GEOLOGICAL AND GEOCHEMICAL INVESTIGATIONS IN THE KYUQUOT AREA

Vancouver Island

Lat. $50^{\circ}10'$N. - Long. $127^{\circ}22'$W.

September-October, 1971

N.T.S. 92/L/3W

December 1971 G. Harper

KYUQUOT AREA - Geological & Geochemical Investigations, Vancouver Island.
By: G. Harper, December 1971

92-L-3
B.C.

REPORT ON GEOLOGICAL AND GEOCHEMICAL INVESTIGATIONS IN THE KYUQUOT AREA

VANCOUVER ISLAND

September - October
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(P.N. 160 - Kyuquot Syndicate)

ALBERNI MINING DIVISION
N.T.S. 92/L/3W

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Copies of Geochemical Sample Data Sheets #1-5
for MacDonald Consultants

1. INTRODUCTION

This report covers work undertaken by G. Harper and K. Christensen in the Malksope River area of the Kyuquot Peninsula - northwest Vancouver Island, between the 25th of September and the 7th of October 1971. However, as this is also in the nature of a final report on Falconbridge's interest in the Kyuquot Syndicate prospecting program, an historical background and outline of previous results will also be given.

2. THE KYUQUOT SYNDICATE

In 1969 an exploration program to establish areas of interest and delineate possible targets in the Kyuquot Peninsula region was suggested to Canadian Superior Exploration Ltd., Falconbridge Nickel Mines Limited, and others, by MacDonald Consultants. A syndicate was to be formed with they and Falconbridge as eventually the only remaining partners. Some 50 claims were to be included as "left-overs" from MacDonald's work the previous year. The area was chosen because of geological similarities, long known to F.N.M.L., with the Rupert Inlet area to the north, the site of Utah International Inc.'s large porphyry-type copper deposit. Falconbridge has owned the adjacent Kyuquot Crown Grants for years and coupled with the MacDonald ground, plus the current availability of MacDonald's geochemical crews, it was felt that an arrangement could be worked out advantageous to both participants.

3. PREVIOUS WORK

During May, June, July and August of 1970 a MacDonald Consultant's crew, financed and partly assisted by Falconbridge personnel and facilities, carried out silt sampling, prospecting and recce. geological mapping of the eastern part of the peninsula. The silt sampling indicated a number of moderately anomalous areas. The mapping and prospecting provided a reasonable background understanding of the geology and indicated the existence of one intrusive

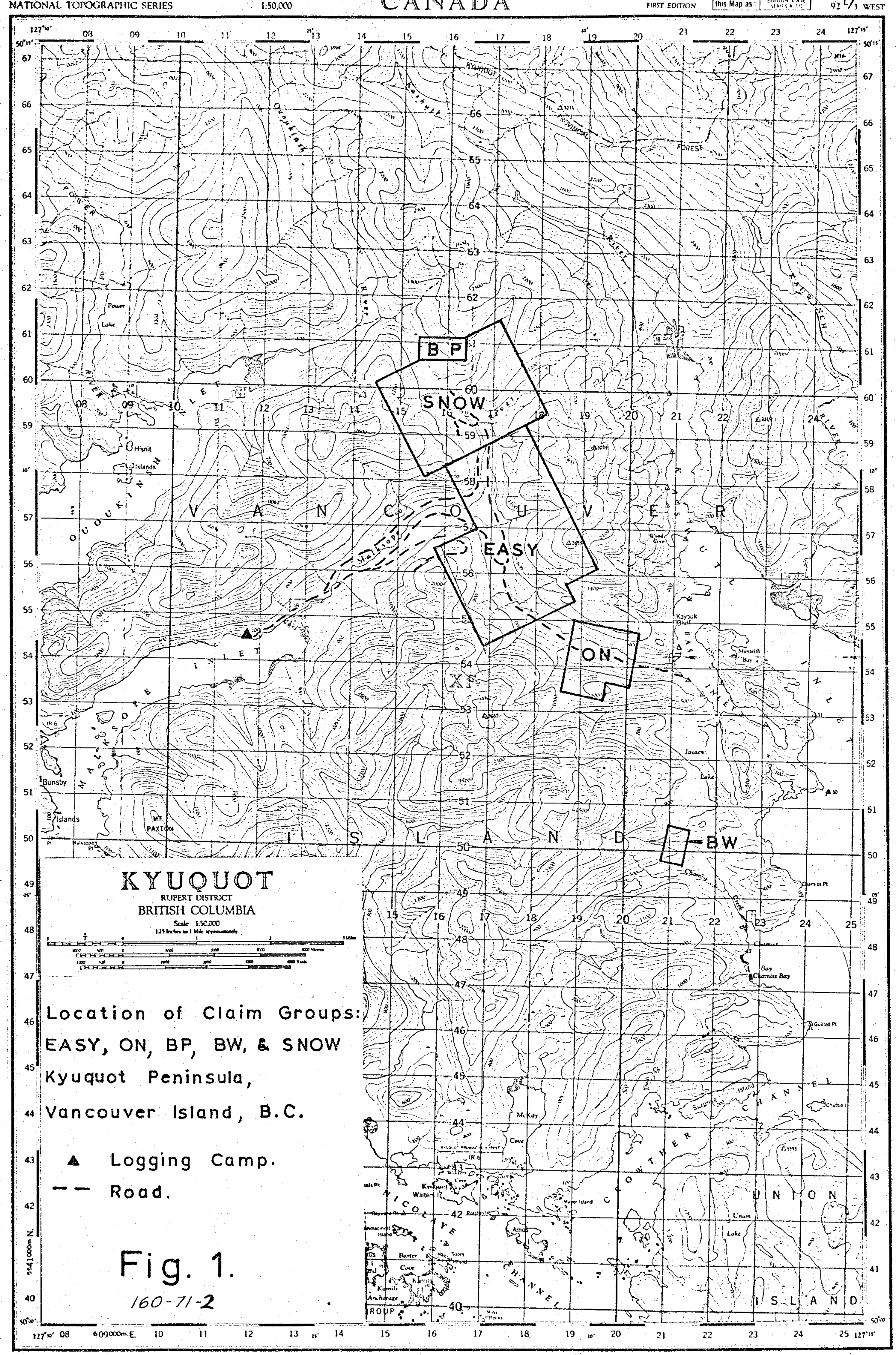

NATIONAL TOPOGRAPHIC SERIES
1:50,000
CANADA
FIRST EDITION
Refer to this Map as:
92 L/3 WEST
BP
SNOW
EASY
ON
XF
BW
V A N C O U V E R
I S L A N D
Power Lake
Hisnit Islands
Bunsby Islands
MT PAXTON
Kayouk Bluff
Monteith Bay
Jansen Lake
Chamiss Bay
McKay Cove
Kyuquot
Walters Is
Union Lake
U N I O N
I S L A N D
KYUQUOT
RUPERT DISTRICT
BRITISH COLUMBIA
Scale 1:50,000
Location of Claim Groups:
EASY, ON, BP, BW, & SNOW
Kyuquot Peninsula,
Vancouver Island, B.C.
▲ Logging Camp.
— — Road.

Fig. 1.

160-71-2

body in the area, coincident with one geochemical anomaly. Blocks of claims were staked, in MacDonald's name, over several of the geochemically anomalous areas which included a couple of high grade zinc discoveries. The earlier block of claims was allowed to lapse in favour of the latter, to which one year's assessment work was applied.

In January 1971 J. Schussler staked a block of claims, adjoining the Syndicate's claims, which effectively cover all the remaining geochemically anomalous areas, save for those on Can-Fer ground to the east. A program of soil geochemistry, magnetometer survey and geological mapping was proposed by MacDonald for the summer of 1971. However, due to budget restrictions and complications over the Syndicate agreement, this program was not undertaken.

4. PRESENT WORK

During late September and early October 1971, G. Harper and prospector K. Christensen examined the area, undertook limited soil sampling and assessed the geological potential. The investigations were centred on the intrusive and coincident largest geochemical anomaly. Exposure has been substantially improved in the last twelve months by a network of new logging roads. No significant copper mineralization or alteration features were discovered. Considerable pyrite but only traces of chalcopyrite, malachite, galena and sphalerite were noted in the vicinity of the main north-northwesterly fault.

B horizon soil samples collected along all the roads in the area were analysed for copper, zinc, molybdenum, silver and lead. These elements showed a high background throughout the area - effectively regardless of bedrock type. The only anomalies are single sample highs.

5. LOCATION AND CLAIM STATUS

The property at present comprises 91 mineral claims. These are distributed as shown in Fig. 1, up the Easy Creek - upper Malksope

River valley. Fifty-five mineral claims in four claim groups (B.P., EASY, ON and B.W. claim groups) were staked by and recorded in the name of Earl D. Dodson of MacDonald Consultants. The SNOW 1-36 mineral claims in the SNOW claim group were staked and recorded in the name of John Schussler.

