1970 GEOLOGICAL AND GEOCHEMICAL REPORT

MALONEY CREEK COPPER PROSPECT

POT #1-48 (inclusive)

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 $14,100

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

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

Commissioner of Yukon Territory

14,100

Whitehorse Mining Division
115 I 4

AMAX Vancouver Office

W. Lodder

T.J.R. Godfrey, P.Eng. (B.C.

August 1970

APPENDICES

ILLUSTRATIONS

SUMMARY AND CONCLUSIONS

The Maloney Creek Copper Prospect is located fifty miles west of the settlement of Carmacks at latitude 62°01'N and longitude 137°54'W. The property lies between elevations of 3000 to 4100 feet in the southwestern part of the Yukon Plateau, an area which escaped glaciation during Pleistocene times. The property consists of 48 claims (Pot #1-48 inclusive) staked by Amax Exploration, Inc. in September 1969.

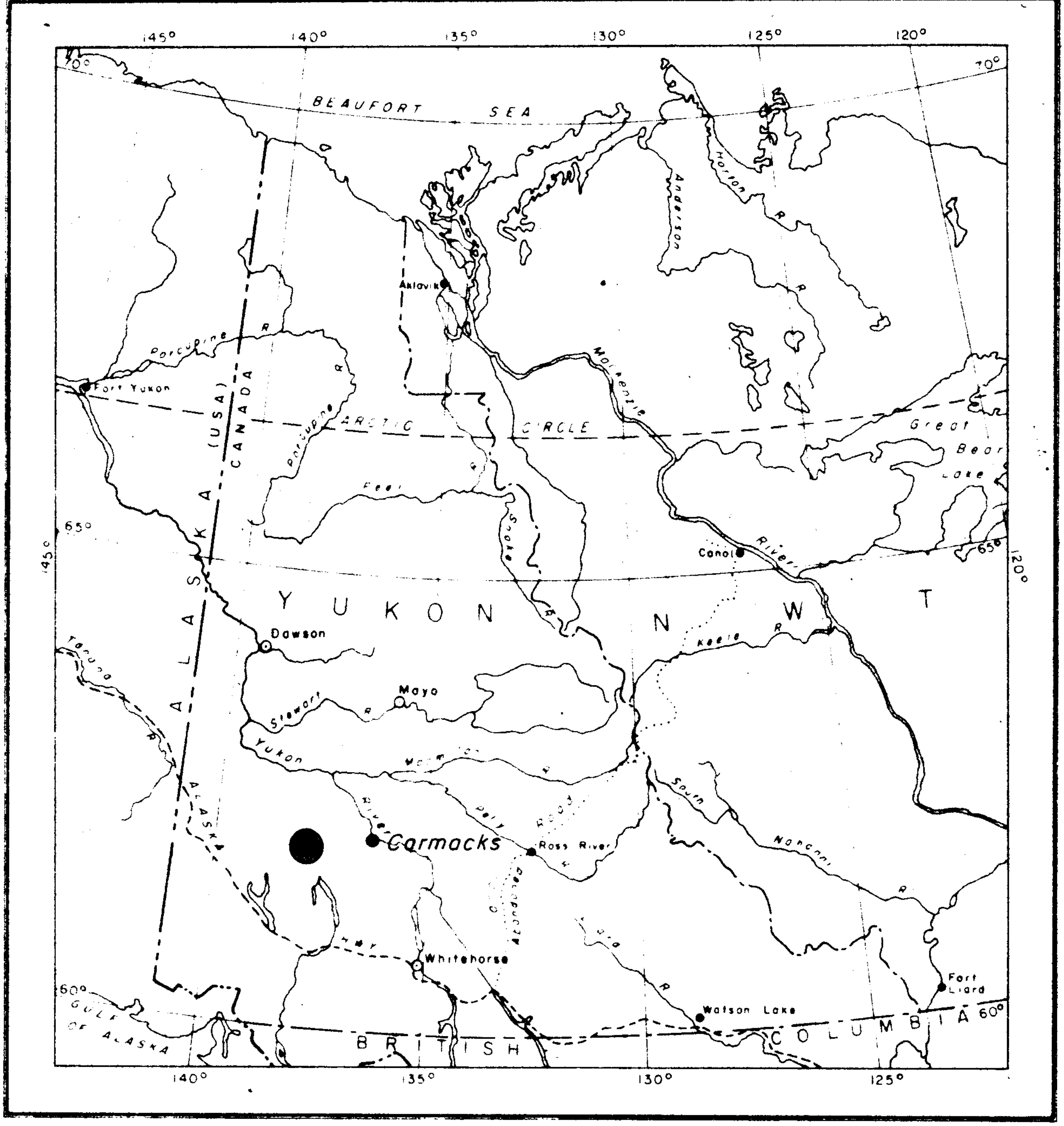
The Maloney Creek Prospect is underlain by Precambrian-Early Paleozoic rocks of the Yukon Group which are intruded by dioritic rocks related to the Mesozoic Coast Range Complex. These rocks are overlain and intruded by a complex Tertiary sequence of extrusive and sub-plutonic rocks. On the property, copper and/or molybdenum mineralization is encountered in three of the Tertiary sub-plutonic rock phases, i.e. a quartz diorite, a quartz porphyry, and a quartz porphyry breccia. The best Cu-Mo mineralization is confined to the quartz diorite and its adjacent Yukon Group wall rocks. The quartz diorite has dimensions of 1 by 1/2 mile.

The mineralization comprises or pyrite (up to 10%), chalcopyrite, molybdenite, chalcocite (?), jarosite, azurite, malachite, hematite and magnetite.

Magnetite may occur in considerable amounts (up to 25%) and is often concentrated along the northern edge of the quartz diorite while pyrite appears to be concentrated along the southern edge. Locally, small amounts of copper and/or molybdenite mineralization are associated with the magnetite and pyrite. On the claim group the best copper and/or molybdenum mineralization occurs in scattered exposures between the zones of magnetite and pyrite concentration.

On surface, molybdenite and chalcopyrite are strongly leached and/or oxidized and their former presence is only indicated by the occurrence of jarosite, malachite and/or azurite staining, the occurrence of moly oxides or the presence of maroon limonite. Although chalcocite has not been encountered on surface, its presence is inferred below the surface zone of leaching and/or oxidation. Associated with the Cu-Mo mineralization-intense pervasive silicification and strong quartz vein stockworks are locally present. In addition, K-feldspar introduction, intense argillization and fluorite are encountered in the quartz diorite. Tourmaline and scheelite are found peripheral to the Cu-Mo mineralization. Evidence of strong surface leaching is widespread on the claim group and preliminary pack sack drilling has proven a zone of leached and/or oxidized rock with a thickness of at least 70 feet.

Geochemistry has outlined an area of 3000 x 4000 feet of anomalous Cu and Mo values which occurs over the projected extension of the quartz diorite. It is thought that the anomaly reflects mineralization in the quartz diorite. A correct interpretation of the anomalous geochemical values is, however, complicated by the paucity of exposure. The latter fact also obscures correct information on the actual grade and extent of the Cu-Mo mineralization.



AMAX EXPLORATION INC.

MALONEY CREEK COPPER PROSPECT

WHITEHORSE MINING DISTRICT — YUKON

LOCATION MAP

SCALE 1" = 120 MILES

to accompany report: "1970 geological and geochemical report on the Maloney Creek Copper Prospect"

by: w. lodder and t. j. godfrey

Vancouver - FIG. 1 H.P.

