K- Shell- Mt. Banner East 82(1)A

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K-SHELL-Mt. Banner East
82(1)A

MOUNT BANNER EAST PROSPECT

GEOLOGICAL REPORT ON COAL LICENCES 277, 280, 281, 1299 and 1302

GROUP NO. 329

HELD BY: SHELL CANADA RESOURCES LIMITED

OPERATED BY: CROWS NEST RESOUCES LIMITED

KOOTENAY LAND DISTRICT

BRITISH COLUMBIA

FOR WORK DONE IN PERIOD

JULY, 1982 TO OCTOBER, 1982, INCLUSIVE

LATITUDE 50°01'30" WEST

LONGITUDE 114°45'30" WEST

MAP REFERENCE N.T.S. 82J/2

FEBRUARY 28, 1983

CONSULTANT GEOLOGIST: J.K. STOBERNACK

CNRL GEOLOGIST: B. RYAN

Crows Nest Resources
LIMITED
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March 21, 1983

Ministry of Energy, Mines and Petroleum Resources
British Columbia

Dear Sirs:

Enclosed please find our report on the Mount Banner Property. Consultant Dr. J.K. Stobernack was in charge of the field work and development of maps, sections and table of coal seam thicknesses for the Mt. Banner Licences. These Licences are held by Shell Canada Resources Limited and operated by Crows Nest Resources Limited.

Dr. Stobernack received his PhD from The Technical University of Clausthal-Zellerfeld in 1968 and since 1973 has been working in the coal industry in Canada.

Dr. Barry Ryan compiled this report, he received his PhD from the University of B.C., Vancouver in 1973. He has worked for a number of mining companies before accepting a post with CNRL in April 1981.

I consider Dr. Stobernack and Dr. Ryan to be well qualified to expedite the geological field work and report preparation involved in this project. I am satisfied that the attached report dated March 1983 has been competently prepared and contains all pertinent information.

Yours very truly,

H.G. Rushton
Vice President, Development

Enclosure

BDR/md

MOUNT BANNER EAST

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MOUNT BANNER EAST

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1.0 SUMMARY

The Mount Banner East Prospect is part of the Elk Valley Coalfield in the Rocky Mountains of Southeastern British Columbia. It is located at Latitude 50°01'30" North and Longitude 114°45'30" West 12 kilometres from the town of Elkford. The prospect is 2.5 kilometres from the nearest existing railway (FIGURE 1), on which it is approximately 1,180 kilometres to the Vancouver area coal ports.

The Mount Banner East Prospect is located in the northeastern corner of the Central Block, Group No. 329, B.C. Coal Licences held by Shell Canada Resources Limited, operated by its wholly-owned subsidiary, Crows Nest Resources Limited (Enclosure 1).

The coal bearing Jura-Cretaceous Kootenay Group crops out on the prospect where it is divided into 4 thrust blocks (Enclosure 2). The intervening 3 thrusts tend north south and dip to the west. They are named from west to east, Michael thrust, Ewin thrust and twin anticline thrust. The blocks are named from west to east, West Block; Michael-Banner Block; Ewin Pass-Banner Block and Ewin Pass-Banner East Block. Previous analyses (Table 1) reported by Sloan 1981 indicate that the coal is low to medium volatile bituminous in rank. In the 1981 report Sloan estimated a reserve of 8 million tonnes of low ratio open pit mineable coal on the east flank of Mount Banner.

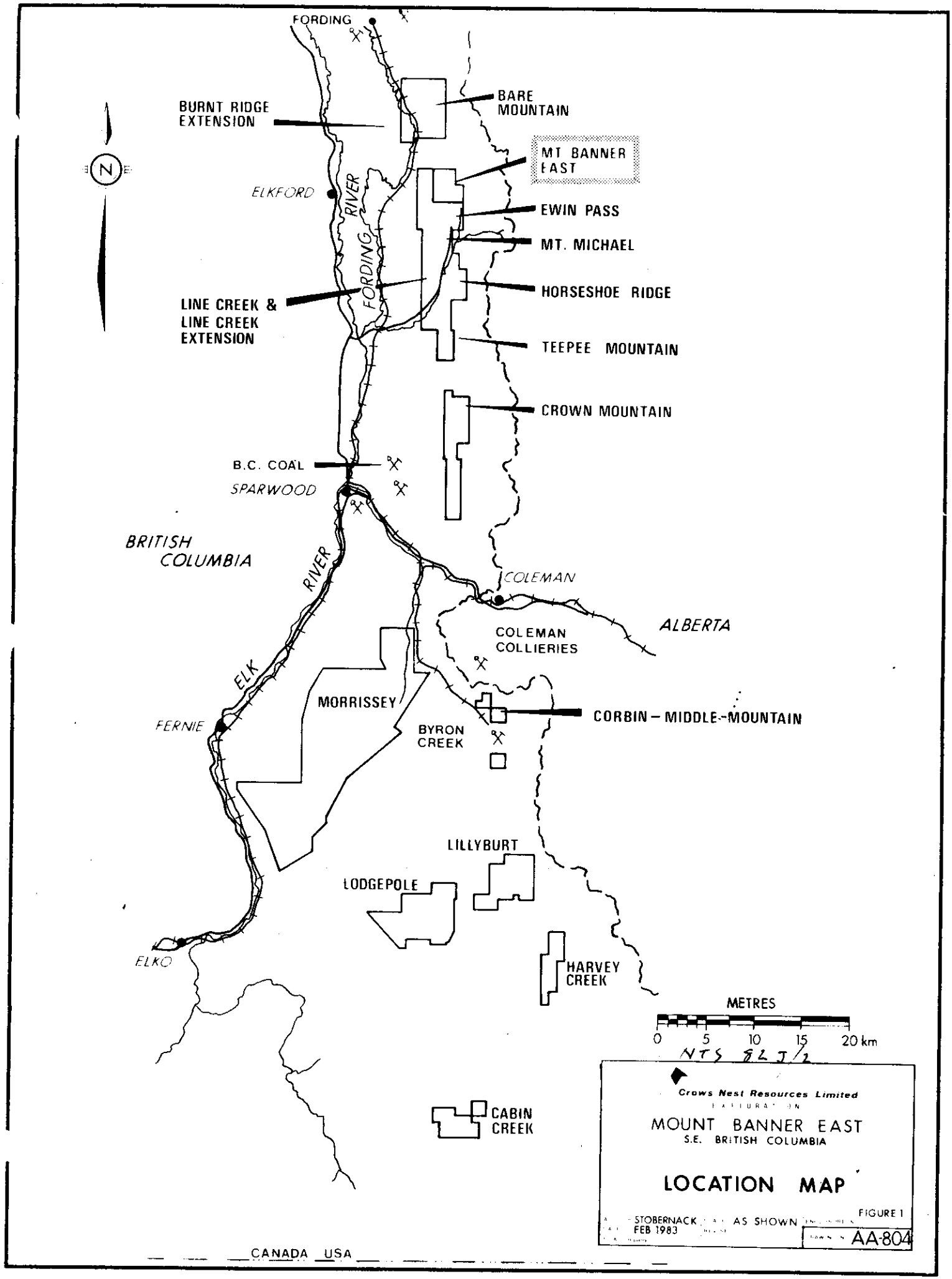

FORDING
BURNT RIDGE EXTENSION
BARE MOUNTAIN
MT BANNER EAST
ELKFORD
FORDING RIVER
EWIN PASS
MT. MICHAEL
HORSESHOE RIDGE
LINE CREEK & LINE CREEK EXTENSION
TEEPEE MOUNTAIN
CROWN MOUNTAIN
B.C. COAL
SPARWOOD
BRITISH COLUMBIA
ELK RIVER
COLEMAN
ALBERTA
COLEMAN COLLIERIES
MORRISSEY
FERNIE
BYRON CREEK
CORBIN – MIDDLE MOUNTAIN
LILLYBURT
LODGEPOLE
ELKO
HARVEY CREEK
CABIN CREEK
METRES
0 5 10 15 20 km
NTS 82J/2
Crows Nest Resources Limited
MOUNT BANNER EAST
S.E. BRITISH COLUMBIA
LOCATION MAP
FIGURE 1
STOBERNACK AS SHOWN
FEB 1983
AA-804
CANADA USA

TABLE 1

COAL QUALITY (From Sloan 1981)

Proximate Analyses		Raw Coal	Float at 1.6 SG
Moisture	%	0.30 - 4.54	0.30 - 2.41
Ash	%	12.05 - 45.64	5.87 - 12.54
Volatile Matter	%		17.42 - 23.94
Fixed Carbon	%		58.30 - 71.85
FSI	-	0 - 8	0 - 8.50
Sulphur	%		0.32 - 0.90
Calorific Value	Kcal/Kg		7,533 - 8,124
Yield at 1.6 S.G.	%		34 - 86

2.0 INTRODUCTION

2.1 Coal Land Tenure

Five B.C. Coal Licences (No's: 277, 280, 281, 1299 and 1302 comprise Group No. 329 covering approximately 908 hectares in southeastern British Columbia's Kootenay Land District. These Licences are held by Shell Canada Resources Limited and operated by its' wholly-owned subsidiary, Crows Nest Resources Limited.

