

# ARCHER, CATHRO

• ASSOCIATES (1981) LIMITED

CONSULTING GEOLOGICAL ENGINEERS

091803

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## GEOLOGICAL AND GEOCHEMICAL REPORT

on the

NIT PROPERTY

(ITN 1-48 and 60-63 Claims)

located at

Latitude 62°33'N; Longitude 138°00'W

on

NTS Mapsheets 115J/9 and 115I/12

091803

W. Douglas Eaton, B.A., B.Sc.

Work done during the period June 18-25 and

July 29 - August 2, 1985

This report has been examined by  
the Geological Evaluation Unit  
under Section 53 (4) Yukon Quartz  
Mining Act and is allowed as  
representation work in the amount  
of \$ 24,700.

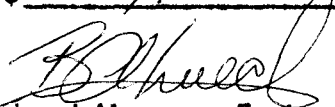
  
Regional Manager, Exploration and  
Geological Services for Commissioner,  
of Yukon Territory.

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## INTRODUCTION

The Nit property was staked by Freegold Venture (FV) in June, 1985 to protect favourable geological and geochemical targets, and was extended in July, 1985 to provide additional protection.

The ground was previously staked by a joint venture between three junior mining companies in 1969 as part of a larger block surrounding a low grade porphyry copper prospect (Tad prospect), 2 km to the northeast; and by Nat Joint Venture (Nat) as the Nit 1-36 claims in 1980. The junior companies cut seven bulldozer trenches in the northern part of the claim block but discovered only traces of chalcopyrite. Nat conducted wide spaced soil geochemistry and geological mapping in 1981 before allowing the claims to lapse in 1982. This work outlined a belt of anomalous soil values trending west-northwest away from the Tad prospect, which included up to 1000 ppb Au, 10.9 ppm Ag, 235 ppm Pb and greater than 1000 ppm As.

The 1985 FV program consisted of geological mapping, prospecting and grid soil sampling in June with more detailed soil sampling and reconnaissance chip sampling in late July and August. The work was done from a flycamp on the west side of the claim block and was supervised by the author. Appendix I contains the author's Statement of Qualifications while Appendix II lists personnel who worked on the property.

PROPERTY, LOCATION AND ACCESS

The Nit property consists of 52 ITN claims, as shown on Figure T1 on the following page. The claims are registered in the name of Archer, Cathro & Associates (1981) Limited with the Whitehorse Mining Recorder as listed below.

<u>Claim Name</u>	<u>Grant Number</u>	<u>Expiry Date</u>
ITN 1-37	YA91875-YA91911	June 19, 1986
ITN 38-48	YA92627-YA92637	July 10, 1986
ITN 60-63	YA92649-YA92652	July 10, 1986

The claim block is located at latitude 62°33'N and longitude 138°00'W, on NTS map sheets 115J/9 and 115I/12, 103 km northwest of Carmacks. Access in 1985 was by helicopter operating from a base in Carmacks. The nearest road access is the Freegold Road, 41 km to the southeast. The route for the proposed Casino Road passes through the property.

PHYSIOGRAPHY AND GEOMORPHOLOGY

The Nit property is situated in the central portion of the Dawson Range on the west side of Hayes Creek. Typical terrain consists of rounded ridge crests flanked by gentle north-facing and steep south-facing slopes. Local elevations range from 870 m on the floor of Hayes Creek to 1285 m on ridge tops. Soil development is generally poor and the volcanic ash layer is thin. North-facing slopes and valley bottoms are usually frozen and are vegetated with thick moss and black spruce, while south-facing slopes are drier and feature grasses and poplar trees. Outcrop and talus are rare.

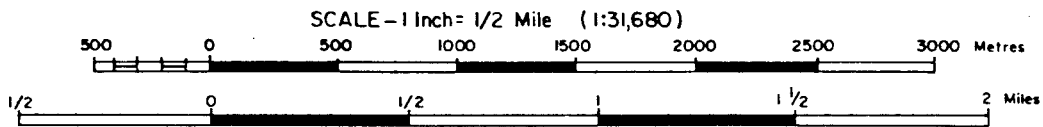
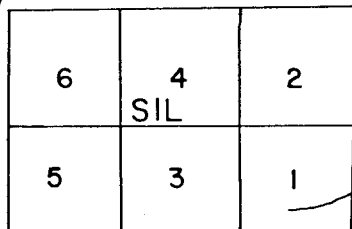
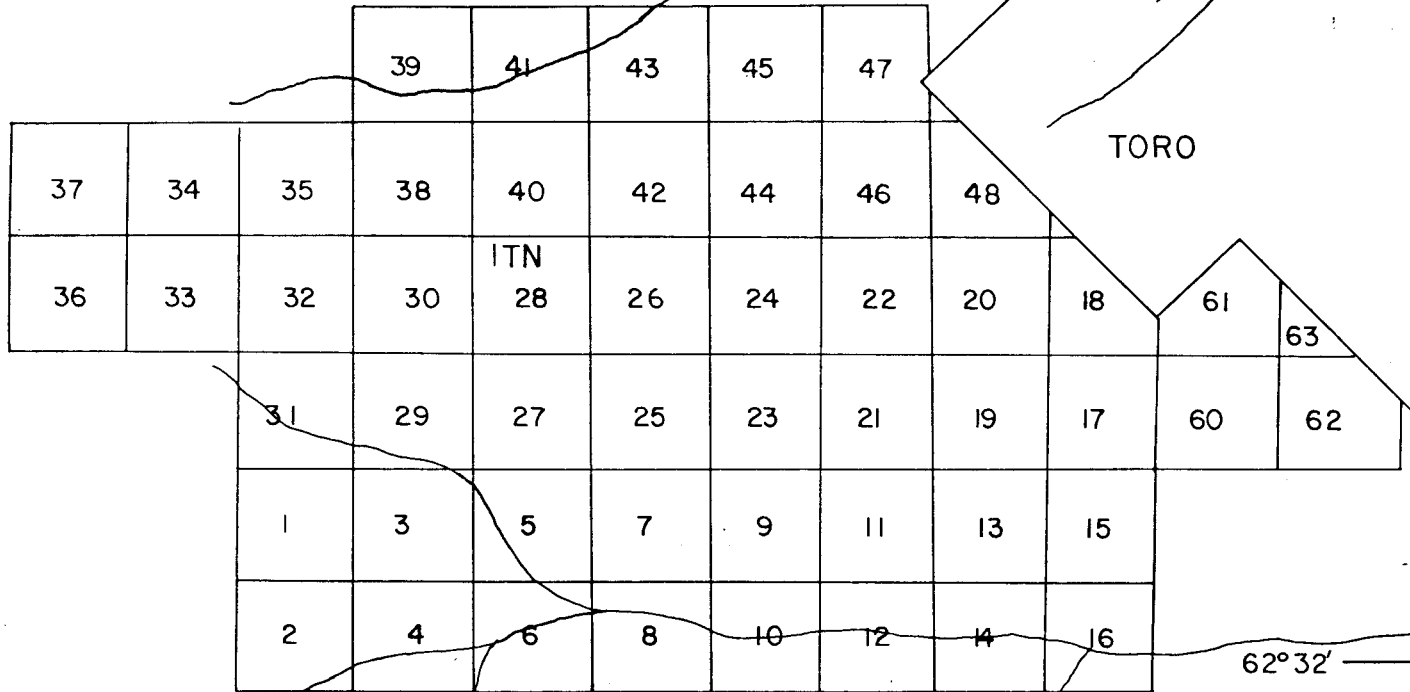


FIGURE T1  
 ARCHER, CATHRO & ASSOCIATES (1981) LIMITED  
 CLAIM MAP  
 NIT PROPERTY  
 FREEGOLD VENTURE  
*WAS ed*

## GEOLOGY AND MINERALIZATION

### General

Figure T2 on the following page illustrates the general geology which consists of Pelly Gneiss metamorphic rocks intruded by a complex of Cretaceous stocks and dykes.

