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 M
Manex Holdings Ltd. (N.P.L.)
Preliminary Examination and Evaluation
TH Copper-Molybdenum Prospect
Thoen Mountain, Omineca M.D.
British Columbia
March 1970. W.M. Sharp, P. Eng.


WILLIAM M. SHARP, P. ENG.
CONSULTING GEOLOGICAL ENGINEER

171 WEST ESPLANADE
NORTH VANCOUVER, B.C.

March 30, 1970


President & Directors,
Manex Holdings Ltd. (N.P.L.)
c/o Mr. D.W. Small,
McLeod, Small & Bray,
20th Floor, Guinness Tower,
Vancouver, B.C.

Gentlemen:

With this the undersigned transmits his report PRELIMINARY EXAMINATION & EVALUATION, TH COPPER-MOLYBDENUM PROSPECT, THOEN MTN., B.C., - resulting from his November 3, 1969 field examination and pertinent engineering and historical data received from both the vendor and Mr. M.J. Baley of Manex Mining Ltd. (N.P.L.).

The writer herewith expresses his thanks and acknowledgements to the afore-named persons for their co-operation and contributions, as well as to Mr. R.A. Barker for helpful suggestions resulting from his analyses of the geological data.

Yours truly,



W.M. Sharp, P. Eng.

GEOLOGICAL REPORT
ON A
PRELIMINARY EXAMINATION & EVALUATION
OF THE
TH COPPER-MOLYBDENUM PROSPECT
SITUATED NORTHWEST OF
THOEN MOUNTAIN, B.C.
IN THE
OMINECA MINING DIVISION

FOR
MANEX HOLDINGS LTD. (N.P.L.)
Vancouver, B.C.

BY
W.M. SHARP, P. ENG.
North Vancouver, B.C.

March, 1970

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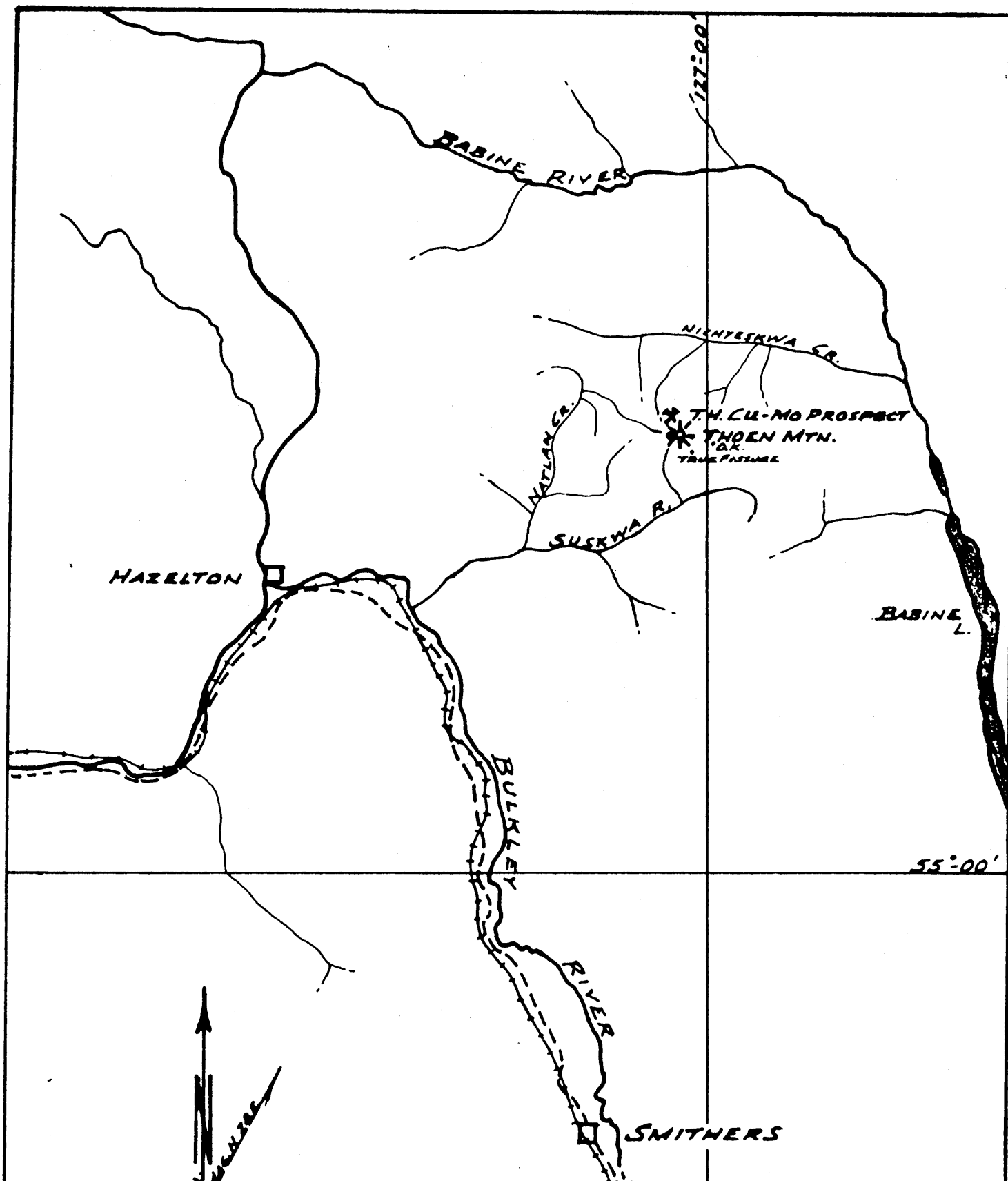
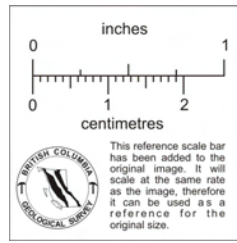


FIG. 1 - INDEX MAP
T.H. GROUP, THOEN MTH.
OMINECA MINING DIV., B.C.
SCALE: 1 IN. = 8 MI. MARCH, 1970
LEGEND:
 - - - - - PROVINCIAL HWY. 16
 - + - + - C.N. RLY. TO PRINCE RUPERT.
 REF. G.S.C. MAP 971A



SUMMARY & RECOMMENDATIONS

The TH property comprises one near-square block of 22 adjoining claims of about 1 3/4 square-miles total area, situating on the northwesterly side of Thoen Mountain. The property lies approximately 45 miles north of Smithers, B.C.; present access is by helicopter, out of this base.

