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CONSULTING GEOLOGIST . . . PROFESSIONAL ENGINEER
P.O. Box 566
WHITEHORSE, YUKON TERRITORY
"LAND OF THE MIDNIGHT SUN"

GEOLOGICAL, GEOCHEMICAL AND GEOPHYSICAL REPORT

ON THE

APEX 1-40 (Y49679-Y49718), APEX 41-72 (Y52957-Y52988)

PAT 1-24 (Y40407-Y40430)

KOOK 101-164 (Y38873-Y38936), KOOK 165-172 (Y52991-Y52998)

MINERAL CLAIMS

DAWSON RANGE AREA

YUKON TERRITORY

LATITUDE 62° 30' N

LONGITUDE 138° 00' W

N.T.S. DESIGNATION

115-I-5 115-I-12

115-J-8 115-J-9

WHITEHORSE MINING DIVISION

-- JULY 7th to AUGUST 11th, 1970 --

BY

G.G. CARLSON, GEOLOGIST
R.G. HILKER LIMITED
WHITEHORSE, YUKON TERRITORY

UNDER THE SUPERVISION OF
R.G. HILKER, P.ENG.

OCTOBER 30, 1970

RECEIVED
5 NOV 1970
MINING
RECORDERS OFFICE
WHITEHORSE, Y.T.

RECEIVED
NOV 5 1970
MINING
INSPECTORS OFFICE
WHITEHORSE, Y.T.

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 $ 51,130.13

R. G. Reedham

Resident Geologist or
Resident Mining Engineer

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

[signature]

Commissioner of Yukon Territory

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INTRODUCTION

During late 1969 and early 1970, a total of 128 claims, the Apex, Pat and Kook claim groups, were staked in the Hayes Creek area of the Dawson Range, Yukon Territory, by Montana Mines Ltd. (N.P.L.). On May 12th, 1970, the claims were visited by F.M. Smith, area geologist for Phelps Dodge Corporation of Canada Ltd., accompanied by B. Fulcher, geologist for Montana Mines Ltd. (N.P.L.). During this visit, copper mineralization was discovered on the property. The claims were subsequently optioned by Phelps Dodge Corporation of Canada Ltd. for the purpose of primary exploration work. As part of the agreement, Montana Mines Ltd. (N.P.L.) staked an additional 40 claims which adjoined the Kook and Apex claim groups.

In early June 1970 a camp was established on the lower part of Apex Creek. From this camp, a crew from Phelps Dodge Corporation of Canada Ltd. located claim posts, carried out reconnaissance geological investigations, and supervised the line cutting of 120 linemiles of grid over the three claim groups.

On July 7th, 1970, a crew from R.G. Hilker Limited arrived at a new campsite on Apex Creek located near the centre of the linegrid. Part of the crew was mobilized from a camp near the Casino airstrip, while the other half arrived from Whitehorse via the Minto airstrip. A program of geological mapping, soil sampling and magnetics was carried out over the entire line grid. On August 11th, 1970, the crew and camp gear were returned to Whitehorse via the Minto airstrip.

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This report describes the field investigations carried out and interprets the data collected. It is submitted for the purpose of assessment work on the Apex, Kook and Pat claim groups, in the Dawson Range area, Claim Sheets Nos. 115-I-5, 115-I-12, 115-J-8 and 115-J-9, Whitehorse Mining Division, Yukon Territory, on behalf of Phelps Dodge Corporation of Canada Ltd.

It is requested that information in this report remain CONFIDENTIAL.

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LIST OF PERSONNEL

The following personnel of R.G. Hilker Limited were directly involved in the geological, geochemical and geophysical program on the Apex, Kook and Pat claim groups:

Name	Address	Position
R.G. Hilker, P.Eng.	Box 1566 Whitehorse, Y.T.	Consulting geo- logist - supervision
G.S. Zimmer	Box 1293 Whitehorse, Y.T.	Geologist - mapping and supervision
G.G. Carlson	Box 548 Whitehorse, Y.T.	Geologist - super- vision and report preparation
G.R. McMurray	422 Froom Cresc. Regina, Sask.	Student geologist - mapping
B. Slater	Rm. 017 Rundle Hall Univ. of Calgary Calgary, Alberta	Magnetometer Operator *
G. Hillson	St. Andrew's Coll. Saskatoon, Sask.	Soil sampler *
J. Greer	Box 422 Whitehorse, Y.T.	Soil sampler *
A. Ashton	Box 56 Parry, Sask.	Soil sampler *
N. Marty	6216 - 150th St. N. Surrey, B.C.	Soil sampler *
T. Silvester	Box 103 Whitehorse, Y.T.	Cook
Miss M. Metcalfe	Box 153 Whitehorse, Y.T.	Draftsman

* Note: The soil samplers were fully trained by R.G. Hilker Limited previous to this project. The magnetometer operator, with previous experience in other types of geophysical surveys, was trained on the job.

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The following personnel of Phelps Dodge Corporation of Canada Ltd. and Eastern Associates Reg.'d were involved on the property in the reconnaissance work and linecutting:

Name	Address	Position
B. Vanderkamp	c/o Ph. Dodge	Geologist - field supervision
L. Watt	c/o Ph. Dodge	Student geologist
B. Jolliffe	c/o Ph. Dodge	Student assistant
A. Williams	c/o Ph. Dodge	Student assistant
R. Voisine	Eastern Assoc. Reg. Box 3245 Whitehorse, Y.T.	Linecutter
L. Roy	"	Linecutter
G. Desautels	"	Linecutter
P. Laramée	"	Linecutter
L. Boucher	"	Linecutter

The interpretation of the magnetometer survey has been prepared by Mr. J.H. Ratcliffe, P.Eng., Chief Geophysicist, Phelps Dodge Corporation of Canada Ltd.

LOCATION AND ACCESS

The Dawson Range lies in the west central part of the Yukon, between latitudes 62° 00' and 62° 45' north and longitudes 137° 00' and 140° 00' west. The range trends approximately N 45° W, with a length of about 110 miles and a width of 20 miles. It is roughly parallel to the Yukon River, which lies to the north and east, and is cut off by the White River on the northwest, and by the Donjek and Nisling Rivers on the southwest. Physiographically, it is bounded by the Klondike Plateau to the north and by the Lewes Plateau to the southwest.

The Apex, Kook and Pat claim groups are located at approximately 138° 00' west longitude and 62° 30' north latitude. The groups are to the north and east of Apex Mountain and west of Hayes Creek. Apex Creek, a tributary of Hayes Creek, runs through the centre of the claim groups. This is in the south-east half of the Dawson Range, approximately half-way between the Casino and Minto airstrips. The claims are located within the Whitehorse Mining Division, Yukon Territory, on Claim Sheets 115-I-5, 115-I-12, 115-J-8 and 115-J-9.

Access to this area has opened up somewhat as a result of the Casino Mines discovery and the subsequent rush of exploration activity. Several winter roads and tractor-trails have been developed, both from the Alaska Highway north of Kluane Lake and from the Yukon River north and east of the area. However,

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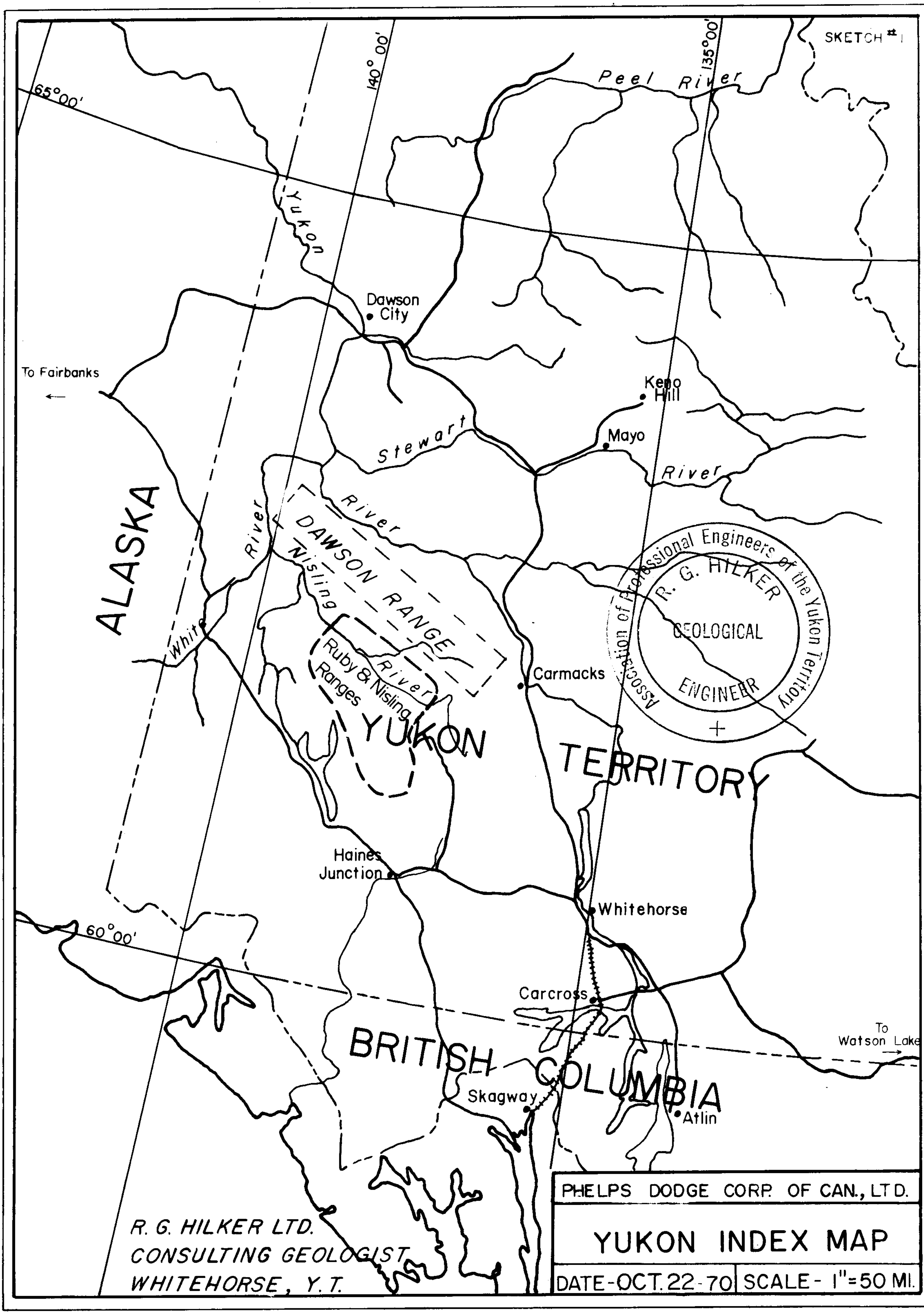
at present none of these roads are located near the Apex property. Best access is by truck from Whitehorse to the Minto airstrip, at Mile 131 on the Whitehorse-Keno Road, and by helicopter from there to the claim groups. Trans North Turbo Air has been maintaining one or more helicopters in this area which may be chartered on a casual basis.



PHELPS DODGE CORP. OF CAN., LTD.

YUKON INDEX MAP

DATE - OCT. 22 - 70 | SCALE - 1" = 50 MI.

R. G. HILKER LTD.
CONSULTING GEOLOGIST
WHITEHORSE, Y. T.

CLAIMS

The following information on the Apex, Kook and Pat claim groups was obtained from the records in the Whitehorse Mining Recorder's Office, on September 24th, 1970, by G.G. Carlson:

Claims	Grant Nos.	Anniversary Date	Recorded Owner
Apex 1-8 (incl.)	Y49679-Y49686 (incl.)	Feb. 2/71	Phelps Dodge Corp. Canada
Apex 9-16 (incl.)	Y49687-Y49694 (incl.)	Feb. 2/71	Phelps Dodge Corp. Canada
Apex 17-24 (incl.)	Y49695-Y49702 (incl.)	Feb. 2/71	Phelps Dodge Corp. Canada
Apex 25-32 (incl.)	Y49703-Y49710 (incl.)	Feb. 2/71	Phelps Dodge Corp. Canada
Apex 33-40 (incl.)	Y49711-Y49718 (incl.)	Feb. 2/71	Phelps Dodge Corp. Canada
Apex 41-48 (incl.)	Y52957-Y52964 (incl.)	June 25/71	Phelps Dodge Corp. Canada
Apex 49-56 (incl.)	Y52965-Y52972 (incl.)	June 25/71	Phelps Dodge Corp. Canada
Apex 57-64 (incl.)	Y52973-Y52980 (incl.)	June 25/71	Phelps Dodge Corp. Canada
Apex 65-72 (incl.)	Y52981-Y52988 (incl.)	June 25/71	Phelps Dodge Corp. Canada
Pat 1-8 (incl.)	Y40407-Y40414 (incl.)	Nov. 24/70	Phelps Dodge Corp. Canada
Pat 9-16 (incl.)	Y40415-Y40422 (incl.)	Nov. 24/70	Phelps Dodge Corp. Canada
Pat 17-24 (incl.)	Y40423-Y40430 (incl.)	Nov. 24/70	Phelps Dodge Corp. Canada

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Claims	Grant Nos.	Anniversary Date	Recorded Owner
Kook 101-108 (incl.)	Y38873-Y38880 (incl.)	Oct. 22/70	Phelps Dodge Corp. Canada
Kook 109-116 (incl.)	Y38881-Y38888 (incl.)	Oct. 22/70	Phelps Dodge Corp. Canada
Kook 117-124 (incl.)	Y38889-Y38896 (incl.)	Oct. 22/70	Phelps Dodge Corp. Canada
Kook 125-132 (incl.)	Y38897-Y38904 (incl.)	Oct. 22/70	Phelps Dodge Corp. Canada
Kook 133-140 (incl.)	Y38905-Y38912 (incl.)	Oct. 22/70	Phelps Dodge Corp. Canada
Kook 141-148 (incl.)	Y38913-Y38920 (incl.)	Oct. 22/70	Phelps Dodge Corp. Canada
Kook 149-156 (incl.)	Y38921-Y38928 (incl.)	Oct. 22/70	Phelps Dodge Corp. Canada
Kook 157-164 (incl.)	Y38929-Y38936 (incl.)	Oct. 22/70	Phelps Dodge Corp. Canada
Kook 165-172 (incl.)	Y52991-Y52998 (incl.)	June 26/71	Phelps Dodge Corp. Canada

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G E O L O G Y

REGIONAL GEOLOGY - DAWSON RANGE

The Dawson Range occurs in the physiographic Yukon Plateau Province. It is a mountainous terrain, with peaks rising more than 2,000 feet from the level of the plateau, and elevations within the range varying from 3,000 feet to 6,600 feet. Almost all of the area has been left completely untouched by recent glaciation. Accordingly, the outcrops, which predominate on the mountain tops and ridges, are quite irregular. Exposed rocks are highly jointed, fractured and weathered due to frost action and wind erosion. Overburden may reach thicknesses greater than 50 feet in the lower areas, restricting outcrop occurrences to the steeper valley slopes.

The predominant rocks in the area consist of the Upper Cretaceous Coastal Intrusive granites which form a batholith intruding the Yukon Group of sediments, Precambrian/Palaeozoic in age. These are also in contact with the Jurassic Mount Nansen group of volcanics and sediments. The Tertiary Carmacks volcanics overlie all of the earlier rocks in some areas.

The following is a general summary of the granitic rock types which occur in the coast range intrusive:

1. Granite Porphyry - composed of 40% orthoclase feldspar and 30% smokey quartz with biotite, augite and minor magnetite. Generally jointed and fractured and weathers a rusty brown color.
2. Granodiorite Porphyry - composed of 50 to 60% orthoclase

feldspar, 10 to 15% plagioclase feldspar, 15% clear quartz, augite, biotite and minor magnetite. Occurs in the Casino Creek area and is characterized by large phenocrysts.

3. Granodiorite - composed of 60% orthoclase feldspar and 20% plagioclase feldspar with augite and biotite. Fine to medium-grained texture.

4. Diorite - composed of plagioclase and orthoclase feldspar with approximately 30% augite and biotite.

5. Quartz Monzonite - composed of 50% plagioclase feldspar, 10 to 15% orthoclase feldspar, 15% clear quartz, augite and fine to coarse crystalline biotite.

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TABLE OF FORMATIONS

CENOZOIC

Quaternary

[Q] - Alluvium, volcanic ash, ground ice.

Tertiary

Carmacks Volcanics

[9] - Thick flows, basalt, amygdaloidal flows, top of flows breccia, local brecciation and porphyritic flows.

MESOZOIC

Jurassic - Upper Cretaceous

Coastal Intrusives

[8] - Granite, granodiorite, quartz-monzonite, porphyry and breccia, altered (ore host rock).

[7] - Syenite and monzonite.

[6] - Diorite and gabbro.

Mount Nansen Group

[5] - Basalt, andesites and dacite flows, breccias and tuffs. Green-black color, contains sedimentary rocks consisting of sandstone, siltstone, pyritic arkose and argillites. Bands and bedding distinct.

Tantalus Formation

[4] - Conglomerate, sandstone, shale and coal seams.

Jurassic

[3] - Laberge Group

Triassic

[2] - Granite, monzonite.

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PRECAMBRIAN & LATER

Yukon Group

[1] - Limestone, shale, mica-quartz schist, chlorite schist, quartzite.

After Bostock: G.S.C. Paper 44 - 34.

REFERENCE TO PUBLISHED GEOLOGY

The following listed publications and geological maps contain geological information in select areas of the Dawson Range, and reference was made to the information in the preparation of this report for Phelps Dodge Corporation of Canada Ltd.:

1. D.D. Cairns 1916 - Klotassin Yukon Territory No. 1702, Geology Map, scale 1" = 2 mi. Canada Department of Mines Geological Survey, 1918.
2. H.S. Bostock 1944 - Paper 44-34 Preliminary Map, Selwyn River, Yukon - Canada Department of Mines and Technical Surveys.
3. H.S. Bostock 1936 - Memoir 189 - Carmacks District, Yukon - Geological Survey of Canada - Department of Mines and Technical Surveys.
4. J.R. Johnston 1937 - Memoir 214 - Geology and Mineral Deposits of Freegold Mountain, Carmacks District, Yukon - Geological Survey of Canada - Department of Mines and Technical Surveys.

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CLAIM GEOLOGY - FIELD METHODS

Geological mapping was carried out at a scale of 1" = 400 ft. over the entire 120 linemiles of grid system, using the picketed lines for survey control. Bedrock exposures occupy only a small portion of the total area mapped. This region has not been affected by glaciation, and most boulders are frost-heaved vertically. The rock frost-heaving is a common feature in the Yukon Territory and northern areas of extreme temperatures. These frost-heaved boulders have been mapped, both individually and as boulder trains. The resulting definition of geological boundaries will not be exceedingly accurate, but it should be adequate for the general purposes for which it is intended.

During the mapping program, all claim posts encountered were tied in to the grid, streams were mapped, and general vegetation noted.

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CLAIM GEOLOGY - DESCRIPTION

The Apex, Kook and Pat claim groups were staked largely over the Dawson Range batholith, consisting mainly of granitic intrusives. This has been confirmed by the geological mapping, with several different phases of the intrusive being defined. The intrusive body is bordered on the east edge of the grid area by Yukon Group sediments and on the south by a large body of volcanics. The volcanics are considered to be Tertiary aged Carmacks Volcanics and occur south of the linegrid and extend over Apex Mountain. These volcanics are considered to be flows capping the Jurassic-Upper Cretaceous aged Coastal Intrusives. Offshoots of these rock types within the major intrusive are not abundant, except in the vicinity of the main contacts. However, small xenoliths, up to 5 inches in diameter, of both metasedimentary and igneous rocks, are found throughout the intrusive body.

The majority of the intrusive consists of a coarse-grained hornblende quartz monzonite (Unit 2) with the following average composition:

quartz	20%
orthoclase ...	35%
plagioclase ..	20%
hornblende ...	20%
biotite	5%

This rock is generally fresh, sometimes with minor limonitic stain, and is typified by large hornblende phenocrysts, up to 15 mm. on the long axis.

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Minor intrusives (Unit 3) include monzonite, quartz granite, rhyolite, dacite, latite and granite, rhyolite, quartz monzonite, monzonite and latite porphyries. Descriptions of these rocks appear in the Appendix. They are fine to medium grained and predominantly more leucocratic than the main intrusive. These rocks are limonitic stained and pyrite was identified in several specimens. The relation between the major and minor granitic intrusives is uncertain, but the minor intrusives appear to be younger. They could be products of magmatic segregation during the intrusion of the main body, or, more likely, separate intrusive bodies. No distinct contacts have been defined.

The most recent rocks in the area include both acid and basic dikes. These may be associated with the later stages of the Coastal intrusives or the Tertiary Carmacks volcanics. None of these dike rocks are particularly abundant through this area.

