REPORT

OF

GEOLOGICAL MAPPING & MAGNETOMETER SURVEY

MAX PROPERTY, UNUK RIVER AREA

SKEENA MINING DIVISION, BRITISH COLUMBIA

NTS MAP 104B/7E

50° 25' N Latitude 103° 32' W Longitude

By: E. Ostensoe

For: Granduc Mines, Limited

January 24, 1978

Erik A. Ostensoe

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Illustrations

I. INTRODUCTION

The Max iron-copper property of Granduc Mines, Limited is located in the Coast Mountains of northwestern British Columbia at Cebuck Creek, (also known as Barclay Gulch) on McQuillan Ridge. It lies east of Unuk River, about 14 kilometers north of the USA-Canada Boundary and 65 km northwest of Stewart, B.C. (Figure 1).

The prospect was discovered in 1960 as a result of airborne magnetometer surveys by Newmont Mining Corporation of Canada Ltd. working on behalf of Granduc Mines, Limited. During the period 1960 through 1962 the prospect was explored by geological and geophysical surveys and by 5,461 metres of diamond drilling. This work indicated a skarn-type deposit that contains approximately eleven million metric tons of potentially mineable iron and copper bearing rock. No work was done from 1963 through 1974. During 1975 line-cutting and geological and magnetometer surveys were completed on the Max prospect in the vicinity of the indicated mineral zone. These surveys confirmed results of earlier work and expanded coverage in the southern and southwestern parts of the property. During May and June 1977 similar surveys were applied to the western and northern parts.

Eleven of the original Max claims were abandoned effective May 7, 1977, then partially restaked in accordance with provisions of the Mineral Act. The Minimax claim (record number 369, anniversary date June 2), a six-unit modified grid system claim, was staked to cover parts of the pre-existing claims. The property now consists of claims as shown in Figure 2.

Work on the Max property during 1977 was done by a three man field crew that left Vancouver on May 4th. Field work commenced on May 7, 1977. Access to the area was by Jet Ranger helicopter operated by Vancouver Island Helicopters Limited from a base at Stewart, B.C. A temporary tent camp was established on a gravel bar 0.7 km south of the confluence of Unuk River and Cebuck Creek at elevation 150 metres. Field work was done by Erik

