6404

COMINCO LTD.

EXPLORATION
N.T.S. 82L/6W

WESTERN DISTICT
31 AUGUST 1977

ASSESSMENT REPORT

ON THE

SUPER AND NOVA CLAIMS

BY

M. OSATENKO

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ATTACHMENTS:

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2. Geology of Super-Nova claims, 1:10,000.
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4. Ground magnetic survey on the Goodenough grid, 1:2,000.

COMINCO LTD.

EXPLORATION

WESTERN DISTRICT
26 AUGUST 1977

ASSESSMENT REPORT

GOODENOUGH PROPERTY

N.T.S. 82L/6W

SUMMARY AND CONCLUSIONS

The Goodenough copper property is located 9 km west of Vernon, B.C.

Work done during 1977 included geological mapping and a detailed ground magnetic survey. Data collected shows that the principal mineralized rock type is a calcareous, cherty basaltic tuff interbedded with quartz diorite porphyry; chert; cherty, basaltic tuffite; chert breccia; augite basalt; basalt-andesite; and limestone. Mineralization consists of disseminated pyrite, chalcopyrite, magnetite and minor bornite and chalcocite (?) with copper values up to 18,400 ppm (1.84%). The main mineralized unit is about 10m wide and at least 600m long. It is traceable by scattered exposures in trenches and by ground magnetics. The adjacent quartz diorite porphyry is also mineralized with pyrite and chalcopyrite up to 10's of meters away from the cupriferous basaltic tuff units.

It is apparent that the mineralization is stratigraphically controlled and related to volcanic processes. The favorable package of rocks seen at the main showing strikes into drift-covered areas to the northwest and southeast and cannot be easily traced. More detailed mapping and further ground magnetic surveys are necessary to trace the favorable horizons.

INTRODUCTION

This report describes the results of a geological mapping and ground magnetic project on the Goodenough copper property, situated 9 km west of Vernon, B.C. The work was conducted by M.J. Osatenko and B.G. Ames variously during the period July 8th to July 29th, 1977. Data is presented at a scale of 1:10,000 for the whole property and 1:2,000 for the Goodenough copper showing area.

LOCATION AND ACCESS

The property is located 9 km west of Vernon, B.C. on the west side of Okanagan Lake between Naswhito and Equesis Creeks (Plate 1). Access is off the paved Westside road to the graveled Six Mile road and then along Siwash road to a system of logging and mining roads which lead to the property. It takes about 45 minutes to drive from Vernon.

The elevations of the area range from 1400 to 3600 feet with open savannah on parts of the property. Elsewhere fir and poplar bush is present which is easily passable.

PREVIOUS WORK

A number of exploration projects have been carried out by other companies on the ground encompassed by the Super and Nova claims. These are listed below.

References	Type of Work	Claim Or Property name	Operator	Year
Private Cominco files	trenching	?	?	1924 1899,1900, 1904,1921,
"	?	?	Granby	1930
"	drilling	?	Highland Valley	1962
"	geology, soil geochem, magnetics, self potential.	Goodenough	Empire	1963
"	drilling (1008m)	"	"	1964
Assessment report 2042	I.P.	Hugal	HudsonBay Ex.	1969
Local Farmers	drilling (7 holes) on I.P. anomaly.	Hugal	"	?

PROPERTY AND OWNERSHIP

The Goodenough property is 100 percent owned by Cominco Ltd. and consists of the following claims.

Claim	Record No.	Number of Units	Date Recorded
Super	120	18	Sept. 9, 1976
Nova	121	18	Sept. 9, 1976

GEOLOGY

The Goodenough property is located in a thick sequence of northwesterly trending (steeply dipping) argillites, limestones and basic, volcanic rocks (flows and tuffs). Work by the G.S.C. (Jones, 1959 map 1059A memoir 296) assigns these rocks to the Paleozoic Cache Creek group but more recent work by A. Okulitch of the G.S.C. suggests an Upper Triassic age (Nicola Group). Geology of the property outside the grid is shown in Plate 2 while Plate 3 shows a detailed map of the main Goodenough copper showing area. Outcrop is generally very poor with most of the exposures in old trenches or along the north and south sides of Naswhito Creek.