The presently exposed area of Cu-Mo mineralization, currently inferred to be a minor part of a more extensive through-going contact zone, straddles the crestal area of a local spur. The mineral exposures lie between the 5500-6700 foot elevations - well above timber line. Bedrock showings of the mineralized zone in this locality are largely restricted to the crest of the spur; talus and rubble cover most other intervals of the zone.

The present extent of exploration, most of it done during the summer of 1968, comprises six rock trenches and occasional pits over a 300-foot length of the spur; these and related bedrock exposures have been systematically sampled.

The claims area is largely underlain by sediments of the Bowser assemblage-comprising

Argillite, Quartzose-arkosic sandstone, graywacke, and minor tuff. These contact a large body of quartz monzonite, but are complexly intruded by minor offshoots from the main body. The sediments have been converted to hornfelsic and quartzitic rock types/ the quartz monzonite is fractured and hydrothermally altered. The altered assemblage comprises the potentially-mineralized zone.

The Cu-Mo-Au-Ag mineralization veins and impregnates both hornfels and altered quartz monzonite within the generally SW-NE trending contact zone. Typically pyrite, chalcopyrite, bornite, and molybdenite occur as fine-grained disseminations and thin seams. To date, mineralization has been traced across the hornfels-intrusive complex for some 800 feet; due to a prevalent talus-rubble cover, it has been effectively traced for less than 400 feet along the "strike" of the zone.

From the present evidence the mineralized and potentially mineralized contact zone is inferred to have a more-or-less continuous length of 2 miles within the claims group. Even with as little as one-eighth of this being substantially mineralized, there would be good possibilities for a large volume - low grade Cu-Mo deposit.

Occurrences of tourmaline, secondary apatite and biotite, and thoroughly sericitized feldspars - frequently in association with coarser

sulphide aggrretages - suggests a possible high temperature source area of mineralization. This could, conceivably, exist as an intensely fractured, well mineralized pipe or cupola anywhere within the local assemblage of altered sedimentary and intrusive rocks. The possibility of zoning about such a centre is partly substantiated by the presence of Ag-Pb-Zn and Au-Arsenopyrite deposits situated at various locations on the lower flanks of Thoen Mountain.

The weighted average of assays related to the small (trench) area selected for a preliminary evaluation is: Cu, 0.35%; Mo, 0.044%; Ag, 0.27 oz./- ton; Au, 0.01 oz./- ton; for an area of 23,000 square feet. With the % Mo stated in terms of % Au, this translates to 2,000 tons per vertical foot @ 0.46% Cu-equivalent; plus 0.01 and 0.27 oz./- ton of Au and Ag, respectively for a gross value of \$6.51 per ton.

On the basis of the present mineral indications and the probability that significant extensions and repetitions of these will occur elsewhere along strike , there is a reasonably good chance that a multi-million ton deposit grading 3/10 percent copper, or better may be present.

The mineralogical features of the TH deposit, together with substantial evidence of mineral zoning

within the Thoen Mtn. locality, suggest that a deposit of this magnitude would lie in, or close to a high-temperature "source-zone"; the local geological relationships would also suggest that such a deposit would be of the "breccia-pipe" or "porphyry-copper" type.

The writer's recommendations for systematic exploration and evaluation of the property's potential follow:

STAGE 1:

- A. Carry out reconnaissance-to-detailed geological mapping, with sampling as indicated, of the major lithologic units and potentially-mineralized areas.
- B. Perform magnetometer surveys-in conjunction with (A) and for assistance in Au-Mo (+ pyrrhotite) zone delineation.

STAGE 2:

- A. Strip, trench, and sample areas indicated via Stage-1 exploration.
- B. Carry out preliminary diamond-drill exploration of possible ore targets indicated via Stage 1 & 2 exploration.

STAGE 3:

(see over)

Provisions for evaluation via trenching and stripping,
comprehensive diamond-drilling, etc.

ESTIMATED COSTS

Stage 1: (1 month)

A. Helicopter, supplies, salaries, samples, contingencies	\$ 6,500
B. Supplementary to (A) plus instrument rentals, etc.	<u>500</u>
	<u>\$ 7,000</u>

Stage 2: (2 months)

A. Helicopter, supplies, wages, equipment rentals, contingencies	\$ 7,500
B. Helicopter, supplies, 2500 lin. ft. (ex.ray) @ \$10.00, contingencies	<u>26,500</u>
	34,000
Total, Stages 1 & 2	41,000

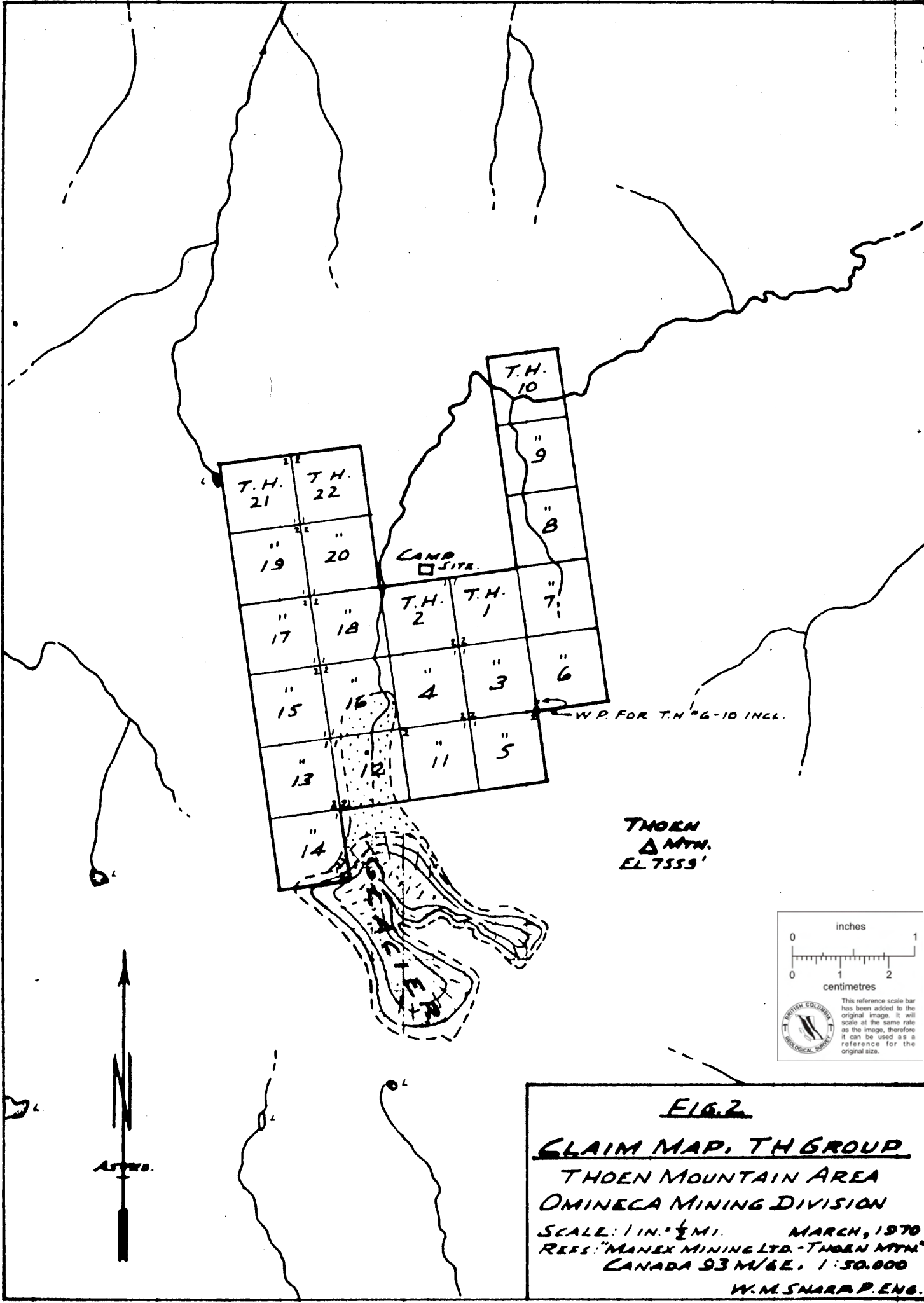
Stage 3:

General provision: local trenching & stripping, 7500 lin. ft. of B.Q.W.L. drilling @ \$12.00 Ft., helicopter, supplies, 300 samples @ \$14-\$16.00 each, contingencies	<u>\$100,000</u>
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Respectfully submitted,

W. M. Sharp

W.M. Sharp, P. Eng.



THOEN
 Δ MOUNTAIN
 EL. 7559'

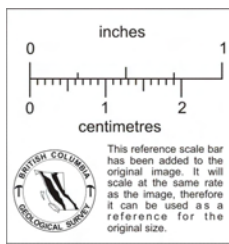


FIG. 2
CLAIM MAP, TH GROUP
 THOEN MOUNTAIN AREA
 Omineca Mining Division
 SCALE: 1 IN. = 1/2 MI. MARCH, 1970
 REFS: MANEX MINING LTD. - THOEN MOUNTAIN
 CANADA 93 M/B.E. 1:50,000
 W.M.S. NARAP, ENG.

INTRODUCTION

Pursuant to his client's general request and authorization for a field appraisal of the TH showings, the writer left Vancouver on November 1st, studied the vendor's sample material, reports, etc. and arranged helicopter transportation during November 2nd, accomplished the property examination on November 3rd, and returned to Vancouver on November 4th. Field conditions, although unfavourable for mapping, were unusually good for the time of year, in view of the mountainous setting and high altitude of the showings; however, the gusty winds, below freezing temperatures, and limited helicopter stand-by-time, restricted field work to a brief geological reconnaissance with localized check-sampling.

Mr. V. Niedolin, vendor, provided field guidance and assistance and, subsequently, a considerable amount of background information via earlier geological and sampling reports, plus a comprehensive suite of rock and mineral specimens - all of which is thankfully acknowledged.

The writer's principal geological reference comprises a brief report on the 1968 exploration of the pre-existent "Nick Group" by E.R. Woznick of Mastodon-Highland Bell Mines Ltd. (N.P.L.). Other reference material is noted

directly on the accompanying maps and within the body of the report.

PROPERTY

This is depicted by Fig. 2, Claim Map, TH Group.

The property consists of one group of 22 contiguous, full-sized located claims of approximately $1 \frac{3}{4}$ square miles total areas. The area staked covers showings of mineralized hornfels exposed over a minor interval of the NNW-trending spur of Thoen Mtn. and, more importantly, of the probable 2-mile strike-extent of this wide band of rocks.

The group consists of TH 1 - 22, inclusive; the corresponding record numbers are 79369 - 79390, inclusive. All claims were located by Mr. M.J. Beley, and recorded by him at Smithers, B.C. on September 5, 1969. The claim group lies within the Omineca Mining Division.

LOCATION & ACCESSIBILITY

Fig. 1 supplements the following text.

The TH group is situated on the northwest side of Thoen Mtn. within the Babine Range, at approximately 45 miles north of Smithers.

The generally-mineralized zone lies between elevations 5,500 - 6,700 feet.

Currently, helicopters operating out of the Smithers base provide the most convenient transportation for small crews and preliminary exploration supplies and equipment. In circumstances involving larger numbers of personnel and significant amounts of field supplies and equipment, and the more practicable method would employ truck transportation over logging roads along branches of the Suskwa River, followed by helicopter transport from a road depot into the property.

The mineralized showings are situated well above timber-line; hence outcrops are plentiful except where obscured by frost-heaved rubble or talus.

HISTORY

The local copper-molybdenum showings were discovered by Victor Niedolin during 1967. In 1968 he continued prospecting, and staked the 54-claim "Nich" Group - for Mastodon-Highland Bell Mines Ltd. The balance of the 1968 season was taken up with general sampling, and systematic rock-trenching and sampling of the ridge, or spur exposures only. No further exploration was carried out by this company: hence no depth exploration of the vertically-extensive mineralized

hornfels contact panel (or roof pendant) was attempted.

The property was restaked for the present owners during the summer of 1969, and examined by the writer towards the close of the past field season.

Geologically-relevant occurrences of Ag-Pb-Zn mineralization have been investigated by open cuts and/or short adits within the original "O.K." and "True Fissure" prospects - situated closely southeast of Thoen Mtn., but evidently situated significantly outward of the main body of the intrusive.

GEOLOGY & MINERALIZATION

The general Thoen Mtn. area is situated within a southeasterly section of the so-called "Bowser Basin". Underlying rocks comprise units of the regional "Bowser Assemblage" of Middle Jurassic to Lower Cretaceous age; locally these include argillites, quartzose and arkosic sandstones, graywackes, and minor intercalated (andesitic) tuffs and lavas. The bedded sequence has been rather complexly intruded by masses and fingers of the Thoen Mtn. stock - this ranging in composition from quartz diorite to quartz monzonite. As a consequence of the local intrusion, marginal sections and embayments, or inclusions, of Bowser

sediments have been thermally metamorphosed to generally siliceous-quartzitic and hornfelsic rock types.