TABLE 2 is a summary of the coal land tenure standing. This report accounts for work performed in 1982 on Licences 277, 280, 281, 1299 and 1302, the Mount Banner East Prospect and adjacent Licences of the Ewin Pass Prospect.

Crows Nest Resources LIMITED

B.C. COAL LICENCES

TENURE STANDING

PROJECT: MT. BANNER EAST

YEAR: 1981 - 82

DATE: MARCH 83

GROUP	LICENCE			ACQ/ADM		RENTALS		ANNIVERSARY	WORK REQUIREMENT				TOTAL EXPLORATION			REMARKS
NO.	NO.	LEGAL DESCRIPTION	AREA TOTAL/HA	YEAR	FEES	ANNUAL	TOTAL NEXT ANN.	DATE	EXPIRED	CURRENT	LIC. TERM	EXC. CREDIT	YEAR	AMOUNT	CASH IN LIEU	
329	5	LICENCES	908		1,882.848	4540	30.060	JANUARY 31st	63,680	11,200		$40/ACRES &	79 - 80	247,050	–	THE LICENCES
	277	LOT 6748	259	75							END OF 7	$96.08/HA	80 - 81	41,845	–	ARE IN GOOD
	280	LOT 6751	259	75							END OF 7		81 - 82	–	–	STANDING UNTIL
	281	W½ LOT 6752	130	75							END OF 7					JAN 31st 1990
	1299	W½ LOT 6782	130	74							END OF 8					UNDER THE '74
	1302	E½ LOT 6752	130	74							END OF 8					COAL ACT AND
																JAN 31st 1991
																UNDER THE '78
																COAL ACT, WITH
																$46.08/HA CREDIT
																FOR THE SUBSE-
																QUENT TERM.

TABLE 2

8A-312

2.2 Location and Physiography

The prospect is located in the Rocky Mountains of southeastern British Columbia, in an area regionally known as the Upper Elk Valley. It is on the east side of the Fording River Valley, 12 kilometres by air from the town of Elkford. It is centered approximately on the intersection of Latitude 50°01'30" North and Longitude 114°45'30" West.

The prospect area is a ridge and east slope of the ridge which extend northeasterly from Mount Banner. It is bounded on the northeast by Ewin Creek and on the west by a small tributary of Ewin Creek.

The main ridge of Mount Banner East is rugged with a relief of up to 825 metres from the crest to the valley floor to the east. Average surface gradients range from 45% on the western slopes to 55% on the eastern slopes.

The prospect area is generally heavily forested, in sharp contrast to the more open west facing grassy slopes of Mt. Banner.

2.3 Access

Rail and road transport routes are located within 2.5 kilometres of the prospect. It is 11.4 kilometres by road to B.C. Coal Resources' Greenhills Plant construction site. The Canadian Pacific Railway Fording spur line roughly parallels a paved highway owned by Fording Coal Limited, which connects Elkford to the Fording mine site. Access to the base of the prospect from the Fording highway is by a gravel logging road which parallels the highway, then turns southeast up Ewin Creek. During 1980, Crows Nest Resources extended this road by 3.6 kilometres from its southern end, to wind northwest up Mount Banner East at an 8% grade (Sloan, 1981). It was a four-wheel drive road, but the lower portion has since been reclaimed by recontouring.

3.0 WORK DONE

3.1 Summary of Previous Work

A report filed by Crows Nest Resources Limited in 1979 entitled North Central Block Project (Group No. 266 was a part of Shell-CNRL's Central Block of B.c. Coal Licences) (Fisher 1979) accounts for the initial reconnaissance mapping.

A report filed by Crows Nest Resources Limited in 1981 entitled Mount Banner East Prospect (Sloan 1981) describes follow-up mapping; hand trenching, sampling and analysis of the coal occurrences: construction of 3.6 kilometres of exploration road and 127 metres of backhoe trenching of coal occurrences along the road. A single vertical diamond core hole was drilled to 319 metres. The core was described and the hole geophysically logged.

TABLE 1 provides the results of proximate analyses of core samples from Mount Banner East. The coal is low to medium volatile bituminous by rank, according to A.S.T.M. standards.

In 1981 Crows Nest Resources personnel undertook a small program of surface mapping and hand tranching (4 trenches) (Ryan 1982). The results were recorded on a 1 to 5000 geological map.

3.2 Objectives of the 1982 Program

Previous mapping on Mt. Banner East has revealed a complex structure. The objective of the 1982 program was to produce a comprehensive geological map at a scale of 1 to 5000 and an accompanying structural interpretation.

3.3 Work Done in 1982

Five Licences were mapped on a scale of 1 to 5000 using orthophotos and 5m contour 1 to 5000 topographic maps. The mapping was supported by helicopter. During the mapping emphasis was put on established the overall geological structure by following the cliff-forming sandstones within the Mist Mountain Formation and the massive Elk sandstone at the Elk Formation Mist Mountain Formation contact. These sandstones can be traced over long distances.

Sixty-eight hand trenches were dug during the mapping; after study the trenches were refilled to minimize surface disturbance.

The mapping is presented on two 1 to 5000 sheets (enclosures 3, 4) and 3 sections (enclosures 5, 6, 7). Trench locations are indicated on the maps and the associated coal thickness measurements tabulated in Table 3. Average seam thicknesses are given in Table 4.

3.4 1982 Exploration Expenditure

The total cost of the program was $63,000.04. The part of the cost attributed to the Mt. Banner East Licences was $45,374. This is the amount recorded on the application to extend term of Licence form (Table 4).

Table 3

Description of 1982 Hand Trenches

* LOCATION	TRENCH elev.	PLUNGE	LENGTH (M)	BEDS STRIKE	BEDS DIP	TRUE THICKNESS OF LITHOLOGIES (M) STARTING AT HANGING WALL	DESCRIPTION Seam	TOTAL TRUE THICKNESS (M)
C.L.								
280 1 660395 E 5542660 N	264 2415 m	0	3.24	008 008 008	75 75 75	1.43 0.3 1.3	Coal Fine grained sandstone Coal 2	3.03
280 2 660365 E 5542680 N	281 2400 m	18	14.45	336 194	50 32		Coal, east side of anticline 3 Coal, west side of anticline	
280 3 660335 E 5542685 N	267 2390 m	0	0.75	180	43	0.51	Coal 2	0.51
280 4 660320 E 5542675 N	264 2390 m	0	3.94	184	43	2.67	Coal 2	2.67
283 5 659840 E 5542420 N	292 2315 m	-19	1.96	40	4.27	0.19 0.75 0.76 0.43 1.52	Coal Carbonaceous mudstone Coal Carbonaceous mudstone Coal L	3.65
283 6 659850 E 5542410 N	256 2315 m	8	3.14	184	53	0.2 0.1 0.39 0.16 0.25 0.39 0.61	Coal Carbonaceous mudstone Coal Mudstone Coal Mudstone Coal L	2.10
283 7 659765 E 5542310 N	277 2315	-6	2.82	207	40	0.52 0.28 0.46 0.46 0.2	Coal K Carbonaceous mudstone Coal Slightly carbonaceous mudstone Coal	1.92

