

ENGINEERING AND GEOCHEMICAL REPORT

A Group Claim Sheet 106-D-1 64°06'N, 134°15'W
B Group Claim Sheet 106-D-1 64°05'N, 134°12'W
MK Group Claim Sheet 105-M-15 63°43'N, 134°49'W
JAR Group Claim Sheet 106-D-1 64°02'N, 134°13'W

MAYO DISTRICT
YUKON TERRITORY

BY

Wilfred K. Lee, P. Eng.

Work Performed September 7-20, 1966

6762.79

GEOLOGICAL SURVEY
FEB 1967
Resident Geologist
Whitehorse, Y. T.

This report has been examined by
the Geological Evaluation Unit.
Approved as to technical worth by:

Residley
RESIDENT GEOLOGIST

Approved as to cost in the amount
of: \$ 6762.79

P. Redden
RESIDENT MINING ENGINEER

Accepted as representation work
under Section 53(4) Yukon Quartz
Mining Act.

Mill
COMMISSIONER OF YUKON

CONTENTS

INTRODUCTION	1
Previous Work	1
Methods of Investigation	2
PROPERTY DESCRIPTIONS	3
JAB Group	3
- Geology	3
- Trenching	3
- Geochemical Surveys	4
- Assay Results	5
A Group	5
- Geology	5
- Geochemical Survey	6
B Group	6
- Geology	6
- Geochemistry	6
MK Group	6
- Geology	6
- Geochemical Survey	7
CONCLUSIONS	7
REFERENCES	8
CERTIFICATE OF QUALIFICATIONS	9
ADDENDA	10
List of Personnel	10
Statement of Expenditures	11
- Schedule - 1	11
- Schedule - 2	11
- Schedule - 3	12
- Schedule - 4	12
- Schedule - 5	12
Statutory Declaration	13
Supporting Documents	13
LIST OF ILLUSTRATIONS	
Figure 1 - Key Map	
Figure 2 - JAB Groupings	
Figure 2A - JAB Group - Geochemical Map (envelope)	
Figure 3 - A & B Groups	
Figure 3A - A & B Groups - Geochemical Map (envelope)	
Figure 4 - MK Grouping	
Figure 4A - MK Group - Geochemical Map (envelope)	

INTRODUCTION

This report describes work carried out September 7-20, 1966, on the A, B, JAB and MK claim groups, situated in the Beaver River and Mayo Lake areas, Mayo District, Yukon Territory (Figure-1).

The claim groups are all owned solely by Arivaca Explorations Limited, (N.P.L.) with offices at 1111-736 Granville Street, Vancouver, British Columbia. The claims were located early in 1965 and were all recorded on February 26, 1965 (McIntyre - 1966).

The writer in his capacity as a geological engineer was instructed to complete as much exploration work as possible, which could be used as representation work for Certificates of Work. The writer recommended the following program.

1. Hand trenching in areas of known E.M. anomalies.
2. A geochemical soil survey to supplement information obtained from geochemical surveys completed by the Geological Survey of Canada, and the Electro-Magnetic Surveys completed under the direction of McIntyre (1966).
3. Aerial reconnaissance of the claim groups by helicopter to note geological formations and structures.
4. Sampling gossan zones found in the area.

Previous Work

The Geological Survey of Canada carried out geochemical surveys along streams and springs in the Beaver River and Mayo Lake areas, G.S.C. Maps (Rackla River 24-1964, 25-1964) and Mayo Lake, 18-1964, 19-1964). This work was of a reconnaissance nature and could only be used to note the high heavy metal content (mainly Zn, Pb, and Cu) in the water courses flowing in the areas.

Electromagnetic surveys were carried out on the above claim groups in February, 1966. Several EM anomalies were outlined by C.B. Salmser, P.Eng. The significance of the anomalies as related to geology and geochemistry is described by McIntyre, P.Eng. (1966).

Methods of Investigation

Trenching

Trenches were excavated using a copco drill and explosives. Most of the trenches are situated in areas of known EM anomalies. Where possible trenches were excavated along steep cliff faces to allow the maximum amount of rock to be removed in the shortest period of time. Rock samples were taken from the trenches and assayed for silver, lead and zinc.

Geochemical soil sample surveys were conducted using pace and compass traverses. Soil samples were taken on an average of one sample every 200 feet along traverse lines. The samples were analyzed by the Bio-Metals Corp. Ltd. (N.P.L.) Vancouver, B.C. Samples were fume dried with sulphuric and nitric acid and then taken up in ammonium acetate solution. The solution is then run through an E.E.L. Atomic Absorption Spectrographic Photometer. The analyses are recorded as parts per million (ppm).

Rock samples were assayed for silver, lead and zinc by J.R. William and Son Ltd., Provincial Assayers, Vancouver, B.C.

PROPERTY DESCRIPTIONS

JAB Group

Geology

The JAB group is underlain by low grade metamorphic rocks consisting mainly of phyllites and argillites, that are commonly graphitic. Minor amounts of platy argillaceous quartzite and quartz-sericite schist also occur. These rocks are mapped by Green and Raddick (1961) as Post Devonian.

The metasedimentary rocks are intruded by small plugs of gabbro and diorite, mapped as Cretaceous, Green and Raddick (1961). The mafic intrusions are now schistose having undergone metamorphism and deformation similar to the surrounding country rock.

The rocks exhibit well developed foliation and strike N60°W to N70°W, and dip 50° to 80°N.E. The axis of small folds tend to strike S50°E and plunge 50° to 80°.

