Province of British Columbia
Ministry of Energy, Mines and
Petroleum Resources

MINERAL RESOURCES DIVISION
Geological Survey Branch

STRATIGRAPHIC TRENDS IN THE GETHING FORMATION

By A. Legun

A Contribution to the Canada/British Columbia Mineral Development Agreement, 1985-1990

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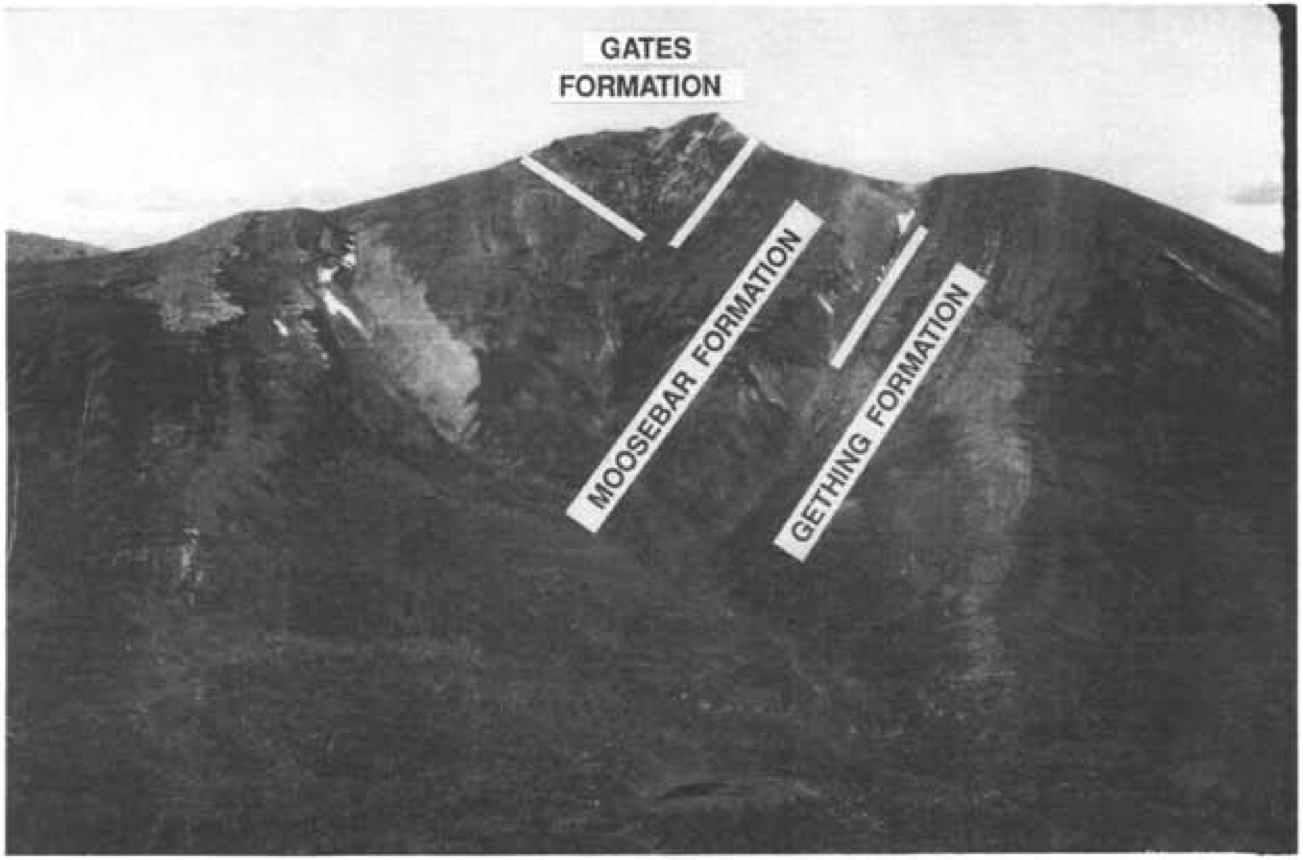

Lower Cretaceous stratigraphy (Cadomin to Gates Formation) exposed in core of syncline at Roman Mountain.

TABLE OF CONTENTS

INTRODUCTION

GENERAL

This project provides a stratigraphic framework for interpreting of the geology of the Gething Formation in the southern portion of the northeast British Columbia coalfield which lies between the Sukunka River and Kinuseo Creek. The study area is covered by NTS map sheets 93P/1 to 8 and 93I/14 and 15, but focuses on a slightly smaller area that excludes 93P/1, 7 and 8 (Figure 1). The study integrates data from the Plains, largely from oil and gas wells, with Foothills data from coal exploration work. The area potentially underlain by economic coal measures roughly coincides with the surface exposure of the Gething and Moosebar Formations within the Foothills, as illustrated by Figure 2, which is based on mapping by Kilby *et al.*, (1989). Figure 2 also illustrates the distribution of the stratigraphic data used in the study.

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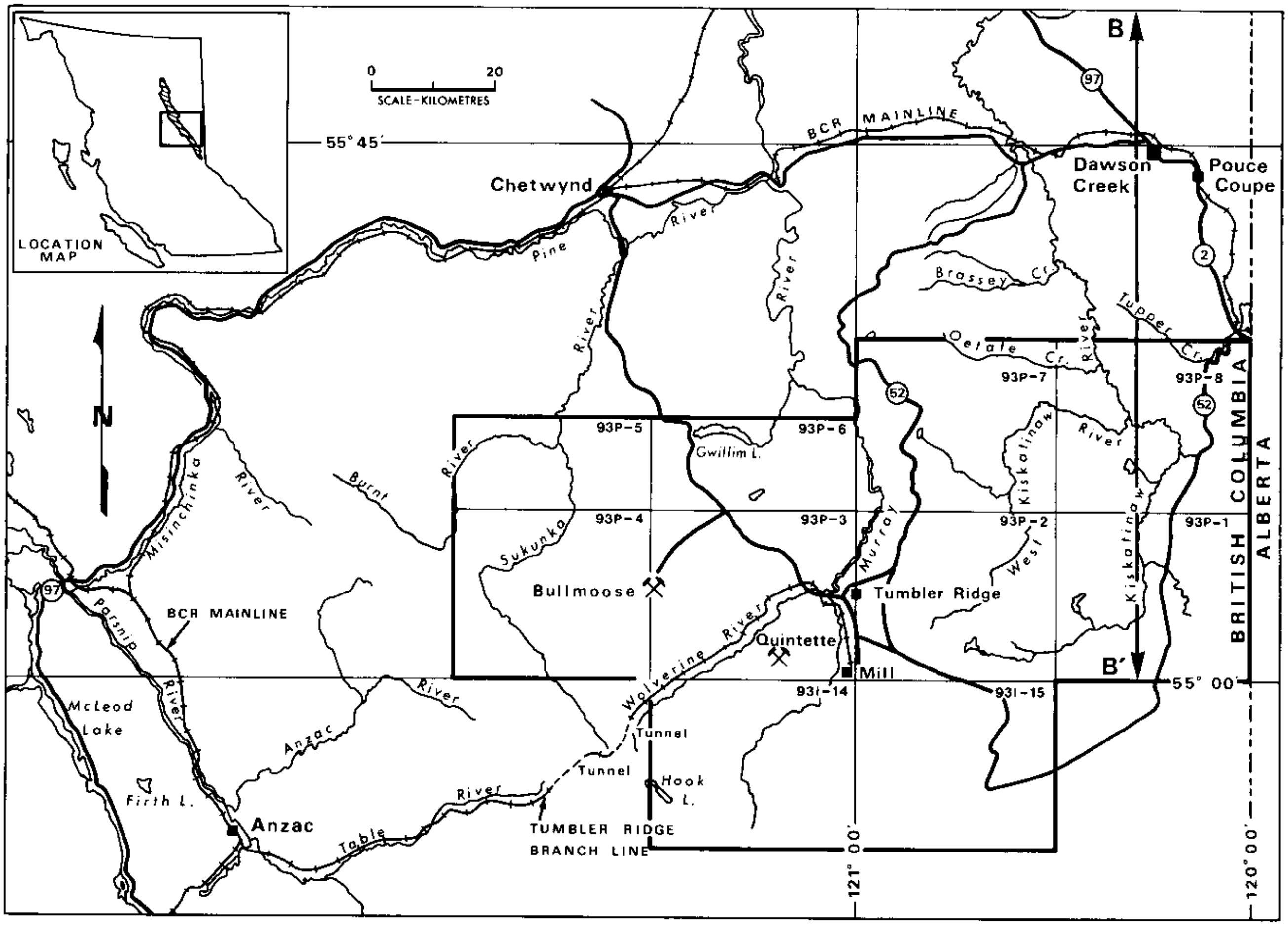


Figure 1. Location map of study area.

initial plots of data from COALFILE, to Ward Kilby for familiarization with databases and computer plots and to Dave Johnson of the Petroleum Engineering and Operations Branch at Charlie Lake for access to petroleum well data. David Hughes kindly provided the Geological Survey of Canada Sukunka database compiled by Caleen Kilby. Dave Gibson of the Geological Survey of Canada clarified aspects of stratigraphic subdivision of the Gething Formation. Dave Johnson of Quintette Coal Ltd. kindly provided current stratigraphic data for the Gething Formation in the Quintette mine area. George Walker ably assisted me in the field. I am indebted to the patience of Pierino Chicorelli who draughted the figures. Last but not least thanks to Vic Preto, Manager of District Geology for an open handed approach to the execution of this project.

GEOLOGY

The coal-bearing Lower Cretaceous Gething Formation is overlain by Moosebar Formation marine shales and underlain by conglomeratic sandstones of the Cadomin Formation.

