COMBINED GEOLOGICAL, GEOCHEMICAL & GEOPHYSICAL REPORT

LAP CLAIM GROUP

61° 39' N 133° 10' W

WHITEHORSE MINING DIVISION

NTS 105F/11

BY

G. Holland

C. J. Westerman

UTAH MINES LTD. EXPLORATION DEPARTMENT

1977

090341

This report has been examined by the Geological [illegible] and is recommended to the [illegible] to be considered as representing the amount of $2400.00

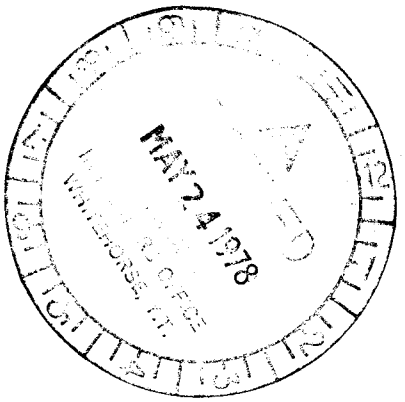
[illegible]
[illegible] Engineer

Considered as [illegible] station work under Section 53 (8) [illegible] Quartz Mining Act.

R. R. BAXTER
Supervising Mining Recorder

for Commissioner of Yukon Territory

TABLE OF CONTENTS



FIGURES

MAPS

SUMMARY

The LAP claim group is located in alpine terrain in the Pelly Mountains, Yukon Territory, approximately 53 kilometers southwest of the town of Ross River. The claims were staked on August 17, 1977 and recorded August 23, 1977 after geochemical soil anomalies were known to be present. The 1977 work program included geological mapping prospecting, a geochemical soil survey and a magnetometer survey.

The LAP claims are underlain by Upper Proterozoic to Lower Cambrian metasediments which strike northerly and dip at shallow angles to the east. The western part of the claims is underlain by biotite schists and quartzofeldspathic schists of Proterozoic age. Concordant granitoid material is locally abundant in the schists which are also intruded by a thin, fine grained, mafic diorite sill. A dolomitic limestone of Lower Cambrian age in the central part of the claims is probably separated from the schists by a fault. The eastern part of the claims is underlain by limey, phyllitic siltstones of Lower Cambrian age which have been intruded by dikes of coarse grained biotite granodiorite. The 1977 program located minor chalcopyrite in small, massive pyrrhotite pods in the mafic diorite sill in the southwestern part of the property. The geochemical soil survey has defined three lead-zinc anomalous zones. The reason for the presence of these zones has not yet been determined despite intensive prospecting. Anomaly 'A' may be due to downslope dispersion from a small source located in the central dolomitic limestone unit. The 550 metre width (E-W)

of anomalies B and C is almost entirely due to downslope migration. The anomalies are, however, almost continuous along a strike length of 700 metres (N-S) which is only partially downslope.

The magnetic survey revealed small anomalies related to pyrrhotite pods in the fine grained mafic diorite.Magnetic response in the vicinity of the geochemical anomalies is relatively flat.

INTRODUCTION

The LAP claim group is located in the Pelly Mountains, Yukon Territory approximately 53 kilometres southwest of the town of Ross River. The claim group lies within the Quiet Lake map sheet, NTS 105F/11, at latitude 61° 39'N and longitude 133° 10'W.

Access to the claim group is by helicopter from Ross River. The South Canol Road passes 5.5 kilometres to the east of the property at Lapie Lakes.

Elevations on the claim group range from 4,500 feet to 6,500 feet. Topography is moderately steep with some cliff sections but access within the property presents no major problems. The majority of the property is above tree line with a large percentage of rock exposure on ridges but relatively little outcrop in valley floors.

CLAIMS

The LAP claims were staked by D. Perkins, T. Hodson and D. Rennie on August 17th, 1977 and registered on August 23, 1977 at the Mining Recorder's office in Whitehorse. The claim group comprises a total of twenty-four (24) claims staked on a bearing of zero degrees true, in a block four claims wide and six claims long. Ownership of the claims was transferred to Utah Mines Ltd. on October 27th, 1977.

Claim Name	Record (Claim Tag) Numbers
LAP 1-24 inclusive	YA 19678 - YA 19701 inclusive

WORK PROGRAM

Four reconnaissance lines of soil samples were taken from the main cirque area in early June 1977. During July and August 1977 a survey control grid was established which consisted of a 2.6 km north-south baseline and 32.3 km of east-west survey lines. The geochemical soil survey collected a total of 593 soil samples from this grid. All soil samples were analyzed for copper, lead, zinc and silver. A vertical field magnetic intensity survey covering 472 stations and a total of 18.6 km of grid lines was also completed. Geological mapping and detailed prospecting was also carried out during this period. Personnel involved in the surveys were transported to the property daily by helicopter from a base camp at Fox Creek, 27 kilometres to the northeast.

GEOLOGICAL SURVEY

Regional Geology

The regional setting of the Pelly Mountains area has been summarized by Templeman-Kluit (1976, 1977).

The core of the Pelly Mountains is underlain by a miogeoclinal assemblage of clastic sediments, platform carbonates and volcanics ranging in age from Upper Proterozoic to Triassic. These rocks are part of the Pelly-Cassiar Platform. A belt of time-equivalent shales and associated classic sediments, lying to the northeast of the platform, are facies equivalents of rocks found within the Selwyn Basin. Southwest of the platform are metamorphosed shales, quartzites and volcanic rocks of the Yukon-Omineca Crystalline Terrain which are believed to be of Paleozoic age. The metamorphic rocks are locally covered by an overthrust assembly of late Paleozoic basalts, serpentinised peridotite and chert which are part of the Anvil-Campbell Allochthon.

In southern Quiet Lake map area (NTS 105F) the metamorphic rocks and overlying basic and ultrabasic assemblage have been thrust northeastwards over Upper Triassic rocks of the Pelly-Cassiar Platform. The Platform assemblage has also been affected by complex internal folding and faulting of post Triassic age. The entire region has been extensively invaded by mid-cretaceous granodiorite intrusions.

The LAP claim group is located within the southwestern part of the Pelly-Cassiar Platform.

Local Geology

Regional stratigraphic relationships indicate that the rocks underlying the LAP claim group are of Upper Proterozoic to Lower Cambrian age. Regional and local strikes are north-north-westerly and the strata dip consistently to the east at 20-30°. In the southern part of the claim group the strike changes gradually to a more northwesterly orientation. A carbonate horizon-which is centrally located within the claim block - conveniently divides the lithologic package into an upper (eastern) assemblage and a lower (western) assemblage.

The upper assemblage consists of grey-green, dark weathering, weakly calcareous phyllites of probable Lower Cambrian age. The phyllites are predominantly siltstones but locally contain thin argillaceous horizons. Primary compositional banding has been strongly transposed by a thoroughly penetrative phyllitic foliation.

