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K - Bingay Creek 79(1)A

PRELIMINARY GEOLOGICAL REPORT

COAL LICENCE NO. 5176

(LOT NO.9478)

BINGAY CREEK

FORT STEELE MINING DIVISION

N.T.S. 82J/SE

FOR: SPECIFIC NATURAL RESOURCES LTD.

August 25, 1979

John Jenks

**CONFIDENTIAL**  
GEOLOGICAL BRANCH  
ASSESSMENT REPORT

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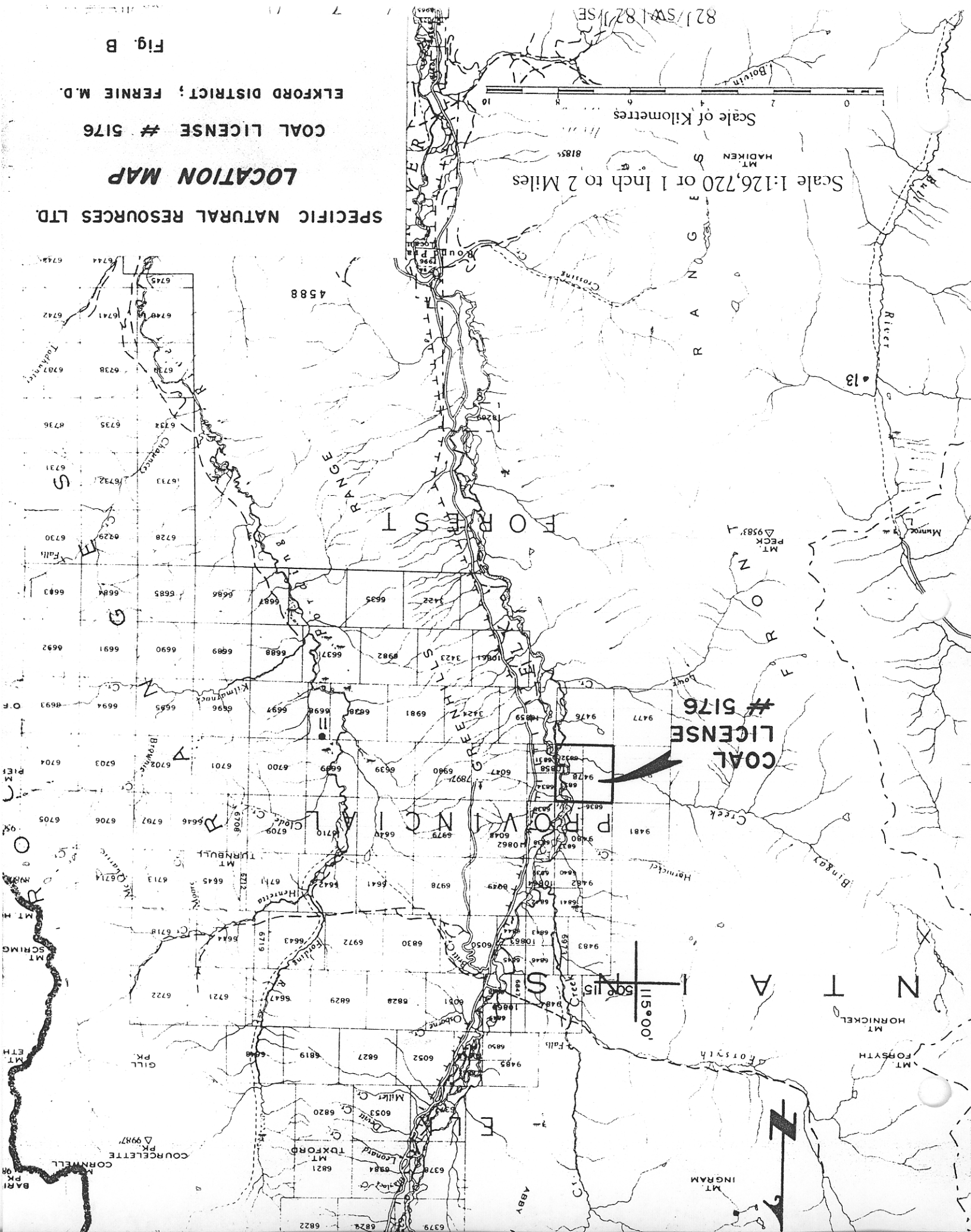
SPECIFIC NATURAL RESOURCES LTD.