The basic lithologic sequence in the Gething Formation is shown in Table 1 together with a comparison of the stratigraphic terminology used by Gibson (1987), Duff and Gilchrist (1983), Oppelt (1986) and Williams (1984). Duff and Gilchrist informally divided the Gething Formation into three units: the upper, middle and lower Gething. The middle Gething is a coarsening-upward sequence, grading from shale to sandstone, containing marine fauna. Also known as the Gething marine tongue, it separates the upper and lower coal measures. Gibson revised this subdivision and formally define three new units: the Chamberlain, Bullmoose and Gaylard members. Gibson's subdivision is utilized in this report. The principal change from Duff and Gilchrist's subdivision has been to split the Middle Gething. The thick sandstone of the upper half of the coarsening-upward sequence is now the basal sandstone of the Chamberlain member and the shale below constitutes the Bullmoose member; the Lower Gething remains intact and is renamed the Gaylard member. The entire Bullmoose and Chamberlain interval ap-

TABLE OF FORMATIONS

<table>
<tr><th>Lithologic Unit</th><th>Williams (1984)</th><th>Duff and Gilchrist (1983)</th><th>Gibson (1987)</th><th>Oppelt (1986)</th></tr>
<tr><td>Glanconitic sst. chert conglomerate</td><td>Bluesky facies A</td><td rowspan="2">Upper Gething (Chamberlain member)</td><td rowspan="2">Chamberlain member</td><td rowspan="2">Upper Gething (Chamberlain member)</td></tr>
<tr><td>Upper coal measures</td><td>Bluesky facies B_1</td></tr>
<tr><td>Sandstone</td><td rowspan="2">Bluesky facies B</td><td rowspan="2">Middle Gething (Gething marine tongue)</td><td rowspan="2">Bullmoose member</td><td rowspan="2">Bluesky Fm. facies B</td></tr>
<tr><td>Shale</td></tr>
<tr><td>Glauconitic sst. conglomerate, quartzitic sst.</td><td>Bluesky facies C</td><td rowspan="2">Lower Gething</td><td rowspan="2">Gaylard Member</td><td>Bluesky Fm. facies C</td></tr>
<tr><td>Lower coal measures</td><td>Gething Fm.</td><td>Lower Gething</td></tr>
</table>

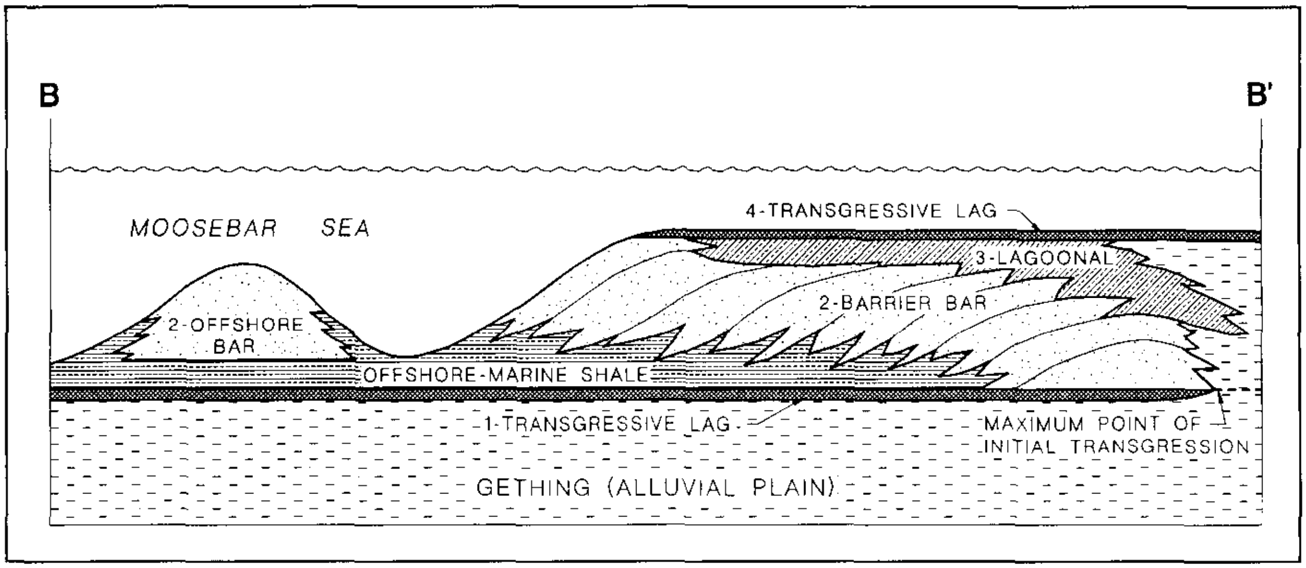


Figure 3. South to north schematic section of Bluesky unit in the Plains region from Smith *et al*., (1984) (*see* Figure 7 for cross-section location). The Bluesky unit as represented here is equivalent to the combined Chamberlain Bullmoose member interval in the Foothills. The original caption for the figure reads: Schematic cross-section B-B' illustrating the sequence of events that occurred in the study area during the transgression of the Moosebar sea. (1) A "Bluesky" transgressive lag is formed as the sea advances across the Gething alluvial plain. (2) An increase in sediment supply results in the development of a prograding "Bluesky" barrier bar/offshore bar system. (3) As the barrier progrades seaward, a bay/lagoon develops landward of the barrier. (4) The barrier system is ultimately overpowered by the sea and is once again transgressed. A transgressive lag caps the system.

pears to be equivalent to the Bluesky unit of the Plains region (Figure 3).

A unit of chert-pebble conglomerate, glauconitic sandstone and pebbly mudstone may occur at the top of both the Gaylard and the Chamberlain members. These deposits reflect two separate transgressive events of the Moosebar sea.

STRATIGRAPHIC TRENDS

Stratigraphic data have been compiled in the form of a stratigraphic panel diagram (Figure 4) and a computer database (Appendix 1).

The stratigraphic panel diagram illustrates the following:

- Basic lithology and distribution of the Chamberlain and Bullmoose members within the Foothills and adjacent Plains area (NTS 93P/2, 3, 4, 5; 93I/14, 15).
- Stratigraphic and areal distribution of the more significant coal seams.
- Thickness trends of the combined Chamberlain and Bullmoose member interval, illustrated by a stratigraphic fence diagram.

CHAMBERLAIN MEMBER

The Chamberlain member consists of sandstone and shale with or without coal measures. In the Sukunka area it is approximately 80 to 100 metres thick. It thins rapidly to the north, wedging out as a sandstone unit in Moosebar marine shale near WA 5874. Southeast along the Foothills coalbelt it varies from 60 to 100 metres thick with an anomalously low thickness in the vicinity of QWD-7112. Perpendicular to the Foothills coalbelt the Chamberlain member thins and is only 20 metres thick at the northeast corner of the study area.

The extent of the coal facies within the Chamberlain member is shown in Figure 5. The boundary of the coal facies (as defined by the presence or absence of coal in geophysical density logs) runs roughly east-west in the

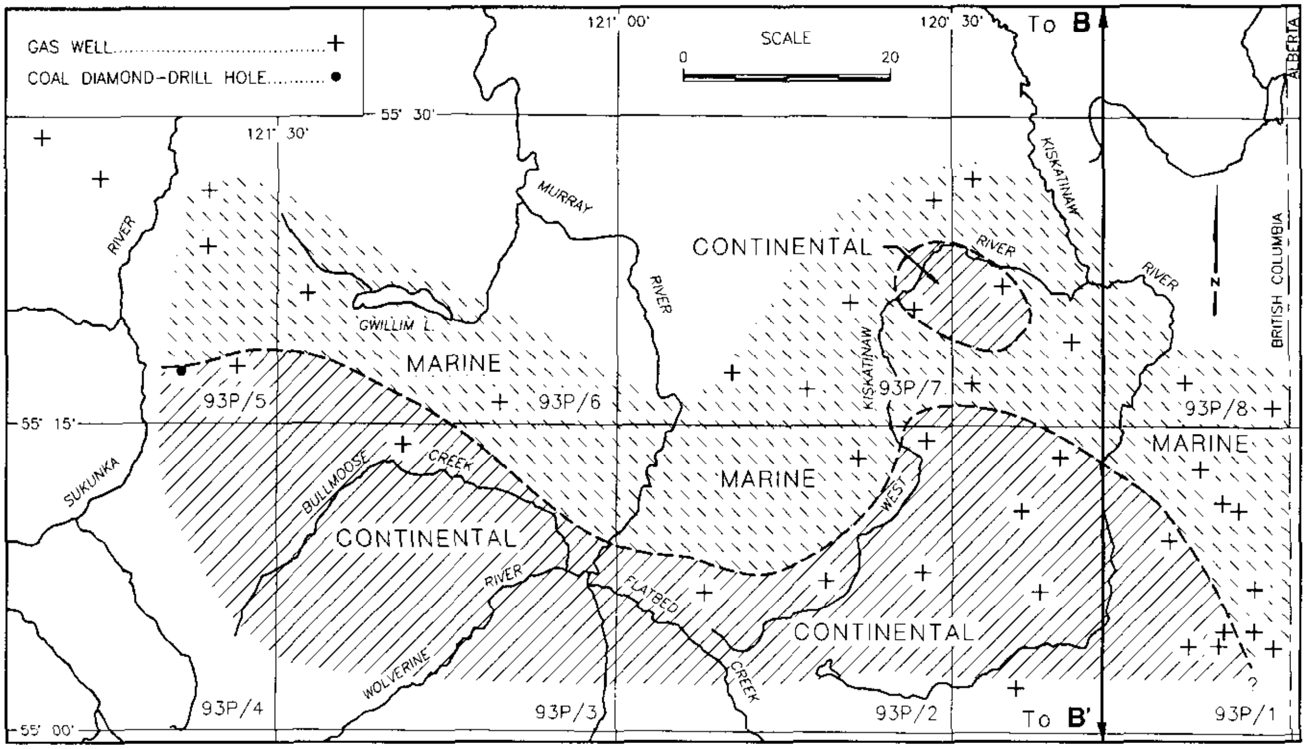


Figure 5. Areal extent of coal facies in the Chamberlain member.

Sukunka River area, swings east-southeast near Gwillim Lake, north in the vicinity of West Kiskatinaw River then reverts to a southeast trend near Kiskatinaw River. The edge of the coal facies is interpreted as the approximate trace of the delta-top environment(s) The sinuous trace is interpreted as several laterally linked deltas within a coastal plain setting.

The Chamberlain member beyond the area of coal facies in Figure 5 is defined by sandstone and shale of marginal marine character.

