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PRELIMINARY ENGINEERING REPORT

NORDENSKIOLD COAL AREA

YUKON TERRITORY

TERRITORIAL COAL EXPLORATION

LICENCES #10, #11, and #12

by Jos. F. Hlavay, P.Eng.

September 1970

TABLE OF CONTENTS

	<u>Page</u>
1. General Information.	1.
2. Access Road to Division Mountain Outcrop.	2.
3. Description of Outcrop Area.	3.
4. Trenching.	4.
5. Samples.	6.
6. Analyses.	7.
7. Permanent Road To Site.	8.
8. Conclusions.	9.
9. Appendix A - Reports of Analyses.	
10. Appendix B - Photographs 1 to 14.	
11. Enclosures - Drawing No. 1 - Site Plan and Section Test Area.	

GENERAL INFORMATION

The areas covered by Coal Exploration Licences #10, #11 and #12 are situated approximately 50 miles north of the City of Whitehorse. The terrain varies in elevation from 2500 feet to 4500 feet and consists of rolling hills with broad flat valleys and a number of steep high ridges. At one time all of the area was densely timbered with spruce trees ranging in size up to 18" diameter but a fire within the last decade has burned most of this timber and only small areas of green timber remain. The whole area is covered with volcanic ash to a depth of about 6 inches. There are two major streams through the area being the Nordenskiold River (20' wide by 6 feet deep) and Klusha Creek (12' wide by 3' deep). Several small lakes are present, some of which cover areas of up to 1/2 square mile. There are no roads situated within the block itself however, the Whitehorse to Dawson Highway (gravel surfaced) is located just a few miles to the east. A high tension power line parallels the highway. The locality of Braeburn Lodge, is at mile 55 on this highway and the coal outcrop on Division Mountain investigated by us, is located 20 miles south west of this lodge. Braeburn Lodge has sleeping and eating facilities as well as telephone and gasoline service. There is also a 3000 ft. air strip adjacent to the highway at this site. The climate in the area is semi-arid with temperature ranges of from - 60°F in winter to +90°F in the summer. Average precipitation is about 10" annually.

ACCESS TO COAL OUTCROP

Coal outcrops were reported by Cairnes (1908) in National Topographic Series Maps., N.W. and S.W. of 115 H/8E. These are shown on the accompanying Geological maps prepared by R.J.Kirker. The Access trail to the outcrops is also shown on this map. Starting at Braeburn Lodge (mile 55 - Dawson Highway) there is a trail to a number of summer cabins at the north end of Braeburn Lake. The lake is crossed by fording (150' wide by 6" deep) and the trail continues N.W. to join with the old Whitehorse - Dawson stage route. From here the old stage route is followed southward and westward for a distance of about 14 miles to a point opposite the N.W. end of Corduroy Mountain and approximately due east of the coal outcrop on Division Mountain. From this point a new trail has been constructed in a westerly direction across Klusha Creek Valley and up the slopes of Division Mountain, to the coal outcrop.

The Access trail is generally 10 to 12 feet wide and is readily passable with a 4 wheel drive vehicle. In addition to the ford at Braeburn Lake there is a ford across Klusha Creek and across Joe Creek but these present no problems. A second crossing of Klusha Creek is made over a timber structure covered with earth. From a point about 2 1/2 miles east of the Coal outcrops the trail begins to ascend up the N.E. slopes of Division Mountain out of Klusha Creek Valley and encounters a number of short steep grades (15%) for about one mile after which it begins to descend towards the Nordenskiold Valley. The last mile into the coal outcrop is on a shaded north slope of Division Mountain over perma frost and although the trail was constructed and used over this area it is possible that because of thawing it cannot be used at all times. With the exception of this last mile all of the trail is over firm dry ground. A helio pad has been cleared at the coal outcrop thus providing access by helicopter. Photo No. 1 Appendix B, shows access trail construction.

DESCRIPTION OF OUTCROP AREA.

The outcropping of coal is on a ravine running east to west on the north slope of Division Mountain and we have named this ravine Teslin Creek. The area is shown on the attached Drawing No. 1. At the coal outcrop the ravine is 125 feet deep as shown in X-Sec A-A on the drawing. The area of the Creek and southward, is covered with dense green timber however, the fire kill begins about 500 feet to the N.W. of it and continues endlessly northward. The south facing slope of the ravine is steep, dry and devoid of trees while the north facing slope is steep, moss covered and underlain with perma frost and densly covered with spruce trees. Photos Nos. 2, 3, 4 and 5, Appendix B taken looking west shows the nature of the slope of the ravine, while Photo #14, taken from the south rim shows the north rim of the ravine. There is no water in the ravine. The terrain in the general area of the ravine is a gentle slope to the North West.

TRENCHING

Trenching was carried out at the outcrop site at locations indicated on Drawing No. 1 attached. Initially a D6 tractor with hydraulic blade and no ripper was employed and Pit Nos. 1 and 2 were opened up. (See Photo #6, Appendix B)

Pit No. 1.- was located as shown on the drawing towards the west end of the site where the ravine takes a sharp turn northward. The coal seam was found to be thin with hard sandstone on either side. The trench was dug roughly along strike at the rim of the ravine and after digging down about 5 feet the trench was abandoned since the dozer could not dig the hard sandstone any further. The seam was measured at 3 feet but no sample was taken.

Pit No. 2.- was located some distance east of Pit No. 1, as shown on the drawing. Here the trenching was started directly over a visible coal outcrop (see Photo #7 Appendix B) and at right angles to the rim of the ravine. The cover over the coal consisted of 2 to 4 feet of loose earth and volcanic ash. The trench was dug about 30 feet wide and extended northward from the rim for about 80 feet. The material excavated was pushed over the slope into the ravine. At a depth of 10 feet from top of original ground the D6 bulldozer could not dig further due to the compact nature of the coal and the hardness of the sandstone partings and trenching was thus temporarily suspended. Three samples weighing 25 lbs each were taken at points as shown at Level I in Sec B-B, Drawing No. 1. At a latter date a D7E bulldozer with ripper was employed to continue trenching and Pit No. 2 was deepened to 18 feet where five samples were taken at locations indicated at Level II in Sec. B-B (See Photo #8, Appendix B).

Pit No. 3. - was dug just north of Pit No. 2 at right angles to the strike of the coal seams to better determine the exact thickness of the seams. The trench was dug 5 feet deep and was 200 feet long by 15 feet wide. The earth cover over the coal and sandstone was 2 feet deep. Since the coal seams were intercepted at right angles an accurate measure of their thickness was made. The coal seams intercepted are marked C, D, E, F, G and H on Drawing No. 1. Photo # 9 in Appendix B shows coal seams D, E and F. No samples were obtained from this trench.

Pit No. 4. - was dug on strike about 800 feet northwest of Pit No. 2 in order to determine if the coal seams at this point were still near the surface. A side hill cut was made and the coal was exposed after 2 feet of earth was removed. No further trenching was done and no samples were taken.

Pit No. 5. - was dug on the south side of the ravine about 800 feet south east of the rim at a location which was believed to be on strike. A cross trench 60 feet long by 4 feet deep was dug but no coal was found. The material excavated was boulders, silt and sand. Since the area is heavily treed it was concluded that the trenching was probably not on strike or that the coal seams were at a depth greater than 4 feet.

Pit No. 6.- was dug on the north rim of the ravine after it was observed from the south rim that a dark streak was present west of Pit No. 2, (See Photo #14, Appendix B). The trench was dug on the rim of the ravine and in addition to intercepting seam C which had originally been exposed at the very westend of Pit No. 3, a new seam was found. This seam is marked B in Sec. B-B. No samples were taken from this trench.

Pit No. 7. - was dug west of Seam B on the rim of the ravine and uncovered black shale.

SAMPLES

Samples were taken only in Pit No. 2 in the three large coal seams, D, E, and F. All samples were approximately 25 lbs and were placed in plastic bags which were tightly tied.

Sample #1 Bottom, #2 middle and #3 bottom, were taken 60 feet north of the ravine slope at a depth of 10 feet. They were obtained from small pits dug by pick and shovel in the bulldozed trench at the bottom of Seam D, the middle of Seam E and the bottom of Seam F respectively as shown in Sec. B-B at Level I.

Samples #1, #2 west, #2 east were taken 35 feet north of the ravine slope at a depth of 18 feet. They were obtained from a small trench excavated by pick across the width of the seam D and E as indicated at Level II, Sec. B-B (See Photo #10 & #11, Appendix B). Sample #3 and #4 were taken 80 feet north of the ravine slope at a depth of 18 feet. They were obtained from a small trench excavated by pick across Seam F as indicated in Level II, in Sec. B-B (See Photo #12 and #13, Appendix B).

The samples were transported to the laboratory by the author.

ANALYSES

Proximate Analyses were conducted by Loring Laboratories Ltd., on all raw samples and the results are given in Appendix A pages I and II. From this analysis it can be observed that the coal belongs to the high volatile group with a rather high moisture content. It was the opinion of the analyst that the coal samples were probably weathered.

Further tests were conducted by Cyclone Engineering Sales Ltd., on Samples #1, #2 west #2 east, #3 and #4. These tests consisted of ash analyses of the raw samples, screen analyses of crushed samples, Float-sink analyses @ 1.5 sp.gr and analyses of the Float-sink samples. The results of these tests are given in Appendix A pages III to IV . It was the opinion of the analyst that the samples were probably oxidized although tests to determine this were not made. It was also his opinion that the samples represent a good quality steam coal in their raw state and that it could be beneficiated at moderate cost to reduce the ash content thereby improving the quality.

PERMANENT ROAD TO SITE

From a point at Mile 50 on the Whitehorse Dawson highway a permanent access road could be readily built to the coal outcrop on Division Mountain. The length of such a road would be 13.5 miles. From mile 50 the new road would head in a southwesterly direction down the Klusha Creek Valley for a distance of 10.0 miles to a point at the northwest tip of Corduroy Mountain, where it would turn westward and follow roughly along the present access trail for 3.5 miles to the coal outcrop. There are no particular problems in constructing a road on this route. All creek crossings could be made by installing culverts and no bridges would be required. Gravel and other good construction materials are readily available in the benches along Klusha Creek Valley.

Although the access trail encounters some steep grades up the slope of Division Mountain, these could easily be avoided in the construction of a new road.

CONCLUSIONS

The Division Mountain: coal discovery is an important one in three main respects, namely;

1. Demand
2. Reserves and Mining Potential
3. Location

1. Demand

There is a demand for steam coal in the Yukon Territory both for electric power generation and for use as a fuel in the mining industry. At the present time there are two hydro electric plants in Whitehorse, both of which are fully developed and operating to capacity. These plants are insufficient to meet the demand and additional power is generated by diesel electric sets. At the time of our investigation, two more new 6000 K.V.A diesel plants were being installed as emergency units. With the increasing development of mines and industry in the Yukon the need for additional power is imminent and the Northern Canada Power Commission is in fact, investigating how to cope with this demand. It has been suggested that an additional source of power capable of 50 mega watt output is contemplated by N.C.P.C.

Within the mining industry itself, steam coal is required as a fuel to dry ore concentrates being shipped by truck from the mines. The present market in this area is a modest, 25-30,000 tons per year at one mine-mill operation however, other important mining developments are in progress and these will undoubtedly require substantial amounts of coal for their operation.

