



GEOPHYSICAL AND GEOCHEMICAL REPORTS

ON THE CO CLAIM GROUP



N.T.S. 115 J/9 AND J/10

62° 40' N - 138° 25' W

This report has been examined by the Geological Evaluation Unit and is recommended to the Commissioner to be considered as representation work in the amount of

\$12,260.87

*J.B. Craig*

Resident Geologist or  
Resident Mining Engineer

Considered as representation work under  
Section 53 (4) Yukon Quacks Mining Act.

JUNE - AUGUST, 1969

*[Signature]*

Commissioner of Yukon Territory

By: W. M. Dolan  
and  
C. P. Costin

Supervised By: R. F. Sheldon, P. Eng.

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PLATES

(1) Magnetometer Survey	1" = 200'
(2 - 4) Geochemical Stream Sediment Survey Cu, Mo, Zn	1" = 5000'
(5 - 6) Geochemical Soil Survey Cu, Mo	1" = 200'
(7) Claim Locations	1" = 1/2 mile

NEWMONT MINING CORPORATION OF CANADA LIMITED

REPORT ON GROUND MAGNETIC SURVEY  
OF THE CO GROUP OF  
MINING CLAIMS  
CONDUCTED DURING AUGUST, 1969

SPECIFICATIONS AND STATISTICS

Survey Executed By	- J. Cockroft
Instrument	- Sharpe MF-1
Line Spacing	- 400'
Line Direction	- E.W.
Station Interval	- Nominally 100', closer where exceptionally anomalous
Total Coverage	- 23.5 line miles
Claims	- Co 1-52
Location (N.T.S.)	- 115 J/9 and J/10
Location (Cartographic)	- 62° 40' N, 138° 25' W
Magnetic Inclination	- 78°
Magnetic Declination	- 33° E

INTERPRETATION AND CONCLUSIONS

The magnetic pattern and the geological mapping are rarely reconcilable. The best example is the relatively clear definition of the contact between the country rock intrusive and Costin's "Unit 6", which is the mineralized intrusive.

Generally, the magnetics reflect N-S trends which appear to have little relationship with the mapped geology.

Locally, e.g., 600 W of baseline 2 and 3600 N, there are concentrations of magnetite deduced to be as much as 1% by volume.

The most significant feature on the magnetics is considered to be a crudely circular outline centering at about 2000 W of baseline 1 and 2800 N and having an approximate diameter of 3500'.

It is suggested that that feature is the outline of the strongest alteration, reflected by an overall depletion in magnetite. Such a concept is crudely compatible with the geology.

The locally high magnetic zone within the above mentioned feature is possibly the reflection of a "pipe-like" feature. There is insufficient geological information to check such a concept.

There does not appear to be any reason to recommend further geophysical work. Rather, it is concluded that a drilling target has been defined, by the geochemistry and magnetics, as indicated on the magnetic map.

REFERENCE:

Preliminary report by C.P. Costin, dated November, 1969.

  
.....  
W. M. Dolan, M. Sc., P. Eng.  
Chief Geophysicist.

February 11, 1970

NEWMONT MINING CORPORATION OF CANADA LIMITED

REPORT ON GEOCHEMICAL SURVEYS  
OF THE CO CLAIM GROUP  
JUNE - AUGUST, 1969

INTRODUCTION

The Co Group was located as a result of the Wellesley Project, a regional geochemical stream sediment sampling program. The results of this survey, designated Area 1 in the Wellesley Project, are portrayed on Plates 3, 4 and 5.

Subsequently, a geochemical soil survey was conducted along a picket-line grid established during exploration of the Co Group. The soil survey does not completely cover known mineralization as it was felt geologic examination of areas having good rock exposures would preclude the need for soil geochemistry. The results of this soil survey are portrayed in Plates 6 and 7.

GEOCHEMICAL ANALYSIS

Both the stream sediment and soil samples were analyzed in Barringer's Whitehorse laboratory. All samples were dried and sieved in the laboratory and the minus 80 mesh material retained. Weighed amounts of the samples were heated with concentrated perchloric acid until all sample material had completely reacted. The leach solution was then diluted and copper and zinc content determined by atomic absorption spectrophotometry, using the Techtron AA-4 instrument. Molybdenum content was determined using a bi-sulphate fusion process and standard colorimetric methods.

