

PR-WEST BRAZION 79(1)A

Report on the 1979
Exploration Program
West Brazion Coal Property
(Coal Licences 4524-4529 inclusive)
Sukunka River Area, B.C. (93P/5W)

OPEN FILE

By
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for
Teck Corporation
and
Amalgamated Brameda-Yukon Limited

December 1979

GEOLOGICAL BRANCH
ASSESSMENT REPORT

00 687

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INTRODUCTION

During the period July 31 to August 19, 1979, a grass roots exploration program was carried out on the West Brazion coal licences held by Brameda Resources Limited (now Amalgamated Brameda-Yukon Limited).

It was designed to gain knowledge of the structure and stratigraphy of the area, as well as determine the extent and quality of coal seams discovered in late 1978.

The program consisted of geologic mapping and diamond drilling. A tent camp for four men was established on July 31, and work began shortly thereafter. Full-time staff included one geologist, two diamond drillers and one geological assistant.

Minor physical land disturbance took place as all support was by air, and all sites prepared for drilling were in natural clearings in a burnt-off area. Reclamation and forest hazard abatement measures were carried out and were co-ordinated with the Reclamation Branch and the local forestry office.

PROPERTY, LOCATION, ACCESS

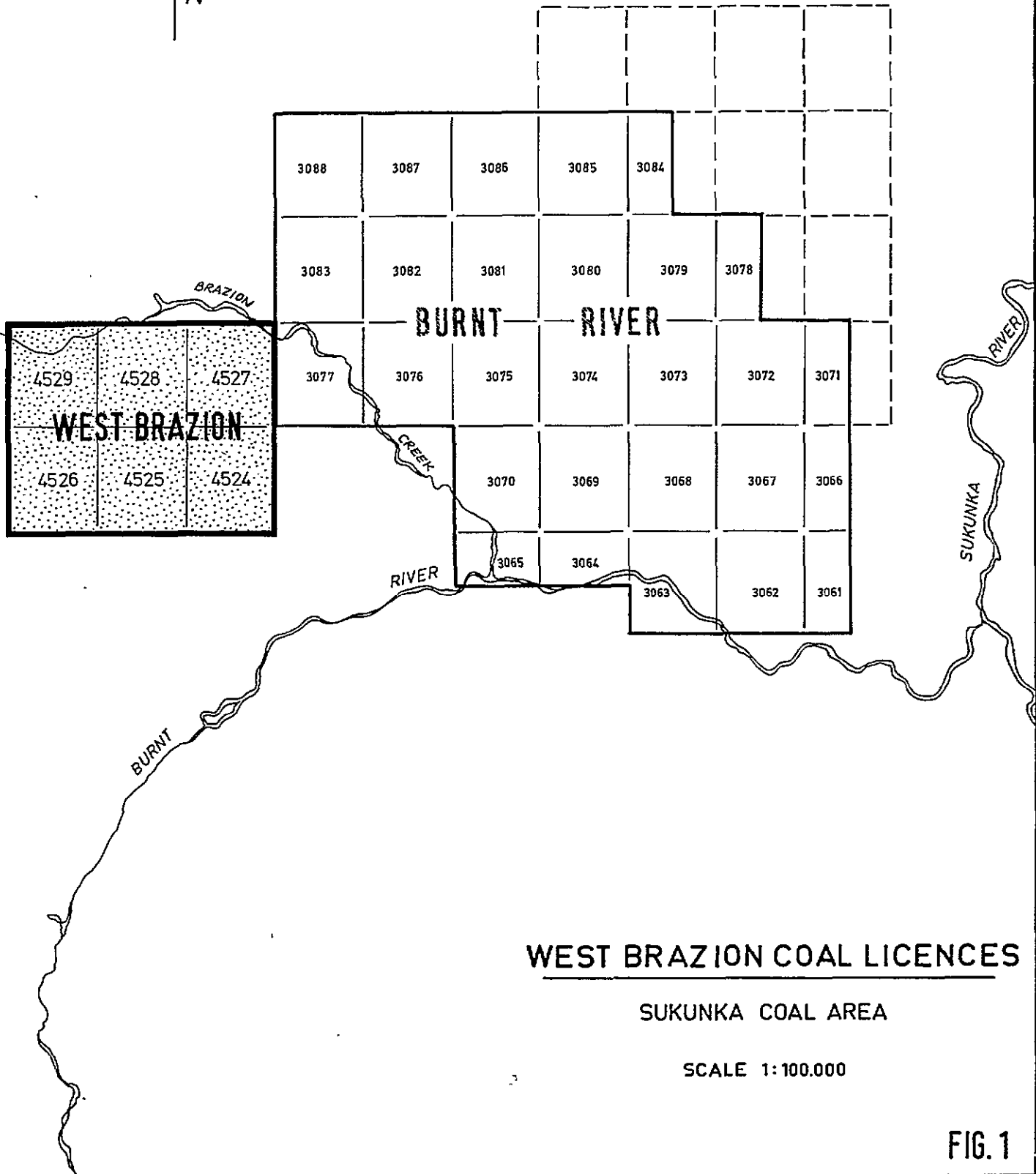
The West Brazion coal property comprises six coal licences wholly owned by Amalgamated Brameda-Yukon Limited (fig. 1).

The property is located 44 kilometres south-east of Chetwynd, B.C. in the Laird Mining Division (fig. 2).

Access to the property is confined to helicopter. The property lies mainly on a broad plateau that was burnt off by forest fires several years ago.

