

4586

GEOLOGICAL AND GEOCHEMICAL REPORT

MAN CLAIM GROUP,

ASHCROFT AREA, B.C.

FOR

MANTLE MINERALS LTD. (NPL)

Department of
Mines and Technical Resources
ASBESTOS ACT
NO. 4586 100

SEPTEMBER 1973

VANCOUVER, B.C.



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GEOLOGICAL AND GEOCHEMICAL REPORT
MAN CLAIM GROUP
ASHCROFT AREA, B.C.

INTRODUCTION:

The MAN claim group is located in the Highland Valley Area on the west contact of the Guichon Batholith, about 10 miles south of the town of Ashcroft, B.C. The geology of the claims area is very similar to that found at or near the numerous copper ore bodies located to date in the Highland Valley area to the SE.

The present report is a summary of past work and an evaluation of a geological and geochemical survey conducted during the period of April 21 to April 30, 1973.

CLAIMS DESCRIPTION:

The MAN claim group consists of 60 claims, the MAN 1 to 60. The present work was carried out on the north part of the group which covers the north parts of the MAN No.1 group, and the MAN No.2 group.

The two groups consist of the following claims:

MAN Group No.1:

<u>Claims</u>	<u>Record Numbers</u>
MAN 1-10	123233-123242
12	123244
34	123266
37-46	123269-123278
53-60	120431-120438

MAN Group No.2:

<u>Claims</u>	<u>Record Numbers</u>
MAN 11	123243
13-33	123245-123265
35-36	123267-123268
47-52	102425-102430

The MAN claims 1-46 are held in the name of D.R. Morgan of Vancouver and the MAN 47-60 are held by R.G. Hawley of Langley, B.C.

LOCATION AND ACCESS:

The MAN claim group is located on the east side of the Thompson River, 10 miles south of the town of Ashcroft, B.C., in the Kamloops Mining Division. The centre of the group is at latitude $50^{\circ}35'$, longitude $121^{\circ}16'$. The north boundary is 2 miles south of Basque and the south boundary 1/4 mile east of Spatsum. The property extends from the Thompson river east to within 1/2 mile of the Highland Valley road.

The group is readily accessible on the west side by a good dirt road leaving the Highland Valley road $3\frac{1}{2}$ miles south of Ashcroft and following the Thompson River, south through Basque and Spatsum to Highway 8 near Spences Bridge. Another dirt road runs from Spatsum east to the Highland Valley road at a point 14 miles south of Ashcroft. The road is good from where it crosses the SE part of the group to the Highland Valley road, a distance of five miles, partly following a new pipeline from the Thompson River.

The west part of this road may require a 4-wheel drive in places. New logging roads have intersected both the south and north parts of the group.

CLIMATE AND TOPOGRAPHY:

The property is in the dry belt of British Columbia with precipitation approximately 10-11 inches per year in the lower parts.

The highest part of the property is about 4,000 feet above sea level, 3,000 feet above the Thompson River. The east half of the group consists of fairly flat lying areas, with some steep slopes along generally NS trending ridges, covered with fairly open timber, mainly pine. From this timbered area the ground drops very steeply to the west, from 2,500 feet to 1,500 feet, to open, gently sloping areas covered with sand, talus and sagebursh on the west side of the group near river level.

Most of the outcrop of the south part of the group occurs in a NS belt along this steep slope. In the north part of the group abundant outcrop occurs along NS ridges and cliffs.

Good timber is available for mining and water could be drawn from the Thompson River. For drilling on higher levels water could be drawn from numerous ponds. A power line crosses the south part of the group.

REGIONAL EXPLORATION:

Except for the very extensive work carried on in the main Highland Valley area about 10 miles to the SE, very little work has been done on the west contact of the Guichon Batholith in the vicinity of and outside the area of the MAN group.

Most of the work has not been very extensive and has been done on properties which appear to lie along a NNW trending zone, indicated by copper showings, observed faults and alligned gossan zones. This zone, if projected would pass through the MAN group.

About $\frac{1}{2}$ mile south of the south boundary of the claims, between Spatum and Coldstream creek, copper showings occur near an old adit at 1,400 feet elevation. In 1961 and 1962, work carried out by Alscope Consolidated on a 150 claim group here, consisted of an IP (induced potential) and magnetometer surveys, trenching, and drilling 7 diamond drill holes totalling 2100 feet, plus one hole in 1963 of 564 feet. Recent grid lines were noted on this property which is now owned by Lornex mining.

Approximately 1/2 mile north of the claims area, 2 old shafts were sunk, one 10 feet and one 61 feet deep, 100 feet apart, on a mineralized west dipping fault along a hornfels - diorite contact. Recent grid lines have been run in this area on the DN claim group.

At Red Hill, 4 miles NNW of the MAN claims, Noranda exploration did detatiled work in 1962 consisting of EM (electromagnetic) and magnetic surveys, soil sampling, stripping, and diamond drilling.

Results of the above work is not available to the writer.

Along the same NNW trend, about 10 miles N of Cache Creek, extensive deep drilling by Bethex has developed a copper ore body on a property known as the Maggie Mine.

HISTORY:

Prior to 1970, no evidence of work was noted on the group, except for fresh grid lines to the north and south of the property. During 1970 a geological and geochemical survey was carried out on the south part of the property by the writer and is described in a report dated November, 1970.

The results of this survey indicated NNW and ENE anomalous trends, generally following projected fault lines in the area.

The present survey described in this report is an extension of the above to the northern part of the group.

GEOLOGY - GENERAL:

The Guichon Batholith occupies an area extending from the west side of Guichon Creek westward to the Thompson River. The main rocks are diorite and granodiorite though considerable variety through zoning within the batholith, and smaller plugs of younger intrusives such as diorite porphyries and monzonites, has been mapped by Northcote. These igneous rocks intrude the Paleozoic Cache Creek group and the Upper Triassic Nicola group. They are in part overlain partly by Tertiary volcanic rocks.

It has been suggested that the younger intrusives and fault zones have much to do with ore control.

In the vicinity of the claims area the western part of the Guichon Batholith comes in contact with the Cache Creek and Nicola rocks. In general, a belt of Cache Creek sediments and greenstones is exposed from Red Hill, NW of the claims area, south along the west side of the Thompson River, and cover most of the area south of the claims on the east side of the river. On the east side of the river and north of the claims a section of Nicola rocks is exposed, and to the north of this

the area is mainly covered by Kamloops volcanics and Jurassic conglomerates.

