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REPORT ON THE GEOLOGY
OF COAL LICENSES 58, 59 AND 60
IN THE BIG SALMON COAL BASIN
80 KM. ESE OF CARMACKS, Y. T.

KERR ADDISON MINES LIMITED

YUKON TERRITORIAL COAL LICENSES
58 - NE Quarter of NTS 105E/15
59 - NW Quarter of NTS 105E/15
60 - SE Quarter of NTS 105E/15

by

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Vancouver, B. C.

September 1977

This report has been examined; de-
clared acceptable as Representation
Work under Section 32 and Schedule
B of the Canada Mining Regulations
and valued in ^{part of} the amount of \$27,941.55

Chief, 

Date: Dec. 15, 1977.

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SUMMARY:

Geological mapping of Coal Licenses 58, 59 and 60 which cover about 80% of the Big Salmon Coal Basin, 80 km. ESE of Carmacks was conducted by G. A. Noel & Associates for Kerr Addison Mines Limited between June 6 and July 3, 1977. The coal basin is at least 50 km. long by 6 km. wide and trends N30°W along the east side of Big Salmon River. The area is underlain by the Upper Jurassic and Lower Cretaceous non-marine Tantalus Formation which consists of pebble conglomerate overlain by sandstone and shale with minor coal seams. The Tantalus formation is warped into a rather flat synclorium which plunges shallowly to the southeast in the northern section. The coal-bearing shale member is exposed in the northern part of the basin along Jumpout Creek. It probably underlies an area 5,000 meters long by 1,000 meters wide to a depth of 100 - 200 meters. The coal generally occurs in the shale as narrow seams 1 to 5 cm. wide. Several seams of shaly coal up to one meter thick are exposed in places. There would seem to be a good possibility for coal seams of greater thickness and better quality than those seen to date.

INTRODUCTION:

The 1977 field investigations by Kerr Addison Mines Limited on Coal Licenses 58, 59 and 60 in the Big Salmon Coal Basin, 80 kilometers S75°E of Carmacks, Yukon Territory consisted of airborne and ground geophysical surveys and geological mapping. The purpose of these investigations was to explore the potential reserves of thermal coal underlying the coal licenses. The geological mapping was done for Kerr Addison under contract by G. A. Noel of G. A. Noel & Associates Ltd. of Vancouver, B. C. This report is solely concerned with the geological phase of the work, which was done between June 6 and July 3, 1977.

The area under consideration encompasses 546 square kilometers of which about one-half may be potentially coal-bearing. To cover this area, traverses were conducted from a two-man camp that was systematically moved by helicopter to five convenient locations. On the average, four days of traversing were required at each camp location to provide adequate coverage. Traverses were run by pace, compass and altimeter and were plotted on 1:12,500 (metric) field sheets blown-up from the 1:50,000 105E15 (E and W) Big Salmon, Yukon Territory topographic sheets. The topographic blow-ups provided control for the traverses which are plotted on Figure 3. Geology was mapped directly on field sheets with all pertinent field notes included on the map-sheet. Survey notes relative to the traverses were kept in a field book and the altimeter readings were adjusted for changes in barometric pressure using a straight-line method on the basis of elapsed time between

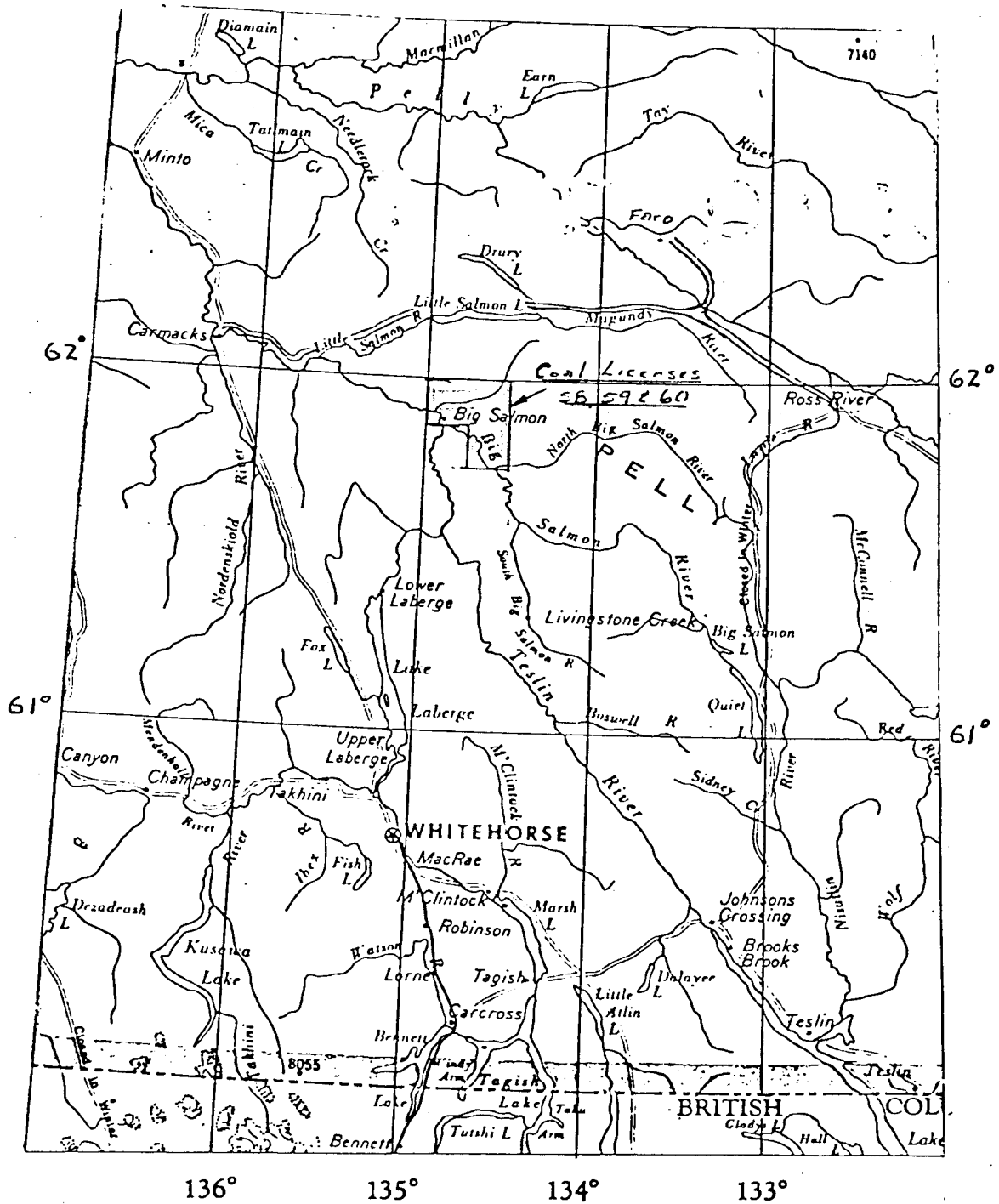


Figure 1 - Location Map

control points. Helicopter reconnaissance was done at the time of camp moves to locate areas of rock exposure, which were then marked on the 1:50,000 topographic base map. This preliminary reconnaissance facilitated the planning and locating of the ground traverses from each camp. In addition the helicopter was used for about one-half day to check isolated outcrops which could be neither reached nor, in some cases, located by traverses on foot.