DIAMOND DRILLING

The object of the drilling program was to explore the com-



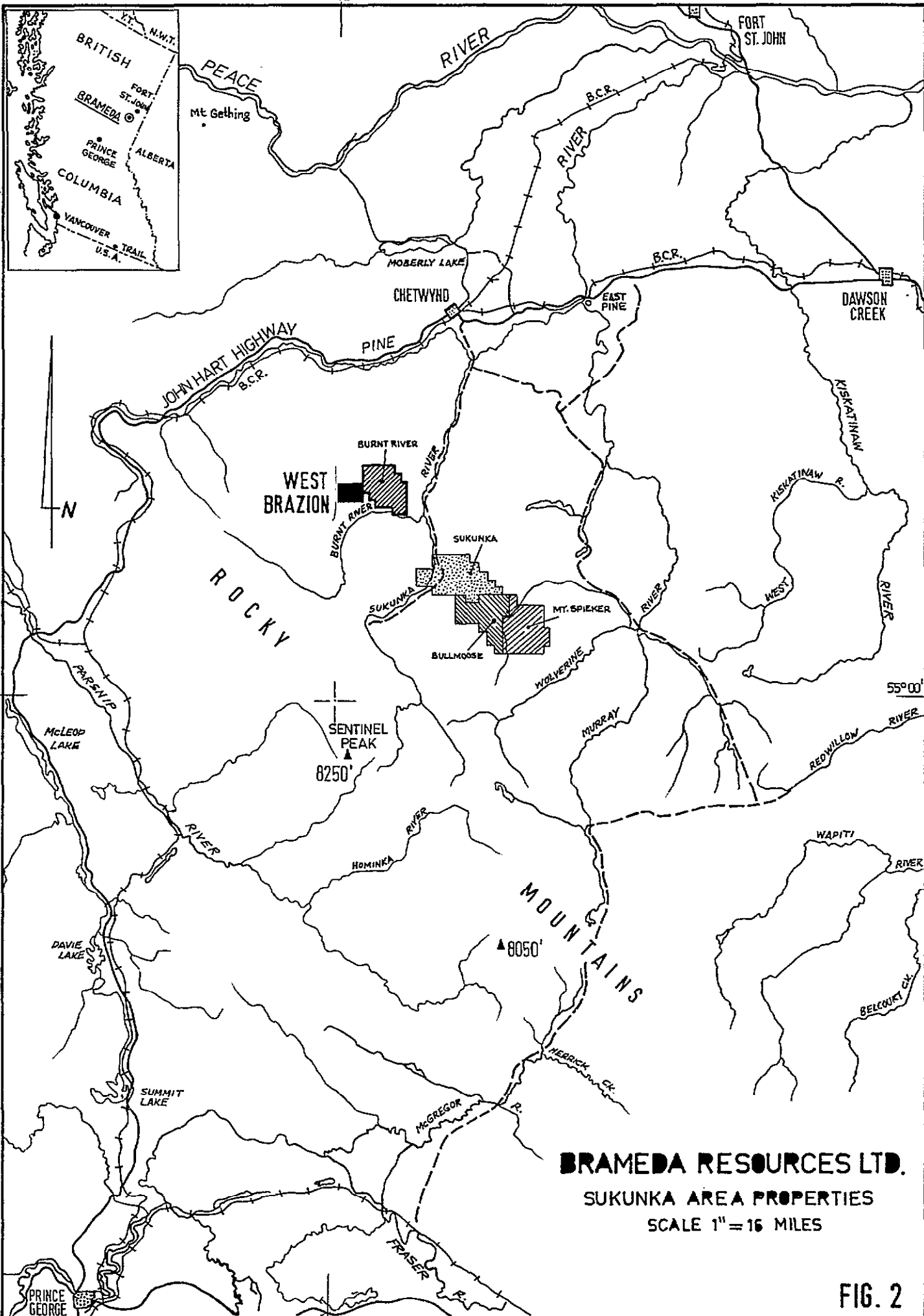
WEST BRAZION COAL LICENCES

SUKUNKA COAL AREA

SCALE 1:100.000

FIG. 1

122°



BRAMEDA RESOURCES LTD.

SUKUNKA AREA PROPERTIES

SCALE 1" = 16 MILES

FIG. 2

plete stratigraphic section of Lower Gething exposed on the licences. To achieve this, Teck Explorations provided a portable winkle drill capable of producing AX core. Due to a water shortage, neither hole could be finished. The two holes totalled 97.07 meters (318'). The equipment was moved between drill sites using a Jet Ranger 206B. The drill crew worked a ten-hour shift and averaged 9.7 metres (32') per shift, including moving. This average would have been higher if a plentiful supply of water had been available. Fig. 4 shows the location of drill holes and stratigraphic logs for each hole are attached in a separate pocket.

CORE LOGGING AND SAMPLING

All drill cores were logged in detail and stratigraphic logs were prepared on a scale of 1:200. Coal seams considered mineable were sampled and sent to Cyclone Engineering for proximate analysis. Results of core analyses are shown in Appendix I. Core recovery was extremely high (> 95%). The core is presently stored in Chetwynd and will be moved to the government facilities in Charlie Lake at a later date.

GEOLOGY

The West Brazion coal licences were acquired due to our geologic investigations in the Burnt River area. Air photo interpretation led us to believe that a section of the coal-bearing Gething Formation with gentle dips occurred in the Brazion Creek area adjoining the Burnt River coal licences. In late 1978 during initial field reconnaissance, the 'Discovery Seam' was located in the northern part of the property, and one winkle drill hole was drilled to test the thickness and quality of the coal (BW-27).

In 1979, detailed mapping and diamond drilling were

carried out for two purposes. Firstly, to test the quality and extent of the Discovery Seam, and secondly, to see if any other seams occurred in the now known section of Gething on the property.

GEOLOGIC SETTING

The regional geology of this particular area had previously been investigated with very little detail, but is now felt to be similar to the setting found on the Burnt River licences. The area of interest, i.e. underlain by the 'Discovery Seam', is one of general geologic simplicity. To the west, an east-dipping thrust fault of moderate displacement occurs. Directly to the west of the fault, the Gething and Cadomin Formations are tightly folded. The structural trend of these features is to the north-west, as at Burnt River. The Gething, Cadomin and upper members of the Minnes Group underly the West Brazion licences. The northern and western edges of the property are overlain by a considerable amount of glacial till. Very little outcrop occurs on the property; less than 5%, most of which comprises units of the Cadomin Formation.

STRATIGRAPHY

The stratigraphic thickness of lower Gething that occurs on the property is probably less than 90 metres (295'). The predominate rock type is carbonaceous mudstone (> 50%) with the remaining portion consisting of thinly inter-bedded sandstone, siltstone and mudstone (30%); with conglomerate and sandstone approximately 20%. As usual for this area, the only available marker-beds were the coal seams. The bedding in the rock units was generally convoluted and sand-pebble units were poorly sorted. From looking at the core, I strongly suspect that several facies changes occur in the area, although they may be minor.

The Cadomin Formation, due to its resistant nature, proved to be the only usable formation for mapping purposes. Rock units exposed were coarse sandstones to poorly sorted conglomerates. The formation itself is some 75 metres thick where exposed in the northern part of the property.

The Brenot (upper Minnes Group), where exposed, consisted of silty to shaley sandstones of locally limited thickness. Very little attention was given to these units during mapping.

COAL SEAMS

During the 1979 program, three (3) new seams were discovered when WB79-1 was drilled. This hole drilled a stratigraphic section above BW-27 ('Discovery Seam'). The three new seams will be known as A, B and C seams (see stratigraphic logs)..

All four seams discovered to date on the property are quite similar in character.

1. Combined mudstone for roof and floor rock.
2. Basically bright, hard, blocky coal.
3. Minor rock partings (except for 'C' seam - 33.7% ash).

The seam most amenable for open-pit mining is the 'Discovery Seam' due to its thickness and quality. The 'B' and 'C' seams may prove to be as valuable once further data on their extent and quality is obtained.

