

82F/6E&W

GEOCHEMICAL, MAGNETOMETER & GEOLOGICAL SURVEYS
OF THE
FRESNO GROUP

18 Miles south of Nelson at the Town of Ymir
D. T. S. Area 82 F 6

Latitude 49°30' Longitude 117°15'

(49°117° S.E.)

Supervisor:	L. J. Manning, P.Eng.
Author:	L. J. Manning, P.Eng.
Claims owned by:	Copper Horn Mining Ltd. (N.P.L.)
Work Done for:	Copper Horn Mining Ltd. (N.P.L.)
Dates of Work	November 1966 to August, 1967

1083

S U M M A R Y

Regional soil sampling, stream sediment, water sampling and geological surveys outlined an area of interest in the Fresno claim group just west of Ymir, B. C. in area 82 F 6.

Part of the area of interest was covered by a 4,000' x 4,000' grid on which geological magnetometer and soil sampling surveys were completed at a spacing of 100 by 400'.

A part of the larger grid 1,200' x 2,000' was detailed on a spacing of 50 x 200'.

It is recommended that four areas outlined by geochemical and magnetometer coincidences in a geologically favourable area be tested by diamond drilling.

D. J. Reframing P. Eng.

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HILL, MANNING & ASSOCIATES LTD.

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R E P O R T

on

GEOCHEMICAL, GEOPHYSICAL & GEOLOGICAL SURVEYS

CONDUCTED ON THE FRESNO CLAIM GROUP

of

COPPER HORN MINING LTD. (N.P.L.)

OBJECT:

This report is submitted for the purpose of recording the results and conclusions of geological, geophysical, and geochemical surveys carried out on the Fresno claim group in late 1966 and the summer of 1967. The claims are owned by Copper Horn Mining Ltd. (N.P.L.).

LOCATION:

The Fresno claims are located immediately due ^{west} east of Ymir, B. C. in the Nelson mining division. The claims under consideration are located in the area drained by Quartz and Stewart Creeks, at approximately $117^{\circ}15'$ W. longitude and $49^{\circ}30'$ N. latitude, in Dominion Topographic system area 82 F 6. Elevations range from 2,500 to 5,000 feet. (Drawing No. 1)

TITLE:

The claims under consideration in this report are as follows:

TITLE: (Continued)

<u>Claim Name</u>	<u>Record No.</u>	<u>Expiry Date</u>
Fresno 1 <i>Showing</i>	7818	Sept. 4, 1969
Fresno 2 - 3	7819 - 7820	Sept. 4, 1969
Fresno 4	8791	June 30, 1968
Fresno 6 - 7	8973 - 8974	August 16, 1969
Fresno 8 - 13	8975 - 8980	August 16, 1968
Fresno 14- 16	9193 - 9195	Sept. 7, 1968
Fresno 22 - 33	9201 - 9212	Sept. 7, 1968
Fresno 37	9216	Sept. 7, 1968
Fresno 40	9621	Nov. 14, 1967
Fresno 42 - 69	9622 - 9649	Nov. 14, 1967
Fresno 71 - 72	9651 - 9652	Nov. 14, 1967
Fresno 74 - 76	9654 - 9657	Nov. 14, 1967
Fresno 79	9659	Nov. 14, 1967
Fresno 135	9715	Nov. 14, 1968
Fresno 137	9717	Nov. 14, 1968
Fresno 139	9719	Nov. 14, 1968
Fresno 141	9721	Nov. 14, 1968
Fresno 157 - 159	9737 - 9739	Nov. 14, 1968
Fresno 161	9741	Nov. 14, 1968
Fresno 163 - 165	9743 - 9745	Nov. 14, 1968
Fresno 167	9747	Nov. 14, 1968
Fresno 168 - 171	9748 - 9751	Nov. 14, 1967

ACCESS AND TOPOGRAPHY:

Parts of the eastern half of the property are accessible by logging roads along Quartz and Stewart Creeks. These roads join the Nelson-Salmo highway near the town of Ymir. The western half of the property, however, is, in most places, not readily accessible.

The topography of the area in which the claims under consideration are located is rugged. Steep-sided ridges with relief of 1,000 to 3,000 feet are separated by steep, narrow draws.

Vegetation type is primarily a function of elevation and ranges from thick rain forest at lower elevations to sub-alpine spruce forest and large "jungles" of small deciduous species, notably alders, at higher elevations. The rugged topography and dense vegetation makes access to much of the area quite difficult.

no record of this in MMAR
(other props only) ENT

HISTORY:

The showing was staked by C. Fresu about 1902 as a galena and gold prospect. Samples from the showing, when assayed however, were found to contain molybdenite rather than galena. The grade, however, was uneconomic at the time and this property was dropped. Because of the success of the Torwest property at Rossland, Mr. Fresu refound his original showing and re-staked it.

The property was brought to the attention of Copper Horn Mining Ltd. (N.P.L.) and was examined by Mr. M. K. Lorimer, P.Eng. of Hill, Manning and Associates Ltd., in September, 1966.

The examination revealed a small exposure exposed by cat work and covered on all sides by overburden. The rocks appeared to be of a syenite or pulaskite and were heavily fractured and sheared. Molybdenite was plated on the sheares and though surface assays were low, the deposit was of a type to lend itself to producing mineable ores, if sufficient concentrations and size were available. Several x-ray holes on the original showing showed that the zone was persistent for a distance of 170' x 70' x 100' deep but no trends or limits were revealed. X-ray drilling of this deposit was proven impractical by sludge/core assays ranging from 2/1 to 6/1. Core values though sub-commercial were persistent throughout. Reported numerous additional showings in the Creek plus Government reports of molybdenite in three old adits in the area, prompted the exploration of the general area for a molybdenite deposit of commercial tenor.

PROCEDURES PERTINENT TO APPLICATION TO RECORD WORK

SUMMARY:

The area was staked in November and December of 1966 and soil samples were taken through the snow concurrently along the location lines to see if broad areas of interest could be obtained while the area, near civilization, was being protected by staking for further examination.

Lines 400 feet apart were cut in early spring over the main area of interest around the discovery showing and permitted, geologically, magnetometer and geochemical surveys to be completed in an area of 4,000' by 4,000'. An area 2,000' x 1,200' within this area was then detailed by extra lines being cut 200 feet apart and magnetometer and soil sampling intervals were reduced from 100 feet to 50 feet along the lines.

PROCEDURES:

A. Staking and Reconnaissance Soil Sampling

Staking and reconnaissance soil sampling was performed by Callison Line Cutting Ltd. A base line was laid out approximately east-west through the area of interest, and claim location lines were run north-south from this line. Soil samples were taken along the location lines as shown on Drawing No. 2. Soil samples were taken at 200 foot intervals along all location lines staked by Callison Line cutting. Location lines were extended through the area staked previously by the owners and soil samples taken at 500 foot intervals along these lines. Additional lines between interesting location lines were sampled at 500 foot intervals.

Soils were taken through the snow in many cases and results were used in only the broadest sense.

Field Party Staking & Reconnaissance Soil Sampling

B. L. Callison - Ste. 214 - 535 West Georgia Street, Vancouver, B. C.
William Meilleur - Vancouver, B. C.
Malcolm Peacock - Vancouver, B. C.