To date, only preliminary geologic mapping of a small part of the Thoen Mtn. complex has been accomplished; however, the current information suggests that the very locally exposed Cu-Mo mineralization occurs within either a broad contact-band or roof-pendant of fractured, thermally altered rocks which trends south-southwesterly across the northerly slopes of Thoen Mtn. The existing (1953) air photos of the region do not provide much auxiliary structural or lithological detail - this deficiency being due to poorly-spaced flight-lines, the time lapse and consequent difference in snow cover between adjacent flight-lines, the coarse grain of the photographs, and a general lack of photo-contrast in tone and/or reflectivity between the various lithologic units.

Cu-Mo-Au-Ag mineralization occurs in both altered sediments and intrusives - as a more-or-less mineralized contact metamorphic-to-metasomatic zone. There is presently some uncertainty re the structural relationships of the zone. The writer's conception is that it is essentially peripheral with respect to the N.W.-lying main (?) body of quartz monzonite, but which, in detail is complicated by numerous minor tongue, and finger-like intrusions into the adjoining sediments - these, as well as

the sediments, being fractured, altered, and mineralized.

The presence of fracture-filling tourmaline with secondary apatite, biotite, and sericite (after feldspar), often associated with relatively coarse aggregates of copper sulphides, within occasional exposures of hornfels and/or quartz monzonite probably signifies relatively high-temperature conditions of mineralization. A high-temperature center could quite conceivably exist as a strongly fractured and mineralized core or cupola anywhere within the general hornfels-monzonite complex.

Mineralization at the True fissure-O.K. properties, situated in Thoen Basin at about one mile southeast of Thoen Mtn., consists of vein-filling argentiferous lead and zinc sulphides in a siliceous breccia gangue containing considerable rhodonite. Mineralization in Bergsten Basin, about one mile northeast of Thoen Mtn., is similar; however, the quartzitic host rocks - intruded by tongues of "granodiorite"-contain appreciable disseminated chalcopyrite. Again, significantly, rhodonite occurs in the vein fillings. Showings within the Copper Basin locality, situating roughly one mile southwest of Thoen Mtn., consist of chalcopyrite replacements within sheared

granodioritic dykes intruding Bowser sedimentary rocks. At the Babine prospect, two miles west of Thoen Basin, a narrow vein contains gold-bearing arsenopyrite in quartz.

The spatial arrangement and mineralogy of the above deposits, together with that of the TH showings, is highly suggestive of a zoned arrangement with, possibly, a high-temperature source area locating somewhere within Thoen Mountain - a situation showing a significant resemblance to that at Hudson Bay Mountain, which contains a major disseminated molybdenum deposit.

Typical mineralization within the hornfelsed host rocks comprises, in order of decreasing abundance; pyrite, chalcopyrite, chalcocite, molybdenite, and bornite. These sulphides typically occur as very fine-grained disseminations and thin seams - generally requiring examination under the hand-lens for an estimation of the actual mineral content. The copper-molybdenum mineralization appears to favour the more siliceous varieties of hornfels, and occurs as both fracture-fillings and disseminations. Within some specimens a finely-granular, soft, sectile silvery mineral, which adheres to a magnetized knife blade, was noted; this may consist of a fine-grained mixture of molybdenite and magnetite or pyrrhotite.

The local Cu-Mo sulphide mineralization occurs in both hard-siliceous, and soft biotitic (locally chloritic) varieties of hornfels. The more significant concentrations occur within the more closely fractured areas of bedrock - particularly within intensely altered and fractured zones at, or between sedimentary-intrusive contacts.

The Figs. 5-6 assay data provide direct evidence of the continuation of significant Cu-Mo mineralization for at least 400 feet northwestward of the ridge area selected for detailed trench-sampling. With this, the current N-S extent of detailed and general cross-sectional surface sampling adequately demonstrates continuous Cu-Mo mineralization - admittedly much of it grading under 0.10% Cu-equivalent - over a plus - 800 foot local cross-section of the zone. Although hornfels is the principal host rock, it is significant that equivalent amounts of Cu-Mo mineralization are dispersed within locally subordinate, strongly altered prongs of quartz monzonite.

Correlation of the available field and photogeological evidence permits the inference of a 2 mile strike - length of more-or-less altered and fractured contact rocks within the claims group. The writer suspects that an important part of this is substantially mineralized with the additional

possibility that the gross "panel" of mineralization could include one, or more large volume-low grade mining situations.

DETAILED PETROGRAPHY

Four typical rock samples were taken to Gordon Coote for thin-section preparation; these and the corresponding sawn rejects were, in turn, submitted to a qualified petrographer for megascopic and microscopic determinations. The following represent abbreviated descriptions of these specimens:

Sample T - 1:

Hand Specimen:

Greenish-grey (andesitic) feldspar porphyry with an extremely fine-grained groundmass. Pyrite is scattered through-out the rock and limonite lines fractures.

Thin Section:

Altered feldspar phenocrysts	23%
Quartz-c-feldspathic groundmass (v.f.g.)	60%
Chlorite in groundmass	10%
Opaque minerals	2%
Stilbite (?)	2%
Epidote	2%
Biotite (original)	trace
Hornblende	1%

General:

Quartz and feldspar matrix and phenocrysts are strongly sericitized and saussuritized. Chlorite occurs as blebs and aggregates of tiny flakes throughout the altered groundmass, as do the opaque minerals. Hornblende is relatively fresh. Epidote is an alteration product of the feldspars.

Name:

Amygdaloidal intermediate (andesitic?)
feldspar porphyry.

Origin:

Volcanic or subvolcanic.

Sample T - 2:Hand Specimen:

Fine-grained hornfelsed sandstone with scattered pyrite. Films of finely-divided molybdenite are evident on broken surfaces.

Thin Section:

Biotite	8%
Zircon	trace
Quartz	54%
Opagues	2%
Apatite	1%
Altered rock fragments	15%
Altered feldspar fregments	20%

General:

Matrix grains are mainly unstrained quartz with sharp boundaries. Rock fragments are altered to a variety of clay and mica minerals. Orthoclase and plagioclase feldspar fragments are slightly altered to kaolin minerals. Apatite is apparently of hydrothermal origin. Biotite, as small pleochroic flakes, occurs as a replacement of parts of most of the rock fragments.

Name:

Thermally metamorphosed (hornfelsed) immature arkosic arenite.

Origin:

A fine-grained arenite that has been thermally metamorphosed. Its constituent fragments are of sedimentary and volcanic derivation.