* Indicates true thickness measured directly in trench

** Corresponds with location number on maps (Enclosures 3 and 4).

Description of Trenches

COAL LICENCE

LOCATION	TRENCH elev.	PLUNGE	LENGTH (M)	BEDS STRIKE	BEDS DIP	TRUE THICKNESS OF LITHOLOGIES (M) STARTING AT HANGING WALL	DESCRIPTION SEAM	TOTAL TRUE THICKNESS (M)
277 8 659510 E 5544600 N	258 2195	-21	1.58	173	51	0.9 0.12 0.48	Coal A Mudstone Coal	1.5
277 659515 E 5544600N 9	273 2190	-39	1.28	173	51	1.27	Coal B	1.27
277 10 659525 E 5544610 N	275 2185	-31	5.33	173	51	0.59 0.18 1.16 0.2 3.07	Coal C Carbonaceous mudstone Coal Mudstone Coal	5.20
277 659540 E 5544605 N 11	303 2180	-37	1.15	173	51	0.98	Coal D	0.98
277 659595 E 5544820N 12	303 2135	-34	1.11	183	56		Coal F	
277 13 659610 E 5544815N	313 2150	-42	5.88	183	56	2.04 0.25 4.5 0.08 2.16	Coal Shale/mudstone Coal Fine grained sandstone Coal G	4.98
277 659635 E 5544815 N 14	312 2115	-36	1.5	183	56	1.27	Coal H	1.27
277 659680 E 5544830 N 15	305 2115	-35	1.19	183	56	1.07	Coal J	1.07

Description of Trenches

COAL LICENCE 277

LOCATION	TRENCH	PLUNGE	LENGTH (M)	BEDS		TRUE THICKNESS OF LITHOLOGIES (M) STARTING AT HANGING WALL	DESCRIPTION SEAM	TOTAL TRUE THICKNESS (M)
				STRIKE	DIP			
16 659650 E 5544805 N	316 2075	-35	39.66	183	56	1.54 1.54 4.81 3.29 1.77 0.85 1.11 0.41 3.31 1.13 0.51 0.1 0.66 0.21 4.12 0.32 2.48 1.7 0.41 0.78 1.37	Coal Mudstone Coal Mudstone Coal Mudstone Coal Carbonaceous Mudstone Coal Mudstone Coal Mudstone Coal Mudstone Coal Carbonaceous Mudstone Coal Carbonaceous Mudstone Coal Mudstone Coal	K 32.42
17 659740 E 5544790 N	317 2040	-37	14.6	178	52	0.96 0.17 3.42 0.13 0.99 0.16 0.24 2.94 2.43	Coal Mudstone Coal Mudstone Coal Fine grained Sandstone Coal Slightly carbonaceous Mudstone Coal	L 11.44

Description of Trenches

COAL LICENCE 277

LOCATION	TRENCH	PLUNGE	LENGTH (M)	BEDS		TRUE THICKNESS OF LITHOLOGIES (M) STARTING AT HANGING WALL	DESCRIPTION	SEAM	TOTAL TRUE THICKNESS (M)
				STRIKE	DIP				
18* 659710 E 5545230N	elev 2000		19.65	181	44	0.63 0.13 2.94 1.43 4.95 1.17 7.53	Coal Mudstone Coal Mudstone Coal Mudstone Coal	K	18.78
280 659815 19 5543810N	286 2445	-28	1.53	225	39	1.3	Coal	A	1.3
280 20 659820 E 5543800 N	259 2430	-30	2.68	225	39	0.76 0.04 1.06	Coal Carbonaceous Mudstone Coal	B	1.86
280 659835 E 21 5543800 N	2425						No coal intersected		
22 659840 E 5543790 N	259 2420	-4	2.56	186	34	0.25 0.09 0.31 0.25 0.61	Coal Mudstone Coal Carbonaceous Mudstone Coal	C	1.51
280 23 659865 E 5543775N	280 2410	-20	4.31	183	53	1.27 0.68 0.22 1.06 2.79	Coal Mudstone Coal Mudstone Coal, foot wall not exposed	D	6.02
280 659885 E 24 5543765N	280 2395	-15	3.16	180	47	2.76	Coal	E	2.76

Description of Trenches

COAL LICENCE	LOCATION	TRENCH	PLUNGE	LENGTH (M)	BEDS STRIKE	BEDS DIP	TRUE THICKNESS OF LITHOLOGIES (M) STARTING AT HANGING WALL	DESCRIPTION SEAM	TOTAL TRUE THICKNESS (M)
280	25 659890 E 5543769 N	254 2390	-11	1.1	180	47	0.91	Coal	0.91
280	26 659905 E 5543745 N	274 2380	-4	5.51	175	50	1.93 0.29 2.19	Coal Mudstone Coal F	4.41
280	27 659915 E 5543735 N	263 2385	-10	2.35	174	60	2.21	Coal G	2.21
280	28 659930 E 5543740 N	266 2375	-21	1.77	174	60	1.75	Coal H	1.75
280	29 659940 E 5543750 N	264 2370	-22	2.0	112	35	0.67 0.1 0.34	Coal Mudstone Coal J	1.11
280	30 659750 E 5543500 N	315 2265	0	15.97	192	36	0.94 0.06 3.20 0.09 3.24 0.13 0.21	Coal Mudstone Coal Clay Ironstone Coal Silty Sandstone Coal K	7.87
279	31 659505 E 5542820 N	284 2115	29	6.2	168	56	0.24 0.08 2.04 0.07 0.25	Coal Mudstone Coal Carbonaceous Mudstone Coal L	2.68
280	32 659740 E 5543585 N	315 2310	0	8.25	192	36	4.07	Coal H+J	4.07

Description of Trenches

COAL LICENCE	LOCATION	TRENCH	PLUNGE	LENGTH (M)	BEDS STRIKE	BEDS DIP	TRUE THICKNESS OF LITHOLOGIES (M) STARTING AT HANGING WALL	DESCRIPTION	SEAM	TOTAL TRUE THICKNESS (M)
280	33 659760 E 5543650 N	310 2345	-12	6.37	202	43	3.75 0.76 0.5	Coal Carbonaceous Mudstone Coal	G	5.01
280	659745 E 34 5543675 N	300 2350	0	6.05	172	40	3.07	Coal	F	3.07
280	659735 E 35 5543685 N	306 2355	0	1.25	172	40	0.58	Coal		0.58
279	659240 E 36 5543335 N	232 2265	0	2.37	149	42	1.57	Coal	I	1.57
279	37 659225 E 5543606 N	240 2340	17	3.74	155	65	1.95 0.61 0.21	Coal Mudstone Coal	II	2.77
279	659180 E 38 5543260 N	284 2165	-34	5.85	192	25	5.01	Coal	IV	5.01
284	659225 E 39 5542050 N	2165						No Coal		
284	659210 E 40* 5542045 N	2165		1.7	163	53	1.34	Coal	I	1.34
284	659285 E 41 5542130 N	243 2195	0	1.84	163	53	1.45	Coal	II	1.45
	660285 E 42 5542520 N	235 2350	-27	1.24	203	30	0.78	Coal	2	0.78
279	43 659180 E 5543665 N	221 2325	25	9.96	154	38	0.32 0.17 0.68 0.10 0.12 0.17 0.23	Coal Siltstone Coal Carbonaceous Mudstone Coal Silty Mudstone Coal	II	1.79

Description of Trenches

COAL LICENCE

LOCATION	TRENCH elev m.	PLUNGE	LENGTH (M)	BEDS STRIKE	BEDS DIP	TRUE THICKNESS OF LITHOLOGIES (M) STARTING AT HANGING WALL	DESCRIPTION SEAM	TOTAL TRUE THICKNESS (M)
279 44 659165 E 5543555 N	210 2265	17	5.59	154	38	1.09 0.06 0.29	Coal Mudstone Coal I	1.44
280 45 659230 E 5543380 N	319 2215	0	4.7	212	59	1.15 0.57 2.13	Coal Siltstone Coal L	3.85
280 46 659240 E 5543335 N	319 2215	0	1.26	212	59	0.66 0.10 0.27	Coal Mudstone Coal L	1.03
280 659725 E 47 5542780 N	213 2215	26	15.29	168	56	4.31	Coal L	4.31
284 48 659410 E 5542185 N	245 2180	-9	9.87	170	48	4.53 0.53 1.54 1.91	Coal Mudstone Coal Overburden mixed with coal H+J	8.03
284 659505 E 49 5542205 N	250 2195	-2	2.09	194	70	1.65	Coal G	1.65
277 50 659700 E 5545235 N	285 2010	-30	22.95	175	50	0.54 0.17 0.99 0.10 1.17 0.12 0.57 1.25 5.74 0.53 1.99 1.51	Coal Mudstone K Coal Mudstone Coal Mudstone Coal Silty Mudstone Coal Mudstone Coal Mudstone	

