

EWIN CREEK LICENCES

PROGRESS REPORT

FEBRUARY, 1980

~~CONFIDENTIAL~~
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KAISER RESOURCES LTD.
SPARWOOD, B.C.

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**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

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CONTENTS

	Page
GENERAL	
Location	1
Utilities.....	1
Land Description and Ownership.....	4
Field Work.....	4
PHYSICAL FEATURES and CLIMATE	
Topography.....	6
Climate.....	6
GEOLOGY	
General.....	7
Economic.....	8
PROPOSALS.....	10
ILLUSTRATIONS	
Location Map.....	2
Licence Map.....	3
TABLES	
Reserve estimates.....	13
Coal Quality Data.....	11
FOR FURTHER DATA, REFER TO CONFIDENTIAL COAL ANALYSIS FILE	
APPENDIX	
Stratigraphic Column, Imperial Ridge.....	14
Method of reserves calculation.....	15
POCKET	
Surface Geology of Ewin Creek Licences	
Geologic cross-section, 5,547,200N	
Geologic cross-section, 5,548,900N	

GENERAL

Location:

The four Ewin Creek licences are located in the Fording River valley and cover the lower portion of the Ewin Creek drainage. They center approximately 50°03'30" north latitude and 114°46'30" west longitude.

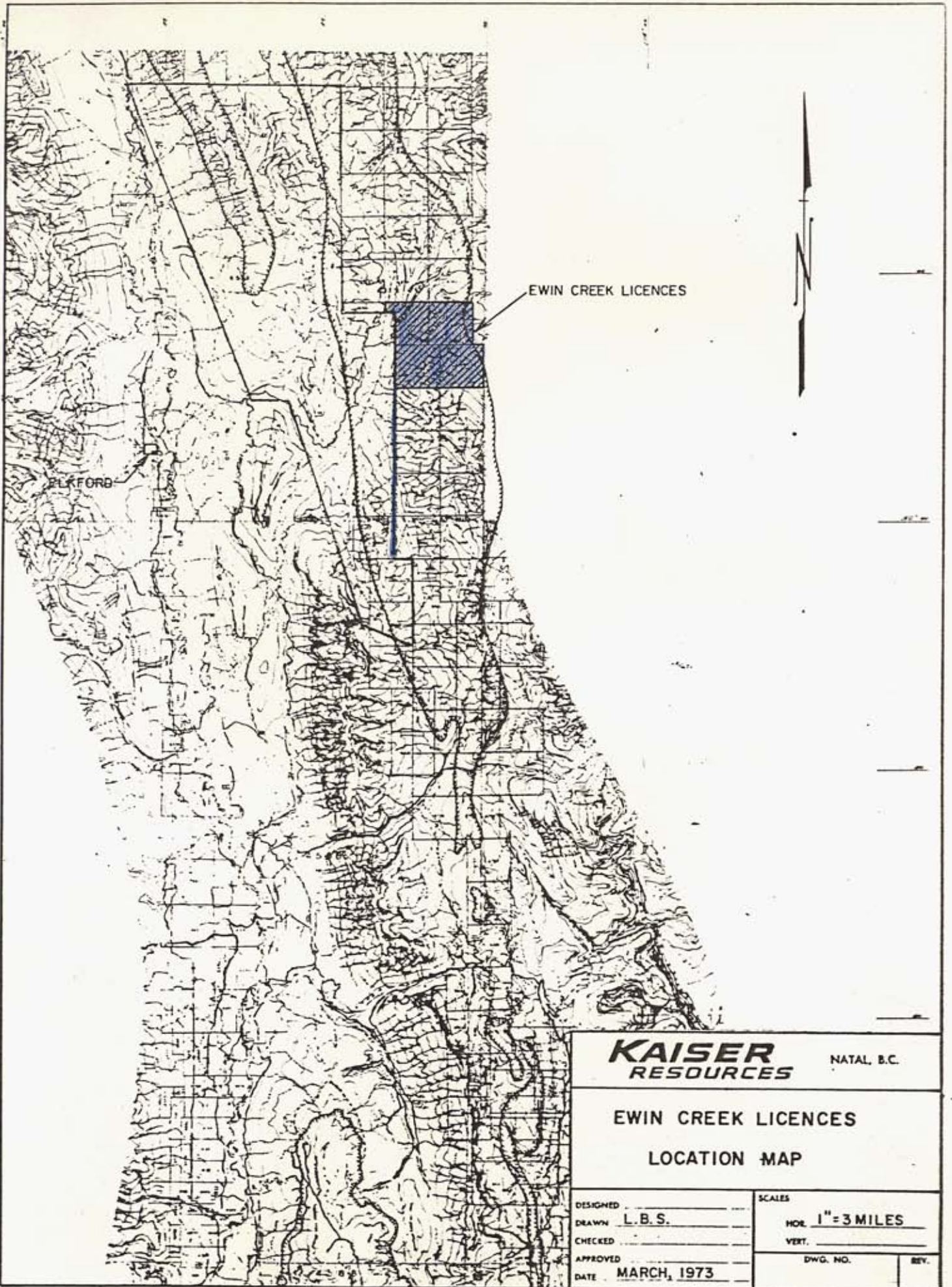
Access:

The Ewin Creek licences can be reached via the Crows Nest Resources logging road which follows up the east side of the Fording River. New logging roads were constructed in Ewin Creek and Todhunter Creek giving easy access to the area. Four-wheel drive roads lead from the logging roads to other areas of the licences.

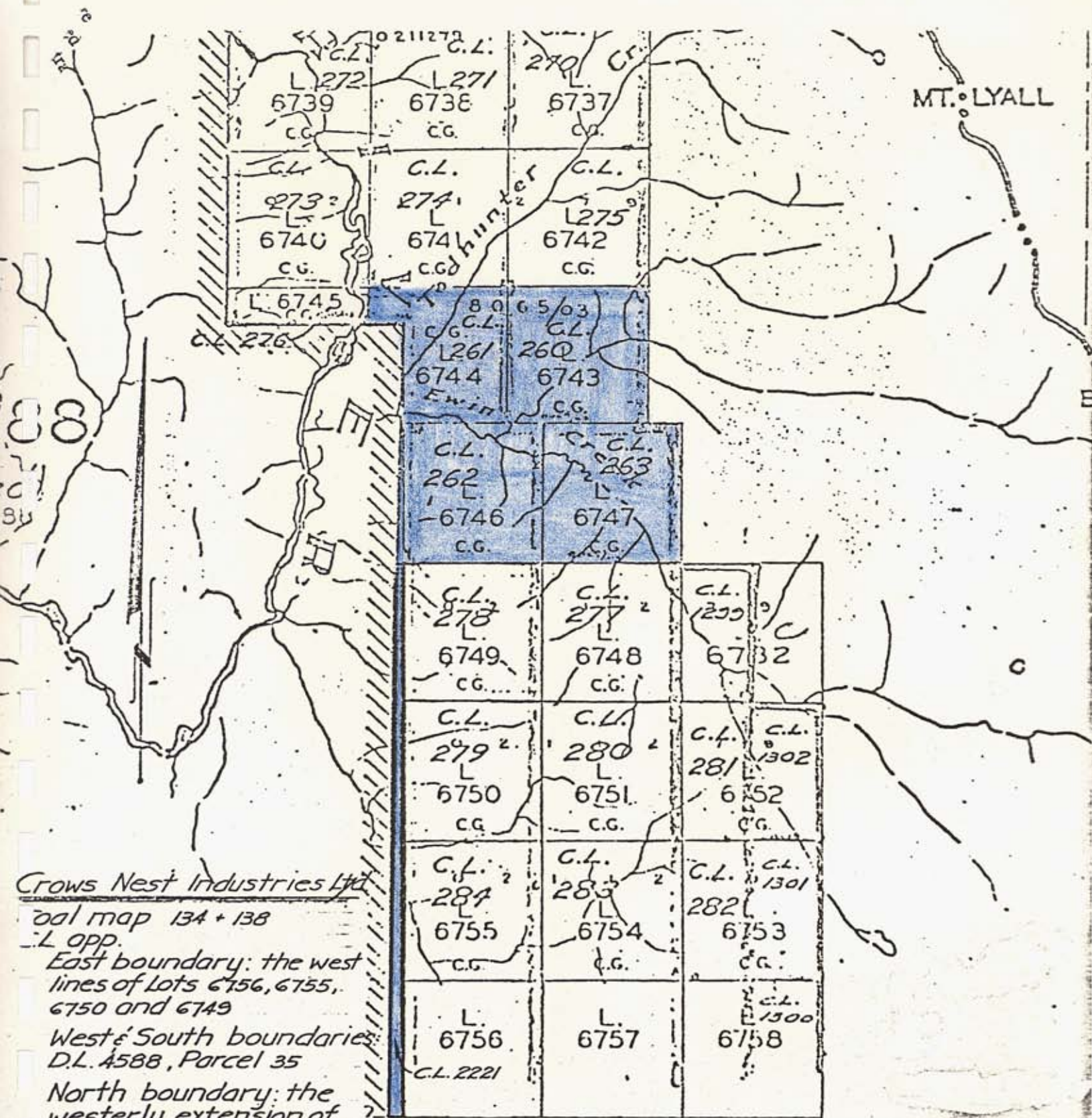
Utilities:

A Canadian Pacific spur line and natural gas pipeline run along the bottom of the Fording River valley, on the western edge of the Ewin Creek licences, and terminate at the Fording Coal mine site 15 kilometres to the north.

Telephone services and electrical power are available at the Elkford townsite 11 kilometres southwest of the Ewin Creek licences, in the Elk River valley.



Kootenay Land District, upper Elk area.



Crows Nest Industries Ltd

Original map 134 + 138

L. opp.

East boundary: the west lines of Lots 6756, 6755, 6750 and 6749

West & South boundaries: D.L. 4588, Parcel 35

North boundary: the westerly extension of the north boundary of Lot 6749 to intersect D.L. 4588

L. no. 2221

Scale 1 inch to 1 mile

Land Description and Ownership:

During February of 1968, Kaiser Resources Ltd., acquired the coal rights on 43,725 hectares of coal-bearing lands. The four Ewin Creek licences were part of the acquisition and cover 980 hectares of which approximately 62% or 608 hectares are coal bearing.

Field Work:

Geological mapping of the Ewin Creek licences were conducted from mid-May to late August, 1978 and mid-May to early June 1979.

In 1978 mapping was done on the south side of Ewin Creek, on the north ridge of Ewin Creek and on the ridge between Unknown Creek and Tod Hunter Creek (Imperial Ridge). Chain and compass surveying was used for location purposes. Established survey was limited for most of the field season. Underhill Engineering established new survey at various points throughout the licences late in the summer. Ten hand-trenches were proposed and dug on Imperial Ridge. The coal was measured and samples were taken for raw ash and F.S.I. testing. Other coal outcrop and trenches were measured and sampled throughout the licences.

In 1979 mapping was done on the ridge between Tod Hunter Creek and the Fording valley (Todhunter Ridge) and the south side of Ewin Creek. Some unit thickness measurements were done on Imperial Ridge and a stratigraphic column was constructed. (See Appendix).

The ten hand-trenches on Imperial Ridge were deepened, measured and sampled again. The nine trenches on the top of this ridge were surveyed during the summer. Some hand-trenches were dug, sampled and measured on Todhunter Ridge.

Two adit sites were proposed for the south side of Ewin Creek. Construction of the sites started late in 1979 and the adits will be driven early in 1980.

PHYSICAL FEATURES AND CLIMATE

Topography:

Ewin Creek has a gradient of about 23 metres per kilometre and flows through the center of the licences in a flat valley bottom that, in places, is up to 400 metres wide. Two streams, Todhunter Creek and Unknown Creek, with gradients of approximately 38 metres per kilometre flow through the licences into Ewin Creek from the northeast. These three creeks drain an area of approximately 80 square kilometres and carry large volumes of water in the late winter and spring run-off.

Mountains rise sharply from the valley bottom and on the south side of Ewin Creek they reach a height of 670 metres above the valley floor. Numerous seasonal streams drain into Ewin Creek down the north facing slope of this mountain. On the north side of Ewin Creek, Imperial Ridge stands 460 to 490 metres above the valley floor. Seasonal drainages on the southeast and east facing slopes of this ridge are sparse while on the northwest facing slope, seasonal drainages are more numerous.