The intrusive which occurs on the MAN claims is classified by Northcote on his regional map as quartz monzonite of the Witches Brook phase mapped by him elsewhere only at the Bethlehem copper mine. It intrudes what he refers to as a hybrid phase of the Guichon diorite. Smaller bodies of younger coarse feldspar - porphyries are mapped by Carr NE of Martel and NE of Basque, apparently intruding along NW fault directions. Fine grained porphyritic quartz diorite outcrops south of Basque near river level and to the east at higher elevations.

A series of NW trending fault and shear zones strike through the area, the largest one being that striking from south of the MAN claims, along the Thompson River channel to Red Hill. Several faults parallel to this have been mapped by Carr.

GEOLOGY - MAN GROUP:

The west central part of the property, on the lower slopes to the river, is covered by sand, talus, and sagebrush. The south east part is covered with sand, boulders and pine.

Rocks of the Cache Creek group overlie the SW corner of the group. In this area they consist mainly of very fine grained grey to dark green greenstones or greywackes. The bedding or foliation strikes generally to the NW. The dip is about 40° to the NE in the south part of the outcrop but becomes very steep to vertical in the north part where the rocks are very strongly fractured, sheared, and highly serpentized. Considerable granitization was noted in places near the intrusive contact.

Rocks ^{of} the Nicola group overlie the NW corner of the group. These are very fine grained, usually pale green, siliceous, well banded rocks, probably greywackes. They have a very consistent strike to the NE, dipping 30° to 40° to the NW.

Some granitization with considerable epidote and chlorite, was noted in these rocks near the intrusive contact.

Intruding the above rocks and underlying most of the central and northern part of the claims are the igneous rocks of the Guichon batholith, in this area, referred to as the hybrid phase by Northcote, outcrop in only one place on the claims, near the south central boundary. Here the rock is a dark diorite with grey feldspars, abundant mafic, usually hornblende, with little or no quartz. Here it is medium to coarse grained showing some signs of shearing. The rest of the intrusive on the group consists of a younger quartz monzonite stock, classed by Northcote as the Witches Brook phase. This rock is usually a medium to coarse grained intrusive with pale to dark green feldspars, very low mafic and from 10% to 20% quartz. This rock becomes a lighter green and appears to grade into a light tan or brown phase which is much richer in quartz, in places up to 30%. and often much finer grained or aplitic with increased chlorite and epidote as near the Spatsum creek canyon. This latter phase occupies most of the south part and north central part of the claims. Quartz stockwork was noted in the north,

A feldspar porphyry was noted in the north central part of the group. It is characterized irregular white to grey feldspar phenocrysts, often varying greatly in size in a very fine grained groundmass varying from grey to dark or light green. Occasionally abundant chlorite or epidote is present. Frequent brecciation and angular inclusions of volcanic rocks occur. This unit may indicate a border phase of the monzonite.

No definite faulting was observed but strong fracturing and shearing along projections of faults mapped by Carr in the surrounding area, usually NW, are probably indicative of

continuations. Strong fracturing in the Spatsum Creek canyon in the central part of the group may indicate EW faulting.

The northern part of the claims, mapped in the present survey, 1973, is mainly rock outcrop consisting of NS ridges, steep slopes and high cliffs. The Nicola rocks extend into the NW section contacting with the Witches Brook intrusive in the north central part of the group. The outcrop is the north and east part are mainly a less mafic part of the hybrid phase of the older part of the Guichon batholith. A relatively narrow band of finer grained intrusive, containing glassy feldspars, more quartz and less mafic, strikes generally NE through the central part of the area, indicating a chilled contact between the hybrid phase and the later Witches Brook intrusives.

MINERALIZATION:

In the general area outside of the MAN group frequent gossans, some quite large, with garnet skarn, epidote, quartz, and sericite alteration, occur in the metamorphosed rocks, usually near an intrusive and usually along one of the NW fault directions. Pyrite is abundant, and malachite, occasionally with remnant minor chalcopryrite and chalcocite is found at some locations, such as the Alscope showing southeast of Spatsum, the old shafts and the Nicola-Guichon contact on the DN group north of this property, at Oregon Jack creek south of Red Hill, and at the Red Hill showing.

On the MAN group several gossanous outcrops and rusted float areas, strongly limonitic with little or no remnant sulphides occur along the western edge of the outcrop area. These appear to allign in a NW direction. In most spots where the feldspar porphyry was crossed it contained frequent specks and blebs of pyrite and fairly frequent small blebs and very fine disseminated chalcopryrite. Strongly rusted intrusive float,

often with quartz stockwork occurs occasionally, along with float of the mineralized porphyry float in the pine area to the east. Magnetite is found occasionally in the rocks in the NE part of the group.

In the area surveyed in 1973, one gossanous area was located on the Witches Brook contact at 88N 4W and one small area of malachite impregnated monzonite at 80N, 24W.

DESCRIPTION OF WORK - APRIL 1973

The present geological and geochemical survey was conducted by Agilis Engineering between April 21 and April 30, 1973. The geological mapping was done by the writer, who also supervised the geochemical survey. William Hawley and Kerry Hawley were hired as leadmen and Kelly Hawley and R. Murphy as soil samplers. Samples were collected in paper soil sample bags, supplied by Core Laboratories, at 100 foot intervals along chained and flagged compass lines, spaced 400 feet apart, running EW from a NS base line.

The samples were collected with shovels from the B horizon which consisted of usually base sand in shallow, rocky overburden.

Sample testing was done by Core Laboratories of Vancouver, using a method of total extraction of copper by digestion by per HCl, and analyses by atomic absorption giving copper content in parts per million.

Approximately 20 miles of line were run and over 1,000 samples taken.

GEOCHEMICAL RESULTS:

The survey in general appears to be quite flat with background readings of the order of 40 parts per million.

Occasional spot highs of 100 to 150, and one of 4,000 ppm.,

were located, usually near the monzonite contact.

