COMBINED GEOLOGICAL AND GEOCHEMICAL REPORT

BET CLAIM GROUP

62° 36'N 129° 47'E

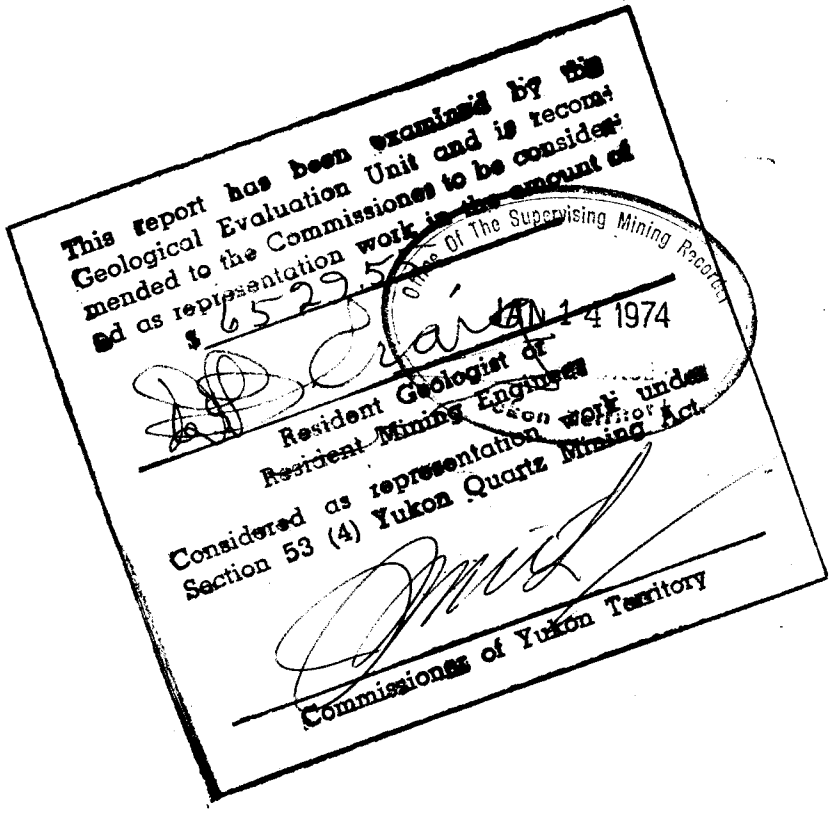
NAHANI MINING DIVISION

105 I/12

P.M. McAndless
J.D. Knauer
G.E. Dirom, P. Eng.

NORANDA EXPLORATION COMPANY LIMITED

July 4-6, 1973
July 11, 1973
August 13-18, 1973



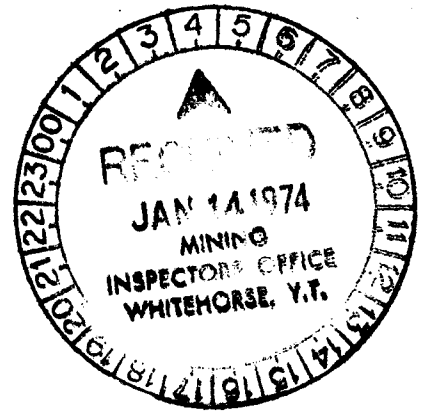


Table of Contents

Page

INTRODUCTION 1

Location Map - Fig. 1

GEOLOGY..... 2

Stratigraphy
Structure
Mineralization

GRID PREPARATION 4

GEOCHEMICAL STREAM SEDIMENT SURVEY 4

Sampling Method
Laboratory Determination Method
Presentation of Results
Discussion of Results

GEOCHEMICAL SOIL SURVEY 5

Sampling Method
Laboratory Determination Method
Preparation of Results
Discussion of Results

CONCLUSIONS AND RECOMMENDATIONS 7

APPENDIX I

Statement of Qualifications

APPENDIX II

Statutory Declaration
Application for a Certificate of Work
Application to Group Mineral Claims

APPENDIX III

Expenditures Incurred in Performing the work including all statements and vouchers.