Very little structure was observed during the mapping program due to the lack of actual outcrop. A few measurements of joint planes were taken. These roughly indicate northeasterly and northwesterly near-vertical trends.

Two occurrences of copper mineralization were discovered. The first is located at approximately 14+00E; 19+50N, and consists of chalcopyrite and bornite disseminated in a quartz

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stringer that was a few inches in width, within the intrusive. Minor copper staining is visible in the intrusive in the immediate area. A large zone of Yukon Group schists and gneisses, possibly along the main intrusive-sediment contact, has been mapped a few feet to the north and east of the showing, and it appears that the copper mineralization is caused by the contact zone effect.

The second showing is located at 133+00W and 56+00S and consists only of a trace of disseminated chalcopyrite in a boulder of medium-grained secondary granitic intrusive. This mineralization is quite probably derived from the Carmacks Volcanics which occur to the south.

The Carmacks Volcanics, as mapped on the southern boundary of the linegrid, may belong to the Mount Nansen Volcanics group. The Carmacks Volcanics were inferred based on amygdaloids and om uniform composition where observed south of the various lines. F.M. Smith when mapping on the south-east side of Apex Mountain identified the volcanics to be Mount Nansen, due to the variety of composition of the flows. Detailed mapping of the volcanics was not done to the south of the linegrid and perhaps only a lower volcanic flow with uniform composition was observed.

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TABLE OF FORMATIONS

CLAIM GEOLOGY

CENOZOIC

Tertiary

Carmacks Volcanics

[5] - Basalt, andesite, etc.

MESOZOIC

Jurassic-Upper Cretaceous

Coastal Intrusives

[4] - Intrusive dikes.

- [4a] - acid dikes: rhyolite to latite.
- [4b] - basic dikes: diorite to gabbro.

[3] - Minor intrusives.

- [3a] - monzonite.
- [3b] - quartz granite, rhyolite, dacite, latite.
- [3c] - porphyry: granite, rhyolite, quartz monzonite, monzonite, latite.

[2] - Hornblende quartz monzonite.

PRECAMBRIAN

Yukon Group

[1] - Quartzite, biotite gneiss, schist, etc.

GEOCHEMICAL SURVEY

INTRODUCTION

The systematic sampling of soils and the subsequent analysis of these samples for trace amounts of copper and molybdenum has been successfully used throughout the Cordilleran region in the search for porphyry-type copper-molybdenum mineralization. This success has been extended to the Dawson Range, where several mineralized zones, including the Casino Silver Mines deposit, have been outlined by this technique.

For the successful application of a soil sampling survey, however, a careful study of all factors which might affect the geochemical characteristics of the soils, referred to here as the geochemical environment, must be undertaken. This environment is defined mainly by the characteristics of the soil. Basically, two distinctly different environments exist in the Dawson Range area, which are described below.

The "slope" environment exists mainly on slopes steeper than 5° and on the hill and ridge tops. The soil is residual or it has been transported a short distance down slope, and is composed mainly of weathered bedrock. A thin layer of humus and partially decomposed organic material may form the surface horizon. Vegetation may be completely lacking, but generally moss, grass and buckbrush are prominent, with minor spruce. Drainage in these areas is good, due to the slope and the general permeability of the soils.

The "bench" environment, by far the most predominant in this area, occurs over most of the flat or gently sloping areas. Here a thick humus, almost muskeg layer, has developed over the underlying soils. Drainage is poor, and the ground is often frozen quite close to surface. Vegetation consists of thick moss and grass with buckbrush and minor spruce. The underlying soils consist of alternating clay-rich and sand-rich horizons, which are partly colluvial (transported by gravity) and partly alluvial (transported by water).

A third environment, "intermediate", describes the transition zone between the two main environments. This zone may be absent, but it is often quite extensive.

Soil sampling conditions in "slope" areas are generally very good, except on very steep slopes where talus is often abundant. The "bench" environment, however, presents sampling difficulties. The humus layer is often very thick and hard to penetrate, especially if it is frozen at depth. A meaningful sample from this area, though, must be completely humus-free. As a result, during the survey, several "No Sample" stations were encountered. Here, the ground in the vicinity of the station is either frozen or swampy, and a humus-free sample could not be obtained.

The soil samples are taken from what is probably the upper "C" soil horizon, or the layer directly beneath the surface

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humus-rich "A" horizon. As the soils in this area have been transported only a short distance from the parent bedrock source, the samples collected are expected to reflect fairly accurately metal abundances in bedrock in the general vicinity.

FIELD METHODS

The soil sampling program was carried out using four samplers. Samples were taken along the baseline and all crosslines at 100-foot intervals. Sample material was taken, wherever possible, from the upper sand or clay soil horizon, at least a few inches below the upper humus layer ("A" horizon) using a 2½-lb. grubhoe. The sample material was collected in a pre-numbered Kraft paper sample bag, while notes on location, soil color and type, slope and grade direction, vegetation and any other pertinent data, were taken at each station. The samples were strung on wire, with approximately 30 samples per string, and hung at camp for partial drying.

All creeks encountered were noted and the pH was tested using Fisher Scientific Company alkacid test ribbon, which ranges from pH 2 to pH 10. In addition, pH determinations were carried out at camp on sample material from every second station on the Base Line, L160+00W (north), L124+00W (north), L88+00W (north) and L52+00W (north) and from each station on L116+00W (south) and L156+00W (south), using a LaMotte-Morgan Soil pH Testing Kit.

SAMPLE HANDLING, ASSAYS AND TREATMENT OF DATA

After collection, samples were wired in strings of 30 to 40 samples, partially dried, and then packed in burlap sacks for shipment to Whitehorse. At Whitehorse, the samples were crated and sent via C.P. Air freight to Chemex Labs in North Vancouver, where they were analyzed for copper and molybdenum.

The analytical procedure at Chemex Labs consists of drying and sieving the samples, saving the -80 mesh fraction. One gram of this fraction is digested using perchlorate and is then dissolved in hot aqua regia. This solution is evaporated to dryness overnight. The residual is dissolved in hydrochloric acid and this solution is brought to volume for final analysis. The solution is run for copper and then molybdenum (using the Loring method) on a Techtron AA-5 Digital atomic absorption unit. Results were returned to Whitehorse by First Class mail.

Certificates of Analysis, for all soil samples tested, from Chemex Labs Limited, are on file in the office of R.G. Hilker Limited, #8 Northern Metalic Bldg., Whitehorse, Yukon Territory.

The interpretation of geochemical data is often aided with the calculation of a few simple statistics. The arithmetic mean and standard deviation have been calculated for both the copper and molybdenum assay values, using the following formulae:

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$$\bar{x} = \frac{\Sigma ppm}{n}$$

$$s = ((n\Sigma ppm^2 - (\Sigma ppm)^2)/(n(n-1)))^{1/2}$$

where: n = total number of values

Σppm = sum of values

$\bar{x}$ = arithmetic mean

Σppm^2 = sum of squares of values

s = standard deviation

These two statistics are useful in the definition of statistical anomalies which may or may not be relevant in the survey area. Experiment and field experience have indicated that, assuming a lognormal distribution of values, a value greater than $\bar{x}$ + 1s is statistically "possibly anomalous" and a value greater than $\bar{x}$ + 2s is statistically "probably anomalous". These values, as calculated for the present survey, have been used as guidelines in contouring the Geochemical Survey maps (see Pocket).

The assumed lognormal distribution is monomodal. That is, there is ideally one set of values, and the arithmetic mean is substantially greater than the geometric mean (mode). However, the effect of the secondary rock types of the Yukon Group and Carmacks and Mount Nansen volcanics may have a profound effect on the distribution of values, and, for this reason, a histogram has been made for the copper values on the south half of the grid, where these rock types occur.

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TOPOGRAPHY, VEGETATION AND SOILS

The baseline of the grid roughly parallels Apex Creek, which flows out of the grid area to the west. South of the baseline is a gentle to medium slope to the base of Apex Mountain. This slope is cut by two small creeks which flow into Apex Creek. The environment here is largely "slope" with transitional "intermediate" and minor "bench" environment in the more gently sloping areas. Boulder trains are abundant, especially on steeper slopes, and outcrops occur on the few ridge tops dividing the creek valleys. Drainage is good on steep slopes, but as the slope decreases, both surface and groundwater flow are impeded by thick moss and grass and near surface clay-rich soil horizons. The vegetation here is entirely low-growing with very few trees, minor clumps of buckbrush and generally thick-growing moss and grass. The soils are more or less residual, with dominant colluvial (transported by gravity) characteristics on the lower slopes. Although the area has not been glaciated, it has been suggested that the abundant clay and sand-clay layers may have been deposited by a shallow glacial sea. These sediments may also have been transported by downslope surface run-off and by solifluction. The soil pH has been tested along a few of the grid lines and results indicate a consistent slight acidity, with most values falling between 5.0 and 6.0. This is normal for soils derived from a granitic source. Typical soil profiles are described under "Test Pits".

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North of the baseline is a slope which rises gently to a central ridge which parallels the baseline. The slope falls gently away from ridge to the north to a second larger creek which parallels Apex Creek and forms the northern limit of the grid. With the exception of a narrow band along the ridge top, most of the area of the north half of the grid is in a "bench" environment. Drainage is poor, with highly saturated surface soils. Vegetation consists of thick grass and moss, fairly abundant buckbrush and minor spruce. Poorly developed frost boils are scattered throughout. The ridge top and steep upper slopes are marked by very little vegetation, abundant outcrop, well-washed almost truly residual soils and large boulder train areas.

TEST PITS

A total of four geochemical test pits were dug and sampled within the grid area. Two of these are located in areas of background values and two are located over zones of anomalous molybdenum values. All test pit samples were analyzed for copper and molybdenum, and the soil pH was determined on the sample material.

Test Pit #1 (see Sketch #2) located on the baseline at 110+10W, is in an area of "slope" environment. The pit was dug to a total depth of three feet, where abundant groundwater and frozen ground were encountered. The soils here are quite typical, with a thin surface humus layer covering poorly defined layers of clay, sand and gravel in roughly equal portions. The soil color is consistently a yellowish brown. The soil pH shows little variation from very slightly acidic (pH = 5.5).

The pit was sampled on only one face. The copper values show little correlation with depth, soil color or soil composition. The highest value occurs in the humus-rich "A" horizon, where erroneous values are to be expected. Another higher value occurs at a depth of 29 inches, and might possibly be correlated with a slightly lower pH, although the variation in pH here is almost negligible. No molybdenum was detected in any of the samples in this pit.

Test Pit #2 (see Sketch #3) at 81+50W; 4+00N, is located in a typical "bench" environment. The pit was dug to a depth of 28 inches where solidly frozen soil was encountered. The soils here vary from those in the "slope" environment in that clay-rich horizons are more abundant, while sand is a minor soil constituent, and the soil color is more typically a grey-brown. The "A" horizon is almost totally composed of humic material. The soil pH again shows little variation, although a more basic "A" horizon is noted and a slight decrease of pH with depth is evident in one of the pit corners sampled.

The pit was sampled in two corners. The copper values are again relatively low, with no strong correlation with any of the variables measured or from one corner of the pit to the other. A possible zone of oxidation, indicated by a reddish-rust hue, does not appear to have any effect on the copper values. A lower pH (5.4) at the bottom of one corner may again be responsible for a slight increase in copper ppm. There was no molybdenum detected in the soil.

Test Pit #3 (see Sketches #4 and #5) is located within the "B" zone anomaly at 56+00W; 57+50N. This pit was dug to a depth of 30 inches in an "intermediate" environment on the east side of the anomaly. The anomaly consists of high molybdenum values with only a few moderately high supporting copper values. The soils here are quite variable, with alternating clay-rich, sand-rich and gravel-rich horizons. A black, possibly manganese oxide stain is evident in the top 10 to 14 inches of the profile. Below this, the soils are most typical of those in Test Pit #1.

.../29

All of the soils are quite highly saturated. The soil pH shows little variation, with the exception of the "A" horizon, and is typically slightly acidic.

The pit was sampled on three faces, and the three resulting profiles show good correlation of copper and molybdenum values. Highly anomalous molybdenum (15 ppm. and greater) and moderately anomalous copper (50 ppm. and greater) values correspond with the upper soil horizons -- both the humus-rich "A" horizon and the underlying black-stained residual soils. Below this, copper drops to background levels and molybdenum decreases to zero or near zero values. It would appear that the anomalous copper and molybdenum ions have been derived from an upslope source and transported by chemical and/or mechanical means. The probable manganese oxide stain possibly indicates oxidization of downward percolating near-surface groundwater, while the local environment itself, the base of a medium slope, and the erratic nature of the composition of the profile, suggest a certain amount of downslope soil movement. The low values at depth indicate that the source is probably not directly beneath the test pit location.

Test Pit #4 (see Sketch #6) located a short distance east of the "A" zone anomaly at 124+00W; 55+00N, does not show a good profile due to abundant large boulders and very shallow frozen soil. The environment here is "intermediate" with a saturated greyish-black clay horizon occurring directly below

.../30

the "A" soil horizon. Sand and gravel become more abundant with depth. The black stain prominent in Test Pit #3 is not evident here. Soil pH is again slightly acidic with no strong correlation with other variables.

Both copper and molybdenum values are only moderately anomalous in some of the near-surface horizons. A rough correlation is evident between these two, but it is not readily extended to the other variables except possibly depth. Anomalous values only in surface or near-surface horizons again suggest an up-slope source of copper and molybdenum ions, with transport by chemical or mechanical means, or both.

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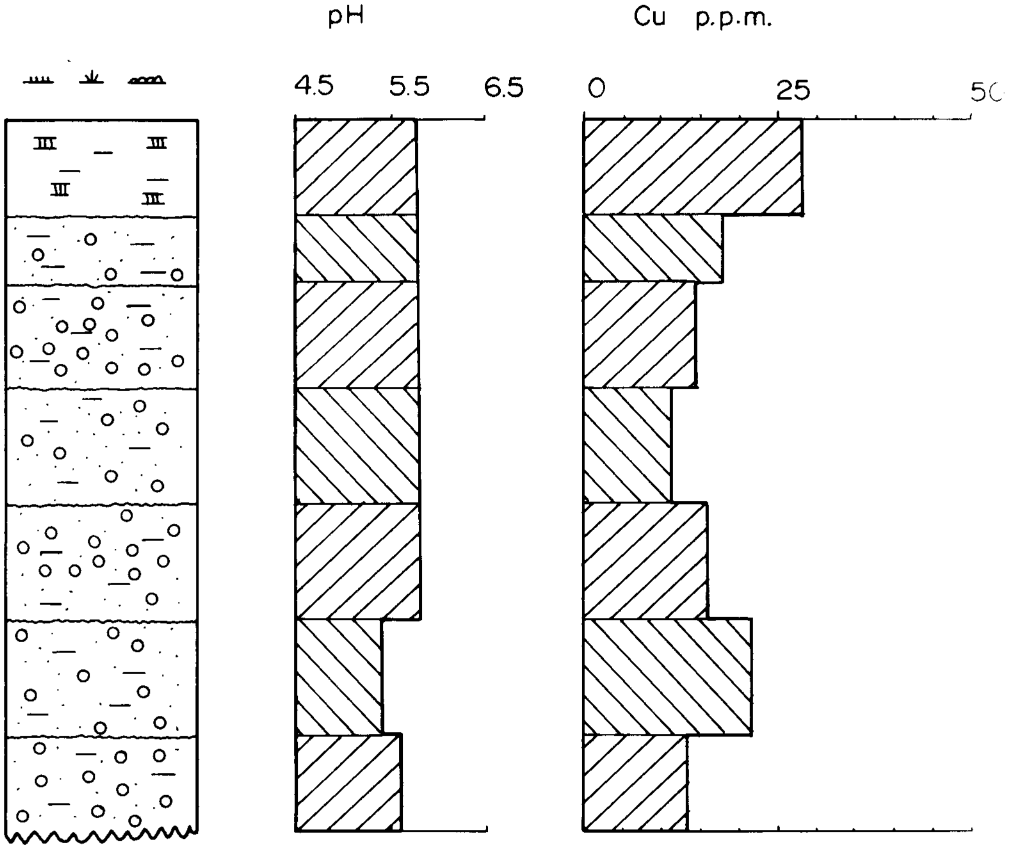
SKETCH # 2

TEST PIT # 1

location – Base line ; 110+10W

Sample Number	Color	Sample Depth (inches)
A-1	bl.	3
A-2	br.y.	5.5
A-3	br.y.	11
A-4	br.y.	17
A-5	br.y.	23
A-6	br.y.	29
A-7	br.y.	35



LEGEND

Vegetation

- ш grass
- ⊥ buckbrush
- ≈ swamp

Soil Composition

- = clay
- ∴ sand
- ∞ gravel
- Ш humus

Soil Color

- br. brown
- bl. black
- y. yellow

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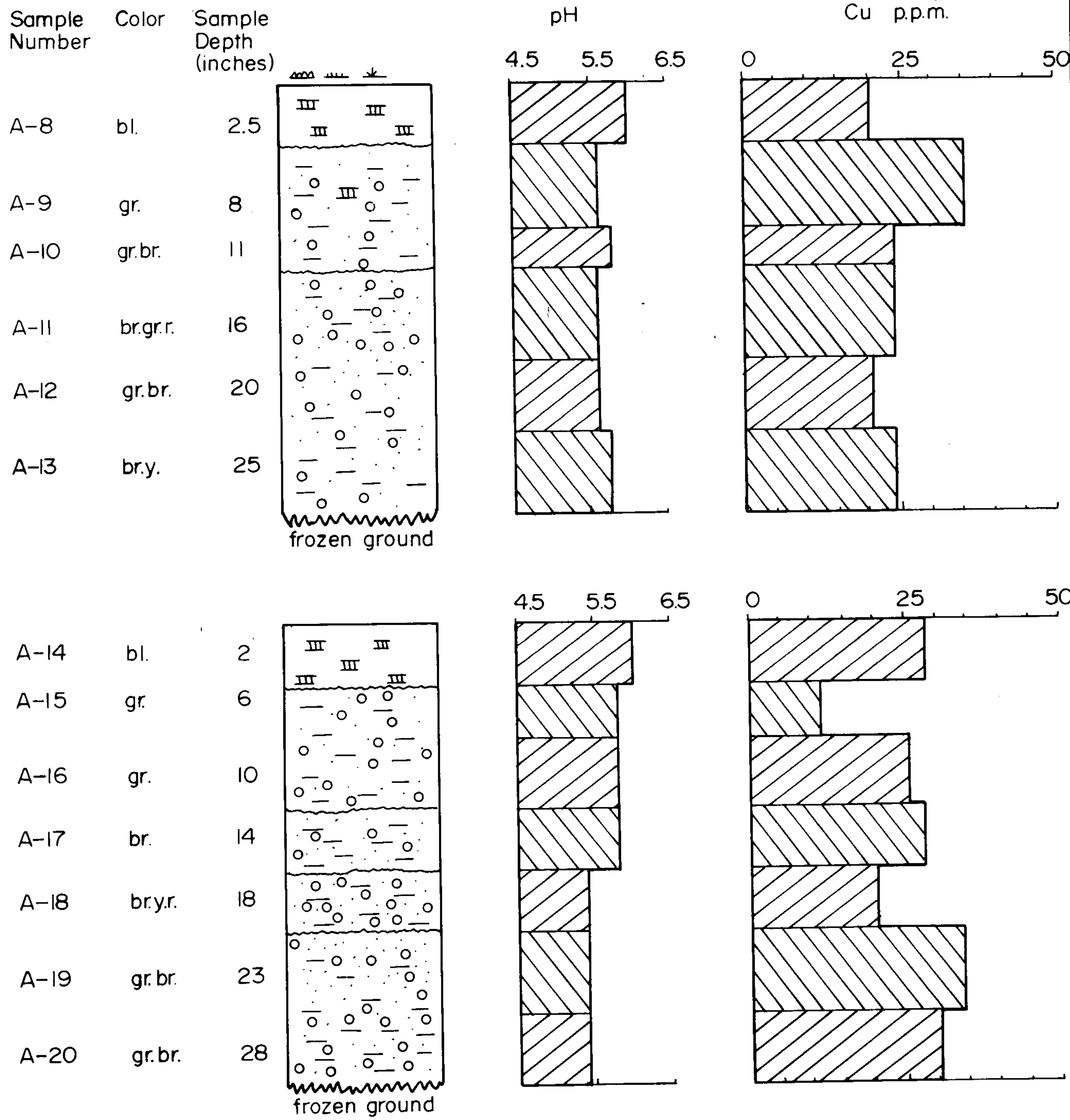
SKETCH # 3

