GM 17151

REPORT ON TURAM EM SURVEY AND METHOD

Documents complémentaires

Additional Files

Licence

License

Énergie et Ressources naturelles
Québec

BOUNTY EXPLORATION LIMITED
REPORT ON
TURAM ELECTROMAGNETIC SURVEY
LA MOTTE TOWNSHIP PROPERTY
ABITIBI DISTRICT, QUEBEC

by

Harold O. Seigel, Ph.D., P.Eng.

Toronto, Ontario.

January 3, 1966.

SUMMARY

The present Turam electromagnetic survey has yielded very minor conductive indications on this property. Some small residual interest resides in a reversed sense electromagnetic disturbance which exists on one line only. The source of this disturbance is very likely overburden conduction but some residual possibility exists of a deeply buried, poorly conductive structure in this vicinity. The possibility is not deemed strong enough to make a firm drilling recommendation on the basis thereof.

Extract from 11151

HAROLD O. SEIGEL & ASSOCIATES, LIMITED
GEOPHYSICAL CONTRACTORS AND CONSULTANTS
79 MARTIN ROSS AVE.
DOWNSVIEW, ONTARIO

CABLE:
"SEIGEO", TORONTO

TELEPHONE
633-2450

BOUNTY EXPLORATION LIMITED
REPORT ON
TURAM ELECTROMAGNETIC SURVEY
LA MOTTE TOWNSHIP PROPERTY
ABITIBI DISTRICT, QUEBEC

INTRODUCTION

This report is based upon results of a Turam electromagnetic survey carried out in December 1965 on a property in La Motte Township on behalf of Bounty Exploration Limited. The surveyed area consists of four contiguous mining claims numbered 203054, claims 1 and 2, and 205515, claims 1 and 2, located in lots 19, 20, 21 and 22, Range 3, La Motte Township, Province of Quebec.

Access to the property is by means of an all weather, gravel surface highway (No. 61), a distance of fourteen miles from Malartic.

Traverse lines were cut at 400' intervals across this property, oriented due north-south and were picketed at 100' intervals. A Turam electromagnetic survey was conducted on these lines employing a solid-state system of our own design and manufacture, and a primary operating frequency of 400 c.p.s. A description of the Turam method is found in "Appendix T" which is bound herewith.

Previous exploration work on this property includes a magnetometer

survey carried out in April 1964 using an MF-1 fluxgate magnetometer. As a result of this survey Mr. Basil T. Wilson, P. Eng. in his report dated June 4, 1964, concludes that the southern half of the property may have been intruded by a number of basic to ultrabasic masses. These would be of potential interest for nickeliferous sulphide mineralization such as has been found in the Marbridge deposit which is located on the property immediately to the north of the present survey grid.

DISCUSSION OF RESULTS

The accompanying plan on the scale of 1" = 200' presents the results of the Turam survey in profile form. The profile scales are 1" = 20% for field strength ratio and 1" = 10° of relative phase. Because of the presence of power lines and the interference resulting therefrom, lines 24 and 28 west could not be read in their entirety. In addition, due to a power line along the north edge of the property, the last three or four stations at the north end of each line could not be read.

The observed electromagnetic distortions are of very low amplitude throughout the whole of the survey area, being invariably less than 10% in field strength ratio and 7 degrees in amplitude. A fence occurring in the vicinity of 4000' north on line 32 west gives rise to a local disturbance of modest amplitude. Within the possible ultrabasic area, as indicated by the magnetometer survey results, the most prominent electromagnetic distortion occurs on line 12 west, in the vicinity of 1000' north of the base line. This is a broad indication of low amplitude (8% field strength ratio and 5 degrees phase) and is of reversed sign to that normally expected from a proper conductor.

