

GEOLOGICAL SURVEY  
INDUCED POLARIZATION AND RESISTIVITY SURVEY  
and  
GEOCHEMICAL SURVEY  
on the  
B.U. 1, 3-7, 19-26, 74, 76 & 78 M.C.'s  
R.C. Heim, P. Eng.  
J.R. Fraser  
J.T. Walker  
J.D. Knauer  
Noranda Exploration Company, Limited  
Clinton Mining Division  
August 11, 1972 to August 31, 1972

92N/10E

4540

# 4540

GEOLOGICAL SURVEY  
INDUCED POLARIZATION AND RESISTIVITY SURVEY  
and  
GEOCHEMICAL SURVEY  
on the  
B.U. 1, 3-7, 19-26, 74, 76 and 78 Mineral Claims

51° 43' N 124° 38' W

R.C. Heim, P. Eng.  
J.R. Fraser  
J.T. Walker  
J.D. Khauer

Department of	
Mines and Technical Resources	
ASSESSMENT REPORT	
NO. 4540	MAP.....

Noranda Exploration Company, Limited  
Clinton Mining Division  
August 11, 1972 to August 31, 1972

TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION	1
Location Map	
GRID PREPARATION	2
REGIONAL GEOLOGY	2
PROPERTY GEOLOGY	3
SUMMARY	6
INDUCED POLARIZATION AND RESISTIVITY SURVEY	6
Method	7
Discussion of Results	8
CONCLUSIONS AND RECOMMENDATIONS	8
GEOCHEMICAL SURVEY	9
Sampling Method	9
Laboratory Determination Method	9
Presentation of Results	10
Discussion of Results	10

Statement of Qualifications:

J.R. Fraser  
J.T. Walker  
J.D. Knauer

Maps in Pockets:

#1 Claim Map	1
#2 Soil Survey - Copper Moly	2
#3 Soil Survey - Zinc	3
#4 Resistivity Contour	4
#5 Percent Fe Contour	5
#6 Geology	6
#7 Location map	

GEOLOGICAL SURVEY  
INDUCED POLARIZATION AND RESISTIVITY SURVEY  
and  
GEOCHEMICAL SURVEY  
on the  
B.U. 1, 3-7, 19-26, 74, 76 and 78 Mineral Claims  
Noranda Exploration Company, Limited

INTRODUCTION

The claims referred to in this report are registered in the name of Noranda Exploration Company, Limited (No Personal Liability). The claim names and record numbers are listed:

<u>Claim Name</u>	<u>Record Number</u>
B.U. 1	28914
B.U. 3-7	28916-28920
B.U. 19-26	28954-28961
B.U. 74	29009
B.U. 76	29011
B.U. 78	29013

The surveys described in this report were conducted on grid lines, within the boundaries of the above listed mineral claims. Claim boundaries and claim names are shown on Drawing No. 1, a plan map at a scale of one inch equals 400 feet.

The claims are located approximately 4 miles southeast of Bluff Lake near the headwaters of Butler Creek. Access to the property is by helicopter, the nearest road is located along the east side of Bluff Lake (see location map, fig. A).

Elevation of the claim group lies between 4500 and 7500 feet, with topography varying from gently rolling to precipitous toward the south. Vegetation varies from scrub trees to alpine meadows.



BUTLER CREEK PROPERTY

4540  
M7

Noranda Exploration Company, Limited

LOCATION MAP

B.W.J., 3-7, 19-26, 74, 76 and 78

Mineral Claims

Clinton Mining Division

1" = 4 miles

92N/10E

Fig. A

*[Handwritten signatures and scribbles]*

M

Department of  
Mines and Petroleum Resources

APPLICANT'S NAME

NO. 4540 M.P. # 7



The Geological Survey, Induced Polarization Survey and the Geochemical Soil Survey were carried out during the period of August 11, 1972 to August 31, 1972 intermittently. The I.P. Survey, soil survey and grid line control, were carried out by four employees of Noranda Exploration Company, Limited under the direction of R.C. Heim, P. Eng., J.T. Walker, Geophysicist and J.D. Knauer, Geochemist. The geological survey was carried out by J.R. Fraser, Geologist.

#### GRID PREPARATION

A grid consisting of one baseline and fifteen grid lines was developed to control the surveys. The bearing of the base line is N 42° E. The grid lines vary in length from 2400 feet to 4400 feet and are spaced at 400 foot intervals along the baseline. Stations are chained and flagged at 200 foot intervals along the grid lines.

#### REGIONAL GEOLOGY

The area between Mosley Creek and the Homathko River, and bounded on the southwest by a line joining the southern ends of Middle Lake and Tatlayoko Lake, is underlain by intensely faulted Upper Triassic to Upper Cretaceous volcanic and sedimentary rocks and Late Cretaceous and/or Tertiary intermediate intrusive rocks of the Coast batholith.

In the southwestern part of the area, Upper Triassic basic volcanic, clastic sedimentary and carbonate rocks are in contact with plutonic rocks of the Coast batholith. Along the western shore of Tatlayoko Lake, Lower to Middle Jurassic marine shale, siltstone, graywackes and conglomerate are exposed and are possibly conformable with Triassic strata. The north-westerly trending band of Early Cretaceous sedimentary and volcanic rocks west of Tatlayoko Lake were laid down on the southwestern side of the Tyaughton Trough, a Late Jurassic depositional basin, and are probably resting unconformably on the above Triassic sequence. Overlying the Early Cretaceous rocks, possibly unconformably, are basic pyroclastic rocks of the Late Cretaceous Kingsvale Group.

The areas to the northwest and the southwest of the sedimentary and volcanic rocks are underlain largely by plutonic rocks of granodioritic, quartz dioritic and dioritic composition that were emplaced between Cenomanian and Eocene time. To the southwest, these rocks form the main mass of the coast mountains. Smaller, related intrusive bodies occur throughout the above mentioned volcanic and sedimentary pile.

PROPERTY GEOLOGY (See Geology Map - Drawing No. 6)

Outcrop in the grid area is sparse and is restricted to the valley of Butler Creek and to the steeper slopes. Below tree line, slopes are covered with a thick mantle of glacial debris up to at least 25 feet thick, and above this elevation unconsolidated deposits consist of talus and felsenmeer.

The grid area is underlain by Early Cretaceous volcanic and sedimentary rocks and Late Cretaceous and possibly Tertiary intrusive rocks.

