

GEOCHEMICAL REPORT

TROUT LAKE PROPERTY

REVELSTOKE MINING DIVISION, B.C.

Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT

By

NO. 5598 MAP

T. N. Macauley, P. Eng.

September 5, 1975

Location: 2 miles west of Trout Lake village  
Lat. 50° 38', Long. 117° 36'  
N.T.S. 82 K/12 E

Claims Owned By: A. E. Marlow and B. M. Oakey

Work Done By: Newmont Mining Corporation of Canada Limited

Work Done Between: July 2 and September 5, 1975

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### INTRODUCTION

A geochemical survey has been done on the Trout Lake Property between the dates of July 2 and September 5, 1975. A total of 855 samples were taken for analysis, comprising 816 soils, 26 stream silts and 13 rocks.

The survey covers the properties that have been known for years as the Lucky Boy and Copper Chief. They were staked in 1901 and 1897. Early prospecting and development work was concentrated on small quartz veins, as evidenced by numerous open cuts, pits and adits. Shipments prior to 1920 totalled 490 tons of silver-lead ore. In the 1942-53 period scheelite-bearing skarns were explored for their tungsten content.

In 1969-70 Cascade Molybdenum Mines explored the property by bulldozer trenching and diamond drilling. They outlined a small intrusive body and extended the area of molybdenite mineralization that had been known from surface exposures. The present survey was planned as a follow-up to this work. To the writer's knowledge, no previous geochemical work has been done on the property.

### LOCATION AND ACCESS

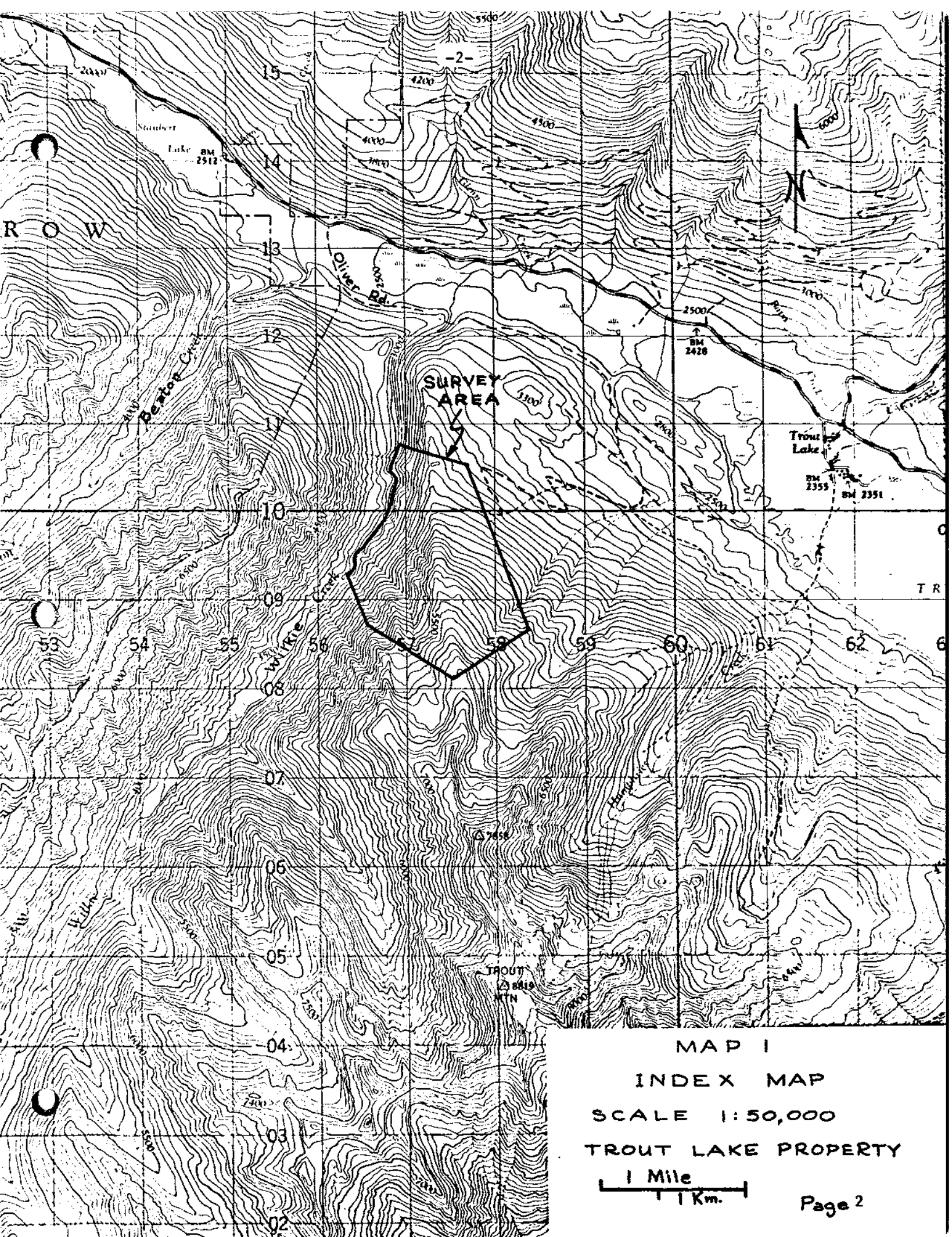
The property is located in the Selkirk Mountains of southeastern British Columbia, 2 miles west of Trout Lake village and the north end of Trout Lake. See the index map (Page 2). The latitude is 50° 38' N, longitude is 117° 36' W; N.T.S. 82 K/12 E.

Access is available from Revelstoke (51 road miles to N.W.), or Nakusp (53 road miles to S.W.) by taking Highway 23 to the Galena Bay Junction and then the gravelled Trout Lake road. At 4.5 miles N.W. of Trout Lake a system of logging roads of Celgar Ltd. (Oliver Road) can be taken to the Lucky Boy mine. Beyond that point a 4 wheel drive vehicle is necessary for traveling the roads on the property.

### CLAIMS

The claims are recorded in the Revelstoke Mining Division, and form a part of the Min Group (#21/491) for assessment work purposes. They are under option to Similkameen Mining Company Limited; with the work being done by an associated company, Newmont Mining Corporation of Canada Limited.

The claims upon which the survey was conducted are listed as follows:



MAP I  
INDEX MAP  
SCALE 1:50,000  
TROUT LAKE PROPERTY



<u>Claim</u>	<u>Status</u>	<u>Lot, Lease or Record No.</u>	<u>Owner</u>
CH	Crown Grant	L4741	Alan E. Marlow
XYZ	"	L4742	"
CD	"	L4743	"
Blue Jay	"	L4744	"
Doubtful	"	L4745	"
LB	"	L5423	"
Horseshoe	Mineral Lease	24	"
Anex Fraction	Located Claim	182	"
LB Fraction	"	4246	"
Lucky Jay No. 1	"	9889	"
No. 2	"	9890	"
No. 3	"	9916	"
No. 6	"	9968	"
No. 7	"	9969	"
No. 9	"	9971	"
No. 10	"	9972	"
No. 11	"	9973	"
Rover No. 2	"	10002	"
No. 3	"	10003	"
No. 4	"	10004	"
No. 5	"	10005	"
No. 6	"	10006	"
Copper Chief Moly	"	9968	Beulah M. Oakey
Copper Chief Moly No. 1	"	5658	"
Copper Chief Moly No. 2	"	5669	"

TOPOGRAPHY AND VEGETATION

The property lies on the north spur of Trout Mountain, and has an elevation range of 2900 to 6300 feet above sea level. The topography is shown on the accompanying Map 2, where the contours have been blown up from the 1:50 000 topographic sheet. West of the ridge, the slope of Wilkie Creek is quite steep, (averaging 40°) and access is limited to foot travel. East of the ridge, the slope is more moderate and is amenable to road-building.

