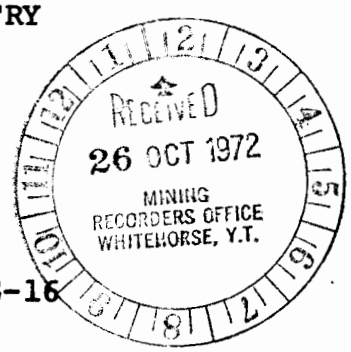
CANADIAN OCCIDENTAL PETROLEUM LTD.

MINERALS DIVISION

GEOLOGY AND GEOCHEMISTRY OF THE TYR CLAIM GROUP



Claim Sheet No. 115-G-16
(N.T.S. 115-G-16)

Long. 138° 20'W
Lat. 61° 85'N

35

This report has been examined by the Geological Evaluation Unit and is recommended to the Commissioner to be considered as representation work in the amount of $24,324.09

Claims Tyr 1 - 80

Y63770-Y63849

$24,324.09

Resident ~~Geologist~~ or
~~Resident Mining Engineer~~

Considered as representation work under Section 53 (4) Yukon Quartz Mining Act.

By:

Commissioner of Yukon Territory

C.F. Gleeson, Ph.D.
D.M.S. Bhatia, M.Sc.

Duration of Work:
July 2, 1972 to July 27, 1972
August 26, 1972 to September 4, 1972

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PLANS ACCOMPANYING REPORT

SUMMARY

The Tyr claims are underlain by flat-lying quartzites containing several sills of porphyritic andesite. In addition, porphyritic rhyolite and andesite flows are present in the west and northeast sectors of the claims; their contacts with the quartzite appear to trend northwest.

Two stocks of Nisling Range granodiorite intrude the quartzites in the southeast and northwest portions of the property.

The south edge of an alaskite granite stock occupies the north part of the claims. In addition, smaller granite masses intrude the northwest and central parts of the claims.

Molybdenite in quartz veins and stringers has been found in the southeast granodiorite stock. High Mo values are found in the soils along the south, west and north margins of this stock.

Copper-zinc mineralization has been found in the north and central parts of the claims. The sulphides present are pyrrhotite, chalcopyrite and sphalerite. Massive pyrrhotite containing chalcopyrite and in places massive sphalerite is restricted to a 6 to 8-inch bed in an amphibolitic quartzite which contains at least 3 sills of intercalated porphyritic andesite. Assays of grab samples vary from 0.22% to 2.35% Cu and 0.05% to 21.5% Zn.

An alteration zone (skarn-hornfels) some 1800

feet in diameter, has been outlined in the vicinity of the showings on the north part of the property - (Kiwi Zone). Chalcopyrite also occurs here in tremolite-quartz filled fractures in the altered quartzites and as disseminations in the quartzites and porphyritic andesite.

The 100 ppm copper contour lying between elevations of 4500 and 5000 feet is probably related to the exposed edge of the mineralized bed carrying the massive sulphides.

Further line cutting, soil and rock geochemistry, geology, prospecting, magnetometer and I.P. surveys are recommended over the alteration zones, mineralized zones and geochemical anomalies.

INTRODUCTION

The Tyr (1-80) claims were staked as a result of a reconnaissance geochemical program carried out in the summer of 1971. Staking was done under contract by Harman Management Limited of Whitehorse on October 1st, 1971.

This report will describe and discuss the geology of the claims and the analytical results obtained from soil, rock and stream sediment samples. The work was completed by Canadian Occidental Petroleum Ltd. (Minerals Division) between July 2 to July 27 and from August 29th to September 4th, 1972. The purpose of the work was to determine the cause of the reconnaissance stream sediment copper, zinc and molybdenum anomalies detected in the claim area.

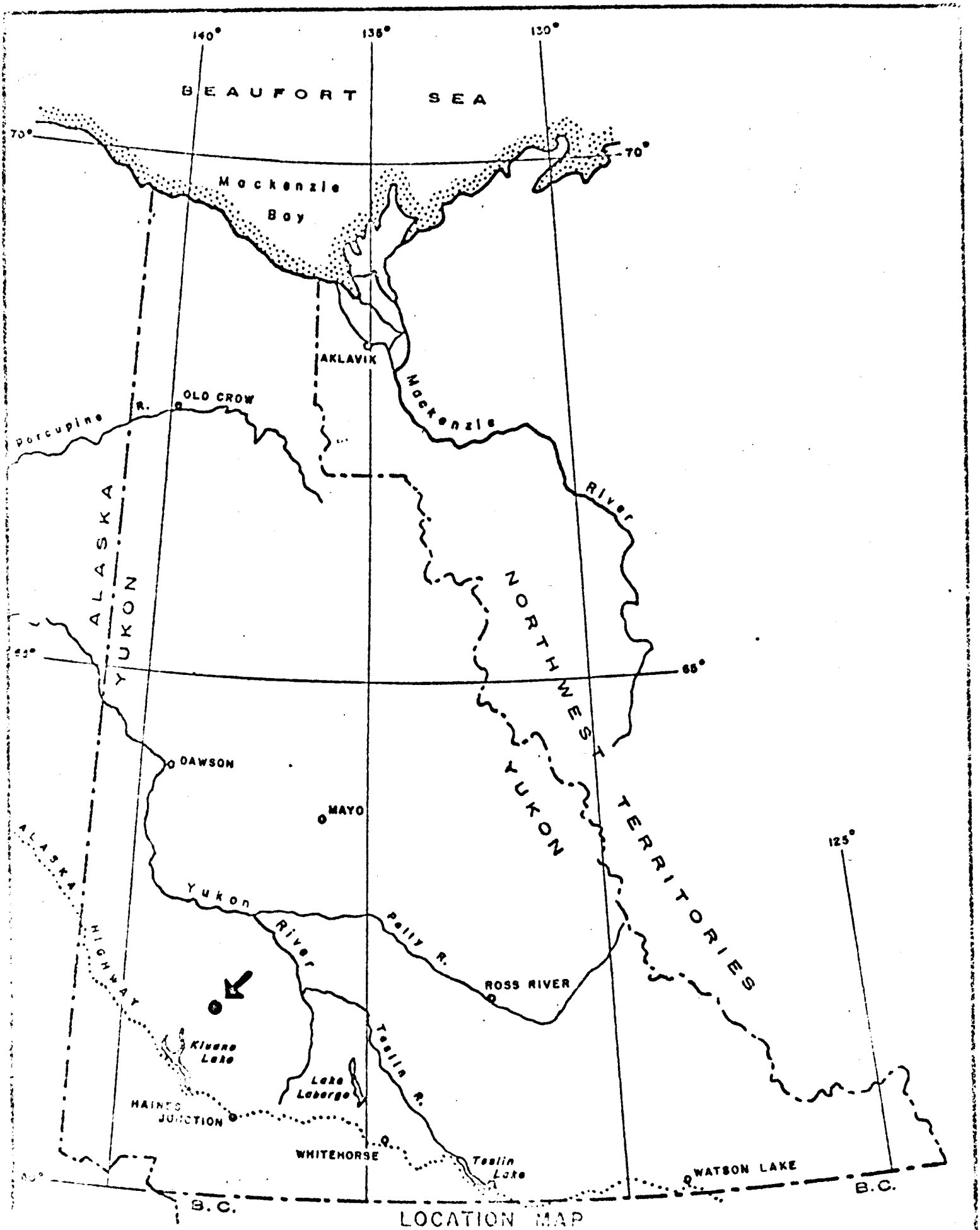
LOCATION AND ACCESS

The claim group is recorded on claim map 115-G-16 in the Whitehorse Mining District. The property is located approximately 42 miles north-west of Burwash Landing, Y.T., which is at mile 1093 on the Alaska Highway. The claims can be reached from there by helicopter (Figure 1).

Adjacent properties in the vicinity are the Rye claims approximately 6 miles due west.

VEGETATION

Vegetation in the area is generally sparse except in the south-east corner where trees are found. The tree



LOCATION MAP

TYR CLAIM GROUP

Figure 1

line is at an elevation of about 3800'.

The vegetation consists mainly of dwarf birch, with subordinate amounts of willows, black spruce, grass and moss.

WORK COMPLETED

(a) Line Cutting

Line cutting over the claims was done by Harman Management Limited of Whitehorse between June 29 and July 15, 1972.