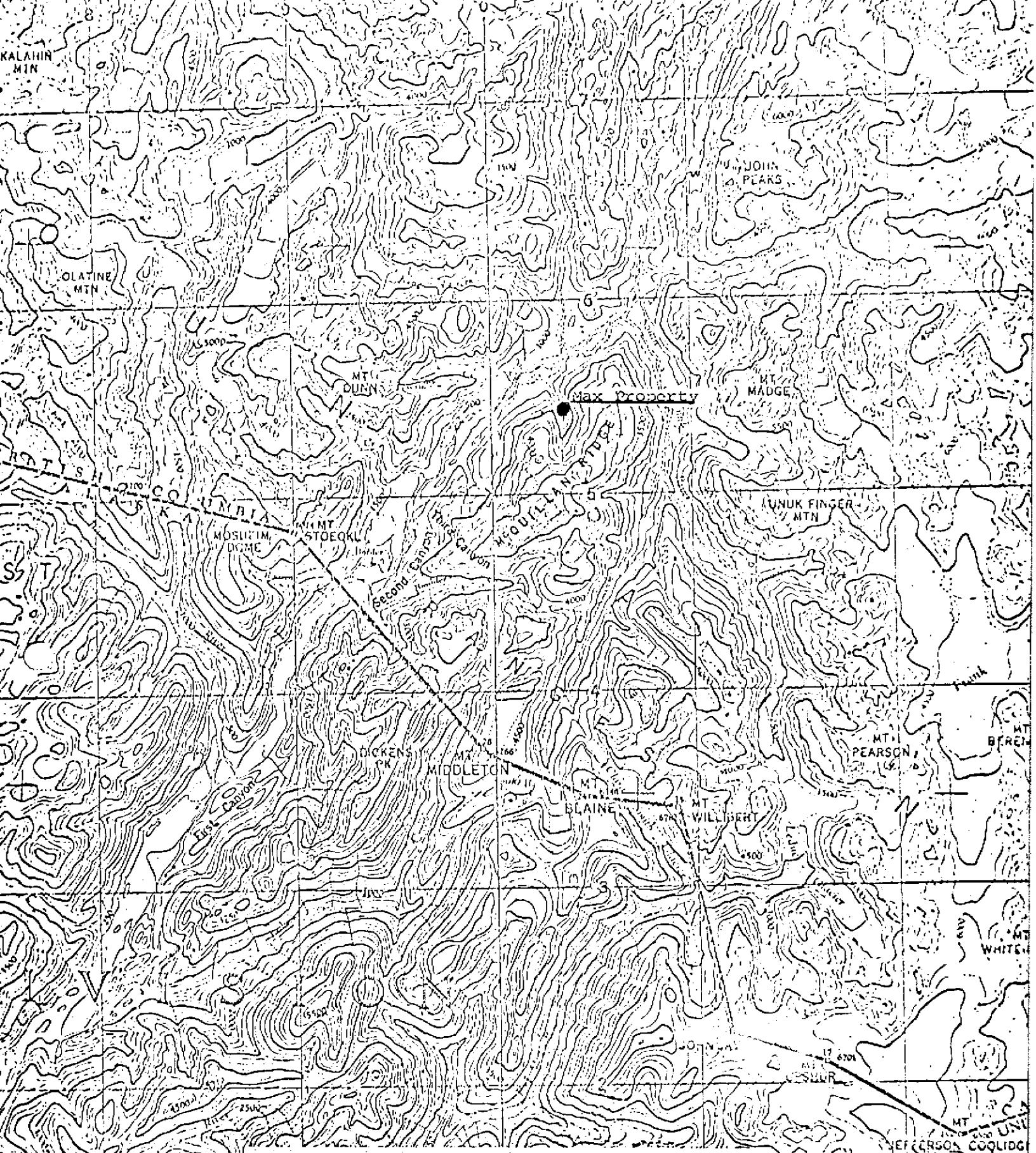

FIGURE 1
Location Map - Max Property, Unuk River Area,
Skeena M.D., British Columbia
Scale: 1:250,000 (approximate)

To Accompany Report by E. Ostensoe
For Granduc Mines, Limited (N.P.L.)