Drainage on the property is to the northwest and to the northeast. With the exception of Wilkie Creek, the streams are small and often subject to drying up in late summer.

All of the property is forest-covered, with trees at lower elevations consisting of large hemlock and cedar. Above 5300 elevation, in an

area of an old burn, small dense balsam are found. Underbrush consisting of buck brush is prevalent in most areas; and thick alders and devil's clubs are found in wetter areas, particularly in snow slide paths and the Main Creek basin.

#### GEOLOGY

The most complete public report on this property is that of Fyles and Eastwood (1962). Private reports by Makela (1970) and Hausen (1974) have given additional information on the intrusion and molybdenite mineralization.

Bedrock on most of the property consists of a series of phyllite, argillite and impure quartzite striking about N 48 W and dipping 55° to 80° N.E. Two horizons of carbonates are known: a white dolomite runs through the Lucky Boy mine, and another series of dolomite and/or gray limestone (altered to skarn in places) passes through the Copper Chief area and across the ridge to the S.E.

A small granodiorite stock intrudes the above rocks in the vicinity of lines 92 to 99 at the base line. It contains a number of quartz veins which continue out into the schists. A zone of vein quartz with some granodiorite extends from the east side of the stock southward up the ridge.

Molybdenite is the mineral of current interest on this property, and it occurs associated with the quartz veining in the stock and adjacent schists. Minor pyrite is associated with it. Disseminated pyrite and pyrrhotite are widespread in the schists, and traces of chalcopyrite can be seen in some areas. Heavy pyrrhotite, along with some scheelite, occurs in the skarn. Quartz veins of the Lucky Boy and Copper Chief mines carry galena, sphalerite, tetrahedrite, chalcopyrite and pyrite.

#### OVERBURDEN

Overburden in the survey area consists of a combination of glacially transported and residual types. On the steep N.W. slope it is thin; with outcrop, talus and rubble being prevalent in some areas. On most of the ridge and all of the N.E. slope, overburden covers nearly all of the bedrock. Trenching and road-building have shown it to range from a foot or two in thickness in some places near the ridge to more than five feet over large areas.

Overburden in most areas is a loamy soil carrying numerous rock chips and larger cobbles and boulders. The rocks are usually angular to sub-angular, but due to the similarity of local types it is difficult to estimate

how far they have travelled from their source. Float rock from the granodiorite stock has been traced at the same elevation for a considerable distance to the southeast, suggesting glacial transport in that direction. In the trenched area boulders or slumped blocks as large as 6 feet have been found. No layering or imbrication can usually be discerned in the till. In the wetter alder-covered areas, dark brown-black loam may be the only soil found.

Soil horizons can readily be recognized in trench walls and sample pits. They are described from the surface down, as follows:

<u>Thickness in Feet</u>	<u>Description</u>
0.1 to 0.5	Humus: moss, roots, needles and some talus blocks.
0.05 to 0.5	Light gray leached horizon. Loamy soil with numerous rock fragments. Thickest and best developed on N.E. slope in area of Mo mineralized zone and downslope from it. Thin to absent elsewhere.
0 to 0.5	Dark gray-brown to chocolate brown. Absent in most areas.
0.5 to 1.0	B horizon. Bright rusty brown to medium brown.
Below the above	Light brown to yellow-brown till. Gradational to above.

#### FIELD PROCEDURE

Control for the survey was established by cutting an 8000 ft. N-S base line the length of the property. The bearing was determined by solar observation at diamond drill hole TL-4 (99+00N). The line was run by transit from there to 88+00N and 104+00N. Due to the excessive amount of time required for surveying in thick underbrush, large timber and steep ground, the transit work was suspended and the remainder of the base line was run by compass. It is well marked by blazing and lath pickets. E-W cross lines at 400 ft. intervals were then run by compass to the property boundary on the east and over the ridge to the west. They are marked by flagging. Stations were marked every 100 feet (horizontal) with slope corrections being determined by clinometer. Due to the steep terrain on the N.W. slope and the impossibility of running a straight compass line in some areas, four contour lines labelled A, B, C, and E were chained and flagged. Control was provided by altimeter, and lines B and C are southerly extensions of the lower and upper Copper Chief trails.

Profile soil sampling was done from road banks at six sites labelled A to F to see what range of values may be expected from the different horizons. Soil samples along cross lines and contour lines were taken at 100 ft. intervals. At the sample point a hole was dug with a mattock to a depth of 6 to 18 inches. The hole was then cleaned out and a sample taken from the bottom of it by trowel. The objective was to sample the B horizon, but the sample depth varied depending on the depth to the B and the presence of boulders or bedrock. Practically no organic material was in the soils, with the exception of a few black loams from the wet areas. Samples were placed in 3-1/2 x 6" Kraft paper envelopes. The soils at the time of sampling were dry to damp.

Rock sampling was done in certain areas of interest by taking numerous chips over the sampled width to achieve a representative sample. About 4 to 10 pounds of rock were taken.

#### LABORATORY PROCEDURE

The samples were prepared and analyzed at Chemex Labs Ltd. in North Vancouver, B.C. The soils and silts were dried in their envelopes and then sieved through an 80 mesh screen. For Mo-Zn-Cu-Ag analyses, a 1/2 gram sample of the -80M fraction is put in a tube, subjected to hot digestion for 2 to 3 hours in a mixture of 3 ml of 70% perchloric and 2 ml of nitric acid, diluted to 25 ml with demineralized water, mixed and sediment allowed to settle, and then the metal content is determined by atomic absorption. For tungsten, a 1/2 gram sample is mixed with pyrosulphate flux, fused in a high-temperature furnace, leached with dilute HCl, and the W content determined colorimetrically by the dithiol procedure with a sensitivity of 4 ppm. Rock geochemical samples are pulverized to 100 mesh.