6. ACCESS

In the past, access has generally been by float plane to either Malksope or Easy Inlet. An interconnecting system of logging roads runs up both these creeks. Trailbikes, backpacking or rides with the logging company trucks have been used to get from tidewater to the target areas. In September-October 1971 access was by helicopter, but investigations have shown that a surface route is perfectly feasible. Good logging roads from Gold River to Fair Harbour can be driven at nights or weekends with the permission of:

Mr. D. Brealey
C.F.P./C.Z. Road System Administrator
North Island Agencies Ltd.
6-942 Island Highway
P.O. Box 909
Campbell River, B. C.

From Fair Harbour it is only a 20-mile boat trip through sheltered Kyuquot Sound to Easy Inlet. If it is intended to take a truck over to the Peninsula, this can be done using a Landing Craft which takes supplies from Fair Harbour to Kyuquot Village. This landing craft meets the Island Freighter at Fair Harbour every Sunday afternoon.

The logging company operating under contract to Tahsis Co. in the Peninsula area is:

Friell Lake Logging Co. Ltd.
815 West Hastings Street
Vancouver 1, B. C.

The owner is Rudy Deering, and the field superintendent is Bob Bell.

7. GEOLOGY

(a) General Outline

The portion of the Kyuquot Peninsula under consideration is underlain chiefly by sedimentary and volcanic rocks which are thought to belong to the Bonanza Group. The Lower Bonanza Group consists predominantly of calcareous sediments including light and dark limestones with intercalated volcanics, argillites and skarns. The Upper Bonanza is predominantly volcanic and includes both intermediate flows and intermediate to acid pyroclastics. The Bonanza Group rocks in this area generally dip to the southeast, south or southwest at between 25° and 50°.

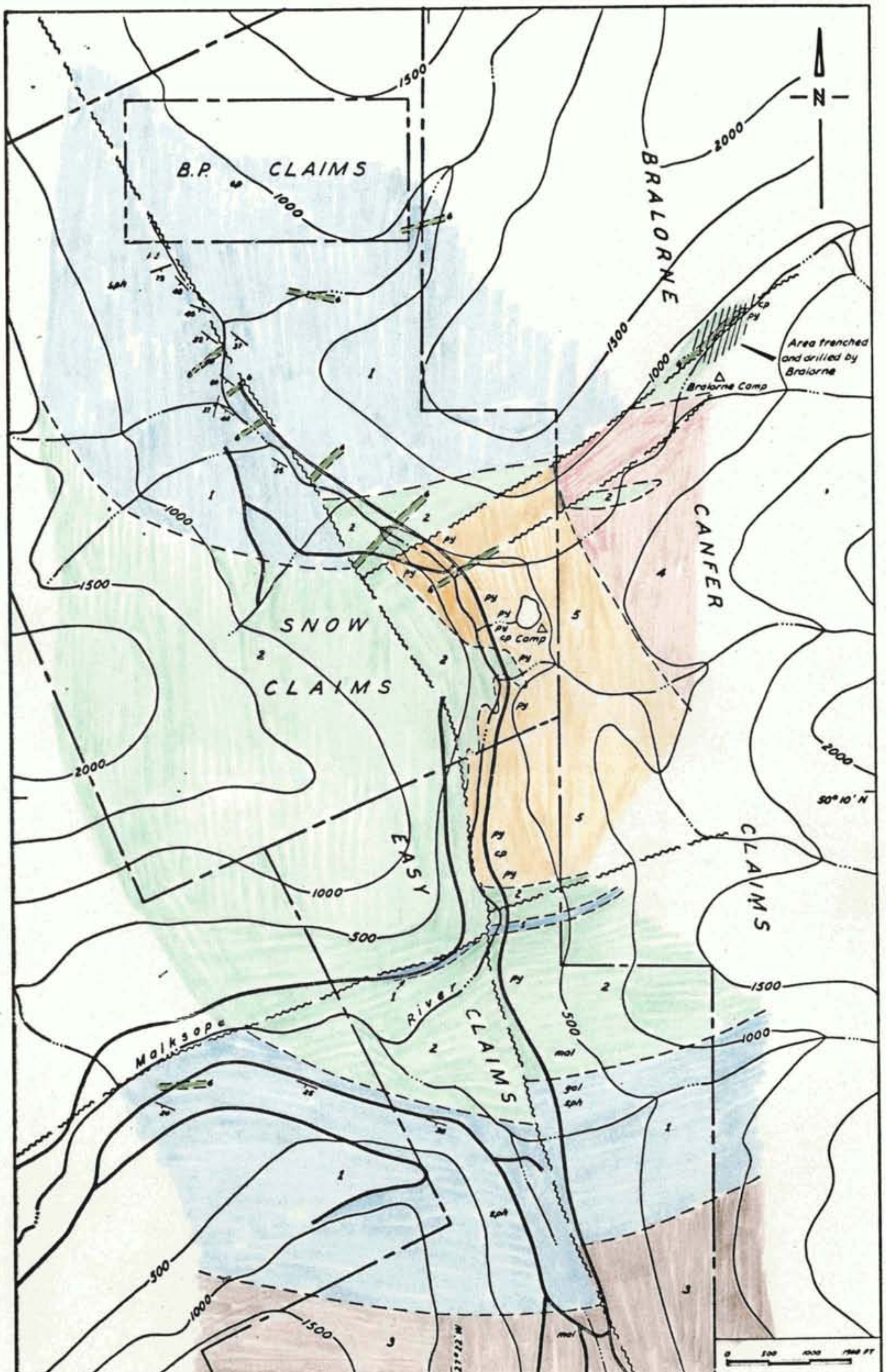
In the vicinity of Kashutl Inlet, the Bonanza rocks have been intruded by a medium-grained syenodiorite plug. In the vicinity of the Malksope River the strata are cut by a minor quartz porphyry intrusion. The age relationship between these two intrusions is not clear.

The area is transected by a major northwest trending fault zone. This is either the southward extension of the Mahatta Fault slightly offset; or a parallel fault.

The various claim blocks are located over areas where: (1) prospecting in 1970 revealed mineralization and (2) where silt samples indicated geochemical anomalies. The EASY claims were sited to cover a zone with widespread but minor chalcopyrite and pyrite. The sulphides are associated with quartz veins in both volcanics and sediments. The SNOW claims adjoin the EASY claims to the north and cover the north end of a large geochemical anomaly. A quartz eye porphyry body with minor disseminated pyrite, outcrops within these claims.

The ON claims were located to cover an extensive skarn zone containing minor disseminated sphalerite.

The BP claims cover a showing with chalcopyrite, hematite and magnetite in a shear zone in dark calcareous sediments. The BW claims were located to cover an exposure of dark green andesite containing minor disseminations and veinlets of chalcopyrite.



GENERAL GEOLOGY OF THE UPPER MALKSOPE RIVER AREA, KYUQUOT PENINSULA

N.T.S. No. 92 L 3-W

LEGEND

- 6 Dykes, mainly micro-diorite
- 5 White feldspar quartz-eye porphyry
- 4 Pink feldspar quartz-eye porphyry
- 3 Red brown Volcanic Unit
- 2 Green Volcanic Unit
- 1 Lower and upper Limey Unit

- Bedding
- Fault
- Contact
- Road

cp = chalcopyrite, mol = malachite, py = pyrite, gal = galena, sph = sphalerite

Map Ref. No. 160-71-4

Fig. 3

(b) Mapping

The object of the work undertaken in September - October 1971 was to assess the merit and potential of the ground in and around the claim blocks. Attention was directed at the intrusive body. To this end Harper undertook: (1) detailed geological mapping of selected traverses, largely along newly-cut roads; (2) reconnaissance and check mapping of some of the areas recce. mapped in 1970 by MacDonald; (3) reconnaissance of the intrusive east onto the adjoining Bralorne Can-Fer claims; (4) investigation of the most significant showing in the area -- namely the Bralorne Can-Fer chalcopyrite/pyrite mineralized zone. Christensen carried out prospecting and geochemical sampling.

(c) Lithology

The distribution of rock types in the central area and their inferred spatial relationships are shown in Figs. 2 and 3. The various rock units recognized are described below.

i) The Lower Limey Unit

This is an extremely variable unit. Rock types included are: massive white limestone, well bedded purple - hematite rich limestone, bedded purple limestone with interbedded ferruginous shale bands (½" every 2" - 6"), purple and green limey shales and greywackes. The shaley rocks tend to occur as lenses within the purer limestones. Intercalated with these sediments are cryptocrystalline, dark green, massive volcanic rocks; probably largely tuffaceous. Colour on the Munsell Colour Chart varies from 5GY5/2 to 10GY6/4.

Exposure is generally poor, due largely to the ease with which these soft rocks weather. Consequently contacts between bands and lenses are frequently obscured or so deeply weathered as to be of little interpretative value. It appears though that limestone is the dominant rock type and that the sequence was deposited under violent conditions. Contacts between tuffs and limestones, where visible, show flame structures and small scale slumping. Large (up to 20' across) pillow-like, spirally-layered blocks of tuff surrounded by limestone are best explained as having formed by accretion while rolling or sliding down a turbid slump slope. The converse, blocks of limestone surrounded by volcanics also occur.