### **PALEOZOIC OR EARLIER**

Pelly Gneiss (Psn) includes dirty quartzite, sericite-muscovite schist, amphibolite, chlorite schist and assorted gneisses. The chlorite schists often exhibit potassium feldspar and quartz veinlets that are conformable to foliation. Extensive hornfelsing is present adjacent to a granodiorite stock to the west.

### **CRETACEOUS**

Casino Granodiorite (Kgd) is resistant weathering and forms castellated ridges. It characteristically contains hornblende and biotite and ranges from equigranular to porphyritic with potassium feldspar phenocrysts up to 3 cm in diameter.

Coffee Creek Granite (Kg) is the predominant unit in the map area. It is normally a coarse-grained, equigranular, biotite-bearing leucogranite but grades locally to alaskite or quartz monzonite. All three phases are supergene clay altered, recessive weathering and form rusty subcrops.

Quartz-Feldspar Porphyry (Kmnr) consists of 2 to 5 mm quartz and feldspar phenocrysts in fine-grained to aphanitic felsic matrix. The unit is recessive and bright orange weathering. It forms a 300 m wide dyke, a 1000 m in diameter plug-like body and several small dykes.



Andesite (Kmn) occurs in dark, resistant weathering dykes and plugs cutting granite near the centre of the property. It consists of dark green porphyritic andesite with 2 to 3 mm plagioclase phenocrysts.

The 300 m wide feldspar porphyry dyke, which is located in the southwest part of the property, truncates against a large, east-northeast trending fault. It may have been offset from the 1000 m in diameter plug located near the centre of the property. The fault's trace is recessive and rocks adjacent to it are propylitically altered and often exhibit slickensides. It appears to be a major structure and the Tad porphyry deposit is developed where it intersects the Big Creek Fault. The Coffee Creek Granite south of the fault is relatively quartz-rich and contains no mafics, while the same unit north of the fault features abundant hornblende, pyroxene and chlorite with little quartz. A second, smaller fault lies south of the major structure and exhibits a 170 degree strike and 35 to 40 degree westerly dip.

No economic minerals were observed on the property except for minor chalcopyrite disseminated in granite exposed in old bulldozer trenches along its northern edge. A cobble-sized specimen of limonite- and quartz-cemented breccia was discovered in talus immediately south of the main fault near the centre of the property.

## GEOCHEMISTRY

### General

Soil samples were collected at 50 m intervals on compass and topofil controlled lines spaced 50 m apart in areas where Nat sampling had returned anomalous values, and at 100 m intervals on lines spaced 200 m apart over the remainder of the claim block. Survey control was provided by two baselines which are oriented approximately east-west and follow the claim lines. The baselines are marked with 1 m lath pickets every 100 m, while the sample sites are indicated by 0.5 m lath pickets bearing aluminum tags inscribed with the sample number and grid coordinates. All soils were taken from the B horizon except for a few C horizon ridge top samples and some mixed A and B horizon material from the frozen, north-facing slopes. Reconnaissance chip samples consisting of 2 by 2 cm fragments were collected at regular intervals from outcrop and/or talus slopes over lengths ranging from 10 to 100 m. Each sample contained 150 to 200 chips and weighed about 10 kg. The beginning and end of each sample length was marked by a 0.5 m lath picket bearing the sample number.

All samples were sent to Chemex Labs in North Vancouver. Soil samples were screened to -35 mesh, crushed and geochemically analyzed for gold using a fire assay preparation and neutron activation analysis. The rocks were crushed, ring pulverized to -100 mesh and then analyzed for gold by the same technique. Seven hundred and seventy-seven soil samples were later submitted for 30 element ICP analysis.

## Results

Figure T5 illustrates gold values while Figures T7 to 11 inclusive show silver, arsenic, lead, zinc and copper geochemical results, respectively. Background values for all metals are low. Anomalous gold, silver, arsenic, lead and zinc values largely coincide and form three tight clusters, labelled A, B and C. Copper values rarely exceed background.

Table 1 below shows the maximum value obtained for each anomaly for the various metals.

<u>Anomaly</u>	<u>Au ppb</u>	<u>Ag ppm</u>	<u>As ppm</u>	<u>Pb ppm</u>	<u>Zn ppm</u>	<u>Cu ppm</u>
A	1020	14.0	770	414	550	121
B	850	5.2	980	464	570	51
C	193	54.0	880	1550	420	27

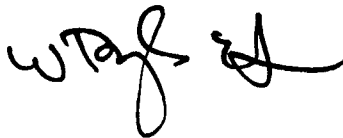
All three anomalies are in areas covered by moss and thick vegetation. Anomaly A is a 500 by 200 m area lying north of the main fault along a contact between feldspar porphyry and granite. The other anomalies are located south of the main fault and are underlain by granite. Anomaly B is elongate in an east-northeast direction and covers a 1000 by 400 m area with no apparent geological control, while Anomaly C has a 700 by 200 m crescent shape that coincides with the trace of the 170 degree striking, west-dipping fault. Nearly all of the reconnaissance chip samples were taken peripheral to Anomalies B and C and most returned background values similar to the surrounding soils. The highest value (19 ppb Au) was obtained from a 100 m long sample taken where Anomaly C crosses a ridge top. Other samples collected along the ridge returned less than 1 ppb Au.

DISCUSSION AND CONCLUSIONS

Geological data on the property is scant, but suggests potential for bulk tonnage deposits associated with feldspar porphyry dyking or higher grade mineralization related to faults. Pathfinder geochemistry best supports the vein fault model as this combination of metals and metal ratios is normally associated with epithermal veins elsewhere in the Dawson Range. The high gold and silver values and silver-to-lead ratios obtained from Anomaly C, coupled with its exposure on the ridge crest and known geological control, make it the logical target for the next stage of property evaluation.

