QUINTETTE COAL LIMITED
1990 ANNUAL ASSESSMENT REPORT
APRIL 1991

Prepared by Technical Services Department

Pit Engineering

Quintette Coal Limited

#818

1990 ANNUAL ASSESSMENT REPORT

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TITLE PAGE

1990 ANNUAL ASSESSMENT REPORT

Transfer, Grizzly, Marmot, Mesa North Extension and Perry Creek

Coal Licences: 3339, 3340, 3341, 3381, 3593, 3594, 3597, 3598, 3618, 3635, 3660, 3661, 3661

Quintette Coal Limited - Owner/Operator

Assessment Report for the Application to Extend the Term of Quintette Coal Limited's Licences, 1990-1991

Location: Latitude - 55° 00' N
Longitude - 121° 10' W

NTS Map Sheets 93-P-3
93-I-14

Peace River Land District

Work conducted between May 2, 1990 and August 31, 1990

Report prepared by: Pit Engineering
Technical Services Department
Quintette Coal Limited

PREFACE

This report documents and describes the geology and coal quality based on exploration work completed to the end of 1989, of the areas known as Transfer, Grizzly, and Mesa North Extension located on Quintette Coal Limited's Coal Licences in northeast British Columbia.

Exploration work has been undertaken on Quintette's licences since 1971. All work was completed under the supervision of Denison Mines Limited, Coal Division, and Quintette Coal Limited. The data presented in the report is from rotary/percussion drilling, core drilling, geologic mapping and refraction seismic surveys. The 1989 geologic data is recorded on geologic maps which locate the mapping, drill holes and similar prior years work. Correlation charts, seam structure contours and cross sections and analytical data are presented to supplement the geology plans.

The report presents regional and detailed geologic descriptions of the resource areas.

This report references all previous geologic reports on the Quintette Property.

Previous nomenclature for the areas discussed in this Report:

Transfer Area	- Johnson Area, Hermann Area
Grizzly Area	- Hermann South, Dupont Licence Area
Perry Creek Area	- Wolverine Area, Wolverine River North
Marmot Area	- Marmot Steep, Nabors Road, Hermann North
Wolverine Valley South Area	- a continuation of Mesa Extension Structures
Mesa North Extension	- Wolverine Valley South

STATEMENT OF QUALIFICATIONS

I, Robert A. Booker, graduated from the University of Calgary, Calgary, Alberta, with a Bachelor of Science Degree in Geology in May, 1982 . I have worked in coal exploration, mine development, and mine operations for the last eight years, six of those years in northeast British Columbia. I have conducted field exploration, geologic mapping, core logging, trenching; supervised core drilling, rotary drilling, adit driveage, and associated field work; managed exploration crews, contractors, and reclamation; participated in mine development, coal quality control, reserve evaluation; have prepared several structural and stratigraphic interpretations of coal reserve areas northeast British Columbia.

Robert A. Booker

Senior Geologist
Quintette Coal Limited
Tumbler Ridge, British Columbia

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_____. (1987c): Transfer Area Geological Report, March 1987. Text and Appendices I and II (separate), variously paged.

_____. (1988a): 1987 Exploration Report: Transfer, Grizzly and Perry Creek Areas, February 1988, February 1988. Text and Appendices 1 and 2, variously paged.

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_____. (1989a): 1988 Reclamation Report: Persuant to Reclamation Permit C-156, March 1989. 24 p.

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_____. (1989c): Transfer and Grizzly Geological Report, June 1989. Text and Appendix 1, Parts 1 and 2 (separate), variously paged.

1.0 SUMMARY

The Quintette Coal Limited (Q.C.L.) property is situated in the Peace River Land District in northeast British Columbia in the inner foothills of the northern Rocky Mountains. Q.C.L. has a contract in place to produce five million tonnes of clean metallurgical coal per year. All coal production is from the Lower Cretaceous Gates Formation.

Exploration work on the Q.C.L. property was initiated in 1971 and has proceeded almost continuously through mine startup in 1982 to date. 1990 exploration was conducted in the Transfer, Grizzly, Marmot, Mesa North Extension, and Perry Creek areas.

The 1990 exploration program consisted of field mapping and establishing survey control in the aforementioned areas. Additional work was carried out on development of a regional interpretation for the entire lease area. Seismic direct current work was conducted in Transfer but the results are not available at this time.

1.1 Work Completed

Twenty-eight kilometers of surface mapping was completed in 1990 to provide additional structural and stratigraphic control. Exposures of Boulder Creek, Gates, Moosebar and Gething Formations were mapped. Additional surface geophysical work was conducted in Transfer with two lines cut and an EM direct current survey completed.

1.2 Conclusions

The mapping and geophysical work conducted in 1990 provided additional stratigraphic and structural information in the exploration areas. This information has not resulted in significant alteration to the stratigraphy, coal seam development, structure or coal quality previously reported in the Transfer, Grizzly, Marmot, Mesa North Extension, or Perry Creek areas. The

data collected to date allows the resource available in Transfer and Grizzly areas to be measured with a high degree of confidence.

The Marmot, Mesa North Extension, and Perry Creek areas, from the geologic data collected, have resource potential but further definition of the structure, seam development, quality and stratigraphy is required.

2.0 INTRODUCTION

The Quintette property is situated in the Peace River Land District of northeast British Columbia in the inner foothills of the northern Rocky Mountains. Quintette Coal Limited (Q.C.L.) has a contract to produce five million tonnes of clean metallurgical coal per year. All coal production is from the Lower Cretaceous Gates Formation.

Work on the Q.C.L. property was initiated in 1971 and has proceeded almost continually through mine startup in 1982 to the present. Exploration of the resources began with regional scale geologic mapping. Drilling and mapping have continued as the need to evaluate the reserve potential has increased.

Extensive sampling and testing programs have confirmed that Q.C.L. coal is a good quality medium volatile coking coal. It is a strong coking coal, and is capable of replacing most of the world's best medium and low volatile coking coals in blends.

Potential mineable reserves on the Q.C.L. property are estimated at 2.8 billion tonnes of coal in-place to a maximum depth below surface of 500 m.

