

K. Michel 80(1)A

**ASSESSMENT REPORT**  
 82-9-7

00 *Forest of Commercial Logging*  
*on the Michel Land Co. tract*  
*5177* **348**  
*Food Resources Committee*  
 C.C. #5177 *W.E. King*  
*April 1481*

348

# OPEN FILE

REPORT OF GEOLOGICAL MAPPING  
ON THE MICHEL COAL LICENSE #5177

LOCATION: KOOTENAY LAND DISTRICT  
NTS 82-G-7  
49°28' Lat. 114°40' Long.

ESSO RESOURCES CANADA LIMITED

WARD E. KILBY

WORK: OCTOBER 17 - OCTOBER 22, 1980

PREPARED: April 1981

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## INTRODUCTION

The Michel property is located 25 km south of Sparwood, B.C. in the Fernie coalfield. Access to the property is by the Michel Creek Road, 41 km south of Sparwood. This route is well maintained and gravel surfaced. Additional access throughout the property is provided by a road presently maintained by CNRL for access to their property which lies to the north of the Esso license (Map 1 and 2).

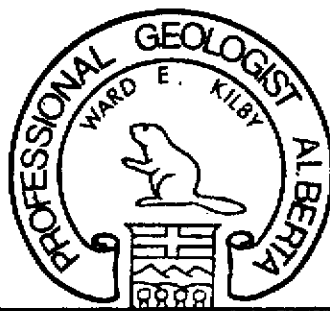
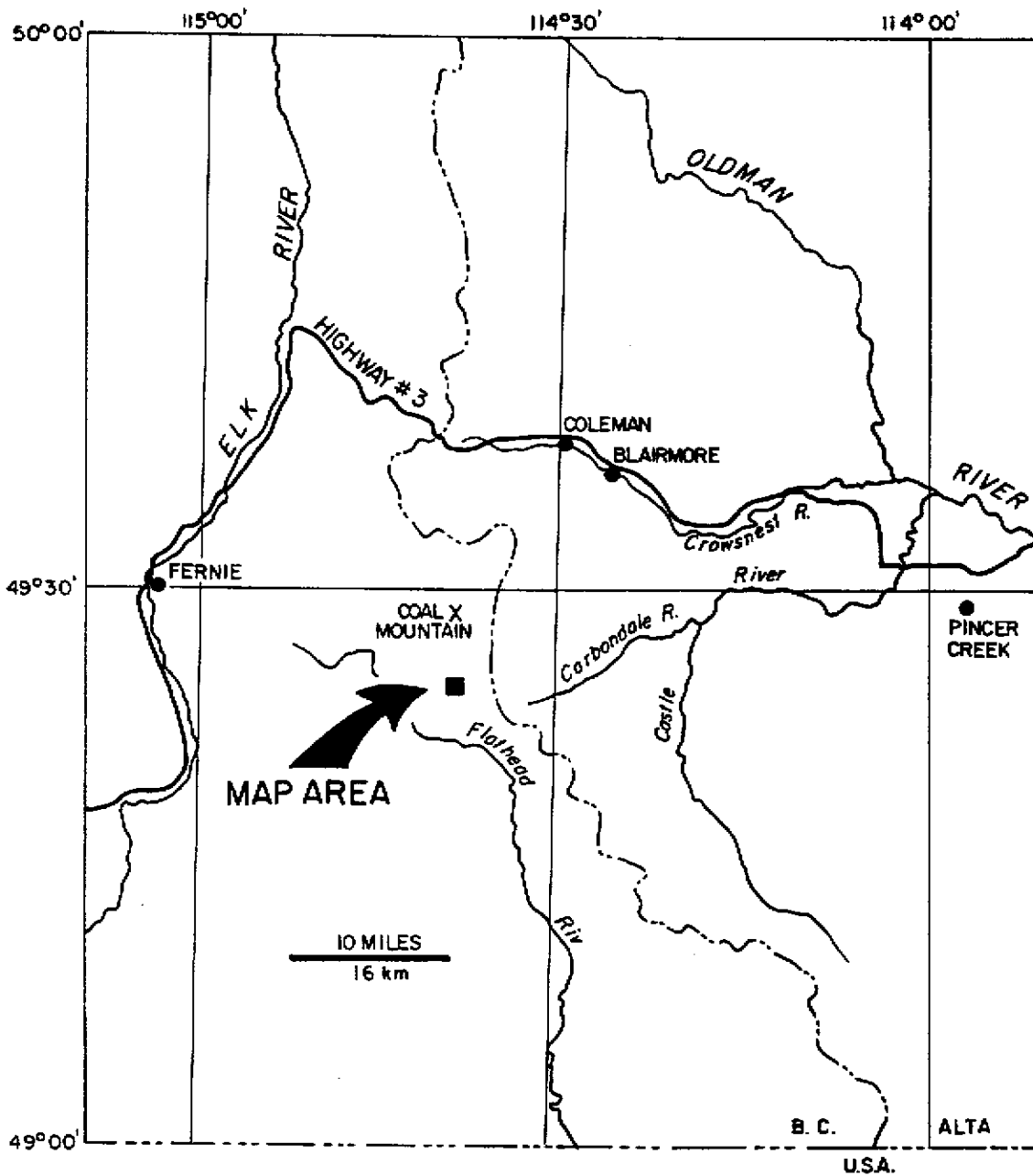
The property is situated on the southern portion of the north-south trending Coal Mountain. Corbin and Michel creeks flow northwards in the valleys to the east and west of the property, respectively. Elevations within the property vary from 1995 to 1630 metres above sea level. Pine and spruce are the dominant forest cover in the area with sparse growth at higher elevations due to past logging and an old forest fire.