Disseminated fine-grained pyrite, forming up to 3% of the rock, occurs patchily through the white limestone, but is very rare elsewhere. There are also sporadic minute vugs containing galena in the white limestone. Limonite and pyrite are developed on fractures adjacent to faults.

ii) <u>The Volcanic Unit</u>

The proportion of green tuffs in the limey unit increases rapidly towards the top. Where no further limestone beds are visible is considered the top of the limey unit and base of the volcanic unit. They are essentially conformable.

The majority of the unit is crypto-crystalline, dark green, massive, tuffaceous volcanics. In the few places where grains are visible the composition is that of a dacite. Either inter-bedded or as wide dyke intrusions through this unit and the lower limey unit are porphyritic andesites. These are greyish green, massive, fine-grained to crypto-crystalline rocks (colour on the Munsell Chart is 10GY6/2). All through are 10%-15% of 2 - 5 mm long, anhedral, black, hornblende phenocrysts. These are uniformly distributed through the rock, as are also 3 - 5 mm vugs filled or lined with epidote. These epidote vugs are presumed to be of secondary origin.

Outcropping in the extreme north in or through the lower limey unit is one zone of a modified form of this andesite. In addition to the hornblende phenocrysts are 5%-7% of uniformly distributed 2 - 5 mm vesicular zeolites. These vesicles contain radiating fibrous crystals of white - pale pink zeolite. The zeolites are probably of secondary, low temperature origin.

There is insufficient evidence to confirm the extrusive or intrusive nature of these porphyritic andesites. From their wide extent, though, it is likely that they are extrusive flows interbedded with the tuffaceous rocks.

Patchily the joints in the volcanics contain abundant hematite. Limonite after pyrite is widespread on joints. Disseminated pyrite was not observed anywhere in the volcanics. The only copper minerals observed were very occasional small flecks of malachite on random joint planes.

iii) The Upper Limey Unit

This unit is extremely similar to the lower limey unit. Its varied suite of limestone, shales and volcanics outcrop to the south of the intrusive. Its lower contact is imperceptibly gradational up from the volcanic unit. The only difference from the lower limey unit is the greater proportion of volcanics and lower proportion of limestones. Otherwise all descriptions from (a) hold good.

iv) Dykes

Several varieties of dykes have been mapped, but it is thought that most are of similar origin, related either to the volcanic or intrusive phases.

The most common type of dyke is a pale green, white and black, very fine-grained microdiorite. These dykes are widespread throughout intrusives, sediments and volcanics. The dykes are generally 10' - 20' wide, strike 055^{o} - 080^{o} and dip vertically. They have sharp contacts with very narrow or virtually non-existent chilled margins. The microdiorite is uniformly grained and consists essentially of $\pm$60% white to pale green feldspar, $\pm$30% black pyroxene or amphibole and up to 10% of pale green quartz grains. The rock generally appears fresh and unaltered. No disseminated sulphides were observed in it. Only minor limonite was developed on some fracture planes.

A single example of a felsite dyke occurs near the south end of the mapped area. Its contacts are not exposed and therefore its attitude is unknown. It has an exposed width of nearly 100 feet. The rock is aphanitic and appears to be predominantly quartz. The white colour is patchily stained brown by limonite which is quite abundant on joints. There are no phenocrysts in the rock. The name felsite is used in a non-specific sense to describe the general nature and presumed composition of the rock.

A dyke of quartz eye feldspar porphyry occurs in the north. This rock is essentially the same as the main quartz eye feldspar porphyry intrusive mass. It strikes about 040° and dips vertically through volcanics. Other outcrops of the porphyry, intruding volcanics but closer to the intrusive contact, can be interpreted either as dykes or apophyses of the intrusive. The description of the main intrusive is applicable to these dyke-like outcrops.

A narrow zone of leached-looking aphanitic quartz, spotted through with pyrophyllite, occurs as a fault zone filling in the southwest.

v) The Quartz Eye Feldspar Porphyry Intrusive

This, the only intrusive in the mapped area, lies largely west of the Malksope River. It is bounded in part by faults and in part has a gradational intrusive contact with the stratigraphic sequence which is mainly volcanics in the area of the intrusive. As the volcanics contact is approached there are increasing numbers of smoothly rounded - 6"-20'+ across - included fragments of volcanics. The contacts of these volcanic inclusions are abrupt and they do not have broad chilled margins. In the immediate vicinity of the contact the increase in included volcanics has proceeded to the point where the rock is all volcanics, except for minor stringers and lenses of porphyry filling weak structural zones in the volcanics.

In places the intrusive with included lenses of volcanics has a brecciated appearance. It is apparently not brecciated though, just lenses of volcanics assimilated during intrusion. In contrast, brecciated material was recognized in the vicinity of the main north-northwest trending fault. Here the granite not only contained some more angular blocks of volcanics, but also contained blocks of porphyry.

The porphyry does not vary much throughout the area. Two types are mapped, one containing all white and the other partly pink feldspar. These were the only noticeable differences. The rock has a pale grey or off-white colour. On the weathered surface, 1 - 2 cm long oval quartz eyes are recognizable, but they are not distinguishable on freshly broken surfaces from the overall high quartz content. Some 70%-80% of the rock is medium- to coarse-grained (5 - 10 mm) quartz grains, through which are scattered 10%-20% of similar sized white calcic or white calcic plus some pink potash feldspar grains. Uniformly distributed through also are finer grained 2 - 5 mm aggregates of dark green hornblende crystals. In patches there are pyrite crystals forming nuclei to these hornblende grains. Minor limonite/goethite occurs on random fracture planes.

(d) Fracturing

No pronounced sets of closely spaced joints, either with or without cupriferous minerals, were observed. What pervasive fractures that do occur tend to strike east to northeast or north-northwest. The latter trend parallels the major fault through the area. The former set aligns with geological boundaries and a second fault direction. Nowhere are the fractures intensely developed.

(e) Structure

A body of quartz eye feldspar porphyry has intruded a succession of interbedded limey sediments and volcanics that now dip gently to moderately to the SSE - SSW.

Dykes have intruded both porphyry and strata.

The lack of chilled margins between volcanic inclusions and the porphyry suggests that the whole environment was at a high temperature during intrusion. Intrusion was probably synorogenic, equating closely in time with extrusion of the volcanics. The dykes are either virtually identical to the porphyry or are finer grained (in the case of the diorite), intermediate between the intrusive and extrusives. The dykes are probably late stages of this igneous phase.

Although the intrusive is restricted in exposure to east of the main NNW fault, it appears to trend ENE parallel to the dykes, and the strike of the strata.

Two sets of faults - both vertical - are developed. A set on which there is no more than minor displacement trends ENE. These are characterized by shear zones or narrow - 20'-30' - zones of siliceous pyrophyllitic fault gouge.

The second fault direction trends NNW. This is the trend of several major faults on Vancouver Island. A fault on this trend running right down the upper Malksope River Valley and on down the Easy Creek Valley is inferred from signs of alteration and breccia-tion in rocks in close proximity. This NNW fault has displaced the ENE faults.

(f) Alteration

No evidence was found to indicate a significant halo of alteration as generally occurs around porphyry copper deposits. Alteration of any sort was limited. Minor pyrophyllite was observed in a fault zone in the southwest. Epidote is weakly developed through the volcanics. Moderate amounts of limonite and in places goethite occur throughout the volcanics and intrusives. Hematite is very locally developed in the volcanics. Carbonate stringers are abundant through the volcanics adjacent to the limestone horizons but lacking elsewhere. Quartz veins are not abundant anywhere.

(g) Mineralization

The minor amounts of copper minerals, chalcopyrite and malachite, found by either the present workers or MacDonald's 1970 prospecting crew, are of no significance. They apparently represent no more than the random traces invariably found in such rock types when prospected hard enough. The cupriferous occurrences in the volcanics are all on fracture planes, whereas in the intrusives very occasional fine-grained specks of disseminated chalcopyrite occur with the more widespread disseminated pyrite. Disseminated pyrite forms up to 3% of the quartz eye feldspar porphyry in large (hundreds of feet across) patches concentrated in the northwest corner of the porphyry body.

Prospecting the extension of the intrusive to the east onto the Bralorne Can-Fer claims did not yield other areas of porphyry containing disseminated sulphides. It therefore seems likely that the pyrite is a local concentration rather than part of a large pyritic halo extending to the east. If it is just a local concentration, then its location is possibly controlled by the east-northeasterly fault immediately to the north. To the east, Bralorne Can-Fer's main showing is a shear zone with abundant, in places massive, chalcopyrite and pyrite developed along a short section of this fault. The Bralorne Can-Fer zone was subsequently cut by a barren microdiorite dyke.

Major sulphide development is not known along any of the other fault zones. However, the slight concentration of pyrite, patchily along the western intrusive-volcanic contact, could be construed as; due to, or concentrated by, the fault.

8. GEOCHEMISTRY

Results of silt sampling the area during 1970 showed that the two eastern tributaries of the Malksope River draining the porphyry area contained anomalous copper values. The southern of these two creeks also yielded anomalous zinc values. The zinc is not considered too significant as all the creeks draining limestone areas have high zinc values. Limestone is not known in the immediate catchment of the northern but is known in the southern creek.