TEST PIT # 2

location – 81+50W; 4+00N



LEGEND

Vegetation	Soil Composition	Soil Color	
moss	= clay	br.	brown
grass	sand	bl.	black
buckbrush	oo gravel	gr.	gray
	Ш humus	r.	red
		y.	yellow

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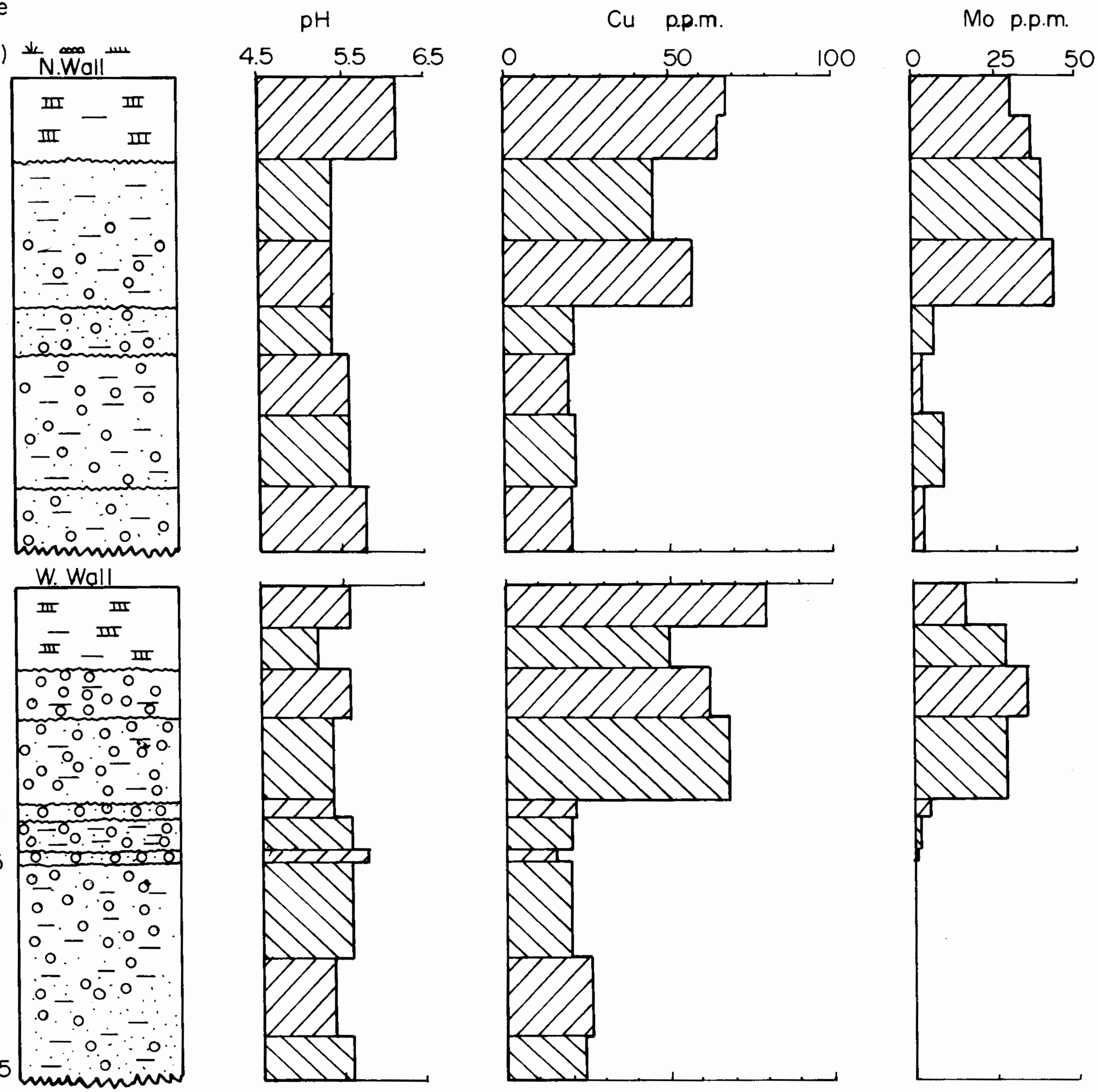
TEST PIT # 3 B Zone Anomaly 56+00W; 57+50N

Sample Number	Color	Sample Depth (inches)
A-21	bl. br.	2
A-22	br. bl.	4
A-23	br. bl.	8
A-24	br. bl.	12
A-25	br. y. r.	15
A-26	br. y.	18
A-27	br. y.	23
A-28	br. y. r.	28
A-30	bl.	2
A-31	gr. bl.	3
A-32	bl.	6.5
A-33	bl. br.	10
A-34	br. y. r.	13.5
A-35	br. y.	15
A-36	br. y. r.	16.5
A-37	br. y.	20
A-38	br. y.	25
A-39	br. y.	29.5



SKETCH # 4

Test pit 3 continued

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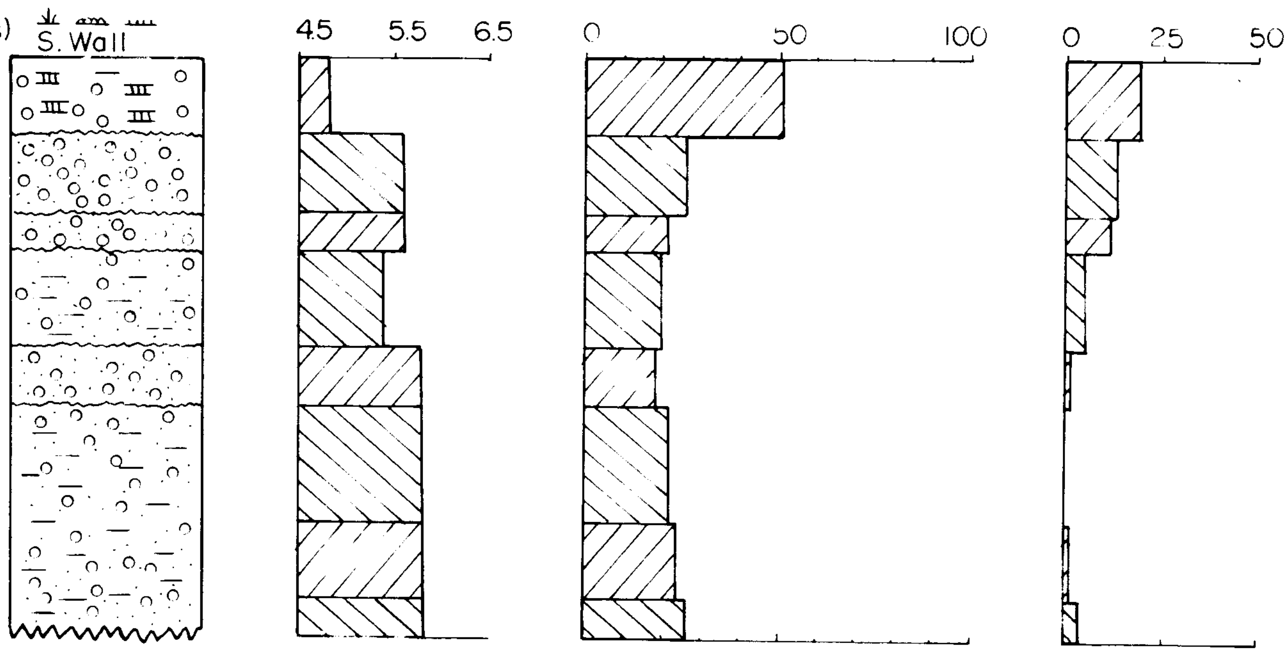
TEST PIT # 3 part I

DATE: SEPT 2/70

SCALE AS SHOWN

TEST PIT # 3 part 2 (south wall)

Sample Number	Color	Sample Depth (inches)
A-40	bl.	2
A-41	br.bl.	6
A-42	br.	9
A-43	br.y.	12.5
A-44	br.y.	16.5
A-45	br.y.	22
A-46	br.y.	26
A-47	br.y.	29.5



LEGEND

Vegetation

- buckbrush
- moss
- grass

Soil Composition

- = clay
- sand
- oo gravel
- Ш humus

Soil Color

- br. brown
- bl. black
- gr. gray
- r. red
- y. yellow

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TEST PIT # 3 part 2
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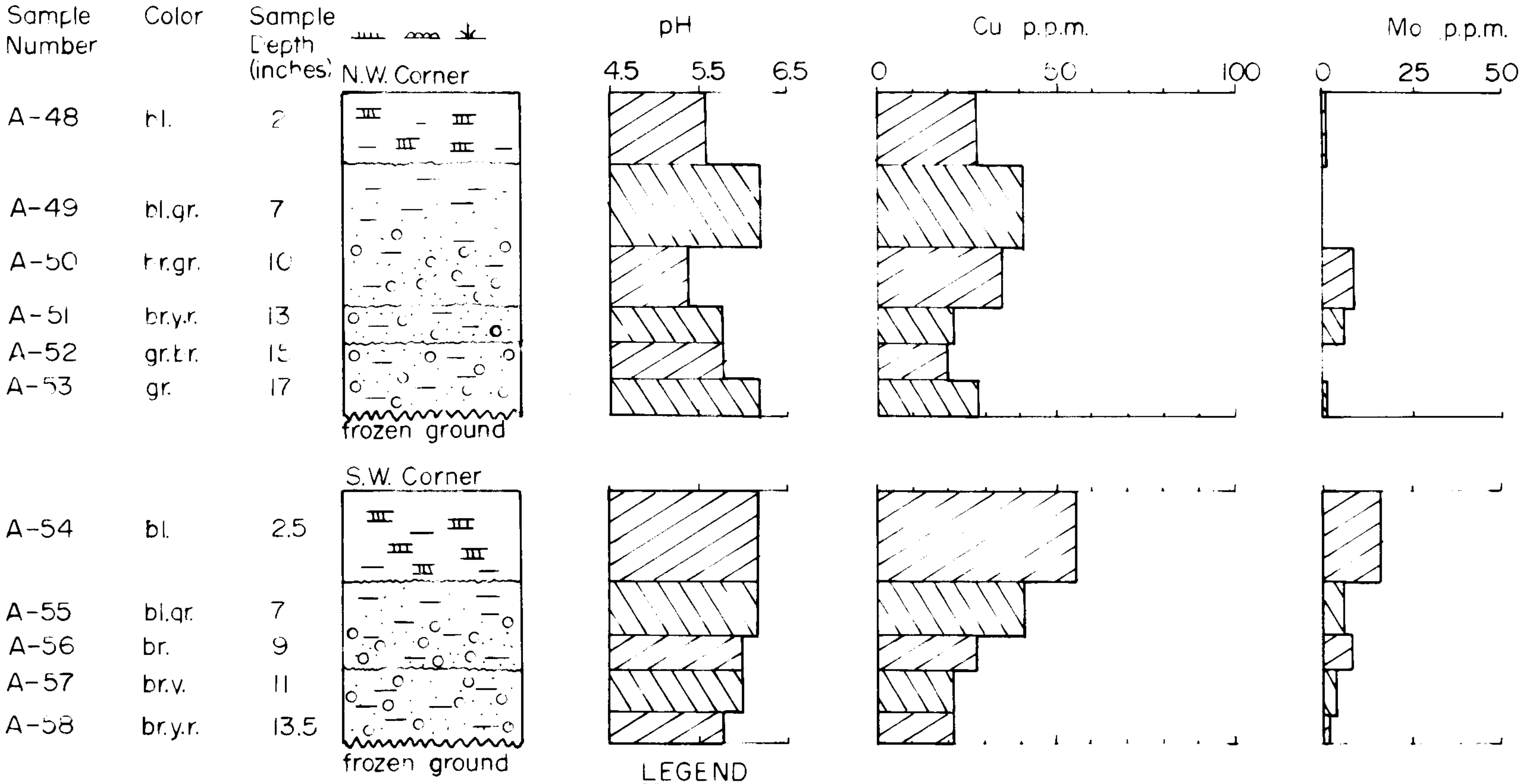
SKETCH #

TEST PIT #4

location – 55+CON; 124+OOW



LEGEND

Vegetation	Soil Composition	Soil Color	
grass	= clay	br.	brown
moss	sand	bl.	black
buckbrush	∞ gravel	gr.	gray
	Ш humus	r.	red
		y.	yellow

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TEST PIT # 4
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INTERPRETATION

Both the copper and molybdenum values over the entire grid area represent relatively low background. The statistics have been computed as follows:

	Cu (p.p.m.)	Mo (p.p.m.)
$\bar{x}$	19	0
s	10	2

where n = 5,474

It should be noted that since these values have been calculated using a hand calculator, with a large number of values, minor errors are inevitable. However, these errors would not be expected to influence the final results by more than a fraction of one p.p.m.

The arithmetic mean for both copper and molybdenum are typical background values, while both standard deviations are low and indicate a relatively small variance from the mean. The lowest statistically "possibly anomalous" value, or $\bar{x}$+1s, is 29 p.p.m. for copper and 2 p.p.m. for molybdenum, and the lowest statistically "probably anomalous" value, or $\bar{x}$+2s, is 39 p.p.m. for copper and 4 p.p.m. for molybdenum. In contouring the geochemical map, these values have been used only as a guide, as they are below truly "possibly anomalous" and "probably anomalous" values for surveys in the Dawson Range area. For copper, contour values of 40, 60 and 100 p.p.m. have been used, and for molybdenum, contour values of 3, 7 and 12 p.p.m. were used.

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As there is little overlap of anomalies, both copper and molybdenum have been contoured on the same map (see Pocket).

In order to discover more about the behavior of the copper values, a histogram has been compiled from all copper values (n = 3232) in the south grid. The class interval is 5 p.p.m. copper and the range is from 0 p.p.m. copper to 50 p.p.m. copper, with one extra interval to accommodate all values greater than 50 p.p.m. copper.

The histogram shows a rough lognormal distribution, but it is quadramodal, ignoring anomalous values greater than 50 p.p.m. copper. The four modal values are approximately 13 p.p.m. copper, 20 p.p.m. copper, 30 p.p.m. copper and 40 p.p.m. copper, in order of decreasing size. All four of these modes are in the background range of copper values. A comparison of these values with geology and topography does not reveal significant correlations. However, the modal values of 13, 20 and 30 possibly represent a background over various phases of the intrusive, with 13 p.p.m. copper representing the main body of hornblende quartz monzonite. The mode of 40 p.p.m. copper may represent effects from the Mount Nansen Volcanics. Many other soil, vegetation and topographic factors will also affect the distribution of the copper values, but these are much too numerous and complex to be investigated at this time.

The molybdenum values do not show the same type of distribution, and any values greater than 0 should be considered as representing either significant or non-significant anomalies.

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Three geochemical anomalies occurring within the grid deserve mention here. These have been labelled Zones "A", "B" and "C", and are centred at approximately L128+00W; 55+00N, L60+00W; 57+00N and L76+00W; 75+00S respectively.

Zones "A" and "B" are quite similar, consisting of anomalously high molybdenum values with only a few moderately high supporting copper values. Both anomalies occur along the north ridge and both are associated with minor, fine-grained intrusives within the main granitic body. Although the molybdenum values are quite anomalous, neither zone is very extensive and, as indicated by the test pit study, secondary dispersion has probably enlarged them in a downslope direction. However, the saturated, frozen and clay-rich nature of the soils below the ridge top may suppress the mobility of metallic ions from any source other than directly on the ridge top and the upper slopes.

The nature of the source of these ions is difficult to predict. Rocks exposed in both areas show no evidence of mineralization. Minor molybdenum and copper may be finely disseminated within the minor intrusive in contact areas, or quartz stringers may carry molybdenum and traces of copper. Both Zones "A" and "B", however, appear to be the result of minor mineralization effects and not of any great significance in the present survey.

Zone "C" consists of a group of copper anomalies with minor associated molybdenum. They have been grouped together as it is felt that they are very similar in nature. The copper

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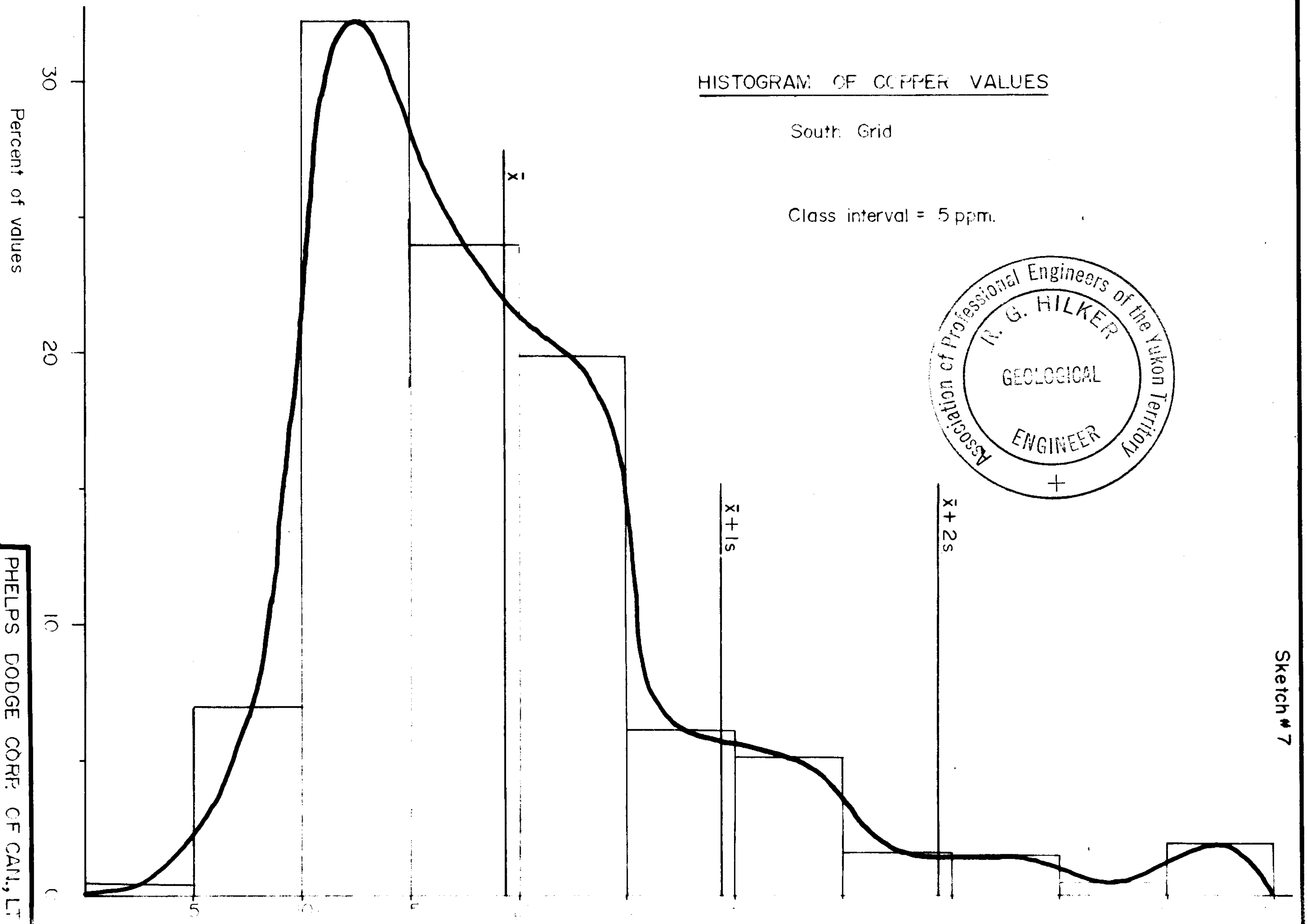
values are generally highly anomalous when compared with other values over the grid area. These range from under 100 p.p.m. to over 200 p.p.m. copper. All anomalies are associated to a greater or lesser extent with inclusions of volcanics, probably of the Mount Nansen Group, within the main intrusive. This is supported by the magnetometer survey interpretation. Most anomalies appear to be derived from a small source with expansion of anomalies downslope and along creek valleys by secondary dispersion. The copper ion source is probably the copper-normal Mount Nansen volcanics. Again the intensity of mineralization is not expected to be significant due to both the relatively low magnitude of anomalies for the Dawson Range area and their limited size.

No substantial geochemical anomalies are evident in the vicinity of either of the two surface copper showings.



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CONSULTING GEOLOGIST,
WHITEHORSE, Y.T.

PHELPS DODGE CORP. OF CAN., LT...
MONTANA OPTION – APEX CLAIM...
HISTOGRAM
DATE: OCT. 20/70 | SCALE AS SHOW...