### Stream Sediment Survey

Geochemical stream sediment samples were collected at 1/4 mile intervals from streams draining the Battle Creek area. A 1/4 mile sample separation was chosen as, in other similar geologic environments in the Yukon, experience has shown this spacing definitive in locating large mineralized areas. Two samples were collected within 50 feet of each other at each sample point and the values presented represent the average value of determination of each sample.

Statistical interpretation of geochemical data suggests background levels for Cu, Mo and Zn to be 75, 5 and 100, respectively. Maps have been contoured on this basis. Some values which are in the anomalous range for Cu and Mo extend downstream from and outside of the contoured source areas. However, these values are interpreted as having been derived from mineralization within the contained area.

Anomalous Cu values show a relatively coherent pattern trending roughly northwest of Battle Creek. Statistically, two anomalous populations are recognized for Cu - 75 to 119 ppm and 120 + ppm. Values in excess of 120 ppm are interpreted as Cu source areas.

Mo values have been similarly treated. Again, two populations are recognized, 5 to 9 ppm and 10+ ppm. Values in excess of 10 ppm are interpreted as source areas. Four source areas are defined. Molybdenum anomalies show a north-northwest trend with the largest anomaly roughly coincident with the Cu anomaly.

Zinc values in excess of 100 ppm have been outlined. These values show a northwest trend but are not coincident with Cu or Mo. Zinc

may occur as a zoned halo effect around Cu and Mo.

The Co Group covers the majority of the Cu and large Mo anomalies.  $\text{CuFeS}_2$  and  $\text{MoS}_2$  mineralization has been located on these claims.

#### Soil Survey

Geochemical soil samples were collected on a picket-line grid on lines spaced 400 feet apart with samples at 100 foot intervals on lines.

Test pits in both well drained and poorly drained areas were sampled at 6 inch intervals to indicate Cu and Mo distribution in soil profiles (Plate 6). In consideration of these profiles, samples were collected at a depth of 12 inches or greater. A total of 804 samples were collected and analyzed for Cu and Mo. Statistical studies have been made of these values and are summarized below.

Five populations are interpreted for Mo (Plate 6). Background is interpreted as less than 18 ppm. Populations between 18 - 34, 35 - 49, 50 - 99, and 100 + are contoured.

Mo geochemical data shows a clear correlation with mapped geology and mineralization. However, downslope movement of overburden is interpreted at points.

Between lines 4N and 24N in the southern portion of Grid 1, Mo values in excess of 35 ppm are closely coincident with the mapped extent of Unit 6 and Unit 4 where it overlies Unit 6 as a thin hood. On lines 40N to 48N on Grid 2, values in excess of 35 ppm overlie Unit 6. Again, in the northernmost portion of Grid 2 and between lines 56N and 72N, values greater than 35 ppm find their source in Unit 6.

The lone series of anomalous values in Grid 1 on line 44 are

in the bottom of a small valley draining higher topography underlain by Unit 6. These values are considered mechanically transported and not indicative of underlying bedrock. Similarly, the easternmost anomalous values on line 56N overlie a small fan of slide material and are thought transported.

It is noted that, although essentially all anomalous values overlie Unit 6, all samples overlying Unit 6 are not anomalous. Differentiation of populations greater than 35 ppm suggests a predominant N-S striking geochemical fabric. As slopes are generally east or west sloping, overburden movement is in discord with this direction. Mineralized joint trends and the magnetic "fabric" show a northwest trend. The N-S relationships portrayed geochemically are probably correlative with N-S linear mineralized zones.

It is also theorized that since Unit 6 appears relatively homogeneous lithologically, significant Mo mineralization did not accompany alteration of Unit 6 but was emplaced at a later time.

The distribution of Cu presents a seemingly more complex pattern than Mo. Statistical work suggests a background of 149 ppm. Values in excess of 150 ppm are in four separate groups of 150 - 339, 340 - 499, 500 - 1000, and 1000 + ppm.

In the southeastern portion of the grid, values greater than 150 ppm closely approximate the contact between Units 6 and 7 - high values overlying Unit 6. In the southwestern portion of the grid, however, anomalous values overlie Units 3, 4, 6 and 9. Progressing to the north in Grid 2, anomalous values are noted again in Units 6 and 9.