INTRODUCTION

General Statement

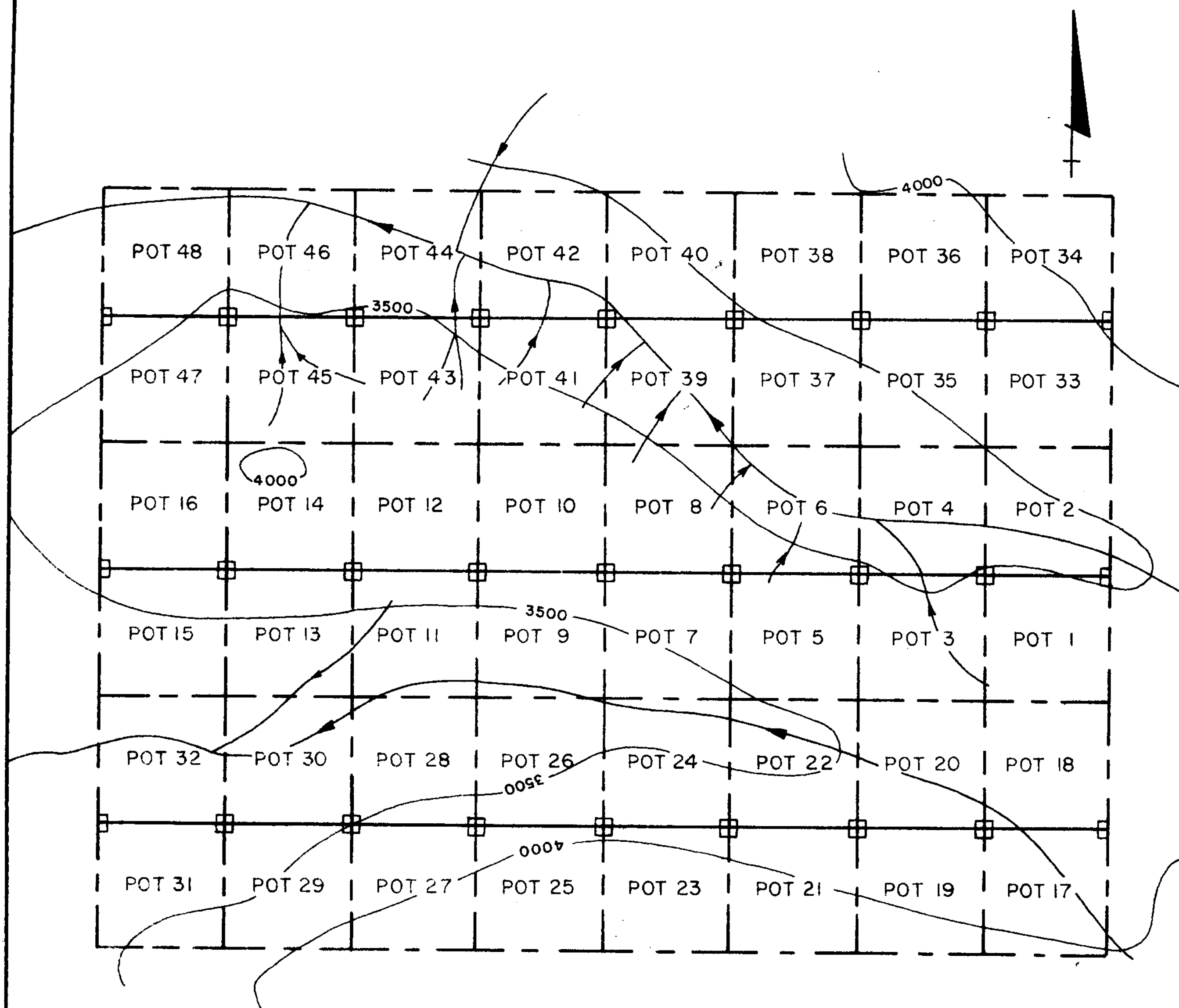
The Maloney Creek Copper Prospect (Pot claims #1 - 48 inclusive), 50 miles west of Carmacks, was staked by Amax Exploration in September of 1969 to cover an area of scattered mineralized exposure and anomalous geochemistry in an unglaciated area. After the staking some geological and geochemical work was carried out on the property. The results of this preliminary work warranted an extensive program of geological, geophysical and geochemical surveys. This report deals with the geological and geochemical results obtained during the period May 21 to September 1, 1970.

Location and Access (See Figure 1)

The Maloney Creek Copper Prospect is located 50 miles west of the settlement of Carmacks at latitude 62°01'N and longitude 137°54'W, between elevations of 3000 to 4100 feet. Access to the claims is by helicopter only.

Property (See Figure 2)

The property consists of 48 claims (Pot #1 - 48 inclusive) staked by Amax Exploration, Inc. and recorded on September 8, 1969.



AMAX EXPLORATION INC.

MALONEY CREEK COPPER PROSPECT

WHITEHORSE MINING DISTRICT — YUKON

CLAIM MAP

SCALE : 1 inch = 2000 feet

to accompany report: "1970 geological and geochemical report on the Maloney Creek Copper Prospect"
by: w. lodder and t. j. godfrey

NTS File 115 I 4
Fig. 2

REGIONAL GEOLOGY

The Maloney Creek Copper Prospect is situated in the Dawson Range in an unglaciated area underlain predominantly by Precambrian to Early Paleozoic metamorphic sediments and intrusions of the Yukon Group, intruded by dioritic to granodioritic rocks related to the Coast Range Complex. These rocks are overlain and intruded by a complex sequence of Tertiary extrusive and sub-plutonic rocks, which occur in north-northwest trending belts. They are thought to be erupted along fissures (or points arranged along fissures). The Tertiary igneous activity was intermittent with a marked difference in composition in place and time. On a broad scale two sequences can be recognized, an early basic to intermediate sequence and a later intermediate to acid sequence.

The first sequence is only rarely associated with sub-plutonic activity whereas the second sequence commonly is. Copper and molybdenite mineralization is frequently associated with the sub-plutonic rocks of the second sequence, and a number of significant prospects have been found in the area.

The Tertiary plutonic activity closely associated with the above sequences also appear to be concentrated along north-northwest trending linears (coincident with the trend of the volcanic belts).

GEOLOGY OF THE POT #1 - 48 CLAIMS (See Figure 3)

General Statement

Detailed geological mapping was carried out on the property on a scale of 1" = 500'. Basic control for the mapping was provided by a grid cut on the property with an east-west base line 12,000 feet long, and north-south across lines spaced 800 feet apart extending 4500 feet both north and south of the baseline. Over the area underlain by the mineralized quartz diorite (24+00W - 27+00E) additional lines were cut at 400 foot intervals from 16+00S to 32+00N.

Overburden obscures in excess of 95 percent of the bedrock within the property, consequently a large part of the geological mapping consisted of examining float. Dynamite blasting was extensively used to expose frost-heaved bedrock.

Lithology

The claim group is underlain predominantly by Precambrian to Early Paleozoic metamorphic rocks of the Yukon Group, which are intruded by dioritic rocks related to the Coast Range Complex. These rocks are overlain and intruded by a Tertiary series of acid flows, porphyritic intrusions, dyke rocks and a mineralized quartz dioritic plug. Exposure is poor within the claim group and consequently little is known about the contact and/or age relationship of most of the mapped rock units. The lithology of the mapped rock units is described below in order of their assumed decreasing age.