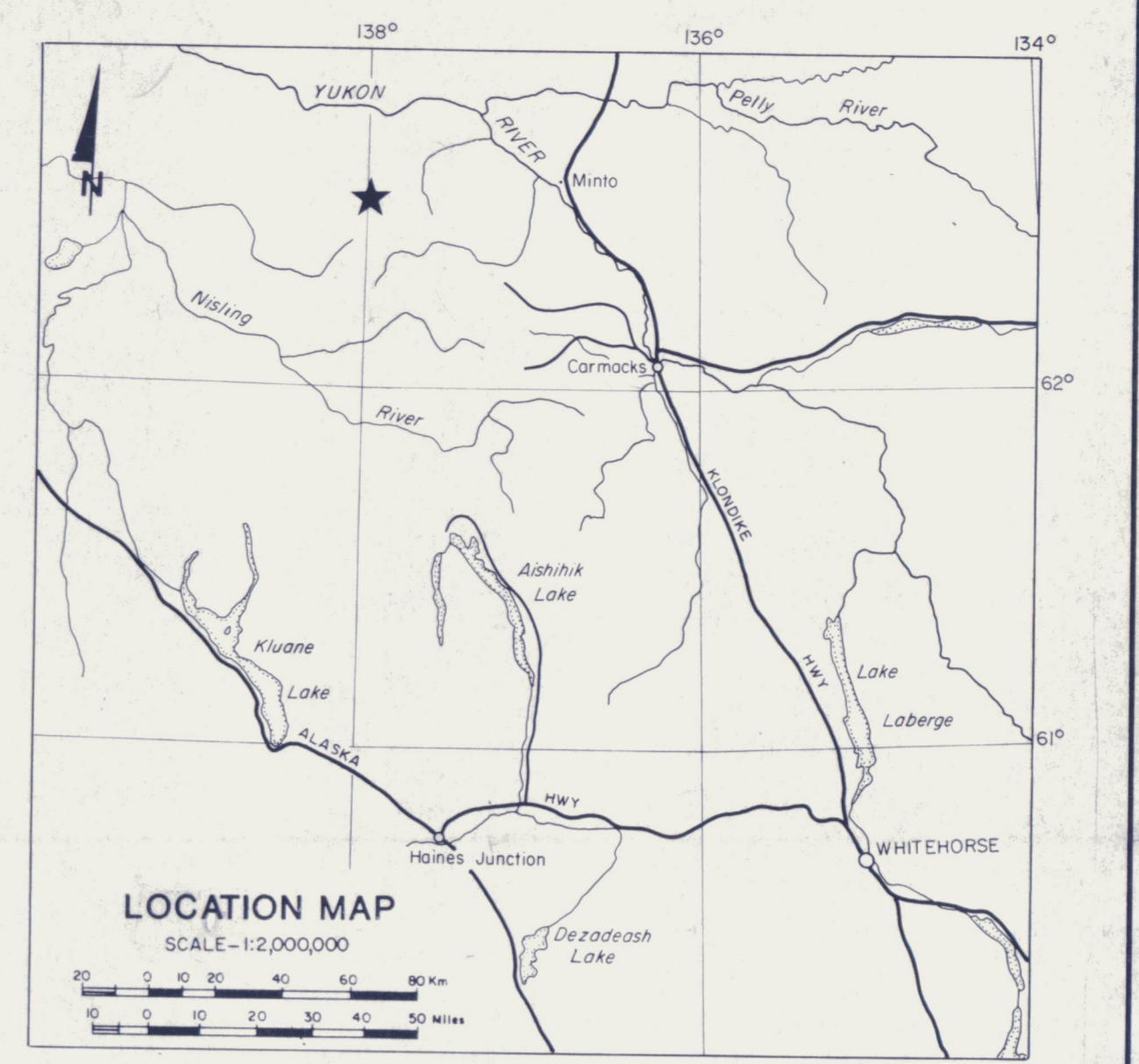
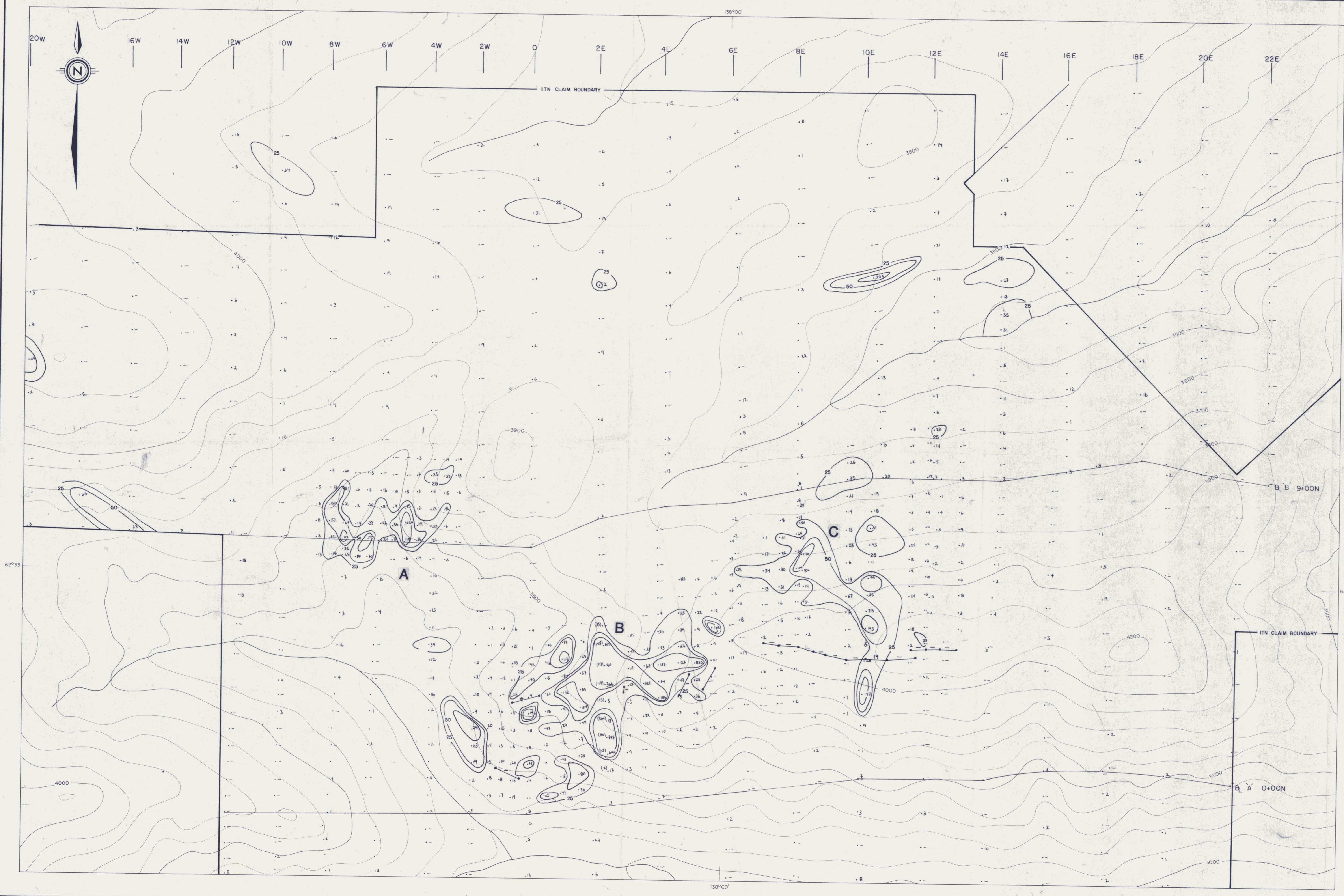
Respectfully submitted,

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

A handwritten signature in black ink, appearing to read 'W.D. Eaton', with a stylized flourish at the end.

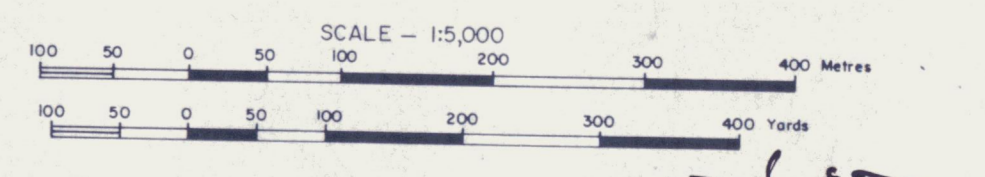
W.D. Eaton, B.A., B.Sc.