MAPS IN POCKET

Claim Map - Fig. 2
Geology Map - Fig. 3
Geochemistry Maps - Fig's.4,5,6,7,8

COMBINED GEOLOGICAL

and

GEOCHEMICAL REPORT

on the

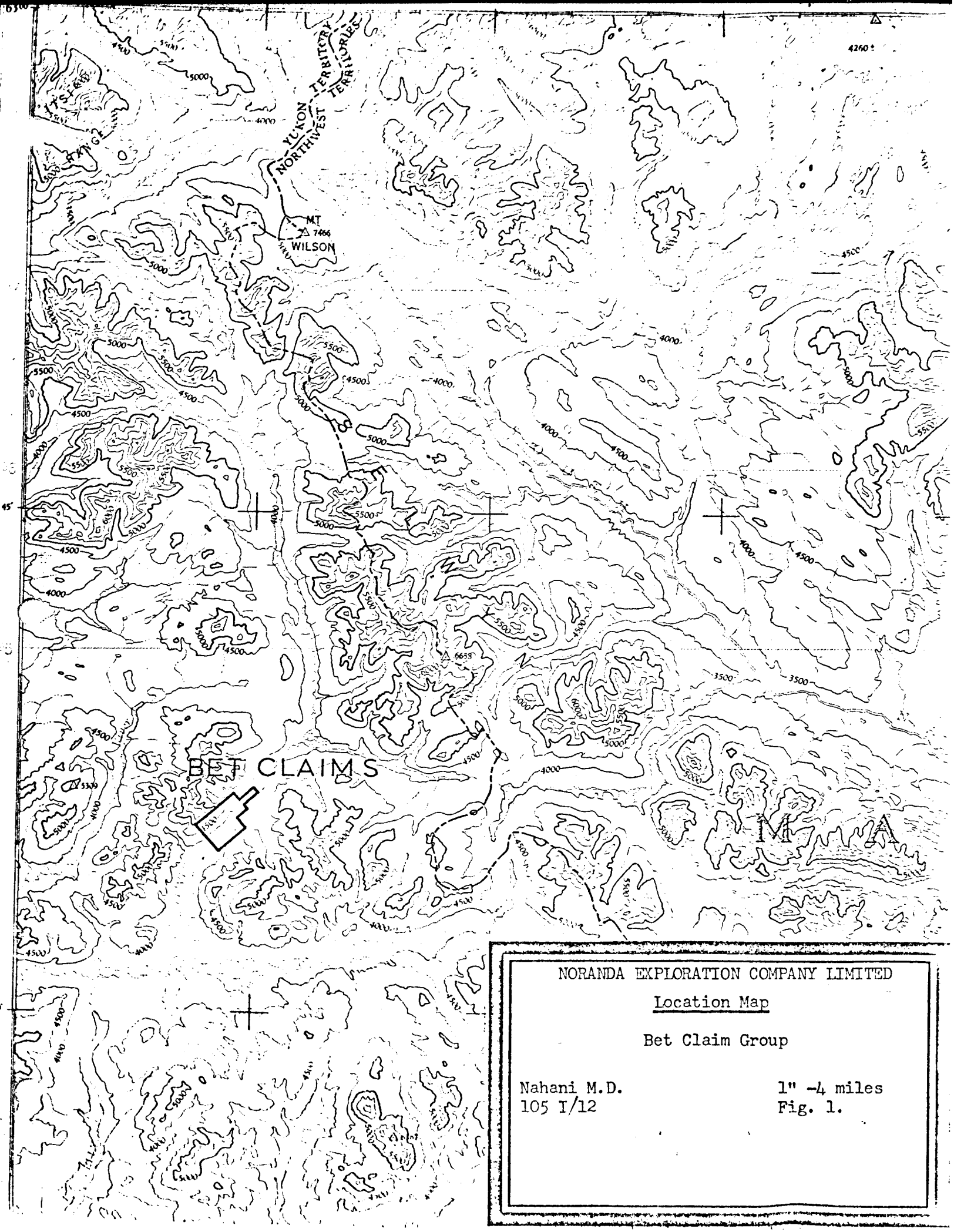
BET CLAIM GROUP

Noranda Exploration Company Limited

INTRODUCTION

The claims referred to in this report are registered in the name of John H. Wick and H.S. Aikins. Noranda Exploration Company Limited (No Personal Liability) optioned the claims in January 15, 1973. The claim group consists of 26 contiguous mineral claims in the Nahani Mining District, Yukon Territory.