January 24, 1978

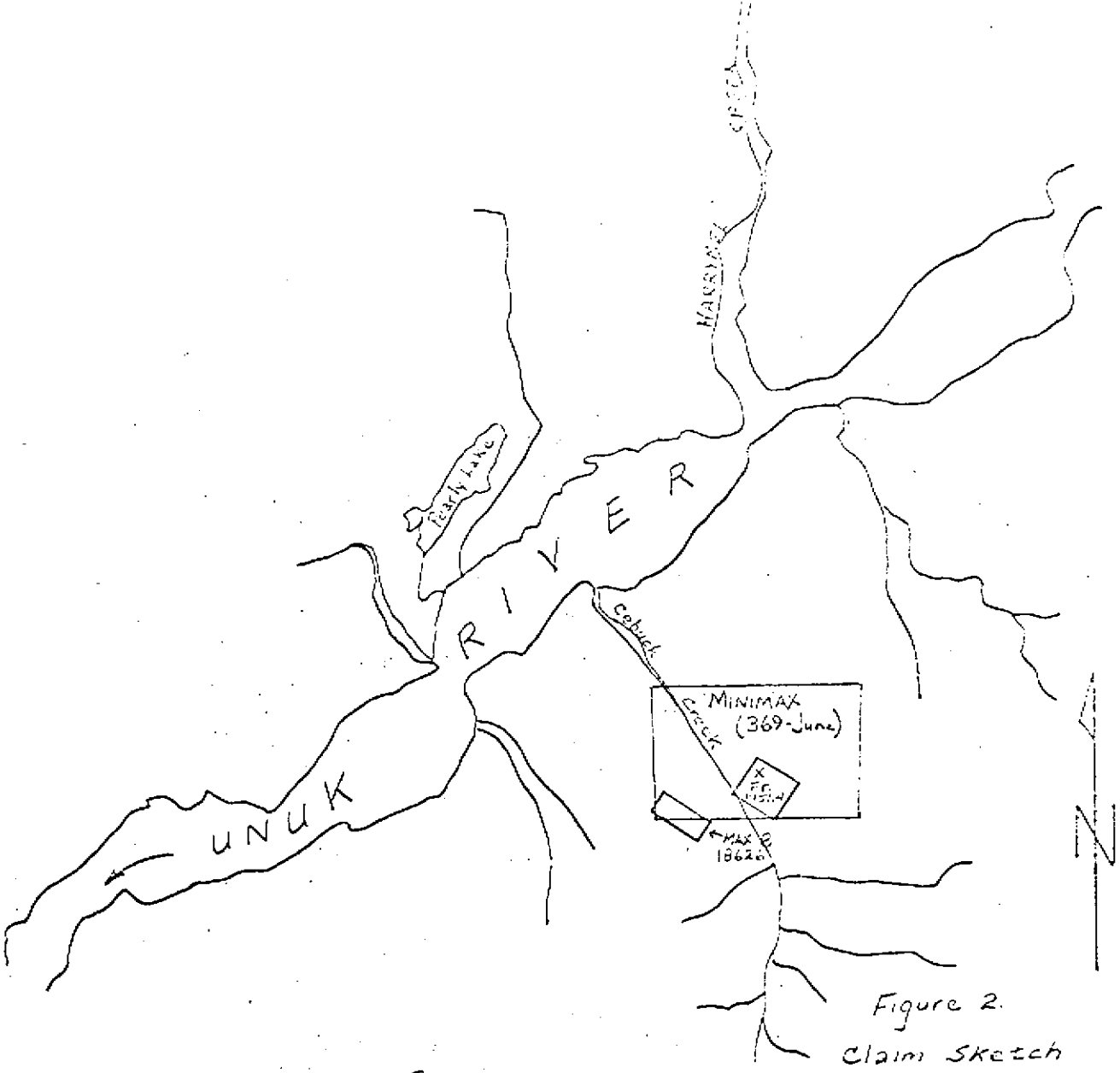

Figure 2.

Claim Sketch

1:50000

MAX PROPERTY - UNUK R. AREA

SKEENA M.D., B.C.

To accompany report by

E. Ostensoe

for Granduc Mines Ltd.

January 24, 1973.

from-

B.C. Ministry of Mines

Map 104B/7E.

Ostensoe, geologist, Ed Kruchkowski, geologist and Rick Burega, helper. Messrs. Ostensoe and Kruchkowski plotted data and prepared reports after completion of field work. Drafting was by C. L. Cory.

7.3 kilometres of base lines and grid lines were slashed, flagged and picketed to facilitate geological mapping and magnetic surveys. Grid lines and claim boundaries are shown in Figures 3 and 4 which display the technical data obtained at scale 1:2400. Almost all of the field work was done on the Minimax claim.

A pyritic zone located near the entrace to "Barclay Gulch", approximately 1 km south of the confluence of Unuk River and Cebuck Creek was drilled using a "Cobra" gasoline-powered portable rock drill and blasted in order to obtain a reasonably fresh sample for assay purposes.

II. GEOLOGICAL SURVEY

a) Regional Geology

The Unuk River area lies between the Bowser Sedimentary Basin to the east and the crystalline core of the Coast Mountains to the west. Rocks are almost entirely of Triassic and Jurassic age, with small areas of Cenozoic basaltic extrusions and unconsolidated fluvio-glacial deposits in stream valleys. Crystalline rocks, apparently partially pre-dating Coast Intrusions, range in composition from gabbro through diorite and syenite. Bedded rocks are predominently immature clastic types including sandstone, arkose, greywacke and wacke with lesser quantities of shale and siltstone. Limestone appears to be restricted in its stratigraphic occurrence but being resistant and a distinctive unit, its distribution is quite well documented. Dykes are abundant and vary widely both in composition and in orientation. Most of the dykes are narrow, seldom exceeding 3 metres in width.

b) Geology of the Max Property

The Max deposit consists of massive magnetite mineralization with associated chalcopyrite, pyrrhotite and pyrite. The zone occurs at the

contact between diorite and a sequence of sedimentary rocks with almost all of the magnetite and chalcopyrite occurring in the sedimentary members. Typical skarn-type metamorphic (metasomatic) alteration is evident within the sediments and to a lesser extent in the diorite immediately beneath the magnetite zone.