/mc

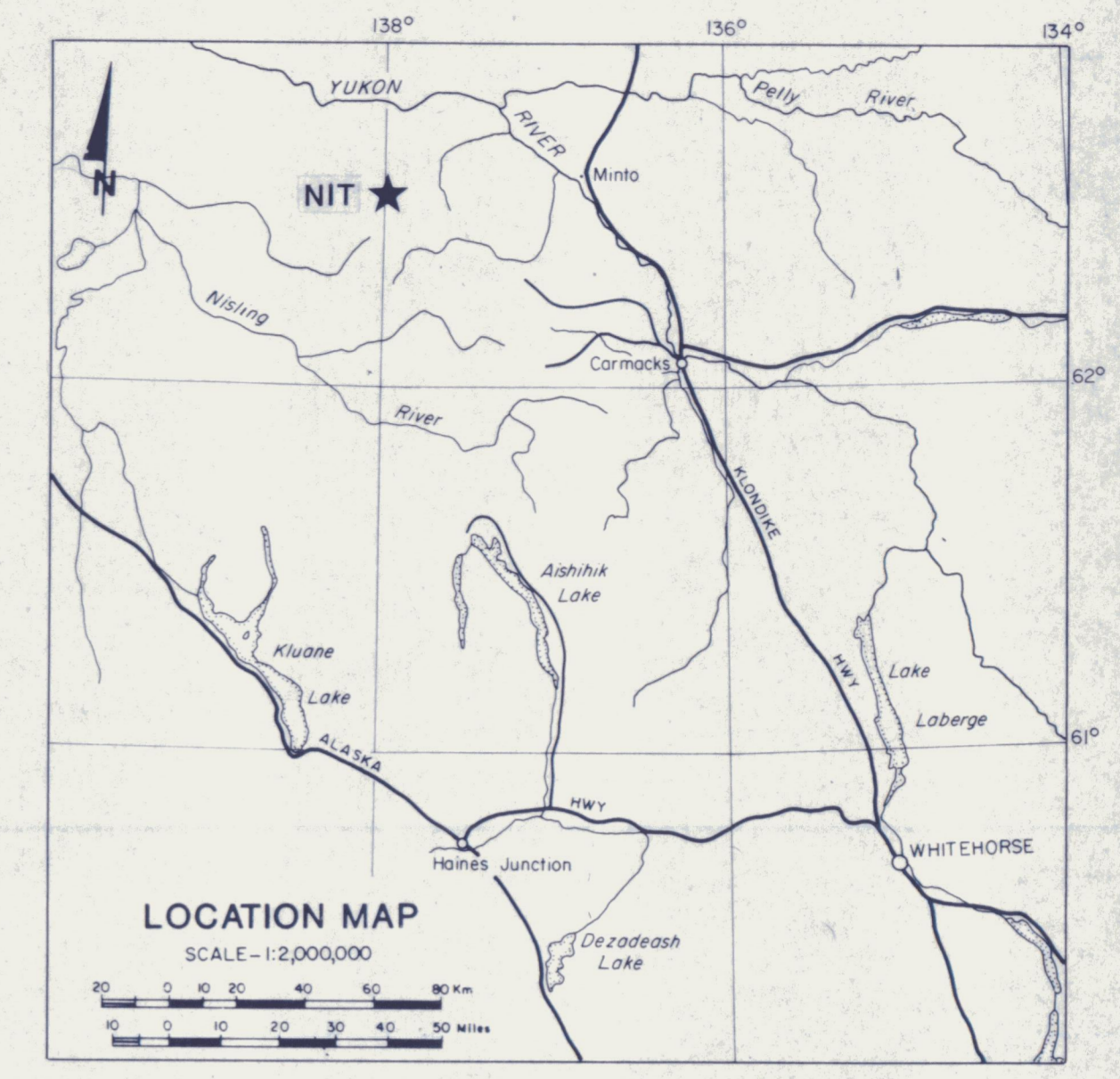
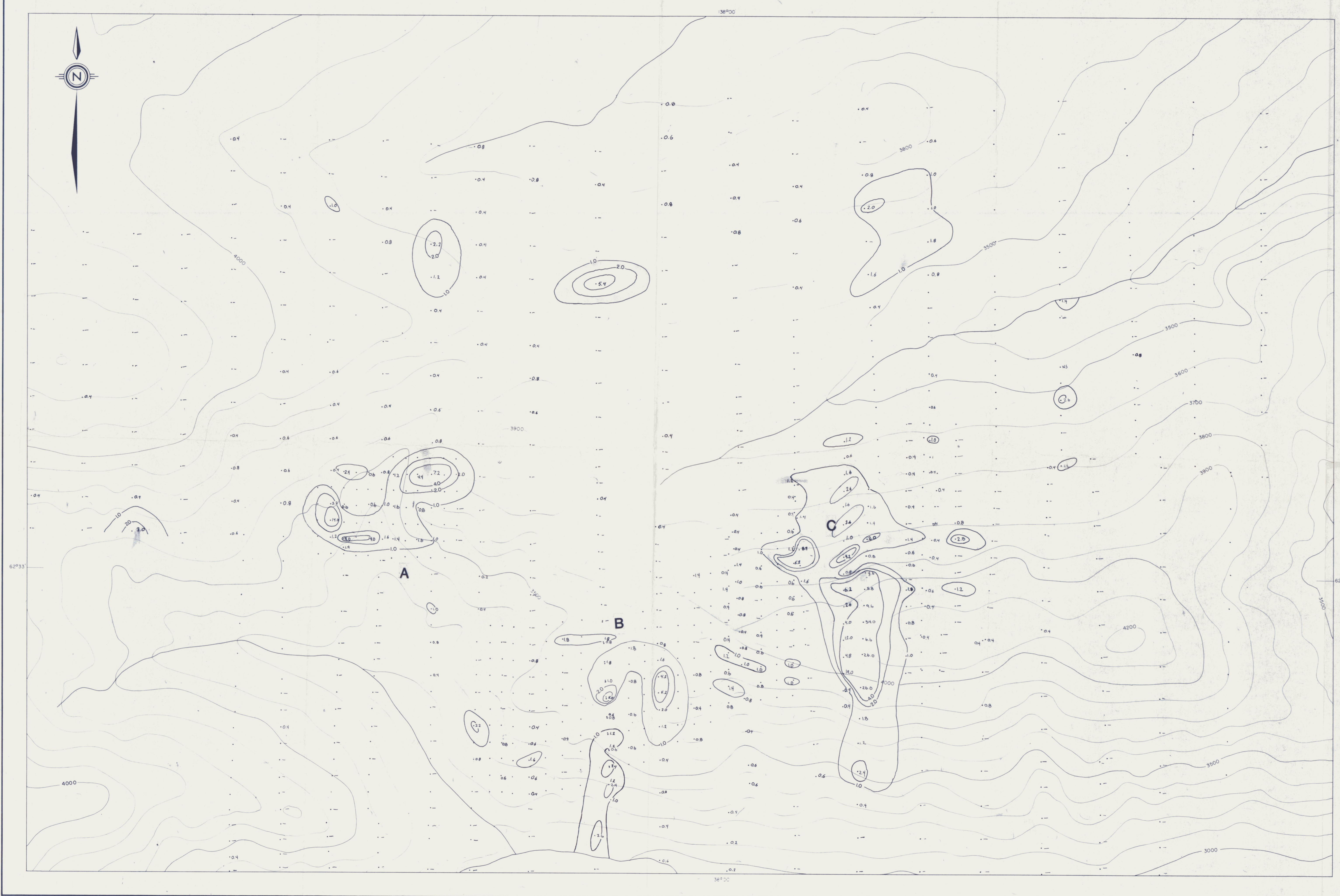


- LEGEND**
- 25 soil sample location with gold value in ppb
  - ← 5 reconnaissance chip sample with gold value in ppb
  - A anomalous zone

Figure T5 091803  
 ARCHER, CATHRO & ASSOCIATES (1981) LIMITED  
**GOLD GEOCHEMISTRY**  
 NIT PROPERTY  
 FREEGOLD VENTURE