Numerous white quartz stringers and veins intrude the phyllites and quartzites. Most of the quartz veins tend to parallel the foliation and bedding planes of the country rock. Many of the veins are stained with rust, although no fresh sulphides were observed.

Gossan zones found in the metasedimentary rocks are badly oxidized and leached. Thin lenses of pyrite and pyrrhotite occur along shear planes in the country rock. Many of the gossan zones coincide with known EM anomalies.

Trenching

Sixteen trenches involving 226.3 cu. yds. of rock were excavated. Most of these trenches were located along cliff faces to help facilitate the removal of rock.

The number of trenches and the amount of rock excavated are listed on the following page.

<u>Claim</u>	<u>Trench Size</u>	<u>Cu. Yds.</u>
JAS-19	21x3x2	7.0
	8x2x2	1.2
	8x2x2	1.2
	2(1x3x2)	1.5
	10x20x4	29.6
	25x4x5	31.5
	40x4x5	35.5
	7x2x2	1.5
	3x3x3	1.0
TOTAL JAS-19		96.8
JAS-27	9x6x3	6.0
	7x2x2	1.6
	6x3x3	2.0
TOTAL JAS-27		9.6
JAS-34	10x6x12	60.0
JAS-54	60x2x6	26.6
JAS-53	40x3x3	12.1

Geochemical Surveys

Numerous geochemical surveys have been conducted in the Galena-Keno Hill area, Yukon, by officers of the geological survey of Canada. Geochemical investigations of heavy metal content, of streams and springs, in the Galena Hill - Mount Haldane Area, Yukon Territory, were carried out by Boyle et al (1956). Chemical results of this survey show that zinc is the principal heavy metal in the stream water detected by the dithionite reaction. The concentration of lead and copper in all stream water is too low to be detected by routine methods. Boyle et al (1956), conclude that the high dispersion of zinc is due to the high solubility of its sulphate, and that zinc is a good indicator element for tracing mineralization by hydrogeochemical prospecting methods. They also conclude that the relative

immobility and limited dispersion of lead make this element an ideal indicator in geochemical soil sample surveys.

A lead content of 25 ppm is considered background for soil sample analyses taken from the JAB, A, B and MK groups. This figure was chosen after studying a cumulative distribution curve for lead in stream and spring sediment in the Kano Hill area, Gleason et al (1964).

A zinc content of 100 ppm was chosen as background for the JAB, A, B and MK groups. This value was arbitrarily chosen by the writer. No cumulative distribution curve for zinc is available for comparison.

Seventy-six soil samples were obtained from claims JAB-4, 5, 6, 7, 8, 9, 10, 11, 12, 17, 19, 21, 22, 23, 24, 33, 35, 53 and 54. The samples were analyzed for lead, zinc and silver, and are designated J-1 thru J-76 on the enclosed geochemical analyses report.

The chemical results are not anomalous in silver or lead, but do appear to be anomalous in zinc. However, an increase in the content of silver and lead is required if these high zinc values are to be of economic significance. A summary of the results are plotted on Figure - 2A.

Assay Results

Twenty rock samples were assayed for silver, lead and zinc. The samples whose locations are plotted on Figure 2A, do not contain economic amounts of the metals tested.

A - Group

Geology

Approximately 3% outcrop occurs on the A Group. The area is underlain mainly by graphic phyllites. The structural trend is similar to that of the JAB Group and the foliation strikes N65°W and dips steeply to the N.E. Gabbroic intrusions are exposed below the phyllite along the creek.

Geochemical Survey

The A Group was examined September 16, 1966. A helicopter was used for transportation and aerial reconnaissance work.

18 soil samples were collected and analyzed. No results of economic significance were obtained. The chemical results are plotted on Figure - 3A.

B Group

Geology

Rock types and structural trends are similar to those found on the JAB and A groups. Some outcrops of conglomerate and gabbro are exposed along the creek bed.

Three medium sized gossan zones were found and sampled. Two of these zones were indicated by EM anomalies.

Rock samples BS-1 to BS-4 were collected and assayed for silver, lead and zinc.

Geochemistry

Twelve soil samples were collected while examining the B group on September 17, 1966. The sample locations are shown on Figure - 3A. The chemical results that range from 21 to 653 ppm zinc, trace to 30 ppm lead, and nil ppm silver are plotted on Figure -

High zinc values associated with moderate lead values could be anomalous and may indicate a mineralized zone of economic value, more exploration work is needed to confirm or refute this suggestion.

The chemical results are plotted on Figure - 3A,

NK Group

Geology

The rocks underlying the NK group are mapped as Precambrian quartzites, graphitic phyllites and schists. These rocks are intruded by Paleozoic plugs and sills of diorite and gabbro. Foliation and bedding strike east-west and dip 40° to the south Bostock, (1941).

Geochemical Survey

The property was examined on September 18, 1966. Fourteen soil samples were collected. The sample locations and chemical results are plotted on Figure - 4A.

No anomalous geochemical values were obtained for the samples analyzed.

CONCLUSIONS

Most of the geochemical soil samples analyzed in this report are not anomalous. They suggest that the high geochemical values obtained from surveys conducted by the Geological Survey of Canada (Rackla River maps 24-1964, 25-1964), are due to a high zinc content in the soils.

Higher contents of silver and lead are required before these chemical results can be considered as indicating mineral deposits of economic significance.

The relatively high zinc and lead values from samples taken from the B Group and some of the samples taken from the JAB Group could be anomalous. However, more work will be required to test the significance of these results.

