

CANEX PLACER LIMITED
EXPLORATION DIVISION

REPORT ON THE EXPLORATION OF
THE EXPLORATION LICENCES 61 & 62
IN THE AREA OF THE LIARD COAL BASIN
SOUTH OF WATSON LAKE, YUKON TERRITORY

N.T.S. 105-A-2-SEQ & SWQ
Lat. 60°00' Long. 128°45'

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 the amount of \$11,073.00

for Chief, *A. D. Oliver*

Date: *Nov. 16, 1977.*

For: Canex Placer Limited
BY: I. Borovic - P. Eng.,
Geologist

Field Work: May-June, Sept, 1977
Report: October, 1977

061587

TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION	1
PROPERTY & LOCATION	1
ACCESS	1
HISTORY OF EXPLORATION	1
GEOLOGY	2
Property Geology	3
Basin	3
Structure	4
COAL	4
GENERAL TESTING CERTIFICATE (October, 1976)	5
TABLE I	6
TABLE II	6
PROPOSED EXPLORATION PROGRAM	7
REFERENCES	8
STATEMENT OF EXPENSES	9
CERTIFICATE	10

A REPORT ON THE EXPLORATION OF
LIARD COAL BASIN, WATSON LAKE, Y.T.

INTRODUCTION:

This report describes the exploration work done to date, the results of regional mapping and sampling and gives the results of proximate analyses of 13 coal samples - from the area of Liard Basin south and west of Watson Lake, Yukon Territory.

Property & Location (See Fig. 1)

The eight exploration licenses 61, 62, 66, 67, 68, 69 70 and 71 covering the area of NTS Map Sheets 105-A-2, 3 & 6, were granted to Canex Placer Limited in October 1976 and October 1977.

61- 105A-2-SWQ	Anniv. Date	October, 1977
62- 105A-2-SEQ	Anniv. Date	October, 1977
66- 105A-3-NEQ	Anniv. Date	October, 1978
67- 105A-3-NEQ	Anniv. Date	October, 1978
68- 105A-3-SEQ	Anniv. Date	October, 1978
69- 105A-3-SWQ	Anniv. Date	October, 1978
70- 105A-6-SWQ	Anniv. Date	October, 1978
71- 105A-6-SEQ	Anniv. Date	October, 1978

The licenses 66, 67, 68, 69, 70, 71, are bounded by 60°00' to the south, 60°17.5' to the north. 129°30' to the west and 129°00' to the east. The licenses 61 and 62 are bounded by 60°00' to the south, 129°00' to the west, 60°7.5' to the north and 128°30' to the east.

Access:

The area of licenses is traversed by Alaska and Campbell Highways and has a well developed and growing community of Watson Lake located right in the middle, with schools, a hospital, an airport, and other modern facilities available. A main logging road owned by the Yukon Forest Products, passes through the middle of the coal basin.

