A Geophysical Report

on

Turam Surveys, Anvil Area, Y.T.

by

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A REPORT

ON

TURAM ELECTROMAGNETIC SURVEYS

Anvil Area, Whitehorse M.D.,
Yukon Territory

FOR

ANVIL MINING CORPORATION LIMITED

Faro, Yukon Territory

BY

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INTRODUCTION

Between March 5th and August 5th, 1973 Peter E. Walcott & Associates Limited carried out Turam surveys over parts of various claims held by Anvil Mining Corporation Limited.

The surveys were carried out on handcut lines 800 feet apart on grids known respectively as the East Sea, Seamor, Sink, Gale - Dy, and Pea - BP - DP grids.

In addition a survey was carried out on similarly spaced lines over a gravity anomaly on the Sun grid.

Measurements of field strength and phase difference were made every 100 feet along the lines with a S.E. 71 electromagnetic unit operating at a frequency of 400 Hz and using a coil separation of 100 feet.

The data are presented in profile form on Maps W-166-1 to 7 that accompany this report.

PURPOSE

As the Vangorda, Champ, Firth, etc. sulphide deposits are associated with graphitic horizons within underlying biotite muscovite phyllites, the purpose of the survey was to locate the presence of electromagnetic conductors, the causative sources of most of which could be attributable to the above mentioned graphitic horizons, and which could be screened on the basis of gravity, magnetic and geological investigations as to their association with economic sulphide mineralization.

PREVIOUS WORK

Previous work done in the area includes airborne and ground magnetic and electromagnetic surveys, geology, geochemistry, gravity and diamond drilling.

The results of the above are well documented in reports by the staff of Anvil Mining Corporation Limited.

SURVEY SPECIFICATIONS

The basic principle of any electromagnetic survey is that when conductors are subjected to primary alternating fields secondary magnetic fields are induced in them. Measurements of these secondary fields give indications as to the size, shape and conductivity of conductors. In the absence of conductors no secondary fields are obtained.

The electromagnetic survey was carried out using a S.E. 71 electromagnetic unit. The primary field was set up by closed inductive loops laid on the ground. Two receiver coils connected by a light-weight shielded cable to a compensator amplifier are used to measure the distortions in the electromagnetic field. The quantities measured are:

1. the ratio of the field strengths at each coil and

2. the phase difference in the fields at the two coils.

Large rectangular loops of varying size (3200 to 4800', 2500 to 3000' deep) were used on the survey with the loops always on the assumed footwall side of the formations.

Readings were taken every 100 feet along the picket lines perpendicular to the long side of the loops with a 100 foot coil separation and using a frequency of 400 Hz.

DISCUSSION OF RESULTS

The reader should study the data in conjunction with the geology and soil sampling maps of Anvil Mining Corporation Limited.

The responses of the two most prominent rock types in the areas surveyed, namely biotite muscovite phyllites and amphibolites, appear characteristically different on Turam surveys over areas of known geology within the Anvil area.

The amphibolites are characterized by constant low field strength ratios and very small if any phase differences, whereas the phyllites are characterized by irregular field strength ratios and phase differences with stronger readings indicating the more graphitic horizons.

Accordingly on this basis the writer has attempted to map the grids surveyed into areas of predominantly underlying phyllites or amphibolites, units 1 and 2 respectively on Maps W-166-1 to 7. These should be modified and/or revised to correlate with known geology and borehole information.

East Sea grid.

The Turam survey indicated the presence of a number of conductors of moderate to poor conductivity as can be seen from Map W-166-1.

The better of these conductors can be grouped into four complex conductive bands, namely A, B, C & D on Map W-166-1, which are thought to be attributable to graphitic horizons in the underlying phyllites.

Conductor A has since been investigated by gravity profiles across Lines 288 and 296 E.

Seamor grid.

The Turam survey indicated the presence of a poor to moderate conductor exhibiting a depth to its axis of between 100 and 200 feet in an area of otherwise low flat response as can be seen from Map W-166-2.

The conductor appears to be on strike from known sulphide occurrences further to the east.

Sink grid.

The Turam survey indicated the presence of a number of conductors of poor to moderate conductivity as can be seen from Map W-166-3.