Staking and soil sampling was completed by November, 1966. All samples were assayed by Technical Services Laboratories, Vancouver, B. C. Results were plotted by Hill, Manning and Associates and a follow-up program was outlined for the spring of 1967. For results of Procedure A, see Drawing No. 2.

B. From the fall program, an area including the discovery showing 4,000 feet x 4,000 feet was selected as suitable for detailing by geological, magnetometer, and geochemical surveys. In addition, it was decided to cover the ridges in the favourable vicinity by geological and soil sampling surveys as soon as the snow left.

Phase B results of geochemical, geological and geophysical surveys on the 4,000' x 4,000' grid are shown on Diagrams 3M, 3S, and 3G. Results of regional stream sediment, water, and soil sampling surveys are shown on Diagrams 6S and 6DS. Line cutting for Phase B was performed by Callison Linecutting Ltd, under the supervision of P. Chubb, Geological Engineer, Hill, Manning and Associates Ltd.

PROCEDURES: (Continued)

Geological surveys were performed by Mr. P. Chubb and geochemical and magnetometer surveys were completed by him or by Mr. John Wallace and/or Mr. Dave Coffey, both of Vancouver, B. C. and both 2nd Year Engineering students at the University of B. C., working under his supervision.

C. Surveys completed on the 4,000 x 4,000 foot area delimited a central area of interest 2,000' x 1,200'. Additional 4,000' lines were cut permitting a sampling interval 200' x 50' on this area. Geological examination of soil sampling anomalies on some of the steeper ridges revealed the probable source as being very low grade molybdenum bearing detrital material, as soil was too shallow to be properly developed.

Results of phase C are shown on Diagram 4S, and 4M.

D. Targets warranting further development in the grid area were outlined by compiling the surveys completed.

All soil samples on grids and ridges were taken below the humus level, by one of the aforesaid crew and the colour and texture of each sample was noted as well as any other peculiarities. All samples were assayed by T. S. L. Laboratories, 325 Howe Street, Vancouver 1, B. C.

Assays were by hot HCl extraction. Some comparisons were made in assaying for molybdenum by fusion techniques. The hot acid gave comparable but more consistent results and was used for all samples later.

Stream sediments and water samples were taken by Mr. Phil Chubb and again assayed by T. S. L. Water sampling was delayed until after the heavy melt water run off.

The magnetometer surveys were completed by Mr. John Wallace of 1257 Park Drive, West Vancouver, a second year Engineering Student at U. B. C. who was trained by Mr. Phil Chubb of 1366 West 58th Avenue, Vancouver, B. C., a graduate in Geological Engineering, U. B. C. 1965.

A sharpe M.F. 1 Vertical Force, Fluxgate magnetometer was used for this survey. Reading accuracy of this instrument is about 5 gammas.

The geological mapping on the scale 1" = 200' was completed by Mr. Phil Chubb who acted as field supervisor for the whole program after February, 1967.

COSTS:

Reconnaissance soil sampling along claim lines plus additional lines through previously staked areas and 1/2 way between claim location lines.

Line cutting contract		
10.6 miles @ 125.00/mile		\$1,330.00
Line cutting labour - 10 shifts @ 16.00		160.00
Soil Sampling contract		840.00
Soil Sampling labor		
36 shifts @ 16.00/shift		576.00
Water sampling labor		
8 shifts at 16.00/shift		128.00
Magnetometer Survey		
14 shifts @ 16.00/shift		224.00
Engineer - Supervision & Operating		320.00
Supplies - Sample Bags		51.25
- Miscellaneous items		14.00
Room & Meals		1,080.00
Transportation - Truck		365.00
- Ski Doo Rental		240.00
Magnetometer rental		311.05
Assays		<u>273.40</u>
		\$8,369.70

RESULTS:

Certain anomalous readings on the ridges have been ruled out as being caused by low grade detrital material. However, a general area of interest has been outlined by the reconnaissance work and it includes the single exposure developed to date by bulldozing and trucking.

Reconnaissance geochemical and geological surveys have limited the favourable area of molybdenum mineralization to the elise formation of lower Jurassic volcanics. (G.S.C. Papers 51-4 and 52-13).

Mineralization appears to occur in sheared granitic dykes of probable Coryell Age intruding the Elise volcanics.

Surveys have revealed a good correlation between magnetic lows, geochemical highs and the single visible showing. It appears the creek course is partially along the sheared favourable zone. Sufficient regional pyritization was evidenced to obviate useful Induced Polarization surveys.

RESULTS: (Continued)

Five zones of interest are defined in the grid area by the correlation of magnetic lows and geochemical highs. The area in the vicinity of the creek is fairly heavily covered with overburden, and it appears that heavy erosion has taken place in the sheared dyke system resulting in the creek overlying much of the favourable area.

Several targets were outlined appearing more favourable for development than the location of the existing cat work and diamond drilling.

In order of priority the following approximate grid locations should be tested by diamond drilling before further work is continued on the property.

1. 602N, 203W -- 604N, 500W
2. 598N, 194W
3. 594N, 183W
4. 600N, 199W

HILL, MANNING & ASSOCIATES LTD.


L. J. Manning, P.Eng.

LJM:mjr

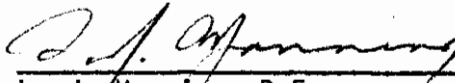
September 29, 1967

CERTIFICATE OF QUALIFICATIONS

I, Luard J. Manning of 945 Belvedere Drive, North Vancouver, B. C. certify as follows:

1. That I am a graduate of the University of British Columbia and hold a Bachelor of Applied Science degree in Mining Engineering
2. That I have been a member of the Association of Professional Engineers of Ontario since 1959 and a member of the Association of Professional Engineers of British Columbia since April, 1966.
3. That I have been engaged in the profession of mining engineering for over 15 years.
4. That I was a member of the engineering and supervisory staff of the Taxco Unit of the American Smelting and Refining Co. Ltd. from 1951 to 1953.
5. That in 1953 I joined the staff as chief engineer of Giant Mascot Mines Ltd., Spillimacheen, B. C. and remained there until 1955.
6. That from 1955 to 1957 I was employed by Rix Athabasca Uranium Mines Ltd. as chief engineer and assistant manager.
7. That from 1957 to 1959 I was a mine captain at Pronto Uranium Mines Ltd.
8. That from 1959 to 1960 I was in charge of research and auxilliary mine services at Pronto.
9. That from 1960 to 1963 I was mine superintendent of the Pronto Division of Rio Algom Mines Ltd.
10. That from 1964 to 1965 I was General Mine Superintendent of the Pronto Division of Rio Algom Mines Ltd.
11. That from August to December 1965 I was resident manager at Orecan Mines Limited.
12. That from January 1966 I have been involved in general exploration and consulting work.
13. That I am at present a partner in the firm of Hill, Manning & Associates Limited of Vancouver, a firm of consulting mining engineers.
14. That I do not hold any financial or other interests in the properties or stock of Copper Horn Mining Ltd. (N.P.L.) or their affiliates nor do I expect to do so in the future.

Dated at Vancouver, B. C. this 29th day of September, 1967.