Climate:

The climate and weather conditions in the Fording River - Ewin Creek area are similar to that around Sparwood, having pleasant summers and autumns, rainy and wet springs and cold winters with moderate snowfalls.

GEOLOGY

General:

Prominent sandstone units outcrop on the north and south sides of Ewin Creek. Sandstone, mudstone and coal outcrop along Imperial Ridge and Todhunter Ridge. Some outcrop occurs along road cuts on the south side of Ewin Creek, but it is usually sluffed giving little information.

The Moose Mountain Member forms a prominent sandstone cliff beyond the licence boundary on the north end of Imperial ridge and farther to the north on Todhunter Ridge. It can be found outcropping on the north side of Ewin Creek as well as the south side where the exposure is not as good.

On the south side of Ewin Creek, the Kootenay Formation appears to be in excess of 1,000 metres thick. It is in excess of 600 metres thick on Imperial Ridge, with over 400 metres of section within the licence boundary. On Todhunter Ridge there is little or no Kootenay Formation within the licence boundary.

Elk Formation sandstone is thought to form the top of the ridge on the south side of Ewin Creek, and may be present within the licence boundary on Todhunter Ridge.

The Ewin Creek licences lie on the east limb of the Fording river Syncline. The beds strike north-south and dip about 40 degrees to the west.

From the outcrop observed on the south side of Ewin Creek and Imperial Ridge, there appears to be no major faulting. To the north of the licence boundary on Todhunter Ridge there appears to be a fault, possibly a thrust causing distortions in the basal sandstone.

The lack of coal greater than 1.5 metres on Todhunter Ridge within the licence boundary may suggest a fault runs through the Todhunter valley. This fault is proposed because coal seams on the south side of Ewin Creek cannot be correlated to Todhunter Ridge. There is no strong evidence for the fault, and the lack of coal on this portion of Todhunter Ridge may be due to the thinning of the seams on the south side of Ewin Creek.

Economics:

On the top of Imperial Ridge there are nine coal seams ranging in thickness from 2 metres to 10 metres. The raw ash from samples ranges from 7.2% to 43.6%.

On Todhunter Ridge, there are six old adits to the north of the licence boundary. The dry ash-free volatile matter for five of these adits ranges from 26.6% in the adit lowest in the section to 33.7% for one of the adits higher in the section. The clean ash ranges from 7.4% to 8.4% and the F.S.I. ranges from 1.5 to 7.5. The coal in the adits should correlate with the seams on Imperial Ridge and may be an indication of coal quality for this Ridge.

On the south side of Ewin Creek there are nine old adits, six of which are in seams greater than 1.5 metres thick. Previous results taken from these adits indicate the d.a.f. volatile matter to range from 26.8% in the adit lowest in the section to 35.4% in the adit highest in the section (Table 1). Reserve estimates based on the coal in the adits and other coal outcrops are placed at 466 730 690 tonnes (Table 2). Two new adits will be constructed in 1980 in seams lower in the section, and more reserve and quality data will be obtained.

Coal seams were measured and sampled within the licence boundary on Todhunter Ridge. They range in thickness from 1 metre to 1.6 metres and the raw ash ranges from over 20% to just under 50%. These seams are thought to be upper Kootenay Formation but aren't directly correlatable with the adits on the south side of Ewin Creek. Economical coal seams do occur north of the licence boundary on this ridge.

PROPOSALS

The open hillsides of Ewin Creek are of major importance as a winter game range for both elk and Rocky Mountain bighorn sheep and are under constant scrutiny by local wildlife groups. Indiscriminate road building and trenching by cats on the north side of Ewin Creek should be avoided in order to placate the local conservationists. This area is suited as a testing ground for the location of coal seams by use of geophysical methods. A survey line could be run across the open hillside, at right angles to the strike of the beds, with a minimum of disturbance to the environment. The various geophysical methods could be tested along this line and the results correlated to the information obtained along the road on the south side of Ewin Creek.