At the present time coal is being produced at the Tantalus Mine at Carmacks at a rate of about 100 tons per day from an operation one mile underground. This coal is being used to dry ore concentrates.

2. Reserves & Mining Potential

From the limited amount of investigations carried out in our program, it appears that we have encountered a large reserve of good quality steam coal. In addition to the number of seams discovered, there is a good possibility that other seams exist within the favorable geological section shown in Mr. R. J. Kirker's Geological Report.

Furthermore, there are a number of additional reported outcrops within the permit area which have not as yet, been investigated. These could add substantially to the reserves estimated by Mr. Kirker.

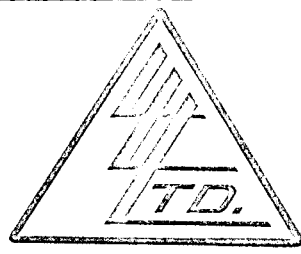
Strip mining in the immediate area of the Teslin Creek outcrop would be a relatively straight forward operation. It is estimated that the ratio of overburden to coal recovery for the first 200 feet of depth is 5 to 1 and that in a two mile section 4,500,000 tons of coal could be recovered.

3. Location

The reserves are located in the heart of development of the southern Yukon. The area encompassed by a radius of 150 miles centred on the coal deposits includes such developments as the Anvil mine, the proposed Casino Silver mine, the City of Whitehorse and Skagway Alaska. The Whitehorse-Dawson highway could be reached at mile 50 by an all weather road as described in the previous section. Coal could thus be transported by ore carrier trucks on back-haul to the mines. A thermal generating plant situated at the coal field would be in an ideal location to distribute power to the demand areas. In the event that export markets were realized, shipment to Skagway Alaska could be made, either by slurry pipeline constructed directly from the coal field to Skagway or by new railroad to Whitehorse thence by the existing rail to the coast.

APPENDIX "A" - ANALYSES

To: TESLIN EXPLORATION LTD.
 Box 8592
 Station F.
 Calgary 13, Alberta.
 Mr. Joe Hlavay



File No. 2944
 Date July 14th 1970
 Samples Coal

Certificate of
ASSAY of
LORING LABORATORIES LTD.

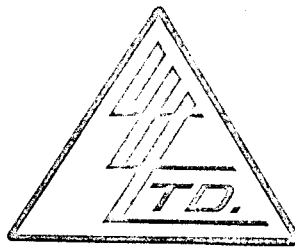
SAMPLE No.	Received H2O%	Vol. Matter %	Ash %	Fixed Carbon %	S %	B.T.U. /lb.	F.S.I.
# 1 Bottom	14.2	42.13	11.33	46.54	.35	9,654	N.A.
# 2 Middle	14.2	41.54	21.10	37.36	.44	8,245	N.A.
# 3 Bottom	14.0	37.54	17.79	44.67	.49	8,541	N.A.

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 Pulps Retained one month
 unless specific arrangements
 made in advance.

[Signature]
 Licensed Assayer of British Columbia

To: TESLIN EXPLORATION LTD.
 Box 8592 Station F
 Calgary 13, Alberta.
 Attn. Joe Hlavay



File No. 3017
 Date July 31st 1970
 Samples Coal

**Certificate of
 ASSAY of
 LORING LABORATORIES LTD.**

SAMPLE No.	RECEIVED H2O %	Vol. Matter %	Ash %	Fixed Carbon %	S %	B.T.U. /lb.	F.S.I.
<i>SEAM</i> 'D' # 1	19.7	39.65	16.21	44.14	.13	9,136	N.A.
'E' # 2 West	20.7	32.07	21.60	46.33	.21	8,353	N.A.
'E' # 2 East	18.9	34.68	24.67	40.65	.30	8,007	N.A.
'F' # 3	17.7	37.62	18.26	44.12	.25	9,006	N.A.
'F' # 4	20.1	36.49	16.17	47.34	.23	9,064	N.A.

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 Pulps Retained one month
 unless specific arrangements
 made in advance.

CLM
 Licensed Assayer of British Columbia

CYCLONE ENGINEERING SALES LTD.

LABORATORY REPORT

August 21, 1970

CLIENT: Teslin Exploration Ltd.

C.E.S. PROJECT NO.: S1-88

C.E.S. SAMPLE NO.: #1

RAW SAMPLE ANALYSIS

	<u>C.E.S.#</u>	<u>TESLIN #</u>	<u>ASH %</u>	<u>F.S.I.</u>
SEAM ↓ 'F'	1.	S1-88 #3/18'	18.98	N/A
'F'	2.	S1-88 #4/18'	14.49	N/A
'E'	3.	S1-88 #2 East End	24.99	N/A
'D'	4.	S1-88 #1/14'	14.80	N/A
'E'	5.	S1-88 #2 West End	19.79	N/A

Client: Teslin Exploration Ltd. Date Received:
 Project: SEAM 'F' C.E.S. Project No.: S1-88
 Client Sample No.: ~~S1-88~~ # 3/18' C.E.S. Sample No.: #1

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	62.84
20 x 100 mesh	24.05
- 100 mesh	<u>13.11</u>
Total	100.00

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	33.20
Sinks @ 1.5 in 1/4" x 20 mesh -	29.64
Floats @ 1.5 in 20 x 100 mesh -	12.46
Sinks @ 1.5 in 20 x 100 mesh -	11.59

ANALYSES.

Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	R.M.% XXXXXXXX
Combined floats @ 1.5	45.66	8.28	38.55	N/A	6.63
Combined sinks @ 1.5	41.23	31.91			
- 100 mesh	13.11	20.03	38.11	N/A	6.63
Total	100	19.56	*		

* Total of Floats only.

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: August 21, 1970

Per: _____
 R. Sehgal, Head of Laboratory

170
 940
 730

Client: Teslin Exploration Ltd.

Date Received:

Project:

C.E.S. Project No.: S1-88

Client Sample No.: *SEAM 'F'*
SEAM #4/18'
80' from Bank

C.E.S. Sample No.: #2

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	49.09
20 x 100 mesh	40.32
- 100 mesh	<u>10.59</u>
Total	100.00

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	28.38
Sinks @ 1.5 in 1/4" x 20 mesh -	20.71
Floats @ 1.5 in 20 x 100 mesh -	21.71
Sinks @ 1.5 in 20 x 100 mesh -	18.61

ANALYSES.

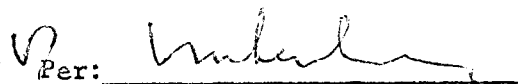
Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	R.M.% XXXXXXX
Combined floats @ 1.5	50.09	7.76	36.96	N/A	7.48
Combined sinks @ 1.5	39.32	24.59			
- 100 mesh	10.59	16.26	38.74	N/A	7.48
Total	100 .00	15.27	*		

* Total of Floats only.

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: August 21, 1970

Per: 
R. Sehgal, Head of Laboratory

BTU

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Client: Teslin Exploration Ltd	Date Received:
Project: <i>SEAM 'E'</i>	C.E.S. Project No.: S1-88
Client Sample No.: Scam #2 East End 6'	C.E.S. Sample No.: #3

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	65.85
20 x 100 mesh	23.59
- 100 mesh	<u>10.56</u>
Total	100.00

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	24.88
Sinks @ 1.5 in 1/4" x 20 mesh -	40.97
Floats @ 1.5 in 20 x 100 mesh -	8.55
Sinks @ 1.5 in 20 x 100 mesh -	15.04

ANALYSES.

Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	<i>R. M. %</i> Sulphur %
Combined floats @ 1.5	33.43	9.86	39.98	N/A	5.38
Combined sinks @ 1.5	56.01	34.54			
- 100 mesh	10.56	24.61	38.46	N/A	5.38
Total	100	25.24	*		

* Total of Floats only.

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C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: August 21, 1970

Per: *R. Sehgal*
R. Sehgal, Head of Laboratory

BOREHOLE SAMPLES: REPORT OF ANALYSES ON FLOAT-SINK SAMPLES

Client: Teslin Exploration Ltd.	Date Received:
Project: <i>SEAM 'D'</i>	C.E.S. Project No.: S1-88
Client Sample No.: SEAM #1/14' 35' From Face	C.E.S. Sample No.: #4

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	62.08
20 x 100 mesh	24.46
- 100 mesh	<u>13.46</u>
Total	100.00

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	38.43
Sinks @ 1.5 in 1/4" x 20 mesh -	23.65
Floats @ 1.5 in 20 x 100 mesh -	14.62
Sinks @ 1.5 in 20 x 100 mesh -	9.84

ANALYSES.

<u>Property</u> <u>Fraction</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>R.M.%</u> XXXXXXXXXX
Combined floats @ 1.5	53.05	7.18	39.82	N/A	6.66
Combined sinks @ 1.5	33.49	26.38			
- 100 mesh	13.46	16.86	43.60	N/A	6.66
Total	100.00	14.91	*		

* Total of Floats only.

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: August 21, 1970Per: *[Signature]*

R. Scheel, Head of Laboratory

BTU

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Eolo

BOREHOLE SAMPLES: REPORT OF ANALYSES ON FLOAT-SINK SAMPLES

Client: Teslin Exploration Ltd.	Date Received:
Project: SEAM 'E'	C.E.S. Project No.: S1-88
Client Sample No.: Seam #2 West End 9'	C.E.S. Sample No.: #5

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	62.40
20 x 100 mesh	26.02
- 100 mesh	<u>11.58</u>
Total	100.00

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	26.71
Sinks @ 1.5 in 1/4" x 20 mesh -	35.69
Floats @ 1.5 in 20 x 100 mesh -	10.11
Sinks @ 1.5 in 20 x 100 mesh -	15.91

ANALYSES.


<u>Property Fraction</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>R.M.%</u> XXXXXXXXXX
Combined floats @ 1.5	36.82	8.25	39.70	N/A	6.34
Combined sinks @ 1.5	51.60	26.21			
- 100 mesh	11.58	21.91	42.62	N/A	6.34
Total	100 .00	19.62	*		

* Total of Floats only.

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: August 21, 1970

Y Per: 
R. Sehgal, Head of Laboratory

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APPENDIX "B" - PHOTOGRAPHS



Photo No. 1 - Access Road construction on west edge of Klusha Creek Valley at base of north slope of Division Mountain.