The central carbonate horizon, which is in the order of 100 meters thick, is a massive bedded, orange weatherings, grey, dolomitic limestone. The limestone locally contains abundant quartz filled vugs and minor, randomly oriented, quartz healed fractures. In the vicinity of 92N, 97E the dolomite exhibits a rusty weathering due to the presence of both pyrite and pyrrhotite in veinlets and in vugs. The lowermost exposed 5 metres of the carbonate unit is thinner bedded and contains an abundance of argillaceous partings.

The contact between the carbonate unit and the lower (western) assemblage is not exposed. In view of the abrupt change in metamorphic grade across this contact it is assumed to be a fault.

The lower (western) assemblage consists of interlayered quartzo-feldspathic schists and biotite schists which have been metamorphosed to amphibolite grade. Compositional banding in this package parallels the strong metamorphic foliation. Field estimates indicate that the medium grained quartzo-feldspathic schists are composed of approximately 50% quartz, 42% feldspar, 5% biotite and 3% muscovite. Pink almandine garnet is a common accessary mineral. The finer grained biotite-schist is composed of approximately 40% biotite, 10% muscovite, 25% quartz and 25% feldspar. The two types of schist are commonly interlayered on all scales and the units depicted on the accompanying map are defined in terms of the dominant type present. Gradational boundaries between these two types are more abundant than sharp contacts.

The lower assemblage also contains a variable proportion of leucocratic granitoid rock. This component is present in a wide variety of forms varying from leucosome stringers a few centimeters wide to concordant sills or "lit-par-lit" injections up to a metre in width. Rapid compositional variations from tonalite through to granite are common and much of this granitoid component contains pink garnet as an accessory mineral. It is probable that part of the granitoid component was generated by "in-situ" anatexis and part was intruded as concordant sills.

A single grey marble horizon occurs as thin, discontinuous lenses within the schist assemblage, close to the western margin of the claim block. The carbonate horizon is underlain by a fine grained, mafic diorite sill which is four to five metres thick. The diorite has purple to rusty weathering colouration and carries trace quantities of disseminated pyrrhotite. Small pods of massive pyrrhotite are locally present which contain trace amounts of chalcopyrite.

The lower assemblage has been mapped by Templeman-Kluit (1977) as being of Proterozoic and/or Lower Cambrian age.

Phyllitic siltstones of the upper (eastern) assemblage are intruded at two localities by dikes of porphyritic biotite granodiorite. The granodiorite contains coarse phenocrysts of biotite, quartz and felspar set in a fine grained lencocratic matrix. The dikes have deeply dipping contacts which strike 070° T.

MINERALIZATION

Small pods of massive pyrrhotite up to 20 cms in maximum dimension occur within the fine grained mafic diorite sill at two localities in the western part of the claim block. Trace amounts of fine grained chalcopyrite occur in these pods. The mafic diorite also carries accessary quantities of fine grained, disseminated pyrite, pyrrhotite and chalcopyrite in most outcrops.

The central limestone unit contains minor quantities of pyrite and pyrrhotite in vugs and irregular veinlets in the vicinity of grid location 92N, 97E. Soil samples from this area returned anomalous geochemical values for lead, zinc and silver. Despite intensive detailed prospecting

no primary or secondary mineralization could be found to account for these high soil geochemical values.

GEOCHEMICAL SURVEY

Soil samples were collected from four reconnaissance survey lines run parallel to the creek in the main cirque area during June, 1977. The area of this survey was restricted due to extensive snow cover. From a total of 54 samples collected, only one - located at the extreme south-western corner of the reconnaissance grid - returned anomalous geochemical values.

During July and August 1977 a survey control grid was established which consisted of a 2.6 km north-south baseline and 32.3 km of east-west survey lines, spaced 100 metres apart. Soil samples were taken from locations on the survey lines spaced at intervals of 50 metres. The samples were taken, where possible, from the "C" soil horizon and placed in Kraft sample envelopes marked with the sample location. At locations where a soil horizon was not present, samples were taken from fine grained talus material. All samples were forwarded to Bondar Clegg and Co. Ltd., 136B Industrial Road, Whitehorse, Yukon, for analysis. After drying in an electric oven, the samples were screened and the minus 80 mesh fraction was digested in a perchloric-nitric acid solution. Quantitive analysis of silver, copper, lead and zinc was performed by the atomic absorption technique and results recorded in parts per million (ppm). Background corrections were applied to all silver and lead analyses.

Statistical analysis of the results indicates effective thresholds values of 160 ppm Zn, 75 ppm Pb and 55 ppm Cu. Ninety percent (90%) of the analysed values fall below these thresholds.

Anomalous zinc and lead values coincide to outline three anomalous areas referred to as zones A, B and C. The lead values in fact outline slightly larger anomalous areas than the zinc values and tend to link zones B and C. Anomalous copper values occur at the southern margin of zone B and are continuous into an anomalous area coincident with zone A. Copper also defines two small, weakly anomalous areas in the southern part of the survey grid - zones D and E - which lack any coincident lead and zinc anomalies.

Anomalous zone A has dimensions of 200 metres E-W, across strike, on a gentle slope to the east and 300 metres N-S, along strike and down a steep northerly slope. Anomalous values in zone A range up to 2150 ppm Zn, 2000 ppm Pb, 215 ppm Cu and 15 ppm Ag. The source for this zone can be located fairly accurately at 92N, 97E. Outcrop and talus at this location consists of orange weathering, dolomitic limestone containing between two and three percent of pyrite and pyrrhotite in irregular veinlets and vugs. Despite intensive prospecting no other sulphide or secondary minerals could be found to explain the anomaly.

Anomalous zone B covers the north and east slopes of the main ridge on the property and is open to the west. Dimensions of the anomaly are approximately 550 metres E-W, across

strike and 350meters N-S parallel to strike. Anomalous soil values range from 220 ppm to 400 ppm Zn (mode 250 ppm Zn) and from 75 ppm to 1120 ppm Pb (mode 450 ppm Pb). Silver values are generally less than 1.0 ppm. It is probable that the wide areal extent of this anomaly is due to downslope migration of material from a source in the area of grid station 91N, 90E. If this is correct, it is interesting to note that lead appears to have migrated further downslope than zinc.

Weakly anomalous values for copper ranging from 55 ppm to 80 ppm define a narrow zone elongate E-W along the southern margin of zone B. The anomalous copper values are continuous downslope into zone A and occur only at higher elevations on the northern slope of an east-west topographic ridge.

Prospecting has failed to reveal any primary or secondary mineralization in the abundant outcrop and talus which occurs along the ridge in the vicinity of grid station 91N, 90E. The quartzo-feldspathic schists and biotite schists in this locality contain trace amounts of pyrrhotite but no other sulphides were found.

Anomalous zone C is similar to zone B. Anomalous lead values in the range 80 ppm to 2200 ppm cover a greater area than anomalous zinc values in the range 270 ppm to 1120 ppm (mode approx. 600 ppm). The lead anomaly is almost continuous into zone B. The C zone extends downslope for 550 metres E-W and across strike; parallel to slope and strike it varies from 50 to 200 metres N-S. Prospecting of the C zone has not revealed any source for the geochemical anomaly.

