REPORT ON
A TECTONIC LINEAMENT STUDY AND COPPER MINERALIZATION ALONG THE CANTUNG ROAD, YUKON TERRITORY

by

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INTRODUCTION

This report contains the results of attempting to determine if copper mineralization approximately between mile 56 and 58 along the Cantung Road, Yukon Territory, should warrant further exploration. The objective of further exploration would be to determine if economical grades and tonnages of copper ores are present below surface.

The above mineralization was first observed by Mr. Cliff Turner some years ago. The mineralization of economical interest consists mainly of chalcopyrite and pyrrhotite in large angular float, which were uncovered by the bull-dozer work during the time when the Cantung Road was being built. The size of the float is in several places very large, as much as 6 to 10 feet in diameter. The distribution of mineralized float in the neighborhood and along the Cantung Road between the above milages appears to be relatively uniform.

The use of the word float is perhaps unfortunate with respect to the above; rather, one should talk about material which has been frost heaved. Consequently, in this report the author shall by the term float refer to material which has been frost heaved.

In view of the lack of apparent glacial movement in the general area of the mineralization, and because of the angular shapes of the float, rather than rounded, it is suggested that at the very best the float could have moved less than than a claim length. It should also be noted that the topography in the general area is relatively flat. The uniform distribution of float is also thought to be an argument for it being close to source.

The exploration programs conducted in the area of the mineralization have consisted of a ground magnetic survey and two short diamond drill holes. The author believes that the reason for the magnetic survey was a suspected magnetic response of purrhotite associated with the chalcopyrite. However, the intensity of the magnetic response of pyrrhotite vary greatly, the less magnetic varieties contain more iron. The magnetic contour map of the ground magnetic survey, however, does not seem to correlate with possible detailed geology. Detailed reasons for this will be suggested further on in this report. Consequently, it is believed that this survey is not diagnostic with respect to mineralization.

The two diamon drill hole cores were both classified as mainly in micaceous phyllite, and the holes were supposed to havê intersected magnetic anomaly sources. After a careful examination and interpretation of the magnetic contour map it can be seen that the direction and the attitude of the holes is approximately parallel to interpreted structures. Further, an examination of the rock type containing the mineralization in the float would suggest a granitic type rather than phyllite. Evidently, the above drill holes were not spotted in a location where the source of the float could be intersected by shallow drilling.

GEOLOGY

The geology in the immediate area of the copper mineralization is reported by the Geological Survey of Canada, Map 6-1966, to consist of primarily three units.

Proterozoic sediments, which to the west and the northwest of the property are mainly shale, slate, phyllite, and quartzite, and to the east, quartz-feldspar-mica gneiss and schist, quartzite, and numerous small granitic bodies, aplite, and pegmatite, have been intruded by Cretaceous quartz monzonite and granodiorite, which in places are porphyritic.

In the immediate area of the mineralized float the surface rock is mapped as unconsolidated erosional deposits.

It was found possible to extrapolate known geology immediately to the northwest of the property below the erosional deposits by a qualitative interpretation of the government aeromagnetic map.

The float correlates with a magnetic low, this low also correlates with quartz monzonite intrusions to the northwest. The sediments , and especially to the west and the northwest, correlate with magnetic highs. Therefore, it is suggested that the bedrock in the area of economical interest is likely to be quartz monzonite. The author believes that this interpretation corresponds to the probable rock type observed in the float samples.

In the area of interest the granitic rocks are commonly bordered by complex zones as much as ¼ mile wide in which massive plutonic rock is interspersed with lit-par-lit migmatites and partly granitized inclusions. Subsequently, in these areas the mapped boundaries are largely arbitrary, and based on proportions of intrusive to sediments.

The mineralized samples taken from the float contain a relatively good percentage of pyrrhotite. This would suggest that mineralized fluids were relatively low in oxygen and that the iron content in the fluids would, therefore, form pyrrhotite, rather than becoming locked up in rock forming minerals such as feldspars.

The interpretation of this observation coupled with the observation of magnetic highs over sediments and metasediments would suggest that contact metamorphism in the sediments includes replacements with associations of low iron content pyrrhotite and/or magnetite. It seems perfectly rational that it would be possible for the oxygen content or the sulfur content in the volatiles to be relatively higher in the zone of contact metamorphism such as to form minerals which could account for the magnetic highs versus lows.

On the other hand, it is also possible for secondary alterations to have occurred whereby alteration or remobilization of iron minerals could have taken place locally.