This may be a function of body geometry if due to a bedrock conductor. In the writer's opinion it is more likely, however, that these indications are due to overburden conduction. There is no confirmation on the adjacent lines of the presence of a conductor. Line 8 west, near its south end, shows modest departures which are of reverse sign and are undoubtedly due to overburden effects. The peak of the line 12 west indication lies in a relative magnetic depression between two strong magnetic anomalies. Test Turam results over one of the Marchant nickeliferous sulphide bodies gave primarily field strength ratio responses and almost no phase angle distortion, indicating that this body is highly conductive. None of the present indications are in this category.

Whereas the conductor indication on line 12 west at 1000' north of the base line is very likely due to overburden effects, a residual possibility exists of a bedrock conductor of modest conductivity existing at a depth of approximately 300' below this point. A strong recommendation for drilling investigation of this target cannot be made on the basis of the present information.

Respectfully submitted,

Harold O. Seigel

Harold O. Seigel, Ph. D., P. Eng.

Toronto, Ontario.
January 3, 1966.

HAROLD O. SEIGEL & ASSOCIATES, LIMITED
GEOPHYSICAL CONTRACTORS AND CONSULTANTS
79 MARTIN ROSS AVE.
DOWNSVIEW, ONTARIO

CABLE:
"SEIGEO", TORONTO

TELEPHONE
633-2450

A P P E N D I X "T"

BRIEF DESCRIPTION OF THE TURAM ELECTROMAGNETIC METHOD

GENERAL

The Turam method can be classified as a fixed source compensation method. The primary or source field consists of a large energizing layout in the form of a long wire or a large loop laid out on the terrain, to which an audio frequency alternating current is fed by means of a motor generator. The resulting current pattern is investigated inductively, with two identical receiving coils connected to a bridge compensator which compares the signal received in each coil in relative phase and amplitude. When grounded cable is used, the energization is both galvanic and inductive; when the primary layout consists of a closed loop, the energization is purely inductive. Under most conditions the presence of galvanic current is undesirable and inductive energization is, as a rule, preferred.

Although the system allows the comparison of any two components of the resultant field, it is standard procedure in systematic surveys to measure the gradient of the vertical component.

The pattern for a typical Turam survey is shown in Fig. 1. A large rectangular loop is used as primary layout and the field gradients are measured with horizontal receiving coils along profiles perpendicular to a long side of the transmitting loop.

DATA REDUCTION

The relative strength of the undisturbed primary field is dependent on the loop dimensions and the location of the observation points, and can be determined by calculation. The measured

field strength ratios are normalized through division by these calculated free space ratios.

The primary field causes eddy currents to flow in subsurface conductors. As a result the resultant field will be distorted in both amplitude and phase. The presence of conductors will thus be indicated by abnormal field strength ratios and phase differences.

PRESENTATION

The measuring results are usually presented in profile form, as (reduced) field strength ratio and phase difference curves, with the observed values plotted at the midpoint between coil positions.

Occasionally one of the two parameters is presented in contour form, but contour plans are generally inadequate to express the full significance of the data.

INTERPRETATION

Where field distortion occurs the curves indicate the location and the depth of burial of the main current flow. The "current axis" are well defined when the current is concentrated as, for instance, in thin, steeply dipping conductors. In wide, banded conductors, or in horizontal conductors such as, for instance, overburden, the current is usually more dispersed and the anomalies will yield less positive information.

As a rule the current axis is located right below the maximum field strength ratio deflection or the maximum negative phase shift. Its depth under the traverse is indicated by the shape of the anomaly.

The relative amplitudes of field strength and phase distortions are a measure of the conductivity of the conducting bodies, i.e. good conductors are characterized by field strength distortion combined with relatively little phase shifting, whereas poor conductors affect the phase, rather than the strength of the resultant field.

For an accurate grading the resistivity thickness (r/d) ratio of the individual conductors can be derived from the calculated in-phase and out-of-phase components, taking further

into consideration the exciting frequency and the strike length of the conductor. The relations are shown in Fig. 2 and Fig. 3. The obtained r/d values are marked on the upper right side of the anomalies, in units of ohmcm/m. On the lower left side the depth of the current axis (ft.) is marked. It is normally located 30 - 40 ft. within the body and the indicated depth should be regarded as the maximum depth to the upper surface of the conductor.