Sample 61: (from V. Niedolin Suite)Hand Specimen:

A fine-grained hornfelsed sandstone with scattered pyrite and chalcopyrite.

Thin Section:

Biotite	10%
Quartz	37%
Chlorite	2%
Opagues	1%
Lithic material (Fig. clay minerals, etc.)	50%

General:

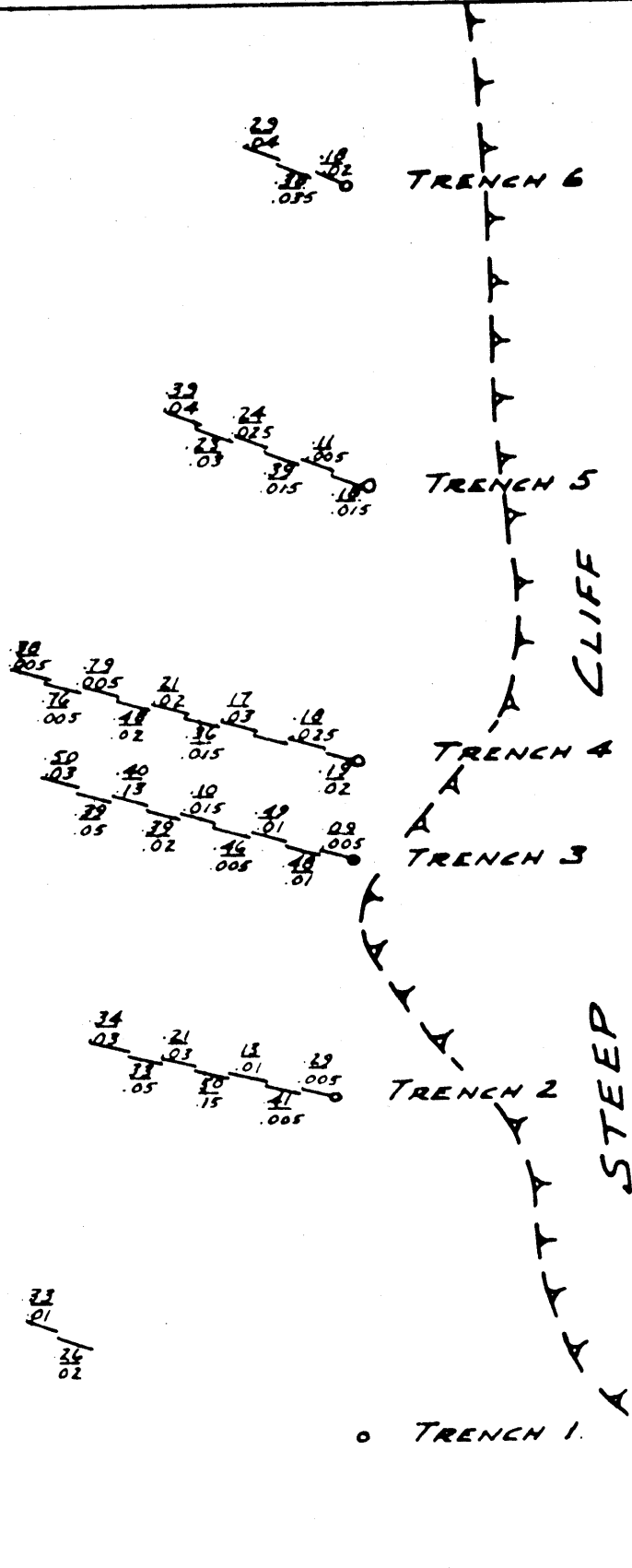
Quartz grains are monocrystalline and unstrained with sharp boundaries; most coarser grains are fairly well "rounded". Biotite is metamorphic, and has grown at the expense of pre-existing clay and other minerals; it occurs as scattered, tiny flakes. The rock is cut by narrow regular veinlets of regenerated quartz.

Name:

Thermally metamorphosed greywacke or lithic arenite.

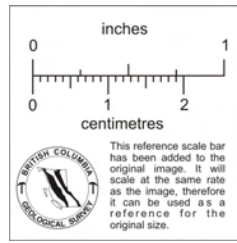
Origin:

A texturally immature sandstone derived from a sedimentary-volcanic source area.



33
01
34
02

FIG. 4
ASSAY PLAN
1968 TRENCH EXPOSURES
TH CU-MO PROSPECT
SCALE: 1 IN. = 50 FT. MARCH, 1970
ASSAYS: $\frac{Cu}{Mo}$ %
BEE:



Sample T - 3:Hand Specimen:

Equigranular biotite hornblende quartz monzonite or quartz diorite.

Thin Section:

Plagioclase	40%
K-feldspar	20%
Quartz	15%
Biotite	5%
Hornblende	8%
Apatite	1%
Opaques	1%