Yukon Group (Unit 1)

The Yukon Group consists of crystalline rocks of sedimentary and intrusive origins. These include schists and gneisses (1A), cherts (1B), limestones (1C) and skarns (1D).

Unit 1A consists principally of quartz mica schists, impure quartzites and ortho and para gneisses. These rocks are normally light coloured, medium to fine grained with a well developed schistosity or gneissic texture. They are strongly folded with a northwest trend. Unit 1A is by far the most common unit on the property. Aphanitic greenish cherts (Unit 1B) with a conchoidal fracture were noted at two localities on the property. Massive recrystallized limestone (Unit 1C) outcrops in the northwest portion of the claim group. The limestone is white in colour, medium grained and interbedded with sandstone beds (up to eight inches in thickness). The beds dip very shallow to the north. No calc-silicates were observed in the limestone.

Epidote-garnet-diopside skarns (Unit 2D) are found south of Peace Creek outcropping along the ridge between Peace and Chimo Creek. The skarns consist of quartz-feldspar bands, frequently containing diopside crystals, alternating with epidote rich calc silicate bands that occasionally contain small euhedral brownish-black garnets. Normally the bands are small but locally they reach thicknesses of six feet.

Locally banded amphiboles are found within the skarns. They are composed essentially of hornblende.

Coast Range Complex (Unit 2)

Exposure of quartz dioritic to dioritic rock related to the Coast Range Complex has been observed in the southwest portion of the property. The quartz dioritic phase is a massive, coarse grained, equigranular rock consisting of quartz, plagioclase, biotite and amphibole. Biotite occurs in greater amounts than amphibole and biotite crystals up to 1 cm in length are charactertistic for this phase. The dioritic phase is finer grained (medium to fine grained) contains less quartz while amphibole is more abundant than biotite.

No contact relations were observed however these phases are believed related.

Strongly assimilated inclusions of the Yukon Group are common in both phases.

Hornblende-Biotite-Porphyry (Unit 3)

This Unit occurs as small lenses and dykes in the schists and gneisses of the Yukon Group south of Chimo Creek. The rocks are massive, medium grained, and light gray in colour.

The composition of the porphyry is not uniform but an average composition would be 40% feldspar, 25% quartz (interstitial), 15% biotite, 15% amphibole (hornblende). Locally the amphibole content may exceed the biotite content. Cumulo-porphyritic clots of radiating amphibole crystals are frequently present in this rock unit.

Andesite (Unit 4)

This Unit comprises fine grained, dark green andesitic rocks intruded into rock of the Yukon Group and Coast Range Complex. The rocks occur as ring-type intrusions or as dykes, the latter with a predominantly northwest trend. Macroscopically the rock is characterized by fine crystalline amphibole and feldspar with the occasional blue quartz eye (up to 3 mm in diameter). Amygdules filled with carbonitic material are common in the rock. The rock is locally fairly magnetic and contains up to 1% disseminated pyrite.

Quartz Diorite (Unit 5)

Rocks of this Unit occur in an intrusive plug, which is elongated in an east-northeast direction and has approximate dimensions of 2000 x 5000 feet. The massive, brownish-gray porphyritic rocks of the plug are characterized by phenocyrsts of feldspar (up to 1.5 cm in length) set in a greyish fine grained granular matrix composed of quartz and feldspar. Quartz eyes up to 7 mm in diameter are often noticed in the groundmass. Biotite and amphibole are both present but the amounts vary strongly from place to place. Locally, biotite alone is present while in other places amphibole greatly exceeds the amount of biotite. Biotite occurs as idiomorphic individual crystals or in the form of biotite booklets which may represent an alteration product of amphibole. Amphibole occurs as long prismatic crystals (up to 1 cm in length) which locally show alteration rims. The crystal size of both biotite and amphibole varies but averages around 4 mm. Combined they constitute approximately 5-15% of the rock. Well-rounded generally strongly assimilated inclusions of the Yukon Group are common in the quartz diorite. The diorite is locally strongly leached and altered.

<u>Quartz Porphyry</u> (Unit 6)

This Unit occurs as a small intrusive body elongated in an east-west direction along the southern contact of the quartz diorite. Exposure of the intrusion is extremely poor and available outcrop is strongly leached and altered consequently fresh specimen are hard to obtain. No contact relations of the intrusion are known.

Rocks of this Unit are characterized by small quartz eyes (up to 3 mm in diameter) set in a fine grained, sugary, chalky white feldspathic groundmass. Small vugs lined with jarositic and/or limonitic material are common and occasionally, deeply bleached biotite crystals have been recognized in the groundmass.

Quartz Porphyry Breccia (Unit 7)

This Unit intrudes the rocks of the Yukon Group (Unit 1) to the east of the quartz diorite (Unit 5) and forms an irregular shaped body trending northwest with an average width of 800 feet, and a length of 2200 feet. The grayish white rocks of this unit are characterized by, often broken, quartz (up to 1 cm in diameter) and feldspar (up to 1.5 cm in length) phenocrysts set in a fine grained gray siliceous groundmass. The feldspar phenocrysts are strongly argillized and often show yellow stained cores (? limonite).

It is thought that large parts of the quartz porphyry have been brecciated. However, this feature is hard to recognize in the field, due to the similarity of texture and composition of both fragments and matrix. Locally, large angular fragments (up to 2 - 3 ' in diameter) of strongly silicified Yukon Group and small angular quartz fragments also of the Yukon Group, are found embedded in a quartz porphyry matrix.

Quartz Feldspar Porphyry (Unit 8)

Exposure of this Unit is confined to a north-south trending belt on the western portion of the claim group in which small outcrops are found.

The rocks are massive, light orange in colour with very distinct dipyramidal quartz crystals (pseudomorphic after quartz) and small K-feldspar phenocrysts set in a very fine grained groundmass in which on close inspection plagioclase crystals can be recognized. Cumulo-phyric clots of idiomorphic

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quartz crystals (up to 1 cm in diameter) are characteristic in the rock.

Orange Rhyolite (Unit 9)

Rhyolites with a typical orange colour are found in the western portion of the property. They are fine grained and have up to 10% combined quartz and K-feldspar phenocrysts in a fine grained matrix. Rapid changes in phenocryst content and grain size of the matrix are common.

Dyke Rocks (Unit 10)

A number of acid to basic dykes intruding the different rock units have been encountered on the claim group. They comprise very fine grained bluish or greenish rhyolitic dyke rocks, small aplitic dykes and several dark green to black fine grained basic dykes.

Fine grained aplitic rock just east of the quartz diorite (Unit 5) may represent a late magmatic phase of the quartz diorite.

Coarse Grained Quartz Feldspar Porphyry (Unit 11)

Exposure of this Unit is restricted to the extreme western boundary of the claim group. Rocks of this Unit are strongly weathered and only a few semi fresh samples could be obtained. The rocks are heavily stained, coarse grained with quartz and plagioclase phenocrysts set in a fine grained quartz-feldspathic matrix in which locally biotite has been recognized.