W. J. Fisher  
 Revised March, 1986  
 To accompany report dated December, 1985



**LEGEND**

- Soil sample location with Ag in ppm
- A** Anomalous zone

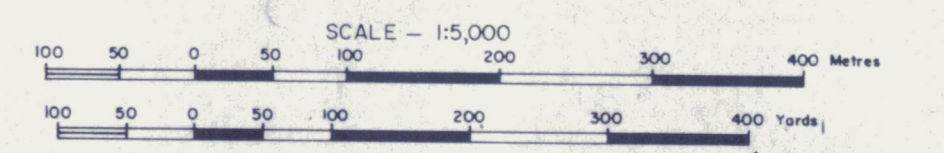
**FIGURE T7**

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

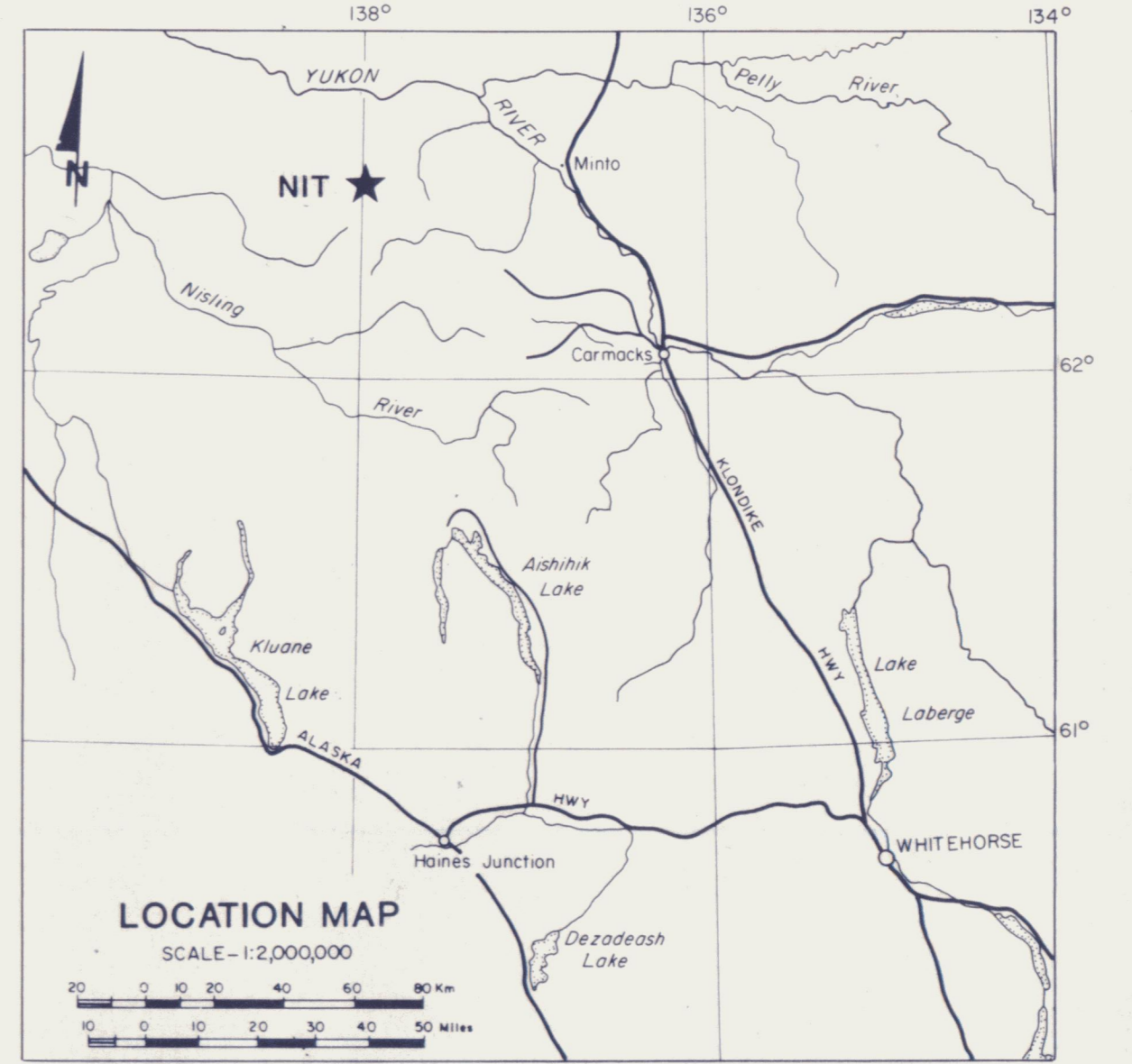
**SILVER GEOCHEMISTRY**

**NIT PROPERTY**

**FREEGOLD VENTURE**



*W. J. Cathro*  