#### RESULTS AND INTERPRETATION

The Mo results are presented on Map 3 and the Zn-Cu-Ag-W results on Map 4. The soil profiles and rock chip sampling are in the Appendix. The profiles showed that sampling any of the brown soils below the humus and leached horizon would yield significant values, and in only 2 of the 6 sites did Mo have a slightly increasing trend in the till below the B horizon. An interpretation of results for each element follows:

##### Molybdenum

The Mo values in soil range from less than 1 to 500 ppm. The most significant feature is a strong anomaly extending from the centre of the survey area toward the S.E. corner. The N.W. end of the +100 ppm area coincides with the Mo-mineralized zone at 92-99N on the base line. To the S.E., very little outcrop can be found, but rock sampling of the schist bedrock found in



pits at sites 6, 10, 11 and 12 has yielded Mo values much less than the overlying soil. Molybdenite-bearing cobbles and boulders can be found in the till along the length of this anomaly, and it can be interpreted that they either were carried along the hillside by glacial action from the known zone, or originated at some other unknown source. Traces of molybdenite occur along the ridge upslope from the main anomaly and are likely the source of the 10-50 ppm values in the soils of that area. The quartz zone and associated granodiorite carry 50 to 100 ppm Mo even when no mineralization can be seen, as shown by rock samples 5, 8 and 9.

Weaker anomalies in soils of the N.W. slope ranging from 10 to 95 ppm Mo have probably originated from the weathering of the schists adjoining the mineralized zone, and themselves carrying trace amounts of molybdenite. For instance, rock sample 1 is a siliceous schist with some quartz vein material and 25 ppm Mo. One 10 inch quartz vein with molybdenite was found on the N.W. slope.

The anomaly trending to the N.E. corner of the survey area clearly reflects the drainage downslope from the mineralized zone. A number of tiny intermittent creeks are found here and nearby soils are moist black loams.

Silt samples did not yield much information additional to that from the soils. The few anomalous ones at the N.W. corner may be attributed to the small creek originating at a spring in a limestone band just below the Lucky Boy mine, and possibly denoting Mo mineralization in the quartz vein there. The pH of creek waters tested in various parts of the property was about 8.

#### Zinc

Zn determinations were made on all samples to see if any zoning pattern existed relative to Mo, but such was not found to be the case. Over most of the survey area and over the Mo anomalies, Zn values ranged mainly from 50 to 250 ppm. The highest Zn values were observed to be associated with limestone-dolomite bands. Examples are just N.W. of the Lucky Boy mine, and lines 68 to 80 just west of the base line. Other samples in the 250 to 600 ppm range are mainly in the projected trace of the two carbonate horizons.

#### Copper

From drill hole information it is known that no copper mineralization is associated with the molybdenum deposit, and therefore it was only determined on the profile orientation samples and on lines B and C in the Copper Chief area. In that area traces of chalcopyrite can be seen in skarns (rock samples 3 and 13), and a schist band at L88 carries very weak but persistent chalcopyrite (rock 6).

Silver

Ag analyses were made on several lines as test cases in the vicinity of known deposits. In the Copper Chief area the soils commonly contain 1 to 8 ppm, with the few higher values likely caused by contamination from adit dump material moving down the steep draws. Low values at the south end of lines B and C offer no encouragement to prospect south of Main Creek.

Of the 3 lines run over the Lucky Boy, L108 upslope to the south of the mine contained up to 8.5 ppm, whereas L112 and L116 to the north were much lower at 3 or less ppm. This could represent glacial transport from the north.

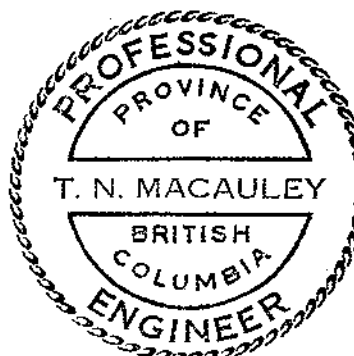
Tungsten

W analyses on the profile orientation samples gave 8 to 22 ppm in the soils over the Mo mineralized zone and 65 to >500 ppm on the ridge to the south where limestone and skarn are cut by the quartz zone and granodiorite. On the Copper Chief trails the scheelite-bearing skarns are readily detected with values in some cases exceeding 500 ppm. Soils in this steep area are entirely local in origin, and should reflect mineralization at the site or directly upslope.

RECOMMENDATIONS

1. Detailed geological mapping of the property should be completed in order to better interpret some of the soil anomalies.
2. Further pitting and rock sampling should be carried out on the main Mo anomaly. If its origin is not better explained than at present, consideration will have to be given to bulldozer trenching or drilling.
3. Some additional analyses should be made for tungsten in the area of interest.

*T. N. Macauley*  
T. N. Macauley, P. Eng.