A total of 24 rock specimens was collected in the course of geological mapping and these specimens are listed and described in the Appendix of this report. The location of each specimen is shown on the geologic maps included with the report.

Several partial sections of the shale and shaly coal were measured during the geological mapping and these are described in detail in the geology section of the report.

PROPERTY:

Kerr Addison Mines Limited hold three Territorial Coal Licenses within NTS map sheet 105E/15 in the Big Salmon area of central Yukon Territory. These licenses are more particularly described as follows:

License

58	61°52'30" - 62°0'0"N	134°30' - 134°45'W
59	61°52'30" - 62°0'0"N	134°45' - 135°0'W
60	61°45' - 61°52'30"N	134°30' - 134°45'W

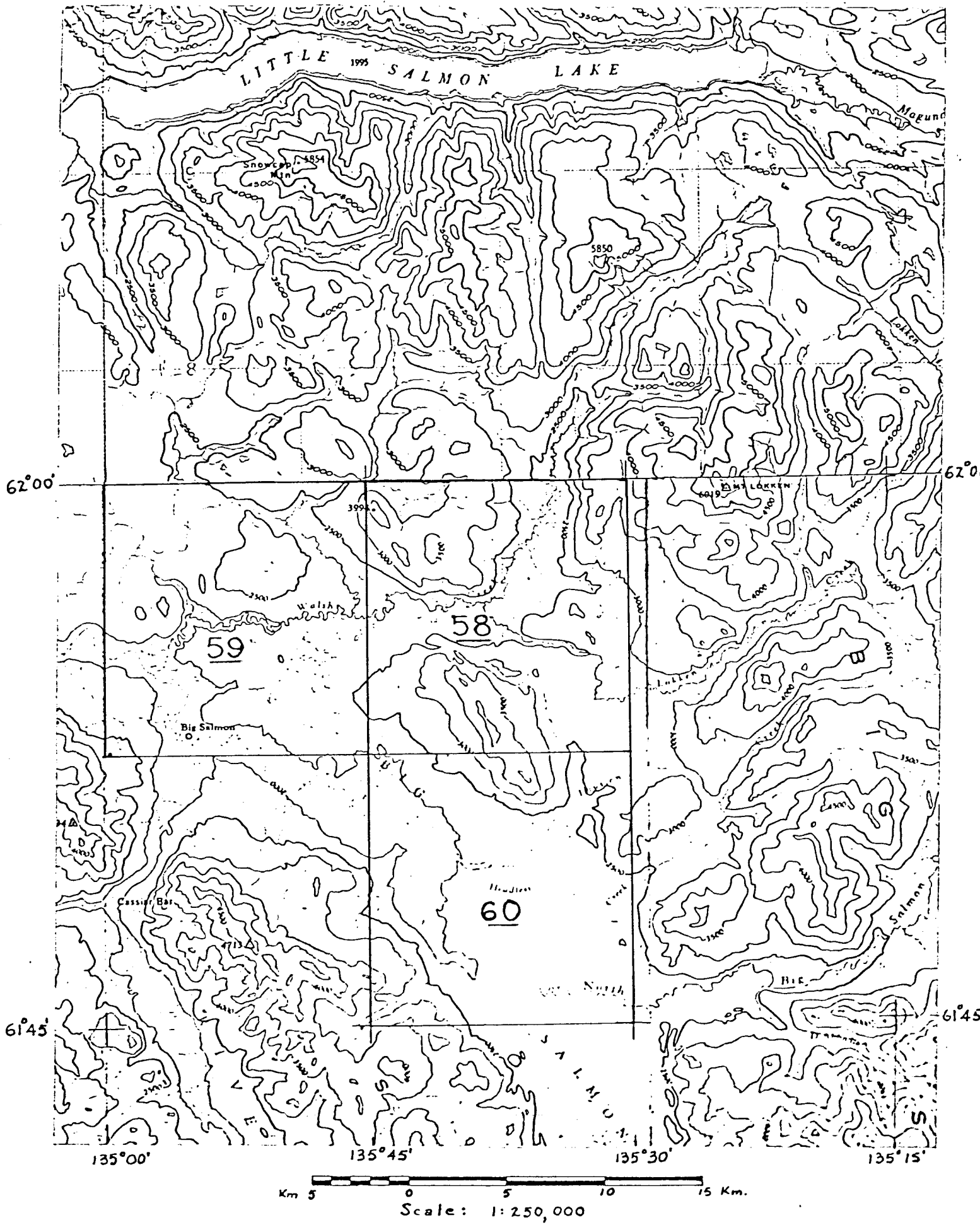


Figure 2 - Property Map

The area of each license is 13 kilometers (east-west) by 14 kilometers (north-south) for a total area of 546 square kilometers. The licenses were issued on November 9, 1976 and they form a contiguous block covering the northwest, northeast and southeast quarters of NTS map-sheet 105E/15.

LOCATION AND ACCESS:

The coal licenses are located about 130 km. north of Whitehorse and 80 km. ESE of Carmacks, which is about 160 km. northwest of Whitehorse on the Klondike Highway. The Campbell Highway, which extends eastward from Carmacks to Ross River, passes within 35 kilometers to the northwest of the property. The Big Salmon River flows northwesterly through the western half of License No. 60 to join the Yukon River in the southwestern quadrant of License No. 59 at the abandoned trading post of Big Salmon.

Access to the licenses at the present time is provided by helicopter, float aircraft or river boat from Carmacks or Whitehorse. A winter tractor road of about 35 kilometers from the Campbell Highway would provide relatively easy access for drilling or similar definitive exploration work with heavy equipment.

TOPOGRAPHY:

The licensed area is part of Yukon Plateau, a broad region of generally modest relief consisting of rolling hills and wide flat valleys, with elevations ranging from 500 to 1,200 meters.

Glacial drift covers most of the valleys and lower areas to a considerable depth. The main streams have cut deep trenches into the drift exposing sand, gravel and bedded silt and clay up to 60 meters in depth. Most of the area is timbered with timber-line at about 1,300 meters. The south-facing slopes are usually grass covered with groves of poplar and birch, whereas the north-facing slopes are marked by alpine plants and moss as well as spruce, pine and balsam timber. Most of the timber in the southeastern quadrant of 105E/15 has been destroyed by forest fires. Permafrost is generally more prevalent under north-facing slopes. Outcrop in the area is restricted to ridges and to some of the deeply incised creek valleys.

HISTORY:

Dr. G. M. Dawson of the Geological Survey of Canada first reported on the occurrence of coal in the Carmacks area in 1887. Coal has been produced from four mines in the Carmacks area since 1900, and one of these, the Tantalus Butte mine of Cyprus Anvil Mining Corporation, is still in production.

Coal occurrences in the Big Salmon Coal Basin were noted by H. S. Bostock (1938) during geological mapping east and north of Big Salmon River in 1934. B. R. MacKay (1947) mentions the coal occurrence on Jumpout Creek, a tributary of Walsh Creek, which is, in turn, tributary to Big Salmon River. Surface stripping was done in several places along Jumpout Creek by Atlas Exploration Co. Ltd. in 1970 with unsatisfactory results due to the recessive nature of the shale and coal near the surface.