To accompany report dated March, 1986



**LEGEND**

- 250 Soil sample location with arsenic in ppm
- A Anomalous zone

091803

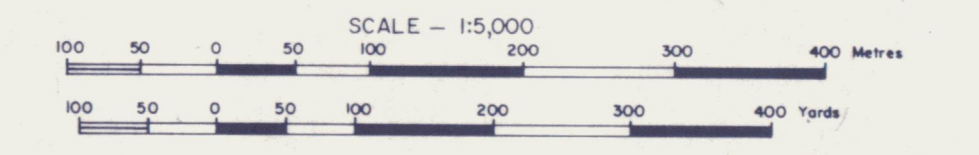
**FIGURE T8**

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**ARSENIC GEOCHEMISTRY**

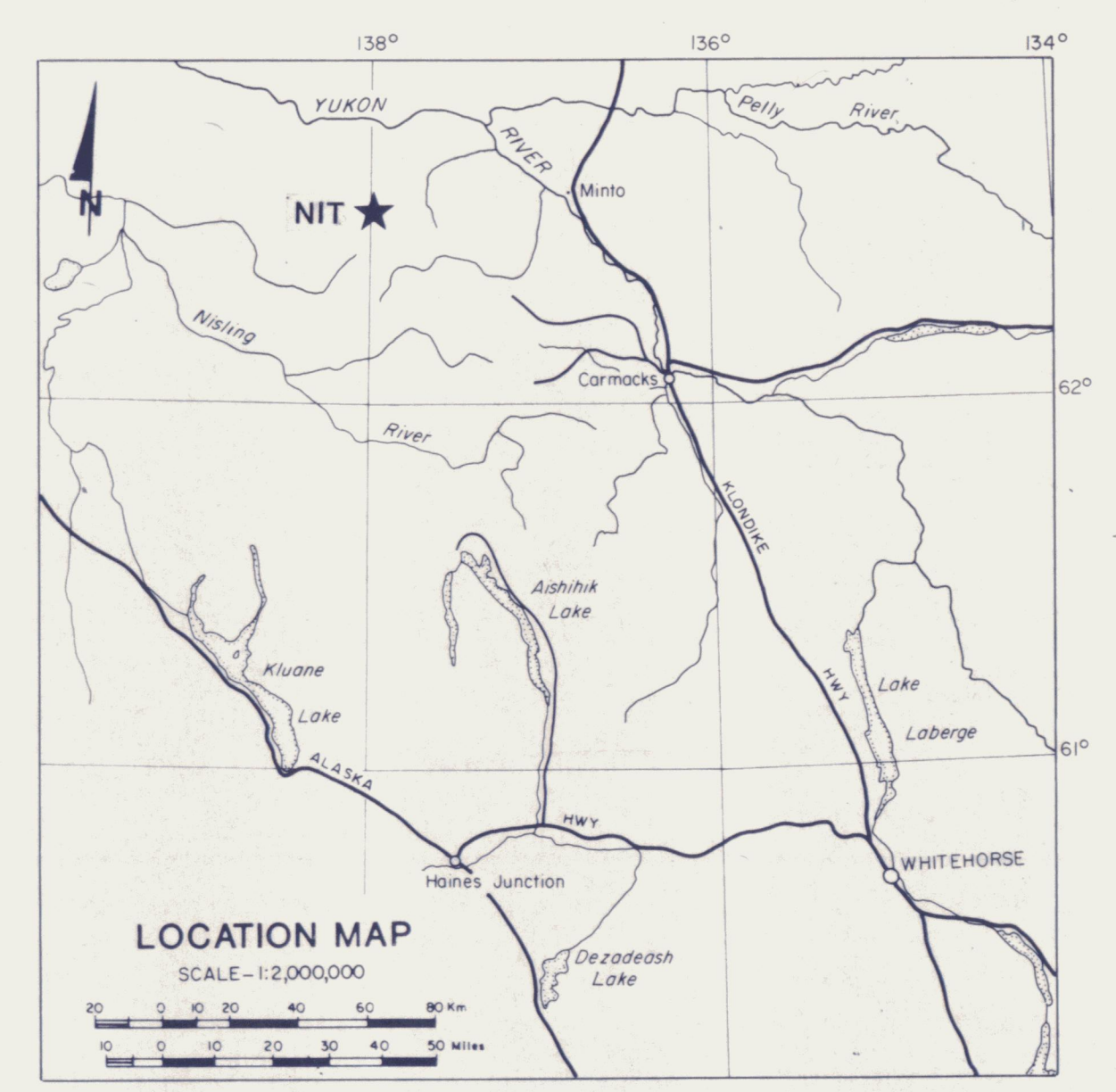
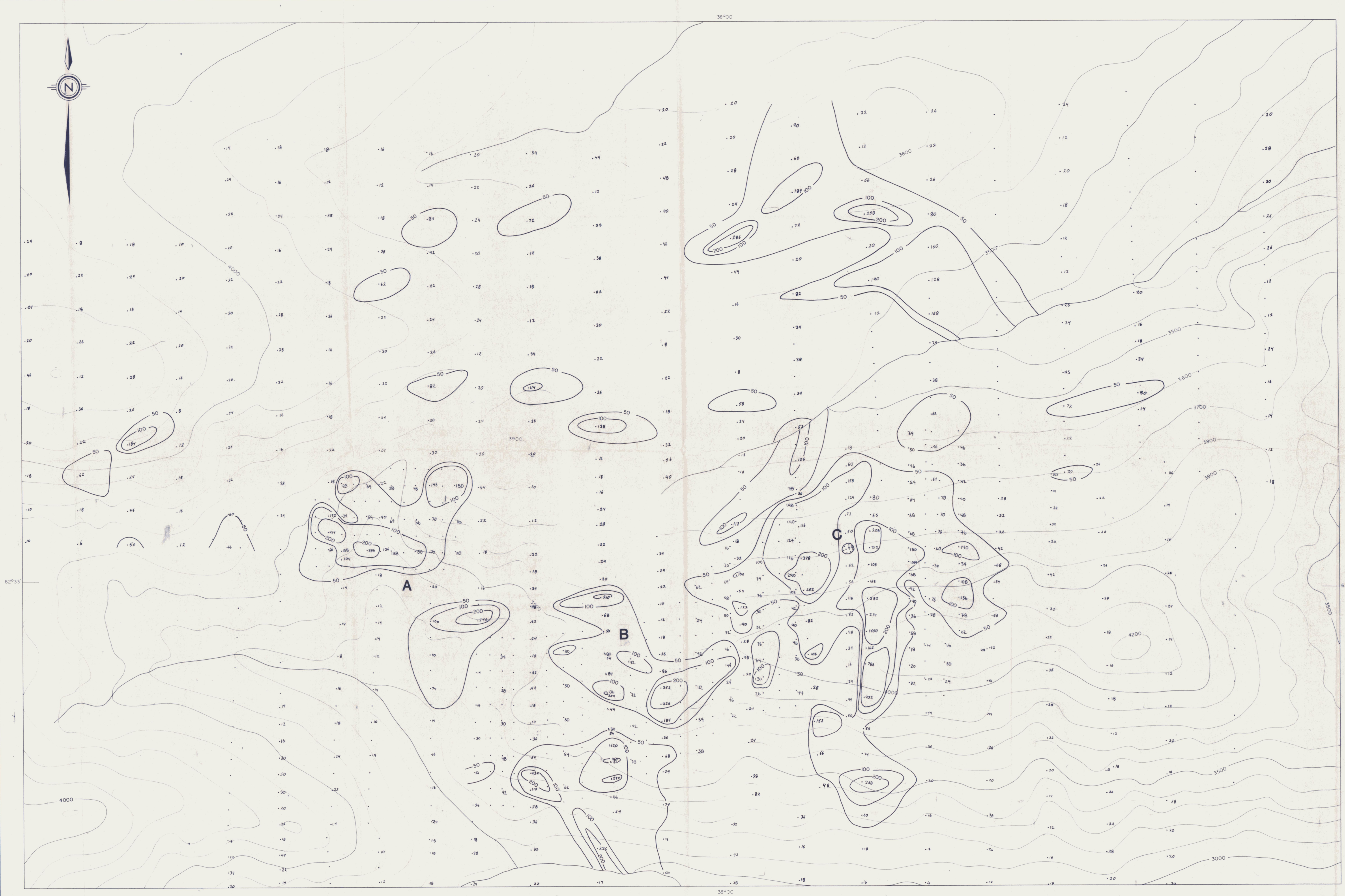
NIT PROPERTY