Cu values seem somewhat sporadic in their distribution. Anoma-

lous areas are fragmentary and generally comprise 4 - 8 sample points. The distribution of anomalous Cu values, as contoured, shows a remarkably persistent north-northwest trend which crosscuts several intrusive units.

It is also noted that on line 16N a one line series of values in excess of 1000 ppm Cu occur. Comparison with Mo geochemistry shows a more widespread (3 lines - 12N, 16N, 20N) anomaly to be coincident. Preliminary magnetic interpretation by W. M. Dolan has suggested the existence of a relatively weak E-W fault coincident with these anomalies. It is quite possible a transverse E-W striking fault or fractured zone has localized mineralization at this point. Geologic mapping does not recognize this structure. However, extensive overburden and talus leaves this possibility open.

It is seen that the most consistent and numerically highest copper values fall within Unit 6. Other strongly anomalous values, though, are derived from Units 3, 4 and 9. It is suggested that Cu mineralization:

- 1) postdates emplacement of intrusive units and alteration of Unit 6;
- 2) is not directly related to Mo mineralization - though at points juxtaposition of mineralization is noted;
- 3) may be emplaced on, or guided by, north-northwest trending structures.

Both Mo and Cu geochemistry are in general agreement with observed lithologies and mineralization.

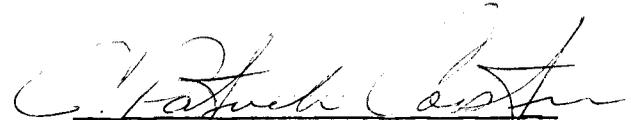
#### CONTROL SURVEY

Two grids totalling approximately 23.5 line miles were established



	Brought forward	\$ 9,673.37
3) Magnetic Survey		
23.5 line miles @ \$75/mile		1,762.50
4) Supervision		
W. M. Dolan (Magnetic interpretation)		
2 days @ \$150/day		300.00
J. A. Coope (Geochemical interpretation)		
1 day @ \$150/day		150.00
C. P. Costin (Field Supervisor)		
5 days @ \$75/day		<u>375.00</u>
	TOTAL	<u>\$12,260.87</u>