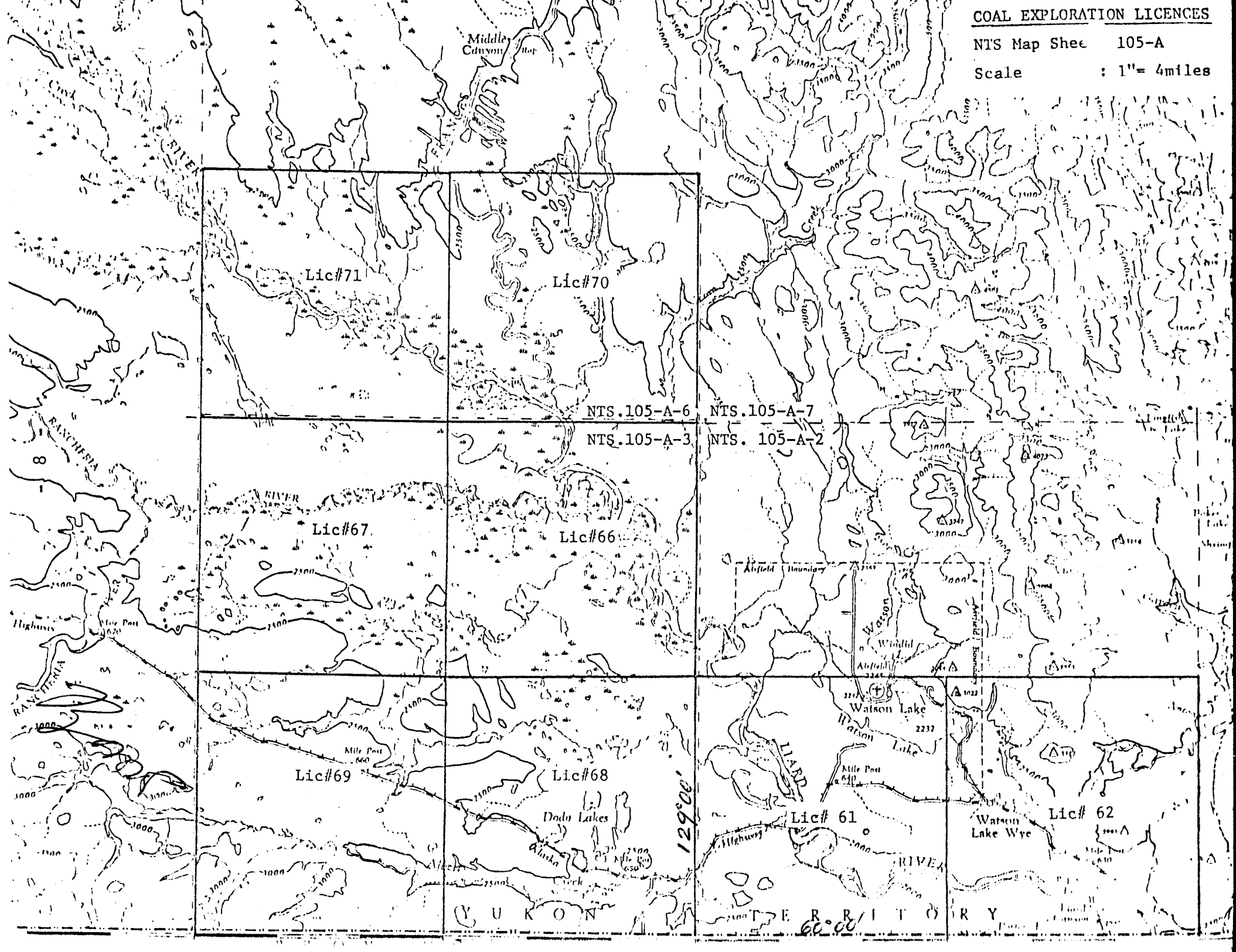
History of Exploration:

During the months of March and April, 1976 the author collected and studied the available data on coal resources of the Yukon and the Northwest Territories.

COAL EXPLORATION LICENCES

NTS Map Sheet 105-A

Scale : 1" = 4miles



"The composite file on the coal occurrences and production in the Yukon and the Northwest Territories" was assembled. (I. Borovic, April, 1976)

B. Ainsworth and D.M. Jenkins traversed the Upper Liard during late August, 1976 (B. Ainsworth, September 1976) and noted coal bed exceeding 20 feet in thickness, approximately 5 km south of Watson Lake. Two samples of surface material were taken. Some "trace coal occurrences were noted in the banks of the Liard River" ... and a thicker (10-12') but steeply dipping seam was found 12 km downstream from the confluence of the Liard and the Frances Rivers. The proximate analyses of the coal samples showed high ash, low sulphur and a calorific value from 3,700 to 7,029 BTU's/lbs. Coal was classified as lignite (ASTM classification) equivalent to the B.C. Hydro's Hat Creek coal. Consequently exploration licenses were taken for two areas around Watson Lake.

During May and early June, 1977, the author assisted by Percy Pacor, prospected the areas of Canex's Liard River coal licences 61 and 62 as a follow-up program to 1976 research and discovery of the coal in the area of Liard River.

The prospecting encompassed a larger area along Liard, Rancheria and Frances Rivers. Four additional coal outcrops were found and sampled.

A large area of the Liard Basin underlain by thermal coal, ideal location of the basin traversed by Alaska and Campbell Highways and ease of access to the heart of the area by established logging roads has given enough justification for taking six more exploration licenses in early summer of 1977. Mapping, prospecting and sampling continued in late September on old and newly acquired licenses and more coal outcrops were found, sampled and analyzed.

Geology:

The oldest geological notes on the Upper Liard coal were written by G.M. Dawson. Following are excerpts from D.B. Dowling's "Coal Fields of B.C., G.S.C. Memoir 69 of 1915:"

"The Upper Liard was traversed by Dr. G.M. Dawson, who notes Tertiary rocks on the Dease River and again on the Upper Liard and Frances Rivers and on his map joins them all into one rather large area. His description of the rocks in the Liard is here incorporated: "Six miles from the cañon

Tertiary clays of whitish and grey colours, and associated with impure lignite, are first met with, and these continue to appear here and there along the river as far as the Frances.