To acquire further information concerning these silt anomalies, soil samples were collected. They were taken from the base of the B horizon of the soil profile exposed all along the logging roads. Samples were collected at 200-foot intervals by K. Christensen. Analyses for Cu, Zn, Mo, Ag and Pb, by Atomic Absorption methods, were undertaken by the Falconbridge Geochemical Laboratory in Vancouver. The results are shown in Fig. 4. The 1" - 500' scale copy of Fig. 4 has been coloured up for copper, and four 50% reductions coloured up for each of the other elements. One-hundred-and-twenty-one samples were collected, from which the following information was deduced.

Element	Regional Background (ppm)	Threshold (ppm)	Weak Anomalies (ppm)	Anomalies (ppm)
Cu	74	200	150-200	>200
Zn	56	200	150-200	>200
Mo	3	15	10-15	> 15
Ag	1.0	1.7		>1.7
Pb	30	100		>100

Note that on Fig. 4, Ag values are given in tenths of a part per million.

The object of the sampling was to determine the metal concentrations in soil traverses along either bank of the Malksope River. These results would indicate the existence or not of anomalous bedrock metal concentrations up the hill slopes of the Malksope River Valley. If anomalies were not located adjacent to anomalous creeks, then the silt anomalies were presumably derived from substantially higher up the creeks.

The copper plot shows two exceptionally high valued samples (10,450 and 1,070 ppm Cu) which have no supporting, adjacent, reasonably high values. Analytical re-runs confirmed the high values. These two results presumably represent fortuitous samples from extremely localized copper concentrations due to single boulders containing copper minerals. These two values are therefore discounted effectively. None of the other anomalous samples group into an impressive anomaly, but rather are a series of random spot highs. These largely occur over volcanic bedrock and probably reflect narrow "high grade" veins or shear type sources. The only anomaly over the porphyry is a weak one near the 10,450 and 1,070 ppm Cu samples, near the contact of the intrusive and volcanics adjacent to the north-northwesterly fault. Disseminated pyrite and occasional traces of disseminated chalcopyrite were noted in this area of brecciated intrusive. From the absence of a significant anomaly over the intrusive it is concluded that the creek anomalies are derived from sources in the Can-Fer ground. In the case of the northern creek it flows over exposures of massive pyrite and chalcopyrite. The background copper content of the soils of the whole area is high.

The zinc anomalies occur almost without exception over areas of limestone. This is to be expected in view of the affinity of limestone for zinc. Although minor occurrences of sphalerite in the limestone are prolific (see Dodson's prospecting results from 1970), no major concentrations have been found. The single point nature of the soil anomalies reflects this sporadic occurrence of minor showings.

The only molybdenum anomalies occur in the southwest of the intrusive in its contact zone with the volcanics, adjacent to the north-northwesterly fault. These anomalies coincide with copper anomalies. Outcrops in the vicinity contain only traces of chalcopyrite while molybdenum minerals were not observed. Therefore, either these rather weak anomalies were caused by minute quantities of molybdenum in the contact/fault zone, or have been transported down the east hill slope from unexposed mineralized bedrock.

Silver anomalies are all of the single sample type with no build up either side and are sporadically distributed. None of the anomalies is considered significant.

The lead anomalies, like the zinc, occur over or near areas of limestone. The anomalies on the southeast road occur in a zone of interbedded limey shales and volcanics. Significant concentrations of galena were not noted by prospectors in the vicinity of any of these anomalies. In all probability, therefore, the isolated single point anomalies reflect insignificant galena concentrations. Only those values down the southeast road could reflect more important lead mineralization upslope to the east.

The soil sampling has therefore shown that -

i) the silt anomalies in the northern tributary creek draining the porphyry are not derived from the porphyry generally, but from specific showings on Bralorne Can-Fer ground;

ii) the only anomaly of any possible significance is a molybdenum with coincident copper at the south end of the intrusive which could possibly reflect mineralized bedrock upslope to the east, rather than local, sporadic, weak, mineralization;

iii) a lead anomaly in the southeast with minor coincident zinc anomalies could also possibly indicate mineralization upslope to the east.

9. CONCLUSIONS

The results of the geological and geochemical surveys undertaken by Harper and Christensen are unfortunately disappointing. The area is favourable geologically. The porphyry has widely developed abundant disseminated pyrite and also fault controlled small lenses of chalcopyrite as on the Bralorne claims. However, there are no indications of porphyry copper mineralization. The pyrite seems to be concentrated near the intrusive contacts and is not necessarily a pyrite halo to a copper sulphide-cored porphyry. Alteration features are not abundant.

The geochemical survey served to discount the significance of some of the silt anomalies. It indicated only one area of possible interest -- upslope to the east from the southwest corner of the intrusive. However, the area still has merit due to the high background copper content. The improved exposure and ease of movement as logging is extended further through the area portends well for future prospecting. Although surveys to date do not indicate signs of a major ore body, the area still has sufficient merit to justify further check prospecting as this artificial exposure is improved.

G. Harper

Vancouver, B.C.
December 1971

APPENDIX

Copies of Geochemical Sample Data Sheets #1 - 5

for MacDonald Consultants

Oct. 8/71 Rcvd Oct 8 #1 5

GEOCHEMICAL SAMPLE DATA SHEET

PHOTO/MAP No. PROGRAMMING FORM

FALCONBRIDGE NICKEL MINES
1314 WEST 71st AVENUE
VANCOUVER 14, B.C.
261-0722

PROJECT No. 103 AREA KYUQUOT

Sample Number	Date D M	X ROAD TRAVERSE (West/East) Line	Y South North Station	Sampler	Material	Environ.	Colour	Size	Organic	Moisture	Depth	Width / Slope	Flow / Hor.	Precipitate	✓ Copper	✓ Zinc	✓ Moly.	✓ Silver TENTHS	✓ Lead	Mang.	Iron	pH	
B79601	0110	0 00			1	.	12	2			6	2	2		51	49	1	4	8			:	
02		2			0		2	3		2		3	B		19	24	2	4	11			:	
03		4			0		12	5		2		3	B		9	4	1	4	3			:	
04		6			0		2	12		2		2	B		45	21	1	7	12			:	
05		8			1			1			2	1	2		39	22	(2) 3	4	8			:	
06		10			0		2	13		2		2	A		20	13	3	6	7			:	
07		12			0		15	1		2		2	A		14	14	1	3	6			:	
08		14			0		2	15		2		3	B		60	47	4	4	17			:	
09		16			0		2	5		2		3	B		34	16	2	3	7			:	
11		18			0		1	15		2		3	B		24	24	9	4	12			:	
12		20			0		13	1		2		4	BC		79	29	5	8	14			:	
10		22			0		2	3		2		4	B		20	12	5	2	6			:	
13		24			0		1	15		2		4	C		9	10	3	2	6			:	
14		26			0		2	2		2		3	B		46	16	1	6	11			:	
15		28			0		1	1		2		3	C		115	33	1	6	8			:	
16		30			0		12	15		2		3	B		(8) 5	(7) 7	5	(2) 3	(8) 8			:	
17		32			0		2	2		2		3	B		15	15	3	7	13			:	
18		34			0		1	1		2		4	C		10,450	45	(2) 2	64	18			:	
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27		52			0		2	15		2		3	B		(35) 38	(30) 33	4	10	16			:	
28		54			0		2	12		2		2	B		106	20	3	20	27			:	
29		56			0		2	15		2		3	B		82	42	3	12	19			:	
B79630		58			0		2	23		2		3	B		178	211	6	16	23			:	

#2 -5

GEOCHEMICAL SAMPLE DATA SHEET

PHOTO/MAP No. PROGRAMMING FORM

FALCONBRIDGE NICKEL MINES
1314 WEST 71st AVENUE
VANCOUVER 14, B.C.
261-0722

PROJECT No. 103. AREA KYUQUOT.

Sample Number	Date D M	X ROAD TRAVERSE (West/East) Line	Y South/North Station	Sampler	Material	Environ.	Colour	Size	Organic	Moisture	Depth	Width / Slope	Flow / Hor.	Precipitate	Copper	Zinc	Moly.	Silver (TENTHS)	Lead	Mang.	Iron	pH	
B79631	0110	60			0		2	5		2		3	B		96	35	4	18	35				
32		62			0		2	35		2		3	B		65	43	8	14	43				
33		64			0		2	25		2		4	B		36	30	9	9	30				
34		66			0		2	15		2		4	B		106	100	2	15	100				
35		68			0		2	1		2		4	C		235	140	1	12	140				
36		70			0		2	15		2		4	B		341	400	1	19	400				
37		72			0		2	5		2		4	B		87	57	1	16	57				
38		74			0		12	15		2		3	B		98	204	1	12	204				
39		76			0		2	15		2		3	B		39	44	1	20	44				
40		78			0		2	15		2		4	B		20	43	2	15	43				
41	0310	2			0		1	3		2		3	BC		91	39	1	4	39				
42		6			0		2	5		2		2	B		44	27	1	15	27				
43		8			0		2	3		3		3	B		146	62	1	13	25				
44		10			0		12	23		2		3	B		30	34	(1) 1	11	18				
45		12			0		2	2		2		3	B		55	36	2	11	17				
46		14			0		12	23		2		3	B		32	16	1	7	16				
47		16			0		2	23		2		3	B		26	16	2	5	15				
48		18			0		12	23		2		2	B		114	178	11	11	172				
49		20			0		12	12		2		2	AB		52	137	8	10	72				
50		22			0		2	35		2		2	B		19	31	1	8	18				
51	0410	24			0		2	35		2		3	B		130	54	1	10	21				
52		26			0		3	5		3		3	C		66	46	1	6	14				
53		28			0		2	5		3		3	B		(34) 34	(24) 26	(2) 2	7	(12) 12				
54		30			0		3	5		3		3	BC		39	41	1	8	15				
55		32			0		1	5		3		3	C		52	47	1	11	15				
56		34			0		2	35		2		3	B		35	22	1	12	16				
57		36			0		2	3		2		2	B		81	123	3	10	28				
58		38			0		2	35		3		2	BC		95	79	1	8	16				
59		40			0		2	15		2		2	B		48	42	1	10	17				
B79660		42 50			0		23	15		2		3	B		22	24	1	12	12				