GEOLOGY:

1. Regional

The Big Salmon Coal Basin represents a small part of a major structural element the Whitehorse Trough, which was an intermontane basin in an island arc environment. From Triassic to Cretaceous time this trough received marine volcanic and sedimentary accumulations of the Lewes River Group, marine and non-marine clastic sediments of the Laberge Group and non-marine clastics of the Tantalus Formation. These rocks have been subjected to folding and faulting and were intruded by small plutons prior to being covered by later volcanic rocks.

In the Carmacks area, coal occurs in the non-marine clastic units of the Jurassic-Lower Cretaceous Laberge Group and Tantalus Formation. In this area, the Tantalus Formation conformably overlies the Laberge Group (Bostock, 1936); however, in the Whitehorse area, the contact is unconformable in places and fault-defined in others. The Laberge Group overlies the Upper Triassic Lewes River Group, disconformably in places, and possibly conformably in others. The Tantalus Formation and Laberge Group are overlain with angular unconformity by the mid-Cretaceous Hutshi Group (Wheeler, 1961).

The Lewes River Group consists of sedimentary and volcanic rocks with upper Triassic fauna lying immediately below the Laberge Group. In the Whitehorse area it comprises over 1,200 meters of volcanic fragmentals and flows, clastic sediments and fossiliferous limestone. The limestone section is thick and includes limestone breccia with characteristic chert nodules in places (Wheeler, 1961).

In the Laberge map-area, Bostock (1939) recognized three members: upper and lower limestone members separated by a clastic member. The upper and lower limestone members are described as massive light grey crystalline limestone with calcite veinlets. The lower limestone has an estimated thickness of 600 meters while the upper limestone is estimated to be about 120 meters thick. The middle clastic member is up to 750 meters thick and consists of volcanics, sandstone and limestone overlain by a thick section of argillite and greywacke. In the Glenlyon map-area, to the north of the Big Salmon Coal Basin, the Lewes River Group is limited to a few small outcrops in the southwestern part of the area (Campbell, 1967).

The Laberge Group is Lower to Middle Jurassic in age and occupies over 600 square miles of the Whitehorse map-area in two belts (Wheeler, 1961). In the western belt, the Laberge Group lies disconformably on the Lewes River Group and consists of coarse conglomerate over 1,400 meters thick. To the east it wedges out into finer clastics with graded bedding. The eastern belt shows conglomerate with a thickness of less than 180 meters.

Other units of the Laberge Group in the Whitehorse area include greywacke, sandstone and argillite. In the Laberge map-area, which encompasses the Big Salmon Coal Basin, the Laberge Group consists of three members. The lower member includes sandstone (in places a red grit) and argillite with minor shale and conglomerate with an aggregate thickness of 150 - 350 meters. It is conformably overlain by the middle member which is largely conglomerate, and about 200 meters thick. The middle-member conglomerate consists of closely packed volcanic and granodiorite

boulders up to 0.6 meters in diameter in a greywacke matrix (Bostock, 1960). The upper member consists of sandstone and argillite. In the Glenlyon map-area to the north, the Laberge Group outcrops only in the southwestern quadrant, where conglomerate forms the basal beds. Clasts include volcanic and intrusive rocks as large boulders up to 35 cm. in diameter.

The Tantalus Formation of Upper Jurassic and Lower Cretaceous age was not observed in contact with the Laberge Group in the Laberge map-area. However, it unconformably overlies the Lewes River Group in this area where it is estimated to be 300 meters thick (Bostock, 1938) with the following lithology:

	<u>Approximate thickness in meters</u>
Shale and coal	150
Sandstone with minor conglomerate	200
Conglomerate (chert & quartz pebbles)	

The Tantalus Formation outcrops to the north in the Glenlyon map-area southwest of Little Salmon Lake as pebble conglomerate beds 1-3 meters thick with minor sandstone. The pebbles largely consist of chert and quartz. In the Whitehorse map-area, the Tantalus is up to 600 meters thick and includes conglomerate, shale, grit and sandstone. The conglomerate is predominant, and occurs in beds up to 15 meters thick with relatively well-sorted clasts. (Wheeler, 1961).

The mid-Cretaceous Hutshi Group overlies the Tantalus Formation, Laberge Group and Lewes River Group in places along the Whitehorse Trough. It consists of flat-lying to gently dipping flows and flow breccias of

basalt to rhyolite composition and also includes agglomerate, tuff and minor epiclastics.

2. Property

(a) General

Geological mapping on licenses 58, 59 and 60 was confined to the Tantalus Formation and the immediately underlying and overlying rocks. The following Table of Formations was constructed as a result of the detailed mapping on the licenses.

TABLE OF FORMATIONS

PERIOD	FORMATION	LITHOLOGY
Eocene or younger	Carmacks Group	Andesite, basalt, rhyolite flows and flow breccias; includes some conglomerate, tuffaceous sandstone and shale.
Eocene or younger	Mount Nansen Group	Acid to intermediate tuffs and tuff breccias.
Lower Cretaceous and/or Upper Jurassic	Tantalus Formation	Chert and quartz pebble conglomerate, sandstone, tuff, shale and coal.
Jurassic or Triassic		Hornblende granodiorite to quartz diorite. Diorite
Upper Triassic or older	Lewes River Group	Massive impure grey limestone.
		Andesite, dacite, trachyte & basalt flows, breccia & tuff; limestone conglomerate and breccia; and chert

Upper Triassic Volcanics

Upper Triassic volcanics were mapped in the southwestern corner of Coal License 60, where they directly underlie massive grey limestone of the Lewes River Group (Figure 5). This unit is probably equivalent to the "Massive Green Volcanics" unit of Tempelman-Kluit (1974) in the Carmacks area and to the "greenstone" member included within the Lewes River Group in the Whitehorse map-area (Wheeler, 1961). The section exposed in the southwest corner of License 60 includes brown-weathering dacite porphyry, thin-bedded yellow and red-weathering white grey, brown and black chert, siltstone and impure cherty limestone. In places, the volcanics show considerable disseminated pyrite and extensive quartz veins and masses through fractured and sheared cherty limestone. This section is probably at least 200 meters thick; however, it is evidently folded so that the section may have been repeated at least once.

Lewes River Group

Limestone of the Upper Triassic Lewes River Group is exposed in the southwest and northeast corners of License 60 and continuing from the northeast corner of License 60, in a northwest-trending diagonal band across License 58. It is typically cream to pink and red-weathering grey to cream or buff-colored massive limestone and limestone breccias with chert nodules in places. The partial section of the Lewes River Group mapped in the northeast corner of License 60 and extending northwest across License 58 represents a minimum thickness of about 300 meters.

Tantalus Formation

The Tantalus Formation probably underlies most of the area covered by the coal licenses. Unfortunately due to the subdued relief, heavy glacial drift and recessive weathering of the coal-bearing shale section, outcrops of the Tantalus Formation are exceedingly scarce. Only about 4% of the area probably underlain by the Tantalus shows outcrop. The Tantalus Formation outcrops along the southwest slope and crest of the northwest-trending ridge between Walsh and Illusion Creeks in the north central part of License 60 and the southwest quadrant of License 58. A few scattered small exposures can also be found on the lower ground to the southwest of the above ridge in the southwest corner of License 58. Otherwise, exposures of shale and shaly coal are limited to cut banks along Jumpout Creek in the northeast quadrant of License 59.