# LOCATION MAP

COAL LICENSE # 5176

ELKFORD DISTRICT; FERNIE M.D.

Fig. B

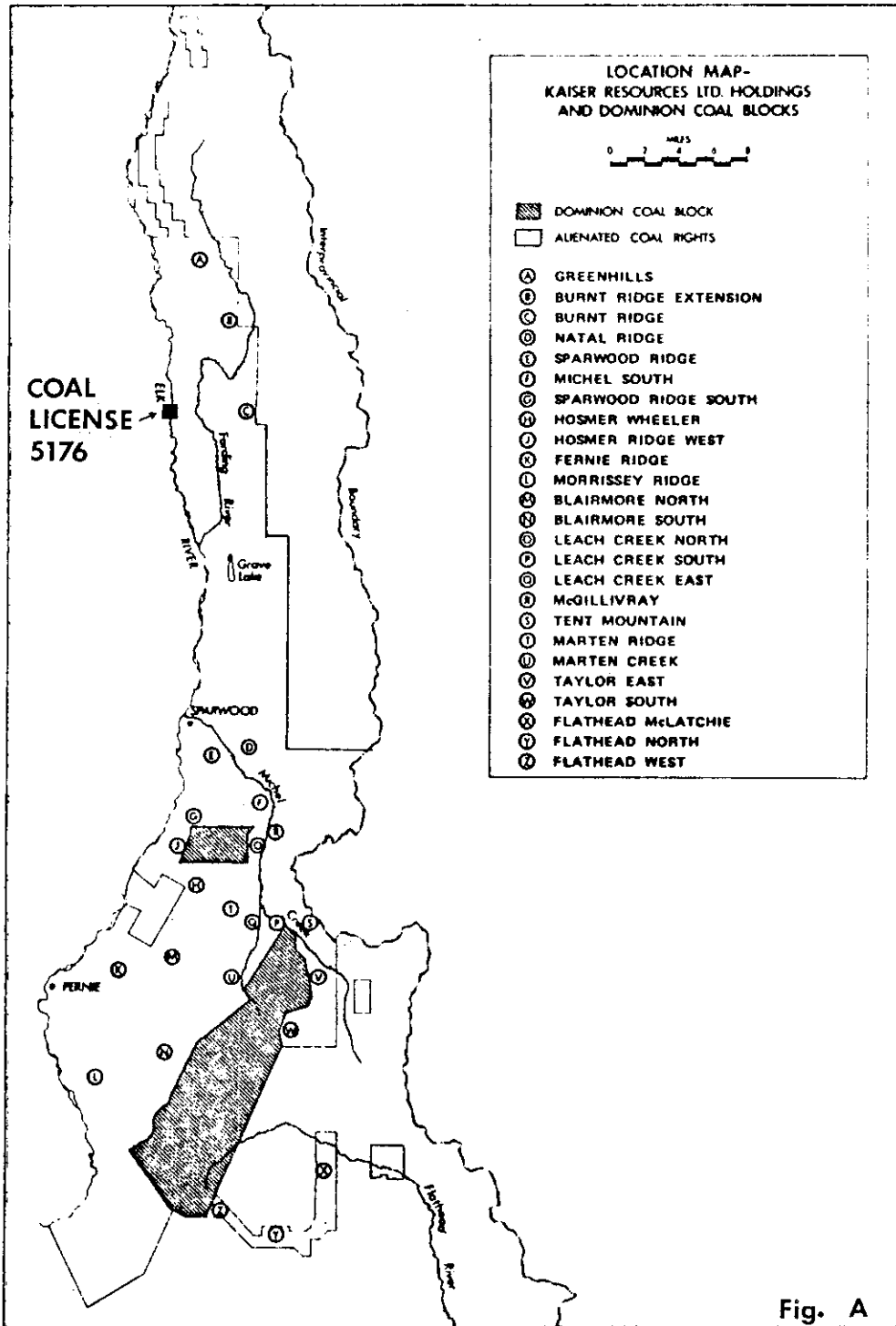


Scale of Kilometres

Scale 1:126,720 or 1 Inch to 2 Miles

COAL LICENSE # 5176

115°00' W  
50°15' N



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## SUMMARY

The following report describes the geological examination of Coal Licence No.5176 located in the southern portion of the Elk Basin north of Elkford. The property has undergone surface trenching and test pitting many years in the past. Five coal seams have been uncovered, one of which would appear to be between 3 and 10 metres in thickness. The seams are part of a narrow northeasterly-plunging syncline and would appear to have in-situ reserve possibilities of between one and four million short tons. This prospect, merits further attention.

The subject coal licence is readily accessible, is close to present or near-future producers, is proximate to rail lines proposed for construction by the mid-80's and constitutes one of the few available blocs of ground left in the Crowsnest area with coal potential (aside from the Dominion Blocs).

The main questions to be answered are: The viability of a one to four million ton bloc of metallurgical coal assuming it is mineable? Can it be economically mined and processed as a separate entity or must it be custom processed at one of the pre-existing facilities? If custom milling is required, would operators such as Kaiser, Elco, Fording Coal or Rio Algom with reserves of 147.5, 44.0, 71.4, and 21.0 million short tons respectively of clean product coal be interested in such a small item?

## GEOLOGIC OVERVIEW - CROWSNEST COALFIELDS

Coal occurs within the Crowsnest coalfields in a near-continuous belt extending along the eastern Rocky Mountains from the International border to the headwaters of the Elk River.

The coalfields may be divided into three characteristically separate basins extending from north to south. They are:

- a) The Elk Basin. Distinguished by an elongate north-northwesterly trending syncline generally faulted and complexly folded. Erosional remnants are present in the southern portion.
- b) The Fernie Basin. Consists of a broad syncline trending west of north. The syncline plunges northerly in the southern portion and southerly in the northern portion. Coal beds are gently dipping and broadly folded in the central portion and moderately to steeply dipping along the margins (particularly the eastern) as well as folded and faulted.
- c) The Flathead Basin. Consists of erosional remnants within a complex geological setting. Coal beds are orientated in a variety of structural positions and truncated by gravity or low angle thrust faults or displaced by strike-slip faulting.

Coal occurrence and production in the Crowsnest fields is confined to the Kootenay Formation, a Juro-Cretaceous unit approximately 600 metres thick and consisting of sandstone, greywacke, shale, and coal.

Approximately 22 coal horizons have been delineated throughout the Kootenay Formation for an aggregate thickness of 46 metres.

Coal rank and characteristic varies somewhat throughout the Crowsnest field and is generally described as low to medium volatile bituminous, a category common to coals in mountainous terrains which have been deeply buried and highly deformed.

According to a 1976 coal task force report, reserves of clean product-metallurgical coking coal in the Crowsnest field are as follows:

	<u>Millions of Short Tons</u>
Kaiser Resources	
(Harmer, Sparwood, Hosmer-Wheeler)	147.5
Fording	71.4
Crowsnest Industries, (now owned by Shell	
(Resources) (Line Creek, Horseshoe Ridge)	12.1
Elco	
(Elk River)	44.0
Rio Algom	
(Sage Creek)	<u>21.0</u>
TOTAL	<u>296.0</u>

In addition, reserves of thermal coal from the Byron Creek Collieries are listed at 85 million tons (Northern Miner) in-situ. The latter has been oxidized and is unfit for metallurgical use.