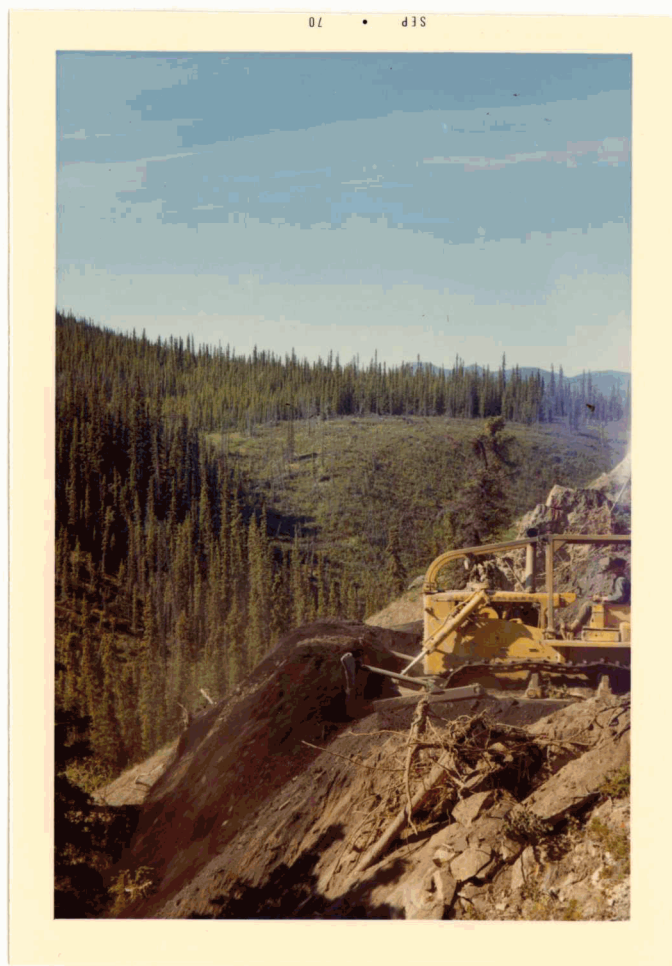


Photo No. 2 -
View looking west along
Teslin Creek 50 ft. east
of Pit No. 2.



Photo No. 3 -

View looking west on Teslin
Creek 1000' east of Pit No. 2.

Photo No. 4 -

View looking west on Teslin Creek
from point just west of Pit No. 2.
Note coal outcrop bottom left corner.



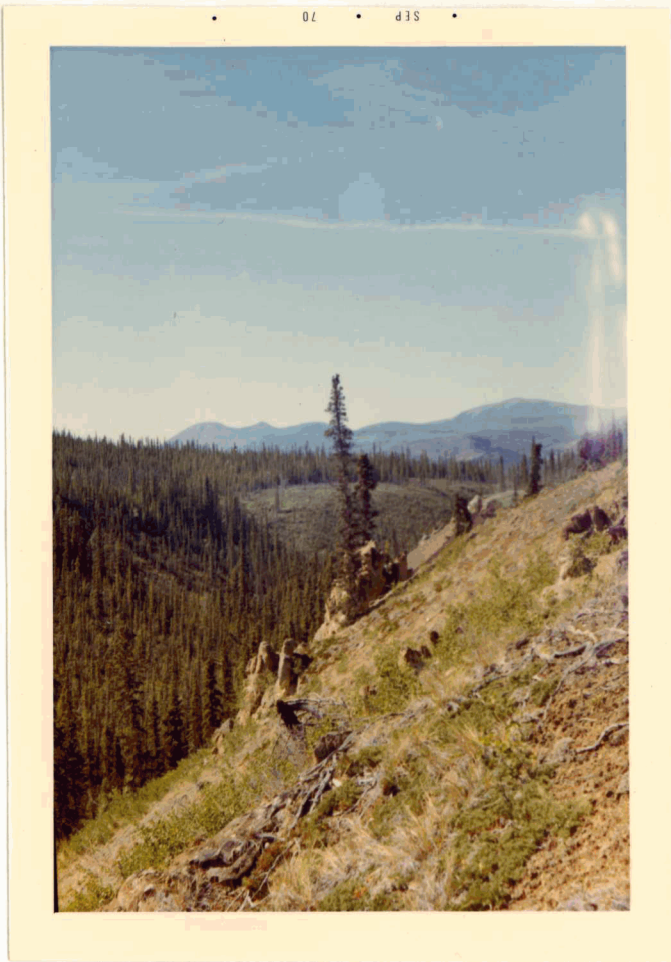


Photo No. 5 -

View looking west on
Teslin Creek 500 ft.
east of Pit No. 2.



Photo No. 6 - Trenching with D6 Dozer in Pit No. 2.



Photo #7. - View of coal outcrop before Pit No. 2 was Trenched.
Note excavation centre right believed to be where
Cairnes sampled in 1908



Photo # 8 - Looking south in Pit No. 2. Strike of seams
is diagonal from right to left.



Photo No. 9 -

View of Pit No. 3 looking West. Coal Seam 'F' in foreground followed by 'E' and 'D'.



Photo No. 10 - Sampling Pit No. 2. Seam 'E' Level II. Sample #2E and #2W. Note sample bag in Seam 'D' left foreground. Seam 'F' in extreme background.

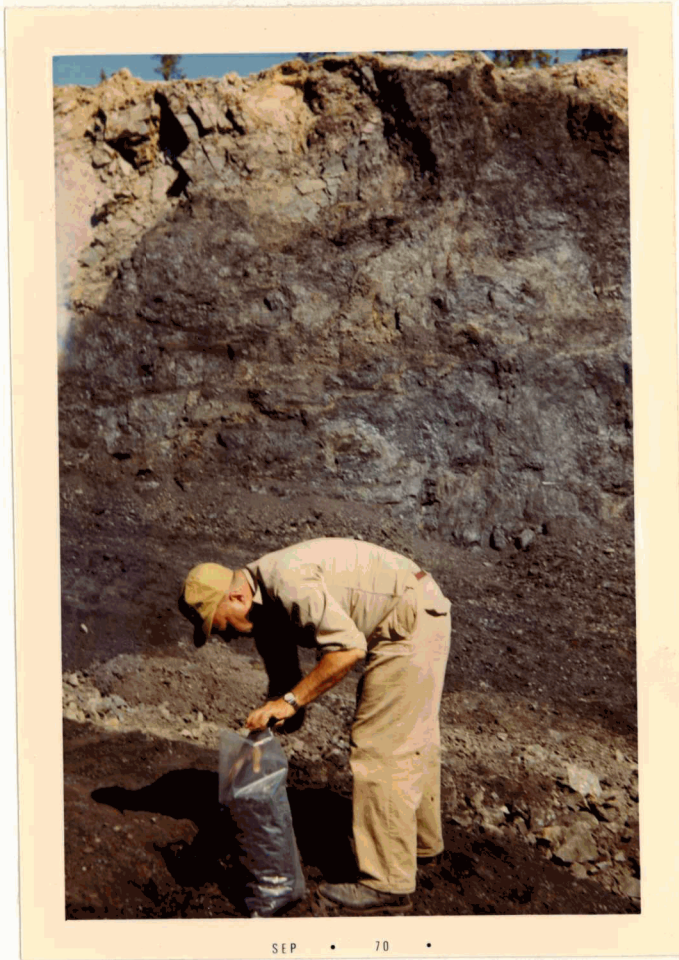


Photo No. 11 -

Pit No. 2
Sampling Seam 'D' Level II
Sample #1.
Note Seam 'E' in wall at back.

SEP • 70 •



12

Photo No. 12 - Pit No. 2. Sampling Seam 'F' Level II,
Samples #3 and #4.



Photo No. 13 -
Pit No. 2 Sampling
Seam 'F'
Sample #4 taken at shovel.



Photo No. 14 - Panorama taken from south rim of ravine looking
N.W. along strike. Red Ridge in background.
Pit No. 1 on left and Pit No. 2 on right.
Note coal show on slope left of Pit No. 2.

R
~~#00045~~

NORDENSKIOLD COAL AREA

YUKON TERRITORY

TERRITORIAL COAL EXPLORATION

LICENCES #10, #11, and #12

by R. J. Kirker, Prof. Geologist

August, 1970

060584

~~092548~~

#7

TABLE OF CONTENTS

1. Summary page 1

2. Recommendations page 3

3. Geography page 5

4. Geology-Earlier Workers page 6

 -Stratigraphy page 7

 -Structure page 9

5. Coal Occurrence page 10

6. Reserves page 13

7. Quality of Coal page 14

8. Conclusions page 16

9. Bibliography page 17

10. Appendix-Sample Descriptions i

 -Section Descriptions iii

11. Photographs viii

- ENCLOSURES: A) Geological map of Territorial Coal Exploration Licences #10, #11, and #12.
- B) Cross-section showing portion of Laberge Group exposed along small creek on north side of Division Mountain.
- C) Regional Cross-sections of the Licenced areas.
- D) Strike-section to accompany Reserve calculations.

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NORDENSKIOLD COAL AREA - YUKON TERRITORY

SUMMARY

This report summarizes the exploration work performed upon Territorial Coal Exploration Licences #10, #11, and #12, optioned to Teslin Exploration Ltd. The program, consisting of three parts comprised

- a) locating the coal outcrops examined by D. D. Cairnes of the Geological Survey of Canada in 1907 and the determination of their stratigraphic relationships.
- b) the excavation of a pit on the reported coal occurrences in

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order to obtain their true thickness and clean samples for analysis and

c) a geological reconnaissance of the unmapped areas to the north and west.

The writer with Mr. Joe Hlavay, Professional Engineer, and two junior assistants, left Calgary June 29th. and returned July 13th.

We were successful in locating the coal occurrence mapped by Cairnes on the north end of Division Mountain, however we were unable to locate the second exposure described on Red Ridge, some 4 miles along the strike to the northwest.

Trenching was carried out on the first coal measures and true thicknesses were obtained on eight coal seams, near the middle of the section. Samples were taken from the thickest seam and an approximate analysis was obtained from Loring Labs in Calgary. (see accompanying report by J. Hlavay)

The third phase of the project involved a reconnaissance survey of the licences and adjacent lands in order to map the continuation of the coal measures. The results of which are shown on the accompanying map and cross-sections.

It is recommended that:

1. The field notes of D.D. Cairnes for the years 1907 and 1908 be examined in the hope that a better description of the location of the coal exposure on Red Ridge is given.
2. Additional trenching be carried out east and west of that done this year in order to determine whether the other covered intervals may be underlain by coal. (See enclosed cross-section of coal measures.)
3. Additional trenching should be carried out along the north side of the small gully approximately one half mile to the north, and along the large creek about one mile to the north. (It may also be possible to expose the coal to the south although there is a cover of andesitic lava indicated.)
4. Detailed examinations should be made of both sides of the Red Ridge syncline for the possible extension of the coal measures. (The southeast flowing creek draining the lakes north of Vowel Mountain exposes an excellent section although no coal seams were noted in flying over same.)
5. If successful in locating the coal measures on Red Ridge, a trail should be built across the Nordenskiold, after freeze up, to the coal and sufficient trenching done to establish the continuity of the individual coal seams.
6. A line of diamond drill holes on 2000 foot centers should be drilled across the Nordenskiold Valley in order to:

- a) establish continuity of individual seams
 - b) obtain representative samples for analysis of coking qualities.
 - and c) determine the thickness of glacial material in the valley bottom.
7. A line of diamond drill holes on 2000 foot centers should be drilled southeast of Trenches to establish the continuity of the coal seams and determine the thickness of andesite cover.

Territorial Coal Licences #10 (SE quarter of N.T.S. 115 H8), #11 (NE quarter of N.T.S. 115 H8) and #12 (SW quarter of N.T.S. 105 E5) each containing 46,012 acres, are located some 50 miles northwest of the city of Whitehorse in the Yukon Territory. The Licences cover an area some 18 miles north/south by 16 miles east/west.