  
R. F. Sheldon, P. Eng.

  
C. P. Costin

*C. J. Cockcroft*

# MAGNETIC SURVEY AND MAGNETIC INTERPRETATION

CO GROUP M.C.'s 115 J 9

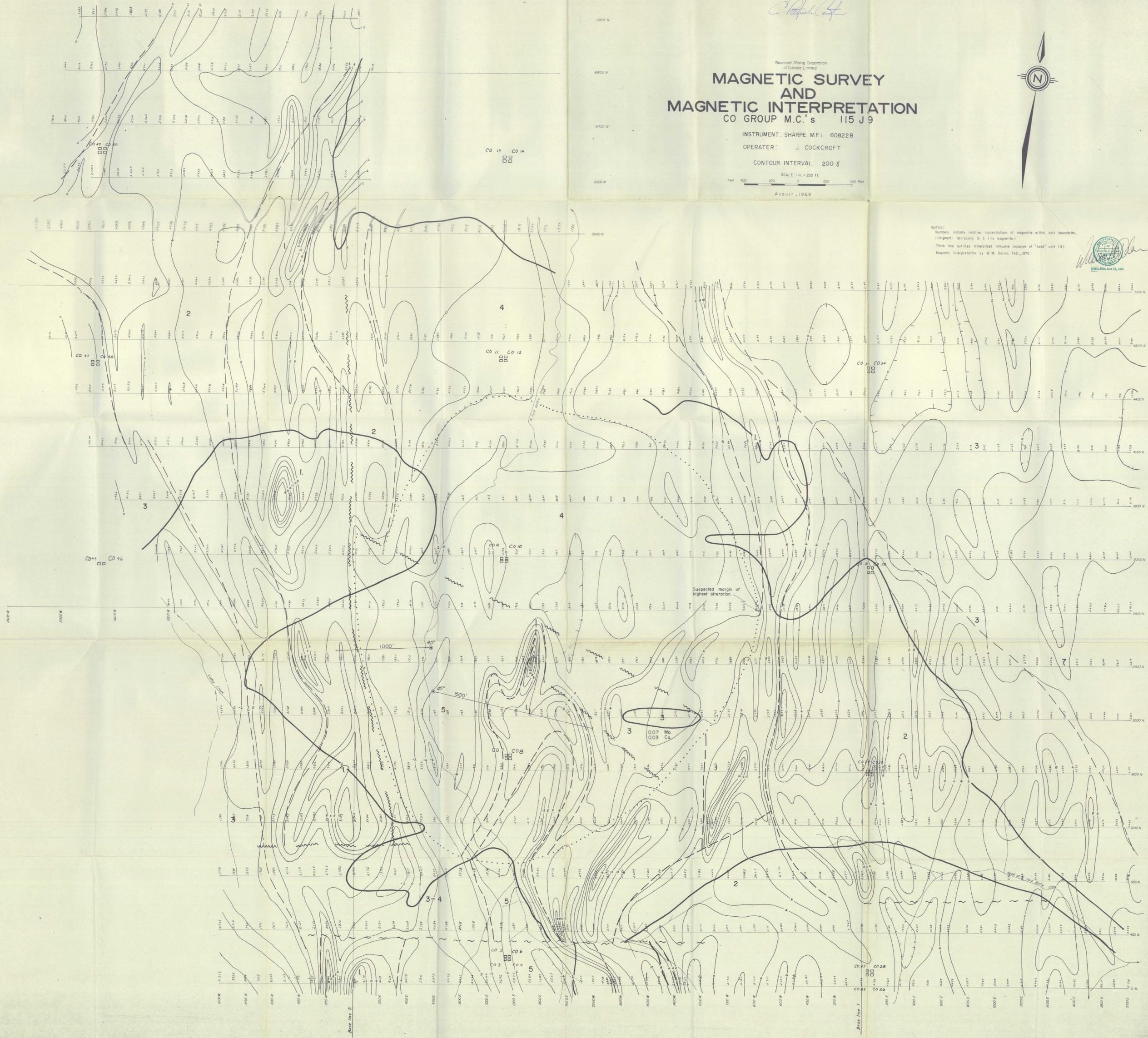
INSTRUMENT: SHARPE MF I 608228  
OPERATOR: J. COCKCROFT