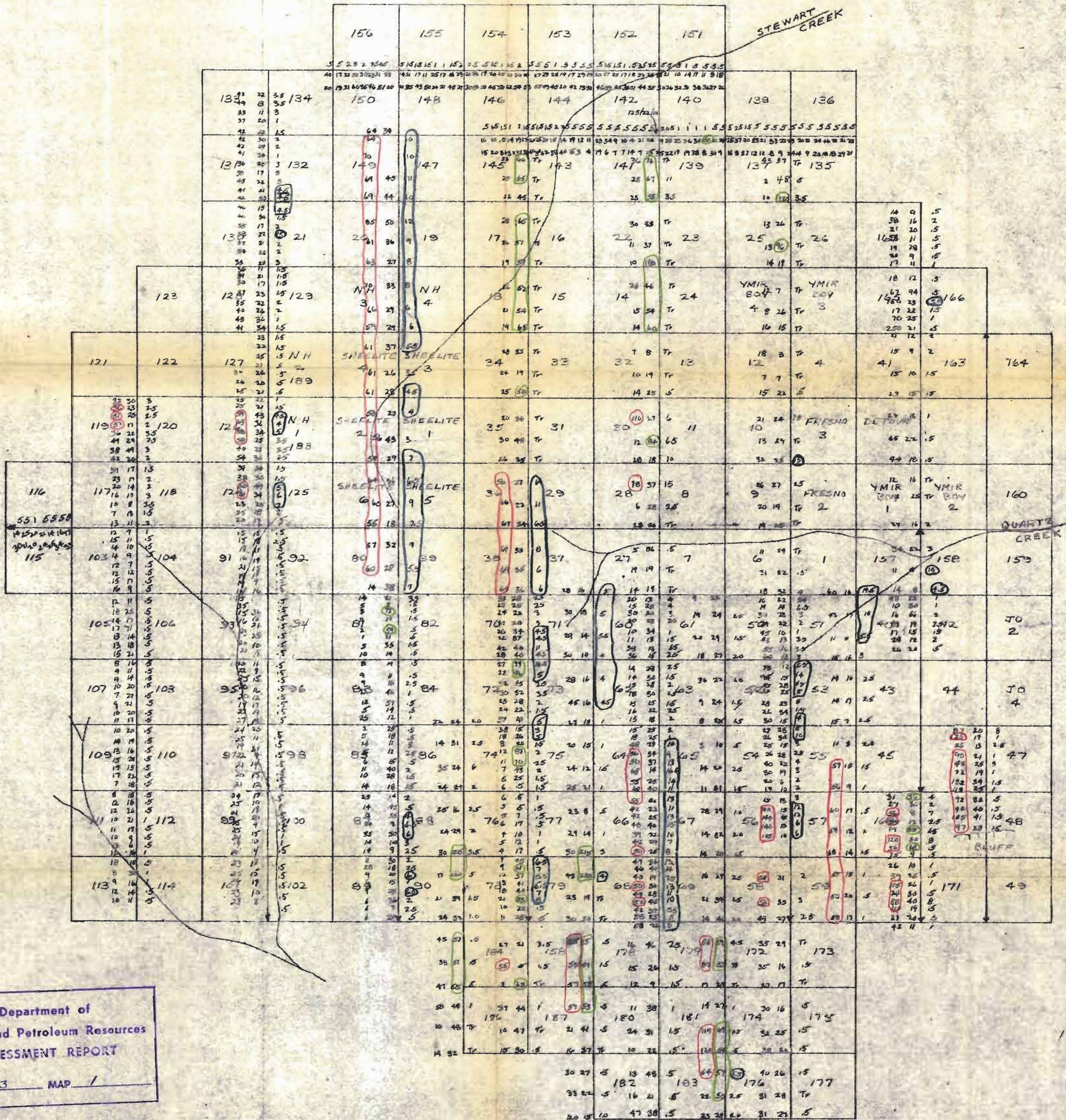
L. J. Manning, P.Eng.



HILL, MANNING & ASSOC.
 COPPERHORN MINING CO.
 FRESNO GROUP

SCALE: 1" = .80 MILE FILE NO.: - 82 F-6-A
 DATE: - SEPT 1967 DRAWING NO. - 1
 DRAWN BY: - J WALLACE

D. P. Manning



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1083 MAP 1

RECONNAISSANCE GEOCHEMICAL SURVEY

LOCATIONS APPROXIMATE - NOT SURVEYED
VALUES GIVEN AS P.P.M. - CU Pb Mo
Cu, Pb, Mo - HOT ACID
Cu, Pb - DETERMINED BY A.A.
Mo - DETERMINED BY DITTOL METHOD

30th Sept. 1967
[Signature]

HILL, MANNING & ASSOCIATES
COPPERHORN MINING CO.
YMIR, B.C.
FRESNO GROUP

SCALE: 1" = 1500'
DATE: SEPT 1967
FILE NO.: 02F6 A
DRAWING NO.: 2
TRACED BY: J. WALLACE
To Accompany Report of 15th Sept 1967
By: L. J. MANNING P. Eng.

1083

Copper Horn Mining Ltd. (N.P.L.)

Ymir Property - Nelson M.D.

Outcrop Map - No. 1 Grid Area

Mapped by J.R. Shubb June '67 from traverses of most grid lines, roads, and Quartz Cr.

TO ACCOMPANY SEPT. 15/67 REPORT BY L.J. MANNING HILL, MANNING & ASSOC. JPC 11/7/67

Scale: 1" = 200'