The subject lands were transected by the old Whitehorse/Dawson staging route which was superceded by a new highway, some 12 miles to the northeast, in the early forties. Access can be obtained with the use of four wheel drive vehicles, over the old stage road from Braeburn Lake.

There are no other trails or roads within the area and a helicopter was used to examine the remainder of the block.

The licences are crossed by the Nordenskiold River and its south fork which is known as Klusha Creek. The Nordenskiold is about six feet deep and twenty feet across while the Klusha is only three feet deep and ten feet across. Fords were built across the latter at a number of points.

D. D. Cairnes of the Geological Survey of Canada was the first geologist to visit the area in 1907. Memoir #5, one of the Survey's earliest, printed in 1910, sets out his examinations. (It is of note, that Cairnes was sent to the area with the object of locating metallurgical coal for a possible smelter for the newly discovered copper deposits of the Whitehorse area. New Imperial Mines recently went on production and big reserves have been attributed to the recent discovery of Casino Silver.)

In 1929 and 1930, Mr. E. J. Lees of the Geological Survey of Canada, mapped the southeast quarter of the Licenced area. The remainder of the lands have not been covered by any published geological report.

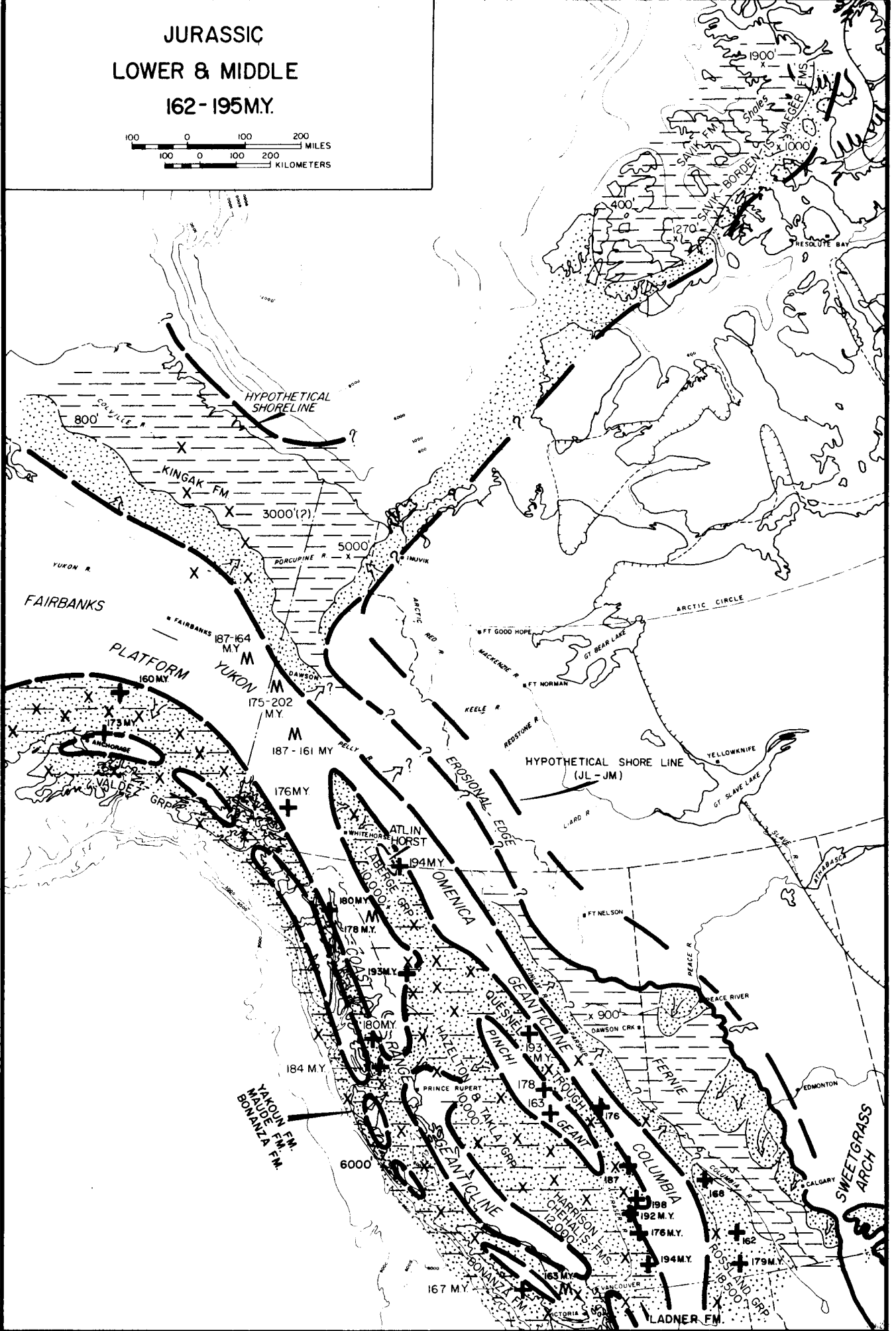
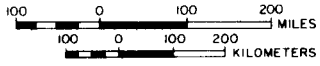
The oldest rocks examined were Triassic limestones of the Lewes River Group. The Lewes is overlain by a thick (9000') sequence of sands, shales, and conglomerates called the Laberge Group. These rocks have been dated as Jurassic on the basis of plant remains. The sequence is largely of continental origin and consequently highly variable in composition depending on provenance and depth of sedimentation. Unfortunately there are extensive flows of acidic and basic lavas overlying the Laberge and as a consequence it is almost impossible to correlate the few scatter sections within this thick sequence.

The accompanying map taken from Ziegler shows the distribution of the Laberge and its relationship with the Jurassic of western North America.

The Laberge is overlain conformably by the Tantalus conglomerates of Basal Cretaceous Age. Some 975' of clean siliceous chert pebble conglomerate were measured on Corduroy Mountain near the middle of the prospect. There are extensive outcrops of chert pebble conglomerate exposed on Division Mountain and Red Ridge, however, these rocks are highly ferruginous and much dirtier. (more felspathic material) It is suspected that the latter may actually belong to the Laberge group, however for simplicity sake we have followed the usage of earlier geologists and mapped them as Tantalus.

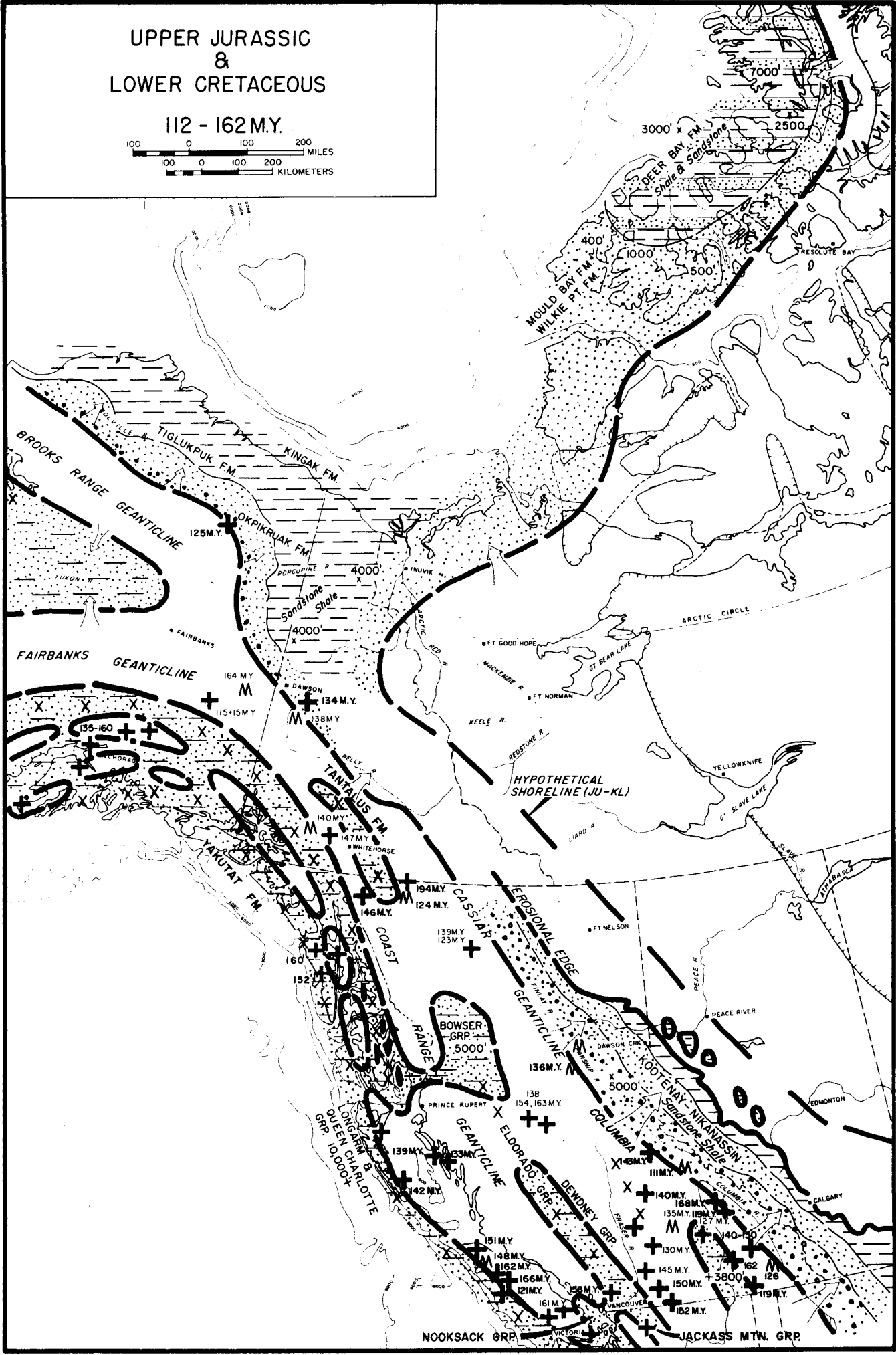
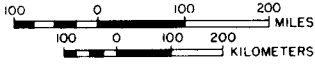
The accompanying map is also from Ziegler's work and shows the distribution of the Cretaceous within the Whitehorse Trough and its relationship to the Bowser Basin of British Columbia.

JURASSIC
LOWER & MIDDLE
162-195MY.



UPPER JURASSIC & LOWER CRETACEOUS

112 - 162 M.Y.



There is a major unconformity at the top of the Tantalus and it is overlain by a thick series of Cretaceous volcanics known as the Hutshi Group. This is in turn overlain unconformably by an even thicker sequence of volcanics of Tertiary age, known as the Skukum Group.