REFERENCES

- 1) Bostock, H.E. (1941) - Geol. Map, Mayo, Yukon Territory
Geol. Sur. Can. Map 890A
- 2) Boyle, R.W., Illsley, C.T. and Green, R.N. (1955) - A
Geochemical Investigation of the Heavy Metal Content
of the Streams in the Keno Hill - Galena Hill Area,
Yukon Territory.
- Geol. Sur. Can. paper 54-18
- 3) Boyle, R.W. (1957) - The Geology and Geochemistry of
the silver-lead-zinc deposits of Galena Hill, Yukon
Territory.
- Geol. Sur. Can. paper 57-1
- 4) Boyle, R.W. (1965) - Geology, Geochemistry and origin
of the Lead-Zinc-Silver Deposits of the Keno Hill -
Galena Hill Area, Yukon Territory.
- Geol. Sur. Can. Bull. - 111.
- 5) Gleeson, C.F. et al (1964) - Heavy Metal Content of
Stream and Spring Waters. Rackla River, Yukon Territory
- Geol. Sur. Can. Map 24-1964.
- 6) Gleeson C.F. (1964)- Heavy Metal Content of Stream and
Spring Sediments, Rackla River, Yukon Territory, Geol.
Sur. Can. Map 25-1964.
- 7) Gleeson C.F. (1966) - Lead content of Stream and Spring
Sediments, Keno Hill Area, Yukon Territory. Geol. Sur.
Can Map 45-1965.
- 8) Green, L.H. and Raddick J.A. (1962) - Dawson, Larsen Creek,
and Nash Creek Map - Areas, Yukon Territory. Geol. Sur. Can.
Paper 62-7
- 9) Kindle, E.D. (1955) - Keno Hill, Yukon Territory. Geol. Sur.
Can. Paper 55-12
- 10) McIntyre, J.P. (1966) - Engineering Report for Arivaca
Explorations Ltd. (N.P.L.)
- 11) Salmser, C.B. (1966) - Geophysical report, A, B, C, MK and
JAB groups for Arivaca Explorations Ltd. (N.P.L.)

CERTIFICATE OF QUALIFICATIONS

I, W.K. Lee, P.Eng., hereby declare that:

- 1) I hold a Degree of B.Sc. in Geological Engineering, Queen's University, 1962, Kingston, Ontario, and have just completed graduate studies leading to a Masters Degree in Geology, University of Washington, Seattle, Washington, U.S.A.
- 2) I am a registered member in good standing of the Association of Professional Engineers of Ontario.
- 3) I have had mining exploration experience in Quebec, Ontario, and the Northwest Territories in Canada, and in the State of Washington, U.S.A.
- 4) I have personally examined all of the claim groups referred to in this report during September, 1966.

Signed:

Wilfred K. Lee

Wilfred K. Lee, P.Eng.

ADDENDUM

List of Personnel

W.K. Lee, P.Eng. Geological Engineer.
1207 - 1450 Chestnut Street,
Vancouver, B.C.

E.M. Scott, Prospector.
Room 1111 - 736 Granville Street,
Vancouver 2, B.C.

A.A. Wise, Rock Driller and Powder Man.
Room 1111 - 736 Granville Street,
Vancouver 2, B.C.

Peter Lucas, Labourer.
Mayo, Yukon Territory.

P. Armand, Pilot
Klondike Helicopter, Whitehorse, Yukon Territory.

W.G. Leslie, Pilot.
Klondike Helicopter, Whitehorse, Yukon Territory.

ADDENDUM

Statement of Expenditures

Schedule - 1

1. Klondike Helicopters Invoice - Sept. 26/65	
29:35 Hours flying time	\$3,801.75
Helicopter Maintenance	282.30
	<hr/>
TOTAL	\$4,084.05
	<hr/>

2. Arivaca Explorations Ltd.

Room		129.00
Telephone		115.50
Air Transportation (C.P.A.) Three men		
Vancouver to Mayo		590.00
Camp Supplies		487.64
Geochemical Analysis		292.10
Assay Analysis		50.40
Wages: Geologist	- 900.00	
Prospector	- 800.00	
Driller and Powder Man	- 800.00	
Labourer	- 300.00	
	<hr/>	
	\$2800.00	2,800.00
		<hr/>
		\$4,464.64
		<hr/>

Schedule - 2

Helicopter survey time pro-rated on the basis of hours flown by groups.

A Group	- 15%	612.61
B Group	- 15%	612.61
JK Group	- 20%	816.81
JAS Group	- 50%	2,042.02
		<hr/>
		\$4,084.05
		<hr/>

Schedule - 3

All costs other than Schedule - 2 pro-rated on basis of number of claims.

A Group	-	10%	446.46
B Group	-	10%	446.46
MK Group	-	25%	1,116.16
JAB Group	-	55%	2,455.56
			<u>\$4,464.64</u>

Schedule - 4

Total expenditures by Groups

A Group -	1,059.07
B Group -	1,059.07
MK Group -	1,932.97
JAB Group -	4,497.58

Schedule - 5

Total expenditures distributed in Schedule - 4 according to applications for Certificates of Work.

<u>Grouping Applied For</u>	<u>Total Expenditures</u>
Marked A @ 100%	1,059.07
Marked B @ 100%	1,059.07
Marked MK-S @ 100%	1,932.97
Marked JAB I @ 0%	—
Marked JAB II @ 25%	1,124.40
Marked JAB III @ 28%	1,259.32
Marked JAB IV @ 40%	1,799.03
Marked JAB V @ 7%	314.83
	<u>\$8,548.69</u>

This is True A Witnessed to in
the affidavit of WILFRED K. LEE
sworn before me at VANCOUVER
this 11th day of JANUARY 1967

P. J. Jasul
A Commissioner for taking Affidavits
within British Columbia

SUPPORTING

DOCUMENTS

FOLIO _____

September 27

19 66

M ARIVACA EXPLORATIONS LTD.