The D and E anomalies are both small zones outlined by weakly anomalous copper values. These anomalies are probably related to the presence of minor amounts of chalcopyrite in small massive pyrrhotite pods within the fine grained mafic diorite sill.

MAGNETOMETER SURVEY

The magnetometer survey employed a vertical field fluxgate M-700 instrument. Readings were taken at 50 metre spacings on lines 100 metres apart for a total of 472 stations on 18.6 km of grid lines. Readings ranged from - 65 g to + 395g from an arbitrary base zero at station 90N, 100E. In general, the contoured magnetic values show little or no relation to bedrock geology or geochemical soil values. A small, isolated magnetic high at 91N, 96 + 50 E may be related to pyrrhotite present in the central dolomitic limestone at this location. This high is roughly coincident with geochemical anomaly A. Geochemical anomalies B and C are characterized by low, featureless magnetic response.

Magnetically high areas in the southwestern part of the survey grid may be related to pyrrhotite concentrations in the fine grained mafic diorite sill.

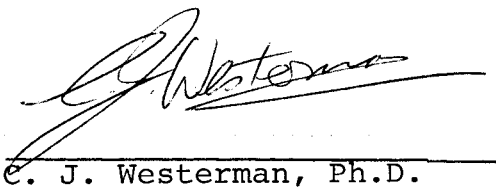
Magnetically high area in the northeastern part of the survey grid (98N, 100E) cannot be related to bedrock geology due to a lack of outcrop.

CONCLUSIONS AND RECOMMENDATIONS

The 1977 geological mapping and prospecting program has located minor chalcopyrite in association with small massive pyrrhotite pods in a fine grained mafic diorite sill in the western part of the property.

The geochemical soil sampling survey has revealed three lead-zinc anomalous zones. The reason for the presence of these anomalies has not yet been explained despite intensive prospecting. The magnetometer survey, which covered the geochemically anomalous areas, has been of little or no assistance in interpreting the geological and geochemical survey results.

From the available evidence it seems likely that the geochemical soil anomalies result from downslope dispersion of metals from three surface locations. ('A' zone 92N, 97E; 'B' zone 91N, 90E; 'C' zone 97N, 92E).



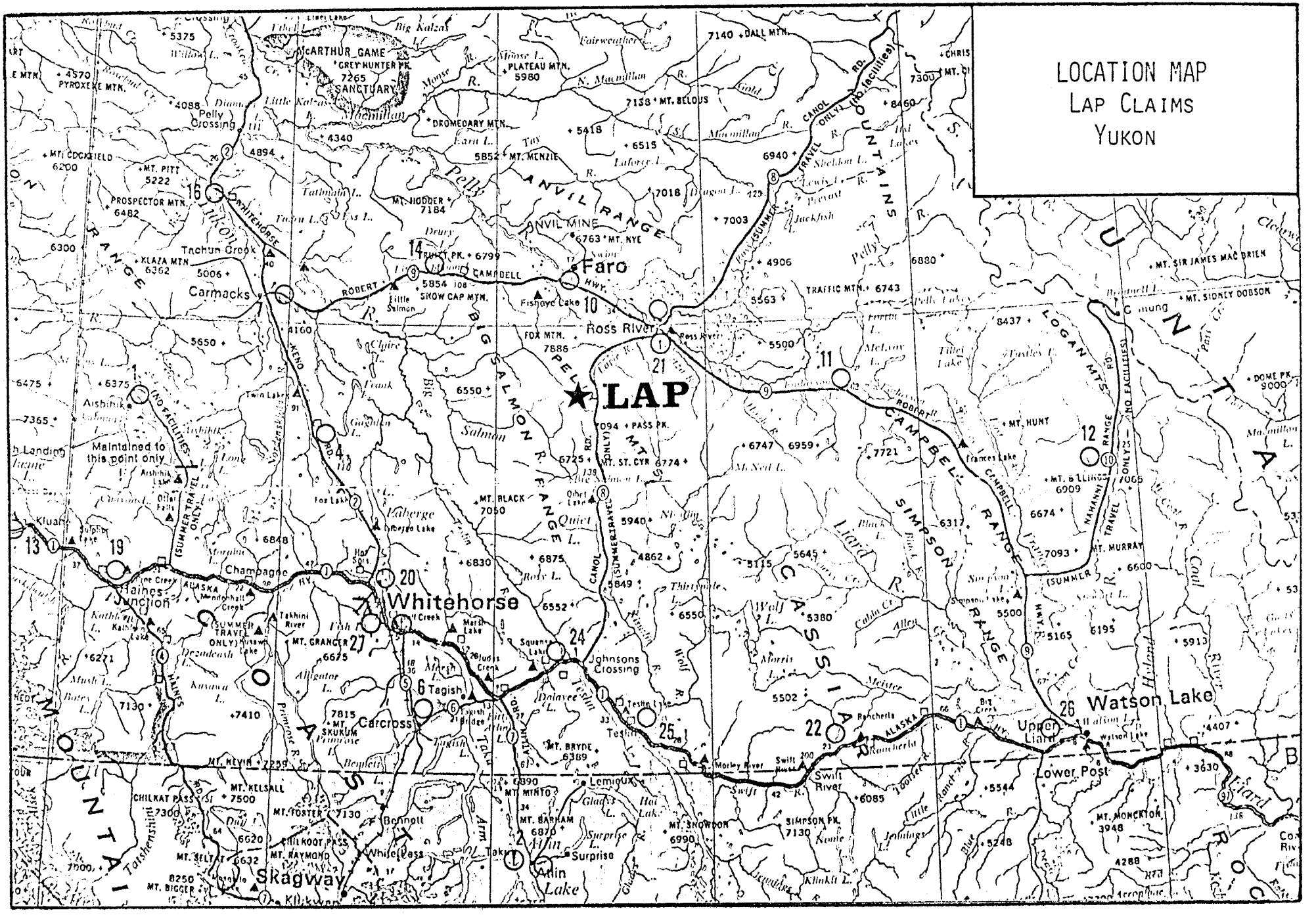
C. J. Westerman, Ph.D.
Senior Geologist, Utah Mines Ltd.
Fellow-Geological Associaion of Canada

May 11, 1978
Vancouver, B.C.