Description of Trenches

LOCATION	TRENCH	PLUNGE	LENGTH (M)	BEDS		TRUE THICKNESS OF LITHOLOGIES (M) STARTING AT HANGING WALL	DESCRIPTION SEAM	TOTAL TRUE THICKNESS (M)
				STRIKE	DIP			
50 (cont'd)						1.37	Coal	
						0.41	Mudstone	
						1.56	Coal	
						0.35	Mudstone	
						2.52	Coal	
						0.07	Mudstone	
						0.72	Coal	21.68
277 659715 E 51 5545220 N	304 1985	-29	1.98	175	50	1.65	Coal K	1.65
52 277 659630 E 5545250 N	281 2045	-17	3.0	184	69	0.28	Coal	
						0.18	Mudstone	
						2.0	Coal	
						0.16	Mudstone	
						0.35	Coal F	2.97
53 277 659565 E 5545255 N	270 2085	-36	5.57	196	59	1.62	Coal	
						0.54	Silty Mudstone	
						1.01	Coal	
						1.29	Silty Mudstone	
						0.44	Coal B	5.40
277 54 659730 E 5545230 N	286 1985	-25	4.91	164	48	3.28	Coal	
						0.13	Mudstone	
						0.78	Coal L	4.19

Description of Trenches

COAL LICENCE

LOCATION	TRENCH elev. m	PLUNGE	LENGTH (M)	BEDS STRIKE	BEDS DIP	TRUE THICKNESS OF LITHOLOGIES (M) STARTING AT HANGING WALL	DESCRIPTION SEAM	TOTAL TRUE THICKNESS (M)
55 659775 E 5545295N	280 1960	-21	12.88	171	41	1.12 0.11 5.26 1.85 0.26 0.98 1.36	Coal Clay Ironstone Coal Mudstone Coal Silty Mudstone Coal M	10.94
56* 659775 E 5545295 N	1960		2.08	171	41	1.42	Coal M	1.42
57* 658160 E	 1585		1.64			0.28 0.1 1.26	Coal Mudstone Coal N	1.64
58* 658145 E 5547210N	 1585					2.26 0.03 0.14 0.06 0.34 0.88 1.17 0.12 1.31	Coal Mudstone Coal Mudstone Coal Mudstone Coal Mudstone Coal M	6.3

Description of Trenches

COAL LICENCE

LOCATION	TRENCH	PLUNGE	LENGTH (M)	BEDS		TRUE THICKNESS OF LITHOLOGIES (M) STARTING AT HANGING WALL	DESCRIPTION	TOTAL TRUE THICKNESS (M)
				STRIKE	DIP		Seam	
59*						1.72	Coal	
						0.14	Mudstone	L
658085E						3.02	Coal	
						0.04	Mudstone	
000L 5547215N						0.66	Coal	
						0.09	Shaley Coal	
						0.38	Coal	
	1600					0.04	Mudstone	
						0.81	Coal	
						0.16	Mudstone	
						0.09	Coal	
						0.06	Mudstone	
						0.25	Coal	7.46
60*						0.14	Carbonaceous Mudstone	
						0.10	Shaley Coal	J
658040E	1590					0.11	Coal	
						0.07	Mudstone	
5547220N						0.15	Coal	
000L						0.10	Mudstone	
						0.14	Coal	
						0.29	Carbonaceous Shale	
						0.51	Siltstone	
						0.25	Coal	
						0.6	Siltstone	
						0.3	Shale	
						0.8	Coal	
						0.09	Coaly Shale	
						1.99	Coal	5.61

Description of Trenches

COAL LICENCE 00ØL

LOCATION	TRENCH	PLUNGE	LENGTH (M)	BEDS		TRUE THICKNESS OF LITHOLOGIES (M) STARTING AT HANGING WALL	DESCRIPTION	TOTAL TRUE THICKNESS (M)
				STRIKE	DIP			
61*	elev.					0.77	Coal	
657980 E						0.15	Carbonaceous Mudstone	E
5547180 N	1620					0.85	Coal	1.7
62*						1.11	Coal	
658400 E						0.18	Carbonaceous Mudstone	
						2.16	Coal	3
5547030 N						0.04	Mudstone	
						1.01	Coal	
	1630					0.21	Carbonaceous Mudstone	
						0.18	Coal	4.89
63*						0.04	Coal	
						0.03	Mudstone	3
658415 E						0.05	Coal	
						0.03	Mudstone	
	1620					0.16	Coal	
5547040 N						0.06	Mudstone	
						0.05	Coal	
						0.03	Mudstone	
						0.10	Coal	
						0.39	Mudstone	
						0.15	Coal	
						0.28	Mudstone	
						0.08	Coal	
						0.19	Mudstone	
						0.11	Coal	
						0.03	Mudstone	
						0.03	Coal	
						0.02	Mudstone	
						0.15	Coal	
						0.18	Mudstone	
						0.03	Coal	
						0.10	Shaley Coal	
						0.16	Coal	2.55

Description of Trenches

COAL LICENCE	LOCATION	TRENCH	PLUNGE	LENGTH (M)	BEDS STRIKE	BEDS DIP	TRUE THICKNESS OF LITHOLOGIES (M) STARTING AT HANGING WALL	DESCRIPTION	TOTAL TRUE THICKNESS (M)
000L	64* 658040E 5547205N	1605					0.15 0.08 0.45 0.14 0.78 1.7 1.95	Coal (Seam F) Clay Ironstone Coal Carbonaceous Mudstone Coal Silty Sandstone Coal	5.3
000L	65* 657950E 5547195N	1615					3.35	Poor exposure coal (A+B+C)	3.35
000L	66* 657950E 5547180N	1620					0.1 0.12 0.46 0.07 1.05	Coal Mudstone (A+B+C) Coal Clay Ironstone Coal	2.80
000L	67 658415E 5547040N	268 1615	0	12.3	199	24	1.26 0.49 1.45 0.13 1.34	Coal (4) Mudstone Coal Mudstone Coal	4.67
000L	68* 659195E 5546845N	1625					3.06 0.28 0.91	Coal (7) Carbonaceous Mudstone Coal	4.25

TABLE 4

AVERAGE SEAM THICKNESSES IN EACH THRUST BLOCK

WEST PLATE		MICHAEL-BANNER PLATE		EWIN PASS-BANNER PLATE AND EWIN PASS-BANNER EAST PLATE	
Seam	T/TM	Seam	T/TM	Seam	T/TM
				0	?
I	1.45	A	1.37		
		B	2.32	1	?
II	1.68	C	2.85		
		D	4.9	2	4.94
III	2.77	E	4.99		
		F	2.6	3	5.37
IV	5.01	G	3.46		
		H	1.51	4	7.89
		J	1.96		
		J+K	5.20	5	5.80
		K	14.97		
		L	5.76	7	6.77
		M	8.87		
		N	1.53	8	8.00

Mont Banner East

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

APPLICATION TO EXTEND TERM OF LICENCE

I, LESLIE GRAMANTIK (Name) agent for SHELL CANADA RESOURCES LIMITED (Name)

P.O. BOX 100 (Address) CALGARY (Address)

ALBERTA T2P 2M7

Valid FMC No. 257.6777

hereby apply to the Minister to extend the term of Coal Licence(s) No(s). 277, 280, 281, 1299, 1302, 5 LICENCES, GROUP #329, 908 HECTARES

for a further period of one year.