The Early Cretaceous volcanic rocks are andesitic in composition and are largely pyroclastics although the occasional porphyritic flow or dyke is present. The pyroclastics (Unit 1) are predominantly fine grained tuffs but near 80N/100E volcanic breccia crops out. Fragments in the breccia range from 1/16 inch to several feet in diameter and are black, green and occasionally purple. The fragments consist of aphanitic and porphyritic volcanic rocks and are subangular to subrounded. The breccia matrix is white carbonate and upon weathering the fragments stand out in relief. The tuffs are medium greenish gray, dark greenish gray or dark gray, are well sorted and often limy. Tuffs cropping out at 108E/88N contain small grains of white carbonate which readily weather imparting a vesicular appearance to the rock. In the valley of Butler Creek, the tuffs are moderately to intensely altered with the formation of quartz, epidote and minor carbonate (Unit 1 a). The quartz epidote alteration ranges from localized clots and fracture fillings to pervasive development



over small areas. The altered rocks range from medium greenish gray to light yellowish green, the latter being the colour of the pervasively altered rocks. Pyrite and pyrrhotite, as fracture fillings and disseminations, are present in amounts up to 10%. The altered rocks are strongly oxidized and leached, forming a conspicuous gossan 2,000 feet long and 1,000 feet wide. Outcrops of sedimentary rocks were not observed but on line 80N between 80E and 88E angular boulders of arenaceous rock are common, suggesting a nearby source. These rocks exhibit a well defined graded bedding, are grayish brown and would probably be termed arkose.

Light gray fragmental rocks and light gray rhyolite crop out on lines 80N and 84N between 100E and 76E and are grouped together as Unit 2. The rhyolite contains abundant inclusions of gray and black chert as subrounded fragments, slabs and disrupted but traceable beds. Disseminations of pyrite and pyrrhotite are present locally in amounts up to 10%.

In contact with the Early Cretaceous volcanic rocks and presumably underlying much of the northern part of the grid are igneous rocks of the Late Cretaceous Coast batholith (Unit 3). These rocks are medium grained and range in colour from light greenish gray to grayish orange. The colour index is 15 to 20, the mafic minerals being hornblende and minor biotite. Compositionally, the intrusive rocks are diorite and quartz diorite. Alteration, which is weak, consists of chloritization of hornblende and biotite and kaolinization of plagioclase. Fine, felted hydrothermal biotite is occasionally present on the fracture surfaces. Veins, up to 0.6 cm. wide, of fine grained, sugary quartz containing sulphides and clots of epidote are present but appear to be in one direction only. Carbonate is present on some of the fractures. These rocks may contain up to 15% pyrite or pyrrhotite, the former as fracture fillings and the latter as disseminations. The degree of oxidization is much less than that observed in the volcanics. The contact with the Early Cretaceous volcanic rocks is seen in one location only, at 112N/95E. The volcanic rocks adjacent to the contact have been skarnified with the development of patches of pinkish garnet.

Andesite dykes (Unit 4) are present in both the intrusive rocks and the light gray rhyolite and associated fragmental rocks. They range in width from 15 feet to several tens of feet and trend northerly to northeasterly.

In the southern part of the grid, on lines 80N and 84N, several dyke-like bodies of quartz porphyry (Unit 5) crop out. This rock is medium greenish gray and contains phenocrysts of quartz, up to 2 mm. across, set in a fine grained matrix. The phenocrysts, which comprise 5% to 10% of the rock are rounded to angular, the latter appearing to be crystal fragments. Sulphide mineralization was not observed.

The emplacement of dykes of hornblende-feldspar porphyry (Unit 6) represents the latest phase of igneous activity. When fresh, this rock is a light olive gray color (C.I. = 5) but when weathered, the feldspars assume a chalky appearance, with the overall rock colour being a light greenish gray. In addition to phenocrysts of hornblende and feldspar, the rock also contains hexagonal phenocrysts of quartz. The predominant mafic mineral is hornblende, although minor biotite is also present. The hornblende is usually altered to biotite. Minor carbonate is present in both the weathered and unweathered rocks. Sulphide mineralization is absent.

Copper-molybdenum mineralization is restricted to coarse grained intrusive rocks and the altered volcanics. Chalcopyrite occurs in the altered volcanic rocks as fine coatings on fracture surfaces and as clots in quartz veins. In the intrusive rocks, the chalcopyrite, with pyrite, occurs as heavy fracture fillings and as weak disseminations adjacent to the fractures. The mineralization appears to be localized in one direction of fracturing but due to the rubbly nature of the outcrops only one attitude was obtained, that being  $040^{\circ}/59^{\circ}$  N.W. Molybdenite has been observed in the intrusive rocks only and occurs as fine smears, with pyrrhotite, pyrite and epidote in fine grained quartz veins, up to 0.6 cm. wide, that cut the copper-bearing fractures. Attitudes on the quartz veins are not available. Very little malachite is present and is restricted to the intrusive rocks.

The most conspicuous structural features observed in the map area are the three northwest to north-northwest trending faults that parallel the regional structural trend. At the north end of the grid, the altered zone is terminated by a fault against unmineralized volcanic rocks. The surface trace of this fault defines an abrupt change in slope. The presence of the other faults was detected from inspection of air photographs. Fracturing ranges from intense to weak, the most intense fracturing being in the altered volcanic rocks. Although the fracturing in the altered zone is intense, there does not appear to be any faulting or brecciation associated with it. Due to the frost heaved and rubbly nature of many of the outcrops, fracture altitudes and densities are difficult to obtain. Despite this, three general directions of fracturing have been recognized: north-south, northeast and northwest.

#### SUMMARY

Traces of copper and molybdenum mineralization are present in an elongate, northeasterly trending zone of weakly to moderately altered intrusive and volcanic rocks. The intrusive rocks are largely quartz diorite in composition and alteration consists of kaolinization of plagioclase and chloritization of mafics. The volcanic rocks, which are predominantly andesite tuffs, are moderately altered to quartz and epidote. Associated with the quartz and epidote alteration are pyrite and pyrrhotite in amounts up to 10%. Chalcopyrite is present in both rock types and occurs as fracture fillings and weak disseminations. Molybdenite appears to be restricted to the intrusive rocks and occurs as fine grained accumulations in quartz veins.

#### INDUCED POLARIZATION AND RESISTIVITY SURVEY

The Induced Polarization and Resistivity survey was carried out utilizing variable frequency I.P. equipment owned by Noranda Exploration Company, Limited and manufactured by Sabre Electronic Instruments Ltd., North Burnaby, B.C.