IN ACCOUNT WITH BORD SCOTT

TERMS _____

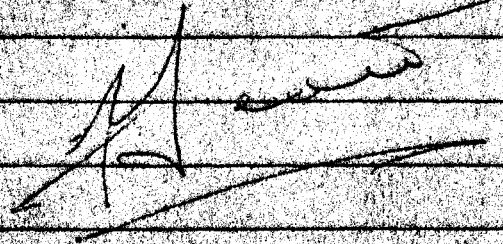
Trenching - Keno property

\$800. 00

1300. 1500

Chq # 102 + 116

Pd. Sept 6 + 27th



Folio _____

October 6

19 66

M. Arivaca

IN ACCOUNT WITH Inland Copper Ltd. re: B.C. Telephone Co.

TERMS _____

June | July

Long Distance Phone Calls

75 50

75.50

40.00

115.50

pd.
Net 13

Chq# 120

December 16, 1960

INVOICE

Invoice no. 150

To: Arivaca Explorations
1111-730 Granville Street
VANCOUVER, B.C.

Professional services in connection with Geo-chemical
results:

Project 619

Bio Metals reference no. A3417 - 3479

Analysis for - Pb, Zn, Ag

64 samples @ \$ 1.95 \$ 124.80

Drying & sieving

61 samples @ \$ 0.20 \$ 12.20

Crushing & pulverizing

3 samples @ \$ 0.60 \$ 1.80

Total \$ 138.80

DUE ON RECEIPT.

Frank M. McQuinn



NO. 1 HANGAR, MCCALL FIELD
CALGARY, ALBERTA

SOLD TO .

Aravca Explorations
Room 1111,
736 Granville Street,
VANCOUVER, B.C.

26th September, 1966.

ACCOUNTS DUE WHEN RENDERED
CUSTOMER'S ORDER NUMBER

SHIP VIA

DATE SHIPPED

AIRCRAFT
CP-NJW
CP-MLL

PAYABLE AT PAR. CALGARY

TRIP NO.

QUANTITY	PART NUMBER	DESCRIPTION	PRICE	AMOUNT
----------	-------------	-------------	-------	--------

PILOTS: R. Conant, P. Arund

RE: Charter of Bell 4703 and Hiller 123 helicopters as per authorized
Daily Flight Reports 4512, 4516-4518, 4520-4522, 5791 attached.

FLYING: Sept 9th, 12, 13, 16, 17, 18, 19, 1966.

CP-MLL 5:35 hrs @ 135.00 per hr 753.75

CP-NJW 24:00 hrs @ 127.00 per hr 3,048.00

3,801.75

Plus 359 gals 100/130 aviation fuel @.70 gal 251.30

Cost of Trucking gas Mayo to Keno City 31.00
4,084.05

Rounding off in acc/w our A.T.B. Charter
Tariff

TOTAL INVOICE \$ 4,084.00

Charter • Overhaul • • • Bell and Hiller Helicopters

No 1275

987-7522
TELEPHONE 988-6181
AREA CODE 604

BIO METALS

CORPORATION LTD. (N.P.L.)

ENGINEERING OFFICES
204 - 1515 PEMBERTON AVE.
NORTH VANCOUVER, B. C.

November 29, 1966

INVOICE

Invoice no. 139

To: Arivaca Exploration
1111-736 Granville Street
VANCOUVER, B.C.

Project 519

Professional services in connection with Geo-chemical
Analysis results:

Bio Metals reference no. - A2575-2609
A2611-2638
- Ag, Zn, Pb
- all wet

3 metal samples
63 samples @ \$1.95 \$ 122.85

Drying & sieving
63 samples @ \$0.20 12.80

Bio Metals reference no. A2639-2645
- Ag, Zn, Pb
- Rock

3 metal samples
7 samples @ \$1.95 13.65

Crushing & pulverizing
7 samples @ \$0.80 4.20

Total \$ 153.30

DUE ON RECEIPT

Don M. Moncrieff

CANADIAN PACIFIC AIR LINES, LIMITED
PASSENGER, EXPRESS AND AIR MAIL SERVICES

NO 140624

ISSUING OFFICE Vancouver B.C.

DATE Dec 23 1966

Received FROM Aerivac Exploration \$ 570⁰⁰
Five hundred + seventy DOLLARS

FOR Tkt from M. 7 Sees - A. time to L.A.