The following is a typical section of Tantalus Formation in the Big Salmon Coal Basin:

<u>Lithology</u>	<u>Thickness (meters)</u>
Sandstone and shale	10 (+)
Tuffaceous sandstone	1
Shale and shaly coal, siltstone, mudstone, shale and thin shaly coal seams	} 100 - 150
Coarse grey sandstone - poorly consolidated)	} 50
thin bedded sandstone with few thin-bedded)	
pebble conglomerate beds)	
Quartz pebble conglomerate with sandstone wedges	+ 200
TOTAL	<hr/> + 350 - 400

The Tantalus arenites differ from those of the Lewes River and Laberge Groups in that they contain much more quartz and no potash feldspar or mafics other than a little biotite. The shales and thin-bedded sandstones commonly exhibit poorly preserved plant fragments along bedding planes. The sandstone shows graded bedding and channelling in places. The Tantalus conglomerate shows remarkable uniformity in composition and size of clasts.

The conglomerate is typically brown-weathering to rusty with well-rounded quartz, chert, quartzite and argillite pebbles in sand of similar composition with limy cement. The conglomerate is in beds up to 5 meters thick with sandstone inter-beds up to 0.5 meters thick. Several distinctive white rhyolitic tuff beds were noted in the conglomerate section. These marker beds are generally 0.5 meters thick.

The shale and shaly coal are subject to severe recessive weathering resulting in very limited exposure. Two partial sections of shale and shaly coal were measured along Jumpout Creek at about 750 meters elevation. The location of these sections is shown on Figure 4.

Section A (Elevation 780 meters)

<u>Lithology</u>	<u>Thickness (meters)</u>
Well-bedded fine sandstone	10.0
Shaly coal	3.7
Sandstone	0.3
Shaly coal - (coal seams 1 cm. thick)	4.5
Fine grained sandstone (massive)	3.5

<u>Lithology</u>	<u>Thickness (meters)</u>
Fine sandstone with many coal partings up to 2 cm. thick	2.4
Coal - shaly	0.6
Fine sandstone	3.0
Shaly coal with fine sandstone partings up to 0.1 m.	1.0
Brown and black shale with thin coal partings (0.5 cm)	7.0
Brown and black shale	5.0
TOTAL	41.0 m.

Section B (Elevation 750 meters)

<u>Lithology</u>	<u>Thickness (meters)</u>
Fine sandstone	13.0
Shaly coal	0.1
Sandstone	2.0
Shaly coal	0.7
Sandstone	5.0
Shaly coal	0.2
Conglomerate	10.0
TOTAL	31.0 m.

Younger Volcanics

It is quite conceivable that these volcanics may belong to the mid-Cretaceous Hutshi Group. However, Tempelman-Kluit (1974) has assigned similar volcanics to the Eocene Mt. Nansen and Carmacks Groups in the adjoining Carmacks map-area. As a result, a similar designation has been used in the present mapping.

Tuffs tentatively assigned to the Eocene or younger Mount Nansen Group include well bedded chert, cherty tuffs and andesite exposed along and west of the Big Salmon River on the western edge of License 60 (Figure 5).

Amygdaloidal andesite and basalt with some rhyolite flows outcrop north and south of Walsh Creek in the central part of License 59. These rocks have been tentatively assigned to the Carmacks Group of Eocene or younger age.

b) Structure

The Big Salmon Coal Basin is roughly 50 km. long by 5 km. wide and trends N30°W along the northwest side of Big Salmon River. It is fairly well covered by the present coal licenses but probably extends 8 - 10 km. to the northwest of License 59 and 5 or 6 km. to the southeast of License 60. It is an elongate rather flat basin in which the Tantalus Formation assumes a large open synclinal fold with minor parallel folds across the basin floor. In the central part of the basin the folding is subdued with dips generally less than 15°. Along the northwest and southwest margins, the dips steepen to about 60°. A complementary anticlinal fold has been mapped in the southwest corner of License 60 and southwest of the probably contact of the Tantalus with the underlying Laberge or Lewis River Groups. Thus the Tantalus probably outcrops further southwest in a secondary basin but this entire area is masked by overlying volcanic rocks. The Big Salmon Coal Basin plunges very moderately to the southeast in its northern half and probably to the northwest in its southern half. The structure of the basin is shown in vertical section on Figure 6.

c) Coal Occurrence

The recessive weathering of the shale sections makes it difficult to define individual coal seams. However, the most notable coal occurrences were limited to the valley of Jumpout Creek between 700 and 800 meters in elevation. At the 700 meter elevation, a 12-meter section is exposed in a cutbank showing much overlying shaly coal with individual coal seams up to 5 cm. thick. At the bottom of the cutbank, 0.5 meters of shaly coal is exposed in the creek. At the 800-meter elevation, badly sloughed bulldozer cuts have exposed seams of shaly coal up to 0.5 meters in thickness.

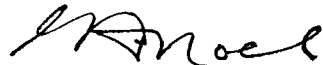
The actual coal occurrences as well as the area of greatest potential for coal are indicated on the accompanying geology maps.

OBSERVATIONS AND CONCLUSIONS

The Big Salmon Coal Basin is at least 50 km. long (N30°W) by 6 km. wide and is underlain by the Tantalus Formation which consists of conglomerate, sandstone and shale with minor coal seams. The Tantalus Formation assumes a warped flat syncline in the basin. The basin has been deeply eroded in its central part exposing the lower conglomerate. The northern part of the basin plunges shallowly to the southeast and the southern part probably plunges in a similar manner to the northwest. The coal-bearing shale member is exposed in the northern third of the basin and probably underlies an area 5,000 meters long by 1,000 meters wide trending N30°W. The shale is roughly 100 to 200 meters thick with the coal occurring as thin seams 1 to 5 cms. thick. In several places, shaly coal seams up to one meter thick were seen. Due to the characteristic recessive weathering of the shale

and coal and very limited exposures of each there is a good possibility for seams of better quality and greater thickness, similar to some of those in the Carmacks Coal Basin. Drilling is probably the best method of testing the coal potential and several possible drill sites are suggested as indicated on the geological map (Figure 4). Coordinates of these locations are as follows:

1. 61°59'24"N; 134°47'30"W
2. 61°58'12"N; 134°47'30"W



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September 1977

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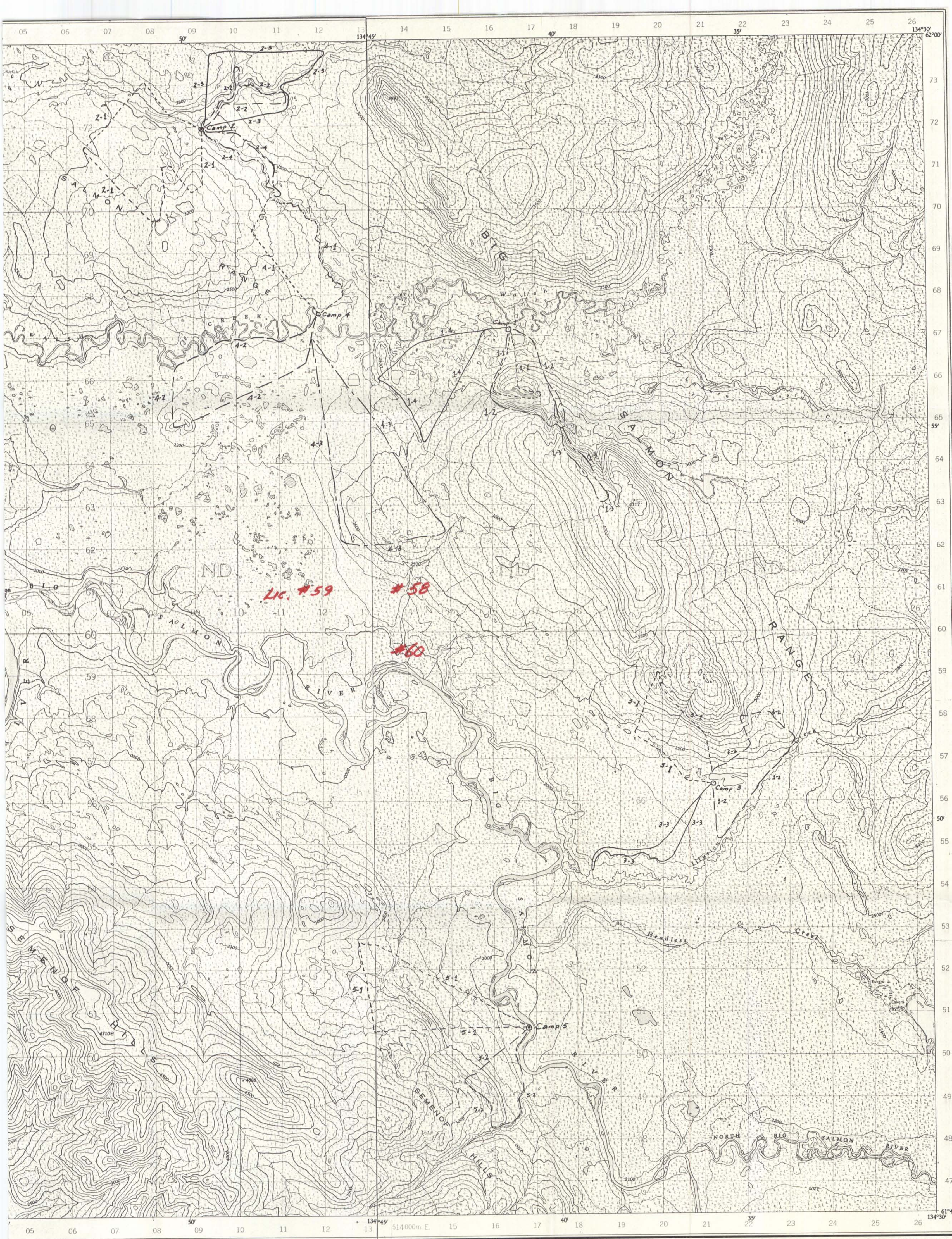
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LIST OF ROCK SPECIMENS

Big Salmon Project - Y.T. - June 1977

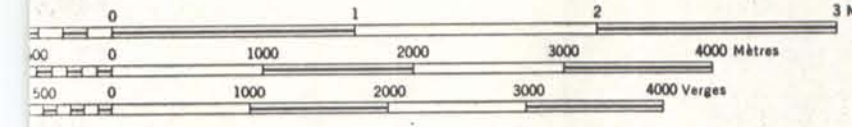
<u>Marked</u>	<u>Description</u>
BS- 1	<u>Tuff</u> : creamy white, fine grained; soft; well-bedded, light yellow weathering on exposed surface.
BS- 2	<u>Sandstone</u> : grey to brown, fine grained; fairly soft; thin-bedded; few rusty casts.
BS- 3	<u>Conglomerate</u> : grey brown; cobbles sub-rounded and fairly uniform in size, 1-3 cm. in maximum dimension; include quartz 40% with rest shale, limestone, volcanic and metamorphic rocks; sandy matrix with carbonate cement; rather loosely cemented; rusty brown weathering.
BS- 4	<u>Limestone</u> : creamy white; medium-grained to crystalline; fairly hard; vuggy; yellow-brown weathering.
BS- 5	<u>Gabbro</u> : black, fine to medium grained and porphyritic with few feldspar phenocrysts; moderately hard and dense; magnetic; little disseminated pyrite; rusty weathering on fractures.
BS- 6	<u>Andesite</u> : grey green to black; very fine grained to dense; very hard; non-magnetic; little disseminated pyrite.
BS- 7	<u>Basalt</u> : black, very fine grained to dense; hard; magnetic; rusty weathering along fractures.
BS- 8	<u>Rhyolite</u> : white, fine grained to dense; quartz phenocrysts; hard; rusty weathering and numerous rusty vugs.
BS- 9	<u>Rhyolite</u> : white; fine grained to dense with quartz phenocrysts; hard, numerous rusty vugs and finely disseminated black iron oxide after hematite and pyrite (?); rusty weathering along fractures.
BS-10	<u>Shaly Coal</u> : black, soft; numerous thin coal seams 1-3 cms. thick in 50 cms. of carbonaceous black shale with white mudstone inclusion.
BS-11	<u>Dacitic Tuff</u> : light grey to grey brown; fine grained, quite hard; numerous small rusty vugs; little fine disseminated pyrite, rusty on weathered surfaces and along fractures.
BS-12	<u>Limestone</u> : grey, very fine grained to dense.
BS-13	<u>Tuffaceous sandstone</u> : bleached white, very fine grained, soft, well-bedded.

- BS-14 Sandstone: light grey to grey-brown; medium to coarse grained; grains include quartz, feldspar, biotite, muscovite; rather loosely cemented (carbonate).
- BS-15 Basalt: grey to black; fine grained to dense; amygdaloidal with calcite and epidote amygdules; moderately hard, non-magnetic; light iron oxide staining on weathered surface.
- BS-16 Limestone: black; very fine grained to dense; fairly hard; somewhat shaly.
- BS-17 Dacite porphyry: brown, fine grained; feldspar phenocrysts; fairly hard; light iron-oxide coatings on weathered surfaces; zeolite (laumontite?) coatings along fractures.
- BS-18 Granodiorite: grey; medium grained; hard; prominent hornblende; fairly magnetic.
- BS-19 Dacite: light grey-brown; very fine grained to dense; hard; little very fine pyrite; rusty weathering on exposed surface; also iron oxide vugs and casts in the rock.
- BS-20 Limestone: grey to cream, fine to medium grained or crystalline; soft.
- BS-21 Altered dacite: brown to purple; fine grained, fairly hard; carbonate altered; brown and pink coloration on weathered surface.
- BS-22 Diorite: fine to medium grained, dark grey, fairly hard, moderately magnetic.
- BS-23 Dacite: fine grained, grey to tan, fairly hard; non-magnetic; little finely disseminated pyrite.
- BS-24 Andesite: fine grained, grey-green, fairly soft; somewhat porphyritic with augite and feldspar phenocrysts; non-magnetic.
- BS-25 Diorite: medium grained, grey, fairly soft; non-magnetic.



