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- GEOLOGICAL MAP WITH LOCATION OF DRILLHOLES
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1. INTRODUCTION

The drilling carried out in the Grace Mountain/Cottonbelt area during July/August 1978 was a follow up of the 1976 and 1977 geological mapping and IP survey.

The exploration concept was to search in the Cottonbelt area for Ruddock Creek style structural deformation of the Shuswap type stratiform Pb/Zn mineralization with the consequent possibility of improved geometric and qualitative parameters of ore concentrated in a fold closure of a syncline.

Two parallel ore zones are known in the area: the Cotton horizon in the SW and the McLeod horizon in the NE.

Based on microlithostratigraphic studies by P. Levin (1976) and on a larger scale mapping program carried out by J. Kovacik (1977) it was concluded that both horizons are part of one folded horizon. A sequence of three marker horizons could be found proving the mirror images of the rock sequences at the Cotton horizon in the SW and at the McLeod horizon in the NE.

1. The sulfide horizon S_1
2. A white-bluish clear marble horizon M_1
3. A rusty marble horizon M_2 frequently containing allochthonous fragments, garnets and other calc-silicate bands as well as disseminated sulfides. By McMillan & Moore, 1974, this kind of marble encountered at other places was interpreted to be a carbonatite.

In 1977, an IP (pole-dipole survey) was done which detected a pronounced resistivity and chargeability anomaly (4 times background) improving towards depth. The IP results seemed to support the existence of a first steepening and then outright back curving conductive body downwards which could be best interpreted as a synformal structure connecting the S_1 outcrops of the Cotton and McLeod zones.

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2. WORK IN 1978

2 drillholes were drilled on location 1350 + 0^{o} N, 1 + 75 W: ddh No. 1 at 46^{o} to a depth of 317 m, ddh No. 2 at 80^{o} to a depth of 210 m. Drillhole No. 1 was surveyed with a downhole Pulse EM system.

The ore bearing marble and calcsilicate sequence was encountered in both holes, however the ore horizon itself was reduced to a mineralized zone of only 5 centimeters. A steepening of the beds was not found to occur. The majority of structural evidence (dragfolds) indicated that the upper limb is an overturned limb which would corrborate the assumption of a syncline.

The downhole PEM measurements picked up a pyritic zone in the immediate hanging wall of the marble/calcsilicate series but not the ore sequence itself. The PEM measurements indicated that Drillhole No. 1 encountered an edge of a conductive sheet that is dipping 20^{o} - 30^{o} away from the drillhole (see report by J. Duncan Crone in Appendix). The IP effect is obviously caused by disseminated pyrite and, to a lesser degree, by chalcopyrite in the footwall of the marble/calcsilicate series. The intensity of these disseminated sulfides increases to depth as can be seen in Drillhole No. 2. This also corresponds with the results of the IP survey.

From the outcropping footwall series containing disseminated pyrite and chalcopyrite soil samples were taken on three lines. The geochemical analyses did not yield anomalous results.

3. CONCLUSION

Geologically, most of the dragfolds corroborate the interpretation that the upper limb is overturned and that the fold therefore is a syncline.

Geochemically, the rusty marble considered to be a carbonatite was assayed for Niobium and the Rare Earth elements. The results were anomalous values though of no economic consequence.

Geophysically, it may be concluded that there is no correlation between the intensity of the electrical effects which increase to depth and the degree of the mineralization in the ore sequence which decreases to depth.

For the time being there does not seem to be a geophysical tool available at reasonable cost to locate the target of a fold closure.

Therefore, at this point, no further work is recommended within the scope of this joint exploration program.