CANADIAN PACIFIC AIR LINES, LIMITED

PER H. Leedial

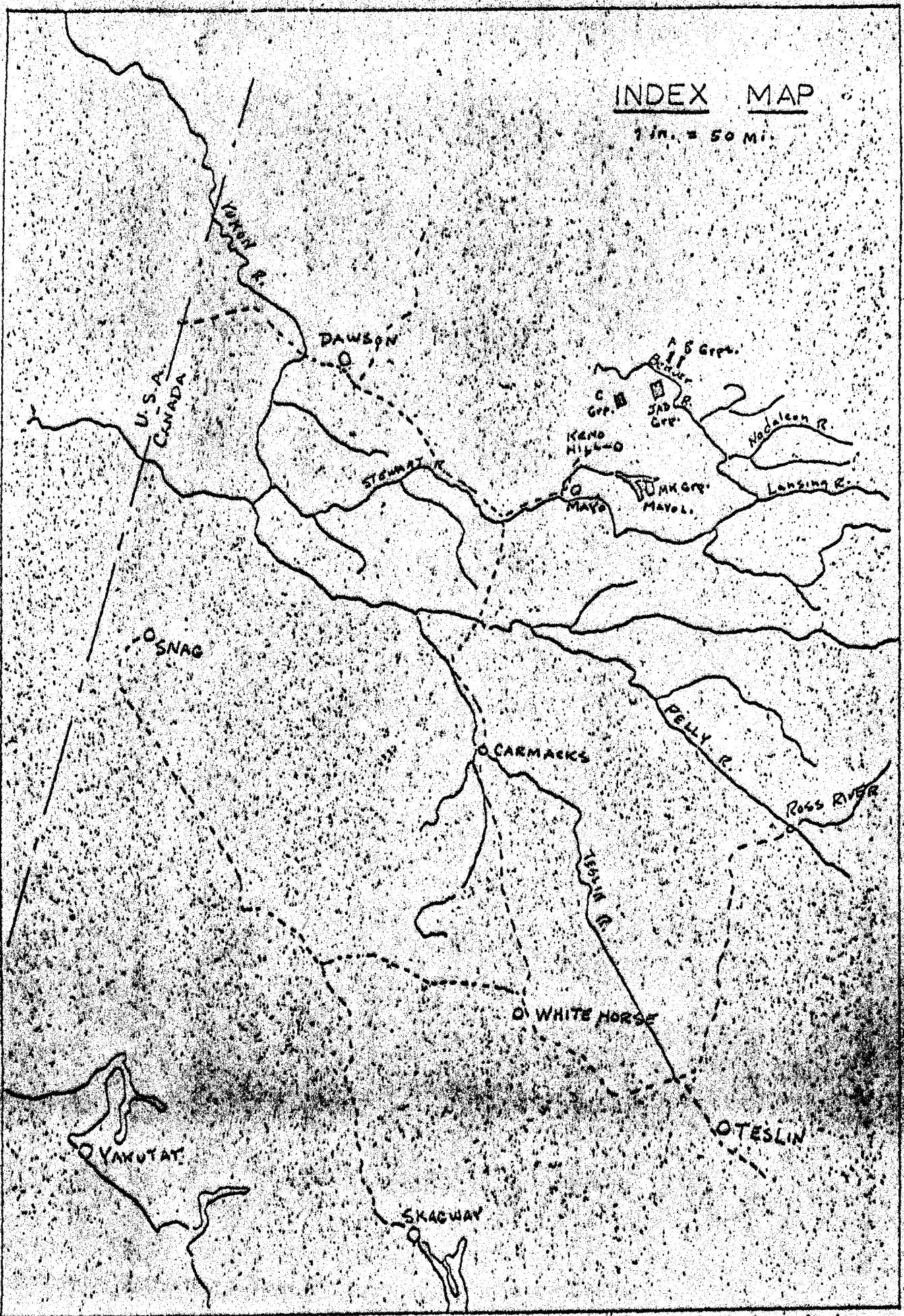
PRINTED
IN CANADA

098 2 407708/7/10

PSR 1901

INDEX MAP

1 in. = 50 mi.