The purpose of the 1990 exploration was to explore for mineable open pit reserves which may represent alternate options to those included in Q.C.L.'s current long term mining plan.

2.1 Location and Access

The Q.C.L. property is located in the Rocky Mountain Foothills belt of northeastern British Columbia (see Figures 2.1 and 2.2). The coal bearing trend of this region is commonly referred to as the Peace River Coal Block.

The locations of the Transfer, Grizzly, Marmot, Mesa North Extension, and Perry Creek areas relative to the property's primary infrastructure are illustrated in Figure 2.3. The focus of recent exploration activity (1990)

was on the four distinct geological structures: Transfer, Grizzly, Mesa North Extension and Perry Creek.

Air distances to communities surrounding the property are as follows:

City	Population*	Distance
Prince George	67,721	160 km southwest
Dawson Creek	10,544	106 km northeast
Chetwynd	2,774	98 km north
Tumbler Ridge	4,385	20 km east

*1986 Census

The property is accessible by three routes: the Boundary Road (Heritage Highway) from Tupper, British Columbia; the Fellers Heights Road (Heritage Highway) from Dawson Creek/Fellers Heights; and Highway 29 from Chetwynd to Tumbler Ridge. The distances for the routes are as follows:

Boundary Road - Dawson Creek to Tumbler Ridge	210 km
Fellers Heights Road - Dawson Creek to Tumbler Ridge	127 km
Chetwynd to Tumbler Ridge	100 km
Tumbler Ridge to plantsite	18 km

Access within the property is gained by several existing roads developed for the mine. The exploration programs established 4-wheel drive access routes from the existing roads into the exploration areas. The location of these routes is shown on the regional geology plan in Appendix 1.

The current road distance from the Preparation Plant and Mine Service Complex to the target areas are listed as follows:

Exploration Areas
Current Road Access Distances

From	To	Distance (km)
Transfer	Preparation Plant	22
	Mine Service Complex	13
Grizzly	Preparation Plant	7
Marmot	Preparation Plant	25
	Mine Service Complex	4
Mesa North Extension	Preparation Plant	22
	Mine Service Complex	4
Perry Creek	Preparation Plant	24
	Mine Service Complex	4

2.2 Property Description

The Q.C.L. property consists of 136 Coal Licences covering an area of 33,001 ha and Coal Lease #6 consisting of 11,667 ha (see Figure 2.4). The original Q.C.L. licences were acquired by Denison Mines Limited (D.M.L.) in 1969 and 1970. The first coal exploration on the property was undertaken by D.M.L. in 1970. A significant exploration program was conducted each of the following years to 1977. Smaller programs were completed in 1979 and 1980. In 1981, large scale exploration was again undertaken.

For the purpose of developing the coal licences, Q.C.L. was incorporated under the laws of British Columbia on December 20, 1971.

D.M.L. was appointed by Q.C.L. to manage the Q.C.L. project through the feasibility and construction/development stages of the project and to assume responsibility for the management of operations thereafter.

Current major partners in Quintette Coal Limited are D.M.L., Charbonnages de France, the Japanese Steel Industry, Mitsui Mining, Tokyo Boeki, and Sumitomo Corporation.

The Transfer, Grizzly, and Marmot areas are situated between the two sections of Coal Lease #6. The Transfer Area is approximately 3 km long and 700 m wide (average) while the Grizzly Area is 1.6 km in length and 500 m wide on average. The Marmot area is 2.5 km long and 1.5 km wide. Slopes vary from gentle (0^{o} to 10^{o}) to maximum natural slopes of 36^{o}.

The Mesa North Extension Area extends from Mesa Pit northwest to the Wolverine River, an area approximately 2.1 km long and 1.5 km wide. Relief is generally high in this area with many slopes approaching 36^{o}.

The Perry Creek area is northwest of Mesa North Extension area, approximately 2 square km.

The Transfer, Grizzly and Marmot areas range from sub alpine to well below tree line in the Murray River Valley. The Mesa North Extension and Perry Creek area range from just below tree line to valley floors. Stands of spruce and pine with cottonwood and poplar are predominant. The range in elevation for each area is as follows:

Maximum and Minimum Elevations Above Sea Level

Area	Maximum Elevation (m)	Minimum Elevation (m)
Transfer	1650	780
Marmot	1400	1280
Grizzly	1150	780
Mesa North Extension	1400	850
Perry Creek	1520	900

2.3 Exploration Programs

A summary of exploration activity undertaken in the exploration areas to the end of the 1990 field season is presented in Table 2.1.

Pre-1989 Exploration

Regional scale geologic mapping (1:5000) aided by aerial photograph interpretation was the only form of geological assessment undertaken in the Transfer and Grizzly areas prior to 1984 when the first rotary (6) and diamond (1) holes were completed in the Hermann South area, now referred to as the Grizzly area. In 1985, limited mapping and the first two diamond drill holes were completed in the Transfer Anticline. One 1976 core hole, QJD7643 was collared in the West Limb of the Transfer Syncline. This hole intersected only B and D seams.

The 1986 exploration program allowed for the completion of detailed geological mapping of naturally exposed outcrops as well as those exposed by access routes and trench construction. No rotary drilling was conducted in the Transfer or Grizzly areas, but a total of 7 diamond drill holes, 2 in the Grizzly area and 5 in the Transfer area, were completed. This supplemented the above-noted mapping such that a preliminary determination of resources could be made within approximate pit limits (unscheduled mine area).

During the 1987 exploration season, 7 diamond and 36 rotary drill holes were completed in the Transfer area while 5 diamond and 21 rotary drill holes were completed in the Grizzly area. Three adits were driven into the mineable coal seams in each area in order to obtain bulk samples. Aerial photography and topographic mapping at 1:2500 scale were also completed.

During the 1988 exploration season, work concentrated in the Transfer West limb and the Shikano Syncline which lies between the Grizzly and Transfer areas. A total of 11 core holes and 31 rotary holes were completed in the areas. In addition a seismic refraction survey was conducted to determine overburden depth in the Shikano Syncline.