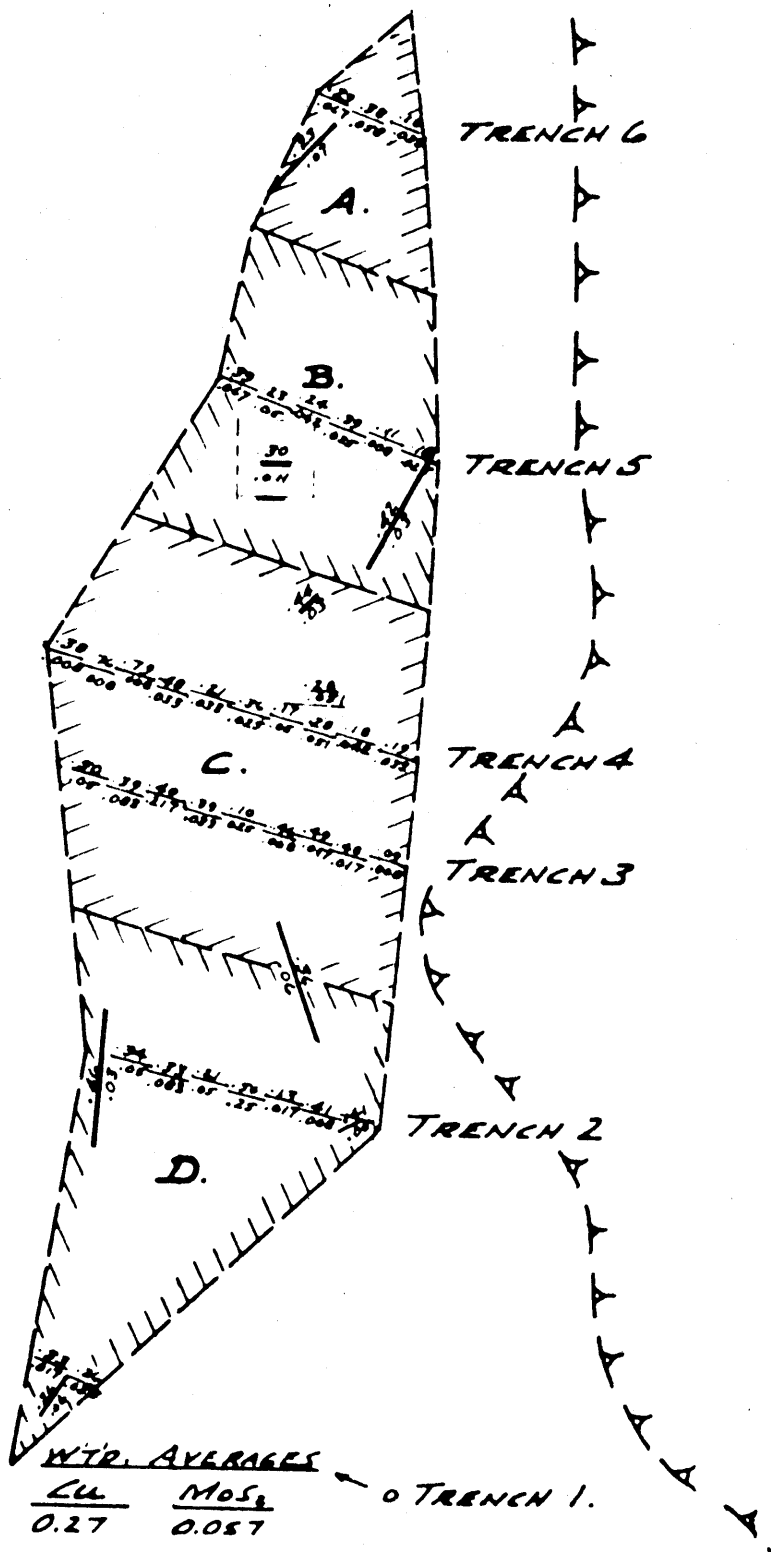
General:

This is a medium grained, equigranular hypidiomorphic rock. Plagioclase (An38) forms large subhedral, thick tubular, zoned, and beautifully twinned crystals, Orthoclase forms equant subhedral crystals commonly slightly sericitised. Hornblende is intergrown with biotite. Quartz occurs as interstitial patches. Opaque minerals are scattered throughout. The rock (I.E., this particular specimen) is fresh and unaltered.

Name:

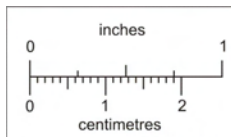
Equigranular biotite-hornblende quartz monzonite.

Notes: Other occurrences of quartz monzonite are conspicuously altered via sericitization of feldspar and the introduction of



BLOCK	AREA
A	0.78
B	2.05
C	3.68
D	2.76

WTR. AVERAGES	
CU	MOSE
0.27	0.057
0.32	0.030
0.37	0.041
0.36	0.054



This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

FIG. 6
COMPOSITE PLAN
TRENCH & OUTCROP ASSAYS
TH CU-MO PROSPECT
 SCALE: 1 IN. = 50 FT. MARCH, 1970
 ASSAYS: CUT
 MOSE
 REF: MASTODON-HIGHLAND BELL. JAN. 1969
 W.M.S.

grains and sheafs of black tourmaline adjacent to and occupying (mineralized) fractures - suggesting a condition of high temperature (deep) hydrothermal mineralization.

CURRENT ASSAY DATA:

Figs. 4 and 5 depict trench and outcrop sampling accomplished by Mastodon-Highland Bell during 1968 and the corresponding assay data expressed as percentages of Cu and Mo, and of Cu and MoS₂ respectively.

Fig. 6 compiled by the writer, combines the separate data on Figs. 4 and 5, but expresses all metal values in terms of percentages of Cu and MoS₂ - for reasons of uniformity and the fact that molybdenic oxide occurs very superficially and in relatively unimportant percentages of the total molybdenum present.

The assay area shown on Fig. 6 derives from the very localized sampling program carried out during 1968, and which was generally confined to the more accessible ridge exposures. The writer surmises that equivalent or better mineralized extensions could be revealed by extending exploration into adjacent rubble and talus-covered

areas, and/or into accessible sections of the deep gully to the east of the present showings.

Admittedly, additional sampling is required to fully substantiate the average grades computed in the following text; however, the writer observes that this deficiency is largely compensated by the over-all uniformity of mineralization within the local area of hornfels-quartz monzonite host rocks.

Calculation of grades within the component areas, and combination of the individual blocks on the basis of their respective areas, results in an over-all "weighted" estimate of 23,175 sq. ft. @ 0.35% Cu, 0.044% MoS₂, 0.27oz/ton Ag, 0.01oz/ton Au.

Using an $\frac{\text{MoS}_2}{\text{Cu}}$ value-ratio of 2.5, the above may be expressed as:

23,175 sq.ft. @ 0.46% Cu-equivalent
 0.27 oz/ton Ag
 0.01 oz/ton Au

for a gross value of \$ 6.51 per ton, Canadian funds - based on


Cu @ \$.60 per lb.
 MoS₂ @ \$ 1.85 per lb.
 Ag @ \$ 2.00 per oz.
 Au @ \$ 35.00 per oz.

Also, on the basis of a probable volume-weight factor of approximately 12 cu. ft. per ton, the current (projected) very localized assay-area

develops approximately 2,000 tons per vertical foot of depth, or 1,000,000 tons within an average depth range of 500 ft. - which the writer considers highly significant in respect to the much larger potential within the indicated 2-mile strike length of the hornfels-monzonite panel.

On the basis of the present mineral indications and the geological probability that equally effective ore controls will extend into and/or operate over other parts of the zone, there are good possibilities for the occurrence of major concentrations of Cu-Mo mineralization. These could, conceivably, be in the multi-million ton range with grades of 3/10 percent copper, or better.

Respectfully submitted,



W.M. Sharp, P. Eng.

C E R T I F I C A T E

I, William M. Sharp, with business and residential addresses in North Vancouver, British Columbia, DO HEREBY CERTIFY THAT:

1. I am a Graduate of the University of British Columbia with (B.A.Sc.) and M.A.Sc (1950) degrees in Geological Engineering.
2. I am a registered Professional Engineer in the Province of British Columbia.
3. I have practised my profession in senior Geological positions for 20 years, and as a consultant since 1964.
4. I have personally examined the TH copper-molybdenum prospect and the available reference material prior to preparing this report of date March 30, 1970.
5. I have no direct or indirect interest in the properties of Manex Holdings Ltd. (N.P.L.), nor do I expect to acquire any such interest.
6. I inspected such claim locations as were encountered during my November 3, 1969 examination and believe these have been made as stipulated by the B.C. Mineral Act.