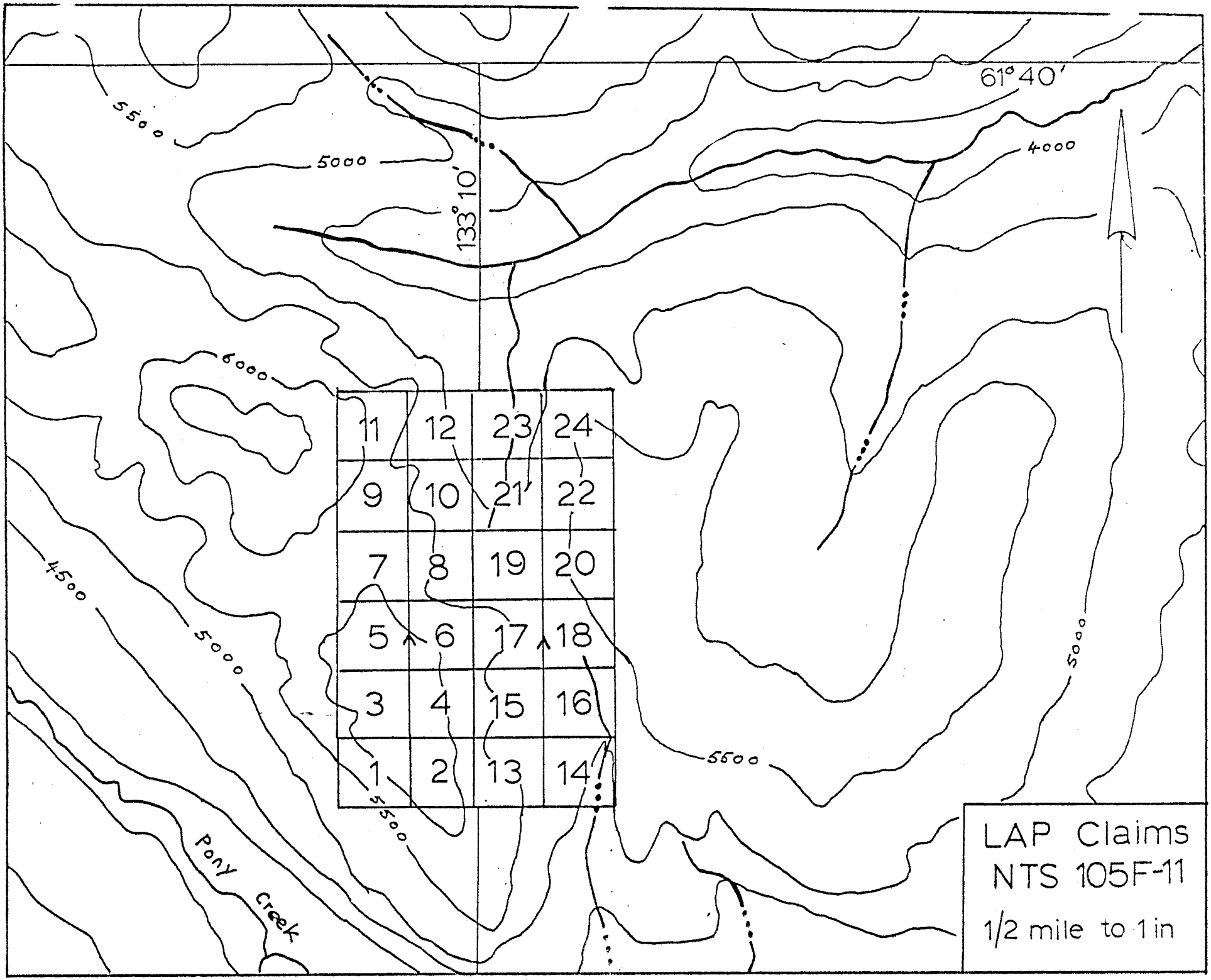
References

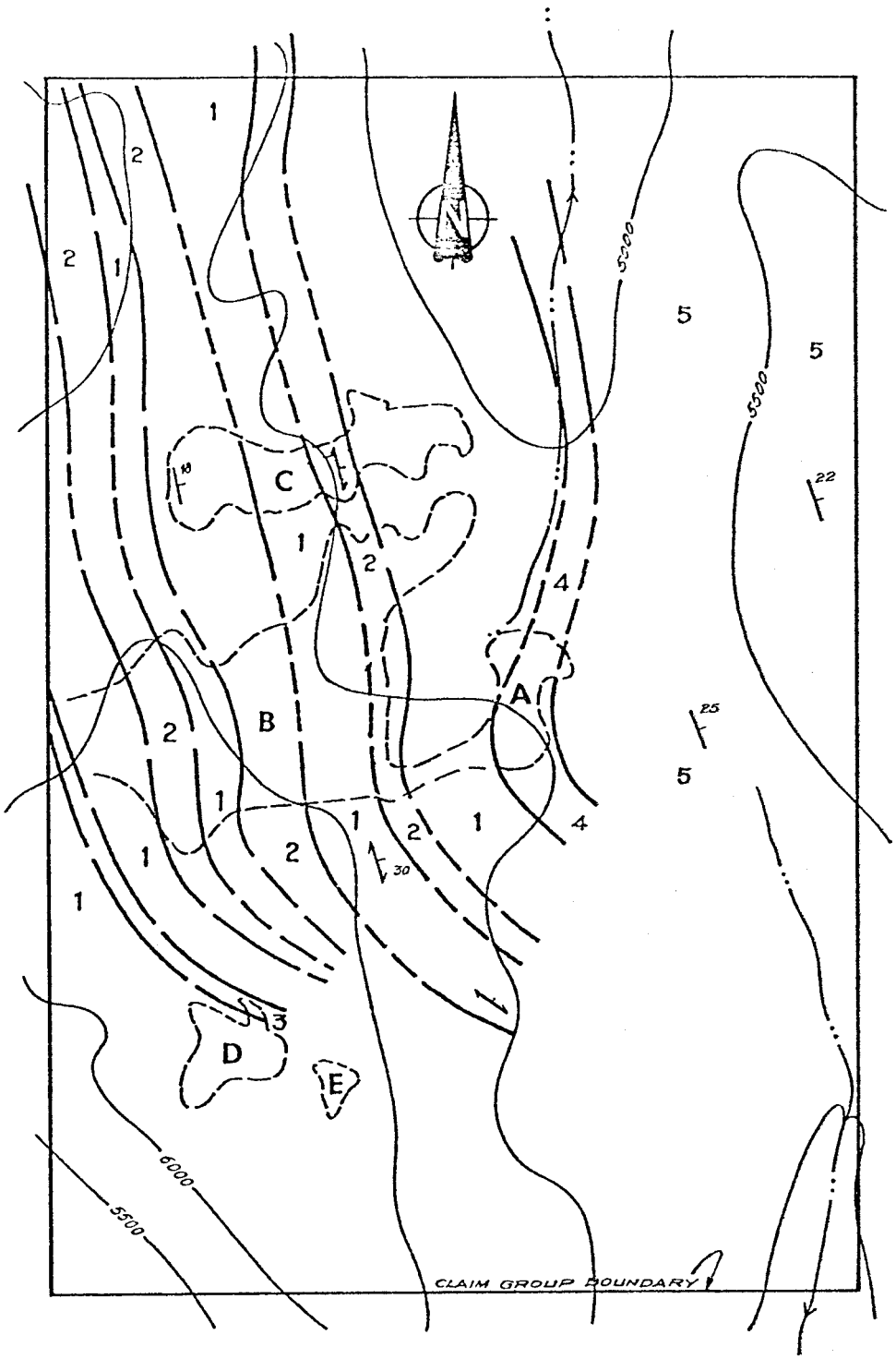
1. D.J. Templeman-Kluit, S.P. Gordey and B.C. Read 1976:
Stratigraphic and structural studies in the Pelly Mountains, Yukon Territory: Geol. Surv. Can., Paper 76-1A, pp. 97-106.