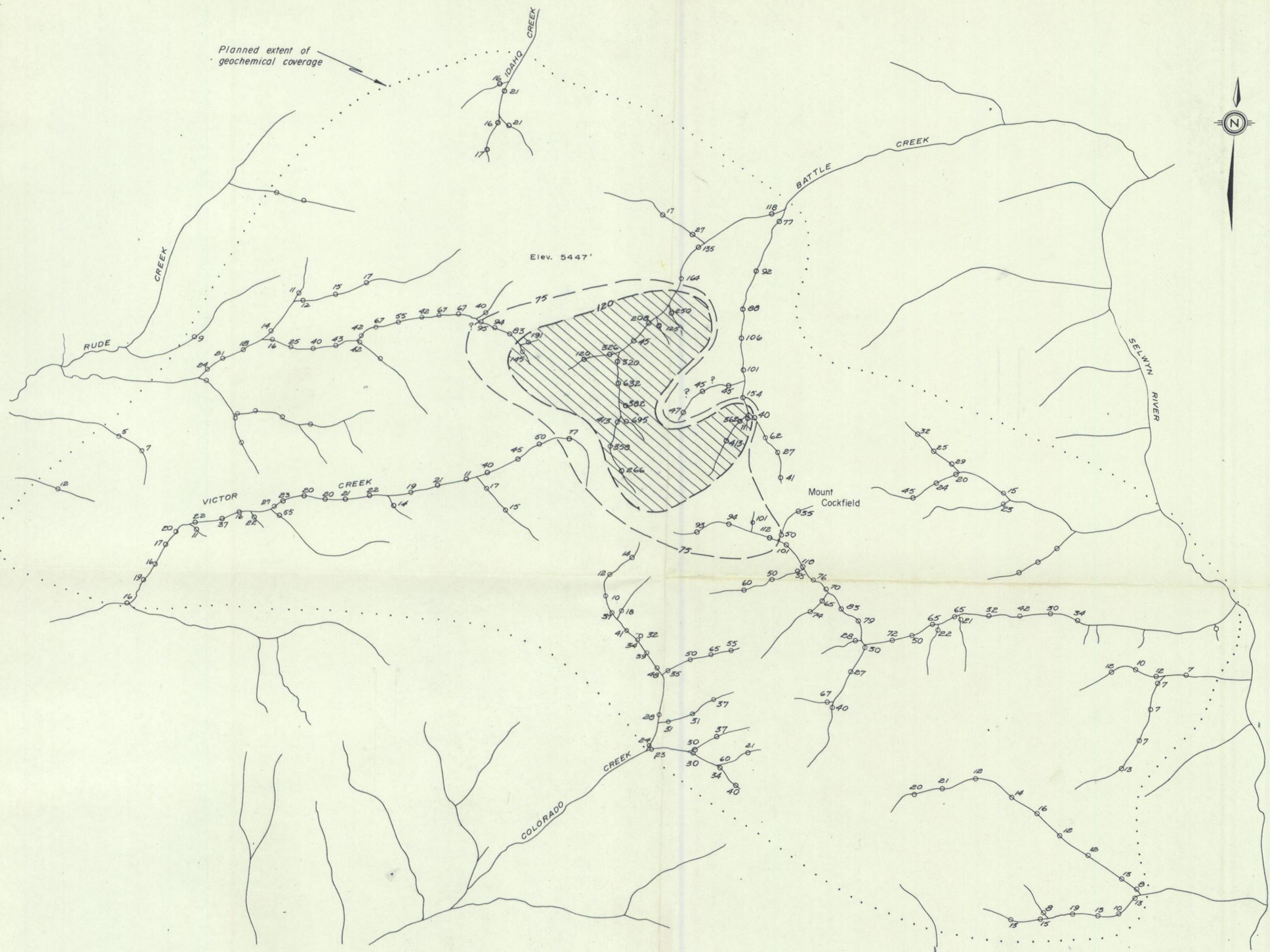
CONTOUR INTERVAL: 200 G

SCALE: 1 in. = 200 ft.  
Feet 400 200 0 200 400 Feet  
August, 1969



NOTES:  
Numbers indicate relative concentrations of magnetite within unit boundaries.  
1 (highest) decreasing to 5 (no magnetite).  
Thick line outlines mineralized intrusive inclusive of "hood" unit (4)  
Magnetic Interpretation by W. M. Dolan, Feb., 1970