2. Property name MOUNT BANNER EAST, KOOTENAY LAND DISTRICT

3. I am allowing the following Coal Licence(s) No(s). to forfeit N/A

4. I have performed, or caused to be performed, during the period FEBRUARY 1, 1982 to JANUARY 31, 19 83, work to the value of at least $ .....
on the location of coal licence(s) as follows:

CATEGORY OF WORK	Licence(s) No(s).	Apportioned Cost
Geological mapping		
Surveys: Geophysical		
Geochemical		
Other		
Road construction		
Surface work		
Underground work		
Drilling		
Logging, sampling, and testing		
Reclamation		
Other work (specify)		
Off-property costs		

5. I wish to apply $ ..... of this value of work on Coal Licence(s) No(s). .....

6. I wish to pay cash in lieu of work in the amount of $ ..... on Coal Licence(s) No(s).

7. The work performed on the location(s) is detailed in the attached report entitled PLEASE APPLY EXCESS CREDIT ON THESE LICENCES.

24/01/83 (Date)

(Signature)

ASSISTANT LANDMAN (Position)

(FORMS AND REPORT TO BE SUBMITTED IN DUPLICATE)

TABLE 5

GEOLOGICAL MAPPING Yes ☐ No ☐

	Area (Hectares)	Scale	Duration
Reconnaissance			
Detail: Surface			
Underground			
Other* (specify)			

Total Cost $ .....

GEOPHYSICAL/GEOCHEMICAL SURVEYS Yes ☐ No ☐

Method .....
Grid .....
Topographic .....
Other* (specify) .....

Total Cost $ .....

ROAD CONSTRUCTION Yes ☐ No ☐

Length ..... Width .....
On Licence(s) No.(s) .....
Access to .....

Total Cost $ .....

SURFACE WORK Yes ☐ No ☐

	Length	Width	Depth	Cost
Trenching				
Seam Tracing				
Crosscutting				
Other* (specify)				

Total Cost $ .....

UNDERGROUND WORK Yes ☐ No ☐

	No. of Adits	Maximum Length	No. of Holes	Total Metres	Cost
Test Adits					
Other workings*					

Total Cost $ .....

DRILLING Yes ☐ No ☐

	Hole Size	No. of Holes	Total Metres	Cost
Core: Diamond				
Wireline				
Rotary: Conventional				
Reverse circulation				
Other* (specify)				

Contractor .....
Where is the core stored? .....

Total Cost $ .....

LOGGING, SAMPLING, AND TESTING Yes ☐ No ☐

Lithology: Drill samples ☐ Core samples ☐ Bulk samples ☐
Logs: Gamma-neutron ☐ Density ☐

Other* (specify) .....

Testing: Proximate analysis ■ FSI ☐ Washability ☐
Carbonization ☐ Petrographic ☐ Plasticity ☐

Other* (specify) .....

Total Cost $ .....

RECLAMATION Yes ☐ No ☐

Details ..... Total Cost $ .....

OTHER WORK (Specify details) Yes ☐ No ☐ Cost

.....
.....

Total Cost $ .....

OFF–PROPERTY COSTS Yes ☐ No ☐

Details ..... Total Cost $ .....

Total Expenditures $ .....

....
(Date) (Signature)

.....
(Position)

*A full explanation of other work is to be included.

4.0 GEOLOGY

4.1 Regional Geology

The Mount Banner East Prospect is within the Elk Valley Coalfield, the northernmost of three major coalfields in southeastern British Columbia. The coalfield is preserved as a synclinal remnant (Alexander Syncline) composed of sediments of Upper Jurassic to Lower Cretaceous Age. Coal seams of economic interest are found in the Mist Mountain Formation of the Kootenay Group.

4.2 Stratigraphy

Jurassic-Cretaceous sediments (TABLE 6) grading from marine shales (Fernie Formation) to fully alluvial conglomerates and sandstones (Blairmore Group) represent the regression to the northeast of the Jurassic "Fernie Sea" from this area. This regression occurred through various epineritic and deltaic environments, the latter being favourable to coal deposition.

Fernie Formation

Interbedded marine shales, siltstones, sandstones and limestones comprise the Fernie Formation. These strata are usually recessive in outcrop and weather dark brown. Fernie shales occur at the foot of the eastern side of Mount Banner East.

Kootenay Group

This report adheres to the stratigraphic nomenclature established Gibson (1979) of the Geological Survey of Canada. He divides the Kootenay Group into three formations: the Morrissey, Mist Mountain and Elk in ascending order (TABLE 6).

Morrissey Formation

This Formation represents the transition from marine to deltaic depositional environment. It is divided into the Moose Mountain and Weary Ridge Members.

TABLE OF FORMATIONS TABLE 6 (Adapted from Gibson, 1979)

ERA	PERIOD	FORMATION	LITHOLOGY	THICKNESS (M)
MESOZOIC	Lower Cretaceous	Cadomin Fm.	non-marine: sandstone, conglomerate and shale	360 - 1980
	LOWER CRETACEOUS AND JURASSIC	KOOTENAY GROUP: Pocaterra Creek	non-marine: sandstones, conglomerate, siltstones and shales	
		KOOTENAY GROUP: ELK FORMATION	non-marine: interbedded medium to coarse grain sandstone, chert-pebble conglomerate with minor siltstone shale and uneconomic coals	150 - 490
		KOOTENAY GROUP: MIST MTN. FORMATION	non-marine and brackish: interbedded coal, siltstones, shales, and sandstones	380 - 480
		KOOTENAY GROUP: MORRISSEY FORMATION: Moose mtn. / Weary Ridge	non-marine: massive cliff-forming sandstone	40 - 60
	Jurassic	Fernie Fm.	marine: shales, siltstone, sandstone, limestone	180 - 380

The Weary Ridge Member consists of medium to thick bedded, fine to medium grained sandstone with minor iron-stained concretions and silty as well as shaley interbeds. The member is grey but weathers orange-brown. The Moose Mountain Member is generally massive, well indurated, medium to coarse-grained gray sandstone with a few thin chert pebble or silty bands. It weathers light to medium gray and is a distinct cliff-former. Coal seams have been found in this member on other CNRL properties, but on Mount Banner East only one thin coaly stringer was observed in outcrop and in the diamond drill core (Sloan, 1981).

Mist Mountain Formation

This Formation is an interstratified succession of siltstones, silty shales, mudstones, sandstones and coal seams. All coal of economic interest in southeastern British Columbia occurs in this Formation, and often makes up more than 10% of the Formation.

Elk Formation

This Formation consists of cliff forming, buff weathering, gray sandstones, a few conglomerate bands, siltstones, shales, and of a few thin seams of hard coal. More than 200 metres of Elk Formation caps the south end of the main ridge of Mount Banner East.

4.3 GEOLOGICAL STRUCTURE

The prospect is located on the east limb of the Alexander Creek Syncline. Much of the prospect is a scarp slope of west dipping beds cropping out on the east side of a north trending ridge. The structural geology is governed by four plates separated by their individual thrust faults. Names have been assigned to the plates to aid in the description of the structural geology of the Mount Banner area. The plates are: the West Plate, the Michael-Banner Plate, the Ewin Pass-Banner Plate, and the Ewin Pass-Banner East Plate. They are separated by the Mt. Michael Thrust, the Ewin Pass Thrust and the Twin Anticline Thrust.

(a) West Plate and Mount Michael Thrust

The West Plate is located west of the Mount Michael Thrust. This plate consists mostly of Elk Formation.

The Mount Michael Thrust separates the West Plate from the central Michael-Banner Plate to the east of the Mount Michael Thrust. In the northern part of the project area the Mount Michael Thrust is located entirely in the Elk Formation. In the south, toward Mount Michael, the thrust fault is located in the upper part of the Mist Mountain Formation, exposing four thin coal seams in the West Plate.

The Mount Michael Thrust tends to upthrow Elk Formation on top of coal-bearing Mist Mountain Formation, thus limiting the open pit area in the underlying Michael-Banner Plate.

Four coal seams are located in the southern part of the West Plate. They have been given the Roman numbers I, II, III and IV from top to bottom. All seams are of minor importance because they are either very thin or, as in the case with Seam IV, appear only for a short distance. The true seam thicknesses for the West Plate seams, are shown in Tables 3 and 4.