STRUCTURE

The structure of the claim group appears to be complex, and its interpretation is rendered difficult by the paucity of exposure. Isoclinal folding, drag folding and limb bands are common features in the Yukon Group. Locally small northwest trending faults (slickensides) were noticed.

The most dominant structural feature in the mapped area is a series of northwest trending topographic linear. This direction is also reflected in the regional drainage pattern of the area and is thought to represent a regional fault direction. The direction coincides closely with some of the before mentioned Tertiary intrusive trends, suggesting that faulting, at least in part, might have localized Tertiary intrusive activity in the area.

ALTERATION

Silicification and argillization have been recognized on the claim group. Silicification occurs within the quartz diorite (Unit 5), the quartz porphyry (Unit 6), the quartz porphyry breccia (Unit 7) and its adjacent wall rocks. The silicification within the intrusions is locally intense and pervasive and is generally concentrated along the contacts. It is especially noticeable in rocks of the Yukon Group along the intrusive contacts where silica was introduced along foliation planes.

Intense argillization of the feldspar is found in Unit 6 and 7, and locally in Unit 5. It comprises kaolinization and/or sericitization of the feldspar phenocrysts and the feldspar of the groundmass. In Unit 5 (the quartz diorite) the argillization is confined to the southern portion of the intrusion.

Apart from some erratic, scattered, quartz hair veinlets in the quartz porphyry breccia (Unit 7), quartz veining on the property is restricted to the quartz diorite (Unit 5) and its immediate adjacent Yukon Group wall rocks. The quartz veining in the quartz diorite occurs as a well developed quartz stockwork in scattered exposures along the southern edge of the intrusion. The stockwork (10-15 veins per square foot) consists of well defined quartz veins ranging from 2-3 mm to several cm in width.

Quartz veining in the rocks of the Yukon Group never reaches the dimensions of a stockwork. Here, quartz veining was introduced along foliation planes and nowhere reaches a density of over 2 or 3 veinlets (up to 5 mm in width) a foot. The quartz veins often carry magnetite in strongly variable amounts (10-25%).

Propylitic alteration and K-feldspar envelopes along quartz veins have been locally recognized within the quartz diorite.

Pyrite (up to 10%) and fluorite (up to 0.1%) are widespread within the quartz diorite, the quartz porphyry and quartz porphyry breccia.

Scheelite and tourmaline were locally encountered in the quartz diorite peripheral to the copper mineralization. No alteration zoning pattern has been established yet, but it appears that magnetite is concentrated north of the copper mineralization while pyrite is concentrated south of it. Evidence of strong surface leaching is widespread on the property and, although it is thought that the bulk of the clay mineral content of the intrusions was formed by hydrothermal agencies, considerable amounts of supergene clay are thought to be formed by leaching processes. Preliminary pack sack drilling on the property has revealed that the quartz diorite is leached to a depth of at least 70 feet.

MINERALIZATION

As presently known, mineralization on the property occurs in the quartz diorite, quartz porphyry, quartz porphyry breccia and their Yukon Group wall rocks.

The mineralization in the Yukon Group schists consists of quartz pyrite veins with occasionally some chalcopyrite and/or molybdenite. Disseminated pyrite (up to 10%) with small amounts of chalcopyrite and/or molybdenite is locally found in the Yukon Group skarns.

Quartz-molybdenum hair veinlets, and small amounts of disseminated pyrite and molybdenum have been occasionally observed in the quartz porphyry breccia. Considerable amounts of limonitic and/or jarositic material in the porphyry breccia indicate that considerable leaching has occurred.

The former presence of sulphides in the quartz porphyry is indicated by numerous vugs in the rock lined with jarosite and/or limonite, no indications of copper or molybdenum mineralization have been found in this rock type.

The best mineralization exposed on the property appears to be confined to the southern edge of the quartz diorite intrusion (Unit 5). The mineralization in this Unit comprises pyrite, chalcopyrite, molybdenite, (?) chalcocite, jarosite, azurite, malachite, magnetite and hematite.

Magnetite is concentrated along the northern edge of the quartz diorite where it occurs in quartz veins occasionally together with trace amounts of chalcopyrite. Pyrite is widespread along the extreme southern edge of the quartz diorite (up to 10%). It is generally leached and occurs with limonite and jarosite. Small amounts of chalcopyrite and/or molybdenite are locally associated with the pyrite. The best mineralized showings on the property occur scattered between the zones of magnetite and pyrite concentration.

Chalcopyrite and molybdenite are almost always strongly leached and/or oxidized and their former presence is only indicated by the occurrence of jarosite, malachite and/or azurite, of molybdenum oxides, or the presence of maroon limonite.

Although chalcocite has not been encountered on the property its presence is inferred below the surface zone of leaching and/or oxidation. The inference is based on correlations with similar prospects in the area.

GEOCHEMISTRY (See Figures 4A and 4B)

A total of 875 soil samples were collected on the claim group. The sampling was done along a grid with lines spaced at 800 and 400 feet. The sample interval was 200 feet. In addition about 30 silt and water samples were collected from creeks draining the property.

The samples were analyzed at the AMAX Laboratory in North Burnaby. Soil and silt samples were analyzed for molybdenum and copper. Water samples were analyzed for molybdenum only. Determination of pH was done on every fifth soil and silt sample and on all water samples.

The sampling procedures, analytical methods and laboratory methods are outlined in Appendix I. The sample location and results are shown in Figures 4A and 4B.

The property lies within the permafrost area of the Yukon Plateau. It is also covered by a layer of sub-recent volcanic ash which has an average thickness of ten inches. A typical soil profile consists of 2 - 8 inches of organic rich top soil (peat, average pH 5.5), 6 - 8 inches of volcanic ash, 2 - 5 inches of an iron enriched horizon (Bf, pH 4.5 - 6.7). Followed by dark brown clayey material containing numerous bedrock fragments. Often this profile is disrupted by frost heaves composed mainly of soil and bedrock fragments. The average thickness of overburden on the property is estimated to be 2-3 feet.Wherever possible (perma frost) soil samples were taken from the Bf horizon. The Mo and Cu content in soils and silts ranges widely. A background of 1 ppm Mo was established for the claim group. The anomalous threshold was set at 2 ppm Mo.

Background values for Cu in soil and silt were at 35 and 25 ppm respectively and thresholds were set at 70 and 50 ppm.

Soil sampling has outlined a large area (3000 x 4000 feet) of anomalous Cu and Mo values. The best portions of the anomaly average 8 to 10 times background for molybdenum. Most of the anomalous values occur over the quartz diorite intrusion, especially along its northern contact and its center part. The anomalous values along the northern edge of the quartz diorite may be explained by scattered exposed mineralization in the Yukon Group skarns while exposed mineralization in the center and southern part of the quartz diorite may account for the other anomaly. Interpretation of the anomaly is seriously complicated by the lack of exposure, however, it is inferred that the anomaly reflects bedrock mineralization.

AMAX Vancouver Office

August 1970

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APPENDIX I

SAMPLE HANDLING PROCEDURE

Procedures for Collection and Processing

of Geochemical Samples

Amax Exploration, Inc.

Vancouver Office

December 1968

R.F. Horsnail

SAMPLE COLLECTION

Soils

B horizon material is sampled and thus organic rich topsoil and leached upper subsoil are avoided. Occasionally organic rich samples have to be taken in swampy depressions.