Claim Name	Grant Number
Bet 1	Y 70875
Bet 2	Y 70876
Bet 3	Y 70877
Bet 4	Y 70878
Bet 5	Y 70879
Bet 6	Y 70880
Bet 7	Y 70881
Bet 8	Y 70882
Bet 9	Y 70883
Bet 10	Y 70884
Bet 11	Y 72094
Bet 12	Y 72095
Bet 13	Y 72096
Bet 14	Y 72097
Bet 15	Y 72098
Bet 16	Y 72099
Bet 17	Y 72100
Bet 18	Y 72101
Bet 19	Y 72086
Bet 20	Y 72087
Bet 21	Y 72088
Bet 22	Y 72089
Bet 23	Y 72090
Bet 24	Y 72091
Bet 25	Y 72092
Bet 26	Y 72093



NORANDA EXPLORATION COMPANY LIMITED

Location Map

Bet Claim Group

Nahani M.D.
105 I/12

1" -4 miles
Fig. 1.

The Bet claim group is located approximately 186 miles north of Watson Lake, Yukon Territory, on the Pelly River. Access to the property is by means of fixed wing and helicopter from Watson Lake. The claims lie adjacent to the Pelly River on a south facing slope. Elevation ranges from 2800 to 5200 feet a.s.l.

Geological and geochemical surveys were carried out by Noranda Exploration Company Limited during the periods July 4 to 6, July 11 and August 13 - 18, 1973. The work was performed under the direction of G.E. Dirom, P.Eng. with field supervision by P.M. McAndless (geological). Geochemical field and laboratory procedure was co-ordinated by J.D. Knauer.

The geological and geochemical stream sediment surveys were plotted on a 1 inch to 1000 foot, air photo controlled, topographic base map. The geochemical soil survey was plotted on 1 inch to 400 foot scale map. Claim boundaries are included on all maps.

GEOLOGY

There is almost no rock exposure on the Bet claim group. Geological investigation was restricted to the exposed ridge tops directly above the claim group.

Stratigraphy

Adjacent ridges are underlain by a sequence of sedimentary rocks of Devonian and Mississippian age (G.S.C., Map 8-1967, Nahani). A Black Clastic Unit (Nahani Formation (?) was the only formation exposed in the area directly above the claim group.

Table of Formations

Era	Period	Formation and thickness (feet)	Lithology
Paleozoic	Devonian and Mississippian (?)	Black Clastic Unit 5000 [Nahani (?)]	interbedded silty, sandy and pebble shale, black cherty shale and greywacke.

The Black Clastic Unit comprises resistant, thickbedded, grey weathering repetative interbeds of silty, sandy and pebble shale as well as black cherty shale and greywacke.

Dark grey, laminated, fissile to platy, silty shale possibly represents the basal beds of the thick clastic sequence. These well cleaved, somewhat recessive rocks grade into coarser fraction interbeds of sandy and pebble shale. These fine to coarse-grained, green-grey weathering rocks are relatively resistant and well defined beds that range up to 300 feet thick. A 500 foot wide bed of resistant, black weathering, laminated to medium-grained cherty shale and greywacke is included within the clastic interbeds. The Black Clastic Unit is possibly a counterpart to the Nahani Formation of Devonian-Mississippian age. No exposed Road River Formation was located above the claim group.

Structure

Clastic beds strike northwesterly and dip moderately to the southwest. The dip of the beds range from 40 to 70 degrees. Several east trending faults transect the clastic beds. The clastic beds possibly represent part of the western limb of a large, open anticline.

Mineralization

No visible lead, zinc or copper mineralization was encountered.

GRID PREPARATION

A northwest trending chain and compass grid was established for a geochemical soil survey. Grid lines of varying lengths were fixed at 400 foot intervals along a 4,000 foot base line. The lines were extended for 1,400 feet on both sides of the base line except for the three eastern most lines which were extended for 2200 and 2800 feet to the north. All lines were flagged and marked at 200 foot stations. A total of 6.51 miles of grid was prepared.

GEOCHEMICAL STREAM SEDIMENT SURVEY

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

Sampling Method:

Samples were obtained by collecting the finest transported material available - preferably silt, from the centre portion of the creek, away from the creek banks. The samples were placed in "Hi Wet Strength 3½"x 6 1/8" Open End" envelopes and the sample number and collectors initials marked on the envelopes with indelible felt pen. Stream sediments were taken wherever possible on all the main drainages and their tributaries. The sample interval varied but was approximately one sample every 500 feet, if possible.