Lines were cut at 070°T spaced 800 feet apart. Total footage cut was approximately 260,000 feet or 49.0 miles of lines; they were completed at the rate of 2,653 feet per man per day.

(b) Geological Mapping

The area was mapped during the period July 2 to July 27, 1972 by Mr. D.M.S. Bhatia, Geologist, under the supervision of Dr. C.F. Gleeson.

(c) Geochemical Survey

Soil sampling was done in this area by Mr. Peter D. Tanaskow, rock and stream sediment sampling was done by Mr. D.M.S. Bhatia.

(d) Names and Addresses of Personnel:

Canadian Occidental Petroleum Ltd.

Mr. D.M.S. Bhatia	110 Wellesley St.E.#403 Toronto 5, Ont.	Geologist
Mr. Peter D. Tanaskow	671 Dunboyne Cres. London 23, Ont.	Soil Sampler
Mr. Bill LeDoux	General Delivery Whitehorse, Y.T.	Cook
Dr. C.F. Gleeson	764 Belfast Road, Ottawa, Ont.	Consultant Geologist

Harman Management Limited, Whitehorse

John McInnis	1895, 5th Ave. Prince George, B.C.	Party Chief
Peter Magnusson	General Delivery Whitehorse, Y.T.	Cook
Louie Carlick	General Delivery Whitehorse, Y.T.	Line Cutter
Jim Atkinson	Ross River, Y.T.	"
Harry Atkinson	Ross River, Y.T.	"
Charlie Ollie	Ross River. Y.T.	"
Jim Etzel	Ross River, Y.T.	"
Daroll Beatie	General Delivery Whitehorse, Y.T.	"

PHYSIOGRAPHY

The area forms part of a deeply dissected upland surface. The highest peak in the claim group has an elevation of 5500 feet above sea level and it is located in the west-central portion of the property. Extending from there northward, eastward and southeastward, in a semi-circular configuration, are a series of hills that vary in elevation from 4400 feet to 5488 feet. The cirque-like or semi-circular shape is caused by the incised head of an east flowing tributary of Tyrrell Creek. The valley bottom on the east side of the property is at an elevation of 3600 feet thus creating a maximum relative difference in elevation of 1900 feet over a distance of 1.5 miles.

Drainage in this area is good. All the creeks have a continuous and moderate flow of water during the spring and summer months. Most of their water is provided by the thawing of permafrost, springs and from rain water.

The valleys in the claim area are 'V' shaped and they have slopes which vary from 10 to 45 degrees. No evidence of glaciation has been seen.

GEOLOGY

The rocks observed can be correlated as follows:

Table of Formations

MESOZOIC	(Mesozoic and/or (Tertiary (	(Nisling Range (Alaskite	Alaskite; minor granite
	(Jurassic and? (Cretaceous (	(Nisling Range (Granodiorite	Granodiorite; mino-quartz diorite to diorite
	(Triassic and? (later	(Nisling Range (Volcanics	Non-porphyritic to porphyritic basalt, andesite, latite, rhyolite
	Pre-mesozoic	Yukon Group	Marble, quartzite

Outcrops in this area are almost absent. Angular rock debris of local origin is spread over the hill tops and hill sides thus creating extensive talus slopes.

Yukon Complex

Quartzite

Outcrops of micaceous quartzite occur at three places in the area. These are at approximately an elevation of 5450 in the central region, on the stream draining the

central portion of the claim area (L88N,51E) and on the north-central hill slope, at L131N, 51+50E. However, angular debris is widespread on both the hill tops and slopes.

The quartzite consists mainly of quartz and subordinate amounts of biotite, sericite and muscovite. It is hard and compact, whitish grey, greyish black to whitish brown in colour. Incipient schistosity is present locally in the quartzite and in places surface weathering gives it a phyllitic appearance.

Phases of the quartzite are amphibolitic, especially in the northwest sector of the property. Three hundred feet south of L128N,82E an area covering about 300'x 400' is strewn with large black angular blocks of amphibolite. It is medium grained and it is composed of about 60 to 70 percent hornblende, 25 to 35 percent feldspar and about 5 percent quartz. Farther to the west on lines 120N and 128N, stations 50E to 70E the quartzites may contain up to 40 percent amphibole.

In the latter area the quartzites have been metamorphosed to a hard hornfelsic unit which contains fractures (1/8" to 1" in width) filled with tremolite and/or quartz. In places these fillings may contain minor amounts of chalcopyrite. The alteration zone will be described more fully later in the report.

Where seen in outcrop (L120N,44E) the quartzites are flat lying to gently dipping (5^{o}) southward.

Marble

Marble is exposed at an elevation of about 4700' at the following locations: L88N,36E, L64N,50E, 200 feet north of L72N,55E and 150 feet north of L128N between stations 51E and 62E. The marble is interbedded with the quartzite and appears to be about 6 to 8 feet thick. An outcrop near L128N,51E indicates that it strikes northeast and dips gently (5 to 7°) to the southeast.

The fresh surfaces of the marble are coarse, crystalline and white.

Nisling Range Volcanics

The Triassic volcanics in the map area are represented by porphyritic to non-porphyritic basalt, andesite, latite and rhyolite. These rocks occupy parts of the west central and north regions of the map area. Rhyolite is the predominant rock type in the west central portion of the claims, whereas latite and andesite are predominant in the north areas.

Basalt

Basalt debris generally occurs mixed with that of andesite, and can be seen at L85N,52E, L133N,51+50E and at 123N,82E. Basalt is probably the most subordinate volcanic rock in the area.

The rock is fine-grained and compact, and varies in colour from ash grey to dark grey. It is generally non-porphyritic, but in some places the presence of phenocrysts of plagioclase feldspar, hornblende and occasionally calcite gives it a porphyritic appearance.

Andesite

The occurrence of andesite dykes and sills are relatively common in the areas occupied by the volcanic rocks.

The rock is dark grey to greyish black in colour and it is generally porphyritic containing phenocrysts of plagioclase and hornblende in a fine to medium-grained matrix. At 125N, 53E, the andesite is cream to whitish grey and appears to have been bleached and chloritized. In places the coarse grained facies of the andesite takes on the appearance of a medium grained granodiorite.

Latite

Latite is common in the north-west and north-central portions of the map area.

The rock is light greenish grey to grey to greyish black in colour, fine grained and cherty in appearance. It generally contains phenocrysts of pink-coloured feldspar, and occasionally hornblende and/or quartz.

Thin, discontinuous chert bands (or chert inclusions) about ½ to 1 cm thick are present in the volcanic rocks of latite-rhyolite composition along line 104N,4E to 8E. The chert appears to have undergone some recrystallization.

Rhyolite

Outcrops of rhyolite are found east of the base line between lines 96N and 104N. Elsewhere, the rhyolite occurs as float which, at some places, is intermixed with quartzite.

A determination made on the attitude of the contact between the rhyolite and quartzite on the west side of the base line at 88N indicates that the rhyolite flow-

quartzite contact strikes 120T and dips 18° south.

Where fresh some of the rhyolite boulders are angular and sharp-edged and give a metallic ring when struck. On the west side of the claims the weathered rhyolite takes on a crumpled appearance and is creamy to brown in colour. On the fresh surface the colour varies from creamy white to light brown to light grey. Phenocrysts of quartz and feldspar are sometimes present in a fine-grained matrix. A porphyritic phase of the rhyolite runs north-westerly between lines 120N and 136N, station 73E. It appears to be a dyke about 100 feet wide. The rock is vuggy and it is composed of phenocrysts of white feldspar (50%) 1/16" - 1/8" long and 10 to 15% smokey, grey, euhedral quartz crystals (1/16 - 1/8" in diameter) in a fine-grained, light grey matrix.