FREEGOLD VENTURE



*wof*

To accompany report dated March, 1986



**LEGEND**

- 64 Soil sample location with lead in ppm
- A Anomalous zone

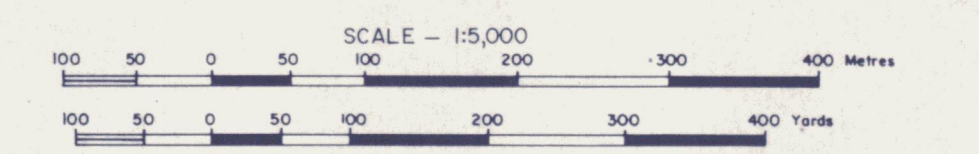
**FIGURE T9**

ARCHER, CATRO & ASSOCIATES (1981) LIMITED

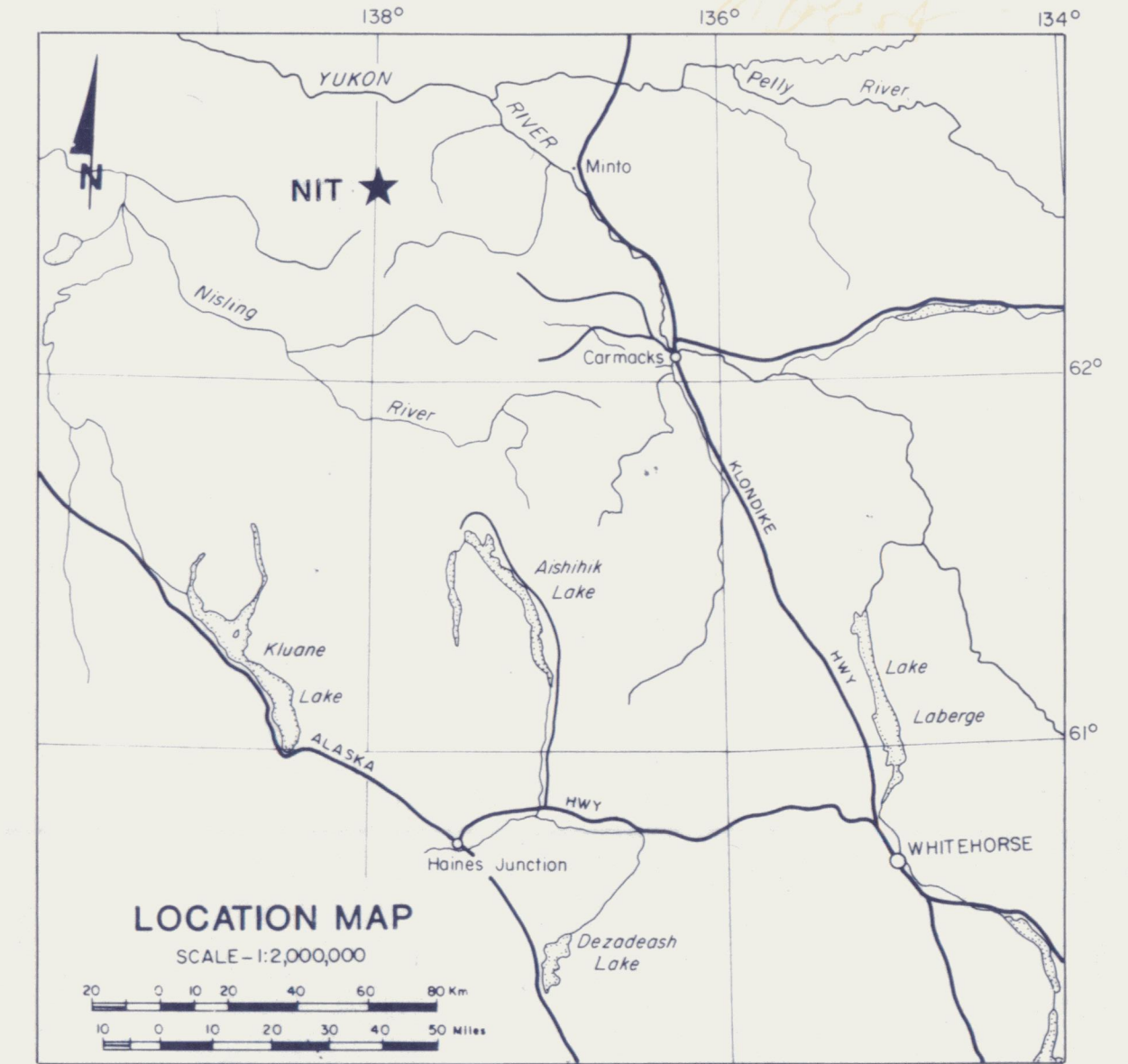
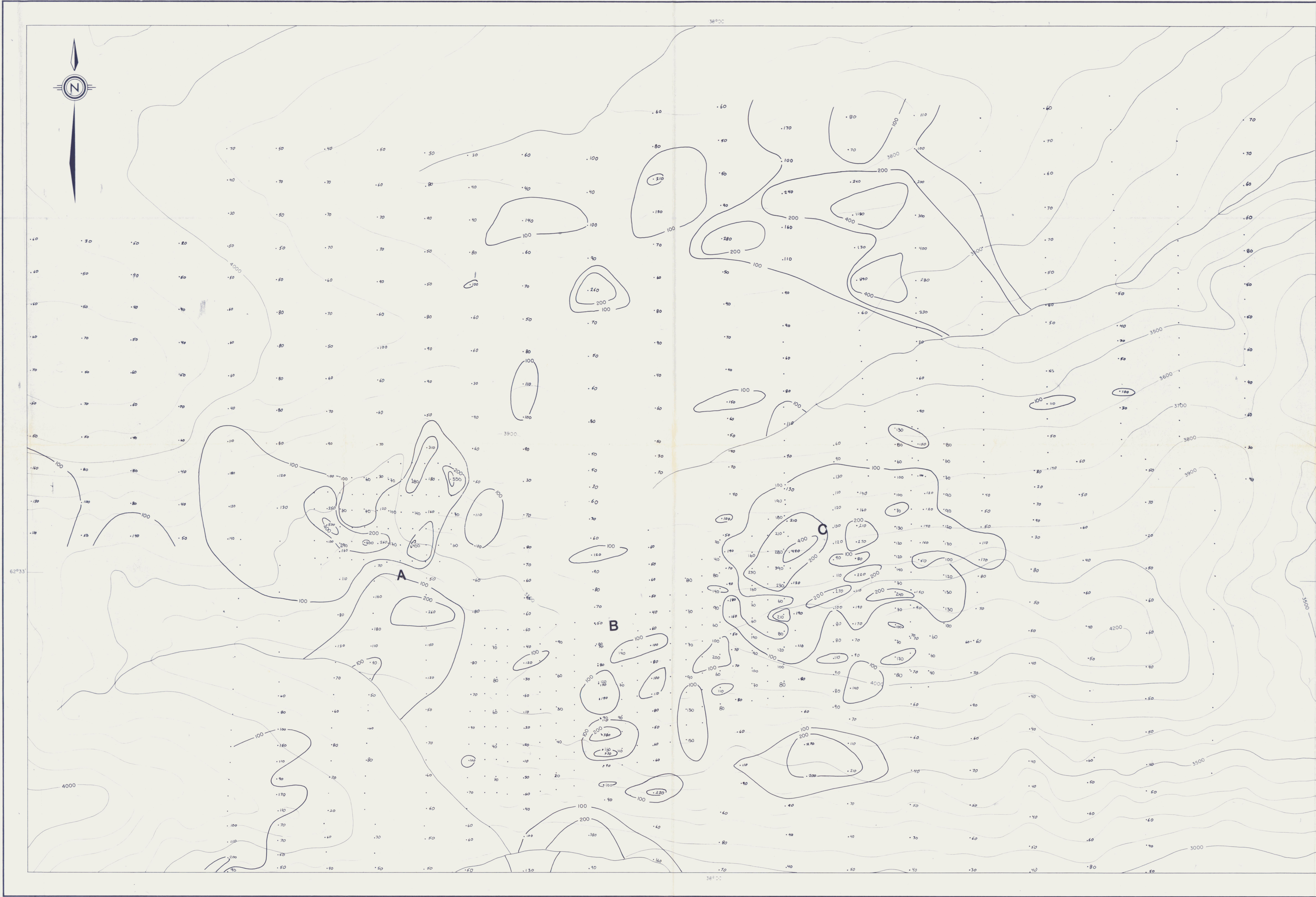
**LEAD GEOCHEMISTRY**

**NIT PROPERTY**

**FREEGOLD VENTURE**



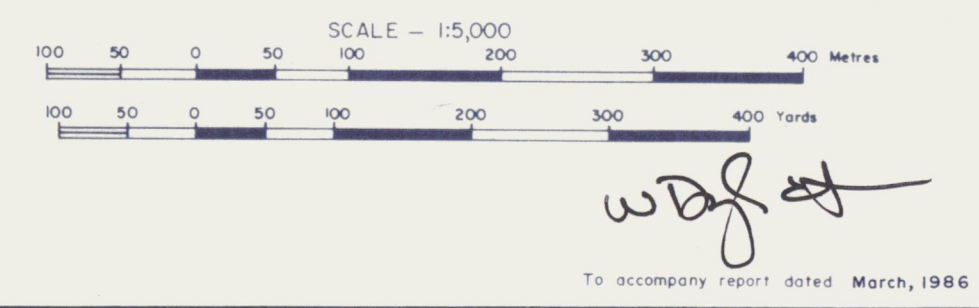
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To accompany report dated March, 1986