In the Transfer area, 2 diamond and 24 rotary holes were drilled. Geologic mapping was also done along new access roads and where previously unmapped natural exposures were identified.

The 1987 adits in both Transfer and Grizzly were resampled. One new adit was driven in Grizzly to sample J and K1 seams.

In the Marmot area, initial exploration, in the form of regional geologic mapping took place in the 1970s. In 1982, 2 short rotary holes were drilled along Nabors Road. This was followed in 1983 by a further 5 rotary holes and in 1984 by 3 core holes and 6 rotary holes. Geologic mapping of exploration roads was also completed. In 1988 2 diamond and 5 rotary drill holes were completed along with geologic mapping of new rock exposures. The new data permitted confirmation of the correlation of the seams between Transfer and Mesa Pit. Of interest is that F seam (Transfer) correlates with E2/3 seams in Mesa Pit and G1 seam (Transfer) correlates with E4 seam in Mesa Pit.

The Mesa North Extension area has only had geologic mapping conducted in the area prior to 1988. In 1988 1 core hole and 11 rotary holes were completed. Accompanied by geologic mapping and data from additional drilling performed for QCL's Production Geology group, an updated interpretation of the structure was done. The interpretation indicates some near surface coal and shows a steeply northwest plunging Middle Anticline In 1989 3 core holes and 32 rotary holes were completed along with detailed mapping of road and natural rock exposures.

In the Perry Creek area, the coal measures were drilled in 1971 with the completion of 6 core holes on the northeastern slopes of Fortress Mountain. These holes were drilled to test for underground potential. Hole #QWD7119, closest to the current area of interest, intersected a thick J seam section. Later drilling in 1974, in adjacent areas, also confirmed the presence of significant coal thicknesses in the Gates Formation in the Wolverine River Valley. Five rotary holes drilled in 1987 confirmed a thick J seam sequence.

1990 Exploration

The Transfer and Grizzly areas witnessed 4 km of surface mapping. Transfer also had 2 surface geophysical lines cut and surveyed at 20 m intervals. An EM direct current survey was conducted along the lines. Results are still forthcoming.

Marmot had 11-1/2 km of mapping done in 1990.

Mesa North Extension and Perry Creek had 5 km of surface mapping done.

2.3.1 Project Management and Primary Contractors

This report and the exploration work was completed by Q.C.L. geology staff, consultants and contractors.

Quintette Coal Limited

R.A. Booker	- Senior Geologist
D.G.S. Johnson	- Senior Geologist
T. Wall	- Geologist
C. Baker	- Geologist-in-Training
D.P. Lortie	- Computer Geologist
N.C. Hori	- Geological Technician
D. Johnson, N. Counter	- Draftspersons

Consultants

W. R. Leeder, E. Toth	- Denison Mines Limited, Coal Division

Contractors 1990

Geophyicon	- Surface Geophysics
Stables, Tryon and Associates	- Surveying

2.4 STANDARDS AND PROCEDURES

2.4.1 Geologic Mapping

Geologic mapping in the Transfer, Grizzly, Marmot, Mesa North Extension and Perry Creek areas was conducted at 1:2500 scale by Quintette personnel.

Mapping was conducted from exploration roads or seismic lines. Exploration roads provided excellent rock and coal exposures. Control was based on survey points spaced at approximately 100 m intervals along the roads.

Reconnaissance mapping off the exploration roads and seismic lines was controlled by previously established survey points, airphoto control points, geologic control points and drill holes. Accuracy was maintained by closing the traverses to one of the known points.

Field data was recorded on map cards at 1:2500 scale. The mapping was done by a modified plane table method using a chain and compass. Lithologies, structural and sedimentological features, and bed orientation were recorded on the map cards.

2.5 Future Development

Exploration work has defined a significant resource in the Transfer and Grizzly areas. Sampling of the coal has confirmed the quality of the coal. Further work will be required to:

1. Confirm interpreted fault structures in the Transfer West Limb.
2. Define the depth of the Transfer Syncline (Transfer West Limb).
3. Define the extent of J/K seam thinning in the Transfer West Limb.

4. Define the extent of seam thickness anomalies on the Transfer Anticline East Limb (F Seam); in the M-9 structure (J Seam).

5. Further define the M-9 Syncline structure.

Regardless of the extent of future exploration or development work, definition of the geology in the Transfer and Grizzly areas currently has a high confidence rating. A mine plan based on the geology presented in this report will also have similar confidence rating vis a vis reserve figures.

In the Marmot area, a simple geologic structure has been interpreted. Prior to any commitment to recover coal in the area, further work will be required to:

1. Define the extent of overburden.
2. Define the extent of faulting identified in Mesa Pit that extends into the area.
3. Confirm seam thicknesses and quality.
4. Confirm the existence of a significant northeast dipping fault that has been interpreted.

In the Mesa North Extension area, drilling in 1989 confirmed near surface coal. Mapping and drilling have indicated the structures on the south western limit are extremely complicated. On the other hand, the structure is very simple near the Wolverine Valley. Since this area is continuous with the Mesa Extension reserve, further work is required to:

1. Define the structure and coal outcrop limit along the south-west boundary of the resource.

2. Define the structural complications where Middle Anticline rapidly changes to a faulted structure and more open fold.

3. Define coal seam development and structure to the northeast of the resource.

4. Tie the Mesa North structures and Mesa North Extension structures together.

5. Define depth of overburden cover in the Wolverine Valley and the coal seam subcrop limit.

6. Obtain further quality data.

7. Confirm seam thickness and development.

In the Perry Creek area, the exploration data indicates a simple geological structure with thick J seam coal. Future work will depend on the requirements of the Quintette project. If the resource is to be exploited, further work will be required to:

1. Define the extent of the thick J2 parting.
2. Define J seam outcrop.
3. Define any structural complications near the Perry Creek Syncline axis.
4. Explore and define the Fortress Mountain Anticline/Syncline to the southwest.

3.0 GEOLOGY

The exploration mapping and geophysical work completed in 1990 has added to the geologic data available for interpretation of the exploration areas. The regional and local stratigraphy, local seam development and correlation, regional and local structure and coal quality remain unchanged in the exploration areas from the previously submitted 1988, 1989 Geologic Assessment Reports.