The sedimentary rocks consist of limestone, sandstone, and argillite. Limestone varies in appearance and abundance in different parts of the property. Near the magnetite zone it is grey and black, elsewhere it is bluish-grey, white and ivory white. Composition varies from pure limestone to argillaceous and graphitic limestone. Bedding is generally obscure due to recrystallization. West of Cebuck Creek limestone is tightly folded and more than 30 m thick in contrast to thicknesses of 3 to 15 m in the magnetite area. The sandstone is a fine to medium grained grey to brown colored massive rock. Fine grained black sedimentary rocks have been classed as argillite but broad variation, from soft mudstone to a cherty rock, occurs.

As noted above, sedimentary rocks in the vicinity of the Max deposit have been altered. The alteration includes recrystallization, chloritization resulting from regional metamorphism, and development of actinolite-diopside-epidote-garnet skarn. Skarn and magnetite mineralization are closely related.

Medium grained diorite is in fault contact with sedimentary rocks immediately to the east of the mineral zone. Diorite is also present southeast of the mineral zone where it appears to be in an intrusive relationship. Fine to medium grained feldspar porphyry dykes are intrusive into all sedimentary members. They are characterized by a dark grey and grey-brown colored matrix and they frequently contain 20 to 40% feldspar phenocrysts. The dykes are remarkably similar in appearance to some of the medium-grained sandstones with which they are associated.

In addition to the fault that separates the diorite from the sedimentary terrain, other vertical or high angle faults are present along Cebuck Creek. Offsets of some hundreds of metres have been suggested but are not fully documented. The attitudes of the sedimentary rocks vary from northeast strike with a steep southeasterly dip west of Cebuck Creek, to north-south strike with a steep easterly dip on the east side of the creek.

c) 1977 Geological Work

Mapping during May and June 1977 covered the area northeast of Cebuck Creek north of the mineral zone and south of Unuk River. The area mapped extends from the bottom of the valley at elevation approximately 150 metres up steep slopes to elevation approximately 700 m. South and southwest of Cebuck Creek the Minimax claim location lines and several grid lines were mapped. On Figure 3 newly acquired data has been combined with that obtained in 1975. The respective areas are separated by a heavy black line. Mapping in the area east of Cebuck Creek served to better define the location of the diorite/sedimentary rock contact and revealed several previously unrecognized linear structures in the diorite. Seasonal low water flows in Cebuck Creek permitted some mapping in the canyon portions and resulted in recognition that the diorite-sandstone contact is located along the north wall of the creek rather than, as previously assumed, in the creek.

As indicated in Figure 3 the work west of Cebuck Creek yielded new information concerning the distribution of limestone and revealed the presence of a red-purple colored fragmental andesite. The latter unit is siliceous and contains small amounts of magnetite.

III. MAGNETIC SURVEY

The 1977 grid lines were surveyed in detail using a fluxgate-type magnetometer. Two different instruments were used; one, a McPhar M-700 instrument, developed an electrical fault and was replaced by a rented

Scintrex MF-1 fluxgate magnetometer. The survey data displayed in Figure 4 was obtained using the Scintrex instrument.

Magnetometer surveys are applied in mineral exploration to determine the relative variations of magnetic susceptibilities of rocks. Characteristics of the magnetic response may be interpreted in terms of variations of rock types, the type and intensity of alteration, the depth of overburden and, particularly in the case of magnetite deposits, the amount of magnetite contained in the underlying rocks.

At the Max property magnetometer readings were taken to an accuracy of ten relative gammas at flagged locations 30 m apart on the various grid lines. For purposes of the survey a base station was established close to the camp site on Cebuck Creek. A magnetic reading was taken at this base station at the start and at the completion of each day's work. If practical the magnetometer operator took additional readings at this station during the day. The base station readings varied from 840 to 1200 relative gammas. Field notes consisted of the magnetometer reading, the location of the reading, and the time that the reading was taken. Sufficient data concerning diurnal variations was available from repeated observations at the base station and at grid points to indicate that minor adjustments to readings were necessary to compensate for this variation and consequently diurnal corrections were applied when the data was plotted.