COAL QUALITY

The data available on coal quality at the present time is of a limited degree so comparisons are difficult, and conclusions impractical. The coal measures encountered are medium volatile bituminous coals with low ash and high

calorific value. The Free Swelling Index (F.S.I.) has extreme variations, and the sulphur content is considered very low (< .55%).

These coals are generally clean, hard and bright, although rock splits and "high-ash bands" were observed. The seam of most interest is the 'Discovery Seam' as it is the thickest seam discovered to date. It has possibilities as a blending coal for metallurgical use, but more realistically as a thermal coal. Its character is very similar to the coals found on the adjacent Burnt River coal property, although in some cases the Brazion coals have a high F.S.I.

The proximate analyses for the drill intersections sampled are appended to this report.

RESERVES

Due to inadequate data, a reserve calculation is near impossible at this stage. However, for the 'Discovery Seam', it may be said that it has "possible" reserves in the order of seven to eight (7 - 8) million tons of raw coal in-place.

RECOMMENDATIONS

The 1979 program demonstrated that the West Brazion area has limited potential for coal reserves. However, if an exploration program is conducted on the Burnt River licences in 1980, one, and possibly two, winkle drill holes should be drilled to complete section line A-A'.

Respectfully submitted

B. McClymont
P.Geol.

TECK CORPORATION LIMITED

Project: Burnt River
Hole No.: BW-27 (DISCOVERY SEAM)
Footage: 21.18 - 23.77

S1-273
CES # 94

	<u>Air Dry Basis</u>	<u>Dry Basis</u>
<u>PROXIMATE ANALYSIS:</u>		
Ash %	8.77	8.91
Residual Moisture %	1.56	--
Volatile Matter %	<u>20.60</u>	20.93
Fixed Carbon %	69.07	70.16
<u>CALORIFIC VALUE</u> BTU/lb.	13,750	13,970
Cal/gm.	7,640	7,760
<u>SULPHUR %</u>	0.45	0.46
<u>FREE SWELLING INDEX</u>	<u>1 1/2</u>	

TECK CORPORATION

Project: Burnt River (Brazion)

S1-273

Hole No.: WB-79-1

Sample No.: 3 "A seam"

		<u>Air Dry Basis</u>	<u>Dry Basis</u>
<u>PROXIMATE ANALYSIS:</u>			
Ash %		11.91	12.04
Residual Moisture %		1.08	-
Volatile Matter %		23.41	23.67
Fixed Carbon %		63.60	64.29
<u>CALORIFIC VALUE</u>	BTU/lb.	13,500	13,650
	Cal/gm.	7,500	7,580
<u>SULPHUR %</u>		0.55	0.56
<u>FREE SMELLING INDEX</u>			7½

TECK CORPORATION

Project: Burnt River (Brazion)

S1-273

Hole No.: WB-79-1

Sample No.: 2 "B seam"

	<u>Air Dry Basis</u>	<u>Dry Basis</u>
<u>PROXIMATE ANALYSIS:</u>		
Ash %	14.06	14.24
Residual Moisture %	1.24	-
Volatile Matter %	24.73	25.04
Fixed Carbon %	59.97	60.72
<u>CALORIFIC VALUE</u> BTU/lb.	12,760	12,920
Cal/gm.	7,090	7,180
<u>SULPHUR %</u>	0.33	0.33

FREE SWELLING INDEX

7

TECK CORPORATION

Project: Burnt River (Brazion)

SI-273

Hole No.: WB-79-1

Sample No.: 1 "C seam"

	<u>Air Dry Basis</u>	<u>Dry Basis</u>
<u>PROXIMATE ANALYSIS:</u>		
Ash %	33.29	33.71
Residual Moisture %	1.23	-
Volatile Matter %	19.33	19.57
Fixed Carbon %	46.15	46.72
<u>CALORIFIC VALUE</u> BTU/lb.	9,850	9,970
Cal/gm.	5,470	5,540
<u>SULPHUR %</u>	0.35	0.35

FREE SWELLING INDEX

4

TECK CORPORATION

Project: Burnt River (Brazion)

SI-273

Hole No.: WB-79-2 (DISCOVERY SEAM)

Sample No.: -

	<u>Air Dry Basis</u>	<u>Dry Basis</u>
<u>PROXIMATE ANALYSIS:</u>		
Ash %	10.74	10.93
Residual Moisture %	1.72	-
Volatile Matter %	20.98	21.35
Fixed Carbon %	66.56	67.72
<u>CALORIFIC VALUE</u> BTU/lb.	12,820	13,040
Cal/gm.	7,120	7,240
<u>SULPHUR %</u>	0.26	0.26
<u>FREE SWELLING INDEX</u>	N/A	