Samples are taken by hand from a small excavation made with a cast iron mattock. Approximately 200 gms of finer grained material is taken and placed in a numbered, high wet-strength, Kraft paper bag. The bags are closed by folding and do not have metal tabs.

Observations as to the nature of the sample and the environment of the sample site are made in the field on standard forms, examples of which are shown overleaf.

Drainage Sediments

Active sediments are sampled with stainless steel trowels from tributary drainages which are generally of five square miles catchment or less. Composite samples are taken of the finest material available from as near as possible to the centre of the drainage channel thus avoiding collapsed banks. More than one sample is taken if marked mineralogical or textural segregation of the sediments is evident.

Some 200 gm of finer material is collected unless the sediment is unusually coarse in which case the weight is increased to 1 kg. Samples are placed in the same type of Kraft paper bag as are employed in soil sampling.

RECCE SAMPLE DATA SHEET

Camp ______________________

Collector ______________________ Project ______________________ Area (lake, highway, etc.) ______________________

Date ______________________ Plotted (map, photo) ______________________

CODE	Number: Sample Number	Type: Rock	Type: Soil	Type: Water	Type: Silt	Type: Veg.	Location: General	Location: Sample Site	Environment: TOPO. Terrain TYPE	Environment: DIRECTION Drainage TYPE	Sample Description: SIZE Texture TYPE	Sample Description: TONE Colour BASE	Analytical Results: pH	Analytical Results: Mo	Analytical Results: Cu	Analytical Results	Remarks (Geology, Geomorph., Culture, Float)
1					a b c		N	E									
2					a b c		N	E									
3					a b c		N	E									
4					a b c		N	E									
5					a b c		N	E									
6					a b c		N	E									
7					a b c		N	E									
8					a b c		N	E									
9					a b c		N	E									
10					a b c		N	E									
11					a b c		N	E									

General Remarks:

Form JAH-67

REFERENCE FOR COMPLETING RECCE SAMPLE DATA SHEET

Code Number - Year, project, samplers initial and type of sample

Sample Number - Each sampler is to number consecutively irrespective of sample type or area.

Sample Type (Rock, Soil, Water, Silt, Veg.) - Put check mark in appropriate column. In case of silt (stream sediment) more than one sample is commonly taken at given site, therefore, identify different samples by subscript a,b,c, and check accordingly. If only one sample, check "a" and add subscript to number on sample envelope.

Location - Location information is used to assist accurate plotting and re-locating site in field:

General	Sample Site
Given with reference to plot on map or photo, e.g., highway, lake, river, creek, mountain, traverse, etc.	Detailed location of actual sample site; e.g., side of road, mountain slope, distance from lake, stream junction, bridge, swamp, culture, etc.

______ N ______ E - The "N" and "E" spaces refer to some numerical coordinate, i.e., latitude or longitude, leave blank in field, for office use later.

Environment

Terrain
- Topo - mountainous, hilly, rolling, flat, dissected, (other) (specify other)
- Type - deciduous, coniferous, grassland, swamp, cultivated, grazing, orchard, jungle, rock, (other)

Drainage
- Direction - N, NE, E, SE, S, SW, W, NW, ?
- Type - groundwater, sheetwash: for streams-mature or meandering, youthful or eroding; PLUS size in actual feet at water level - seepage, 1 ft, 1-5 ft, 5-15 ft, over 15 ft.

Sample Description

Texture
- Size - very fine, fine, medium, coarse, very coarse, unsorted, mixed, (other)
- Type - Rock -- acid granitic, intermed. granitic, basic granitic, acid volc., basic volc., sandstone, carbonate, shale, metamorphic, (other)
  - Soil -- A_0, A_1, B_1, B, C (if recognized) PLUS clay, loam, silt, sand, and approximate proportion of organic content - 1/4, 1/2, 3/4, if any
  - Silt -- clay, loam, silt, sand, (other); PLUS amount of organic material-1/4,1/2,3/4, if any

Colour
- Tone - pastel, light, medium, dark, deep, speckled, spotted, (other)
- Base - white, gray, black, brown, yellow, orange, red, mixed, (other)

NOTE: In describing Environments and Samples pick one word only for each section; (put any additional comments under the "Remarks" column).

Remarks - Any additional information not covered by other columns that may be pertinent to interpretation of results, e.g., geological features such as faults, dikes, quartz veining, geology of float, use of fertilizers on cultivated soils, sample below culvert, old mine, etc.

General Remarks - Any comments worth noting either with respect to area in general or taking and handling of samples including analytical remarks noted in lab report.

Water samples are taken at all sites where appreciable water is present. Approximately 100 mls are sampled and placed in a clean, screw sealed, polythene bottle.

Observations are made at each site regarding the environment and nature of the sample. The same standard sheet that is used for soil sampling is employed.

Rock Chips

Composite rock chip samples generally consist of some ten small fragments broken from unweathered outcrop with a steel hammer. Each fragment weighs some 50 gms. Samples are placed in strong polythene bags and sealed with non-contaminating wire tabs. Samples are restricted to a single rock type and obvious mineralization is avoided.

Soil, sediment and rock samples are packed securely in cardboard boxes or canvas sacks and dispatched by road to the AMAX geochemical laboratory in Vancouver.

SAMPLE PREPARATION

Packages of samples are opened as soon as they arrive at the laboratory and the bags placed in numerical sequence in an electrically heated sample drier (maximum temperature 70°C).

After drying soil and sediment samples they are lightly pounded with a wooden block to break up aggregates of fine particles and are then passed through a 35 mesh stainless steel sieve. The coarse material is discarded and the minus 35 mesh fraction replaced in the original bag providing that this is undamaged and not excessively dirty.

Rock samples are exposed to the air until the outside surfaces are dry; only if abnormally wet are rocks placed in the sample drier. Rock samples are processed in such manner that a fully representative ½ g sample can be obtained for analysis. The entire amount of each sample is passed through a jaw crusher and thus reduced to fragments of 2 mm size or less. A minimum of 1 kg is then passed through a pulverizer with plates set such that 95% of the product will pass through a 100 mesh screen. Where samples are appreciably heavier than 2 kg the material is split after jaw crushing by means of a Jones splitter. After pulverizing the sample is mixed by rolling on paper and is then placed in a Kraft paper bag.

WEIGHING AND DIGESTION FOR Cu and Mo ANALYSIS

Digestion tubes (100 x 16 mm) are marked at the 5 ml level with a diamond pencil. Tubes are cleaned with hot water and concentrated HCl. 0.5 g samples are weighed accurately, using a Fisher Dial-O-Gram balance, and placed in the appropriate tubes.

To each of the samples thus prepared are added 2 ml of an acid mixture comprising 15% nitric and 85% perchloric acids. Racks of tubes are then placed on an electrical hot plate, brought to a gentle boil (½ hour) and digested for 4½ hours. Samples unusually rich in organic material are first burned in a porcelain crucible heated by a bunsen burner before the acid mixture is added. Digestion is performed in a stainless steel fume hood.

After digestion tubes are removed from the hot plate and the volume is brought up to 5 ml with deionized water. The tubes are shaken to mix the solution and then centrifuged for one minute. The resulting clear upper layer is used for Cu and Mo determination.