TABLES

Table 2.1

EXPLORATION SUMMARY

		Transfer and Grizzly	Mesa North Extension	Totals
1989				
Rotary Holes	#	24	32	56
	m	3312	2964	6276
Core Holes	#	2	3	5
	m	435	579	1014
Adits*	#	1	-	1
	m	69	-	69
Roads	km	2.5	4.7	7.2
1988				
Rotary Holes	#	31	11	42
	m	3049	1147	4196
Core Holes	#	11	1	12
	m	1455	234	1689
Geotechnical Holes	#	6	-	6
	m	272	-	272
Roads	km	7.6	4.5	12.1
1987				
Rotary Holes	#	67	-	67
	m	8244	-	8244
Core Holes	#	12	-	12
	m	1844	-	1844
Adits	#	6	-	6
	m	251	-	251
Roads	km	21.4	-	21.4

*In addition, 5 adits driven in 1987 were resampled.

Table 2.1
(continued)

EXPLORATION SUMMARY

		Transfer and Grizzly	Mesa North Extension	Totals
1986				
Core Holes	#	8	-	8
	m	1142	-	1142
Roads	km	7.6	-	7.6
1985				
Core Holes	#	2	-	2
	m	374	-	374
Roads	km	-	-	-
Pre-1985				
Rotary Holes	#	6	-	6
	m	686	-	686
Core Holes	#	1	-	1
	m	110	-	110
Roads	km	1.5	-	1.5
Totals				
Rotary Holes	#	128	43	171
	m	15291	4111	19402
Core Holes	#	36	4	40
	m	5360	813	6173
Geotechnical Holes	#	6	-	6
	m	272	-	272
Adits	#	7	-	7
	m	320	-	320
Roads	km	40.6	9.2	49.8

Table 2.1
(continued)

EXPLORATION SUMMARY

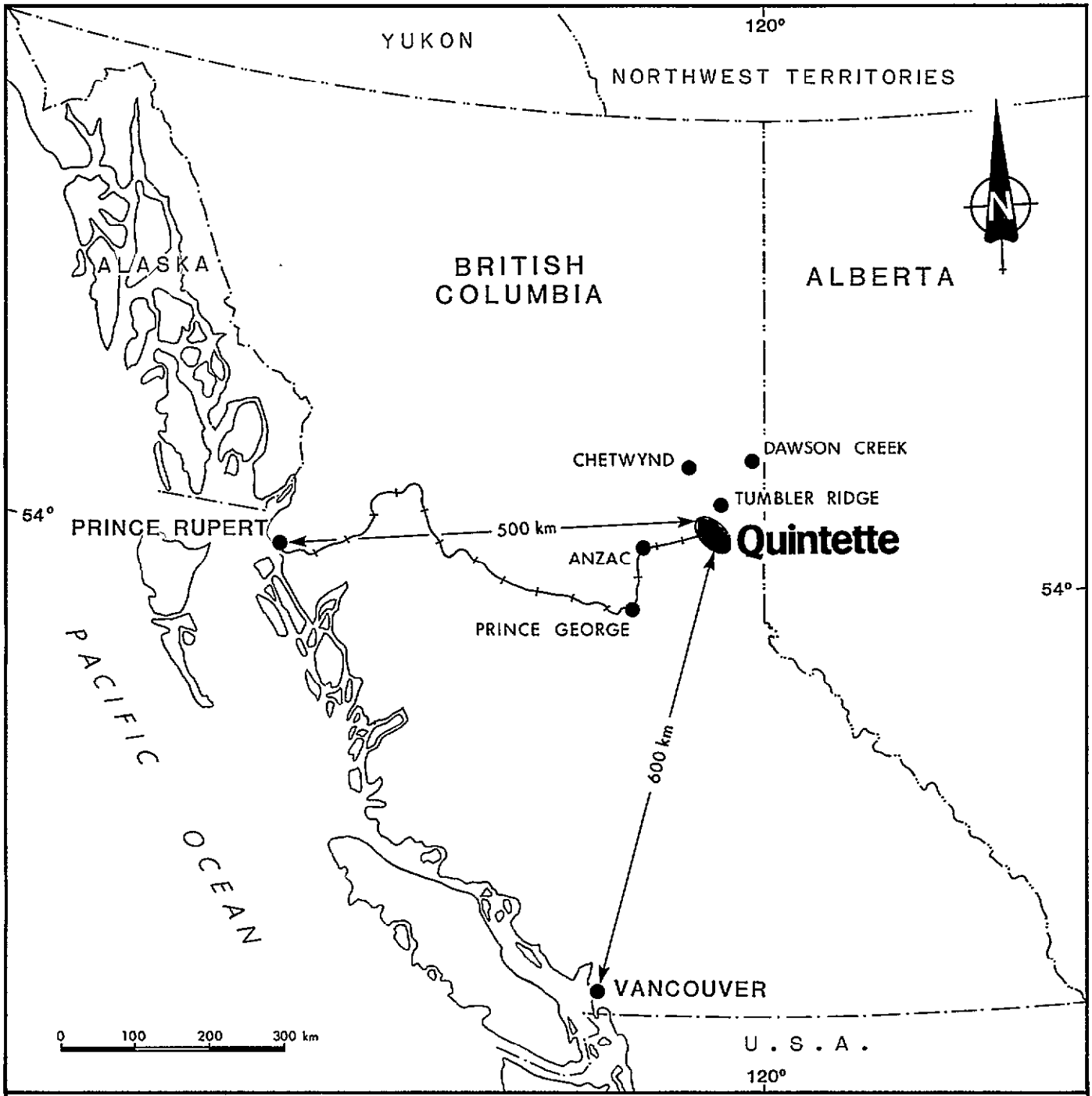
		Perry Creek	Marmot	Totals
1989		0	0	0
1988				
Rotary Holes	#	4	5	9
	m	567	974	1541
Core Holes	#	2	2	4
	m	365	293	658
Geotechnical Holes	#	-	-	-
	m	-	-	-
Roads	km	2.3	2.7	10
1987				
Rotary Holes	#	5	-	15
	m	260	-	260
Core Holes	#	-	-	-
	m	-	-	-
Roads	km	1.3	-	1.3
1986-85	No activity			
Pre-1985				
Rotary Holes	#	-	13	13
	m	-	1413	1413
Core Holes	#	10	3	13
	m	2480	579	3059
Roads	km	10	2.3	12.3