LEGEND

LOWER CRETACEOUS
MINNESOTA GROUP | BULLHEAD GROUP

Kge GETHING FORMATION
Kcd CADOMIN FORMATION
Kbr BRENOT FORMATION

SYMBOLS

○ WB79-2 DRILL HOLE
▲ COAL SEAM OUTCROP
/ / BEDDING
↕ ANTICLINE
↕ SYNCLINE
↔ THRUST FAULT
- - - FORMATION BOUNDARY

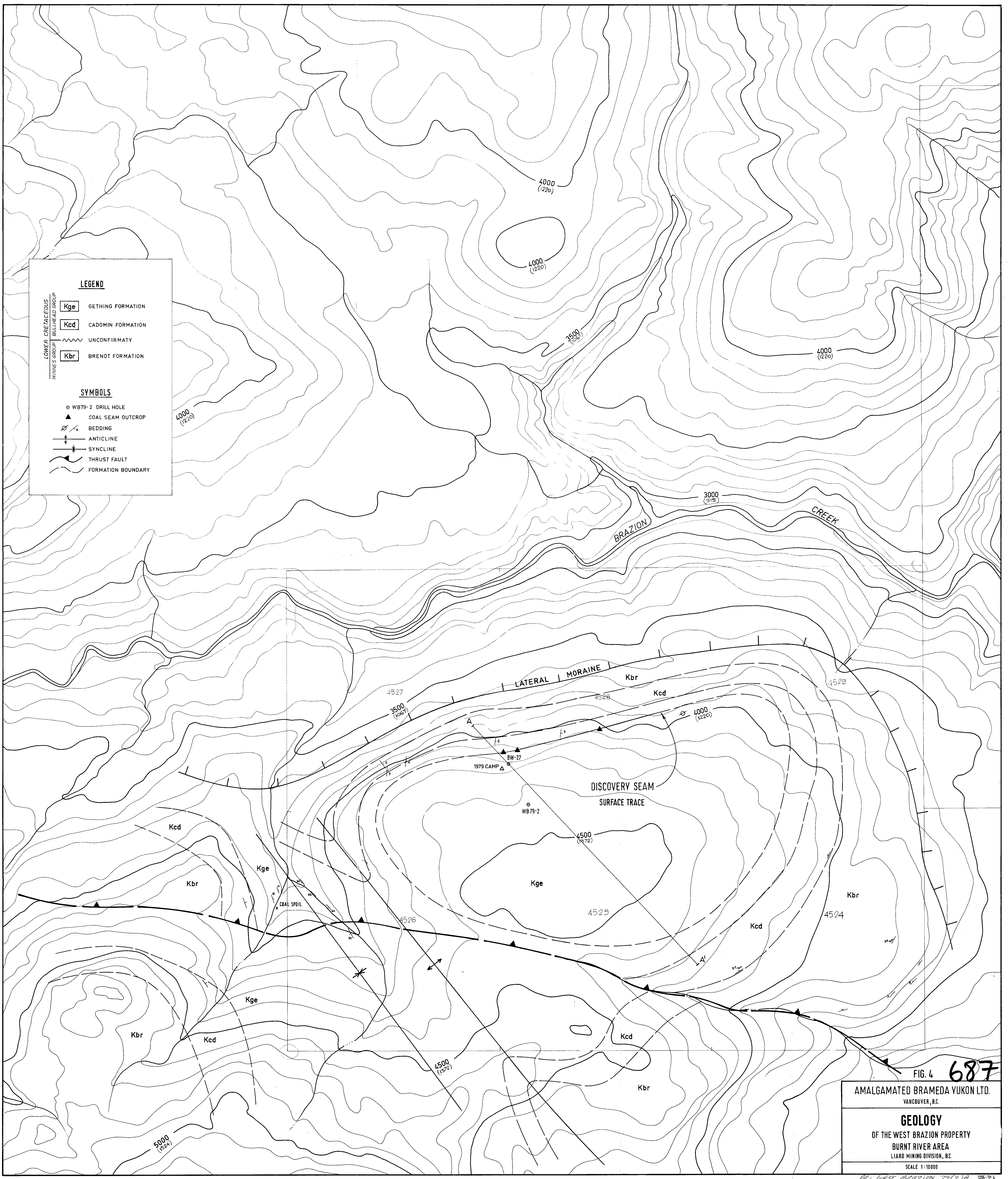
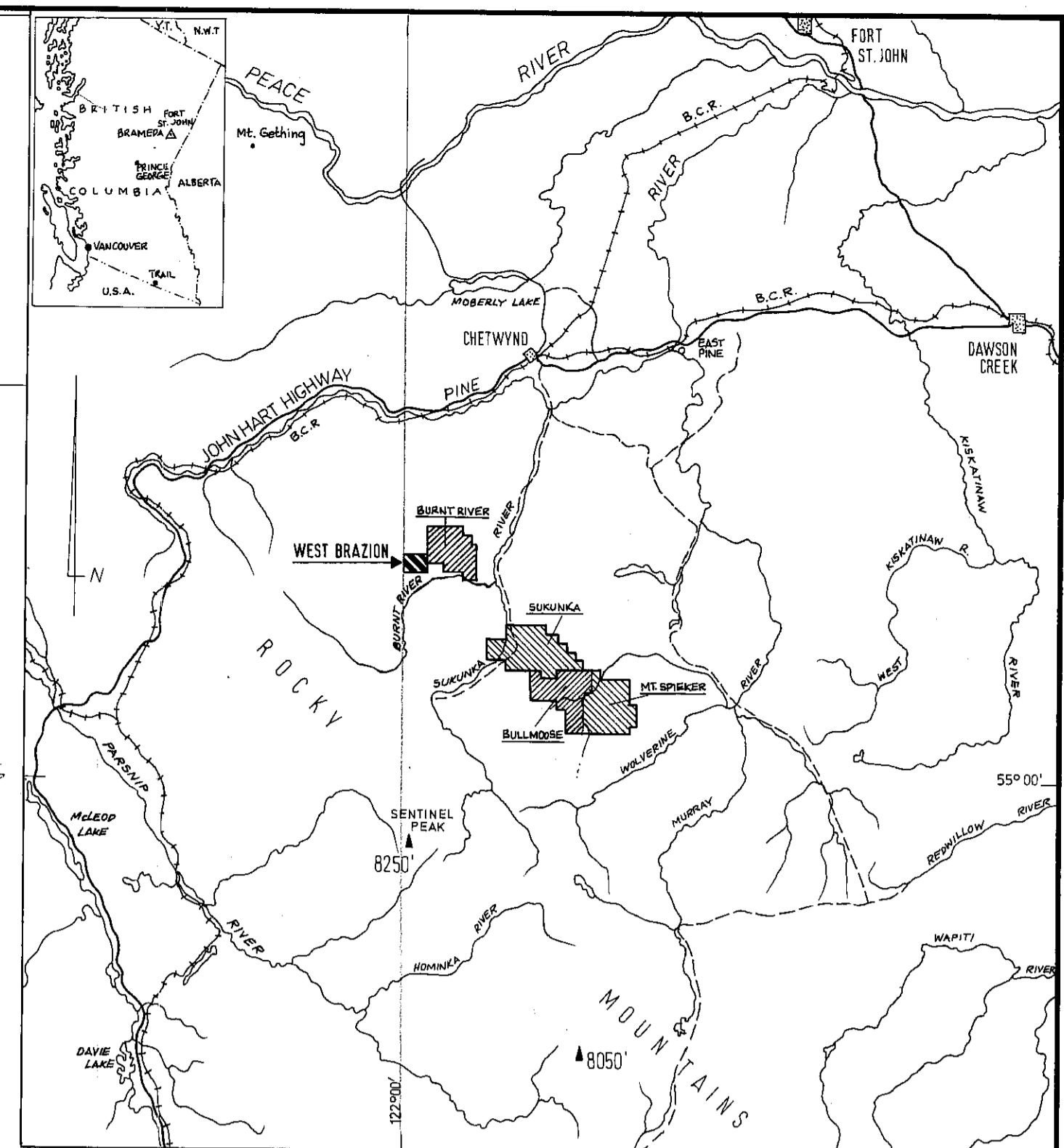
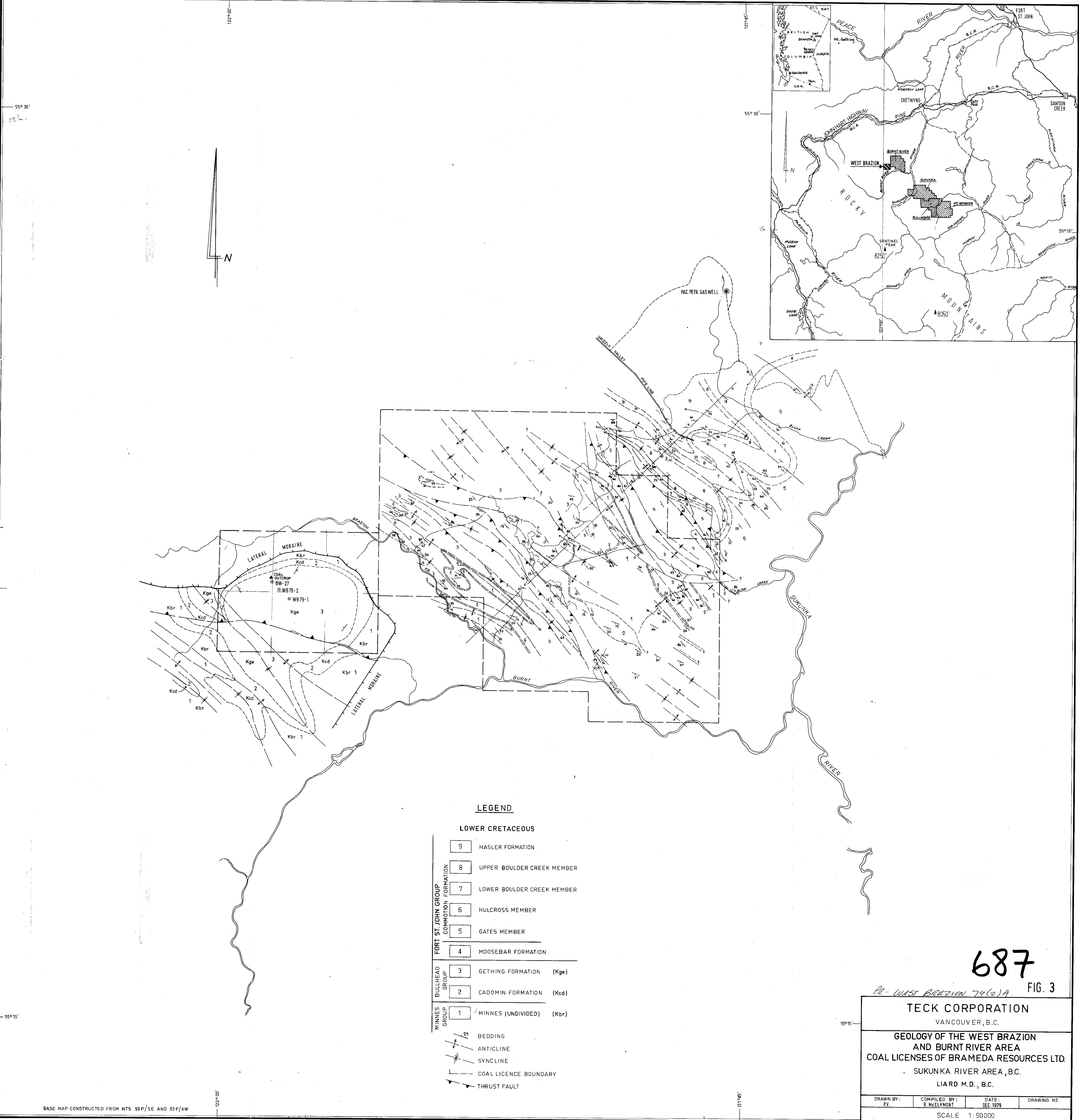