Kaiser Resources and Fording Coal are the only active coking coal producers at present, producing 5.5 and 3.4 million tons of coking coal respectively per annum, which sells in excess of \$57.23 per long ton (March 31, 1978 prices).

Byron Collieries produces one million tons of thermal coal per annum. No selling prices are available, however the price received is probably about \$30 per long ton.

The above-listed properties owned by Shell Resources, Elco Consortium, and Rio Algom are due to come on stream in the mid-1980's at annual production rates of 1.1, 4.0, and 3.4 million short tons of clean product metallurgical coal respectively.

COAL LICENCE NO: 5176

Introduction

A geological evaluation of Coal Licence No.5176 was conducted by the writer in the company of William and Bob Shenfield, vendors at the property. The property is situated north of Elkford and south of the Elko bloc, a massive project slated to begin construction in 1982. Part of this project involves the construction of a railroad to be located immediately east of licence No.5176.

Showings and strata were examined on the property and an aerial photo based reconnaissance map constructed. At least five different coal seams occur, the thickest being between 3 and 10 metres by estimate.

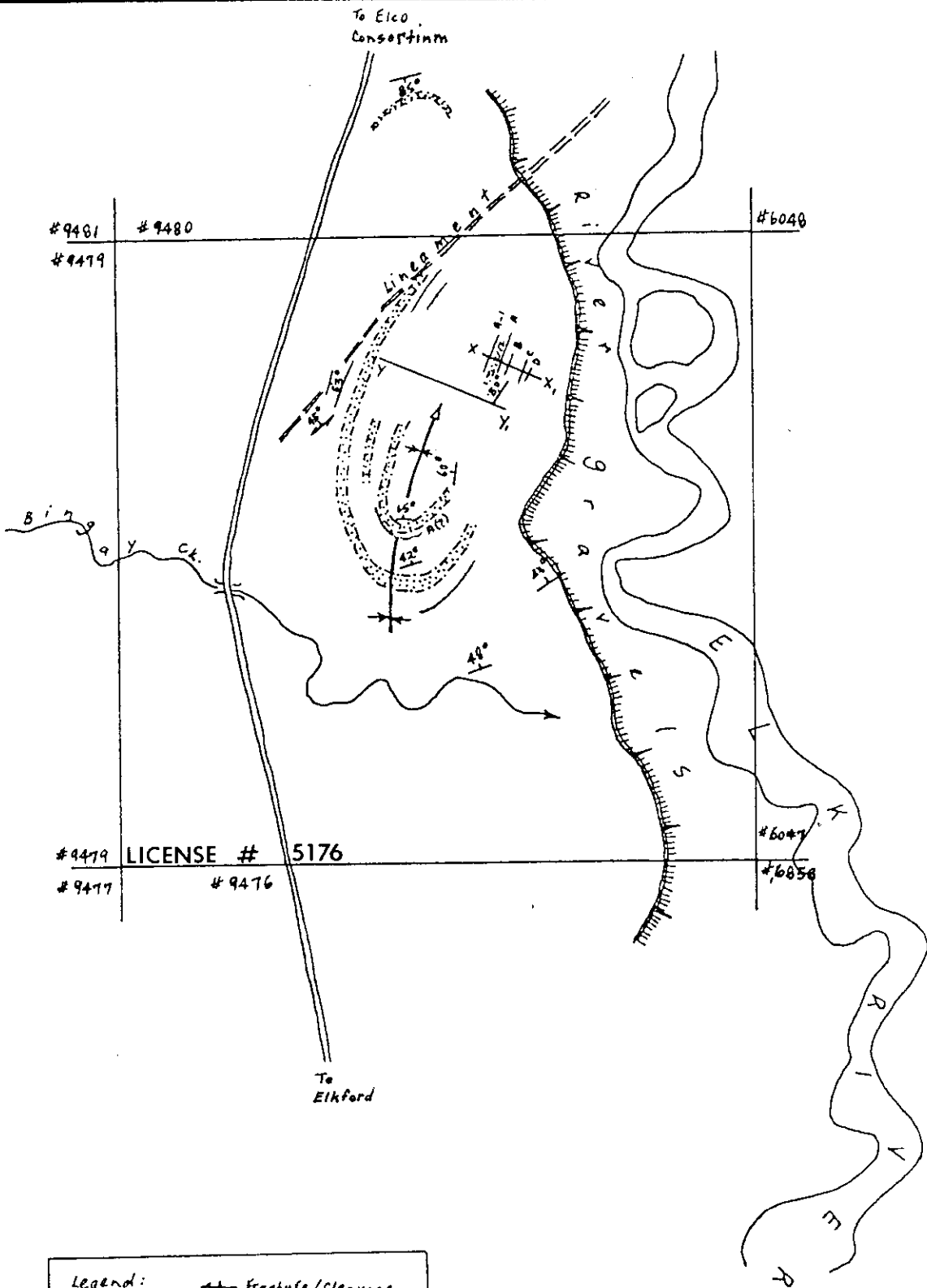
The seams form part of a syncline plunging to the northeast. The thickness of "A" seam (fig.C) would appear to have in-situ reserve potential in the order of one to four million short tons. Thickening in the axial plane zone as well as the inclusion of other seams could enhance or add to this figure.