The thickest bed of lignite observed was about three feet, four miles below the Frances. The lignite is generally impure and often very distinctly laminated. It resembles in character the lignites of the Miocene of British Columbia, and the associated clays and soft shales are similar in character to those of that formation. Numerous boulders of basalt are found along this part of the river, and the basalt was observed to form a mural cliff, at a height of about 300 feet above the river, at a place just below the mouth of the Rancheria river. This rock evidently overlies the lignite-bearing beds. The shaly clays and lignites show evidence of considerable disturbance, and dip in some places at rather high angles. This may be due to the action of old land-slides along the banks of the river; but appears to be rather too constant to be satisfactorily accounted for in this way."

Property Geology:

The Paleocene (?) or Eocene (?) sediments containing lignite are outcropping along the Liard River and its tributaries. Their stratigraphic position is assumed because the fossil evidence is missing and correlation is impossible.

Basin: (see Liard Coal 1:50,000 map in pocket)

Tertiary (?) sediments occur in an elongated trough, approximately outlined on the 1:50,000 scale map, 105-A-2, 3 and 6. The outline of the trough is based on the 1" = 4 miles G.S.C. geology map 105A and correlation supported by the airborne magnetic survey (1961), shown on the sheet 105-A-2, 3 and 6. The trough (basin) is elongated in NW-SE direction more or less along the Liard River and probably cut by two or more cross faults of obscure nature. The airborne magnetic survey shows existence of tertiary volcanic rocks, which was verified by our recent field examination of the area. The thickest portion of the trough appears to be located around Dodo Lakes and Upper Liard.

Structure:

Structure and relations to the other formations are not well understood. The attitude of the sediments does not follow any visible structural pattern. The beds are sometimes steeply dipping and sometimes horizontal or gently dipping (5° - 10°).

A definite angular unconformity was observed at the outcrop RC-77-35 and 36, near the confluence of the Rancheria and Liard Rivers. Coal measures dip 50° SE and are overlain with horizontally lying basal conglomerates followed by deposition of cross-bedded sandstones.

The relative age of the unconformity is not known.

Coal:

During eighteen days of prospecting and mapping the vast area of Liard Coal Basin some twelve coal outcrops were found, sampled and analysed. Locations of Jenkins 1 & 2, RC-77-30, 31, 33, 35, 36, 45, 46, 46A, 48, 52, and 53, are shown on the 1:50,000 "Liard Coal" map (in pocket).

The proximate analyses performed by General Testing Laboratories of 1001 East Pender Street, Vancouver, B.C. shows that the Liard coal rank ranges from lignite to sub-bituminous B and that resampled seam (RC-77-31) shows fair consistency with seam RC-77-53 which is very probable its extension. It appears to have the same basic characteristic of low ash, very low sulphur and higher calorific value.

GENERAL TESTING LABORATORIES

DIVISION SUPERINTENDENCE COMPANY LIMITED
 100 EAST HENLEY STREET, VANCOUVER, B.C., CANADA

TELEPHONE 681-1234 TELETYPE 681-1234

CERTIFICATE OF ANALYSIS

TO:

CANADIAN PACIFIC LIMITED
 4800 - 1030 West Georgia Street,
 Vancouver, B.C. Canada

Attn: Mr. D. Ainsworth

FILE 7609-2202

DATE
October 1, 1976

WE HAVE ANALYZED the herein described samples submitted by you on September 22, 1976, and report as follows:

DESCRIPTION: Two (2) submitted samples of LIGHTS
 MARKED: JENKINS 1 and JENKINS 2

ANALYSIS:	As Received		Dry Basis	
	JENKINS 1	JENKINS 2	JENKINS 1	JENKINS 2
Total Moisture	42.73%	44.20%	---	---
Residual Moisture	---	---	---	---
Ash	23.50%	20.84%	41.08%	37.94%
Total Sulphur	0.31%	0.20%	0.54%	0.36%
Calorific Value (WU/lb)	3788	3822	6615	7029

IL:AT

L. Laksoil
 L. Laksoil - Industrial Chemist

THIS COMPANY ACCEPTS NO RESPONSIBILITY EXCEPT FOR THE DUE PERFORMANCE OF INSPECTION AND/OR ANALYSIS IN GOOD FAITH AND ACCORDING TO THE RULES OF THE TRADE AND OF SCIENCE.