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 soluable copper, lead and zinc is as follows:

0.200 grams of the -80 mesh material is digested with 5 ml. of 0.5 NHCl to a boil for 25 minutes. The sample is brought back to 5 ml. with 0.5 NHCl after cooling. A Varian Techtron Model AA-5 Atomic Absorption Spectrophotometer was used to determine the parts per million copper, zinc and lead content in each sample.

The determination procedure for total molybdenum is as follows:

0.200 grams of the -80 mesh material is digested in 2 ml. of $HClO_4$ and 0.5 ml. of HNO_3 for approximately four hours. Following digestion, each sample is diluted to 5 ml. with demineralized H_2O. A Varian Techtron Model AA-5 Atomic Absorption Spectrophotometer was used to determine the parts per million molybdenum content in each sample.

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

Presentation of Results:

Results of the stream sediment survey are presented in Drawing No's. 4 and 5 of this report. These are plan maps scale 1 inch = 1,000 feet showing copper, lead, zinc and molybdenum in parts per million.

Discussion of Results:

Stream sediments, taken from two major drainages and their tributaries in the area of the Bet Group of mineral claims, were analyzed for zinc, lead, copper and molybdenum. Values obtained range from 250 to 4000 P.P.M. zinc, 2 to 40 P.P.M. lead, 24 to 130 P.P.M. copper and 7 to 62 P.P.M. molybdenum. The only element to show significant contrast between background and anomalous values was zinc. The majority of the high zinc values occur in the sediments of the northern drainage. A black cherty shale unit exposed near the headwaters of this drainage is thought to be the source for the high zinc values.

A decrease in stream velocity and an increase in organic material may be factors producing the higher zinc values near the mouth of the creek.

GEOCHEMICAL SOIL SURVEY:

All soils were analyzed for copper, lead, zinc, molybdenum and cadmium in the Noranda Exploration Company, Limited laboratory, located at 1050 Davie Street, Vancouver 5, B.C. Analyst was Evert VanLeeuwen.

Sampling Method:

Samples were obtained by digging holes with a shovel to a depth where the visible C horizon or sub-outcrop was encountered. The C horizon was sampled whenever possible. The samples were placed in "Hi Wet Strength Kraft 3½" x 6 1/8" Open End" envelopes and the grid station was marked on the envelopes with indelible felt pen. 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, lead, zinc, cadmium and molybdenum is as follows:

0.200 grams of the -80 mesh material is digested in 2 ml. of $HCLO_4$ and 0.5 ml. of HNO_2 for approximately four hours. Following digestion, each sample is diluted to 5 ml. with demineralized H_2O. A varion Techtron Model AA-5 Atomic Absorption Spectrophotometer was used to determine the parts per million copper, lead, zinc, cadmium and molybdenum content in each sample.

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

Presentation of Results:

Results of the soil survey are presented in Drawing No's 6,7, and 8 of this report. These are plan maps at a scale 1 inch = 400 feet which show copper-cadmium, lead-zinc and molybdenum in parts per million. Anomalous values for each element are indicated as shown in the legend.

Discussion of Results:

Zinc values show a background of less than 500 P.P.M. and anomalous values above 1,000 P.P.M. Lead values indicate a background of less than 35 P.P.M. Cadmium has a background of less than 9 P.P.M. and anomalous values above 12 P.P.M. Copper ranges from a background of less than 70 P.P.M. to anomalous values over 100 P.P.M. Molybdenum background ranges from less than 2 to 22 P.P.M. and anomalous values greater than 45 P.P.M.

The results of the soil survey are as follows:

1. A strong correlation exists between anomalous zinc and cadmium values particularly in the area of the grid between 20+00E and 40+00E from 4+00S to 28+00N.

2. A partial correlation exists between anomalous copper values and anomalous zinc-cadmium values. An area of anomalous copper molybdenum values occurs in an area lacking anomalous zinc-cadmium values in the northeast corner of the grid.

3. No correlations were noted between anomalous molybdenum and zinc-cadmium values.

4. Three lead values were above threshold with two associated with high zinc values.

5. The areas of anomalous values have a close association with the drainage patterns as well as the low lying areas on the eastern portion of the grid. This may be an indication that the anomalous values are caused by hydromorphic and mechanical transport.

6. Poor outcrop exposure on the Bet Group of mineral claims limits a more detailed interpretation of the soil survey.

Conclusions and Recommendations:

No lead, zinc or copper mineralization was encountered on the Bet claim group.