FILE NO. 82FG DRG. NO. 39

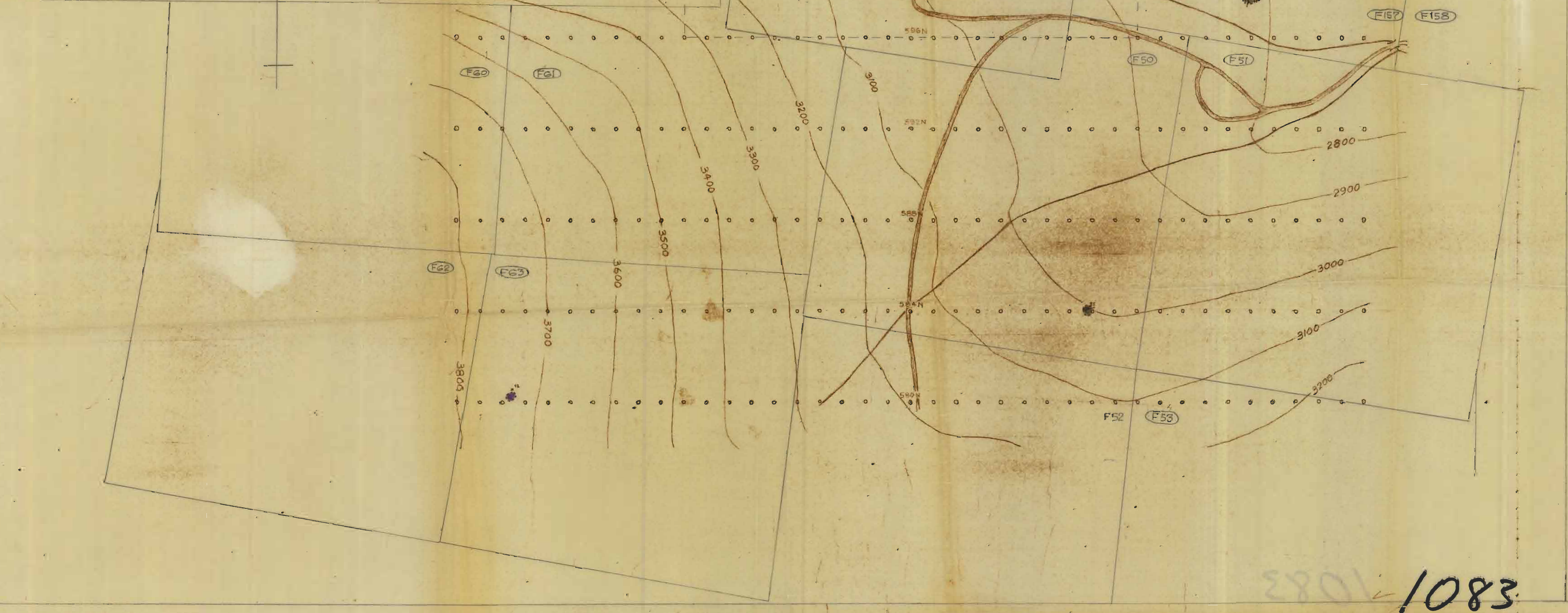
30th Sept. 1967

LEGEND

- Rock Types:**
- Nelson Amphibole
 - Nelson Hornblende Granite or Granodiorite
 - Elite Formation - Foliated Hornblende Porphyry
 - Elite Formation - banded aphanitic lavas and pyroclastic rocks ± minor interbedded slate and argillite (<10%)
- Alteration and Sulphide Mineralization**
- encircled outcrop contains disseminated pyrite
 - encircled outcrop contains visible MoS₂ ± other sulphide bodies pyrite
 - rock shows extensive hydrothermal alteration (Silicification, chloritization)
- Structure**
- attitude of bedding planes
 - attitude of joints
 - attitude of foliation (banding in volcanic rocks)
 - fault
- Samples**
- Hand specimen taken at exposed outcrop
 - sample taken for assaying at exposed outcrop

CLAIM SURVEY NOT COMPLETE
CLAIMS SHOWN AS ACCURATELY AS POSSIBLE
WITH DATA AVAILABLE

(FND) FRESNO OR FRESNO CLAIM
(CBND) CITY BOY CLAIM



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1083 MAP

1083

Copper Horn Mining Ltd. (N.P.L.)

Ymir Property - Nelson N.L.

Soil Sampling Survey - No. 1 Grid Area

- 80 surface samples collected by J. Wilson, I.B. Clark Jun 67
- Analyzed at T.S.L. Laboratories Ltd. Vancouver, B.C.
- Copper and molybdenum extracted with hot HCl
- Copper determined by colorimetric spectrometer
- Molybdenum determined by Zn-Dithionite method

HILL, MANNING & ASSOC. D.C. 8/7/67
To accompany report Sept 1967 by L.J. Manning, P.Eng.

Scale 1" = 200'
200 0 200 400 600
FILE NO 1-82FG DRG NO - 55

LEGEND

- - Not detectable 100% (small spots on map)
- - Molybdenum
- - < 25 PPM
- - 25 - 50
- - 51 - 75
- - > 75

HILL, MANNING & ASSOC.

D.C. 8/7/67

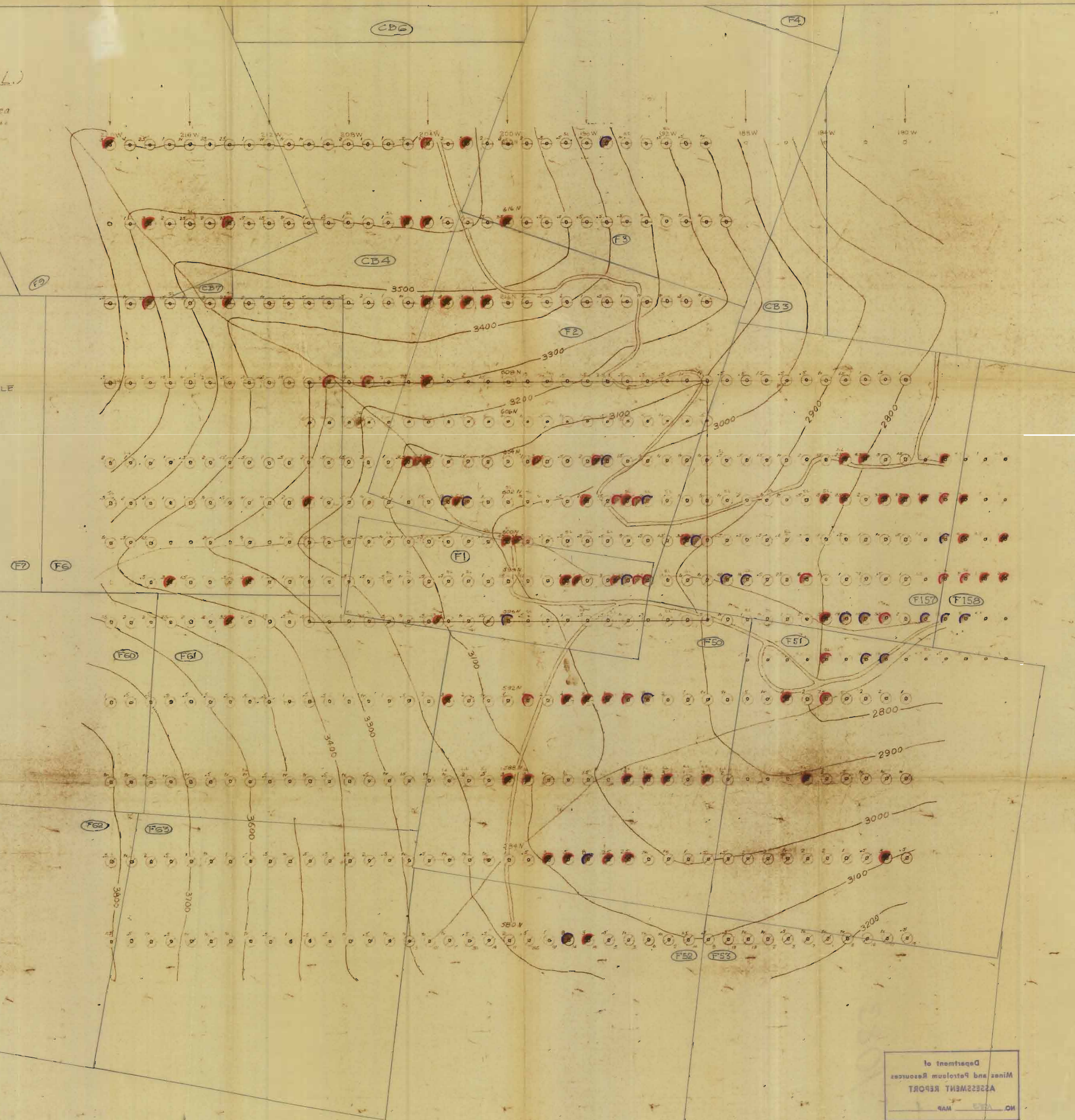
CLAIM SURVEY NOT COMPLETE
CLAIMS SHOWN AS ACCURATELY AS POSSIBLE
WITH DATA AVAILABLE

(F1) FRESNO OR FRESNO CLAIM

(CB) CITY BOY CLAIM

30th Sept. 1967

L.J. Manning



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1083
MAP

1083

Copper Horn Mining Ltd. (N.P.L.)