The better of these can be grouped into complex conductive bands A, B & C as shown on Map W-166-3, thought to be attributable to graphitic horizons in the underlying phyllites.

These bands have been further investigated by gravity profiling along Lines 8 S, 16S, 16 N and 48 N respectively.

Gale - Dy grid.

The Turam survey indicated the presence of a number of conductors of poor to moderate conductivity as can be seen from Map W-166-4.

Again the better of these conductors can be grouped into single or complex conductive bands, conductors A, B, C, D, E & F as shown on Map W-166-4, all of which are probably attributable to graphitic horizons.

Conductor A of moderate conductivity appears to exhibit true single conductor characteristics with its strongest response within the central half of its strike length. It has a suggested depth to its conductor axis of between 150 to 250 feet along its strike.

Conductor B also exhibits moderate conductivity with depths to conductor axis of 100 to 150 feet at its eastern extremity based on assuming dykelike causative sources and deepening to the west. Its location corresponds to outcropping graphitic rocks on its eastern extremity.

Conductors C, D, E & F are zones of poor to moderate conductivity with deeper depths to conductor axes.

Pea - BP - DP grid.

The eastern half of the grid is underlain by two main conductive zones of poor conductivity while the western half is characterized by numerous conductive bands of poor to moderate conductivity with a fairly well defined break occurring between Lines 104 and 112 W.

This latter response is very similar to that obtained with higher frequencies and large inductive loops in areas of highly conductive overburden and suboutcropping bedrock, but in view of the results obtained in a previous survey over the Ski Hill grid, where frequencies of 800, 400 & 200 Hz were used, the writer concludes that the area is underlain by numerous graphitic horizons.

An attempt has been made to correlate the various conductors from line to line on the basis of their shape and apparent conductivity but this could be for naught due to the fact that as the lines were very poorly cut, were crooked and very badly chained the normalized field strength ratios, i.e. the observed divided by the theoretical, which are calculated from the coil positions with respect to the loops, could be substantially in error.

Seamor grid.

The Turam survey indicated the presence of a number of conductors of poor to moderate conductivity as can be seen from Map W-166-6.

The better of these conductors can also be grouped in complex conductive bands, conductors A and B, as shown on Map W-166-6, both of which are thought to be attributable to graphitic horizons within the underlying phyllites.

Sun grid.

A limited Turam survey was carried out over a previously obtained gravity high on the northern end of the area surveyed.

Two complex conductive bands of moderate conductivity, conductors A and B, were indicated as can be seen from Map W-166-7.

Conductor A was located in the southern portion of the gravity high and had suggested depths to conductor axes of 100 to 150 feet, while conductor B appears to have depth to conductor axes of between 150 to 200 feet.

The above would appear to suggest that the gravity high is attributable to bedrock relief.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Between March 5th and August 5th, 1973, Peter E. Walcott & Associates Limited carried out Turam surveys over parts of various claim groups for Anvil Mining Corporation Limited.

The claim groups are located in the Anvil area of the Yukon Territory.

The survey, as expected, indicated a number of conductors most of which could be grouped into various conductive bands.

These complex conductors were thought to be attributable to graphitic horizons in the underlying phyllites.

Four of these complex conductors were further investigated for associated sulphides by gravity profiling with negative results.

Based on responses obtained over known rock units the writer has attempted to map the survey area into areas underlain by predominantly phyllites and amphibolites.

As a result the writer concludes that

(1) although he has not seen the Turam results over the Vangorda deposit he sees no reason to believe that one can differentiate between graphitic horizons and sulphide mineralization in this area on the basis of previous work with the amplitudes and relative ratios of the field strengths and phase differences being dependent on the amount and complexity of the graphitic horizons as well as the depth of burial, etc., and

(2) unless one can eliminate some of these conductors on the basis of geology, then one has no alternative but to conduct magnetic and gravity surveys over and around them to investigate for possible sulphide mineralization.

He therefore recommends that

(1) the Turam, geological and other data be reduced to the same base

(2) the geological associations of the conductors be studied, and

(3) magnetic and gravity profiles be run over the favourable conductors to test for associated sulphide mineralization.

Respectfully submitted,

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