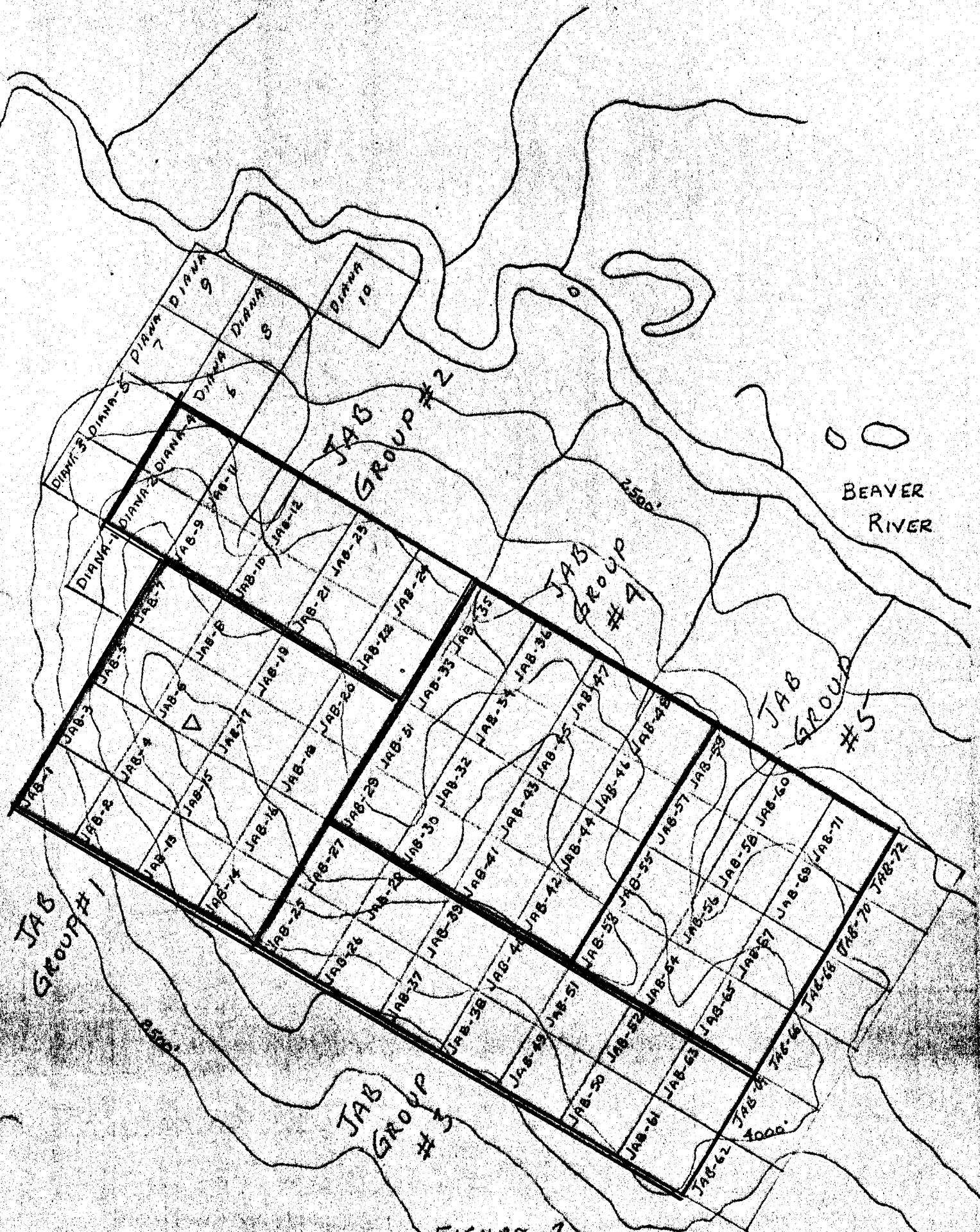


FIGURE - 2



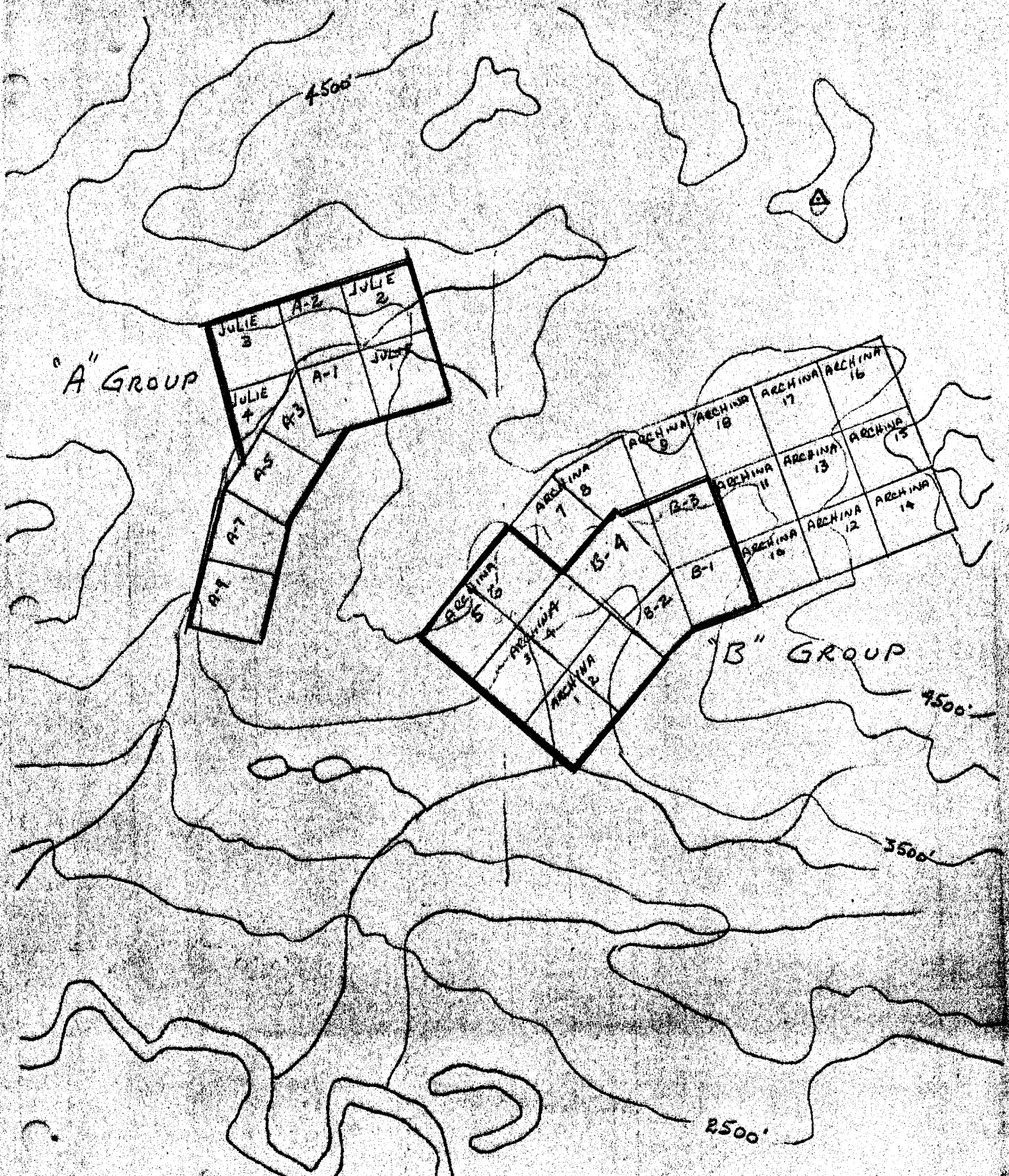
FIGURE - 2A
 GEOCHEMICAL SURVEY
 JAB CLAIM GROUP
 MAYO DISTRICT
 YUKON TERRITORY

Ag (Pb) - J-1 SOIL SAMPLE LOCATION
 Zn (ppm)
 (N) - NIL ppm
 (T) - TRACE
 JS-5 ROCK SAMPLE

APPROXIMATE SCALE 1"=870'