Table 2.1
(continued)

EXPLORATION SUMMARY

		Perry Creek	Marmot	Totals
Totals				
Rotary Holes	#	9	18	27
	m	827	2387	3214
Core Holes	#	12	5	17
	m	2845	872	3720
Geotechnical Holes	#	-	-	-
	m	-	-	-
Adits	#	-	-	-
	m	-	-	-
Roads	km	13.6	5.0	18.6

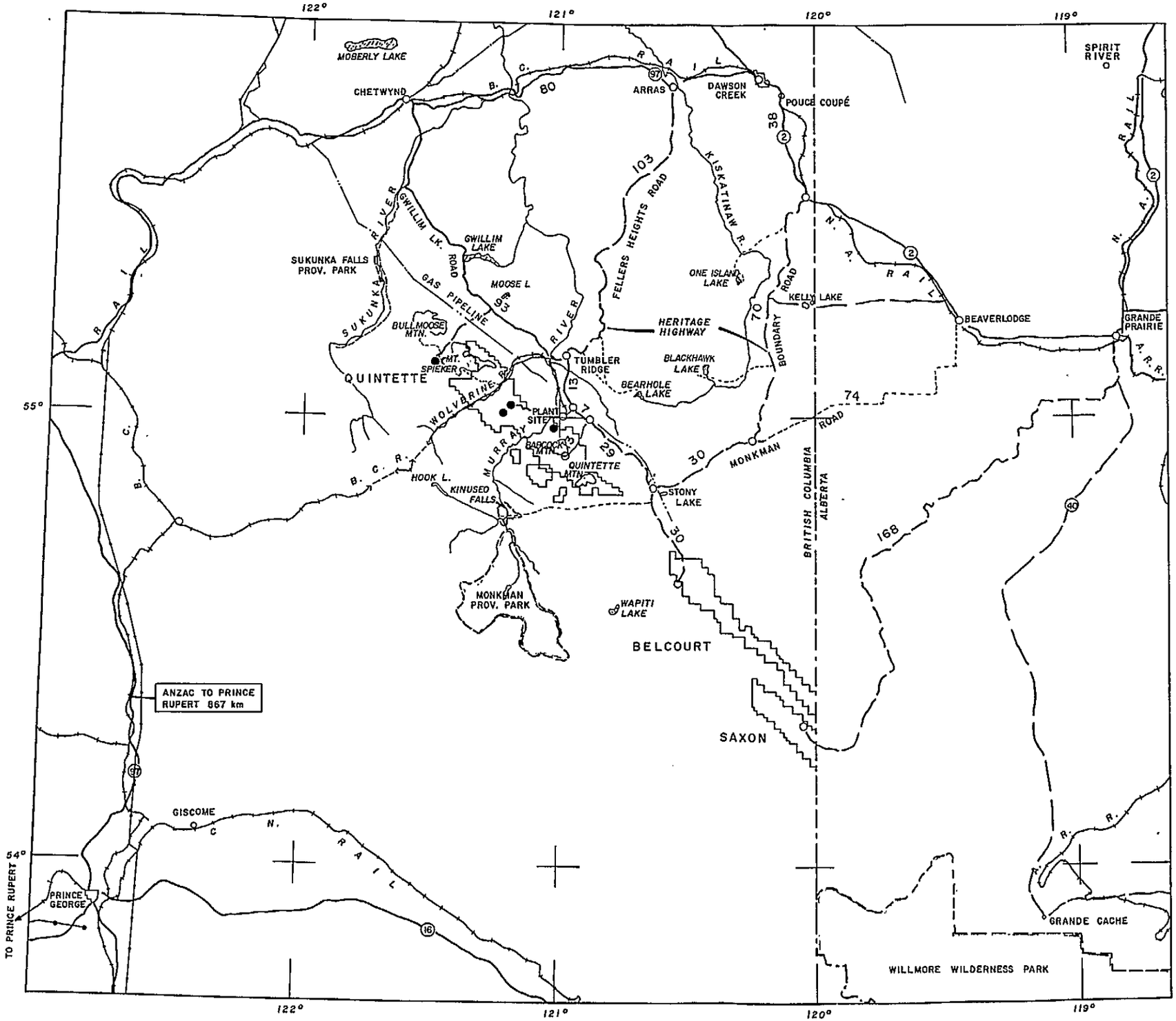
F I G U R E S



Quintette Coal Limited

GENERAL LOCATION

FIGURE 2.1



APPROXIMATE DISTANCE (in km) BETWEEN POINTS — 30

PAVED ROAD

ALL WEATHER ROAD

SECONDARY ROAD

RAILWAY

PIPELINE

POWERLINE

DENISON MINES PROPERTIES

PIT LOCATION

SCALE 1:1,000,000

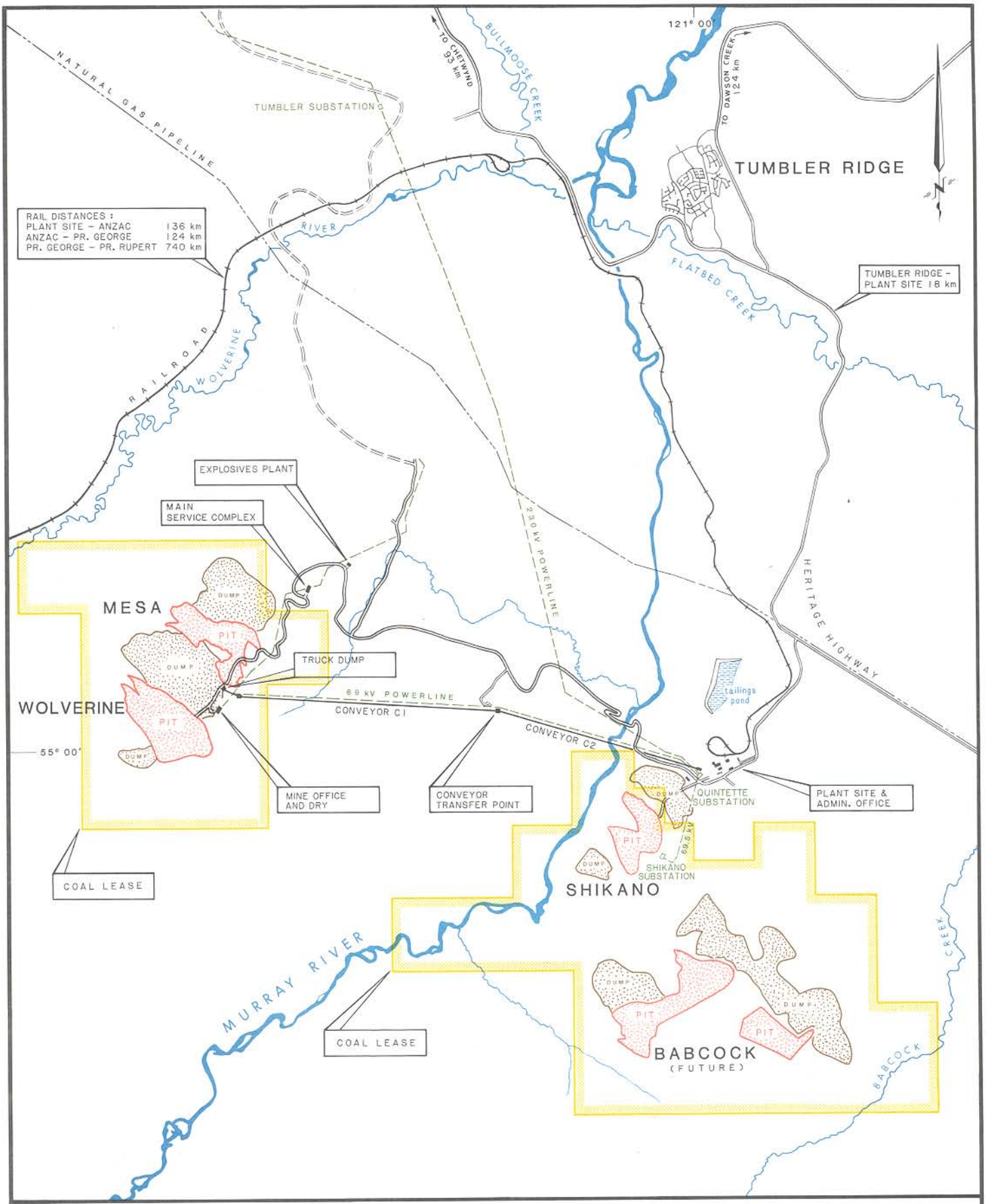
10 5 0 10 20 30 40 50 60