To obtain the projection of the current pattern, the anomalies are connected between lines, whereby depth and r/d values, as well as other characteristics of the curves are used as criteria. The strike of the formations, if known, is also taken into consideration.

Fig. 4 and Fig. 5 show a plan and section of a typical Turam survey and interpretation.

References:

1937	Hedstrom, E.H.	Phase Measurements in Electrical Prospecting. A.I.M.E. Techn. Publ. 827.
1964	Bosschart, R.A.	Analytical Interpretation of Fixed Source Electromagnetic Prospecting Data. Delft.

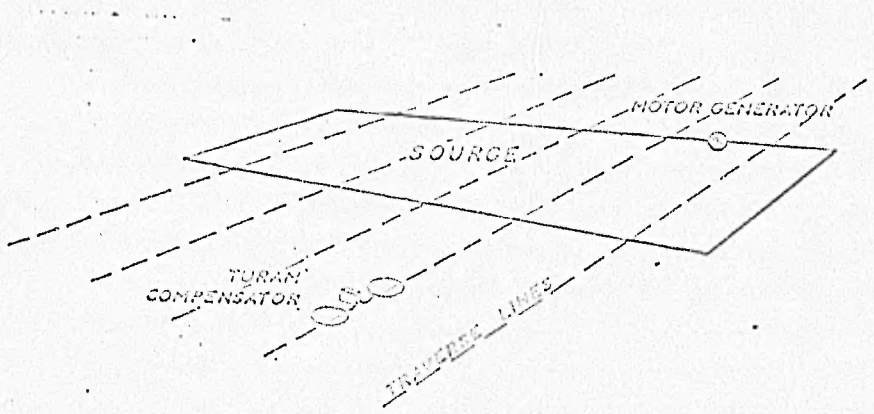

Fig. 1 The Turam method. General layout

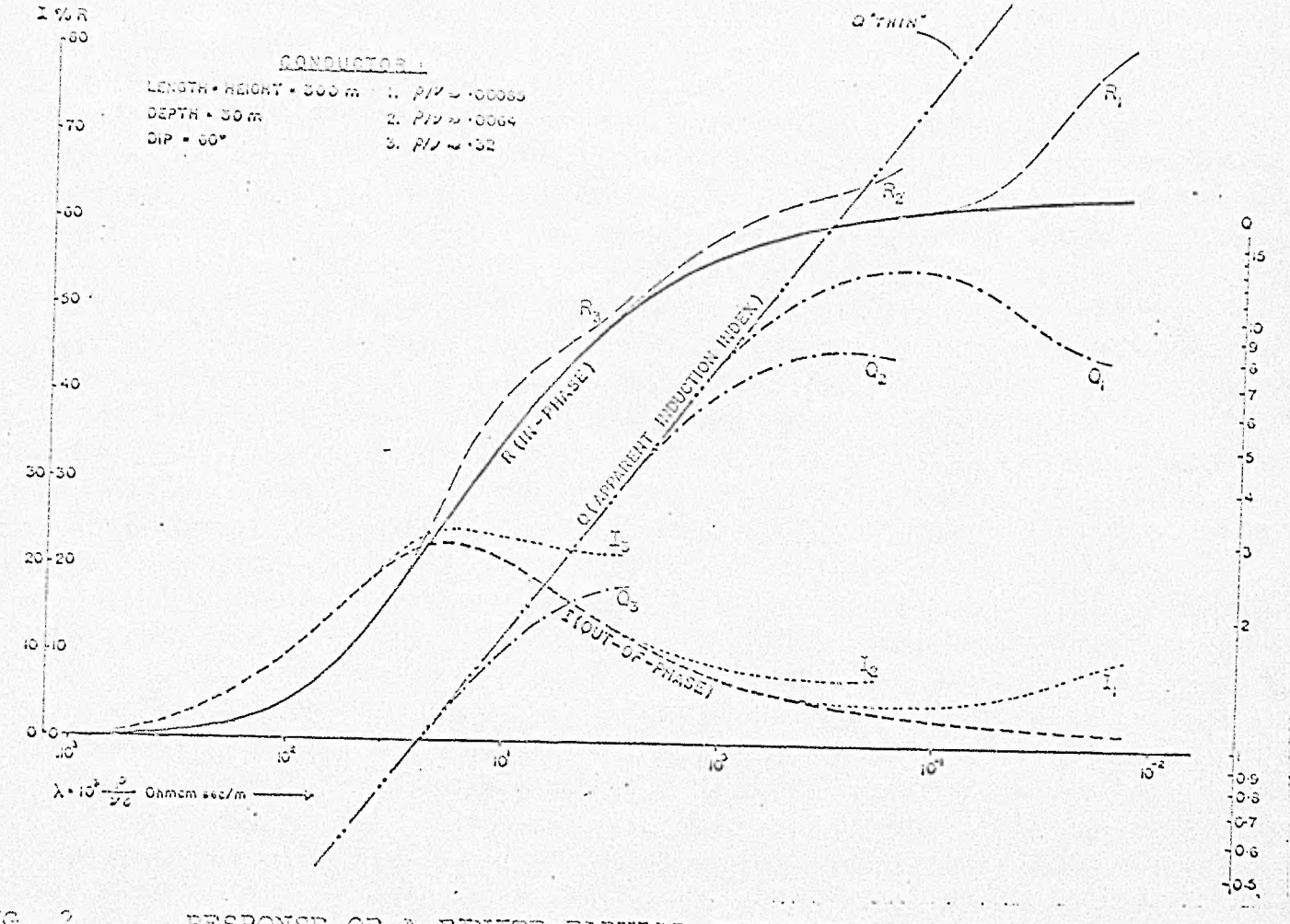

FIG. 2 RESPONSE OF A FINITE TABULAR CONDUCTOR.
(R.A. Bosschart 1964)