2. D.J. Templeman-Kluit (1977):
Stratigraphic and structural relations between the Selwyn Basin, Pelly-Cassiar platform and Yukon crystalline terrace in the Pelly Mountains, Yukon: Geol. Surv. Can., paper 77-1A, pp 233-227.



LOCATION MAP
LAP CLAIMS
YUKON


61°40'
133°10'
5500
5000
4000
6000
4500
5000
5000
5500
5500
11
12
23
24
9
10
21
22
7
8
19
20
5
6
17
18
3
4
15
16
1
2
13
14
Pony Creek
LAP Claims
NTS 105F-11
1/2 mile to 1 in



LEGEND :

L. Cambrian

5 Calcareous phyllite

4 Limestone

? Proterozoic

3 Diorite

2 Quartzo feldspathic schist

1 Biotite schist

(A) Geochemical soil anomaly

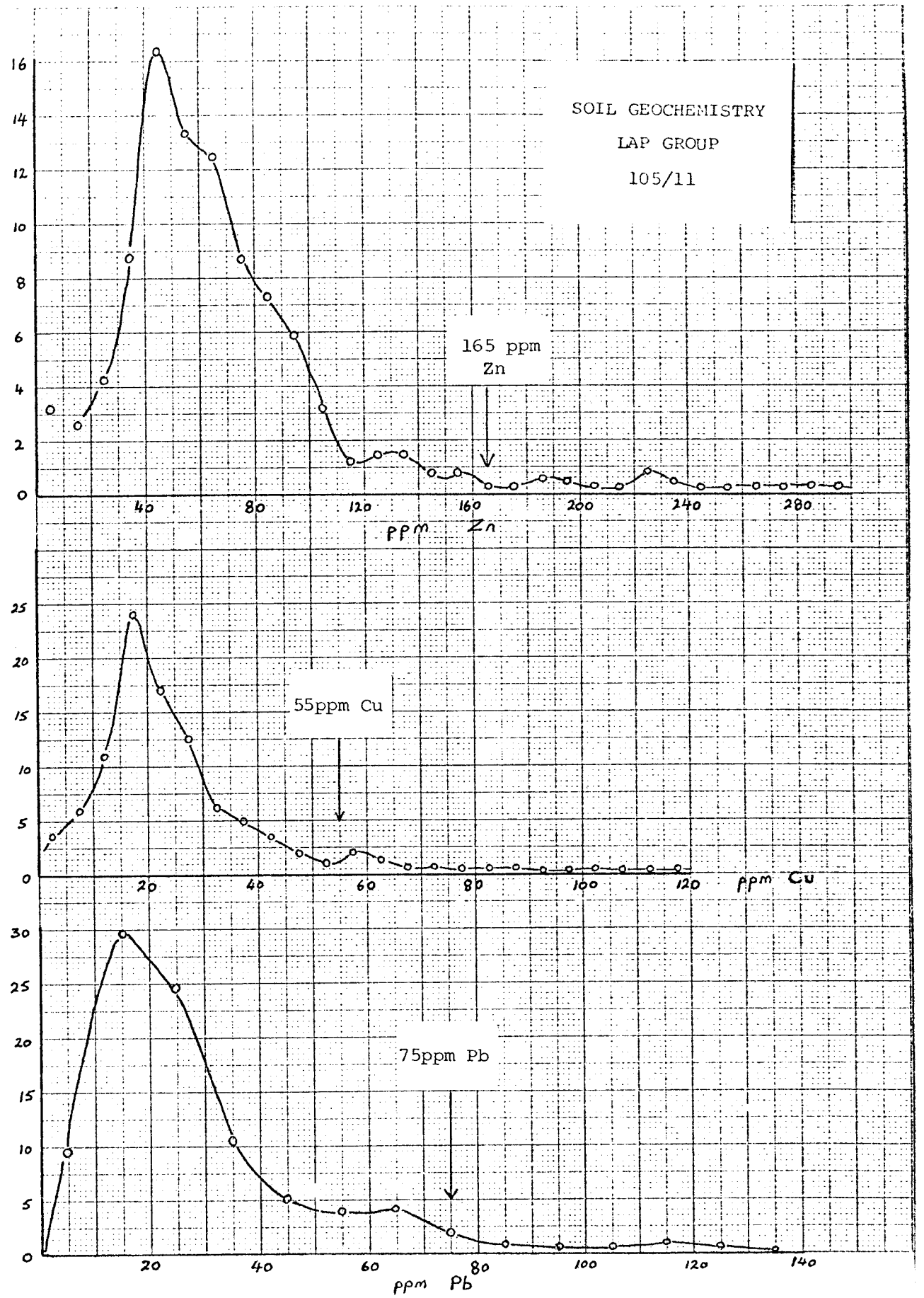
LAP CLAIM GROUP

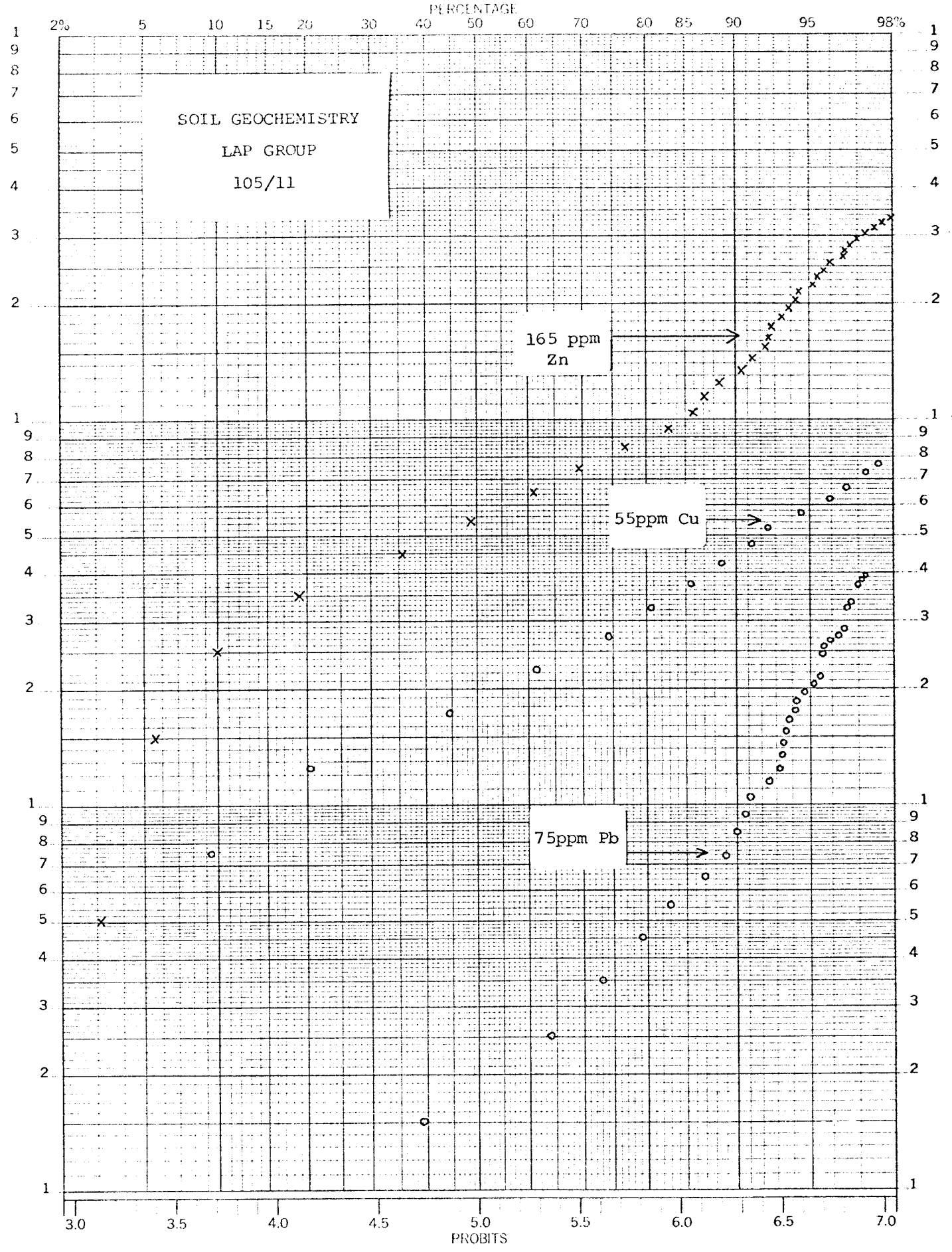
NTS 105 F-11

PELLY MOUNTAINS, YUKON

0 1000

SCALE: FEET


SOIL GEOCHEMISTRY
LAP GROUP
105/11
165 ppm
Zn
ppm Zn
55ppm Cu
ppm Cu
75ppm Pb
ppm Pb


PERCENTAGE
2%
5
10
15
20
30
40
50
60
70
80
85
90
95
98%
SOIL GEOCHEMISTRY
LAP GROUP
105/11
165 ppm
Zn
55ppm Cu
75ppm Pb
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5
7.0
PROBITS

133°10'W

61°39'N

5000

4500

5000

84E 86E 88E 90E 92E 94E 96E 98E 100E 102E 104E 106E 108E 110E

104N

100N

96N

92N

88N

84N

6000

5500

5000

4500

4000

PONY CREEK

133°10'W

Cu | Zn
Ag | Pb

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
A. J. SCHMIDT

UTAH MINES LTD.

EXPLORATION DEPARTMENT

VANCOUVER BRITISH COLUMBIA

LAP CLAIMS

PELLY MOUNTAINS, YUKON

GEOCHEMISTRY

Work by:	Date:	NTS Ref.:	105 F/11
Drawn by:	Revised:		

SCALE: 1:5000

LINE 104 N

LINE 100 N

LINE 96 N

LINE 92 N

LINE 88 N

LINE 84 N

A

D

E

CREEK

61° 39' N

135° 0' W

4500

5000

5500

6000

4000

LEGEND

Soil Sample Location (Geochemical Survey Grid)

Soil Sample Location (Reconnaissance Sample)