(A) Rock Units

The rock units on the Super and Nova claims are described below by lithologies with no speicific time connotations, however,it

is possible to generally group the rock units into a time sequence with the oldest comprising the sediments and basic, volcanic rocks followed by the intrusive bodies (quartz diorite porphyry and lamprophyre) with the youngest rocks consisting of Tertiary basalt flows.

(1) Augite basalt (unit 1)

Augite basalt occurs in a lense-shaped body (>150 x 20m) just north of the base line between 0 + 50 N and 1 + 00S. These rocks are fine to medium grained, porphyritic, dark green and consist of 5 to 15 percent augite phenocrysts in a fine grained green basaltic matrix. They are usually massive, fresh and do not contain pyrite.

(2) Andesite-basalt (units 2a and 2b)

Rocks of the andesite-basalt unit (unit 2a, flows)occur just to the northeast of the augite basalts and comprise a unit about 150 x 20 m. These rocks are highly fractured, strongly chloritized and epidotized and show spotty garnetization and from 1-5% disseminated to fracture-controlled pyrite. Veinlets of calcite and quartz carrying minor pyrite and chalcopyrite are common. Locally, magnetite occurs as irregular replacements and is usually associated with the formation of garnet. Some basic dykes (unit 2b) are also present.

(3) Basaltic, cherty tuffite (unit 3)

Basaltic, cherty tuffites occur in two narrow lenses in the vicinity of the baseline to 30E and between 0 + 25S to about 0 + 50S. They consist of greenish chert, interbedded basaltic tuff and chert breccia (fragments up to 2cm). These rocks are usually highly fractured and contain pyrite and minor chalcopyrite, especially in the more chloritic and greenish areas.

(4) Calcareous, cherty basaltic tuff (unit 4)

The calcareous, cherty basaltic tuff unit occurs in a number of layers generally separated by quartz diorite porphyry. Individual layers are from 2 to perhaps 15 m thick with the main one traceable in outcrop and by ground magnetics for at least 600m. The rocks are fine grained, green, calcareous and often contain cherty layers with magnetite. Pyrite and chalcopyrite are the main sulfides with minor bornite and chalcocite. Grades within this basaltic tuff are the highest of any rock type on the property, hence, the unit is of greatest ore making potential (see MINERALIZATION part of this report).

Alteration is usually well developed and consists of chloritization and epidotization. A few quartz and calcite veins cut the rocks and they often carry pyrite and chalcopyrite.

(5) Chert (unit 5)

Chert occurs in a number of places on the grid. It is dense, highly fractured, grey and commonly contains pyrite and pyrrhotite (1 to 3 percent). In the vicinity of line 0 + 50 N/1 + 00E chalcopyrite is common as disseminations in grades up to 2,000 ppm copper. Some outcrops show well brecciated rocks (0+50S/0+60E).

Some of the chert outcrops maybe very fine grained porphyry.

(6) Limestone (unit 6)and interbedded chert (unit 6a)

Limestone is the principal rock type on the east side of the grid and in the canyon of Naswhito Creek. It is fine to medium grained, grey and often contains crinoid stems and pelecypods. Minor calcite veining is common as are dark grey calcite spots. No sulfides are present except about 900 m southeast of the main showing where massive pyrite and pyrrhotite occurs in a ½m wide cherty bed interbedded with limestone.

Units (6a) is a grey, dense interbedded chert.

(7) Argillite (unit 7)

Argillite and argillaceous siltstones are found in one outcrop on the grid (325°/85°E) and just to the southwest of the southeast corner of the Super claim (Plate 2). They are often gossanous and contain fine grained pyrite.

(8) Quartz diorite porphyry (unit 8)

The quartz diorite porphyry unit is the most widespread of the rock types on the property. It is fine to medium grained, porphyrytic (plagioclase phenocrysts), grey to greenish and occurs in plugs, and sill-like masses. No cross-cutting dykes have been noted.