Ymir Property - Nelson M.D.
Vertical Field Magnetometer Survey - No. 1
Grid Area

- Surveyed and contoured by J. Wallace, June 57
 - Instrument used: Shupac MF-1 Fluctometer
 - Contoured at ten gamma intervals - 1000 gamma added to all field readings
 - Instrument taped to control stations on bench
- TO ACCOMPANY SEPT 15/57 REPORT BY
L.J. MANNING, P. ENG.

FILE NO. 8250 DRG. NO. - 3M.

Scale 1" = 200'



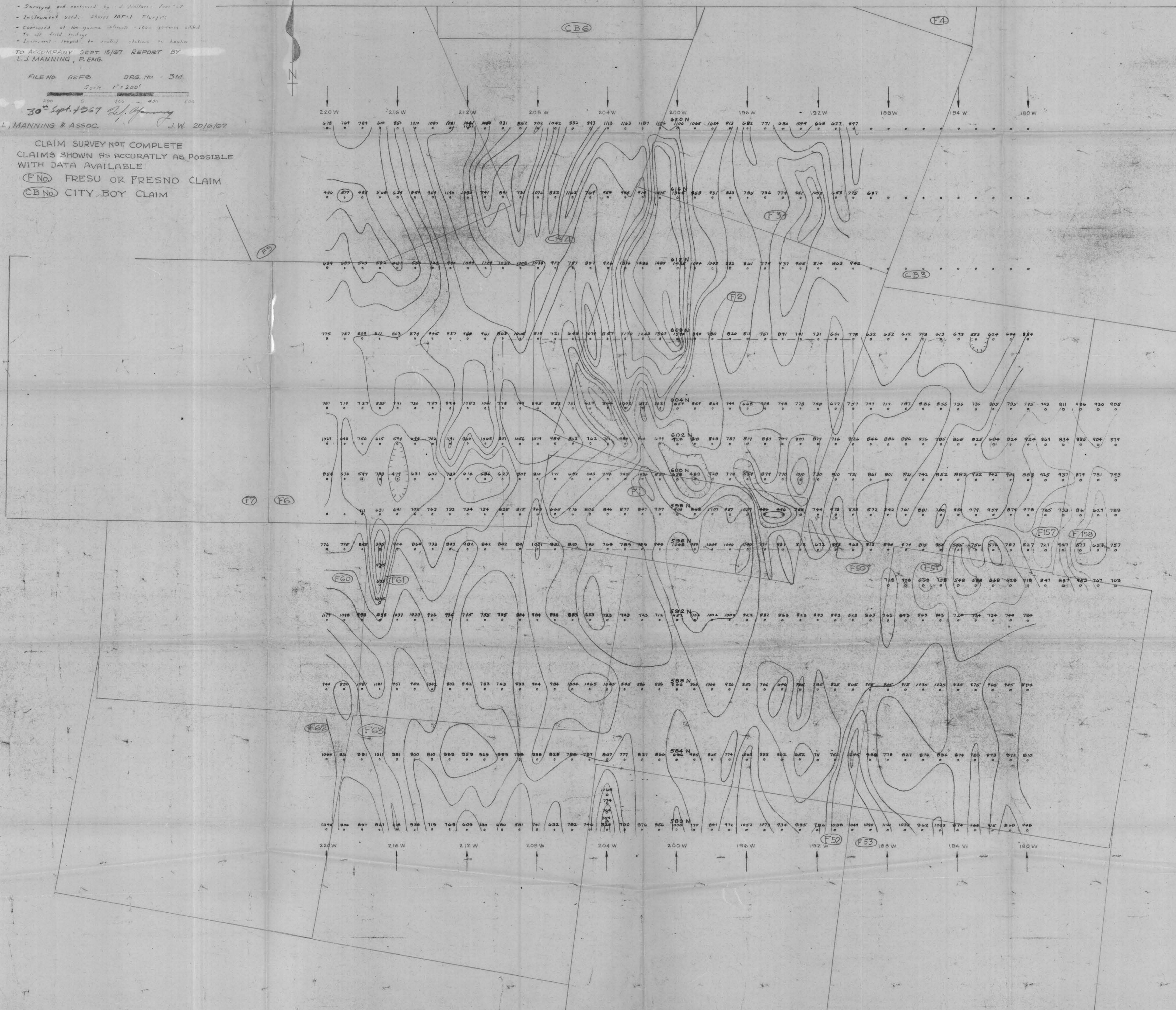
30th Sept. 1967 *J. Manning*

HILL, MANNING & ASSOC. J.W. 20/10/67

CLAIM SURVEY NOT COMPLETE
CLAIMS SHOWN AS ACCURATELY AS POSSIBLE
WITH DATA AVAILABLE

- (FNo) FRESNO OR FRESNO CLAIM
- (CBNo) CITY BOY CLAIM

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1083
MAP



COPPER HORN MINING LTD.


YMIR PROPERTY - NELSON M.D.

LOCATION OF MAP SHOWING ANOMOLOUS SOIL
SOIL SAMPLES AND MAGNETIC LOWS - CENTRAL
PART OF NO. 1 GRID AREA


To accompany Sept 15/67 Report by L.J. Manning, P. Eng.