The survey was conducted employing frequencies of 0.3 Hz and 5.0 Hz. A dipole-depole electrode array was used with the dipole length of 400 feet and a separation of 400 feet between dipoles. A total of 7.8 line miles of survey was carried out.

Method:

Throughout the survey, the following field procedure was carried out for the recorded readings at each 400 foot interval along the prepared lines. A dipole-depole configuration ( $C_2$   $C_1$   $P_1$   $P_2$ ) was employed with an electrode separation of 400 feet. A current is injected into the earth between electrodes  $C_2$  and  $C_1$ , and the induced voltage produced between the porous pot electrodes  $P_1$  and  $P_2$  is measured. A four man crew, one man at each electrode conducts the survey moving electrodes, connecting wires and instruments, station to station, along the survey lines.

At each "set-up" the station location of each electrode ( $C_2$   $C_1$   $P_1$   $P_2$ ) is recorded and the following electrical measurements are read and recorded.

- 1) Transmitter current on frequency 5 Hz  
(current recorded in milliamperes)
- 2) Receiver measures the developed voltage  
(recorded in millivolts)
- 3) Transmitter current maintained constant but frequency changed to 0.3 Hz
- 4) Receiver measures voltage change as a percent deviation caused solely by the change in frequency of current.  
(Percent deviation of voltage recorded as Percent Frequency Effect).

By definition, Percent Frequency Effect, is the percent change of resistivity caused by a change in the frequency of the current. Since resistivity is directly proportioned to voltage, if the current is constant at each frequency, the percent change of resistivity equals percent change of voltage.

The resistivity value for each "set-up" is calculated from the recorded current and voltage measurements and the array dimension measured in feet. This equation is:

$$Pa = \frac{V}{I} \times k$$

Where:            V = millivolts  
                     I = milliampers  
                     x = dipole length  
                     k = array constant

#### Discussion of Results:

Results of the induced polarization survey indicates a background of 1 to 2 percent frequency effect. Two anomalous areas of greater than 5% F.E. are indicated. The northern anomaly extends from line 124N to 132N and is open to the north while the southern anomaly extends over two lines and is open to the south. The rock talus south of line 96N produced unstable currents due to poor electrode contacts, preventing a continuation of the survey to the south.

Information regarding the attitudes and densities of the fractures and veins is scanty due to the intense oxidation and the rubbly, frost heaved nature of the outcrops. The altered zone, as defined by surface mapping, is at least 2,000 feet long by 1,000 feet wide.

#### CONCLUSIONS AND RECOMMENDATIONS

Geological mapping and geochemical and geophysical surveying have outlined an area, approximately 4,000 feet long by 1,000 feet wide, with potential for containing a low grade copper-molybdenum deposit. Work on the property is at the stage where little remains to be done except reconnaissance diamond drilling to test the anomalies.

### GEOCHEMICAL SOIL SURVEY

All soils were analyzed for copper, zinc and molybdenum in the Noranda Exploration Company, Limited laboratory, located at 1050 Davie Street, Vancouver 5, B.C. The analyst was Evert Van Leeuwen.

#### Sampling Method:

Samples were obtained by digging holes with a shovel to a depth, if feasible, where the visible C horizon or sub-outcrop was encountered.

The C horizon was sampled and the B horizon, where visible, was also sampled. The samples were placed in "Hi Wet Strength Kraft 3½" x 1/8" Open End" envelopes and the grid station was marked on the envelopes with indelible felt pens. Soil samples were taken at 400 foot intervals along the grid lines.

#### Laboratory Determination Method:

The samples are first placed in a drying cabinet for a period of 24 to 48 hours. The sample material is then screened and sifted to obtain a -80 mesh fraction.

The determination procedure for total copper, zinc and molybdenum is as follows:

0.200 grams of the -80 mesh material is digested in 2 ml. of  $\text{HClO}_4$  and 0.5 ml. of  $\text{HNO}_3$  for approximately four hours. Following digestion, each sample is diluted to 5 ml. with demineralized  $\text{H}_2\text{O}$ . A Varian Techtron Model AA-5 Atomic Absorption Spectrophotometer was used to determine the parts per million copper, zinc and molybdenum content in each sample.

The Theory of Atomic Absorption Spectrophotometer is fully described in the literature and will not be described in this report.

Presentation of Results:

Results of this survey are presented in Drawings No. 2 and No. 3 of this report; plan maps (scale 1" = 400') showing copper, zinc and molybdenum in parts per million. Copper values greater than or equal to 110 p.p.m., zinc values greater than or equal to 130 p.p.m. and molybdenum values greater than or equal to 7 p.p.m. are all indicated by circles.

Discussion of Results:

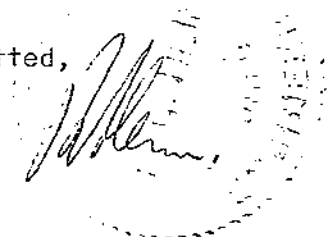
Copper determination values range from a background of less than 70 p.p.m. to anomalous values greater than 100 p.p.m. Zinc values show a background of less than 100 p.p.m. and anomalous values ranging from 130 to 220 p.p.m. Molybdenum values are mainly within a background of less than 2 p.p.m. with a few values of interest from 7 to 25 p.p.m.

Comments with regard to the soil survey are as follows:

1. From the results of copper, zinc and molybdenum in the soils, copper appears to be the major element of interest.
2. Anomalous copper values have defined a soil anomaly approximately 4,000 feet long and 800 feet wide roughly parallel with the course of Butler Creek. Copper mineralization was found within the copper anomaly.
3. The copper anomaly may be terminated north of line 132N by a fault indicated from the geology, however, it may still be open to the northwest as is reflected by the values on both 132N and 128N, station 76E.
4. Coincident anomalous copper and molybdenum values occur at a number of stations on both the north and south ends of the copper anomaly.

5. The main zinc anomaly to the west of Butler Creek and other scattered zinc values east of Butler Creek occur outside the high copper soils. Due to lack of outcrop in the areas of anomalous zinc values it can only be suggested that primary zinc dispersion is occurring outside the altered and mineralized zone exposed along Butler Creek.
  
6. Overburden in the grid area consists of mainly locally transported rubble. In general, soil development is poor over most of the area covered by the soil grid.

Respectfully submitted,



R.C. Heim, P. Eng.

A handwritten signature in cursive script, appearing to read "John R. Fraser".

J.R. Fraser

A handwritten signature in cursive script, appearing to read "J. T. Walker".