The license to explore and evaluate the coal resources of Esso's Michel holding was granted on June 22, 1979 with the 22nd being the anniversary date. The license number is 5177 and it occupies lot number 6993 in the Kootenay land district. The licensee and operator is Esso Minerals Canada, Coal Department.

The coal potential of this license has been evaluated and has been found to be negligible. A phosphatic horizon is located at the contact between the Spray River Formation and the Fernie Group. This contact outlines an anticline in the southwest portion of the license and may be of some economic significance.

The area has been mapped by the GSC, with GSC maps 4-1956, 1154A, and Memoir 336 providing the bulk of the background information. Map 4-1956 by D.K. Norris and R.A. Price provides a detailed stratigraphic and structural description of Coal Mountain which lays just to the north of the Michel license. Map 1154A and Memoir 336 by R.A. Price provide a large-scale interpretation of the structure and stratigraphy which surrounds the Michel area.

The present appraisal commenced on October 17, 1980 with two geologists, Caleen Kilby and Ward Kilby mapping the area on a scale of 1:10000. Airphoto positioning as well as chain and compass surveys were used to provide accurate positioning. The area was completely surveyed with these methods. Twenty-three exposures on or near the license were visited. The small number of outcrops was due to the recessive weathering nature of the Fernie Group which is the strata exposed on the surface over the majority of the license. Four days of field work were completed with a fifth day spent compiling the field data and performing some computer-based structural analysis of the area.



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**MICHEL**

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## STRATIGRAPHY

Three mappable units were encountered on the property: the Jurassic Fernie Group; Triassic Spray River Formation; and the Permian Rocky Mountain Formation. The coal-bearing Cretaceous Kootenay Formation was the target formation but it was not encountered on the property (Table 1).

### Rocky Mountain Formation

One small exposure of this formation was located in the core of the major anticline in the southwest corner of the property. This formation is disconformably overlain by the Mesozoic strata and it conformably overlies the Mississippian Rundle Group. At this exposure, the dolomite was porous with oil stains or bitumen coating the vug openings.

### Spray River Formation

The Spray River Formation was visited at nine outcrops, all of which were exposed on either side of the major anticline in the southwest of the property. All exposures were of a light grey dolomitic sandstone. The Spray River Formation is disconformably overlain and underlain by the Fernie Group and the Rocky Mountain Formation, respectively.

### Fernie Group

The Fernie Group is exposed over the majority of the license. The Fernie in this area may be broken into three units from top to bottom: Passage Beds; Grey Beds; and the Middle Fernie. The Passage Beds form a gradational contact between the Fernie shales and the overlying Kootenay sandstones. They are a distinctive thin-medium interbedded sequence of sandstones and shales.