The deposit appears to have underground potential, that may be feasible pending the results of further exploration with respect to tonnage, rank, stratigraphy, structure and mineability of the seams present.

LOCATION AND ACCESS

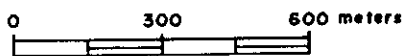
Coal Licence No.5176 straddles the Elk River some 12 miles north of the town of Elkford, B.C. The property is easily accessible from Fernie via paved road to Elkford, a distance of 85 kilometres plus a further 19 kilometres north of Elkford along a good gravel road running through the western half of the property. It is approximately 8 kilometres due east of the Fording coal deposits and between 8 and 29 kilometres south of the massive Elco project.





**Legend:**

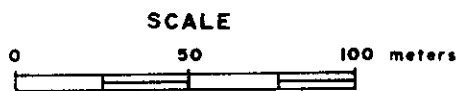
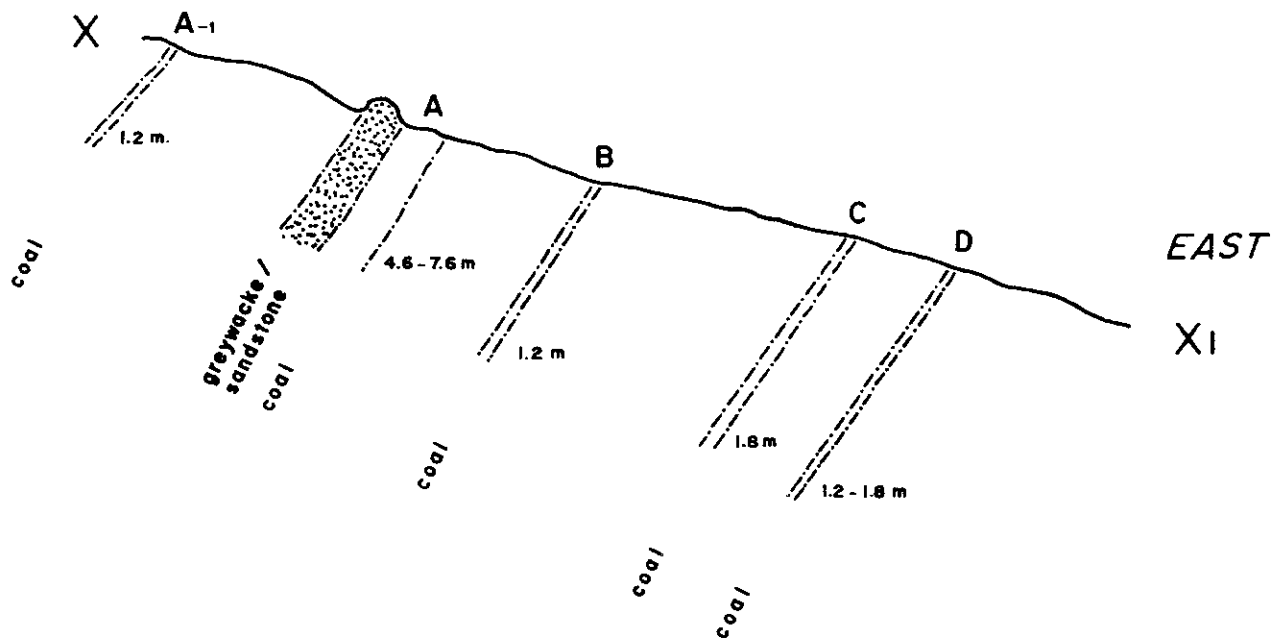
- fracture/cleavage
- Lineament
- Road
- Terrace (start of river gravels)
- grayhacks/sandstone layer
- coal horizon
- plunging syncline  
Bedding dip