J.T. Walker

A handwritten signature in cursive script, appearing to read "James D. Khauer".

J.D. Khauer

July 23, 1973



STATEMENT OF QUALIFICATIONS

I, John R. Fraser, of the City of Kamloops, Province of British Columbia, do certify that:

1. I have been employed as a geologist by Noranda Exploration Company, Limited continuously since June 1972, and intermittently since June 1970.
2. I am a graduate of the University of British Columbia with a Bachelor of Science degree in Geophysics (1967) and a Master of Science degree in Geology (1973).
3. I am a member of the Canadian Institute of Mining and Metallurgy, an Associate Fellow of the Geological Association of Canada and a Junior Member of the Society of Mining Engineers of the American Institute of Mining, Metallurgical and Petroleum Engineers.

Dated at Vancouver  
this 23rd day of  
July 1973



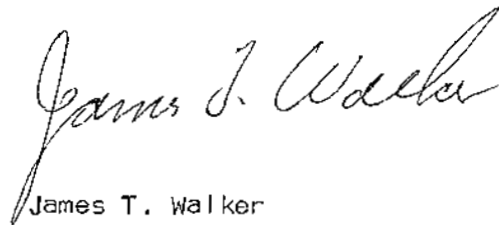
John R. Fraser  
Geologist  
Noranda Exploration Company, Limited  
(No Personal Liability)

STATEMENT OF QUALIFICATIONS

I, James T. Walker of the City of Vancouver, Province of British Columbia do certify that:

1. I have been an employee of Noranda Exploration Company, Limited since May 1958.
2. I have held the position of Geophysicist for Noranda Exploration Company, Limited, British Columbia, since June 1965.
3. I am a member of the Canadian Institute of Mining and Metallurgy.

Dated at Vancouver  
this 20th day of  
July 1973.



James T. Walker

Geophysicist

Noranda Exploration Company, Limited

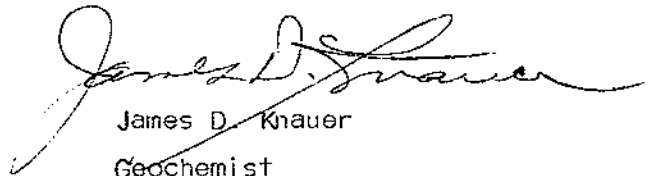
(No Personal Liability)

STATEMENT OF QUALIFICATIONS

I, James D. Knauer of the City of Vancouver, Province of British Columbia do certify that:

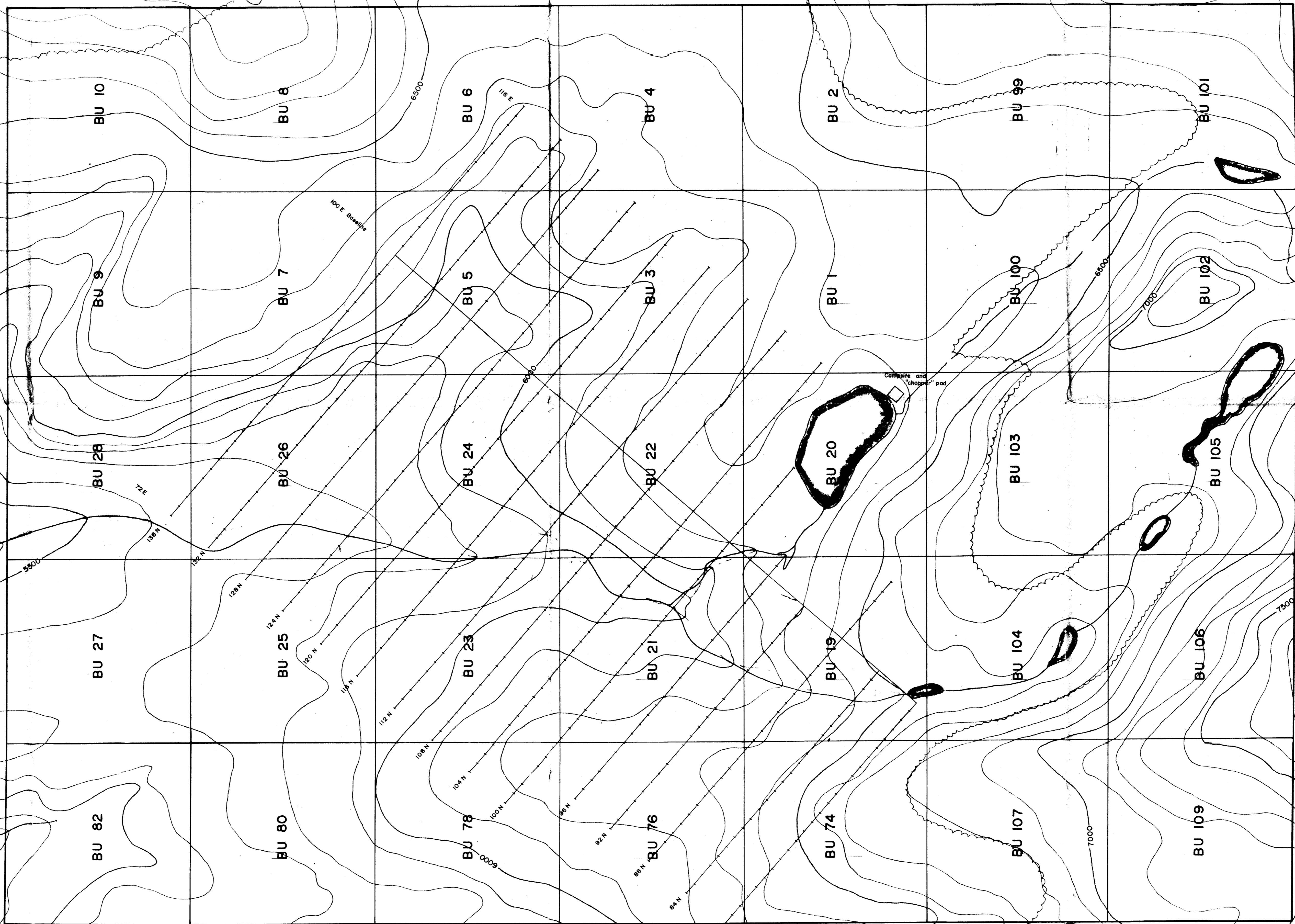
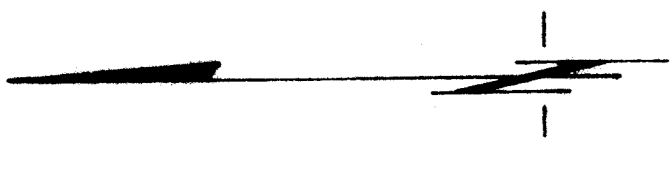
1. I have been an employee of Noranda Exploration Company, Limited since August 1964.
2. I am a graduate of the University of New Mexico with a Bachelor of Science Degree in Geology.
3. I am a member of the Geochemical Society.
4. I have held the position of Geochemist for Noranda Exploration Company, Limited, British Columbia since June 1965.