In the Sukunka area a marine interval has been documented within the coal facies of the Chamberlain member on the basis of the marine bivalve *Entolium Incense eg.* (*see* BP 53, Duff & Gilchrist 1983, Figure 3). The interval does not have a good geophysical signature but lithology appears to be represented by a few metres of shale between the Bird seam above and the Skeeter seam below. The marine interval apparently pinches out to the southeast, near QWD 7115, where fining-upward sequences, interpreted as deposits of delta distributaries or fluvial channels, appear in the stratigraphic sequence.

A thick and persistent sandstone facies at the base of the Chamberlain member appears to represent wave-dominated delta-front deposits. At Mount Reesor, hummocky and swaly cross-stratification appears to represent storm activity on this front, alternating with periods of quiescence marked by horizons of intense vertical burrowing. To the south at Quintette, bioturbation is lacking and the sandstones include thin sheet-like beds of conglomerate (*see* Figure 6).

In the Plains region these sandstones are interpreted as deposits of barrier bars (Figure 3).

The Chamberlain seam is recognized as the coal immediately above the basal Chamberlain sandstone. To the northwest it is the last coal seam in the member to pinch out against marine strata. To the southeast it becomes thin and discontinuous across the Wolverine River. The Skeeter seam lies above the Chamberlain seam and is usually separated from it by 10 metres or less. It is thin and impersistent southeast of the Wolverine River.

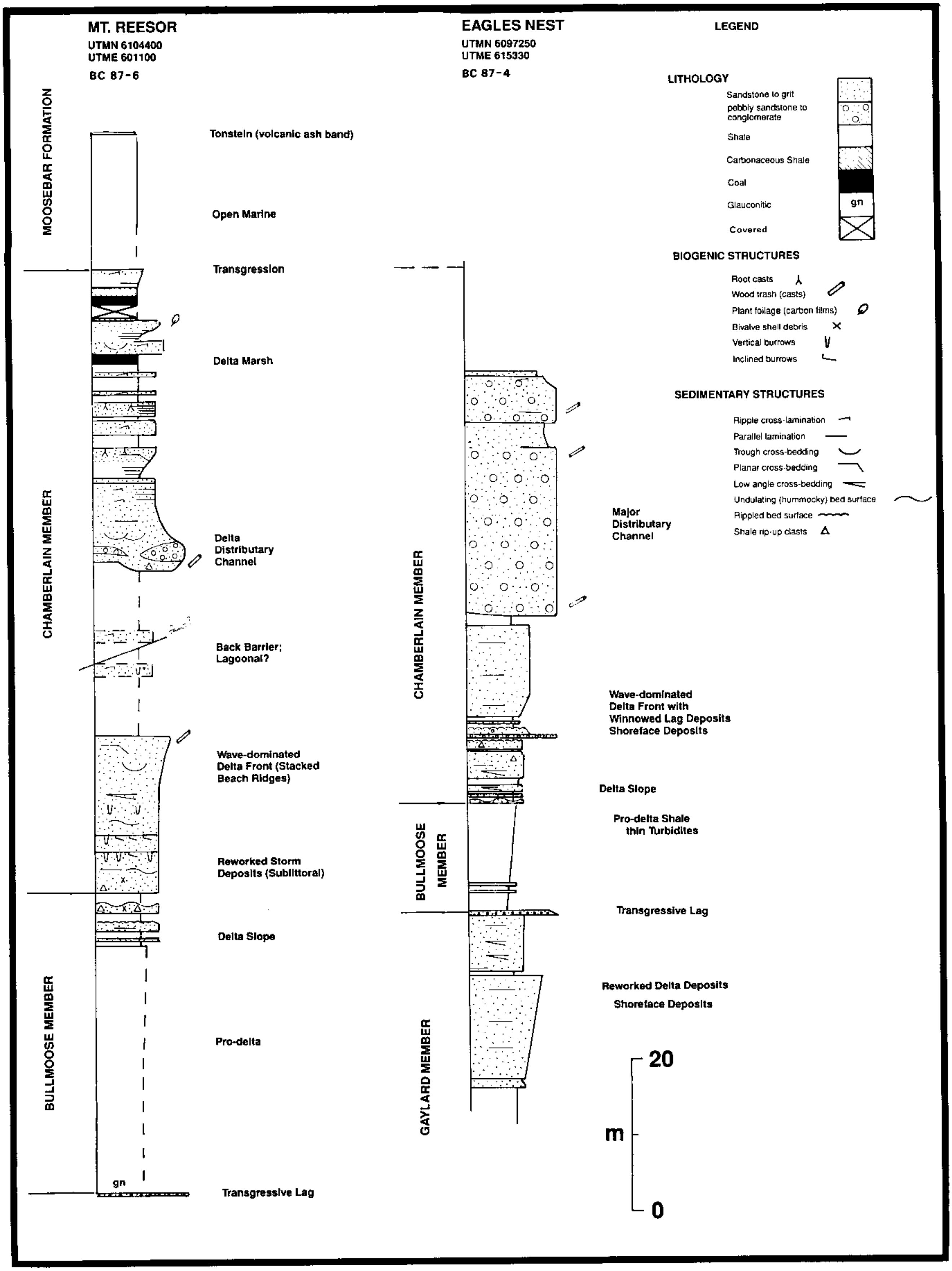


Figure 6. Interpretation of two stratigraphic sections.

The Bird seam lies at or just below the Moosebar-Gething formation contact in the Foothills. Additional continental strata may lie between the Bird and the Moosebar formations in westernmost exposures (*e.g.* west flank of Mount Reesor). The seam or its stratigraphic equivalent can be traced to the southeast to near Kinuseo Creek, but is missing in the area of QBR-8121 and QBD-8106 near the Murray River.

The thickness trend of Chamberlain member coals in the Sukunka area is east-southeast, while that of the foothills structural trend is southeast.

In the vicinity of the Quintette mine, thick coarse deposits are present in the Chamberlain member. For example 30 metres of pebbly sandstone and conglomerate is exposed at the Eagle's Nest (BC 87-4) and 22 metres is recorded in QHD 86010. There is poor coal development associated with the channel sandstones and the Skeeter and Chamberlain seams, which are several metres thick in the B.P. Sukunka deposit to the north, are missing at the Quintette mine.

BULLMOOSE MEMBER

The Bullmoose member thins northwest to southeast along the Foothills coalbelt (Figure 7). The Bullmoose member passes laterally into the Moosebar Formation to the northwest. Deposits of the embayment are thus deposits within the Moosebar sea. In the northwest the Bullmoose member is over 100 metres thick in SUK BP-2. Near the Quintette mine it is only 15 to 20 metres thick. Bullmoose member shales pinch out along on east-west line roughly coincident with Kinuseo Creek. This apparently is the southern shoreline of Gething marine embayment. The western shoreline is not defined. The embayment extends east of the area covered by the stratigraphic chart.

The Bullmoose member consists of marine shale and graded siltstones (turbidites) mottled with trace fossils. The shale passes stratigraphically upward into interbedded sheet sandstones and siltstones. The upward appearance of thick, parallel-laminated to low-angle crossbedded arenites marks the contact with the Chamberlain member. This transition is fairly abrupt on most geophysical logs (gamma trace). The shale becomes more silty to the south and the proportion of sand to shale in the coarsening-upward sequence is greater. This suggests a southward shoaling of the marine embayment.

GAYLARD MEMBER

The Gaylard member was not examined with respect to the underlying Cadomin Formation below, therefore thickness trends were not assessed. The Gaylard, however, is thick in

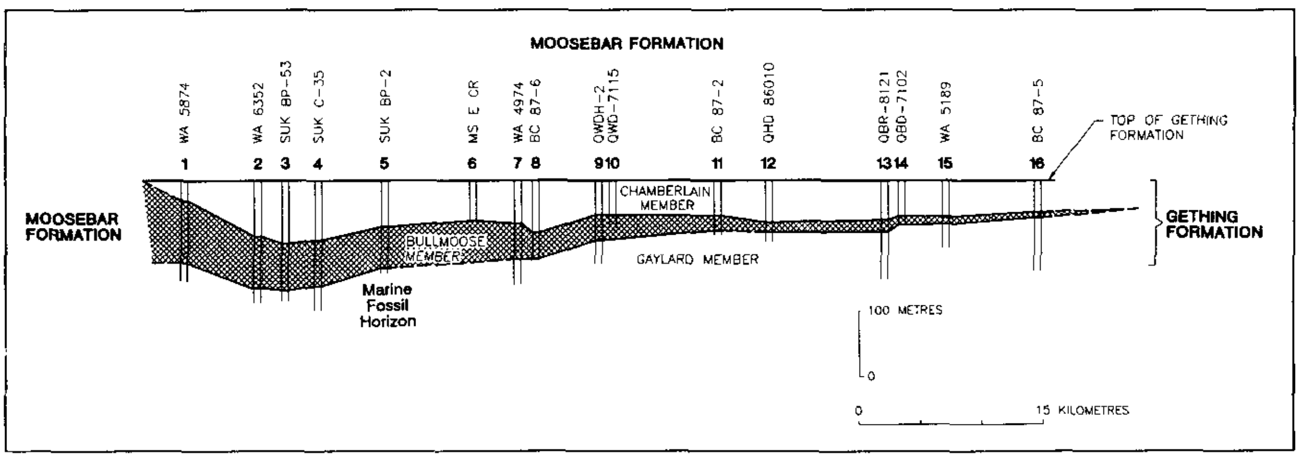


Figure 7. General (northwest-southeast) line of section through the Gething Formation.

the northwest where 336 metres is recorded in SUK 80-02 and thin in the southeast at Kinuseo Creek, (*e.g.* 72 metres in BC 87-5). Southeast along the coalbelt, shales of the Bullmoose member appear to pass laterally into sandstones, then conglomerates and finally coal measures of the Gaylard member. The lateral change is first seen in the stratigraphic section at the Eagle's Nest B.C. 87-4. Here, the Bullmoose shales are apparently replaced by 22 metres of horizontally laminated and low-angle crossbedded arenites of probable shallow-marine origin. To the south, at QHD-86010, the arenites are replaced by 32 metres of clean quartzitic conglomerate and quartzitic arenite. The basal contact is marked by a rapid increase in argillaceous content and a "dirty" appearance (lithic matrix of the arenite) suggesting derivation of the upper lithology by reworking and "washing" of the pre-existing sediments. These shoreface or coastal bar deposits pass southward along the coalbelt into coal measures, as evidenced in QBR8121 and the Oakwood *et al.*, Murray well (WA 5189). This apparent lateral stratigraphic relationship suggests coal measures of the Gaylard member in the southeast are time-equivalents of Moosebar sea deposits in the northwest.