The magnetometer readings recorded at each station on the grid are shown in Figure 4. One thousand gamma interval contour lines are imposed on the data.

IV. DISCUSSION OF GEOLOGICAL AND MAGNETOMETER SURVEY DATA

Magnetic variation is slight in the area surveyed east of Cebuck Creek. Anomalously high readings in the vicinity of 31 W on Line 68 S are

attributed to a large boulder of magnetite, presumably glacially transported from the main Max mineral deposit. As is indicated by geological mapping, much of the area east of the Creek is underlain by diorite, but fine grained dark green andesite occurs at the west side of lines 60 through 66 S and sandstone outcrops at lowermost elevations on lines 68 S and 70 S. The diorite-sandstone contact closely coincides with a break in slope: from 30° in areas of diorite to more than 40° in areas of sandstone.

West of Cebuck Creek very little magnetic variation was encountered on the north-south claim line, but readings greater than 3000 gammas, to a maximum of 6300 gammas, were recorded at the very south end of the grid. Several additional observations were taken in that vicinity in an attempt to define the anomalous area. Small amounts of magnetite found in siliceous portions of the limestone-andesite-fragmental andesite series may be sufficient to produce the anomalously high magnetic response.

V. TRENCHING

A small pit was excavated near the west end of line 68 S at a site close to the edge of Cebuck Creek. The outcroppings in this area are heavily iron stained and the rocks contain disseminated pyrite. Five "Cobra" drill holes were drilled to a depth of approximately 0.6 metres and were blasted using dynamite and black fuse to produce an excavation with approximate dimensions: 1 m X 1/2 X 1/2 m. The freshly broken rock was identifiable as sheared and altered sandstone. A sample of pyritic rock was found by assaying to contain 0.042 oz/ton gold and 0.30 oz/ton silver.

VI. CONCLUSIONS

The 1977 work on the Minimax claim of the Max property continued the program of up-dating of earlier geological and magnetic survey work that was commenced in 1975. No major revisions resulted. Anomalous magnetic readings in the southwesternmost portion of the property result from magnetite that occurs in siliceous andesite. Further detailed survey work in that area is warranted.

VII. STATEMENT OF EXPENDITURES

(Costs incurred prior to completion of staking Minimax claim on May 9, 1977 are omitted from this statement).

a) Field Expenditures

i) Wages -	
Erik Ostensoe - 15 days, May 10 - 24 incl. $109/day	$1,635.00
Ed Kruchkowski- 6 days, May 10 - 15 incl. $ 60/day	360.00
Rick Burega - 15 days, May 10 - 24 incl. $ 37/day	555.00
ii) Groceries - ($312.58), camp supplies, fuels and field supplies (estimated $65.00)	377.58
iii) Transportation - Service trips and demobilization of camp using Bell 206 helicopter - May 15, 17, 21, 1977 4.9 hours at $315/hour	1,543.50
- return crew from Stewart to Vancouver 3 fares at $111.00 each	333.00
- freight on magnetometer	19.75
iv) Magnetometer Rental - May 16 - 25, 1977 - 10 days $9/day	90.00
v) Cobra drill expenses - fuel and drill steel estimated	6.00
vi) Assays - one sample assayed for gold and silver at $8	8.00
Total Field Expenditures	$4,927.83

b) Preparation of Reports

i) Wages -	
Erik Ostensoe - June 23, 30, July 5 - 1/2 day, July 7 - 1/2 day, January 16, 18, 19, 20 - 1/2 day, 24, 8 days $109/day	872.00
Rick Burega - June 5, 1 day $37/day	37.00
Ed Kruchkowski- January 18, 19, 2 days $60/day	120.00
B. Reid, Secretary - January 19, 23, 2 days $45/day	90.00
C. L. Cory, Draftsman - September 12 1/2 hours, January 6 hours; 18 1/2 hours $8/hour	148.00
ii) Map printing	6.00
Total Preparation of Reports	$1,273.00
Total Expenditures	$6,190.82

VIII. STATEMENT OF QUALIFICATIONS

The professional qualifications of technical personnel engaged in the work reported on herein, are detailed below:

1. Ed Kruchkowski, B. Sc., Geologist - completed B.Sc. course at University of Alberta (Edmonton) in May 1972; in summers of 1969, 1971 and 1972 employed by Hecla Operating Company in Schaft Creek area as coresplitter, soil sampler and geologist respectively. In 1970 employed by consultant and assigned to projects in southeastern British Columbia. Employed by Hecla Operating Company as geologist from May 1973 to June 1974 and assigned to projects at Mess Creek, B.C. and Bute Inlet, B.C. under direction of Erik Ostensoe and P. I. Conley, P.Eng. Employed by Granduc Mines, Limited (N.P.L.) from July 1974 to present as geologist on projects in Stewart area, B.C.

2. Erik A. Ostensoe, B.Sc. (Hons.), Member: Canadian Institute of Mining and Metallurgy, Association of Exploration Geochemists; geologist - completed B.Sc. Honours course at University of British Columbia in 1960 and course requirements for M.Sc. at Queen's University in 1966; employed by Newmont Mining Corporation of Canada Ltd., under direction of Dr. G.W. H. Norman, P.Eng., from May 1960 through August 1964 as field geologist in Granduc Mine area, B.C., by Mount Billings Venture in southeastern Yukon in summer 1965, by Scud Venture (Asarco) in Iskut River area, B.C. in summer 1966 and by Granduc Mines, Limited (N.P.L.) and Hecla Mining Company of Canada Ltd. from October 1966 to present as Chief Geologist and Exploration Supervisor respectively under the direction of P. I. Conley P.Eng.

3. Rick Burega, field assistant, second year student in geological technician course at Sault College, Sault Ste. Marie, Ontario, employed by Granduc Mines, Limited (N.P.L.) as line cutter and geological assistant in Stewart area, B.C.

N

MINIMAX CLAIM
Record No. 369

Barclay (Gebuck) Creek

Barclay Creek

1977 Work

1977 Work

BASELINE Bearing - N 12° E

10 W

21 + 30 W

25 W

30 W

34 W

37 W

40 W

38 W

3 + 50 ME

9 + 50 E

6 + 50 E

LCP

TAG No. 26563

I D Post 15

I D Post

CAMPSITE (on gravel bar)

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 6690

To accompany
Report of Geological and Magnetometer Surveys,
Max Property, Unuk River Area,
Skeena M.D., B.C.
by E. Ostensoe, January 24, 1978

Erik A Ostensoe

CLAIM BOUNDARY (Not Surveyed)

LOCATION OF CLAIM POST (approx) OR I D POST

Figure 4 MAGNETOMETER SURVEY

Contour Interval - 1000 gammas

100 0 100 200 FEET
30.5 0 25 50 62.5 METRES

GRANDUC MINES LTD.	TITLE MAX PROPERTY	
Scale: 1 inch =	DATE AUG 1977	DRAWN C. L. C.	No.

(1)

MINIMAX CLAIM
Record No. 369

LCP - MINIMAX CLAIM
TAG No. 26563

Barclay (cebuck) Creek

Barclay Creek

CAMPSITE
(on gravel bar)

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
6690
NO.

LEGEND

1	D	DIORITE
2	FP	FELDSPAR PORPHYRY
3	A	ARGILLITE
4	Lst	LIMESTONE
5	C	CHERT
6	MV	META VOLCANIC ROCKS; TUFF, ANDESITE
7	Sk	SKARN
8	S	SANDSTONE

60 JOINT, VERTICAL ANGLE
78 BEDDING, VERTICAL ANGLE
FAULTING
ROCK SAMPLE
CLAIM BOUNDARY (Not Surveyed)
LOCATION OF CLAIM POST (approx) OR I D POST

To accompany
Report of Geological and Magnetometer Surveys,
Max Property, Unuk River Area,
Sheena M.D., B.C.
by E. Ostensoe, January 24, 1978

Erik A Ostensoe

Figure 3 GEOLOGY

1 2400

100 0 100 200 FEET
30.5 0 25 50 62.5 METRES

GRANDUC MINES LTD.
Scale 1 inch =

TITLE MAX PROPERTY
DATE AUG 1977
DRAWN C L C
No.

(2)