FIG. 4 **687**

AMALGAMATED BRAMEDA YUKON LTD.
VANCOUVER, B.C.

GEOLOGY
OF THE WEST BRAZION PROPERTY
BURNT RIVER AREA
LIARD MINING DIVISION, B.C.

SCALE 1:10000



687

Pr- West Brazion 79(2)A FIG. 3

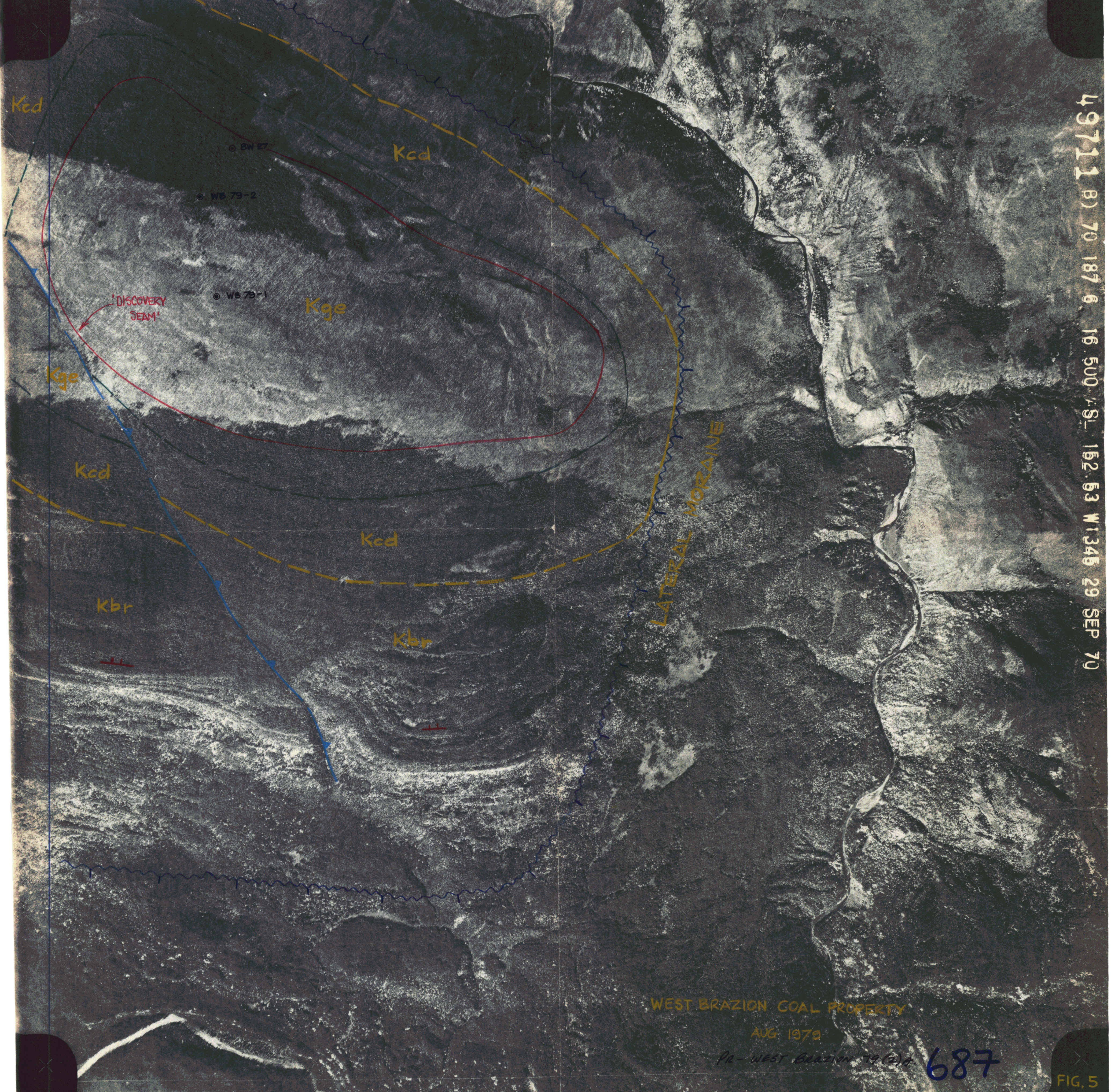
TECK CORPORATION
VANCOUVER, B.C.