REPORT ON
GROUND MAGNETOMETER SURVEY
APEX CLAIMS, MONTANA OPTION
HAYES CREEK AREA, YUKON TERRITORY
FOR
PHELPS DODGE CORPORATION OF CANADA, LIMITED
BY

R. G. Hilker

J. H. Ratcliffe,
P. Eng.

REPORT ON

GROUND MAGNETOMETER SURVEY

APEX CLAIMS, MONTANA OPTION

HAYES CREEK AREA, YUKON TERRITORY

FOR

PHELPS DODGE CORPORATION OF CANADA, LIMITED

BY

R. G. Hilker

J. H. Ratcliffe, P. Eng.

N.T.S. 115 J/8 & 9,
I/5 & 12

62°30'N, 138°00'W

October 7, 1970

C O N T E N T S

INTRODUCTION

On June 1, 1970, the Apex claim group, consisting of 128 claims, located in the Hayes Creek Area, Whitehorse Mining Division, Yukon Territory, was optioned by Montana Mines Limited to Phelps Dodge Corporation of Canada, Limited. An additional 40 claims were staked in mid-June and added to the group, so that the present holdings contain 168 claims.

Shortly thereafter, picket lines were cut and chained over the greater part of the property at 400 foot intervals. The north-south picket lines were controlled by an east-west Base Line and five east-west Tie Lines. The network of Base Line, Tie Lines and picket lines were then used for mapping control for a geological survey, a geochemical survey and a ground magnetometer survey, the latter work being the subject of this report.

PROPERTY LOCATION

The Apex claim group is roughly centered about Latitude 62°30'N, Longitude 138°00'W. The greater part of the property lies within maps N.T.S. 115 J/8 and 115 J/9 but smaller portions are also found in N.T.S. 115 I/5 and 115 I/12. The south boundary of the claim group lies about 1/2 mile north of the peak of Apex Mountain, the highest peak in the Dawson Range. In a general way, the Base Line follows the valley of Apex Creek.

The property is most easily reached by helicopter from the Minto airstrip on the Mayo highway, which lies about 40 miles to the east of the centre of the property.

The property consists of the following claims: Pat 1-24, Kook 101-172 and Apex 1-72, or 168 claims in all.

PREVIOUS WORK

In view of the relative inaccessibility very little work had been done in the area prior to the present programme. According to Bostock (1944), placer gold was discovered in Klines Gulch on Hayes Creek, about 9 miles north of the property in 1898. This led to the further exploration of Hayes Creek upstream to Apex Creek, but apparently no further. All of this work was directed toward locating placer gold deposits, and consequently the surrounding country was not examined in detail.

H. S. Bostock mapped the Carmacks District immediately to the east for the G.S.C. in 1932, 1933, and 1934. His report, G.S.C. Memoir 189, published in 1938 with Map 340A, draws attention to the possibility of mineral occurrences due to contact metamorphism in the Apex Mountain area, where the older Yukon group schists and gneisses, and the Mount Nansen volcanics were intruded by later granitic rocks.

Bostock returned to the area in 1941 and explored the Selwyn River Area (G.S.C. Preliminary Map 44-34), which contains the present Apex claim group. Bostock's geological map, though generalized, appears to portray the geology as presently known, quite accurately.

In 1964 Canadian Aero Service Limited flew an aeromagnetic survey for the G.S.C. which covered that portion of the property east of

Longitude 138°00'W. The aeromagnetic data are shown on maps 3297G - Prospector Mountain and 3298G - Mount Pitt. Then in 1967, Aero Photo Inc. were awarded the contract for an aeromagnetic survey to the west of longitude 138°00'W. The data covering the major portion of the Apex claim group are shown on G.S.C. aeromagnetic maps 4331G - Apex Mountain and 4332G - Selwyn River.

The present work in the area was sparked by the report in 1969 of interesting results being obtained by Casino Silver Mines Ltd. at Casino Creek, about 30 miles to the northwest of the Apex claim group. Casino have indicated that they have found a large tonnage, low grade, copper, silver, molybdenum deposit in the granitic rocks of the area.

GEOLOGY

The geology of the area as mapped by Bostock suggests that the Apex claim group is underlain by granitic rocks of Mesozoic age. The oldest rocks in the area belong to the Yukon group which consist of schists and gneisses. These are found along the eastern boundary of the claim group. The Yukon group were overlain by the Mount Nansen volcanics which were later infolded in part with the Yukon group. Bostock shows the Mount Nansen group as forming the cap rock for Apex Mountain and suggests that the resistance to erosion exhibited by the volcanics has resulted in the higher peaks of the Dawson Range. The Mount Nansen volcanics are found along the southern border of the claim group.

Both the Yukon group and the Mount Nansen group were intruded by the Mesozoic granitic-type rocks which underlie most of the property.

In his report on the Carmacks District, Bostock suggests that the intrusive contacts between the Mesozoic granites and the pre-existing Yukon group and Mount Nansen group could be of economic interest on the basis of possible contact metamorphic deposits.

Overlying all of the preceeding rock types are the Carmacks volcanics which are somewhat similar in composition to the volcanics of the Mount Nansen group, but much fresher. Bostock does not show any of the Carmacks volcanics on the property, but does show them overlying the Mount Nansen group to the south of Apex Mountain, and overlying the Mesozoic granites to the south and west of the Selwyn River, a short distance west of the property.

From the aeromagnetic data it is obvious that the Mount Nansen volcanics are quite magnetic and produce a prominent magnetic anomaly. The Carmacks volcanics on the other hand do not appear to produce a definitive magnetic pattern. However this could be due to the thickness of the flows, assuming that the Mount Nansen group have a large vertical dimension as contrasted to a thin flat-lying capping exhibited by the Carmacks flows.

The granitic intrusives are only slightly magnetic, but they do show some magnetic relief. On the other hand the Yukon group are characterized by a magnetic low. Thus the major rock types in the area appear to have characteristic magnetic signatures, and for this reason a ground magnetometer survey was proposed.

SURVEY PROCEDURE

An east-west Base Line was cut and chained from 20+00E to 160+00W, a distance of 3.4 miles. North-south picket lines were turned off the Base Line at 400 foot intervals and cut and chained to the property boundaries. Station pickets were established at 100 foot intervals along each picket line for survey control. East-west Tie Lines were then cut and chained at appropriate distances in order to determine the degree of wandering of the picket lines and thus provide mapping control.

In all a total of 109.4 miles of picket line, and 9.6 miles of Base Line and Tie Lines were laid out in preparation for the survey.

A Base Control Station was established at the base camp which was located near Apex Creek, in the vicinity of 78+00W, 1+00S. The Base Control Station was assigned an arbitrary value of 2000 gamma, with all values obtained during the survey being referred either directly or indirectly to the Base Control Station.

At the beginning of each day the field survey magnetometer was read at the Base Control Station to determine the Base Station Constant for the day. The field survey magnetometer was then taken out on traverse, and a diurnal monitoring magnetometer was set up at the Base Control Station. The diurnal monitor was read at five minute intervals throughout the day while the field survey magnetometer was on traverse. In this manner an accurate record of the diurnal variation for the survey period was obtained.

As a final check at the end of the day, the field survey instrument re-occupied the Base Control Station to determine the instrumental drift, if any. In all cases it was found that the instrumental drift was less than the instrument reading error, so that it may be assumed that the accuracy of the survey is comparable to the readability of the field instrument.

Readings were taken by the field survey instrument at intervals of 100 feet on all of the picket lines, but no readings were taken on the Base Line and the Tie Lines at points other than their intersections with the picket lines.

In all, a total of 5,867 readings were obtained on 109.4 miles of picket line, exclusive of Base Control Station tie-ins. Other field checks were also made during luncheon breaks and these also are not included in the total.

The data were calculated in the field by applying the Base Station Correction and the diurnal variation. The map was drafted in Mr. Hilker's office in Whitehorse, Yukon Territory and sent to the Toronto, Ontario office of Phelps Dodge Corporation of Canada, Limited for checking, contouring and interpretation.

The resulting data are presented on two maps, Sheet 1 and Sheet 2, divided by the Base Line, at a scale of 1 inch equals 400 feet, accompanying this report.

INSTRUMENTATION

The field survey instrument used was a Scintrex Model MF-2 vertical field fluxgate magnetometer, Serial Number 003132. This is a second generation transistorized, integrated circuit instrument which retains the sensitivity of the older MF-1 units, but has greater temperature stability. A copy of the manufacturer's specification sheet forms Appendix A of this report.

For the field survey, the MF-2 magnetometer was set to read 3000 gamma full scale, or 50 gamma per scale division. Normal field practice is to read to 1/2 of a scale division, giving rise to a readability of 25 gamma. This precision was maintained throughout the survey.

The Base Control Station instrument or diurnal monitor, was the older and larger Sharpe Model MF-1 vertical field fluxgate magnetometer, Serial Number 749. This instrument is similar in many respects to the MF-2 and was its predecessor. Copies of the manufacturer's specification sheets form Appendix B of this report.

The diurnal monitor was set to read 1000 gamma full scale or 20 gamma per scale division. By reading to 1/2 scale division, a precision of 10 gamma was obtained.

A time plot of the diurnal variation was prepared, thus enabling the diurnal variation to be determined for each reading obtained by the field instrument.

PERSONNEL

The field work was conducted by Mr. B. Slater, during the period July 20 to August 9, 1970, inclusive, under the supervision of Mr. R. G. Hilker, Consulting Geologist and Professional Engineer, Whitehorse, Yukon Territory. Mr. Hilker also supervised the data calculations and mapping. Data contouring, at 100 gamma intervals was done by Mr. R. W. Woolham, P. Eng. and Mr. J. H. Ratcliffe, P. Eng. of Phelps Dodge Corporation of Canada, Limited. The interpretation report was written by Mr. Ratcliffe. These latter phases were done in Toronto between September 16, and October 7, 1970.

INTERPRETATION

In general the magnetic data are remarkably uniform, as one would expect over a granitic batholith. The great majority of the values lie between 1900 gamma and 2400 gamma, but one value as low as 530 gamma and one value as high as 3475 gamma were recorded.

It is interesting to note, but not particularly surprising, that if the ground magnetic values could be integrated over broad limits, the picture would be very similar to that obtained by the airborne magnetic survey. In this regard there is a generally high area in the western part of the grid, north of the Base Line; the eastern section is generally low; sharp, strong anomalies are found in the extreme south; and two higher areas separated by a low are found in the south central sector.

Within the broad, flat magnetic area, trends are somewhat complex. Overall, northeasterly trends appear to be predominant, but a north-south imprint appears to have been superimposed. In some cases the trends appear to flow around the margins of elliptical features within the overall ground mass. All of these features are typical of the magnetic pattern derived from a relatively homogeneous granitic mass. There is very little evidence of differentiation within the intrusive, although the content of magnetic minerals does vary.

The eastern side of the mapped area is magnetically lower than normal, indicating a magnetite deficiency. It has been pointed out that the aeromagnetic low along the east side of the property coincided with the location of the Yukon group schists and gneisses, and while the only remaining Yukon group rocks found on the grid are in the extreme easternmost section, it is not impractical to assume that the Yukon group rocks originally extended further to the west and were assimilated in varying degrees by the invading granite with the result that although the rocks now look granitic, they retain the non-magnetic characteristic of the Yukon group.

The major problem in interpreting the ground magnetic survey is obtaining an explanation for the anomalous highs and lows scattered throuhgout the area. In many instances these appear to be associated with volcanics of one sort or another, the most prominent of course being the anomalous zone on the southern margin of the grid between Line 68W and Line 88W. The strong positive anomalies here are no doubt associated with the Apex Mountain volcanics. The minor low found on Lines 68W and 72W just north of the major high is no doubt a normal polarization low. Other local magnetic highs which are probably related to these same volcanics are found a short distance to the west on Line 92W and Lines 100W and 104W.

Volcanics are also known to underlie the magnetic lows in the vicinity of 34+00S on Line 0, 33+00S on Line 100W, and 61+00S on Line 124W. Why should some of the volcanics be characterized by strong positive anomalies, and others by strong negative anomalies?

One possibility is suggested by the regional correlation of the aeromagnetic data and the geological mapping by Bostock. The strong positive magnetic anomalies may be related to the Mount Nansen volcanics while the anomalous lows may be related to the Carmacks volcanics. This would suggest a reversal in magnetic polarization in the period between early Cretaceous and early Tertiary time. Considering the present state of paleomagnetic studies this possibility is not too remote, and may provide a method for locally distinguishing between rock types and/or ages.

If it can be shown that the strong positive anomalies are related to the Mount Nansen volcanics (late Jurassic or early Cretaceous) while the magnetic lows are associated with the Carmacks volcanics (Tertiary - Miocene or older), then it becomes apparent that only the strong positive anomalies hold any potential for contact metamorphic deposits. Such occurrences would therefore be limited to the south central section of the grid.

CONCLUSIONS AND RECOMMENDATIONS

The ground magnetometer survey provides correlation in a general way with the four major rock units known to exist in the area. The bulk of the property is underlain by granitic type rocks, which, according to the geological mapping, do vary in composition. But this variance does not carry through to the magnetic patterns, and as a result no particular structure or differentiation within the granitic mass can be identified.

The rocks of the Yukon group may have extended further to the west than they are presently recognized, but assimilation by the granitic magma has resulted in a loss of identifiable characteristics. Only the magnetic signature remains.

It is believed that the Mount Nansen volcanics are represented by strong, positive magnetic anomalies which are particularly prominent in the south central section of the grid.

The magnetic lows, or negative anomalies are ascribed to the later Carmacks volcanics, the negative anomalies being possibly due to inverse remanence resulting from a magnetic pole reversal in Tertiary time.

From an economic point of view it would appear that the most likely areas for mineralization are near the granite contacts with the Yukon group and the Mount Nansen volcanics, in the eastern and south central sections, with the best chance being in the Mount Nansen volcanics.

There is little or no suggestion of porphyry copper-type mineralization within the granitic rocks.

In view of the inaccessibility of the property and the lack of evidence pointing to large scale mineralization it is suggested that further work on the property should be limited to prospecting for contact metamorphic or skarn-type deposits near the Mount Nansen volcanics -- granite contact.

Respectfully submitted,

J. H. Ratcliffe, P. Eng.

JHR:jmd

APPENDIX "A"

SCINTREX

MF-2 FLUXGATE MAGNETOMETER

The MF-2 is a completely new concept in vertical force fluxgate magnetometers. These instruments, which are designed for fast and accurate mineral ground surveys, are orientation independent, self levelling and require no tripod.

The MF-2 combines in one compact 5½ lb. package electronics, sensor and rechargeable batteries. With the latest I.C. and F.E.T. circuitry and high precision components, a temperature stability better than 1 gamma per degree is standard (with .25 gamma on special order) over a range of —40° to +40° centigrade.

The instrument has a built-in hemisphere polarity switch providing two overlapping ranges. For the Northern hemisphere the full range is +80,000 to —20,000 gammas, and reversible for the Southern hemisphere.

A calibrated feedback system can be provided which makes it possible to determine the total vertical component strength.

Measuring accuracy, on the 100 gamma scale is 0.5 gamma, and on the 1000 gamma scale 5 gammas.

The Scintrex MF series of magnetometers have been in use for many years in varied applications, e.g. ground reconnaissance, base station recording and monitoring, study of magnetic properties of rocks, observatory monitoring and recording of both vertical and horizontal components.

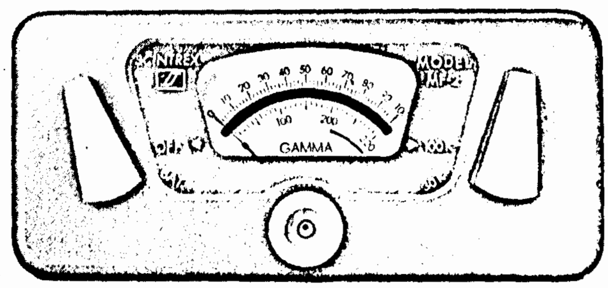
OPTIONAL

a) MF-2G

The MF-2G Fluxgate Magnetometer has the same electronics and specifications as the MF-2, but the sensor is detached and enclosed in a small cylindrical tube which permits it to be oriented and tilted in any desired direction. A 25 foot cable connects the sensor to the instrument housing. This version is particularly suitable for the study of the magnetic properties of rocks, and the measurement of magnetic field components of any orientation, etc.

b) MF-2GS

The MF-2GS Magnetometer again has the same electronics and specifications as the MF-2 but has two sensors, the enclosed self-levelling sensor of the MF-2 as well as the detached geoprobe of the MF-2G, either one of which can be employed at any one time. Thus, this instrument can be employed as the standard MF-2 as well as for vertical gradient measurements, and for the determination of the magnetic properties of rocks, etc.



SPECIFICATIONS OF FLUXGATE MAGNETOMETER MODEL MF-2

	RANGES	SENSITIVITY
Standard:	Plus or minus	
	1,000 gammas f.sc.	20 gammas/div.
	3,000 gammas f.sc.	50 gammas/div.
	10,000 gammas f.sc.	200 gammas/div.
	30,000 gammas f.sc.	500 gammas/div.
	100,000 gammas f.sc.	2000 gammas/div.
Optional:	100 gammas f.sc.	2 gammas/div.
	300 gammas f.sc.	5 gammas/div.

Meter: Taut-band suspension
100 gamma scale 2.1" long — 50 div.
300 gamma scale 1.9" long — 60 div.

Accuracy: 1000 to 10,000 gamma ranges ±0.5% of full scale.

Operating Temperature: —40°C to +40°C
—40°F to +100°F

Temperature Coefficient: Less than 1 gamma per °C (½ gamma/°F)

Noise Level: Less than 1 gamma P-P

Bucking Adjustments: (Latitude) —20,000 to +80,000 gammas
9 steps of 10,000 gammas plus fine control of 0 - 10,000 gammas by ten turn potentiometer. Reversible for southern hemisphere.

Recording Output: Optional.

Electrical Response: D.C. to 0.3 cps (3db down) on 1000 gamma range with meter in circuit. D.C. to 20 cps with meter network shorted for recording purposes.

Connector: Cannon KO2-16-10SN
for plug Cannon KO3-16-10-PN and cover KO6-16-⅜.

Batteries: Internal 3 x 6V-1 amp/hr. Sealed Lead Acid rechargeable Centralab GC 6101; recharge time 8 Hrs.

Consumption: 60 milliamperes — GC6101 batteries are rated for 16 hours continuous use.

Dimensions: 6¼"x 2¾"x 10" Instrument.
161 mm x 71 mm x 254 mm

Weights: 5 lb. 8 oz. — 2.5 kg.

Battery Charger: 6"x 2½"x 2½"
155 mm x 64 mm x 64 mm
110V - 220V 50/60 Hz supply or 28 - 42V D.C. supply
Automatic charge rate and cutoff preset for Centralab GC6101 batteries.

SCINTREX LIMITED
79 Martin Ross Avenue, Downsview, Ontario, Canada

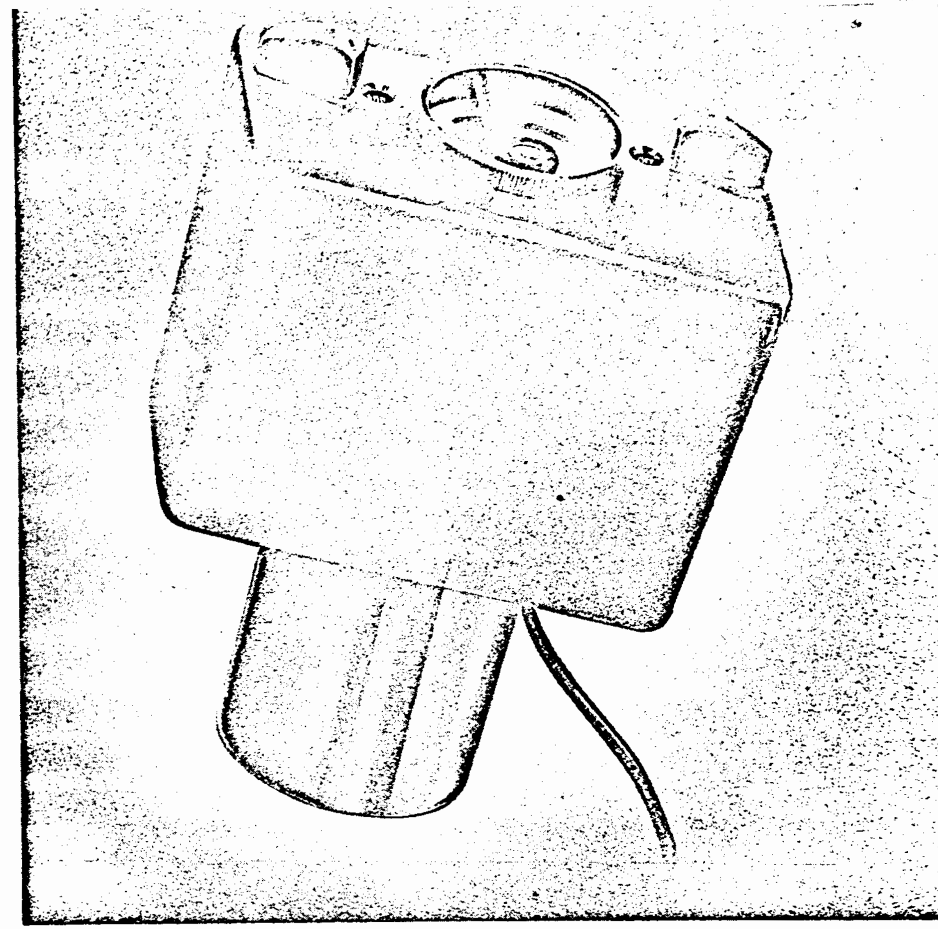
PLEASE NOTE OUR NEW ADDRESS

APPENDIX "B"

MF-1 FLUXGATE MAGNETOMETER

A first order fluxgate type vertical component magnetometer. Advanced transistorized circuitry and extensive temperature compensation is the core of its accuracy comparable to precision tripod mounted Schmidt type magnetometers.