The Grey Beds are a grey weathering unit of calcareous shales with thin beds of limestone. This member is often exposed due to its more resistant weathering nature and locally contains belemnite fragments.

The Middle Fernie is more typical of the black Fernie shale found further north in Alberta. Locally, it contains large limonitic concretions and many of the outcrops visited were highly disturbed. Due to its recessive nature, it was only seen along road cuts and very steep stream exposures.

#### Kootenay Formation

The Kootenay Formation conformably overlays the Passage Beds of the Fernie Group. The lower 30 metres of the Kootenay were of interest during this project. The Moose Mountain Member which lays immediately above the Passage Beds is from 12-15 metres in thickness and is an easily recognizable grey-weathering, resistant sandstone. Above the Moose Mountain sandstone is the 4.5-7.5 metre Mammoth coal seam. This seam has been extremely structurally thickened to the north in the Coal Mountain mine. It was this seam which we were hoping to locate upon our license, but this was not the case (Plate 1).



ERA				
MESOZOIC	CRETACEOUS AND JURASSIC?	Kootenay Formation	Dark grey, carbonaceous sandstone and conglomeratic sandstone, siltstone shale and coal.	150 – 520 m
	JURASSIC	Fernie Group	Grey calcareous shale, shaly limestone, silty limestone; dark grey shale, limestone; sandstone	380 m
	TRIASSIC	Spray River Formation	Grey dolomitic siltstone and sandstone; brown siltstone and silty shale.	90 m
PALAEOZOIC	PERMIAN	Rocky Mountain Formation	Sandstone, quartzite, dolomite, dolomitic sandstone	200 m

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MICHEL CREEK  
TABLE OF FORMATIONS

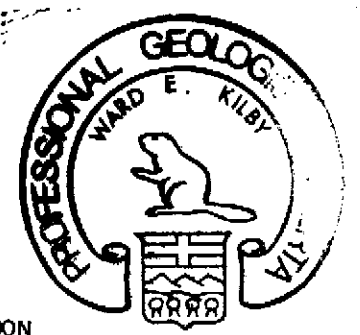
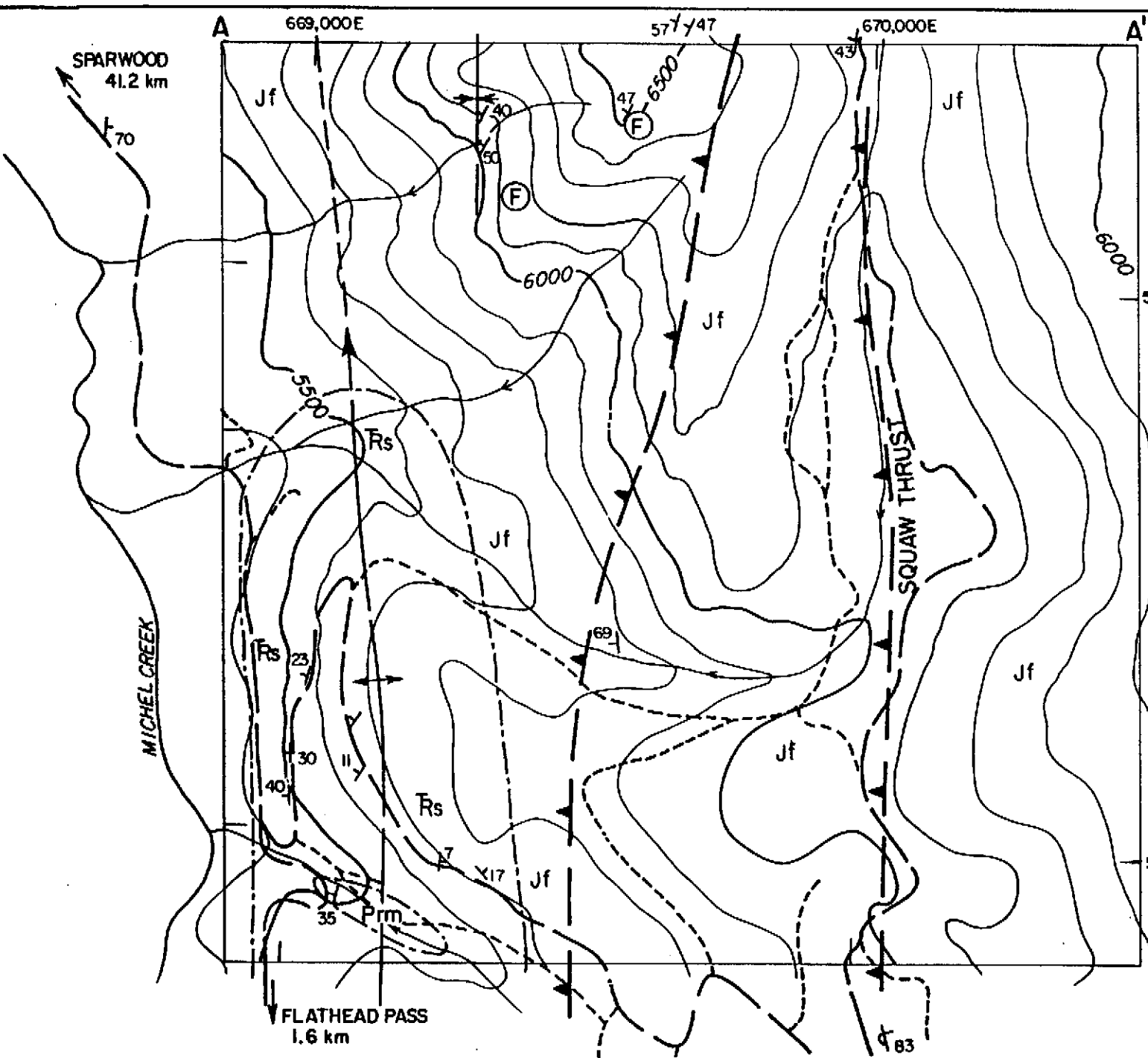
## STRUCTURE