The access road along the south side of Ewin Creek should be cleaned out and rebuilt. The geology uncovered should be picked up and coal seams should be sampled and measured.

Drillholes along the road on the south side of Ewin Creek should be drilled in order to determine coal reserves and the structural features of the subcrop. More adits on the south side of Ewin Creek would be useful in determining coal quality of the lower seams.

T A B L E S

TABLE 1 (1 of 2)

SUMMARY OF COAL QUALITY EWIN CREEK LIC. ADITS and OUTCROP

ADT NO.	SAMPLE NO.	THICK. (m.)	DATE Smpld.	RAW COAL	
				ASH	FSI
EWIN CREEK					
1		3.05	69/3/17	12.2	
2		1.52	69/3/17	18.2	
3		1.52	69/3/17		
5		1.89	69/3/17	14.8	
7		5.24	69/3/17	14.3	
8		2.44	69/3/17	20.8	
TODHUNTER RIDGE					
1		1.98	69/1/05	13.6	6.5
2		1.37	69/1/11	12.9	6.0
3		2.84	69/1/05	12.5	1.0
4		5.49	69/1/11	13.5	
5		3.66+	69/1/05	11.3	3.0
	EWIN CREEK				
	Trench A	5.05	79/8/03	7.2	N.C.
	Trench B	3.43	79/8/03	34.8	N.C.
	Trench C	4.29	79/8/03	43.6	N.C.
	Trench D	4.42	79/8/03	19.3	N.C.

TABLE 1 (2 of 2)

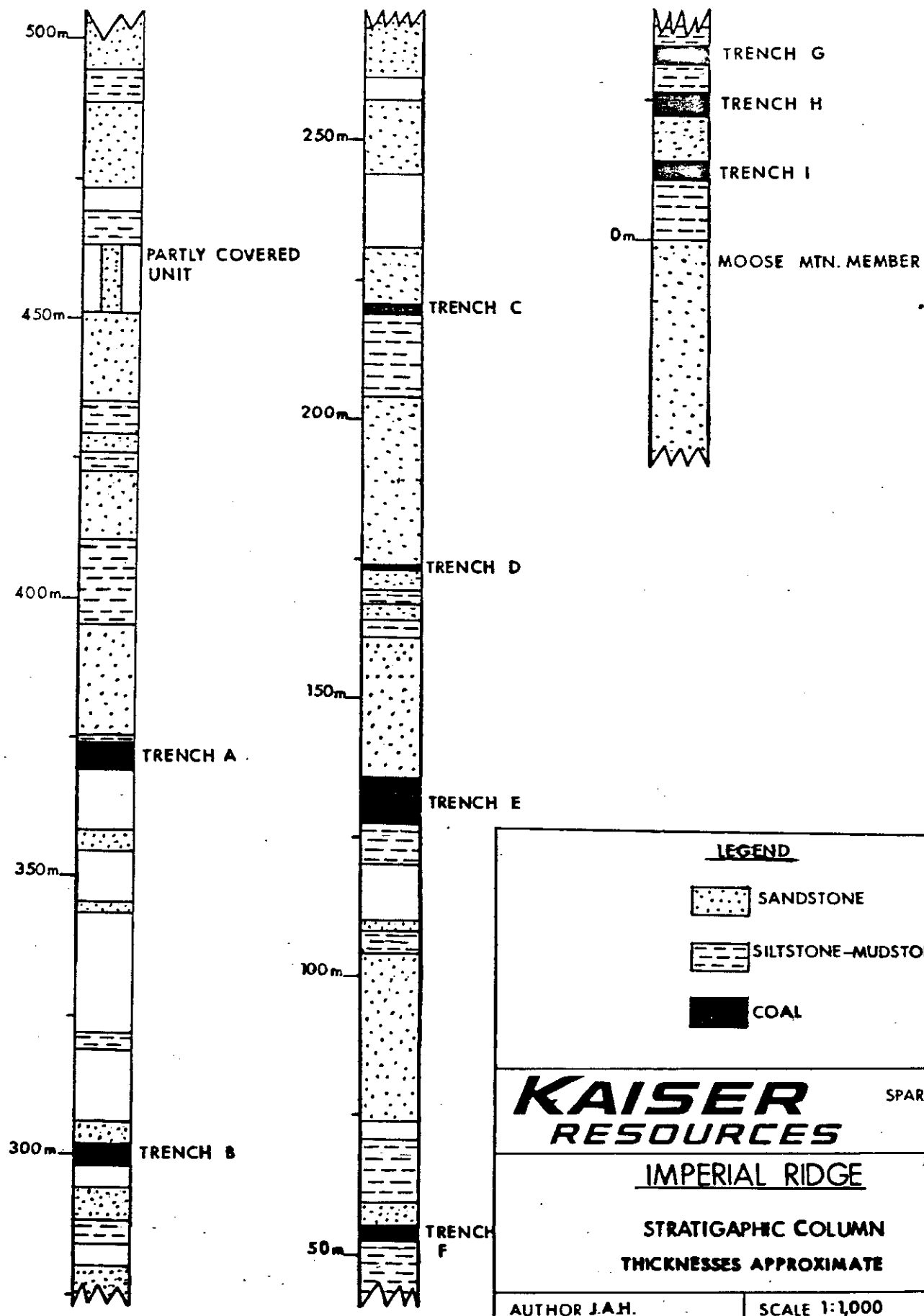
SUMMARY OF COAL QUALITY EWIN CREEK LIC. ADITS and OUTCROP