Alteration of the porphyry varies from fresh to strong sericitic (see Plate 3) with no obvious correlation to the mineralized basaltic tuffs. It is, however, clear that the porphyry is only well mineralized adjacent to chalcopyrite - rich basaltic tuffs, perhaps up to a few 10's of meters away. Here, pyrite and chalcopyrite occur along fractures and as disseminations in quartz veinlets (up to 1 cm in width).

To the northwest of the main showing (about 500 m) old trenching has exposed highly sericitized and pyritized quartz diorite porphyry with the intensity of alteration and pyritization apparently increasing towards the southwest. The amount of chalcopyrite (about 200 to 400 ppm copper) is also highest in the more altered and pyritic rocks.

(9) Lamprophyre (unit 9)

A lamprophyre dyke (about 4 m wide) outcrops about 135 m southwest of the baseline around 1+40W. It is a dark green, medium to coarse grained rock composed essentially of chloritized pyroxene with 2 to 5 percent large pale green epidote crystals. The matrix of the lamprophyre is very calcareous.

(10) Basalt (unit 10)

Basalt flow breccias outcrop in the extreme western edge of the grid. Fragments are about 7 cm across. These rocks are of early Tertiary age and cap all rocks in the area.

(B) Structure

The structure of the volcanic-sedimentary pile is difficult to determine due to the extremely poor outcrop and to the presence of widespread quartz diorite porphyry. Units generally trend about 325° and are thought to dip steeply to the northeast. Ground magnetics suggest that the main basaltic tuff unit is folded with an axial plane striking about 325°. The plunge of the fold is thought to be steep but no concrete evidence exists to support this contention.

MINERALIZATION

The contents of copper, silver, tungsten and gold for rocks from the Goodenough property are shown in Plate 3. Copper and silver were determined by atomic absorption spectrophotometry after an aqua regia digestion while gold was done by a DIBK extraction followed by atomic absorption analysis. Tungsten was analyzed using a Zn dithiol extraction and colorimetric methods. Reproducibility is estimated at ± 10 percent for all elements (one standard deviation).

Copper mineralization occurs principally in the basaltic tuff with lower widespread grades in the adjacent quartz diorite porphyry. Chalcopyrite, pyrite (minor phyrrhotite), magnetite and traces of bornite and chalcocite(?) occur throughout the rock, as disseminations along bedding, as disseminations in quartz veinlets for the copper bearing sulfides and as irregular splashes and as disseminations along bedding for magnetite. In the tuff horizons grades range from 745 to 18,400 ppm copper with typical grades of 5,000 to 10,000 ppm copper. It is apparent that the porphyry is only well mineralized (pyrite, chalcopyrite) adjacent to the tuff with grades from less than 100 to 5,000 ppm copper. Silver and gold values are highest in the tuff, 3.5 ppm and 230 ppb are the highest values respectively. Tungsten values are uniformly low (less than 2 ppm).

To the northwest of the main showing (500 m) minor chalcopyrite occurs in highly pyritic, sericitized quartz diorite porphyry.

GEOPHYSICS

The geophysical survey consisted of a detailed ground magnetic survey over the grid at a spacing of 10m (about 1,100 readings, see Plate 4) using a Scintrex MF-2 magnetometer. In areas of high readings stations were read at 5m intervals.

High magnetic values occur over the main magnetite-rich, basaltic tuff horizon which is at least 600 x 10m. Another magnetic zone exists just to the southwest and is about 500 x 10m but no outcrop is present. A third magnetic anomaly is present adjacent to the main one

(20m to the northeast) but is of shorter strike length than the previously discussed magnetic anomalies and wider (200 x 30m).