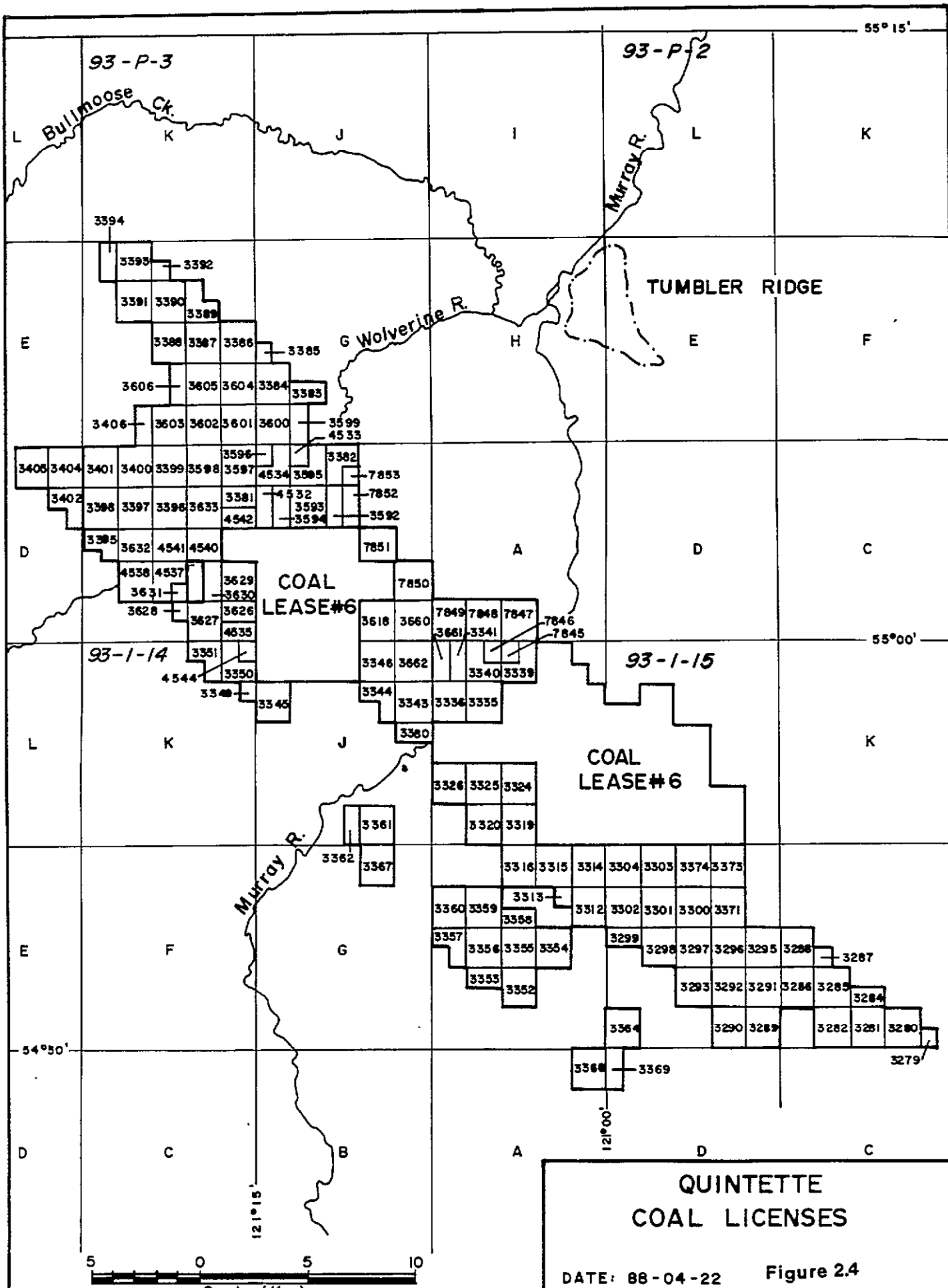
KILOMETRES

QUINTETTE COAL LIMITED

NORTHEAST B.C. PROPERTIES

Fig. 2.2


121° 00'
TO CHETWYND 93 km
BULLMOOSE CREEK
TO DAWSON CREEK 124 km
NATURAL GAS PIPELINE
TUMBLER SUBSTATION
TUMBLER RIDGE
RAIL DISTANCES :
PLANT SITE – ANZAC 136 km
ANZAC – PR. GEORGE 124 km
PR. GEORGE – PR. RUPERT 740 km
RIVER
FLATBED CREEK
TUMBLER RIDGE – PLANT SITE 18 km
RAILROAD
WOLVERINE
EXPLOSIVES PLANT
MAIN SERVICE COMPLEX
230 kV POWERLINE
HERITAGE HIGHWAY
MESA
DUMP
PIT
TRUCK DUMP
WOLVERINE
69 kV POWERLINE
CONVEYOR C1
CONVEYOR C2
tailings pond
55° 00'
MINE OFFICE AND DRY
CONVEYOR TRANSFER POINT
QUINTETTE SUBSTATION