DWN: A. A. WISE
 DATA: W. K. LEE
 JANUARY 1967

64°00'N
 134°19'30"W



"A" Group

"B" Group

4500'

4500'

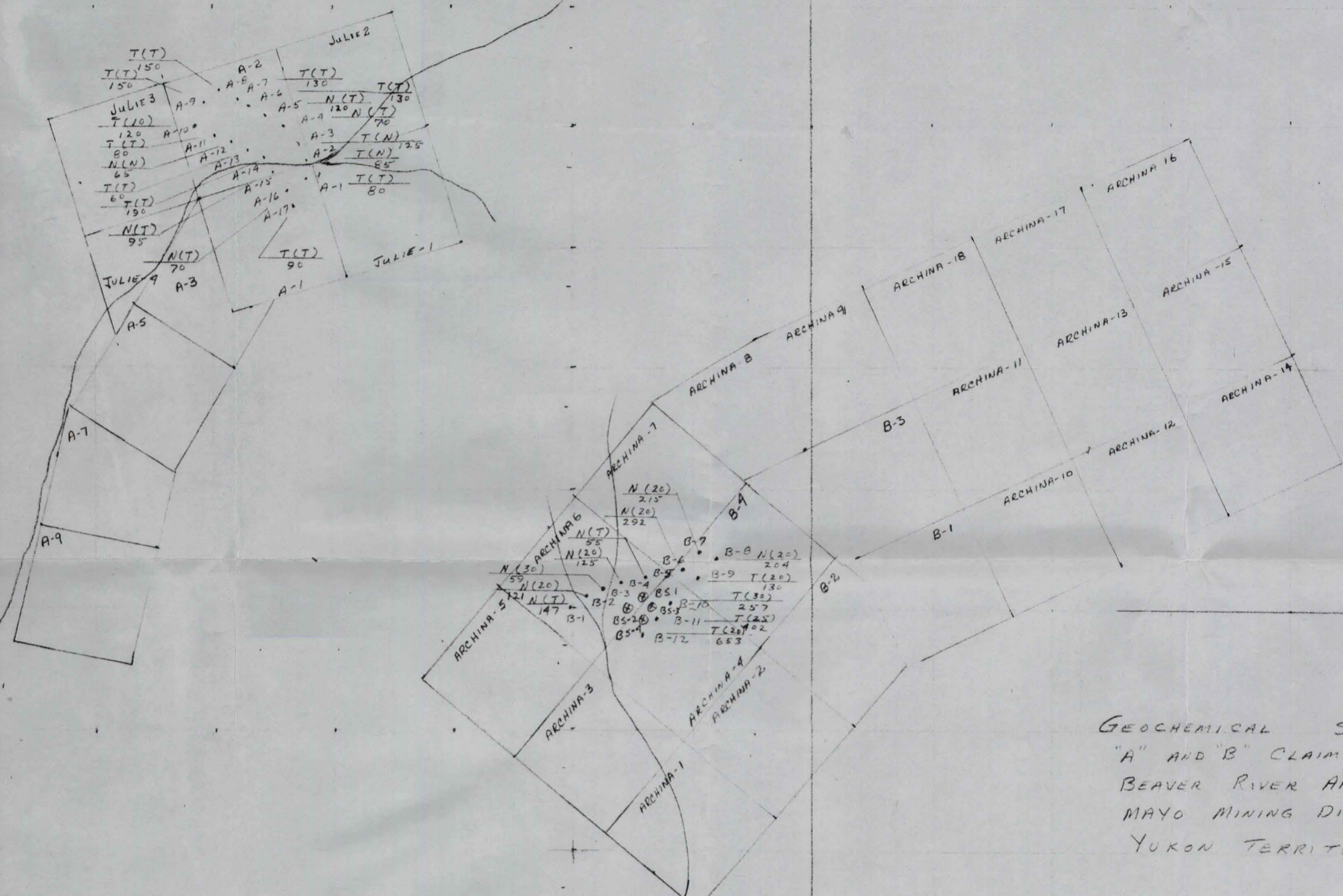
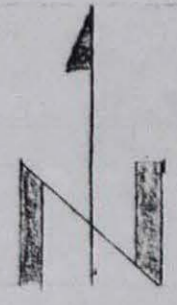
3500'

2500'

BEAVER RIVER

Reference-Claim MAP
106 D-1

Map Group



64° 04' - 43" N

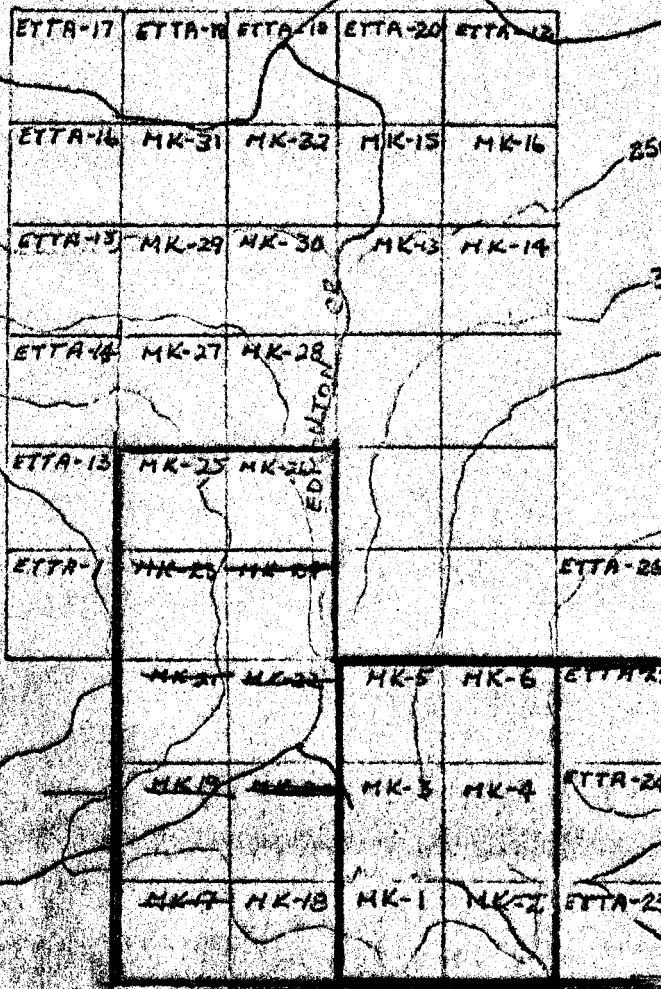
GEOCHEMICAL SURVEY
"A" AND "B" CLAIM GROUPS
BEAVER RIVER AREA
MAYO MINING DISTRICT
YUKON TERRITORY