The Gaylard coal measures have been the subject of little exploration activity in this area, except on the Teck Corporation Burnt River property to the north, where seams reach 8 to 9 metres in thickness. However, a possible 17 metres of coal, over 25 metres of section, is present in the Dome PCI Sukunka well (W.A. 6352, NTS 93P/5). The coal interval may be equivalent to the lower zone in BRE 5 (Burnt River East property) at UTM North 6124500, UTM East 585900, consisting of 15 metres of carbonaceous to coaly mudstone and minor coal, and may also correlate with 3.5 metres of coal in BPM 79-2. Good Gaylard coal development thus may extend ESE from the Burnt River area into the region of Sukunka North. Also significant are seams GT1 and GT2 on Quintette's Hermann Gething property near well BP *et al.*, Murray (b-92-J, NTS 93I/14). These seams are 45 metres below the base of the marine tongue and comprise 5 to 6 cumulative metres of coal.

In summary, the economic potential in the Gaylard member, and in the Gething Formation as a whole, is postulated to slowly decrease southeastward from the Burnt River toward Kinuseo Creek, in line with the increasing alluvial (conglomeratic) character of the Gething Formation along the Foothills structural trend.

SOURCES OF DATA

Stratigraphic and coal-thickness data are compiled from numerous sources including:

- Numerous coal assessment reports from 1970-1987. These reports are on file with the Petroleum Engineering and Operations Branch in Charlie Lake and the Coal Resources unit in Victoria.
- Field sections measured by the writer 1985-1987.
- Petroleum well data and logs on file with the Petroleum Engineering and Operations Branch in Charlie Lake and Victoria.
- Stratigraphic lines of section in Duff and Gilchrist (1983).
- Geological Survey of Canada reports, particularly Gibson (1987).
- Geological Survey of Canada coal database for the Sukunka deposit. (John Hughes, personal communication).

SELECTED BIBLIOGRAPHY

Broatch, T. (1987): Palynological Zonation and Correlation of the Peace River Coalfield, Northeastern British Columbia an Update; *B.C. Ministry of Energy, Mines and Petroleum Resources*, Geological Fieldwork 1986, Paper 1987-1, pages 379-382 (unfortunately contains some correlation errors).

Duff, P.McL.D. and Gilchrist, R.D. (1983): Correlation of Lower Cretaceous Coal Measures, Peace River Coalfield, British Columbia; *B.C. Ministry of Energy, Mines and Petroleum Resources*, Paper 1981-3, 31 pages.

Gibson, D.W. (1987): Stratigraphy, Sedimentology, Coal Geology and Depositional Environments of the Lower Cretaceous Gething Formation, Northeastern British Columbia and West-central Alberta; *Geological Survey of Canada*, in press.

Kilby, W.E. and Johnston, S.T. (1988): Kinuseo Mapping and Compilation Project (93I/14, 15; 93 P/3); *B.C. Ministry of Energy, Mines and Petroleum Resources*, Geological Fieldwork 1987, Paper 1988-1 and Open File 1988-21, 1988-22.

Kilby, W.E. and Wrightson, C.B. (1987a): Bedrock Geology of the Bullmoose Creek Area, Northeastern British Columbia, NTS 93P/3; *B.C. Ministry of Energy, Mines and Petroleum Resources*, Open File 1987-6.

Kilby, W.E. and Wrightson, C.B. (1987b): Bedrock Geology of the Sukunka River Area, Northeast British Columbia, NTS 93P/4; *B.C. Ministry of Energy, Mines and Petroleum Resources*, Open File 1987-7.

Oppelt, H.P. (1986): Stratigraphy and Character of the Bluesky Formation (94A, B, H, G; 93I, O, P); *B.C. Ministry of Energy, Mines and Petroleum Resources*, Geological Fieldwork 1985, Paper 1986-1, pages 161-166.

Smith, D.G., Zorn, C.E., Sneider, R.M. (1984): The Paleogeography of the Lower Cretaceous of Western Alberta and Northeastern British Columbia in and Adjacent to the Deep Basin of the Elmworth Area, *in* Elmworth Case Study of a Deep Basin Gas Field, John A. Masters, Editor; *American Association of Petroleum Geologists,* Memoir 38, pages 79-114.

Williams, C. (1984): The Bluesky Formation of Northeastern British Columbia: Depositional History and Stratigraphy, unpublished B.Sc. thesis; *University of Calgary*, 32 pages.

APPENDIX 1

GETHING DATABASE NOTES

ID#: Section Name
EAST: UTM Easting
NORTH: UTM Northing. The database is sorted by UTM Northing
BCN: Angle of bedding to normal core axis (degrees)
V = variable
SECTION ID: D = diamond-drill hole
C = diamond-drill hole with core stored at Charlie Lake
R = rotary-drill hole
W = Winkie-drill hole
S = surface section
STRUCTURE (recognized): T = tectonic thickening
F = faulted
CHAMBERL: Thickness (metres) of Chamberlain member
BULLMOOS: Thickness (metres) of Bullmoose member
STRATIG: STRATIGRAPHY 1 = Moosebar Formation
2 = Chamberlain member (Gething Formation)
3 = Bullmoose member (Gething Formation)
4 = Gaylord member (Gething Formation)
5 = Cadomin Formation

Only the thickest coal in the Chamberlain member is recorded in the database under the FIELD NAME of LWSEAM, MDSEAM or UPSEAM.

LWSEAM: Thickness (metres) of basal seam in Chamberlain member
MDSEAM: Thickness (metres) of a middle seam in Chamberlain member (more than one middle seam may be present)
UPSEAM: Thickness (metres) of upper seam in Chamberlain member
Where only one or two seam(s) is present its relative stratigraphic position within the Chamberlain member is used to designate it as lower, middle or upper seam.
The LWSEAM corresponds to the approximate stratigraphic position occupied by the Chamberlain seam of the Skukunka area. The UPSEAM corresponds to the approximate stratigraphic position occupied by the Bird seam in the Sukunka area. The MDSEAM has a less well defined stratigraphic position between the LWSEAM and UPSEAM as more than one middle seam may be present. The MDSEAM may correspond to the approximate stratigraphic position occupied by the Skeeter seam in the Sukunka area.
TOTCOAL: Total thickness of coal in Chamberlain member
Only seams 50 centimetres in thickness or greater were summed
SEAMS: Total number of seams 50 centimetres in thickness or greater in Chamberlain member
GETH TOP: Top of Gething Formation as marked on geophysical log

ID #	EASTING	NORTHING	BCN	SECTION ID	STRUCTURE	CHAMBERLAIN	BULLMOOSE	STRATIGRAPHY	LWSEAM	MDSEAM	UPSEAM	TOTCOAL	SEAMS	GETH TOP
WA 3395	588757	6144390	*	*	*	0	124	4210	*	*	*	0	0	1890
WA 5112	588626	6139077	*	*	*	11	110	43210	*	*	*	0	0	1992
WA 6499	595259	6134360	*	*	*	*	*	*	*	*	*	*	*	
WA 5874	588414	6133563	*	*	*	31	98	43210	*	*	*	0	0	2048
SR-7105	586875	6128691	*	R	*	*	*	21	*	*	*	*	*	
SR-7518	586530	6128608	*	R	*	*	*	3	*	*	*	0	0	
WA 6352	591674	6128455	1	*	*	87	81	43210	*	*	.8	.8	1	1291
SR-7515	586287	6128341	*	R	*	*	*	21	*	*	*	*	*	
SUK 80-02	574400	6128275	*	C	*	*	*	21	*	*	*	*	*	
WA 4398	679673	6128138	?	*	*	41.5	44.5	43210	*	*	*	0	0	2571
SUK 80-03	579080	6127750	*	C	*	*	*	21	*	*	*	*	*	
BPM 79-2	586625	6126615	*	C	*	*	*	21	*	*	*	*	*	*
SR-7508	588792	6125983	*	R	*	*	*	3	1.5	*	*	1.5	1	
SR-7506	589066	6125943	*	R	*	*	*	3	*	*	*	*	*	
BRE 1	589142	6125103	*	D	*	*	*	3	1.3	*	*	1.3	*	*
BRE 4	589589	6124680	*	D	*	*	*	3	*	2.05	*	3.0	2	*
BRE-3	589680	6124613	*	D	*	*	*	3	*	*	*	.1	1	*
BRE 2	589752	6124530	*	D	*	*	*	32	*	*	*	0	*	*
SK-1	589220	6123950	0	D	*	*	*	43	1.6	*	*	2.9	2	47
WA 5468	656409	6123949	*	*	*	23	24	43210	.8	*	*	.8	1	2522
SUK W-12	589790	6123900	*	D	*	*	*	3	2.7	*	*	3.1	*	
SUK RDH-E	588834	6123851	*	R	*	*	*	4	*	*	*	*	*	
SK-2	589540	6123760	5	C	F	*	*	3	2.1	*	*	2.7	2	
SUK RHD-C	587873	6123735	*	R	T	*	*	3	*	8.6	*	*	*	
SUD RDH-D	588564	6123699	*	R	*	*	*	43	*	*	*	0	*	17.5
SK-3	588840	6123475	*	C	*	*	*	43	*	*	*	0	0	25.5
SUK RDH-B	586550	6123392	*	R	*	*	*	21	*	*	*	*	*	
SUK RDH-A	586330	6123338	*	R	*	*	*	2	*	*	*	*	*	
SUK W-17	589410	6123200	*	D	*	*	*	3	.2	*	*	.2	*	
WA 5162	619464	6122530	*	*	*	38.5	44.5	43210	*	*	*	0	0	2594
SUK W-16	590950	6122120	*	D	*	*	*	3	2.5	*	*	2.5	1	
WA 3522	607150	6122007	*	*	*	60.5	58	43210	*	*	*	1.5	1	1499
WA 5473	649880	6122006	*	*	*	32	23	43210	*	*	*	0	0	2635
SUK RDH-I	586359	6121713	*	R	*	*	*	21	*	*	*	*	*	
SUK M-2	587085	6121705	*	C	*	*	*	210	*	*	*	*	*	
SUK S-8	587835	6121625	*	D	*	*	*	321	*	*	*	2.4	2	
SUK RDH-K	587323	6121614	*	R	*	*	*	21	*	*	*	*	*	
SUK RDH-T	586472	6121594	*	R	*	*	*	21	*	*	*	*	*	
SUK C-47	590041	6121591	*	C	*	*	*	3	1.7	*	*	3.4	2	
SUK C-48	590610	6121574	*	D	*	*	*	43	4.4	*	*	5.0	2	58
SUK RDH-W	586579	6121558	*	R	*	*	*	21	*	*	*	*	*	
SUK BP-63	589339	6121535	*	C	*	*	*	43	2.1	*	*	3.9	2	41.5
SUK RDH-L	587606	6121533	*	R	*	*	*	21	*	*	*	*	*	
SUK BP-60	589047	6121476	*	C	*	*	*	43	2.6	*	*	4.0	2	31
SUK C-52	589331	6121428	*	D	*	*	*	43	*	*	2.4	7.2	4	88.5
SUK C-38	590275	6121353	V	D	*	*	*	43	3.4	*	*	6.5	3	76
SUK P2-2	589130	6121260	0	C	*	*	*	3	*	3.6	*	5.9	2	
SUK BP-68	589314	6121243	V	C	T	*	*	3	*	2.4	*	4.5	*	
SUK S-6	590690	6121225	*	D	*	*	*	43	.9	*	*	*	*	228
SUK C-46	589759	6121201	V	D	T	*	*	3	*	1.9	*	5.6	4	
SUK S-50	588875	6121150	V	D	*	*	*	32	1.5	*	*	2.9	2	
SUK P2-1	589065	6121150	0	C	*	*	*	3	1.8	*	*	3.5	2	
SUK C-6	588920	6121130	V	D	F	*	*	3	*	*		*	*	
SUK CM-3	588607	6121128	5	D	*	*	*	3	1.6	*	*	3.3	2	
SUK CM-2	588494	6121084	1	D	*	*	*	3	2.0	*	*	4.0	2	
SUK CM-6	589078	6121031	1	D	*	*	*	3	1.8	*	*	3.9	2	
SUK C-39	589902	6121026	*	D	T	*	*	432	*	*	*	*	*	189.
SUK CM-1	588384	6121023	1	D	*	*	*	3	*	2.4	*	3.9	2	
SUK BP-43	587446	6120987	*	R	*	*	*	3	*	*	*	3.6	3	*
SUK CS-5	588691	6120957	*	D	*	*	*	43	2.0	*	*	4.4	4	46
SUK CS-6	588765	6120955	*	D	*	*	*	43	*	4.9	.*	8.8	4	35
SUK CS-7	588868	6120935	*	D	*	*	*	432	*	2.4	*	4.8	3	19