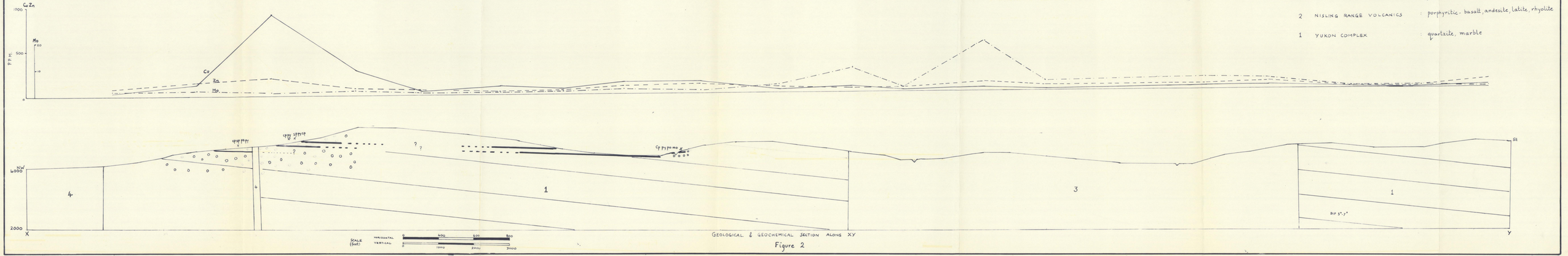
At first sight the outcrop areas of the porphyritic volcanics appear to be distributed erratically. The reason for this is that the outcrops, which frequently occur on the spurs of the hills, are in fact erosional remnants of a series of sills that trend east-west and dip gently to the south (Figure 2).

At least three such sills appear to be present in the northwest sector of the claims. They vary in thickness from about 6 feet to 50 feet and occur intercalated with the quartzites.

Nisling Range Granodiorite

Granodiorite occurs as angular debris in the southeast and north-west portions of the property.

TYR CLAIMS
115-G-16



- as ALTERATION ZONE
- 4 NISLING RANGE ALASKITE : alaskite
- 3 NISLING RANGE GRANODIORITE : granodiorite
- 2 NISLING RANGE VOLCANICS : porphyritic - basalt, andesite, latite, rhyolite
- 1 YUKON COMPLEX : quartzite, marble

GEOLOGICAL & GEOCHEMICAL SECTION ALONG XY

Figure 2

The rock is whitish grey in colour, coarse-grained and contains quartz, feldspar, some biotite and hornblende. Tiny specks of molybdenite the size of a pinhead or smaller, occur rarely in the granodiorite. This is especially true in the southeast intrusion. At several locations northwest trending dykes of granodiorite occur.

Locally, the granodiorite may be altered. The hornblende appears to have been altered to chlorite. Near the south contact of the northwest granodiorite, skarn has developed locally in the Yukon Group.

A north-northwest trending dyke of diorite or quartz diorite is present between L40N,29E and L72N,36E. It is 30-50 feet wide. It is porphyritic, unaltered and darker in colour than the granodiorite. Also the matrix is relatively fine grained and contains more mafic constituents than the granodiorite.

Nisling Range Alaskite

Angular debris of alaskite occupies the region in the extreme north-central and north-east corners of the claim group. This marks the south west edge of a stock which is about 1 mile in diameter. In addition a dyke of this rock strikes northwest and southeast from L136N,60E; it is 50 to 80 feet wide and can be traced in outcrop and debris for about 1000 feet along the spur of the hill. The dyke is projected to continue for another 1000 feet to connect with more alaskite debris to the northwest. Other irregularly spaced areas underlain by angular blocks of alaskite are present on the south side of the northwestern

granodiorite stock.

The fresh rock is light in colour, however its weathered surface is generally crumbly and rusty brown. Frequently the rock is rather porous and contains quartz-lined miarolitic cavities. The mafic content (biotite) is generally less than 10 percent.

Pegmatite

Pegmatite dykes intrude the quartzites in two localities near lines 120N,57E and L128N,55E. They are present as rock debris on the hill sides and it was not possible to determine their attitudes. They are 5 to 10 feet wide, white in colour, they exhibit graphic intergrowths and they are made up exclusively of coarse grained quartz and feldspar.

Quartz Veins

Opaque, white quartz veins are present here and there over the property. For the most part they are barren and occur in the quartzites. However, one 3"-6" wide vein on L48N,42+50E contained 1 to 5% finely disseminated molybdenite and pyrite. The vein occurs on the southwest margin of a granodiorite stock. A sample of the material assayed 0.026% Mo and 0.03% Cu (Table 1).

Structure

Since solid rock outcrops in this area are almost absent, structural trends are hard to define. However, it appears that the property is underlain by quartzite which is flat to gently dipping southward and contains interbedded marble. Much of the volcanics appear to be intercalated with the sediments and erosion of the upland surface has

resulted in the development of erosional remnants of volcanic rocks on the hill tops and their spurs. The northwest attitude of the dykes would indicate that probably some northwest trending fracturation of the rocks has taken place.

Locally the aeromagnetic map* indicates northwest trending highs which probably outline the location of the volcanics in the northeast corner of the property. A westerly lobe on an A-M high in the southeast part of the property marks the location of the granodiorite stock. The quartzites and rhyolite fall within magnetic lows.

Metamorphism and Alteration

The Yukon group has been regionally metamorphosed to the greenschist facies. However, locally, in the vicinity of the porphyry sills and intrusions, the quartzites have been altered metasomatically to a bleached quartzite (e.g. in the vicinity of the Bill zone), hornfels and skarn. A circular alteration zone, about 1800 feet in diameter, is present in the north part of the claims between L120N and L136N.

For the most part the amphibole-rich quartzite in this zone has been altered so that it is now a rather hard, blocky rock (hornfels?) which is cut through by vertical stringers of quartz and tremolite (1/8-2" wide). In places and in the vicinity of the granite dyke and near the south contact of the northwestern granodiorite stock, skarn is present. At the latter location the calc-silicate rocks contain 5 to 20% garnet.

* GSC Map 4329G - Rhyolite Creek, Y.T.

ECONOMIC GEOLOGY

Sulphide mineralization occurs at several localities on this property, the minerals being pyrite, pyrrhotite, chalcopyrite, molybdenite, and sphalerite. Depending on the "environment" (rock types, alteration, etc.) the sulphide mineralization can be grouped into two categories.

1) Mineralization associated with rocks of the Nisling Range Granodiorite

The granodiorite present in the south-east corner of the claim area contains specks of molybdenite which occur along narrow quartz stringers in the rock. Rarely a molybdenite flake 1 cm wide, may be visible. A rock sample (TR18-L52N,70E) of this material analyzed 240 ppm Mo. A vugging quartz vein is present at the western border of the granodiorite near its contact with the quartzite. Small amounts (<1%) of molybdenite and pyrite (5%) are present locally in the quartz vein. A grab sample (TR 26) of this vein material assayed 0.026% Mo and 0.03% Cu (Table 1).

2) Mineralization associated with rocks of the Yukon Group

At several places sulphide mineralization is associated with rocks of the Yukon Group; viz. 400 feet south of L84N,55E, 200 feet south of L128N,53E, 300 feet south of L128N,62E, 400 feet north of L128N,54+50E and on the south side of L136N,61E. The sulphide mineralization is of two types, one is made up of massive sulphides, the other is made up of fracture fillings and disseminations. The massive mineralization may contain masses of pyrrhotite-

sphalerite with minor chalcopyrite (The Bill Zone - 400'S of L84,55E and the Kiwi Zone - 300 feet south of L128N,62E). Also the massive sulphide mineralization may be made up of massive pyrrhotite with chalcopyrite and a trace of sphalerite. This type of occurrence is present 200 feet south of L128,54+50E.

The third type of sulphide mineralization consists of disseminated pyrite, pyrrhotite and chalcopyrite in porphyritic andesite, in altered quartzite (amphibolitic) and in tremolite and/or quartz-filled fractures in the quartzite.

The massive sulphides form a band 6 to 8 inches thick which is interbedded with the quartzites. The sulphide-rich bed is in the altered quartzite between three sills of andesite porphyry (Figure 2). The middle sill near the sulphides is about 4 feet thick, it has been altered and as a result the feldspar phenocrysts are white and cloudy and the matrix appears to have been silicified and chloritized.

The skarnification has probably been caused by the granite and/or granodiorite. Diopside-garnet skarn has been found in the quartzites near their contacts with the intrusions.

Hence, it appears that the massive sulphide showings (Kiwi Zone and Bill Zone) found on this property are actually exposures of an eroded bed that dip gently southward. Superimposed on these rocks has been fracturation, skarnification and near the Bill Zone bleaching of the quartzite has taken place due to the intrusions of the granites and/or granodiorite. Some introduction or remobi-

lization has taken place as chalcopyrite is found (L128N,53E) in some of the tremolite-filled fractures in the amphibole-rich phase of the quartzite and as disseminated grains in the porphyritic andesite (125+50N,54E). The alteration (hornfels and skarn) zone on the north side of the property appears to be about 1800 feet in diameter. In the vicinity of the Bill Zone a dark green coloured skarn is present and the quartzite in the vicinity is bleached and has a white or creamy colour. Rosettes of molybdenite in small glassy quartz stringers are also found in and near the Bill Zone.