APPROXIMATE SCALE 1" = 1000'
Ag (Pb)
Zn (ppm) - A-2 SOIL SAMPLE LOCATION
(N) - NIL ppm & BS-1 ROCK SAMPLE
(T) - TRACE
DATA: W.K. LEE
DWG: A.A. WISE
JANUARY 1967

FIGURE - 3A

MAYO LAKE - 2200'

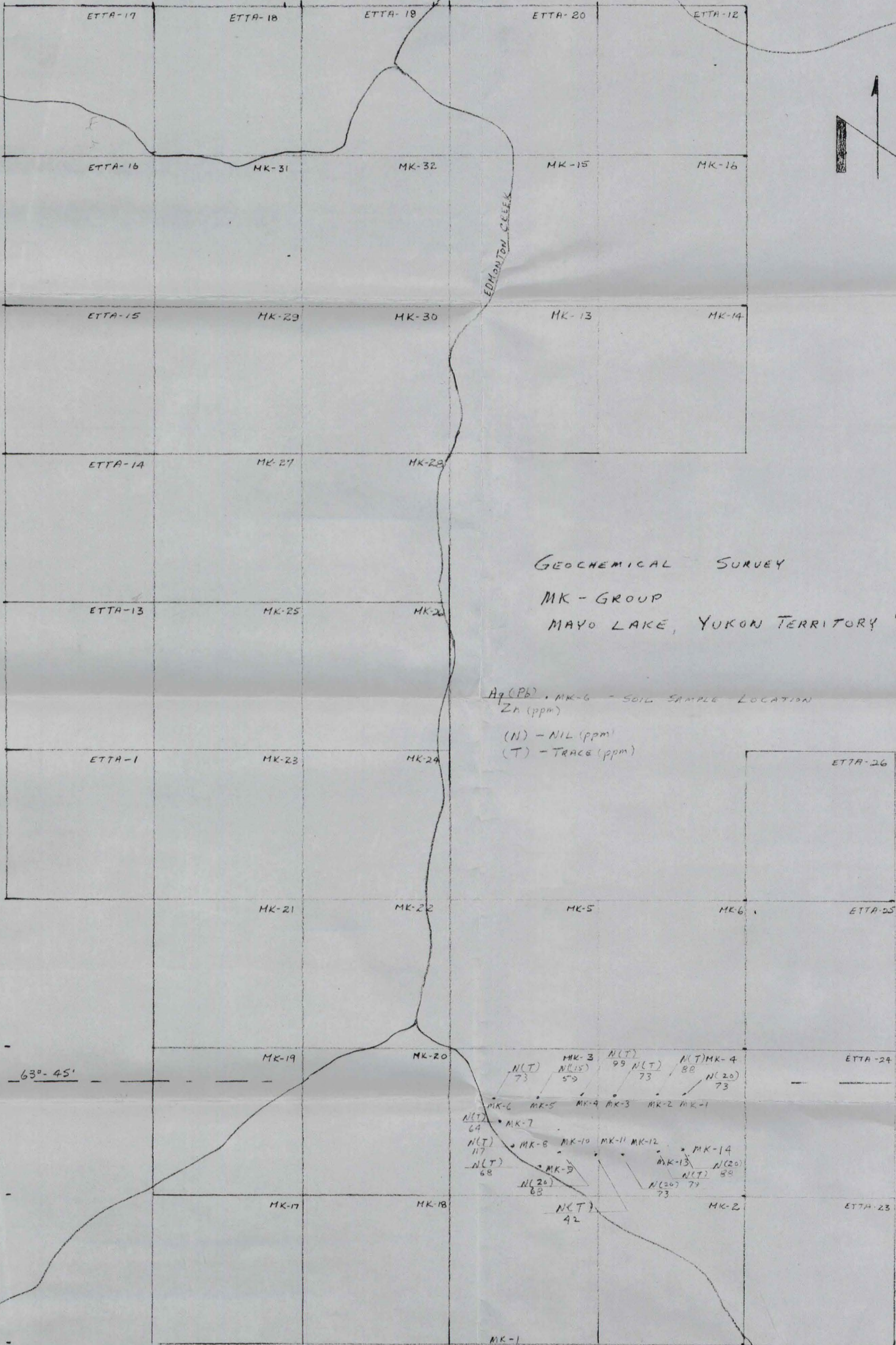
EDWARDS CR.
CABIN



MK GROUP (5)

Reference Map
105-M-15

MAYO LAKE - 22,00'



DATA: W.K. LEE
DWG: A.A. WISE
JANUARY, 1967

FIGURE - 3A