Dated at Vancouver  
this 20th day of  
July 1973



James D. Knauer  
Geochemist

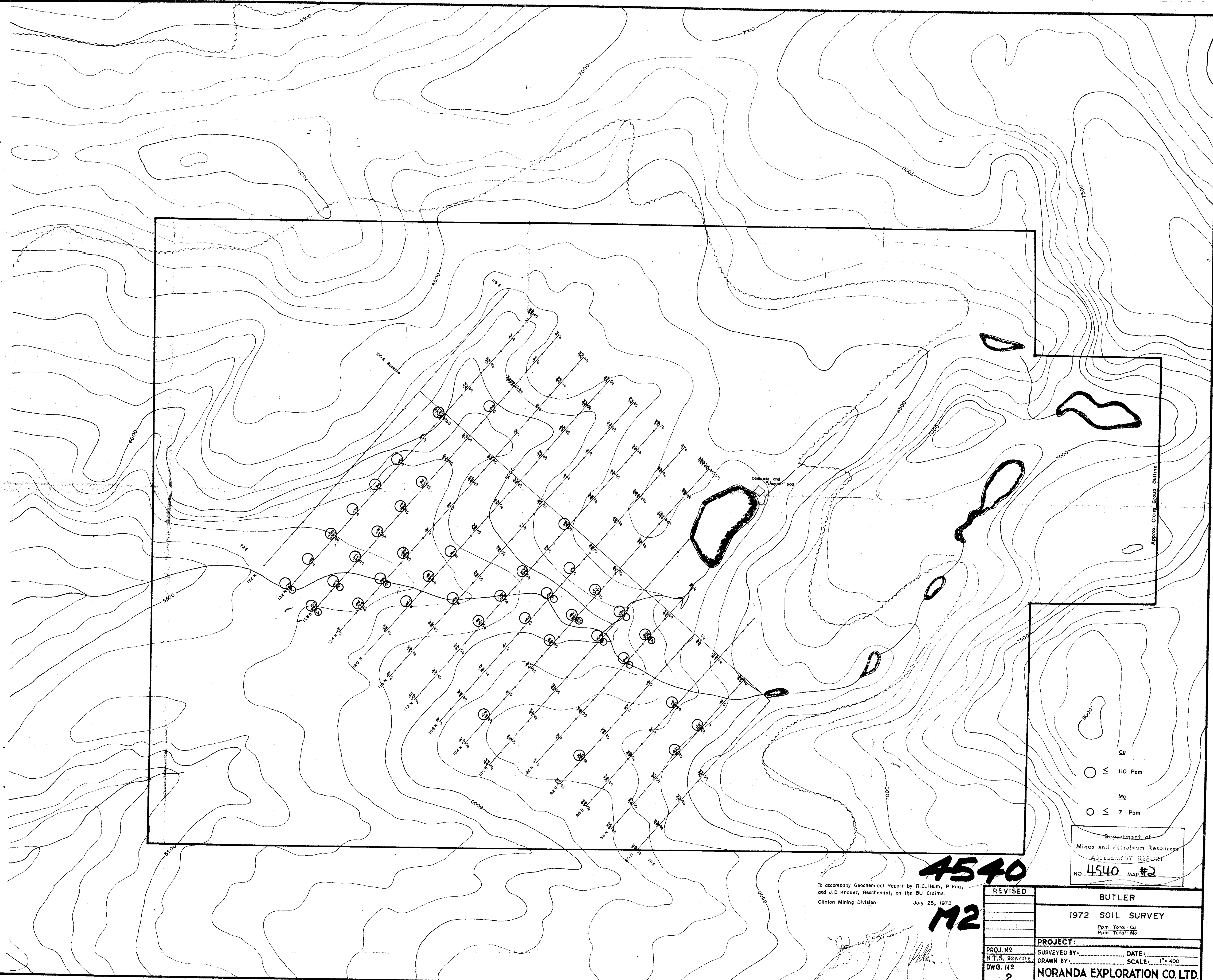
Noranda Exploration Company, Limited  
(No Personal Liability)



To accompany Geochemical Report by R. C. Hejral, P. Eng., and J. D. Khauer on the BU Claims, Clinton Mining Division, July 25, 1973

**4540**  
**MI**  
Mines and Resources  
Assessment Report  
No. 4540 MAP #1

REVISED	BUTLER
	CLAIM MAP
PROJECT:	
PROJ. NO.	DATE:
N.T.S. 92N/10E	DRAWN BY:
DWG. NO.	SCALE: 1" = 400'
1	NORANDA EXPLORATION CO. LTD.
	OFFICE: VANCOUVER