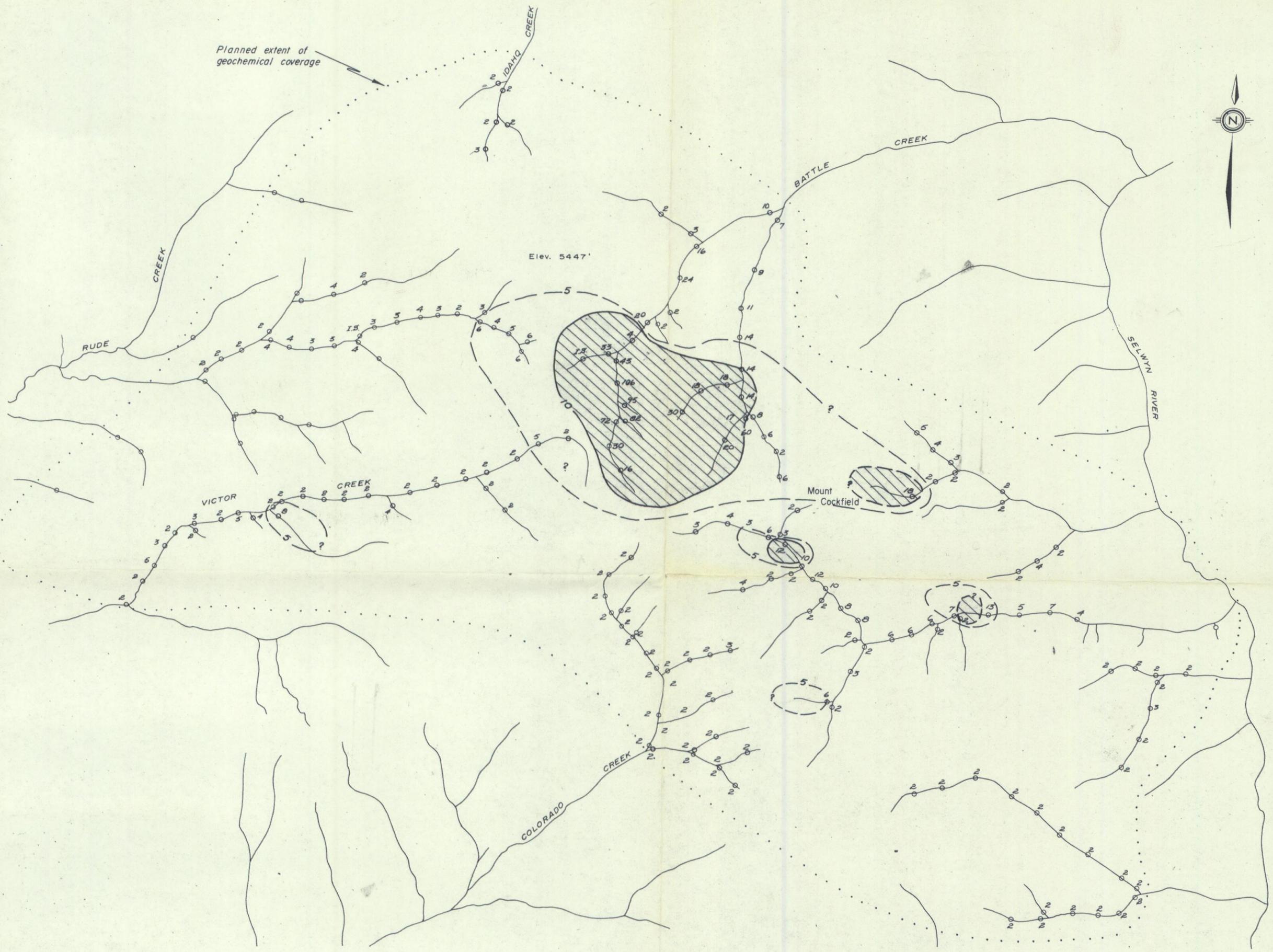
**LEGEND**

○ 57  
 SILT SAMPLE LOCATION.  
 Copper value in ppm.

NEWMONT MINING CORPORATION OF CANADA  
 WELLESLEY PROJECT  
 AREA I  
**GEOCHEMICAL  
 STREAM SEDIMENT SURVEY  
 TOTAL COPPER**  
 80 MESH FRACTION ANALYSED  
 Battle Creek, Yukon Territory  
 SCALE: 1" = 5,000'  
 FEET 5000 0 5000 10,000 FEET