MOLYBDENUM DETERMINATION

1. Transfer a 1 ml aliquot of digestion solution into a clean test tube.
2. Add 2 ml of a freshly prepared mixture comprising 1:1 5% KSCN solution and 15% $SnCl_2$ solution.
3. Make up to 10 mls with demineralized water.
4. Add 1 ml isopropyl ether, cork tube and shake for 45 minutes.
5. Estimate Mo content by matching intensity of amber-yellow colour in solvent phase with a standard series.

Standard Molybdenum Solutions

Stock Standard Solution (100 μg/ml) - Dissolve .015 gms of MoO_3 in 5 ml conc. NaOh and make up to 100 ml with demineralized H_2O. This solution must be made up bi-monthly.

Working Standard Solution (10 μg/ml) - Pipette 10 ml of 100 gamma/ml stock solution in a 100 ml volumetric flask and make up to 100 ml with demineralized H_2O.

Molybdenum Standards of Analyses for Soil, Silt & Rock Chip - To 11 clean 16 x 100 mm test tubes marked at 5 ml mark, pipette the following amounts of standard solution:

mls of 10 μg/ml Mo Solution	ppm
0.2	4
0.4	8
0.8	16
1.2	24
2.0	40

mls of 100 μg/ml Mo Solution	ppm
0.4	80
0.6	120
0.8	160
1.2	240
1.6	320
2.0	400

- then make up to 5 ml

To 16 x 150 ml test tubes pipette 1 ml from each of the 11 standards made above. After the standard solution has been added, the following solutions are to be pipetted in the standard tubes.

1) 1 ml of HCl
2) 2 drops of $FeCl_3$ (1% solution)
3) 1 ml of 5% KSCN solution
4) 1 ml of 15% $SnCl_2$ solution
5) Make up to 10 ml with H_2O
6) 1 ml isopropyl ether
7) Stopper and shake for 45 seconds.

<u>Molybdenum Determination in Waters</u>

1) Measure pH of samples with pH meter
2) Transfer 50 mls of sample into 125 ml separatory funnel
3) Add 5 mls dilute(1:1)HCl
4) Add 4 mls of a mixture comprising 1 part 1% $FeCl_3$ solution to 3 parts 5% KSCN solution and shake
5) Add 3 mls 15% $SnCl_2$
6) Add 2 mls isopropyl ether, shake for 30 seconds and allow phases to settle
7) Drain off water layers, retaining organic layer into 13 x 100 mm test tube. Compare with standards.

<u>Molybdenum Standards</u> - Label 10 clean test tubes 0, 4, 10, 16, 20, 40, 50, 60, 70, and 80 ppb, to the respective tubes pipette the following volumes of 1 gamma/ml Mo work solution:

mls of 1 μg/ml Mo Solution	ppb
.20	4
.50	10
.80	16
1.00	20
2.00	40
2.50	50
3.00	60
3.50	70
4.00	80

After the standard solution has been added, the following solutions are to be pipetted into the standard tubes:

1) 1 ml 1:1 HCl solution
2) 2 drops of 1% $Fe_2(SO_4)_3(NH_4)_2SO_4$
3) 2 mls of 15% KSCN solution
4) 1 ml of 15% $SnCl_2$ solution
5) 1 ml of isopropyl ether
6) Stopper and shake for 45 seconds.

COPPER DETERMINATION

The digestion solution is sprayed directly into a Perkin-Elmer 290B atomic absorption spectrophotometer from which the Cu concentration is read on the scale.

Instrument settings are:

Coarse Wavelength Control	280.1
Slit Width	7 A°
Lamp Current	5 ma
Acetylene Flow	14.0
Air Flow	14.0

The instrument is calibrated such that the maximum scale reading corresponds to 20 ppm in solution ie: 200 ppm in the sample. Samples with Cu contents of over 200 ppm are diluted until a reading is obtained on the scale. It is practical to measure concentrations in the range 5 ppm to 1%.

pH MEASUREMENTS

Soil and drainage sediment samples are dampened with water in a glass beaker to a pasty consistency. Demineralized water is used for this purpose as it has a low buffer capacity and thus does not influence the pH of the sample. Measurement is made with a Fisher Acumet pH meter. Electrodes are stored in buffer overnight. A 30 minute warm up time is allowed for the instrument each morning. A 10 ml aliquot is taken from water samples for pH measurement.

APPENDIX II

ASSESSMENT DATA

Pot #1 - 48 inclusive (Maloney Creek Copper Prospect)

Work done on Pot #1-48 inclusive mineral claims from May 21st to September 1st, 1970.

Geochemical Soil Survey	33 line miles (875 samples)
Silt and Water Survey	16 samples
Geological Mapping	4 square miles
Geochemical Samples Analyzed	

Soil - 875 (Cu,Mo,pH for every fifth sample)
Silt - 16 (Cu,Mo,pH for every fifth sample)
Water- 15 (Mo,pH for every fifth sample)

Personnel Employed

W. Lodder, Geologist I/C, 951 Westview Crescent, North Vancouver, B.C.

T.J.R. Godfrey, Geologist, P.Eng., 3024 Del Rio Drive, North Vancouver

L.A. Bell, Sr. Assistant, 5334 Rannock Ave., Winnipeg 20, Manitoba

J.L. LeBel, Sr. Assistant, R.R. #4, Belleville, Ontario

L.A. Procyshyn, Jr. Assistant, Box 272, Winnipegosis, Manitoba

N. Sworyk, Labourer, Box 235, Houston, B.C.

Salaries

T.J.R. Godfrey, P.Eng. Geologist (Supervision) 2 days @ $100.00/day	$200.00
W. Lodder, PhD. Geologist I/C 8 days @ $ 70.00/day	560.00
L.A. Bell, BSc. Geologist 2 mos. @ $800.00/month	1600.00
J.L. LeBel, Senior Assistant 10 days @ $ 25.00/day	250.00
L.A. Procyshyn, Junior Assistant 2 mos. @ $525.00/month	1050.00
N. Sworyk, Labourer 2 mos. @ $660.00/month	1320.00
	$4980.00

Camp Costs

As per Schedule B	$1720.00

Geochemical Analysis

Carried out at Amax Laboratory, 2225 Springer Ave., Burnaby, B.C.

875 Soil Samples Cu,Mo(pH every 5th)	@ $2.00/sample	$1750.00
16 Silt Samples Cu,Mo(pH every 5th)	@ $2.00/sample	32.00
15 Water Samples Mo,pH	@ $2.00/sample	30.00
C.P. Air express charges (estimate)		25.00
		$1837.00