File No. 82 F6 Drp. No 5 30th Sept. 1967 L.J. Manning


LEGEND


 Magnetic field intensity (8)
- Magnetic low

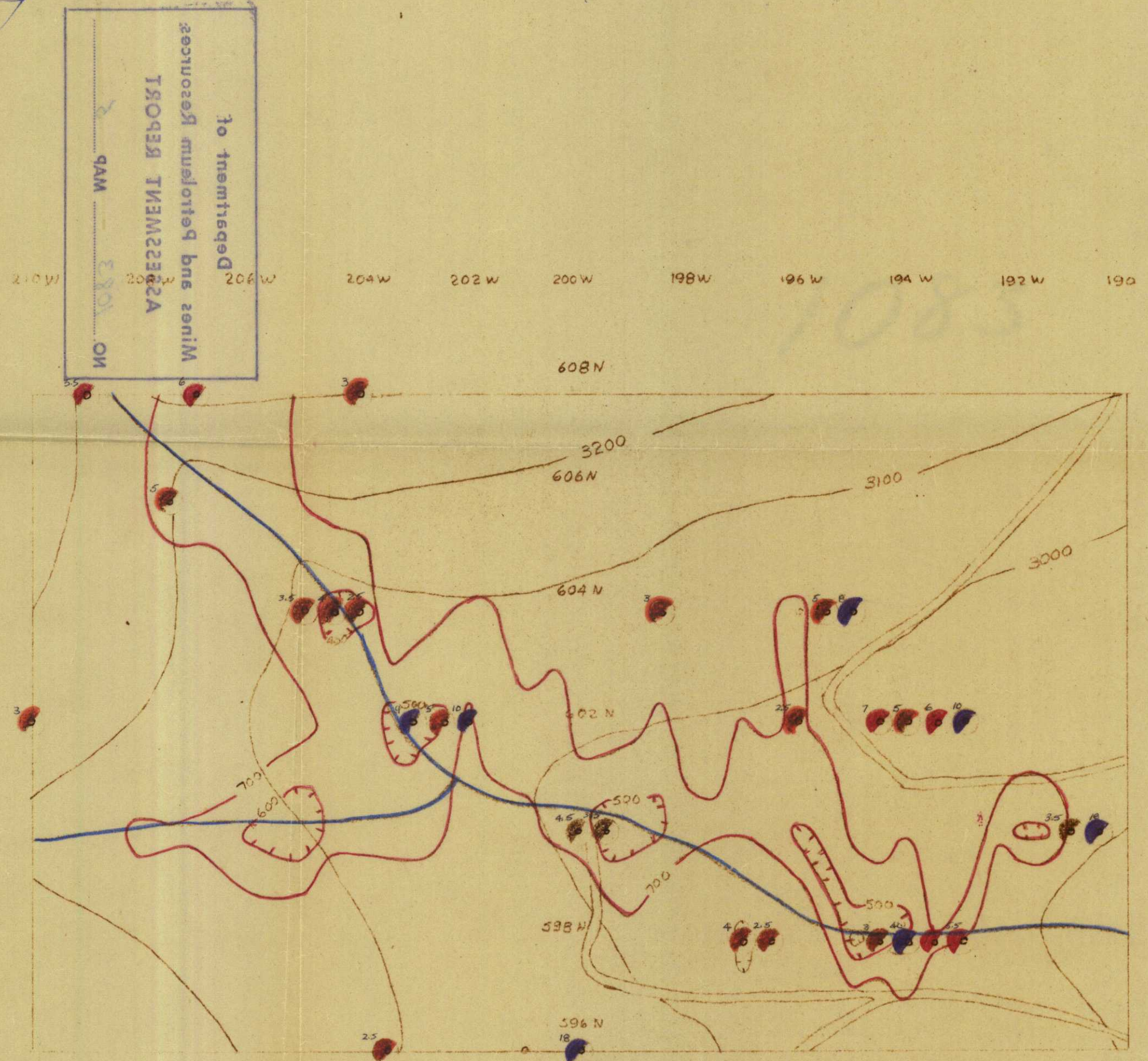
Soils (Hot HCL extraction)

 < 2.5 ppm

 2.5 - 5.0 ppm

 5.0 - 7.5 ppm

 > 7.5 ppm



1083

1083

Copper Horn Mining Ltd. (NPL)

Ymir Property - Nelson M.D.

Detailed Soil Sampling Survey
Central part of #1 Grid Area

-B-horizon samples

-analyzed by T.S.L. Laboratories Van. B.C.

-Cu & Mo extracted by hot HCl

-Cu determined by atomic absorption spectrometry

Hill, Manning & Assoc. Ltd.

DC 31/7/67

30th Sept. 1967

R. J. Manning

To accompany Sept 15/67 report by L.J. Manning P. Eng

Scale 1"=100'

File No 82 F6 Drg. No 4S

LEGEND

Mo - hot extractable Mo content ppm

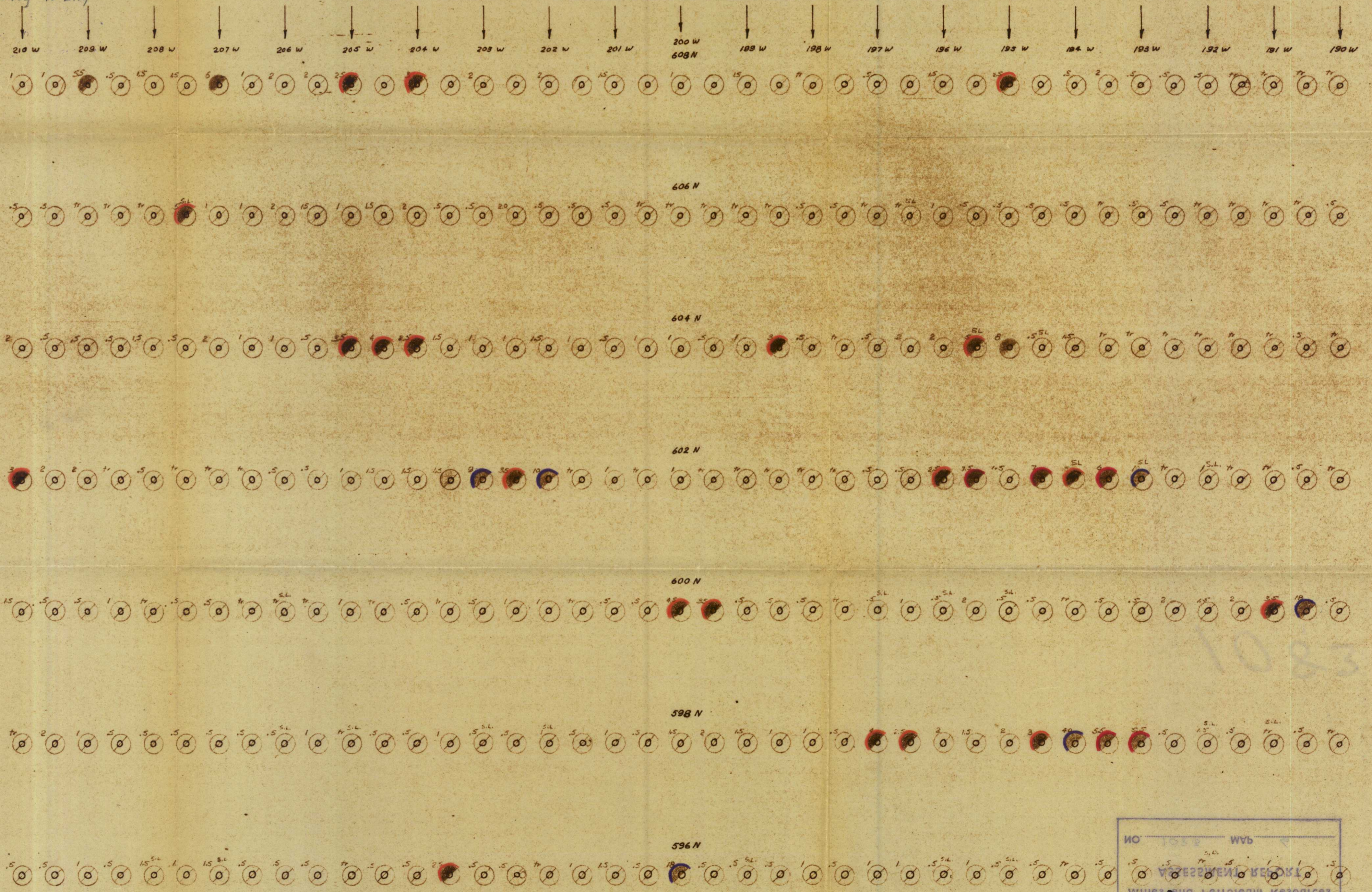
Mo

○ < 2.5

● 2.5 - 5.0

● 5.1 - 7.5

● > 7.5



MO 1083 WAB
 APPROVED FOR RELEASE
 Mining and Petroleum Resources
 Department of
 1083

Copper Horn Mining Ltd. (NPL)

Ymir Property - Nelson, N.D.