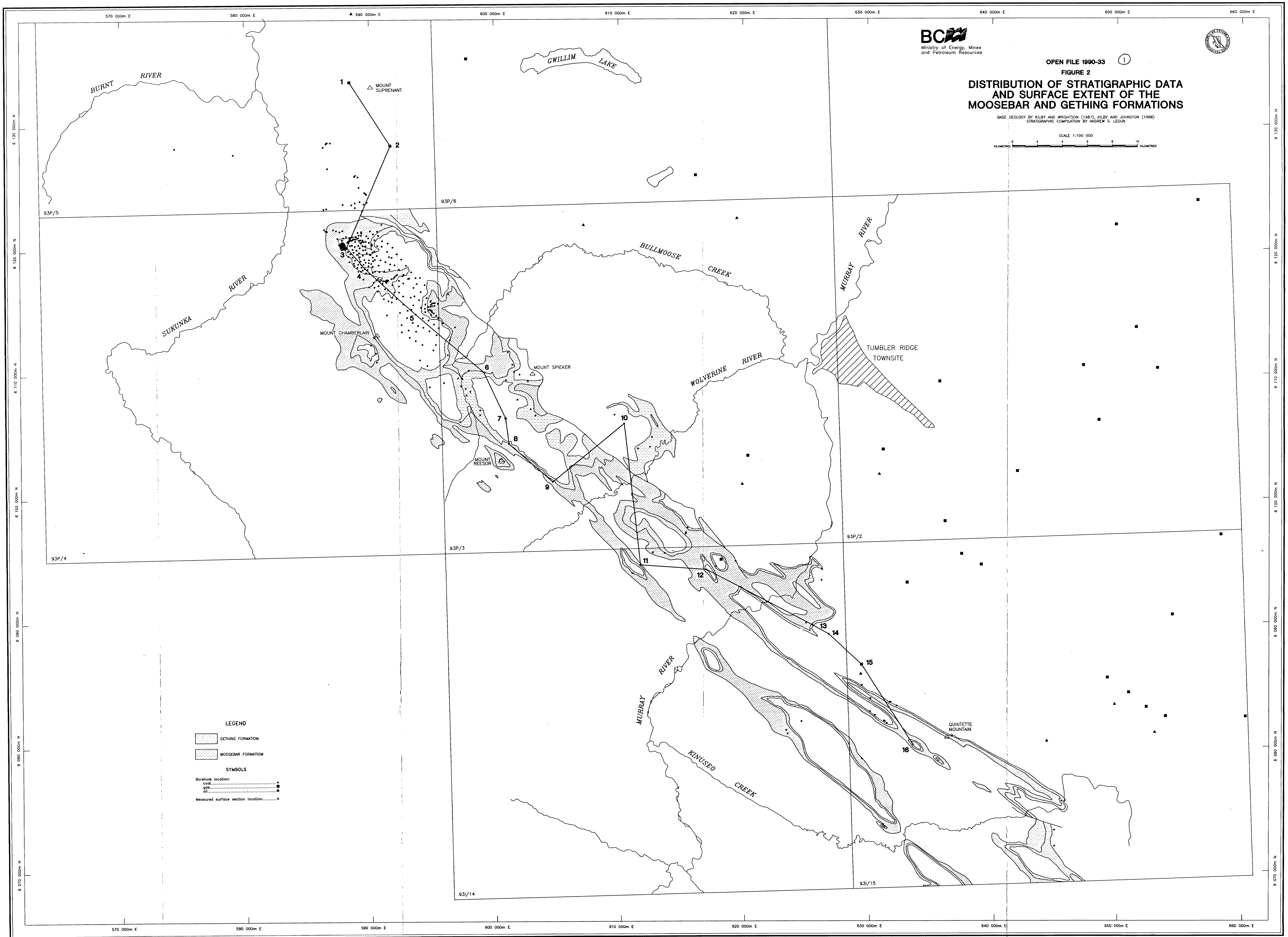
SUK S-1	588415	6120900	*	D	*	*	*	43	*	1.5	*	2.9	2	80
SUK C-34	590406	6120887	2	D	*	*	*	43	2.1	*	*	7.4	7	230
SUK C-50	589277	6120873	1	D	F	*	*	3	2.1	*	*	5.2	3	
SUK CS-4	588609	6120870	5	D	*	*	*	43	*	1.8	*	5.4	4	51
SUK P2-3	589450	6120860	1	C	*	*	*	3	2.0	*	*	3.9	2	
SUK CM-7	589184	6120847	2	D	*	*	*	3	*	2.8	*	4.7	2	
SUK CS-3	588509	6120846	5	D	*	*	*	432	*	2.1	*	4.5	3	57.5
SUK S-47	588414	6120833	*	D	*	*	*	432	*	4.8	*	9.6	3	60.5
SUK C-43	591019	6120797	2	D	*	*	*	43	1.5	*	*	2.0	2	520
SUK BP-66	589694	6120758	*	C	F	*	*	32	*	*	*	*	*	
SUK C-4	588860	6120755	*	D	?	*	*	43	*	3.9	*	10	4	55.5
SUK P2-5A	589540	6120725	0	C	*	*	*	3	3.1	*	*	3.2	1	
SUK CS-1	588244	6120690	5	D	*	*	*	43	1.8	*	*	4.9	4	77.5
SUK C-45	589951	6120677	*	D	*	*	*	43	2.4	*	*	5.7	4	30
SUK P1-28	587847	6120670	0	D	*	*	*	3	1.3	*	*	1.3	1	
SUK S-19	589296	6120659	*	D	*	*	*	3	*	*	*	3.7	3	
SUK BPS-19	589297	6120657	0	C	F	*	*	32	*	2.5	*	5.2	*	*
SUK P1-3	587786	6120650	*	D	*	*	*	3	1.4	*	*	1.4	1	
SUK C-30	587956	6120615	*	D	F	*	*	3	*	*	*	*	*	
SUK C-42	591463	6120610	*	D	?	*	*	3	3.4	*	*	*	*	
SUK P1-27	587902	6120582	0	D	*	*	*	3	1.6	*	*	3.1	2	
SUK P1-11	587694	6120559	*	R	*	*	*	3	1.7	*	*	1.7	1	
SUK P1-14	587868	6120556	0	D	*	*	*	3	*	2.8	*	4.8	2	
SUK P1-20	587651	6120534	0	D	*	*	*	3	1.6	*	*	1.6	1	
SUK P1-21	588000	6120520	0	D	*	*	*	3	1.5	*	*	2.8	2	
SUK P1-16	587697	6120515	*	D	*	*	*	3	1.46	1.80	*	*	*	
SUK P1-17	5876697	6120515	0	D	*	*	*	3	1.9	*	*	3.1	2	
SUK C-31	587791	6120509	1	D	F	*	*	32	1.8	*	*	3.0	2	
SUK P1-19	587578	6120487	0	D	*	*	*	3	1.5	*	*	1.5	1	
SUK S-49	587964	6120471	*	D	F	*	*	32	*	*	*	3.3	2	
SUK S-41	590200	6120460	0	D	*	*	*	432	2.1	*	*	6.9	5	97
SUK P1-18	587618	6120455	0	D	*	*	*	3	1.9	*	*	1.9	1	
SUK C-11	588598	6120450	*	D	*	*	*	43	*	3.4	*	8.5	3	206
SUK P1-7	587903	6120441	*	R	*	*	*	3	1.8	*	*	3.1	2	
SUK P1-15	587718	6120435	2	D	*	*	*	3	1.7	*	*	3.2	2	
SUK P1-1	587825	6120408	*	D	*	*	*	3	1.6	*	*	3.0	2	
SUK C-44	590625	6120408	*	D	*	*	*	432	3.0	*	*	6.8	4	312
SUK C-51	589672	6120401	*	D	F	*	*	3	2.4	*	*	4.8	3	
SUK P1-16	587645	6120399	0	D	*	*	*	3	*	1.8	*	3.3	2	
SUK S-31	590987	6120352	0	D	*	*	*	43	4.5	*	*	9.9	4	337
SUK P1-10	587784	6120333	*	R	*	*	*	3	*	1.6	*	3.5	3	
SUK P1-2	587709	6120314	0	D	*	*	*	3	1.6	*	*	2.9	2	
SUK P1-22	587914	6120305	5	D	*	*	*	3	1.6	*	*	2.3	2	
SUK P1-4A	588050	6120302	*	R	*	*	*	3	*	2.1	*	4.8	3	
SUK C-17	591843	6120274	2	D	*	*	*	43	3.7	*	*	5.1	3	684
SUK BP-53	588169	6120260	*	D	*	99	74	4321	2.0	*	*	4.6	3	37
SUK C-32	589218	6120239	*	D	*	*	*	43	*	2.0	*	3.8	3	35.5
SUK P1-23	587781	6120232	1	D	*	*	*	3	1.7	*	*	2.6	2	
SUK P1-5	587954	6120230	*	D	*	*	*	3	*	1.7	*	4.7	4	
SUK P1-9	587700	6120225	*	R	*	*	*	3	1.9	*	*	1.9	1	
SUK P1-25	588130	6120188	2	C	F	*	*	43	1.9	*	*	4.4	4	11.0
SUK P1-6	587844	6120134	*	R	*	*	*	3	2.5	*	*	4.1	2	
SUK BP-48	588650	6120116	*	R	*	*	*	43	2.8	*	*	4.9	3	224
SUK P1-8	587781	6120101	*	R	*	*	*	2	*	*	*	*	*	
SUK S-18	589674	6120096	*	D	*	*	*	432	3.2	*	*	5.8	3	38.5
SUK BP-59	589484	6120077	*	R	F	*	*	43	*	*	*	6.5	4	45
SUK C-7	588960	6120050	*	D	*	*	*	43	2.7	*	*	5.8	4	209
SUK S-5	590403	6119985	*	D	*	*	*	432	2.4	*	*	5.5	3	105
SUK S-30	591409	6119946	0	D	*	*	*	43	?	*	0.8	1.4	2	327
SUK C-8	590260	6119900	V	D	*	*	*	43	*	*	2.3	5.4	3	84.5
SUK C-10	588730	6119887	V	D	*	*	*	43	*	*	1.8	4.1	3	198.
SUK S-24	589158	6119839	*	D	*	*	*	43	*	2.7	*	6.2	3	218
SUK CM-9	589783	6119836	0	D	*	*	*	43	2.8	*	*	7.5	4	105
SUK C-2	588470	6119760	3	D	*	*	*	432	*	*	*	5.2	4	67
SUK S-35	592175	6119747	*	D	*	*	*	43	2.6	*	*	3.4	2	472
SUK S-21	590031	6119722	5	D	*	*	*	43	2.7	*	*	6.6	3	138
SUK BP-46	589007	6119719	*	R	*	*	*	43	2.8	*	*	5.0	2	257
SUK S-40	590084	6119680	*	D	*	*	*	43	2.7	*	*	5.1	3	324.