GEOLOGY OF THE WEST BRAZION AND BURNT RIVER AREA
COAL LICENSES OF BRAMEDA RESOURCES LTD.
SUKUNKA RIVER AREA, B.C.
LIARD M.D., B.C.

DRAWN BY: PV	COMPILED BY: B. McCLYMONT	DATE: DEC. 1979	DRAWING NO.
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SCALE 1:50000

49711 B) 70 187 6 16 500 151 162 63 W 348 29 SEP 70

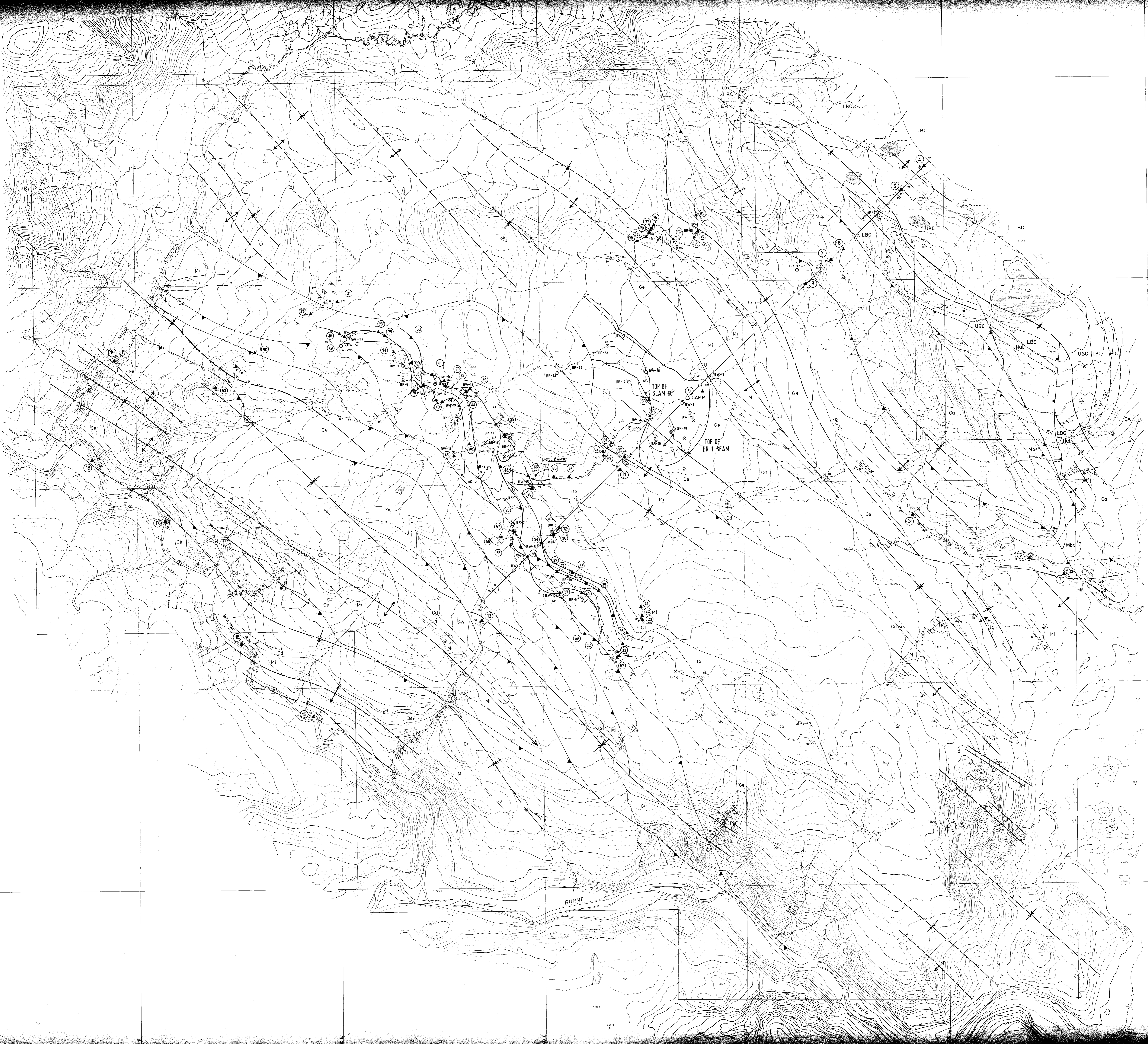
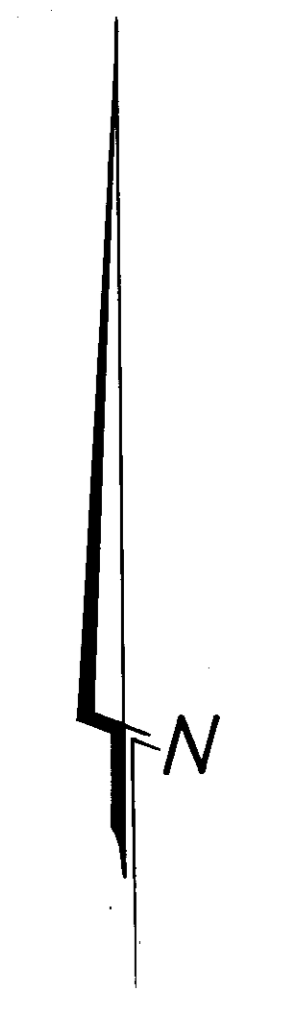