Vertical Field Magnetometer Survey

Central part of No. 1 Grid Area

- Surveyed & contoured by J. Wallace - July/67

- Instrument used - Sharp MF-1 Fluxgate

- Contoured at 100 gamma intervals

- 1000 gammas added to all field readings

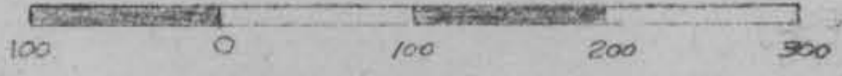
- Instrument looped to central stations on baseline

Hill Manning & Assoc.

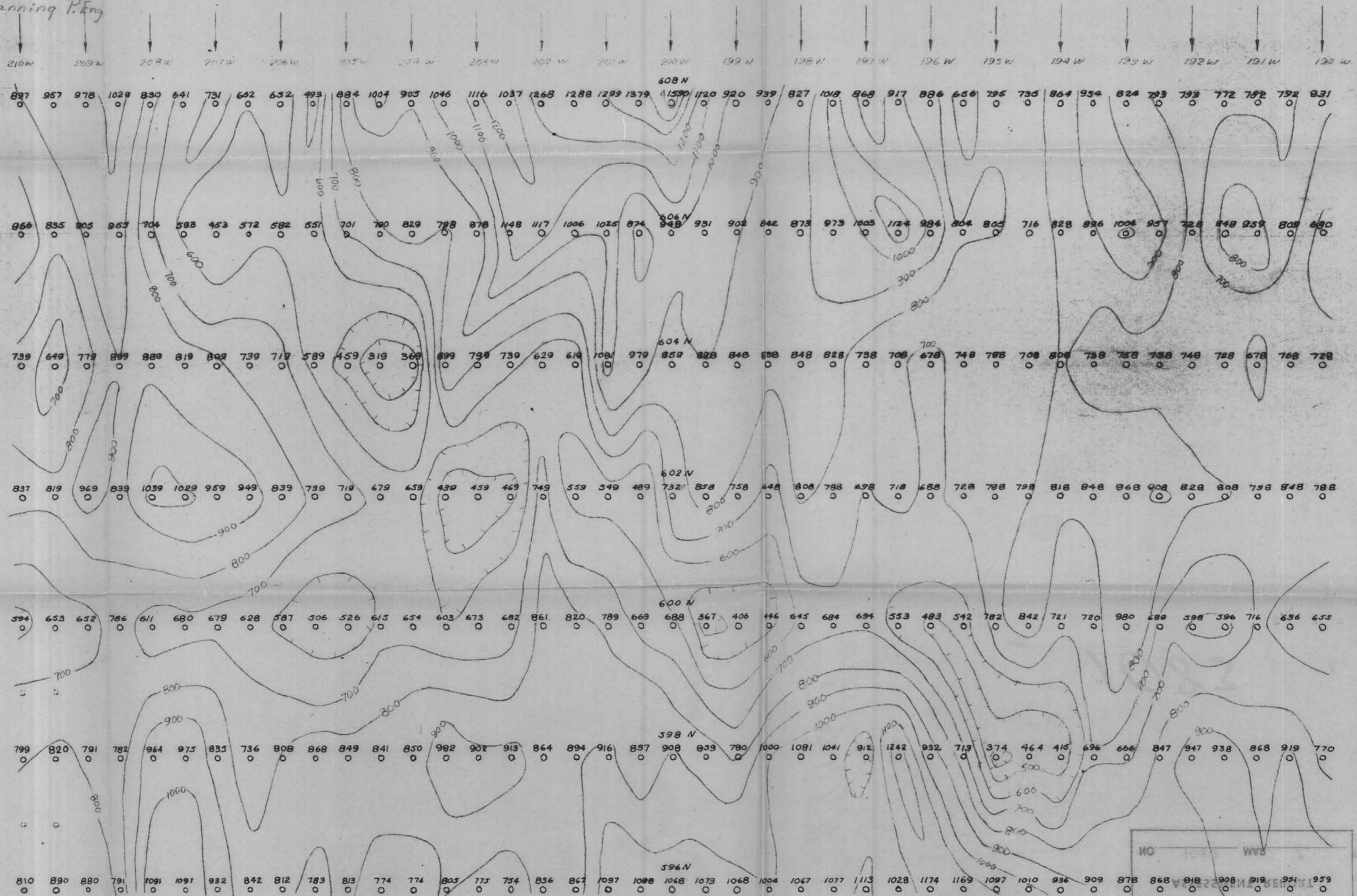
1967

To accompany Sept 15/67 report by L. J. Manning P. Eng

Scale 1" = 100'



File No 82 F6 Dwg. No. 4M.
30th Sept. L. J. Manning



NO. 1083
MINES AND PETROLEUM RECONSTRUCTION

COPPER HORN MINING LTD(N.P.L.)
YMIR PROPERTY - NELSON M.D.