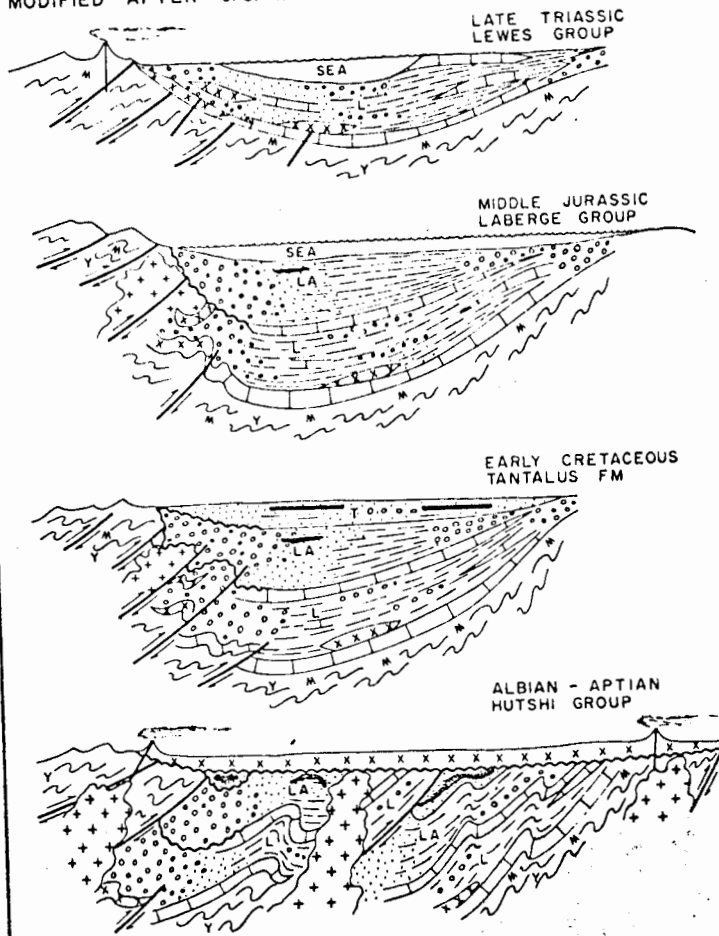
Locally, basalts of Recent age are also found. This typical eugeosynclinal sequence has also been intruded by a variety of acid granites similar to those of the Coast Range.

The Quaternary period left a thick mantle of glacial material along the Nordenskiold River. However, with the exception of the end moraine at Braeburn Lake, the Klusha Creek drainage system appears to have only a thin cover of drift.

A peculiar feature of this area is the widespread occurrence of a thin layer of pumiceous sand. This white volcanic ash is about 6 inches thick and is of recent origin being deposited since the present waterways had cut their courses. Cairnes speculated that this ash could be from Mount Wrangel, the nearest known volcano, or some undiscovered extinct volcano in its vicinity.

The writer is tempted to postulate the existence of an extinct volcano in the vicinity of Satasha Lake. ($61^{\circ} 30' N$ and $136^{\circ} 15' W$) The thick basalts here appear to be parts of the crater rim with the east and northwest sides blown out. This may have been the source of the pumiceous sands described above.

MESOZOIC EVOLUTION OF WHITEHORSE TROUGH
MODIFIED AFTER J.O. WHEELER



The sediments of the Whitehorse Trough were laid down during the late Paleozoic and early Mesozoic eras, and subsequently folded parallel to its long axis (NW/SE). The orogen is dated as Middle Cretaceous in as much as all rocks older than the Hutshi Volcanics are deformed.

The axial planes of the folds are steep; some even overturned to the northeast; similar to those described by Wheeler in the west half of the Whitehorse sheet. Elsewhere as on Belleview Mountain, the strata dip moderately (27°) to the north.

This discrepancy suggests the presence of a fault between Belleview and Corduroy Mountains. The remaining sediments examined all showed high dips about the northwest/southeast axis.

The sections facing this page are taken from Ziegler and show the evolutionary stages of the Whitehorse Trough.

The coal measures on the north end of Division Mountain, examined by Cairnes in 1908, were studied in order to determine the stratigraphic relationships. Approximately 3000 feet of Laberge strata was examined. The strike varied only slightly from 140° and the dip was between 60° and 70° to the southwest. Unfortunately the base of the section was not exposed but a basalt with large white phenocrysts was found some 500 feet further up the creek to the southeast. Similarly, the top of the section exposed a red andesite with white phenocrysts. Neither exposure of the volcanics was large enough to indicate whether it was a dyke or a sheet. There is a thick exposure of highly ferruginous conglomerate (Tantalus?) a short distance to the south on Division Mountain and the strike is the same although the dip is considerably less. It is believed the rocks are conformable and the coal measures are in the uppermost Laberge (possibly within 500 feet of the base of the overlying Tantalus conglomerate.) The photograph in the appendix shows this relationship. There is some variation in the sand size from the top to the base of the section. The grain size ranged from fine grained to micro conglomerate with pebbles to $\frac{1}{2}$ inch. The latter showed as angular white particles on the weathered surface and gave the rock a "stuccoed" appearance. The sandstone beds were sharp in places and rounded in others depending on the degree and type of cementation. A number of dark blue/black shale beds were exposed, some of which were carbonaceous while others were

platy and micaceous. The sands were of the greywacke-type to the east but cleaner and more quartzose to the west. There was considerable ferruginous material throughout the section and many beds weather to a rich orange or red colour.

The lowermost coal seam was exposed between 1626 and 1628 feet. (subsequent trenching indicated this seam to be 4 feet thick.) The coal was soft and of low lustre.

There was a small digging; probably that of Cairnes as an old claim post was found above it; between 1715 and 1725 feet. There was a 35 foot covered interval above the showing. A large pit was opened at this point and exposed three seams of 10.0', 14.5' and 13.0' between the sandstone outcrops at 1680 and 1730. The intervening sand lenses were 3.5 feet and 2.7 feet in thickness.

Another coal seam was evident between 1916 and 1921 feet. This seam was also low in lustre but more competent than the others. Trenching gave a true thickness of 4 feet between two competent sandstone lenses.

Seams of coal, 1 and 3 feet in thickness, were exposed at 2221 and 2339 feet. The first was overlain by a 14 foot covered interval that should be trenched. Additional seams of coal, two/three feet thick, were noted on the west end of the section (from 2400 to 2750 feet) where the outcrops are small and scattered. This area should also be trenched in 1971.

In summary, it can be said that coal is exposed over an interval

of approximately 1000 feet with one trenched interval of 150 feet yielding an aggregate coal thickness of 61 feet. The remaining 850 foot interval, within the known coal measures, is largely covered. In as much as coal is recessive, it is strongly recommended that those covered intervals west of the 1970 trenching, be opened in 1971. In addition it would seem prudent to trench a number of the covered intervals below the lowest known seam (east of seam at 1626') in as much as they may also contain coal reserves.

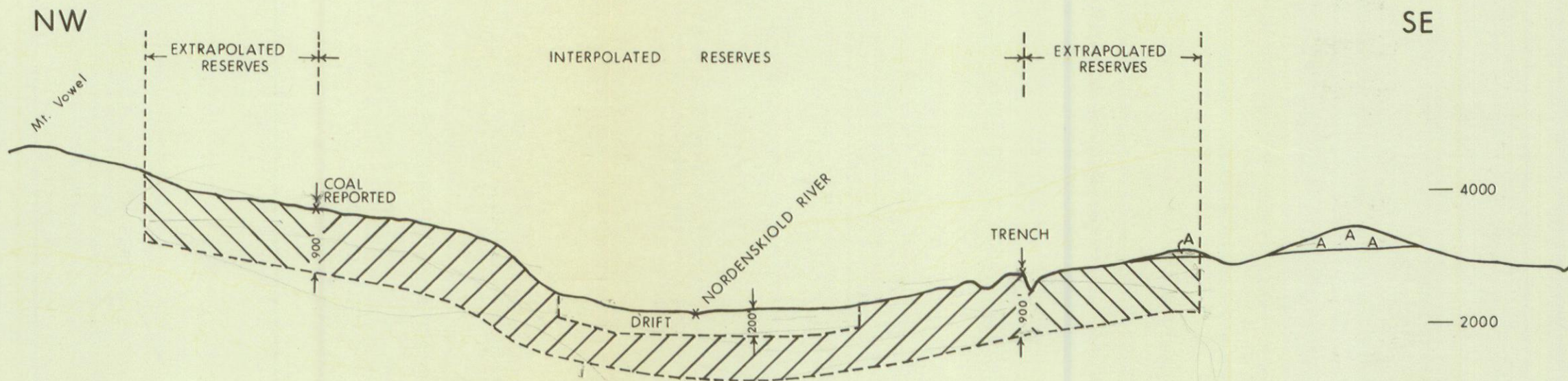
The lateral extent of the coal measures is not as well known. D.D. Cairnes stated in G.S.C. Memoir #5:

"The coal measures of this lower horizon were seen outcropping along the northeast face of Red Ridge and are well exposed along a small creek on the northeast side of Division Mountain."

The writer was only able to make one traverse of the uppermost portion of Red Ridge because of the lack of helicopter landing sites. However, the continuity of the Tantalus Conglomerate with attitudes close to those at the trenched exposures suggest that the coal measures should occur further down the slope. The seams here would be dipping west into the slope so it would not be surprising if the coal is largely obscured. There is a wooded bench near the spot shown on Cairnes' map and it is possible that new growth has covered his outcrops. A request has been sent to Ottawa to examine Cairnes' original field notes and hopefully this will pinpoint the old exposure.

NORDENSKIOLD STRIKE SECTION G - H

SCALE { HORIZONTAL: 1" = 4224'
VERTICAL: 1" = 2000'



ASSUMPTIONS

1. COAL MEASURES ARE CONTINUOUS BETWEEN TRENCH AND RED RIDGES
2. AGGREGATE THICKNESS OF COAL SEAMS > 8 FEET IN THICKNESS — 56 FEET
3. STRIPPING OF SOUTH END AND UNDERGROUND MINING OF NORTH END TO DEPTH OF 900 FEET
4. THICKNESS OF GLACIAL DRIFT IN NORDENSKIOLD VALLEY IS 200 FEET
5. SPECIFIC GRAVITY OF COAL 1.38 86 lbs/cu.ft. 23 cu. ft/ton.

If one assumes the coal measures reported by Cairnes on Red Ridge are continuous with those north of Division Mountain and that only those seams greater than 8 feet in thickness exposed in the trench are present as far north as Red Ridge; then it is estimated that the coal in place (to a depth of 900 feet) between these two coal showings is as follows:

(Probable reserves interpolated between trenches and reported coal on Red Ridge)

$$\frac{56' \times (900' \times 22,809' - 200' \times 9715')}{23 \text{ cu. ft./ton}} = 45,210,000 \text{ tons}$$

(Possible reserves, extrapolated — area one mile south and one mile north of control points)

$$\frac{56' \times 900' \times 2 \times 5280'}{23 \text{ cu. ft./ton}} = 23,160,000 \text{ tons}$$

NOTE: A depth of 200 feet of glacial drift has been assumed for Nordenskiold River Valley and this thickness deducted. Reserves southeast of the river can probably be stripped while those to the northwest will have to be gained by underground mining.

If the trenching proposed for 1971 is as successful as anticipated the above figures may double or even triple.

A number of analyses have been run on grab samples taken from the seams exposed by the bulldozer. (see accompanying report) Unfortunately, these appear to be from the weathered zone and consequently the coking characteristics can not be determined. The only good information available on Laberge coal is an analysis run on samples from the Five Fingers Mine, north of Carmacks. The mines branch in Ottawa give the following analysis for the sample as received:

H ₂ O	5.95%
Ash	8.43%
Volatile Matter	40.46%
Fixed Carbon	45.16%
Gross B.T.U.	12,100 - 13,600 (Dry/ash free basis)

In addition, it was stated to be strongly coking.