(b) Michael-Banner Plate and Ewin Pass Thrust

The Michael-Banner Plate is located between the Mount Michael Thrust and the very important Ewin Pass Thrust. A significant number of coal seams outcrop in the Michael-Banner Plate. 13 coal seams designated from top to bottom as Seam A, B, C, D, E, F, G, H, J (or H + J) K, L, M and N are identified. It is interpreted that Seam D shales out and that the thick seam H + J splits into two thin seams, called seam H and seam J. This development cannot be proved conclusively by field mapping.

The seams of the Michael-Banner Plate vary in thickness from very thin to very thick, (32.42m for K seam). True seam thickness for Michael-Banner plate coal seams are tabulated in Tables 3 and 4.

(c) Ewin Pass-Banner Plate and Ewin Pass-Banner East Plate With the Twin Anticline Thrust

Both plates are separated from the Michael-Banner Plate by the prominent Ewin Pass Thrust. The Twin Anticline Thrust separates these thrust plates from each other. Both thrust plates can be described together because the seam development is similar in each, but vastly different from the Michael-Banner Plate.

The Ewin Pass-Banner Plate consists of an anticline that develops north and south into a monocline due to the position of the Twin Anticline Thrust.

The Ewin Pass-Banner East Plate is formed by an anticline and a syncline. The syncline is assymmetrical with the axial plane slightly dipping to the west (approximately 70^{o}). The anticline axial plane, however, is almost vertical or dips slightly to the west.

The seams in the Ewin Pass-Banner Plate and Ewin Pass-Banner East Plate carry arabic numbers from top to bottom as follows: Seam 1, 2, 3, 4, 5, 7 and Seam 8.

The seam thicknesses are calculated using data from one drill hole on Banner East and trenching in this area. It was felt that this is the most reliable information. Seam 8 was never intersected in borehole or trenches and the thickness of 8 m originates from geological work of the B.C. Government north of Ewin Creek on Imperial Ridge. Seam thickness data for the Ewin Pass-Banner and Ewin Pass-Banner East Plate is presented in Tables 3 and 4.

5.0 COAL RESERVES

The potential exists for at least 6 million tonnes of insitu coal at a low strip ratio in the east part of the property (Sloan 1981). This coal is in the Ewin Pass-Banner East Plate. The present mapping indicates that thick seams also exist in the Ewin Pass-Banner Plate and Michael-Banner Plate. These plates probably contain additional reserves at low strip ratios.

6.0 RECOMMENDATIONS

Construction of additional sections will allow detailed surface and underground reserve calculations. Further field work must include sampling of fresh coal by drilling. At the moment, the only reliable source of coal quality data is the single drill hole which penetrates the lower part of the Mist Mountain section in the Ewin Pass-Banner East plate.

7.0 SELECTED BIBLIOGRAPHY

FISHER, J. - Geological Report for work done during 1979, Crows Nest Resources Limited, 1980.

GIBSON, D.W. - The Morrissey and Mist Mountain Formations - newly defined lithostratigraphic units of the Jura-Cretaceous Kootenay Group, Alberta and British Columbia; Bulletin of Canadian Petroleum Geology, Vol. 27, No. 2, pp. 183-208, 1979.

SLOAN, G. - Geological Report: Mount Banner East Prospect; Internal Crows Nest Resources Limited filed with B.C. Ministry of Energy, Mines and Petroleum Resources, 1981.

RYAN B. - Geological Report on Coal Licences 277, 280, 281, 1299 and 1302 Group No. 329 Crows Nest Resources Limited, 1982.

114° 50'
660 000 m E
114° 45'
665 000 m E
5 545 000 m N
50° 00'
5 540 000 m N
5 535 000 m N
49° 55'
5 530 000 m N
655 000 m E

11.4km to B.C. Coal Resources Plant

MT. BANNER EAST
EWIN PASS
MT. MICHAEL
LINE CREEK EXTENSION
LINE CREEK MINE
HORSESHOE RIDGE
COAL LEASE 4
TEEPEE

GROUP 329
GROUP 330
GROUP 331

CL278 CL277 CL1299
CL279 CL280 CL281 CL1302
CL284 CL283 CL282 CL1301
CL285 CL286 CL287 CL1300
CL304 CL289 CL288
CL290 CL291
CL293 CL292 CL368
CL294 CL295 CL373
CL297 CL296 CL369
CL298 CL299
CL301 CL300
CL302
CL303
CL370

CROWSNEST FREEHOLD BLOCK

Service Area

Sparwood
20 km (approx.)
Plant Site
Grave Lake

Fording River
Dry Creek
Grave Creek
Line Creek
Tornado Creek
Alberta-British Columbia
North Fork Pass
Ewin Pass
Canadian Pacific Railway
Mt. Lyne
Mt. Salter
Mt. Michael
Mt. Banner
Mt. Erris
Horseshoe Ridge
Teepee Mtn.

Reference map produced by the Surveys and Mapping Branch, Department of Energy, Mines and Resources in 1975 and updated from 1979 Province of British Columbia 1:100.000 mapping. Metric contours were manually interpolated.

Scale 1:50 000

Kilometres 0.5 0 0.5 1.0 1.5 2.0 2.5 3.0 Kilometres

Miles 0.5 0 0.5 1.0 1.5 2.0 Miles

Contour Interval 100m
Transverse Mercator Projection
Universal Transverse Mercator Grid Zone II

Legend

- Road; Highway, Main road
- Road; Loose surface, Dry weather
- Track or trail
- Railway
- River
- Stream
- Contours (2000, 1500)
- Licence boundary
- Licence group boundary

T.N. 1°43' Grid North

HARDY ASSOCIATES (1978) LTD.

434

K-SHEET-Mt. Banner East 82(2*)A(*1)

Crows Nest Resources Limited
EXPLORATION

MOUNT BANNER EAST
S.E. BRITISH COLUMBIA
INDEX TO COAL LICENCES AND ACCESS MAP

N.T.S. 82 G/15 & 82 J/2

AUTHOR STOBERNACK	SCALE 1:50 000	ENCLOSURE No.
DATE FEB 1983	REVISED	CA 273
To Accompany		

114° 50'
660 000 m E
114° 45'
665 000 m E
5 545 000 m N
5 540 000 m N
5 535 000 m N
5 530 000 m N
50° 00'
49° 55'

MT. BANNER EAST
EWIN PASS
MT. MICHAEL
LINE CREEK EXTENSION
LINE CREEK MINE
HORSESHOE RIDGE
COAL LEASE 4
TEEPEE
Service Area
Plant Site
Sparwood 20 km (approx.)
CROWSNEST FREEHOLD BLOCK
GROUP 329
GROUP 330
GROUP 331
CADOMIN CONG.
MT. BANNER
MT. MICHAEL
MT. LYNX
MT. SALTER
MT. ERRIS
TEEPEE MTN.
CL277
CL278
CL279
CL280
CL281
CL282
CL283
CL284
CL285
CL286
CL287
CL288
CL289
CL290
CL291
CL292
CL293
CL294
CL295
CL296
CL297
CL298
CL299
CL300
CL301
CL302
CL303
CL304
CL368
CL369
CL370
CL373
CL1299
CL1300
CL1301
CL1302
MsM
JKmm
JKe
Jf
Alexander Creek
Syncline
Fording River
Grave Lake
Ewin Pass
Tornado Creek
Line Creek Ridge
Horseshoe Ridge
North Fork Pass
Canadian Pacific Railway
Alberta & Columbia

655 000 m E 114° 50' 660 000 m E 114° 45' 665 000 m E

Reference map produced by the Surveys and Mapping Branch, Department of Energy, Mines and Resources in 1975 and updated from 1979 Province of British Columbia 1:100 000 mapping. Metric contours were manually interpolated.