CONCLUSIONS AND RECOMMENDATIONS:

Major copper ore bodies in the region such as Bethlehem, Craigmont, Lornex, Valley Copper, etc., have been found in or near the Guichon batholith, as disseminations in the intrusive or as contact bodies in the Nicola rocks. These are usually associated with brecciation, faulting, and later phases of the intrusive consisting of quartz monzonite and porphyry. Magnetically low areas have been associated with some of the orebodies.

The area of the MAN claim group contains significant features similar to these. Most significant are the strong NNW fault structures and the EW cross structures indicated by mapping and geochemical readings, as well as the porphyry and monzonite intrusive phase similar to that at the Bethlehem mine. Exploration to date, except for recent surveys on adjacent ground for which results are not available, has been concerned only with known exposed showings which are mainly contact veins in the metamorphic rocks of the Nicola or Cashe Creek formations. There is no indication that exploration has been conducted to depth nor directed toward areas of intersection of the faulting with the younger monzonite.

In the present survey the geochemical results have indicated no definite strong trends. There are still some gaps between this survey and the one to the south, done in 1970, which indicated anomalous trends, possible along copper bearing faults.

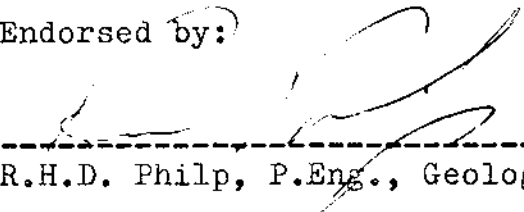
Though only a few copper occurrences were found, the geological mapping indicates a favourable environment, and economic bodies at depth are not ruled out.

It is recommended that follow up work be done consisting of a magnetic survey and several lines of reconnaissance I.P. over parts of the Witches Brook intrusive near its contacts.

Submitted by:

R.G. Hawley, Geologist

Endorsed by:



R.H.D. Philp, P.Eng., Geologist

September 1973

Vancouver, B.C.

DOMINION OF CANADA: }
PROVINCE OF BRITISH COLUMBIA. }

To Wit:

In the Matter of geological and geochemical surveys on the MAN No.1 and MAN no.2 claim groups of D.R. Morgan and R.G. Hawley at 50°35' latitude; 121°16', 10 miles south of Ashcroft, B.C. Kamloops Mining Division.

I, Robert Garth Hawley

of 4481 232nd Street, Langley, B.C.

in the Province of British Columbia, do solemnly declare that the following personnel were employed and costs incurred in conducting the surveys are as follows:

Personnel:

Kerry Hawley - Leadman	9 days @ \$60/day	\$ 540.00
William Hawley - "	9 days @ \$60/day	\$ 540.00
R. Murphy - Soil sampler	9 " @ \$50/day	\$ 450.00
Kelly Hawley - " "	9 " @ \$50/day	\$ 450.00
G. Hawley - Geologist	12 " @ \$125/day	<u>\$1,500.00</u>
		\$3,480.00

Disbursements:

Vehicle rent & gas & mileage	\$460.15	
Hotel & phone	\$257.25	
Meals, groceries	\$450.00	
Misc. tags, flagging etc.	\$ 86.36	
Sundry equipment		
Testing-Core Laboratories	\$930.00	
Draughting, typing, copying	<u>\$275.00</u>	
	\$2,458.76	
+ 10% overhead on disbursements	<u>\$ 245.87</u>	<u>\$2,704.63</u>
	TOTAL	<u><u>\$6,184.63</u></u>

And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

Declared before me at the *City*
of *Vancouver*, in the
Province of British Columbia, this *19th*
day of *September, 1979*, A.D. }

R. G. Hawley

John Paul Sub-mining Recorder
A Commissioner for taking Affidavits for British Columbia or
A Notary Public in and for the Province of British Columbia.