The company's original objective was to determine if the lower coal horizon (Laberge) at Nordenskiold contained coking coal similar to that at the Five Fingers Mine. It is important therefore that a series of representative samples be obtained of the thicker seams from below the weathered zone. Normally, this requires drilling or drifting through some 200 feet of section in the foothills of Alberta. However, there is a permafrost condition at this latitude and it may not be necessary to go so deep to obtain representative material.

It is recommended that a series of diamond drill holes be drilled in the Nordenskiold Valley in 1971. The holes should be sloped

to intersect the coal as near as possible at right angles and to penetrate the coal well below the weathered zone. These holes would also confirm the continuity of the individual coal seams and provide data on the thickness of the drift cover in the valley bottom.

The Nordenskiold Coal Exploration Licences contain probable coal reserves of 45 million tons with the possibility of double or triple that number.

The coal measures probably extend for eight miles along the east flank of the Red Ridge syncline with the possibility of repetition on the west flank.

The individual coal seams are thick and the prospective coal measures are at least 1000 feet thick.

The coal seams, east of the Nordenskiold Valley could be readily stripped while those to the west will require underground mining.

The coal is low in sulphur and the B.T.U. values indicate it to be a good steam coal in the event that it is non-coking.

The prospect is readily accessible and only 170 miles from tide water at Skagway, Alaska, which is in turn, some 300 miles closer to Japan than the new superport at Roberts Bank, British Columbia.

This short land haul and the shortened sea haul, coupled with the low sulphur content, should make the strippable coal, even if it is non-coking, viable in the Japanese market.

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- Ziegler, P. A.-The Development of Sedimentary Basins in Western
and Artic Canada. Alberta Society of Petroleum
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DESCRIPTION OF OUTCROP SAMPLES

(i)

- #10-1 RHYOLITE-BROWN APHANITIC
- #10-2 NO SAMPLE
- #10-3 GRANITE-LEUCOCRATIC, CREAM TO BROWN WITH MUCH SMOKY QUARTZ (angular to rounded)
- #10-4 A. SHALE-BLACK-DK. GREY CARBONACEOUS WITH RANDOM STRIATIONS BLOCKY, FIRM.
- #10-4 B. CONGLOMERATE-FERRUGINOUS, ORANGE/BROWN CHERT PEBBLES W/ SALT AND PEPPER COARSE SANDSTONE MATRIX.
- #10-5 DACITE-NORDENSKIOLD?-PINK/PURPLE W/PHENOCRYSTS OF BIOTITE AND FELSPAR.
- #10-6 SANDSTONE-BROWN-RED-F/M GRAINED, NON-CALC. FERRUGINOUS, QUARTZOSE-O/C LARGELY BASAL LABERGE CONGLOMERATE. (600') W/60' DEPRESSION ALONG MOUNTAIN.
- #10-7 ANDESITE-PINK-APHANITIC W/RED RUSTY WEATHERED SURFACE, PLATY CLEAVAGE.
- #10-8 A. ANDESITE, AS ABOVE, W/CALCITIC INCLUSIONS.
- #10-8 B. ANDESITE-GREEN BROWN APHANITIC, BLOCKY FRACTURE. SOME RED FERRUGINOUS STAIN.
- TC1- PORPHYRITIC BASALT DYKE, DARK GREY W/GREY PLAGIOCLASE PHENOCRYSTS
- TC2- COAL
- TC3- ANDESITE-PINK PORPHYRITIC W/WHITE PHENOCRYSTS OF FELSPAR, SLIGHTLY CALCAREOUS .
- 11-1 ANDESITE -PINK APHANITIC
- 11-2 FLOW BRECCIA-DK. BROWN, GREEN ANDESITES. PHENOCRYSTS OF HORNBLLENDE.
- 11-3 ANDESITE-GREY, BROWN W/ PHENOCRYSTS OF HORNBLLENDE.
- 11-4 ANDESITE-PALE GREEN/GREY APHANITIC W/NEEDLES OF HORNBLLENDE OR STAUROLITE.
- 11-5 FLOW BRECCIA-BROWN W/ LUSTROUS SHEEN FROM CRYSTAL FACES AT CERTAIN ANGLES.
- 11-6 BASALT-DK. GREY, BLACK W/WHITE PHENOCRYSTS.

DESCRIPTION OF OUTCROP SAMPLES cont'd.

(ii)

- 11-7 BASALT-DK. GREY, BLACK W/ FLAT FACED CRYSTALS OF HORNBLLENDE WEATHERS GREY
- 11-8 ANDESITE-PINK AND BROWN, RUSTY WEATHERING, WITH LARGE PHENO-CRYSTS OF WHITE FELSPAR AND DARK BROWN/BLACK BIOTITE. (FELSPAR WEATHERS YELLOW/ORANGE TO MAKE VERY DISTINCTIVE ROCK.)
- 11-9 ARKOSE-PINK/BROWN, MED. GRAINED FERRUGINOUS WEATHERS PINK/BROWN NON. CALC. MUCH QUARTZ.
- 11-10 LIMESTONE-GREY APHANITIC, WEATHERS LIGHT GREY. FRACTURED W/ CALCITE BLEBS AND STREAKS. HARD, BRITTLE.
- 11-11 ARGILLITE. DARK GREY/BLACK, WEATHERS BROWNISH GREY. NON. CALC.
- 11-12 FLOW BRECCIA-W/FELSPATHIC PHENOCRYSTS-PINK W/ MUCH BRIGHT FERRUGINOUS MATERIAL, WEATHERS PINK WITH LEACHED (PITTED) SURFACE. SLIGHTLY CALCAREOUS. CEMENT.

PORTION OF THE LABERGE GROUP EXPOSED ALONG SMALL
CREEK (TESLIN) ON THE NORTH SIDE OF DIVISION MOUNTAIN

(iii)

0-50'	Sandstone, grey-white, f.g. Ferruginous, mass-thin bedded 145° 70° SW
50-125'	Covered (75')
125-140'	Sandstone, white, f.g. Quartzose
140-245'	Covered (105')
245-260'	Sandstone as above
260-310'	Covered (50')
310-320'	Sandstone, grey W/ quartz pebbles (less than ½")
320-380'	Covered (60')
380-430'	Sandstone Lt. grey, ferruginous, soft, weathering, massive
430-505'	Covered (175')
505-540'	Sandstone, massive as above (at ridge running NW from stream)
540-580'	Covered (40')
580-595'	Sandstone, grey-brown, Greywacke-like, massive
595-710'	Covered (115')
710-720'	Sandstone as above
720-770'	Covered (50')
770-810'	Sandstone as above, reddish weathering massive with thin inter- beds. 135° - 68° SW, Some cross-bedding apparent in mass. units
810-840'	Sandstone, grey, soft/friable conglomeratic (<½") at top
840-915'	Covered (75')
915-975'	Sandstone, grey, medium coarse grained, soft/hard.
975-981'	Conglomerate, average size 1" diameter. Basal 3' weathers to gravel, top 3' compacted chert and ferruginous quartzite pebbles
981-1056'	Covered (81')
1056-1080'	Sandstone, as above, red weathering with carbonaceous blebs and partings

- 1080-1120' Covered (40')
- 1120-1170' Sandstone, greywacke W/ biotite and feldspars, conglomerate W/ angular and rounded chert pebbles up to 1" diameter massive W/ prominent cross-bedding.
- 1170-1190' Covered (20')
- 1190-1210' Greywacke, light, dark bands 6"-3' beds hard and soft.
- 1210-1260' Covered (50')
- 1260-1290' Greywacke as above
- 1290-1350' Sandstone, grey-brown quartzose
- 1350-1360' Covered (10')
- 1360-1362' Conglomerate, quartz and chert pebbles to $\frac{1}{4}$ ", well cemented, clean, hard, resistive, 143° - 70° SW
- 1362-1537' Covered
- 1537-1540' Sandstone, coarse, white, quartz and feldspathic, hard compact
- 1540-1570' Covered (30')
- 1570-1585' Sandstone as above, prominent cross-bedding, softer weathering
- 1585-1600' Covered (15')
- 1600-1626' Shale, blue/grey, platy, silty, with coarse ferruginous sandstone in middle
- 1626-1628' COAL. soft, low lustre.
- 1628-1632' Covered (4')
- 1632-1654' Sandstone, white quartzose, fine to very coarse grain, well cemented W/ medium of 1' of clear quartz pebble conglomerate to $\frac{1}{2}$ ".
- 1654-1660' Shale, dark carbonaceous, hard-brittle.
- 1660-1680' Conglomerate as above, grading to medium grained sandstone at top.
- 1680-1715' Covered (35')
- 1715-1725' COAL. soft (Pit #2-see detail)
- 1725-1730' Covered (5')

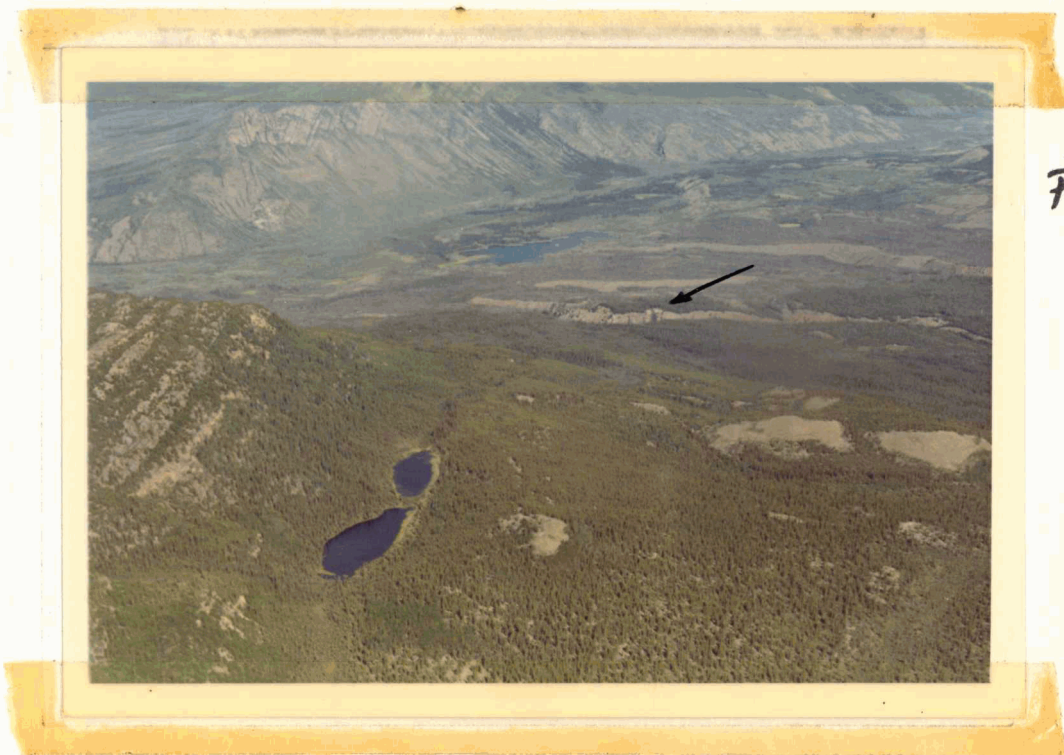
- 1730-1732' Sandstone, white/pink, felspathic
- 1732-1735' Shale, blue/grey, platy
- 1735-1743' Conglomerate to $\frac{1}{4}$ " quartzose clear, W/white chert
- 1743-1749' Covered (67')
- 1749-1755' Sandstone, arkosic/felspathic, fine to medium grained, ferruginous specks, weathers pink, massive.
- 1755-1757' Shale, blue/grey
- 1757-1775' Sandstone as above
- 1775-1800' Covered (25')
- 1800-1812' Sandstone conglomerate, W/clear quartz (angular) very ferruginous
- 1812-1877' Covered (65')
- 1877-1880' Sandstone, green, fine to medium grained W/ strong cross-bedding.
- 1880-1910' Covered (30')
- 1910-1916' Conglomerate, clear quartz and white chert in dark carbonaceous matrix.
- 1916-1921' COAL. (Pit #1) low lustre, competent (5')
- 1921-1926' Shale, hard, dark grey, silty.
- 1926-1956' Sandstone, pink, arkosic, medium to conglomerate W/ clear quartz at top.
- 1956-2006' Covered (51')
- 2006-2008' Sandstone, white-faced, m.g. well sorted, clean, thin bedded
- 2008-2026' Conglomerate, quartz to $\frac{1}{4}$ ", grey, brown, dirty, massive-some clean white W/some pink ferruginous; cementing at top.
(Point where creek turns along strike)
- 2026-2046' Sandstone, massive white, trace pink weathering and trace carbonaceous material
- 2046-2096' Covered (50')