The weathered surfaces of the sulphide showings are distinctive because they have a reddish brown to chocolate brown colour.

Grab samples obtained from the various mineralized outcrops were assayed or analyzed geochemically; the results of this analytical work are as follows (Table 1):

Table 1

ANALYSES OF ROCKS FROM SHOWINGS ON TYR GROUP

Sample No.	Location	Rock Type	Cu	Zn	Mo	Pb	Ag
TR26	48N,42+50E	Disseminated molybdenite and pyrite in quartz vein in granodiorite	0.03%	0.01%	0.026%		
TR36	126N,61E)	Massive pyrrhotite sphalerite: 6"-12" bed in altered quartzite	0.22%	21.5%	tr	0.02%	60 ppm
TR37	126N,61E)		0.25%	16.85%	tr		35 ppm
5082-1	126N,53E	6" bed of massive pyrrhotite-chalcopyrite in altered quartzite	1.85%	0.05%	tr		.03 oz/ton
TR18	132N,56E	Massive pyrrhotite chalcopyrite in altered quartzite	2.35%	0.07%	tr		
TR22	86N,54E	Skarn with trace of chalcopyrite	2800 ppm	66 ppm	3 ppm		
P1	85+50N,54E	Massive pyrrhotite with dark green (pyroxene?) mineral	6300 ppm	39 ppm	2 ppm		
P2	"	"	55 ppm	98 ppm	2 ppm		
TR35	125+50N,54E	Porphyritic andesite with disseminated pyrrhotite-chalcopyrite	1430 ppm	41 ppm	1 ppm		
TR17	17N,61E	Granodiorite with Mo specks in quartz stringer	16 ppm	11 ppm	240 ppm		

The sulphide mineralization found on the Tyr group is sufficiently interesting to warrant additional work.

ROCK GEOCHEMISTRY

In addition to the rocks that were assayed, rock geochemistry was carried out on individual samples of various rock types and on composite samples of the major rock units. The latter samples were made up from rock chips picked up by the samplers at each soil sample site. It was felt that the composite samples would provide a statistically reliable background for Cu, Zn and Mo in each of the major rock units of the claim group. The results of these analyses are shown in Table 2.

Table 2

Cu, Zn AND Mo IN COMPOSITE ROCK SAMPLES

Sample No.	Rock Type	Values in ppm Cu	Zn	Mo
TR41	Granodiorite	6	29	8
" 42	Rhyolite	6	50	2
" 43	Basalt	30	104	2
" 44	Latite	11	86	1
" 45	Alaskite	10	64	1
" 47	Quartzite	10	68	2

A study of the results indicate that the background for copper is highest in the basalt (30ppm) and 6 to 11 ppm in the other rocks. Zinc is also highest in the basalt (104 ppm) and lowest in the granodiorite (29 ppm). The granodiorite has a high background in molybdenum (8 ppm) as compared to the other rocks (1 to 2 ppm).

In the individual rock analyses (Appendix I) two

samples of granite TR #6 and TR #24 contained 113 and 106 ppm copper respectively. These samples are located in the vicinity of two sills of porphyritic andesite in which massive sulphides (pyrrhotite-chalcopyrite) and mineralized skarn was found (Table 1 - #s P1, P2 and TR22). It is possible that the granite is related to the Cu mineralization and development of the skarn.

Similarly geochemical analyses of the quartzite, TR34 and TR23, and porphyritic andesite, TR35, in the vicinity of the copper showings on the north part of the property analyzed 60, 71 and 1430 ppm copper respectively. These are well above the average for these rocks

A sample of latite (TR 31) from 122+50N,10E contained 200 ppm zinc. This confirms that the source of the extensive zinc anomaly in the soils here is definitely related to the volcanic rocks.

SOIL GEOCHEMISTRY

Soil samples were collected every two hundred feet on lines spaced 800 feet apart. A total of 1300 samples were collected. The sampling was done to help determine the possible presence of Cu-Mo-Zn mineralization. Every alternate sample was analyzed for Cu, Mo, and Zn at Bondar-Clegg's Laboratory in Whitehorse.

The samples were dried and sieved to -80 mesh and analyzed on a Tectron AA5 atomic absorption spectrometer after digestion with a hot solution of $HCl.HNO_3$.

Soil Horizons

"A" Horizon

The "A" horizon is well developed in most of the claim area. Its thickness varies from 1" to 10" in the non-swampy areas and it may be considerably thicker in the low lying, swampy portions that occur in the valley bottoms and on the gentle slopes.

"B" Horizon

The "B" horizon is well developed in this area. The soil is brown and clayey and is overlain by volcanic ash. The "B" horizon is a few inches below the surface on most hill tops, however it may occur at a depth of 12" to 18" on the lower slopes and in the valleys.

Ash

The volcanic ash layer overlying the "B" horizon in this area is generally 8"-10" thick in the valleys and 4"-6" thick on the hill tops. The ash is white to whitish grey to whitish brown, generally powdery (sand size) and granular. In some places the ash layers appear to be developing another "B" horizon.

Profile Soil Sampling

Two pits were dug to determine the relationship between the metal content and soil horizons. Descriptions and locations of the pits are given below (Table 1)

Table 1

Cu, Zn AND Mo IN SOIL PROFILES

Sample No.	Location	Horizon	Values in pp, Cu	Zn	Mo	Description
Sample Pit No. 1						
9404A	L87N,55E	A_o	66	102	2	0 to 4" thick black poorly decomposed organic matter (80%), clay and silt (20%)
9404B	"	A_1	62	98	2	4" to 6" black, 60% clay, 20% silt, and 20% sand
9404C	"	Ash	11	12	1	6" to 12" whitish grey ash
9404D	"	B(ash)	26	33	2	12" to 14", 50% clay, 10% silt, 40% sand Mixed "B" horizon and ash
Sample Pit No. 2						
9403	L89N,56E	A_o				0-1" undecomposed brown, organic matter
9403A	"	A_1	9	22	1	1"-4" black, 80% undecomposed to semi-decomposed organic material, 20% silt and clay
9430B	L89N,56E	Ash	12	9	nd	4" to 14" ash layer, some "B" horizon developing in ash layer
9403C		B	87	94	2	14" to 20" brown 80% clay, 20% silt

The results of the soil profiles emphasize the need to avoid taking ash samples. The lowest metal values invariably are present in the ash. Some confusion can result where the

ash has started to form its own soil. The ash then becomes brown and could easily be taken for the "B" horizon. However the true "B" horizon is always clayey whereas the ash is sandy. Hence, wherever possible the soils were obtained from the "B" horizon.

Statistics

Histograms have been drawn for Cu, Zn and Mo in the soil and these are shown in Figure 3.

Both Cu and Zn histograms show that their distribution are bimodal.

Background values were established as 50 percent of the non-anomalous population and anomalous values were set at the 97% interval of this grouping. For Cu, Zn and Mo background values have been taken at 35 ppm, 85 ppm and 2 ppm respectively and anomalous values are 70 ppm for Cu, 161 ppm for Zn and 6 ppm for Mo.