Report by:
M. OSATENKO,
Project Geologist

Endorsed by:
D.W. HEDDLE, P.Eng.
Assistant Manager

Approved for
Release by:
G. HARDEN,
Manager, Exploration
Western District

MO/gk

Distribution:

Mining Recorder
Western District

A P P E N D I X "A"

EXHIBIT "A"

STATMENT OF EXPENDITURES FOR A GEOLOGICAL AND GEOPHYSICAL SURVEY ON THE SUPER AND NOVA MINERAL CLAIMS
1977

GEOLOGY

Salaries

M.J. Osatenko	July 13th and 14th, July 17-29, 1977 (15 days at $140/day)	$2,100.00
	Report writing and drafting (3 days at $110/day)	330.00
B. Ames	July 8-13, July 18-29, 1977 (19 days at $67/day)	1,273.00

Supervision

F.L. Wynne, G. Harden		400.00

Domicile

	Accomodation and food in Vernon (34 days at $25/person/day)	850.00

Transporation

	Truck for ½ month plus gas	400.00

GEOPHYSICS

	Rental of magnetometer (½ month)	150.00

Assays

	53 samples @ $11/sample (Cu, Au, Ag, W)	583.00
	TOTAL EXPENDITURES	$6,086.00

A P P E N D I X "B"

IN THE MATTER OF THE
B.C. MINERAL ACT

AND

IN THE MATTER OF A GEOLOGICAL AND GEOPHYSICAL PROGRAM CARRIED OUT ON THE SUPER AND NOVA MINERAL CLAIMS

Located in the Vernon Mining Division

of the Province of British Columbia

More particularly N.T.S. 82L/6W.

A F F I D A V I T

I, MYRON J. OSATENKO, OF THE CITY OF VANCOUVER, IN THE PROVINCE OF BRITISH COLUMBIA, MAKE OATH AND SAY:

1. THAT I AM EMPLOYED AS A PROJECT GEOLOGIST BY COMINCO LTD., AND AS SUCH HAVE A PERSONAL KNOWLEDGE OF THE FACTS TO WHICH I HEREINAFTER DEPOSE:

2. THAT ANNEXED HERETO AND MARKED AS "EXHIBIT A" TO THIS OUR AFFIDAVIT IS A TRUE COPY OF EXPENDITURES OF A GEOLOGICAL AND GEOPHYSICAL PROGRAM CARRIED OUT ON THE SUPER AND NOVA MINERAL CLAIMS;

3. THAT THE SAID EXPENDITURES WERE INCURRED BETWEEN THE EIGHTH DAY OF JUNE 1977 AND THE 29TH DAY OF JULY 1977 FOR THE PURPOSE OF MINERAL EXPLORATION ON THE ABOVE NOTED CLAIMS.

Sworn Before Me at the City of Vancouver in the Province of British Columbia this 7th day of August, September, 1977

A NOTARY PUBLIC IN AND FOR THE PROVINCE OF BRITISH COLUMBIA

Myron J. Osatenko
MYRON J. OSATENKO

A P P E N D I X "C"

EXPLORATION

WESTERN DISTRICT
31 AUGUST 1977

COMINCO LTD.

STATEMENT OF QUALIFICATIONS

I, MYRON J. OSATENKO, OF THE CITY OF VANCOUVER, BRITISH COLUMBIA, HEREBY CERTIFY:

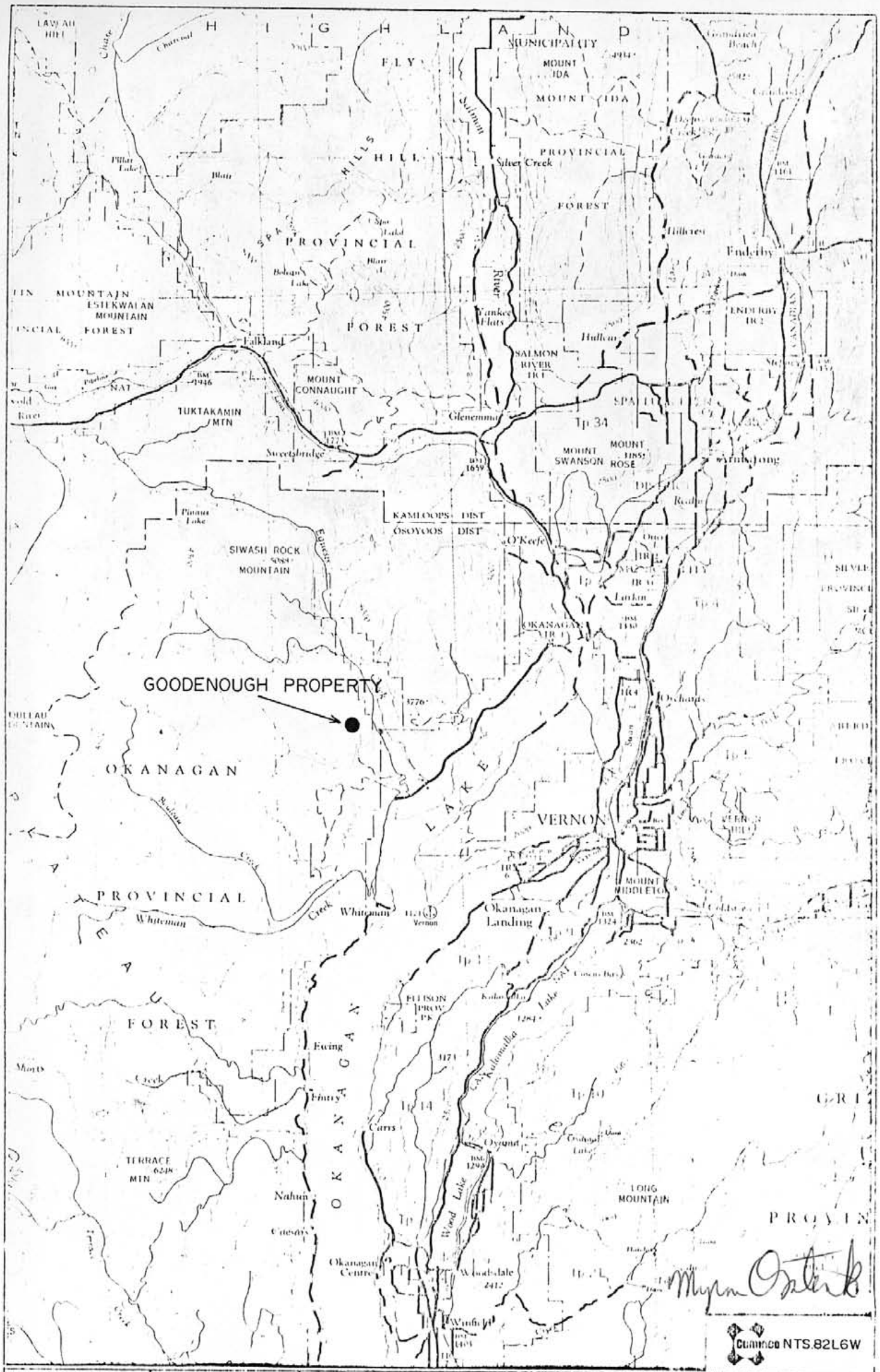
1. THAT I AM A GEOLOGIST, RESIDING AT 6437 - 116TH STREET, DELTA, BRITISH COLUMBIA WITH A BUSINESS ADDRESS AT 200 GRANVILLE SQUARE, VANCOUVER, BRITISH COLUMBIA.

2. THAT I GRADUATED WITH B.Sc. AND M.Sc. DEGREES IN GEOLOGY FROM THE UNIVERSITY OF BRITISH COLUMBIA IN 1965 AND 1967 RESPECTIVELY.

3. THAT I HAVE PRACTISED GEOLOGY WITH COMINCO LTD. FROM 1967 TO 1977.

DATED THIS 7 DAY OF SEPTEMBER, 1977 AT VANCOUVER, BRITISH COLUMBIA.

SIGNED: Myron J. Osatenko
MYRON J. OSATENKO, M.Sc.



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Revised by	Date	Revised by	Date

GOODENOUGH PROPERTY
LOCATION MAP

Scale: 1:250,000

Date: SEPTEMBER 6, 1977

Plate: 1

NGI - 117 - C.L.

