road and into a forested area, cutting an erosion channel 6 inches wide and 3 inches deep down the bank of the road.

Worked Performed:

- The drill casing was cut 8 inches below the surface and plugged with a log.
- The cuttings around the drill hole were used to cover the plugged casing.

- The oil patch was scooped up and removed.
- The airphoto marker was removed.
- The area was seeded and fertilized.

Recommendations:

- A re-inspection is scheduled for 1981 to determine if further reclamation is required.

Site TR-RDH-11 and -12

These sites are located side by side on the west side of the Hasler Creek forestry road.

Reclamation Deficiencies:

- Drill Hole 12 has surface casing protruding 1 foot out of the ground and it is flowing water at a rate of approximately 1 gallong/minute.
- The water is flowing into low land next to the road and has formed a pond 50 feet X 15 feet X 8 inches deep, which could was across the road if the water flow remains unchecked.
- Drill Hole 11 has been plugged to the surface with cement.
- There are 2 cutting piles on site (8 diam. X 1.5' high and 8'X 10'X 6").
- There is a cement patch on site (3'X 4'X 1").

Work Performed:

- Due to the extent of ground forst, the cuttings piles could not be spread at this time.
- The airphoto marker was removed and the area was seeded and fertilized.
- On February 22, 23, 1981 the flow of water was stopped and the drill hole was cemented from the bottom to within two feet from the surface by a pressure cementing crew.

Recommendations:

- The drill casing should be cut off at the cement plug and the cuttings piles should be spread over the drill site. All debris and cement on site should be removed. This work should not be attempted until well after the spring thaw.

Summary of Recommendations

- Further reclamation work may be required on some of the drillsites to upgrade them to meet the reclamation guidelines set out by the B.C. Government. This work may require the use of light machinery to be carried out effectively. Re-seeding of some of the disturbed areas may also be required.