It is a hand held instrument and needs only coarse levelling and no orientation. Features such as direct reading of gamma values and the possibility of accurate zero setting at base stations ensure simplicity of operation and higher field economy.



The Model MF-1 Fluxgate Magnetometer is designed for accurate ground surveys in the mining industry as well as a basic component for air surveying by small aircraft. Technical data and comparison charts available on request.

SPECIFICATIONS

MAXIMUM SENSITIVITY:	20 gammas (per scale division) on 1000 gamma range.
READABILITY:	5 gammas (¼ scale division on 1000 gamma range.
RANGES: (FULL SCALE)	1,000 gammas 3,000 gammas 10,000 gammas 30,000 gammas 100,000 gammas

MAXIMUM RANGE:	± 100,000 gammas
LATITUDE ADJUSTMENT RANGES:	10,000 to 75,000 gammas, Northern hemisphere convertible to: 10,000 to 75,000 gammas, Southern hemisphere or ± 30,000 gammas equatorial.
DIMENSIONS: (INCLUDING BATTERY CASE)	7" x 4" x 16"
WEIGHT: (INCLUDING BATTERY CASE)	9 lbs.
BATTERIES:	12 Flashlight Batteries ("C" cell).

DESCRIPTION OF FLUXGATE MAGNETOMETER MODEL MF-1

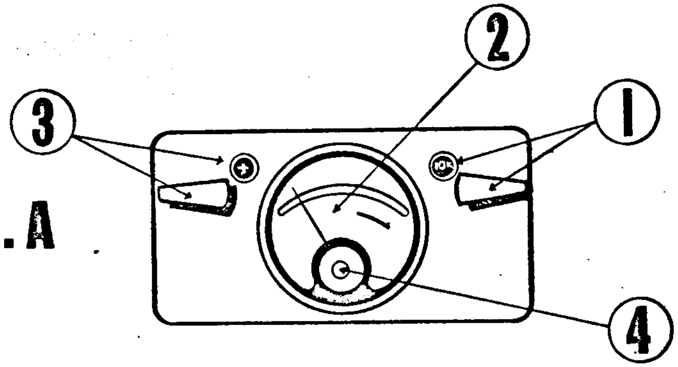


FIG. A

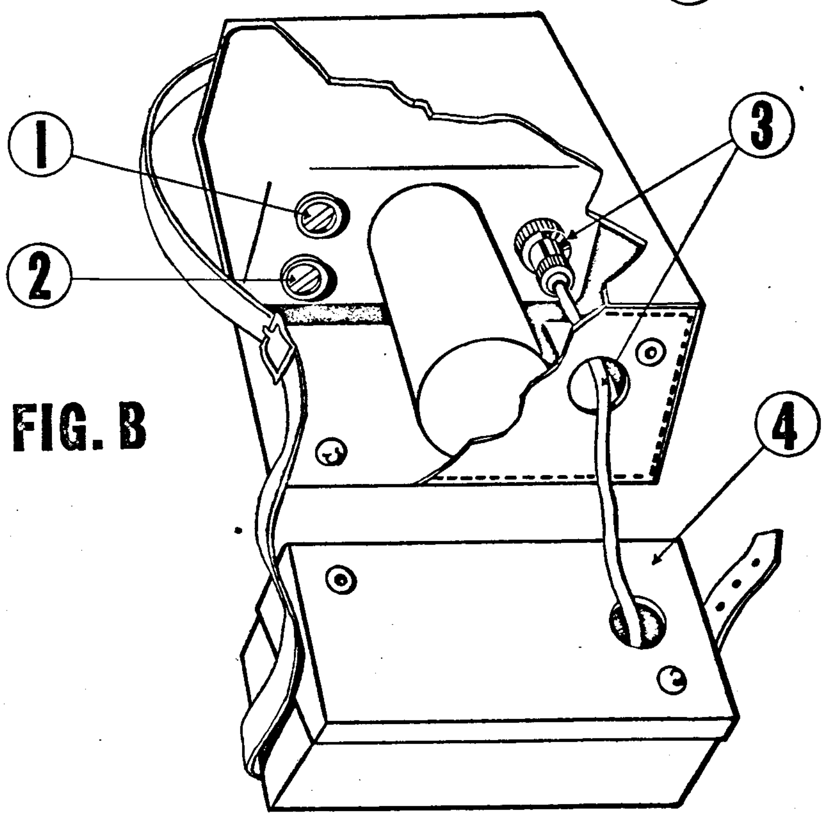


FIG. B

FIGURE A

1	RANGE SWITCH	— indicating gamma values in ranges of 100 K, 30 K, 10 K, 3000, 1000.
2	METER SCALE	— upper scale indicating 0-1000 (50 divisions) — lower scale indicating 0-3000 (60 divisions) red arc for battery check
3	MAIN SWITCH	— showing the following steps: OFF Battery check + —
4	CIRCULAR LEVEL	— for rough levelling the instrument

FIGURE B

1	LATITUDE ADJUSTMENT SWITCH	— in steps
2	LATITUDE ADJUSTMENT	— fine
3	BATTERY CABLE AND CONNECTOR	
4	BATTERY PACK	— For transportation — attachable to instrument

E. J. SHARPE INSTRUMENTS OF CANADA LTD.

P.O. Box 279, Willowdale, Ontario

PRINTED IN CANADA

VERTICAL INTENSITY FLUXGATE MAGNETOMETER MF-1

SPECIFICATIONS

MODEL MF-1 Standard surveying and prospecting magnetometer with self-levelling sensor.

Ranges:

Plus or minus -	Sensitivity:
1000 gammas f.sc.	20 gammas per div.
3000 "	50 "
10,000 "	200 "
30,000 "	500 "
100,000 "	2000 "

Meter: Taut-band suspension. 1000 gamma scale: 1 7/8" long - 50 div.
3000 " " : 1 11/16" long -60 div

Accuracy: 1000 to 10,000 gamma ranges ±0.5% of full scale
30,000 to 100,000 gamma ranges ±1% of full scale

Operating Temperature: -40° C to +40° C
-40° F to +100° F

Temperature Stability: Less than 2 gammas per °C (1 gamma /°F)

Bucking Adjustments: (Latitude) 10,000 to 75,000 gammas by 9 steps of approximately 8,000 gammas and fine control by 10-turn potentiometer. Convertible for Southern hemisphere or ± 30,000 gammas equatorial.

Batteries: 12 x 1.5V-flahslight batteries ("C" cell type)
(AC Power supply available)

Consumption: 50 milliamperes

Dimensions:

Instrument: 6 1/2" x 3 1/2" x 12 1/2" - 165 x 90 x 320 mm
Battery pack: 4" x 2" x 7" - 100 x 50 x 180 mm
Shipping Container: 10" dia. x 16" - 255 mm dia. x 410 mm

Weights:

Instrument: 5 lbs. 12 oz. - 2.6 kg.
Battery pack: 2 lbs. 4 oz. - 1 kg.
Shipping: 13 lbs.

MODIFIED FLUXGATE MAGNETOMETERS

MODEL MF-1R Magnetometer equipped with standard (self-levelling) sensor and additional recording outlet.

Noise Level: 1 gamma P-P

Long Term Stability: ± 1 gamma for 24 hours at constant temperature

CONCLUSIONS

The Apex, Kook and Pat claim groups are situated largely over a portion of the Dawson Range batholith, with Yukon Group schists and gneisses on the east and Mount Nansen volcanics on the south. Inclusions of both of these older rock types are found within the batholith and are most prominent adjacent to contact zones. Minor secondary intrusives occur throughout the area and consist of a variety of mainly leucocratic fine-grained rock which appear to be closely associated with the main intrusive and later stage basic dikes and sills associated with the Carmacks volcanics.

Interpretation of the magnetometer survey has indicated very little magnetic variation within the granitic rocks of the area. Assimilation by the granitic rocks of Yukon Group sediments in the eastern part of the grid area is suggested as a cause of the lower magnetic intensity in this region. Minor trends are evident and these are typical of the magnetic patterns within a relatively homogeneous granitic mass. Sharp magnetic highs appear to correlate with Mount Nansen series volcanics, while the strong magnetic lows are attributed to the Carmacks volcanics which may have been emplaced during a period of reversal of magnetic polarization.

The geochemical survey also indicates a generally homogeneous background for both copper and molybdenum concentrations in the soils, with variations resulting from the complex

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CERTIFICATION

I, ROBERT G. HILKER of #6 Chalet Crescent, Hillcrest, in the City of Whitehorse, in the Yukon Territory, DO HEREBY CERTIFY:

1. THAT I am a Consulting Geologist, with an office located at #8 Northern Metalic Building and postal address P.O. Box 566, in the City of Whitehorse, in the Yukon Territory.

2. THAT I am a graduate of the Michigan Technological University located in Houghton, Michigan, U.S.A., where I obtained a Bachelor of Science degree in Geological Engineering (Exploration Option) in 1962.

3. THAT I am a registered member in good standing of The Association of Professional Engineers of the Yukon Territory.

4. THAT I have practised my profession as an engineer and geologist for the past eight years.

5. THAT I have personally supervised the geological-geochemical and magnetics evaluation conducted on the Apex 1-72, Kook 101-172 and Pat 1-24 claim groups in the Whitehorse Mining Division of the Yukon Territory, between July 7th to August 11th, 1970, and report preparation during October of 1970.

6. Work conducted on the property and report preparation, is hereby acknowledged to G.G. Carlson - Geologist, Scott Zimmer - Geologist, J.H. Ratcliffe, P.Eng. - Geophysicist, and all field personnel of R.G. Hilker Limited.

7. THAT I have no direct or indirect interests in any of the mineral claims, or in any of the securities held by Phelps Dodge Corporation of Canada Limited, nor do I expect to receive any.

DATED this 30th day of October, 1970.

Association of Professional Engineers of the Yukon Territory
R. G. HILKER
GEOLOGICAL
ENGINEER

R.G. Hilker, P.Eng.

A P P E N D I X

PHELPS DODGE CORPORATION OF CANADA LTD.

T O R O N T O

GEOLOGICAL MACROSCOPIC DESCRIPTION

OF

APEX CREEK

ROCK TYPES

BY

R.G. HILKER LIMITED

WHITEHORSE, YUKON TERRITORY

AUGUST 7, 1970

Sample No.	Line	Co-Ordinate
9	136W	71S
	Quartz Granite	
	20% quartz	
	60% orthoclase	
	5% plagioclase	
	10% biotite	
	5% hornblende	
10	136W	25S
	Rhyolite (?)	
	+ quartz	
	60% orthoclase	
	± plagioclase	
11	132W	57S
	Quartz Granite	
	25% quartz	
	60% orthoclase	
	10% plagioclase	
	5% biotite	
12	132W	57S (Note: chalco)
	Hornblende - Quartz Monzonite	
	20% quartz	
	50% orthoclase	
	20% plagioclase	
	10% hornblende	
13	132W	5S
	Quartz Monzonite	
	30% quartz	
	40% orthoclase	
	10% plagioclase	
	10% biotite	
	10% hornblende	
14	124W	74S
	Quartz Granite (Porphyry)	
	15% quartz	
	60% orthoclase	
	15% plagioclase	
	10% biotite/chlorite	
15	124W	73S
	Latite/Trachyte	
	+ quartz	
	75% orthoclase	
	20% plagioclase	
	±5% epidote (?)	

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Sample No.	Line	Co-Ordinate
16	124W	63S
	Andesite (amygdaloidal) 5% quartz 5% orthoclase ±50% plagioclase ≥40% mafics/hornblende	
17	123W	63S
	Hornblende Granite 15% quartz 45% orthoclase 20% plagioclase 10% hornblende 10% biotite	
18	120W	67S
	Quartz Granite 30% quartz 55% orthoclase 10% plagioclase 5% biotite/mafics	
19	116W	84S
	Hornblende Quartz Monzonite 15% quartz 30% orthoclase 30% plagioclase 15% hornblende 10% biotite	
20	116W	62S
	Andesite (amygdaloidal) + quartz 35% plagioclase ≥40% mafics	
21	112W	25S
	Hornblende Quartz Monzonite 25% quartz 35% orthoclase 20% plagioclase 15% hornblende 5% biotite	
22	108W	70S
	Basalt (hornblende phenocrysts)	

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Sample No.	Line	Co-Ordinate
23	108W	61S
	Hornblende Monzonite 10% quartz 40% orthoclase 25% plagioclase 15% hornblende ±10% epidote	
24	104W	82S
	Monzonite/Latite 5% quartz 30% orthoclase 40% plagioclase 20% hornblende 5% pyrite	
25	104W	80S
	Quartz Monzonite 30% quartz 35% orthoclase 20% plagioclase 5% biotite 5% hornblende 5% epidote	
26	104W	30S
	Andesite + quartz	
27	100W	80S
	Monzonite Porphyry 10% quartz 55% orthoclase (phenocrysts) 25% plagioclase 10% hornblende Tr disseminated sulfides	
28	100W	80S
	as (27) with 10-15% disseminated sulfides (pyrite?); Fe stained and altered feldspars; occasional plagioclase laths still evident.	
29	92W	76S
	Basalt Conchoidal fracture; slightly banded.	

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Sample No.	Line	Co-Ordinate
36	60W	74S
	Hornblende Quartz Monzonite 35% quartz 25% orthoclase 15% plagioclase 20% hornblende/chlorite 5% biotite	
37	60W	72S
	Rhyolite 30% quartz 50% orthoclase 10% plagioclase ±5% epidote 5% hornblende/chlorite	
38	60W	41S
	Latite Porphyry Tr quartz 40% orthoclase (phenocrysts) 20% plagioclase 40% hornblende/mafics	
39	51W	61S
	Hornblende Quartz Monzonite 20% quartz 35% orthoclase 15% plagioclase 30% hornblende/chlorite	
40	45W	60S
	Andesite 5% quartz 10% orthoclase 55% plagioclase 30% mafics	
41	40W	51S
	Hornblende Quartz Monzonite 20% quartz 30% orthoclase 25% plagioclase 20% hornblende 5% biotite	

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Sample No.	Line	Co-Ordinate
42	8W	10+50S
	Quartz Granite/Rhyolite	
	30% quartz	
	50% orthoclase	
	10% plagioclase	
	±5% epidote	
	5% mafics	
43	8W	14S
	Rhyolite	
	30% quartz	
	70% orthoclase	
	Tr plagioclase	
44	4W	26S
	Quartz Granite	
	30% quartz	
	60% orthoclase	
	-- plagioclase	
	10% hornblende/biotite	
45	1E	31+50S
	Basalt	
46	4E	39S
	Hornblende Quartz Monzonite	
	quartz	
	orthoclase	
	plagioclase	
	hornblende	
	Altered (contact zone?)	
47	12E	41S
	As above	
48	16E	17+50S
	Thin-bedded Quartzite (gneissic)	
49	18E	37+50S
	as (48)	
50	18E	16+50S
	Rhyolite	
	20% quartz	
	50% orthoclase	
	10% plagioclase	
	10% biotite	
	10% mafics	

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Sample No.	Line	Co-Ordinate
51	20E	17+50S
	Syenite ?? quartz 45% orthoclase 20% plagioclase 30% hornblende (phenocrysts) 5% biotite Probably quartz monzonite garbaged up in vicinity of contact.	
52	20E	7S
	Quartzite: partially recrystallized and altered.	
53	156W	44N
	Diorite 10% quartz 10% orthoclase 40% plagioclase 40% mafics + 1% pyrite	
54	154W	32N
	Monzonite Porphyry 5% quartz 40% orthoclase (phenocrysts) 25% plagioclase 20% hornblende (phenocrysts) 10% biotite/chlorite	
55	152W	26N
	Monzonite 5% quartz 35% orthoclase 30% plagioclase 30% hornblende/mafics	
56	152W	16+50N
	Rhyolite (porphyry) 20% quartz 75% orthoclase 5% plagioclase	
57	124W	26+50N
	Hornblende Quartz Monzonite 30% quartz 25% orthoclase 20% plagioclase 20% hornblende 5% biotite	

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Sample No.	Line	Co-Ordinate
58	124W	8+40N
	Hornblende Granodiorite 30% quartz 20% orthoclase 30% plagioclase 10% hornblende 10% biotite	
59	124W	17+50N
	Latite Porphyry 10% quartz 45% orthoclase (phenocrysts) 30% plagioclase 15% hornblende/mafics + pyrite	
60	124W	13+50N
	Diorite 20% orthoclase 40% plagioclase 40% hornblende/biotite/mafics occasionally ophitic	
61	124W	3+50N
	Rhyolite 30% quartz 50% orthoclase 10% plagioclase 10% biotite	
62	124W	2N
	Hornblende Quartz Monzonite 20% quartz 30% orthoclase 20% plagioclase 20% hornblende 10% biotite	
63	112+00W	61+00N
	Latite (porphyry) 5% quartz 40% orthoclase (phenocrysts) 30% plagioclase 25% hornblende/mafics (phenocrysts)	

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Sample No.	Line	Co-Ordinate
64	108W	39+40N
	Hornblende Quartz Monzonite 30% quartz 25% orthoclase 25% plagioclase 15% hornblende 5% biotite	
65	108W	27N
	Hornblende Monzonite 105% quartz 45% orthoclase 20% plagioclase 10% hornblende (phenocrysts) 15% biotite Note: Inclusions of older more mafic intrusive.	
66	108W	3N
	Hornblende Quartz Monzonite 25% quartz 25% orthoclase 30% plagioclase 15% hornblende (phenocrysts) 5% biotite	
67	100W	31+50N
	Rhyolite ±20% quartz 75% orthoclase 5% mafics	
68	92W	17+60N
	Hornblende Quartz Monzonite 20% quartz 30% orthoclase 20% plagioclase 20% hornblende 10% biotite	
69	88W	27+20N
	Hornblende Quartz Monzonite 20% quartz 30% orthoclase 30% plagioclase 15% hornblende 5% biotite	

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Sample No.	Line	Co-Ordinate
70	88W	8N
	Rhyolite/Felsite ±10% quartz 75% orthoclase ±10% plagioclase 5% mafics	
71	83W	15+60N
	Rhyolite/Dellinite 30% quartz 30% orthoclase 25% plagioclase 5% mafics	
72	80W	70+50N
	Quartz Granite 25% quartz 50% orthoclase 15% plagioclase 10% mafics	
73	72W	75+50N
	Hornblende Granodiorite 25% quartz 25% orthoclase 30% plagioclase 15% hornblende 5% biotite	
74	72W	46N
	Granite/Rhyolite 25% quartz 50% orthoclase 15% plagioclase 10% biotite	
75	69W	27N
	Diorite 5% quartz 15% orthoclase 40% plagioclase 40% hornblende	
76	68W	86N
	Rhyolite/Felsite ±10% quartz 80% orthoclase ±10% plagioclase	

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Sample No.	Line	Co-Ordinate
77	68W	54+20N
	Granite 20% quartz 70% orthoclase 10% plagioclase	
78	68W	7+20N
	Basalt + pyrite hornblende phenocrysts	
79	68W	5"90N
	Monzonite/Latite Porphyry 5% quartz 60% orthoclase (phenocrysts) 20% plagioclase 15% hornblende/mafics	
80	64W	62+50N
	Rhyolite (pink) Numerous small fractures with Fe staining.	
81	64W	17+80N
	Hornblende Quartz Monzonite 30% quartz 30% orthoclase 20% plagioclase 15% hornblende 5% biotite	
82	63W	24N
	Monzonite 5% quartz 45% orthoclase 25% plagioclase 20% hornblende (phenocrysts) 5% biotite	
83	60W	72N
	Andesite 5% quartz 10% orthoclase 45% plagioclase 40% mafics	