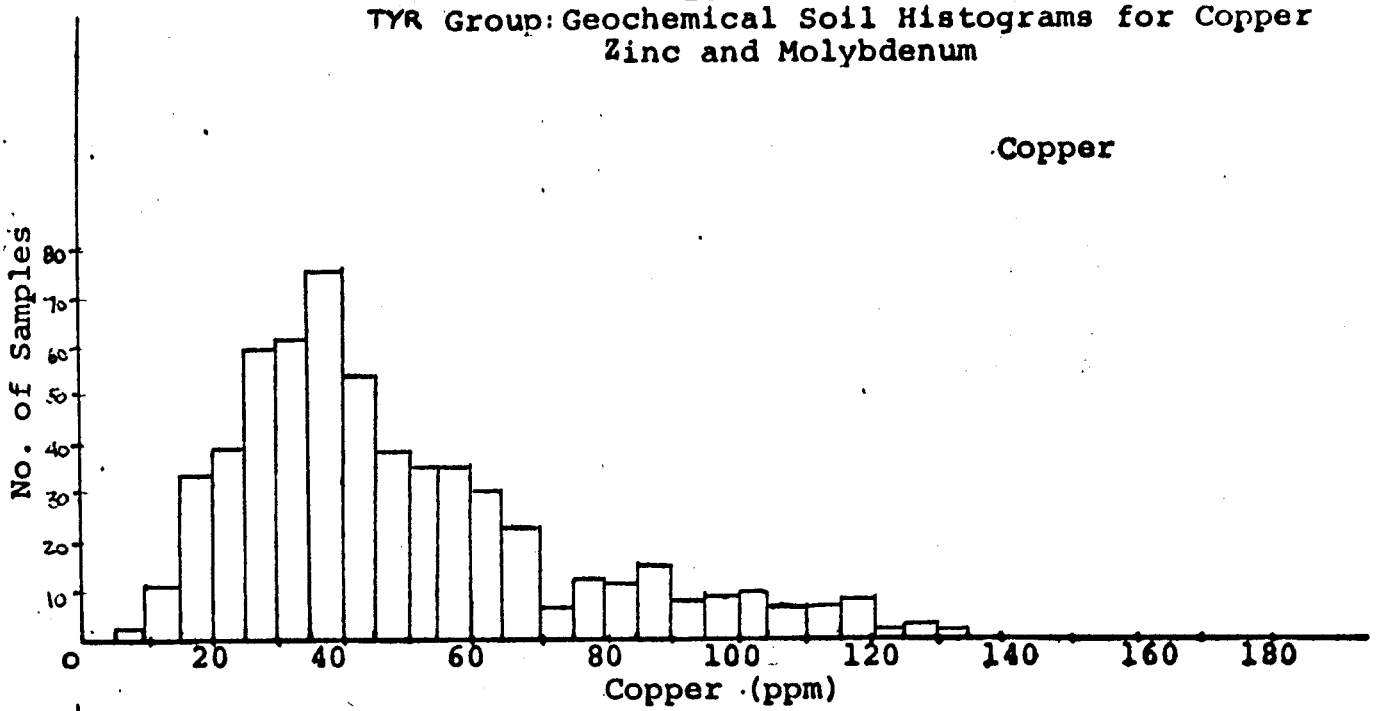
Results

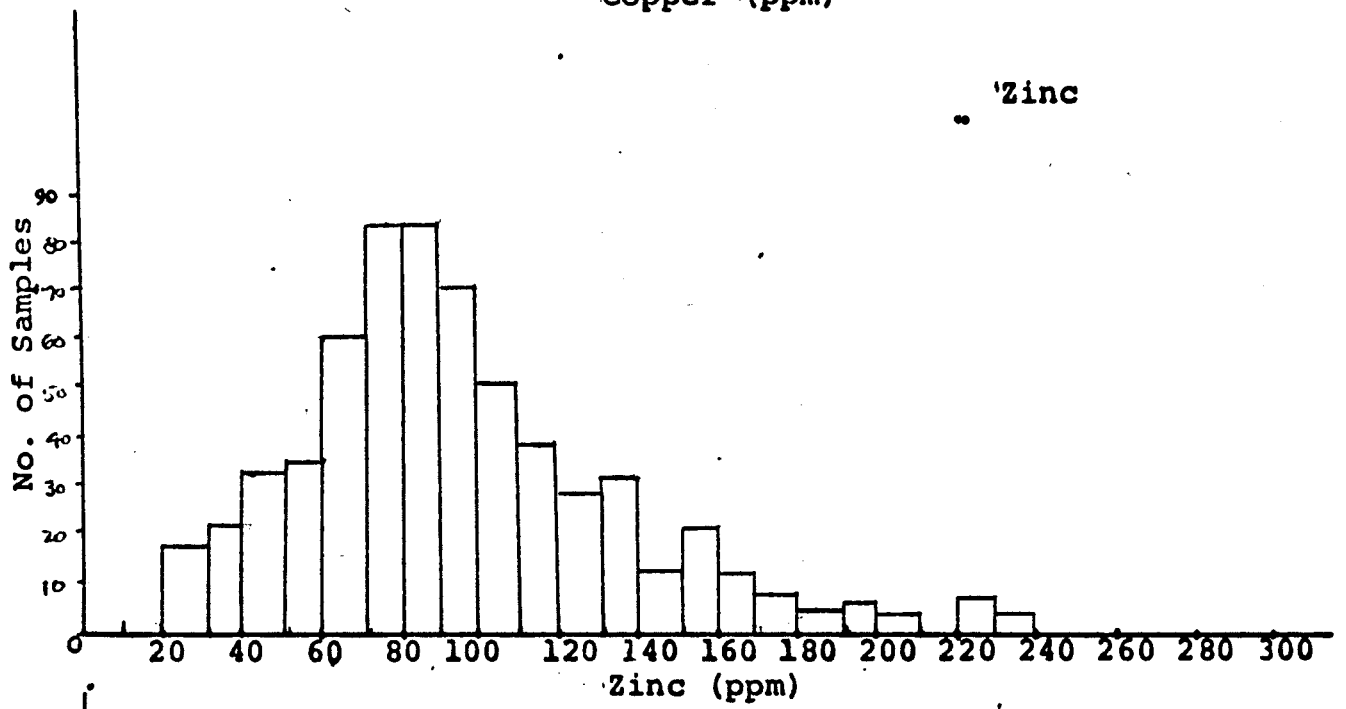
Copper

Copper values in the soil range from 10 ppm to 6900 ppm and average 35 ppm. Copper anomalies occur almost exclusively in terrain underlain by quartzite

A. Two north trending weakly anomalous zones are outlined by the 100 ppm contours in the southwest corner of the property. A circular one (1000 feet in diameter) is present 2000 feet east on lines 40N and 48N and it is on the west side of a diorite dyke. The maximum value for copper here is 187 ppm and the zone is coincident with abnormally

TYR Group: Geochemical Soil Histograms for Copper Zinc and Molybdenum





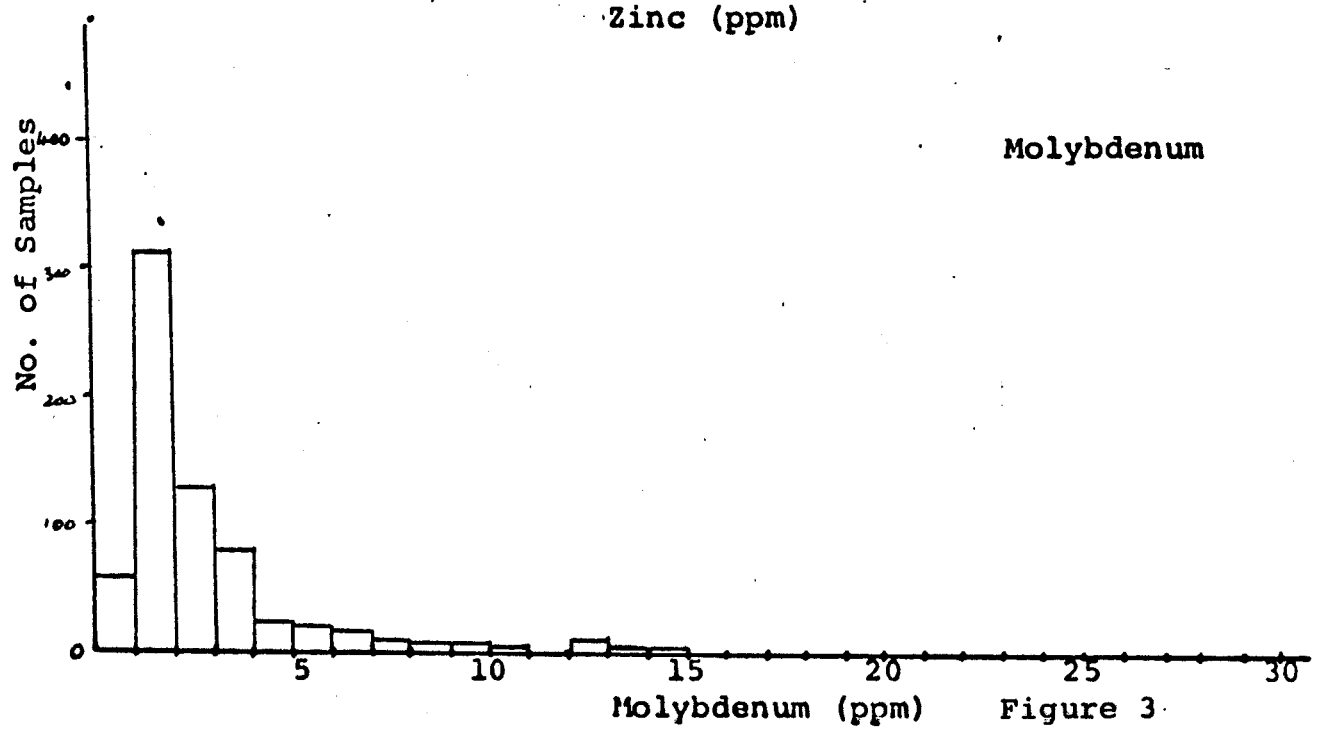


Figure 3

high zine and molybdenum. The above zones occur between elevations of 4500 and 5000 feet.

