

MOUNT KLAPPAN ANTHRACITE PROJECT

LOST - FOX AREA

GEOLOGICAL REPORT

1987

GEOLOGICAL REPORT



GULF CANADA RESOURCES LIMITED

COAL DIVISION

740

GULF CANADA RESOURCES LIMITED

**Mount Klappan Anthracite Project Geological Report
Lost-Fox Area**

1987

Coal Project Licence Numbers

7118 to 7177

7381 to 7392

7416 to 7432

7487 to 7539

7559 to 7561

and

7714 to 7757

Cassiar Land District

NTS Map Number 104 H

Latitudes Between 57° 06' and 57° 23'
Longitudes Between 128° 37' 30" and 129° 15'

Gulf Canada Resources Limited

April, 1988

PREFACE

The Mount Klappan Anthracite Project is located in northwest British Columbia and is wholly owned and operated by Gulf Canada Resources Limited.

The 1987 Lost-Fox Area Geological Report provides a current assessment of the geology, coal quality, and resource potential of the Lost-Fox Area, which is situated in the central region of the Mount Klappan property.

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LOST-FOX AREA
1987 GEOLOGICAL REPORT

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APPENDIX I

Trench Data and Coal Quality, Measured Sections,
and 1:50 000 Maps

Drawing No.

1987 Trench Data and Coal Quality (58 in total)

Summary Sheet

Sample Summary Sheet

Data Source Summary

Data Sheet (1:40 scale)

Descriptive Log

Coal Quality Analyses (where available)

1987 Measured Sections (15 in total)

Summary Sheet

Data Source Summary

Descriptive Log

Strip Log (1:200 scale)

1981-1987 Measured Section Location Map

KPN87002

1987 1:50 000 Map Sheets

1987 Geology Map

KPN87003

1987 Coal Resource Map

KPN87004

1987 Coal Licence Map

KPN87005

1984-1987 Fossil Location Map

KPN87006

APPENDIX II

1987 Geology Maps and Cross-Sections

Drawing No.

Volume I

1:2 000 Maps:

Sheet C-4	KPN87LF-19
Sheet C-5	KPN87LF-20
Sheet D-4	KPN87LF-21
Sheet D-5	KPN87LF-22
Sheet D-6	KPN87LF-23
Sheet E-4	KPN87LF-24
Sheet E-5	KPN87LF-25
Sheet E-6	KPN87LF-26

1:2 000 Cross-Sections:

1000N	KPN87LF-35
1125N	KPN87LF-36
1250N	KPN87LF-37
1375N	KPN87LF-38
1500N	KPN87LF-39
1625N	KPN87LF-40
1750N	KPN87LF-41
1875N	KPN87LF-42
2000N	KPN87LF-43
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	Drawing No.
2250N	KPN87LF-45
2375N	KPN87LF-46
2500N	KPN87LF-47
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3000N	KPN87LF-51
3125N	KPN87LF-52
3250N	KPN87LF-53
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1:5000 Cross-Sections:

5000S	KPN87LF-81
3000S	KPN87LF-82
1000S	KPN87LF-83
1000N	KPN87LF-84
3000N	KPN87LF-85
5000N	KPN87LF-86

APPENDIX III
1987 Diamond Drill Hole Data

Drawing No.

1987 Diamond Drill Holes (34 holes)

Data Source Summary

1:2000 Schematic Profile

Descriptive Log

Coal Seam Data Sheet

Stratigraphic Log

Geophysical Logs

1:10 000 Drill Hole Location Map

KPN87001

Volume I

KPNLRDDH87001

to

KPNLRDDH87008

Volume II

KPNLRDDH87009

to

KPNLRDDH87018

Volume III

KPNLRDDH87019

to

KPNLRDDH87026

Volume IV

KPNLRDDH87027

to

KPNLRDDH87034

APPENDIX IV

1987 Diamond Drill Hole
Coal Quality Data

1987 Diamond Drill Hole Coal Quality (34 holes)

Data Source Summary

1:2000 Schematic Profile

Sample Summary

Coal Seam Data Sheet

Coal Quality Data

Volume I

KPNLRDDH87001

to

KPNLRDDH87019

Volume II

KPNLRDDH87020

to

KPNLRDDH87034

1.0 SUMMARY

Gulf Canada Resources Limited's Mount Klappan Anthracite Project is located in the Bowser Basin of northwest British Columbia, 290 kilometres north of Smithers, and 150 kilometres northeast of Stewart, British Columbia. The property is composed of 152 crown coal licences totalling 40 186 hectares of land.

The Mount Klappan property has been a focus of Gulf's coal exploration activities since 1981. Several areas with economic coal potential have been highlighted or further defined during each of the exploration programs undertaken since the acquisition of the property.

The Mount Klappan property has been subdivided into three project blocks: the Lost-Fox Area, the Hobbit-Broatch Area and the Summit-Nass-Skeena Area. This report pertains to the Lost-Fox Area. A 1987 report covering exploration activities in the Summit-Nass-Skeena Area has been completed as well. No exploration was initiated this year in the Hobbit-Broatch Area.

Encouraging results in terms of quantity, quality and accessibility of coal has provided a basis for increased attention to the Lost-Fox Area each year. Results from detailed geological mapping, hand and mechanical trenching, diamond and rotary drilling, as well as adit driveages and trial cargoes have contributed to the delineation of economic resource areas in the Lost-Fox Area. In 1982 a Mining Assessment of the area was completed and in 1985 Gulf prepared a Stage I submission to the Government of British Columbia with respect to the development of the Lost-Fox Area. A feasibility study and concurrent Stage II submission were completed in early 1987.

Combined exploration activity on the Mount Klappan property during 1987 comprised 34 diamond drill holes totalling 4 931 metres, 53 mechanical trenches totalling 700 metres and 13 hand trenches totalling 58 metres. Geological mapping was completed in the Lost-Fox Area at scales of 1:2 000 and 1:5 000. Mapping in the Summit Area was at scales of either 1:5 000 or 1:10 000.

The Mount Klappan property covers sedimentary strata ranging in age from Upper Jurassic to Lower Cretaceous. These strata are interpreted to have been subjected to two phases of structural deformation resulting in NW-SE trending folds of the first phase (F₁) and generally NE-SW trending folds of the second phase (F₂). More apparent within the first phase, thrust and minor normal faulting are associated with both phases of deformation. The Lost-Fox Area is well within this structural regime, and displays results of both deformation phases.

The sediments underlying the property have been subdivided into four sequences: the Spatsizi, Klappan, Malloch, and Devils Claw, in ascending order. The Klappan Sequence is the main coal-bearing unit and is presently interpreted to attain a thickness of up to 1 100 metres. The Lost-Fox Area is predominantly underlain by strata of the coal-bearing Klappan Sequence.

Exploration diamond drilling in the Lost-Fox Area has delineated 36 unique coal and carbonaceous horizons within approximately 576 metres of Klappan Sequence section. Twenty-two of these horizons average thicker than 0.50 metres with individual true thicknesses ranging up to 9.23 metres (Seam K in DDH87005).

The in-situ anthracite resource potential on the Mount Klappan property totals over 5 500 million tonnes, of which 85.7 million tonnes have been "measured" in the Lost-Fox Area. Table 1.1 below outlines the categorization of the in-situ resources. These resource estimates do not imply mineability or economic viability. They represent estimated in-place anthracite resources only.

Table 1.1
ANTHRACITE RESOURCE SUMMARY
(million tonnes)

	Mount Klappan Property	Lost-Fox Area
Measured	97.8	85.7
Indicated	133.0	108.5
Inferred	540.4	138.7
Speculative	4753.7	705.2
 Total	 5524.9 mt	 1038.1 mt

The coal, which is of anthracite rank, can be cleaned to simultaneously produce a variety of sized products, ranging in ash content from 5% ash premium coals to briquetting coals of 25% ash or greater. The anthracite products are characterized by low sulphur values (usually 0.5%), high calorific values, and only traces of chlorine.

2.0 RECOMMENDATIONS

Although enough exploration work has been done to identify sufficient anthracite reserves for initial mine planning, additional work would be useful in the following areas:

1. continue "step out" diamond drilling patterns in those areas northeast and southwest of Lost Ridge where there is good potential for low strip ratio H and I seams;
2. infill drilling as required to verify structural or stratigraphic interpretations in the vicinity of Lost Ridge;
3. complete the mapping and correlation program between the West Ridge and Lost Ridge areas;
4. continue with detailed sedimentological and structural studies outlined in Section 5.9 of this report for use in seam identifications and correlations as well as for predictions of future areas of interest;
5. continue geological and coal quality data collection through drilling, mapping and trenching in the Lost-Fox Area of the property.

3.0 INTRODUCTION

3.1 Mount Klappan Anthracite Project

3.1.1 Location

The Mount Klappan coal licences are situated in northwest British Columbia approximately 930 kilometres north of Vancouver, 150 kilometres northeast of Stewart and 530 kilometres northwest of Prince George (Figure 3.1).

Geographically the coal licences are at the northern extremity of the Skeena Mountains between $57^{\circ} 06'$ and $57^{\circ} 23'$ north latitude, and $128^{\circ} 37'$ and $129^{\circ} 15'$ west longitude, and cover the headwaters of the Klappan, Little Klappan, Spatsizi, Skeena and Nass Rivers.

The nearest community to the property is the community of Iskut (population 500) located 100 kilometres to the northwest on the Stewart-Cassier Highway (Hwy 37).

3.1.2 Access

The Mount Klappan property straddles the partially completed British Columbia Railway line between Prince George and Dease Lake (Figure 3.2). Prior to cessation of work on the construction of the line, steel was laid to within 80 kilometres south of the property. With the exception of a 24 kilometre stretch north of the Kluatantan River, the railway

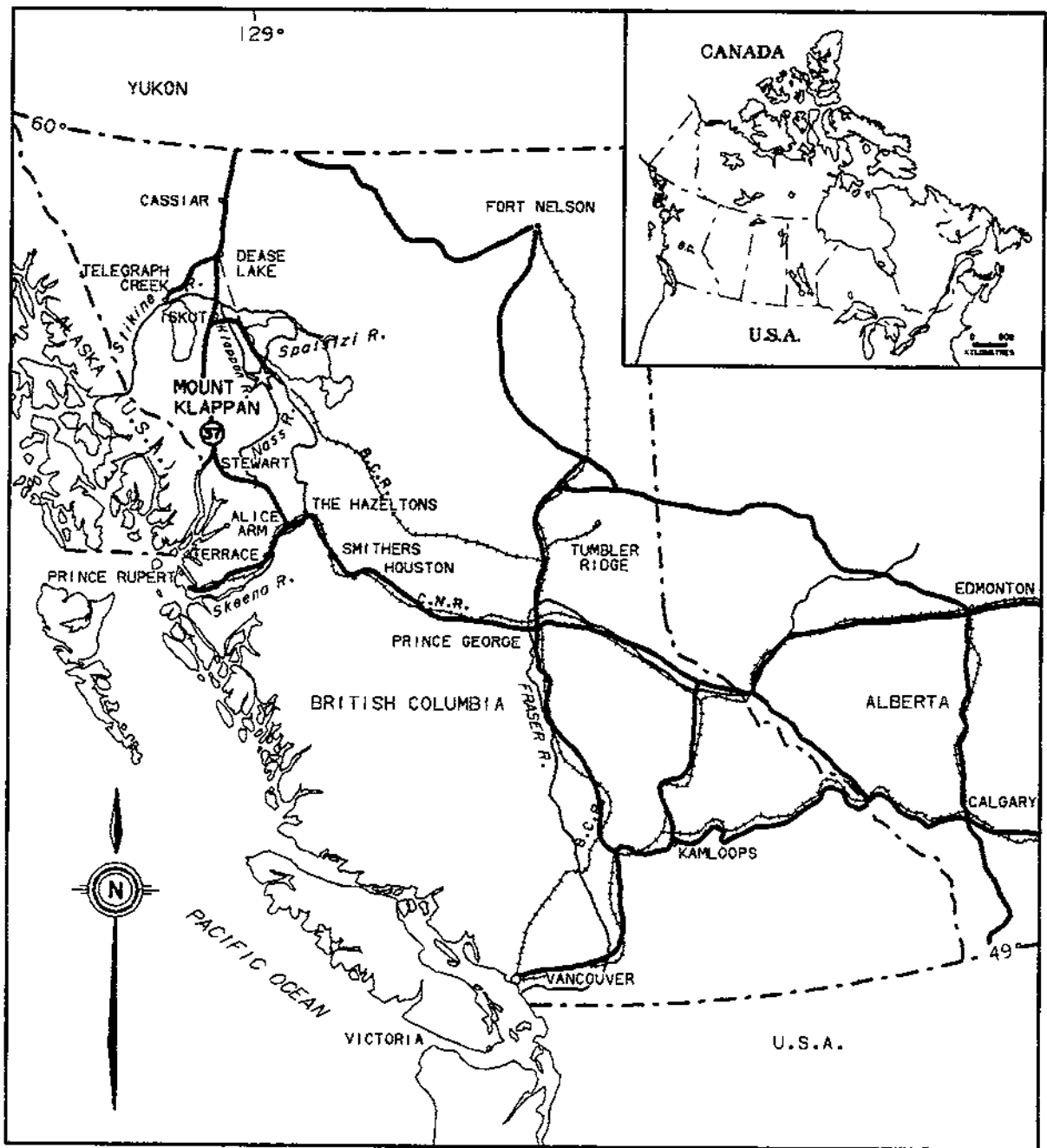
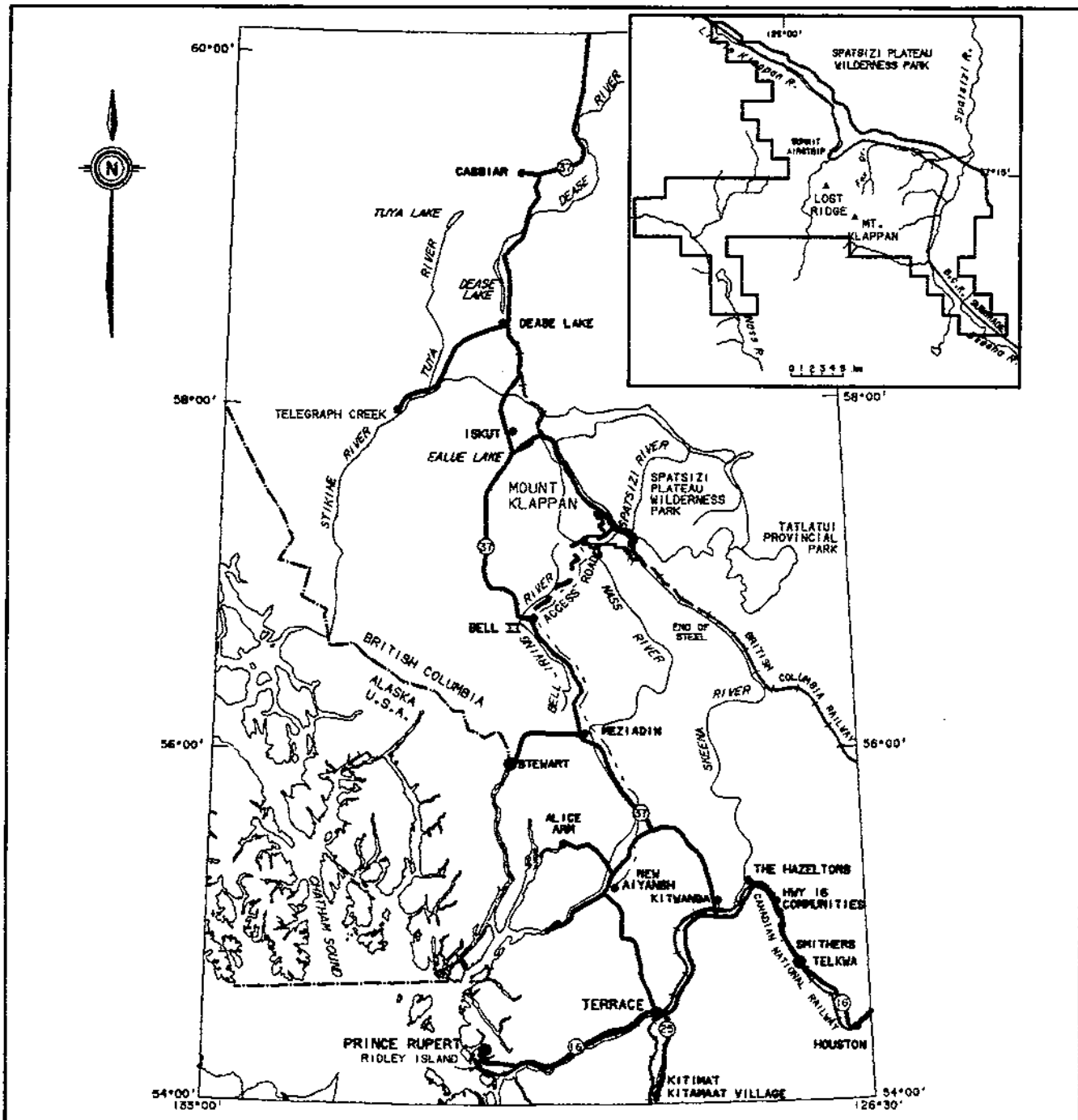


FIGURE 3-1
MOUNT KLAPPAN ANTHRACITE PROJECT
LOCATION MAP

GULF CANADA RESOURCES LTD.

GULF CANADA RESOURCES LTD.
 26/01/87
 KLAP:12050571840564005.L0C





SCALE 0 20 40 60 80 100 km

LEGEND








-  EXISTING ROAD ACCESS
-  PROPOSED ROAD ACCESS
-  TRANSMISSION LINE
-  EXISTING RAILWAY
-  EXISTING RAILWAY SUBGRADE
-  MOUNT KLAPPAN LICENCE AREA

FIGURE 3-2
MOUNT KLAPPAN ANTHRACITE PROJECT
PROPERTY ACCESS

GULF CANADA RESOURCES LTD.

GULF CANADA RESOURCES LTD.
 21/01/87
 KLAP: [205057]870008011.LOC



subgrade was constructed through and beyond the property to the Stikine River just south of Dease Lake.

Road access to the property from Highway 37 via Ealue Lake Road, is provided along the British Columbia Railway subgrade. Three bridges were constructed along the subgrade early in 1984 to permit surface access to the property. Road distances from Terrace and Stewart to the property are 575 kilometres and 426 kilometres, respectively.

Fixed wing aircraft provide access by air and use the 1000 metre Summit Airstrip located along the railway subgrade in the central region of the property.

3.1.3 Property Description

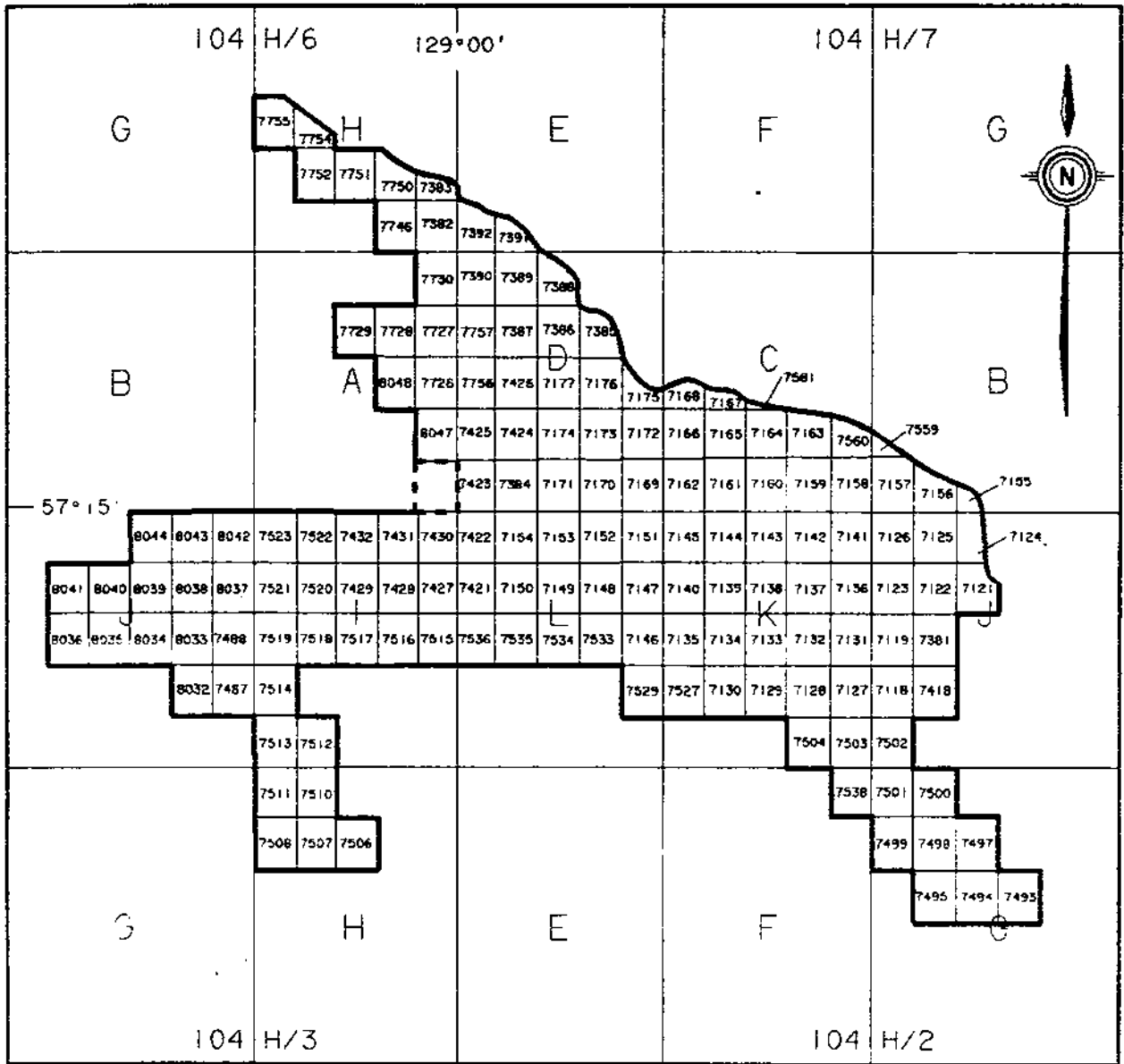
The Mount Klappan property comprises 152 coal licences totalling 40 186 hectares of land (Appendix A; Figure 3.3) as of October 31, 1987. The property was acquired in five separate applications from 1981 to 1985.

3.1.4 Ownership

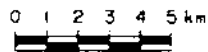
Gulf wholly owns the coal licences comprising the Mount Klappan property.

3.1.5 Property Geography and Biophysical Environment

The Mount Klappan property is located at the headwaters of the Little Klappan, Klappan, Nass, Skeena, and



SCALE



LEGEND

- LICENCE AREA
- 7386 LICENCE NUMBER
- UNDER APPLICATION


FIGURE 3-3

MOUNT KLAPPAN ANTHRACITE PROJECT

LICENCES

GULF CANADA RESOURCES LTD.

GULF CANADA RESOURCES LTD.
10/30/86
KLAP: [205057]831024020.L0C



Spatsizi Rivers (Figure 3.2). This area is within the northern extremity of the Skeena Mountains physiographic region. The regional physiography is of mountainous terrain with broad northwest to southeast trending valleys of the aforementioned rivers.

Elevations on the property range from 991 metres in the Klappan River Valley to over 2000 metres on Mount Klappan and the adjacent ridge tops.

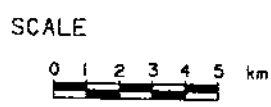
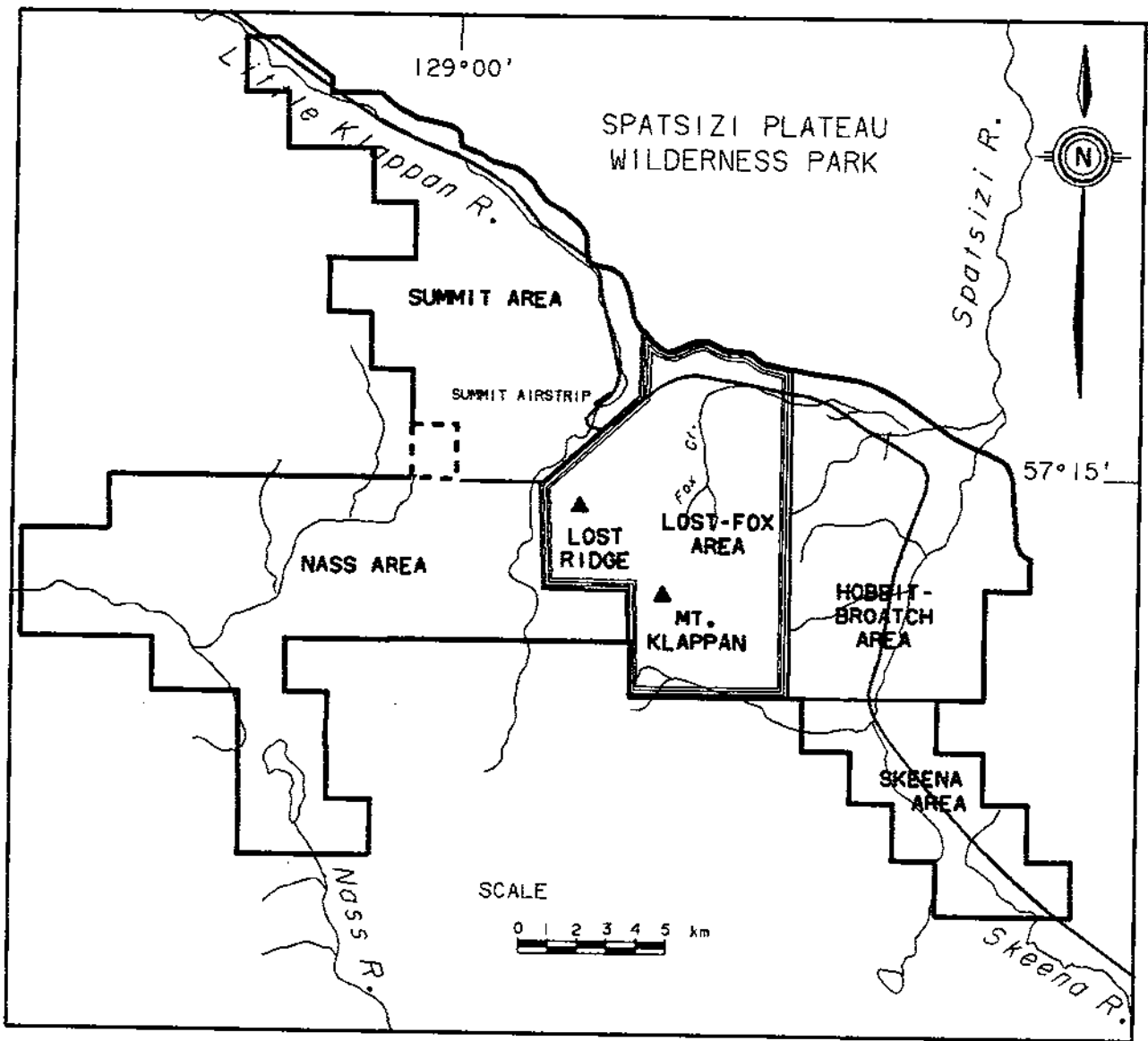
The climatic regime of the area is in the Northern and Central Plateau and Mountain Zone. Precipitation values average 300 to 400 mm per year with the mean daily temperatures comparable to Fort Nelson and Prince George. This information is derived from a weather station located near the Summit Airstrip and has been monitored monthly since being installed five years ago.

Tree line in the area is at approximately 1500 metres. Valley bottoms are partially covered with scattered coniferous forests, grasses, shrubs, meadows, and bogs. The higher elevations are characterized by alpine tundra.

3.2 Lost-Fox Area

3.2.1 Location

The Mount Klappan property has been divided into project blocks to facilitate exploration, expansion and subsequent logistics. (Figure 3.4). The Lost-Fox Area is



- LEGEND
- BRITISH COLUMBIA RAILWAY SUBGRADE
 - LICENCE AREA
 - [- -] LICENCE UNDER APPLICATION

FIGURE 3-4

MOUNT KLAPPAN ANTHRACITE PROJECT

LOST-FOX
1987 EXPLORATION AREAS

GULF CANADA RESOURCES LTD.

GULF CANADA RESOURCES LTD.
20/01/87
KLAP:12050571841165015.L0C

situated in the central region of the Mount Klappan property. Major geographic features included in the area are Lost Ridge, Mount Klappan and Fox Creek.

3.2.2 Access

The British Columbia Railway subgrade provides road access to the northern extremity of the Lost-Fox Area. An eight kilometre long coal haul road completed in 1985 provides access to Lost Ridge where the bulk of exploration activities occur. Where road access is not available, track-mounted vehicles are used to transport drill and support equipment.

3.2.3 Area Description

The Lost-Fox Area covers 8 757.5 hectares and includes 35 of the 152 licences comprising the Mount Klappan Anthracite Project (Appendix A). Two licences, 7171 and 7173, are divided between the Lost-Fox Area and the Summit Area, the former being concerned with the southeastern half of each of those licences.

3.2.4 Biophysical Environment

With tree line at approximately 1 500 metres a.s.l., the Lost-Fox area is characterized by alpine tundra, grasses, and shrubs, with swamps and some scattered coniferous stands at lower elevations.

The Mount Klappan massif influences the physical character of much of the area. The valley separating it from the second predominant feature, Lost Ridge, expresses the influence of Fox Creek, the major drainage in the Lost-Fox Area.

4.0 EXPLORATION HISTORY

4.1 Mount Klappan Property

4.1.1 Summary of Exploration 1981 - 1986

Gulf Canada Resources Limited has been actively involved in the exploration of the Bowser Basin in northeastern British Columbia since 1981. The vast majority of this work has been in the northern end of the Groundhog Coalfield delineating the anthracite potential of the area using the various techniques outlined in Table 4.1

A total of 10 separate reports have been submitted detailing the results of our exploration activities:

Mount Klappan Coal Project - Geological Report	1981
Mount Klappan Coal Project - Geological Report	1982
Mount Klappan Coal Project - Geological Report	1983
Mount Klappan Coal Project - Lost-Fox Area	1984
Mount Klappan Coal Project - Hobbit-Broatch Area	1984
Mount Klappan Coal Project - Summit-Nass-Skeena Area	1984
Mount Klappan Coal Project - Lost-Fox Area	1985
Mount Klappan Coal Project - Summit-Nass Area	1985
Mount Klappan Anthracite Project - Lost-Fox Area	1986
Mount Klappan Anthracite Project-Summit-Nass-Skeena Area	1986

Table 4.1

MOUNT KLAPPAN ANTHRACITE PROJECT
EXPLORATION SUMMARY 1981 TO 1986

	1981	1982	1983	1984	1985	1986	Total
Adits							
Number	--	--	1	--	--	1	2
Tonnes	--	--	39.2	--	--	30	69.2
Diamond Drill Holes							
Number (HQ)	--	7	3	8	34	38	90
Total Metres	--	1 223	603	1 507	6 146	5 550	15 029
Number (AIX)	--	--	6	--	--	--	6
Total Metres	--	--	126	--	--	--	126
Rotary Drill Holes							
Number	--	--	--	17	6	--	23
Total Metres	--	--	--	897	620	--	1 517
Hand Trenching							
Number	24	51	93	95	45	36	344
Total Metres	89	289	527	416	178	95	1 594
Mechanical Trenches							
Number	--	--	--	128	--	--	128
Total Metres	--	--	--	1 041	--	--	1 041
Measured Sections							
Number	--	--	--	13	19	6	38
Total Metres	--	--	--	2 736	3 347	745	6 828
Geological Mapping Scales							
	1:10 000	1:10 000	1: 5 000	1: 2 500	1: 2 500	1: 2 000	
			1:10 000	1: 5 000	1: 5 000	1: 5 000	
				1:10 000	1:10 000	1:10 000	

4.2 Lost-Fox Area

4.2.1 Summary of Exploration 1981 - 1986

During each of the six exploration years prior to 1987, the Lost-Fox Area has received further investigation in the form of geological mapping and trenching with subsequent drilling, adit driveages and trial cargoes after preliminary mapping results were assessed. Encouraging results in terms of quantity, quality and accessibility of coal, provided a basis for increased attention to the Lost-Fox Area each year. Each exploration program has supported a growing data base and has provided a continuing delineation of economic resource areas. Those exploration activities specific to the Lost-Fox Area, prior to 1987, are summarized in Table 4.2.

Table 4.2
LOST-FOX AREA
EXPLORATION SUMMARY 1981 TO 1986

	1981	1982	1983	1984	1985	1986	Total
Adits							
Number	--	--	1	--	--	1	2
Tonnes	--	--	39.2	--	--	30	69.2
Diamond Drill Holes							
Number (HQ)	--	1	2	4	34	38	79
Total Metres	--	244	411	1 017	6 146	5 550	13 368
Number (AIX)	--	--	6	--	--	--	6
Total Metres	--	--	126	--	--	--	126
Rotary Drill Holes							
Number	--	--	--	17	6	--	23
Total Metres	--	--	--	897	620	--	1 517
Hand Trenching							
Number	9	14	49	55	33	18	178
Total Metres	27	86	265	260	130	58	826
Mechanical Trenches							
Number	--	--	--	88	--	--	88
Total Metres	--	--	--	808	--	--	808
Measured Sections							
Number	--	--	--	5	5	2	12
Total Metres	--	--	--	1 368	308	93	1 769
Geological Mapping							
Scales	1:10 000	1:10 000	1: 5 000	1:2 500	1:2 500	1:2 000	
			1:10 000	1:5 000	1:5 000	1:5 000	

5.0 1987 EXPLORATION PROGRAM

5.1 Lost-Fox Area Program Objectives

In summary, the objectives of the 1987 Lost-Fox Area exploration program were:

1. To geologically map in detail all remaining outcrop in the Lost Ridge and West Ridge areas where surface mineable resources were interpreted to exist;
2. To continue a step-out diamond drilling program from the pit area towards the northeast and southwest into areas believed to have good potential for additional surface mineable resources;
3. To initiate a mechanical trenching program to assist in the delineation of seam subcrops along the southern and western slopes of Lost Ridge.
4. To continue with the collection of seam samples for the purpose of detailed coal quality analyses.

5.2 Summary of Exploration

5.2.1 Mount Klappan Anthracite Project

In seven years of exploration programs on the Mount Klappan property, Gulf has advanced through regional investigations to seam tracing, drilling, adit driveage and

trial cargoes (Table 5.1). While new areas are constantly being investigated, exploration is being focussed on those areas which have immediate economic interest.

The 1987 summer exploration program resulted in the completion of 34 diamond drill holes, 53 mechanical trenches, thirteen hand trenches and refinement of the detailed geological maps and cross-sections.

An 8.0 kilometre long haul road constructed in late 1984 from the British Columbia Railway subgrade up the backside of Lost Ridge provided truck and cat access to the central Lost-Fox Area. The Didene Creek Camp provided lodging and working space for up to 50 Gulf and support personnel during the program. Geological, drilling and support crews were transported daily from camp either by four-wheel-drive vehicles or by a Bell 206B helicopter. Drill equipment was skidded from site to site using either D-6 or D-7 Caterpillars and was serviced by either 4 x 4 vehicles or the helicopter.

A four-wheel-drive Emergency Transportation Vehicle was on standby at all times for use in a medical emergency.

Commercial as well as charter fixed wing aircraft linked the Summit Airstrip on the property to major centres and provided convenient air transportation for personnel and cargo throughout the exploration program.