Super

Nova

SEE PLATE 3 FOR DETAILED GEOLOGY

DDH

DDH

Naswhito Creek

INDIAN RESERVATION

3500

3000

2500

2200

2000

1500

10

8

2a

6

2b

7

py

0 500 1000

METRES

LEGEND

- 10 Basalt
- 8 Quartz diorite porphyry
- 7 Argillite, argillaceous siltstone
- 6 Limestone
- 2a Andesite basalt flows
- 2b Andesite basalt dykes

SYMBOLS

- I.P Anomaly
- Magnetic Anomaly
- Diamond drill hole (Hudson Bay Exploration)
- Geological contact
- Road
- Outcrop boundary

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 6404

Drawn by:

Traced by:

Revised by	Date	Revised by	Date

Scale: 1 : 10,000

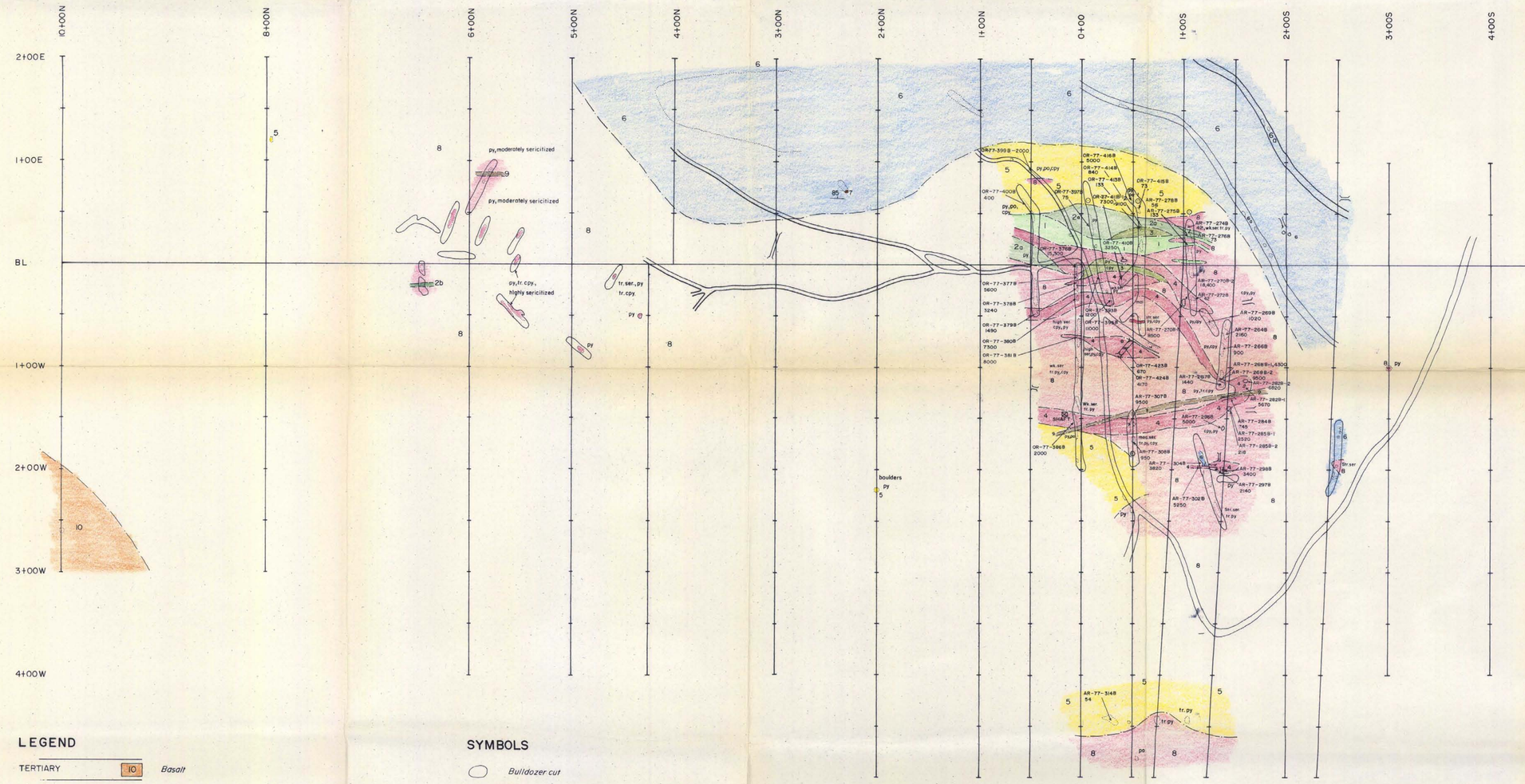
Date: SEPTEMBER 6, 1977

Plate: 2

GOODENOUGH PROPERTY

REGIONAL GEOLOGY MAP

FORM 210-0003



SAMPLE #	TYPE OF SAMPLE	Cu ppm	Ag ppm	W ppm	Au ppb
AR-77-264B	chip 10m	2160	L0.4	2	84
266B	chip 15m	900	L0.4	2	26
267B	chip 6m	1440	L0.4	2	76
268B-1	chip-magnetic / 3m	4300	L0.4	2	140
268B-2	chip-nonmagnetic/	9500	0.8	2	L10
269B	chip 10m	1020	L0.4	2	L10
270B-1	rubble in 6m trench	8500	L0.4	2	62
270B-2	rubble in 6m trench	18400	1.3	L2	230
272B	chip 5m	2600	L0.4	L2	L10
274B	grab	42	L0.4	L2	L10
275B	grab	133	L0.4	L2	L10
276B	grab	73	L0.4	L2	L10
278B	grab	56	L0.4	2	L10
280B	grab	57	L0.4	L2	20
282B-1	chip 3m	5670	L0.4	L2	18
282B-2	chip 5m	6820	0.4	L2	50
284B	chip 3m	745	L0.4	L2	64
285B-1	chip 2m	2520	1.7	L2	180
285B-2	chip 2m	218	L0.4	L2	16
296B	chip 2m	5000	2.6	L2	10
297B	chip 3m	2140	0.7	6	L10