140° 130° 130° 125° 120°

BRITISH COLUMBIA

**MANTLE MINERALS LTD.
(NPL.)**

MAN CLAIMS

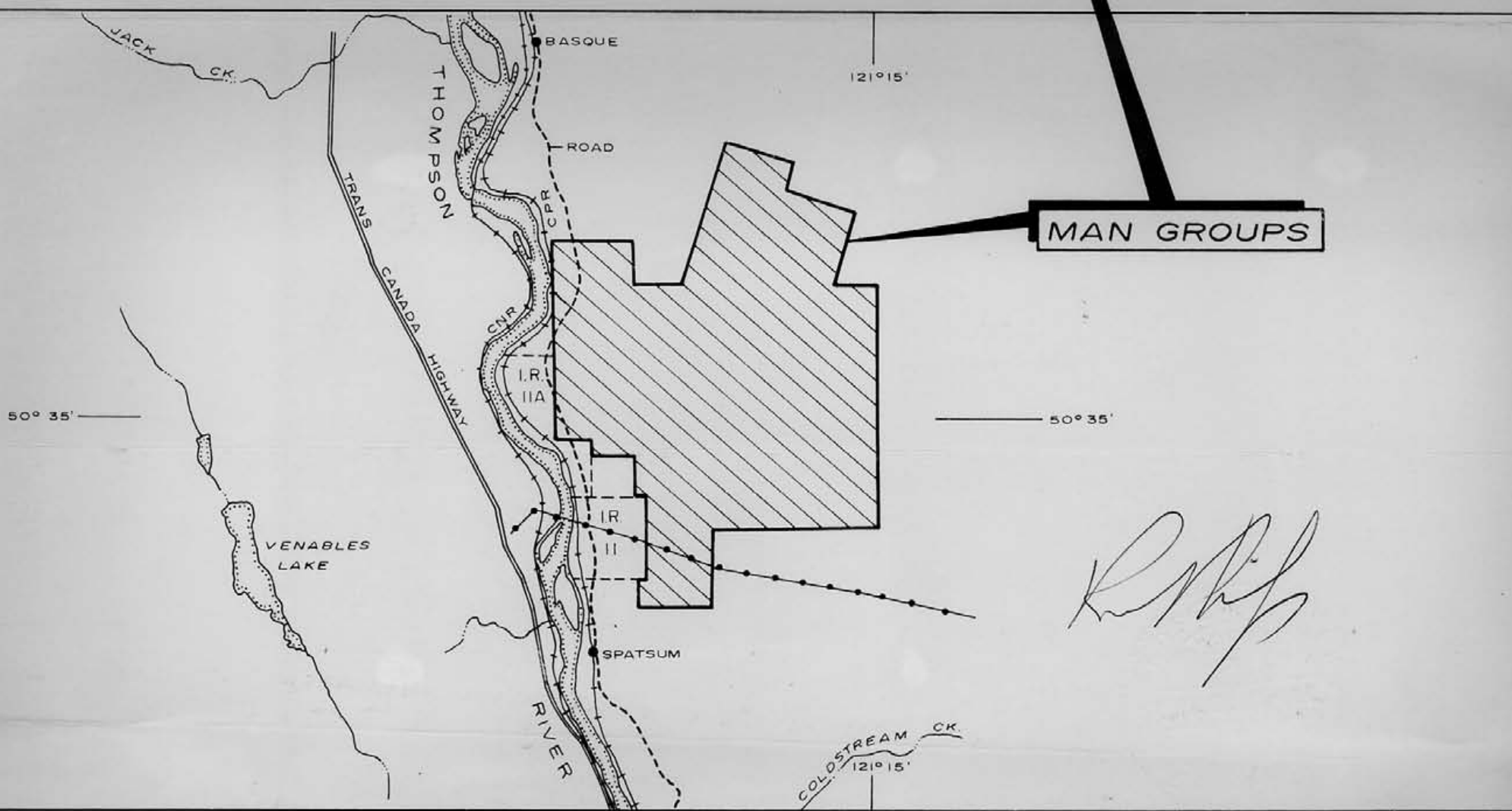
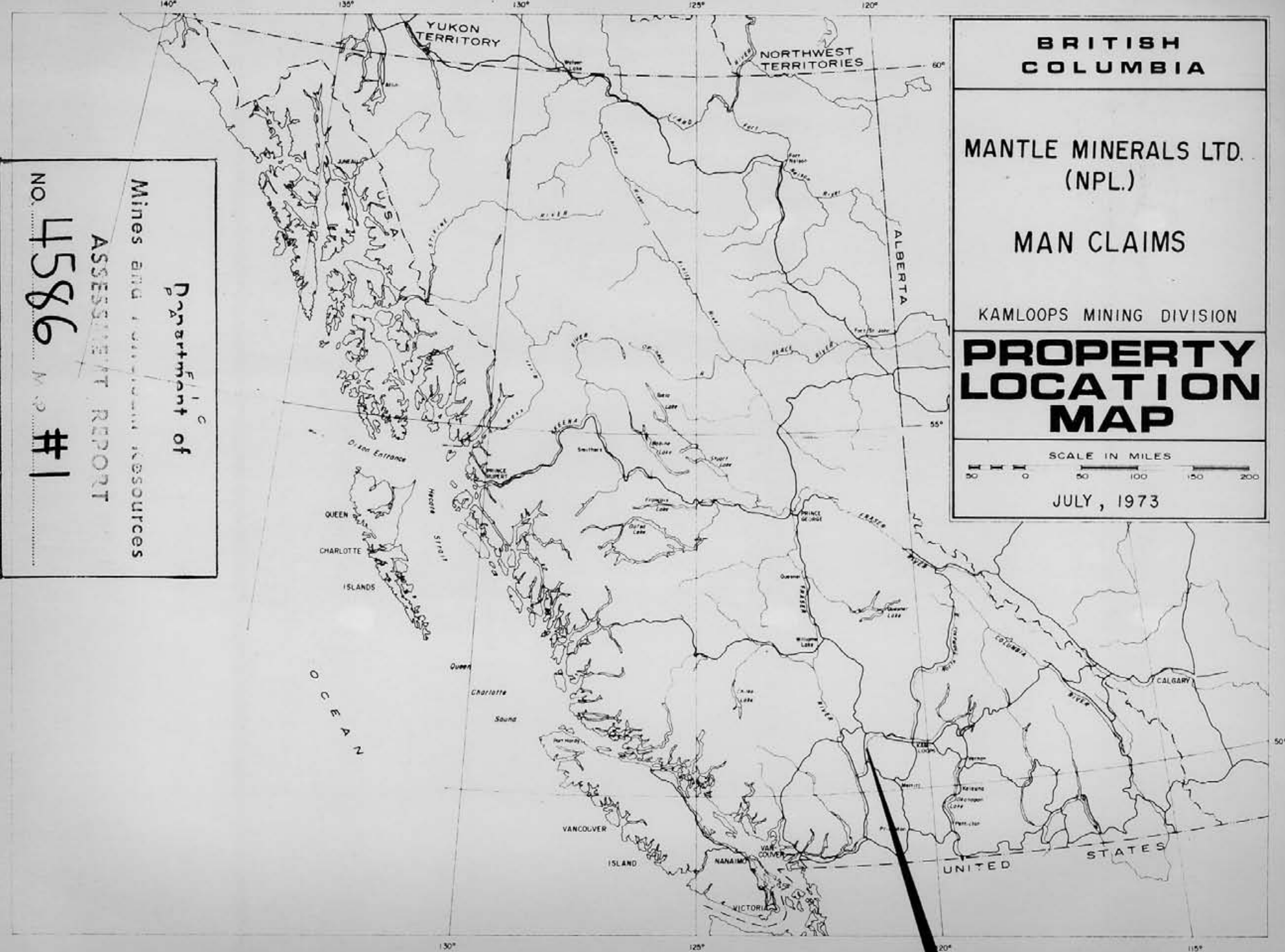
KAMLOOPS MINING DIVISION