Scale 1:50 000

Kilometres 0.5 0 0.5 1.0 1.5 2.0 2.5 3.0 Kilometres

CONTOUR INTERVAL 100 m

GEOLOGICAL LEGEND

LOWER CRETACEOUS

Blairmore Group

Klbl — **Cadomin Formation**

JURASSIC - CRETACEOUS

Kootenay Group

JKe — **Elk Formation**

JKmm — **Mist Mountain Formation, Coal**

JKm — **Morrissey Formation (Moose Mountain Member)**

MsM — ~~Moose Mountain Member (Morrissey Formation)~~ Morrissey Formation (Weary Ridge Member)

Thrust Fault

Anticline

Syncline

Legend

Road; Highway, Main road

Road; Loose surface, Dry weather

Track or trail

Railway

River

Stream

Contours 2000 / 1500

Licence boundary

Licence group boundary

T.N. 1°43' Grid North

HARDY ASSOCIATES (1978) LTD.

434

K-SHELL-Mt. Banner East 82(2*)A (*1)

Crows Nest Resources Limited
EXPLORATION

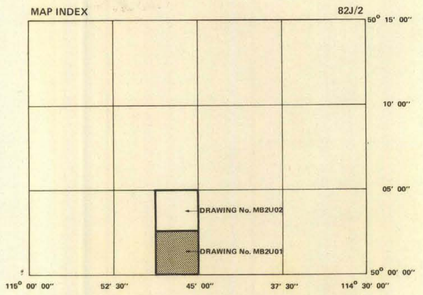
S.E. B.C.
MOUNT BANNER EAST

GEOLOGICAL COMPILATION MAP

N.T.S. 82G/15 & 82J/2

AUTHOR J. STOBERNACK	SCALE 1:50 000	ENCLOSURE No. 2
DATE FEB 1983	REVISED	CA-325
To Accompany		

MAP INDEX 82J/2



REFERENCE

MAIN ROAD		RIVER, LAKE	
SECONDARY ROAD		INTERMITTENT RIVER	
TRACK OR TRAIL		TREED AREA	
RAILWAY		LINE OF TREES	
HEDGE FENCE		INDIVIDUAL TREES	
BRIDGE CULVERT		VERTICAL INTERVAL	1812 1912 1908
CUT FILL		DEPRESSION	
SWAMP		SPOT HEIGHT	1507.5
DRILL HOLE		CONTROL POINT	

MAP PROJECTION : UNIVERSAL TRANSVERSE MERCATOR
CENTRAL MERIDIAN REFERENCE 117° W.

T.N.
Grid North

100 50 0 100 200 300 400 500 METRES

SCALE 1 : 5000
CONTOUR INTERVAL : 5 METERS
DATE OF PHOTOGRAPHY : JUNE/JULY, 1978

GEOLOGICAL LEGEND

LOWER CRETACEOUS
Blairmore Group
Kibl — Cadomin Formation

JURASSIC - CRETACEOUS
Kootenay Group
JKe — Elk Formation
JKmm — Mist Mountain Formation, Coal
JKm — Morrissey Formation (Moose Mountain Member)
MsM — ~~Moose Mountain Member (Morrissey Formation)~~ Morrissey Formation (Weary Ridge Member)

THRUST FAULT
TRACE OF ANTICLINE
TRACE OF SYNCLINE
STRIKE AND DIP OF BEDDING
LOCATION OF 1982 HAND TRENCH
CNRL — LICENCE BOUNDARY (APPROX. ONLY)

434
K-SHELL-Mt Banner East 82 (2*)B (1)

Crows Nest Resources Limited
EXPLORATION

MOUNT BANNER EAST
S.E. BRITISH COLUMBIA

GEOLOGICAL MAP
SHEET 1 of 2

Enclosure 3
N.T.S. - 82 J/2 U.T.M. ZONE 11

AUTHOR: J. STOBERNACK	SCALE: 1:5000	DRAWN BY: J.S.	
DATE: 83 · 02	REVISED:	DRAWING No: MB2U01	
To Accompany			

114°48'45" 50°05'00" 657 000 mE 657 500 mE 658 000 mE 658 500 mE 659 000 mE 659 500 mE 660 000 mE 660 500 mE 114°45'00" 50°05'00"

5 549 500 mN 5 549 000 mN 5 548 500 mN 5 548 000 mN 5 547 500 mN 5 547 000 mN 5 546 500 mN 5 546 000 mN 5 545 500 mN

EWIN PASS THRUST

ELK FORM. JKe

MIST MNTN. JKmm

MOOSE MTN. MsM

FERNIE SHALE

TWIN ANTICLINE THRUST

C.L.278

C.L.277

C.L.1299

W.L. 1522.5

50°02'30" 114°48'45" 657 000 mE 657 500 mE 658 000 mE 658 500 mE 659 000 mE 659 500 mE 660 000 mE 660 500 mE 661 000 mE 114°45'00" 50°02'30"

MAP INDEX 82J/2

50° 15' 00"
10' 00"
05' 00"
50° 00' 00"
115° 00' 00" 52' 30" 45' 00" 37' 30" 114° 30' 00"

DRAWING No. MB2U02

DRAWING No. MB2U01

REFERENCE

MAIN ROAD		RIVER, LAKE	
SECONDARY ROAD		INTERMITTENT RIVER	
TRACK OR TRAIL		TREED AREA	
RAILWAY		LINE OF TREES	
HEDGE FENCE		INDIVIDUAL TREES	
BRIDGE CULVERT		VERTICAL INTERVAL	1810 / 1808
CUT FILL		DEPRESSION	
SWAMP		SPOT HEIGHT	1607.5
DRILL HOLE		CONTROL POINT	

MAP PROJECTION : UNIVERSAL TRANSVERSE MERCATOR
CENTRAL MERIDIAN REFERENCE 117° W.

T. N. GRID NORTH

100 50 0 100 200 300 400 500 METRES

SCALE 1 : 5000

CONTOUR INTERVAL : 5 METERS

DATE OF PHOTOGRAPHY : JUNE/JULY, 1978

GEOLOGICAL LEGEND

LOWER CRETACEOUS

Blairmore Group

Klbl — Cadomin Formation

JURASSIC - CRETACEOUS

Kootenay Group

JKe — Elk Formation

JKmm — Mist Mountain Formation, Coal

JKm — Morrissey Formation (Moose Mountain Member)

MsM — ~~Moose Mountain Member (Morrissey Formation)~~ Morrissey Formation (Weary Ridge Member)

THRUST FAULT

TRACE OF ANTICLINE

TRACE OF SYNCLINE

STRIKE AND DIP OF BEDDING

Loc 6 — LOCATION OF 1982 HAND TRENCH

CNRL — LICENCE BOUNDARY (APPROX. ONLY)

434

K-SHELF-Mt. Banner East B2(a*)A (*1)

Crows Nest Resources Limited

EXPLORATION

MOUNT BANNER EAST
S.E. BRITISH COLUMBIA

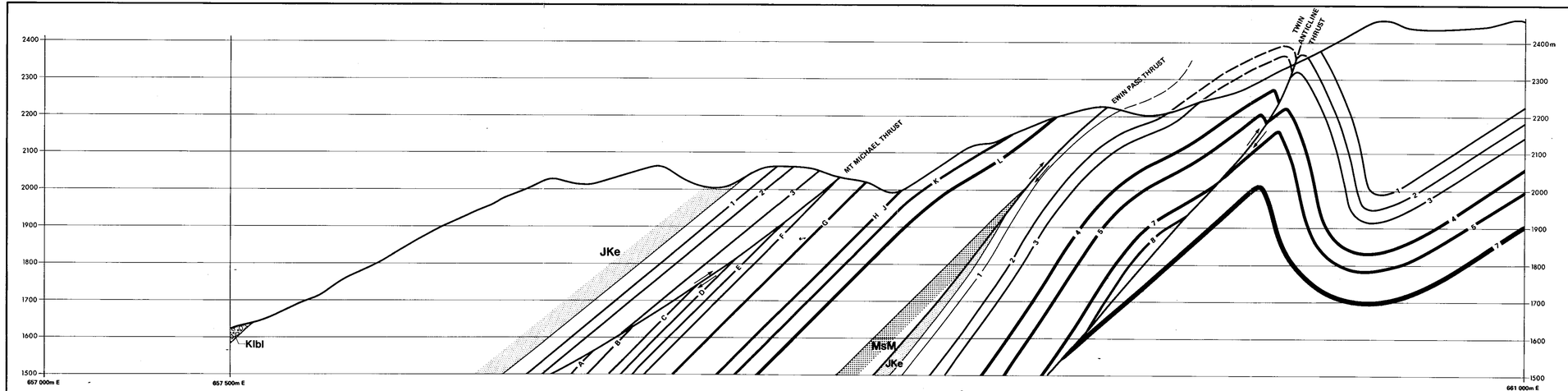
GEOLOGICAL MAP

SHEET 2 of 2

Enclosure 4

N.T.S - 82J/2 U.T.M. ZONE 11

AUTHOR: J. STOBERNACK	SCALE: 1:5000	DRAWN BY: J.S.	
DATE: 83 · 02	REVISED:	DRAWING No: MB2U02	
To Accompany			



GEOLOGICAL LEGEND

LOWER CRETACEOUS

Blairmore Group

KIbl — Cadomin Formation

JURASSIC - CRETACEOUS

Kootenay Group

JKe — Elk Formation

JKmm — Mist Mountain Formation, Coal

JKm — Morrissey Formation (Moose Mountain Member)