#3 5

GEOCHEMICAL SAMPLE DATA SHEET

PHOTO/MAP No. PROGRAMMING FORM

FALCONBRIDGE NICKEL MINES
1314 WEST 71st AVENUE
VANCOUVER 14, B.C.
261-0722

PROJECT No. 103 AREA KYUQUOT

Sample Number (1)	Date D M (10)	X West East (ROAD TRAVERSE) Line	Y South North Station (20)	Sampler	Material	Environ.	Colour	Size (30)	Organic	Moisture	Depth	Width Slope	Flow Hor.	Precipitate (40)	Copper	Zinc	Moly. (OCT 15) (50)	Silver (TENTHS)	Lead	Mang. (60)	Iron	pH	(80)
B79661	0410	4			0		2	5		3		3	B		24	28	1	8	11			:	
62		6			0		2	15		2		3	B		63	45	1	8	12			:	
63		8			0		2	5		2		3	B		34	22	1	12	11			:	
64		10			0		2	5		2		3	B.		16	12	(1) 1	7	9			:	
65		12			0		2	15		2		3	B.		39	38	2	10	15			:	
66		14			0		15	45		3		3	AC		(22) 19	(43) 39	1	6	(14) 10			:	
67		4			0		1	12		3		3	B.		58	56	8	8	17			:	
68		6			0		2	5		3		3	B		42	42	4	7	13			:	
69		8			0		2	15		2		3	B.		79	35	2	6	13			:	
70		10			0		2	15		2		3	B.		27	27	2	7	18			:	
71		12	— SAMPLE MISSING —																			:	
72		14			0		2	15		2		3	B		42	32	2	8	19			:	
73		16			0		2	5		2		3	B.		90	41	2	11	17			:	
74		18			0		2	15		2		3	B		165	58	7	10	25			:	
75		20			0		2	15		3		3	B.		190	44	6	10	23			:	
76		22			0		2	15		2		2	B.		208	53	3	10	22			:	
77		24			0		2	15		3		2	B.		65	55	3	12	21			:	
78		26			0		12	15		3		2	B		39	37	1	8	13			:	
79		28			0		2	15		3		2	B.		57	25	1	10	15			:	
80		30			0		2	15		3		3	B		93	30	(1) 1	11	21			:	
81		32			0		2	15		3		2	B		93	28	1	8	10			:	
82		34			0		2	15		3		2	B		32	44	1	14	12			:	
83		36			0		2	5		3		2	B		21	19	3	11	13			:	
84		38			0		2	15		3		2	B.		126	31	4	9	18			:	
85		40			0		3	15		3		2	C.		17	9	1	7	10			:	
86	0510	80			0		2	15		2		3	B.		34	28	1	13	18			:	
87		82			0		2	15		2		3	B.		40	39	1	15	23			:	
88		84			0		2	15		2		2	B		24	37	2	12	24			:	
89		86			0		2	15		2		2	B.		50	77	3	15	34			:	
B79690		88			0		2	15		2		3	B		76	71	3	15	86			:	

#4 o 5

GEOCHEMICAL SAMPLE DATA SHEET

PHOTO/MAP No. PROGRAMMING FORM

FALCONBRIDGE NICKEL MINES
1314 WEST 71st AVENUE
VANCOUVER 14, B.C.
261-0722

PROJECT No. 103. AREA KYUQUOT.

Sample Number	Date D M	X West / East (ROAD TRAVERSE) Line	Y South / North Station	Sampler	Material	Environ.	Colour	Size	Organic	Moisture	Depth	Width / Slope	Flow / Hor.	Precipitate	Copper	Zinc	Moly. (OCT 15)	Silver (TENTHS)	Lead	Mang.	Iron.	pH
B79691	0510	90			0		2	15		2		2	B		(58) 53	(123) 116	1	(13) 12	(42) 42			
92		92			0		2	15		2		3	B		52	92	1	12	43			
93		94			0		23	15		2		3	B		82	131	1	10	60			
94		96			0		24	15		2		3	B		11	22	1	8	22			
95		98			0		2	15		2		2	B		29	49	1	10	21			
96		100			0		2	15		2		3	B		41	59	1	10	21			
97		102			0		2	15		2		2	B		31	43	1	7	15			
98		0			0		2	15		2		4	B		146	58	1	10	24			
99		2			0		1	15		2		4	B		164	105	1	14	116			
B79700		4			0		2	15		2		4	B		166	110	1	12	48			
01		6			0		2	15		2		4	B		(140) 133	(100) 96	1	12	47			
02		8			0		2	15		2		4	B		236	162	5	16	66			
03		10			0		3	15		2		4	BC		38	37	3	6	14			
04		12			0		3	1		2		4	BC		14	11	4	4	9			
05		14			0		3	1		2		4	BC		9	14	3	2	7			
06		16			0		2	15		2		3	B		25	16	3	5	13			
07		18			0		2	15		2		4	B		22	14	9	6	12			
08		20			0		2	15		2		4	B		74	175	(9) 7	10	20			
09		22			0		2	15		2		4	B		127	290	8	18	46			
10		24			0		2	15		2		4	B		66	159	2	10	28			
11		26			0		2	15		2		4	B		(76) 73	(81) 78	1	13	25			
12		28			0		2	15		2		4	B		164	37	1	9	16			
13		30			0		2	15		2		4	B		149	43	6	12	26			
14		32			0		2	15		2		4	B		161	49	2	15	23			
15		34			0		2	15		2		4	BC		132	49	1	13	32			
16		36			0		2	15		2		4	BC		194	48	1	12	22			
17		38			0		2	15		2		4	B		108	49	2	11	19			
18		40			0		2	15		2		4	B		249	100	9	13	30			
19		42			0		2	15		2		4	B		55	45	2	12	20			
B79720		44			0		2	15		2		4	B		138	38	3	15	18			