W.M. Sharp, P. Eng.

March 30, 1970
North Vancouver, Canada

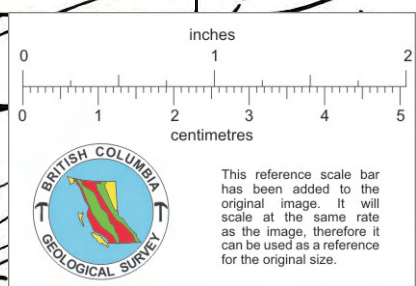


**FIG. 3 - GENERAL GEOLOGY
TH CU-MO PROSPECT**
 THOEN MTN., OMEGA MIN. DIV.
 SCALE, 1 IN = 1/2 MI.; FEBRUARY, 1970
 REFS CANADA 93M/6E @ 1:50,000
 BC. GOVT. AIR PHOTOS, 1953.

LEGEND

	GRANITIC ROCKS		GOSSAN (PYRITE) ZONE
	HORNFELS, INCL. CU-MO SULPHIDE		DYKE FAULT

W.M. SHARP, P. ENG.



Nov 1968

THOEN MTN.

FROM MASTODON-HIGHLAND BELL MINES LTD.
SUMMARY REPORT OF 1968 FIELD WORK.
by E.R. WOZNIAK.

NICH GROUP: - The Nich Group consists of 54 claims and is located on the northside of Thoen Mountain, approximately 45 miles north of Smithers. The showing is situated along a steep northerly trending spur of Thoen Mountain at the 6,700 foot elevation. This being well above timberline, outcrops are plentiful except in areas of talus slides.

The Claims are underlain by Upper Jurassic sediments which belong to the Bowser Group and consist principally of argillite and shale. Some of the argillite beds are quite impure, containing abundant arkosic and tuffaceous material. This sedimentary sequence has been intruded by the Thoen Mountain stock which is essentially a diorite to monzonite in composition. This contact has an E-W trend except in the vicinity of the mineralization where there is a large northerly trending offshoot. Thermal metamorphism has converted the argillite for up to 1,000 feet from the contact to a dense chocolate brown hornfels.

The mineralization is confined chiefly to the hornfels zone and consists mainly of pyrite, chalcopyrite, chalcocite, molybdenite and bornite listed in order of decreasing abundance. The chalcopyrite and molybdenite mineralization occurs along shears, fractures and as disseminations in the highly siliceous sections of the hornfels.

Several geological factors appear to have an important bearing on the localization of mineralization. Probably the most important of these is the physical make-up of the sediments, that is the size of the individual particles and their chemical composition. Proximity of the intrusive contact together with the degree of metamorphism and hydrothermal alteration are of major importance. Lastly, the competency of the individual beds which determines the intensity of shearing and fracturing, is a major controlling factor of the mineralization.

Initial sampling of the better mineralized sections gave an average of 0.35% Cu., 0.03% MoS₂, 0.2 Oz. Ag., and 0.01 oz. Au. over an area approximately 200 x 400 feet along the spur of a ridge. Subsequent systematic channel sampling of the same zone returned approximately the same grade.

"NICH SHOWING"

THIN SECTION STUDY OF A
TYPICAL HORNFELS SPECIMEN
by H. T. CARSWELL

Specimen 19 - Hornfels

10%	-	Quartz porphyroblasts and/or fragments
20%	-	Plagioclase porphyroblasts and/or fragments slight, continuous normal zoning.
70%	-	F.g. matrix, less than 0.03 mm, containing:-
		5% anhedral biotite - red-brown
		1% white mica in veinlets
		1% anhedral opaques
65%	{	(?) anhedral plagioclase
		(?) anhedral K-feldspar
		(?) anhedral quartz

The rock contains angular to round, some chip-like, less than 0.1 mm quartz grains; less than 0.2 anhedral, elongate, inclusion-bearing plagioclase in a f.g. groundmass composed mainly of interlocking quartz and feldspars. Minor intergrowths of quartz and plagioclase are present. Some plagioclase is replaced in part by f.g. K-feldspar. Much f.g. biotite is interstitial.

Plagioclase has been slightly altered to v.f.g. saussurite with albite, and to white mica. Minor chlorite replaced biotite.

Opaques occur as v.f.g., disseminated grains to less than 1 mm octopus-like crystals in vague, linear zones. Minor, thin, white mica veinlets cut the rock.

The groundmass is characterized by clastic and recrystallized textures -- metamorphism has not proceeded far in this rock.

O.K. Group (13)

References: Ann. Repts., Minister of Mines, B.C.: 1921, pp. 91-100; 1929, p. 160.

This group is situated on the north side of Thoen Basin between elevations of 5,500 and 6,500 feet. A pack-trail $3\frac{1}{2}$ miles long leads to the property from Twentynine Mile Creek crossing on the Hazelton-Babine trail. Twentynine Mile Creek is a southerly flowing tributary of Suskwa River approximately 29 miles east of Hazelton. Development work consists of a 40-foot crosscut adit and surface strippings.

The country rock is tuffaceous sandstone and argillite cut by alaskite and porphyritic granodiorite dykes and sills. The stratified rocks strike approximately north 40 degrees east and dip 20 to 30 degrees northwest into the face of the mountain. To the west of the property the sediments are intruded by a stock of granodiorite. A tongue projects from this stock to within 300 yards of the more important veins.

The mineral occurrences consist of small, irregular veins occupying shear zones that for the most part parallel the bedding. The veins are considerably leached, so that the filling now consists largely of iron oxide. The adit cuts through one vein 6 inches wide that is entirely leached and contains no sulphides. Another vein, varying in width from 6 inches to 2 feet, is exposed above the adit, which has not been driven far enough to cut it. This vein contains galena, light and dark brown sphalerite, and tetrahedrite, with some quartz, carbonate, and pyrite. According to the Minister of Mines Report for 1921, a sample of the solid galena assayed: gold, 0.02 ounce a ton; silver, 190 ounces a ton; lead, 70 per cent; and a sample taken across 10 inches of leached-vein filling returned: gold, 0.02 ounce a ton; silver, 80 ounces a ton; lead, 36 per cent. Several other veins 2 to 6 inches wide have been exposed by surface strippings.