Table 5.1

**MOUNT KLAPPAN ANTHRACITE PROJECT
EXPLORATION SUMMARY 1981 TO 1987**

	1981	1982	1983	1984	1985	1986	1987	Total
Adits								
Number	--	--	1	--	--	1	--	2
Tonnes	--	--	39.2	--	--	30	--	69.2
Diamond Drill Holes								
Number (HQ)	--	7	3	8	34	38	34	124
Total Metres	--	1223	603	1507	6164	5550	4931	19978
Number (AXI)	--	--	6	--	--	--	--	6
Total Metres	--	--	126	--	--	--	--	126
Rotary Drill Holes								
Number	--	--	--	17	6	--	--	23
Total Metres	--	--	--	897	620	--	--	1517
Mechanical Trenches (Seam Tracing)								
Number	--	--	--	128	--	--	53	181
Total Metres	--	--	--	1041	--	--	700	1741
Hand Trenches								
Number	24	51	93	95	45	36	13	357
Total Metres	89	289	527	416	178	95	58	1652
Measured Sections								
Number	--	--	--	13	19	6	25	63
Total Metres	--	--	--	2736	3347	745	1951	8779
Geological Mapping								
Scales	1:10 000	1:10 000	1:5 000	1:2 500	1:2 500	1:2 000	1:2 000	
			1:10 000	1:5 000	1:5 000	1:5 000	1:5 000	
				1:10 000	1:10 000	1:10 000	1:10 000	

5.2.2 Lost-Fox Area

The exploration programs undertaken from 1981 to 1986 provided encouraging and supportive data for the continued definition of the coal resources of the Lost-Fox Area. The 1987 Lost-Fox area program was run from June 9 to October 16 and involved diamond drilling, geological studies (Section 5.11), geological mapping, mechanical trenching and hand trenching (Table 5.2). The distribution of this work, on a licence-by-licence basis, is summarized in Appendix B.

5.3 Cartography

Topographic maps at 1:5 000 and 1:2 000 scales were used for plotting of exploration data and subsequent technical interpretation. The 1:5 000 maps were produced from 1:30 000 British Columbia Government air photographs taken in 1971 prior to the construction of the BCR subgrade. Air photographs at scales of 1:8 000 and 1:20 000 were taken over the Lost-Fox Area in September of 1985. Digitized topography derived from 1:2 500 orthophotos was used in-house to create 1:2 000 scale topographic maps for use during the Lost-Fox mapping program. Orthophoto blowups at a 1:2 000 scale were subsequently prepared for the mapping season as well.

Each drill hole completed during the 1987 program was surveyed. The results of this survey are documented in Appendix E.

Table 5.2

LOST FOX AREA
EXPLORATION SUMMARY 1981 to 1987

	1981	1982	1983	1984	1985	1986	1987	Total
Adits								
Number	--	--	1	--	--	1	--	2
Tonnes	--	--	39.2	--	--	30	--	69.2
Diamond Drill Holes								
Number (HQ)	--	1	2	4	34	38	34	113
Total Metres	--	244	411	1017	6164	5550	4931	18317
Number (AIX)	--	--	6	--	--	--	--	6
Total Metres	--	--	126	--	--	--	--	126
Rotary Drill Holes								
Number	--	--	--	17	6	--	--	23
Total Metres	--	--	--	897	620	--	--	1517
Mechanical Trenches								
Number	--	--	--	88	--	--	53	141
Total Metres	--	--	--	808	--	--	700	1508
Hand Trenches								
Number	9	14	49	55	33	18	5	183
Total Metres	27	86	265	260	130	58	29	855
Measured Sections								
Number	--	--	--	5	5	2	15	27
Total Metres	--	--	--	1368	308	93	985	2754
Geological Mapping Scales								
	1:10 000	1:10 000	1:5 000	1:2 500	1:2 500	1:2 000	1:2 000	
			1:10 000	1:5 000	1:5 000	1:5 000	1:5 000	

5.4 Geological Mapping

Detailed geological mapping of the Lost-Fox Area concentrated on the slopes of Lost Ridge and West Lost Ridge, as well as a separate mapping study of Knooph Hill. The program included the remapping of some areas for the purpose of recorrelation based on the results of last year's geological report.

Up to five two-person mapping teams contributed to the geological investigations in the area. Mapping was completed by using 1:2000 orthophotos and tying in to observable locations. The quality of these orthophotos in the Lost-Fox Area has considerably improved the accuracy of plotted geological data points.

Detailed geological maps and cross-sections are provided in Appendix II. A 1:50 000 regional geology map is located in Appendix I with this text.

5.5 Mechanical and Hand Trenching

During the 1987 Lost-Fox exploration program a total of 53 mechanical and five hand trenches were completed which amounted to 729 metres of linear excavation.

A 426 backhoe loader Caterpillar was utilized for mechanical trenching on the back side of Lost Ridge and West Lost Ridge, which amounted to a total length of 700 metres.

The objective of the mechanical trenching program was to

trace seams and obtain bedrock measurements in areas with thick overburden and little or no outcrop. Hand trenches were excavated in areas which were inaccessible to the backhoe.

Trenches were excavated at right angles to the slope where possible. All were logged by Gulf geologists upon completion and then backfilled in most cases. Some trenches remain open for further investigation.

Descriptive logs and pictorial lithological logs can be found in Appendix I.

5.6 Diamond Drilling

The 1987 Lost-Fox Area diamond drill program ran from August 23 to October 15 and comprised 34 HQ drill holes totalling 4931 metres. Two Longyear 44 drill rigs were used and all holes were geophysically logged upon completion.

The 1987 diamond drilling program concentrated, for the most part, on the area to the northeast of Lost Ridge. The objective was to determine the lateral extent of the thickest coal seams, namely H, I and K, and to better define the structure in that area. A noticeable increase in true thickness for K seam, to as much as 9.23 metres in DDH87005, was observed.

All drill core was lithologically and structurally logged by Gulf geologists, and all significant coal intersections were sampled for coal quality analyses. The coal quality results are discussed in Section 8.2.1 and analytical results are provided in

Table 5.3

LOST-FOX AREA
1987 DIAMOND DRILL HOLE SUMMARY

Drill Hole	Northing (M)	Easting (M)	Elavation (M)	Length (M)	Inclination	Licence Number
KPNLRDDH87001	6345007.34	508063.36	1507.48	132.03	90.0	7145
KPNLRDDH87002	6345393.82	508172.54	1480.79	205.47	90.0	7162
KPNLRDDH87003	6345148.65	508294.18	1493.35	101.75	90.0	7162
KPNLRDDH87004	6345072.18	508530.99	1479.52	101.60	90.0	7162
KPNLRDDH87005	6345612.18	508230.62	1452.19	201.62	90.0	7162
KPNLRDDH87006	6345329.93	508433.08	1462.33	153.76	90.0	7162
KPNLRDDH87007	6343325.08	505991.54	1694.47	204.76	90.0	7152
KPNLRDDH87008	6345453.72	507877.83	1484.76	199.50	90.0	7162
KPNLRDDH87009	6345828.14	508266.33	1454.72	125.78	90.0	7162
KPNLRDDH87010	6342981.92	505255.36	1705.37	59.74	90.0	7148
KPNLRDDH87011	6342980.77	505254.96	1705.28	93.27	90.0	7148
KPNLRDDH87012	6345680.44	507950.35	1466.40	132.06	90.0	7162
KPNLRDDH87013	6342487.49	504339.18	1674.21	138.26	90.0	7149
KPNLRDDH87014	6345653.48	507707.30	1473.80	104.68	90.0	7162
KPNLRDDH87015	6342109.47	504253.22	1632.47	122.22	90.0	7149
KPNLRDDH87016	6343561.68	506631.20	1679.17	66.18	90.0	7151
KPNLRDDH87017	6345801.44	507505.26	1472.00	118.19	90.0	7169
KPNLRDDH87018	6342328.11	508842.56	1629.34	152.43	90.0	7140
KPNLRDDH87019	6345555.91	507468.12	1486.65	210.21	90.0	7169
KPNLRDDH87020	6343087.65	508244.57	1582.83	163.67	90.0	7140
KPNLRDDH87021	6345236.49	507990.43	1501.42	96.15	90.0	7162
KPNLRDDH87022	6343789.84	508630.40	1554.94	146.85	90.0	7145
KPNLRDDH87023	6345709.44	508573.13	1460.79	188.06	90.0	7162
KPNLRDDH87024	6344342.82	509312.57	1536.18	161.60	90.0	7144
KPNLRDDH87025	6344833.23	507123.79	1525.32	112.59	90.0	7151
KPNLRDDH87026	6346044.95	508677.41	1444.09	181.45	90.0	7162
KPNLRDDH87027	6346025.03	508322.85	1441.03	127.07	90.0	7162
KPNLRDDH87028	6346510.17	508643.92	1418.86	224.58	90.0	7162
KPNLRDDH87029	6346467.17	508209.75	1420.71	211.76	90.0	7162
KPNLRDDH87030	6347236.20	508236.46	1376.50	250.10	90.0	7166
KPNLRDDH87031	6346975.89	508782.51	1393.83	205.24	90.0	7166
KPNLRDDH87032	6345000.24	505860.97	1615.67	57.00	90.0	7152
KPNLRDDH87033	6344798.90	506456.91	1643.71	124.07	90.0	7151
KPNLRDDH87034	6344895.56	506207.14	1620.07	57.00	90.0	7151

Appendix IV. Table 5.3 summarizes the diamond drilling program statistics.

The drill rigs were skidded to and from each hole location by D-6 and D-7 Caterpillars. The crews were helicoptered or driven to the various sites depending on accessibility. Crews operated on a two-shift, 24 hour per day basis, with a driller and a helper on each shift.

All drill hole locations were established using both chain and compass and detailed orthophotos. Each drill hole has been surveyed and all are clearly indicated on geological maps and cross-sections. Two drill holes, DDH84007 and DDH86030, require resurveying to firmly establish their correct locations. Drill hole 87010 was abandoned prior to completion and redrilled as DDH87011. A drill hole location map and all diamond drill hole data are located in Appendix III.

5.7 Rotary Drilling

A rotary drilling program was run to accumulate geotechnical data on overburden characteristics proximal to the potential wash plant location (see Appendix E for survey points). A total of five shallow rotary holes were completed with a Longyear 44 drill using rotary bits and fitted with a split spoon sampler to collect soil samples. Shallow core recovery was obtained from two holes for geotechnical laboratory analyses.

5.8 Geophysical Logging

Each diamond drill hole was geophysically logged upon

completion. The logging equipment utilized has downhole digitizing capabilities and resulted in a suite of logs comprised of gamma, neutron and sidewall density. Due to poor downhole conditions, all geophysical logging tools were run through the drill rods. Prints of the geophysical logs, at a scale of 1:100, are included in Appendix III along with all drill hole data.

The logging equipment was comprised of two compact and portable units and required a Bell 206B helicopter for mobilization.

5.9 Additional Geological Studies

Increased attention to the Lost-Fox Area over the past four years has permitted the undertaking of various and extremely detailed geological investigations and has resulted in an ever-broadening data base. The results of these ongoing studies have improved the confidence of seam identifications, correlations and even predictions. A thorough and complete understanding of the seam and interseam characteristics and continuity as well as the pattern of coal seam deposition for application to nearby resource areas, is the major objective of these studies.

Studies undertaken in previous years have ranged from being very regional in scope, to concentrating on small and very localized features. Studies conducted this year involved a re-examination of areas immediately surrounding Lost Ridge. By incorporating a detailed understanding of the geology gained from previous years' work, an extension of the main coal-bearing area was discovered into the West Lost Ridge Area. Also, a detailed

TABLE 5.4

LOST-FOX AREA
KEY STRATIGRAPHIC HORIZONS

Seam	Marker Horizon	Description
P	Crest Zone	Thick white ash layer (>20 cm); in distinct contrast with dark mudstone above and below; marks a point 10-15m above N seam.
O		
N		
M/N		
?		
M	Porcelaneous Tuffite Zone	Hard tuffaceous zone with extremely fine grained uniform texture and conchoidal fracture; becomes thinner and more mixed in with the surrounding sediment westward; occurs at a variable stratigraphic level above K seam.
L/M		
L		
?		
K/L		
?		
?		
K	Coaster Zone	Rhythmic, extremely fissile dark grey mudstone; marks occurrence of J seam zone which always lies immediately beneath the Coaster Zone.
?		
?		
J	Tuffite Zone	Variable thickness containing a mixture of tuffaceous material and siltstone; normally has a sharp base and gradational top; occurs always in association with I seam but at a variable stratigraphic level above it.
I		
?		
H/I		
H/12	Recrystallized Zone	Diagenetic recrystallization of carbonate in mudstone; sensitive to facies but occurs widely within 10 m below H seam.
H		
?		
H(lower)		
H-1		
PH	Milky Way Zone	Mudstone speckled with dispersed angular white quartz clasts; variable in thickness and abundance of quartz clasts; marks a point 12 m above F seam.
G		
G(lower)		
F/G	Gastropod Zone	Gastropods occur only in a very restricted portion of the coal sequence; several thin bands densely packed with gastropods can occur above and below D seam (mostly below); bivalves are found in association.
F		
E		
D		
C		
B		
B(lower)		
A		

investigation of Knooph Hill was made to confirm previous work in the area, and to better delineate the Klappan/Malloch Sequence contact.

The marker horizon study initiated in 1985 has proven to be invaluable in correlating drilled strata. There are seven key beds that have demonstrated a reliable consistency and occurrence across the Lost-Fox Area. A description of these correlative horizons and their relative stratigraphic positions is outlined in Table 5.4.

An in-house Geofile computer system is being used to make palinspastic reconstructions of all drill hole locations in the Lost-Fox Area. With the inclusion of each successive year's drilling data isopach maps are generated that depict the original environment of deposition in this region. The trends indicated by these contour maps can be used to predict areas which can be expected to have thick seam development. Each year, this information is then incorporated into the overall drilling strategy for the Lost-Fox Area.

Results from a bentonite study completed in 1986 suggest that the Mount Klappan area bentonites were deposited in brackish waters as they are generally composed of illite-smectite mixed layer swelling clays. Most of the samples collected are from several above I seam, K seam and N seam. Initial results indicate that elemental analyses and ratios can be used to determine stratigraphic positions by using discriminant function statistics. In future drill programs, bentonites will continue to be sampled and analysed to expand the data base and improve on statistical reliability.

During the 1986 field season, an undergraduate study was also completed on the two phases of folding on the Mount Klappan property. Analysis of cleavage and lineation data re-confirmed the presence of two phases of folding, the first trending at 135°, verging to the northeast and plunging to the southeast, the second trending 045° and verging to the southeast.

Work continued for a fourth year on the collection of flora and fauna samples and locations. The results of this work are discussed in section 6.3.3 of this report and shown in table form in Appendix C.

As a culmination of work done to date on the sedimentology of the Mount Klappan property, a paper has been prepared by J.W. Innis, S. MacLeod and E. Swanbergson entitled "The Stratigraphy of the Klappan Coalfield, Northern Bowser Basin, Northwestern British Columbia".

5.10 Data Management

Throughout the 1987 exploration program an IBM AT computer was utilized for cost accounting and budget control. During the field season, it also served as an on-site data storage system which facilitated the subsequent and immediate uploading of outcrop, trench and drill hole data onto Gulf's mainframe Coal Data Base set up on an AMDAHL V8 computer in Calgary. A Hayes 1200 modem was utilized for test transmission of data through a satellite telephone to Calgary. Coal quality data was also stored in the Coal Data Base. System 2000 data base management and Act I software provided the tools for data entry, retrieval and manipulation on the main frame computer.

5.11 Reclamation

All aspects of the drilling program on the Lost-Fox Area resulted in minimal disturbance during the 1987 exploration program. The drill program required two Caterpillars for rig transportation and use was made of the existing haul road to minimize surface disturbances. Each of the 34 sites was cleared of equipment and garbage upon completion of drilling. As each of these sites were at or above tree line, no significant clearing of sub-alpine trees was undertaken.

Trenching operations resulted in minimal disturbances with trenches being excavated at right angles to the slope where possible and later backfilled. Some trenches remain open for further investigation.

In accordance with government regulations a report was completed and submitted along with Form 6/7 regarding reclamation activities during 1987.

5.12 Exploration and Camp Permits

Approvals for the 1987 exploration program on the Mount Klappan property were received following the submission of Coal Exploration Form 6/7 to the Government of British Columbia. The following permits/approvals were issued to Gulf with respect to the Mount Klappan Coal Project 1987 exploration program:

Name	B.C. Ministry of
Reclamation Permit C-160	E.M.P.R.

Free Use Permit 14097	Forests
Waste Management PR-7332 + PA-7717	Environment
Water Management A61-20	Environment
Class B Burning Permit B130734	Forests
Inspection Report C-160	E.M.P.R.

5.13 Project Management and Major Contractors

The Mount Klappan Anthracite Project was managed by E. Swanbergson, Project Geologist, Gulf Canada Resources Limited.

The following professional and technical personnel contributed to the Lost-Fox Area 1987 exploration program:

J. Innis	Senior Geologist
G. Seve	Senior Geologist
F. S. McKenzie, P.Geol.	Geologist
M. Barker, P.Geol.	Geologist
L. Savoie	Geologist
B. Van den Bussche	Geologist
S. Lee	Geologist
K. Hunter	Geologist
A. Ledda	Geologist
M. Woofter	Geologist
G. Parry	Geologist
J. Wallace	Geologist
B. M. Leece, P. Eng.	Senior Engineer-Mining
K. Fujita	Coal Preparation Engineer
A. Sali	Administrator

R. Aftergood	Administrative Analyst
T. Sampietro	Camp Manager
C. D. Ireland	Secretary
C. Boyko	Secretary
W. Osborne	Bookkeeper
A. Penman	Geological Technician
V. Srivastava	Geological Assistant
D. Willis	Geological Assistant
L. Kende	Geological Assistant
G. Murray	Geological Assistant
R. Quock	Data Entry Technician
L. Louie	Core Photographer

A condensed list of those companies that provided services and/or supplies to the exploration program is presented below:

Birtley Coal & Mineral Testing	Calgary, Alberta
Canadian Airlines International	Calgary, Alberta
Canadian Freightways Ltd.	Calgary, Alberta
Central Mountain Air Serv. Ltd.	Smithers, B.C.
Century Geophysical Corp. of Cda.	Calgary, Alberta
I.C.G. Liquid Gas Ltd.	Terrace, B.C.
J. T. Thomas Diamond Drlg. Ltd.	Smithers, B.C.
Loring Laboratories	Calgary, Alberta
Northern Mountain Helicopters Inc.	Prince George, B.C.
Northmount Camp Services Ltd.	Vancouver, B.C.
Orthoshop	Calgary, Alberta
Petro Canada	Terrace, B.C.
Starr Industries Ltd.	Fort St. John, B.C.
Terrace Totem Ford	Terrace, B.C.
Tronnes Surveys Limited	Calgary, Alberta
Westcan Electronic Services Ltd.	Calgary, Alberta

6.0 GEOLOGY

6.1 Introduction

Geological mapping, mechanical trenching and hand trenching activities were undertaken over the majority of the Mount Klappan property during the 1987 exploration program. In addition, diamond drilling continued on the Lost-Fox Area. The results of this exploration program combined with previous years' work provided the basis for geological interpretations presented in this report.

The Mount Klappan property is underlain by uppermost Jurassic to Lower Cretaceous strata which consist of marine to non-marine sediments deposited in the Bowser Basin of northcentral British Columbia. The strata has been subjected regionally to two successive non-coaxial phases of deformation, F1 and F2, which resulted in folding and faulting trending in generally NW-SE (F1) and E-W (F2) directions. (See 1:50 000 Regional Geology Map; Appendix I).

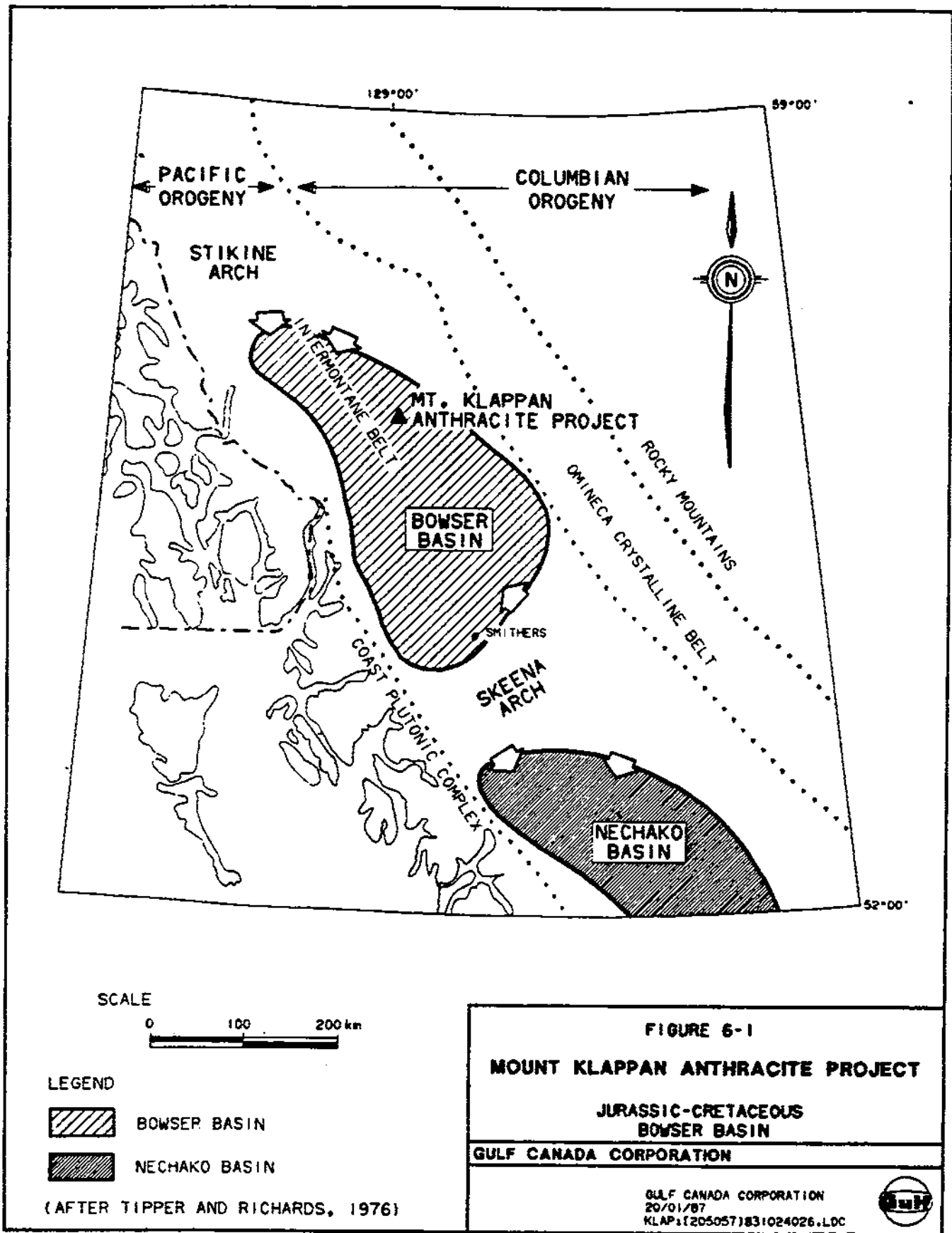
The coal seams of the Mount Klappan property occur primarily in the Klappan Sequence; in addition, some minor seams have been trenched in the Malloch Sequence. Coal seams range up to 9.23 metres in maximum true thickness in the Lost-Fox Area and are usually found to be laterally continuous over broad areas although some seams thin locally.

6.2 Regional Geologic Setting

The coal measures of the Mount Klappan property are contained within a series of sediments ranging in age from uppermost Jurassic to Lower Cretaceous. These sediments were deposited in the Bowser Basin, a successor basin to the volcanogenic Hazelton Trough (Tipper and Richards 1976). The Bowser Basin is bounded to the north and south by the Stikine and Skeena Arches, respectively, and to the east by the Columbia Orogen (Omineca Crystalline Belt). The western margin is thought to have been open to the sea at the time of Bowser sediment deposition (Figure 6.1).

The formation and development of the Bowser Basin was controlled by the "collision and subsequent isostatic uplift of several crustal blocks in the Cordilleran Orogen of western Canada" (Eisbacher, 1981). These crustal blocks include the Stikine Terrane (volcanic arc complex) which directly underlies the Bowser sediments, the Atlin Terrane (remnant oceanic crust) and the Omineca Crystalline Belt (western margin of the North American Craton).

During the Middle Jurassic, the Skeena Arch was uplifted and the subsidence of the Stikine Terrane divided the Hazelton Trough into the Bowser Basin to the north and the Nechako Basin to the south. Uplift of the Atlin Terrane to the north and northeast of the Bowser Basin, coupled with continued subsidence of the Stikine Terrane and collision and suturing of both these terranes with the Omineca Crystalline Belt (Eisbacher, 1981) resulted in a progradation of non-marine over marine sediments within the basin.



Paleocurrent measurements indicate a centripetal flow into the Bowser Basin from highlands to the north, northeast, and south.

Bowser sediment source rocks originate within the Atlin Terrane (high chert; low volcanic content) for the north and northeastern margins of the Basin, and from the remnant volcanic arc assemblage of the Stikine Terrane, (high volcanic; low chert content) for the southern portion of the Basin. Sediments from the Lower Cretaceous (youngest marine succession of the Bowser Basin) through to the Paleocene are found only on the eastern, and in part, the southern margins of the Basin.

Geologic studies in the southern and northern Bowser Basin sediments have resulted in several reports and descriptions of the sedimentary package associated with the Mount Klappan Area. These studies are summarized in Table 6.1.

Structural deformation of Bowser Basin sediments resulted from intermittent tectonic stresses at the western cratonic margin from Cretaceous to recent time. The deformation caused an extensive, shallow decollement, recumbent folds, and local thrust faults extending a few kilometres along strike (Eisbacher, 1976).

The large scale forces resulting from collision of a remnant volcanic arc and cratonic margin subjected the area to northeast-southwest compression (F_1) creating the general structural trend of northwest-southeast.


Later positioning of the former volcanic arc terrain north-

		MALLOCH, 1914	BUCKNAM & LAYOUR, 1950	SOUTHER & ARMSTRONG, 1966	EISBACHER, 1974c	TIPPER & RICHARDS, 1976	RICHARDS & GILCHRIST, 1979	BUSTIN & MOFFAT, 1983	KOO, 1986	INNIS, et al. in press
		SOUTHERN GROUNDHOG COALFIELD	GROUNDHOG COALFIELD	NORTHERN BRITISH COLUMBIA	NORTHERN BOWSER BASIN	SOUTHERN BOWSER	SOUTHERN GROUNDHOG COALFIELD	GROUNDHOG COALFIELD	KLAPPAN COALFIELD	KLAPPAN COALFIELD
CRETACEOUS	UPPER			SUSTUT- SIFTON ASSEMBLAGE	SUSTUT- SIFTON ASSEMBLAGE	SUSTUT GROUP				
	LOWER	SKEENA SERIES	HAZELTON GROUP UPPER PART	BOWSER ASSEMBLAGE	BOWSER ASSEMBLAGE ? JENKINS CREEK FACIES GUNANDOT- GROUNDHOG FACIES UNCONFORMITY GULF RIVER BLANKEESH FACIES	SKEENA GROUP	GUNANDOT ASSEMBLAGE	DEVILS CLAW UNIT	UNIT 5	DEVILS CLAW SEQUENCE
								McEVROY UNIT	UNIT 4 UNIT 3	MALLOCH SEQUENCE
								CURRENTLY PREDOMINANT	UNIT 2U UNIT 2L	KLAPPAN SEQUENCE
JACKSON UNIT	UNIT 1	SPATSIZI SEQUENCE								
JURASSIC	UPPER	HAZELTON GROUP	LOWER PART			BOWSER LAKE GROUP				
	MIDDLE			TAKLA- HAZELTON ASSEMBLAGE		HAZELTON GROUP				
	LOWER				TAKLA- HAZELTON ASSEMBLAGE	UNCONFORMITY				
TRIASSIC	UPPER					TAKLA GROUP				
	MIDDLE									

TABLE 6.1
MOUNT KLAPPAN ANTHRACITE PROJECT
REGIONAL STRATIGRAPHY
TABLE OF FORMATIONS

GULF CANADA RESOURCES LTD.

GULF CANADA RESOURCES LTD.
88/04/06
KLAP:12050571851092003.CHT



wards along interlaced right lateral high angle faults (Eisbacher, 1981) may account for the later north-south compressional (F₂) event. This deformational event resulted in generally broad, open NE to SW trending folds with relatively rare, flat lying thrusts expressed in several Klippen fault structures.

The final deformational event which produced strike-slip and some dip-slip faulting may have resulted from a change in the rotational component of the western crustal block, terminating compression.

6.3 Mount Klappan Property Geology

6.3.1 Stratigraphy

Based on age-dating of collected species of plant macrofossils and fauna, the sediments underlying the Mount Klappan property range from uppermost Jurassic to Lower Cretaceous in age (Section 6.3.3). This sedimentary package has been subdivided into four gradational sequences which in ascending order are the Spatsizi, Klappan, Malloch and Devils Claw sequences (Figure 6.2). These conformable sequences occur within approximately 3 000 metres of section and represent a gradual marine regression. Table 6.2 briefly outlines the sedimentological characteristics observed within each sequence.

Descriptions of the Klappan, Malloch and Devils Claw Sequence type sections are located in Appendix F.

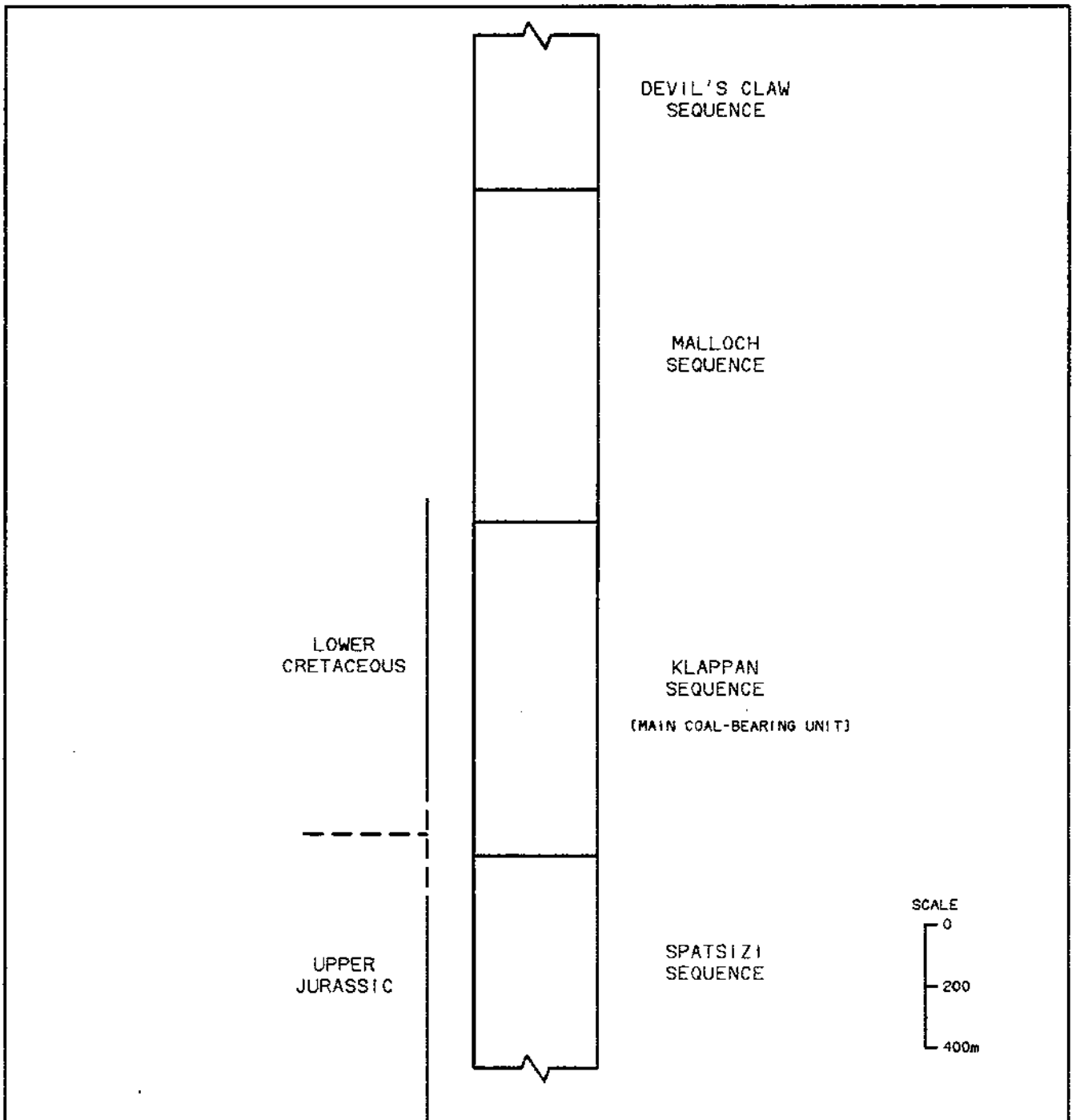


FIGURE 6-2
MOUNT KLAPPAN ANTHRACITE PROJECT
SCHEMATIC STRATIGRAPHIC COLUMN

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 88/04/86
 KLAP1(205057)841165010.CHT SAM



Kdc**DEVILS CLAW SEQUENCE**

SEQUENCE OF THICK CHERT PEBBLE CONGOLMERATES AND MINOR GRITTY SANDSTONES INTERBEDDED WITH AN INCREASING NUMBER OF SILTSONES AND MUDSTONES TOWARDS THE BASAL CONTACT. LARGE SCALE TROUGH AND TABULAR CROSS BEDS ARE COMMON. TEN SPECIES OF PLANT FOSSILS OCCUR WITHIN THE SEQUENCE, A FEW OF WHICH OCCUR PREDOMINANTLY NEAR ITS BASE.

Km**MALLOCH SEQUENCE**

THICK INTERBEDS OF MUDSTONES, ARGILLACEOUS SILTSTONES, FINE GRAINED SANDSTONES AND THIN INTERBEDS OF ORANGE WEATHERING NODULAR SILTSTONES. MANY CONGLOMERATE BEDS DISPLAY LARGE SCALE CROSS BEDDING AND TEND TO BE LATERALLY DISCONTINUOUS. THICK CLEAN SANDSTONE BEDS AND THIN COAL SEAMS INCREASE IN ABUNDANCE TOWARDS THE BASAL GRADATIONAL CONTACT. TWENTY-THREE SPECIES OF PLANT FOSSILS OCCUR WITHIN THE SEQUENCE.

JKk**KLAPPAN SEQUENCE (MAIN COAL-BEARING UNIT)**

FINE TO COARSE GRAINED SANDSTONES INTERBEDDED WITH MUDSTONES, SILTSTONES, OCCASIONAL THIN BANDS OF ORANGE WEATHERING CALCAREOUS SILTSTONES, CONGLOMERATES AND ABUNDANT COAL SEAMS. CONGLOMERATE BEDS GRADE LATERALLY INTO SANDSTONE. SANDSTONES OFTEN DISPLAY TABULAR OR TROUGH CROSS BEDDING. RHYTHMITES OCCUR IN THE MIDDLE OF THE SEQUENCE. TWENTY-THREE SPECIES OF BIVALVES AND UP TO TWENTY-FIVE SPECIES OF PLANTS OCCUR THROUGHOUT. PETRIFIED WOOD AND RARE COQUINA MAY BE PRESENT TOWARDS THE UPPER CONTACT.

Js**SPATSIZI SEQUENCE**

PREDOMINANTLY A MARINE SEQUENCE OF INTERBEDDED MUDSTONES, SILTSTONES, SANDSTONES AND CONGLOMERATES. CARBONACEOUS MUDSTONES, COARSENING UPWARDS SEQUENCES AND CHERT PEBBLE CONGLOMERATES ARE MORE ABUNDANT IN THE UPPER PART OF THE SEQUENCE. NINETEEN SPECIES OF BIVALVES ARE PRESENT. BELEMNITES ARE RARE. PLANT DEBRIS MAY OCCUR NEAR THE UPPER GRADATIONAL CONTACT.