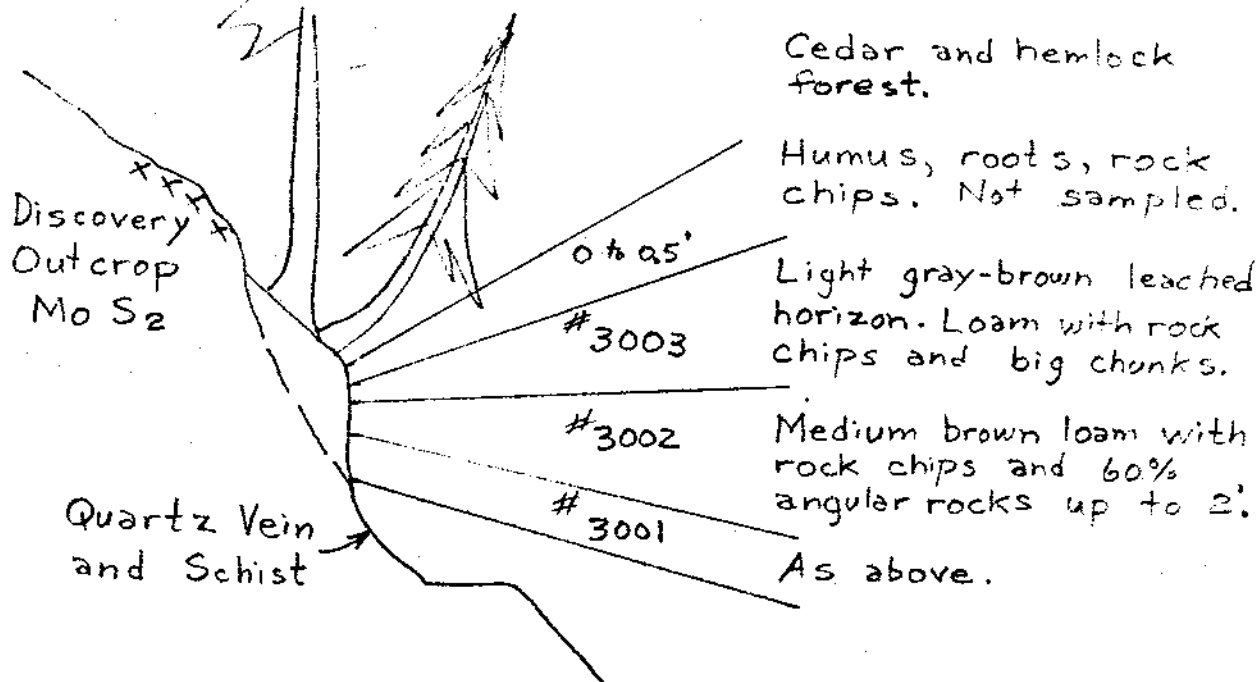


September 5, 1975

REFERENCES

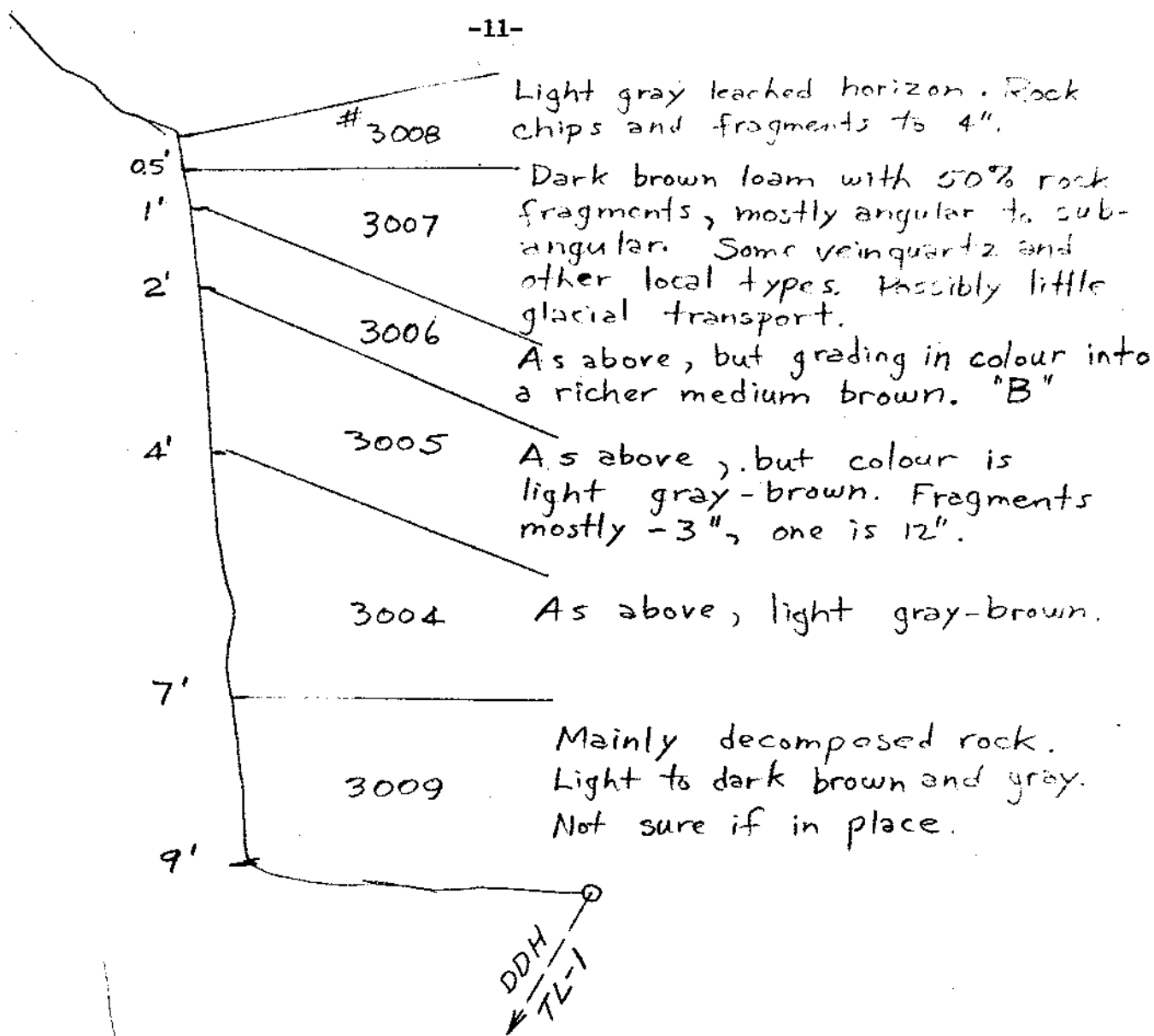
- FYLES, J.T., and EASTWOOD, G.E.P. (1962): Geology of the Ferguson Area, B.C. Department of Mines Bulletin 45, pp. 59-64.
- HAUSEN, D.M. (1974): Features of Hydrothermal Alteration in a Molybdenum Prospect near Trout Lake, B.C., Private Report, Newmont Exploration Limited.
- MAKELA, K. (1970): Final Report on Trout Lake Molybdenum Prospect, Private Report, Cascade Molybdenum Mines Ltd.

A P P E N D I X



<u>Sample</u>	<u>Depth</u>	<u>Cu</u>	<u>Mo</u>	<u>Zn</u>	<u>Ag</u>	<u>W</u>	ppm
3003	0.5 to 1.0 ft.	22	>500	80	1.5	18	
3002	1.0 to 2.0	31	>500	123	2	18	
3001	2.0 to 3.4	38	>500	140	5	18	

TROUT LAKE PROJECT  
 GEOCHEMICAL SURVEY - ORIENTATION PROFILES  
 SITE A - 97 N, 1 W.  
 TNM July 30 /75

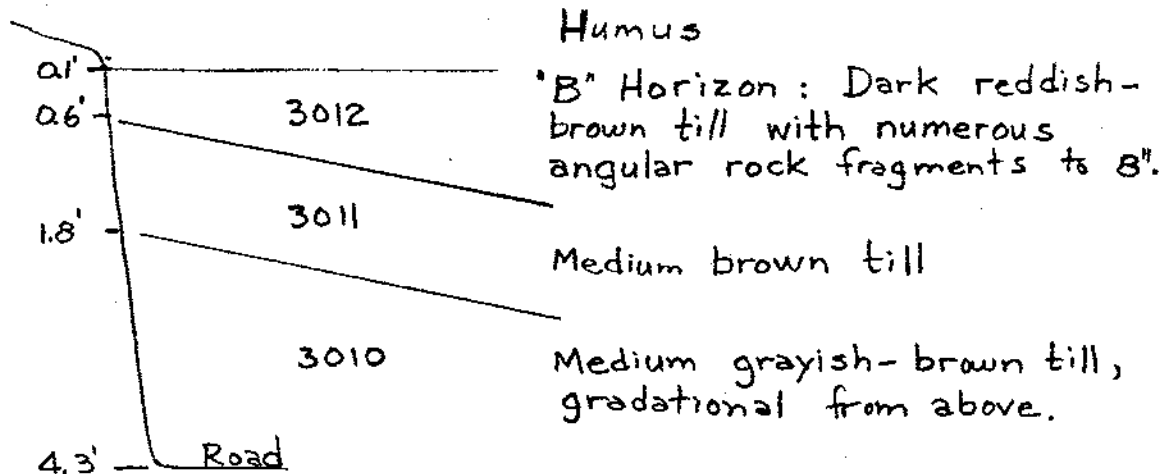


Sample	Cu	Mo	Zn	Ag	W ppm
3008	10	95	22	1	8
3007	28	275	65	4	22
3006	30	280	80	5	16
3005	33	310	86	4	9
3004	38	360	86	1	8
3009	52	470	194	5.5	120