**BIG SALMON
YUKON TERRITORY**

SCALE 1:50,000 ÉCHELLE



CONTOUR INTERVAL 100 FEET
Elevations in Feet above Mean Sea Level
North American Datum 1927
Transverse Mercator Projection

ÉQUIDISTANCE DES COURBES: 100 PIEDS
Élévations en pieds au-dessus du niveau moyen de la mer
Réseau géodésique nord-américain unifié (1927)
Projection transverse de Mercator

DECLINATION 32°52' EAST
CENTRE OF MAP 1962
change (decreasing) 3.8'

DÉCLINAISON MAGNÉTIQUE AU CENTRE
DE LA FEUILLE EN 1962: 32°52' EST
Variation annuelle (décroissante) 3.8'

Compilée en 1960, par la DIRECTION DES LEVÉS et DES RELEVÉS TECHNIQUES, d'après les photographies aériennes prises en 1949. Travaux exécutés sur le terrain en 1954 et 1957, 1962.

Compiled in 1960, by the SURVEYS AND MAPPING BRANCH, MINISTRY OF MINES AND TECHNICAL SURVEYS, from TECHNICAL SURVEYS, from 1949. Field surveys 1954 and 1957, 1962.

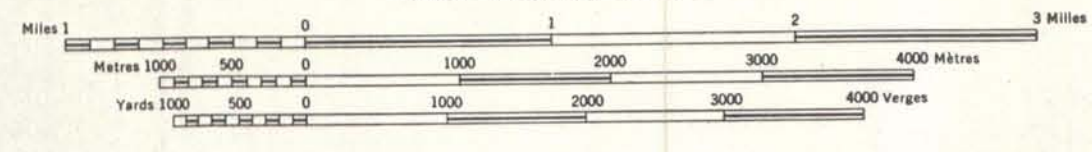
Ces cartes sont en vente au Bureau de distribution de cartes de la Direction des Levés et des Relevés Techniques, Ottawa.

These maps are available from the Map Distribution Office, Ministry of Mines and Technical Surveys, Ottawa.

- Building Bâtiment
- School École
- Church Église
- Lighthouse Phare
- River with bridge Rivière avec pont
- Stream, intermittent or dry Cours d'eau unique (écoulement normal)
- Lake, intermittent, indefinite Lac intermittent ou éphémère
- Marsh or Swamp Marais ou marécage
- Depression contours Courbes de coteaux avec cote
- 454' ±
- BM 157 →

**TRAVERSES ON COAL LICENSES
BIG SALMON PROJECT
Y. T.**

SCALE 1:50,000 ÉCHELLE



CONTOUR INTERVAL 100 FEET
Elevations in Feet above Mean Sea Level
North American Datum 1927
Transverse Mercator Projection

ÉQUIDISTANCE DES COURBES: 100 PIEDS
Élévations en pieds au-dessus du niveau moyen de la mer
Réseau géodésique nord-américain unifié (1927)
Projection transverse de Mercator

MAGNETIC DECLINATION 32°58' EAST
AT CENTRE OF MAP 1962
Annual change (decreasing) 3.8'

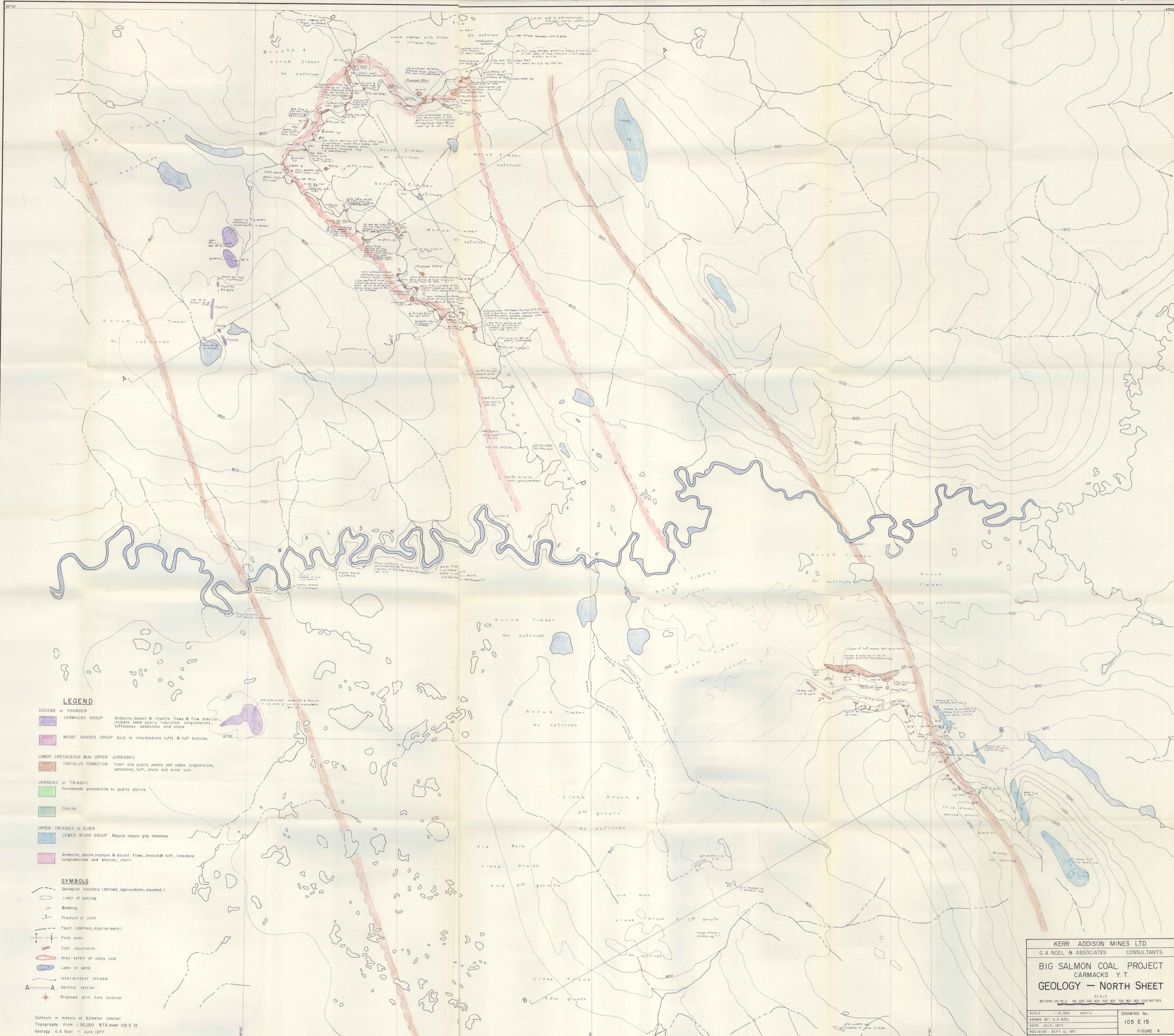
DÉCLINAISON MAGNÉTIQUE AU CENTRE
DE LA FEUILLE EN 1962: 32°58' EST
Variation annuelle (décroissante) 3.8'

Compilée en 1960, par la DIRECTION DES LEVÉS et DES RELEVÉS TECHNIQUES, d'après les photographies aériennes prises en 1949. Travaux exécutés sur le terrain en 1954 et 1957, 1962.

Ces cartes sont en vente au Bureau de distribution de cartes de la Direction des Levés et des Relevés Techniques, Ottawa.