SIGNATURE AND TITLE

Analytical and Consulting Chemists, Bulk Cargo Specialists, Surveyors, Inspectors, Contractors, Valuers

COPY

GENERAL Analytical and Consulting Chemists, Bulk Cargo Specialists, Surveyors, Inspectors, Contractors, Valuers
 100 EAST HENLEY STREET, VANCOUVER, B.C., CANADA
 TELEPHONE 681-1234 TELETYPE 681-1234
 OFFICIAL WEIGHT AND MEASURE OFFICERS

TABLE I

ANALYSIS:	RC 77 - 30		RC 77 - 31		RC 77 - 33		RC 77 - 35		RC 77 - 36	
	as received	dry	as received	dry	as received	dry	as received	dry	as received	dry
Moisture (%)	39.7	---	50.0	---	33.8	---	35.9	---	36.8	---
Ash (%)	19.36	32.06	4.11	8.21	37.48	56.61	12.35	19.27	23.61	37.35
Volatile Matter (%)	27.57	42.42	27.96	55.92	20.42	30.84	29.83	46.53	23.52	37.22
Fixed Carbon (%)	13.37	25.52	17.93	35.87	8.30	12.55	21.92	34.20	16.07	25.43
Calorific Value (BTU's/lb.)	4049	6714	5006	10012	2734	4130	5454	8509	4215	6669
Sulphur (%)	0.11	0.19	0.12	0.24	0.44	0.67	0.42	0.66	0.57	0.90

Proximate Analyses, June 1977

TABLE II

ANALYSES	RC-77-31		- 45		- 46		- 46A		- 48		- 52		- 53	
	as rec'd	dry	as rec'd	dry	as rec'd	dry	as rec'd	dry	as rec'd	dry	as rec'd	dry	as rec'd	dry
Moisture %	48.16		39.09		37.17		35.83		34.20		31.87		48.54	
Ash %	10.70	20.64	10.43	17.13	14.37	22.87	7.36	11.47	16.36	24.87	24.51	35.97	7.20	13.99
V.M. %	24.21	46.70	26.73	43.89	31.65	50.38	31.20	48.62	28.59	43.45	26.12	38.34	26.61	51.71
F.C. %	16.93	32.66	23.75	38.98	16.81	26.75	25.61	39.91	20.85	31.68	17.50	25.69	17.65	34.30
Cal. Value (B.T.U.'s/lb)	4413	8512	5733	9412			6450	10052	4929	7481	5224	7667	4730	9106
S %	0.11	0.22	0.67	1.00	0.65	1.09	0.59	0.91	0.45	0.68	0.45	0.66	0.14	0.26

Proximate Analyses, October 1977

PROPOSED EXPLORATION PROGRAMME
ON CANEX PLACER'S COAL LICENCES
#61, 62, 66, 67, 68, 69, 70 & 71 IN
THE LIARD COAL BASIN, WATSON LAKE, Y. T.

The proposed programme is to run from Nov. 1, 1977, till Nov. 30, 1978. It will consist of :

- Geological Mapping - to continue 1976 and 1977 mapping and prospecting
- Line Cutting - 5-10 line/km (75 cm. width)
- Surface geophysical survey
 - a) EM
 - b) Gravity
 - c) Seismic

- Trenching :

Five trenches 50 x 2 x 3 m with total of 1500 m³ of excavating is proposed. (See 1:250,000 Map).

T1 & T2 will be excavated near the logging road 5 km South of Upper Liard, Y.T.

T3, T4 & T5 will only clear and enlarge abandoned road cuts. T3 and T4 are located about 12 km North of Upper Liard. T5 is located 6 km south of the Francis and Liard River confluence.