**PROPERTY
LOCATION
MAP**

SCALE IN MILES
0 50 100 150 200

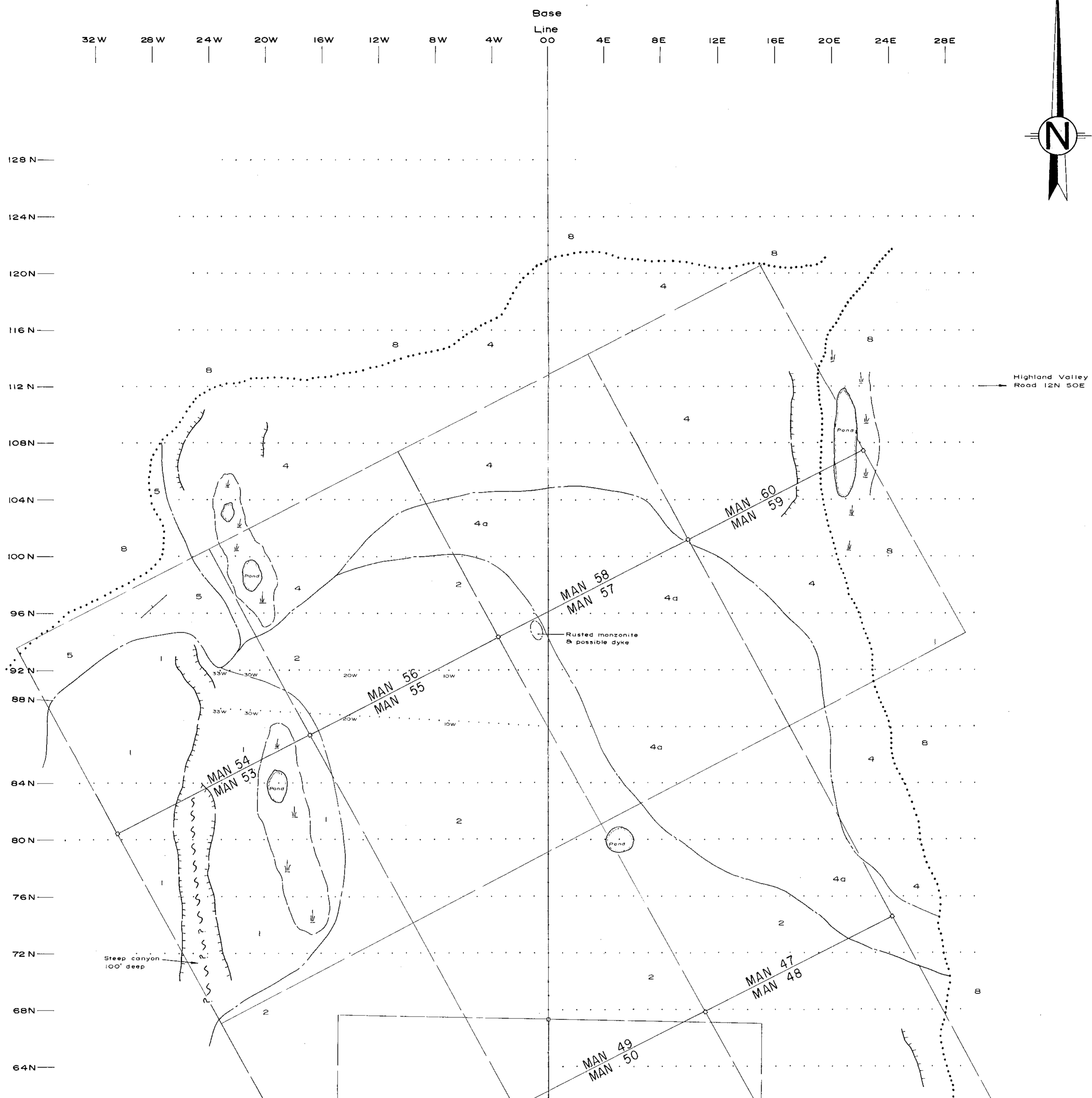
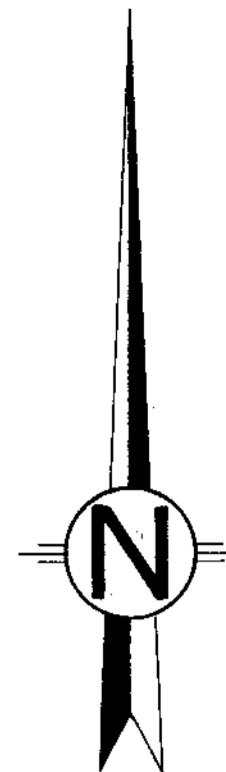
JULY, 1973

Department of
Mines and Technical Resources
ASSESSMENT REPORT
NO. 4586
M.P. #1



MAN GROUPS

R.M.P.



Highland Valley Road 12N 50E

LEGEND

- INTRUSIVES - GUICHON BATHOLITH**
WITCHES BROOK PHASE (Northcote)
- 1 QUARTZ MONZONITE 10-30% quartz, eyes, light tan pink feldspar, med - fine grained, minor mafic
 - 2 QUARTZ MONZONITE 5-20% quartz, light to dark green feldspar, med - coarse grained, low mafic
- HYBRID PHASE (Northcote)**
- 4 DIORITE grey feldspar, hornblende, biotite, minor quartz, med - coarse grained
 - 4a DIORITE fine grained contact phase
- SEDIMENTARY ROCKS - Pre-Intrusive**
- 5 Nicola group
- OVERBURDEN**
- 8 Boulder, sand, pine cover
- Outcrop area (repeats abundant outcrop ridges)
Approximate geological contact
Observed fault or shear
Strike & dip of bedding
Cliff or steep slope