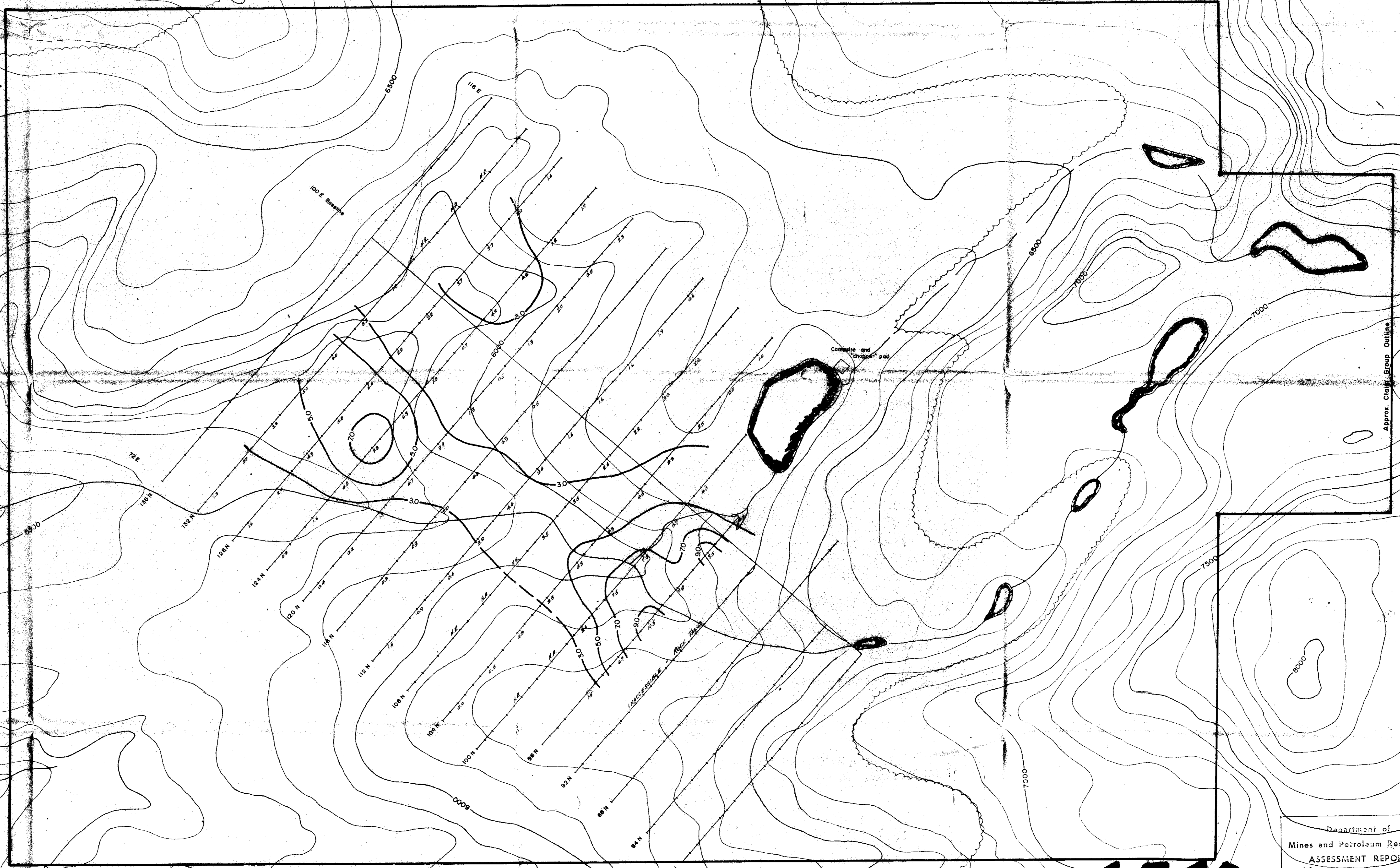
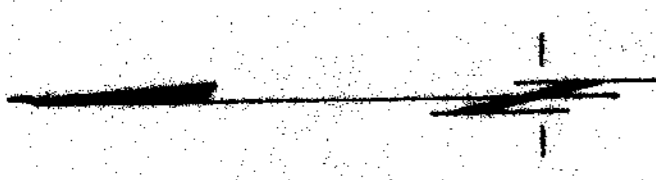
- Cu
- ≤ 110 Ppm
- Mo
- ≤ 7 Ppm

Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO 4540 MAP #2

To accompany Geochemical Report by R.C. Heim, P. Eng,  
and J.D. Knauer, Geochemist, on the BU Claims.  
Clinton Mining Division July 25, 1973

**4540**  
**M2**

REVISED	BUTLER	
	1972 SOIL SURVEY	
	Ppm Total Cu	Ppm Total Mo
PROJECT:		
PROJ. NO	SURVEYED BY:	DATE:
N.T.S. 92M/15E	DRAWN BY:	SCALE: 1" = 400'
DWG. NO	NORANDA EXPLORATION CO. LTD.	
2	OFFICE: VANCOUVER	



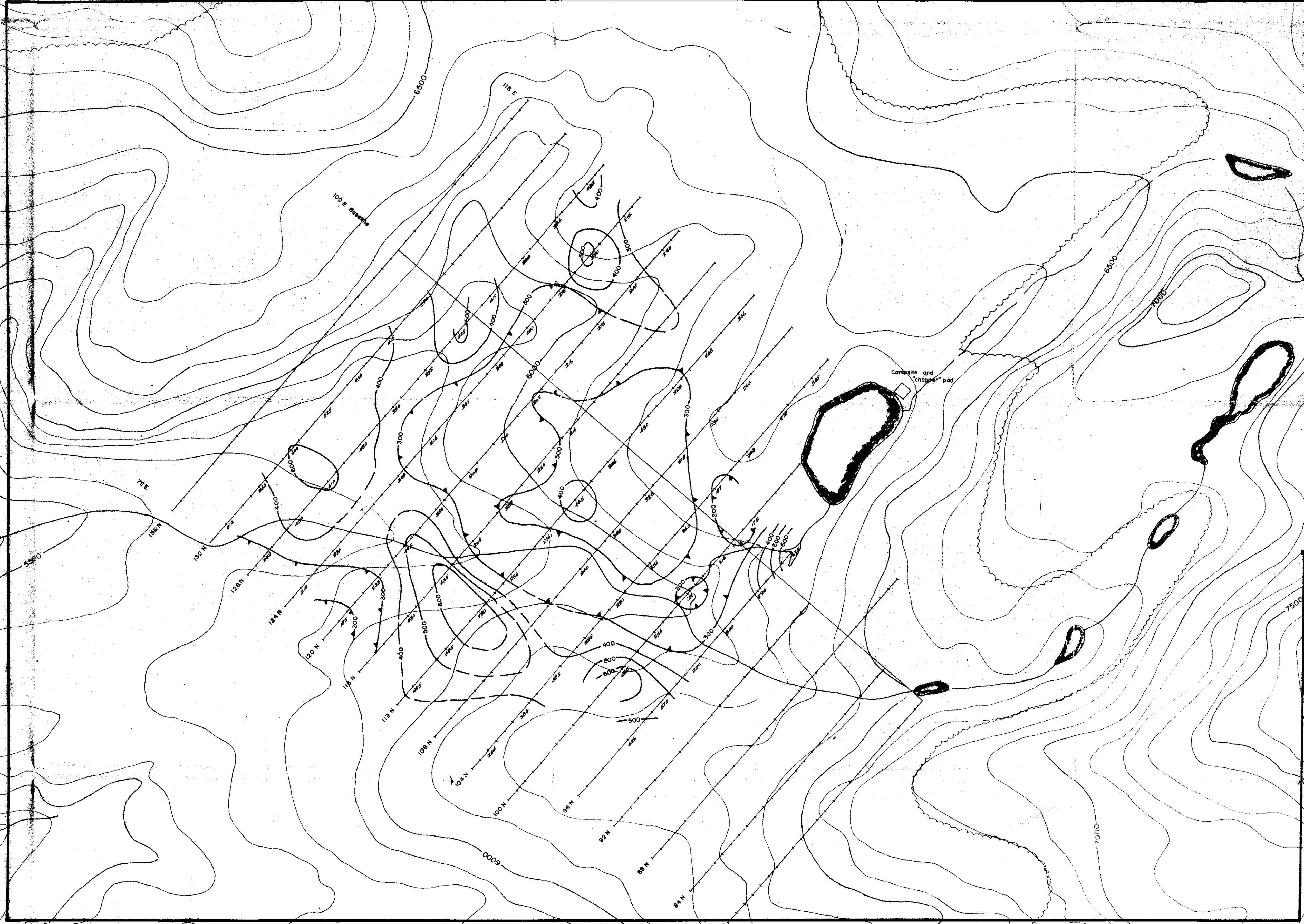
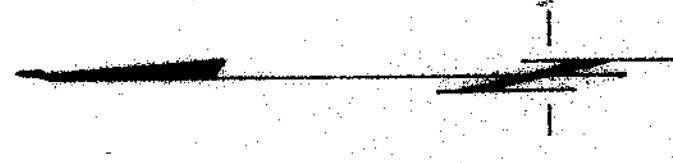
Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 4540 MAP #5