TABLE 6-2

MOUNT KLAPPAN ANTHRACITE PROJECT

TABLE OF FORMATIONS

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88/04/12
KLAP: [205057]880072011.PLT SAM



6.3.1.1 Spatsizi Sequence

The Spatsizi Sequence is the lowest stratigraphic unit within the Mount Klappan property. Approximately 600 metres of this section has been measured and although the base has not been observed the stratigraphic thickness is estimated to be in excess of 1 200 metres. Interbedded mudstones, siltstones and sandstones are found throughout the sequence while thin coal seams and massive conglomerates occur within the upper portion. The overall trend is a coarsening upward sequence with marine conditions throughout and increasing coastal environment influences toward the upper transitional contact with the Klappan Sequence.

Exposures of the Spatsizi Sequence are located in the western and eastern Summit Area and in the northern Nass Area of the Mount Klappan property.

6.3.1.2 Klappan Sequence

The Klappan Sequence, the main coal-bearing unit, conformably overlies the Spatsizi Sequence and occurs over the majority of the property. It represents a transition from marine conditions, at the base of the unit, to more coastal influenced sediments toward the top. The stratigraphy consists of cyclic packages of interbedded fine to coarse-grained

sandstones, siltstones, mudstones, laterally discontinuous conglomerates and abundant coal seams. Up to 36 coal horizons with seam true thicknesses of as much as 9.23 metres occur within the Klappan Sequence. The sequence is interpreted to attain a thickness of up to 1 100 metres though both the upper and lower contacts are transitional.

6.3.1.3 Malloch Sequence

The Malloch Sequence conformably overlies the Klappan Sequence and outcrops in the central, western and southeastern areas of the property. The strata consist of interbedded argillaceous sandstone, siltstone and mudstone with the development of thin coal seams towards the base of the sequence. The Malloch is characterized by its abundance of active channel deposits including laterally discontinuous sandstone and chert pebble conglomerate units. This sequence is estimated to attain a thickness of approximately 900 metres.

6.3.1.4 Devils Claw Sequence

The Devils Claw Sequence is the youngest stratigraphic package on the Mount Klappan property and has a gradational and conformable contact with the underlying Malloch Sequence. Outcroppings of the Devils Claw are restricted to the southeast of the

property in the Skeena Area where approximately 500 metres of the lowermost sequence is exposed. The top of the sequence has not been observed to date. Lithologically the Devils Claw is dominated by thick, laterally extensive conglomerate units separated by sandstones, siltstones and minor mudstones. The sequence has been interpreted to represent an overall prograding, completely terrestrial, alluvial fan system probably resulting from increased uplift generated further west.

6.3.2 Structure

Deformation of sediments within the Mount Klappan property is the result of two regimes of non-coaxial stress which differ in the intensity of their effect on the stratigraphic package. The dominant structural features are the Beirnes Synclinorium and the parallel Nass River Anticlinorium which trend northwest to southeast. These major folds and all associated structures result from the dominant deformational phase (F1). On the Mount Klappan property the synclinorium axis can be observed in the competent Devils Claw strata as bisecting a broad, open, upright feature and plunging gently to the southeast. Smaller folds on both sides of the synclinorium have axes that dip toward the synclinorium axis. The adjacent major anticlinorium is not so clearly discerned as it is defined solely by the assignment of subordinate folds in the less competent Malloch strata.

Across the Mount Klappan property both outcrop and drilling indicate a structure comprised of south-westwardly dipping fold axes and thrust faults that are all part of the F1 regime. The secondary deformation (F2) produces primarily low amplitude, long wavelength folds trending northeast-southwest. These are superimposed on the F1 folding, producing a series of plunge reversals averaging 8 to 10 degrees to the northwest and southeast.

Cleavage is associated with both fold patterns. The F1 cleavage is pervasive and well developed in all fine grained lithologies. It has also been observed in different areas either as axial plane divergent or convergent, trending generally at 135 degrees. Similarly, cleavage related to the F2 folding can be convergent or divergent and trend anywhere from 030 to 110 degrees.

Non-compressional structures are also a feature of the Mount Klappan area. High angle normal faults trending north-south and large scale fracture zones trending east-west have been recorded regionally. These may have resulted from re-activation by F2 stresses of zones of weakness formed during F1 deformation; they may be relaxation features dating from before or after the F2 event; or they may be related to an entirely separate deformational event.

6.3.3 Plant Macrofossils and Fossil Fauna

During the 1984 to 1987 field seasons 1 420 specimens of fossil flora and fauna were collected from 803 sites on

the Mount Klappan property during routine traverses and the drill core logging program. The 27 species of fossil fauna and up to 28 species of plant macrofossils collected have aided in age determination, paleoenvironmental interpretations, stratigraphic delineations and, to a lesser extent, detailed stratigraphic correlations. The 1984 to 1987 Fossil Location Map in Appendix I documents all collection sites, and a complete listing of fossils with stratigraphic and geographic positions collected this year is given in Appendix C.

6.3.3.1 Fossils Evidence for Stratigraphic Age

Twenty three species of plant macrofossils previously identified within the Klappan and Malloch sequences on the Mount Klappan property were dated as Lower Cretaceous on the basis of floristic comparisons with other western Canadian Lower Cretaceous formations with similar collections (Table 6.3).

An age ambiguity is present at the Klappan-Spatsizi contact zone where limited Lower Cretaceous plant species and abundant Jurassic-Cretaceous marine fauna co-exist. Age dating confidence increases, however, towards the middle and upper Klappan Sequence where there is a marked increase in plant species diversity and numbers (Table 6.4). For this reason, the Jurassic-Cretaceous contact, previously placed at or near the Spatsizi-Klappan contact zone, remains unchanged.

* PARTIAL SPECIES LISTS ARE GIVEN FOR ALL FORMATIONS. ONLY THOSE SPECIES COMMON TO BOTH MT. KLAPPAN AND OTHER FORMATIONS ARE INCLUDED.

		KLAPPAN - MALLOCH - DEVILS CLAW FORMATION PLANT MACROFOSSILS																									
		FORMATIONS	CLADOPHLEBIS VIRGINIENSIS	SPIROPTERIS BRULENSIS	EQUISETITES LYELLI	BAIERA FURCATA	BAIERA GRACILIS	GINKGO LEPIDA	GINKGO NANA	GINKGO FLURIPARTITA	CZEKANOWSKIA RIGIDA	PTEROPHYLLUM RECTANGULARE	PTEROPHYLLUM PPLICATUM	NILSSONIA BRONGNIARTI	NILSSONIA CANADENSIS	NILSSONIA TENJICAILIS	CTENIS SCHAUBERGENSIS	NILSSONIA BOREALIS	PITYOPHYLLUM NIGRACOLLENSIS	PODZAMITES NORDENSKIOLDII	SAGENOPTERIS LAKEOLATUS	PHILOPHYLLUM WILLIAMSII	ELATIDES MONTANENSE	CONIOPTERIS BERRYI			
LOWER CRETACEOUS	ALBIAN	BLAIRMORE FM (UPPER FLORA)	•	•																?	•						
		PASAYTEN GP	⊙																								
		KINGSVALE GP																									
		CROWSNEST FM																									
		COMMOTION FM																									
	APTIAN	BLAIRMORE GP (LOWER FLORA)	⊙	•	•			•	⊙											•	•	•	•	⊙	•		
		LUSCAR FM	⊙	•	•				⊙		⊙	•								⊙	⊙	⊙	⊙	⊙	•		
		BULLHEAD GP (GETHING FM)	•			•	•		•		⊙	•								•	⊙	•	•	•	•		
		USLIKA FM	•																								
		HAZELTON GP (SKEENA BEDS)				•		•	•											•			⊙	•			
		JACKASS MOUNTAIN GP	•																						•		
		SPENCE BRIDGE GP																								•	
	NEOCOMIAN - BARREMIAN	KOOTENAY FM	⊙	⊙	•	•	•	⊙	•	⊙					•	⊙	⊙	•	⊙	⊙	•						
		NIKANASSIN FM			•	?			•	•	•									•	•	•					
		HAZELTON GP (HAZELTON AREA)	⊙	⊙	•			⊙		⊙										•	⊙	•	•				
HAZELTON GP (GROUNDHOG AREA)		⊙					•	•							•	•			⊙		•						
TANTALUS FM		•																							•		

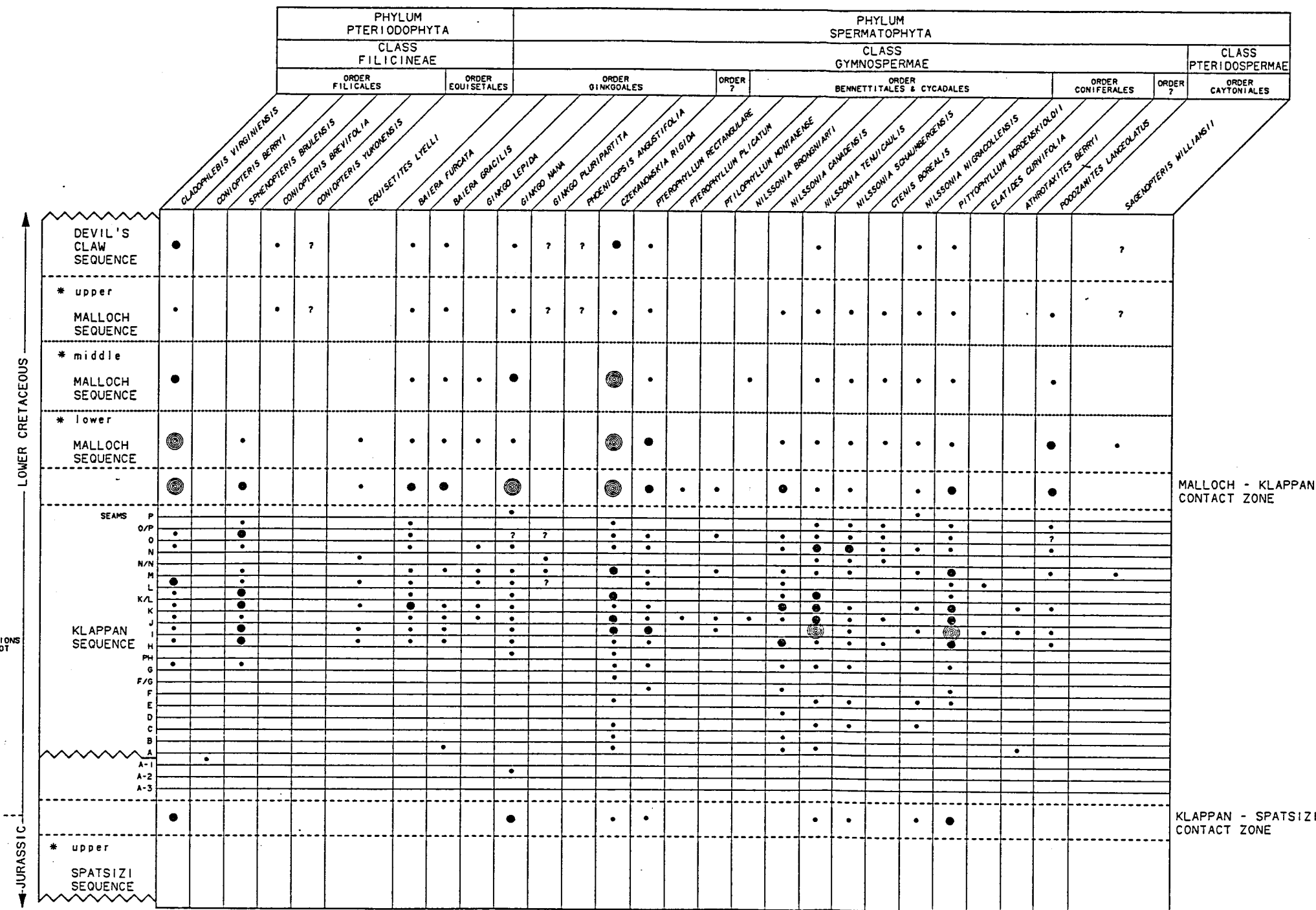
TABLES INDICATES A LOWER CRETACEOUS AGE FOR COAL-BEARING STRATA OF MT. KLAPPAN BY FLORISTIC COMPARISONS WITH OTHER WESTERN CANADIAN LOWER CRETACEOUS FORMATIONS WITH SIMILAR COLLECTIONS.

- 1 - 2 DOCUMENTED OCCURENCES
 - ⊙ 3 - 4 DOCUMENTED OCCURENCES
 - ⊙ 5 OR MORE DOCUMENTED OCCURENCES
- (BASED ON DATA FROM BELL, 1956)

TABLE 6-3
MOUNT KLAPPAN ANTHRACITE PROJECT
AGES OF MOUNT KLAPPAN PLANT
MACROFOSSILS IN OTHER
WESTERN CANADIAN FORMATIONS

GULF CANADA RESOURCES LTD.
12/11/86
KLAP: [205057]851022001.CHT





* SEQUENCE SUBDIVISIONS ARE GENERAL AND NOT FORMALLY DEFINED.

MALLOCH - KLAPPAN CONTACT ZONE

KLAPPAN - SPATSIZI CONTACT ZONE

- ? 1 QUESTIONABLE OCCURENCES
- 1 - 4 DOCUMENTED OCCURENCES
- 5 - 9 DOCUMENTED OCCURENCES
- ⊙ 10 - 20 DOCUMENTED OCCURENCES

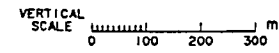


TABLE 6-4
MOUNT KLAPPAN ANTHRACITE PROJECT
STRATIGRAPHIC POSITION
OF PLANT MACROFOSSILS

GULF CANADA CORPORATION
19/01/87
KLAP:[205057]851005001.CHT



6.3.3.2 Fossil Distribution and Limitations as Index Fossils

During the 1987 field season an additional 320 specimens were collected at 213 sites, including all documentation made from drill core, bringing the total specimen and collection site totals to 1 420 and 903, respectively. Despite the increasing data and stratigraphic control, few individual species are believed to be true index fossils except on a localized basis.

Numerous marine bivalves, along with gastropods, belemnites and ammonites have been found in the Spatsizi Sequence which confirms previously known trends. Until this year, the Spatsizi Sequence was the only Mount Klappan strata to be characterized by the presence of lytoceratid ammonites and to lack in-situ plant fossils. In 1987, one ammonite was found above K seam in drill core. An attempt to identify the species and narrow down the age of the fossil was unsuccessful. Belemnites, previously thought to be relatively abundant only within the Spatsizi Sequence, have been recently documented in the Klappan Sequence at one location above K seam in drill core, below A seam on Lost Ridge and on Repeater Ridge in the Summit Area.

The Klappan Sequence contains the only brackish water bivalves, the oysters Ostrea and Modiolus,

both of which have been found only in the lower Klappan Sequence. Ferganoconcha, a large fresh water bivalve, has proven to be more widespread in occurrence than previous documentation indicated. Along with occurrences within the upper Klappan Sequence in the Lost-Fox N - O interseam, in drill core and in outcrop, it has been noted between seams G and M in drill core but at no other geographic location on the Mount Klappan property. Gastropods, known to be abundant in the lower Klappan, have also been found this year in the middle Klappan below seam I and near seam L.

The flora of the Klappan Sequence is apparently more widespread than originally thought as can be expected with a greater number of sites. Athrotaxites berryi is a new addition to the Klappan Sequence assemblage. This conifer was found in abundance at one outcrop site below J seam and in drill core above K seam. The Malloch Sequence continues to be characterized by abundant flora, with 23 of the 25 species represented, and a lack of marine fauna. A few more species were added to the Malloch assemblage in 1987 including Coniopteris brevifolia. The Devils Claw Sequence typically has no marine fauna and rare flora. Tables 6.4 and 6.5 illustrate the stratigraphic position of all species documented on the Mount Klappan property. Given the continuing increase in distribution of flora and fauna throughout the Klappan and Malloch Sequences, property wide

Table 6.6

LOST-FOX AREA: COAL SEAM AND CARBONACEOUS ZONE SUMMARY

Seam	Number of Undisturbed Seam Intersections	Average True Thickness (m)		
		(Coal)	(Coal + Rock)	
P	2	0.63	0.63*	
O	11	1.20	1.54*	
N	13	1.00	1.24*	
M/N	7	1.06	1.42*	
?	4	0.81	0.91*	
M(upper)	1	2.36	2.63*	
M	15	2.00	2.83*	
L/M	1	0.32	0.40	
L	23	2.09	2.82*	
?	4	0.40	0.46	
K/L	25	2.14	2.63*	
?	2	0.64	1.40	
?	1	0	0.28	
K	35	2.93	3.65*	
?	1	0.35	0.41	
?	2	0.35	0.97	
J	46	0.26	0.88	
I	75	4.11	4.60*	
?	1	0.16	0.20	
H/I	17	0.69	1.24*	
H/I ₂	4	1.02	1.18*	
?	2	0.34	0.41	
H	57	3.15	3.95*	
H(lower)	1	1.09	1.16*	
H-1	2	0.53	1.51	
PH	35	0.64	2.48	
G	23	1.19	2.05*	
G(lower)	9	0.53	1.01*	
F/G	2	0.26	0.33	
F	14	2.23	2.91*	
E	11	1.32	1.39*	
D	5	2.01	2.46*	
C	5	0.40	0.79*	
B	3	0.22	1.01	
B(lower)	1	0.30	0.30	
A	6	1.23	1.88*	
Total	36 Seams	471	39.96m	55.96m

* - Potentially mineable seams (22 in total)

* - Average true thickness = 2.04 m

* - Aggregate average true thickness = 44.92 m

of undisturbed intersections of each seam was used. This value represents only those points where seams were found to be unfaulted or undisturbed by intense folding in diamond drill holes.

The intersected thicknesses of some seams can vary widely and it should be kept in mind that although the average measurements of a seam may appear unmineable, isolated areas often exist where that seam is considered mineable.

A detailed list of each coal seam and carbonaceous zone intersected to date by diamond drilling in the Lost-Fox Area is presented in Table 6.7. The seam intervals and thicknesses represented in this table are those used in resource calculations otherwise specified. Correlations have altered minimally from those presented in the 1986 report.

New sedimentological characteristics of the main coal-bearing sequence are forming in this area. In particular, eleven new seams of probably limited lateral extent have appeared. These new seams and carbonaceous zones are listed in Tables 6.6 and 6.8 in their correct stratigraphic position. Many have been designated with a "?" seam name as a suitable nomenclature for them is presently being decided. Representative true interseam thicknesses for all seams and carbonaceous zones are shown in Table 6.8. In addition to the appearance of these new seams, the

Table 6.7

LOST-FOX AREA: SUMMARY OF DIAMOND DRILL HOLE COAL SEAMS AND CARBONACEOUS ZONES

Diamond Drill Hole	Seam	Drilled Seam Interval		True Thickness		Comments
		(m)		Coal (m)	Coal + Rock (m)	
DDH82005	I (ovt)	54.02	- 60.30	4.26	4.98	Not used for resources (< 0.5 m thick.)
	J (ovt)	108.17	- 108.31	0.14	0.14	
	K (ovt)	148.09	- 154.34	3.99	5.16	
	L (ovt)	186.89	- 193.81	2.75	5.75	
	M (ovt)	236.14	- 238.92	1.43	2.24	
DDH83001	I	26.90	- 32.68	4.96	5.51	Resource thickness. Additional coaly zone containing 64.03% ash from 138.22 m to 139.19 m.
	H	74.73	- 79.38	3.83	4.54	
	G	133.42	- 137.43	3.00	3.93	
	G lower	142.45	- 144.75	1.24	2.25	
	F	180.62	- 185.52	3.88	4.79	
	E	209.60	- 210.94	1.32	1.32	
DDH84005	PH	10.67	- 12.24	0.00	1.55	Drill hole intensely folded; carb. zone Carbonaceous zone. Not used for resources (< 50% c/c+r.) Carbonaceous zone.
	G	34.30	- 48.70	0.00	6.49	
	G	59.00	- 61.10	0.41	1.62	
	G	83.40	- 84.78	0.78	0.78	
	G	111.40	- 114.42	0.00	2.95	
DDH84006	I	15.44	- 22.56	5.31	6.67	Intensely folded.
	H (part)	49.43	- 50.17	0.61	0.61	
	I (ovt)	109.99	- 116.94	4.67	5.04	
	J (ovt)	154.04	- 159.35	3.20	3.56	
	K (ovt)	257.54	- 260.95	2.27	2.88	
DDH84007	J	20.53	- 23.09	0.00	2.45	Carbonaceous zone. Not used for resources (< 0.50 m thick) Additional coaly zone at 167.26 m contains 0.38 m of coal.
	I	56.87	- 62.32	5.11	5.43	
	H	103.00	- 107.18	3.26	3.98	
	PH	124.77	- 127.86	2.45	2.98	
	G	151.43	- 151.72	0.28	0.28	
	G lower	164.64	- 165.53	0.72	0.89	
	F	227.26	- 228.36	0.97	1.07	
	E	251.62	- 252.70	1.00	1.00	
	E (ovt)	272.00	- 282.45	3.75	3.79	

Table 6.7 cont'd

LOST-FOX AREA: SUMMARY OF DIAMOND DRILL HOLE COAL SEAMS AND CARBONACEOUS ZONES

Diamond Drill Hole	Seam	Drilled Seam Interval		True Thickness		Comments
		(m)		Coal (m)	Coal + Rock (m)	
DDDH84008	L	23.20	- 29.26	0.94	4.49	Not used for resources (< 50% c/c+r.)
	K	61.40	- 65.37	3.33	3.93	
	J	93.24	- 93.39	0.14	0.14	Not used for resources (< 0.50 m thick.)
	I	133.60	- 137.71	3.40	3.86	
	H/I	169.15	- 169.49	0.33	0.33	Not used for resources (< 0.50 m thick.)
	H	180.08	- 189.53	5.90	6.41	
	H	218.82	- 234.37	3.67	3.84	Intensely folded.
	G	271.11	- 274.55	1.88	3.28	
DDH85001	G lower	290.90	- 291.21	0.29	0.29	Not used for resources (< 0.50 m thick.)
	J (ovt)	22.10	- 22.68	0.36	0.36	Not used for resources (< 0.50 m thick.)
	J	78.02	- 78.89	0.00	0.08	Carbonaceous zone.
	J (rep)	86.63	- 87.16	0.00	0.29	Carbonaceous zone.
	I	119.13	- 123.51	3.38	4.38	
	H/I	141.01	- 141.07	0.05	0.05	Not used for resources (< 0.50 m thick.)
	H	158.65	- 160.98	1.74	2.15	
	PH	175.78	- 176.00	0.22	0.22	Not used for resources (< 0.50 m thick.)
DDH85002	G	214.70	- 215.64	0.85	0.94	
	J					In casing.
	I	59.45	- 62.68	3.00	3.23	Twinned hole. Refer to DDH85004 for seam thicknesses.
DDH85003	H	101.62	- 102.97	1.09	1.35	
	M (ovt)	35.71	- 42.63	3.91	5.30	
	M/N (ovt)	91.30	- 92.00	0.56	0.56	
	N (ovt)	100.20	- 102.39	1.17	1.72	
DDH85004	N (upright)	170.59	- 172.29	1.08	1.44	
	J					In casing.
	I	59.02	- 62.72	3.47	3.70	
	H	101.65	- 105.64	3.20	3.96	
	PH	125.97	- 126.20	0.23	0.23	Not used for resources (< 0.50 m thick.)
	G	160.32	- 161.69	0.94	1.37	Seam G split into two mining sections.
	G	162.44	- 165.35	1.49	2.86	
DDH85005	F	204.19	- 206.57	1.73	2.35	
	E	223.68	- 226.75	2.04	2.23	
	O (ovt)	26.90	- 30.13	0.64	0.67	

Table 6.7 cont'd

LOST-FOX AREA: SUMMARY OF DIAMOND DRILL HOLE COAL SEAMS AND CARBONACEOUS ZONES

Diamond Drill Hole	Seam	Drilled Seam Interval		True Thickness		Comments
		(m)		Coal (m)	Coal + Rock (m)	
	O	51.60	- 53.25	1.11	1.33	
	N	98.55	- 99.65	0.17	0.17	Not used for resources (< 0.50 m thick.)
	M (ovt)	106.13	- 111.87	2.43	3.94	Minor folding.
	N (rep)	175.69	- 175.88	0.13	0.13	Not used for resources (< 0.50 m thick.)
	M (rep)	210.91	- 214.17	1.89	2.93	
	L/M	243.46	- 243.86	0.32	0.40	Not used for resources. (< 0.50 m thick.)
	L	255.98	- 256.63	0.41	0.61	
	K/L	310.83	- 311.56	0.62	0.66	
	K	316.12	- 319.48	2.49	3.10	Resource thickness. Additional coaly zone from 320.99 m to 321.62 m with no ash analysis.
DDH85006	H	23.32	- 26.09	2.13	2.76	
	PH	43.17	- 45.23	0.00	2.06	Carbonaceous zone.
	G	81.93	- 85.47	2.15	3.49	Resource thickness. Additional coal zone containing 67.74% ash from 85.47 to 88.08 m.
	G (rep)	111.27	- 113.25	0.00	0.75	Carbonaceous zone.
	F	153.47	- 156.65	1.94	3.10	
	E	178.13	- 179.04	0.62	0.91	
DDH85007	I	95.50	- 102.30	3.63	4.81	Twinned hole. Refer to DDH85009 for seam thicknesses.
DDH85008	PH	19.00	- 19.36	0.07	0.36	Not used for resources (< 0.50 m thick.)
	G	40.00	- 42.18	1.27	1.69	
DDH85009	I (ovt)	102.85	- 111.00	4.27	4.90	
	J (ovt)	166.20	- 166.23	0.02	0.02	Not used for resources (< 0.50 m thick.)
	K (ovt)	204.40	- 209.51	2.70	3.27	
	L (ovt)	241.14	- 247.93	2.73	4.46	
	K	322.62	- 328.06	2.09	2.81	Intensely Folded.
DDH85010	O	73.40	- 73.62	0.22	0.22	Not used for resources (< 0.50 m thick.)
	N	91.66	- 92.01	0.31	0.31	Not used for resources (< 0.50 m thick.)
	M	130.04	- 134.76	2.60	4.60	Resource thickness. Additional coaly zone containing 63.61% ash from 134.76 to 135.90m.
	L	159.22	- 161.13	1.19	1.81	
	K	222.56	- 228.22	2.82	3.96	

Table 6.7 cont'd

LOST-FOX AREA: SUMMARY OF DIAMOND DRILL HOLE COAL SEAMS AND CARBONACEOUS ZONES

Diamond Drill Hole	Seam	Drilled Seam Interval		True Thickness		Comments
		(m)		Coal (m)	Coal + Rock (m)	
DDH85011	K/L	36.49	- 40.55	2.20	3.47	In casing. Resource thickness. Additional coaly zone from 42.02 to 42.74 m, with no ash analysis. Carbonaceous zone. Twinned hole. Refer to DDH87025 for seam thicknesses. Carbonaceous zone. Becciated coaly claystone.
	K					
	J	70.56	- 70.94	0.00	0.37	
	I	101.44	- 103.34	1.22	1.75	
	H/I	139.23	- 144.84	0.00	5.23	
	H	153.42	- 154.11	0.00	0.65	
DDH85012	L	23.24	- 24.84	1.37	1.37	Resource thickness. Additional coaly zone containing 64.70% ash from 71.73 m to 73.63 m. Carbonaceous zone. Faulted; in vicinity of major fault; not used for resources. Carbonaceous zone. Not used for resources (< 50% c/c+r.)
	K/L	50.16	- 51.69	1.15	1.49	
	K	69.89	- 71.73	1.62	1.74	
	J	125.61	- 126.50	0.00	0.79	
	K (rep)	151.54	- 153.01	0.59	1.22	
	J	176.01	- 176.21	0.00	0.16	
	H	205.78	- 209.20	2.06	3.22	
PH	242.57	- 255.92	0.26	11.63		
DDH85013	K	22.90	- 23.91	0.68	0.98	Carbonaceous zone. Not used for resources (< 0.50 m thick.) Not used for resources (< 0.50 m thick.) Not used for resources (< 0.50 m thick.) Seam F split into two mining sections.
	J	50.02	- 52.93	0.00	2.84	
	I	91.24	- 97.53	5.33	6.16	
	H	146.55	- 150.96	2.60	4.37	
	PH	176.56	- 176.65	0.09	0.09	
	G	185.65	- 185.90	0.22	0.22	
	PH	211.17	- 211.82	0.56	0.65	
	G	235.70	- 236.11	0.18	0.39	
	F	271.23	- 272.18	0.86	0.94	
F	273.20	- 275.51	1.80	2.26		
DDH85014	K	32.60	- 35.40	0.00	2.76	Carbonaceous zone.
	J	63.22	- 64.46	0.00	1.17	Carbonaceous zone.
	I	102.59	- 108.37	5.24	5.46	
	H	155.53	- 157.67	1.04	2.09	
	PH	160.98	- 162.11	0.00	1.12	Carbonaceous zone.
	F	247.19	- 250.10	2.22	2.71	

Table 6.7 cont'd

LOST-FOX AREA: SUMMARY OF DIAMOND DRILL HOLE COAL SEAMS AND CARBONACEOUS ZONES

Diamond Drill Hole	Seam	Drilled Seam Interval (m)	True Thickness		Comments
			Coal (m)	Coal + Rock (m)	
DDH85015	E (ovt)	32.54 - 34.89	0.85	0.95	
	F (ovt)	78.00 - 82.28	1.92	2.73	
	F/G (ovt)	92.37 - 92.57	0.00	0.14	Carbonaceous zone.
	G lower (ovt)	144.09 - 144.80	0.00	0.46	Carbonaceous zone.
	G	157.52 - 166.01	1.74	3.43	Intensely folded.
	G lower	176.39 - 177.71	1.18	1.30	
	G lower (ovt)	185.47 - 185.62	0.15	0.15	Not used for resources (< 0.50 m thick).
DDH85016	J	26.54 - 27.49	0.00	0.94	Carbonaceous zone.
	I	80.80 - 86.41	5.11	5.55	
	H	127.12 - 134.33	4.57	6.75	
	PH	141.86 - 144.38	0.75	2.07	Not used for resources (< 50% c/c+r.)
	G	182.72 - 183.64	0.79	0.79	
	F	205.20 - 207.59	1.77	2.13	
	E	231.45 - 233.78	2.12	2.22	
	D	263.00 - 265.51	2.30	2.41	Resource thickness. Additional coaly zone containing 79.54% ash from 261.44 m to 263.00 m.
	C	285.71 - 286.08	0.34	0.34	Not used for resources (< 0.50 m thick.)
	B	318.22 - 318.55	0.27	0.29	Not used for resources (< 0.50 m thick.)
DDH85017	K				In casing.
	J	64.86 - 65.03	0.16	0.16	Not used for resources (< 0.50 m thick.)
	I	101.36 - 106.87	4.41	5.37	
	H	152.36 - 157.10	3.79	4.67	
	PH	184.56 - 189.06	1.55	4.41	Not used for resources (< 50% c/c+r.)
	G	204.72 - 205.74	0.58	1.01	Resource thickness. Carbonaceous zone continues down to 208.53 m.
	G lower	221.21 - 222.23	0.71	0.97	
	F	241.48 - 243.47	1.56	1.93	
E	261.48 - 263.92	2.27	2.34	Resource thickness. Additional coaly zone containing 68.98% ash from 263.92 m to 265.51 m.	
DDH85018	J	22.42 - 22.52	0.00	0.09	Carbonaceous zone.
	I	69.08 - 71.75	2.54	2.61	

Table 6.7 cont'd

LOST-FOX AREA: SUMMARY OF DIAMOND DRILL HOLE COAL SEAMS AND CARBONACEOUS ZONES

Diamond Drill Hole	Seam	Drilled Seam Interval		True Thickness		Comments
		(m)		Coal (m)	Coal + Rock (m)	
	H	109.90	- 113.78	3.23	3.63	
	PH	132.95	- 139.12	0.00	5.59	Carbonaceous zone.
	G	158.08	- 165.50	0.00	7.35	Coal ripup clasts in sandstone.
	G lower	169.90	- 172.18	0.00	2.24	Coal ripup clasts in sandstone.
	F	212.26	- 218.60	4.89	6.02	
	E	238.76	- 239.00	0.22	0.22	Not used for resources (< 0.50 m thick.)
	D	260.40	- 263.07	1.57	1.89	
DDH85019	C	269.02	- 270.48	0.00	1.03	Carbonaceous zone.
	PH	10.51	- 12.41	0.00	1.90	Carbonaceous zone.
	G	26.21	- 27.51	0.53	1.29	Not used for resources (< 50% c/c+r.)
	G lower	31.26	- 31.78	0.45	0.52	
	F/G	46.16	- 46.68	0.51	0.51	
	F	65.65	- 70.20	3.62	4.21	Resource thickness. Additional coaly zone from 63.14 m to 63.67 m, with no ash analysis.
	E	87.36	- 87.78	0.33	0.33	Not used for resources (< 0.50 m thick.)
DDH85020	D	121.53	- 122.29	0.36	0.43	Not used for resources (< 0.50 m thick.)
	C	139.06	- 139.69	0.36	0.51	
	F	25.59	- 28.14	0.73	2.49	Not used for resources (< 50% c/c+r.)
	E	53.87	- 55.83	1.91	1.91	
	D	98.12	- 106.40	3.51	4.74	Resource thickness. Coaly zone containing 67.74% ash from 94.32 m to 98.12 m.
	C	148.72	- 150.41	1.02	1.19	Resource thickness. Additional coaly zone containing 45.03% ash from 152.19 m to 153.84 m.
	DDH85021	I	32.18	- 33.89	1.30	1.61
H		40.00	- 45.70	4.70	5.55	
PH		73.55	- 76.18	0.00	2.57	Carbonaceous zone.
G		99.67	- 101.60	0.00	1.82	Carbonaceous zone.
F		124.40	- 128.11	3.14	3.43	
E	150.22	- 152.19	1.80	1.81		

Table 6.7 cont'd

LOST-FOX AREA: SUMMARY OF DIAMOND DRILL HOLE COAL SEAMS AND CARBONACEOUS ZONES

Diamond Drill Hole	Seam	Drilled Seam Interval (m)		True Thickness		Comments
				Coal (m)	Coal + Rock (m)	
DDH85022	J					In casing.
	I	49.04	- 53.87	4.50	4.69	Twinned hole. See also DDH87016.
	H	90.26	- 94.20	3.21	3.85	
	PH	111.08	- 114.58	0.00	3.48	Carbonaceous zone.
	G	158.50	- 162.68	0.00	3.93	Carbonaceous zone.
DDH85023	K (ovt)	26.93	- 32.42	3.85	4.47	
	L (ovt)	63.18	- 69.04	3.34	4.57	
	M	125.84	- 145.84	7.55	11.91	Intensely folded.*Used a local straight Intensely folded. average thickness of 3.44m Intensely folded. for resource calculations.
	M (ovt)	214.32	- 230.86	9.67	14.24	
M	270.74	- 290.26	11.75	16.70		
DDH85024	I	12.68	- 19.68	4.28	6.45	
	H	91.08	- 95.87	4.08	4.62	
	PH	117.31	- 123.60	0.11	6.13	Carbonaceous zone.
DDH85025	J					In casing.
	I	36.40	- 40.82	4.04	4.42	
	H	75.74	- 79.47	3.25	3.72	
	PH	98.10	- 102.64	0.00	4.47	Carbonaceous zone.
DDH85026	I	19.68	- 25.41	4.57	5.68	
	H	62.60	- 66.03	2.92	3.43	
	PH	77.80	- 83.46	0.00	5.57	Carbonaceous zone.
DDH85027	N	75.26	- 77.68	1.94	2.17	
	M/N	94.32	- 95.63	0.72	1.15	Limited lateral extent.
	M upper	109.24	- 112.16	2.36	2.63	Limited lateral extent.
	M	114.88	- 116.16	1.15	1.20	
	L	127.56	- 129.29	1.42	1.62	
	K/L	147.78	- 151.69	2.47	3.22	
	K	163.80	- 164.91	0.92	1.08	
	J	191.45	- 191.98	0.01	0.39	Carbonaceous zone.
	I	216.16	- 221.55	4.67	5.03	