WEST BRAZION COAL PROPERTY
AUG. 1979

PC - WEST BRAZION 79(2) 687

FIG. 5

86000 N
84000 N
82000 N
80000 N
78000 N



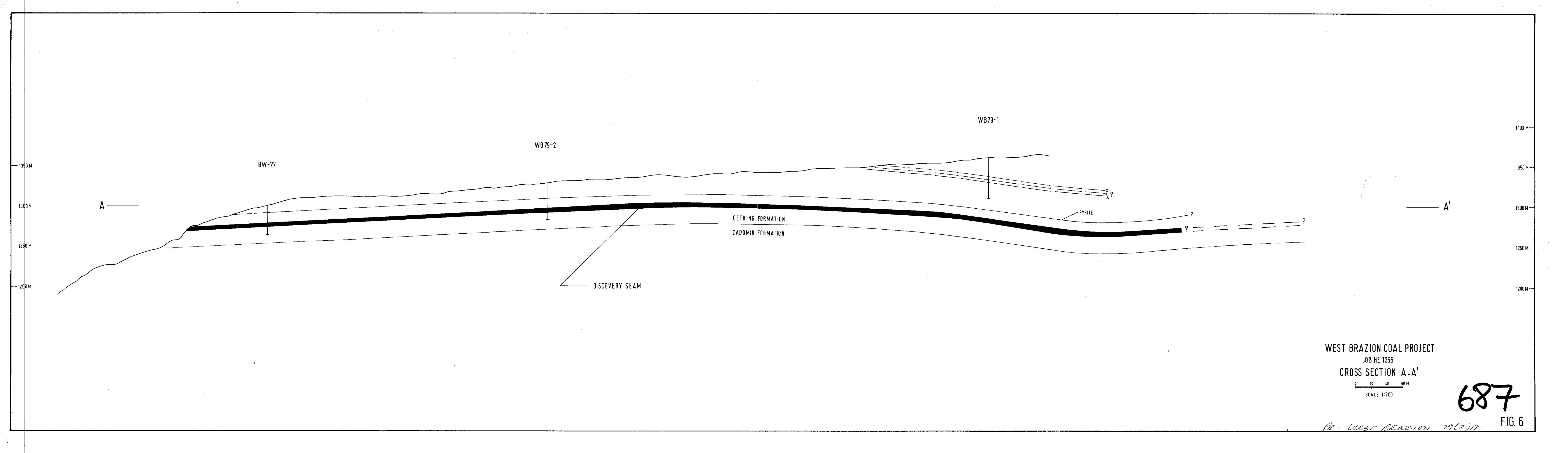
- LEGEND**
- LOWER CRETACEOUS
 - PORT ST. JOHN GROUP
 - BC BOULDER CREEK MEMBER
 - Hul HULCROSS MEMBER
 - Ge GATES MEMBER
 - Mbr MOOSEBAR FORMATION
 - WILLIAMS GROUP
 - Ge GETHING FORMATION
 - Cd CADDIM FORMATION
 - MINNES GROUP
 - Mi MINNES UNDIVIDED
 - BR-18 DRILL HOLE
 - ▲ COAL SEAM OUTCROP
 - BEDDING (HORIZONTAL, INCLINED, VERTICAL, OVERTURNED)
 - ⊕ ANTICLINE, SHOWING DIRECTION OF PLUNGE
 - ⊖ SYNCLINE
 - FAULT
 - FORMATION BOUNDARIES
 - APPROXIMATE POSITION OF CADDIM HORIZON
 - SEISMIC LINES AND TRAILS

687

FIG. 7

BRAMEDA RESOURCES LIMITED
VANCOUVER, B.C.

GEOLOGY AND SEAM TRACES
OF THE BURNT RIVER PROPERTY
SUKUNKA RIVER AREA
LIARD M.D., B.C.



WEST BRAZION COAL PROJECT
 JOB NO. 1255
 CROSS SECTION A-A'
 SCALE 1:200

687

FIG. 6

PR - WEST BRAZION 79(2)A

TECK CORPORATION LIMITED

STRATIGRAPHIC LOG

OF

WDH. BW 27

687

VERTICAL SCALE 1 : 200

PR- WEST BRAZION 79(2)A.

PROJECT BURNT RIVER

LOCATION BURNT RIVER AREA

HOLE NO BW 27 CORE SIZE AX

DATUM _____

CO-ORDINATES _____ N _____ E

DATE STARTED OCT 15/78

COLLAR ELEVATION 1295 METRES

DATE FINISHED OCT 17/78

HOLE ANGLE -90° TOTAL DEPTH _____ M. LOGGED BY _____

SERIES	FORMATION	MEMBER	DISTANCE FROM DATUM	COLUMNAR SECTION	LITHOLOGIC DESCRIPTION
			0		OVERBURDEN
			1.22		
			5		SANDSTONE FINE TO MEDIUM GRAINED, CARBONACEOUS, CROSS-BEDDED FINELY CONVOLUTED SILTS MASSIVE PYRITE AT 6.0 90°/CORE MUDSTONE PARTINGS 5.85-6.10
			7.0		
			10		MUDSTONE, BLACK, VERY CARBONACEOUS, HIGH IRON? VERY HARD WITH COAL PARTINGS
					CLEAN COAL CHIPS CLEAN COAL PARTINGS
			15		VERY FINE GRAINED, SANDY SILTSTONE GRADING TO VERY FINE GRAINED SILTY SANDSTONE AT 13.56
			20		MUDSTONE, DARK GREY TO BLACK COAL PARTINGS THROUGHOUT 4" COAL BANDS GOUGE 17.83-18.73 BADLY BROKEN 17.50-21.20
			21.20		DISCOVERY SEAM COAL, CLEAN, BRIGHT, BLOCKY
			23.77		
			25		MUDSTONE, VERY CARBONACEOUS, COAL PARTINGS 20% COAL, CLEAN, BRIGHT, BLOCKY.
					MUDSTONE, VERY CARBONACEOUS, COAL PARTINGS 20%
			30		SILTSTONE, SANDY PHASES
			31.70		
					MUDSTONE, VERY CARBONACEOUS
			33.50		
			34.14		SILTSTONE, COARSE GRAINED SANDSTONE PHASES
			34.44		SANDSTONE, COARSE GRAINED, S+P, COAL WISPS, MINDR CONVOLUTED SILTS
			35		END OF HOLE
			40		

LOWER CRETACEOUS
LOWER GETTING

TECK CORPORATION LIMITED

STRATIGRAPHIC LOG

OF

WDH. WB79-2

687

VERTICAL SCALE 1 : 200

PL - WEST BRAZION 79(2)A

PROJECT WEST BRAZION LOCATION BURNT RIVER AREA
 HOLE N^o WB 79-2 CORE SIZE 4X DATUM G.L.
 CO-ORDINATES N E DATE STARTED AUG 3/79
 COLLAR ELEVATION 1329 METRES DATE FINISHED AUG 13/79
 HOLE ANGLE -90° TOTAL DEPTH M. LOGGED BY B. MCCLYMONT