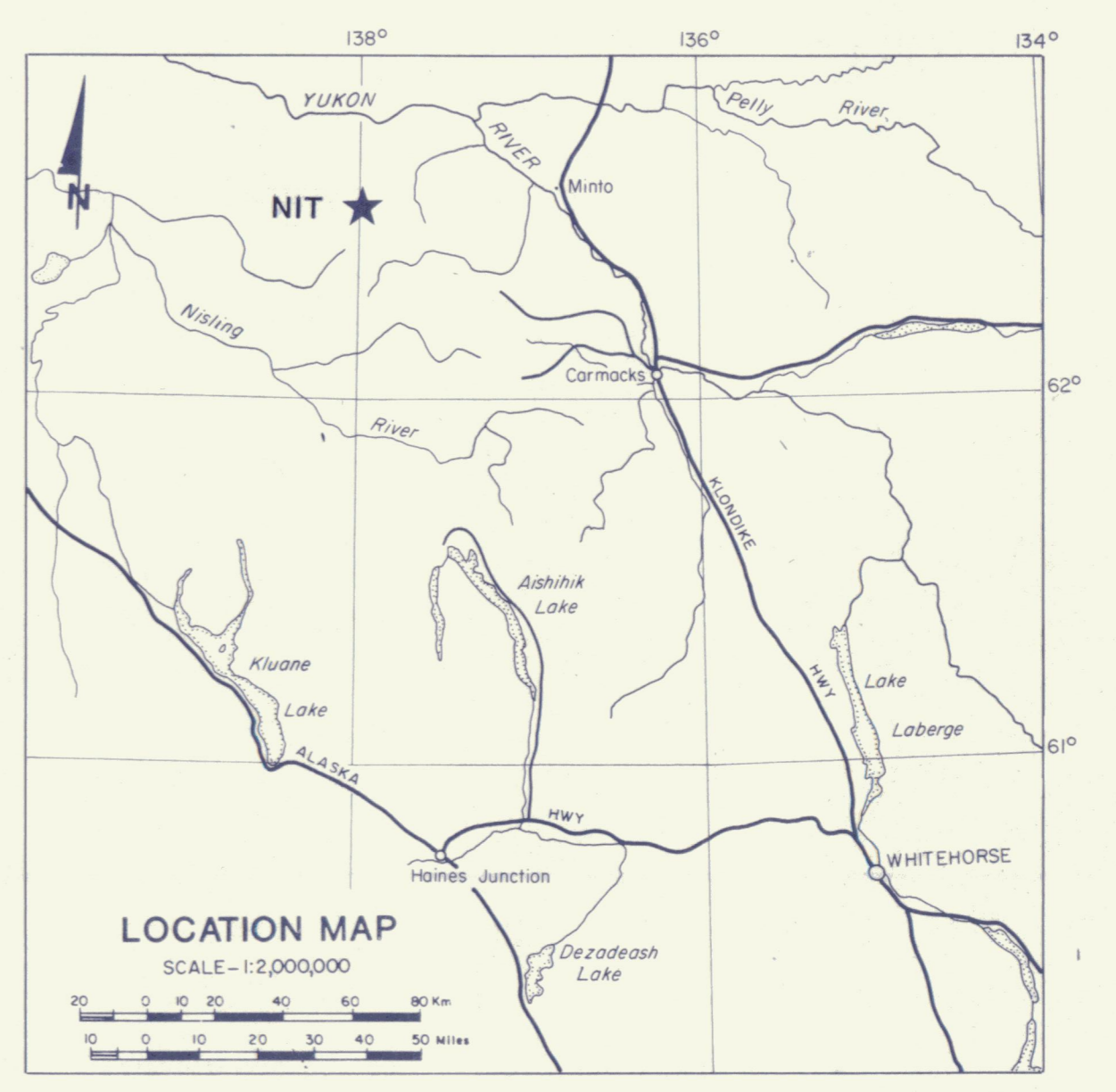
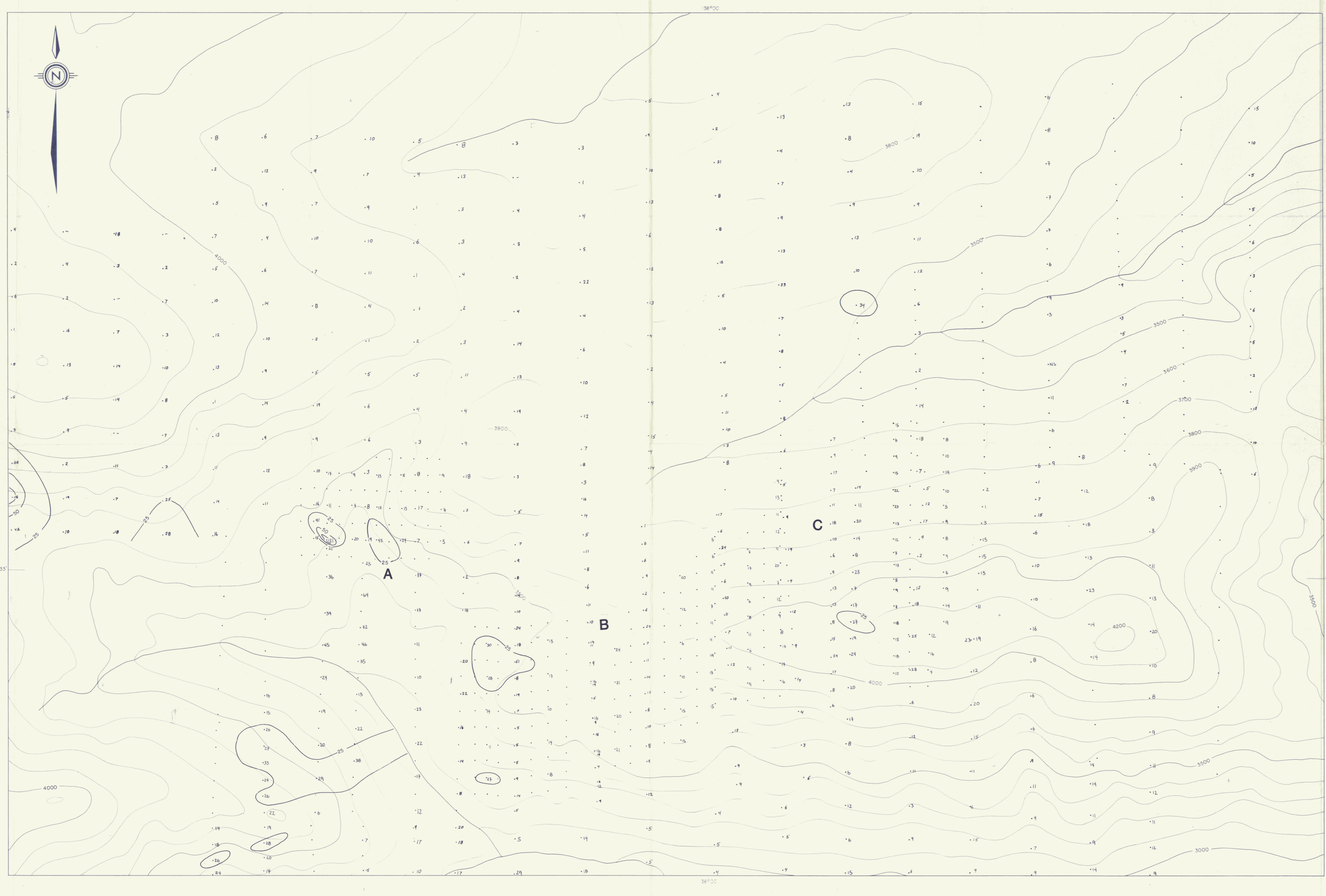
**LEGEND**

- 890 Soil sample location with zinc in ppm
- A** Anomalous zone

**FIGURE T10** 091803  
 ARCHER, CATHRO & ASSOCIATES (1981) LIMITED  
**ZINC GEOCHEMISTRY**  
 NIT PROPERTY  
 FREEGOLD VENTURE



To accompany report dated March, 1986



**LEGEND**

• 28 Soil sample location with copper in ppm

**A** Anomalous zone

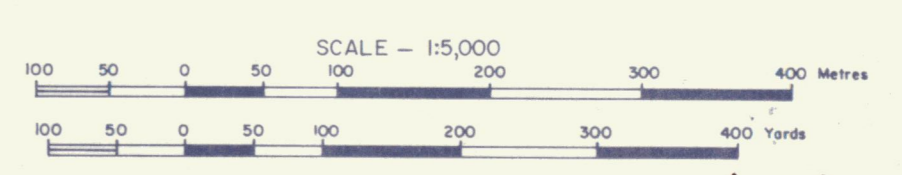
**FIGURE T11**

ARCHER, CATRO & ASSOCIATES (1981) LIMITED

**COPPER GEOCHEMISTRY**

**NIT PROPERTY**

FREEGOLD VENTURE



*W.D.F.*

To accompany report dated March, 1986

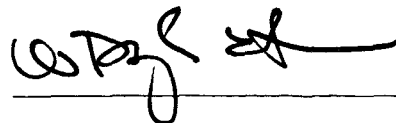
APPENDIX I

Author's Statement of Qualifications

STATEMENT OF QUALIFICATIONS

I, W. Douglas Eaton, geologist, with business addresses in Whitehorse, Yukon Territory and Vancouver, British Columbia, and residential address in Burnaby, British Columbia, do hereby declare:

1. I graduated from the University of British Columbia in 1980 with a B.Sc.
2. From 1971 to the present, I have been actively engaged in mineral exploration in British Columbia and Yukon Territory and on June 1, 1981, became a partner in Archer, Cathro & Associates (1981) Limited.
3. I have personally participated in or supervised the field work reported herein and have interpreted all data resulting from this work.



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W. Douglas Eaton, B.A., B.Sc.

APPENDIX II

List of Personnel

LIST OF PERSONNEL - NIT PROPERTY

DATES WORKED: June 18 to June 25 and July 29 to August 2, 1985

<u>NAME</u>	<u>ADDRESS</u>	<u>POSITION</u>
W. Halleran	Box 793, Fort St. James, B.C.	Geologist
M. Walls	913 - 9th Street S., Cranbrook, B.C.	Geologist
S. Boyce	Box 414, Westport, Ontario	Student
T. Mundle	#8-2104 West 37th Avenue, Vancouver, B.C.	Student
K. Sax	Box 555, Sedgewick, Alberta	Student
P. Schmidt	999 Ridgeway Street, Victoria, B.C.	Student
D. Sinclair	#606 - 2020 Belwood Avenue, Burnaby, B.C.	Student