*From DDH85005: M intersected twice $\frac{3.94 + 2.93}{2} = 3.44$

Table 6.7 cont'd

LOST-FOX AREA: SUMMARY OF DIAMOND DRILL HOLE COAL SEAMS AND CARBONACEOUS ZONES

Diamond Drill Hole	Seam	Drilled Seam Interval		True Thickness		Comments
		(m)		Coal (m)	Coal + Rock (m)	
	H	265.98	- 268.29	2.22	2.25	
DDH85028	I	10.80	- 15.68	4.47	4.74	
	H	56.96	- 61.18	3.39	4.08	
	PH	69.60	- 73.83	0.00	3.70	Carbonaceous zone.
DDH85029	J	49.79	- 50.51	0.00	0.58	Presumed position; rock loss at this point. Not used for resources
	K/L	75.00	- 75.53	0.43	0.43	Not used for resources (< 0.50 m thick.)
DDH85030	I	20.48	- 24.69	3.73	3.98	Drilled within trial cargo pit area.
DDH85031	I	8.12	- 12.85	4.08	4.54	Drilled within trial cargo pit area.
DDH85032	I	27.54	- 33.03	4.83	5.47	Drilled within trial cargo pit area.
DDH85033	I	10.96	- 16.62	4.90	5.48	Drilled within trial cargo pit area.
DDH85034	I	30.32	- 35.52	4.83	5.14	Drilled within trial cargo pit area.
DDH86001	I	25.65	- 29.20	3.28	3.55	
	H	68.24	- 71.08	2.17	2.84	
DDH86002	H (part)	39.33	- 40.21	0.76	0.76	In vicinity of major fault.
	H	56.74	- 62.11	3.77	4.85	
	PH	92.10	- 93.00	.84	.84	
DDH86003	I	40.08	- 47.34	6.80	7.25	Twinned hole. See also DDH87032.
	H	88.03	- 91.73	2.40	3.35	
DDH86004	K/L ?	13.97	- 17.79	3.26	3.76	This hole in vicinity of major faulting.
	K/L ?	27.14	- 28.24	.72	1.09	
	K/L ?	39.38	- 41.47	1.65	2.04	

Table 6.7 cont'd

LOST-FOX AREA: SUMMARY OF DIAMOND DRILL HOLE COAL SEAMS AND CARBONACEOUS ZONES

Diamond Drill Hole	Seam	Drilled Seam Interval		True Thickness		Comments
		(m)		Coal (m)	Coal + Rock (m)	
	K ?	53.20	- 56.64	2.61	3.44	
	K	89.27	- 95.00	4.88	5.47	
	J	103.70	- 104.39	0.00	0.67	Carbonaceous zone.
	I	135.44	- 140.76	4.94	5.28	
	H	191.50	- 199.00	5.95	7.10	
DDH86005	J	19.20	- 20.30	0.02	.95	Carbonaceous zone.
	I	41.00	- 46.35	4.54	4.79	Twinned hole. Refer to DDH87034 for seam thicknesses.
	H	90.45	- 93.53	2.49	2.94	
DDH86006	I	28.44	- 42.43	11.15	12.06	Intensely deformed. *Used a local straight average of 5.01 m.
	H	78.50	- 84.95	5.04	5.89	
DDH86007	K					In casing.
	J	42.72	- 45.39	0.00	0.56	Carbonaceous zone
	I	98.96	- 105.11	5.32	5.57	
	H	157.89	- 161.84	3.27	3.66	
DDH86008	I	20.92	- 24.56	3.10	3.50	
	I (rep)	48.74	- 54.35	4.03	4.86	
	H	93.65	- 100.01	4.73	5.89	
	PH	124.33	- 129.17	4.14	4.68	
DDH86009	K/L					In casing.
	K	70.29	- 76.20	5.08	5.82	
	J	104.55	- 105.00	0.45	0.45	Not used for resources (< 0.50 m thick.)
	I	142.13	- 148.14	5.21	5.80	
	H	189.15	- 190.50	1.32	1.32	Intensely folded: seam H split into two mining sections.
	H	193.71	- 196.08	6.84	7.69	
DDH86010	L					In casing.
	K	55.21	- 69.99	11.36	14.38	Intensely folded, not used for resources.
	J	94.72	- 95.83	0.99	1.08	
	I	134.68	- 140.01	4.77	5.15	
	H	171.65	- 175.62	3.14	3.91	

*Used DDH85013 and 84008
 $6.16 \text{ m} \div 2 = 5.01 \text{ m}.$
 3.86 m

Table 6.7 cont'd

LOST-FOX AREA: SUMMARY OF DIAMOND DRILL HOLE COAL SEAMS AND CARBONACEOUS ZONES

Diamond Drill Hole	Seam	Drilled Seam Interval		True Thickness		Comments
		(m)		Coal (m)	Coal + Rock (m)	
DDH86011	L	25.44	- 30.95	3.74	4.91	
	K/L ?	56.91	- 58.76	1.43	1.70	
DDH86012	O (ovt)	20.10	- 22.99	0.90	1.02	
	O	82.67	- 84.26	1.18	1.46	
	N	113.42	- 115.06	1.23	1.42	
DDH86013	K/L					In casing.
	K	53.56	- 58.53	3.98	4.76	
	J	89.14	- 89.76	0.52	0.61	
	I	112.92	- 121.60	6.15	6.98	
	I (ovt)	159.00	- 176.64	14.59	14.82	Intensely folded. *Used 6.98 m from above for resources.
DDH86014	K (ovt)	40.50	- 44.50	.15	3.26	Poor drill intersection, not used for resources.
	K/L (ovt)	53.44	- 55.19	.61	.97	
	L (ovt)	105.59	- 109.91	2.81	3.05	
	K	154.29	- 156.94	2.27	2.58	
DDH86015	L	29.21	- 30.51	1.16	1.24	
	K/L	42.68	- 43.19	.50	.50	
	K	86.55	- 90.55	3.72	3.98	
DDH86016	J	47.85	- 48.20	0.00	0.28	Carbonaceous zone.
	L	75.66	- 78.30	2.29	2.29	
	K/L	144.00	- 146.77	2.42	2.74	
	K	157.12	- 159.80	2.31	2.62	
	J	172.30	- 172.81	0.00	0.49	Carbonaceous zone.
DDH86017	J					In casing.
	I	60.71	- 65.97	4.87	5.16	
	H (part)	110.00	- 113.00	1.94	2.73	Possible faulted repeat of H.
	H	114.35	- 119.86	3.89	4.45	
DDH86018	I	2.44	- 8.72	1.62	1.62	Not a valid data point (seam partially in casing.)
	H	103.00	- 104.11	0.58	0.83	Bottom of seam possibly faulted.
	PH	115.50	- 120.22	1.14	3.80	

* Used a reliable intersection of I seam encountered earlier in same DDH.

Table 6.7 cont'd

LOST-FOX AREA: SUMMARY OF DIAMOND DRILL HOLE COAL SEAMS AND CARBONACEOUS ZONES

Diamond Drill Hole	Seam	Drilled Seam Interval		True Thickness		Comments
		(m)		Coal (m)	Coal + Rock (m)	
DDH86019	M/N ?	69.31	- 70.84	1.11	1.17	
	M	82.70	- 83.40	0.57	0.68	
	L	100.07	- 101.96	1.69	1.88	
	K/L	120.18	- 124.70	3.96	4.43	
	K	139.68	- 143.13	2.96	3.33	
	J	165.66	- 166.76	0.00	1.03	Carbonaceous zone.
	I	185.15	- 192.38	6.51	6.95	
DDH86020	B	24.37	- 24.77	.37	.37	Not used for resources (< 0.50 m thick.)
	A	67.77	- 71.29	2.27	3.10	
	A (part)	78.38	- 81.18	.16	2.50	Carbonaceous zone.
DDH86021	I	23.82	- 28.55	4.09	4.55	
	K	42.80	- 44.20	1.00	1.15	
	J	72.80	- 73.70	0.10	0.81	Not used for resources (< 50% c/c+r.)
	I (rep)	106.79	- 111.76	4.12	4.60	
DDH86022	M	36.20	- 38.80	1.08	1.52	
	L	64.78	- 68.24	2.00	2.39	
	K/L	88.20	- 93.80	3.54	4.30	
	K	104.90	- 106.87	1.47	1.92	
	J	120.80	- 121.20	0.00	0.38	Carbonaceous zone.
	I	140.41	- 141.56	1.14	1.14	Faulted, not used for resources.
	I (ovt)	175.95	- 184.17	4.26	4.54	
DDH86023	A	24.44	- 27.87	1.01	1.14	
	A	40.82	- 41.96	.36	.36	Not used for resources (< 0.50 m thick.)
	A	55.60	- 61.36	2.11	2.77	
DDH86024	A-4	46.25	- 49.76	2.38	3.11	
	A-5	98.96	- 104.38	3.45	4.69	
DDH86025	P	7.01	- 8.00	.92	.92	
	O	62.22	- 64.16	1.45	1.85	
	N	93.61	- 94.72	.85	1.05	
	J ?	118.82	- 119.15	.23	.28	Coal at base of coasters (may not be in place). < 0.50 m thick. Not used for resources.
	I	131.20	- 134.36	2.78	2.90	
	J (rep)	183.47	- 183.96	.46	.46	Not used for resources (< 0.50 m thick.)

Table 6.7 cont'd

LOST-FOX AREA: SUMMARY OF DIAMOND DRILL HOLE COAL SEAMS AND CARBONACEOUS ZONES

Diamond Drill Hole	Seam	Drilled Seam Interval (m)	True Thickness		Comments
			Coal (m)	Coal + Rock (m)	
	I (rep)	216.24 - 221.72	4.49	4.74	
DDH86026	A-2	36.63 - 37.74	.85	1.02	
	A-3	71.33 - 76.79	4.05	4.98	
DDH86027	O	8.56 - 12.00	2.47	2.98	
	N	26.53 - 28.48	1.52	1.81	
	K/L	73.59 - 79.76	5.27	5.80	
	K	95.95 - 98.95	2.52	2.77	
	J	127.91 - 128.15	0.20	0.22	Not used for resources (< 0.50 m thick.)
	I	158.60 - 159.64	0.95	0.95	Seam faulted.
DDH86028	D	35.88 - 38.87	2.33	2.85	
	C	60.32 - 61.48	0.29	0.88	Not used for resources (< 50% c/c+r.)
	B	93.60 - 96.00	0.02	2.38	Carbonaceous zone.
	B lower	103.40 - 103.70	0.30	0.30	Not used for resources (< 0.50 m thick.)
	A	145.64 - 147.32	1.62	1.65	
DDH86029	K	8.03 - 11.00	2.46	2.96	
	I	50.99 - 55.48	4.07	4.42	
	H	91.50 - 92.73	0.96	1.22	
	PH	131.58 - 131.70	0.11	0.11	Not used for resources (< 0.50 m thick.)
DDH86030	J	21.92 - 22.76	0.69	0.82	
	I	63.15 - 69.65	5.35	5.59	
	H	122.64 - 125.68	2.69	2.98	
	PH	145.01 - 145.48	0.44	0.44	Not used for resources (< 0.50 m thick.)
DDH86031	J				In casing.
	I	40.72 - 45.36	3.97	4.50	
	H	83.44 - 90.27	5.24	6.58	
	PH	117.90 - 120.47	1.88	2.32	
	G?	124.00 - 130.44	5.34	5.78	Resource thickness. Additional coaly zone from 130.44 to 134.51 m.
DDH86032	I	8.15 - 11.33	2.96	3.16	
	H	62.12 - 67.55	3.95	4.92	
DDH86033	M	55.11 - 62.51	2.69	3.55	Additional carbonaceous zone from 48.80 to 55.11 m.

Table 6.7 cont'd

LOST-FOX AREA: SUMMARY OF DIAMOND DRILL HOLE COAL SEAMS AND CARBONACEOUS ZONES

Diamond Drill Hole	Seam	Drilled Seam Interval (m)	True Thickness		Comments
			Coal (m)	Coal + Rock (m)	
DDH86033 cont'd	L	87.42 - 90.06	2.06	2.45	
	K/L	115.07 - 117.31	1.81	2.11	
	K	147.47 - 152.76	4.05	5.03	
DDH86034	K/L	20.03 - 24.02	3.25	3.84	
	K	48.80 - 56.10	4.93	6.50	
	J	81.88 - 82.68	0.61	0.75	
	I	119.66 - 125.13	4.82	5.09	
DDH86035	M				In casing.
	L	50.78 - 54.40	2.53	3.35	
	K/L	67.95 - 69.40	1.27	1.42	
	K	90.73 - 99.39	6.68	8.35	
	J	122.44 - 122.85	0.38	0.38	Not used for resources (< 0.50 m thick.)
	I	157.51 - 158.82	1.23	1.23	
	H/I H	180.33 - 181.21 197.19 - 198.51	0.66 0.99	0.77 1.16	
DDH86036	K	8.29 - 10.21	1.37	1.86	
	J	32.84 - 33.87	0.97	0.99	
	I	78.56 - 84.06	4.92	5.16	
	H/I	113.22 - 114.60	0.87	1.33	
	H	139.56 - 141.85	1.54	2.17	
DDH86037	O	17.48 - 20.03	1.75	2.50	
	N	49.12 - 49.82	0.28	0.64	Not used for resources (< 50% c/c+r.)
	M	73.12 - 78.44	2.97	4.70	Resource thickness. Additional carbonaceous zone from 70.98 to 73.12 m.
	L	148.02 - 150.48	1.61	2.34	
	K/L	153.27 - 153.95	0.66	0.66	
DDH86038	A	50.75 - 53.20	0.00	2.26	Carbonaceous zone.
DDH87001	I	19.60 - 22.35	1.14	2.09	
	H	118.78 - 123.05	3.89	4.14	Seam H split into two mining sections.
	H	125.05 - 126.38	1.29	1.29	
DDH87002	I	23.27 - 30.09	6.22	6.37	
	I (ovt)	48.80 - 56.45	3.51	3.87	

Table 6.7 cont'd

LOST-FOX AREA: SUMMARY OF DIAMOND DRILL HOLE COAL SEAMS AND CARBONACEOUS ZONES

Diamond Drill Hole	Seam	Drilled Seam Interval (m)	True Thickness		Comments
			Coal (m)	Coal + Rock (m)	
DDH87002 cont'd	I (rep)	133.26 - 141.73	7.43	7.97	Carbonaceous zone. Seam H split into two mining sections.
	H/I	174.95 - 177.05	0.29	2.03	
	H	193.89 - 196.13	1.63	1.93	
	H	197.44 - 200.04	1.75	2.17	
DDH87003	I	38.90 - 44.42	5.11	5.52	
	H/I	68.43 - 70.25	1.44	1.80	
	H	90.27 - 94.27	2.85	3.55	
DDH87004	I	18.52 - 22.77	3.82	3.82	Limited lateral extent.
	H/I	33.43 - 34.75	1.19	1.31	
	?	52.97 - 53.49	0.52	0.52	
	H	69.08 - 70.99	1.54	1.90	
	PH	94.80 - 96.27	1.42	1.43	
DDH87005	K/L	19.00 - 23.74	4.05	4.43	Seam K split into two mining sections.
	K	49.66 - 54.70	4.70	5.01	
	K	55.88 - 58.93	2.65	3.05	Carbonaceous zone.
	J	84.08 - 89.01	0.11	4.80	
	I	130.23 - 133.80	3.20	3.44	
	?	157.20 - 157.45	0.16	0.20	Limited lateral extent; not used for resources (< 0.50 m thick.)
	H/I	163.45 - 164.24	0.00	0.74	
	?	168.21 - 168.50	0.15	0.28	Carbonaceous zone. Limited lateral extent; not used for resources (< 0.50 m thick.)
	H	182.40 - 184.30	1.04	1.42	
DDH87006	I	93.75 - 97.47	0.96	1.83	
	H/I	117.94 - 120.40	2.25	2.25	
	H	145.02 - 146.46	1.28	1.28	
DDH87007	K ?	11.45 - 20.80	5.31	6.01	Limited lateral extent.
	I ?	77.75 - 80.82	1.71	2.23	
	H ?	91.32 - 96.19	1.93	2.93	
	H lower ?	99.14 - 101.29	1.09	1.16	
	PH ?	121.35 - 122.85	1.35	1.35	
	G ?	192.62 - 195.50	2.33	2.71	
DDH87008	I (ovt)	9.50 - 18.76	1.57	3.33	
	I	119.71 - 126.75	4.36	4.77	
	I (ovt)	165.78 - 191.67	7.08	7.43	

Table 6.7 cont'd

LOST-FOX AREA: SUMMARY OF DIAMOND DRILL HOLE COAL SEAMS AND CARBONACEOUS ZONES

Diamond Drill Hole	Seam	Drilled Seam Interval (m)	True Thickness		Comments
			Coal (m)	Coal + Rock (m)	
DDH87009	I	42.22 - 47.53	4.40	4.79	Carbonaceous zone. Seam H split into two mining sections.
	H/I	69.88 - 70.97	0.02	0.98	
	H	98.57 - 100.33	1.09	1.35	
	H	101.61 - 103.40	1.25	1.42	
	PH	118.31 - 120.70	1.67	2.16	
DDH87010	H	28.85 - 34.39	4.30	4.68	Twinned hole. Refer to DDH87011.
DDH87011	H	28.85 - 34.39	4.37	4.97	
	PH	68.53 - 69.10	0.34	0.51	
DDH87012	J	33.92 - 35.76	0.76	1.80	Not used for resources (< 50% c/c+r.)
	I	74.45 - 76.05	1.27	1.51	Carbonaceous zone.
	H/I	98.52 - 101.95	0.23	3.27	
	H	119.45 - 125.00	4.41	5.31	
DDH87013	J	14.36 - 15.36	0.88	0.94	
	I	61.83 - 67.43	4.55	4.77	
	H	97.42 - 99.06	1.35	1.35	
	PH	128.87 - 130.45	1.30	1.36	
DDH87014	K	30.60 - 32.67	1.80	1.87	Additional coaly zone from 32.67 to 35.56 m. Carbonaceous zone.
	J	49.39 - 50.32	0.00	0.77	
	I	57.40 - 61.63	2.66	3.04	Drilling stopped within seam. Not used for resources.
	H/I	84.25 - 86.60	1.59	1.60	
	H/I ₂	104.17 - ?	0.22+	0.22+	
DDH87015	L	8.80 - 14.72	4.01	4.84	Not used for resources (< 0.50 m thick.) Not used for resources (< 50% c/c+r); seam faulted.
	K	25.51 - 27.68	1.62	1.92	
	J	45.21 - 45.72	0.33	0.39	
	I	60.52 - 63.50	1.00	2.38	
	H	81.80 - 85.59	2.51	3.33	
	PH	115.24 - 117.37	0.00	1.98	Carbonaceous zone.
DDH87016	J	16.02 - 17.85	0.01	1.83	Carbonaceous zone.
	I	48.60 - 53.55	4.76	4.92	
DQH87017	K	25.34 - 28.80	2.38	2.82	Resource thickness. Additional coaly zone con- taining 74.83% ash from 28.80 to 31.02 m. Carbonaceous zone.
	J	56.86 - 57.84	0.00	0.97	
	I	60.67 - 62.93	2.11	2.26	

Table 6.7 cont'd

LOST-FOX AREA: SUMMARY OF DIAMOND DRILL HOLE COAL SEAMS AND CARBONACEOUS ZONES

Diamond Drill Hole	Seam	Drilled Seam Interval (m)	True Thickness		Comments
			Coal (m)	Coal + Rock (m)	
DDH87017 cont'd	H/I	77.30 - 78.43	0.05	1.11	Carbonaceous zone.
DDH87018	H/I ₂	95.37 - 96.92	1.21	1.38	
	?	29.18 - 30.35	1.14	1.16	Unknown stratigraphic position Unknown stratigraphic position. Resource thickness. Additional coaly zone contain- ing 77.67% ash from 55.35 to 57.86 m.
	?	53.78 - 55.35	1.33	1.51	
DDH87019	I (fld)	114.39 - 134.92	15.41	17.50	*Intensely folded. Used a local straight average of 3.23 m.
	H/I	166.02 - 167.92	1.66	1.79	Resource thickness. Additional carbonaceous zone down to 203.74 m.
	H/I ₂	178.15 - 179.97	1.44	1.66	
	H (fld)	197.64 - 200.52	1.22	1.98	
DDH87020	M/N	53.34 - 56.56	1.89	3.09	Limited lateral extent.
	?	66.57 - 68.06	1.06	1.40	
	M	82.46 - 86.32	2.00	3.61	
	L	95.90 - 100.70	3.54	4.38	
	K/L	147.85 - 153.68	3.43	4.64	
DDH87021	I	28.93 - 32.96	3.39	3.82	Seam H split into two mining sections.
	H	84.27 - 88.65	2.34	2.98	
	H	90.53 - 92.78	0.77	0.84	
DDH87022	P	15.23 - 15.65	0.33	0.33	Not used for resources (< 0.50 m thick.)
	O	62.87 - 65.53	1.94	2.48	
	N	98.16 - 101.45	2.53	2.70	Limited lateral extent.
	M/N	124.93 - 127.09	1.58	1.92	
	?	137.35 - 138.13	0.50	0.53	
DDH87023	K/L	20.47 - 22.25	1.14	1.55	Seam faulted. Not used for resources.
	K (part)	104.42 - 105.10	0.41	0.53	
	K/L (ovt)	177.95 - 180.29	1.43	1.76	
DDH87024	O	15.17 - 16.19	0.66	0.66	Limited lateral extent.
	N	29.95 - 32.24	1.00	1.91	
	M/N	41.87 - 43.10	1.05	1.17	
	?	70.09 - 71.35	1.15	1.15	
	M	86.45 - 89.02	2.27	2.40	

* From DDH85001,87017,87014

$$\frac{4.38 + 2.26 + 3.04}{3} = 3.23 \text{ m.}$$

Table 6.7 cont'd

LOST-FOX AREA: SUMMARY OF DIAMOND DRILL HOLE COAL SEAMS AND CARBONACEOUS ZONES

Diamond Drill Hole	Seam	Drilled Seam Interval (m)	True Thickness		Comments
			Coal (m)	Coal + Rock (m)	
DDH87024	L	117.50 - 119.80	2.01	2.06	Not used for resources (< 0.50 m thick.)
	?	134.50 - 134.90	0.37	0.37	
	K/L	152.00 - 155.21	1.81	2.86	
DDH87025	K	35.69 - 41.44	3.82	4.98	Not used for resources (< 50% c/c+r.)
	J	74.62 - 75.38	0.04	0.71	
	I	102.67 - 107.97	4.33	4.59	
DDH87026	H (ovt)	18.93 - 23.05	1.39	1.61	Not used for resources (< 0.50 m thick) Seam faulted; not used for resources. Seam faulted; not used for resources. Carbonaceous zone. Resource thickness. Additional carbonaceous zone from 171.87 to 172.84 m.
	H/I (ovt)	48.69 - 49.35	0.38	0.38	
	I (part)	79.06 - 80.17	0.78	0.79	
	I (part)	83.13 - 83.92	0.17	0.41	
	H/I	115.00 - 115.39	0.00	0.12	
	H	138.26 - 139.97	0.85	1.25	
	PH	172.84 - 173.78	0.62	0.85	
DDH87027	H	31.33 - 40.32	5.37	8.62	Limited lateral extent.
	H-1	49.79 - 51.30	1.07	1.31	
	PH	67.65 - 68.87	0.97	0.97	
	G	84.20 - 85.17	0.64	0.71	
	G (ovt)	100.27 - 101.53	0.35	0.63	
DDH87028	O	31.58 - 33.10	0.79	1.49	Limited lateral extent. Not used for resources (< 0.50 m thick.) Local intense folding; not used for resources. Limited lateral extent. Not used for resources (< 0.50 m thick.) Limited lateral extent.
	N	40.90 - 41.81	0.88	0.88	
	M/N	61.55 - 62.43	0.49	0.88	
	?	76.43 - 77.00	0.55	0.55	
	M	89.74 - 91.30	1.19	1.48	
	L	108.67 - 109.50	0.68	0.73	
	?	123.47 - 123.77	0.26	0.30	
	K/L	139.94 - 150.95	3.94	9.74	
	?	190.21 - 193.80	1.28	1.46	
	K	200.09 - 203.79	1.83	2.25	
	?	213.22 - 213.87	0.35	0.41	
?	218.55 - 219.93	0.69	0.83		

Table 6.7 cont'd

LOST-FOX AREA: SUMMARY OF DIAMOND DRILL HOLE COAL SEAMS AND CARBONACEOUS ZONES

Diamond Drill Hole	Seam	Drilled Seam Interval		True Thickness		Comments
		(m)		Coal (m)	Coal + Rock (m)	
DDH87029	H	20.65	- 24.28	2.98	3.29	
	H (rep)	49.30	- 50.81	0.74	0.85	Seam faulted; not used for resources.
	H (part) (ovt)	60.02	- 60.56	0.00	0.14	Seam faulted; carbonaceous zone.
	H/I ₂ (ovt)	83.15	- 84.70	0.90	1.02	
	H/I ₂	109.84	- 110.60	0.55	0.68	
	H	138.28	- 139.62	0.65	0.92	
	H-1	147.84	- 150.03	0.00	1.72	Carbonaceous zone.
	PH	161.31	- 162.72	1.23	1.34	
	G	186.32	- 187.30	0.18	0.41	Not used for resources (< 0.50 m thick.)
F	204.73	- 206.47	1.10	1.45		
DDH87030	?	18.07	- 20.13		1.94	In casing.
	M	34.42	- 36.68	1.84	2.23	
	L	59.98	- 61.96	1.98	1.98	
	?	75.25	- 75.73	0.47	0.47	Not used for resources: (< 0.50 m thick.)
	K/L	86.60	- 91.62	1.77	3.50	
	?	106.82	- 108.24	0.00	1.35	Carbonaceous zone; limited lateral extent.
	?	129.20	- 129.50	0.00	0.28	Carbonaceous zone; limited lateral extent.
	K	185.12	- 189.15	2.58	3.26	
	?	208.06	- 209.70	0.00	1.11	Carbonaceous zone; limited lateral extent.
	J	216.90	- 218.06	0.00	1.06	Carbonaceous zone.
I	241.29	- 244.57	2.61	2.87		
DDH87031	M	30.45	- 32.72	2.03	2.08	
	L	46.37	- 47.91	1.45	1.45	
	?	60.11	- 60.70	0.49	0.58	
	?	66.46	- 67.25	0.50	0.70	
	K/L (part)	81.71	- 82.53	0.70	0.70	
	L (rep)	94.89	- 96.59	1.03	1.64	
	K/L (rep)	132.80	- 136.92	3.08	3.65	
	K	182.60	- 187.11	3.17	4.17	
DDH87032	I	44.46	- 50.63	5.08	5.59	
DDH87033	K	35.96	- 40.82	4.13	4.52	Seam K split into two mining sections.
	K	41.89	- 42.84	0.77	0.80	
	J	69.78	- 71.16	0.12	1.27	Carbonaceous zone.
	I	113.04	- 118.97	5.07	5.56	
DDH87034	I	45.50	- 52.46	4.47	4.78	

behavior of several marker horizons is also changing further to the northeast, indicating a possible transition in environments.

Drilling will continue in this area to delineate the lateral extent of the new seams, the thickened K seam, H seam and I seam.

In 1986, six diamond drill holes, in the lowlands north and west of Lost Ridge, intersected coal seams at depth. Whether these seams correlate directly to any known seams in the ridge area or not is still uncertain. Current interpretations suggest that these coal horizons occur below seam B and have been labelled accordingly as A, A-2, A-3, A-4 and A-5 in descending order and are described in Table 6.9. Additional drilling will be required to prove this correlation. These seams were not considered in resource calculations.

In 1986, trenching disclosed the presence of seam I at TRC86012 to the immediate west of Lost Ridge. This interpretation was confirmed in 1987 when seams I through K were delineated in this area. However, the small ridge where these seams occur is interpreted to be one of three or more slump blocks. These seams are likely faulted at a shallow depth and cannot be traced back to the ridge area.

TABLE 6.8
LOST-FOX AREA

COMPLETE STRATIGRAPHIC SEQUENCE WITH REPRESENTATIVE
TRUE INTERSEAM THICKNESSES

Interseams of Limited Lateral Extent (m)	SEAM	Common Interseams (m)		Interseams of Limited Lateral Extent (m)	SEAM	Common Interseams (m)
<hr style="border-top: 1px dashed black;"/>						
	P			I		
	O	48.80		?		24.90
	N	27.85		4.77	H/I	
	M/N	15.20		16.51	H/12	
9.45	?			N/A	?	14.00
12.69	M (upper)	14.20		12.59	H	
2.50	M			1.67	H (lower)	
30.10	L/M	40.20		8.55	H-1	20.10
10.10	L			13.59	PH	
13.75	?				G	33.80
15.42	K/L	28.75			G (lower)	12.20
14.04	?				F/G	7.10
18.50	K	21.25			F	14.75
43.21	?				E	18.00
2.84	?				D	24.25
2.73	?	23.00			C	19.10
5.67	J				B	27.40
	I	36.75		6.99	B (lower)	48.39
	(this seam repeated in next column)			A		
				<p>Total Interseam Thicknesses (m) 519.99</p> <p>Total Coal (m) 55.96</p> <p><hr style="width: 50px; margin-left: 0;"/></p> <p>Total Thickness of Coal-Bearing Sequence (m) 575.95</p>		

Table 6.9

LOST-FOX AREA: ADDITIONAL COAL HORIZONS BELOW SEAM A

Seam	Average True Thickness (m)		Representative True Interseam Thickness (m)
	(Coal)	(Coal + Rock)	
A-1*	Not intersected in drill core		?
A-2	0.85	1.01	?
A-3	4.05	4.98	?
A-4	2.38	3.11	?
A-5	3.45	4.70	?

*Seam A-1 has only been observed in outcrop along the Little Klappan River further to the west of Lost Ridge.

As a result of outcrop descriptions, mechanical and hand trenching, and two diamond drill holes, seams G through P were found on the far southwestern side of Lost Ridge, namely West Ridge. The trace of M seam was not found within this package, however, which may be a result of faulting or non-deposition in this area. The predominant structure in this area is an overturned anticline with a shallowly dipping southern limb and a very steeply dipping northern limb. The anticline axis trends approximately 103° and plunges toward the east. The average thickness of I seam in this area, based on drilling results, is 3.70 m.

Coal seams are indicated on all detailed maps and cross-sections located in Appendix II.

6.4.4.2 Malloch Sequence

Coals of the Malloch Sequence in the Lost-Fox Area are thinner and separated by greater interval thicknesses than those of the Klappan Sequence. As a result a seam correlation has not yet been established. Based on previous hand trench data, the coals range from 0.5 metres to 2.41 metres in thickness with an average thickness of 1.26 metres.

6.4.5 Structure

Evidence supporting the interpretation of two non-parallel regimes of deformation is clear in the Lost-Fox

area. F1 deformation has produced a large-scale series of overturned folds trending at approximately 135 degrees, with southwesterly dipping axes, a wavelength of 1 to 1.5 kilometers and an amplitude of up to 450 metres. Smaller folds and faults (with both reverse and normal displacement) can be superimposed on these large features. The second deformational style (F2) involves primarily low amplitude, long wavelength folds trending northeast-southwest. They are not strongly delineated in themselves, but are seen as overprinting the F1 folding, producing a series of plunge reversals averaging 8 to 10 degrees to the northwest and southeast.

The Lost Ridge main anticline-syncline pair is an F1 feature, and its plunge from the cliff face, southeast down the back of Lost Ridge is an example of F2 deformation. The shape and orientation of the fold pair changes along its strike. In the vicinity of Fox Creek the southwest limbs dip at a fairly shallow angle and the northeast limbs are vertical. The northeast limbs become overturned toward the ridge crest. A structural link between the northern Fox Creek area and Knooph Hill has been established, which is a distance of about three kilometres. Information from 1987 drilling shows evidence of a series of subsurface F-1 folds directly along strike and of comparable amplitude to those observed on Knooph Hill.

Parasitic synclines and anticlines affect strata on both limbs of the larger folds and may involve packages with stratigraphic thicknesses up to 150 metres. Less competent

units may act as decollement surfaces and limit the stratigraphic penetration of the parasitic features by releasing the applied stress via bedding plane slippage. This has been observed along the eastern and central portions of Lost Ridge where overturned folds become detached along coal horizons.

Stress is absorbed not only along bedding planes but also by fractures and faulting across bedding. Stratigraphic repetition in drill-core has been interpreted to represent the presence of localized swarms of thrust faults imbricated upon each other. Localized zones of multiple repetition of strata do occur, but more frequently thrusts have large displacements and are more isolated. Several larger scale reverse or thrust faults are each defined by discontinuities in one or more drill holes. Displacements are on the order of tens of metres, normally under 50 metres. In certain situations, stratigraphic disturbances dictate that displacements of several 100 metres may be present, but there is insufficient drill and stratigraphic control at depth to interpret whether this must all be taken up by one fault or may be distributed among several in a zone.

The deformation of greatest complexity lies in the cores of folds. The syncline emerging on the face of Lost Ridge appears, in the subsurface, to contain in its core a wedge shaped block of quite contorted strata bounded by a major, shallowly dipping normal fault above and a small thrust fault below. The wedge widens toward the opening of the syncline and may be the result of the material at the

core being extruded outward as the syncline approached recumbency. In general, the strata in the vicinity of fold axes may be structurally thickened by convolute folding, particularly affecting incompetent units. Annealed quartz breccia zones are observed along some axes.

Cleavage sets are noted associated with both F1 and F2 folding. Fold related cleavages for the F1 folds are nearly always of the fracture type. Rarely, argillaceous beds show crenulation cleavages. F1 cleavage sets are usually more closely spaced and more consistent in attitude than F2 cleavages, likely due to the greater intensity of stress involved in the formation of F1 folds. Wavelengths of F2 folds are approximately 750 metres with amplitudes of 150 metres. Movement associated with the F2 regime has the affect of complicating the delineation of F1 features. Both bedding and cleavage attitudes from the F1 deformation have been re-oriented locally and cannot be relied upon to be consistent over any distance. In addition, the secondary cleavage set formed through F2 deformation may be confused with F1 cleavage. Joints associated with both cleavage sets may be quartz filled in the hinge areas of anticlines.

In the 1987 geological interpretation of the Lost Ridge Area, specifically south of the pit area, thrust fault movements were re-interpreted to relate to one major thrust fault and its fault splay. As a result the fault's geometry has changed and its surface reflection is shown to be further north and east of its 1986 location. Structure below the fault plane has a plunge and trend of 19°/149° to the south-

east and remains consistent with the average regional structural trend of $14^{\circ}/135^{\circ}$ to the southeast. Above the fault plane the regional structural trend continues to prevail but deformity increases toward the fault. Over a dozen drill holes are involved in the interpretation of the structure in this area, but additional information could initiate a further review.

In the Lost Fox area, as regionally, there are two major fracture sets displaying aspects of brittle deformation, one trending north-south and the other east-west. Both sets are post folding. The easterly trending set appears to be the most systematic, and possibly older. Minor strike slip and dip slip displacements along these high angle fractures are common. Vertical components of displacement may reach 50 metres.

The same structural pattern observed crossing the entire Lost-Fox area is also represented on a smaller scale. Within the trial cargo excavation localized examples of structural failure include a series of equally spaced (about 25 metres) normal faults trending 160 degrees and dipping 65 degrees west. Displacements are in the order of one or two metres, down thrown to the west. Thrust faults with a shallower angle are also present on the same scale. The intensity of stress suggested by the major features of Lost-Fox is such that these small scale adjustments might be expected throughout.

A large scale normal fault trending northwest-southeast, with greater than 500 metres of displacement is interpreted to separate West Ridge from Lost Ridge.

The regional structure described is outlined on the 1:50 000 Regional Geology Map located in Appendix I. Detailed geology maps and cross-sections at 1:2 000 and 1:5 000 scales may be found in Appendix II.