298B	chip 5m	3400	1.2	3	L10
302B	chip 2m	5250	2.2	L2	L10
304B	chip 4m	3820	L0.4	L2	30
307B	chip 10m	9500	1.1	L2	22
308B	(rubble) chip 8m	950	L0.4	L2	L10
314B	grab	54	L0.4	L2	L10
OR-77-376B	rubble 10m	15300	3.5	L2	40
377B	rubble 6m	5600	0.7	L2	L10
378B	rubble 5m	3240	0.5	L2	L10
379B	rubble 6m	1490	L0.4	L2	L10
380B	rubble 8m	7300	1.0	L2	L10
381B	chip 3m	8000	1.5	L2	50
382B	chip 15m	2300	0.5	L2	L10
386B	rubble 15m	2000	0.6	L2	L10
393B	chip 4m	1200	L0.4	L2	30
395B	chip 10m	11000	0.8	L2	120
397B	grab	75	L0.4	L2	L10
399B	chip 10m	2000	0.6	L2	L10
400B	chip 10m	400	L0.4	L2	L10
410B	chip 2m	3250	L0.4	L2	20
411B	rubble	7300	0.6	L2	50
412B	rubble	9100	0.6	L2	30
413B	chip 2m	133	L0.4	L2	L10
414B	chip 2m	840	L0.4	L2	L10
415B	chip 5m	73	L0.4	L2	L10
416B	chip 2m	5000	1.7	L2	80
421B	chip 1m	840	L0.4	L2	80
OR-77-423B	chip 10m	670	L0.4	L2	L10
424B	chip 1m	4170	L0.4	L2	20

LEGEND

TERTIARY	10	Basalt
	9	Lamprophyre
UPPER TRIASSIC NICOLA GROUP?	8	Quartz diorite porphyry
	7	Argillite, argillaceous siltstone
UPPER PALEOZOIC CACHE CREEK GROUP?	6	Limestone, 6a, interbedded chert
	5	Chert
	4	Calcareous, cherty basaltic tuff (pyrite, chalcopyrite, magnetite ± pyrrhotite)
	3	Basaltic, cherty tuffite
	2	Andesite, basalt flows 2a, andesite, basalt dykes 2b
	1	Porphyritic, augite basalt

SYMBOLS

- Bulldozer cut
- Trench
- Adit
- Pit
- Road
- Outcrop boundary
- Geological contact (assumed, defined)
- Drill hole
- py Pyrite
- cpy Chalcopyrite