Total Trenching Area -----500 m²

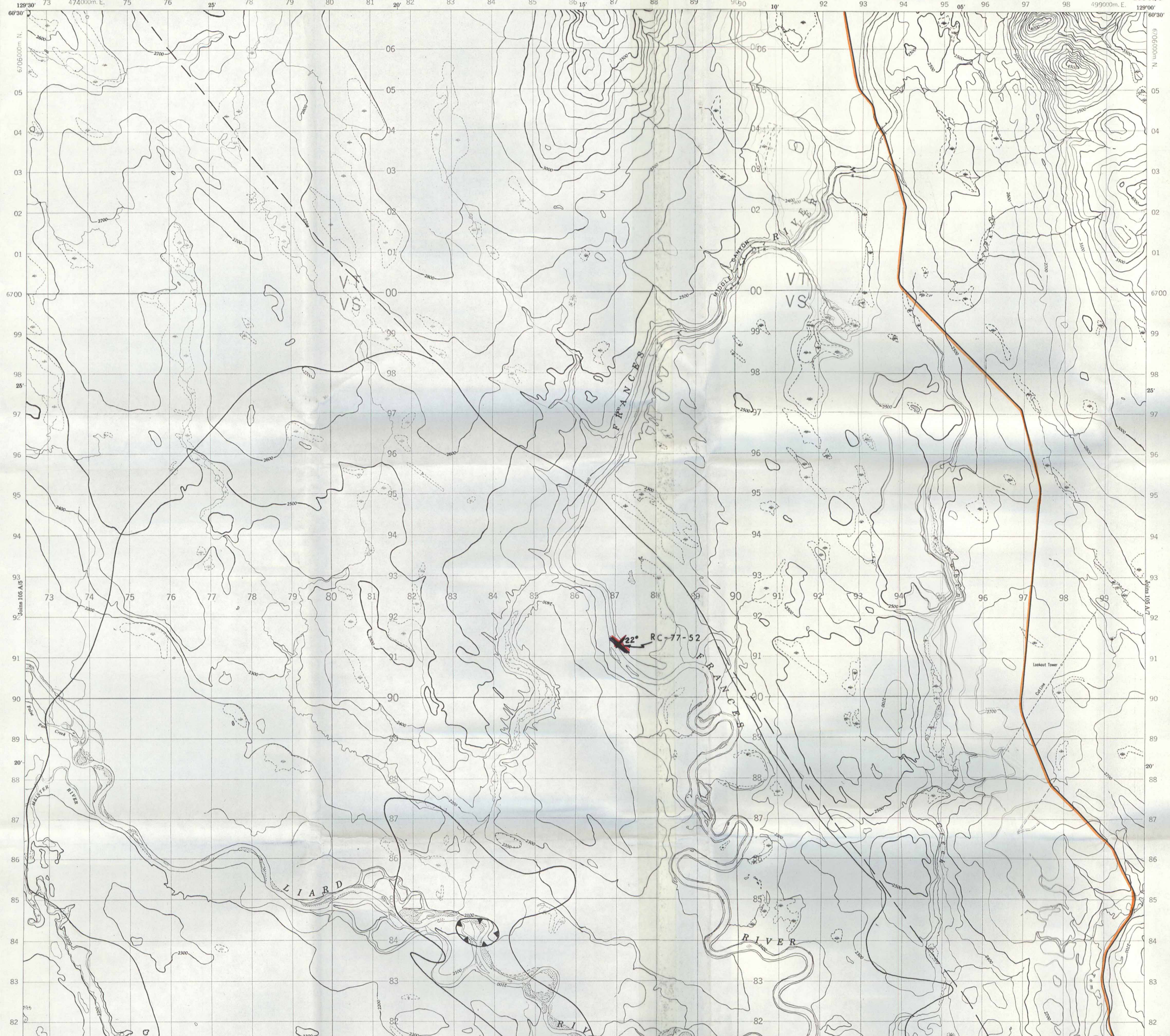
- Diamond drilling, 5 holes about 200 m each with total length of 1,000 m are proposed.

Coring of the whole D.D. hole combined with geophysical bore hole logging: natural gamma ray, density, neutron and caliper should give us good information relating to correlation, thickness and other parameters important for coal seam evaluation.

Total Drill Site Clearing-----2,000 m²

REFERENCES

1. Ainsworth, B. (Sept. 1976) Tertiary Coal/Lignite of the Liard Basin
Canex Placer Limited, File 105-A-2
2. Allen, B.G. P. Eng., (1976) Coal Exploration Targets North of 60⁰
Canadian Mining Journal, Jan. 1976
3. Bostock, H.S. (1953) Potential Mineral Resources of Y.T.
Canadian Department of Mines and Tech. Surveys
G.S.C. Paper 60-14, 1953.
4. Borovic, I. (April, 1976) Coal Resources of Yukon and Northwest Territories
Canex Placer Limited File: 11-8-2-2
5. Borovic, I. (April 1976) Compilation: "Coal Occurrences and Production
in the Yukon and Northwest Territories."
6. Borovic, I. (June, 1977) Progress Report on the Exploration of Liard
Coal Basin, Watson Lake, Yukon Territory
7. Dawson, G.M. (1898) Report on the Exploration in the Yukon District,
N.W.T. and Adjacent Northern Portion of
British Columbia, 1887; G.S.C. Pub. No. 629, 1898.
8. Dowling, D.B. (1915) Coal Fields of B.C.
G.S.C. Memoir 69, 1915.
9. Green, L.H. (1968) Lode Mining Potential of Y.T.
G.S.C. Paper 67-36, 1968.
10. Hage, C.O. (1945) Geological Reconnaissance Along Lower Liard River,
N.W.T., Y.T. and B.C. G.S.C. Paper 45-22, 1945.
11. Lord, C.S. (1944) Geological Reconnaissance Along the Alaska Highway,
Between Watson Lake and Teslin River, Yukon
and B.C., G.S.C. Paper 44-25, 1944.
12. Woodward, H.W. (1976) Coal in the Canadian Territories, Coal Miner, March
1976.