Several other veins were discovered about 1920 in Bergsten Basin immediately north of Thoen Basin. The Minister of Mines report for 1929 describes a shear zone 6 feet wide in the centre of Bergsten Basin at elevation 5,060 feet, 1 foot of which carries galena, sphalerite, arsenopyrite, and pyrite. Three thin rhodonite veins occur above this point on the west side of the basin; all are well mineralized with galena and sphalerite but they are only a few inches wide. [At elevation 6,300 feet, west of the pass between Thoen and Bergsten Basins, a small granodiorite tongue is mineralized with chalcopyrite. A sample across the best 2 feet of this zone, assayed: gold, 0.30 ounce a ton; silver, 11 ounces a ton; copper, 2.1 per cent.

Pole Star Claim (9)

The Pole Star claim is between the Silver Cup mine and the peak of Nine Mile Mountain, on the south side of Silver Cup Basin. The claim was staked by Joe Miller in 1909, and for a number of years small veins were prospected by open-cuts and by stripping on the gently rising ground between elevations of 5,100 and 5,400 feet above Silver Cup Basin.

The main vein is exposed for about 100 feet along the face of the bluff at the top of the basin. It ranges from 6 to 24 inches in width, strikes north 30 degrees west, and dips 15 degrees southwest. The vein

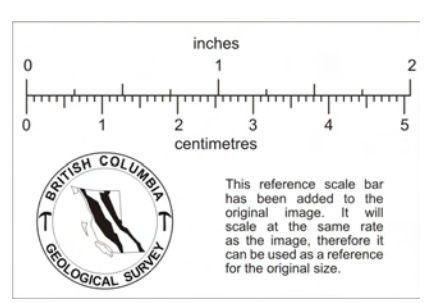
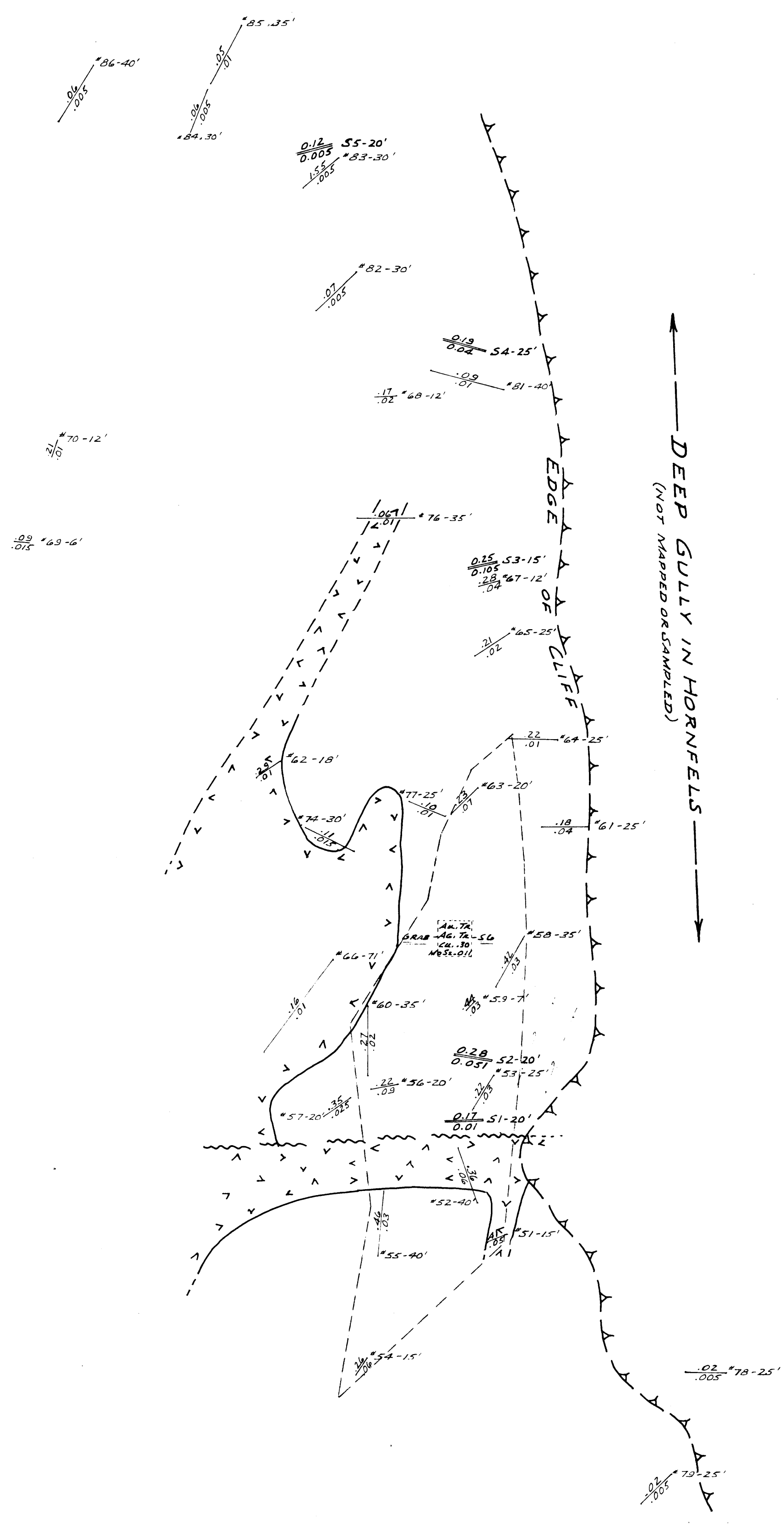
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MANEX HOLDINGS LTD. (N.P.L.)			
PROPERTY:		TH CU-MO PROSPECT THOEN MTN., B.C. OMINICA MINING DIVISION	
TITLE:		PRELIMINARY SURFACE SAMPLING NORTHWEST RIDGE SHOWINGS	
LEGEND:			
$\frac{22}{25}$	CU. % 1968 SAMPLING MO. S ₂		HORNFELS & RELATED ROCKS.
#63-20'	1968 SAMPLE NO. - LENGTH.		FAULT
∇ Δ	GRANITIC ROCKS - VARY QZ. MONZ. - QZ DIORITE	$\frac{0.18}{0.01}$ #52-20'	W.M.S. CHECK SAMPLES, Nov. 1969
SCALE:	DATE: MARCH, 1970	REF: ASSAY PLAN BY V.A.N. MASTODON - HIGHLAND BELL, JAN., 1969	DWG/FIG. No. 5.
1 IN. = 50 FT.	DWN BY: <i>[Signature]</i>		