~~Moose Mountain Member (Morrissey Formation)~~ Morrissey Formation (Wilcox Ridge Member)

Geological Contact - defined, approx., inferred

Thrust Fault (arrow represents direction of thrusting)

434

K-SHELL - Mt Banner East 82J/2a (1)

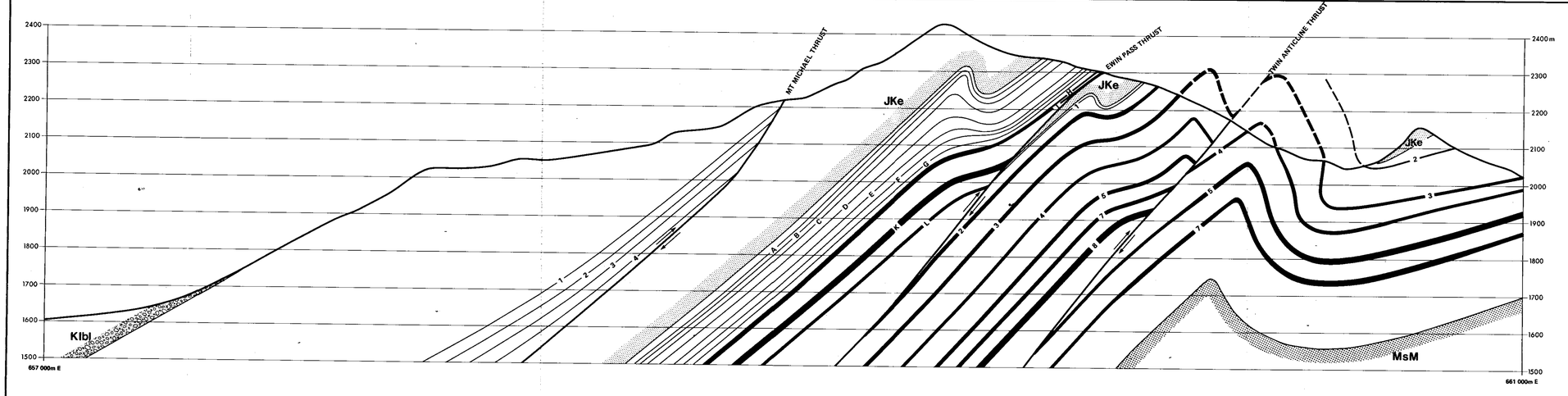
Crows Nest Resources Limited
EXPLORATION

MOUNT BANNER EAST
S.E. BRITISH COLUMBIA

CROSS-SECTION
5 543 000 mN

Enclosure No. 5

NTS. 82 J/2		U.T.M. ZONE 11
AUTHOR / J. STOBERNACK	SCALE 1:5 000	DRAWN BY:
DATE FEB 1983	REVISED:	DRAWING No. MB2X01
To Accompany		



100 50 0 100 200 300 400 500 METRES

HORIZONTAL & VERTICAL

SCALE 1:5 000

GEOLOGICAL LEGEND

LOWER CRETACEOUS

Blairmore Group

KIbl — Cadomin Formation

JURASSIC - CRETACEOUS

Kootenay Group

JKe — Elk Formation

JKmm — Mist Mountain Formation, Coal

JKm — Morrissey Formation (Moose Mountain Member)

~~Moose Mountain Member (Morrissey Formation)~~ Morrissey Formation (Weary Ridge Member)

Geological Contact - defined, approx., inferred

Thrust Fault (arrow represents direction of thrusting)

K-SHELL, Mt. Banner East 82J/1A (*)

Crows Nest Resources Limited
EXPLORATION

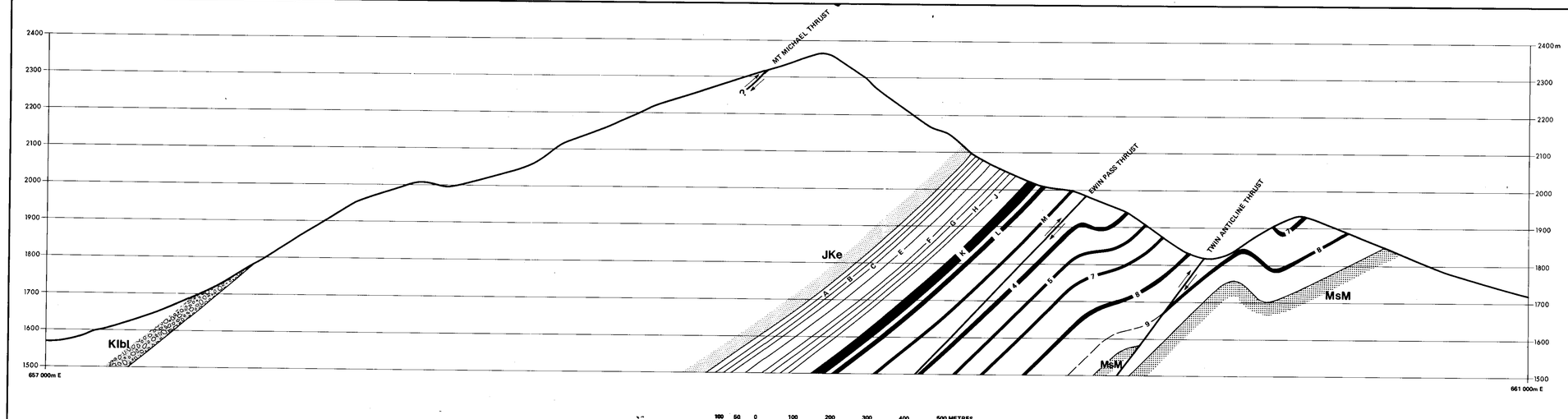
MOUNT BANNER EAST
S.E. BRITISH COLUMBIA

CROSS-SECTION
5 544 000 mN

Enclosure No. 6

N.T.S. 82 J/2 — UTM. ZONE 11

AUTHOR: J. STOBBERNACK	SCALE: 1:5 000	DRAWN BY:
DATE: FEB. 1983	REVISED	
To Accompany		DRAWING No: MB2X02



GEOLOGICAL LEGEND

LOWER CRETACEOUS

Blairmore Group

Klbl — Cadomin Formation

JURASSIC - CRETACEOUS

Kootenay Group

JKe — Elk Formation

JKmm — Mist Mountain Formation , Coal

JKm — Morrissey Formation (Moose Mountain Member)

~~Moose Mountain Member (Morrissey Formation)~~ Morrissey Formation (Weary Ridge Member)

Geological Contact - defined, approx., inferred

Thrust Fault (arrow represents direction of thrusting)

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K-SHEET - Mt Banner East 82J(2)A (1)

Crows Nest Resources Limited
EXPLORATION

MOUNT BANNER EAST
S.E. BRITISH COLUMBIA

CROSS-SECTION
5545 000 mN

NTS 82 J/2 — Enclosure No. 7
U.T.M. ZONE 11

AUTHOR J. STOBBERNACK	SCALE 1:5 000	DRAWN BY
DATE FEB 1983	REVISED	DRAWING No. MB2X03
To Accompany		