SUK BP-50	589473	6119648	*	R	F	*	*	43	2.6	*	*	4.0	2	205
SUK BP-64	590585	6119611	*	R	F	*	*	43	4.1	*	*	6.3	3	296.
SUK BP-65	588324	6119552	*	*	*	*	*	321	2.8	*	*	4.5	2	
SUK CM-4	589231	6119524	*	D	*	*	*	43	*	1.8	*	5.9	3	283
SUK S-17	588650	6119490	*	D	*	*	*	4321	3.0	*	*	7.8	5	30.5
SUK BP-52	590266	6119472	*	R	T	*	*	43	4.4	*	*	8.6	3	323.
SUK S-29	591760	6119454	1	D	*	*	*	43	2.8	*	*	3.7	2	404.
SUK S-37	589956	6119268	*	D	*	*	*	432	3.0	*	*	5.7	3	306
SUK BP-70	590884	6119262	*	R	F	*	*	43	3.9	*	*	6.3	3	345.
SUK BP-56	588848	6119257	*	R	*	*	*	43	3.4	*	*	7.1	3	61
SUK S-23	590295	6119197	V	D	T	*	*	43	*	1.5	*	3.6	3	328
SUK BPS-23	590293	6119196	0	C	F	*	*	43	*	2.4	99	4.8	*	328
SUK S-45	589280	6119175	1	D	*	*	*	432	3.3	*	*	7.2	3	311
SUK S-7	588400	6119123	*	D	*	*	*	210	*	*	*	*	*	
SUK C-13	591277	6119117	*	D	*	*	*	43	2.7	*	*	6.1	5	433
SUK C-9	589689	6119072	3	D	*	*	*	43	4.2	*	*	6.4	4	351.
SUK BP-47	589947	6119035	*	C	*	*	*	432	2.7	*	*	5.1	3	293
SUK BP-57	588751	6118986	*	R	F	*	*	43	3.8	*	*	6.4	3	39
SUK BP-69A	591655	6118931	*	D	*	*	*	43	2.7	*	*	3.9	2	435.
SUK S-34	589096	6118917	*	D	T	*	*	43	2.8	*	*	6.7	3	302.
SUK CM-5	589519	6118911	*	D	*	*	*	43	2.5	*	*	5.9	4	294
SUK S-25	590735	6118833	*	D	*	*	*	43	2.1	*	*	3.5	3	396
SUK S-36	592928	6118815	*	D	*	*	*	43	2.7	*	*	5.1	3	310
SUK S-43	588795	6118810	*	D	*	*	*	43	3.0	*	*	6.6	4	18
SUK S-26	589921	6118803	1	D	*	*	*	43	2.4	*	*	5.7	5	339
SUK BP-62	590263	6118747	*	R	*	*	*	43	2.7	*	*	4.5	3	270
SUK BP-51	589358	6118676	*	R	F	*	*	43	2.8	*	*	4.2	2	294
SUK BP-55	589027	6118666	*	R	F	*	*	432	3.2	*	*	6.8	3	71.5
SUK C-35	589632	6118563	3	D	*	93	73	4321	2.4	*	*	5.9	3	227.
SUK C-1	591594	6118505	0	D	*	*	*	43	2.4	*	*	3.2	2	374.
SUK C-12	589848	6118496	V	D	*	*	*	432	2.8	*	*	5.0	3	205
SUK S-38	589458	6118452	*	D	F	*	*	43	2.7	*	*	8.1	4	205.
SUK S-27	591191	6118379	0	D	*	*	*	43	3.4	*	*	4.3	2	327.
SUK BP-54	589309	6118355	*	R	F	*	*	3	*	*	*	*	*	*
SUK BP-42	590445	6118353	5	C	*	*	*	43	3.20	*	*	5.2	3	314
SUK C-37	590788	6118341	0	D	*	*	*	43	2.44	*	*	4.7	3	314
SUK C-20	593347	6118280	5	D	*	*	*	43	4.51	*		5.1	2	213
SUK C-3	589725	6118225	*	D	*	*	*	43	2.60	*	*	6.1	3	115
SUK C-26	592751	6118099	*	D	*	*	*	43	2.7	*		8.3	5	202.
SUK R-13	592240	6118089	*	R	*	*	*	43	*	*	1.8	1.8	1	74
SUK R-14	592136	6118019	*	R	*	*	*	43	3.7	*	*	6.4	4	62.5
SUK BP-75	592663	6117982	*	R	T	*	*	43	*	4.2	*	12.5	5	616
SUK R-12	592019	6117912	*	R	*	*	*	43	2.4	*	*	4.8	4	52.5
SUK C-19	593688	6117811	*	D	*	*	*	432	3.9	*		4.5	2	271
SUK S-11	591925	6117790	*	D	*	96.5	*	432	*	*	*	3.7	2	34
SUK S-4	590690	6117772	*	D	*	*	*	321	2.8	*	*	2.8	1	
SUK C-23	593188	6117772	2	D	*	*	*	43	3.0		*	8.7	4	542
SUK R-9	591758	6117741	*	R	*	*	*	43	2.4	*	*	7.2	5	9.5
SUK S-2	589505	6117715	V	D	T	*	*	3	6.9	*		*	*	
SUK R-6	591369	6117648	*	R	*	*	*	43	1.1	*	*	1.1	1	47.5
SUK R-8	591497	6117637	*	R	*	*	*	432	1.8	*	*	2.8	2	65.5
SUK R-2	590939	6117637	*	R	*	*	*	43	1.7	*	*	1.7	1	30.5
SUK C-28	592376	6117604	*	D	*	*	*	43	2.7	*	*	4.8	3	305
SUK R-10	591318	6117596	*	R	*	*	*	432	8.5	*	*	11.2	2	3
SUK R-4	591100	6117580	*	R	*	*	*	43	*	6.7	*	10.5	3	38.5
SUK R-5	591247	6117564	*	R	*	*	*	43	3.3	*	*	3.3	1	34
SUK R-1	590820	6117556	*	R	*	*	*	43	2.0	*	*	3.7	2	34
SUK BP-76	591443	6117555	*	R	F	*	*	43	2.3	*	*	3.4	2	77
SUK S-15	590335	6117467	*	D	*	*	*	32	2.4	*	*	2.4	1	
SUK S-13	591342	6117446	*	D	*	*	*	43	3.7	*	*	4.7	2	61
SUK R-3	591041	6117382	*	R	*	*	*	43	*	.9	*	1.7	2	43
SUK C-29	593780	6117337	1	D	*	*	*	43	4.4	*	*	5.0	2	357
SUK C-22	591830	6117271	*	D	*	*	*	43	3.3	*	*	5.7	3	288
SUK BP-21	594414	6117247	0	C	F	*	*	4321	4.2	*	*	5.2	3	191.
SUK BP-77	590725	6117186	*	R	*	*	*	3	2.6	*	*	2.6	1	
SUK S-42	592377	6117156	*	D	F	*	*	432	*	*	*	*	*	360.
SUK BP-72	589955	6117087	V	C	*	*	*	3	3.1	*	*	3.8	2	18
SUK C-41	590390	6117071	5	D	*	*	*	43	2.4	*	*	3.7	3	36