B. North of the latter is another copper anomaly which trends slightly west and north. The maximum value here is 240 ppm; centered on L80N, station 38E, the anomaly is 200 feet wide and 1000 feet long. It appears to be coincident with the north end of a diorite dyke that cuts the quartzites at 345T.

C. Near the northwest corner of the property is a copper anomaly which measures approximately 1600 feet by 1400 feet as outlined by the 100 ppm contour. The maximum value (960 ppm) occurs on L136N, 30E and the region here is underlain by quartzites and a sill of porphyritic andesite.

D. Just east of the above is a large copper anomaly which measures 4000 feet in a northeasterly direction and it is about 1800 feet wide. Copper in this zone ranges from 100 ppm to 6900 ppm. Values over 1000 ppm are concentrated on L128N between stations 44E and 52E. The anomaly is underlain by an altered (hornfels and skarn) amphibolitic quartzite in which occurs three sills of porphyritic andesite.

The anomaly is related to a 6" to 8" flat bed of massive copper-zinc sulphide mineralization that occurs in the quartzite. A 100 ppm lobe of the anomaly extends southeast to an exposure of what is believed to be the down dip extension of the same bed (Bill Zone, 85N,53E).

In addition chalcopyrite was found in tremolite-filled fractures in the altered quartzites and as disseminations in the porphyritic-andesite of the Kiwi Zone. High Mo and Zn values also occur in the soils of this area.

Assays and analyses of rocks from the showings are listed in the appendix of this report.

The sulphide occurrences, alteration zone and copper anomalies occur between an elevation of 4500 and 5000 feet, therefore basically all of the above anomalies could be caused by the same mineralized horizon where it is being exposed by erosion. However this notion is still somewhat hypothetical and will have to be proven by future work.

Zinc

Zinc values in the soils range from 6 ppm to 2320 ppm and average 85 ppm. Most of the anomalous zones trend northwest and occur over areas underlain by quartzite, rhyolite-latite and in one instance granodiorite.

A. In the southwest corner of the property and coincident with a copper high, is a northwest trending zinc anomaly (3000' x 200 to 1200') which has values that range from 102 to 550 ppm. The zone occurs in terrain underlain by quartzites and its northern extent coincides with a rhyolite-quartzite contact.

B. On L48N,22E a single station zinc high (640 ppm) occurs and it is also coincident with anomalous copper values. The rocks here have been mapped as quartzites and they have been intruded by a porphyritic quartz-diorite dyke (345T).

Its extension is probably outlined by the northerly trending, 100 ppm zinc contour.

C. A soil sample containing 225 ppm zinc forms a circular anomaly (400' x 600') that corresponds to a molybdenum high over the southeastern granodiorite stock.

D. A northwest trending zinc anomaly runs northwest from L128N,84E for 1400 feet and it is about 400-600 feet in width. Zinc values range from 120 to 256 ppm and they are in part coincident with high Mo values. A piece of float containing molybdenite in a glassy quartz stringer in quartzite was reportedly found around L128N,80E. This anomaly is thought to be due to this type of mineralization.

E. Another zone of high zinc values (110-320 ppm) occurs over the rhyolite and extends northwest from station 88N to 112N on the base line and thence northward for 2800 feet. The width of the anomalous zone varies from 400 to 1800 feet. The north end of this anomalous zone is abnormally high in copper and it is underlain by quartzite.

The cause of the zinc anomaly is in part related to the latite as a sample of this rock (122+50N,10E) analyzed 200 ppm zinc.

F. A large Zn anomaly is centered around L128N, 41E to 65E and it is about 1200 to 1800 feet in length. The anomaly is made up of an east part (L128N,59E to 65E) and a west part (L128N,41E to 55E) and occurs in a quartzite with intercalated sills of andesite porphyry. This zinc area also corresponds to an extensive region of high copper values (see copper "D"). The east anomaly is associated

with a band of massive pyrrhotite-sphalerite (Kiwi Zone) in the altered quartzites. The sulphides assayed up to 21.5% zinc. The west part of this anomaly is probably due to similar mineralization. The northerly extensions of these zones probably are caused by hydromorphic transport in the streams and groundwaters.

Further work is warranted in this area.

Molybdenum

Molybdenum values in the soils ranged from 1 to 68 ppm and averaged 2 ppm. Most of the Mo anomalies are associated with the southeastern granodiorite stock. However several anomalies do occur in the quartzites.

A. A weak Mo anomaly (3 to 10 ppm) is associated with a weak Cu anomaly in the southwest corner of the claims. The terrain here is underlain by quartzite.

B. On line 40N,20E Mo values up to 20 ppm occur to form a circular shaped anomaly about 800 feet in diameter. It coincides with a Cu-Zn anomaly and it is underlain by quartzite. A granodiorite stock outcrops 2000 feet to the east and a porphyritic diorite dyke is present 800 feet east of this anomaly.

C. Anomalous molybdenum values occur in the soils along the south, west and north periphery of the southeastern granodiorite stock. There are 7 localities which contain anomalous zones in excess of 10 ppm Mo. The 5 ppm contour trends west from the south part of the granodiorite to the quartzite. The cause of this general trend is not known.

The largest Mo anomaly is in the southeast corner of the stock; its east-west axis is about 2200 feet long and it is 1200 feet wide. Values vary from 11 to 65 ppm. A rock sample of granodiorite (TR 17) from 17N,61E contained disseminated specks of molybdenite along a thin stringer (1/8" wide) of quartz; this sample analyzed 240 ppm Mo. Molybdenite was also found associated with a narrow (2"-3" wide) pyritiferous quartz vein near L48N,42E.

The other Mo anomalies within and along the periphery of this stock are caused probably by similar mineralization.

D A small anomaly (400' x 600') containing 5 to 15 ppm Mo is present on BL #2, north of L128N; this coincides with a zinc high. A piece of float containing molybdenite in a rusty, glassy, quartz vein cutting the quartzites was reportedly found here by the soil sampler. The anomaly is related probably to this type of mineralization.

F. Centered around L128N,50E is a circular Mo anomaly (800' x 600') enclosing values from 7 to 15 ppm. The anomaly coincides with the western end of a strong Cu-Zn soil anomaly. Copper and zinc have been found associated with a bed of massive sulphides (pyrrhotite) in quartzite east of this anomaly (Kiwi Zone). Chalcopyrite occurs also along tremolite and quartz filled fractures in altered quartzite and as disseminations in andesite porphyry. This zone should be investigated further.

Discussion

Follow up work on Cu-Zn-Mo stream sediment anomalies has been successful in outlining Cu-Zn mineralization in altered quartzite and Mo bearing quartz veins and stringers in granodiorite. Several interesting Cu, Zn and Mo anomalies have been found in the soils of this claim group.

Coincident Cu, Zn and Mo anomalies in the north part of the claims are related to Cu-Zn mineralization in quartzites and porphyritic andesite. The sulphides occur as a massive flat bed (6"-8" wide) and as disseminations and fracture fillings in tremolite-quartz filled fractures in an amphibolitic quartzite.

A zone of alteration (skarn and hornfels), 1800 feet in diameter, has been mapped in the mineralized area. The bed in which the Cu-Zn mineralization occurs is horizontal or dips gently (5^{o}) to the south. The favourable stratigraphic horizon appears to occur between an elevation of 4500 and 5000 feet. The 100 ppm contour for copper between these elevations is thought to represent the exposed edge of this bed over the property (Figure 2).