7.0 RESOURCES

7.1 Mount Klappan Property

7.1.1 Summary

Significant changes to the resource categorization of Mount Klappan anthracite has resulted from the 1987 exploration program. A total of 85.7 million tonnes of measured resources and 108.5 million tonnes of indicated resources have been delineated in the Lost-Fox Area. The in-situ anthracite resource potential at Mount Klappan totals over 5 500 million tonnes in seams greater than 0.5 metres thick to a maximum depth of 500 metres. Table 7.1 summarizes the resource contributions from the various areas of the property as well as the representation by resource category. These resource estimates do not imply mineability or economic viability. They represent estimated in-place anthracite resources only. Resource categories are discussed further in Section 7.3.3. A 1:50 000 Coal Resource Map (Appendix I) presents the distribution of resources over the Mount Klappan property.

Table 7.1

Area	MOUNT KLAPPAN COAL PROJECT COAL RESOURCES (MT)			
	Measured	Indicated	Inferred	Speculative
Lost-Fox	85.7	108.5	138.7	705.2
Hobbit-Broatch	12.1	24.5	369.1	673.9
Summit			32.6	1 389.8
Nass				1 984.8
Skeena				-
Total	97.8	133.0	540.4	4 753.7

Total Coal Resources Potential: 5 524.9 million tonnes

The coal seams are contained within the strata of the Klappan Sequence. There are also coal measures in other strata underlying these coal licences; however, they are not presently considered of economic importance.

The parameters within which the coal resources were classified and the procedures utilized in resource calculations are outlined in Section 7.3. A standardized method was utilized for the 1987 resource calculations over the Mount Klappan property.

7.2 Lost-Fox Area

7.2.1 Summary

During 1987 increased drill hole density and stepout drilling to the northeast and southwest in the Lost-Fox Area resulted in significant increases in the measured and indicated resource categories. As outlined in Tables 7.2a and b, 194.14 million tonnes are within the measured and indicated categories. The in-situ anthracite resources in the Lost-Fox Area; including speculative resources, total over 1 billion tonnes. This value is from seams included in resource calculations that are greater than 0.50 metres in true thickness to a maximum depth of 500 metres. All resource data is located in Appendix D.

7.3 Procedures and Parameters

7.3.1 Introduction

In-situ resources are defined as the in-place coal

(coal and partings) that is contained in seams occurring within specified limits of thickness and depth from surface. Resources are further defined through classification into "measured", "indicated", "inferred", and "speculative" categories based on the existence and relative spacing of coal seam exploration data points.

The procedures for the resource calculations include standard methods utilizing geological cross-sections and maps as described in Section 7.3.2.

The parameters for resource categorization generally follow those set out for the Cordillera Region by Energy, Mines and Resources Canada in Report ER79-9: Coal Resources and Reserves of Canada. The parameters utilized for the 1987 Mount Klappan Coal Project are described in Section 7.3.3.

7.3.2 Procedures

Diamond drill holes were used as data points for resource calculations. If individual drilled seam intersections were less than 0.5 metres in true thickness or were comprised of over 50% rock partings then they were not used in resource calculations. Intensely disturbed seam intersections were also not used if the true thickness calculation for that data point yielded an anomalously large value. In this case, a straight average of true thickness values for that seam in surrounding drill holes was used. Table 7.3 summarizes the seams and associated thicknesses used for this year's resource calculations.

Polygon maps for each mineable seam were generated at the Calgary offices of Monenco Consultants Limited using their MEDSYSTEM¹ mine modelling software and TELLAGRAF² computer graphics software. On each map, three polygons were drawn for each data point, their areas of influence having a radius of 150 m, 300 m and 1 000 m for measured, indicated and inferred resource categories, respectively. The boundaries for each polygon were transferred onto applicable cross-sections and seam lengths for each area were measured.

The third dimension required for the coal volume calculation, after the seam thickness and length were determined, was the "influence" or "strike length" of the seam. This measurement extends to the midpoint between cross-section lines and measures a maximum of 125 metres in length.

Specific gravity values were determined on a seam-by-seam basis. For a particular seam, specific gravity determinations from applicable drill holes in the resource area were utilized. These specific gravity values were attained by straight averaging and were applied wherever that specific seam was deemed a resource. A summary of these specific gravity averages is shown on Table 7.4.

The following equation summarizes the resource calculation procedure:

$$\begin{array}{l} \text{Tonnes of Coal} = \\ \text{Seam Thickness} \times \text{Seam Length} \times \text{Influence} \times \text{Specific Gravity} \\ \quad (\text{m}) \qquad \qquad (\text{m}) \qquad \qquad (\text{m}) \qquad \qquad (\text{t/m}^3) \end{array}$$

Speculative resources were calculated using a slightly different procedure. The area indicated on the 1:50 000 Coal Resource Map (Appendix I) to be Klappan Sequence within the Lost-Fox Area but outside the 1:2 000 resource map area, was planimetered. The 10.30 metre seam thickness applied to this area is 25% of the average combined coal thicknesses for the Lost-Fox (55.96 metres) and Hobbit-Broatch (26.40 metres) areas, as this figure appeared to be a reasonable estimate of the proportionate coverage of coal-bearing section within the area. The overall average specific gravity for drilled seams on the property has been calculated to equal 1.67 tonnes per cubic metre. The following equation summarizes the Speculative Resource calculation:

Speculative Resource Tonnes of Coal =

$$\frac{\text{Planimetered Area} \times 10.30 \times 1.67}{(\text{m}^2) \quad (\text{m}) \quad (\text{t/m}^3)}$$

System

Copyright by:

¹MEDSYSTEM

Mintec Inc., Tucson, Arizona

²TELLAGRAF

Integrated Software Systems Corp.,
San Diego, California

7.3.3 Parameters

The minimum seam true thickness used for the 1987 Mount Klappan Anthracite Project was 0.50 metres, and the minimum

ratio of coal to coal plus rock partings was 50%. Several seams containing large rock splits, which could be selectively mined out, have been split into two separate mining sections, and the sum of these coal values would be used for resource calculations. Seams were included in the resources to a maximum depth of 500 metres from surface. A list of the seam thicknesses applied to the Lost-Fox resource calculations is shown in Table 7.3.

The following resource category parameters were used for the calculations. The classification scheme is illustrated in Figure 7.1

7.3.3.1 Measured Resources

Measured resources include those in-situ resources delineated through establishment of exploration data points and, therefore, reported with confidence as to the character and continuity of the coal seams. The maximum distance between data points (drill holes) is 300 metres. It should be noted that trenches and correlatable outcrops have not been used as data points in these calculations.

7.3.3.2 Indicated Resources

Indicated resources include in-situ resources which are delineated using established data points as well as reasonable geological projections. The maximum distance between data points is 600 metres.

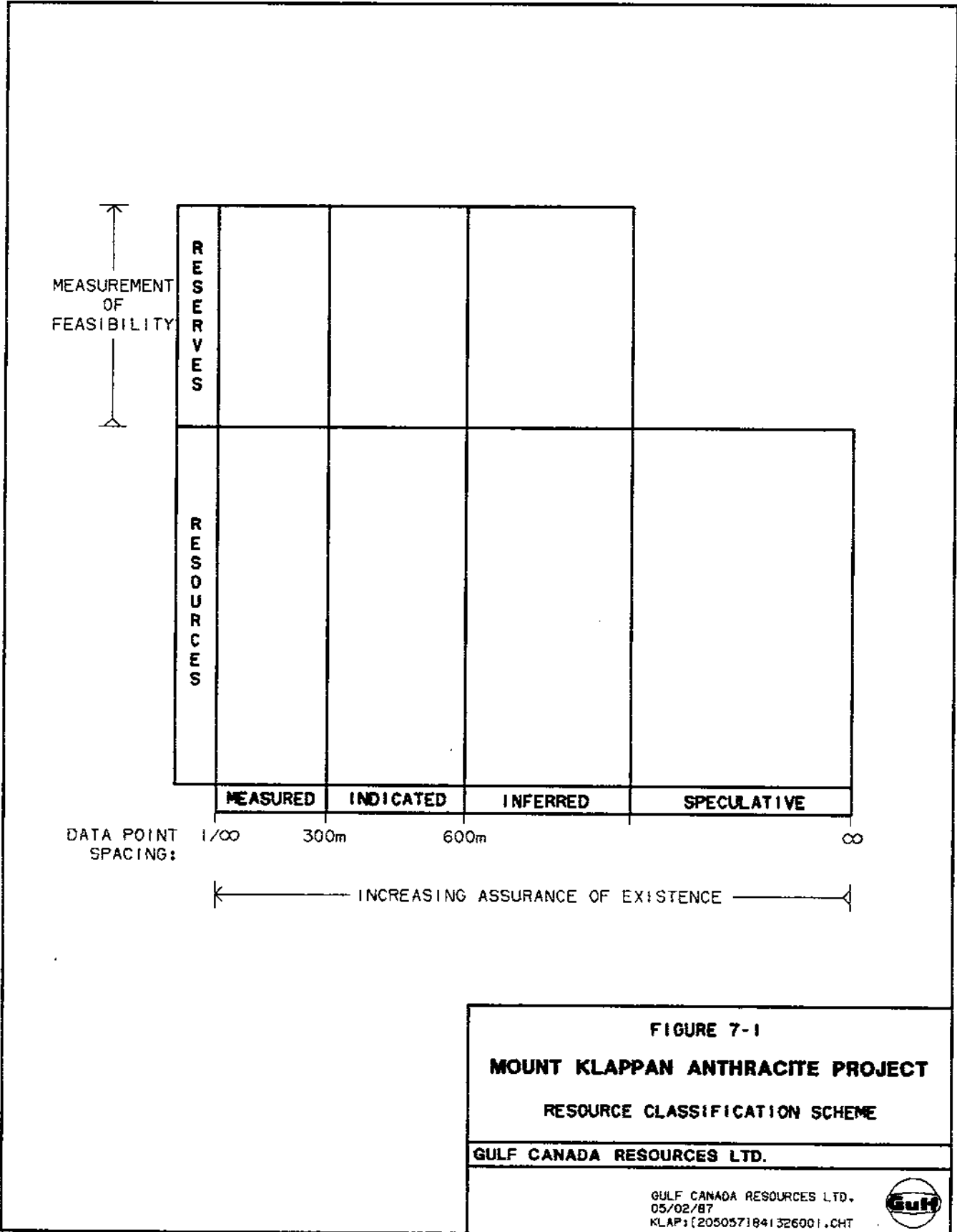



FIGURE 7-1
MOUNT KLAPPAN ANTHRACITE PROJECT
RESOURCE CLASSIFICATION SCHEME

GULF CANADA RESOURCES LTD.

GULF CANADA RESOURCES LTD.
05/02/87
KLAP: [2050571841 326001 .CHT



7.3.3.3 Inferred Resources

Inferred resources include in-situ resources which are delineated utilizing regional geological data including data points which predict the continuity of coal seams. Report ER79-9 does not state a data point spacing for this category. For the purposes of standardization for the 1987 Mount Klappan Anthracite Project resource calculations, a maximum data point spacing of 2000 metres was used for the inferred level. However, in the Hobbit-Broatch Area, inferred resources were calculated over the entire 1:2500 map area due to the continuity of coal seams in that area.

7.3.3.4 Speculative Resources

Speculative resources include those in-situ resources which are calculated from a few scattered coal occurrences in areas of little or no exploration data where the coal-bearing sequence is interpreted to exist. There is no maximum spacing in this category.

Speculative resources are only a broad geological indication of the amount of coal which could be contained within the Klappan Sequence the vast majority of which would not be mineable under current economic conditions.

8.0 COAL QUALITY

8.1 Summary

The 1987 Lost-Fox Area exploration program continued the delineation of anthracite resources in the Lost Ridge region. Coal quality information was augmented in potential pit areas and new data gathered in peripheral regions through detailed analysis of coal samples obtained in diamond drilling.

A total of 34 diamond drill holes produced 4 931 metres of core, 259.37 m of that as recovered coal. Laboratory analysis of the coal core can be found in Appendix IV of this report.

8.2 Procedures and Parameters

8.2.1 Diamond Drilling Program

Each of the 165 coal and carbonaceous zones intersected was logged in detail prior to sampling. Sample intervals were based on the stratigraphy of the seam, including rock partings and variance in coal composition. Geophysical logs were used extensively in defining these seam characteristics. The complete analysis of the coal is outlined on the flow sheet in Figure 8.1 and average analytical results are documented in Table 8.1.

Selected seam intersections from the coal core received were first crushed to pass a top size of 35 mm. Size consist was then determined according to the following:

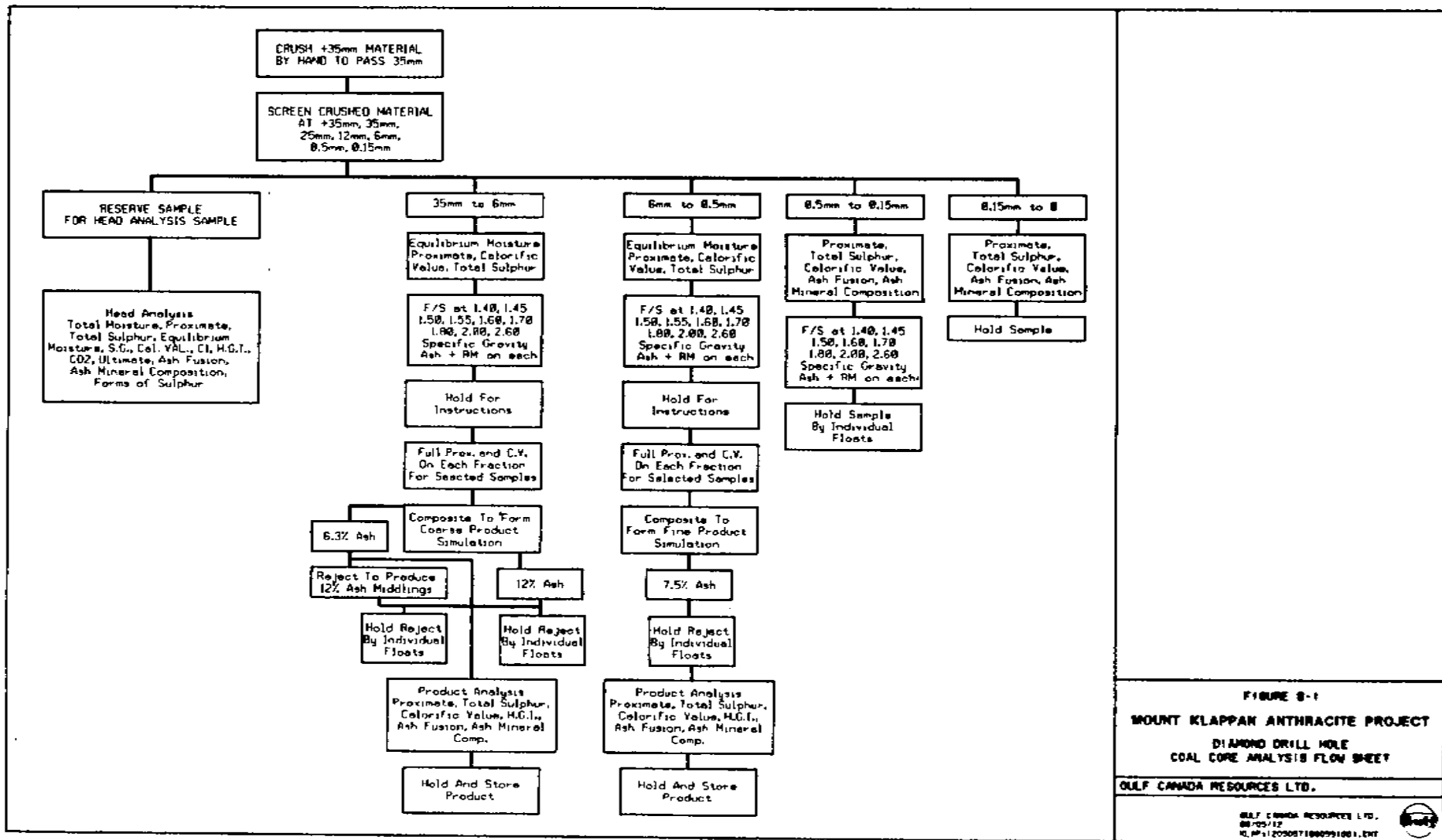


FIGURE 8-1
 MOUNT KLAPPAN ANTHRACITE PROJECT
 DIAMOND DRILL HOLE
 COAL CORE ANALYSIS FLOW SHEET
 OULF CANADA RESOURCES LTD.
 OULF CANADA RESOURCES LTD.
 08/05/12
 KL.P1205087100091001.EXT

Table 8.1

1987
AVERAGE DIAMOND DRILL CORE RAW COAL QUALITY BY SEAM

SEAM	F	G	Phenton	H/I	H-1	H	I	J	K	K/L	L	M	M/N	N	O
Proximate Analysis															
Residual Moisture	0.77	0.70	0.84	0.90	0.61	0.99	1.07	1.14	1.09	1.03	0.96	1.14	0.95	0.87	0.65
Ash	56.84	38.74	50.13	41.83	60.59	39.72	26.63	29.16	38.42	52.64	34.40	43.51	57.52	35.52	34.74
Volatile	9.37	8.08	7.89	7.87	7.07	7.17	7.02	8.09	7.74	7.38	7.42	7.59	8.06	7.00	7.74
Fixed Carbon	33.02	52.48	41.14	49.40	31.73	52.12	65.28	61.61	52.75	38.95	57.22	47.76	33.47	56.61	56.88
H.G.I.															
H.G.I.	68.0	60.0	59.57	60.33		62.41	56.58	61.0	61.5	67.4	61.2	58.4	67.7	63.5	50.0
Specific Gravity	1.89	1.68	1.75	1.72	1.94	1.68	1.54	1.60	1.68	1.86	1.61	1.74	1.89	1.65	1.77
Carbon Dioxide	5.36	4.59	3.32	3.44	2.38	3.01	2.23	3.04	2.84	2.33	3.74	2.46	3.42	1.98	4.49
Chlorine (ppm)	2910.0	64.0	1687.0	2823.0	2290.0	1995.0	2436.0	3010.0	2074.0	2111.0	2116.0	2258.0	2730.0	1615.0	1760.0
Sulphur	0.78	0.33	0.71	1.46	0.540	0.61	0.41	0.49	1.10	0.69	0.65	1.07	0.41	0.93	0.44
Calorific Value															
Gross (MJ/kg)	11.89	18.14	14.39	17.83	10.23	18.29	23.76	21.87	19.26	13.46	20.70	16.81	10.96	20.69	20.98
Gross (cal/gm)	2842	4335	3439	4261	2445	4371	5679	5227	4603	3217	4947	4018	2619	4945	5014
Ultimate Analysis															
Carbon	35.97	53.62		49.14	33.51	55.33	72.33	62.30	53.72	39.44	61.47	48.59	35.75	57.23	
Hydrogen	1.29	1.59	1.83	1.60	1.62	1.89	2.11	1.93	1.82	1.52	2.13	1.74	1.34	1.96	1.71
Nitrogen	0.43	0.55	0.55	0.56	0.47	0.64	0.80	0.70	0.68	0.53	0.74	0.62	0.50	0.73	0.63
Oxygen	3.92	4.47	3.44	3.47	2.66	3.28	3.25	4.28	3.34	3.48	2.73	3.33	3.54	2.78	3.83
Ash Fusion (deg C)															
Oxidizing															
Initial	1219.0	1203.0	1261.0	1229.0	1209.0	1250.0	1262.0	1275.0	1234.0	1271.0	1236.0	1222.0	1266.0	1267.0	1227.0
Softening	1285.0	1251.0	1290.0	1295.0	1274.0	1287.0	1295.0	1283.0	1281.0	1309.0	1282.0	1307.0	1313.0	1276.0	1251.0
Hemispherical	1295.0	1256.0	1303.0	1309.0	1330.0	1303.0	1311.0	1291.0	1296.0	1333.0	1292.0	1325.0	1336.0	1292.0	1278.0
Fluidizing	1353.0	1305.0	1355.0	1357.0	1367.0	1364.0	1369.0	1329.0	1351.0	1396.0	1326.0	1377.0	1380.0	1348.0	1350.0
Reducing															
Initial	1124.0	1200.0	1193.0	1169.0	1190.0	1196.0	1210.0	1240.0	1177.0	1197.0	1158.0	1171.0	1211.0	1158.0	1203.0
Softening	1209.0	1205.0	1232.0	1203.0	1206.0	1233.0	1241.0	1256.0	1211.0	1238.0	1214.0	1234.0	1236.0	1203.0	1238.0
Hemispherical	1216.0	1211.0	1245.0	1218.0	1243.0	1250.0	1260.0	1262.0	1224.0	1268.0	1229.0	1260.0	1271.0	1222.0	1251.0
Fluidizing	1350.0	1235.0	1333.0	1296.0	1351.0	1342.0	1343.0	1305.0	1302.0	1378.0	1281.0	1367.0	1363.0	1312.0	1342.0
Ash Mineral Analysis															
SiO ₂	56.56	53.75	57.40	54.89	60.88	55.54	53.17	49.49	56.96	60.90	46.74	56.86	57.29	59.67	59.44
Al ₂ O ₃	15.86	16.47	17.45	16.29	18.15	17.80	19.79	21.49	17.90	18.24	18.57	19.15	19.91	14.75	14.37
Fe ₂ O ₃	7.46	6.89	6.14	9.47	6.29	5.74	6.48	5.16	6.70	5.05	7.81	6.27	5.30	5.81	2.34
CaO	4.74	7.46	5.08	4.68	1.96	5.74	4.84	6.12	4.50	3.02	8.74	3.40	3.54	4.68	7.28
MgO	3.91	4.89	3.53	3.42	2.62	3.26	3.47	4.83	3.17	2.67	4.34	3.14	2.86	2.74	5.44
TiO ₂	1.05	0.90	0.84	0.86	0.98	0.98	1.05	1.23	1.14	1.02	1.22	1.09	1.11	0.85	0.76
Na ₂ O	1.51	1.57	1.43	1.29	1.33	1.59	1.90	1.26	1.78	1.72	1.69	1.67	1.35	1.24	1.81
K ₂ O	1.56	0.84	1.45	1.34	2.06	1.13	1.04	1.48	1.21	1.68	1.03	1.66	1.70	1.28	0.68
SO ₃	2.18	1.78	2.44	2.26	1.43	2.97	2.65	3.36	2.77	1.78	4.26	2.86	2.00	3.50	2.35
P ₂ O ₅	0.24	0.58	0.61	0.76	0.54	1.03	1.67	1.40	0.68	0.62	1.74	0.53	0.34	1.05	0.97

Note: Table represents a straight average of diamond drill core coal quality.

35 mm x 25, 25 x 12, 12 x 6, 6 x 0.5, 0.5 x 0.15 and 0.15 mm x 0. Results of the average size consist for each seam are presented in Table 8.2.

Washability analysis of the coal core consisted of a consolidation of several sizes into the following 4 fractions: 35 x 6 mm, 6 x 0.5 mm, 0.5 x 0.15 mm, 0.15 x 0 mm. All but the fine fraction, 0.15 x 0 mm, were tested at the specific gravities of separations of: 1.40, 1.45, 1.50, 1.55, 1.60, 1.70, 1.80, 2.00, 2.60. The fine fraction will undergo froth floatation at a later date. All raw washability data is found in Appendix IV.

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APPENDIX A

LEGAL DESCRIPTION AND LISTING OF LICENCES

Appendix A

MOUNT KLAPPAN ANTHRACITE PROJECT LICENCES

1987

Lost-Fox Area

Licence	Effective Date	Hectares	Series	Block
7129	Sept. 1/81	281	104-H-2	K
7130	Sept. 1/81	281	104-H-2	K
7133	Sept. 1/81	281	104-H-2	K
7134	Sept. 1/81	281	104-H-2	K
7135	Sept. 1/81	281	104-H-2	K
7138	Sept. 1/81	281	104-H-2	K
7139	Sept. 1/81	281	104-H-2	K
7140	Dec. 31/82	281	104-H-2	K
7143	Dec. 31/82	281	104-H-2	K
7144	Dec. 31/82	281	104-H-2	K
7145	Dec. 31/82	281	104-H-2	K
7146	Sept. 1/81	281	104-H-2	L
7147	Dec. 31/82	281	104-H-2	L
7148	Sept. 1/81	281	104-H-2	L
7149	Sept. 1/81	281	104-H-2	L
7151	Dec. 31/82	281	104-H-2	L
7152	Dec. 31/82	281	104-H-2	L
7153	Sept. 1/81	281	104-H-2	L
7160	Dec. 31/82	281	104-H-7	C
7161	Dec. 31/82	281	104-H-7	C
7162	Dec. 31/82	281	104-H-7	C
7164	Dec. 31/82	280	104-H-7	C
7165	Dec. 31/82	280	104-H-7	C
7166	Dec. 31/82	280	104-H-7	C
7167	Sept. 1/81	75	104-H-7	C
7168	Sept. 1/81	142	104-H-7	C
7169	Dec. 31/82	281	104-H-7	D

Lost-Fox Area (cont'd)

Licence	Effective Date	Hectares	Series	Block
7170	Dec. 31/82	281	104-H-7	D
7171*	Dec. 31/82	140.5	104-H-7	D
7172	Dec. 31/82	280	104-H-7	D
7173*	Dec. 31/82	140	104-H-7	D
7175	Sept. 1/81	94	104-H-7	D
7527	Oct. 21/82	281	104-H-2	K
7529	Oct. 21/82	281	104-H-2	L
7561	June 30/83	21	104-H-7	C

* Licence split between Lost-Fox and Summit-Nass-Skeena Areas

Lost-Fox Area Total Hectares = 8 757.5

Appendix A

MOUNT KLAPPAN ANTHRACITE PROJECT LICENCES

1987

SUMMIT-NASS-SKEENA AREA

Summit Area

Licence	Effective Date	Hectares	Series	Block
7171*	Dec. 31/82	140.5	104-H-7	D
7173*	Dec. 31/82	140.0	104-H-7	D
7174	Dec. 31/82	280.0	104-H-7	D
7176	Dec. 31/82	277.0	104-H-7	D
7177	Sept. 1/81	280.0	104-H-7	D
7382	Mar. 15/82	280.0	104-H-6	H
7383	Mar. 15/82	108.0	104-H-6	H
7384	Mar. 15/82	281.0	104-H-7	D
7385	Mar. 15/82	204.0	104-H-7	D
7386	Mar. 15/82	280.0	104-H-7	D
7387	Mar. 15/82	280.0	104-H-7	D
7388	Mar. 15/82	172.0	104-H-7	D
7389	Mar. 15/82	275.0	104-H-7	D
7390	Mar. 15/82	280.0	104-H-7	D
7391	Mar. 15/82	115.0	104-H-7	E
7392	Mar. 15/82	260.0	104-H-7	E
7423	Mar. 15/83	281.0	104-H-7	D
7424	Mar. 15/83	280.0	104-H-7	D
7425	Mar. 15/83	280.0	104-H-7	D
7426	Mar. 15/83	280.0	104-H-7	D
7726	Jan. 10/84	280.0	104-H-6	A
7727	Jan. 10/84	280.0	104-H-6	A
7728	Jan. 10/84	280.0	104-H-6	A
7729	Jan. 10/84	280.0	104-H-6	A
7730	Jan. 10/84	280.0	104-H-6	A

Summit Area (cont'd)				
Licence	Effective Date	Hectares	Series	Block
7746	Jan. 10/84	280.0	104-H-6	H
7750	Jan. 10/84	261.0	104-H-6	H
7751	Jan. 10/84	280.0	104-H-6	H
7752	Jan. 10/84	280.0	104-H-6	H
7754	Jan. 10/84	154.0	104-H-6	H
7755	Jan. 10/84	274.0	104-H-6	H
7756	Jan. 10/84	280.0	104-H-6	D
7757	Jan. 10/84	280.0	104-H-6	D
8047	Mar. 29/85	280.0	104-H-6	A
8048	Mar. 29/85	280.0	104-H-6	A

* Licence split between Summit-Nass-Skeena and Lost-Fox Areas.

Summit Area Total Hectares = 8 822.5

Nass Area Licence	Effective Date	Hectares	Series	Block
7150	Sept. 1/81	281	104-H-2	L
7154	Sept. 1/81	281	104-H-2	L
7421	Mar. 15/83	281	104-H-2	L
7422	Mar. 15/83	281	104-H-2	L
7427	Mar. 15/83	281	104-H-3	I
7428	Mar. 15/83	281	104-H-3	I
7429	Mar. 15/83	281	104-H-3	I
7430	Mar. 15/83	281	104-H-3	I
7431	Mar. 15/83	281	104-H-3	I
7432	Mar. 15/83	281	104-H-3	I
7487	Oct. 21/82	281	104-H-3	J
7488	Oct. 21/82	281	104-H-3	J
7506	Oct. 21/82	281	104-H-3	H
7507	Oct. 21/82	281	104-H-3	H
7508	Oct. 21/82	281	104-H-3	H
7510	Oct. 21/82	281	104-H-3	H
7511	Oct. 21/82	281	104-H-3	H
7512	Oct. 21/82	281	104-H-3	I
7513	Oct. 21/82	281	104-H-3	I
7514	Oct. 21/82	281	104-H-3	I
7515	Oct. 21/82	281	104-H-3	I
7516	Oct. 21/82	281	104-H-3	I
7517	Oct. 21/82	281	104-H-3	I
7518	Oct. 21/82	281	104-H-3	I
7519	Oct. 21/82	281	104-H-3	I
7520	Oct. 21/82	281	104-H-3	I
7521	Oct. 21/82	281	104-H-3	I
7522	Oct. 21/82	281	104-H-3	I
7523	Oct. 21/82	281	104-H-3	I

Nass Area (cont'd) Licence	Effective Date	Hectares	Series	Block
7533	Oct. 21/82	281	104-H-2	L
7534	Oct. 21/82	281	104-H-2	L
7535	Oct. 21/82	281	104-H-2	L
7536	Oct. 21/82	281	104-H-2	L
8032	Mar. 29/85	281	104-H-3	J
8033	Mar. 29/85	281	104-H-3	J
8034	Mar. 29/85	281	104-H-3	J
8035	Mar. 29/85	281	104-H-3	J
8036	Mar. 29/85	281	104-H-3	J
8037	Mar. 29/85	281	104-H-3	J
8038	Mar. 29/85	281	104-H-3	J
8039	Mar. 29/85	281	104-H-3	J
8040	Mar. 29/85	281	104-H-3	J
8041	Mar. 29/85	281	104-H-3	J
8042	Mar. 29/85	281	104-H-3	J
8043	Mar. 29/85	281	104-H-3	J
8044	Mar. 29/85	281	104-H-3	J

Nass Area Total Hectares = 12 926

Skeena Area Licence	Effective Date	Hectares	Series	Block
7493	Oct. 21/82	282	104-H-2	G
7494	Oct. 21/82	282	104-H-2	G
7495	Oct. 21/82	282	104-H-2	G
7497	Oct. 21/82	281	104-H-2	G
7498	Oct. 21/82	281	104-H-2	G
7499	Oct. 21/82	281	104-H-2	G
7500	Oct. 21/82	281	104-H-2	G
7501	Oct. 21/82	281	104-H-2	G
7502	Oct. 21/82	281	104-H-2	J
7503	Oct. 21/82	281	104-H-3	K
7504	Oct. 21/82	281	104-H-3	K
7538	Oct. 21/82	281	104-H-2	F

Skeena Area Total Hectares = 3 375

Appendix A

MOUNT KLAPPAN ANTHRACITE PROJECT LICENCES
1987

Hobbit-Broatch Area

Licence	Effective Date	Hectares	Series	Block
7118	Sept. 1/81	281	104-H-2	J
7119	Sept. 1/81	281	104-H-2	J
7121	Sept. 1/81	224	104-H-2	J
7122	Dec. 31/82	281	104-H-2	J
7123	Dec. 31/82	281	104-H-2	J
7124	Sept. 1/81	98	104-H-2	J
7125	Dec. 31/82	281	104-H-2	J
7126	Dec. 31/82	281	104-H-2	J
7127	Sept. 1/81	281	104-H-2	K
7128	Sept. 1/81	281	104-H-2	K
7131	Sept. 1/81	281	104-H-2	K
7132	Sept. 1/81	281	104-H-2	K
7136	Dec. 31/82	281	104-H-2	K
7137	Sept. 1/84	281	104-H-2	K
7141	Dec. 31/82	281	104-H-2	K
7142	Dec. 31/82	281	104-H-2	K
7155	Sept. 1/81	61	104-H-7	B
7156	Sept. 1/81	167	104-H-7	B
7157	Sept. 1/81	265	104-H-7	B
7158	Dec. 31/82	281	104-H-7	C
7159	Dec. 31/82	281	104-H-7	C
7163	Dec. 31/82	257	104-H-7	C
7381	Mar. 18/82	281	104-H-2	J
7418	Mar. 15/83	281	104-H-2	J
7559	June 30/83	22	104-H-7	B
7560	June 30/83	153	104-H-7	C

Hobbit-Broatch Area Total Hectares = 6 305

APPENDIX B
DISTRIBUTION OF WORK BY LICENCE - LOST-FOX AREA

Distribution of Work by Licence

Diamond Drill Hole	Licence
KPNLRDDH87001	7145
KPNLRDDH87002	7162
KPNLRDDH87003	7162
KPNLRDDH87004	7162
KPNLRDDH87005	7162
KPNLRDDH87006	7162
KPNLRDDH87007	7152
KPNLRDDH87008	7162
KPNLRDDH87009	7162
KPNLRDDH87010	7148
KPNLRDDH87011	7148
KPNLRDDH87012	7162
KPNLRDDH87013	7149
KPNLRDDH87014	7162
KPNLRDDH87015	7149
KPNLRDDH87016	7151
KPNLRDDH87017	7169
KPNLRDDH87018	7140
KPNLRDDH87019	7169
KPNLRDDH87020	7140
KPNLRDDH87021	7162
KPNLRDDH87022	7145
KPNLRDDH87023	7162
KPNLRDDH87024	7144
KPNLRDDH87025	7151
KPNLRDDH87026	7162
KPNLRDDH87027	7162
KPNLRDDH87028	7162
KPNLRDDH87029	7162
KPNLRDDH87030	7166
KPNLRDDH87031	7166
KPNLRDDH87032	7152
KPNLRDDH87033	7151
KPNLRDDH87034	7151

Hand Trench	Licence
KPNLRTRC87001	7149
KPNLRTRC87022	7149
KPNLRTRC87031	7149
KPNLRTRC87032	7149
KPNLRTRC87033	7149

Mechanical Trench**Licence**

KPNLRTRC87002	7149
KPNLRTRC87003	7149
KPNLRTRC87004	7149
KPNLRTRC87005	7149
KPNLRTRC87006	7149
KPNLRTRC87007	7149
KPNLRTRC87008	7149
KPNLRTRC87009	7149
KPNLRTRC87010	7149
KPNLRTRC87011	7149
KPNLRTRC87012	7149
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KPNLRTRC87116	7152
KPNLRTRC87117	7152
KPNLRTRC87118	7151
KPNLRTRC87119	7151
KPNLRTRC87120	7152
KPNLRTRC87121	7147
KPNLRTRC87122	7147
KPNLRTRC87123	7152
KPNLRTRC87124	7152

APPENDIX C
FLORA AND FAUNA LOCATIONS

SAMPLE NUMBER	GEOGRAPHIC LOCATION	STRATIGRAPHIC LOCATION	IDENTIFICATION (IF KNOWN)
SL870101	West Pond Cliffs, WLR	above M seam	Pterophyllum rectangulare Sphenopteris sp. bivalves
SL870102	Southern Mohawk, WLR	above J seam	Czekanowskia rigida Ginkgo nana Baiera gracilis Nilssonia tenuicaulis Nilssonia schaubergensis abund. Pityophyllum nordenskioldii bivalve wood
SL870202	Little Klappan River	Lower Klappan	bivalves bivalve escape structure
SL870206	Little Klappan River	Lower Klappan	bivalves
KH870105	Nass	Lower Klappan	Podozamites lanceolatus Nilssonia tenuicaulis abund. Czekanowskia rigida Ginkgo nana
KH870201	Nass	Upper Spatsizi	abund. bivalves (sampled)
KH870203	Nass	Upper Spatsizi	abund. bivalves (sampled)
KH870301	Nass	Upper Spatsizi	bivalves unidentified plant (sampled)
SL870207	Little Klappan River	Lower Klappan	Nilssonia tenuicaulis Nilssonia canadensis Ptilophyllum montanense gastropods bivalves (sampled)
SL870301	Little Klappan River	L. Klappan/Spatsizi	bivalves: Staffinella
SL870303	Little Klappan River	L. Klappan/Spatsizi	bivalves (sampled): Acesta, Somapecte
KH870601	Nass	L./M. Klappan	Pityophyllum nordenskioldii Czekanowskia rigida Nilssonia tenuicaulis
GP/JW87	Knooph Hill	M. Malloch	Pityophyllum nordenskioldii Cladophlebis virginensis fisheri Cladophlebis virginensis martiniana Podozamites lanceolatus Nilssonia schaubergensis Baiera furcata Pterophyllum rectangulare
KH870702	Nass	Spatsizi ?	Helminthopsis bivalves