GEOCHEMICAL SAMPLE DATA SHEET

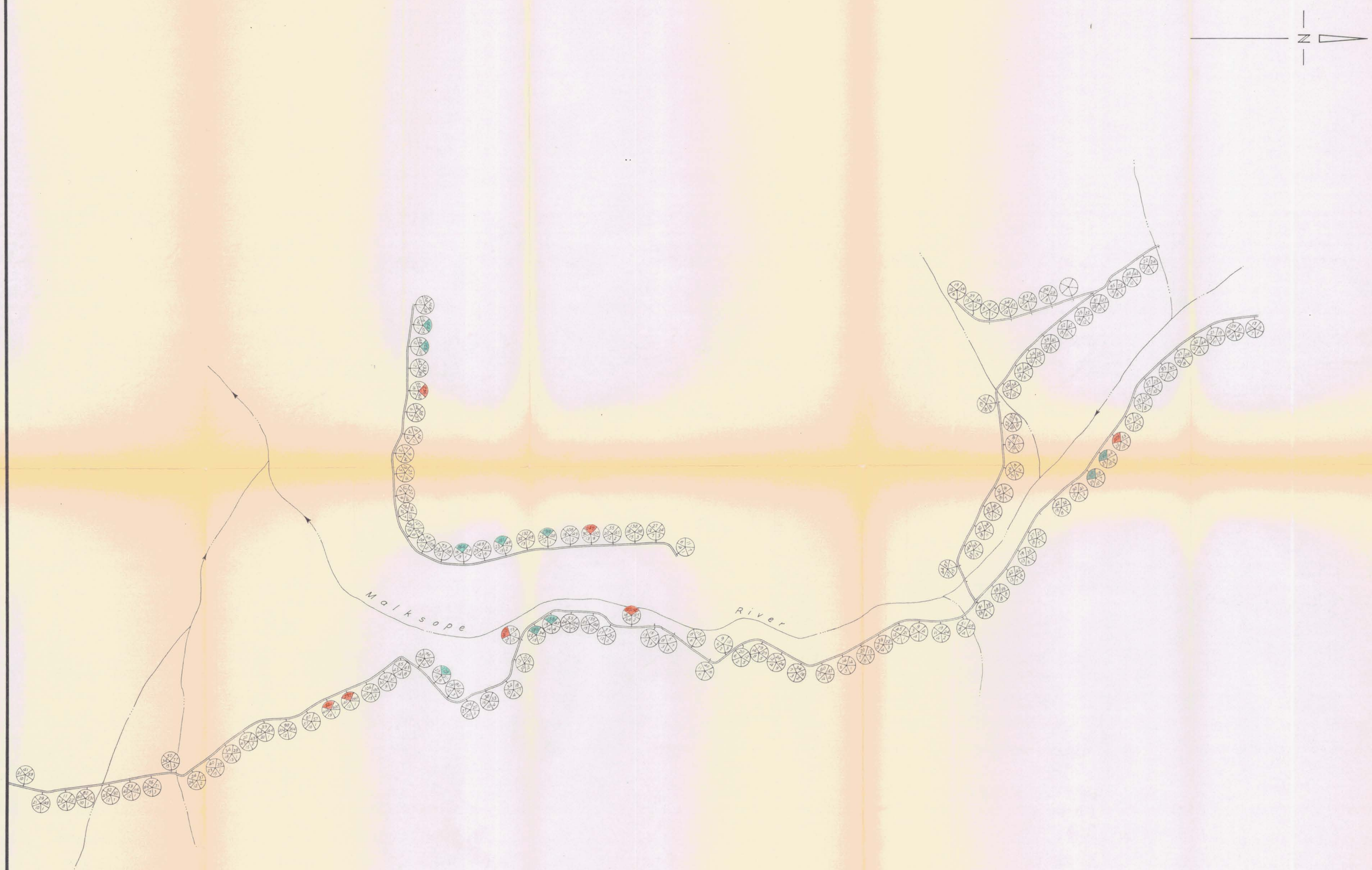
PHOTO/MAP No. PROGRAMMING FORM

FALCONBRIDGE NICKEL MINES
1314 WEST 71st AVENUE
VANCOUVER 14, B.C.
261-0722

PROJECT No. 103 AREA KYUQUOT.

Sample Number	Date D M	X (West / East) Line — ROAD TRAVERSE	Y (South / North) Station	Sampler	Material	Environ.	Colour	Size	Organic	Moisture	Depth	Width / Slope	Flow / Hor.	Precipitate	Copper	Zinc	Moly. (OCT 15)	Silver (TENTHS)	Lead	Mang.	Iron.	pH	
1	10		20					30						40			50			60			80
B79721	0510	46			0		2	15		2		4	B		27	24	3	7	12			.	
B79722		48			0		2	15		2		3	B		11	7	1	4	6			.	

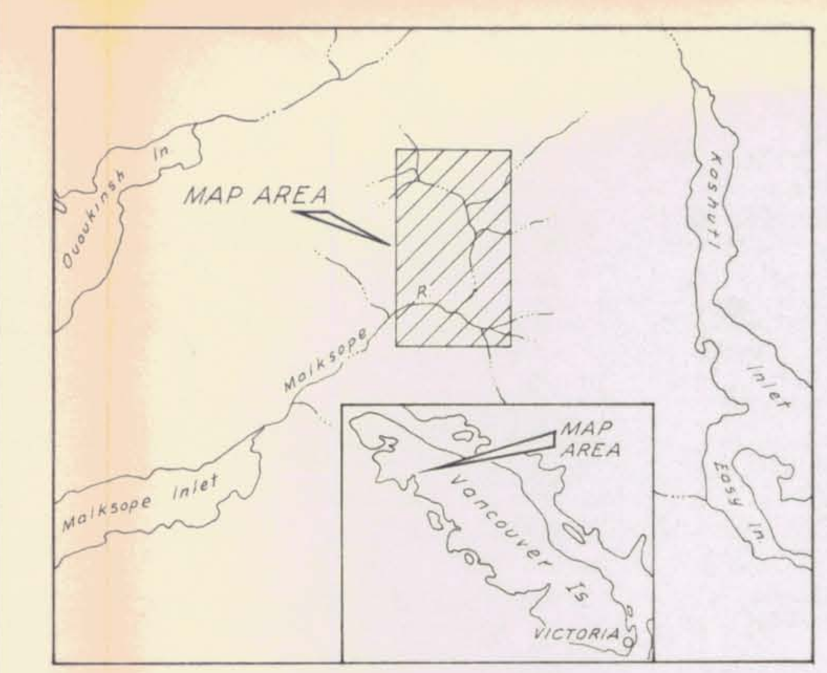
MAP REF. NO.: 160-71-5
N.T.S.: 92-L-3 W



LEGEND

- Logging road
- Creek
- Soil sample location
- A Cu - p.p.m.
- B Zn - p.p.m.
- C Mo - p.p.m.
- D Ag - p.p.10m.
- E Pb - p.p.m.

Anomalies	Weak Anomalies
Cu > 200 p.p.m.	150 - 200 p.p.m.
Zn > 200 p.p.m.	150 - 200 p.p.m.
Mo > 15 p.p.m.	10 - 15 p.p.m.
Ag > 17 p.p.10m.	
Pb > 100 p.p.m.	



0 500' 1000' 1500' 2000'

SCALE: 1 INCH TO 500'

FALCONBRIDGE NICKEL MINES LIMITED

PROPERTY: KYUQUOT

LOCATION: UPPER MALKSOPE RIVER VALLEY

TYPE OF MAP: GEOCHEMICAL

WORKING PLACE: Snow and Easy claims area

BASED ON: Sampling by K. Christensen

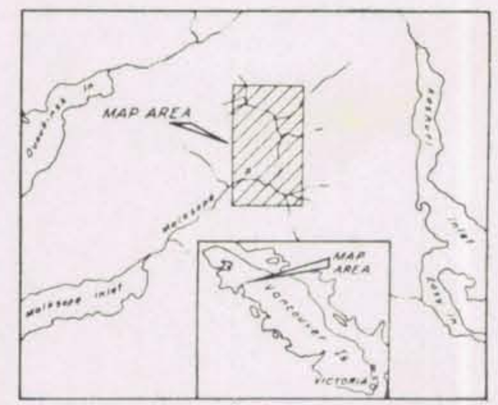
DATE OF WORK: Oct. 1971	MAP REF. NO.: 160-71-5	FIG. NO.: 4
DRAWN BY: H.G.T.		
DATE: Nov. 19, 1971	N.T.S. NO.: 92-L-3 W	

MAP REF. NO.: 160-71-5
N.T.S.: 92-L-3 W

LEGEND

- Logging road
- Creek
- Soil sample location
  - A Cu-ppm
  - B Zn-ppm
  - C Mo-ppm
  - D Ag-pp 10m
  - E Pb-ppm

Anomalies	Weak Anomalies
Cu >200 ppm	150 - 200 ppm
Zn >200 ppm	150 - 200 ppm
Mo >15 ppm	10 - 15 ppm
Ag >17 pp 10m.	
Pb >100 ppm	



0 500' 1000' 1500' 2000'

SCALE: 1 INCH TO 500'