SERIES	FORMATION	MEMBER	DISTANCE FROM DATUM	COLUMNAR SECTION	LITHOLOGIC DESCRIPTION
			0		OVERBURDEN
			4.88		
			5		40 - 30 - 30 MUDSTONE, SANDSTONE, SILTSTONE THINLY INTERBEDDED; CARBONACEOUS CONVOLUTED BEDDING, SANDSTONE, SILTY, FINE TO MEDIUM GRAINED.
			6.85		
			10		BASICALLY SANDSTONE, CONVOLUTED SILTS 20% FINE TO MEDIUM GRAINED, CROSS-BEDDED, MINOR CALCITE, 65°-90°/CORE
			10.20		
			14.95		SANDSTONE, COARSE GRAINED TO CONGLOMERATIC, S+P, MINOR SILTS, POORLY SORTED, MINOR COAL PARTINGS + WISPS 65°-90°/CORE AXIS CONGLOMERATE BANDS: 11.37 - 11.53 12.50 - 12.65 PEBBLES 1-8 MM, AVG. 3 MM 13.0 - 13.15 14.0 - 14.20
			15		
			19.0		SANDSTONE, FINE TO COARSE GRAINED, CROSS-BEDDED, CONVOLUTED SILTS, MINOR COAL WISPS AND MUD BLENDS 70°-90°/CORE, INCREASING SILT DOWNWARDS
			20		
			26.0		MUDSTONE 60-70%, SILTSTONE AND MINOR SANDSTONE PHASES 20.65-21.95 PYRITE AT 19.65, BEDDING 90°/CORE
			25		MUDSTONE: DARK GREY TO BLACK, VERY CARBONACEOUS, COAL PARTINGS THROUGHOUT, CLEAN COAL 20.36 - 20.51, 23.65 - 23.84
			26.0		MAINLY SILTSTONE, MUD PHASES AND MINOR SANDS, LARGE MINOR COAL WISPS.
			26.40		
			29.40		MUDSTONE, DARK GREY TO BLACK COAL PARTINGS THROUGHOUT 50% CLEAN COAL 29.40 - 30.30 .30/76 (COAL BANDS UP TO 15 CM)
			30.30		
			35		BONE COAL COAL, CLEAN, BRIGHT AND BLOCKY 2.50/2.50 MUDSTONE PARTINGS: 33.74 - 33.89, 34.74 - 34.80
			35.87		
			36.33		MUDSTONE, DARK GREY - BLACK, VERY CARBONACEOUS, COAL PARTINGS AND WISPS MINOR SANDSTONE SILTY 41.30 - 41.75, 50% COAL PARTINGS AT 35.50 - 36.33 CLEAN COAL 36.33 - 36.73 90°/CORE
			36.73		
			42.82		
			45		MUDSTONE, SILTSTONE MEDIUM INTERBEDDED, SANDSTONE PHASES 36% CONVOLUTED, MINOR COAL WISPS, FOSSIL FRAGMENTS
			46.87		SANDSTONE, MEDIUM - COARSE GRAINED, S+P, CARBONACEOUS, CONVOLUTED SILTS. END OF HOLE
			50		

LOWER CRETACEOUS

LOWER GETTING

DISCOVERY SEAM

TECK CORPORATION LIMITED

STRATIGRAPHIC LOG OF WDH. WB79-1

687

VERTICAL SCALE 1 : 200

PC - WEST BRAZION 79(2)A

PROJECT <u>WEST BRAZION</u>	LOCATION <u>BURNT RIVER AREA</u>
HOLE NO <u>WB79-1</u> CORE SIZE <u>AX</u>	DATUM <u>G.L.</u>
CO-ORDINATES _____ N _____ E	DATE STARTED <u>AUG 4 / 79</u>
COLLAR ELEVATION <u>1371</u> METRES	DATE FINISHED <u>AUG 16 / 79</u>
HOLE ANGLE <u>-90°</u> TOTAL DEPTH _____ M.	LOGGED BY <u>B. McClymont</u>

SERIES	FORMATION	MEMBER	DISTANCE FROM DATUM	COLUMNAR SECTION	LITHOLOGIC DESCRIPTION
LOWER CRETACEOUS	LOWER GETTING	C'	0	0	OVERBURDEN
			0.90	0.90	SANDSTONE, FINE GRAINED, SILTY, CARBONACEOUS
			2.28	2.28	MUDSTONE, BLACK, CARBONACEOUS
			5	5	
			6.0	6.0	
			10	10	BASICALLY MUDSTONE WITH SILTY PHASES (35%) 90°/CORE AXIS SANDSTONE: 6.70 - 7.30, FINE GRAINED, CROSS-BEDDED, CARBONACEOUS MUDSTONE: CARBONACEOUS, MINOR BONE, COAL PARTINGS.
			12.0	12.0	
			15	15	BASICALLY SANDSTONE (70%), CONVOLUTED SILTS AND CARBONACEOUS DEBRIS THINLY INTERBEDDED MUDSTONE AND SILTSTONE 30% SANDSTONE: FINE TO MEDIUM GRAINED, CARBONACEOUS, CLAM SHELLS (?)
			19.20	19.20	
			20	20	MUDSTONE, VERY CARBONACEOUS. COAL 19.65 - 20.10 .45/.30 GENERALLY BRIGHT WITH "HIGH-ASH" BANDS. (30%)
		22.70	22.70		
		23.93	23.93	COAL SEMI-BRIGHT TO BRIGHT, BLOCKY, THIN "HIGH-ASH" BANDS, SAMPLED 1.22/.91	
		25	25	MUDSTONE, SILTY PHASES, MINOR SANDS, CARBONACEOUS TO VERY CARBONACEOUS	
		28.04	28.04		
		28.34	28.34	BONE COAL	
		30	30	COAL, BRIGHT, BLOCKY, CLEAN. MINOR MUDSTONE PARTINGS AT 29.26 AND 30.02	
		30.18	30.18		
		33.38	33.38	MUDSTONE: CARBONACEOUS, (50% RECOVERY 30.18 - 31.08)	
		35	35	BASICALLY MUDSTONE WITH CONVOLUTED SILT AND SAND PHASES (40%) SANDSTONE: FINE GRAINED CARBONACEOUS.	
		36.58	36.58		
37.60	37.60	MUDSTONE, BLOCKY, VERY CARBONACEOUS			
40	40	SILTSTONE, VERY SANDY PHASES, COAL WISPS.			
42.67	42.67				
43.90	43.90	MUDSTONE (CLAYSTONE?) LIGHT GREY, HIGH IRON			
44.80	44.80				
45	45	MUDSTONE, BLACK, CARBONACEOUS, COAL PARTINGS + WISPS VERY SILTY 46.94 - 48.16 COAL 44.80 - 45.57 .76/.76 CLEAN, BRIGHT, BLOCKY			
45.57	45.57				
50	50	SANDSTONE			
51.20	51.20	END OF HOLE			
55	55				
					TOTAL COAL: 4.26 M (14.0')