SAMPLE NO.	LOCATION	POSITION	IDENTIFICATION
KH870802	Nass	Klappan ?	Helminthopsis bivalves wood fragments
KH870901	Nass	L. Klappan	Helminthopsis
KH870906	Nass	Spatsizi	v. abund. gastropods
MB870508	Scree Bowl, WLR	below seam A	Helminthopsis plant fragments
SL870502	Scree Bowl, WLR	below seam A	wood frags.
MB870601	Fault Block near Twin Ponds, WLR	near seam I	tree branch imprints in ss
MB870607	Fault Block near Twin Ponds, WLR	below seam J	plant frags.
MB870705	Fault Block near Twin Ponds, WLR	above seam I	bivalve: poss. Ferganoconcha
MB870706	Fault Block near Twin Ponds, WLR	M. Klappan	Pityophyllum nordenskioldii or Czekanowskia rigida
SL870708	Southern Mohawk, WLR	below seam J	abund. Ginkgo nana Pityophyllum nordenskioldii Podozamites lanceolatus
SL870904	waterfall below SC04, WLR	near seam C	Nilssononia schaubergensis Nilssononia tenuicaulis Czekanowskia rigida wood
MB870709	Fault Block near Twin Ponds, WLR	M. Klappan	plant frags. wood imprints
MB871201	West Pond Cliffs, WLR	M. Klappan	tree stump insitu (75 cm diameter) plant fragments
MB871203	West Pond Cliffs, WLR	M. Klappan	Staffinella (sampled DW870201) plant frags.
DW870309	west of SC04 cirque, WLR	above seam C	Helminthopsis bivalve imprint Nilssononia tenuicaulis
DW870501	near SC06, WLR	near seam E	Pityophyllum nordenskioldii Nilssononia tenuicaulis
DW870507	near SC06, WLR	M. Klappan	Helminthopsis
SL871001	northeast of TRC84309, WLR	M. Klappan	Nilssononia tenuicaulis Pterophyllum rectangulare Pityophyllum nordenskioldii Nilssononia sp.
SL871002	creek west of TRC84309, WLR	below seam J	abund. Ginkgo nana Nilssononia tenuicaulis Czekanowskia rigida

SAMPLE NO.	LOCATION	POSITION	IDENTIFICATION
			<i>Pityophyllum nordenskioldii</i> <i>Pterophyllum rectangulare</i> <i>Baiera furcata</i> <i>Baiera gracilis</i> <i>Podozamites lanceolatus</i> <i>Sphenopteris</i> sp. branches
SL871204	base of West Pond Cliff, WLR	U. Klappan	<i>Pityophyllum nordenskioldii</i> <i>Sphenopteris</i> sp. petrified wood
SL871205	base of West Pond Cliff, WLR	U. Klappan	worm burrows clam escape structures plant hash
SL871402	Westend Cliff, WLR	above seam A-1 (?)	bivalves
SL871502	base of Mt. Klappan	above seam J	<i>Pityophyllum nordenskioldii</i> <i>Nilssonina tenuicaulis</i> <i>Nilssonina schaubergensis</i> wood
SL871505	base of Mt. Klappan	M./U. Klappan	<i>Pityophyllum nordenskioldii</i>
SL871512	base of Mt. Klappan	near seam K	<i>Pityophyllum nordenskioldii</i> <i>Equisetites lyelli</i> tree trunks <i>Nilssonina canadensis</i> <i>Czekanowskia rigida</i> <i>Podozamites lanceolatus</i> <i>Sphenopteris</i> sp.
SL871603	base of Mt. Klappan	Upper Klappan	<i>Pityophyllum nordenskioldii</i> plant hash
SL871704	base of Mt. Klappan	U. Klappan or Malloch	abund. plants (mostly hash) <i>Baiera furcata</i> <i>Czekanowskia rigida</i> <i>Nilssonina</i> sp.
SL871801	base of Mt. Klappan	U. Klappan or Malloch	<i>Podozamites lanceolatus</i>
SL872001	near TRC84307	M. Klappan	bivalves
SL872002	near TRC84306	below I seam	<i>Nilssonina tenuicaulis</i> <i>Nilssonina canadensis</i> <i>Nilssonina schaubergensis</i> <i>Pityophyllum nordenskioldii</i>
SL8721	upstream from SL871002	below seam J	<i>Nilssonina tenuicaulis</i> <i>Nilssonina schaubergensis</i> <i>Pityophyllum nordenskioldii</i> <i>Ptilophyllum montanense</i> <i>Athrotaxites berryi</i> <i>Elatides curvifolia</i> <i>Pterophyllum rectangulare</i>

SAMPLE NO.	LOCATION	POSITION	IDENTIFICATION
SL872203	south of SC04	below seam E ?	bivalves (sampled)
LS87017	Summit South	L. Klappan	Nilssonina tenuicaulis Ginkgo nana Nilssonina nigracollensis
OTC87013	south of Jack Creek, Skeena	U. Malloch/Rhonda	Coniopteris brevifolia Czekanowskia rigida Baiera furcata Baiera gracilis Ginkgo nana Pterophyllum rectangulare Nilssonina tenuicaulis Nilssonina nigracollensis Claudophlebis virginienensis Coniopteris yukonensis(?) Sagenopteris williamsii(?) Phoenicopsis angustifolia(?) Ginkgo pluripartita(?)
NGJ8701	Calvin's Ridge, Nass	U. Spatsizi	Staffinella Buchia Ferganoconcha Hypoxytona or Acesta ? Belemnopsis sulcatus Buchia concentrica Ammonite (either Cranoccephalites or Arctocephalites)
DW871202	Summit South	L. Klappan	Pityophyllum nordenskioldii Nilssonina canadensis Nilssonina tenuicaulis Czekanowskia rigida
DW871203	Summit South	L. Klappan	horseshoe worm burrows Paleodycton
OTC87016	Marshall Ridge, Summit South	L. Klappan	Helminthopsis Pityophyllum nordenskioldii
OTC87017	Marshall Ridge, Summit South	L. Klappan	bivalves Belemnite petrified wood Pityophyllum nordenskioldii Claudophlebis virginienensis
OTC87023	cirque below TRC82049, LR	L. Klappan	belemnite
TRC87006	backside WLR	seam G	Nilssonina canadensis
TRC87010	above West Pond, WLR	floor of seam O ?	plant hash Nilssonina canadensis
TRC87020	east of S. Mohawk, WLR	seam J	Nilssonina tenuicaulis Pterophyllum rectangulare Pityophyllum nordenskioldii

SAMPLE NO.	LOCATION	POSITION	IDENTIFICATION
TRC87102	south of SC03, LR	seam H roof	<i>Ctenia borealis</i> <i>Ginkgo nana</i> <i>Sphenopteris</i> sp. <i>Nilssonina schaubergensis</i>
MB/DW87101	top of Westend Cliffs, WLR	above seam A	wood <i>Baiera gracilis</i> <i>Nilssonina tenuicaulis</i> <i>Athrotaxites berryi</i> <i>Ptilophyllum</i> sp. bivalves (sampled): <i>Panope</i> (?) Belemnite (sampled)
DDH87001A	Box 21, 46 m from top	24 m below I seam	<i>Helminthopsis</i>
DDH87002A	Box 34, 72 m from top	15 m below I seam	<i>Helminthopsis</i>
DDH87002B	Box 87, 177 m from top	17 m above H seam	<i>Baiera furcata</i> <i>Nilssonina tenuicaulis</i>
DDH87003A	Box 25, 55 m from top	11 m below I seam	<i>Helminthopsis</i>
DDH87003B	Box 27, 59 m from top	15 m below I seam	bivalve
DDH87004A	Box 15, 37 m from top	2 m below H/I seam	bivalve: <i>Hypoxytoma</i> (?) plant fragments
DDH87004B	Box 18, 42 m from top	7 m below H/I seam	<i>Helminthopsis</i>
DDH87004C	Box 26, 59 m from top	10 m above H seam	<i>Helminthopsis</i>
DDH87005A	Box 8, 29 m from top	5 m below K/L seam	<i>Ginkgo nana</i> <i>Nilssonina tenuicaulis</i> <i>Nilssonina</i> sp. <i>Baiera gracilis</i> poss. <i>Nilssonina schaubergensis</i> poss. <i>Baiera furcata</i>
DDH87005B	Box 8, 30 m from top	6 m below K/L seam	<i>Sphenopteris</i> sp. <i>Nilssonina tenuicaulis</i> <i>Nilssonina</i> sp. <i>Baiera gracilis</i> poss. <i>Baiera furcata</i> wood
DDH87005C	Box 9, 32 m from top	8 m below K/L seam	<i>Sphenopteris</i> sp. wood
DDH87005D	Box 17, 48 m from top	1 m above K seam	<i>Nilssonina</i> sp. <i>Czekanowskia rigida</i> <i>Nilssonina nigracollensis</i> poss. <i>Baiera furcata</i> poss. <i>Baiera gracilis</i> wood
DDH87005E	Box 22, 59 m from top	immediately below K seam	<i>Cladophlebis virginiensis</i> wood

SAMPLE NO.	LOCATION	POSITION	IDENTIFICATION
DDH87005F	Box 22, 60 m from top	immediately below K seam	Nilssonia sp.
DDH87005G	Box 25, 65 m from top	6 m below K seam	feeding traces
DDH87005H	Box 76, 165 m from top	near H/I seam	gastropods (.5 cm long)
DDH87005I	Box 76, 166 m from top	near H/I seam	gastropods bivalves: (1 x 1 cm), Ferganoconcha (3.5 x 2.25 cm)
DDH87005J	Box 77, 166 m from top	near H/I seam	gastropods bivalves (<1.5 cm long)
DDH87005K	Box 88, 189 m from top	4 m below H seam	bivalves: Herzogina but poss. Astarte or Staffinella
DDH87006A	Box 49, 104 m from top	6 m below I (?) seam	Nilssonia sp. Pterophyllum rectangulare Cladophlebis virginiensis martiniana (well preserved)
DDH87006B	Box 67, 142 m from top	3 m above H (?) seam	Pityophyllum nordenskioldii coalified plant frags.
DDH87007A	Box 82, 178 m from top	14 m above H (?) seam	Helminthopsis
DDH87007B	Box 87, 189 m from top	3 m above H (?) seam	Helminthopsis
DDH87007C	Box 92, 199 m from top	1 m below H (?) seam	Helminthopsis
DDH87007D	Box 94, 202 m from top	5 m below H (?) seam	bivalves
DDH87008A	Box 5, 19 m from top	immediately above I seam	Pterophyllum rectangulare
DDH87008B	Box 18, 47 m from top	28 m above I seam	Helminthopsis
DDH87008C	Box 23, 58 m from top	39 m above I seam	gastropods (1.5 cm in diameter)
DDH87009A	Box 13, 32 m from top	10 m above I seam	bivalve (qtz replaced)
DDH87009B	Box 23, 57 m from top	10 m below I seam	bivalve (pyritized): Hypoxytoma (?), Staffinella (?)
DDH87009C	Box 33, 79 m from top	9 m below H/I seam	Pityophyllum nordenskioldii Czekanowskia rigida plant fragments
DDH87009D	Box 34, 80 m from top	10 m below H/I seam	Pityophyllum nordenskioldii plant fragments
DDH87010A	Box 2, 5 m from top	24 m above H seam	bivalve (pyritized, .5 cm) plant fragments
DDH87010B	Box 3, 7 m from top	22 m above H seam	bivalves (pyritized): Astarte or Staffinella plant fragments

SAMPLE NO.	LOCATION	POSITION	IDENTIFICATION
DDH87010C	Box 4, 10 m from top	19 m above H seam	bivalve
DDH87010D	Box 17, 38 m from top	4 m below H seam	Nilssonina sp. wood
DDH87011A	Box 3, 10 m from top	19 m above H seam	bivalve (.2 x .3 cm)
DDH87011B	Box 21, 46 m from top	12 m below H seam	Helminthopsis
DDH87012A	Box 37, 86 m from top	12 m above H seam	bivalve fragments
DDH87012B	Box 57, 127 m from top	2 m below H seam	bivalve fragments
DDH87013A	Box 42, 85 m from top	12 m above H seam	Helminthopsis
DDH87013B	Box 53, 107 m from top	8 m below H seam	Helminthopsis
DDH87014A	Box 22, 55 m from top	immediately below J seam	Helminthopsis
DDH87015A	Box 3, 8 m from top	immediately above L seam	bivalve: Herzogina
DDH87015B	Box 7, 16 m from top	8 m above K seam	Nilssonina tenuicaulis Cladophlebis virginiensis fisheri Athrotaxites berryi (?) Sphenopteris sp. Pityophyllum nordenskioldii (?)
DDH87015C	Box 10, 24 m from top	2 m above K seam	abund. Nilssonina canadensis Nilssonina tenuicaulis wood fragments
DDH87015D	Box 34, 71 from top	9 m below I seam	Helminthopsis
DDH87015E	Box 36, 74 m from top	8 m above H seam	occ. bivalve
DDH87015F	Box 37, 76 m from top	6 m above H seam	bivalves
DDH87015G	Box 38, 77 m from top	4 m above H seam	bivalve
DDH87015H	Box 39, 80 m from top	2 m above H seam	bivalves
DDH87015I	Box 47, 96 m from top	10 m below H seam	Helminthopsis
DDH87015J	Box 47, 97 m from top	11 m below H seam	Ginkgo nana
DDH87015K	Box 49, 100 m from top	14 m below H seam	Nilssonina sp.
DDH87015L	Box 51, 104 m from top	18 m below H seam	Helminthopsis
DDH87015M	Box 54, 110 m from top	24 m below H seam	bivalve: Ferganoconcha
DDH87015N	Box 56, 116 m from top	immediately below Ph seam	Nilssonina tenuicaulis Nilssonina schaubergensis Pityophyllum nordenskioldii Czekanowska rigida
DDH87016A	Box 2, 5 m from top	43 m above I seam	Helminthopsis

SAMPLE NO.	LOCATION	POSITION	IDENTIFICATION
DDH87017A	Box 10, 25 m from top	immediately above K seam	Pityophyllum nordenskioldii Nilssononia sp.
DDH87017B	Box 12, 30 m from top	K seam	Nilssononia sp. Ginkgo sp. Czekanowskia rigida
DDH87017C	Box 35, 77 m from top	14 m below I seam	Baiera furcata
DDH87017D	Box 37, 82 m from top	14 m above H/I seam	abund. Pityophyllum nordenskioldii Sphenopteris sp.
DDH87017E	Box 38, 84 m from top	12 m above H/I seam	Pityophyllum nordenskioldii Ginkgo nana
DDH87017F	Box 39, 85 m from top	10 m above H/I seam	Pityophyllum nordenskioldii
DDH87017G	Box 39, 86 m from top	9 m above H/I seam	Ginkgo nana Baiera furcata
DDH87017H	Box 41, 89 m from top	6 m above H/I seam	Nilssononia sp. Baiera gracilis
DDH87017I	Box 43, 95 m from top	1 m above H/I seam	Cladophlebis virginiensis Nilssononia canadensis Pityophyllum nordenskioldii wood
DDH87019A	Box 25, 61 m from top	54 m above I seam	Czekanowskia rigida wood
DDH87019B	Box 72, 157 m from top	9 m above H/I seam	Pityophyllum nordenskioldii Podozamites lanceolatus
DDH87019C	Box 78, 168 m from top	immediately below H/I seam	Helminthopsis
DDH87019D	Box 81, 174 m from top	6 m below H/I seam	bivalve frags. Helminthopsis
DDH87019E	Box 81, 175 m from top	7 m below H/I seam	bivalve: Staffinella plant hash
DDH87020A	Box 8, 26 m from top	27 m above M/N seam	bivalve
DDH87020B	Box 9, 27 m from top	26 m above M/N seam	belemnite (1.5 cm diameter)
DDH87020C	Box 36, 82 m from top	immediately above M seam	Nilssononia canadensis
DDH87021A	Box 22, 46 m from top	13 m below I seam	bivalves
DDH87022A	Box 21, 45 m from top	19 m above O seam	Helminthopsis
DDH87022B	Box 35, 74 m from top	8 m below O seam	Helminthopsis
DDH87022C	Box 36, 76 from top	10 m below O seam	Helminthopsis
DDH87022D	Box 46, 96 m from top	2 m above N seam	bivalves

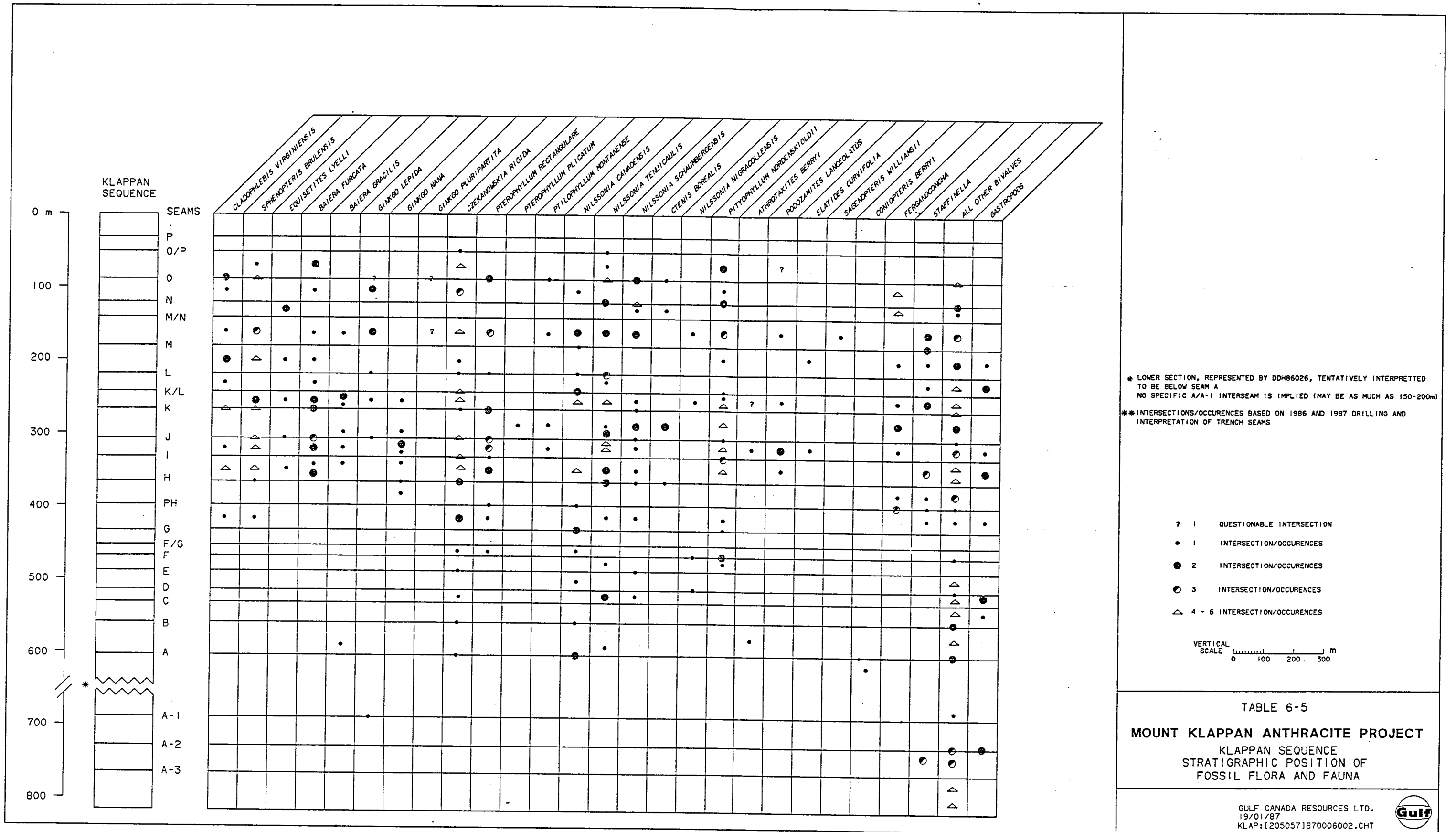
SAMPLE NO.	LOCATION	POSITION	IDENTIFICATION
DDH87023A	Box 34, 88 m from top	16 m above K seam	bivalves (1.5 x 2 cm)
DDH87023B	Box 36, 92 m from top	13 m above K seam	bivalves (.75 x 1.3 x 2. cm)
DDH87023C	Box 38, 97 m from top	8 m above K seam	bivalves: Herzogina or Astarte
DDH87023D	Box 40, 101 m from top	4 m above K seam	bivalves
DDH87023E	Box 45, 111 m from top	5 m below K seam	bivalves (0.5 x 1.2 x 1.5 cm)
DDH87023F	Box 81, 182 m from top	2 m above K/L seam	bivalves: Herzogina or Astarte
DDH87024A	Box 17, 46 m from top	3 m below M/N seam	Staffinella
DDH87024B	Box 20, 52 m from top	9 m below M/N seam	Helminthopsis
DDH87024C	Box 32, 79 m from top	7 m above M seam	bivalves (<.5 x 3 cm) Helminthopsis
DDH87024D	Box 34, 82 m from top	4 m above M seam	bivalves
DDH87024E	Box 57, 128 m from top	8 m below L seam	Helminthopsis
DDH87026A	Box 22, 49 m from top	immediately above H/I seam	bivalves
DDH87026B	Box 27, 59 from top	10 m above H/I seam	bivalves
DDH87026C	Box 28, 61 m from top	11 m above H/I seam	bivalve: Ferganoconcha
DDH87026D	Box 35, 75 m from top	4 m below I seam	bivalves (1.5 cm in cross-section)
DDH87026E	Box 37, 81 m from top	immediately above I seam	Ginkgo nana Nilssonina sp.
DDH87026F	Box 38, 82 m from top	2 m above I seam	Pityophyllum nordenskioldii
DDH87026G	Box 82, 172 m from top	Ph seam	Nilssonina canadensis Nilssonina sp. Pterophyllum rectangulare (?)
DDH87026H	Box 84, 176 m from top	3 m below Ph seam	bivalves: Staffinella
DDH87027A	Box 50, 119 m from top	17 m above Gu seam	bivalves: Buchia, Hypoxytoma or Acesta gastropod
DDH87028A	Box 4, 25 m from top	7 m above O seam	Helminthopsis
DDH87028B	Box 5, 27 m from top	5 m above O seam	bivalves: Staffinella (1 x 3 cm), Ferganoconcha (.75 x 2. x 4. cm)
DDH87028C	Box 6, 29 m from top	3 m above O seam	bivalves: Herzogina or Staffinella
DDH87028D	Box 6, 30 m from top	2 m above O seam	Helminthopsis
DDH87028E	Box 7, 30 m from top	1 m above O seam	Helminthopsis bivalves

SAMPLE NO.	LOCATION	POSITION	IDENTIFICATION
DDH87028F	Box 21, 61 m from top	1 m above M/N seam	<i>Nilssonia schaubergensis</i> <i>Ctenis borealis</i> <i>Nilssonia</i> sp. <i>Equisetites lyelli</i> (stem x-section)
DDH87028G	Box 23, 63 m from top	immediately below M/N seam	bivalves (1 x 1.3 x 2 cm): <i>Herzogina</i> or <i>Staffinella</i>
DDH87028H	Box 24, 66 m from top	4 m below M/N seam	bivalves and plant frags in same beds <i>Ginkgo pluripartita</i> (?)
DDH87028I	Box 27, 73 m from top	11 m below M/N seam	bivalves: <i>Staffinella</i> or <i>Herzogina</i>
DDH87028J	Box 30, 79 m from top	11 m above M seam	<i>Nilssonia</i> sp.
DDH87028K	Box 47, 112 m from top	2 m below L seam	bivalves (1 x 2 x 2.5 cm) poorly defined
DDH87028L	Box 51, 121 m from top	18 m above K/L seam	<i>Helminthopsis</i> gastropods (.5 cm)
DDH87028M	Box 76, 171 m from top	20 m below K/L seam	bivalve frags.
DDH87028N	Box 77, 172 m from top	21 m below K/L seam	bivalves: <i>Staffinella</i>
DDH87028P	Box 78, 174 m from top	23 m below K/L seam	bivalves (3.5 x 4.5 cm)
DDH87028Q	Box 82, 182 m from top	18 m above K seam	bivalve frags.
DDH87028R	Box 83, 184 m from top	16 m above K seam	bivalves (poorly defined): <i>Staffinella</i>
DDH87028S	Box 88, 194 m from top	immediately below K seam	<i>Nilssonia</i> sp. <i>Ctenis borealis</i> (?)
DDH87028T	Box 99, 216 m from top	12 m below K seam	<i>Ptilophyllum montanense</i>
DDH87029A	Box 92, 194 m from top	8 m above G seam	bivalves
DDH87030A	Box 7, 33 m from top	1 m above M seam	<i>Helminthopsis</i>
DDH87030B	Box 19, 57 m from top	3 m above L seam	bivalves: <i>Staffinella</i>
DDH87030C	Box 20, 59 m from top	1 m above L seam	<i>Cladophlebis</i> sp. <i>Sphenopteris</i> sp.
DDH87030D	Box 21, 62 m from top	immediately below L seam	<i>Baiera furcata</i> coaly wood fragments
DDH87030E	Box 22, 63 m from top	1 m below L seam	bivalves
DDH87030F	Box 23, 64 m from top	3 m below L seam	bivalves bivalve escape tubes
DDH87030G	Box 26, 71 m from top	9 m below L seam	<i>Helminthopsis</i>
DDH87030H	Box 27, 74 m from top	12 m below L seam	<i>Helminthopsis</i>

SAMPLE NO.	LOCATION	POSITION	IDENTIFICATION
			gastropod
DDH87030I	Box 28, 75 m from top	13 m below L seam	bivalves (qtz replaced) almost coquina gastropods (.5 cm)
DDH87030J	Box 59, 137 m from top	48 m above K seam	Helminthopsis
DDH87030K	Box 78, 173 m from top	13 m above K seam	scaphopod (?) or Pseudobolus (?)
DDH87030L	Box 79, 174 m from top	11 m above K seam	bivalve (pyritized) belemnite (silicified)
DDH87030M	Box 81, 178 m from top	7 m above K seam	bivalve (pyritized): Buchia, Staffinella, Pseudobolus (silicified)
DDH87030N	Box 82, 185 m from top	immediately above K seam	bivalve (pyritized): Buchia, Staffinella
DDH87030P	Box 114, 245 m from top	immediately below I (?) seam	Nilssonina canadensis
DDH87031A	Box 17, 51 m from top	2 m below L seam	bivalve cross-section (1.7 cm)
DDH87031B	Box 20, 57 m from top	7 m below L seam	Helminthopsis
DDH87031C	Box 35, 85 m from top	3 m below K/L seam	bivalves: Ferganoconcha (1.8 x 4.2 cm), unknown (.1 x .2 cm)
DDH87031D	Box 36, 87 m from top	5 m below K/L seam	bivalves
DDH87031E	Box 37, 90 m from top	5 m above L seam	Helminthopsis gastropods bivalves: Ferganoconcha, unknown (.1 x .2 cm)
DDH87031F	Box 45, 105 m from top	9 m below L seam	Helminthopsis
DDH87031G	Box 52, 119 m from top	22 m below L seam	Helminthopsis
DDH87031H	Box 66, 148 m from top	11 m below K/L seam	Helminthopsis
DDH87031I	Box 69, 153 m from top	16 m below K/L seam	Helminthopsis
DDH87031J	Box 75, 166 m from top	29 m below K/L seam	Helminthopsis
DDH87031K	Box 80, 177 m from top	6 m above K seam	bivalves (2 x >2 cm)
DDH87031L	Box 81, 178 m from top	5 m above K seam	scaphopod (?)
DDH87031M	Box 82, 180 m from top	3 m above K seam	Ammonite
DDH87031N	Box 82, 181 m from top	2 m above K seam	bivalves: Inoceramus
DDH87031P	Box 88, 192 m from top	5 m below K seam	bivalves (qtz replaced)
DDH87031Q	Box 92, 201 m from top	13 m below K seam	Helminthopsis

SAMPLE NO.	LOCATION	POSITION	IDENTIFICATION
DDH87033A	Box 9, 48 m from top	5 m below K seam	rootlets (?)
DDH87033B	Box 14, 56 m from top	13 m below K seam	rootlets (?)

APPENDIX E
SURVEY CONTROL POINTS
1987



correlations on the basis of individual species are not advisable. Although increased data has confirmed a few previously noted fossil group trends, it has also proven that a number of seemingly rare species have a wider stratigraphic and geographic distribution than previously thought.

A chart showing the biostratigraphy and marker horizons of the Klappan Sequence is located in Appendix I.

6.4 Lost-Fox Area Geology

6.4.1 Introduction

The Lost-Fox Area is underlain primarily by sediments of the coal-bearing Klappan Sequence. The overlying non-marine Malloch Sequence becomes predominant in the southern region of the area, south of Fox Creek toward Mount Klappan and Knooph Hill, as the stratigraphic package plunges regionally within the Lost-Fox Area toward the southeast.

The strata have been subjected to two successive non-coaxial phases of deformation. The first phase (F1) resulted in major folds, commonly overturned, which trend in a northwest-southeast direction. The second phase (F2) resulted in discontinuous asymmetric folds which trend roughly east-west. The F2 event has resulted in generally gentle, disharmonic plunge reversals on the F1 structures in most regions of the Lost-Fox Area.

Exploration to date has determined that the Klappan Sequence of the Lost-Fox Area contains at least 36 coal horizons, 22 of which contain potentially mineable coal seams, namely those with an average thickness of 0.50 m or more and contain at least 50% coal. These seams have an aggregate average true thickness of 44.92 metres, average about 2.04 metres in thickness and range up to 9.23 metres true thickness. Drilling and trenching operations have primarily concentrated in the vicinity of Lost Ridge. It is presently interpreted that these 22 coal seams occur within approximately 576 metres of section in the Klappan Sequence strata. The entire thickness of the Klappan Sequence has not been intersected in exploration to date on the Lost-Fox Area. The sequence has been interpreted to attain a thickness of approximately 1 100 metres in the Lost-Fox Area. Exploration this year stepped out to the northeast and west of the ridge area to delineate extensions of H and I seams.

Detailed geological maps and cross-sections pertaining to the Lost-Fox Area are located in Appendix II. All outcrop measured section data is located in Appendix I, as is the 1:50 000 Regional Geology Map of the Mount Klappan property.

6.4.2 Klappan Sequence

The Klappan Sequence predominates in the Lost-Fox Area and extends throughout Lost Ridge to the base of Mount Klappan in the south and into the valley separating Knooph Hill from Lost Ridge in the east. Based on field observat-

ions and drill core analyses, sediments of this sequence range from shallow marine to non-marine within a coastal plain environment.

To date, exploration operations have not delineated the total thickness of the sequence. Based on drill hole and trench information there are at least 576 metres of coal-bearing Klappan Sequence strata within the Lost-Fox Area. Detailed geological interpretations suggest that the Klappan Sequence in the Lost-Fox Area attains a thickness of about 1 100 metres.

The essential lithologic composition of the Klappan Sequence is a cyclic alteration between coal and interlaminated siltstone and mudstone, although sandstone and minor conglomerate are more abundant in the middle of the sequence. Sediments accumulated through the periodic establishment of coal swamps along a marine to transitional marine coastline. Numerous migrating fluvial systems transecting the shoreline provided a constant sediment supply and caused the repeated lateral relocation of coal swamp depositional centres.

The basic cycle of deposition produced coal seams or carbonaceous zones stratigraphically separated by 23 to 33 metres of strata. Superimposed on this cycle was a larger oscillation which resulted in thicker, better developed coaly zones in the middle of the unit, generally seam G to seam K, than those higher or lower. There was also an increase in coarse sediments in this middle section. Associated with this is the appearance of ripple marks and planar and trough cross-bedding, suggesting more fluvial conditions.

The contact between the Klappan Sequence and the underlying, marine, Spatsizi Sequence is transitional. Towards the base of the Klappan Sequence, thinly bedded siltstone and mudstone units increase in abundance, occasional fauna types are observed and coal thicknesses decrease.

A description of the type section of the Klappan Sequence is located in Appendix G.

6.4.3 Malloch Sequence

Approximately 250 metres of the lower Malloch Sequence occur in the Lost-Fox Area, specifically in its southern region. Adjacent areas further south across the Fox Creek Valley such as Mount Klappan, Grizzly Ridge, and Cincie's Ridge have been interpreted as Malloch Sequence sediments as well. The conformable contact between the Klappan and Malloch Sequence is present along the southern edge of the Fox Creek Valley, although it is rarely exposed and difficult to identify in the field.

The Malloch Sequence contains a variety of sediments ranging from thin coal seams, most common near its base, to thick conglomerate lenses near its top. Sandstones and interbedded siltstones are the dominant lithologies, forming repetitive cycles throughout the sequence. The Malloch has been interpreted to represent a prograding fluvial system with meandering river deposits common at its base and braid-plain to distal alluvial fan facies sediments at its upper

limits. Characteristic of the Malloch Sequence are active channel facies, an example of which is shown in Plate 6.1.

A description of the type section of the Malloch Sequence is located in Appendix G.

6.4.4 Coal Seam Development

6.4.4.1 Klappan Sequence

Six consecutive years of drilling programs have determined the presence of 36 coal and carbonaceous horizons, based on present correlations (Tables 6.6, 6.7, 6.8). These horizons occur within approximately 576 metres of section and contain coal seams with true thicknesses of up to 9.23 metres, although several structurally thickened seams up to 17.50 metres have also been drilled. The various main coal horizons have been labelled from A to P.

There are 22 seams which have an average true thickness of 0.50 metres and which have an aggregate average true thickness of about 45 metres within approximately 576 metres of Klappan Sequence strata. The average true thickness of these coal intersections is 2.04 metres.

A summary of the average true thicknesses of coal intersections in the Lost-Fox Area is presented in Table 6.6. In calculating the averages, the number



Plate 6-1 Meandering river channel deposits of the Malloch Sequence displaying well developed channel scour and lateral accretion features. Channel width approximately 60 meters.

GULF CANADA RESOURCES
MOUNT KLAPPAN PROJECT
UTM GEODETIC COORDINATES AND ELEVATIONS IN METRES

DIAMOND DRILL HOLE TYPES

STATION #	NORTHING	EASTING	ELEVATION

87001	6345007.343	508063.358	1507.48
87002	6345393.816	508172.539	1480.79
87003	6345148.647	508294.178	1493.35
87004	6345072.181	508530.991	1479.52
87005	6345612.181	508230.619	1452.19
87006	6345329.927	508433.077	1462.33
87007	6343325.075	505991.543	1694.47
87008	6345453.721	507877.832	1484.76
87009	6345828.141	508266.330	1454.72
87010	6342981.917	505255.358	1705.37
87011	6342980.772	505254.960	1705.28
87012	6345680.444	507950.349	1466.40
87013	6342487.485	504339.182	1674.21
87014	6345653.479	507707.303	1473.80
87015	6342109.469	504253.223	1632.47
87016	6343561.675	506631.203	1679.17
87017	6345801.436	507505.261	1472.00
87018	6342328.105	508842.558	1629.34
87019	6345555.911	507468.120	1486.65
87020	6343087.648	508244.574	1582.83
87021	6345236.494	507990.443	1501.42
87022	6343789.844	508630.399	1554.94
87023	6345709.443	508573.130	1460.79
87024	6344342.819	509312.566	1536.18
87025	6344833.230	507123.794	1525.32
87026	6346044.953	508677.413	1444.09
87027	6346025.031	508322.852	1441.03
87028	6346510.170	508643.916	1418.86
87029	6346467.167	508209.749	1420.71
87030	6347236.199	508236.461	1376.50
87031	6346975.892	508782.513	1393.83
87032	6345000.243	505860.968	1615.67
87033	6344798.898	506456.909	1643.71
87034	6344895.555	506207.137	1620.07

Tronnes Surveys (1976) Ltd.