NOTE: Copper Assays in ppm

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
A. J. SCHMIDT

UTAH MINES LTD.
EXPLORATION DEPARTMENT
VANCOUVER BRITISH COLUMBIA

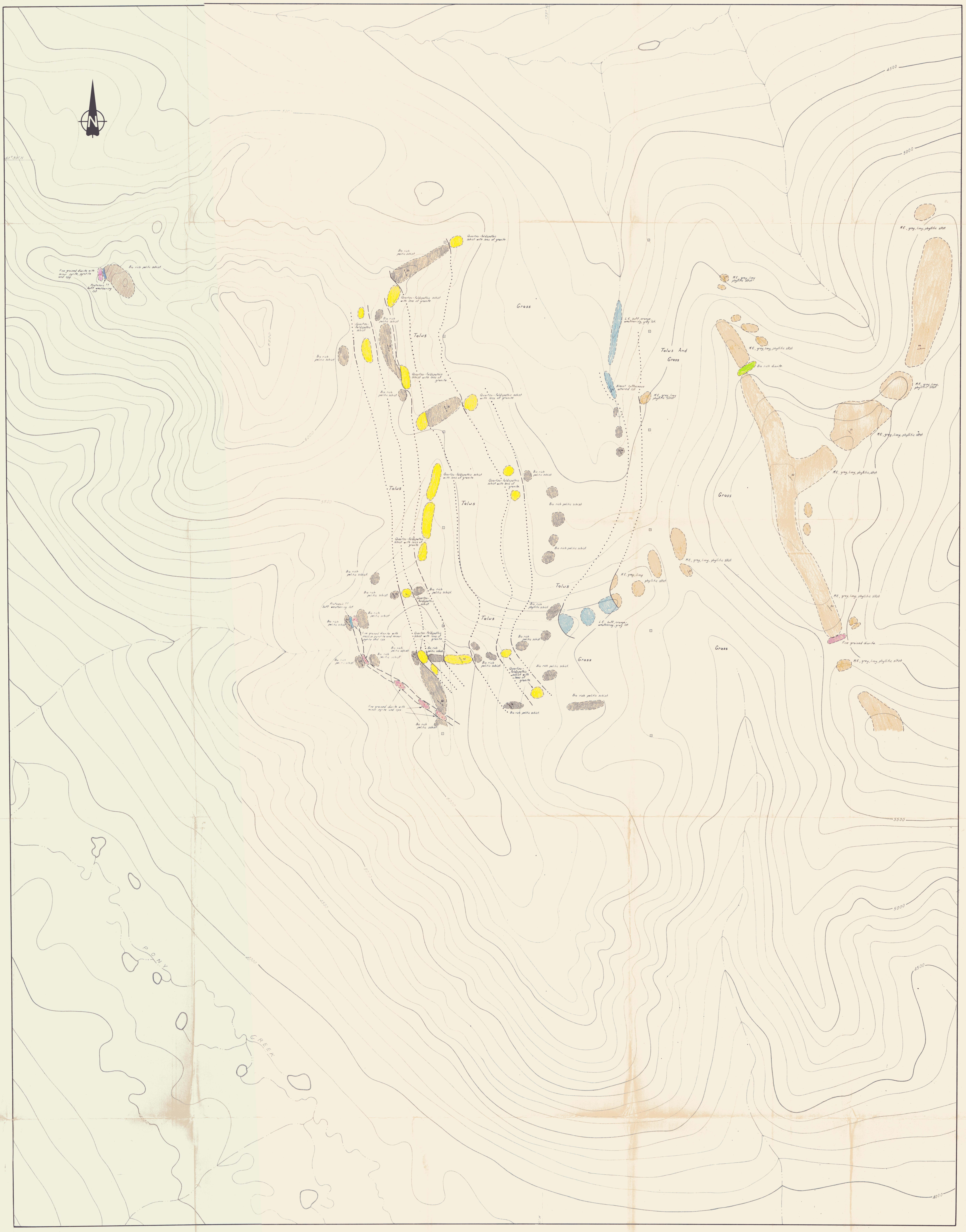
PELLY MOUNTAINS, YUKON

LAP CLAIMS

GEOCHEMISTRY — COPPER

Work by :	Date : January 1978	NTS Ref. 105 F/11
Drawn by : T. Drews	Revised	Scale — 1:5000

0 100 200 300 400 Metres



LEGEND

🟩 Biotite Diorite Intrusive.

🟪 Fine Grained Diorite

🟫 Middle – Upper Cambrian, Grey, Limy, Phyllitic Siltstone.

🟦 Lower Cambrian, Buff, Orange Weathering, Grey Limetone.

🟨 Quartzo – Feldspathic Schist.

⬛ Biotite – Rich Pelitic Schist.

🟦 Protozoic ??, Buff Weathering Limestone.

— — ··· Geological Boundary (Defined, Approximate, Assumed)

Bedding (Inclined)

Schistosity (Inclined)

⊡ Claim Post

● Mineral Occurrence

◌ Outcrop

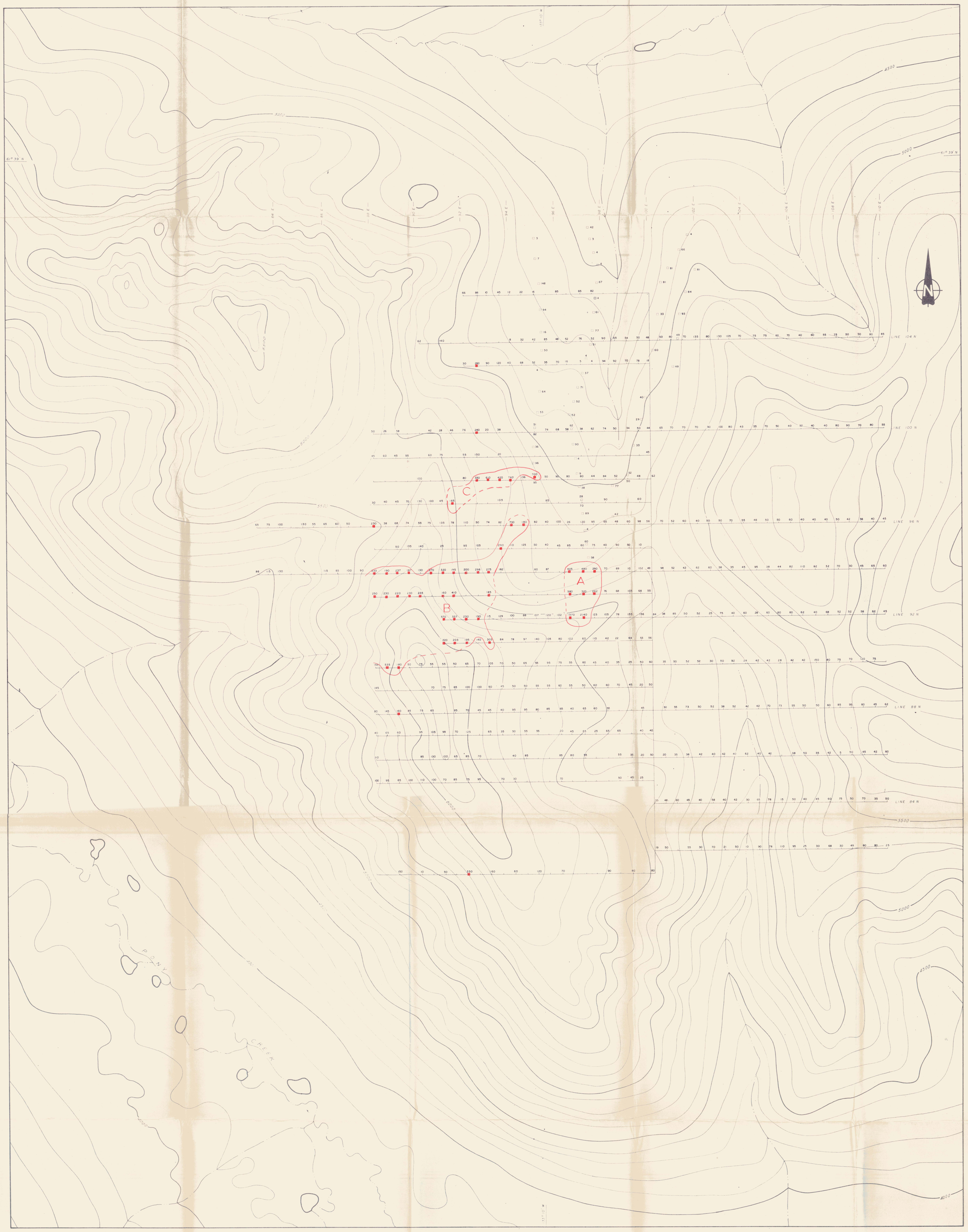
PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA

UTAH MINES LTD.
EXPLORATION DEPARTMENT
VANCOUVER BRITISH COLUMBIA

PELLY MOUNTAINS, YUKON
LAP CLAIMS
GEOLOGY

Work by: G. Holland	Date: February 1978	NTS Ref. 105 F/11
Drawn by: T. Drews	Revised:	Scale – 1: 5000

0 100 200 300 400 Metres
SCALE IN FEET



LEGEND

Soil Sample Location (Geochemical Survey Grid)

Soil Sample Location (Reconnaissance Sample)