Pencil Manuscript Topographic Base Map- Lockwood Survey Corporation	$ 400.00

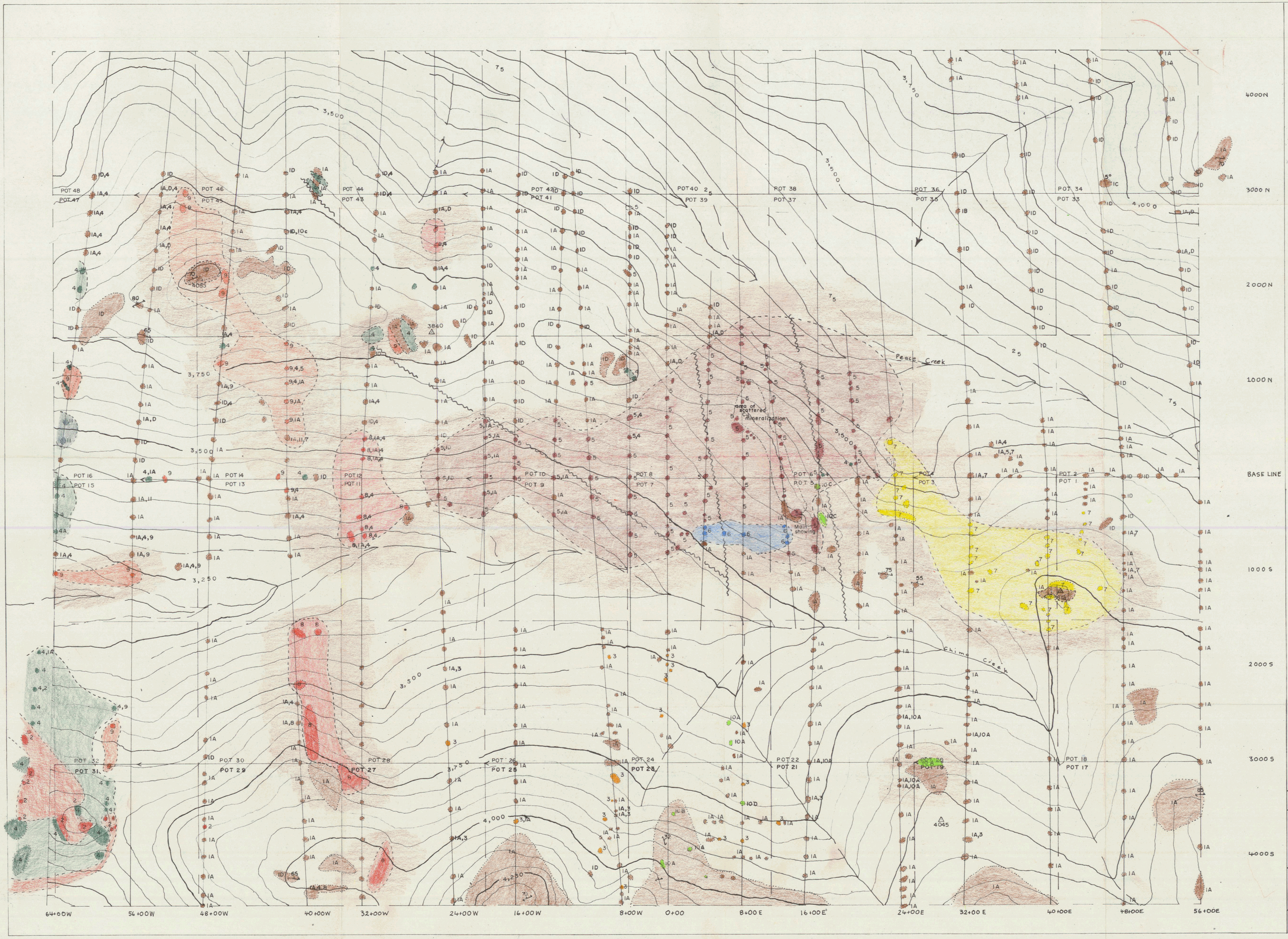
Helicopter

Contract Helicopter CF-RQM (Bell G-3B-1) support from AMAX base camps and Casino Airstrip (See Schedule C)

30.3 hours @ $130.00/hour	$3939.00
Fuel, Oil, etc @ $20.00/hour	606.00
	$4545.00

Office Expenses

Report Preparation, Drafting, Reproduction and Typing (estimate)	$ 300.00
Telephone Service (estimate)	50.00
	$ 350.00
Blasting Supplies	$ 268.00
TOTAL	$ 14,100.00



LEGEND

CENOZOIC TERTIARY

11 coarse grained quartz-feldspar porphyry

10 dike rocks:
- A green rhyolite
- B blue rhyolite
- C aplite
- D basic dikes
- E black quartz eye porphyry

9 orange phyolite

8 quartz-feldspar porphyry

7 quartz porphyry breccia

6 quartz porphyry

5 quartz diorite

4 andesite

MESOZOIC

3 hornblende-biotite porphyry

2 quartz-diorite

PRECAMBRIAN

1 yukon group
- A schist gneiss
- B chert
- C limestone
- D skarn

SYMBOLS

- spot height
- claim location line
- claim boundary line
- float
- outcrop
- geologic contact
- fault
- foliation attitude
- bedding plane attitude
- outline of area of scattered Cu mineralization

AMAX EXPLORATION INC.

MALONEY CREEK
COPPER PROSPECT
WHITEHORSE MINING DISTRICT —— YUKON

GEOLOGICAL MAP

SCALE 1"=500'

date revised		date printed		drawn by: W.R.B.	fig.
				date 27/8/70	
				N.T.S. File 115 I 4	3

to accompany report *1970 Geological and Geochemical Report on the Maloney Creek Copper Prospect*
By; W. Lodder and T.J.R. Godfrey

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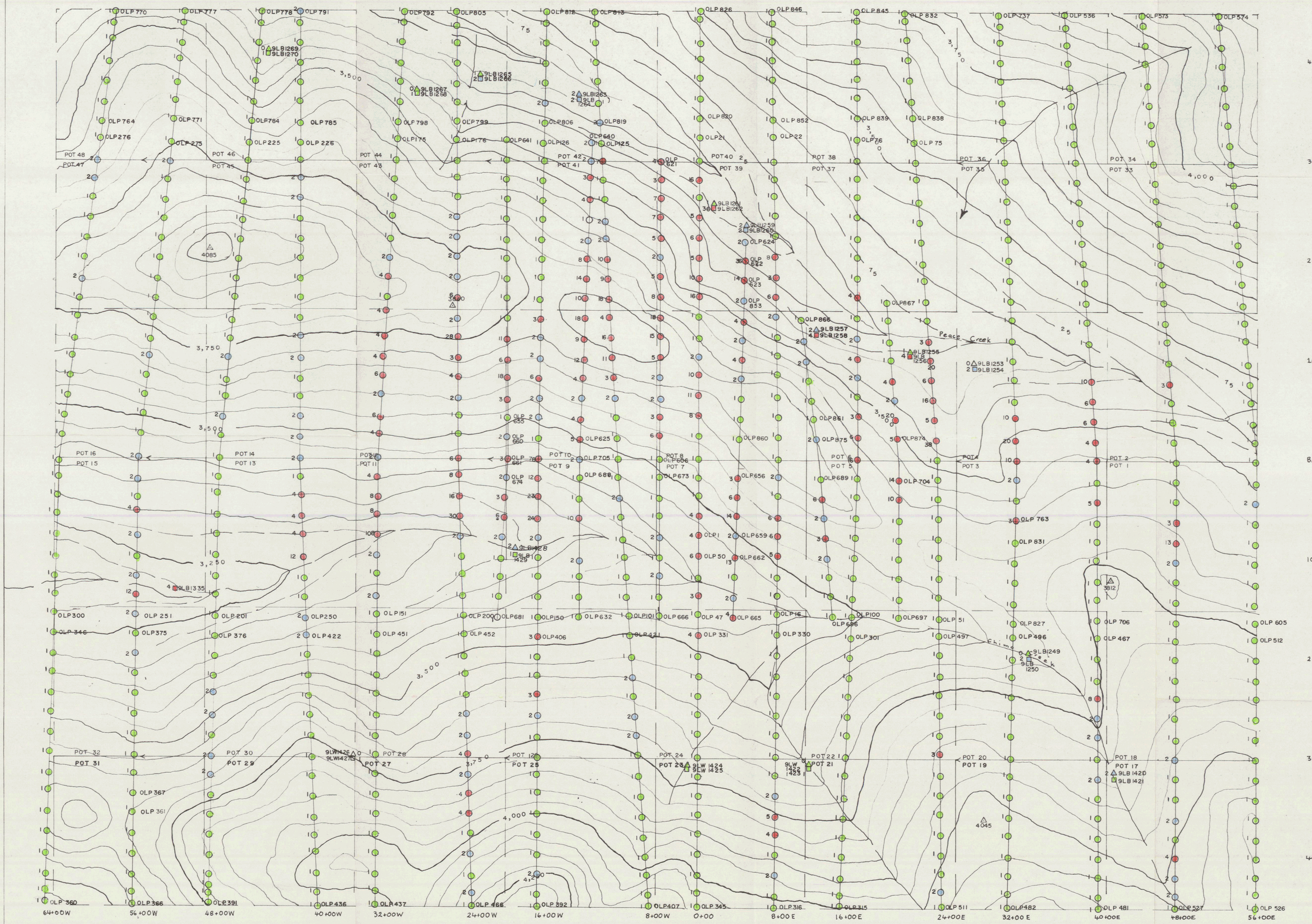