Of the analyzed elements in the drainage sediments, only zinc was anomalous. A source for these high values was not located within the claim group.

Areas containing anomalous soil values in zinc, cadmium, copper and molybdenum were found, however, lack of exposed rock limits the interpretation.

A number of the anomalous zinc, cadmium and copper soil areas occur adjacent to the drainage carrying anomalous zinc sediments. Ground and surface waters may be contributors in the build up of these elements within the surrounding soils.

Mechanically transported material may also be a factor in the concentration of elements within anomalous areas.

On the basis of present geological and geochemical evidence, no further work is recommended.

Respectfully submitted,

G.E. Dirom, P. Eng.

P.M. McAndless,
Geologist

J.D. Knauer,
Geochemist.

P.M.M. Andrews
13/12/73

REVISED	BET CLAIM GROUP
	PROJECT:
PROJ. Nº 904	SURVEYED BY: DATE:
N.T.S. 105I/12	DRAWN BY: SCALE:
DWG. Nº 2	NORANDA EXPLORATION CO. LTD.
	OFFICE:

Bet Group

LEGEND

Black Clastic Unit

DEVONIAN-MISSISSIPPIAN ?

- Interbedded silty, sandy and pebble shale
- Black argillaceous cherty shale, greywacke

Geological Boundary (Inferred)

Outcrop

Fault (Inferred)

Bedding 45

CROSS SECTION

SW A — A' NE

5600
5400
5200
5000
4800
4600
4400

P M McAndless 13/12/73

REVISED
PROJ. Nº 904
N.T.S.
DWG. Nº 3

PELLY RIVER
GEOLOGY
BET CLAIM GROUP

PROJECT:

SURVEYED BY: P McAndless. DATE: 11th December/73

DRAWN BY: D Phillips SCALE: 1" = 1000'

NORANDA EXPLORATION CO. LTD.

OFFICE:

BET 1
BET 2
BET 3
BET 4
BET 5
BET 6
BET 7
BET 8
BET 9
BET 10
BET 11
BET 12
BET 13
BET 14
BET 15
BET 16
BET 17
BET 18
BET 19
BET 20
BET 21
BET 22
BET 23
BET 24
BET 25
BET 26