Molybdenum anomalies are related to molybdenite which is present in quartz veins and stringers in the south-eastern granodiorite stock. Outside of the stock glassy, rusty quartz stringers (85N,53E; 130N,80E) in the quartzite also contain medium to coarse grained molybdenite. The latter also have linear Cu-Zn soil anomalies associated with them.

RECOMMENDATIONS

Sixteen additional claims have been added to the north part of the Tyr group. These should be mapped geologically and soil sampled.

Further prospecting is recommended over and near the granodiorite stock in the southeast part of the property. In particular efforts should be concentrated over the molybdenum soil anomalies so that an economic evaluation and the potential of this area can be amde.

Additional lines should be cut at 400 foot intervals and more detailed geology, geochemistry (soil and rock) and prospecting should be carried out over the western half of the property.

To better define geological contacts and to trace the exposed edge of the massive pyrrhotite bed, a magnetometer survey should be carried out. The pyrrhotite in this area is magnetic and should be traceable with a magnetometer. To trace the extent of the disseminated and fracture filling-type copper mineralization an I.P. survey over the western portion of the claims is recommended.

The diamond drilling should then be carried out over the favourable targets outlined by the above work.

Submitted by:

C.F. Gleeson

REGISTERED PROFESSIONAL ENGINEER
PROVINCE OF ONTARIO

C.F. Gleeson, Ph.D., P.Eng.

D.M.S. Bhatia

D.M.S. BHATIA, M.Sc.

Toronto
September 18, 1972

APPENDIX I

Details of Rock Samples and Analysis

Sample No.	Location	Rock Type	Description	Cu	Zn	Mo
TR1	L83N,4W	Rhyolite	Porphyritic with quartz phenocrysts light brown colour	8	60	2
TR5	L87N,36E	Marble	Whitish grey	9	7	8
TR6	L100N,28E	Granite	Medium to coarse grained. Minor Limonite staining	113	40	2
TR7	L94W,25E	Quartzite	Sericitic quartzite with minor pyrite	16	12	1
TR10	97+50N, 23+50E	Basalt dyke	Fine grained, greyish black	23	110	3
TR11	97+50N, 22+00E	Basalt dyke	" probably outcrop	18	75	2
TR12	120N,31E	Andesite Porphyry		6	112	1
TR13	L120N,37E	Andesite porphyry		5	105	1
TR14	124N,74E	Latite/ Rhyolite	Weathered, light greenish grey with quartz porphyry	5	84	1
TR16	L107N,92E	Basalt	Fine grained, ash grey, non-porphyritic	12	136	2
TR17	L17N,61E	Granodiorite	Whitish grey, coarse grained with Mo specks	16	11	240
TR20	100N,40E	Andesite	Fine grained greyish black	8	74	8
TR21	100W,43E	Basalt	Fine grained greyish black	21	98	4
TR22	L86N,54E	Skarn	Contains Cp and Mo in small quantities	2800	66	3

Sample No.	Location	Rock Type	Description	Cu	Zn	Mo
TR23	L86N,54E	Quartzite		39	17	1
TR24	L82N,63E	Granite	Contains specks of pyrite, minor limonite staining	106	22	1
P1	85+50W, 54E	Skarn	Contains chalco-pyrite, pyrrhotite, pyrite and dark green mineral (diopside?)	6300	39	2
P2	85+50W, 54E	Basic dyke		55	98	2
TR25	63+80N 58+50E	Quartz diorite		9	42	1
TR29	104N,5E	Latite	with chert bands	4	29	2
TR30	96N,8E	Rhyolite porphyry		7	13	2
TR31	122+50N,10E	Latite		12	200	3
TR33	118N,57E	Pegmatite		9	11	1
TR34	L123N,47E	Quartzite	with limonite staining and minor pyrrhotite	60	34	1
TR35	125+50N,54E	Porphyritic andesite	containing pyrr-hotite and chalcopyrite and pyrtite	1430	41	1
TR39	88N,104E	Alaskite		22	84	1
TR40	96N,108E	Alaskite		7	95	1
T23	135+75N, 60+75E	Quartzite	quartzite with pyrrhotite,azurite and pyrite	71	62	2
		COMPOSITE SAMPLES				
TR41		Granodiorite		6	29	8
TR42		Rhyolite		6	50	2
TR43		Basalt		30	104	2

Sample No.	Rock Type	Cu	Zn	Mo
TR44	Latite	11	86	1
TR45	Alaskite	10	64	1
TR47	Quartzite	10	68	2

APPENDIX II

Claim Post Data

Claim No.	Post No.	Tag No.	Location	Staker	Date Staked
TYR 1	1	Y63770	14N,27E	N. Glass	Oct. 1, 1971
" 2	1	Y63771			
" 1	2	Y63770	30N,22W	"	"
" 2	2	Y63771			
" 3	1	Y63772			
" 4	1	Y63773			
" 3	2	Y63772	41N,19+50W	"	"
" 4	2	Y63773			
" 5	1	Y63774			
" 6	1	Y63775			
" 5	2	Y63774	55N,12W	"	"
" 6	2	Y63775			
" 7	1	Y63776			
" 8	1	Y63777			
" 7	2	Y63776	68N,5+50W	S. Williams	"
" 8	2	Y63777			
" 9	1	Y63778			
" 10	1	Y63779			
" 9	2	Y63778	84N,0+50E	"	"
" 10	2	Y63779			
" 11	1	Y63780			
" 12	1	Y63781			
" 11	2	Y63780	97N,6E	"	"
" 12	2	Y63781			
" 13	1	Y63782			
" 14	1	Y63782			
" 13	2	Y63782	110N,10E	"	"
" 14	2	Y63783			
" 15	1	Y63784			
" 16	1	Y63785			
" 15	2	Y63784	120N,20E	H.Atkinson	"
" 16	2	Y63785			
" 17	1	Y63786			
" 18	1	Y63787			
" 17	2	Y63786	132N,29E	"	"
" 18	2	Y63787			
" 19	1	Y63788			
" 20	1	Y63789			
" 19	2	Y63788	143+50N,38E	"	"
" 20	2	Y63789			
" 21	1	Y63790	8N,0+00	"	"
" 22	1	Y63791			
" 21	2	Y63790	24N,5E	"	"
" 22	2	Y63791			
" 23	1	Y63792			
" 24	1	Y63793			
" 23	2	Y63792	38N,12E	(W.Atkinson	"
" 24	2	Y63793		(J.Etzel	
" 25	1	Y63794			
" 26	1	Y63795			

Claim No.	Post No.	Tag No.	Location	Staker	Date staked
Tyr25	2	Y63794	51N,16E	J.Etzel	Oct.1, 1971
" 26	2	Y63795			
" 27	1	Y63796			
" 28	1	Y63797			
" 27	2	Y63796	63+50N,23E	"	"
" 29	1	Y63798			
" 30	1	Y63799			
" 29	2	Y63798	76N,30E		
" 30	2	Y63799			
" 31	1	Y63800			
" 32	1	Y63801			
" 31	2	Y63800	90N,36E	L.McKnight	"
" 32	2	Y63801			
" 33	1	Y63802			
" 34	1	Y63803			
" 33	2	Y63802	103N,41E	"	"
" 34	2	Y63803			
" 35	1	Y63804			
" 36	1	Y63805			
" 35	2	Y63804	116N,49E	"	"
" 36	2	Y63805			
" 37	1	Y63806			
" 38	1	Y63807			
" 37	2	Y63806	126N,59E	"	"
" 38	2	Y63807			
" 39	1	Y63808			
" 40	1	Y63809			
" 39	2	Y63808	136N,64E	"	"
" 40	2	Y63809			
" 41	1	Y63810	3S,27E	D.Plaster	"
" 42	1	Y63811			
" 41	2	Y63810			
" 42	2	Y63811			
" 43	1	Y63812	12N,31E	"	"
" 44	1	Y63813			
" 43	2	Y63812	23N,35E	"	"
" 44	2	Y63813			
" 45	1	Y63814			
" 46	1	Y63815			
" 45	2	Y63814	36N,41E	J.Burnet	
" 46	2	Y63815			
" 47	1	Y63816			
" 48	1	Y63817			
" 47	2	Y63816	49N,46E	"	"
" 48	2	Y63817			
" 49	1	Y63818			
" 50	1	Y63819	65N,53E	"	"
" 49	2	Y63818			
" 50	2	Y63819			
" 51	2	Y63820			
" 52	2	Y63821			