The structure within the license area is complex but much simpler than that encountered further up section to the north at the Coal Mountain mine. The area has an anticline syncline pair in the west half and two steep west-dipping thrust faults in the eastern portion of the license (Map and Section).

The major anticline affects strata from the Rocky Mountain Formation up to the lower Kootenay Formation. The structure is the result of drag folding in the hanging wall of the Squaw Thrust Fault and further up section it develops into a delta structure or an interstratal peel (Norris, 1961), which causes the complex structures of Coal Mountain (Norris and Price, 1955). The fold is shown to be doubly plunging (Price, 1965) but the portion contained within the license has a fold axis orientation of  $351/6$  and the axial plane dips steeply to the west.

To the east of the anticline is a minor syncline which is exposed in the very north of the license and truncated to the south by a splay of the Squaw Thrust. North of the property this syncline deforms both the Moose Mountain Sandstone and the Mammoth seam, but only Fernie strata is enclosed by this structure within the property boundaries (Plate 1).

To the east of this syncline a splay of the Squaw Thrust Fault is encountered. The splay fault truncates the syncline halfway through the property. Within the hanging wall of the splay the strata are involved in the anticline-syncline pair. Within the footwall of the splay and the hangingwall of the Squaw Thrust, the strata dip to the west at 60 degrees. Below the Squaw Thrust, a descending sequence of strata is encountered to the east and off the property.



- (F) FOSSIL
- Jf FERNIE GROUP
- Rs SPRAY RIVER FM.
- Prm ROCKY MOUNTAIN FM.
- GEOLOGICAL CONTACT
- GOOD ROAD
- - - OVERGROWN TRAIL

Scale: 1:10,000  
250m

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COAL DEPARTMENT  
**MICHEL**