To accompany Geophysical Report by R.C. Heim, P.Eng.,  
and J.T. Walker, Geophysicist, on the BU Claims.  
Clinton Mining Division July 25, 1973

**4540**

**M5**

REVISED	BUTLER
	I. P. SURVEY
	% F.E. CONTOUR MAP
	X = 400', N=1; FREQ. 0.3 & 5 Hz.
	Dipole - Dipole Array
PROJECT:	
PROJ. NO.	G. Sander
N.T.S. 92/N/10 E	DATE: AUG 1972
DRAWN BY:	SCALE: 1" = 400'
DWG. NO.	
5	
	NORANDA EXPLORATION CO. LTD.
	OFFICE: VANCOUVER

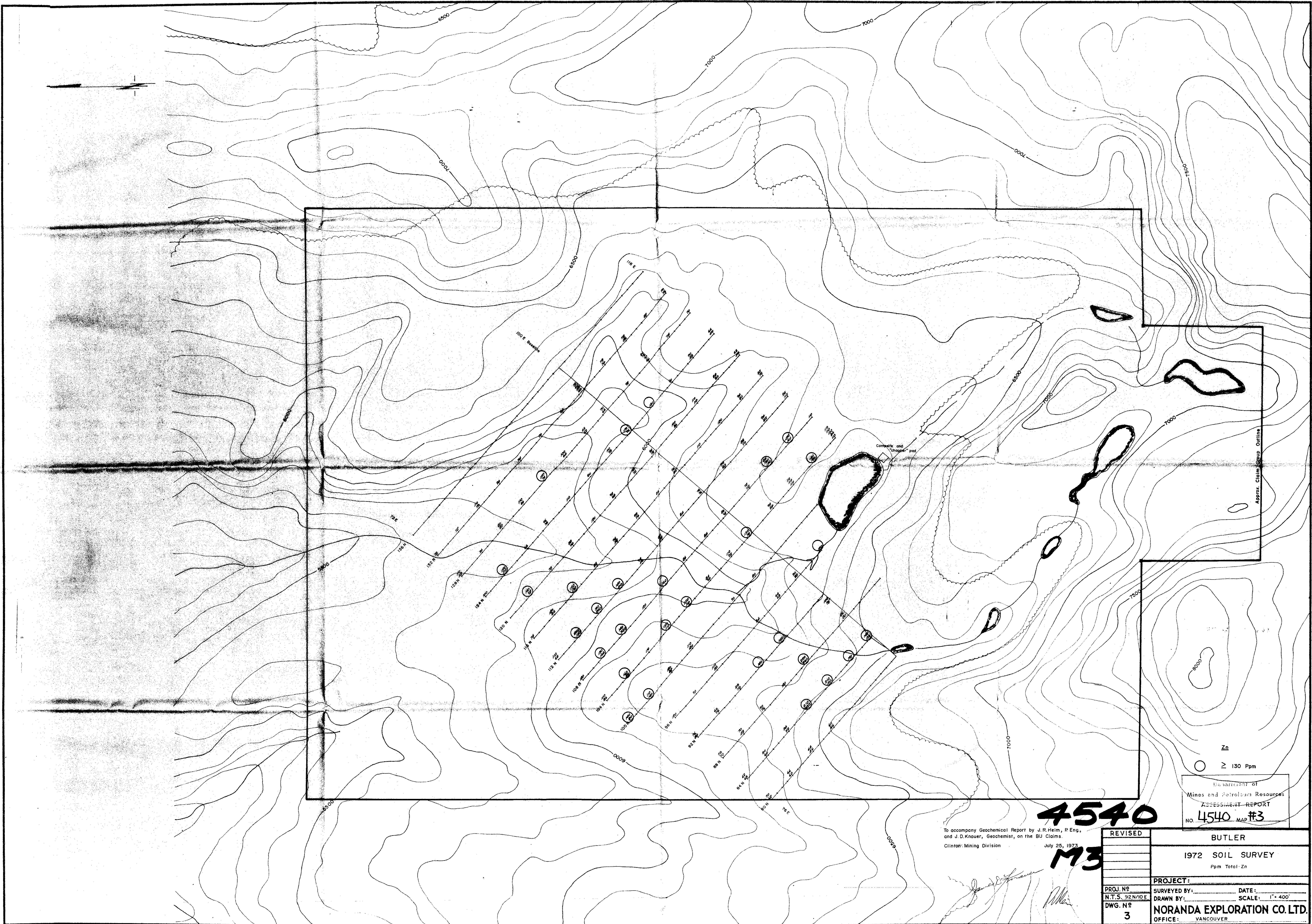


Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 4540 MAP #4

To accompany Geophysical Report by R.C. Heim, P.Eng.,  
and J.T. Walker, Geophysicist, on the BU Claims.  
Clinton Mining Division July 25, 1973