FALCONBRIDGE NICKEL MINES LIMITED

PROPERTY: KYUQUOT

LOCATION: UPPER MALKSOPE RIVER VALLEY

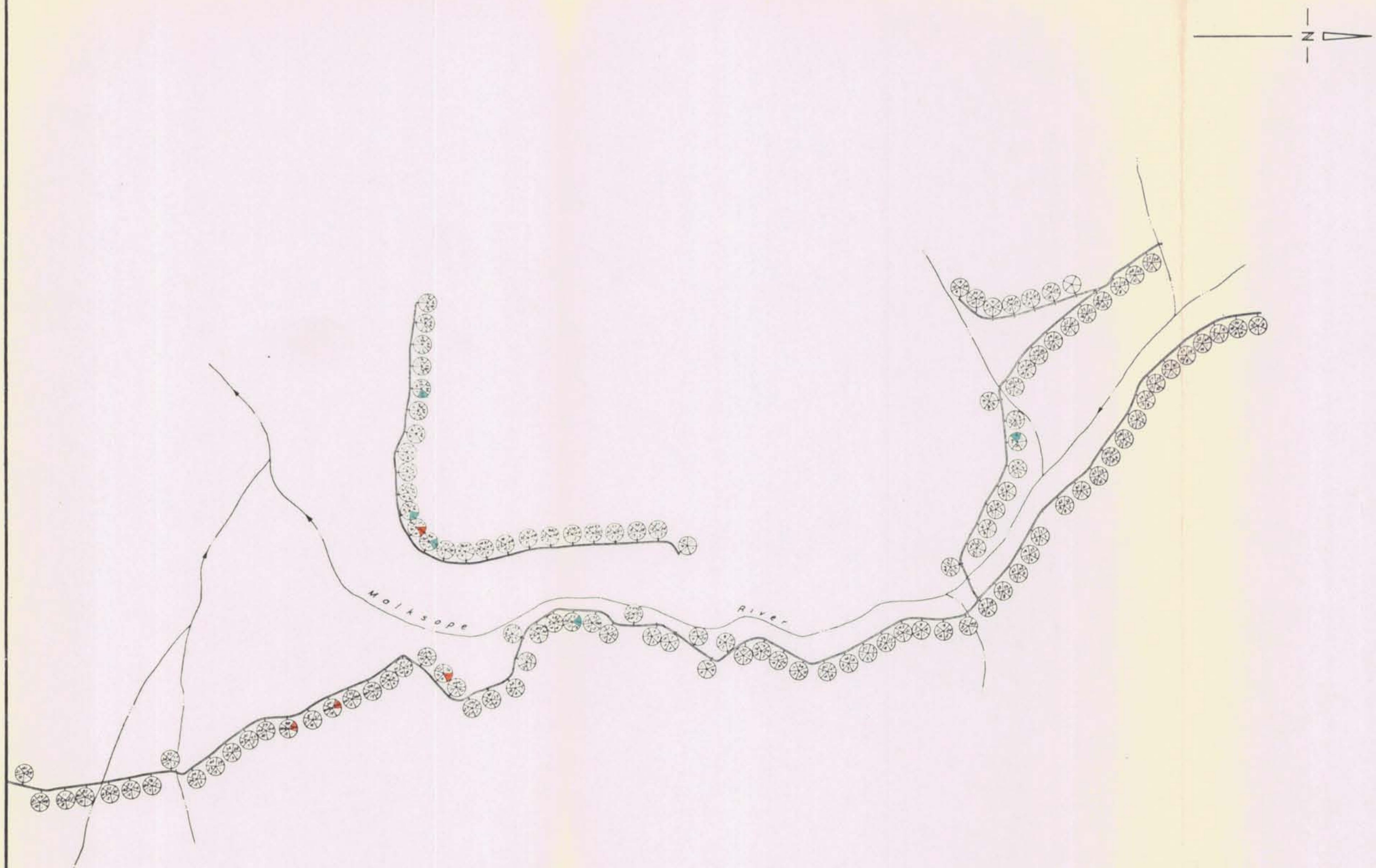
TYPE OF MAP: GEOCHEMICAL

WORKING PLACE: Snow and Easy claims area

BASED ON: Sampling by A. Christensen

DATE OF WORK: Oct 1971	MAP REF. NO.: 160-71-5	FIG. NO.: 4
DRAWN BY: H.G.T.		
DATE: Nov 19 1971	N.T.S. NO.: 92-L-3 W	

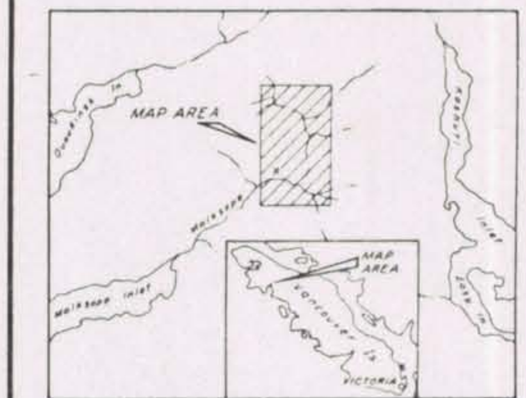
MAP REF. NO.: 160-71-5
N.T.S.: 92-L-3 W



LEGEND

- Logging road
- Creek
- Soil sample location
  - A Cu-ppm
  - B Zn-ppm
  - C Mo-ppm
  - D Ag-pp 10m
  - E Pb-ppm

Anomalies	Weak Anomalies
Cu >200 ppm	150-200 ppm
Zn >200 ppm	150-200 ppm
Mo >15 ppm	10-15 ppm
Ag >17 pp 10m	
Pb >100 ppm	



0 500' 1000 1500' 2000'

SCALE: 1 INCH TO 500'

FALCONBRIDGE NICKEL MINES LIMITED

PROPERTY: KYUQUOT

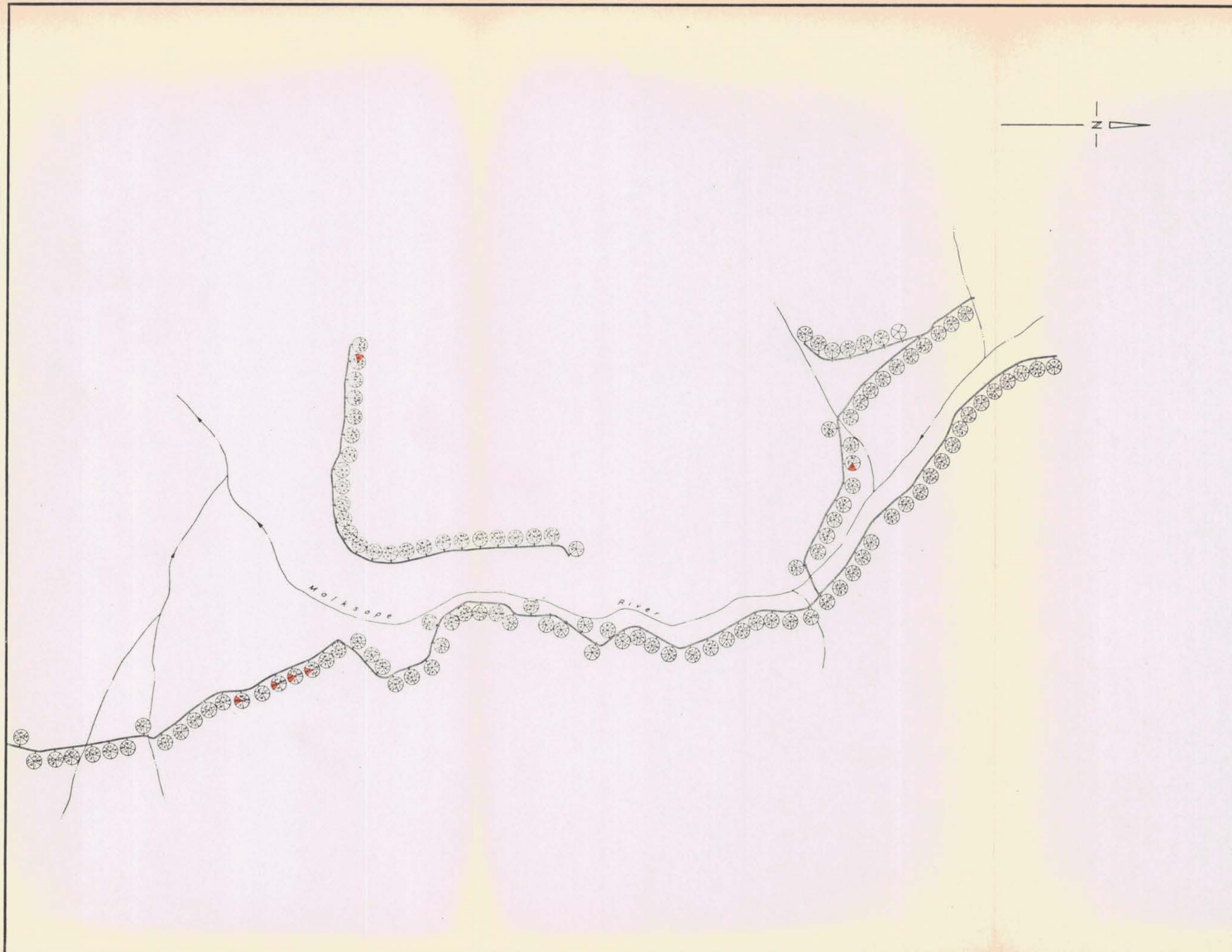
LOCATION: UPPER MALKSOPE RIVER VALLEY

TYPE OF MAP: GEOCHEMICAL

WORKING PLACE: Snow and Easy claims area

BASED ON: Sampling by K Christensen

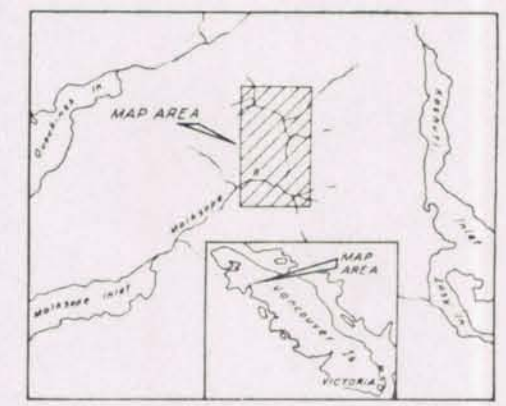
DATE OF WORK: Oct 1971	MAP REF. NO.: 160-71-5	FIG. NO.: 4
DRAWN BY: H.G.T.		
DATE: Nov 19 1971	N.T.S. NO.: 92-L-3 W	



LEGEND

Logging road
Creek
Soil sample location
A Cu-ppm
B Zn-ppm
C Mo-ppm
D Ag-pp 10m
E Pb-ppm

Anomalies	Weak Anomalies
Cu > 200 ppm	150 - 200 ppm
Zn > 200 ppm	150 - 200 ppm
Mo > 15 ppm	10 - 15 ppm
Ag > 17 pp 10m	
Pb > 100 ppm	



0 500' 1000' 1500' 2000'

SCALE: 1 INCH TO 500'