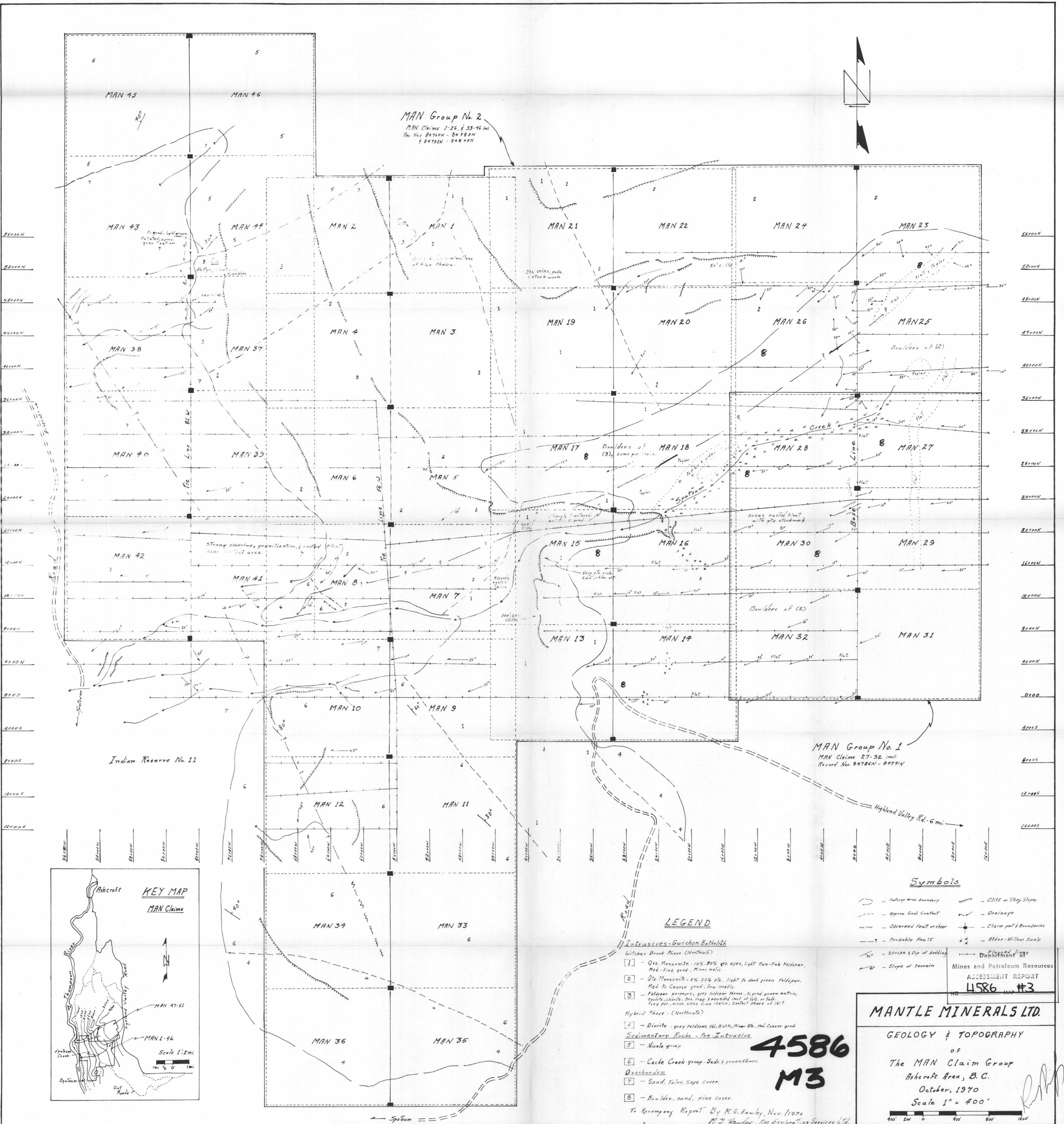
**4586
M2**

Report of
Mines and Technical Resources
AN ASSISTANT REPORT
NO. **4586** #2

MANTLE MINERALS LTD (NPL)
MAN GROUP - HIGHLAND VALLEY AREA
KAMLOOPS MINING DIVISION

GEOLOGY MAP





MAN Group No. 2
 MAN Claims 1-26, & 33-36 incl.
 Rec. Nos. 84760N - 84785N
 & 84792N - 84805N

MAN Group No. 1
 MAN Claims 27-32 incl.
 Record Nos. 84786N - 84791N

Indian Reserve No. 11

Symbols

	Outcrop area boundary		Cliff or steep slope
	Approx. Geol. Contact		Drainage
	Obtained Fault or shear		Claim pat. boundaries
	Probable Fault		Ridge-Willow Swale
	Strike & Dip of bedding		Department of Mines and Petroleum Resources
	Slope of terrain		ASSESSMENT REPORT
			4586 #3

LEGEND

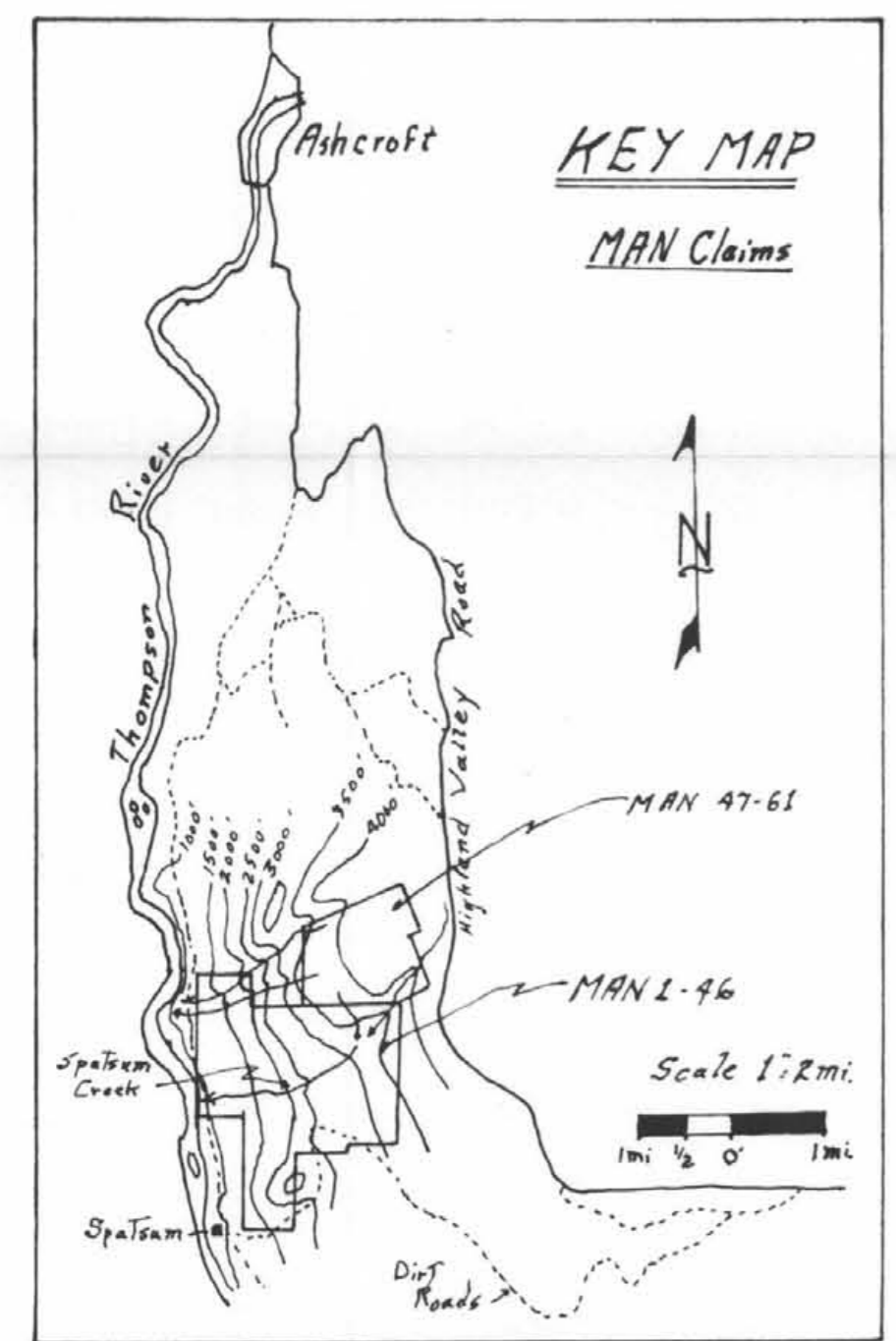
- Intrusives - Guichon Batholith**
- 1 - Qtz. Monzonite - 10% - 30% qtz. eyes, light tan-pink feldspar, Med. Fine grnd., Minor mafic.
 - 2 - Qtz. Monzonite - 6% - 20% qtz., light to dark green feldspar, Med. To Coarse grnd., low mafic.
 - 3 - Feldspar porphyry, grey siliceous feldspar, 5% med. green matrix, apatite, clinopyroxene, Bx. frag. & rounded (incl. of 1st. or 2nd. Frag. pp., calc., siliceous, fine calcite), contact phase of 1st.?
- Hybrid Phase - (Northcote)**
- 4 - Diorite - grey feldspar, 40% Biotite, Minor Qtz., Med. Coarse grnd.
- Sedimentary Rocks - Pre-Intrusive**
- 5 - Nicola group
 - 6 - Cache Creek group Seds. & greenstones.
- Overburden**
- 7 - Sand, Talus, Sage cover.
 - 8 - Boulder, sand, pine cover.