PLANT SITE & ADMIN. OFFICE
69.5 kV
SHIKANO SUBSTATION
SHIKANO
COAL LEASE
MURRAY RIVER
COAL LEASE
BABCOCK
(FUTURE)
BABCOCK CREEK
2 1 0 1 2 3 4 km
QUINTETTE COAL LIMITED
AREA DEVELOPMENT
FIGURE 2.3
DECEMBER 1986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93-P-2
Bullmoose Ck.
Murray R.
TUMBLER RIDGE
G Wolverine R.
COAL LEASE#6
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COAL LEASE#6
Murray R.
55°15'
55°00'
54°50'
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Scale (Km)
QUINTETTE
COAL LICENSES
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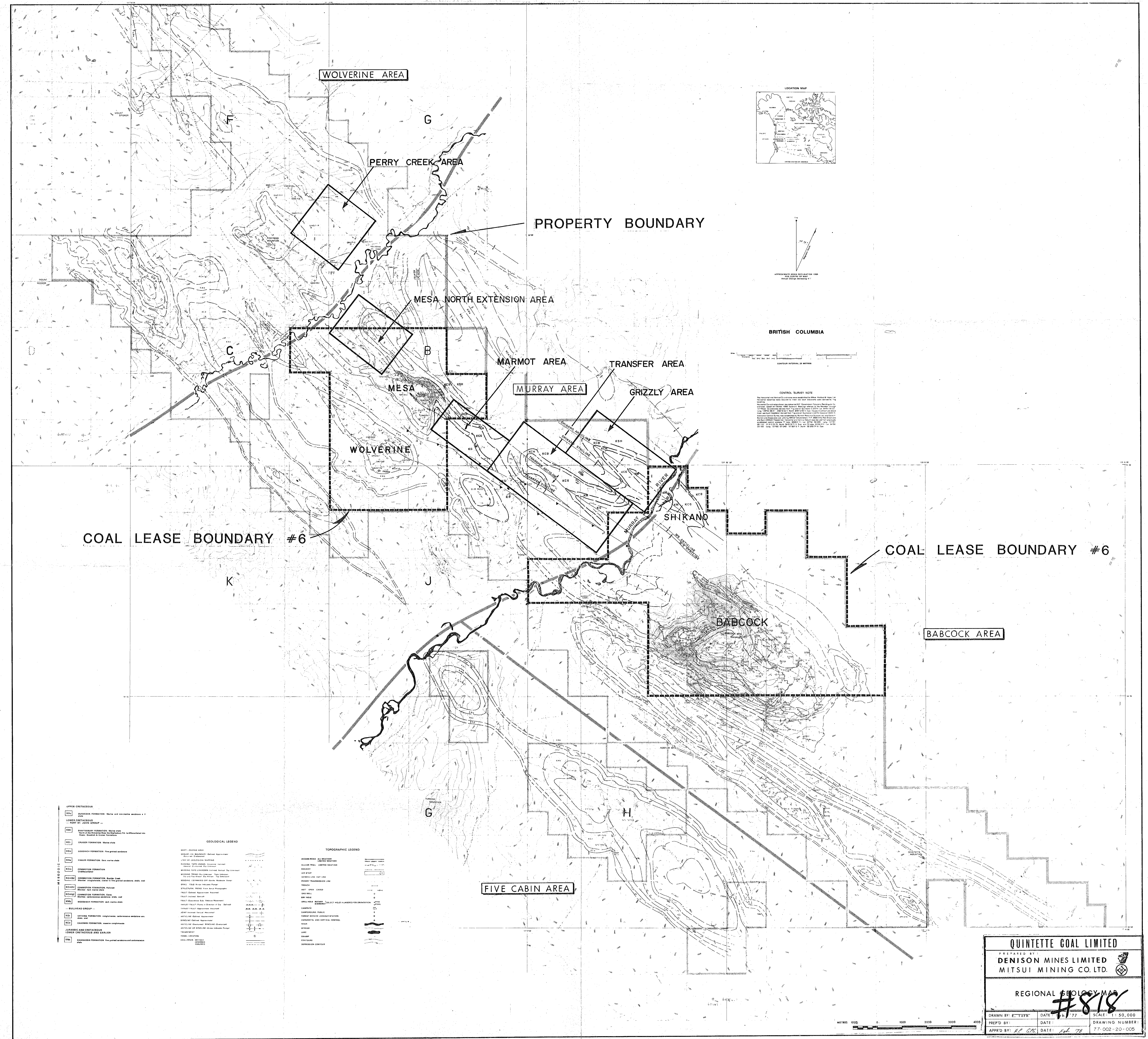
Figure 2.4