LEGEND

OLP 129 soil sample site p.p.m. Mo. sample number

OLP 410 silt sample site p.p.m. Mo.

OLP water sample site p.p.b. Mo.

SOIL SAMPLES

Mo. in p.p.m.

- 0-1 background
- 1-2 positive
- >2 anomalous

SILT SAMPLES

Mo. in p.p.m.

- 0-1 background
- 1-2 positive
- >2 anomalous

WATER SAMPLES

Mo. in p.p.b.

- 0-1 background
- 1-2 positive
- >2 anomalous

SYMBOLS

- spot height
- claim location line
- claim boundary line
- creek

AMAX EXPLORATION INC.

MALONEY CREEK
COPPER PROSPECT
GEOCHEMICAL MAP - MOLYBDENUM
WHITEHORSE MINING DISTRICT - YUKON
SCALE 1" = 500'

date revised		date printed		drawn by: W.B.	fig.
				date 26/8/70	4a
				N.T.S. File 115 I 4	

to accompany report *1970 Geological and Geochemical Report on the Maloney Creek Copper Prospect* By: W. Lodder and T.J.R. Godfrey

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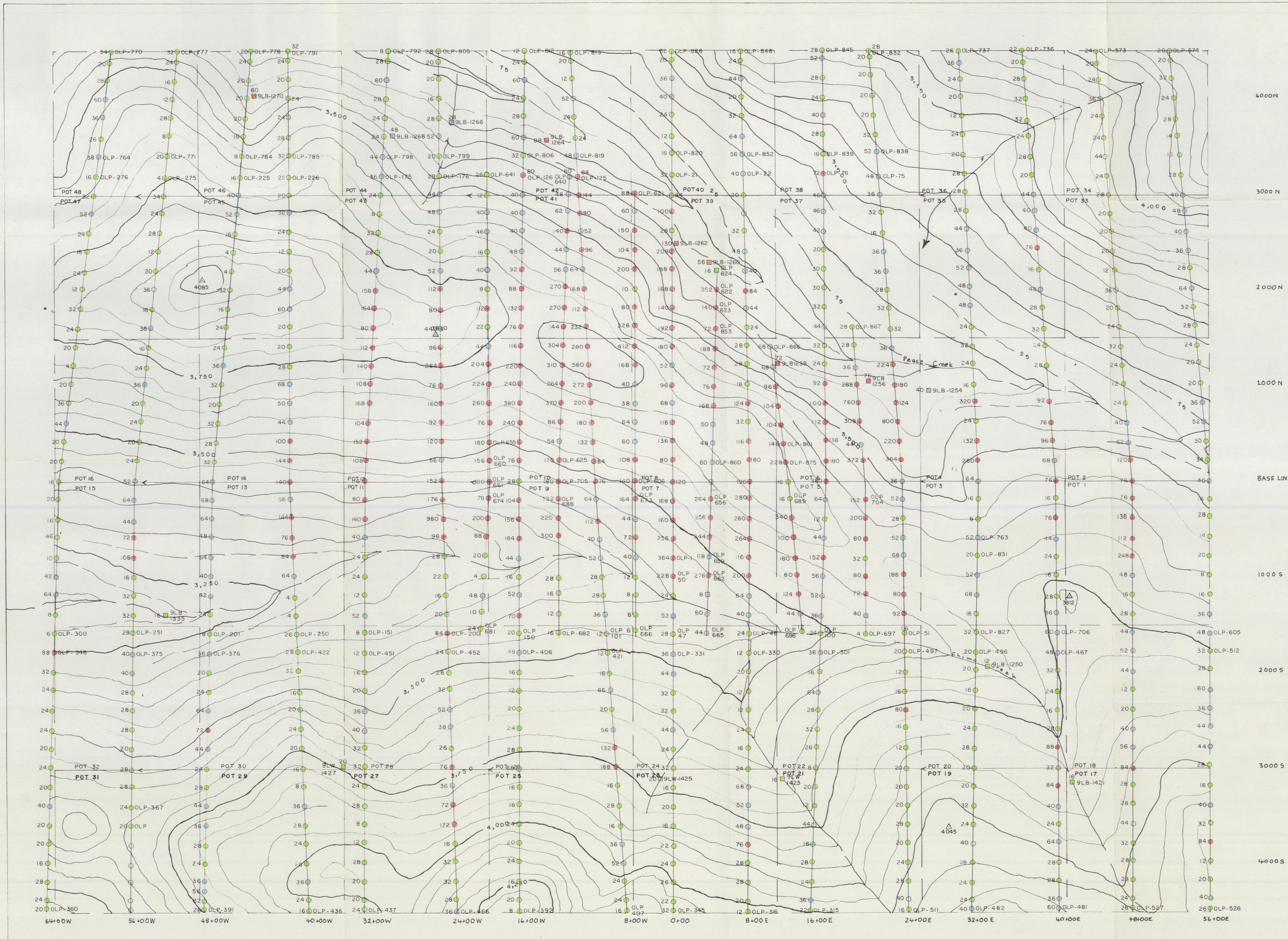

LEGEND

24 ○ OLP 129 Soil sample site, ppm. Cu, sample number.

20 □ OLP 410 Silt sample site, ppm. Cu, sample number.

SOIL SAMPLES

Cu IN P.P.M.

- 0-35 Background
- 35-70 Positive
- >70 Anomalous

SILT SAMPLES

Cu IN P.P.M.

- 0-25 Background
- 25-50 Positive
- >50 Anomalous

SYMBOLS

- △ Spot height
- Claim location line
- Claim boundary line
- Creek

AMAX EXPLORATION INC.

MALONEY CREEK COPPER PROSPECT

GEOCHEMICAL MAP - COPPER

WHITEHORSE MINING DISTRICT-YUKON

SCALE 1"=500'

date revised	date printed		fig.
		drawn by: A.H.S.	4b
		date 26/8/70	
		N.T.S. File 115 I 4	

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