Refer to this Map as: 105 A/6 Edition 1 1967 Sheet 1/2

ONE THOUSAND METRE UNIVERSAL TRANSVERSE MERCATOR GRID ZONE 9

Scale 1:50,000

Vertical Scale: 1 cm = 1000 m

Horizontal Scale: 1 cm = 1000 m

Vertical Datum: Mean Sea Level

Horizontal Datum: North American Datum 1983

Projection: Universal Transverse Mercator

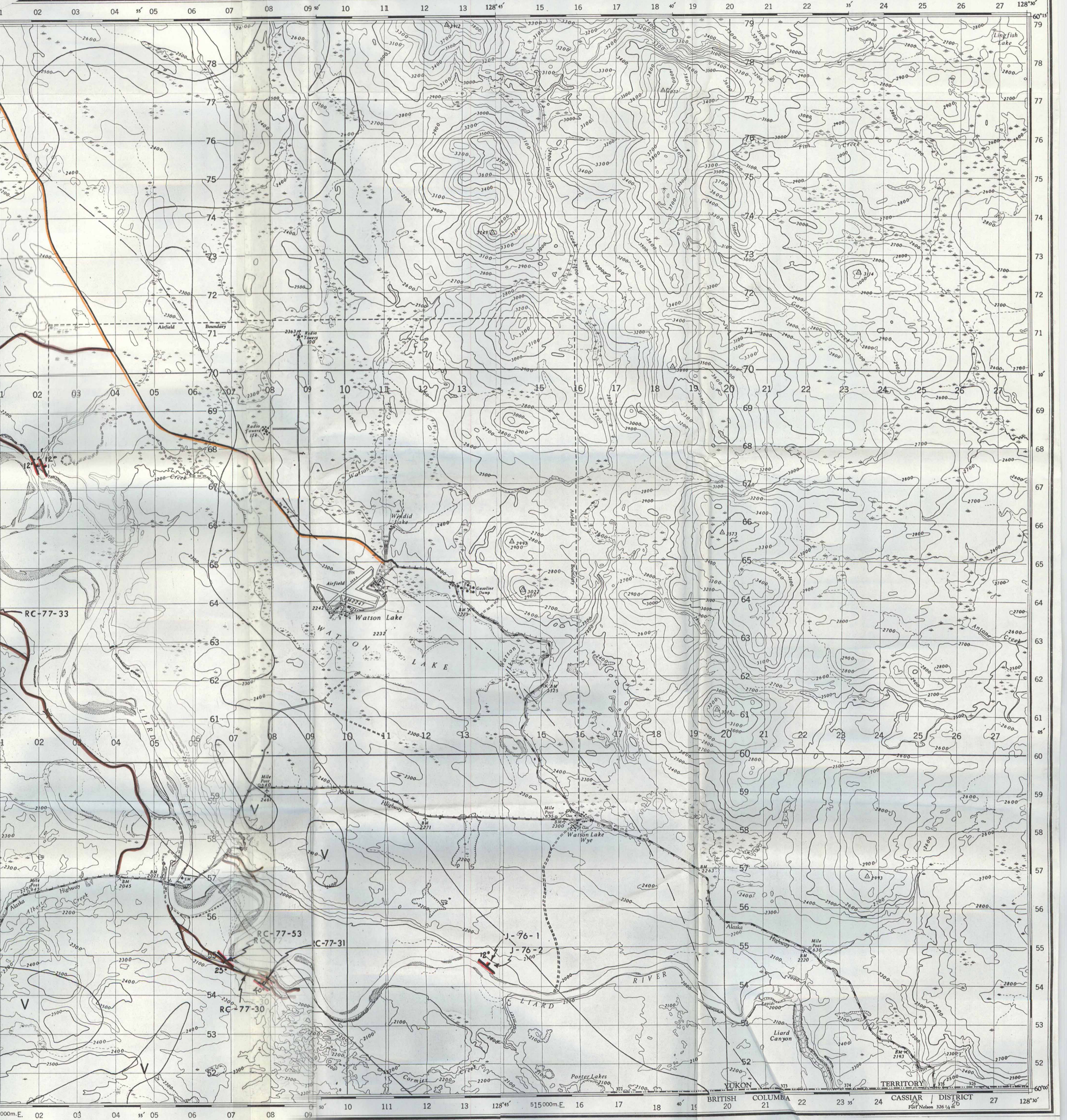
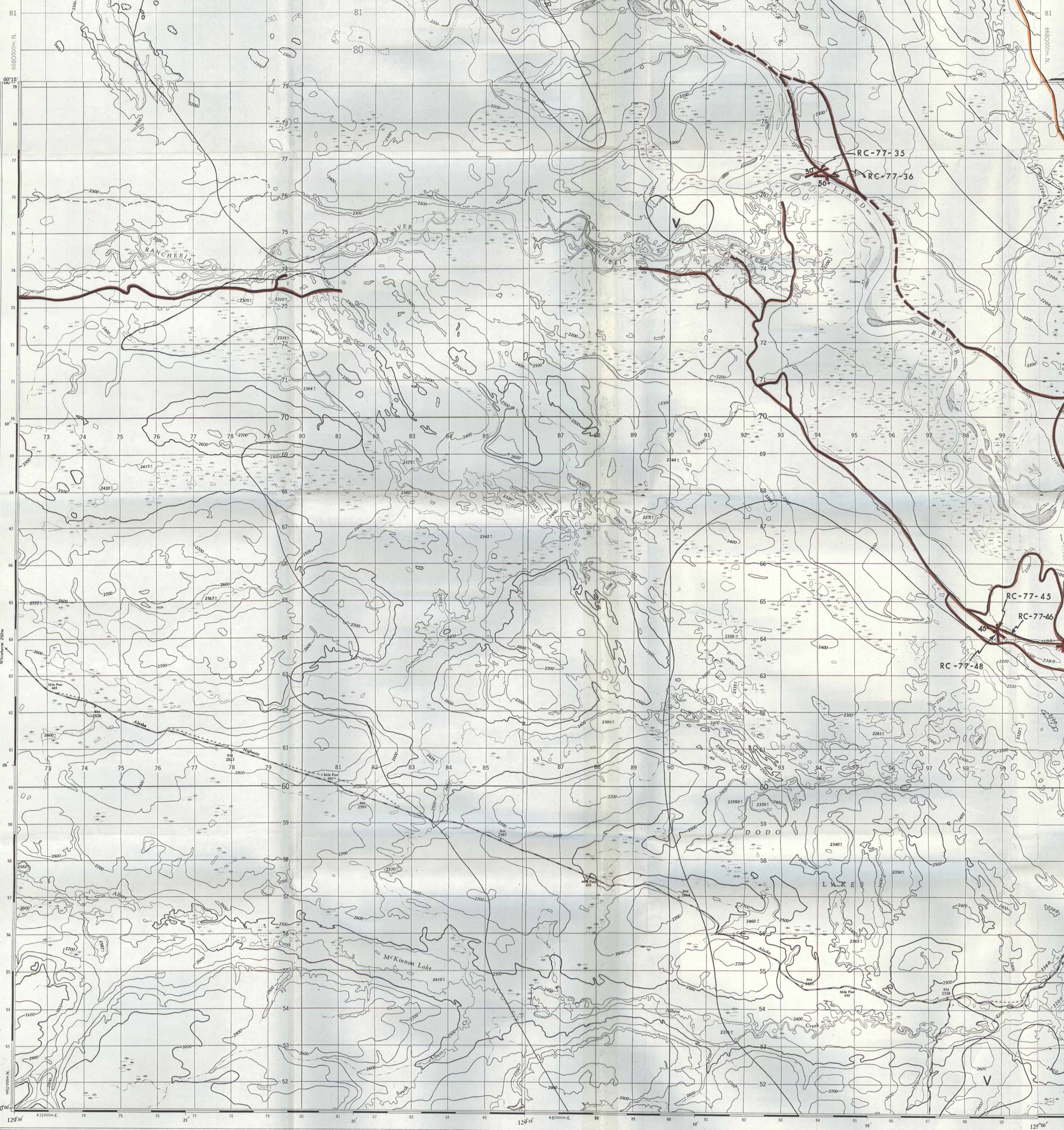
Map Scale: 1:50,000