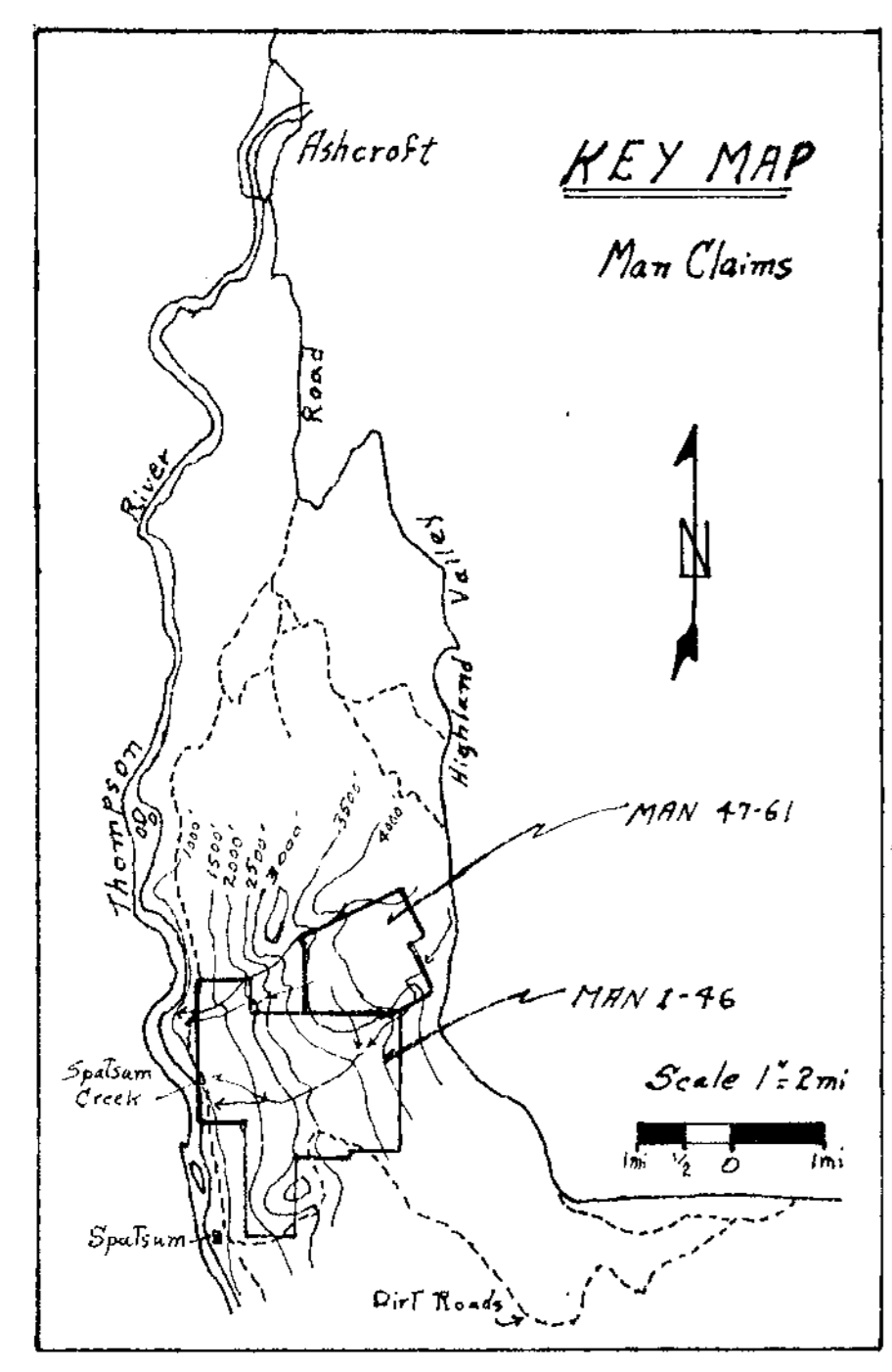
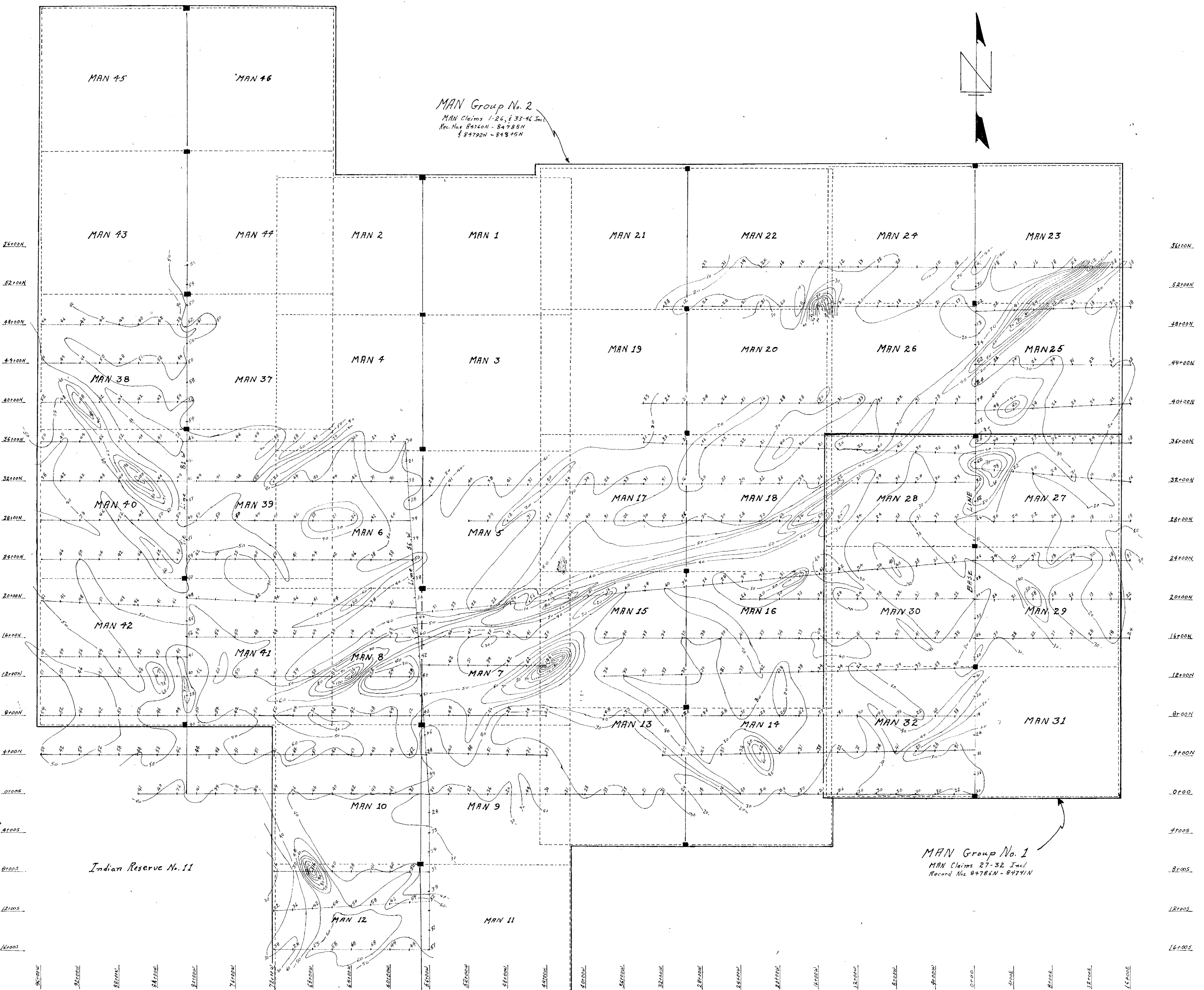
**4586
M3**