SITE B - 95 N, 2 E

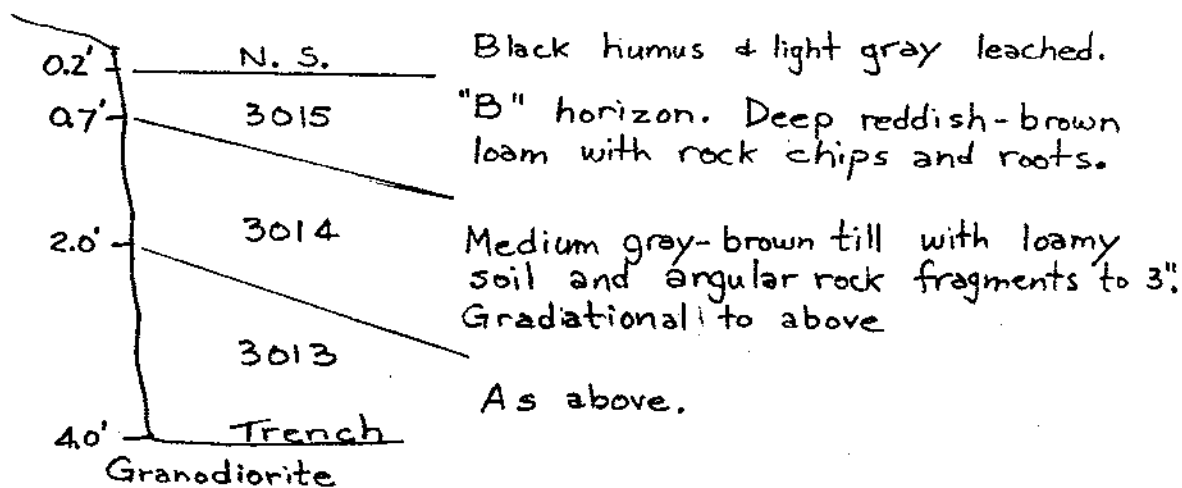
TNM July 30/75

SITE C - 83 N, 2W



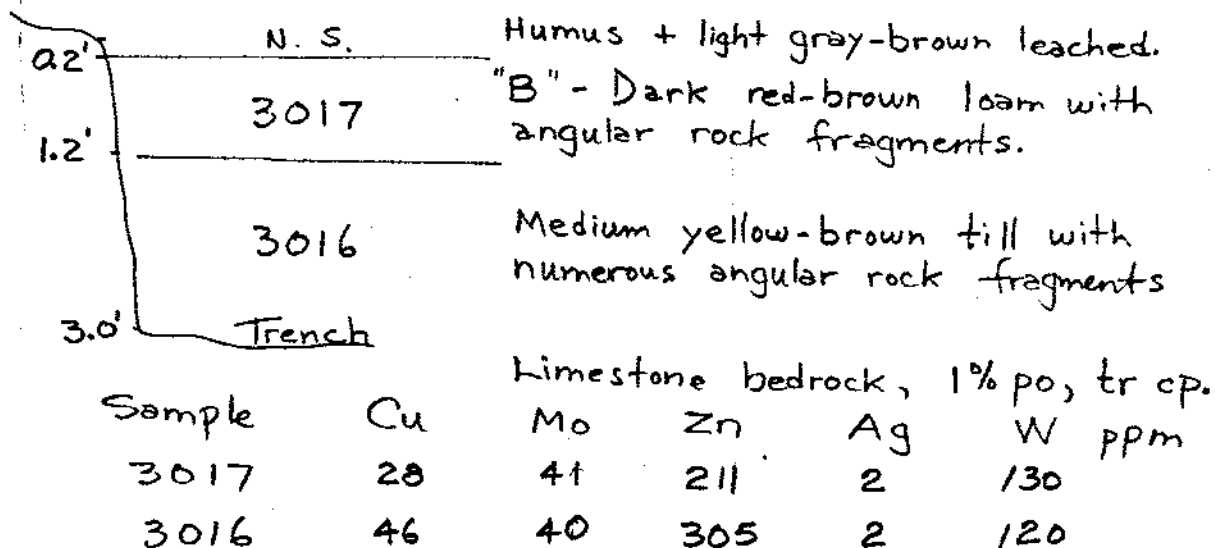
Sample	Cu	Mo	Zn	Ag	W ppm
3012	52	65	179	1	300
3011	100	75	240	1	200
3010	92	49	174	0.5	65

SITE D - 80 N, B.L.

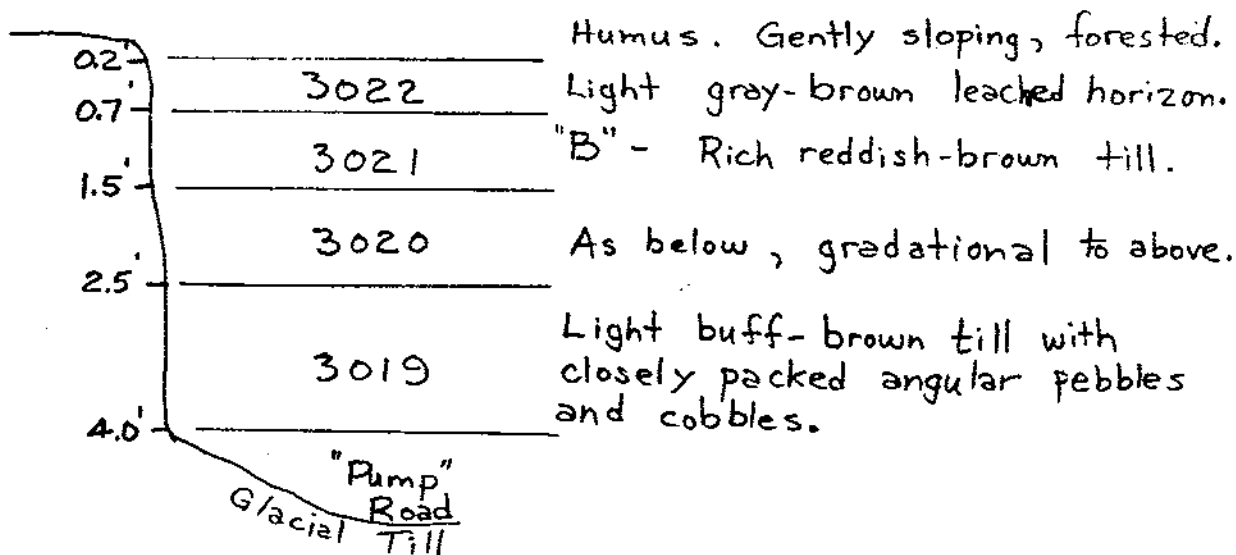


Sample	Cu	Mo	Zn	Ag	W ppm
3015	51	75	189	2	> 500
3014	80	52	233	1	> 500
3013	106	70	233	1.5	500

SITE E - 81 N, 3 E



SITE F - 74 N, 18 E



Sample	Cu	Mo	Zn	Ag	W ppm
3022	12	41	50	< 5	< 4
3021	34	65	98	3	15
3020	48	96	135	2	19
3019	46	110	123	1	17