Claim No.	Post No.	Tag No.	Location	Staker	Date staked
TYR51	2	Y63820	75N,58E	J.Burnet	Oct.1, 1971
" 52	2	Y63821			
" 53	1	Y63822			
" 54	1	Y63823			
" 53	2	Y63822	86N,64E	A.Harman	"
" 54	2	Y63823			
" 55	1	Y63824			
" 56	1	Y63825			
" 55	2	Y63824	103N,69E	"	"
" 56	2	Y63825			
" 57	1	Y63826			
" 58	1	Y63827			
" 57	2	Y63826	116N,74E	"	"
" 58	2	Y63827			
" 59	1	Y63828			
" 60	1	Y63829			
" 59	2	Y63828	127N,83E	"	"
" 60	2	Y63829			
" 61	1	Y63830	12+50S,52E	W. Atkinson	"
" 62	1	Y63831			
" 61	2	Y63830	2S,52E	L.Plaster	"
" 62	2	Y63831			
" 63	1	Y63832			
" 64	1	Y63833			
" 63	2	Y63832	12N,65E	"	"
" 64	2	Y63833			
" 65	1	Y63834			
" 66	1	Y63835			
" 65	2	Y63834	25N,68E	"	"
" 66	2	Y63835			
" 67	1	Y63836			
" 68	1	Y63837			
" 67	2	Y63836	36N,73E	"	"
" 68	2	Y63837			
" 69	1	Y63838			
" 70	1	Y63839			
" 69	2	Y63838	44N,77E	(A. Harman	"
" 70	2	Y63839		(R.Conant	
" 71	1	Y63840			
" 72	1	Y63841			
" 71	2	Y63840	63N,82E		"
" 72	2	Y63841			
" 73	1	Y63842			
" 74	1	Y63843			
" 73	2	Y63842	75N,89E	R.Connant	"
" 74	2	Y63843			
" 75	1	Y63844			
" 76	1	Y63845			
" 75	2	Y63844	84N,95E	"	"
" 76	2	Y63845			
" 77	1	Y63846			
" 78	1	Y63847			
" 77	2	Y63846	98N,103E	"	"
" 78	2	Y63847			

Claim No.	Post No.	Tag No.	Location	Staker	Date Staked
TYR 79	1	Y63848			
" 80	1	Y63849			
" 79	2	Y63848	116N,104E	R. Connant	Oct. 1, 1971
" 80	2	Y63849			

T.N.

M.N.

30°38'

SAMPLE NUMBER Cu / Mo / Zn

ANAMOLOUS SAMPLE

PROBABLY ANAMOLOUS SAMPLE

SAMPLE BEGIN WITH NUMBER 9001

Claim (post, Line)

Stream

Contours 5000

Showing x

Rock samples

Organic Samples A

	Cu	Zn	Mo
Background	35	85	2 ppm
Anomalous	70	161	6 ppm

CANADIAN OCCIDENTAL PETROLEUM LTD.

115-G-16

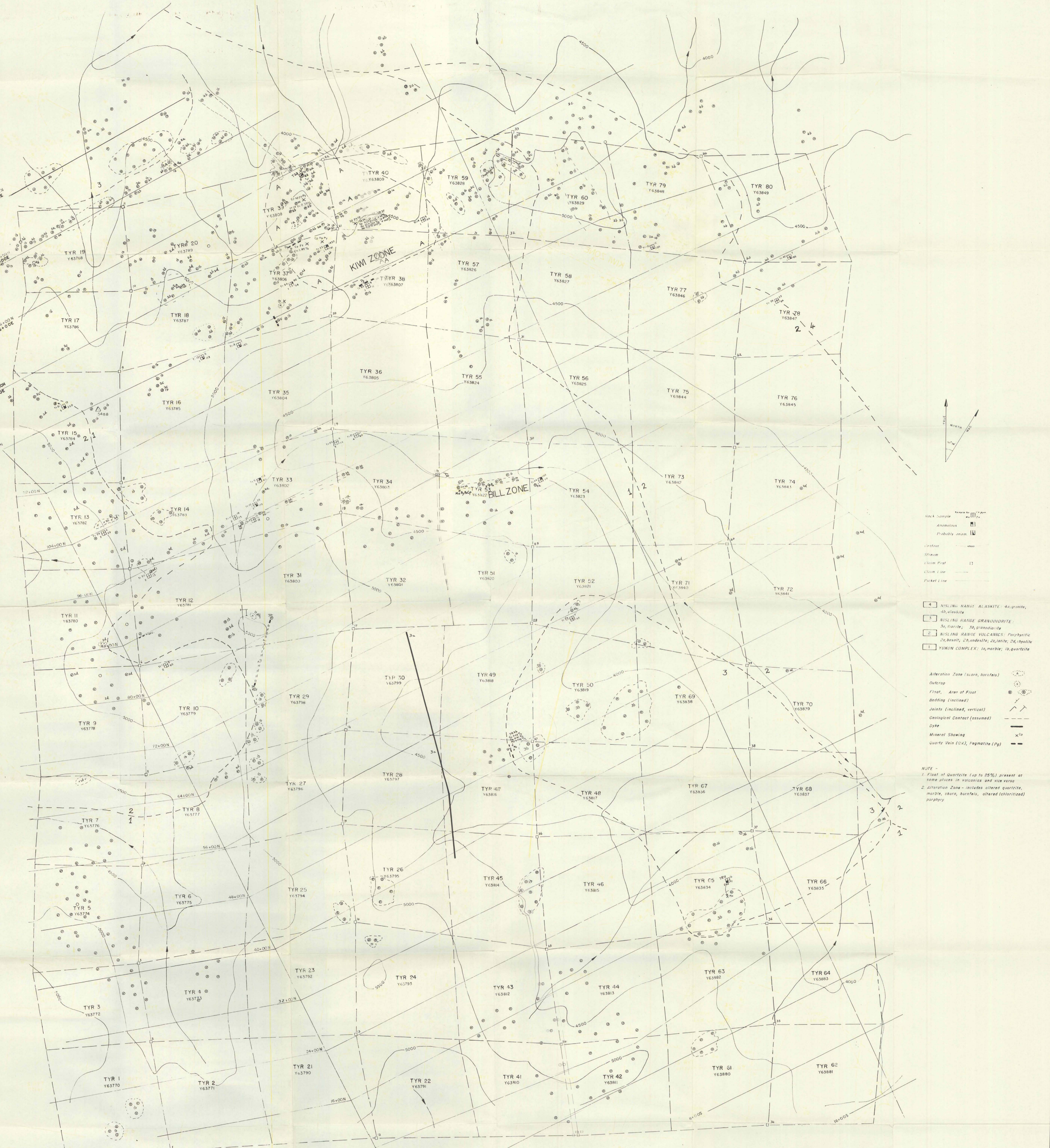
Dwarf Birch Creek Y.T.

TYR CLAIMS 1-80
GEOCHEMISTRY

Scale: 1" = 400' Date: July 24, 1972

Data By: C.F. Gleeson & D.M.S. Bhatia

200 0 200 400 600 FEET



CANADIAN OCCIDENTAL PETROLEUM LTD.
115-G-16

Dwarf Birch Ck. Y. T.

TYR CLAIMS 1-80
GEOLOGY

Data by: D.M.S. Bhatia & C.F. Gleeson Date: July 24, 1972

200 0 200 400 600 FEET

Mineral showing x
Geological contact (assumed)
Dyke
Stream
Contours
elevation 4500
copper
zinc
molybdenum

4 NISLING RANGE ALASKITE: 4a, granite, 4b, alaskite
3 NISLING RANGE GRANODIORITE: 3a, diorite; 3b, granodiorite
2 NISLING RANGE VOLCANICS: Porphyritic 2a, basalt; 2b, andesite; 2c, latite; 2d, rhyolite
1 YUKON COMPLEX: 1a, marble; 1b, quartzite

CANADIAN OCCIDENTAL PETROLEUM LTD.
115-G-16

Dwarf Birch Ck. Y. T.

TYR CLAIMS 1-80
GEOLOGY & GEOCHEMISTRY
(COMPILATION)

Data by: D.M.S. Bhatia & C.F. Gleeson Date: July 24, 1972

200 0 200 400 600 FEET