2300
28
3000
22

Zinc
Lead

P M Middlebro 13/12/73
James D. Fraser 13/12/73
T. P. Dixon

REVISED
PROJ. Nº 904
N.T.S. 105J/12
DWG. Nº 4

BET CLAIM GROUP

Zn & Pb in ppm

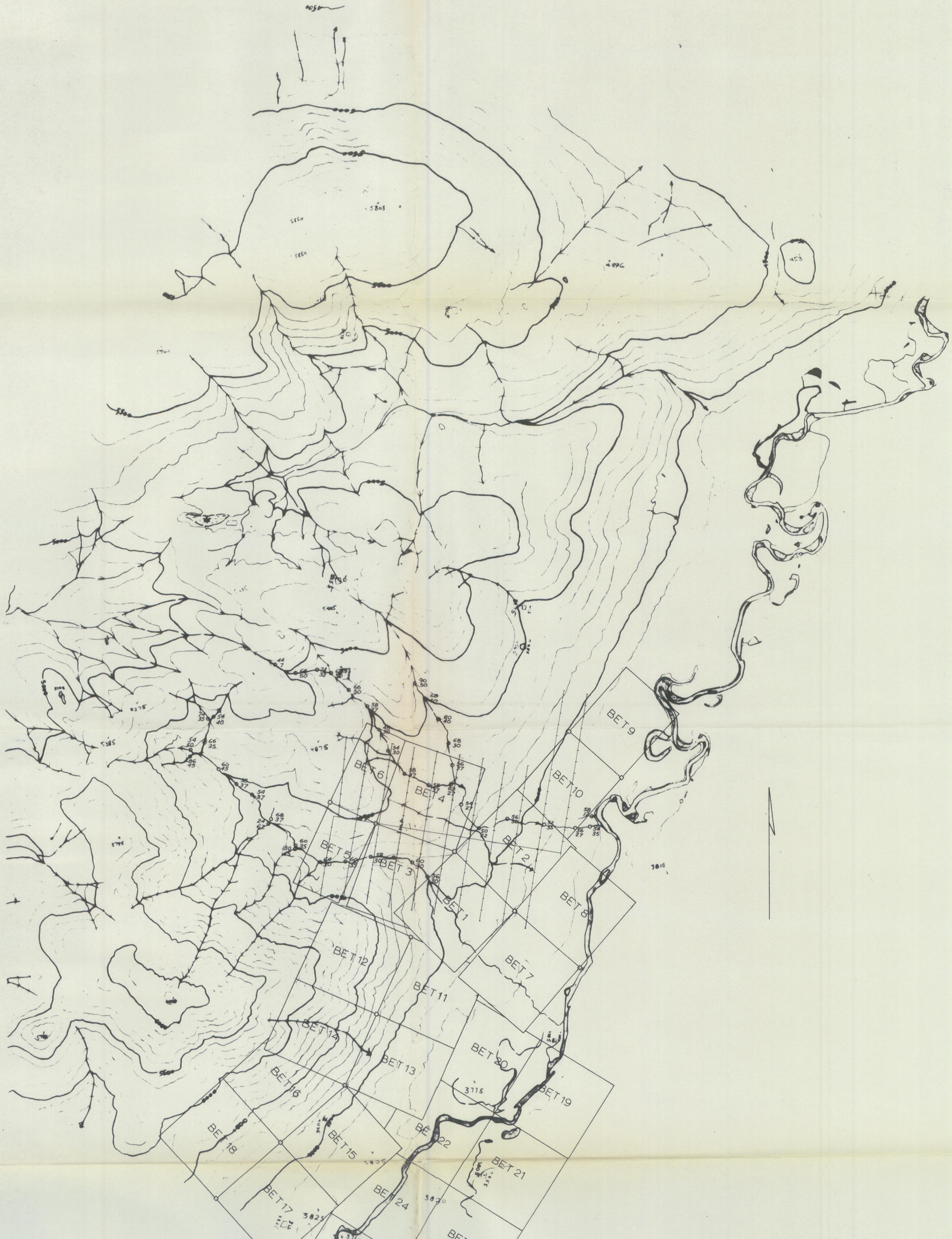
PROJECT: GEOCHEMICAL STREAM SEDIMENT SURVEY

SURVEYED BY: ..... DATE: .....

DRAWN BY: ..... SCALE: 1" = 1000'

NORANDA EXPLORATION CO. LTD.

OFFICE: .....