<b>SPECIFIC NATURAL RESOURCES LTD.</b>		
<b>COAL LICENSE # 5176</b>		
<b>RECONNAISSANCE GEOLOGICAL MAP</b>		
<b>ELKFORD DISTRICT; FERNIE M.D.</b>		
Date: AUG. 1979	By: J. JENKS	N.T.S. 82 J/2
Scale: As Shown		Fig. C

LOOKING NORTHEASTERLY

WEST



SPECIFIC NATURAL RESOURCES LTD.

COAL LICENSE # 5176

ILLUSTRATIVE CROSS-SECTION

X-XI

SEAMS "A-1"- "D"

ELKFORD DISTRICT; FERNIE M.D.

Date: AUG. 1979

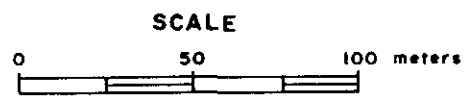
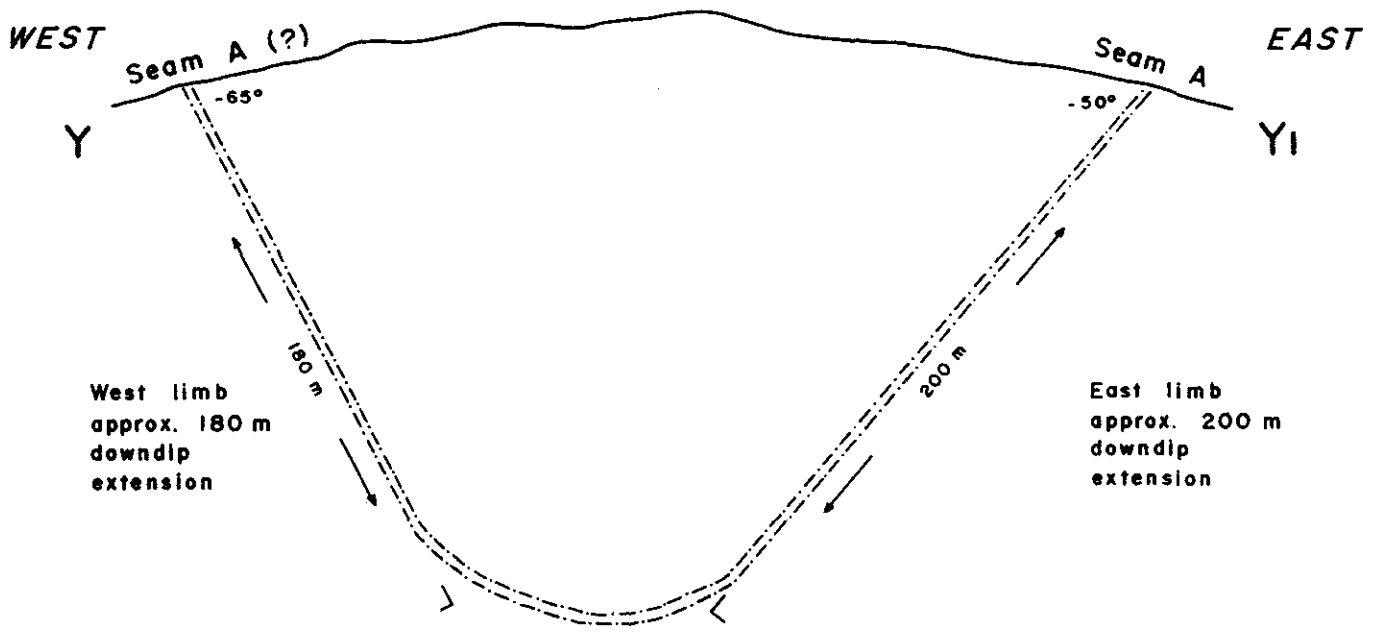
By: J. JENKS