ADIT NO.	SAMPLE NO.	THICK. (m.)	DATE Smpld.	RAW COAL		CLEAN COAL RESULTS								
				ASH	FSI	ASH	VM	FC	SULPHUR	FSI	ddm	\bar{R}_o	YIELD	S.G.
	Trench E	10.36	79/3/8	22.4	N.C.									
	Trench F	4.11	79/10/25	16.3	N.C.									
	Trench G	3.56	79/10/25	23.2	N.C.									
	Trench H	2.09	79/10/25	14.7	N.C.									
	Trench I	2.94	79/10/25	12.3	N.C.									
	TODHUNTER CREEK													
	TR-01-A		79/8/3	23.2	N.C.									
	TR-01-B	10.43	79/8/3	28.1	N.C.									
	TR-02	5.08	79/8/3	31.3	N.C.									
	TR-03	1.06	79/8/3	47.3	N.C.									
	TR-04	1.60	79/8/3	25.7	N.C.									
	TR-05	1.12	79/8/3	20.7	N.C.									




TABLE 2. EWIN CREEK LICENCES PROJECTED RESERVE ESTIMATE OF TONNES OF COAL IN PLACE.

	Average dip of seam	True Thickness (m)	Vertical Thickness (m)	Tonnes of coal in place	
1 Seam (projected from trench)	40 ⁰	2.94	3.84	36 284 571	Reserves are bounded by Ewin Creek Licence Boundary
2 Seam (projected from trench)	40 ⁰	2.09	2.73	25 565 411	
3 Seam (projected)	40 ⁰	3.56	4.65	43 129 286	
4 Seam (projected)	40 ⁰	4.11	5.37	47 941 402	
5 Seam (projected)	40 ⁰	10.36	13.52	106 898 470	
6 Seam (projected)	40 ⁰	4.42	5.77	44 080 664	
7 Seam (projected)	40 ⁰	4.29	5.60	40 512 360	
8 Seam (projected)	40 ⁰	3.43	4.48	30 841 716	
9 Seam (projected)	40 ⁰	5.05	6.59	42 173 862	
Adit 1 Seam (projected)	31 ⁰	3.05	3.56	12 144 548	Reserves are bounded by Todhunter Creek or by Ewin Creek Licence Boundary
Adit 2 Seam (projected)	31 ⁰	1.52	1.77	5 766 448	
Adit 3 Seam (projected)	31 ⁰	1.52	1.77	4 582 105	
Adit 4 Seam (projected)	31 ⁰	1.22	1.43	3 276 745	
Adit 5 Seam (projected)	31 ⁰	1.89	2.20	4 650 504	
Adit 6 Seam (projected)	31 ⁰	1.52	1.77	3 452 827	
Adit 7 Seam (projected)	31 ⁰	5.24	6.11	10 822 215	
Adit 8 Seam (projected)	31 ⁰	2.44	2.85	4 607 595	
TOTAL COAL IN PLACE				466 730 690 tonnes	

A P P E N D I X



LEGEND

-  SANDSTONE
-  SILTSTONE-MUDSTONE
-  COAL

KAISER RESOURCES

SPARWOOD
B.C.