MANTLE MINERALS LTD.

GEOLOGY & TOPOGRAPHY
 OF
 The MAN Claim Group
 Ashcroft Area, B.C.
 October, 1970
 Scale 1" = 400'

To accompany Report By R.G. Hawley, Nov. 1970
 P.O. Box 100, Ashcroft, B.C. Exploration Services Ltd.



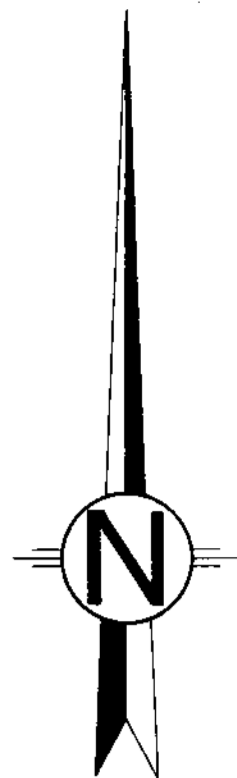


- LEGEND**
- 0 - 40 ppm
 - 40 - 50 ppm
 - 50 - 60 ppm
 - 60 - 70 ppm
 - 70 - 100 ppm
 - > 100 ppm

Total extraction of Cu by digestion by per HCl
Analysis by atomic absorption
Cu values in parts per million
Contour interval - 10 ppm
To Accompany Report By R.G. Hawley, Nov. 1970
P.L. Hawley, Geo Exploration Services Ltd.

4586 - MA

Department of
Mines and Technical Surveys
ANALYTICAL REPORT
NO. 4586 #4
MANTLE MINERALS LTD.
GEOCHEMICAL SURVEY
OF
The MAN Claim Group
Ashcroft Area, B. C.
October, 1970
Scale 1" = 400'



	32 W	28 W	24 W	20 W	16 W	12 W	8 W	4 W	Base Line OO	4 E	8 E	12 E	16 E	20 E	24 E	28 E
128 N									33							
124 N									38							
120 N									43							
116 N									50							
112 N									55							
108 N									60							
104 N									65							
100 N									70							
96 N									75							
92 N									80							
88 N									85							
84 N									90							
80 N									95							
76 N									100							
72 N									105							
68 N									110							
64 N									115							
60 N									120							

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4586 MAP #5

**4586
M5**

MANTLE MINERALS LTD. (NPL)
MAN GROUP-HIGHLAND VALLEY AREA
KAMLOOPS MINING DIVISION

**GEOCHEMICAL
SURVEY
COPPER**

VALUES IN PPM.

SCALE IN FEET
400 0 400 800 1200

AGILIS ENGINEERING LTD. JUNE 1973