*R. J. Sheldon*  
*C. Patrick Carter*

Planned extent of geochemical coverage

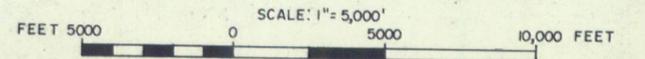


LEGEND

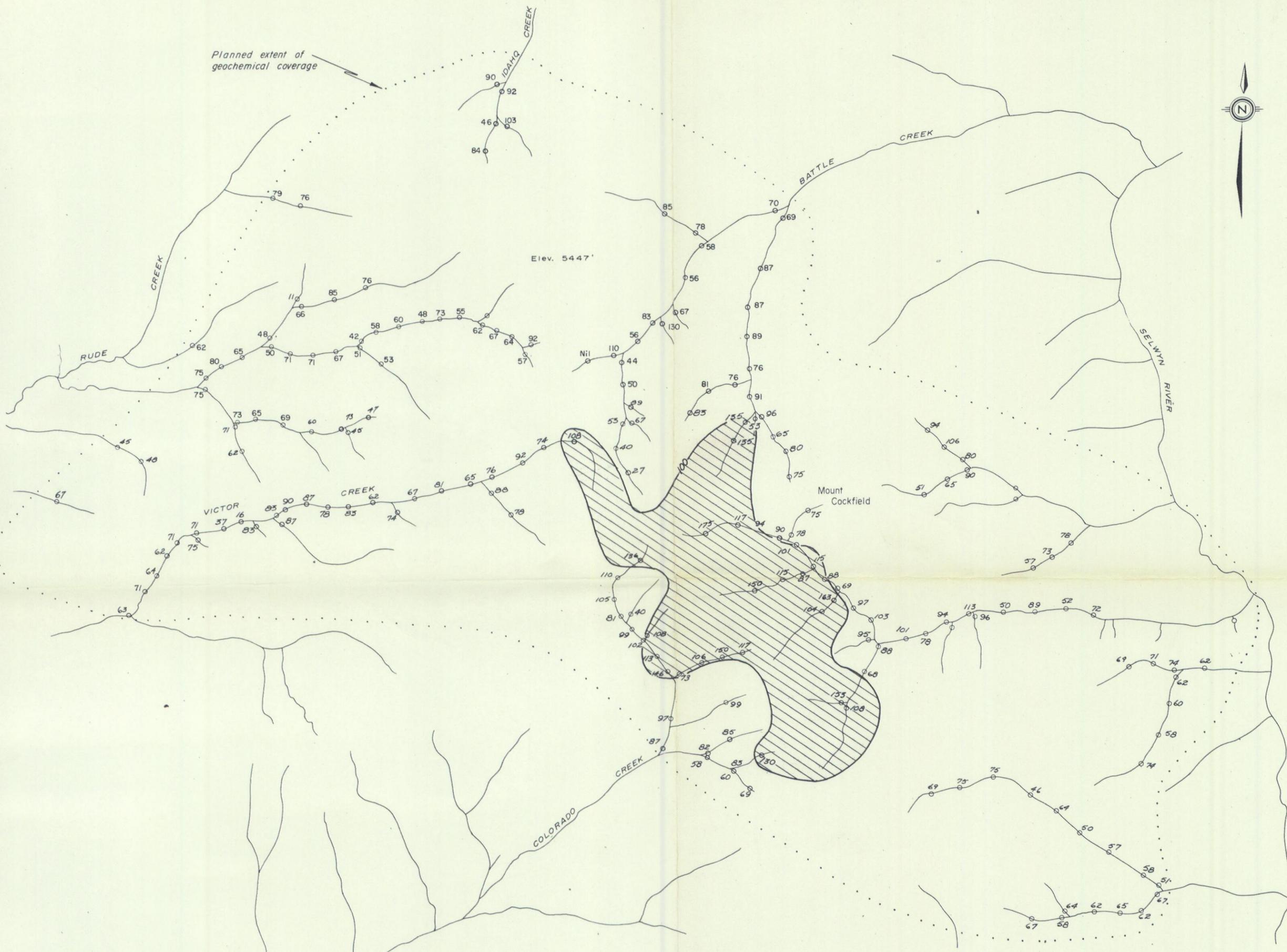
 SILT SAMPLE LOCATION.  
Molybdenum value in ppm.

NEWMONT MINING CORPORATION OF CANADA  
WELLESLEY PROJECT  
AREA I  
GEOCHEMICAL  
STREAM SEDIMENT SURVEY  
TOTAL MOLYBDENUM  
80 MESH FRACTION ANALYSED  
Battle Creek, Yukon Territory

*R. Skellon*  
*C. P. ...*



Planned extent of geochemical coverage



**LEGEND**

 SILT SAMPLE LOCATION.  
Zinc value in ppm.

NEWMONT MINING CORPORATION OF CANADA  
WELLESLEY PROJECT  
AREA I  
**GEOCHEMICAL  
STREAM SEDIMENT SURVEY  
TOTAL ZINC**  
80 MESH FRACTION ANALYSED  
Battle Creek, Yukon Territory

SCALE: 1" = 5,000'  
FEET 5000 0 5000 10,000 FEET

*Handwritten signatures and stamps:*  
Professional Geologist seal (partially visible)  
*R. E. Sheldon*  
*C. P. ...*