- 2096-2126' Greywacke, brown, ferruginous, massive
- 2126-2141' Covered (15')
- 2141-2171' Arkosic sandstone W/white chert to $\frac{1}{4}$ ", weathers reddish
- 2171-2191' Covered (20')
- 2191-2197' Sandstone as above
- 2197-2207' Sandstone conglomerate, white, W/clear quartz, trace ferruginous material, weathers pink
- 2207-2221' Covered (14')
- 2221-2222' COAL. carbonaceous shale.
- 2222-2223' Clear quartz, pebble conglomerate W/ ferruginous cement
- 2223-2225' Shale, blue grey, platy.
- 2225-2229' Sandstone arkosic, pink, medium grained
- 2229-2231' Shale, dark carbonaceous
- 2231-2237' Covered
- 2237-2249' Sandstone conglomerate, clear quartz to $\frac{1}{4}$ ", ferruginous massive, weathers pink.
- 2249-2309' Covered (60')
- 2309-2313' Sandstone conglomerate, as above, weathers to stucco appearance
- 2313-2319' Shale, dark grey, silty, carbonaceous
- 2319-2329' Sandstone/conglomerate as above
- 2329-2332' Shale as above
- 2332-2339' Sandstone/conglomerate as above
- 2339-2342' COAL. dull, crumply
- 2342-2344' Sandstone, orange weathering., Medium grained Arkosic
- 2344-2346' Sandstone, white weathering but dark grey, dirty sandstone on fresh surface.
- 2346-2359' Shale, blue, grey, platy.

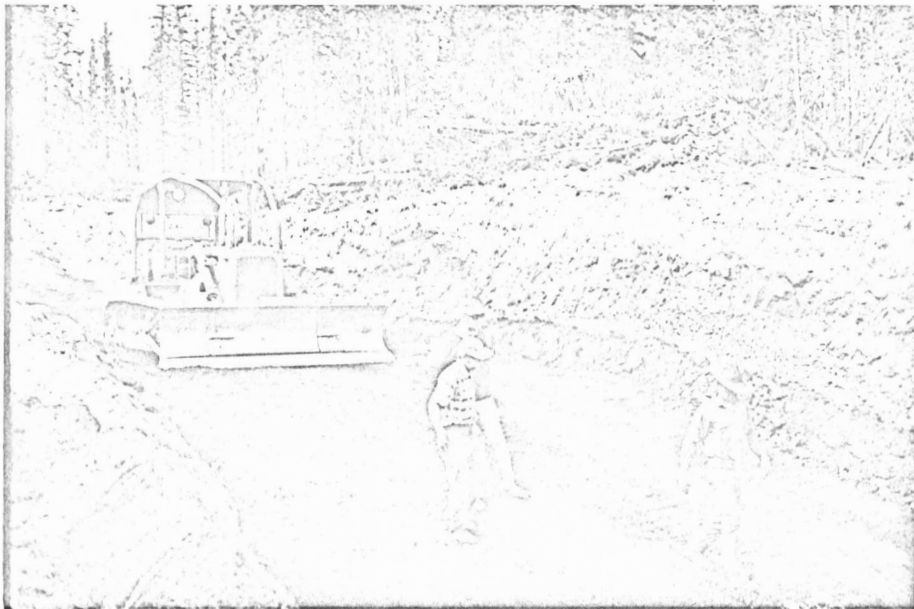
- 2359-2367' Sandstone Arkosic, massive, white, 125°/85° SW,
 2367-2371' Shale, blue/grey as above
 2371-2373' Sandstone Arkosic, white, f.g. at base to coarse at top
 2373-2376' Shale as above, very carbonaceous at top (actually 1' of coal)
 2376-2380' Arkose, pink weathering
 2380-2384' Shale, blue/grey, platy, very silty
 2384-2388' Sandstone, white, fine to medium grained arkosic
 2388-2398' Sandstone, as above, reddish weathering, coarse grained

The creek flows along the strike for 1000' before again crossing it.
 Area of scattered outcrops - Sandstone/conglomerate to halfway point (350' estimated) w/2-3 coal seams.
 - 2' Conglomerate (Tantalus-like)
 - 200' Greywacke (sample TC #2) green
 - 50' Porphritic andesite (sample TC #3) red weathering w/phenocrysts of white feldspar.

3100' TOTAL

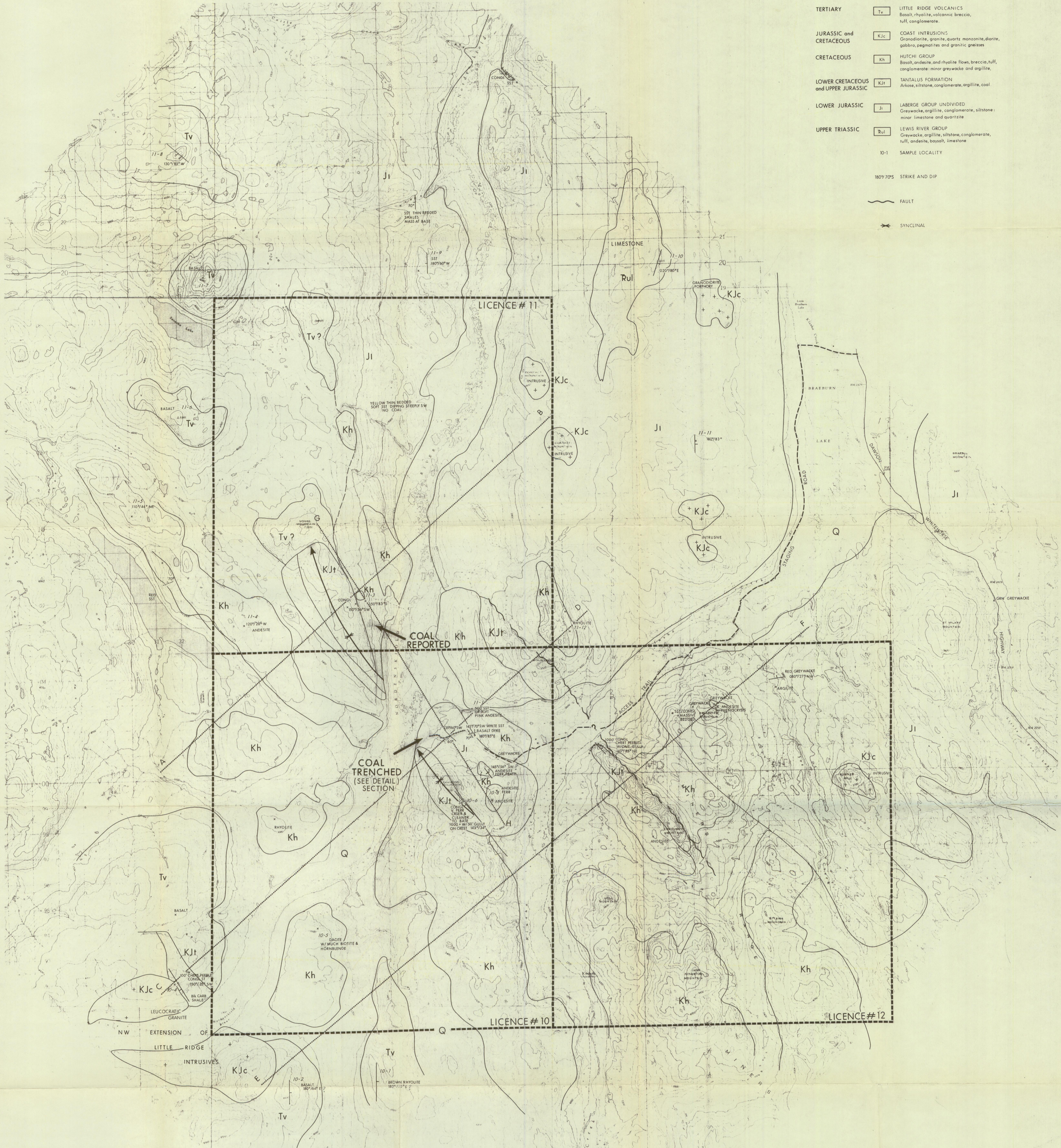


View from 10,000 feet looking northwest along axis of Red Ridge syncline. Division Mountain in left foreground- Nordenskiold River crosses from lower left to upper right. Coal pit shows on lowermost transverse creek near center of picture. Red Ridge and Vowel Mountain in middle background.



View of Pit #2, excavated on Teslin Creek, showing resistive sandstone ridges and type of vegetation.

Note: The thin veneer of glacial drift on the coal seams.