**4540**  
**M4**

REVISED	BUTLER	
	I.P. SURVEY RESISTIVITY CONTOUR MAP X=400, N=1, a/2u in Ohm Ft. Dipole-Dipole Array	
PROJECT:		
PROJ. NO.	SURVEYED BY: G. Seuder	DATE: AUGUST, 1972
N.T.S. 92 N/10 E	DRAWN BY: H. BARR	SCALE: 1" = 400'
DWG. NO.	NORANDA EXPLORATION CO. LTD.	
4	OFFICE: VANCOUVER	



**4540**  
**M3**

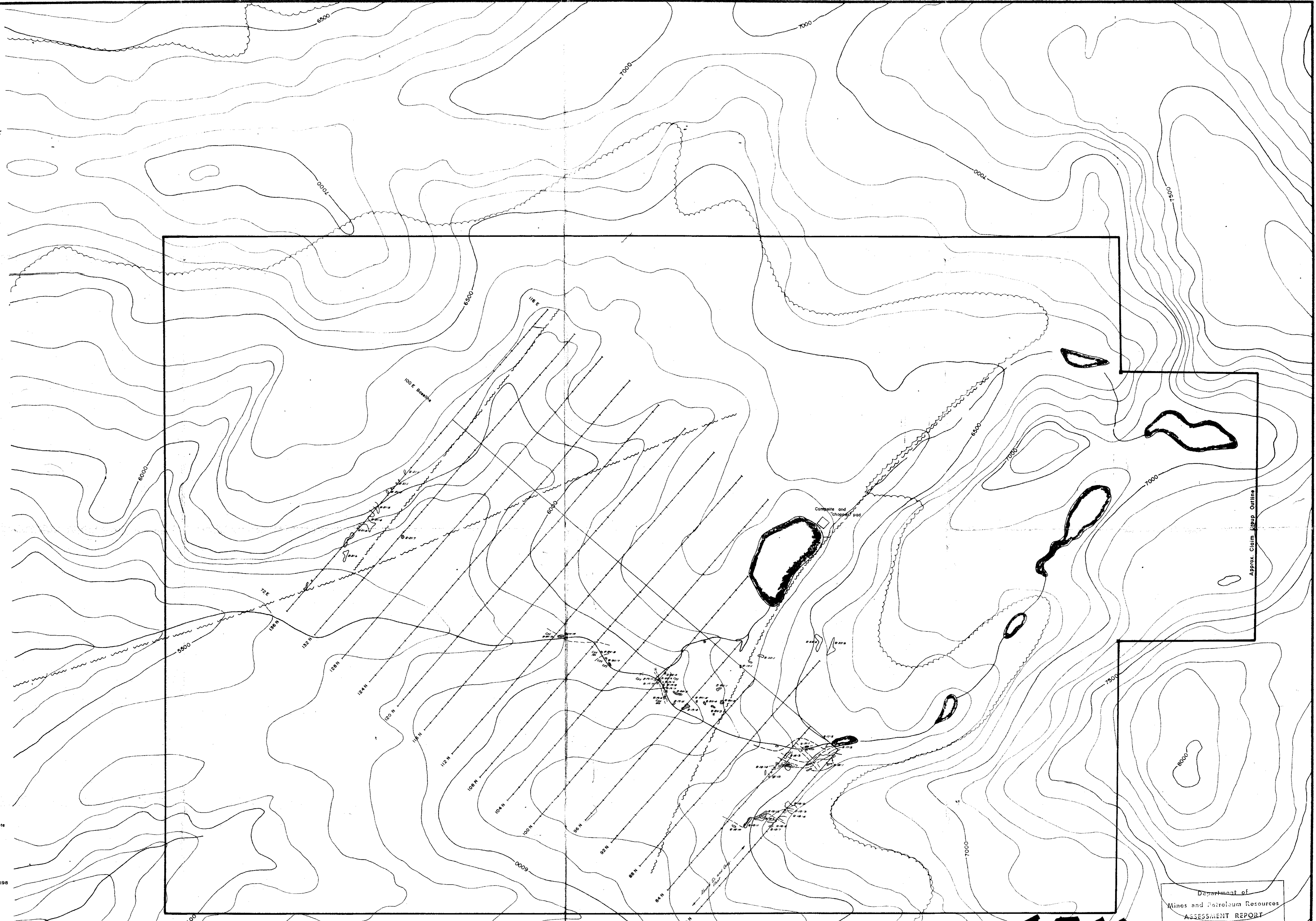
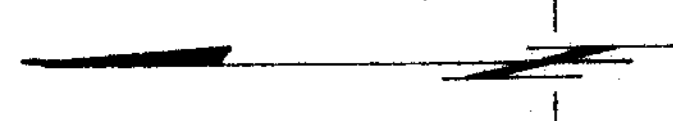
To accompany Geochemical Report by J. R. Heim, P. Eng.,  
and J. D. Knauer, Geochemist, on the BU Claims.  
Clinton Mining Division July 25, 1973

Zn  
○ ≥ 130 Ppm

Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 4540 MAP #3

REVISED	BUTLER	
	1972 SOIL SURVEY	
	Ppm Total Zn	
PROJECT:		
PROJ. No	SURVEYED BY:	DATE:
N.T.S. 92 N/10 E	DRAWN BY:	SCALE: 1" = 400'
DWG. No	NORANDA EXPLORATION CO. LTD.	
3	OFFICE: VANCOUVER	





**LEGEND**

**Rock Types**

**TERTIARY**

- Feldspar porphyry
- Quartz porphyry
- Andesite

**LATE CRETACEOUS**

- Quartz diorite
- L1 grey rhyolite, lt grey fragmented rocks; minor altered sediments.

**EARLY CRETACEOUS**

- Andesite tuff, often limy; minor porphyritic flows or dykes.
- Altered andesite tuff, quartz-epidote and quartz carbonate alteration.

**Symbols**

- Gossan
- Inferred fault from air photo-BC 5150:198
- Contact: defined, inferred
- Outcrop: large, small

**Abbreviations**

- Chalcopyrite
- Molybdenite

Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 4540 MAP #6

**4540**  
**M6**

To accompany Geological Report by R.C. Helm, P.Eng.,  
and J.R. Fraser, Geologist, on the BU Claims.  
Clinton Mining Division July 25, 1973.

REVISED	BUTLER	
	GEOLOGY	
PROJECT:	NORANDA EXPLORATION CO. LTD.	
SURVEYED BY: J. Fraser	DATE: Aug 17-22, 1972	
DRAWN BY: [Signature]	SCALE: 1" = 400'	
DWG. NO. 6	OFFICE: VANCOUVER	