*R. S. Sheldon*

*Clifford R. ...*

Newmont Mining Corporation  
of Canada Limited

# GEOCHEMICAL SURVEY

CO GROUP M.C.'s 115 J 9

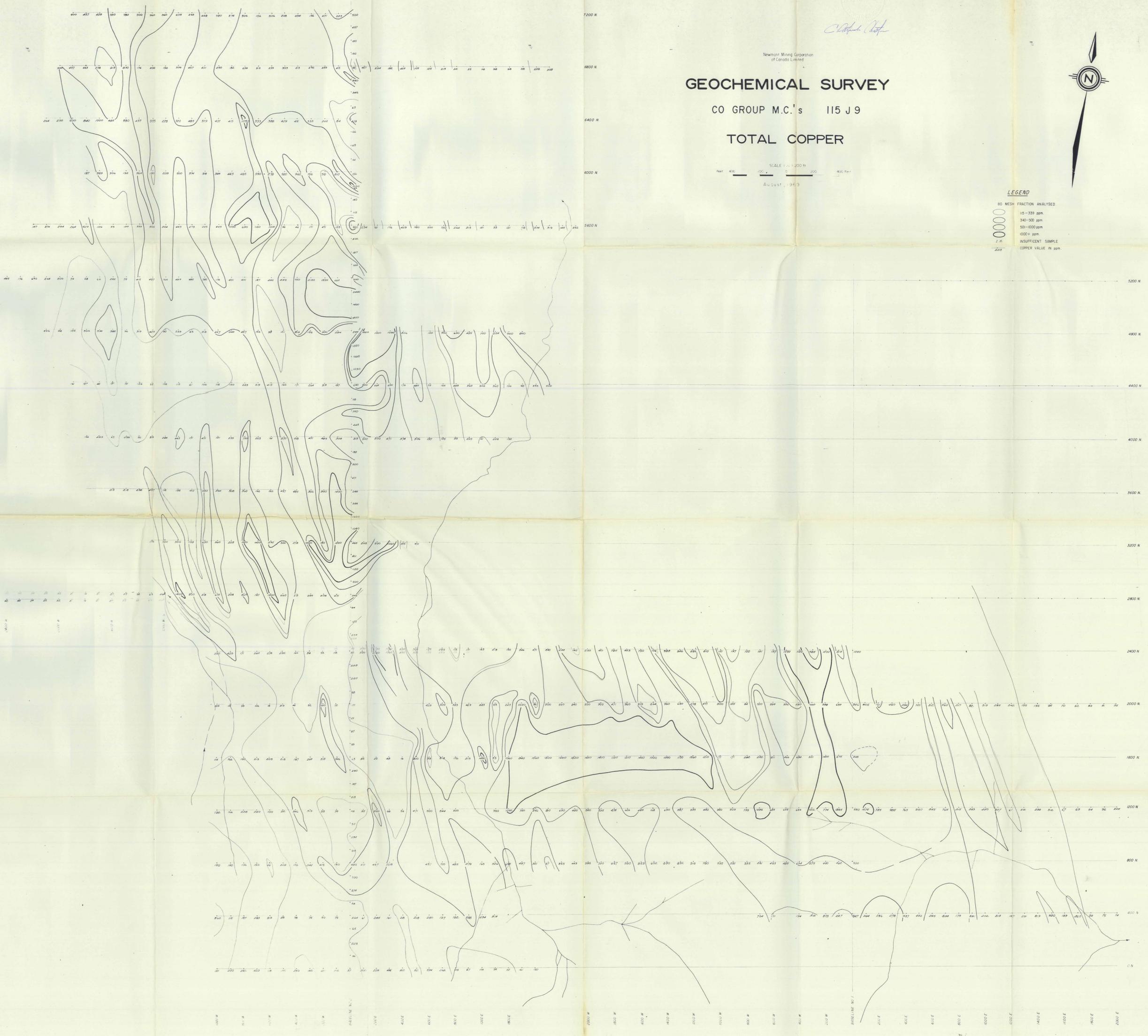
## TOTAL COPPER

SCALE 1" = 200 ft  
feet 400 200 0 200 400  
August, 1963



### LEGEND

- 80 MESH FRACTION ANALYSED
- 110-339 ppm
- 340-500 ppm
- 501-1000 ppm
- 1000+ ppm
- INSUFFICIENT SAMPLE
- COPPER VALUE IN ppm



R.S. Sellen

C. Robert C. [Signature]

Newmont Mining Corporation  
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# GEOCHEMICAL SURVEY

CO GROUP M.C.'s 115 J 9

## TOTAL MOLYBDENUM

SCALE 1 in = 200 ft  
Feet 400 200 0 200 400 Feet  
August, 1969



### LEGEND

- 80 MESH FRACTION ANALYSED.
- 18-34 p.p.m.
- 35-50 p.p.m.
- 51-100 p.p.m.
- 100+ p.p.m.
- NOTE: INSUFFICIENT SAMPLE
- MOLYBDENUM VALUE IN p.p.m.