FALCONBRIDGE NICKEL MINES LIMITED

PROPERTY: KYUQUOT

LOCATION: UPPER MALKSOPE RIVER VALLEY

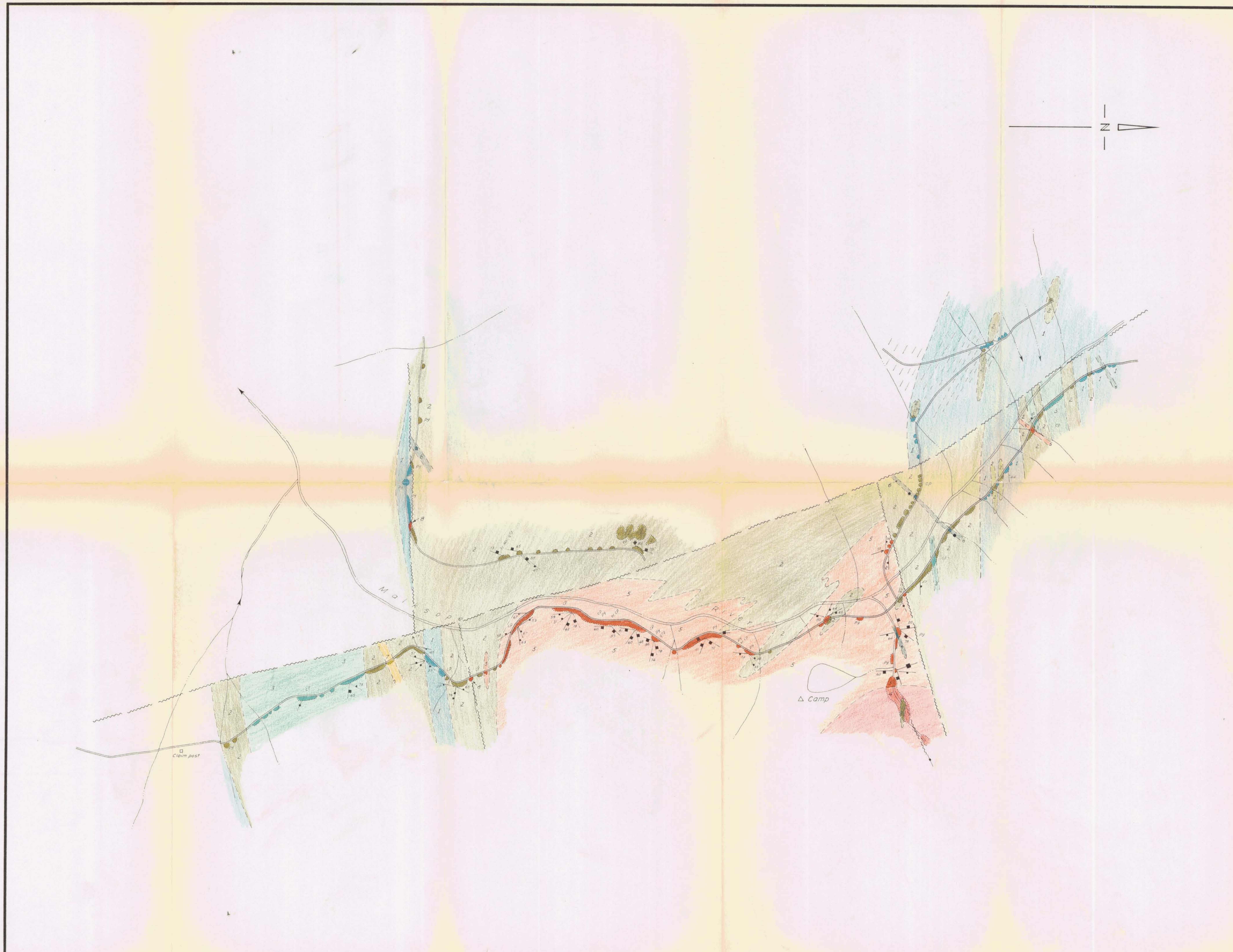
TYPE OF MAP: GEOCHEMICAL

WORKING PLACE: Snow and Easy claims area

BASED ON: Sampling by A. Christensen

DATE OF WORK: Oct 1971	MAP REF. NO.: 160-71-5	FIG. NO.: 4
DRAWN BY: HGT		
DATE: Nov 19 1971	N.T.S. NO.: 92-L-3 W	

MAP REF. NO.: 160-71-3
N.T.S.: 92 L 3-W

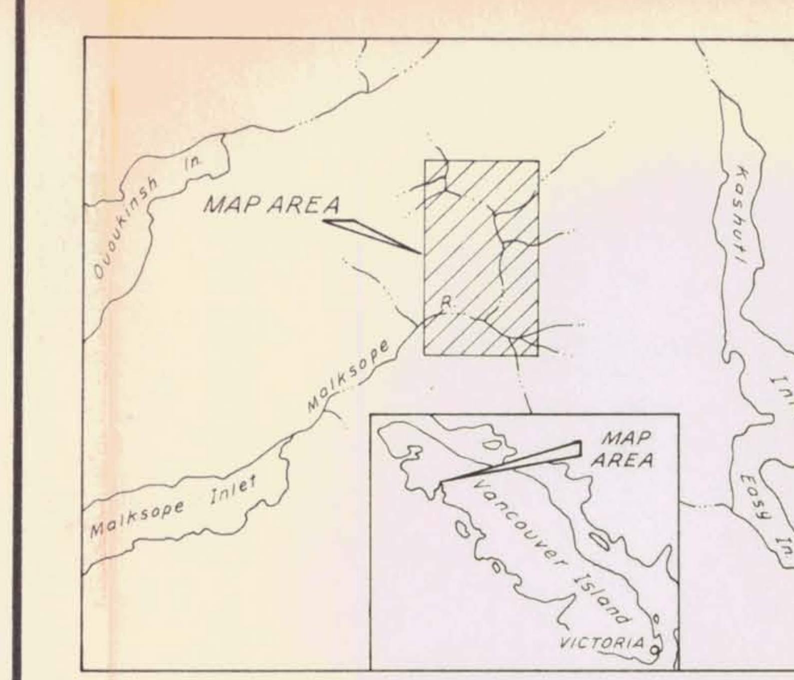


LEGEND

- 8 White, siliceous, pyrophyllitic fault gouge
- 7 Felsite dykes
- 6 Micro-diorite dykes
- 5 White quartz-eye feldspar porphyry (with volcanic inclusions or brecciated)
- 4 Pink feldspar quartz-eye feldspar porphyry
- Upper Limey Unit { Limestone with interbedded shales and volcanics (2)
- Volcanic Unit { Including porphyritic andesite (3)
- Lower Limey Unit { Limestone (1) with interbedded shales (1) and volcanics (2)

- Contact
- Fault
- Bedding
- Foliation
- Lineation
- Fracture: dipping, vertical
- Fracture spacing, closer than 2" apart
- Fracture spacing, 2" - 6" apart
- Fracture spacing, greater than 6" apart
- Thixotropic boulder clay till

py = pyrite, cp = chalcopyrite, mal = malachite, ep = epidote
qtz = quartz stringers



0 500' 1000' 1500' 2000'

SCALE: 1 INCH TO 500'

FALCONBRIDGE NICKEL MINES LIMITED

PROPERTY: KYUQUOT

LOCATION: UPPER MALKSOPE RIVER VALLEY

TYPE OF MAP: GEOLOGICAL

WORKING PLACE: Snow and Easy claims area

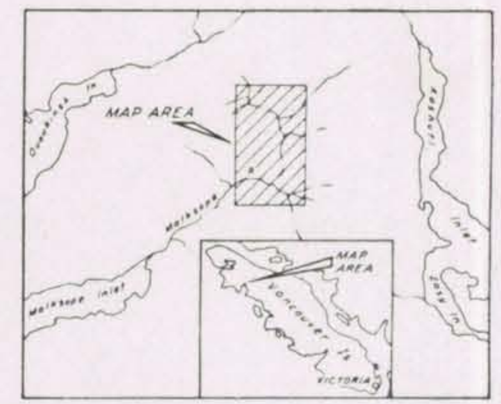
BASED ON: Mapping by G. Harper

DATE OF WORK: Oct. 1971	MAP REF. NO.: 160-71-3	FIG. NO.: 2
DRAWN BY: H.G.T.		
DATE: Nov. 30, 1971	N.T.S. NO.: 92 L 3-W	

LEGEND

Logging road
Creek
Soil sample location
A Cu - ppm
B Zn - ppm
C Mo - ppm
D Ag - pp 10m
E Pb - ppm

Anomalies	Weak Anomalies
Cu > 200 ppm	150 - 200 ppm
Zn > 200 ppm	150 - 200 ppm
Mo > 15 ppm	10 - 15 ppm
Ag > 17 pp 10m	
Pb > 100 ppm	



0 500' 1000' 1500' 2000'

SCALE: 1 INCH TO 500'

FALCONBRIDGE NICKEL MINES LIMITED		
PROPERTY: KYUQUOT		
LOCATION: UPPER MALKSOPE RIVER VALLEY		
TYPE OF MAP: GEOCHEMICAL		
WORKING PLACE: Snow and Easy claims area		
BASED ON: Sampling by K Christensen		
DATE OF WORK: Oct 1971	MAP REF. NO.: 160-71-5	FIG. NO.: 4
DRAWN BY: HGT		
DATE: Nov 19 1971	N.T.S. NO.: 92-L-3 W	