W

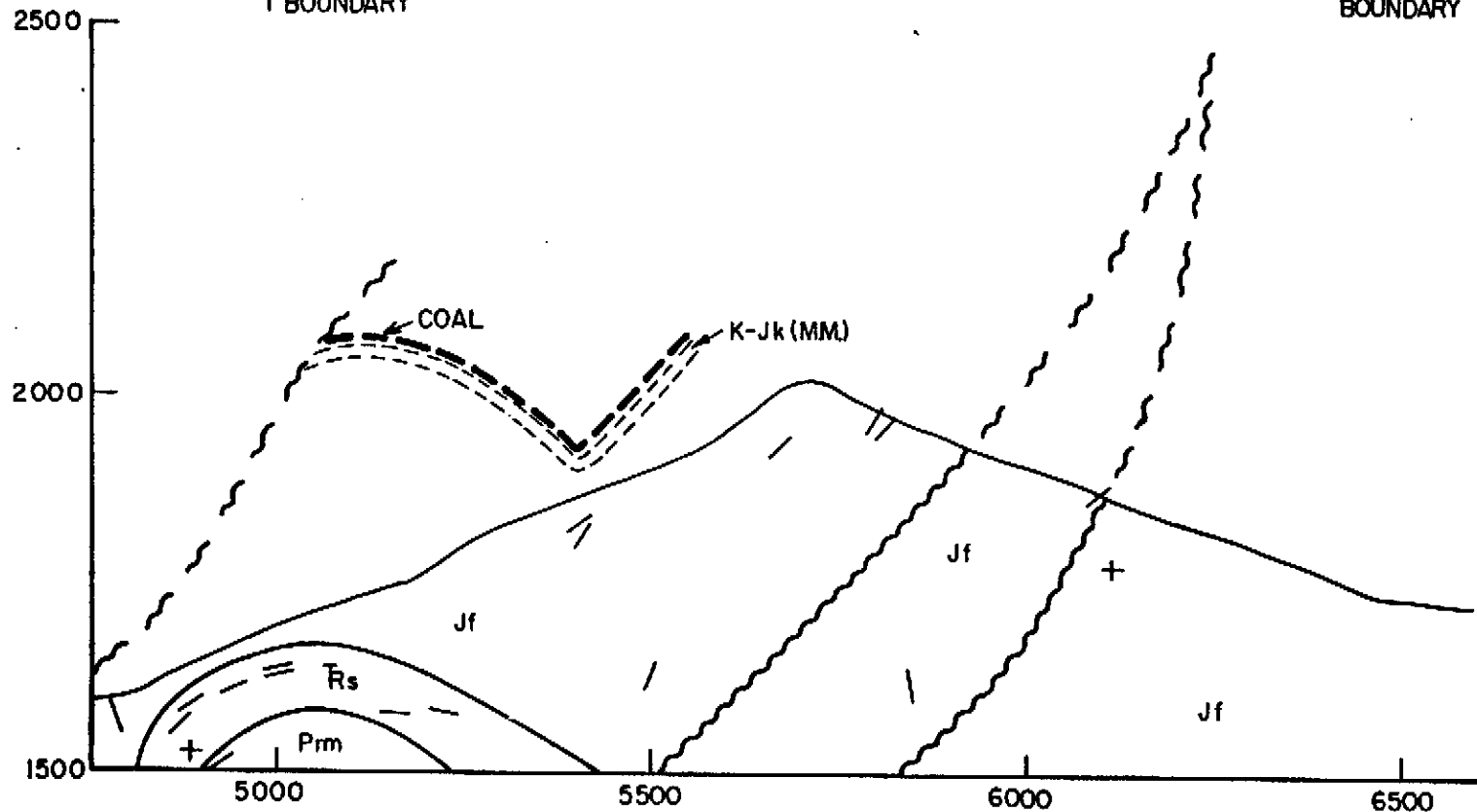
A

PROPERTY  
BOUNDARY

A'

PROPERTY  
BOUNDARY

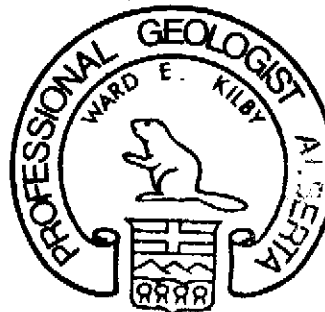
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Scale: 1:10,000

250m

- |           |                           |
|-----------|---------------------------|
| K-Jk (MM) | KOOTENAY FM. (MOOSE MTN.) |
| Jf        | FERNIE GROUP              |
| Rs        | SPRAY RIVER FM.           |
| Prm       | ROCKY MOUNTAIN FM.        |