Grid: UTM Zone 9

Vertical Datum: Mean Sea Level

Horizontal Datum: North American Datum 1983

Projection: Universal Transverse Mercator



Symbol	Description	Symbol	Description
—	Boundary	—	Water
—	Highway	—	Swamp
—	Road	—	Marsh
—	Trail	—	Shrub
—	Path	—	Forest
—	Track	—	Open
—	Footpath	—	Barren
—	Drainage	—	Rock
—	Stream	—	Gravel
—	River	—	Sand
—	Lake	—	Silt
—	Sea	—	Clay
—	Ocean	—	Shale
—	Bay	—	Slate
—	Harbour	—	Schist
—	Strait	—	Gneiss
—	Channel	—	Quartzite
—	Bayou	—	Amphibolite
—	Delta	—	Basalt
—	Point	—	Diorite
—	Island	—	Granite
—	Peninsula	—	Andesite
—	Headland	—	Rhyolite
—	Bay	—	Trachyte
—	Harbour	—	Diorite
—	Strait	—	Granite
—	Channel	—	Amphibolite
—	Bayou	—	Basalt
—	Delta	—	Diorite
—	Point	—	Granite
—	Island	—	Andesite
—	Peninsula	—	Rhyolite
—	Headland	—	Trachyte

LEGEND

— THE CAMPBELL HIGHWAY

— LOGGING ROADS

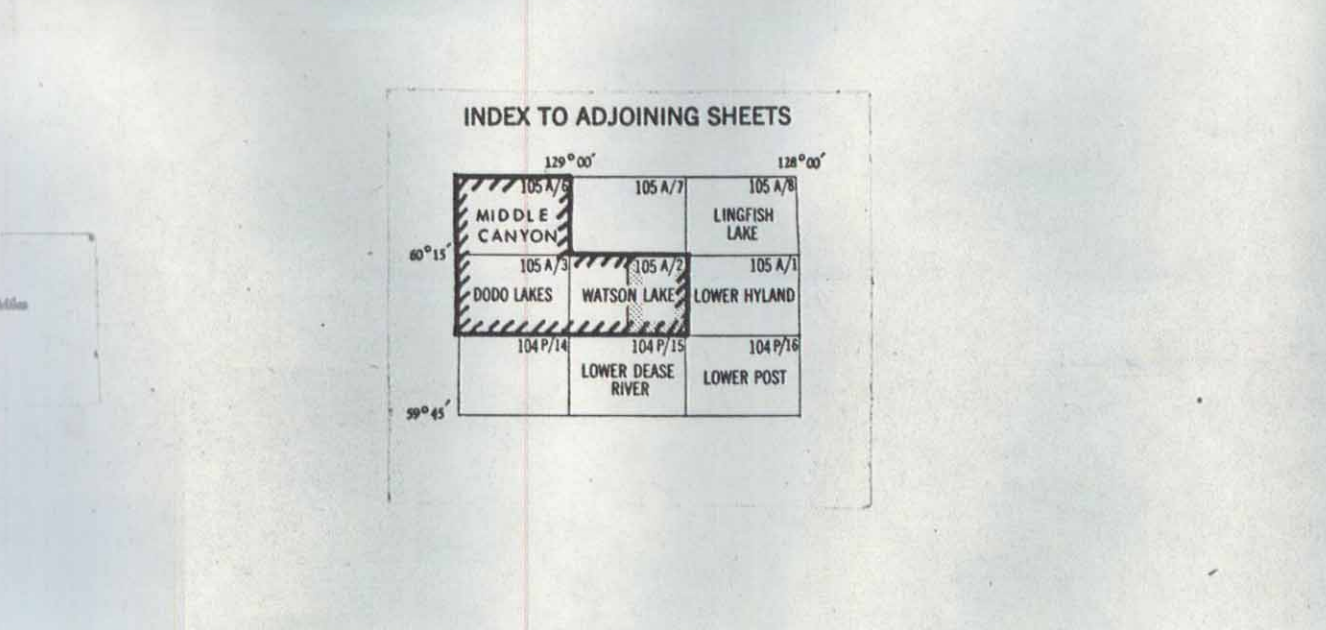
+ BEDDING (INCLINED, HORIZONTAL)

○ RC-77-31 SAMPLED COAL SEAM

○ Volcanic Rocks

OUTLINE OF POSSIBLE EXTENSION OF LIARD COAL BASIN REPRESENTING APPROXIMATE CONTACT OF TERTIARY AND OLDER ROCKS AS SHOWN ON GSC MAPS 19-1966 (105A1 & 1110A) (10A9)

OUTLINE OF THE DEEPER PORTIONS OF THE TERRITORY (1) THROUGH CONTAINING COAL (ON THE BASIS OF THE AIRMAP DATA)



CANEX PLACER LIMITED

LIARD COAL

WATSON LAKE, Y.T.

INDEX TO ADJOINING SHEETS

Scale 1:50,000

125 metres (1/4 mile approximately)