ROCK SAMPLING RESULTS

<u>Sample Number</u>	<u>Location</u>	<u>Description</u>	<u>Analyses in ppm, unless otherwise indicated</u>			
			<u>Mo</u>	<u>Zn</u>	<u>Cu</u>	<u>Ag</u>
1	S. of L92, 4W	Siliceous schist, some qtz vn, oxidized, vuggy. tr py, 2 MoS <sub>2</sub> specks	25	27		
2	92+50N, 0+80W	Open cut in granodiorite having quartz veins carrying MoS <sub>2</sub>	.054%		<.01%	
3	78+30N, 1+50E	Act.-pyrox. skarn. 1-15% po, tr py, tr Mo, tr cp	330	88	333	
4	60' above 350' to 500' S. on line C	Qtz. porph dyke. 1% fine diss po	25	62	31	
5	On main road, 55' W. to 35' E. of R2	White qtz vn mat with sericite-clay altn. Tr py, most leached out	110	25		
6	On main road, 80' to 145' E. of R2	Hard, lt to dk green schist. 2% fine diss po, poss py, tr cp	2	110	205	
7	76N, 42'-72' W. of M37	Schist-rusty and weathered. Py and poss Mo in one place	9	220	94	
8	76N, 18' W. to 26' E. of M37	Quartz zone, slightly weathered, no min	45			
9	78N, 12'-30' W. of M33	White granodiorite, qtz vnlets, intense argillic altn. No vis min	60			
10	160' S.E. of 72N, 14E 6' x 15' area	Siliceous schist, mostly oxidized but <1% diss py in spots. Mo?	<1	41		
11	88N, 750 & 900E	Gray mica schist. 1% diss py at 750E, none at 900E	18			
12	84N, 5E. 5' pit	Hard green-brown-gray schist, 2% diss po & py	6		131	
13	Line B, 850S	Qtz veins in LS and schist, very rusty, sulphides leached out	<1	31	320	<.5

STATEMENT OF QUALIFICATIONS

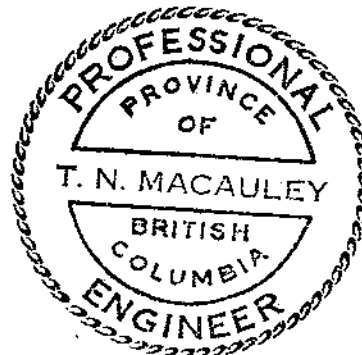
T.N. Macauley is a geological engineer (B.Sc. Queen's University, 1958; M.Sc. Michigan Technological University, 1962) and has been continuously employed in the mining and exploration industry since graduation. During his 10 years of experience in British Columbia he has previously supervised and interpreted geochemical surveys. In this survey he supervised the project and conducted a major portion of the sampling.

M. Reid is a surveying student from B.C. Institute of Technology who was employed as an instrument man for the transit survey, as a compass man for the grid lines, and as a soil sampler.

Miskulin, Spavor, Ottewell, Hartley and Rasmussen were student assistants employed as survey helpers, linecutters, and to a minor extent as soil samplers.

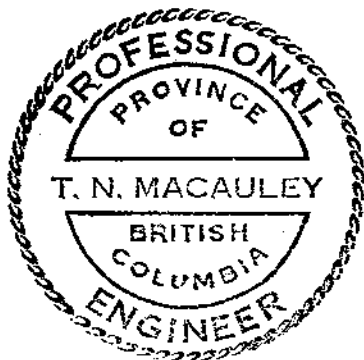
S. Barclay is an experienced prospector who was employed in the pitting done as follow-up work on the main anomaly.

*T. N. Macauley*  
T. N. Macauley, P. Eng.

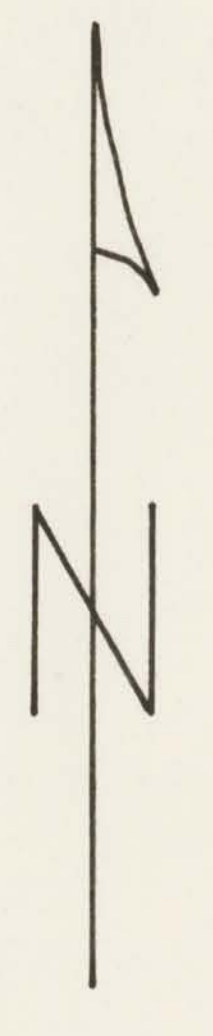


STATEMENT OF COSTS

<u>Name</u>	<u>Dates (1975)</u>	<u>Office Days</u>	<u>Field Days</u>	<u>Total Days</u>	<u>Daily Wage</u>	<u>Cost</u>
T.N. Macauley	July 2,3,4,6,8,9,11-15,18-25,28,31; Aug. 3, 20, 27-29; Sept. 2-5	6	24	30	\$89	\$ 2,670
M. Reid	July 2-7,9-31; Aug. 1,4-11,27-29; Sept. 2	3	39	42	35	1,470
B. Spavor	July 3, 4, 5		3	3	30	90
M. Miskulin	July 3, 4, 5		3	3	30	90
W. Ottewell	Aug. 19-21		3	3	30	90
R. Hartley	July 10-18, 21-25,27-31; Aug. 1,4-11,22,24		30	30	30	900
R. Rasmussen	July 17-25, 28-31; Aug. 3		14	14	30	420
S. Barclay	Aug. 19, 20, 22, 25		4	4	43	172
			<u>120</u>			
<u>Board &amp; Camp Costs</u>	120 man days @ \$12					1,440
<u>Survey Equipment Charges &amp; Field Supplies</u>						400
<u>4 Wheel Drive Vehicle</u>	47 days @ \$20					940
<u>Analyses</u>	855 samples					1,972
<u>Report and Map Typing, Printing, etc.</u>						<u>150</u>
					<b>TOTAL COST</b>	<b><u>\$10,804</u></b>



*T N Macauley*



**LEGEND**

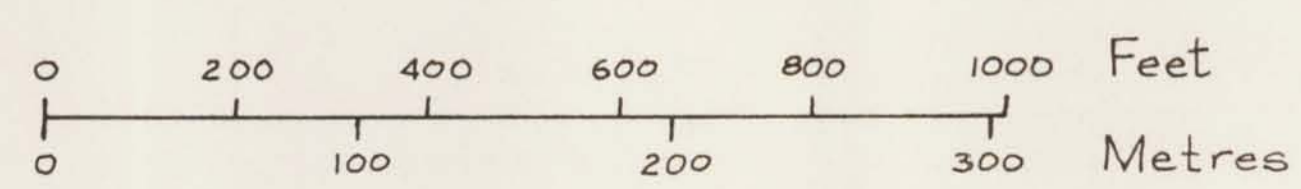
- $+45$  Soil Sample Site } in ppm Mo
- $\oplus$  Stream Silt Sample } in ppm Mo
- $\square$  Rock Sample } See Report
- $\circ$  Profile Soil Sample } See Report
- (62-22) Check Soil Sample with depth
- Contours at 10, 20, 50, 100 ppm Mo
- Creeks (some dry)
- Trails

**NOTES**

Sampling Method: Mattock and Trowel  
 Sample Depth: 6 to 18 Inches  
 Horizon Sampled: "B"  
 Portion Analysed: -80 Mesh Fraction  
 Analytical Method: HClO<sub>4</sub>-HNO<sub>3</sub> Digestion,  
 Atomic Absorption