- Building Bâtiment
- School École
- Church Église
- Lighthouse Phare
- River with bridge Rivière avec pont
- Stream, intermittent or dry Cours d'eau unique (écoulement normal)
- Lake, intermittent, indefinite Lac intermittent ou éphémère
- Marsh or Swamp Marais ou marécage
- Depression contours Courbes de coteaux

G. Ansel
Sept. 1977



- LEGEND**
- Eocene or Younger**
- CARMACKS GROUP: Andesite, basalt & rhyolite flows & flow breccias. Includes some poorly indurated conglomerate, tuffaceous sandstone and shale.
 - MOUNT NANSEN GROUP: Acid to intermediate tuffs & tuff breccias.
- LOWER CRETACEOUS &/or UPPER JURASSIC**
- TANTALUS FORMATION: Chert and quartz pebble and cobble conglomerate, sandstone, tuff, shale and minor coal.
- JURASSIC or TRIASSIC**
- Hornblende granodiorite to quartz diorite.
 - Diorite.
- UPPER TRIASSIC or OLDER**
- LEWES RIVER GROUP: Massive impure grey limestone.
- SYMBOLS**
- Geological boundary (defined, approximate, assumed.)
 - Limit of outcrop
 - Bedding
 - Fracture or joint
 - Fault (defined, approximate)
 - Fold axes
 - Coal occurrence
 - Area extent of shaly coal
 - Lake or pond
 - Intermittent stream
 - Vertical section
 - Proposed drill hole location

Contours in meters at 50meter interval
 Topography from 1:50,000 N.T.S. sheet 105 E 15
 Geology: G.A. Noel - June 1977

KERR ADDISON MINES LTD.
 G. A. NOEL & ASSOCIATES CONSULTANTS

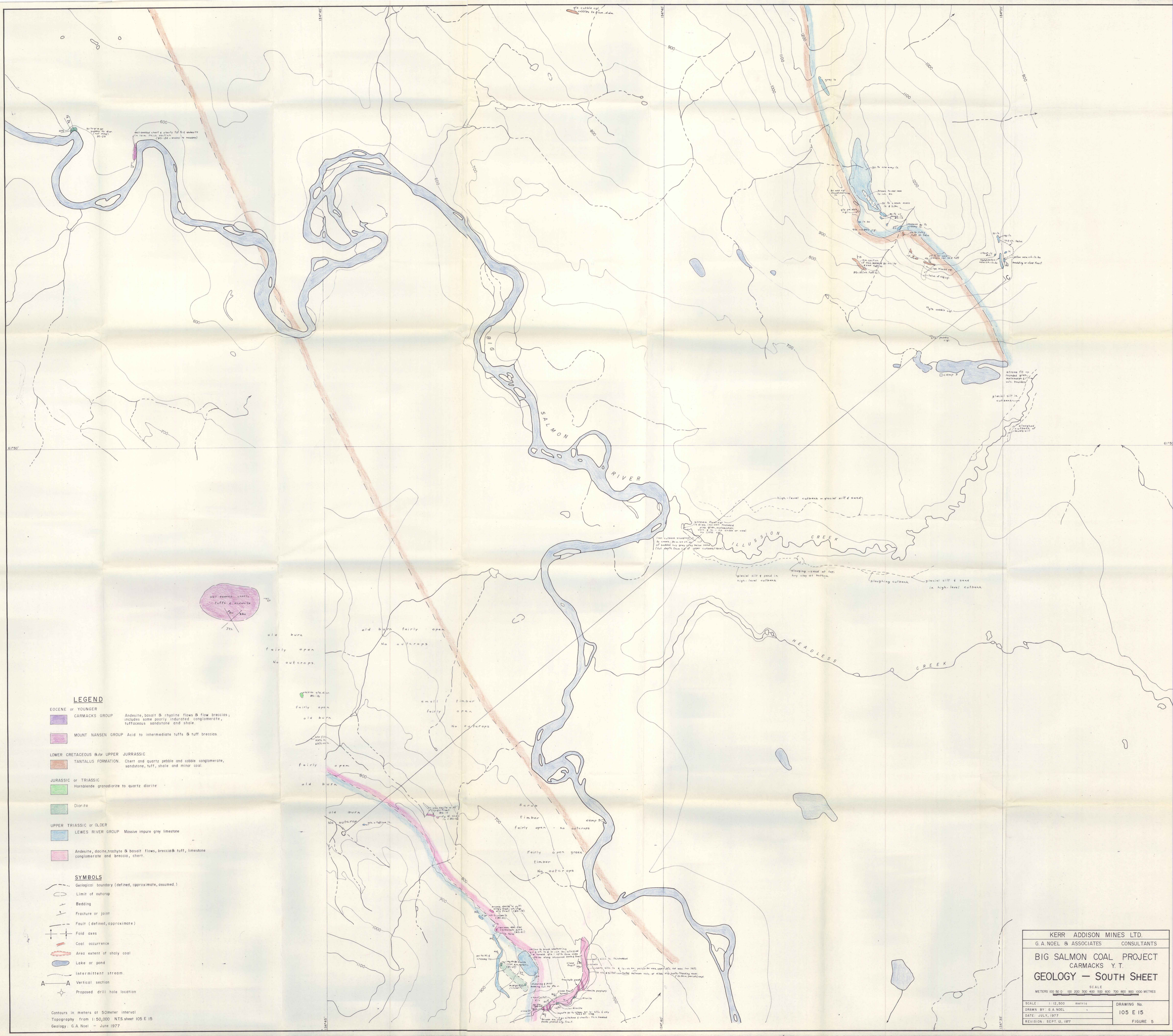
BIG SALMON COAL PROJECT
 CARMACKS Y. T.
GEOLOGY - NORTH SHEET

SCALE: 1:12,500 METRIC

METERS 0 50 100 200 300 400 500 600 700 800 900 1000 METRES

DRAWN BY: G. A. NOEL
 DATE: JULY, 1977
 REVISION: SEPT. 12, 1977

DRAWING No: 105 E 15
 FIGURE 4



LEGEND

- EOCENE or YOUNGER**
- CARMACKS GROUP** Andesite, basalt & rhyolite flows & flow breccias, includes some poorly indurated conglomerate, tuffaceous sandstone and shale.
 - MOUNT NANSEN GROUP** Acid to intermediate tuffs & tuff breccias.
- LOWER CRETACEOUS &/or UPPER JURASSIC**
- TANTALUS FORMATION.** Chert and quartz pebble and cobble conglomerate, sandstone, tuff, shale and minor coal.
- JURASSIC or TRIASSIC**
- Hornblende granodiorite to quartz diorite.
 - Diorite.
- UPPER TRIASSIC or OLDER**
- LEWES RIVER GROUP** Massive impure grey limestone.
 - Andesite, dacite, trachyte & basalt flows, breccia & tuff, limestone conglomerate and breccia, chert.