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Sample No.	Line	Co-Ordinate
84	60W	61N
	Felsite extremely fine grained; creamy white; finely banded; contact salvage??	
85	60W	12N
	Andesite/Basalt	
86	56W	54+50N
	Granite/Rhyolite 25% quartz 65% orthoclase 10% plagioclase	
87	53W	50N
	Quartz Monzonite/Granite 20% quartz 60% orthoclase 20% plagioclase 10% hornblende	

* * * * * * * *

APEX PROJECT

SOIL SAMPLING DIARY

OF

GROUP "A"

ASHTON & GREER

JULY -- 1970

APEX PROJECT

SOIL SAMPLING DIARY -- GROUP "A"

Date	Line	Stations From	To	Sample Nos. From	To	No Samples
July 9	160	1N	34+00N	3201	3234	3234
July 10	160+00W	35+00N	45+00N	3235	3245	3238, 3242
	152+00W	50+00N	1+00N	3251	3300	--
	144+00W	1+00N	55+00N	3301	3355	3354
July 11	136+00W	1+00N	31+00N	3356	3386	--
	132+00W	29+00N	1+00N	3387	3415	--
	128+00W	1+00N	28+00N	3416	3443	--
	124+00N	27+00N	1+00N	3444	3470	--
July 12	126+00W	32+00N	60+00N	3471	3499	--
	132+00W	65+00N	30+00N	3500	3535	--
	128+00W	29+00N	50+00N	3536	3557	3550, 3553, 3555
July 13	128+00W	51+00N	70+00N	3558	3577	3574, 3577
	124+00W	70+00N	28+00N	3578	3620	3603, 3610, 3614
	104+00W	45+00N	1+00N	3621	3665	3664
July 14	96+00W	1+00N	65+00N	3666	3730	3669, 3725, 3730
July 15	96+00W	66+00N	85+00N	3731	3750	3731
	104+00W	80+00N	46+00N	3751	3785	--
	88+00W	60+00N	1+00N	3786	3845	3832, 3840
July 16	80+00W	1+00N	90+00N	3846	3935	3869
	88+00W	90+00N	61+00N	3936	3965	--
July 17	72+00W	1+00N	90+00N	3966	4055	4042, 4044, 4046
	64+00N	90+00N	1+00N	4056	4145	4091, 4092, 4106
July 18	56+00W	1+00N	85+00N	4146	4230	4189
	48+00W	75+00N	1+00N	4231	4305	4265, 4268, 4295

.../2

Date	Line	Stations From	Stations To	Sample Nos. From	Sample Nos. To	No Samples
July 19	40+00W	1+00N	50+00N	4306	4356	4308, 4337, 4340-41-42,43,44,45,46 (Bag 4350 missing)
	36+00W	45+00N	1+00N	4357	4401	4364,65,66,67,70,71 and 4401
	32+00W	1+00N	40+00N	4402	4441	4436
July 20	16+00E	1+00S	45+00S	4442	4486	4446,47,48,49,50,54, 55,56
	8+00E	46+00S	1+00S	4487	4532	4530, 4531
July 21	0+00	1+00S	46+00S	4533	4578	4534,4548,4549,4555, 4572,4576
	8+00W	46+00S	1+00S	4579	4624	4592
July 22	16+00W	1+00S	55+00S	4625	4679	4232, 4677
	24+00W	55+00S	1+00S	4680	4734	4719
	32+00W	1+00S	20+00S	4735	4754	4735

APEX PROJECT

SOIL SAMPLING DIARY

OF

GROUP "B"

HILLSON & MARTY

JULY -- 1970

APEX PROJECT

SOIL SAMPLING DIARY -- GROUP "B"

Date	Line	Stations From	Stations To	Sample Nos. From	Sample Nos. To	No Samples
July 9	156W	1+00N	31+00N	5964	5994	--
July 10	156W	32+00N	50+00N	5995	6013	--
	148W	55+00N	1+00N	6014	6068	6020,6049
	140W	1+00N	60+00N	6069	6128	6110,6125,6128
July 11	120W	1+00N	28+00N	6129	6156	--
	116W	32+00N	1+00N	6157	6188	--
	112W	1+00N	43+00N	6189	6231	6212
	108W	46+00N	1+00N	6232	6263	All sample nos. present but stations 41N to 26N were omitted.
July 12	120W	29+00N	75+00N	6264	6310	6272,6296,6271,6274, 6278
	116W	75+00N	33+00N	6311	6353	6319,6343
July 13	112W	44+00N	80+00N	6354	6385	6367,6376,6381
	108W	80+00N	55+00N	6386	6411	6405,6406,6408,6409, 6410,6411
	100W	23+00N	1+00N	6412	6434	--
July 14	92W	1+00N	66+00N	6435	6500	6440,6454
July 15	92W	67+00N	90+00N	6501	6524	--
	100W	80+00N	24+00N	6525	6581	--
	84W	45+00N	1+00N	6582	6626	--
July 16	76W	1+00N	90+00N	6627	6716	6647
	84W	90+00N	46+00N	6717	6761	--
July 17	60W	1+00N	90+00N	6762	6851	6812,6813
	64W	90+00N	1+00N	6852	6941	6867,6939

.../2

Date	Line	Stations From	Stations To	Sample Nos. From	Sample Nos. To	No Samples
July 18	52W	1+00N	75+00N	6942	7016	6964,6980,81,82,83,86, 6998
	44W	60+00N	1+00N	7017	7076	7021,22,24,25,26,27,35, 37,38,39,40,41,42,43,44
July 19	28W	1+00N	30+00N	7077	7106	--
	24W	30+00N	1+00N	7107	7136	--
	20W	1+00N	25+00N	7137	7161	--
	16W	20+00N	1+00N	7162	7181	--
	12W	1+00N	15+00N	7182	7196	--
	8W	10+00N	1+00N	7197	7206	--
	4W	1+00N	5+00N	7707	7211	--
July 20	20E	1+00S	45+00S	7212	7256	7213,16,17,18
	12E	46+00S	1+00S	7257	7302	7298,7299,7301
July 21	4E	1+00S	46+00S	7303	7348	7306
	4W	46+00S	1+00S	7349	7394	7369,7375
	12W	1+00S	55+00S	7395	7449	--
July 22	20W	1+00S	55+00S	7450	7504	7463
	28W	60+00S	1+00S	7505	7564	--
July 23	36W	1+00S	60+00S	7565	7624	7619
	44W	60+00S	1+00S	7625	7684	7639
July 24	52W	1+00S	65+00S	7685	7749	7718,7727
	60W	75+00S	1+00S	7750	7824	7770,72,74,78,7818
July 26	68W	1+00S	80+00S	7825	7904	7871,7903,7904
	76W	85+00S	45+00S	7905	7945	7911,7942
July 27	84W	1+00S	90+00S	7946	8035	7974,7995,8000,8018
	76W	44+00S	30+00S	8036	8050	--
		29+00S	1+00S	8151	8179	8152,55,60

.../3

Date	Line	Stations From	Stations To	Sample Nos. From	Sample Nos. To	No Samples
July 28	92W	1+00S	90+00S	8051	8140	8056,59,64,66,71,80, 83,84,85,90,8100,8111, 12,13,14
	100W	90+00S	46+00S	8180	8224	8180,8195
July 29	108W	1+00S	90+00S	8225	8314	8270,79,82
	100W	45+00S	21+00S	8315	8339	83,18,8332,33,34,37
July 30	116W	1+00S	85+00S	8340	8424	8347,51,54,55,8412, 8422,8423,8424
July 31	124W	1+00S	85+00S	8425	8509	8436,8458
	132W	85+00S	41+00S	8510	8554	8536,8550
	100W	20+00S	1+00S	8555	8574	8556,58,59,62,63,64,65, 66,67
Aug. 2	140W	1+00S	85+00S	8575	8659	8584
	136W	85+00S	1+00S	8660	8744	8713,8725
Aug. 3	148W	1+00S	80+00S	8745	8824	8785,8819,8820,8823,882
	144W	85+00S	1+00S	8825	8909	8872, --
Aug. 4	160W	1+00S	70+00S	8910	8979	8945,46,62
	156W	75+00S	1+00S	8980	9054	8999,9000
	152W	1+00S	80+00S	9055	9134	9074,9112,9116,9118
	132W	40+00S	1+00S	9136	9175	9146,9150,9170

APEX PROJECT

MAGNETOMETER OPERATOR'S DIARY

OPERATOR: B. SLATER

JULY 20 - AUG. 9, 1970

MAGNETOMETER OPERATOR'S DIARY

Date	Line	Stations From	To
July 20	80+00W	0+00	90+00N
	84+00W	0+00	90+00N
	88+00W	0+00	90+00N
July 21	96+00W	0+00	85+00N
	100+00W	0+00	80+00N
	104+00W	0+00	80+00N
	108+00W	0+00	80+00N
July 22	112+00W	0+00	75+00N
	116+00W	0+00	75+00N
	120+00W	0+00	75+00N
	124+00W	0+00	70+00N
	128+00W	0+00	70+00N
	132+00W	0+00	65+00N
July 23	72+00W	0+00	90+00N
	76+00W	0+00	90+00N
July 24	136+00W	0+00	60+00N
	140+00W	0+00	60+00N
	144+00W	0+00	55+00N
	148+00W	0+00	55+00N
	152+00W	0+00	50+00N
	156+00W	0+00	50+00N
	160+00W	0+00	45+00N
July 25	Day Off		
July 26	56+00W	0+00	85+00N
	60+00W	0+00	90+00N
	64+00W	0+00	90+00N
	68+00W	0+00	90+00N
July 27	40+00W	0+00	50+00N
	44+00W	0+00	60+00N
	48+00W	0+00	75+00N
	52+00W	0+00	75+00N
July 28	4+00W	0+00	5+00N
	8+00W	0+00	10+00N
	12+00W	0+00	15+00N
	16+00W	0+00	20+00N

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Date	Line	Stations From	Stations To
July 28 (cont'd)	20+00W	0+00	25+00N
	24+00W	0+00	30+00N
	28+00W	0+00	30+00N
	32+00W	0+00	40+00N
	36+00W	0+00	45+00N
July 29	160+00W	0+00	70+00S
	156+00W	0+00	75+00S
	152+00W	0+00	80+00S
	148+00W	0+00	80+00S
July 30	136+00W	0+00	85+00S
	132+00W	0+00	85+00S
July 31	144+00W	0+00	85+00S
	140+00W	0+00	85+00S
	128+00W	0+00	85+00S
	124+00W	0+00	85+00S
Aug. 1	Rained Out		
Aug. 2	20+00E	0+00	45+00S
	16+00E	0+00	45+00S
	12+00E	0+00	45+00S
	8+00E	0+00	45+00S
	4+00E	0+00	45+00S
	0+00	0+00	45+00S
	4+00W	0+00	45+00S
	8+00W	0+00	45+00S
Aug. 3	12+00W	0+00	55+00S
	16+00W	0+00	55+00S
	20+00W	0+00	55+00S
	24+00W	0+00	55+00S
	28+00W	0+00	60+00S
	32+00W	0+00	60+00S
Aug. 4	36+00W	0+00	60+00S
	40+00W	0+00	60+00S
	44+00W	0+00	60+00S
	48+00W	0+00	60+00S
	52+00W	0+00	65+00S
	56+00W	0+00	70+00S

.../3

Date	Line	Stations From	To
Aug. 5	120+00W	0+00	85+00S
	116+00W	0+00	85+00S
	112+00W	0+00	90+00S
	108+00W	0+00	90+00S
Aug. 6	Rained Out		
Aug. 7	104+00W	0+00	90+00S
	100+00W	0+00	90+00S
	96+00W	0+00	41+00S
Aug. 8	60+00W	0+00	75+00S
	64+00W	0+00	75+00S
	68+00W	0+00	80+00S
	72+00W	0+00	80+00S
Aug. 9	76+00W	0+00	85+00S
	80+00W	0+00	90+00S
	84+00W	0+00	90+00S
	88+00W	0+00	90+00S
	92+00W	0+00	90+00S
	96+00W	41+00S	90+00S

GEOCHEMISTRY SURVEY

TEST PIT DATA

AND

pH DATA

APEX PROJECT

YUKON TERRITORY

PHELPS DODGE CORPORATION OF CANADA LTD.

JULY 7 - AUGUST 12, 1970

BY

R.G. HILKER LIMITED
CONSULTING GEOLOGIST
WHITEHORSE, YUKON TERRITORY

Sample No.	Line	Station	pH
1382	160+00W	BL	5.6
1384	158+00W		5.8
1386	156+00W		5.4
1388	154+00W		5.8
1390	152+00W		5.4
1392	150+00W		6.0
1394	148+00W		5.0
1396	146+00W		5.8
1398	144+00W		5.8
1400	142+00W		5.6
1402	140+00W		5.8
1404	138+00W		5.4
1406	136+00W		5.1
1408	134+00W		5.6
1410	132+00W		5.2
1412	130+00W		5.8
1414	128+00W		5.1
1416	126+00W		5.3
1418	124+00W		6.2
1420	122+00W		5.6
1422	120+00W		5.6
1424	118+00W		6.0
1426	116+00W		4.9
1428	114+00W		5.8
1430	112+00W		5.8
1432	110+00W		5.8
1434	108+00W		6.0
1436	106+00W		5.8
1438	104+00W		5.6
1440	102+00W		5.8
1442	100+00W	BL	5.8

.../2

Sample No.	Line	Station	pH
1444	98+00W	BL	5.4
1446	96+00W		5.4
1448	94+00W		5.6
1450	92+00W		5.6
1452	90+00W		5.8
1454	88+00W		6.2
1456	86+00W		6.2
1458	84+00W		6.0
1460	82+00W		5.6
1462	80+00W		5.4
1464	78+00W		5.6
1466	76+00W		5.6
1468	74+00W		5.8
1470	72+00W		5.6
1472	70+00W	BL	5.8
1474	68+00W	BL	5.8
1476	66+00W		5.4
1478	64+00W		6.2
1480	62+00W		5.8
1482	60+00W		5.8
1484	58+00W		6.0
1486	56+00W		5.4
1488	54+00W		5.4
1490	52+00W		5.0
1492	50+00W		5.0
1494	48+00W		5.4
1496	46+00W		5.4
1498	44+00W		5.1
1500	41+00W		5.1
1502	40+00W		5.4
1504	38+00W		5.2
1506	36+00W	BL	5.0

.../3

Sample No.	Line	Station	pH
1508	34+00W	BL	5.6
1510	32+00W		5.0
1512	30+00W		5.4
1514	28+00W		5.4
1516	26+00W		5.4
1518	24+00W		5.4
1520	22+00W		5.4
1522	20+00W		5.1
1524	18+00W		5.6
1526	16+00W		5.6
1528	14+00W		6.5
1530	12+00W	BL	6.6
1532	10+00W	BL	6.4
1534	8+00W		5.3
1536	6+00W		6.6
1538	4+00W		5.6
1540	1+00W		5.4
1542	0+00		6.5
1544	2+00E		5.8
1546	4+00E		5.8
1548	6+00E		5.4
1550	8+00E		5.6
1552	10+00E		5.1
1554	12+00E		5.8
1556	14+00E		5.1
1558	16+00E		5.6
1560	18+00E		NS
1562	20+00E	BL	4.9
3202	160+00W	2+00N	5.6
3204	160+00W	4+00N	5.0
3206	160+00W	6+00N	5.0
3208	160+00W	8+00N	5.1

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Sample No.	Line	Station	pH
3210	160+00W	10+00N	5.0
3212	160+00W	12+00N	5.1
3214	160+00W	14+00N	5.4
3216		16+00N	5.4
3218		18+00N	5.1
3220		20+00N	5.3
3222		22+00N	5.3
3224		24+00N	5.2
3226		26+00N	5.2
3228		28+00N	5.3
3230		30+00N	5.4
3232		32+00N	5.8
3234		34+00N	NS
3236		36+00N	6.0
3238		38+00N	--
3240		40+00N	5.1
3242		42+00N	--
3244		44+00N	5.6
3444	124+00W	27+00N	5.4
3446		25+00N	5.6
3448		23+00N	5.4
3450		21+00N	5.8
3452		19+00N	5.4
3454		17+00N	5.4
3456		15+00N	5.6
3458		13+00N	5.8
3460		11+00N	5.0
3462		9+00N	5.6
3464		7+00N	5.8
3466		5+00N	5.6
3468		3+00N	5.8
3470		1+00N	5.6

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Sample No.	Line	Station	pH
3578	124+00W	70+00N	5.6
3580		68+00N	5.6
3582		66+00N	6.0
3584		64+00N	5.0
3586		62+00N	5.6
3588		60+00N	5.8
3590		58+00N	5.8
3592		56+00N	5.8
2594		54+00N	5.8
3596		51+00N	5.4
3598		50+00N	5.8
3600		48+00N	6.0
3602		46+00N	5.4
3604		44+00N	5.8
3606		42+00N	5.8
3608		40+00N	5.6
3610		38+00N	NS
3612		36+00N	5.4
3614		34+00N	NS
3616		32+00N	5.6
3618		30+00N	5.8
3620		28+00N	6.0
3786	88+00W	60+00N	6.0
3788		58+00N	5.6
3790		56+00N	6.0
3792		54+00N	5.6
3794		52+00N	5.6
3796		50+00N	6.3
3798		48+00N	5.6
3800		46+00N	5.4
3802		44+00N	5.4
3804		42+00N	5.8

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Sample No.	Line	Station	pH
3806	88+00W	40+00N	5.8
3808		38+00N	5.8
3810		36+00N	5.4
3812		34+00N	5.4
3814		32+00N	5.4
3816		30+00N	5.8
3818		28+00N	5.8
3820		26+00N	5.6
3822		24+00N	5.8
3824		22+00N	5.6
3826		20+00N	6.0
3828		18+00N	6.0
3830		16+00N	5.8
3832		14+00N	NS
3834		12+00N	5.4
3836		10+00N	5.8
3838		8+00N	6.0
3840		6+00N	NS
3842		4+00N	6.0
3844		2+00N	5.6
3936		90+00N	5.6
3938		88+00N	5.6
3940		86+00N	5.6
3942		84+00N	6.4
3944		82+00N	5.8
3946		80+00N	5.6
3948		78+00N	6.0
3950		76+00N	5.6
3952		74+00N	5.4
3954		72+00N	5.2
3956		70+00N	5.8
3958		68+00N	5.6

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Sample No.	Line	Station	pH
3960	88+00W	66+00N	5.8
3962		64+00N	5.8
3964		62+00N	5.8
6943	52+00W	2+00N	6.2
6945		4+00N	6.0
6947		6+00N	6.2
6949		8+00N	6.5
6951		10+00N	5.8
6953		12+00N	5.4
6955		14+00N	5.8
6957		16+00N	6.0
6959		18+00N	6.6
6961		20+00N	5.6
6963		22+00N	6.0
6965		24+00N	5.8
6967		26+00N	6.0
6969		28+00N	5.8
6971		30+00N	5.8
6973		32+00N	5.1
6975		34+00N	5.6
6977		36+00N	5.8
6979		38+00N	5.6
6981		40+00N	NS
6983		42+00N	NS
6985		44+00N	5.2
6987		46+00N	5.6
6989		48+00N	6.0
6991		50+00N	5.8
6993		52+00N	6.0
6995		54+00N	5.8
6997		56+00N	6.5

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Sample No.	Line	Station	pH
6999	52+00W	58+00N	5.4
7001		60+00N	5.6
7003		62+00N	5.0
7005		64+00N	5.6
7007		66+00N	6.0
7009		68+00N	5.8
7011		70+00N	5.8
7013		72+00N	5.6
7015		74+00N	5.8
8340	116+00W	1+00S	5.8
8341		2+00S	7.0
8342		3+00S	6.0
8343		4+00S	6.2
8344		5+00S	5.6
8345		6+00S	5.8
8346		7+00S	6.2
8348		9+00S	4.6
8349		10+00S	6.0
8350		11+00S	7.0
8352		13+00S	5.6
8353		14+00S	5.8
8356		17+00S	6.2
8357		18+00S	6.2
8358		19+00S	6.2
8359		20+00S	7.0
8360		21+00S	6.2
8361		22+00S	6.2
8362		23+00S	6.8
8363		24+00S	6.6
8364		25+00S	5.8
8365		26+00S	5.8

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Sample No.	Line	Station	pH
8366	116+00W	27+00S	5.0
8367		28+00S	5.6
8368		29+00S	5.6
8369		30+00S	5.4
8370		31+00S	5.8
8371		32+00S	6.2
8372		33+00S	5.8
8373		34+00S	5.6
8374		35+00S	5.8
8375		36+00S	5.6
8376		37+00S	5.8
8377		38+00S	5.8
8378		39+00S	6.0
8379		40+00S	5.6
8380		41+00S	6.2
8381		41+00S	5.8
8382		43+00S	5.8
8383		44+00S	6.0
8384		45+00S	5.8
8385		46+00S	6.2
8386		47+00S	5.6
8387		48+00S	5.8
8388		49+00S	5.8
8389		50+00S	5.8
8390		51+00S	5.6
8391		52+00S	6.2
8392		53+00S	5.8
8393		54+00S	5.8
8394		55+00S	5.8
8395		56+00S	6.2
8396		57+00S	5.8
8397		58+00S	6.0