**SCALE**

1 Inch = 200 Feet = 61 Metres



T. N. Macauley

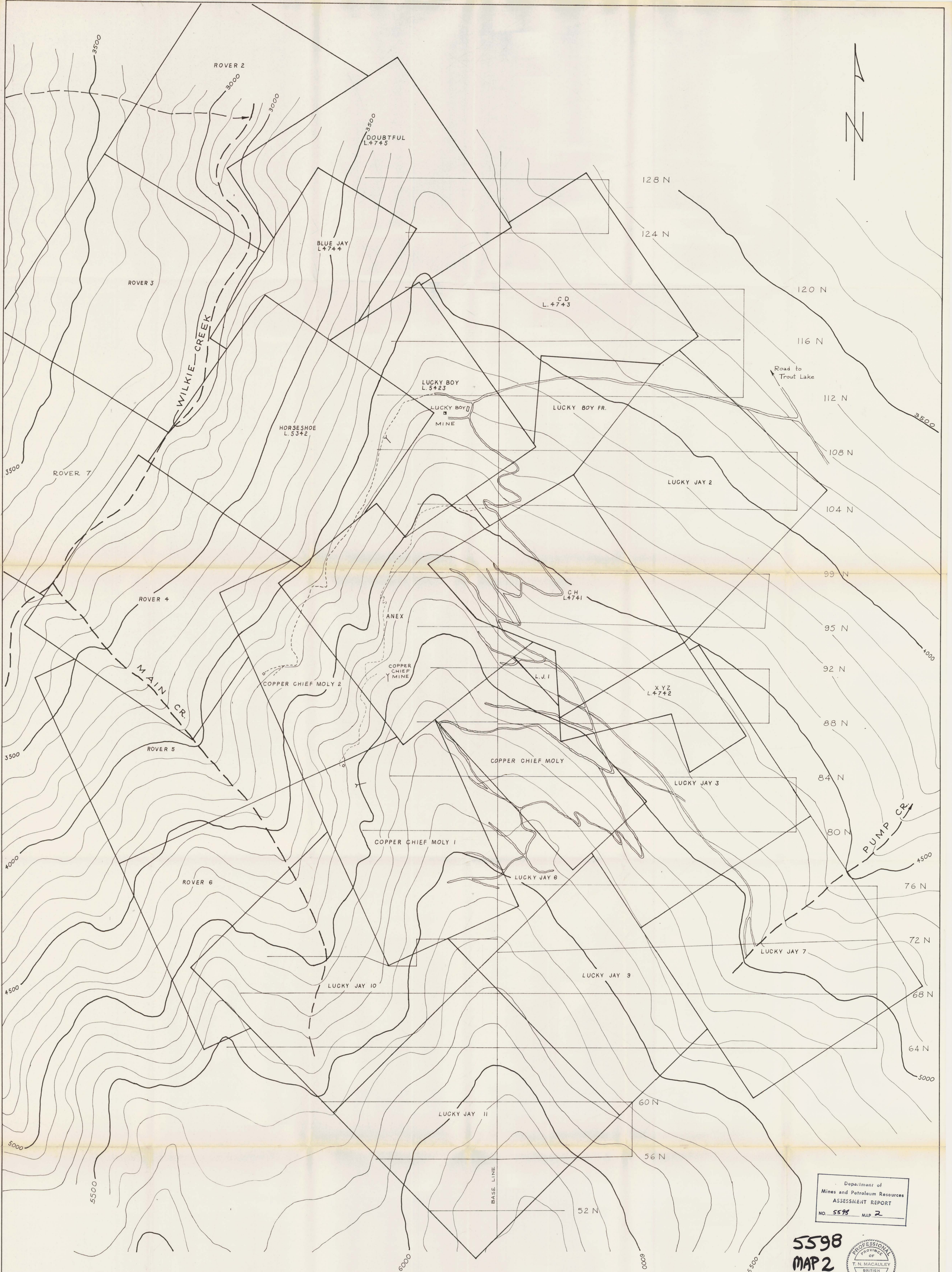
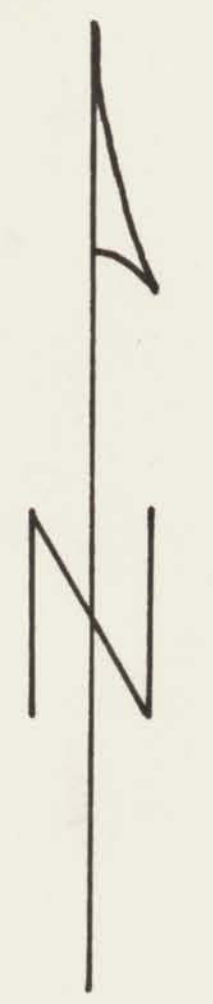
5598  
MAP 3

Department of  
 Mines and Petroleum Resources  
 ASSESSMENT REPORT  
 NO. 5598 MAP 3

NEWMONT MINING CORPORATION OF CANADA LTD.

**MAP 3**  
**GEOCHEMICAL PLAN - MO**  
**TROUT LAKE PROPERTY**  
 REVELSTOKE MINING DIVISION, B. C.

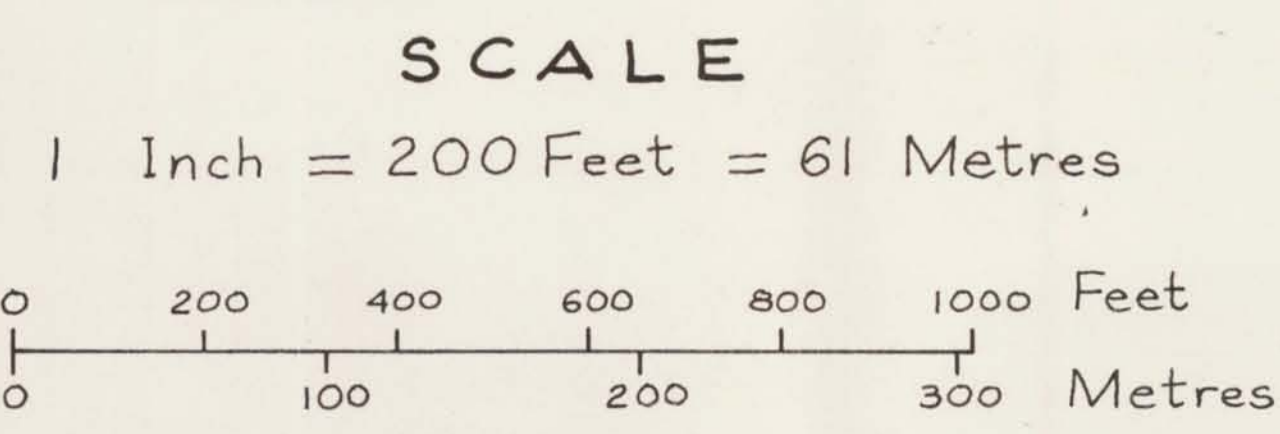
DRAWN BY T. N. MACAULEY	DATE SEPT. 5 1975	N.T.S. 82 K/12E
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**LEGEND**

- Creek
- Road or Trench
- Trail
- Old Cabin
- Shaft
- Adit
- Grid for Soil Survey

Note: Topographic contours are enlarged from the 1:50,000 sheet.



Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 5598 MAP 2

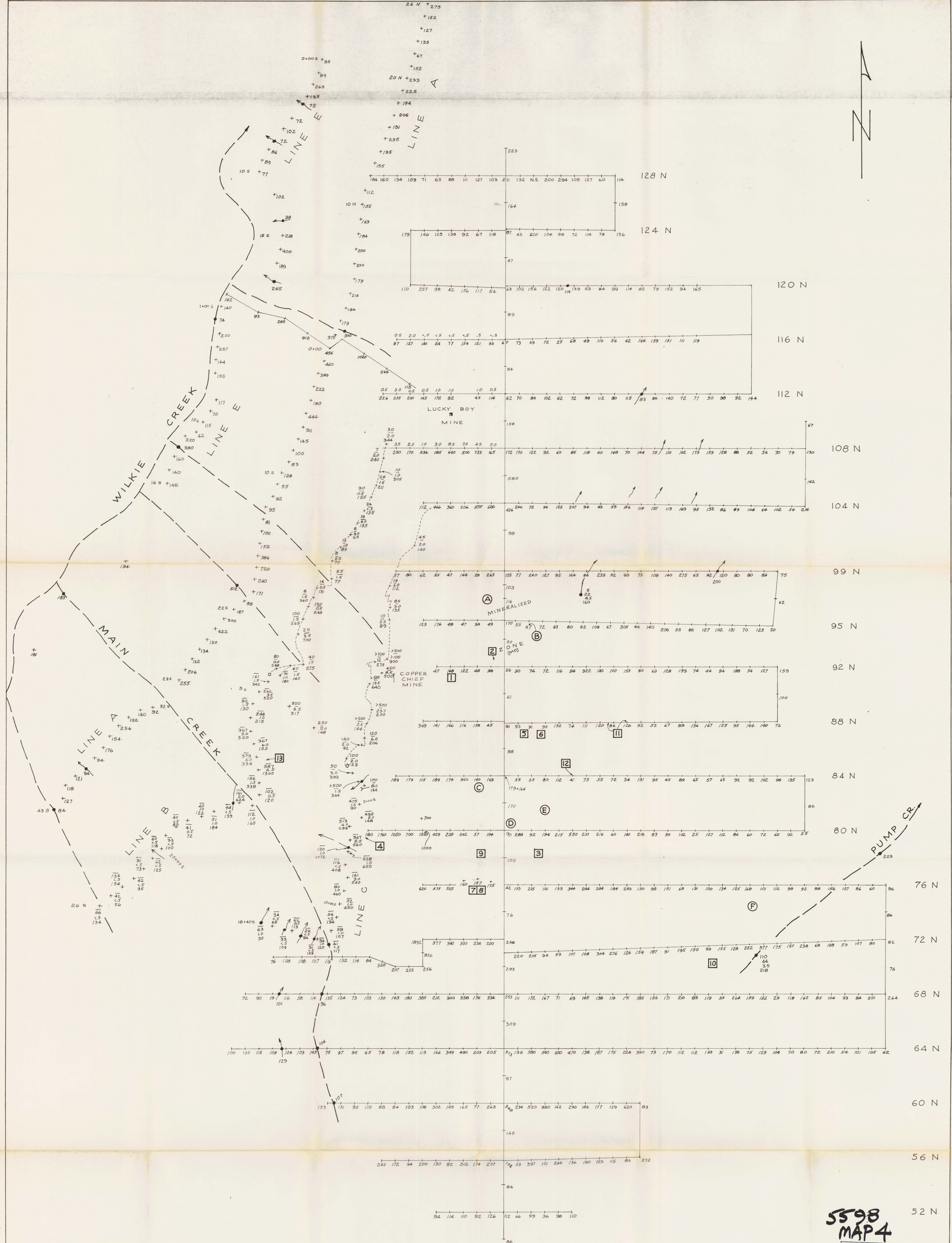
**5598  
MAP 2**



*T.N. Macauley*

NEWMONT MINING CORPORATION OF CANADA LTD.  
**MAP 2**  
**TOPOGRAPHIC - CLAIM MAP**  
**TROUT LAKE PROPERTY**  
REVELSTOKE MINING DIVISION, B. C.

DRAWN BY M. REID	DATE SEPT. 5 1975	N.T.S. 82 K/12E
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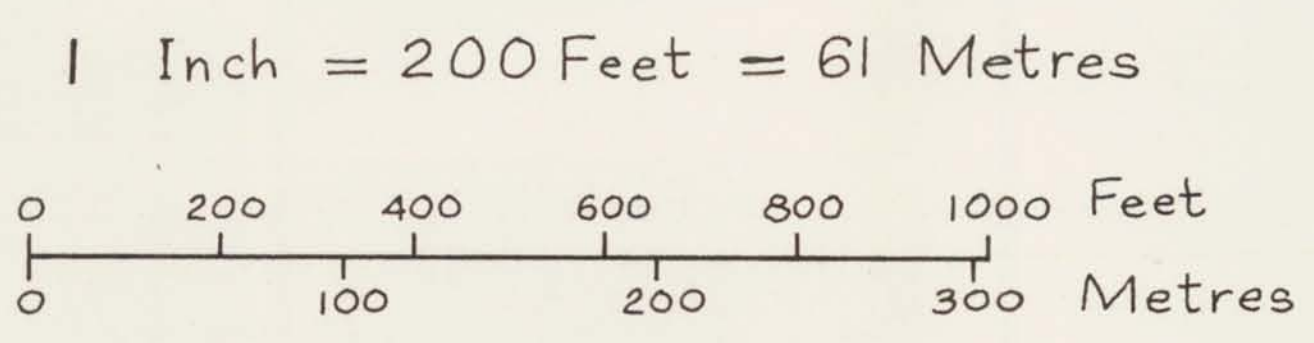
LEGEND

- $\frac{Ag}{Zn} + \frac{W}{Cu}$  Soil Sample Site } in ppm.
- $\frac{Zn}{Ag}$  } in ppm.
- Stream Silt Sample
- Rock Sample } See Report
- Profile Soil Sample
- Creeks (some dry)
- Trails

NOTES

Sampling Method: Mattock and Trowel  
 Sample Depth: 6 to 18 Inches  
 Horizon Sampled: 'B'  
 Portion Analysed: -80 Mesh Fraction  
 Analytical Method: HClO<sub>4</sub> - HNO<sub>3</sub> Digestion, Atomic Absorption

SCALE



5598 MAP 4

Department of  
 Mines and Petroleum Resources  
 ASSESSMENT REPORT  
 NO. 5598 MAP 4

NEWMONT MINING CORPORATION OF CANADA LTD.  
**MAP 4**  
 GEOCHEMICAL PLAN - ZN, W, CU, AG  
 TROUT LAKE PROPERTY  
 REVELSTOKE MINING DIVISION, B.C.

DRAWN BY T. N. MACAULEY	DATE SEPT. 5 1975	N.T.S. 82 K/12E
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T. N. Macauley