NOTE: Zinc Assays in ppm

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
A. J. SCHMIDT

UTAH MINES LTD.
EXPLORATION DEPARTMENT
VANCOUVER BRITISH COLUMBIA

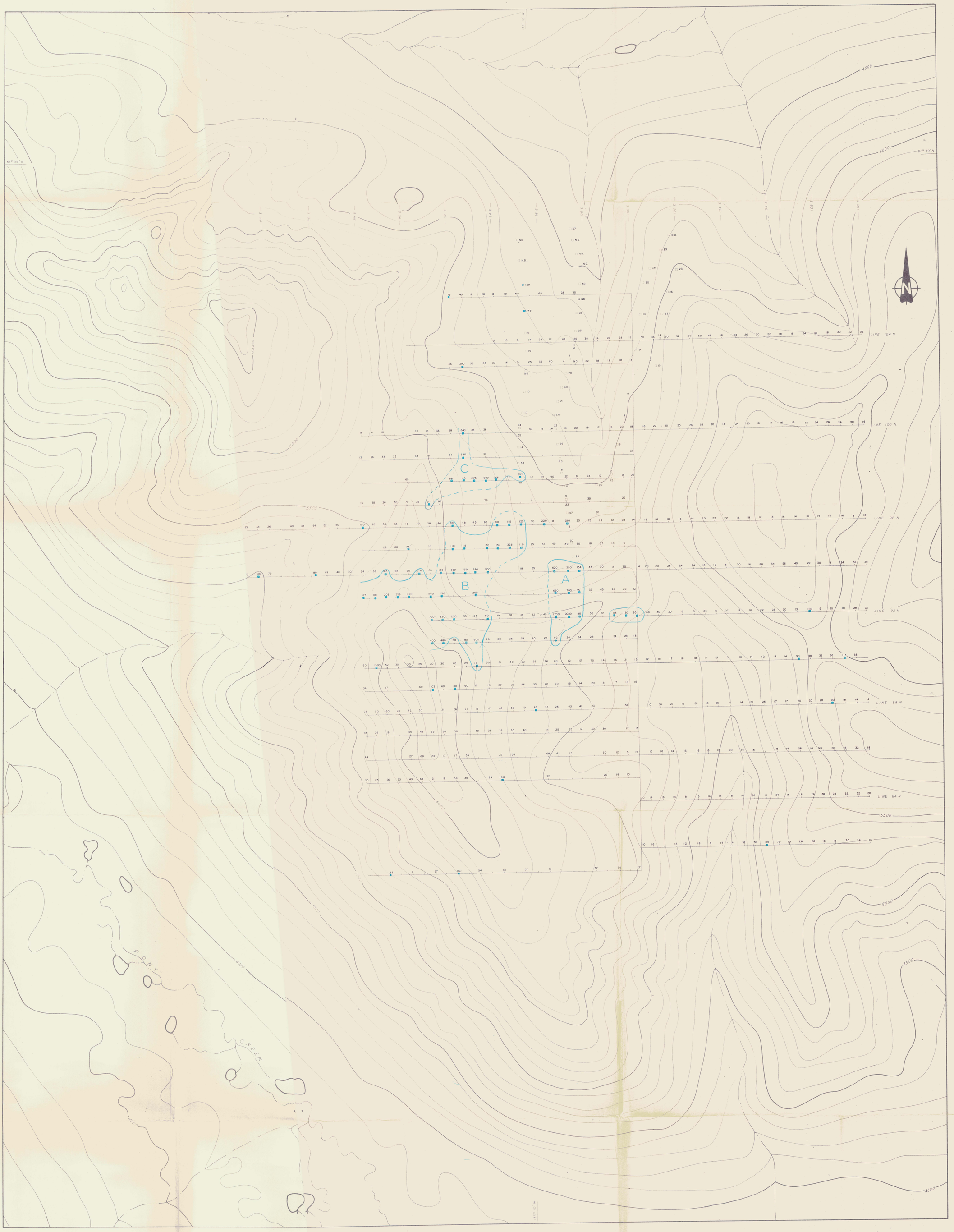
PELLY MOUNTAINS, YUKON

LAP CLAIMS

GEOCHEMISTRY — ZINC

Work by:	Date: January 1978	NTS Ref. 105 F/11
Drawn by: T. Drews	Revised:	Scale - 1:5000

0 100 200 300 400 Metres



LEGEND

Soil Sample Location (Geochemical Survey Grid) Grid

Soil Sample Location (Reconnaissance Sample) Ite

NOTE : Lead Assays in ppm

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
A. J. SCHMIDT

UTAH MINES LTD.
EXPLORATION DEPARTMENT
VANCOUVER BRITISH COLUMBIA

PELLY MOUNTAINS, YUKON

LAP CLAIMS

GEOCHEMISTRY — LEAD

Work by :	Date : January 1978	NTS Ref. 105 F/11
Drawn by : T. Drews	Revised :	Scale – 1: 5000

0 100 200 300 400 Metres

61° 39' N

LINE 104 N

LINE 100 N

LINE 96 N

LINE 92 N

LINE 88 N

LINE 84 N

4500

5000

5500

4000

4500

5000

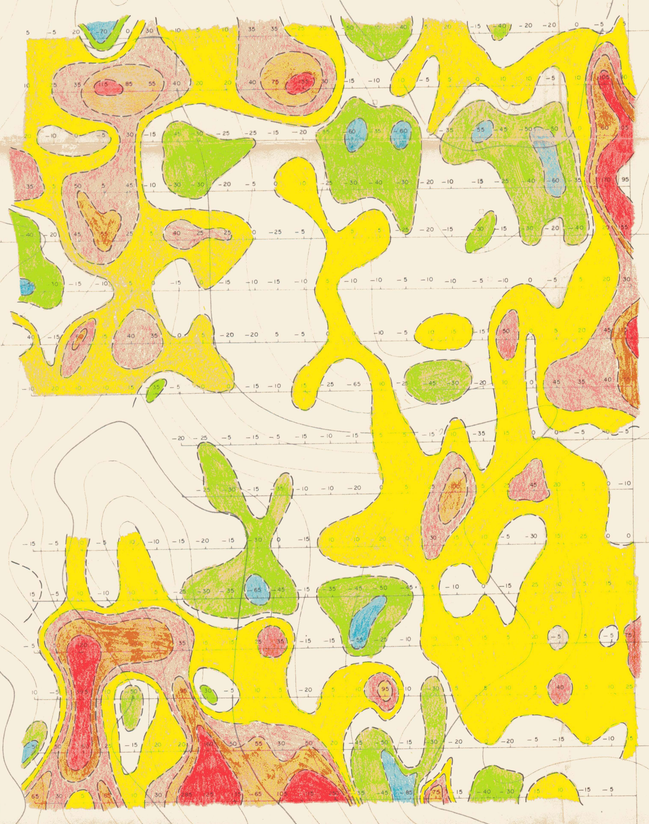
5500

6000

P O N Y

C R E E K

N



LEGEND

- Greater Than + 100 Gammas
- + 50 to + 100 Gammas
- + 25 to + 50 Gammas
- 0 to + 25 Gammas
- 0 to — 25 Gammas
- — 25 to — 50 Gammas
- Greater Than — 50 Gammas

PROFESSIONAL ENGINEER
OF
A. J. SCHMIDT
BRITISH COLUMBIA

UTAH MINES LTD.
EXPLORATION DEPARTMENT
VANCOUVER BRITISH COLUMBIA

PELLY MOUNTAINS, YUKON

LAP CLAIMS

MAGNETOMETER SURVEY

Work by:	Date: January 1978	NTS Ref. 105 F/11
Drawn by: T. Drews	Revised:	Scale - 1 5000

0 100 200 300 400 Metres