IMPERIAL RIDGE

135-10-4

STRATIGAPHC COLUMN
THICKNESSES APPROXIMATE

AUTHOR J.A.H.	SCALE 1:1,000
DRAWN J.A.H.	DATE FEB, 1980

Reserve Estimate Calculation Method

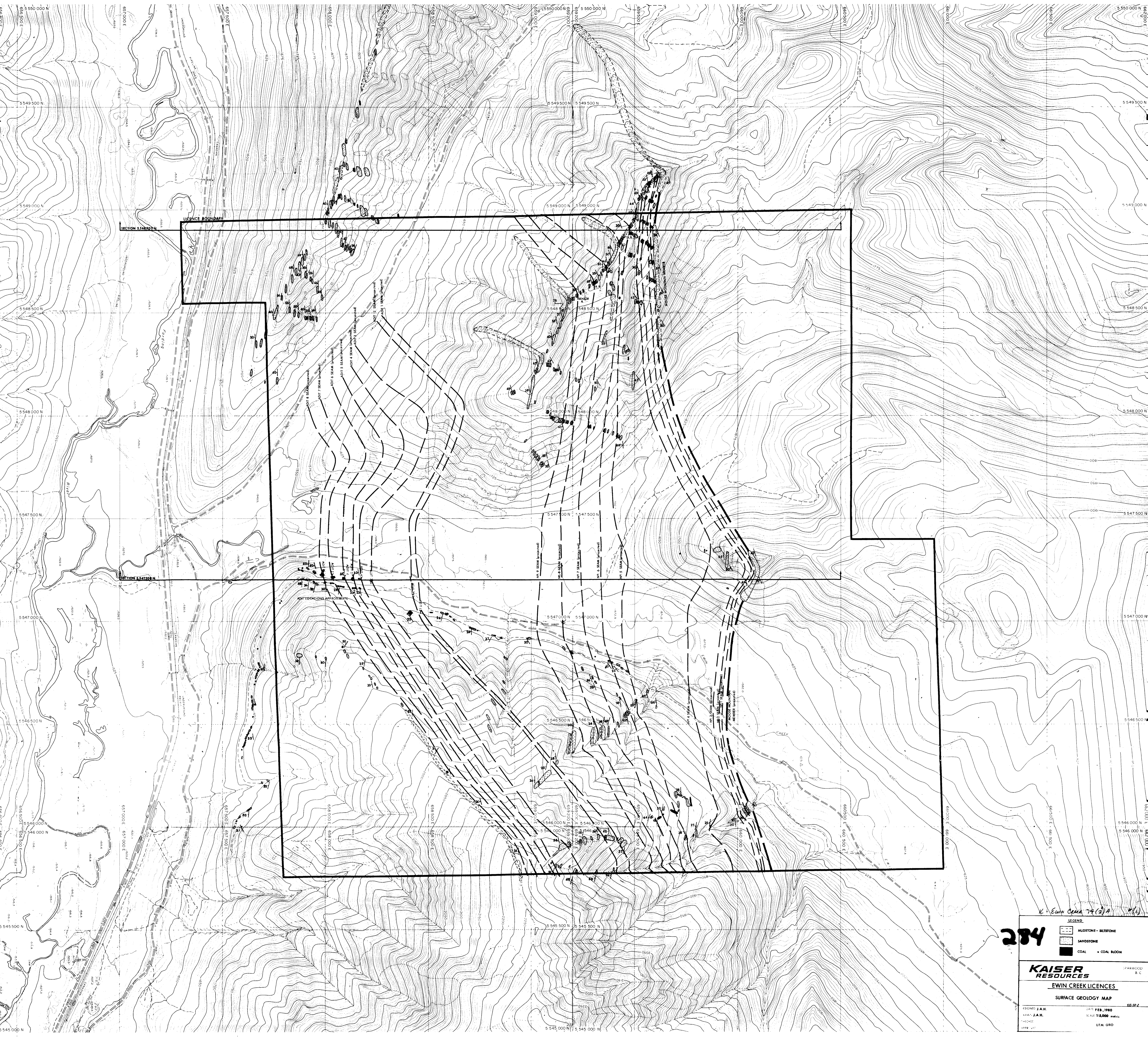
The coal seams used in the reserve estimate were projected from adits and trenches. The true thickness of each seam was known as well as an average dip. The vertical thickness for the seams were calculated using the following equation:

$$\text{Vertical Thickness} = \frac{\text{True thickness}}{\cos. \text{ dip angle}}$$

The area within the licence boundary each seam covered was obtained by using a planimeter. With the area and true thickness known, the coal reserves could be calculated by the following method:

$$\text{Area(m}^2\text{)} \times \text{Vertical th.(m)} = \text{Volume (m}^3\text{)}$$

$$\begin{array}{l} 1.36 \text{ tonnes/m}^3 \text{ Conversion factor} \\ \text{Volume(m}^3\text{)} \times 1.36 \text{ tonnes/m}^3 = \text{Tonnes} \end{array}$$



284

K. Ewin Creek 79 (2) A

LEGEND

- MUDSTONE - SILTSTONE
- SANDSTONE
- COAL
- COAL BLOOM

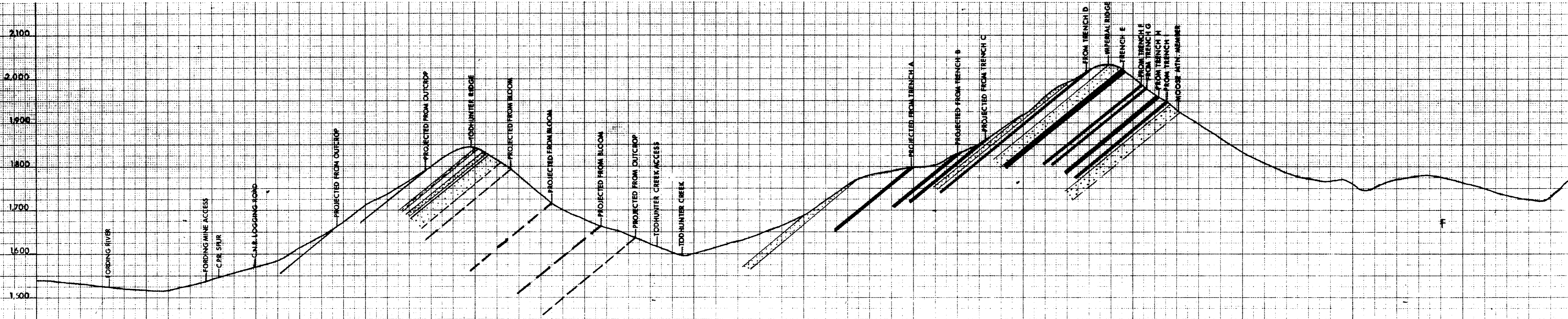
KAISER RESOURCES

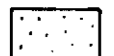
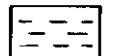

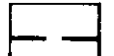
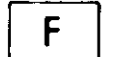
EWING CREEK LICENCES

SURFACE GEOLOGY MAP

DESIGNED: J.A.H. DATE: FEB, 1980
 DRAWN: J.A.H. SCALE: 1:5,000
 CHECKED: DATE: FEB 1980
 APPROVED: DATE: FEB 1980

UTM GRID



- LEGEND
-  SANDSTONE
 -  SILTSTONE MUDSTONE
 -  COAL
 -  BLOOM PROJECTIONS
 -  FERNIE FORMATION

K-EWIN CREEK 79(2*)A ^{*(1)}

KAISER RESOURCES 284

EWIN CREEK LICENCES

SECTION 5,548,900 N

J.A.H.

FEB, 1980

J.A.H.

HORIZONTAL SCALE 1:5,000

VERTICAL SCALE 1:5,000

135-10-3a

657900.E