N.T.S. 82J/2

Scale: As Shown

Fig. D

LOOKING NORTHEASTERLY



SPECIFIC NATURAL RESOURCES LTD.  
COAL LICENSE # 5176  
ILLUSTRATIVE CROSS-SECTION  
Y-Y1  
SEAM "A"  
ELKFORD DISTRICT; FERNIE M.D.

Date: AUG. 1979	By: J. JENKS	N.T.S. 82J/2
Scale: As Shown		Fig. E

### PHYSIOGRAPHY

Topography of the prospect would be described as moderate with elevations ranging from 1370 to 1500 metres. The eastern quarter of the licence is underlain by coarse alluvial gravels of the Elk River. The remainder of the property is characterized by a series of northeasterly trending ridges and boggy depressions, the former caused by the more resistant layers of sandstones and graywackes, the latter by the easily erosionable horizons of shale and/or coal.

A thick cover of second-growth lodgepole pine prevails through most of the property.

Water is abundant throughout due to springs and seepages in addition to the southeasterly flowing Bingay Creek traversing the southern third of the property.

### HISTORY OF THE PROSPECT

There is no recorded history of any exploration activity on coal licence No.5176. Local tradition denies the existence of any coal whatsoever on the west side of the Elk River and, with the exception of a mention in old government reports by Fleet Robertson and a passing disclosure by Dowling (1914) in G.S.C. Memoir 69, little attention seems to have been paid to this area.

However, indications on the ground itself attest to considerable small-scale exploration activity in the past, probably over forty years ago. At least two dozen shallow pits and trenches were dug along coal seams at various locations. In the seam designated "A" on Figure C, an adit, now collapsed, of indeterminable length, was tunnelled and at least 400 tons of coal removed as evidenced by the dump pile. In this same area, an ancient pile driver as well as a couple of hundred feet of old drill rod further indicate the scope of exploration activity.

All the old pits and trenches examined are collapsed to the point where it was no longer possible to reliably determine the thicknesses of the seams present. The piles of coal in the dumps are in such a state of age and oxidation as to no longer give reliable indications of coking qualities, nevertheless the former exploratory activities do reveal the undeniable presence of an apparently high rank coal of interesting quantity.

#### GEOLOGY

Licence No.5176 is underlain by Cretaceous strata of the Kootenay Formation consisting of resistant, ridge-forming greywackes and sandstones interbedded with depression-forming shales and coal measures. The sandstones and greywackes are medium to dark grey in colour, fine-grained and form bedding units ranging from 1.3 cm to 30 cm in thickness. A distinctive and fairly common feature of the Kootenay sandstones is the presence of small wisps and patches of coal along bedding planes. Cross-bedding is also commonly seen.

Outcrop exposure, mainly along ridges and Bengay Creek, is in the order of 20 to 30 percent, and confined mainly to sandstone and greywacke.

A number of coal seams and thin-bedded, fissile shale beds have been uncovered in the numerous pits and trenches previously described. These occur exclusively in negative relief, often boggy areas where the degree of exposure is minimal.