MAP UNITS

QUATERNARY	Q	Alluvium, terrace deposits, talus, glacial outwash and moraine deposits older glacial till and drift
TERTIARY	Tv	LITTLE RIDGE VOLCANICS Basalt, rhyolite, volcanic breccia, tuff, conglomerate
JURASSIC and CRETACEOUS	KJc	COAST INTRUSIONS Granodiorite, granite, quartz monzonite, diorite, gabbro, pegmatites and granitic gneisses
CRETACEOUS	Kh	HUTCHI GROUP Basalt, andesite, and rhyolite flows, breccia, tuff, conglomerate; minor greywacke and argillite
LOWER CRETACEOUS and UPPER JURASSIC	KJt	TANTALUS FORMATION Arkose, siltstone, conglomerate, argillite, coal
LOWER JURASSIC	Jl	LABERGE GROUP UNDIVIDED Greywacke, argillite, conglomerate, siltstone; minor limestone and quartzite
UPPER TRIASSIC	Rul	LEWIS RIVER GROUP Greywacke, argillite, siltstone, conglomerate, tuff, andesite, basalt, limestone

10-1 SAMPLE LOCALITY
180° 70'S STRIKE AND DIP
FAULT
SYNCLINAL

LICENCE # 11

LICENCE # 10

LICENCE # 12

COAL REPORTED

COAL TRENCHED (SEE DETAIL) SECTION

NW EXTENSION OF LITTLE RIDGE INTRUSIVES

092548 060584

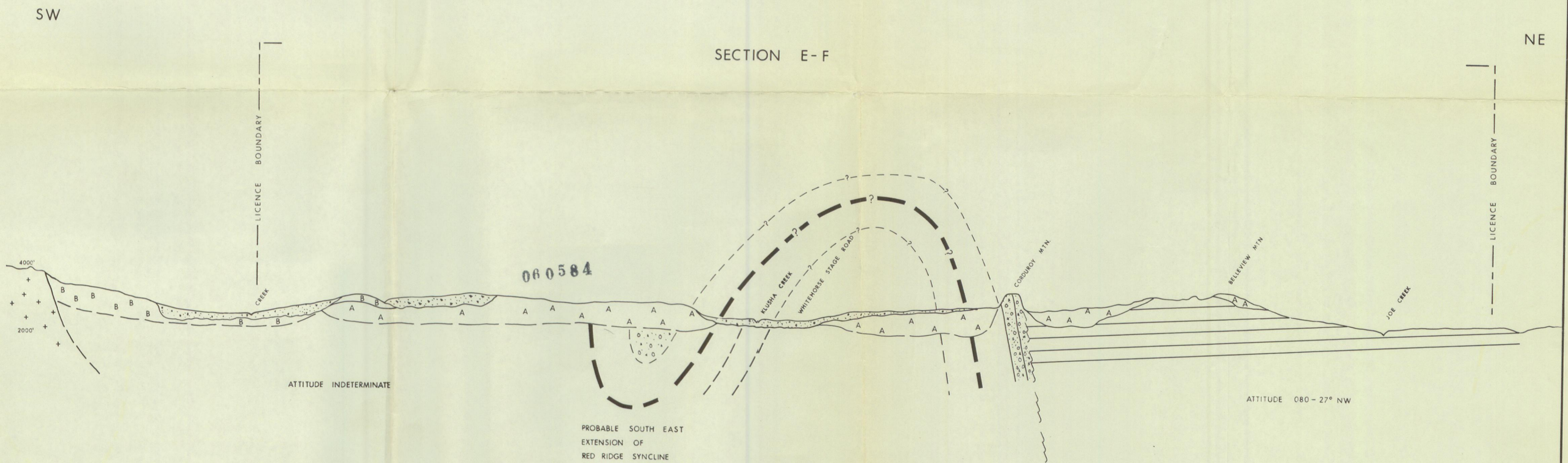
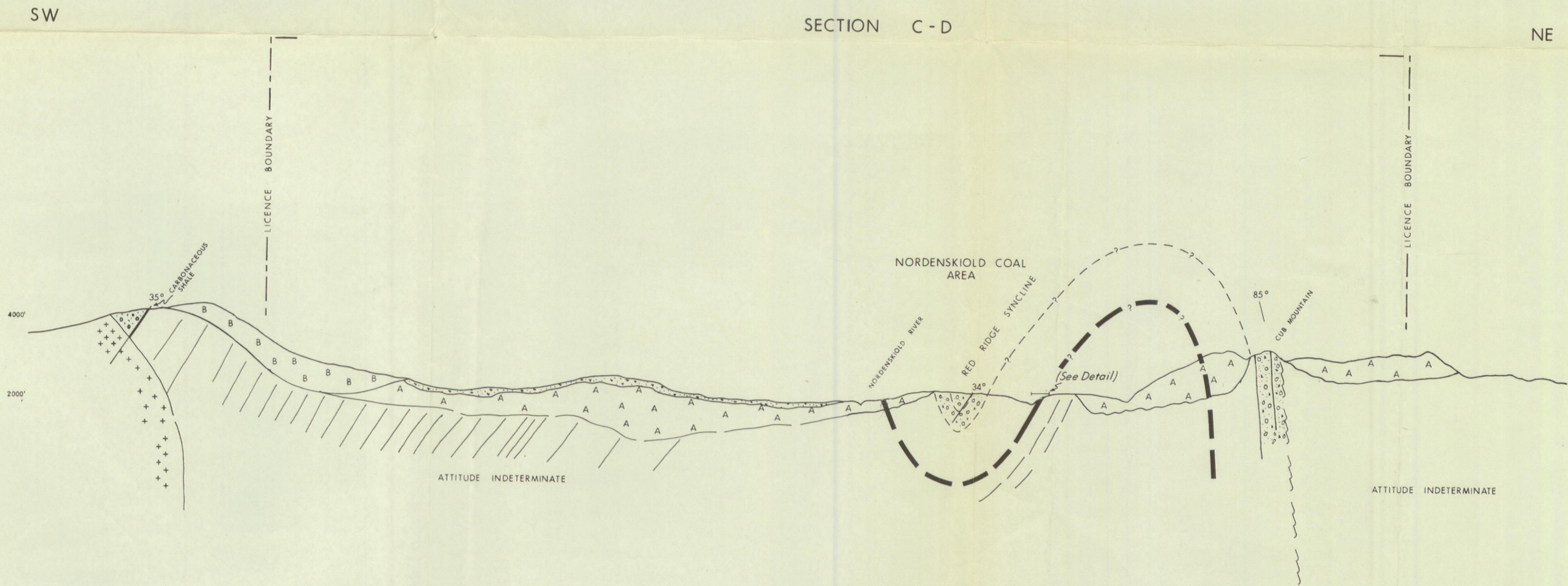
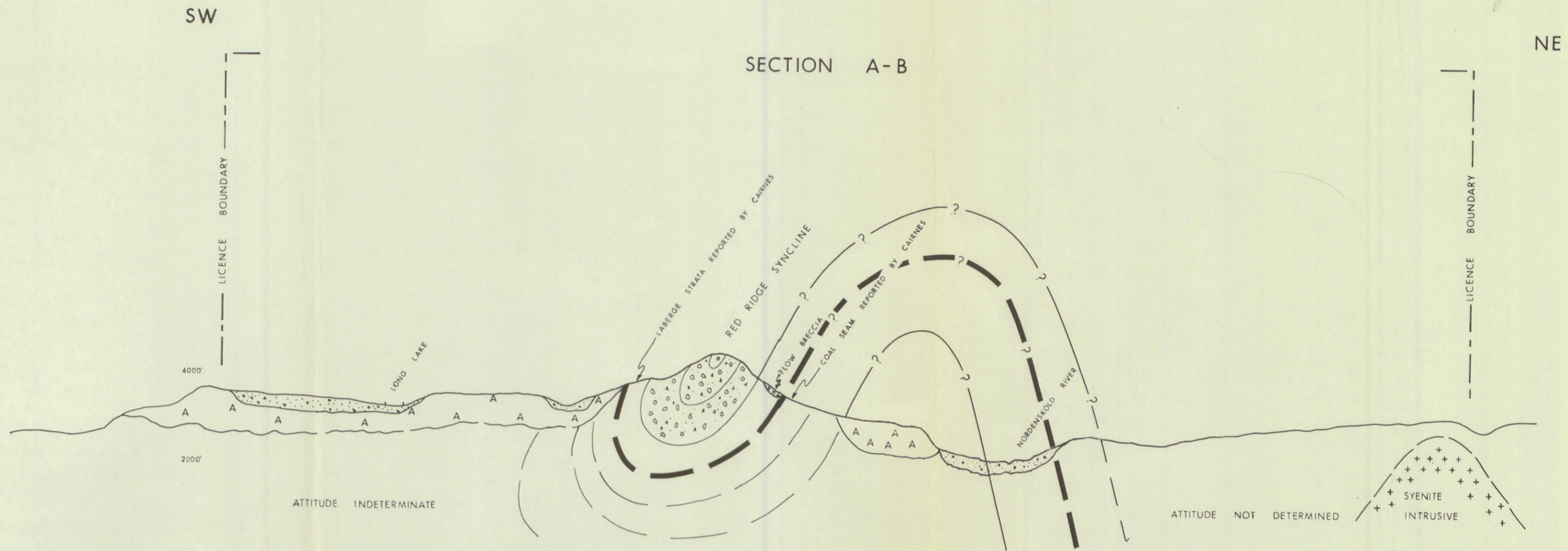
TESLIN EXPLORATION LTD

NORDENSKIÖLD COAL AREA
YUKON TERRITORY
GEOLOGICAL MAP OF
TERRITORIAL COAL EXPLORATION
Licences #10, #11 & #12

SCALE: 1:50,000 (1" = 4166')

DATE: August 1970

ARJAY KIRKER RESOURCES LTD



- LEGEND:
- CONGLOMERATE
 - GLACIAL DRIFT
 - ANDESITE
 - BASALT
 - GRANITE
 - COAL MEASURES

NORDENSKIÖLD COAL AREA
YUKON TERRITORY

REGIONAL CROSS-SECTIONS

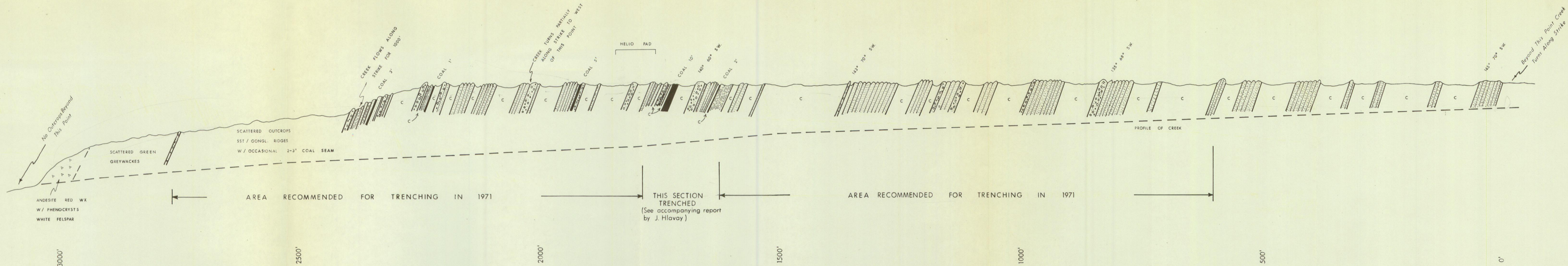
To accompany report on Territorial Coal Licences No's 10, 11 & 12
by R. J. KIRKER July 1970
SCALE: 100' = 1 inch

SCALE { VERTICAL: 1" = 2000'
HORIZONTAL: 1" = 4224'

092548

WEST

EAST



- LEGEND:
- CONGLOMERATE
 - SANDSTONE
 - SHALE
 - COAL
 - ANDESITE
 - COVERED

NORDENSKIÖLD COAL AREA YUKON TERRITORY

CROSS-SECTION SHOWING PORTION OF LABERGE GROUP EXPOSED ALONG SMALL CREEK ON NORTH SIDE OF DIVISION MOUNTAIN 61°20'N 136°05'W
 To accompany report on Territorial Coal Licences No's 10, 11 & 12
 by R. J. KIRKER July 1970
 SCALE: 100' = 1 inch