Another argument for the opinion of the copper float being immediately near its source is the mineral occurrences in the area. A contact zone striking northwesterly from the property has Pb-Zn-Cu showings along it for a distance of 15 miles, and immediately to the south and adjoining the property chalcopyrite has been reported in shales and slates. By considering zoning across contacts it is, therefore, possible to argue a justification for the above opinion of the float.

TECTONIC INTERPRETATION

The purpose of tectonic interpretations is to infer a "plumbing system" through which major mineralization fluids could have moved. As such one is concerned with mainly contacts, faults, and fractures. In this area it is important to remember that breaks in the geology of this kind can be both the "plumbing systems" or impermeous barriers.

The method of interpretation was developed by Dr. J. Wertz who has demonstrated that all hydrothermal ore-deposits in the Cordillera are associated with a set of crustal fractures. These fractures may either be completely defined at surface or else defined at surface where geological activities since the last movement along the fractures have not hidden them.

The usual procedure in interpreting the dimensions, i.e. length, of tectonic lineaments is to start with large scale maps and redefine the interpretations by going to progressively smaller scale maps.

In this case the initial interpretation was arrived at from a map of scale 1:2,000,000. This map was used as a guide to interpret the topographic information on the World Aeronautical Chart series, scale 1:1,000,000, covering a sufficiently large enough area surrounding the area of interest. This interpretation was further used as a guide to an interpretation using maps of scale 1:250,000. The maps used in this the final interpretation were the topographic maps, geological and aeromagnetic maps where available.

In the immediate area of the Cantung Road copper mineralization the tectonic interpretation indicates a complex intersection of three major crustal fractures striking between northerly and northwesterly. The sudden change in the petrology of the sediments across the interpreted linear suggest a significant break which is probably in part associated with the contacts of the Frances Lake batholith. The reported copper mineralization is very close to the intersection of this lineament and the Hyland River lineament. Numerous smaller and less continuous lineaments have been interpreted and they are probably mostly several orders of complement lineaments to the major ones. It is expected that some of the complement lineaments will be block faults.

In the above interpretational procedures it was not possible to establish time relationships between the lineaments. Further, it is seldom possible or the objective to consider offsets of the older lineaments due to relatively younger lineaments since the primary objective has been to determine if a major plumbing system could be responsible for the mineralization of interest.

CONCLUSIONS

It has been found that the copper mineralization in the float is located in an area which is apparently associated with a major plumbing system, which appears to be located near the edge of the Frances Lake batholith. Both the regional and local geology is extremely favourable for porphyry type copper deposits. In view good local correlation between known geology, mineralization, aeromagnetics, and tectonics an exploration target has been outlined (see enclosed location map). Two prospecting and geochemical survey targets have outlined (see location map). These targets are suggested on the strength of a correlation between known geology, aeromagnetics, tectonics, and their possible relationship to the selected exploration target.

In order to evaluate the probability of economical copper mineralization in the area of immediate interest further exploration will have to be conducted before a professional enginneer's report can be written. In view of the possible mineral deposit being blind, such exploration should be either geophysical or drilling.

It is the author's opinion that the only geophysical method which may be of any assistance to subsequent interpretations is the Induced Polarization method. If a porphyry copper situation is present it will be necessary to plan a large I.P. survey since the history of I.P. surveying in such environments suggest that the I.P. anomalies have been associated with pyrite halos rather than the copper mineralization. Consequently, an I.P. survey could become very expensive and it is not recommended in view of the low probability that specific drilling targets will be outlined. These considerations leave only one alternative and that is to conduct some preliminary drilling in the areas of mineralization. After the completion of this drilling a professional engineer's opinion and report should be obtained.

The author's discussions with Mr. D.C. Martin regarding a drill program has led to the conclusion that the least costly mode of drilling for the purpose of arriving at assay values and obtaining these in a minimum period of time will be by using airtrack percussion drilling and assaying of the drill chips. It is suggested that this alternative be discussed in detail.

At the time of writing of this report no recent assays for copper are available for samples taken from the float mentioned in this report. A few samples have been prepared and the results from these will be made available shortly after the completion of this report; however, a visible examination of the samples suggest values from 0.5 percent per ton to several percentages per ton.