*are these coordinates
if so - say so.*

GULF CANADA RESOURCES
MOUNT KLAPPAN PROJECT
UTM GEODETIC COORDINATES AND ELEVATIONS IN METRES

ROTARY DRILL HOLE TYPES

STATION #	NORTHING	EASTING	ELEVATION

87001	6347193.59	505921.89	1345.57
87002	6347491.26	506125.73	1340.52
87003	6347248.31	506494.50	1369.25
87004	6346871.59	506384.81	1378.42
87005	6346797.11	506464.99	1393.15

Tronnes Surveys (1976) Ltd.

GULF CANADA RESOURCES
MOUNT KLAPPAN PROJECT
UTM GEODETIC COORDINATES AND ELEVATIONS IN METRES

EXPLORATION TRENCHES

STATION #	NORTHING	EASTING	ELEVATION

87001	6343012.909	503789.809	1617.19
87002	6343016.193	503977.662	1701.21
87003	6342960.337	503955.233	1695.72
87008	6343023.486	504032.600	1707.77
87010	6343148.988	504440.627	1775.91
87011	6343056.791	504442.227	1776.88
87012	6343066.294	504394.007	1779.21
87013	6343044.503	504418.035	1777.20
87015	6342936.509	504323.091	1749.61
87016	6342948.739	504267.729	1748.77
87017	6342934.968	504231.470	1740.58
87018	6342913.458	504429.263	1745.05
87019	6342852.190	504404.119	1732.43
87020	6342817.693	504412.406	1723.16
87021	6342798.515	504382.684	1717.03
87023	6343655.165	504717.446	1822.56
87024	6343575.077	504746.435	1825.52
87025	6343906.086	504537.062	1847.65
87026	6343936.044	504458.729	1847.95
87027	6343970.937	504772.662	1851.44
87028	6343936.501	504934.548	1856.36
87029	6343843.621	504985.471	1848.76
87030	6343826.261	504690.968	1838.41
87031	6343049.661	503923.373	1682.21
87032	6342152.003	503880.823	1642.03

Tronnes Surveys (1976) Ltd.

APPENDIX F

KLAPPAN, MALLOCH AND DEVILS CLAW SEQUENCE TYPE SECTIONS

KLAPPAN SEQUENCE TYPE SECTION

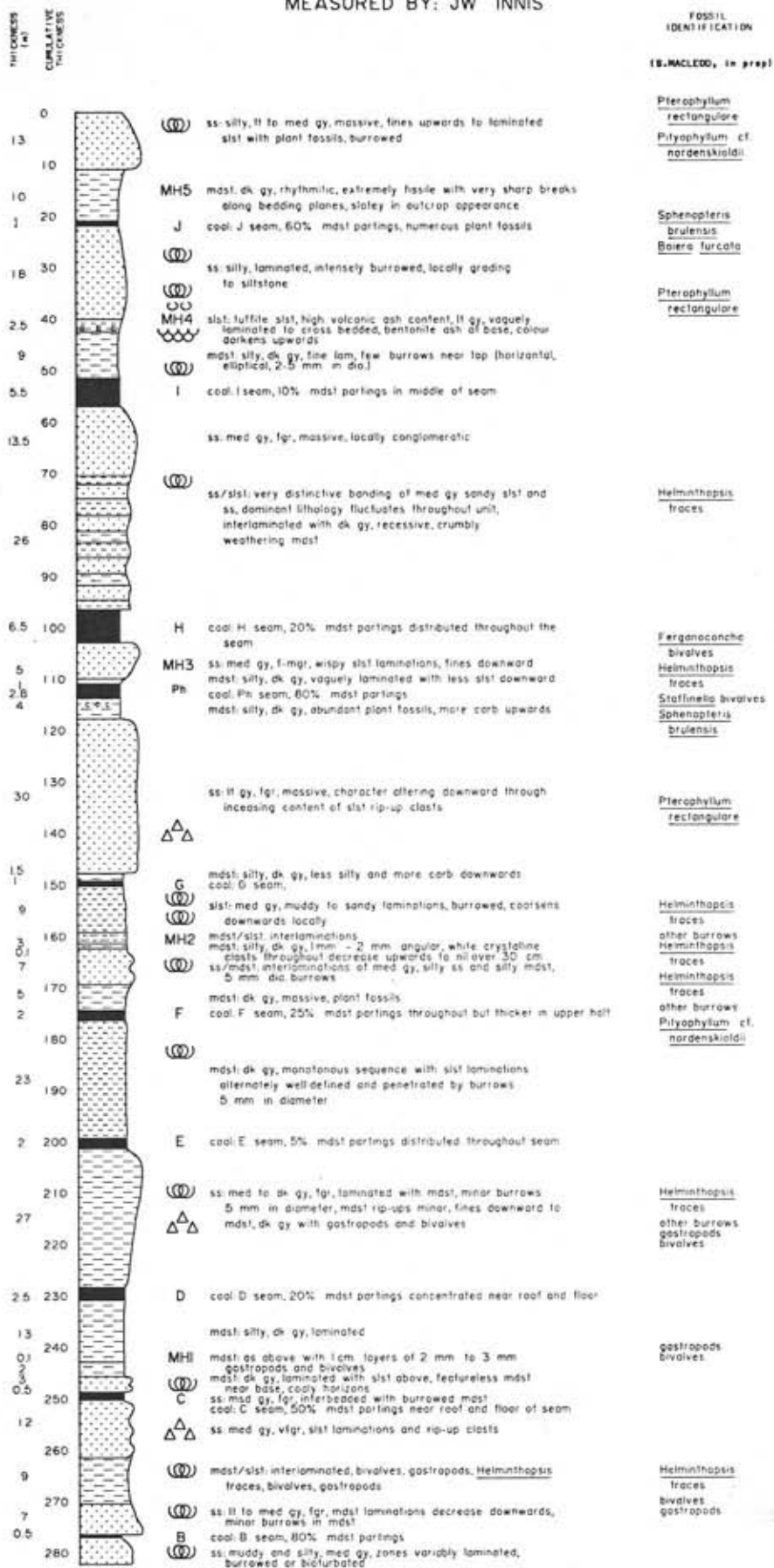
DDH85016

LONGITUDE: 128°54'06" W

LATITUDE: 57°14'56" N

TOTAL LENGTH: 282.5m

MEASURED BY: JW INNIS



KLAPPAN SEQUENCE SUPPLEMENTARY SECTION A

DDH85027

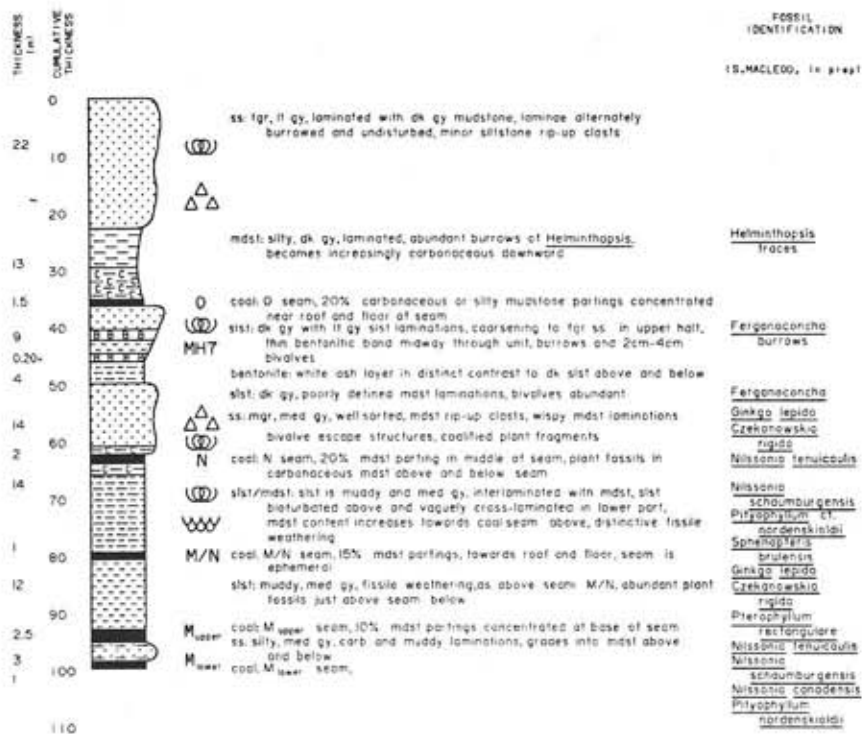
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LATITUDE: 57°13'57" N

TOTAL LENGTH: 99m

MEASURED BY: JW INNIS

THIS SECTION DIRECTLY OVERLIES SUPPLEMENTARY SECTION B
(DIAMOND DRILL HOLE 85-035)



KLAPPAN SEQUENCE SUPPLEMENTARY SECTION B

DDH86035

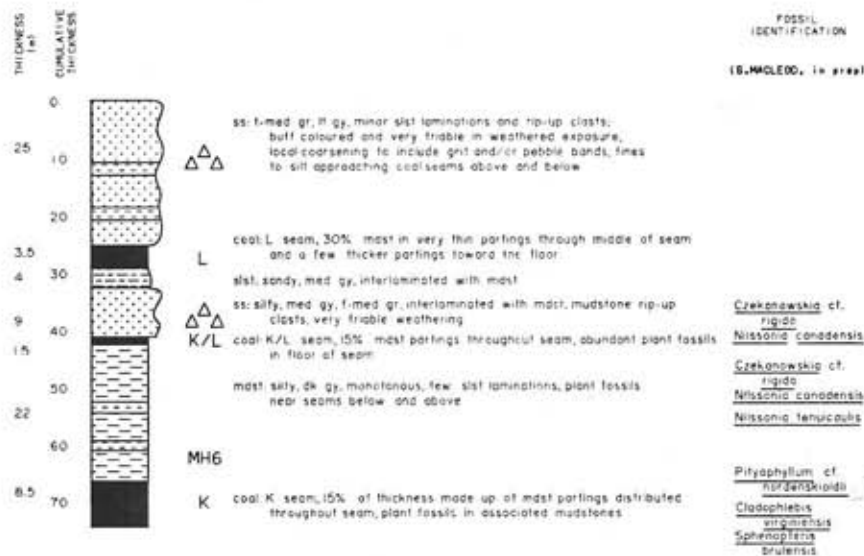
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TOTAL LENGTH: 73.5m

MEASURED BY: JW INNIS

THIS SECTION DIRECTLY OVERLIES THE TYPE SECTION (DDH85016)



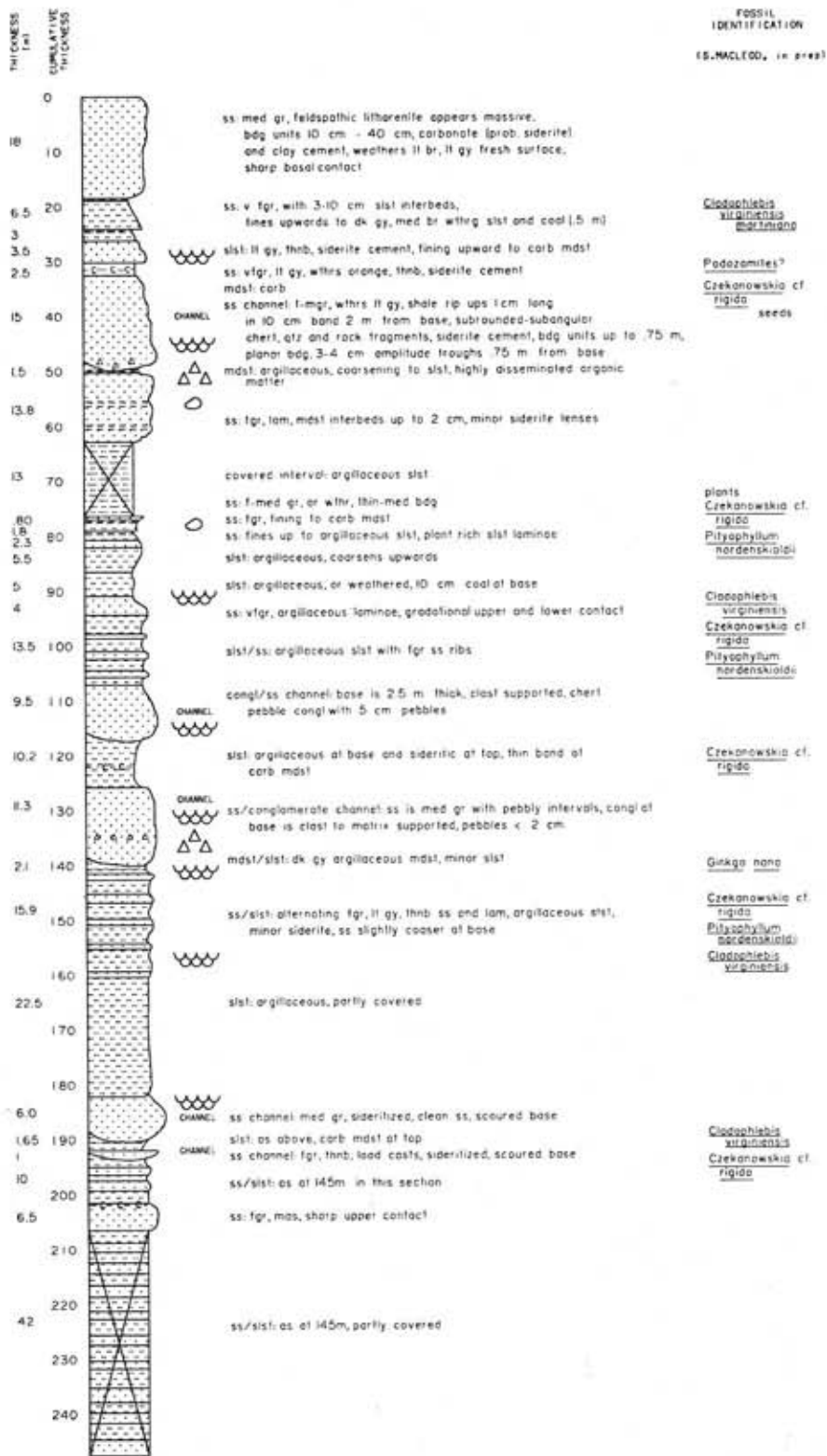
MALLOCH SEQUENCE TYPE SECTION

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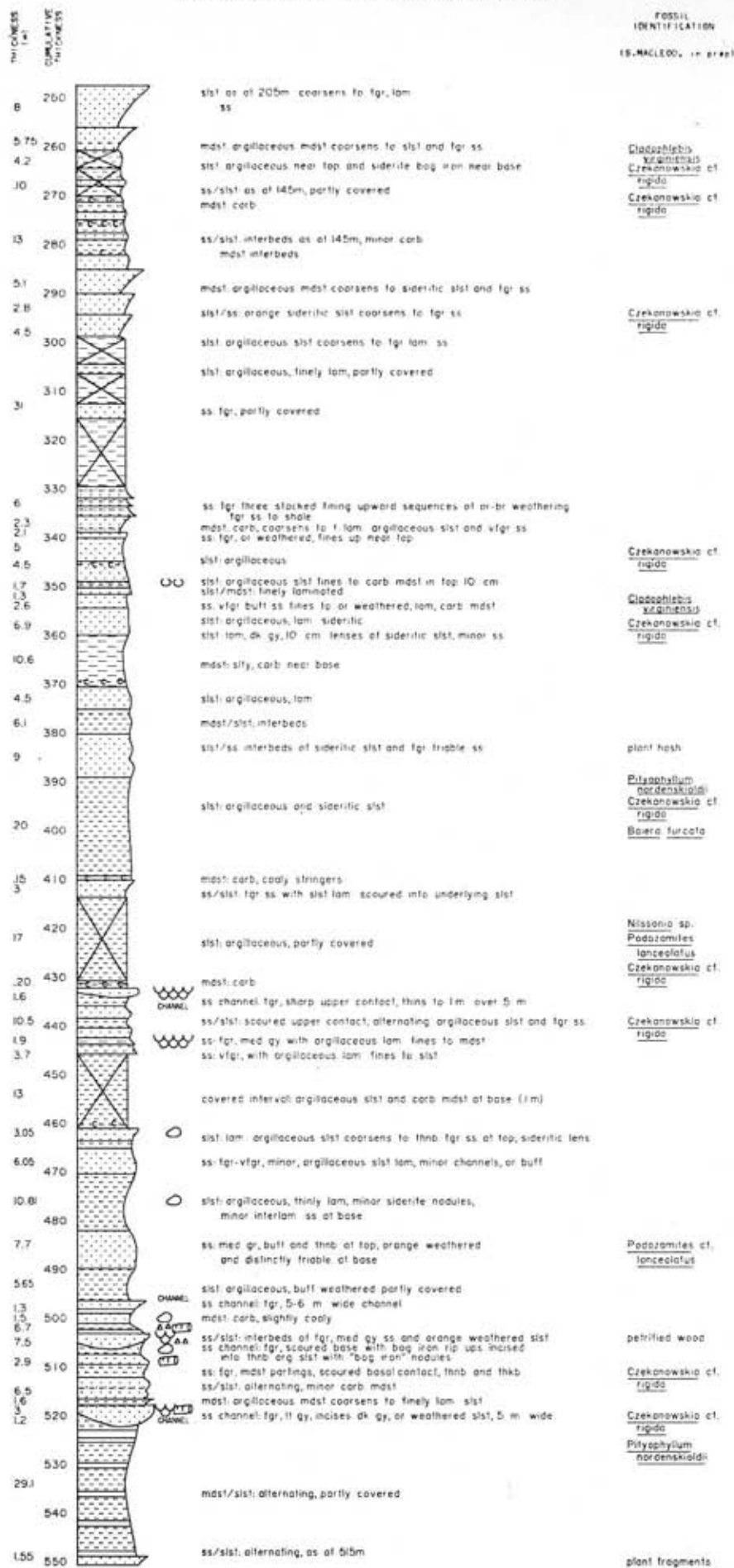
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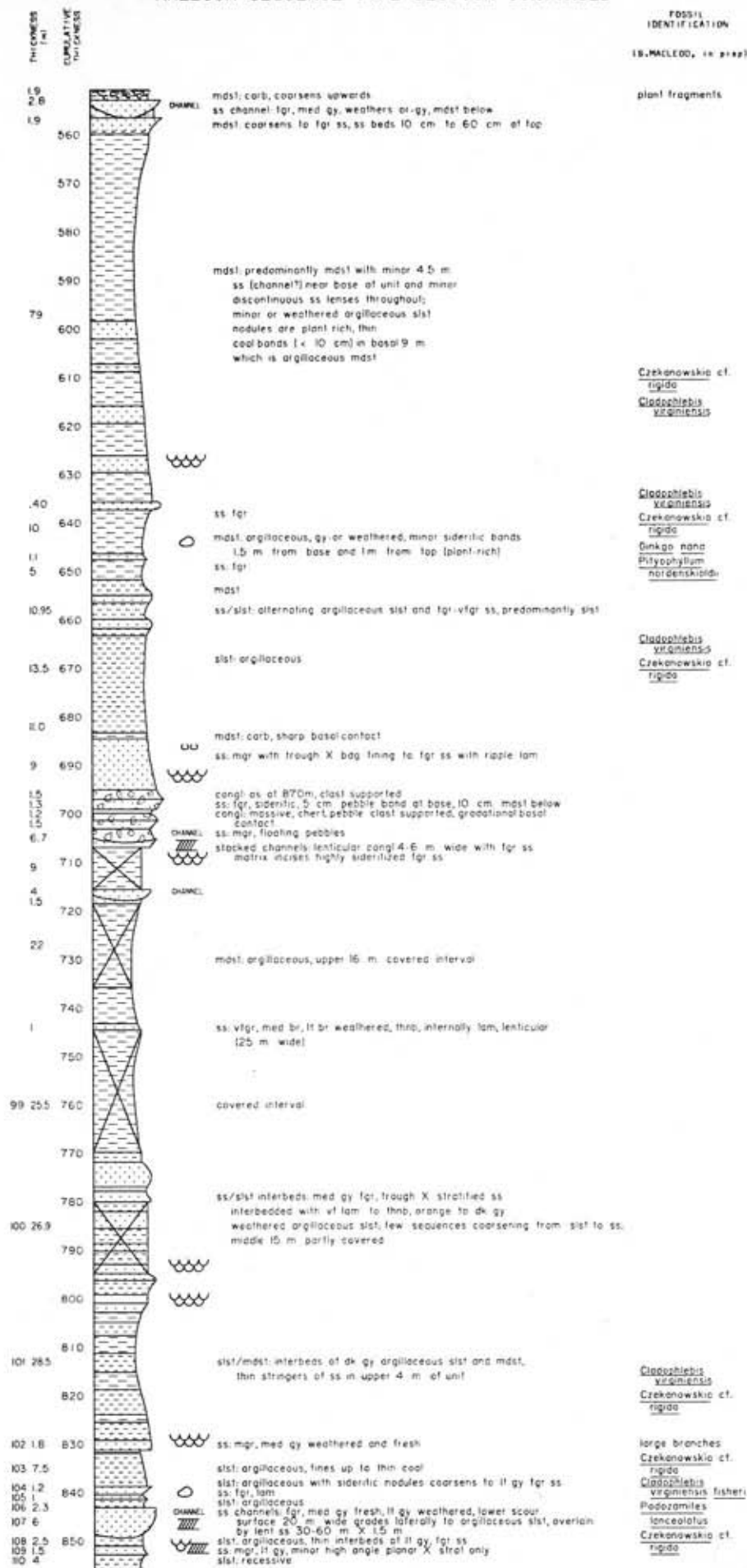
MEASURED BY: SE MACLEOD
LV HILLS



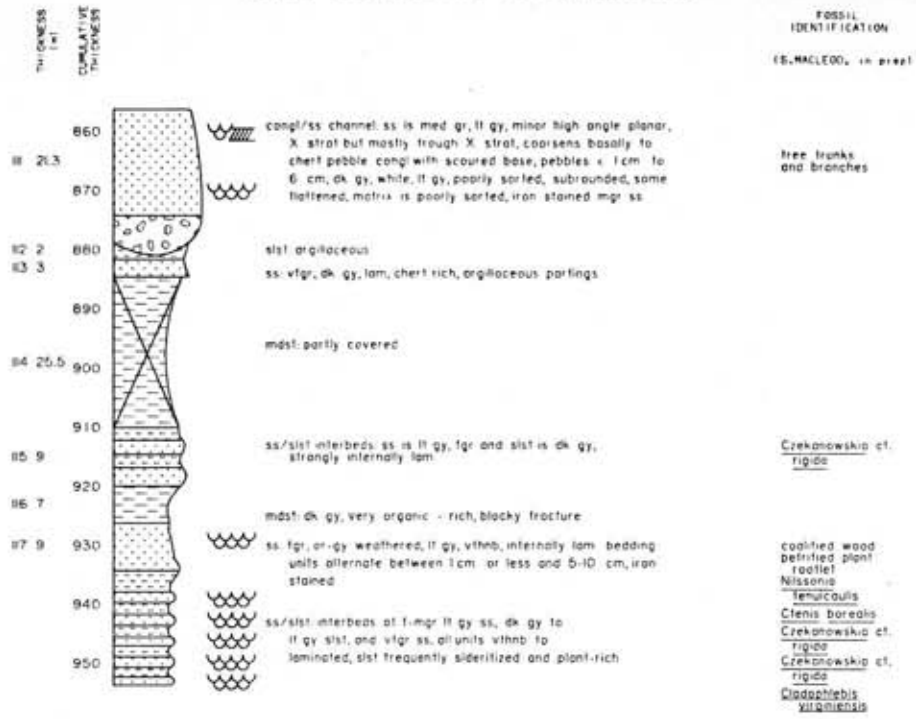
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MALLOCH SEQUENCE TYPE SECTION CONTINUED



MALLOCH SEQUENCE TYPE SECTION CONTINUED



DEVILS CLAW SEQUENCE TYPE SECTION

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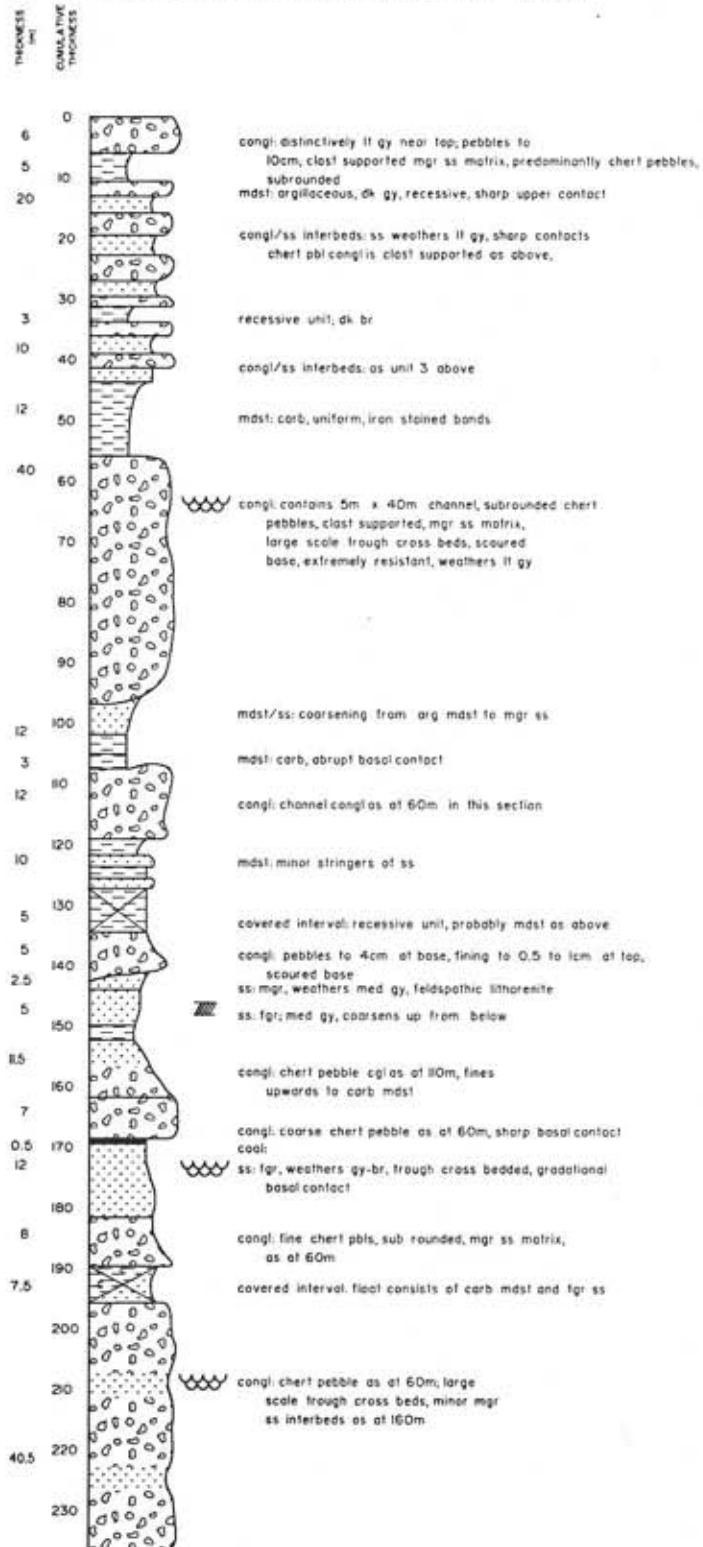
LATITUDE: 57°05'50" N

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MEASURED BY: SE MACLEOD
LV HILLS

NB. UPPER 135 METRES APPROXIMATED; SECTION TOO STEEP TO CLIMB

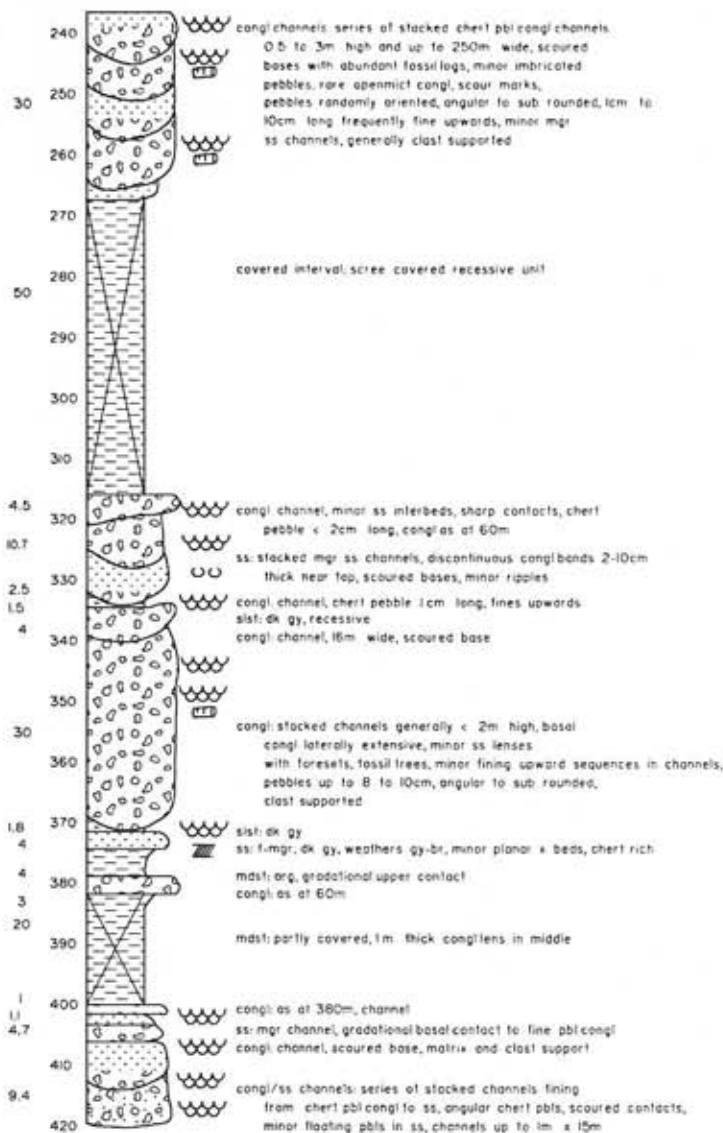
FOSSIL
IDENTIFICATION
IS MACLEOD, in prep



DEVILS CLAW SEQUENCE TYPE SECTION CONTINUED

THICKNESS
(m)
CUMULATIVE
THICKNESS

FOSSIL
IDENTIFICATION
IS.MACLEOD, in press



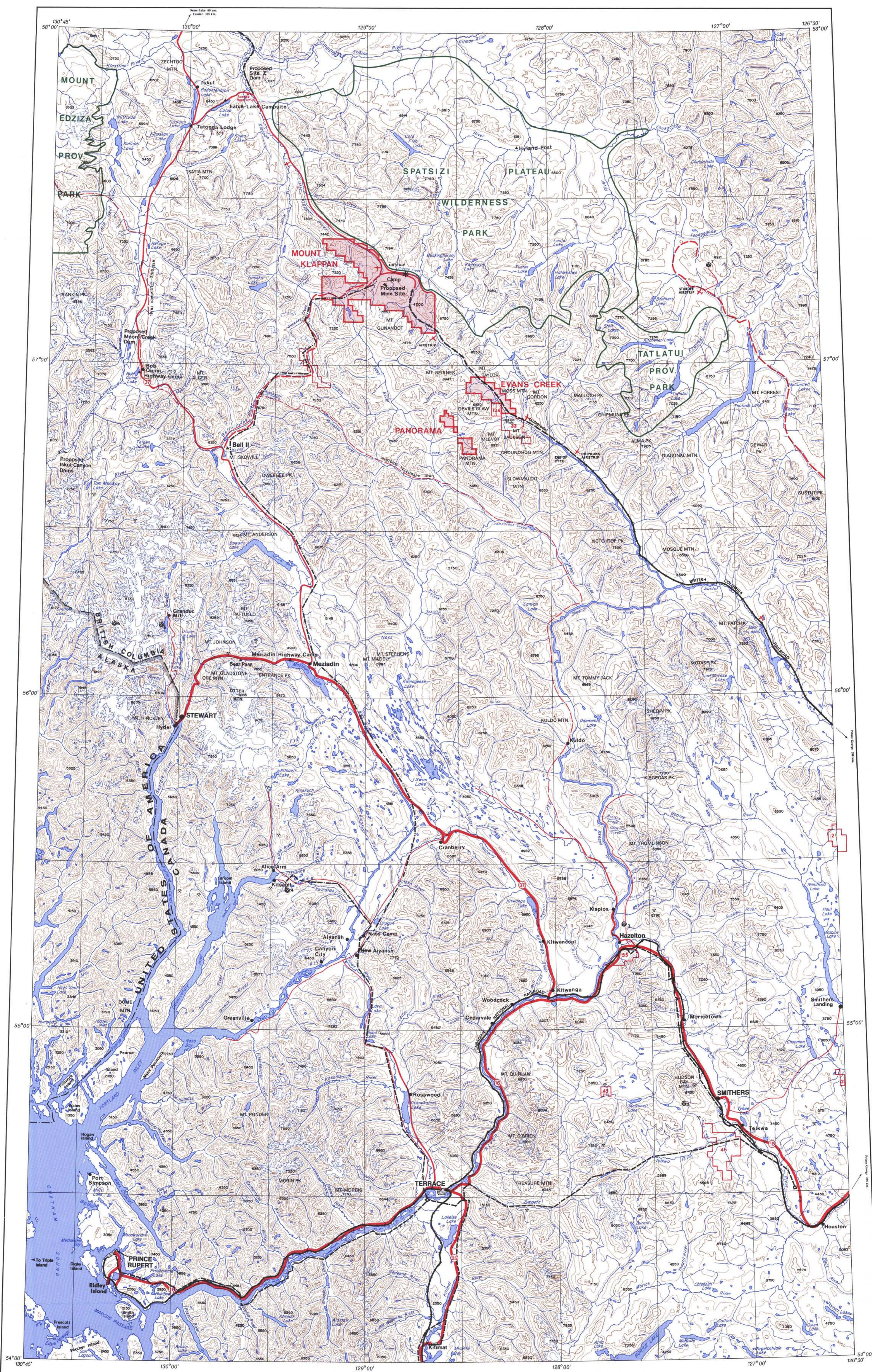
Czekanowski cf.
rigida

IS.MACLEOD, in press

Czekanowski cf.
rigida, Boiera
furcata

APPENDIX G

1:500 000 MAP OF NORTHWESTERN BRITISH COLUMBIA



- Legend**
- Paved Highway
 - Gravel Highway
 - Gravel Road (Restricted use)
 - Proposed Road
 - Railway
 - Existing Transmission Lines
 - Proposed Transmission Lines
 - Electrical Sub Stations
 - Proposed Dam Site
 - Proposed Pt. Mount Klappan Property
 - Boundary, Park or Reserve
 - Boundary, International
 - Spot Elevation (feet above sea level)
 - Mine (see separate list)
 - Prospect
 - Cities, Towns
 - Contours (1000 foot interval)

- COAL PROPERTIES**
- 10 GULF CANADA PROPERTIES LTD.
 - 13 SUNCOR INC.
 - 134 DOMINION ANTHRACITE LTD.
 - 45 SHELL CANADA RESOURCES INC.
 - 46 D. GROOT LOGGING LTD.
 - 11 ESSO RESOURCES CANADA LTD.
 - 1 ASHTON W. MULLAN
 - 2 JOE HEDBER
- MINES**
- 2 DUTHIE - Ag, Pb, Zn, Au, Cd, Cu
 - 3 SILVER STANDARD - Ag, Pb, Zn, Au, Cu
 - 4 KITSALT - Mo
 - 5 SCOTTIE GOLD - Au, Ag
 - 6 GRANDUC - Cu, Ag, Au
 - 7 BAKER - Au, Ag

Gulf GULF CANADA CORPORATION Gulf

NORTHWEST BRITISH COLUMBIA

740

SCALE 1:500,000

Kilometres 10 5 0 10 20 30 40 50 Kilometres
Miles 5 0 10 20 30 Miles

Produced jointly by GULF CANADA DRAFTING DEPT. and HARDY ASSOC. (1978) LTD. MAPPING SECTION.
Revised to Sept. 1988

This map has been compiled by Gulf from several sources and is presented as a convenience to the user. Gulf does not guarantee or warrant its accuracy in any respect. Any reliance placed on this map is at the user's risk.