0 50 100 150 200

METRES

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 6404

GOODENOUGH PROPERTY

NTS 82 L6W

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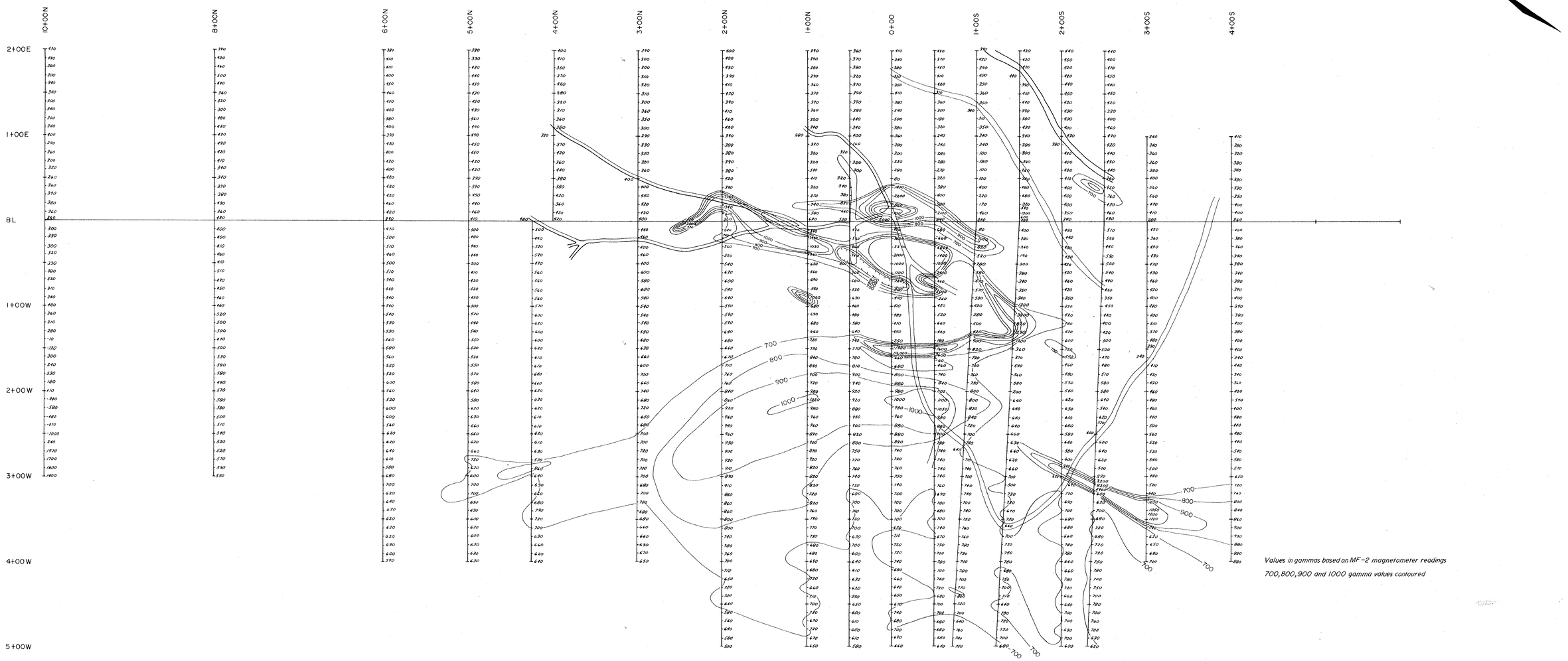
GEOLOGY and ROCK GEOCHEMISTRY

Scale: 1: 2,000 | Date: September 6, 1977 | Plate: 3

NOI - 118 - G.L.

FORM 210.0870



Myron Ostick

GOODENOUGH PROPERTY

NTS 82L6W

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Revised by	Date	Revised by	Date

GROUND MAGNETICS

Scale: 1:2,000 | Date: September 6, 1977 | Plate: 4

NCI - 118 - G.L.

FORM 210