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Sample No.	Line	Station	pH
8398	116+00W	59+00S	5.6
8399		60+00S	5.8
8400		61+00S	5.6
8401		62+00S	5.8
8402		63+00S	6.0
8403		64+00S	5.8
8404		65+00S	5.6
8405		66+00S	5.8
8406		67+00S	5.8
8407		68+00S	6.8
8408		69+00S	6.0
8409		70+00S	6.0
8410		71+00S	5.8
8411		72+00S	5.4
8413		74+00S	4.8
8414		75+00S	5.6
8415		76+00S	5.6
8416		77+00S	5.4
8417		78+00S	5.4
8418		79+00S	5.8
8419		80+00S	5.4
8420		81+00S	5.8
8421		82+00S	5.4
8980	156+00W	75+00S	5.8
8981		74+00S	5.6
8982		73+00S	5.8
8983		72+00S	6.0
8984		71+00S	6.0
8985		70+00S	5.6
8986		69+00S	5.8

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Sample No.	Line	Station	pH
8987	156+00W	68+00S	5.8
8988		67+00S	5.6
8989		66+00S	5.4
8990		65+00S	5.6
8991		64+00S	5.4
8992		63+00S	5.8
8993		62+00S	5.8
8994		61+00S	5.2
8995		60+00S	5.2
8996		59+00S	5.2
8997		58+00S	5.6
8998		57+00S	5.6
9001		54+00S	5.2
9002		53+00S	5.6
9003		52+00S	5.2
9004		51+00S	5.6
9005		50+00S	5.2
9006		49+00S	6.0
9007		48+00S	5.4
9008		47+00S	5.8
9009		46+00S	5.6
9010		45+00S	5.0
9011		44+00S	5.2
9012		43+00S	5.2
9013		42+00S	5.4
9014		41+00S	5.4
9015		40+00S	5.6
9016		39+00S	5.4
9017		38+00S	5.4
9018		37+00S	5.4
9019		36+00S	5.6
9020		35+00S	5.2

.../12

Sample No.	Line	Station	pH
9021	156+00W	34+00S	5.4
9022		33+00S	5.6
9023		32+00S	5.4
9024		31+00S	5.4
9025		30+00S	5.8
9026		29+00S	5.6
9027		28+00S	5.6
9028		27+00S	6.2
9029		26+00S	5.6
9030		25+00S	6.2
9031		24+00S	5.4
9032		23+00S	5.4
9033		22+00S	5.4
9034		21+00S	5.4
9035		20+00S	6.6
9036		19+00S	5.4
9037		18+00S	5.4
9038		17+00S	5.6
9039		16+00S	6.0
9040		15+00S	5.8
9041		14+00S	6.0
9042		13+00S	6.2
9043		12+00S	6.2
9044		11+00S	5.8
9045		10+00S	6.2
9046		9+00S	5.8
9047		8+00S	5.6
9048		7+00S	6.2
9049		6+00S	5.6
9050		5+00S	6.2
9051		4+00S	6.2
9052		3+00S	6.2

.../13

Sample No.	Line	Station	pH
9053	156+00W	2+00S	5.8
9054	┴	1+00S	5.9

TEST PIT 1

A-1	5.8
A-2	5.8
A-3	5.8
A-4	5.8
A-5	5.8
A-6	5.4
A-7	5.6

TEST PIT 2

A-8	6.0
A-9	5.6
A-10	5.8
A-11	5.6
A-12	5.6
A-13	5.8
A-14	6.0
A-15	5.8
A-16	5.8
A-17	5.8
A-18	5.4
A-19	5.4
A-20	5.4

.../14

Sample No.	Line	Station	pH
TEST PIT 3			
A-21			6.2
A-22			5.4
A-23			5.4
A-24			5.4
A-25			5.6
A-26			5.6
A-27			5.8
A-28			5.8
A-30			5.6
A-31			5.2
A-32			5.6
A-33			5.4
A-34			5.4
A-35			5.6
A-36			5.8
A-37			5.6
A-38			5.4
A-39			5.6
A-40			4.8
A-41			5.6
A-42			5.6
A-43			5.4
A-44			5.8
A-45			5.8
A-46			5.8
A-47			5.8

.../15

Sample No.	Line	Station	pH
TEST PIT 4			
A-48			5.6
A-49			6.2
A-50			5.4
A-51			5.8
A-52			5.8
A-53			6.2
A-54			6.2
A-55			6.2
A-56			6.0
A-57			6.0
A-58			5.8

R. G. HILKER
LIMITED
CONSULTING GEOLOGIST . . . PROFESSIONAL ENGINEER
P.O. Box 566
WHITEHORSE, YUKON TERRITORY
"LAND OF THE MIDNIGHT SUN"

Phelps Dodge Corporation of Canada Ltd.
#904 - 55 Yonge Street
TORONTO 215, Ontario

AUGUST 31st, 1970

STATEMENT

Date	Invoice No.	Debit	Credit
July 9/70	1027		18,000.00
July 27/70	1028	2,340.75	
July 27/70	1030	215.25	
Aug. 31/70	Eastern Assoc.Reg'd	9,139.20	
Aug. 7/70	1038		18,000.00
Aug. 7/70	Letter		1,339.20
Aug. 31/70	1041	686.83	
Aug. 31/70	1042	234.75	
Aug. 31/70	1043	8,005.20	
Aug. 31/70	1044	4,715.95	
Aug. 31/70	1045	25,825.00	
		51,162.93	37,339.20
		32.80	
	BALANCE OWING:-	51,130.13	13,823.73
	CN #1066		32.80
			13,790.93

Contract

Linecutting	1,339.20
Surface Exploration	42,405.00
Camp	3,500.00
Transportation	4,700.00
	51,944.20

RECEIVED
EXTN CHK'D
DISTRIBUTION
ACCT NO. 97-32 $ 13,790.93
APPROVED
CHEQUE NO. 4747

SEP 17 1970

PHONE: OFFIC... ..619
RES. 668-2822
AREA CODE 403

R. G. HILKER
LIMITED
CONSULTING GEOLOGIST . . . PROFESSIONAL ENGINEER
P.O. Box 566
WHITEHORSE, YUKON TERRITORY
"LAND OF THE MIDNIGHT SUN"

Phelps Dodge Corporation of Canada Ltd.
#904 - 55 Yonge Street
TORONTO 215, Ontario

AUGUST 31st, 1970

INVOICE NO. 1045

CONTRACT COSTS - APEX PROJECT

R.G. Hilker Limited:

Geochemical Sampling	$ 7,375.00
Geological Mapping	8,125.00
Magnetics Survey	8,125.00
Drafting Data	600.00
Camp Rental	1,000.00
Radio	600.00
TOTAL INVOICE	$ 25,825.00

R.G. HILKER LIMITED
P.O. BOX 566
WHITEHORSE, YUKON TERRITORY

OUR NUMBER	11863
DATE	August 21st, 1970
CUSTOMER'S ORDER	
SALESMAN	
TERMS	
F. O. B.	

SOLD TO Phelps Dodge Corp. of Canada Ltd.
(Apex Contract)

SHIPPED TO

ADDRESS 55 Yonge St., Toronto 215 VIA

INVOICE

CONTRACT COSTS - APEX PROJECT:					
	Geochemical Sampling			7,375	00
	Geological Mapping			8,125	00
	Magnetics Survey			8,125	00
	Drafting Data			600	00
	Camp Rental			1,000	00
	Radio			600	00
	TOTAL			$25,825	00

Rediform 7M31

H

R. G. HILKER
LIMITED
CONSULTING GEOLOGIST . . . PROFESSIONAL ENGINEER
P.O. Box 566
WHITEHORSE, YUKON TERRITORY
"LAND OF THE MIDNIGHT SUN"

7 August 1970

Mr. D.A. Firth
Phelps Dodge Corporation of Canada Ltd.
#904 - 55 Yonge Street
TORONTO 215, Ontario

Re: Apex Creek Linecutting Contract

Dear Dan:

The enclosed bill from Eastern Associates Reg'd. has been mutually agreed upon by Eastern Associates and F.M. Smith. Evidently the price that was originally agreed upon was as follows:

56.6 linemiles @ $90/mile	$ 5,094.00
3.4 miles transit line @ $150/mile	510.00
Open 58.92 miles @ $60/mile	3,535.20
	$ 9,139.20

The balance between the originally agreed-upon contract price and the budgeted $7,800.00 contract price is $1,339.20.

I trust that this is the information that you require.

Yours truly,

R.G. Hilker, P.Eng.
Consulting Geologist

Encl.
RGH/cj

AREA CODE 403

R. G. HILKER
LIMITED

CONSULTING GEOLOGIST . . . PROFESSIONAL ENGINEER

P.O. Box 566
WHITEHORSE, YUKON TERRITORY
"LAND OF THE MIDNIGHT SUN"

Phelps Dodge Corporation of Canada Ltd.
#904 - 55 Yonge Street
TORONTO 215, Ontario

JULY 27th, 1970

RE: COOKHOUSE

INVOICE NO. 1028

COOKHOUSE

Date	Inv.No.	Supplier	Amount
July 7/70	16360	Bob & Ken's Meats	$ 120.85
July 10/70	16365	Bob & Ken's Meats	73.05
July 10/70	16367	Bob & Ken's Meats	51.57
July 16/70	29989	Bob & Ken's Meats	20.06
July 4/70	50	Seely's (Yukon) Ltd.	37.95
July 7/70	--	Riverside Grocery	687.48
July 10/70	9906	Riverside Grocery	115.77
July 18/70	--	Riverside Grocery	153.91
July 16/70	230127	Cons. Hydrocarbons	66.00
July 22/70	230149	Cons. Hydrocarbons	57.50
	002167	Cons. Hydrocarbons	12.00
July 16/70	12176	R.G. Hilker Ltd.	50.00
			1,446.14

Add 10% Expediting Fee 144.61

1,590.75

R.G. Hilker Limited - Cookhouse Labour 750.00

TOTAL INVOICE $2,340.75

RECEIVED ____________
EXTN CHK'D ____________
DISTRIBUTION
ACCT NO. ____________ $ ____

APPROVED ____________
CHEQUE NO. ____________

G.W.S.

R. G. HILKER
LIMITED
CONSULTING GEOLOGIST . . . PROFESSIONAL ENGINEER
P.O. Box 566
WHITEHORSE, YUKON TERRITORY
"LAND OF THE MIDNIGHT SUN"

PHONE: OFFICE 667-2819
RES. 668-2822
AREA CODE 403

Phelps Dodge Corporation of Canada Ltd.
#904 - 55 Yonge Street
TORONTO 215, Ontario

AUGUST 31st, 1970

Re: COOKHOUSE

INVOICE NO. 1041

Date	Inv. No.	Supplies	Amount
JULY 25	13217	Riverside Grocery	$ 120.21
JULY 18	13089	Riverside Grocery	13.94
JULY 25	09902	Bob & Ken's Meats	142.83
AUG. 11	30465	Midway Lodge	19.40
			296.38
Cookhouse Labour:			
		R.G. Hilker Limited	328.01
Add 10% Expediting Fee		....	62.44
		TOTAL INVOICE	$ 686.83

See CN #1066

RECEIVED
EXTN CHK'D
DISTRIBUTION
ACCT NO. $

APPROVED
CHEQUE NO.

R. G. HILKER
LIMITED
CONSULTING GEOLOGIST . . . PROFESSIONAL ENGINEER
P.O. Box 566
WHITEHORSE, YUKON TERRITORY
"LAND OF THE MIDNIGHT SUN"

Phelps Dodge Corporation of Canada Ltd.
#904 - 55 Yonge Street
TORONTO 215, Ontario

SEPTEMBER 11th, 1970 RE: COOKHOUSE

INVOICE NO. 1066

CREDIT INVOICE

To: Overcharge on Expediting Fee (Invoice No. 1041) .... $ 32.80 Cr.

TOTAL INVOICE .... $ 32.80 Cr.

R. G. HILKER
LIMITED
CONSULTING GEOLOGIST . . . PROFESSIONAL ENGINEER
P.O. Box 566
WHITEHORSE, YUKON TERRITORY
"LAND OF THE MIDNIGHT SUN"
...-2822
AREA CODE 403

Phelps Dodge Corporation of Canada Ltd.
#904 - 55 Yonge Street
TORONTO 215, Ontario

AUGUST 31st, 1970

Re: GEOCHEMICAL DETERMINATIONS

INVOICE NO. 1043

Date	Inv.No.	Supplier	Amount
July 31/70	3432	Chemex Labs Ltd.	2,462.60
Aug. 1/70	3448	Chemex Labs Ltd.	1,674.40
Aug. 5/70	3502	Chemex Labs Ltd.	1,031.80
Aug. 20/70	3690	Chemex Labs Ltd.	1,792.00
Aug. 25/70	3718	Chemex Labs Ltd.	1,044.40
		TOTAL INVOICE	8,005.20

RECEIVED
EXTN CHK'D
DISTRIBUTION
ACCT NO. $
APPROVED
CHEQUE NO.

R. G. HILKER
LIMITED
CONSULTING GEOLOGIST . . . PROFESSIONAL ENGINEER
P.O. Box 566
WHITEHORSE, YUKON TERRITORY
"LAND OF THE MIDNIGHT SUN"

Phelps Dodge Corporation of Canada Ltd.
#904 - 55 Yonge Street
TORONTO 215, Ontario

AUGUST 31st, 1970

Re: SOIL SAMPLES

INVOICE NO. 1042

Date	Invoice	Suppliers		Amount
FREIGHT				
Aug. 12	018-5513-9420F	C.P. Air	78.48 W samples	
July 27	018-5513-9184F	C.P. Air	31.84 W samples	
Aug. 27	018-13969922X	C.P. Express	5.00 W samples	
Aug. 1	018-13958280X	C.P. Express	5.00 W samples	
Aug. 3	018-13958921X	C.P. Express	5.80 W samples	
Aug. 5	018-13970666X	C.P. Express	5.00 W samples	131.12 W
CONTAINERS				
July 10	4470	Northwest Sack Co...	20.00 W samples	
July 20	4470A	Northwest Sack Co...	10.00 W samples	
July 28	D-0103	Burns Foods Ltd	16.00 W samples	46.00 W
SUNDRIES				
July 28	A18773	Nelson's Limited....	.70 W samples	
Aug. 12		C.N.T.	1.90 W samples	2.60 W
EXPEDITING				
Aug. 28	11864	R.G. Hilker Limited	Expediting Services	55.03 W
		TOTAL INVOICE		$234.75 W

RECEIVED
EXTN CHK'D
DISTRIBUTION
ACCT NO.

APPROVED
CHEQUE NO.

H

R. G. HILKER
LIMITED

CONSULTING GEOLOGIST . . . PROFESSIONAL ENGINEER

P.O. Box 566
WHITEHORSE, YUKON TERRITORY
"LAND OF THE MIDNIGHT SUN"

Phelps Dodge Corporation of Canada Ltd.
#904 - 55 Yonge Street
TORONTO 215, Ontario

JULY 27th, 1970 RE: SOIL SAMPLES

INVOICE NO. 1030

Freight

C.P. Air Express Bill No. 018-14-380461 .... Chem & Labs $ 129.85

Containers

Burns Food Inv. B-09979 .... Samples 10.40

Expediting

R.G. Hilker Limited Inv. No. 12190 .... Samples 75.00

TOTAL INVOICE .... $ 215.25

RECEIVED ______
EXTN CHK'D ______
DISTRIBUTION

ACCT NO.	$
47-8	215.25

APPROVED ______
CHEQUE NO. ______

PHONE: OFFICE 667-2819
RES. 668-2822
AREA CODE 403

R. G. HILKER
LIMITED
CONSULTING GEOLOGIST . . . PROFESSIONAL ENGINEER
P.O. Box 566
WHITEHORSE, YUKON TERRITORY
"LAND OF THE MIDNIGHT SUN"

Phelps Dodge Corporation of Canada Ltd.
#904 - 55 Yonge Street
TORONTO 215, Ontario

AUGUST 31st, 1970

Re: TRANPORTATION

INVOICE NO. 1044

Date	Inv.No.	Supplier	Amount
July 6/70	K39889	Gulf Oil	15.06
July 24/70	A331295	Gulf Oil	23.10
July 4/70	6949	Mic Mac Motors	7.06
July 6/70	6962	Mic Mac Motors	6.40
July 18/70	7132	Mic Mac Motors	6.25
July 18/70	7124	Mic Mac Motors	4.00
July 28/70	7236	Mic Mac Motors	6.33
July 23/70	7177	Mic Mac Motors	6.20
July 26/70	7224	Mic Mac Motors	4.50
Aug. 10/70	7399	Mic Mac Motors	4.28
Aug. 12/70	7415	Mic Mac Motors	6.98
Aug. 15/70	7440	Mic Mac Motors	10.30
July 27/70	375-70	Trans North Turbo Air	1,671.50
July 30/70	385-70	Trans North Turbo Air	308.50
July 31/70	425-70	Trans North Turbo Air	519.20
Aug. 20/70	470-70	Trans North Turbo Air	1,316.29
July 14/70	12170	R.G. Hilker Ltd	550.00
July 7/70	12158	R.G. Hilker Ltd. (Terrikon)	125.00
Aug. 31/70	11867	R.G. Hilker Ltd. (Terrikon)	125.00
		TOTAL INVOICE	$4,715.95

$3,815.49

TRANS NORTH TURBO AIR LTD.

BOX 1977 PHONE 668-2177
WHITEHORSE, YUKON

ATAC MEMBER

TO: R.G. Hilker Limited
Box 1566
WHITEHORSE, Yukon

DATE July 27, 1970 INVOICE NO. 375-70

P.O. NO.

TO:	Charge you with the following helicopter charters:	
	Bell 47G-3B-2 Helicopter CF-QJW Crew: Connelly and Orban	
FLYING:	July 11, 1970 Daily Flight Report No. 3214	
	0.9 hours at $144.00 per hour (rate when carrier supplies fuel)	$ 129.60
	Bell 206A JetRanger Helicopter CF-XFF Crew: Conant and Lancaster	
FLYING:	July 7, 1970 Daily Flight Report No. 5590	
	6.3 hours at $236.00 per hour (rate when carrier supplies fuel)	1,486.80
PLUS:	Prorated crew expenses at Casino (½ cost of two men for one day)	15.50
	Excess cost of fuel at Minto Charterer assessed with cost of fuel over 60¢ per gallon	
	132 gallons at $.30 per gallon	39.60
	INVOICE TOTAL	$1,671.50

TERMS: One per cent interest per month will be charged on all invoices not paid within 30 days of date issued.

TN
TRANS NORTH TURBO AIR LTD.
BOX 1977 PHONE 668-2177
WHITEHORSE, YUKON

ATAC MEMBER

TO: R.G. Hilker Limited
Box 1566
WHITEHORSE, Yukon

DATE July 30, 1970 INVOICE NO. 385-70

P.O. NO.

TO: Charge you with the charter of Bell 47G-3B-2
Helicopter CF-QJW
Crew: Zutter and Orban

FLYING: July 15 and 19, 1970
Daily Flight Report No. 3225, 3234

1.9 hours at $155.00 per hour (rate when carrier supplies fuel)	$294.50
PLUS: Excess cost of fuel at Minto. Charterer assessed with cost of fuel over 60¢ per gallon	
35 gallons at 40¢ per gallon	14.00
INVOICE TOTAL	$308.50

TERMS: One per cent interest per month will be charged on all invoices not paid within 30 days of date issued.

T N T

TRANS NORTH TURBO AIR LTD.

ATAC MEMBER

BOX 1977 PHONE 668-2177
WHITEHORSE, YUKON

TO:

R.G. Hilker Limited
Box 1566
WHITEHORSE, Yukon

DATE July 31, 1970 INVOICE NO. 425-70

P.O. NO.

TO:	Charge you with the charter of Bell 47G-3B-2 Helicopter CF-QJW Crew: Zutter and Orban	
FLYING:	July 24, 26 and 27, 1970 Daily Flight Report Nos. 3247,3251,3252	
	3.2 hours at $155.00 per hour (rate when carrier supplies fuel)	$496.00
PLUS:	Excess cost of fuel at Midway Charterer assessed with cost of fuel over 60¢ per gallon	
	58 gallons at 40¢ per gallon	23.20
	INVOICE TOTAL	$519.20

TERMS: One per cent interest per month will be charged on all invoices not paid within 30 days of date issued.