P M McAndless 3/12/73

James D Bruce 3/12/73

REVISED
PROJ. Nº 904
N.T.S. 105I/12
DWG. Nº 5

BET CLAIM GROUP

Cu & Mo in ppm

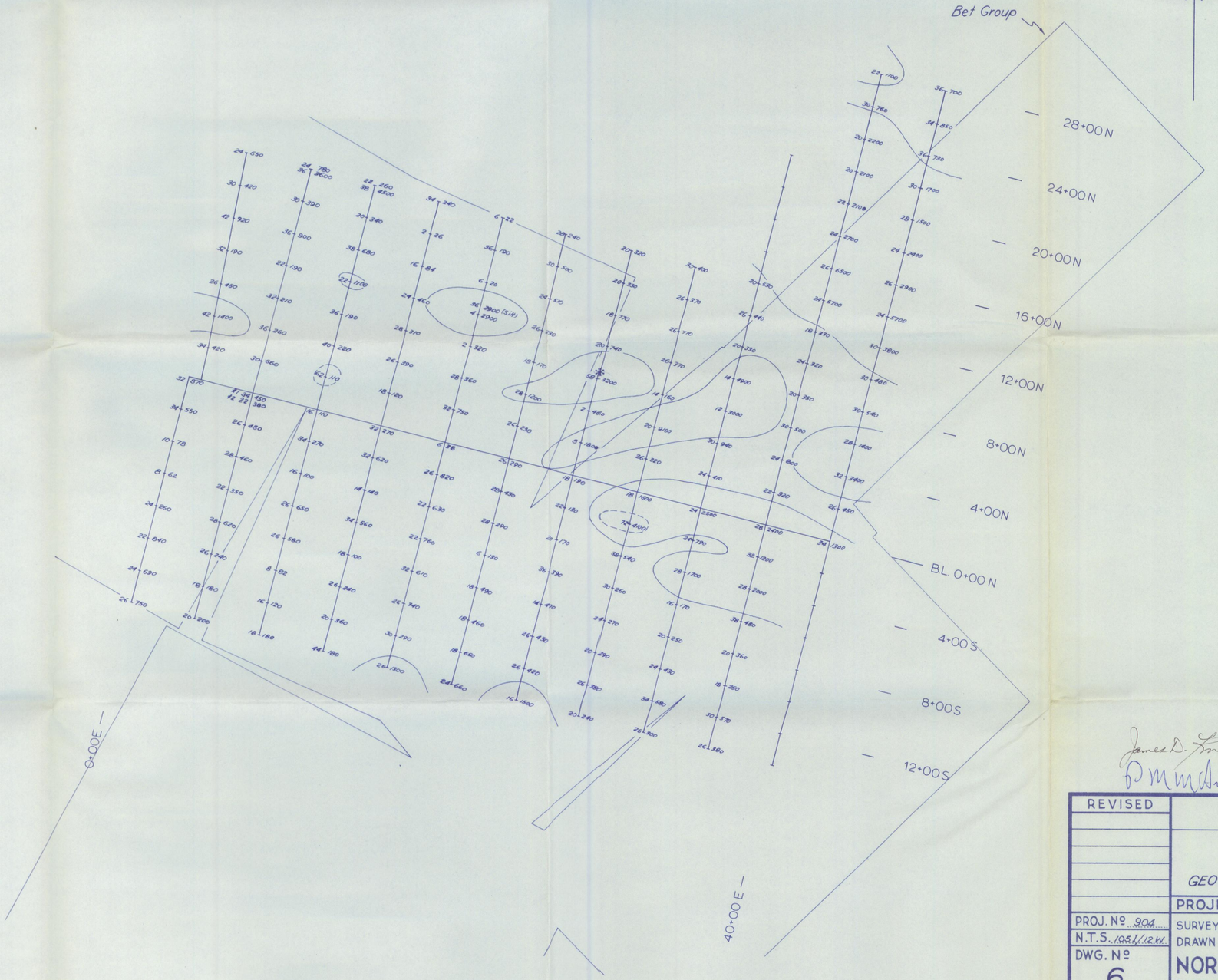
PROJECT: GEOCHEMICAL STREAM SEDIMENT SURVEY

SURVEYED BY: ..... DATE: .....

DRAWN BY: ..... SCALE: 1" = 1000'

NORANDA EXPLORATION CO. LTD.

OFFICE: .....



Pb 58 | Zn 3200

Soil 24 | 780
Silt 36 | 3600

◌ & * ≥ 58 ppm Pb

≥ 1000 ppm Zn

James D. Fraser 13/12/73

D M McAuliffe 13/12/73

REVISED

BET PROPERTY

SOIL GRID

GEOCHEMISTRY RESULTS - LEAD & ZINC

PROJECT:

PROJ. Nº 904

N.T.S. 105I/12W

DWG. Nº 6

SURVEYED BY: ..... DATE: 23 NOV/73

DRAWN BY: D. Phillips SCALE: 1" = 400'

NORANDA EXPLORATION CO. LTD.

OFFICE: Vancouver

Cu | Cd
86 | 4.0

Soil 110 | 62
Silt 60 | 240

○ ≥ 100 ppm Cu

○ & * ≥ 13 ppm Cd

James D. Fraser 13/12/73

P.M.M. Sheddess 13/12/73

T. K. Shaw

REVISED	**BET PROPERTY**
	SOIL GRID
	GEOCHEMISTRY RESULTS – COPPER & CADMIUM
	PROJECT:
PROJ. Nº 904	SURVEYED BY: DATE: 23 NOV/73
N.T.S. 105I/12W	DRAWN BY: D. Phillips SCALE: 1" = 400'
DWG. Nº 7	NORANDA EXPLORATION CO. LTD.
	OFFICE: Vancouver

Mo 45

Soil 57
Silt 32

○ > 45 ppm

James D. Fraser 13/12/73

P. M. McAndless 13/12/73

REVISED	**BET PROPERTY**
	SOIL GRID
	GEOCHEMISTRY RESULTS - MOLYBDENUM
	PROJECT:
PROJ. Nº 904	SURVEYED BY: DATE: 23 NOV/73
N.T.S. 105I/12W	DRAWN BY: D. Phillips SCALE: 1" = 400'
DWG. Nº 8	**NORANDA EXPLORATION CO. LTD.**
	OFFICE: Vancouver