Respectfully submitted

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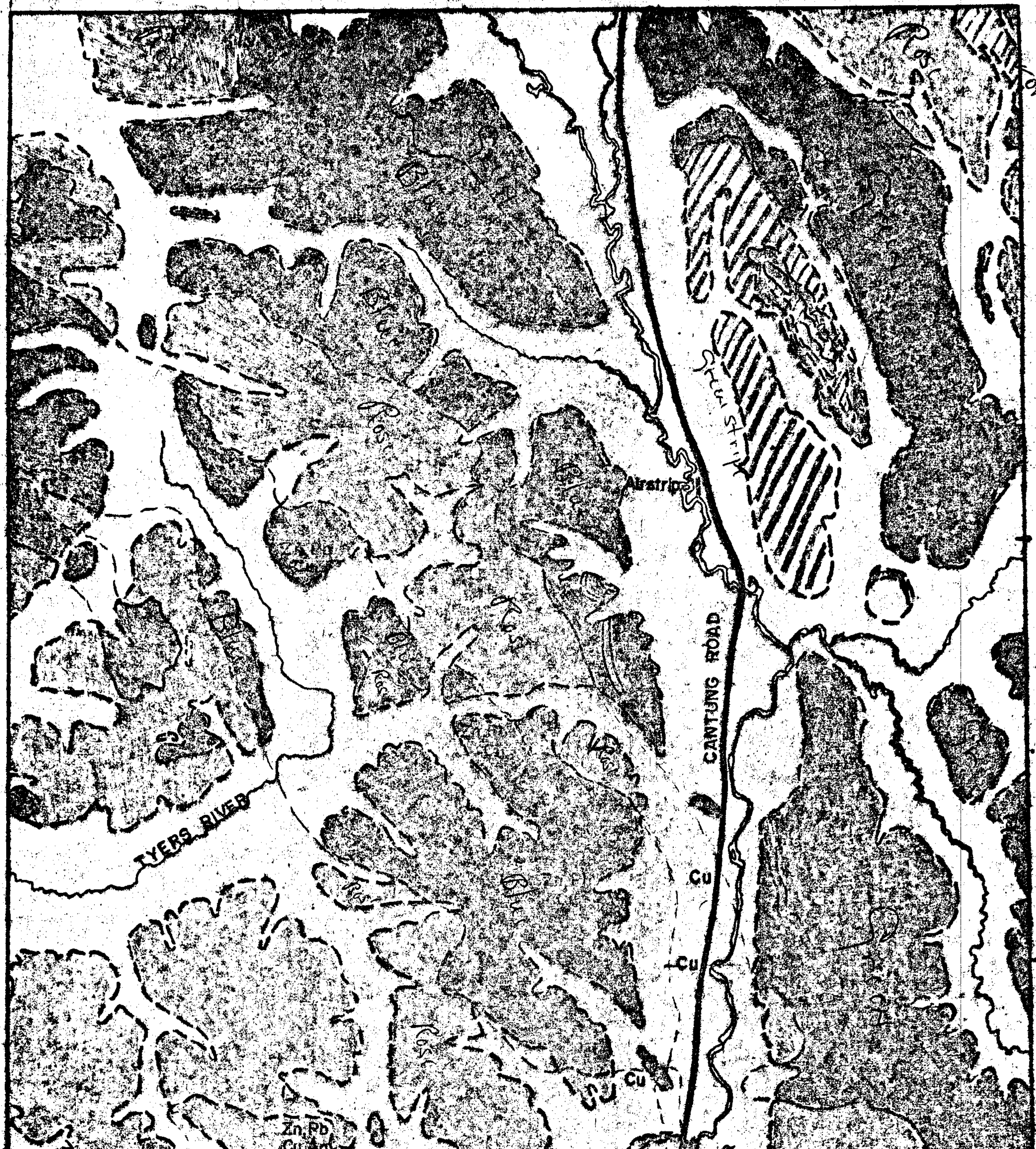

GEOLOGY

PORTION OF FRANCES LAKE MAP SHEET (after GSC)

SCALE 1 inch to 4 miles

LEGEND FOR GEOLOGY MAP

Red	Quartz monzonite, granodiorite
Blue	Gneiss, schist, minor marble and skarn, numerous small granitic bodies, aplite, and pegmatite
Yellow	Shale, siltstone, sandstone, minor hornfels
Orange	Marble
Rose	Argillaceous limestone
Brown	Shale, chert, quartzite, greywacke
Grey	Limestone
Blue Stripe	Green shale, slate
Orange Stripe	Pyritic, calcareous argillite, shale, slate
Lime Green	Slate, phyllite
Green	Shale, slate, phyllite, quartzite