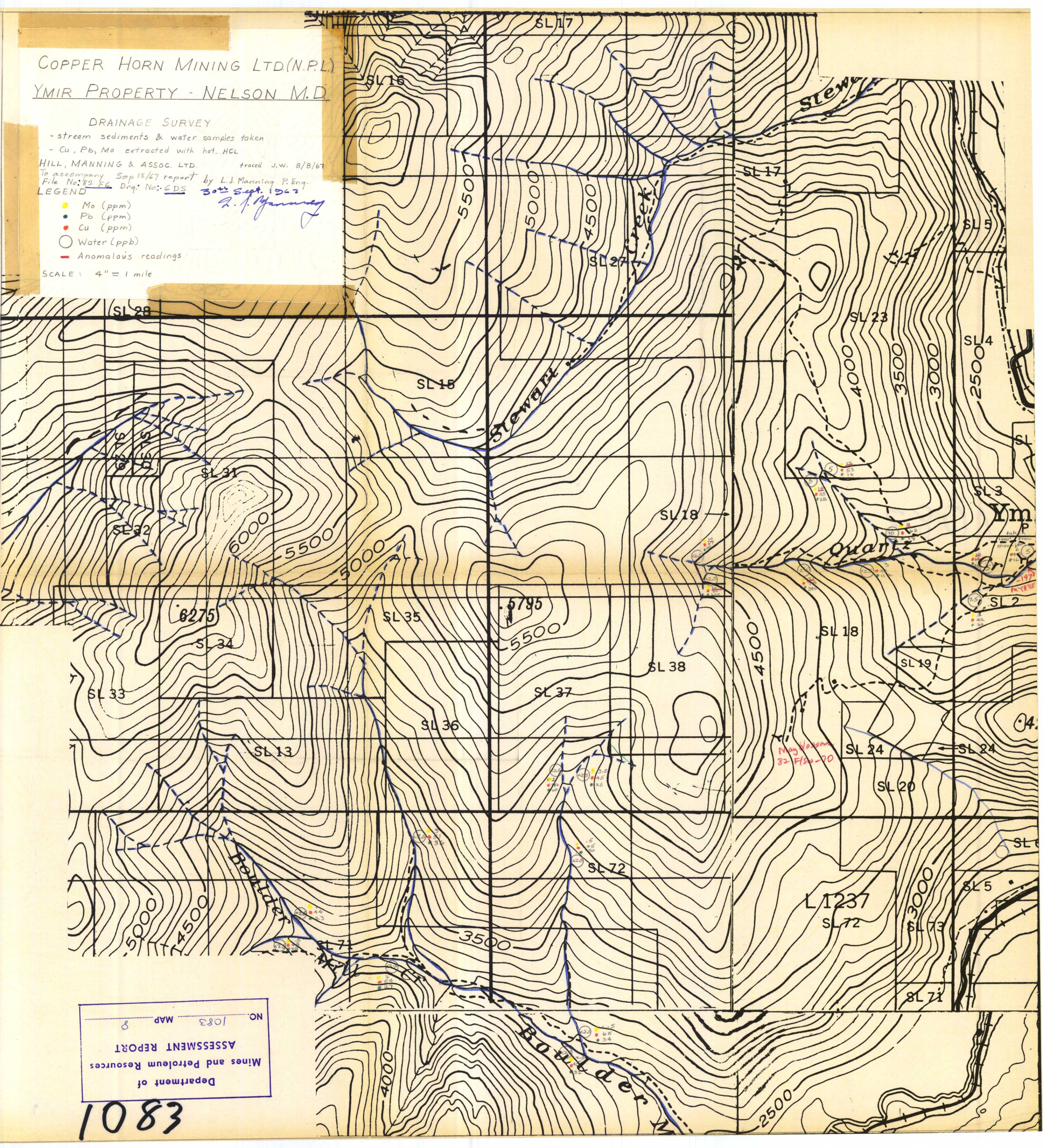
DRAINAGE SURVEY

- stream sediments & water samples taken
- Cu, Pb, Mo extracted with hot. HCL

HILL, MANNING & ASSOC. LTD. traced J.W. 8/8/67
To accompany Sep 15/67 report by L.I. Manning P. Eng.
File No: 82 F6 Drq. No: GDS 30th Sept. 1967
R. J. Manning

- LEGEND
- Mo (ppm)
 - Pb (ppm)
 - Cu (ppm)
 - Water (ppb)
 - Anomalous readings

SCALE: 4" = 1 mile



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
MAP 8
No. 1083

1083

COPPER HORN MINING LTD. (NPL)

YMIR PROPERTY - NELSON M.D.

REGIONAL SOIL SAMPLING SURVEY

- E-Horizon samples taken at 200' intervals
- anomalous areas only are indicated
- samples analyzed by T.S.L. Laboratories
- Cu, Pb & Mo extracted by hot HCl

File No: 82F6 Drq No: 6S 3-3 Sept. 1967

SCALE 4" = 1 mile

L. J. Manning

500' 0 500 1000 2000 3000

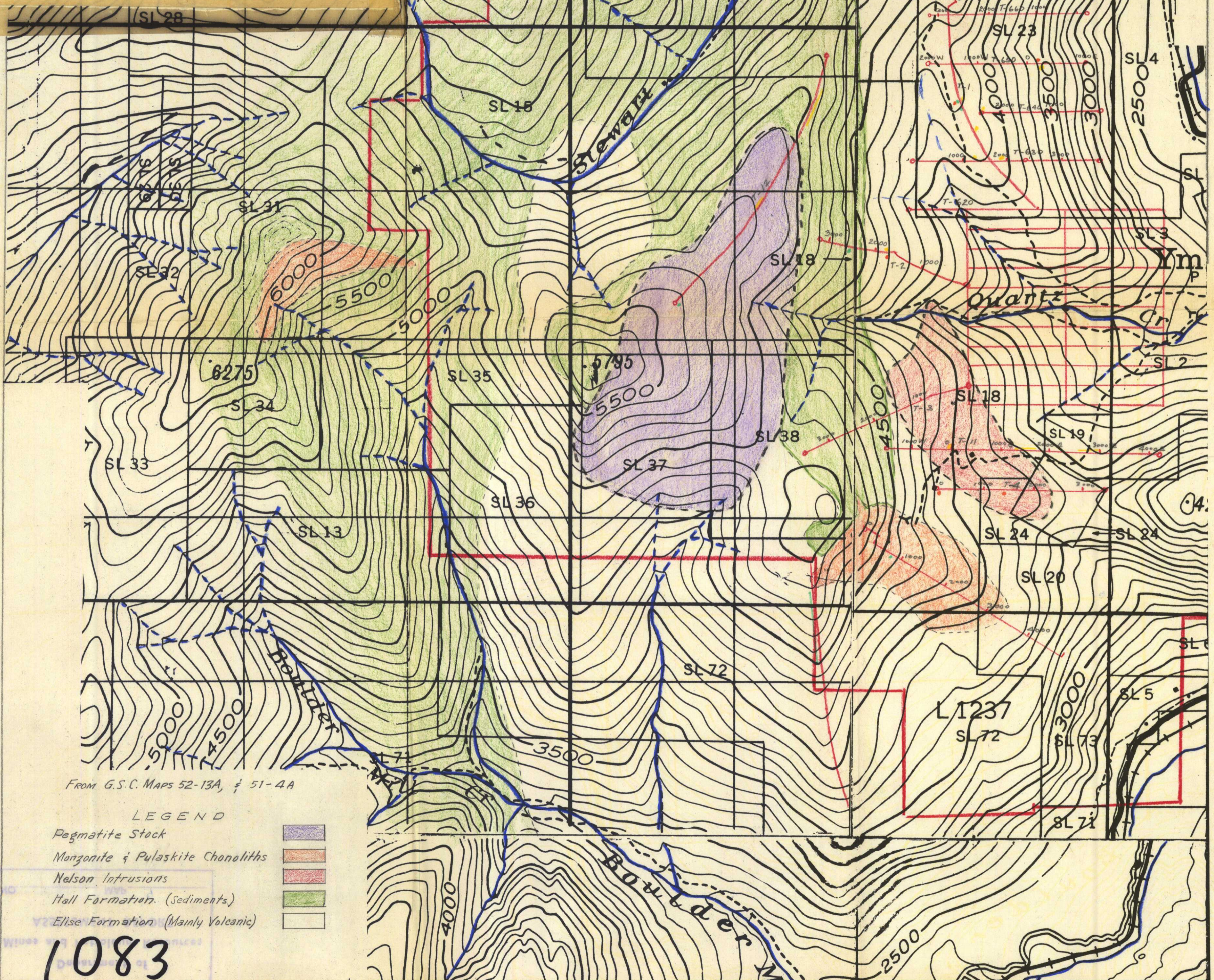
HILL, MANNING & ASSOC.

DC 13/7/67

To accompany Sept 15/67 report by L.J. Manning P.Eng.

LEGEND

- Anomalous Mo Content (isolated sample, group samples)
- " " Cu " "
- " " Pb " "
- Approx. location of traverse lines
- - - Geological boundaries (after McAllister 1951)



FROM G.S.C. MAPS 52-13A, & 51-4A

LEGEND

- Pegmatite Stock
- Monzonite & Pulaskite Chonoliths
- Nelson Intrusions
- Hall Formation. (Sediments)
- Elise Formation (Mainly Volcanic)



1083