At least five different seams appear to be present although exposures are poor and thickness estimates are subject to correction. In the northeastern quarter of the property five exposed seams designated A-1, A, B, C, D respectively (fig.C) appear to total about 12 metres in thickness over a stratigraphic interval of 120 metres. Seam "A" is estimated to be between 5 to 7.5 metres thick, the others 1.2 to 1.8 metres. Strike is to the northeast and dip about - 50° NW in this area.

The hanging wall of "A" is a 7.5 metres thick, massive sandstone. Although considerably weathered, the coal in the dump pile has a shiny, vitreous lustre and would appear to be a fairly high ranking coal.

Field examination and reference to an aerial photo of the property indicates the strata has been folded into a syncline trending and plunging to the northeast.

A rather prominent northeasterly trending lineament is also discernable on the air photograph. This may represent a fault. However, this cannot be field verified due to the scarcity of outcrop northwest of the lineament. There is a chance that the syncline could represent the southern portion of a small faulted-off basin. For practical purposes the structure is assumed to be a syncline plunging to the northeast.

Near the centre of licence No.5176 at the axis of the structure an exposure of coal has been trenched. It appears to have a thickness comparable to the "A" seam and has been tentatively correlated with the "A". Thickness, in this instance, could have been enhanced due to location in the axial plane area.

#### POTENTIAL OF THE PROPERTY

A rough tonnage calculation is in order to give some idea as to the property's potential. To do this I would assume the following:

- the coal-bearing structure is a northeasterly plunging syncline
- only the "A" seam is considered
- a conservative thickness for the "A" seam of 3 metres is taken
- surface separation of the synclinal limbs are 300 metres (see Figure E)
- downdip extensions are 183 metres for the west limb and 213 metres for the east limb.
- a specific gravity of 1.34 is used
- no thickening in the axial plane area is assumed
- a 900 metre strike length is taken

Tonnage:

$$\text{West limb: } \frac{10 \times 600 \times 3000 \times 62.4 \times 1.34}{2000} = 752,544$$

$$\text{East limb: } \frac{10 \times 700 \times 3000 \times 62.4 \times 1.34}{2000} = \underline{877,968}$$

$$\text{Total short tons in-siute} \quad \underline{1,630,512}$$

Assume a 60% recoverability:

$$\text{Total raw recoverable short tons} \quad 978,307$$

Assume a 65% end product:

$$\text{Total clean product coal, short tons} \quad 636,000$$

This at \$51.00/short ton represents a gross value of \$36,398,000

These figures could be increased considerably by

- a) a greater thickness of the seam;
  - b) axial plane thickening;
  - c) the mineability of other seams in addition to the "A" seam
- all of which are eminently possible.

The steepness of the dips would suggest that the deposit is an underground proposition although subsequent exploration could show the syncline to flatten out at depths sufficiently shallow for open cast application.

The competent sandstone hanging wall member of the "A" seam is a positive factor with regard to underground mining though possibly not from the viewpoint of an hydraulic operation.

CONCLUSIONS AND RECOMMENDATIONS

There would appear to be sufficient exposure of coal seams on coal licence No.5176 to warrant further exploration interest. The deposit has underground potential in the 1.5 to 4 million short ton in-situ category with a clean end product coal total amounting to probably 40 percent of the above figures.

Further exploration is necessary to determine

- a) the thickness and continuity of seams present on the property
- b) the rank of the coals involved and
- c) their mineability.

To do this, the following course of action is recommended.

1. Clean out and measure the true thicknesses of coal horizons present in the old pits and trenches, particularly those where the 'A' seam is exposed;
2. more detailed mapping;
3. a series of trenches both across and along strike by either bulldozer or backhoe to further expose the coal seams;
4. a series of surface boreholes across the section to examine
  - a) seam thickness and distribution
  - b) the stratigraphy
  - c) depth of the coal-bearing structure, and to
  - d) obtain sufficient unweathered material for a bulk sample.Full use should be made of electrologs;
5. should positive results accrue from the first four recommendations, a programme of underground tunnelling could be considered.



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