SYMBOLS

- Geological boundary (defined, approximate, assumed)
- Limit of outcrop
- Bedding
- Fracture or joint
- Fault (defined, approximate)
- Fold axes
- Coal occurrence
- Area extent of shaly coal
- Lake or pond
- Intermittent stream
- Vertical section
- Proposed drill hole location

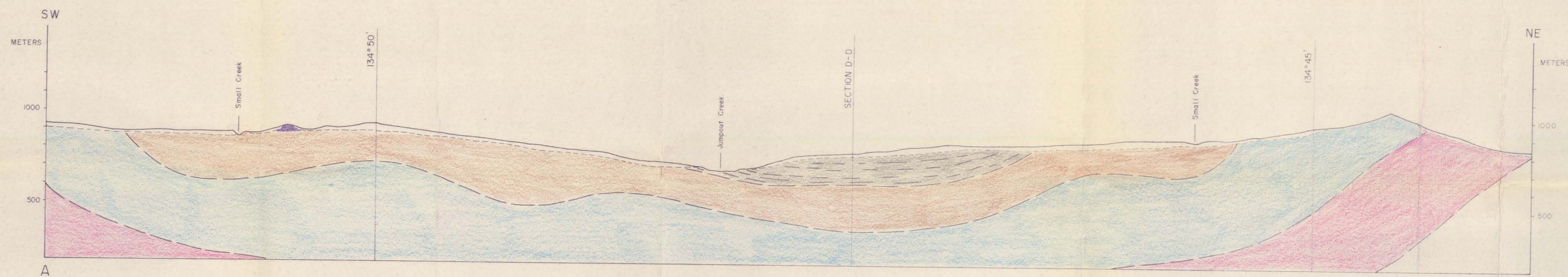
Contours in meters at 50meter interval
 Topography from 1:50,000 N.T.S. sheet 105 E 15
 Geology G.A. Noel - June 1977

KERR ADDISON MINES LTD.
 G. A. NOEL & ASSOCIATES CONSULTANTS

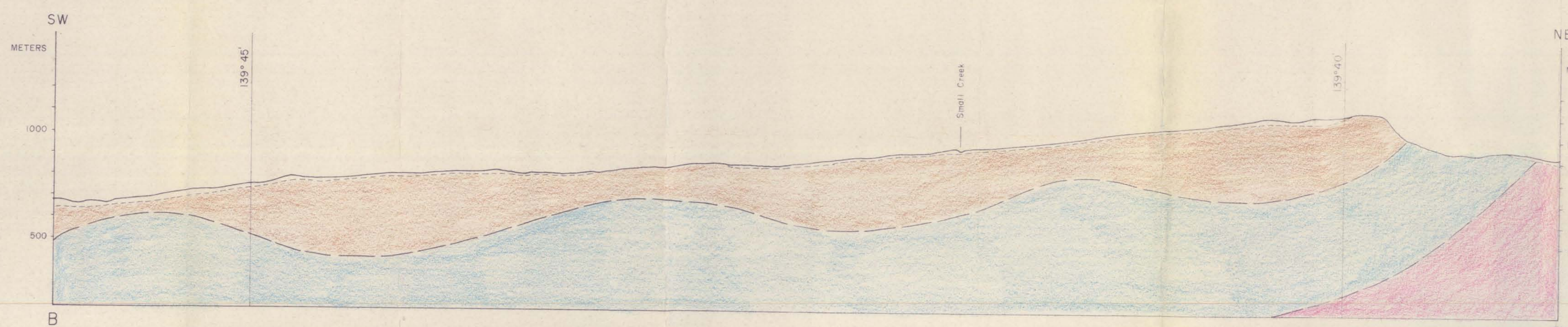
BIG SALMON COAL PROJECT
 CARMACKS Y.T.
GEOLOGY - SOUTH SHEET

SCALE
 METERS 0 50 100 200 300 400 500 600 700 800 900 1000 METRES

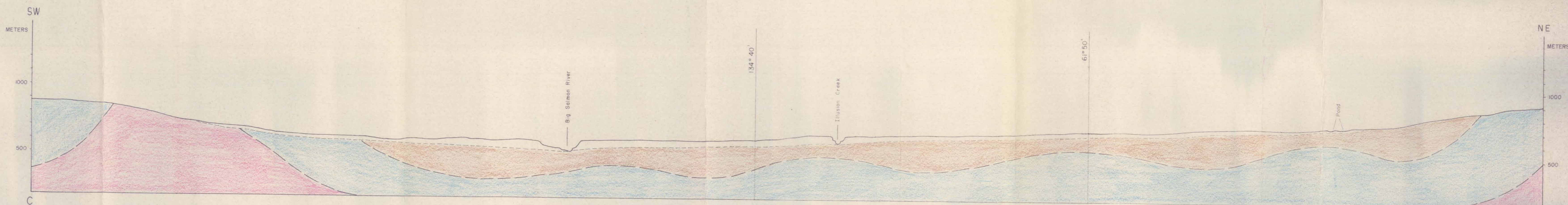
DRAWN BY: G.A. NOEL	DRAWING No. 105 E 15
DATE: JULY, 1977	FIGURE 5
REVISION: SEPT. 12, 1977	



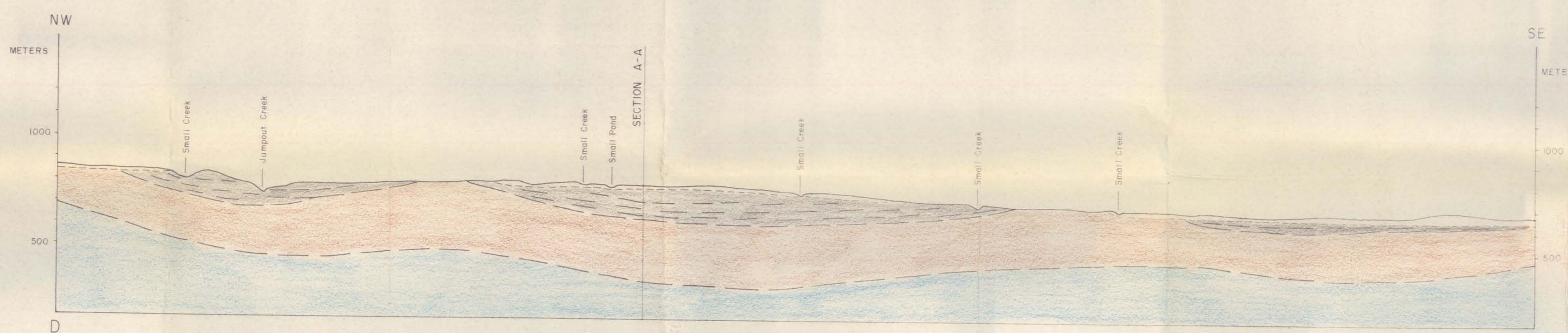
SECTION A-A (N60°E) - Looking N.30°W into section.



SECTION B-B (N60°E) - Looking N.30°W into section.



SECTION C-C (N50°E) - Looking N.40°W into section.



LONGITUDINAL SECTION D-D (N60°W) - Looking N.30°E into section.

LEGEND

- CARMACKS GROUP - Andesite, basalt & rhyolite flows & flow breccias
- TANTALUS FORMATION - Shale & shaly coal, minor sandstone & conglomerate
- TANTALUS FORMATION - Conglomerate & sandstone
- LEWES RIVER GROUP - Limestone, chert & breccia
- U. TRIASSIC OR OLDER - Andesite, dacite, trachyte, basalt flows & breccia
limestone conglomerate, chert, tuffs

KERR ADDISON MINES LTD.	
G. A. NOEL & ASSOCIATES	CONSULTANTS
VERTICAL SECTIONS BIG SALMON COAL PROJECT CARMACKS, Y.T.	
SCALE 1/2,500 (horiz. & vert.)	FIGURE 6
DRAWN BY G. A. Noel	
DATE Sept 15, 1977	
REVISION	