APPENDIX I


WOLVERINE AREA
PERRY CREEK AREA
PROPERTY BOUNDARY
MESA NORTH EXTENSION AREA
MARMOT AREA
TRANSFER AREA
GRIZZLY AREA
MURRAY AREA
MESA
WOLVERINE
SHIKANO
BABCOCK
BABCOCK AREA
FIVE CABIN AREA
COAL LEASE BOUNDARY #6
COAL LEASE BOUNDARY #6
F
G
C
B
K
J
G
H
MOUNT SPIEKER
MOUNT REESOR
FORTRESS MOUNTAIN
WOLVERINE CAMP
MT FRAME
SHIKANO ANTICLINE
SHIKANO SYNCLINE
TRANSFER ANTICLINE
TRANSFER SYNCLINE
M-9 ANTICLINE
M-9 SYNCLINE
MURRAY
RIVER
MURRAY CAMP
BABCOCK MTN.
BABCOCK CAMP
KOSTUIK MTN.
TURNING MOUNTAIN
QUINTETTE MOUNTAIN
LOCATION MAP
ARCTIC OCEAN
ALASKA
YUKON TERRITORY
NORTHWEST TERRITORIES
BRITISH COLUMBIA
PACIFIC OCEAN
QUINTETTE REGION
ALBERTA
SASK
MAN
ONTARIO
HUDSON BAY
UNITED STATES OF AMERICA
T N
23° 54'
Magnetic North
APPROXIMATE MEAN DECLINATION 1965
FOR CENTRE OF MAP
Annual Change decreasing 4.1'
BRITISH COLUMBIA
CONTOUR INTERVAL 20 METRES
CONTROL SURVEY NOTE
UPPER CRETACEOUS
KDu DUNVEGAN FORMATION: Marine and non-marine sandstone & shale
LOWER CRETACEOUS
— FORT ST. JOHN GROUP —
KSh SHAFTESBURY FORMATION: Marine shale
*North of the Wolverine River the Shaftesbury Fm is differentiated into Hasler, Goodrich & Cruiser Formations
KCr CRUISER FORMATION: Marine shale
KGo GOODRICH FORMATION: Fine grained sandstone
KHa HASLER FORMATION: Dark marine shale
KCm COMMOTION FORMATION Undifferentiated
KCm(b) COMMOTION FORMATION, Boulder Creek Member: conglomerate, coarse to fine-grained sandstone; shale, coal
KCm(h) COMMOTION FORMATION, Hulcross Member: dark marine shale
KCm(g) COMMOTION FORMATION, Gates Member: carbonaceous sandstone; shale, coal
KMb MOOSEBAR FORMATION: dark marine shale
— BULLHEAD GROUP —
KGt GETHING FORMATION: conglomerate, carbonaceous sandstone and shale, coal
KCd CADOMIN FORMATION: massive conglomerate
JURASSIC AND CRETACEOUS
LOWER CRETACEOUS AND EARLIER
KNk NIKANASSIN FORMATION: fine grained sandstone and carbonaceous shale
MESOZOIC
GEOLOGICAL LEGEND
DRIFT COVERED AREA
GEOLOGICAL BOUNDARY (Defined, Approximate) (Assumed, Gradational)
LIMIT OF GEOLOGICAL MAPPING
BEDDING TOPS KNOWN (Horizontal, Inclined) (Vertical, Overturned, Dip Unknown)
BEDDING TOPS UNKNOWN (Inclined, Vertical, Dip Unknown)
BEDDING TREND (Dip Unknown, Tops Unknown) (Dip and Top Known, Dip Known, Top Unknown)
BEDDING ESTIMATED DIP (Gentle, Moderate, Steep)
DRAG FOLD (Arrow Indicates Plunge)
STRUCTURAL TREND (From Aerial Photographs)
FAULT (Defined, Approximate, Assumed)
FAULT (Inclined, Vertical)
FAULT (Downthrow Side, Relative Movement)
THRUST FAULT (Points in Direction of Dip, Defined)
THRUST FAULT (Approximate, Assumed)
JOINT (Inclined, Vertical, Horizontal)
ANTICLINE (Defined, Approximate)
SYNCLINE (Defined, Approximate)
ANTICLINE (Overturned) SYNCLINE (Overturned)
ANTICLINE OR SYNCLINE (Arrow Indicates Plunge)
ESCARPMENT
FOSSIL LOCATION
COAL ZONES DEFINED INFERRED ASSUMED
TOPOGRAPHIC LEGEND
ACCESS ROAD ALL WEATHER LIMITED WEATHER
ACCESS TRAIL LIMITED WEATHER
RAILWAY
AIR STRIP
SEISMIC LINE CUT LINE
POWER TRANSMISSION LINE
TRENCH
ADIT OPEN CAVED
GAS WELL
DRY HOLE
DRILL HOLE ROTARY DIAMOND } SELECT HOLES NUMBERED FOR ORIENTATION
CAMPSITE
CAMPGROUND, PUBLIC
FOREST SERVICE LOOKOUT/STATION
HORIZONTAL AND VERTICAL CONTROL
RIVER
STREAM
LAKE
SWAMP
CONTOURS
DEPRESSION CONTOUR
METRES 1000 0 1000 2000 3000 4000
QUINTETTE COAL LIMITED
PREPARED BY:
DENISON MINES LIMITED
MITSUI MINING CO. LTD.
REGIONAL GEOLOGY MAP
#818
DRAWN BY: E. Toth
DATE: Feb. '77
SCALE: 1 : 50,000
PREP'D BY:
DATE:
DRAWING NUMBER:
APPR'D BY: H.P. G.P.G.
DATE: Feb '78
77-002-20-005