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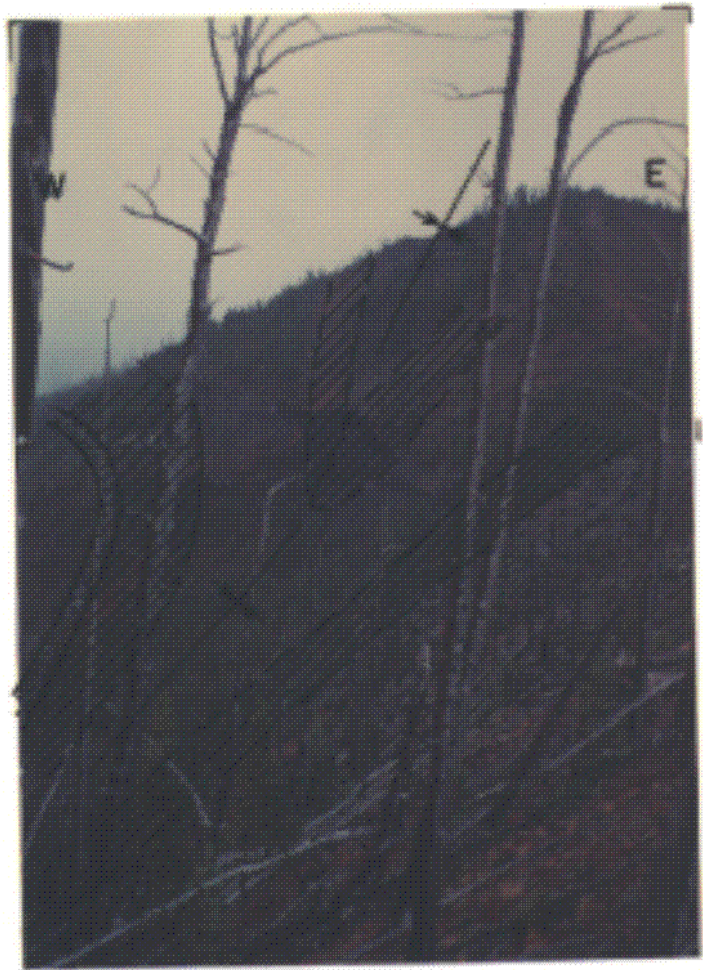


Plate 1

Syncline in lower Kootenay Formation 1 km north of the Michel license. Photo from atop the Moose Mountain sandstone forming east limb of syncline. Note west limb of syncline outlined by this sandstone on the left-centre of the plate. Note lack of vegetation above seam in centre of photo.

CONCLUSIONS AND RESULTS

Detailed mapping and prospecting was initiated within the license area in the hope that some coal-bearing Kootenay Formation had been overlooked by earlier investigators. As a result of this work, the area has been shown to be devoid of the Kootenay and of no economic importance with respect to coal resources.

It is recommended no further work be done on this license. Although the property holds no coal potential it is recommended that it be retained until the surrounding acreage has been evaluated.

REFERENCES

Norris, D.K., 1961, "An Interstratal Peel on Maverick Hill, Alberta",  
Journal of the Alberta Society of Petroleum Geologists, Vol. 9,  
No. 6, pp. 177-191.

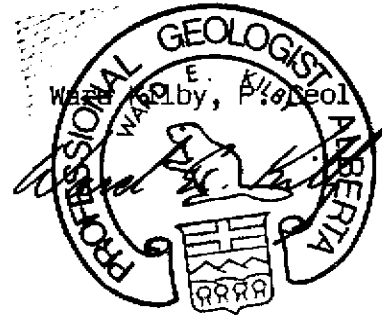
Norris, D.K. and R.A. Price, 1955, "Coal Mountain", Geol. Surv. Canada,  
Map 4-1956.

Price, R.A., 1965, "Flathead Map Area, British Columbia and Alberta",  
Geol. Surv. Canada, Memoir 336.

STATEMENT OF QUALIFICATION

I, Ward E. Kilby, am a practicing Professional Geologist registered in Alberta. A B.Sc. and M.Sc. degree in geology were obtained in 1976 and 1978, respectively.

I have been involved in coal and mineral exploration in Alberta, British Columbia and the Yukon since 1970.



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