SUK BP-32A	593518	6117028	*	C	T	*	*	43	7.5	*	*	8.1	2	535.
SUK BP-32	593520	6117025	*	D	*	*	*	432	6.58	*	*	*	*	535.
SUK S-12	591482	6116845	*	D	*	103.5	72	4321	2.7	*	*	2.7	1	73.5
SUK S-46	590659	6116754	*	D	*	*	*	432	2.7	*	*	3.9	2	201.
SUK BP-14A	594088	6116686	1	C	*	*	*	43	4.4	*	*	5.5	3	438
SUK C-40	592000	6116670	5	D	*	*	*	43	3.05	*	*	6.7	4	195
SUK C-27	592377	6116660	*	D	*	*	*	432	2.4	*	*	5.4	4	369
GSC 80-1	596300	6116500	*	S	*	76.5	61.5	4321	1.8	*	*	2.2	2	0
SUK BP-4	592696	6116344	6	C	*	*	*	43	3.0	*	*	5.2	3	488
SUK BP-8	583590	6116343	*	C	T	*	*	43	*	5.0	*	9.8	3	416.
SUK BP-1	593296	6116249	V	D	F	*	*	43	2.0	*	*	5.6	4	500
SUK C-18	591807	6116247	1	D	*	*	*	43	2.70	*	*	7.2	5	198
SUK BP-22	594567	6116197	1	C	*	*	*	43	5.0	*	*	7.0	4	71.5
SUK C-25	592149	6116142	1	D	*	*	*	43	3.2	*	*	7.0	4	346
SUK C-16	591135	6116135	*	D	*	*	*	43	3.04	*	*	8.3	4	293.
SUK BP-37	593961	6116037	2	D	?	*	*	43	5.8	*	*	7.2	3	324
BULL T-39	594906	6115977	0	C	*	*	*	3	4.8	*	*	4.8	1	
SUK S-16	591500	6115959	*	D	*	*	*	43	3.2	*	*	3.7	2	331
BULL T-51	594874	6115891	*	C	*	*	*	3	4.4	*	*	8.2	3	
SUK C-24	591765	6115870	*	D	*	*	*	432	*	*	2.9	6.3	3	337
BULL T-50	595231	6115804	*	C	*	*	*	43	5.0	*	*	6.6	2	15
BULL T-48	595097	6115780	*	C	*	*	*	3	*	*	*	1.7	3	
SUK BP-39	595001	6115755	*	C	F	*	*	3	*	*	*	*	*	
BULL T-40	595466	6115732	*	C	*	*	*	3	6.9	*	*	7.6	2	
SUK BP-30	592709	6115698	8	C	*	*	*	43	2.6	*	*	5.1	4	625
BULL T-38	594465	6115696	0	C	*	*	*	43	4.0	*	*	5.5	2	58
BULL T-46	594900	6115660	*	C	*	*	*	3	4.5	*	*	5.0	2	
BULL T-19	593502	6115620	*	D	*	*	*	43	4.2	*	*	8.4	3	416
BULL T-49	595188	6115570	*	C	*	*	*	3	4.9	*	*	4.9	1	
SUK BP-33	595009	6115547	*	D	*	*	*	2	*	*	*	*	*	
SUK BP-35	594851	6115500	*	D	T	*	*	32	2.5	*	*	2.5	1	
SUK BP-41	594678	6115490	5	C	*	*	*	3	5.2	*	*	5.7	2	
BULL T-1	594094	6115420	*	D	*	*	*	43	4.2	*	*	8.4	4	261.
SUK BP-40	594425	6115337	9	C	T	*	*	43	*	*	*	*	*	77
SUB BP-26	593351	6115267	*	C	*	*	*	43	3.6	*	*	6.1	2	439
SUK BP-28	594851	6115247	1	C	T	*	*	3	6.5	*	*	7.8	2	
SUK BP-38	594704	6115230	*	C	T	*	*	3	*	5.9	*	10.5	3	
SUK BP-10	593047	6115189	0	C	*	*	*	43	6.6	*	*	9.9	3	613.
SUK BP-34	594884	6115186	*	D	T	*	*	3	13.2	*	*	14.2	*	
SUK BP-27	594973	6115168	*	C	T	*	*	3	*	*	*	0	*	
BULL T-18	594461	6115068	*	D	*	*	*	43	4.2	*	*	7.5	3	102
SUK BP-36	595010	6115040	1	D	*	*	*	43	5.0	*	*	8.1	3	30.5
SUK BP-18	592441	6115024	2	C	*	*	*	43	3.5	*	*	5.7	4	630.
SUK BP-25A	595144	6114953	4	C	T	*	*	43	*	*	2.6	5.2	2	9.5
SUK BP-2	593674	6114870	5	C	*	68	64.5	4321	3.6	*	*	7.3	3	373.
BULL T-4	594925	6114835	*	D	*	*	*	43	4.0	*	*	7.4	3	58.6
SUK BP-16	591384	6114825	2	C	*	*	*	43	3.5	*	*	6.7	4	557
SUK BP-24	595327	6114780	3	C	T	*	*	3	5.2	*	*	5.2	1	
SUK BP-6	592998	6114601	4	C	*	*	*	43	3.2	*	*	5.8	2	623
SUK BP-11	594249	6114575	5	C	*	*	*	43	4.0	*	*	6.7	3	331
BULL T-17	595496	6114553	0	D	*	*	*	43	*	*	4.0	6.1	2	75
BULL T-16	594717	6114394	*	D	*	*	*	43	7.8	*	*	21.5	5	320
BULL T-20	593450	6114210	*	C	*	*	*	43	*	*	2.7	6.0	3	587.
BULL T-5	595867	6114173	*	D	*	*	*	43	*	.9	*	3.0	4	121.
SUK BP-17	595153	6114071	6	C	F	*	*	43	4.0	*	*	6.8	3	355
SUK BP-20	592569	6114036	0	C	*	*	*	43	*	*	2.5	5.2	3	650
SUK BP-5	593877	6113960	1	C	*	*	*	43	2.7	*	*	6.1	3	504.
BULL T-2	596828	6113834	*	D	*	*	*	3	*	1.1	*	2.7	3	
BULL T-3	594291	6113811	*	D	*	*	*	43	4.8	*	*	8.2	3	439.
SUK BP-12	595537	6113774	1	C	*	*	*	432	*	*	2.6	6.7	5	393
WA 6450	651504	6113748	*	*	*	29	21	43210	.8	*	*	.8	1	2352
SUK BP-29	593121	6113599	*	C	T	*	*	43	3.2	*	*	13.2	6	528.
SUK BP-9	593716	6113500	1	C	*	*	*	43	*	*	2.60	4.8	2	479
SUK BP-19	592587	6113457	*	C	*	*	*	43	*	*	4.2	8.0	3	612
BULL T-6	595365	6113213	*	D	*	*	*	43	*	*	2.0	6.0	4	350
BULL T-8	593216	6113014	0	C	*	90.5	*	432	*	*	2.0	3.5	3	490
BC 87-7	590350	6113000	*	S	*	*	*	*	*	*	*	*	*	0
BULL T-9	596413	6112791	*	D	*	*	*	43			2.13	4.2	3	26.5