PLUS:	Prorated crew expenses at Casino (½ cost of two men for one day)	$ 7.75
	Excess cost of fuel at Casino Charterer assessed with cost of fuel over 60¢ per gallon	
	7 gallons at 72¢ per gallon	5.04
	INVOICE TOTAL	$1,316.29

TERMS: One per cent interest per month will be charged on all invoices not paid within 30 days of date issued.

TNT

TRANS NORTH TURBO AIR LTD.

BOX 1977 PHONE 668-2177
WHITEHORSE, YUKON

ATAC MEMBER

TO: R.G. Hilker Limited
Box 1566
WHITEHORSE, Yukon

DATE August 20, 1970 INVOICE NO. 470-70

P.O. NO.

RE: Apex Mobile

TO: Charge you with the following helicopter charters:

Bell 206A JetRanger Helicopter CF-XFF
Crew: Zimmer and Whitticase

FLYING: August 11, 1970
Daily Flight Report No. 7286

	5.0 hours at $236.00 per hour (rate when carrier supplies fuel)	$1,180.00 ✓
PLUS:	Prorated crew expenses at Minto (two men for one day)	30.00
	Excess cost of fuel at Minto Charterer assessed with cost of fuel over 60¢ per gallon	
	105 gallons at 30¢ per gallon	31.50 ✓

Bell 47G-3B-2 Helicopter CF-QJW
Crew: Zutter and Ducey

FLYING: August 11, 1970
Daily Flight Report No. 3262

0.4 hours at $155.00 per hour (rate when carrier supplies fuel)	62.00 ✓

Continued 2

INVOICE

R. G. HILKER LIMITED

OUR NUMBER 12170

DATE July 19/70

CUSTOMER'S ORDER

SALESMAN

TERMS

F. O. B.

SOLD TO Phelps Dodge (Apex Contract)
Transportation

SHIPPED TO

ADDRESS Whitehorse VIA

	Truck Rental - Transportation				
	to Minto Airstrip &			$550	00
	Whitehorse -				
	July 7 — August 7/1970				

INVOICE

R. G. HILKER
LIMITED

OUR NUMBER	11867
DATE	Aug. 31/70
CUSTOMER'S ORDER	
SALESMAN	
TERMS	
F. O. B.	

SOLD TO Phelps Dodge Corp.
Apex Project

SHIPPED TO Transportation

ADDRESS Toronto VIA

	Truck rental from Jessikan Enterprises - Aug 11/70 Whitehorse - Minto & return			$ 125	00

Rediform 7M31

INVOICE

R. G. HILKER LIMITED

NUMBER	12100
DATE	July 7/70
CUSTOMER'S ORDER	
SALESMAN	
TERMS	
F. O. B.	

SOLD TO Phelps Dodge Transportation -Acct

SHIPPED TO

ADDRESS Whitehorse VIA

	Transportation. July 8th transport truck				$125.00
	Territorial Truck.				

Rediform 7M31

3. DISTRIBUTOR'S COPY 2. OFFICE COPY 1. CUSTOMER'S COPY

INVOICE No. [illegible]

SOLD TO (PLEASE PRINT)	PROV. S.T. LIC. NO.	SOLD BY GULF OIL CANADA LIMITED	No. 3988[illegible]
[illegible]	FED. S.T. LIC. NO.	ADDRESS M. KEOBKE, Agent Box 2959 — Phone 8-2243	CUST. NO. M/S
CITY / PROV.	CLASS OF TRADE	WHITEHORSE, YUKON TERRITORY DISTRIBUTOR FOR GULF OIL CANADA LIMITED PETROLEUM PRODUCTS	BULK STATION N[o.]
DELIVERED TO:	ORDER NO.		DATE [illegible] MONTH [illegible] YEAR [illegible]

PACKAGES			PRODUCT	SALES TAX IDEN.	QUANTITY	UNIT PRICE			AMOUNT
NO.	TYPE	SIZE				PRICE	FUEL TAX	TOTAL PRICE	
[illegible]			Gulf Regular Gasoline		30			[illegible]	[illegible]
DISTRIBUTOR C/N NO.			PROVINCIAL TAX	T	%		MUN. CODE (QUE.)		
			PACKAGES TO CHARGE						

ON HAND LAST DEL.	RETURNED THIS DEL.	RECEIVED THIS DEL.	ON HAND THIS DATE	I ACKNOWLEDGE THESE DRUMS TO BE ON LOAN TO ME AND CHARGEABLE AT $12.00 EACH. SIGNED	GOODS RECEIVED [signature] CUSTOMER	RECEIVED PAYMENT DISTRIBUTOR	TOTAL

M-S 117 (1-69) INTEREST CHARGEABLE ON OVERDUE ACCOUNTS THIS COPY MUST ACCOMPANY PROV. FUEL TAX REFUND APPLICAT[ION]

A331295 DATE 24-7-70 19

NAME H.G. HILKER 4 ASS.

ADDRESS

TOWN PROV.-STATE

CUSTOMER'S SIGNATURE Ian Thomas

MAKE OF CAR	LICENCE NO.	SPEEDOMETER

COMPLETED	PLEASE DO WORK INDICATED BY CHECK MARK	QUAN.	PRICE	AMOUNT	
	PREMIUM GASOLINE				
	REGULAR GASOLINE	46		23	10
	MOTOR OIL				
	CHASSIS LUBRICATION				
	TOTAL				

STATION DEALER

ADDRESS

WORK DONE BY	CHECKED BY

MAC MAC MOTORS (YUKON) LTD.

Your "Toyota" Dealer for the Yukon

Main Street and 6th Avenue - Box 2893

WHITEHORSE, Y.T. — PHONE 667-7202

Telex 049-8313

Specialized Volkswagen Service

DATE [illegible] 19[illegible]

NAME [illegible]

ADDRESS #69-2

QUANTITY	DESCRIPTION	AMOUNT	
[illegible]	[illegible]	7	[illegible]
	TAX		
REC'D BY [illegible]	TOTAL	7	[illegible]

CLERK	CASH	C.O.D.	CHARGE	ON ACCT	M. RET'D	PAID OUT
			✓			

S B -16 SYSTEMS EQUIPMENT LIMITED, VANCOUVER, CANADA W 1060-69

6949

MIC MAC MOTORS (YUKON) LTD.

Your "Toyota" Dealer for the Yukon

Main Street and 6th Avenue · Box 2893

WHITEHORSE, Y.T. — PHONE 667-7202

Telex 049-8313

Specialized Volkswagen Service

DATE [illegible] 19

NAME [illegible]

ADDRESS [illegible]

QUANTITY	DESCRIPTION	AMOUNT	
[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]		
	TAX		
REC'D BY	TOTAL	6	40

CLERK	CASH	C.O.D.	CHARGE	ON ACCT.	M. RET'D	PAID OUT

S B.-16 SYSTEMS EQUIPMENT LIMITED, VANCOUVER, CANADA W 1060-69

6962

MIC MAC MOTORS (YUKON) LTD.

Your "Toyota" Dealer for the Yukon

Main Street and 6th Avenue · Box 2893

WHITEHORSE, Y.T. — PHONE 667-7202

Telex 049-8313

Specialized Volkswagen Service

DATE ________________ 19____

NAME R. C. [illegible]

ADDRESS [illegible]

QUANTITY	DESCRIPTION	AMOUNT	
[illegible]	[illegible]	[illegible]	
	TAX		
REC'D BY [illegible]	TOTAL	[illegible]	

CHQ.	CASH	C.O.D.	CHARGE	ON ACCT.	M. RET'D	PAID OUT	

NO. 16 SYSTEMS EQUIPMENT LIMITED, VANCOUVER, CANADA W 1060-69

7132

MIC MAC MOTORS (YUKON) LTD.

Your "Toyota" Dealer for the Yukon

Main Street and 6th Avenue - Box 2893

WHITEHORSE, Y.T. — PHONE 667-7202

Telex 049-8313

Specialized Volkswagen Service

DATE July 18 1970

NAME R. G. Wilkin

ADDRESS 069-1

QUANTITY	DESCRIPTION	AMOUNT	
6.6	Gas	4	00
	TAX		
REC'D BY R. Wilkin	TOTAL		00

CASH	CASH	C.O.D.	CHARGE	ON ACCT.	M. RET'D	PAID OUT
			✓			

S B -16 SYSTEMS EQUIPMENT LIMITED VANCOUVER, CANADA W 1060-69

7124

MIC MAC MOTORS (YUKON) LTD.

Your "Toyota" Dealer for the Yukon

Main Street and 6th Avenue · Box 2893

WHITEHORSE, Y.T. — PHONE 667-7202

Telex 049-8313

Specialized Volkswagen Service

DATE [illegible] 19[illegible]

NAME [illegible]

ADDRESS 69-2

QUANTITY	DESCRIPTION	AMOUNT	
	10 4 gal	[illegible]	[illegible]
	TAX		
REC'D BY [illegible]	TOTAL	[illegible]	

CLERK	CASH	C.O.D.	CHARGE	ON ACCT.	M. RET'D	PAID OUT	
			✓				

S B -16 SYSTEMS EQUIPMENT LIMITED, VANCOUVER CANADA W 1060-69

7236

MIC MAC MOTORS (YUKON) LTD.

MIC MAC MOTORS (YUKON) LTD.

Your "Toyota" Dealer for the Yukon

Main Street and 6th Avenue - Box 2893

WHITEHORSE, Y.T. — PHONE 667-7202

Telex 049-8313

Specialized Volkswagen Service

DATE July 23, '70 19

NAME RG Walker Ltd

ADDRESS

QUANTITY	DESCRIPTION	AMOUNT	
10:2	Oil	6	20
	TAX		
REC'D BY		TOTAL 6	20

CLERK	CASH	C.O.D.	CHARGE	ON ACCT.	M. RET'D	PAID OUT

S B 16 SYSTEMS EQUIPMENT LIMITED VANCOUVER, CANADA W 1060-69

7177

MIC MAC MOTORS (YUKON) LTD.

Your "Toyota" Dealer for the Yukon

Main Street and 6th Avenue - Box 2893

WHITEHORSE, Y.T. --- PHONE 667-7202

Telex 049-8313

Specialized Volkswagen Service

DATE July 26 19[illegible]

NAME [illegible]

ADDRESS [illegible]

QUANTITY	DESCRIPTION	AMOUNT	
[illegible]		[illegible]	[illegible]
	TAX		
REC'D BY	TOTAL	[illegible]	[illegible]

CLERK	CASH	C.O.D.	CHARGE	ON ACCT	M. RET'D	PAID OUT	
			✓				

SYSTEMS EQUIPMENT LIMITED, VANCOUVER, CANADA W 1060-69

7224

MIC MAC MOTORS (YUKON) LTD.

Your "Toyota" Dealer for the Yukon

Main Street and 6th Avenue - Box 2893

WHITEHORSE, Y.T. — PHONE 667-7202

Telex 049-8313

Specialized Volkswagen Service

DATE 10/08 19 76

NAME

ADDRESS

QUANTITY	DESCRIPTION	AMOUNT	
7	Gas	4	20
	#69-1		
	TAX		
	TOTAL	4	20

D BY

CASH	C.O.D.	CHARGE	ON ACCT.	M. RET D.	PAID OUT	
		✓				

YSTENS EQUIPMENT LIMITED, VANCOUVER, CANADA W 1060 69

MIC MAC MOTORS (YUKON) LTD.

Your "Toyota" Dealer for the Yukon

Main Street and 6th Avenue - Box 2893

WHITEHORSE, Y.T. — PHONE 667-7202

Telex 049-8313

Specialized Volkswagen Service

DATE 12/08 19 73

NAME R.G. Hilker Ltd.

ADDRESS Unit #1 69-1

QUANTITY	DESCRIPTION	AMOUNT	
11.5	gas	6	98
	TAX		
	TOTAL	6	98

REC'D BY

CLERK	CASH	C.O.D.	CHARGE	ON ACCT.	M. RE'D	PAID OUT	

SD 16 SYSTEMS EQUIPMENT LIMITED, VANCOUVER, CANADA W 1060-69

7415

MIC MAC MOTORS (YUKON) LTD.

Your "Toyota" Dealer for the Yukon

Main Street and 6th Avenue · Box 2893

WHITEHORSE, Y.T. — PHONE 667-7202

Telex 049-8313

Specialized Volkswagen Service

DATE 15/08 19 7[illegible]

NAME R. G. Miller [illegible]

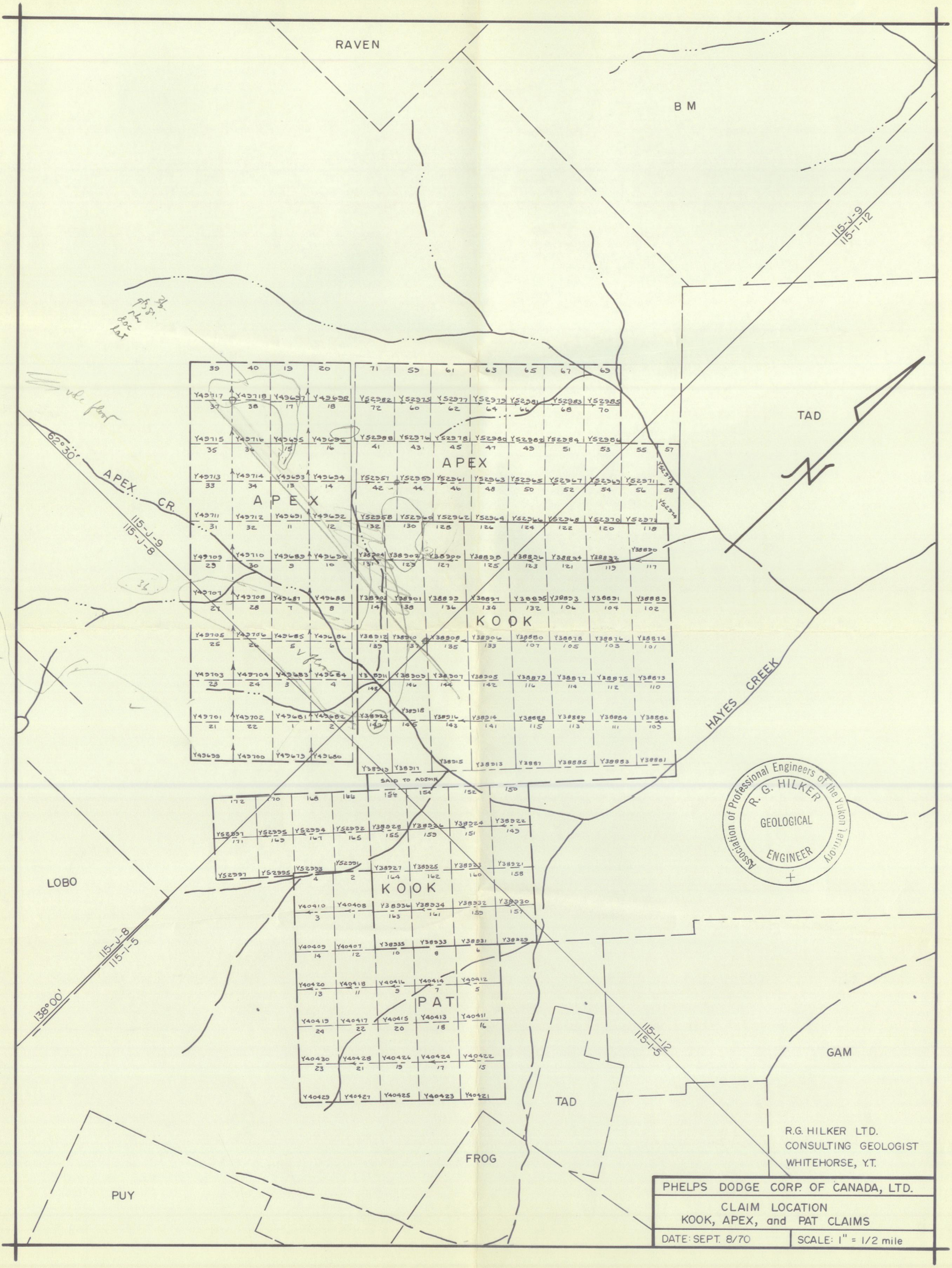
ADDRESS [illegible]

QUANTITY	DESCRIPTION	AMOUNT	
4			
5.	Gas	3.	30
	Charg H.D. Battery	5	-
2	qts 30 W.	2	-
	TAX	10	30
REC'D BY [illegible]	TOTAL	[illegible]	[illegible]

CLERK	CASH	C.O.D.	CHARGE	ON ACCT.	M. REF'D	PAID OUT	

S B -16 SYSTEMS EQUIPMENT LIMITED, VANCOUVER, CANADA W 1060-69

7440


RAVEN
BM
TAD
APEX
KOOK
PAT
APEX CR.
HAYES CREEK
62°30'
138°00'
115-J-9
115-I-12
115-J-8
115-I-5
LOBO
GAM
TAD
FROG
PUY
SAID TO ADJOIN
Association of Professional Engineers of the Yukon Territory
R. G. HILKER
GEOLOGICAL
ENGINEER
R.G. HILKER LTD.
CONSULTING GEOLOGIST
WHITEHORSE, Y.T.
PHELPS DODGE CORP. OF CANADA, LTD.
CLAIM LOCATION
KOOK, APEX, and PAT CLAIMS
DATE: SEPT. 8/70
SCALE: 1" = 1/2 mile

SHEET 1
R. G. HILKER
GEOLOGICAL
ENGINEER
APEX 41,42, 43,44
CREEK
APEX 41,42
KOOK 129,130, 131,132
APEX 19,20
55+00N
KOOK 131, 132
APEX 35,36, 37,38
45+00N
APEX 17, 18, 19,20
APEX 39, 40
APEX 13, 14, 15, 16
APEX 37, 38, 39,40
20+00N
KOOK 137, 138 139, 140
L156+00W
L144+00W
L132+00W
L120+00W
L108+00W
L96+00W
L84+00W
L72+00W
L60+00W
L48+00W
L36+00W
L24+00W
L12+00W
L0+00
L12+00E

GEOLOGICAL LEGEND

CENOZOIC

Tertiary
Carmacks Volcanics
[5] basalt, andesite, etc.

MESOZOIC

Jurassic - Upper Cretaceous
Coastal Intrusives
[4] Intrusive dikes
4a - acid dikes: rhyolite to latite
4b - basic dikes: diorite to gabbro
[3] Minor Intrusives
3a - monzonite
3b - quartz granite, rhyolite, dacite, latite
3c - porphyry: granite, rhyolite, quartz monzonite, monzonite, latite
[2] hornblende quartz monzonite

PRECAMBRIAN

Yukon Group
[1] quartzite, biotite gneiss, schist, etc.

R.G. HILKER LTD.
CONSULTING GEOLOGIST
WHITEHORSE, Y.T.

CLAIM SHEETS 115-I-5, 115-I-12, 115-J-8, 115-J-9.

PHELPS DODGE CORPORATION OF CANADA, LIMITED	
MONTANA OPTION - APEX CLAIMS GEOLOGY	
DATE: JULY 31, 1970	SCALE 1" = 400'


GEOCHEMISTRY - SHEET 1
R. G. HILKER
GEOLOGICAL ENGINEER
ZONE "A"
ZONE "B"
45+00N
55+00N
20+00N
BASE LINE
L156+00W
L148+00W
L132+00W
L120+00W
L108+00W
L96+00W
L84+00W
L72+00W
L60+00W
L48+00W
L36+00W
L24+00W
L12+00W
L0+00
L12+00E

SHEET 1
R. G. HILKER
GEOLOGICAL ENGINEER
N
45+00N
55+00N
20+00N
BASE LINE
L156+00W
L144+00W
L132+00W
L120+00W
L108+00W
L96+00W
L84+00W
L72+00W
L60+00W
L48+00W
L36+00W
L24+00W
L12+00W
L0+00

R.G. HILKER LTD.
CONSULTING GEOLOGIST
WHITEHORSE, Y.T.

CLAIM SHEETS 115-J-8, 115-J-9, 115-I-5, 115-I-12.

PHELPS DODGE CORPORATION OF CANADA, LIMITED

MONTANA OPTION - APEX CLAIMS

GEOCHEMICAL SURVEY

DATE: JULY 31, 1970 SCALE: 1" = 400'

NOTE: All readings are referenced to a base control station which has an arbitrary value of 2000 gammas

Association of Professional Engineers of the Yukon Territory
R. G. HILKER
GEOLOGICAL
ENGINEER

sheet 1
base line
sheet 2

R.G. HILKER LTD.
CONSULTING GEOLOGIST
WHITEHORSE, Y.T.

CLAIM SHEETS 115-I-5, 115-I-12, 115-J-8, 115-J-9.

PHELPS DODGE CORPORATION OF CANADA, LIMITED

MONTANA OPTION – APEX CLAIMS
MAGNETOMETER SURVEY

DATE: JULY 31, 1970 | SCALE: 1" = 400'