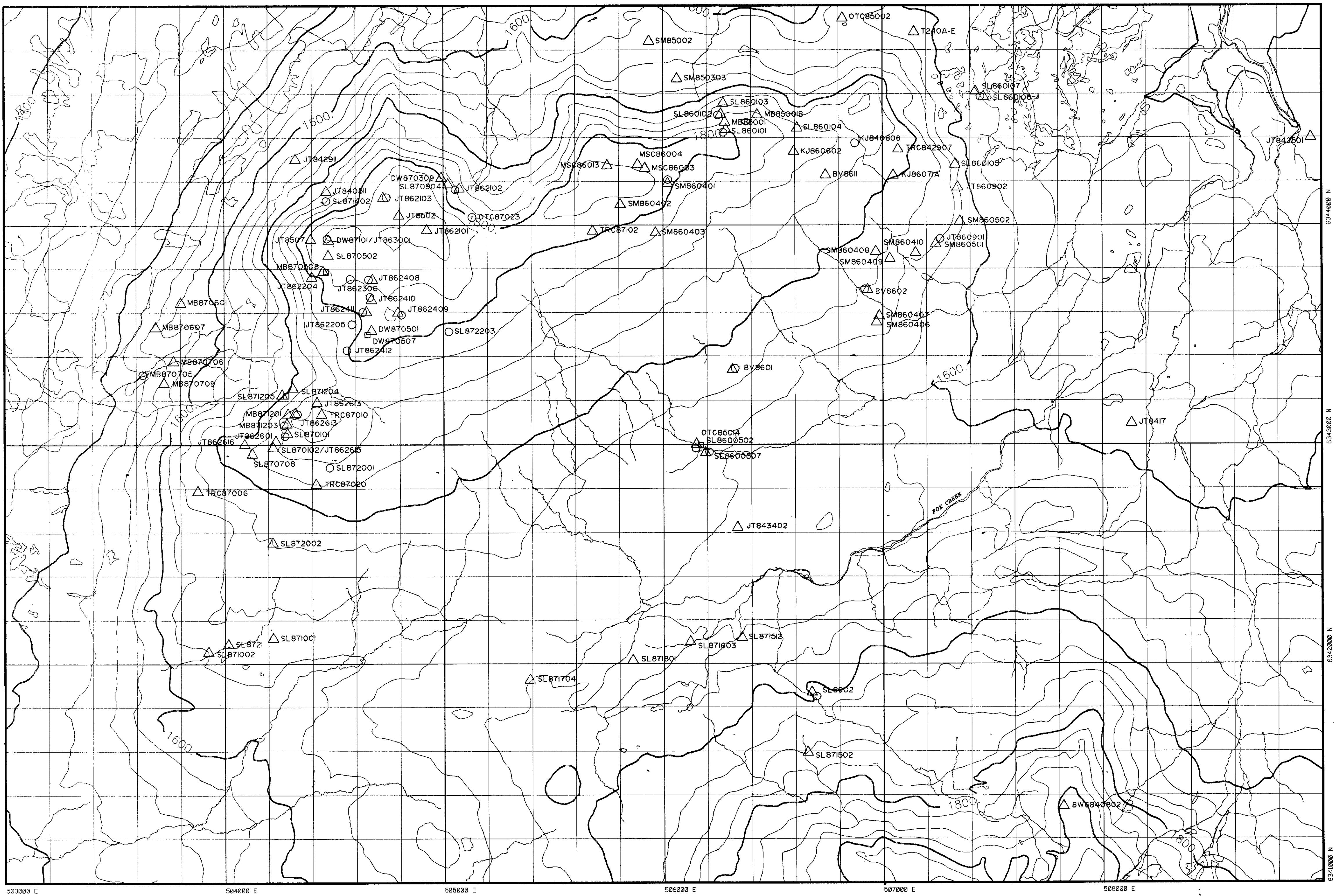
REFERENCE NOTE

Mines: from The Northwest Region - B.C. Regional Economic Study, 1982

Prospects: from Kitimat-Sitka Regional District - 1:500,000 Regional Resource Map, 1981.

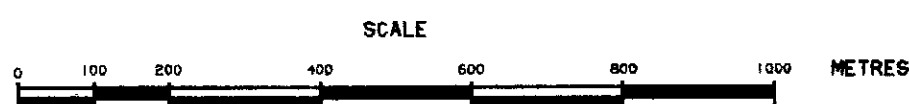
Base Map: from Dept. of Energy, Mines and Resources, Surveys and Mapping Branch, current N.T.S. series maps.

KEY MAP



INDEX

9										6301000 N
8										6299000 N
7	19	13	12	11	10					6297000 N
6	20	14	6	5	9					6295000 N
5	21	15	7	8						6293000 N
4	22	16	8	7						6291000 N
3										6289000 N
2			17	18						6287000 N
1										6285000 N
	A	B	C	D	E	F	G			



- LEGEND
- △ FLORA MACROFOSSILS
 - FAUNA MACROFOSSILS
 - TRACE FOSSILS

740

GULF CANADA RESOURCES LIMITED

MOUNT KLAPPAN ANTHRACITE PROJECT

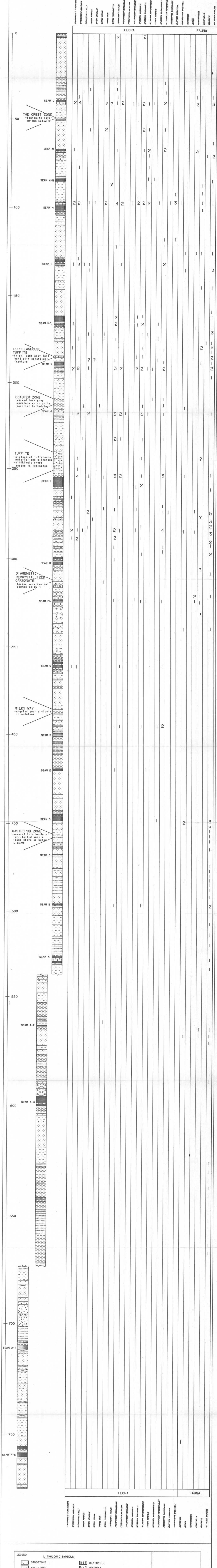
FIGURE
LOST FOX
1984 - 1987
FOSSIL LOCATION MAP

AUTHOR: S. LEE DATE: 88/02/05
CHK'D BY: E.S. KLAP:12050571870354001.LOC.SAM

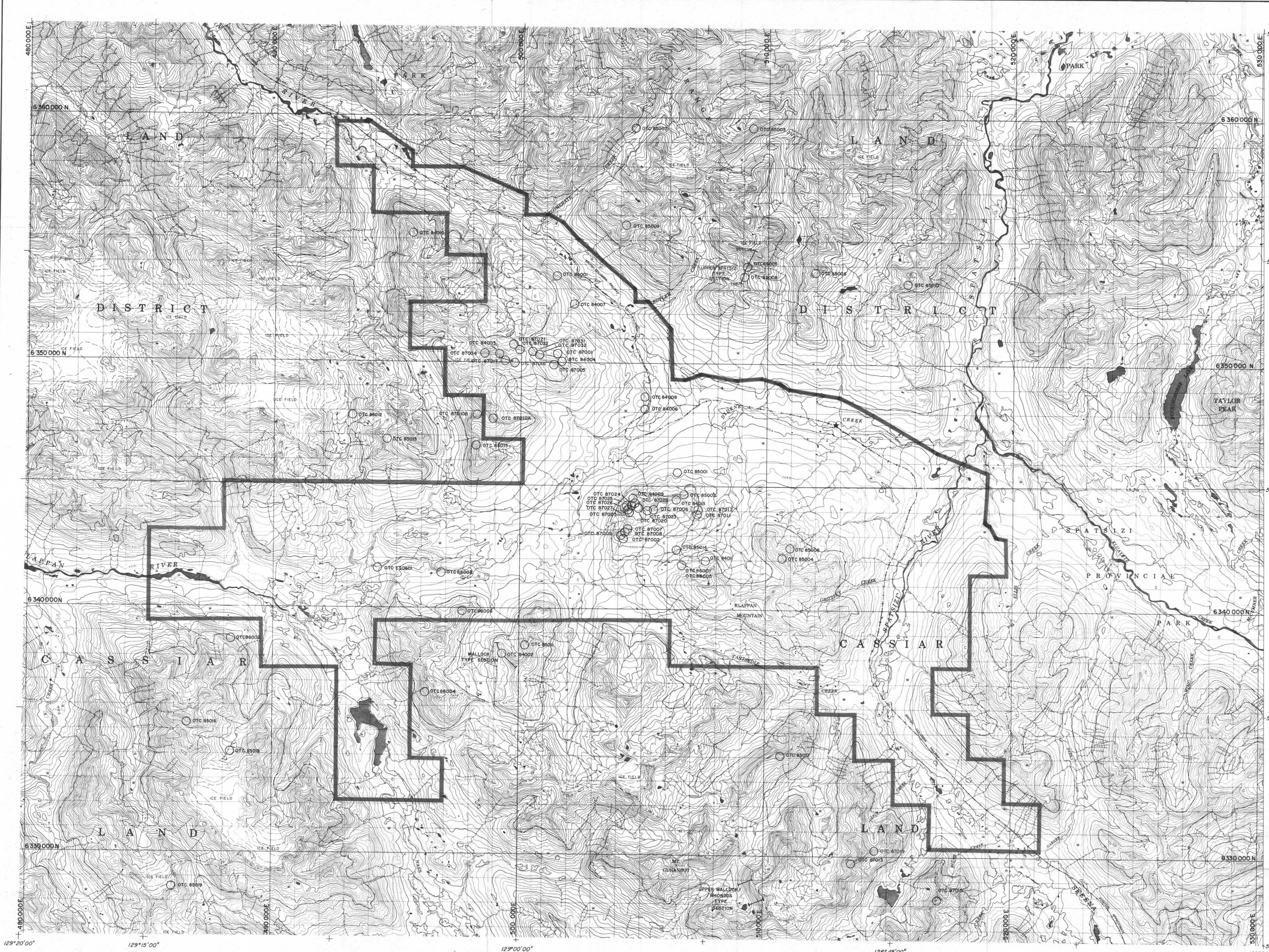
KLAPPAN SEQUENCE BIOSTRATIGRAPHY AND MARKER HORIZONS

MOUNT KLAPPAN ANTHRACITE PROJECT

740



LEGEND	
LITHOLOGICAL SYMBOLS	
<ul style="list-style-type: none"> SANDSTONE SILTSTONE COAL MUDSTONE, CLAYSTONE TUFFITE LIMESTONE LORE LOSS 	<ul style="list-style-type: none"> BENTONITE BRECCIA CARBONACEOUS QUARTZ PYRITE FERRUGINOUS CONGLOMERATE
<p>*TOP STRATIGRAPHIC SECTION IS GENERALIZED SECTION FROM 1984 AND 1985 DRILL HOLES, MIDDLE STRATIGRAPHIC SECTION IS KPNLRDDB6026 LOWER STRATIGRAPHIC SECTION IS KPNLRDDB6024</p> <p>**RELATIVE STRATIGRAPHIC POSITION OF LOWER TWO SECTIONS (INCLUDING SEAMS A-2 TO A-5) SUBJECT TO CONFIRMATION UPON COMPLETION OF DRILLING OF DEEP HOLES</p> <p>FOSSIL OCCURRENCES ARE FROM 1984 TO 1987 DRILL HOLES</p>	
<p>BUFC CANADA CORPORATION 2472777 KLPN L000571870006001.L0</p>	



LEGEND

ROADS AND RELATED FEATURES

- ROAD SURFACE, ALL WEATHER
- LOOSE SURFACE
- CART TRACK, WATER ROAD
- TRAIL, OUTLINE, PORTAGE
- BUILT UP AREA
- RAILWAY, SIGNAL STATION STOP
- BRIDGE
- SEAPLANE BASE, ANCHORAGE

LANDMARK FEATURES

- HOUSE, BARN
- CHURCH, SCHOOL
- POST OFFICE
- INDIAN RESERVE, ETC.
- TOWERS, FIRE RADIO
- WELL, OIL, GAS
- TANK, OIL, GASOLINE, WATER
- TELEPHONE LINE
- POWER TRANSMISSION LINE
- RAIL
- CUTTING, EMBANKMENT
- GRAVEL PIT

BOUNDARIES AND CONTROL

- INTERNATIONAL, PROVINCIAL
- COUNTY, DISTRICT
- TOWNSHIP, PARISH - SURVEYED
- TOWNSHIP, DISTRICT - UNSURVEYED
- MUNICIPALITY
- INDIAN RESERVE, PARK, ETC.
- HORIZONTAL CONTROL POINT
- BENCH MARK
- SPOT ELEVATION, ELEVATION APPROXIMATE

DRAINAGE AND RELATED FEATURES

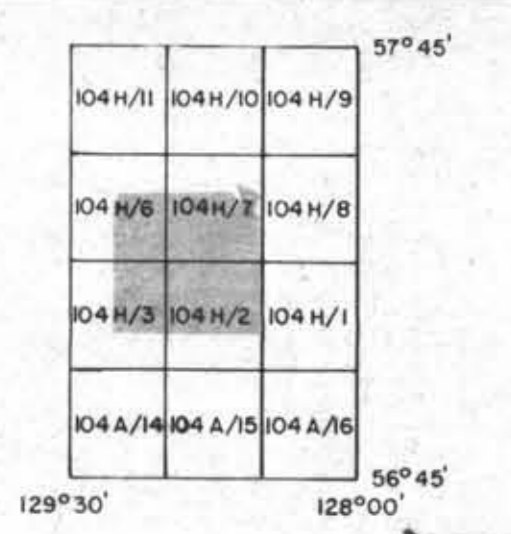
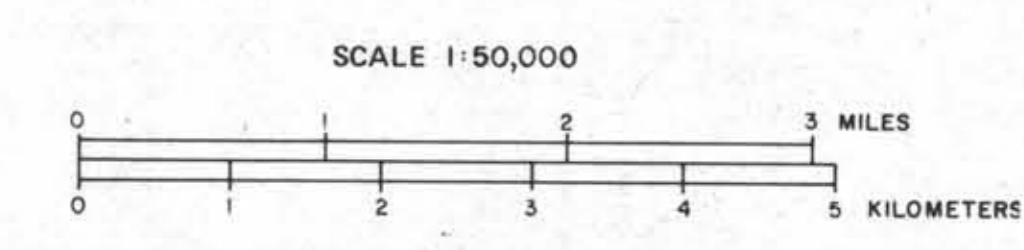
- STREAM, SHORELINE INDEFINITE
- DIRECTION OF FLOW
- LAND, WETLAND
- INDICATED, FLOODED LAND
- MARSH, SWAMP, WOODS
- DRY RIVER BED WITH CHANNELS
- SAND, ABOVE IN WATER
- STRONG ROSS
- TURKISH POND, POLYGENS
- RAPIDS
- FORESHORE FLATS
- ROCK
- DAM
- WHARF
- DITCH

RELIEF FEATURES

- CONTOUR
- APPROXIMATE CONTOUR
- DEPRESSION
- ESKER
- PINGO
- SAND, SAND DUNES
- PALM, SAND
- WOODED AREA

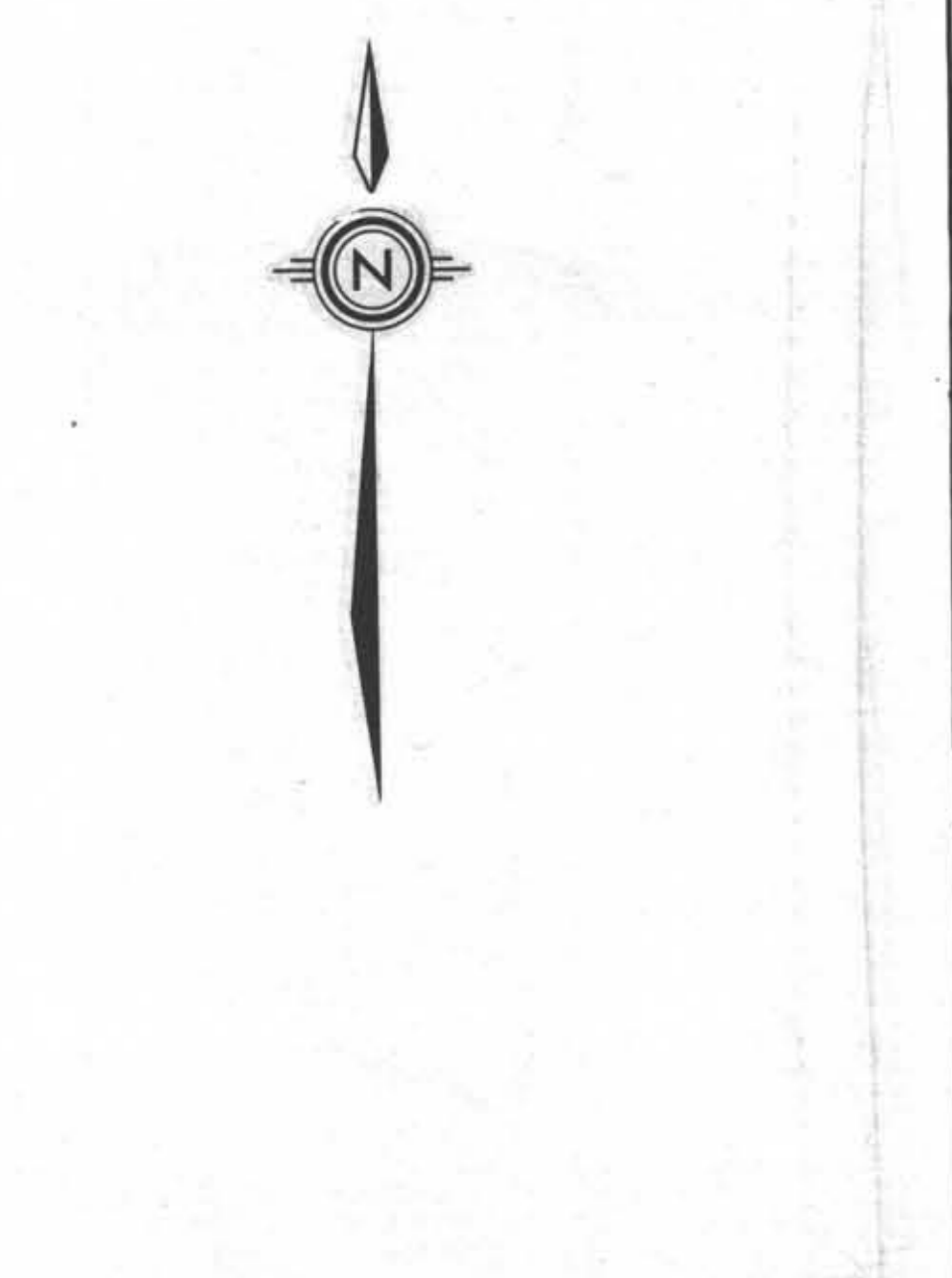
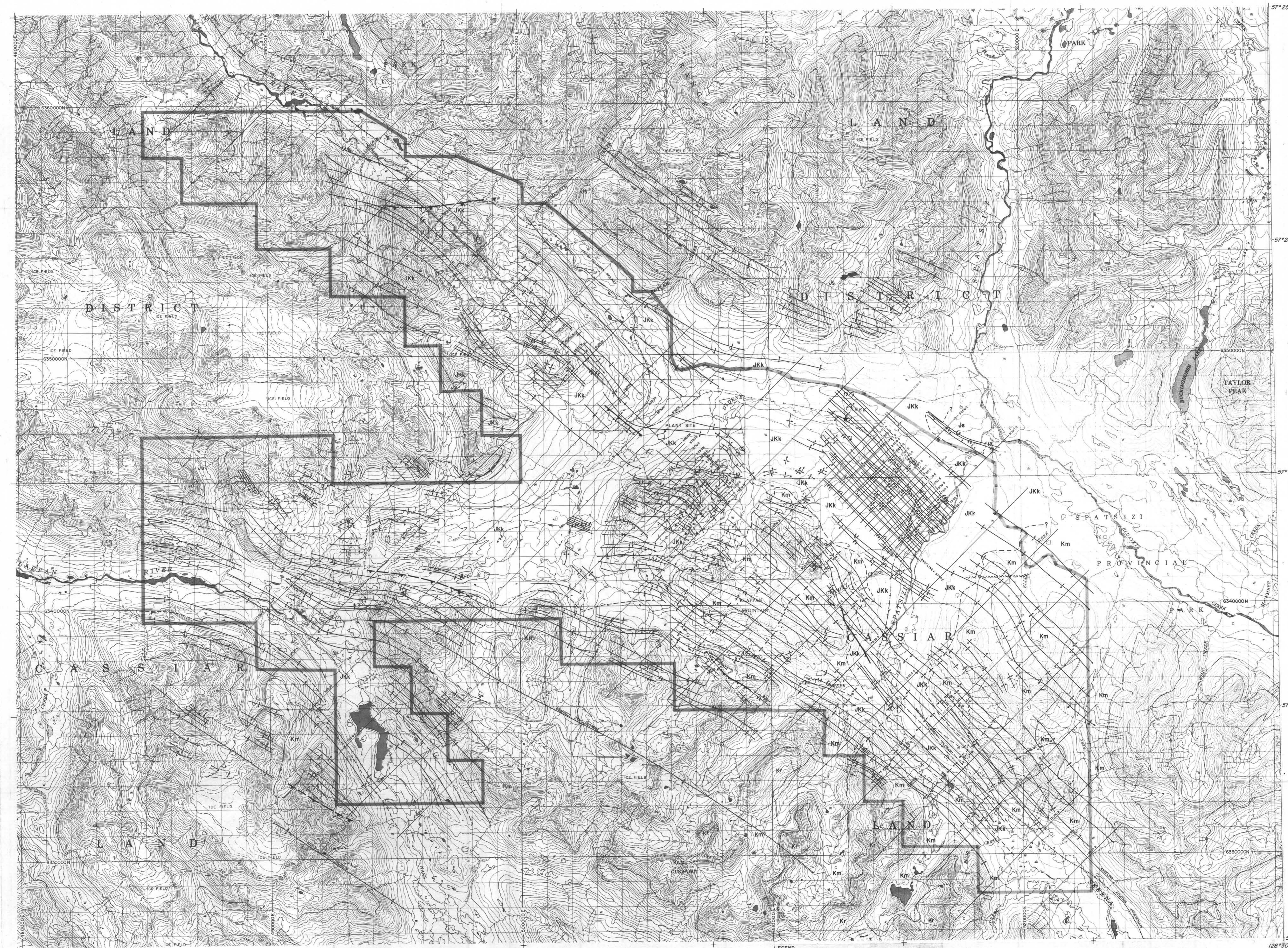
PROPERTY BOUNDARY

- MEASURED SECTION
- FIELD CAMP LOCATION



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GULF CANADA RESOURCES LTD.	
CALGARY	ALBERTA
MT. KLAPPAN COAL PROPERTY	
1981 - 1987 MEASURED SECTION MAP	
PREPARED BY: A.P.	DRAWING No. KPN87002
APPROVED BY: E.S.	DATE: DEC. 1987



LEGEND

ROADS AND RELATED FEATURES

HARD SURFACE ALL WEATHER

LOOSE SURFACE

CART TRACK WINTER ROAD

TRAIL CUTLINE PORTAGE

BUILT UP AREA

RAILWAY STATION STOP

BRIDGE

SEAPLANE BASE ANCHORAGE

LANDMARK FEATURES

HOUSE BARN

CHURCH SCHOOL

POST OFFICE

HISTORICAL SITE

TOWERS FIRE RADIO

WELL OIL GAS

TANK OIL GASOLINE WATER

TELEPHONE LINE

POWER TRANSMISSION LINE

WIRE

CUTTING EMBANKMENT

GRAVEL PIT

BOUNDARIES AND CONTROL

INTERNATIONAL PROVINCIAL BOUNDARY MONUMENT

COUNTY DISTRICT

TOWNSHIP PARISH SURVEYED UNSURVEYED

TOWNSHIP D.L.S. SURVEYED UNSURVEYED

MUNICIPALITY

INDIAN RESERVE PARK ETC.

HORIZONTAL CONTROL POINT

BENCH MARK

SPOT ELEVATION ELEVATION APPROXIMATE

DRAINAGE AND RELATED FEATURES

STREAM SHORELINE INDEFINITE

DIRECTION OF FLOW

LAKE INTERMITTENT

INUNDATED FLOODED LAND

MARSH OR SWAMP (WOODS)

DRY RIVER BED WITH CHANNELS

SAND ABOVE IN WATER

STRING BOG

TUNDRA PONDS POLYDONS

RAPIDS

FORESHORE FLATS

ROCK

DAM

WHARF

DITCH

RELIEF FEATURES

CONTOURS

APPROXIMATE CONTOUR

DEPRESSION

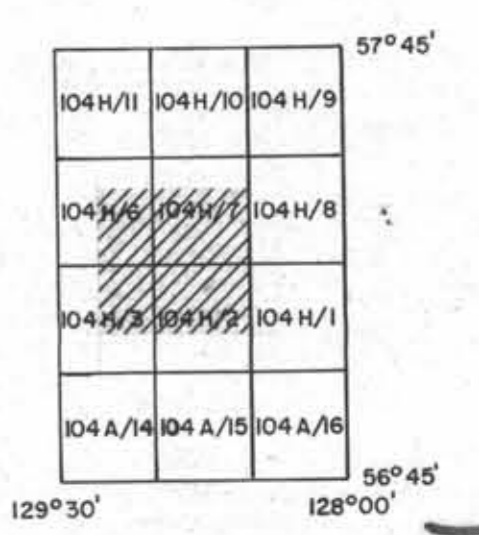
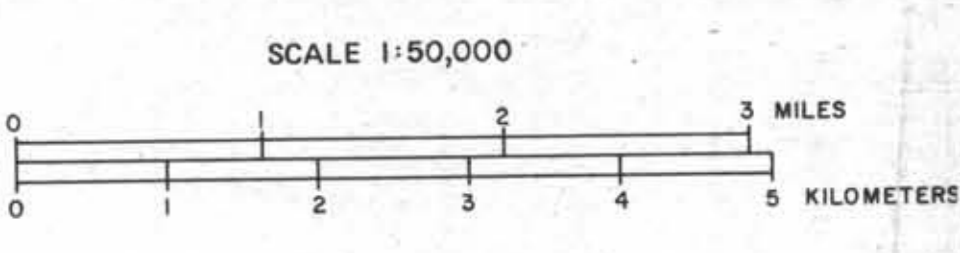
ESKER

FRINGE

SAND SAND DUNES

PALSA BOG

WOODED AREA



RHONDA SEQUENCE

Kr Sequence of thick chert pebbles conglomerates and minor grey siltstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds contain large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gravitational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (non coal-bearing unit)

JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, sandstones and conglomerates. Carbonaceous conglomerates, siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstone of fine to medium grained texture. Many thin coal seams. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

Js Predominantly a marine sequence of interbedded mudstones, siltstones, sandstones and conglomerates. Carbonaceous mudstones containing small sequences and plant debris. Conglomerates are more abundant in the upper part of the sequence. Nineteen species of bivalves are present. Determinate are rare. Plant debris may occur near the upper gravitational contact.

LEGEND

LICENCE BOUNDARY

GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)

GOAL SEAM (DEFINED, INFERRED)

ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION

SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION

OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)

OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)

MONOCLINE (DEFINED, APPROXIMATE)

BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)

FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)

JOINTS (INCLINED, VERTICAL, HORIZONTAL)

THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPRHURST SIDE

FAULT (DEFINED, APPROXIMATE) UPRHURST, DOWNTHROW, SIDE

ADT TRENCH COAL SPOIL

DIAMOND ROTARY WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)

MEASURED SECTION

SURVEY CAIRN

CROSS SECTION LINE

GULF CANADA RESOURCES INC.

Coal Division

ALBERTA

MT. KLAPPAN COAL PROPERTY

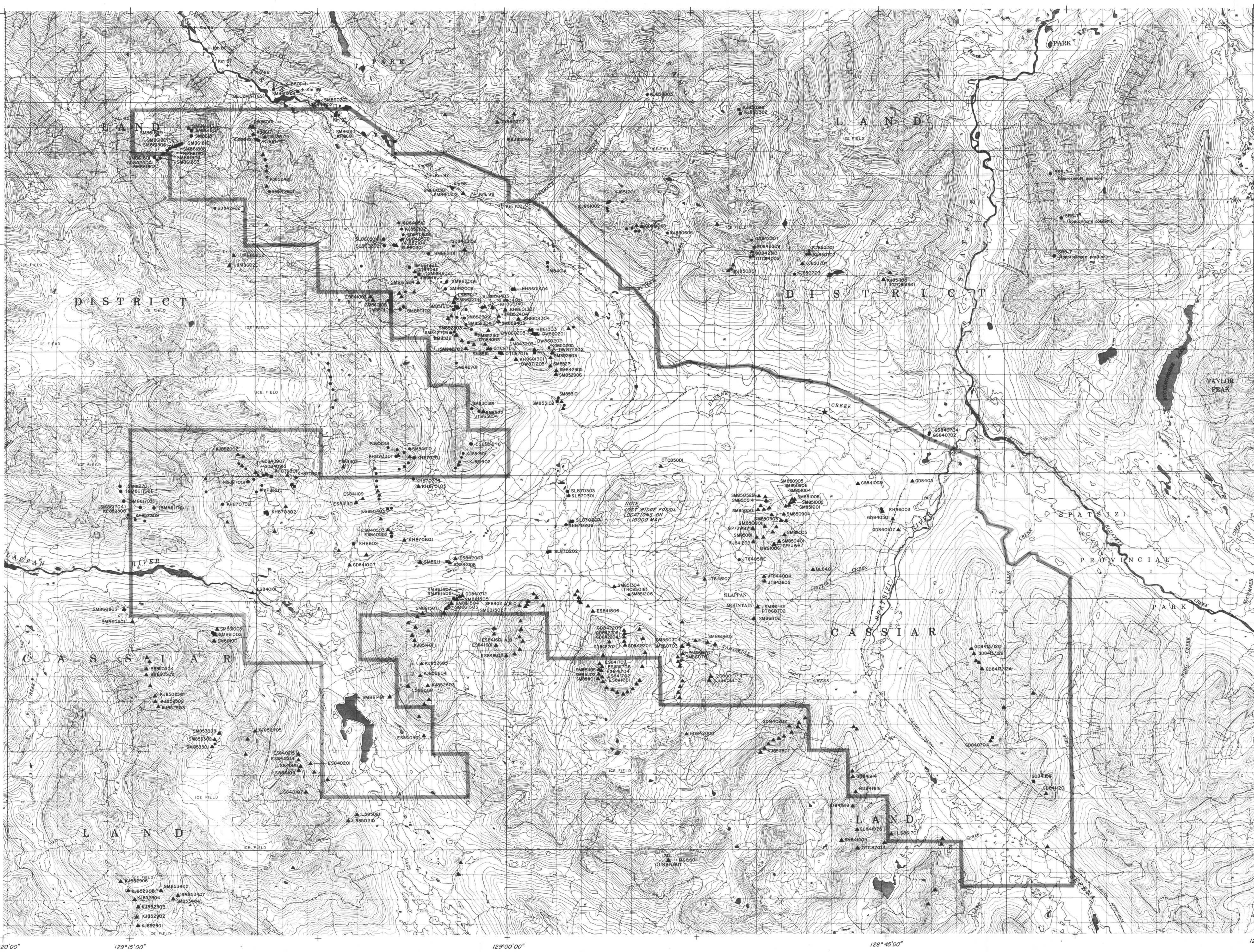
1987

GEOLOGY MAP

PREPARED BY: A.P., E.S. DRAWING NO. KPN 67003

APPROVED BY: E.S. DATE: DEC. 1987

740



57°25'
57°20'
57°15'
57°10'
57°05'

129°20'00"
129°15'00"
129°00'00"
128°45'00"
128°30'00"



LEGEND

ROADS AND RELATED FEATURES

- HARD SURFACE, ALL WEATHER
- LOCAL SURFACE
- GRAVEL WATER ROAD
- PAVED WATER ROAD
- PAVED PORTAGE
- BUILT UP AREA
- RAILWAY: BONG STATION STOP
- BRIDGE
- SEAPLANE BASE ANCHORAGE

LANDMARK FEATURES

- LANDMARK
- HOUSE BARN
- CHURCH SCHOOL
- POST OFFICE
- HISTORICAL SITE
- TOWNSHIP FIRE MOUND
- WELL OIL GAS
- TANK OIL GASOLINE WATER
- TELEPHONE LINE
- POWER TRANSMISSION LINE
- MINING
- CUTTING EMBANKMENT
- GRAVEL PIT

BOUNDARIES AND CONTROL

- INTERNATIONAL PROVINCE BOUNDARY MONUMENT
- COUNTY DISTRICT
- TOWNSHIP PARISH - SURVEYED
- TOWNSHIP DLS - SURVEYED
- MUNICIPALITY
- INDIAN RESERVE PARK, ETC.
- HORIZONTAL CONTROL POINT
- BENCH MARK
- SPOT ELEVATION ELEVATION APPROXIMATE

DRAINAGE AND RELATED FEATURES

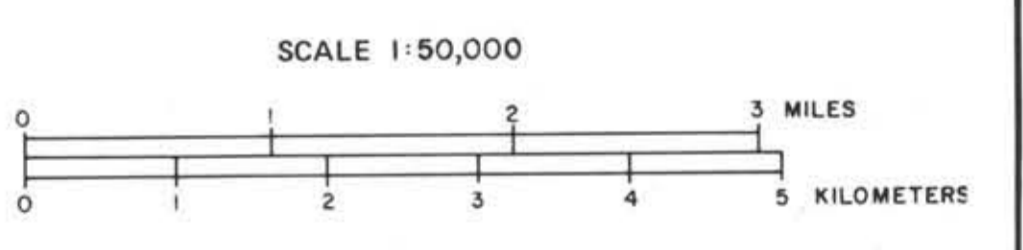
- STREAM SHORLINE INDICATES
- DIRECTION OF FLOW
- LAKE INTERMITTENT
- WATERED FLOODED LAND
- WASH/DEBRIS/WOODS
- DRY RIVER BED WITH CHANNELS
- SAND ABOVE IN WATER
- STRING BOD
- TURBIDITY/POSSIBILITIES
- RAPIDS
- FORESHORE FLATS
- ROCK
- DAM
- WEIR
- DITCH

RELIEF FEATURES

- CONTOURS
- APPROXIMATE CONTOUR
- DEPRESSION
- ESKER
- PINGO
- SAND SAND DUNES
- PALSA BOD
- MOSS/HEATH

PROPERTY BOUNDARY

- FIELD CAMP LOCATION
- FLORA MACROFOSSILS
- FAUNA MACROFOSSILS
- TRACE FOSSILS



04H/3	04H/10	04H/9
04H/8	04H/7	04H/6
04H/5	04H/2	04H/1
04H/14	04H/4	04H/5

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GULF CANADA CORPORATION
Calgary Alberta

MT. KLAPPAN COAL PROPERTY

1984 - 1987 FOSSIL LOCATION MAP

PREPARED BY: S. MACLEOD, S. LEE
APPROVED BY: E. SWANBERGSON DATE: DEC. 1987 DRAWING No. KPNB7006