SUK BP-13	595300	6112424	2	C	*	*	*	43	*	*	3.5	7.2	3	319.
BULL T-10	*594215*	*6112424*	*	*C*	*	*	*	43	*	2.3	*	*4.1*	2	426
BULL TC-3	590100	6112410	*	C	*	*	*	43	*	*	2.3	4.4	2	4
BULL T-11	595098	6111998	*	D	*	*	*	43	*	1.2	*	2.7	3	324.
WA 4692	653143	6111876	*	*	*	26.5	22.5	43210	.4	*	*	.4	1	2840
MS D1 CR.	601050	6111800	*	S	*	*	*	43	*	*	3.0	6.3	4	0
BULL TC-1	590500	6111750	*	C	*	*	*	43	*	2.0	*	5.4	5	42.5
BULL T-7	*596255*	*6111609*	*	D	*	*	*	43	*	*	2.5	*7.6*	7	*24*
SUK BP-7	594016	6111192	2	C	*	*	*	43	*	*	1.71	2.4	2	346
BULL TC-2	590550	6111050	*	C	*	*	*	43	*	*	3.5	6.4	4	23
BULL T-12	594605	6110739	*	D	*	*	*	43	*	.9	*	.9	1	332.
WA 5323	647259	6110695	*	*	*	29	34	43210	.5	*	*	.5	1	2610
MS E CR.	598400	6110370	*	S	*	63	*	3	*	*	*	*	4	0
MS 161	*597900*	*6110350*	*	*	*	*	*	3	*	*	2.3	3.2	2	*0*
MS-11	601538	6110233	*	C	F	*	*	43	*	*	3.6	8.2	5	145
MS-45	597668	6108874	*	D	*	*	*	43	*	*	*	.5	1	
WA 4946	648529	6106280	*	*	*	20.5	27.5	43210	1.1	*	*	1.1	1	2618
MS I CR.	597225	6106200	*	S	*	*	*	3	*	*	*	3.4	3	0
QWD-7115	610406	6106027	1	D	*	54	*	432	2.0	*	*	4.6	3	369
QWD-7112	*612624*	*6104933*	1	D	*F*	37	42	4321	*1.8*	*	*	4.3	3	*142.*
WA 4887	598474	6104894	*	*	*	61	92	43210	*	*	*	0	0	2081
BC 87-6	601100	6104400	*	S	*	82	40	432	*	*	*	*	2	0
QWD-7403	612461	6104147	2	C	*	*	63	210	*	*	*	*	*	
QWDH-1	611496	6104020	0	D	*	*	48	3210	*	3.0	*	5.8	*	
WA 3814	631171	6103919	?	*	*	36.5	27.5	43210	4.8	*	*	7.5	2	1946
WA 3319	*620320*	*6103433*	*	*	*	*45*	*37.5*	*43210*	*	3.0	*	*6.9*	4	928
MS-14	602865	6102203	*	C	*	*	*	43	*	*	2.4	5.2	3	
WA 3194	630863	6101931	?	*	*	29	26	43210	*	*	2.4	5.1	3	2330
QWDH-2	604615	6101350	3	D	*	*	40.5	321	*	*	*	.8	*	
WA 3403	619867	6101145	1	*	*	34.5	34	43210	*	2.1	*	6.2	4	691
WA 4168	636112	6098147	?	*	*	41	24	43210	*	1.2	*	3.4	4	1834
QMR-8122	615461	*6097649*	*	R	*	105	22	321	*	1.4	*	4.0	4	23
QMR 8262	615339	6097268	*	R	*	*	*	1	*	*	*	*	*	
QMR-8123	615312	6097163	*	R	*	*	*	21	*	*	*	*	*	*
WA 4867	658254	6097057	?	*	*	22.5	18.5	43210	2.0	*	*	2.0	1	2931
BC 87-3	612650	6095650	*	S	*	*	13.5	321	*	*	*	*	1	0
QFR 84722	613616	6095609	4	D	*	*	13.5	321			*	1.9	*	
WA 5099	618153	*6095088*	1	*	*	*76*	21	*43210*	*	*	.9	1.6	2	255
QJD 7642	619315	6094950	*	C	*	*	*	21	*	*	*	*	*	
WA 4555	639009	6094659	?	*	*	42.5	31.5	43210	.8	*	*	1.3	2	2170
BC 87-2	611650	6094650	*	S	F	59.5	21	321	*	*	*	*	2	0
QJD 7641	617750	6094550	3	D	*	*	*	1	*	*	*	*	*	*
QHD 86010	616958	6094274	1	C	*	71	15	321	*	*	1.0	1.0	1	5
BC 87-1	611000	6094000	*	S	*	*	39	321	.5	*	*	*	1	0
QBD-8106	626192	6093412	1	D	*	53.5	15.5	4321	3.2	*	*	3.2	1	300
WA 4221	633061	6093214	?	*	*	43.5	18	43210	*	*	1.6	3.2	2	1822
WA 4449	654394	6090628	1	*	*	32.5	1.5	43210	.5	*	*	1.0	2	2558
QBR-8122	634946	6089979	*	R	*	*	*	3210	*	*	*	*	*	*
QBR-8121	625471	6089794	1	R	*	66	20	4321	1.0	*	*	1.0	1	35.6
QBD-7102	626761	6089073	*	D	*	60	*	43	*	*	.7	1.3	2	415.
WA 5189	629384	6086628	2	*	*	64.5	10.5	43210	*	*	2.3	2.8	2	744
WA 4542	638181	6085949	4	*	*	65	8	43210	*	1.8	*	5.2	4	1097
WA 4136	649185	6085556	1	*	*	39.5	16.5	3210	*	2.0	*	3.5	2	2333
WA 3180	650940	6084369	?	*	*	40	22	43210	*	1.2	*	3.5	4	2235
QT 1	630100	6083900	*	*	*	*	*	3	*	*	*	5.2	3	0
QBD 7403	631705	6083610	3	D	*	*	*	43	*	*	2.7	7.0	4	22
QT 19	631640	6083600	*	*	*	*	*	3	*	*	*	4.1	3	0
QT 20	632200	6083300	*	*	*	*	*	3	*	*	*	3.9	3	0
WA 4550	652322	6083195	5	*	*	40	5	43210	*	1.5	*	3.5	3	2319
QT 2	630050	6082850	*	*	*	*	*	3	*	2.8	*	6.4	4	0
QT 3	630450	6082550	*	*	*	*	*	3	*	*	*	6.5	1	0
WA 3407	653858	6082455	7	*	*	38	6	43210	*	*	1.5	6.4	5	2353
WA 5699	660233	6082432	?	*	*	25	5	43210	*	*	2.0	2.0	1	2696
QT 4	631170	6082100	*	*	*	*	*	3	*	*	*	6.9	2	0
QFD 7220	624561	6082057	0	D	*	*	*	43	3.1	*	*	4.4	3	334
QT 5	631250	6082050	*	*	*	*	*	3	*	*	*	7.8	3	0
QT 6	631400	6081900	*	*	*	*	*	3	*	*	*	2.8	*	0
WA 3233	652981	6081149	*	*	*	31	5.5	43210	*	*	1.6	2.6	2	3029

QFD-7222	623460	6081069	*	D	*	*	*	*	*	*	*	*	*			
BC 87-8	636600	6080900	*	S	*	76	*	43210	*	*	*	*	1	0		
WA 3546	644240	6080452	2	*	*	44.5	0	43210	*	*	4.8	5.6	2	1583		
BC 87-5	633500	6080150	*	S	*	*	13	321	*	*	*	*	1	0		
QDH-1	628450	6079200	1	D	*	63.5	4	4321	*	3.0	*	3.7	2	48		
MDH 78-07	645435	6075635	*	R	*	39	0	431	*	*	*	1.3	1	56.5		
MDD 7703	644838	6072002	*	C	*	*	*	431	*	*	*	*	*	57		
SR NO 1	*	*	*	D	*	*	*	432	*	*	*	*	*			
MS-8	*	*	*	C	*	*	*	43	*	*	3.6	8.5	5			



Cartography by P. Chicorelli

TO ACCOMPANY OPEN FILE 1990–33
FIGURE 2
DISTRIBUTION OF STRATIGRAPHIC DATA
AND SURFACE EXTENTS OF THE
MOOSEBAR AND GETHING FORMATIONS

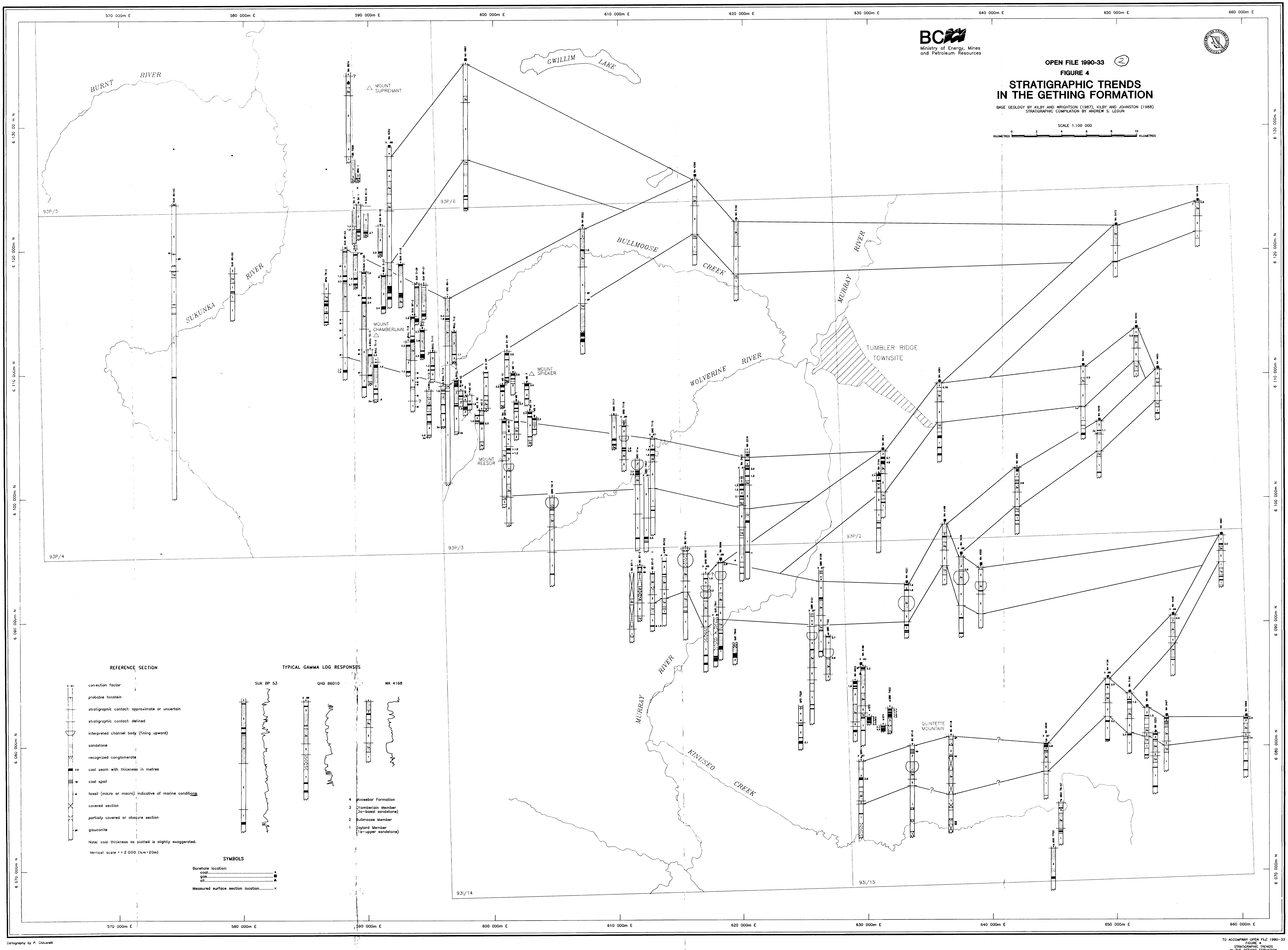


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FIGURE 4
STRATIGRAPHIC TRENDS
IN THE GETHING FORMATION