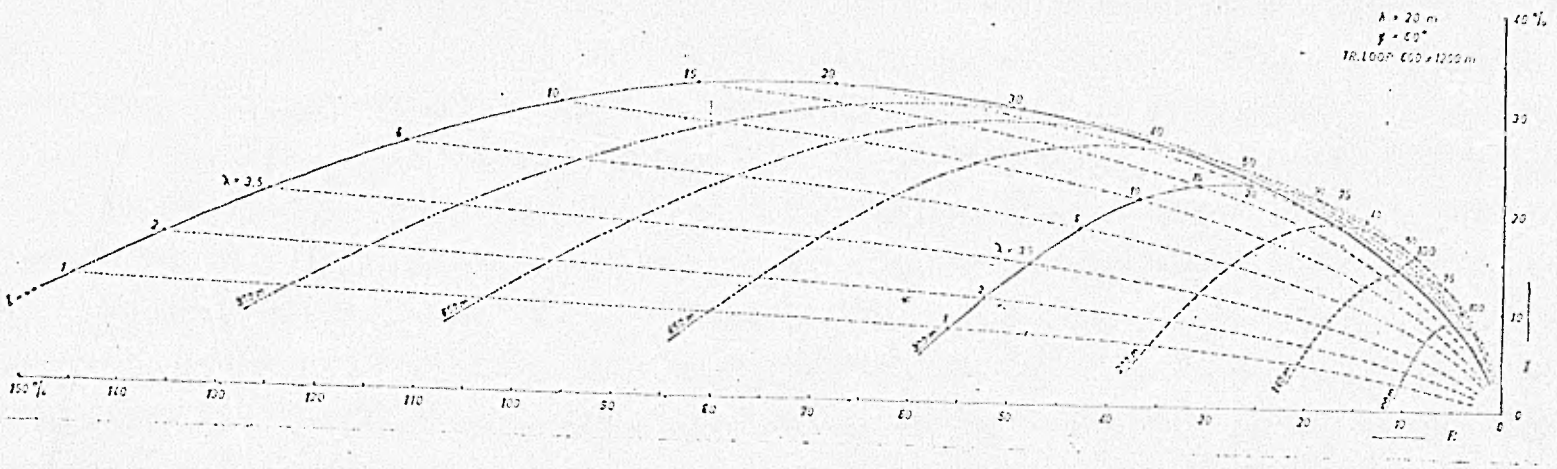

FIG. 3 RESPONSE DIAGRAM FOR CONDUCTORS OF VARYING STRIKE LENGTHS.

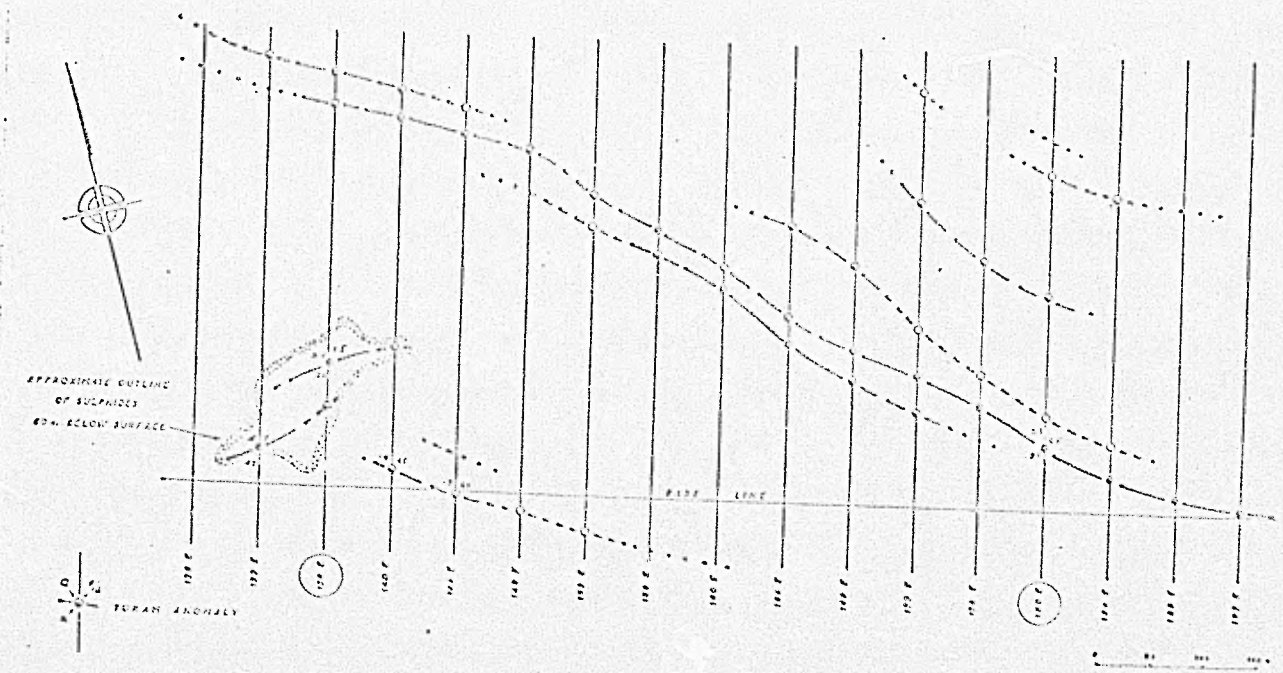

FIG. 4 TURAM SURVEY ON THE MURRAY GROUP, NEW-BRUNSWICK.

(R.A. Bosschart 1964)

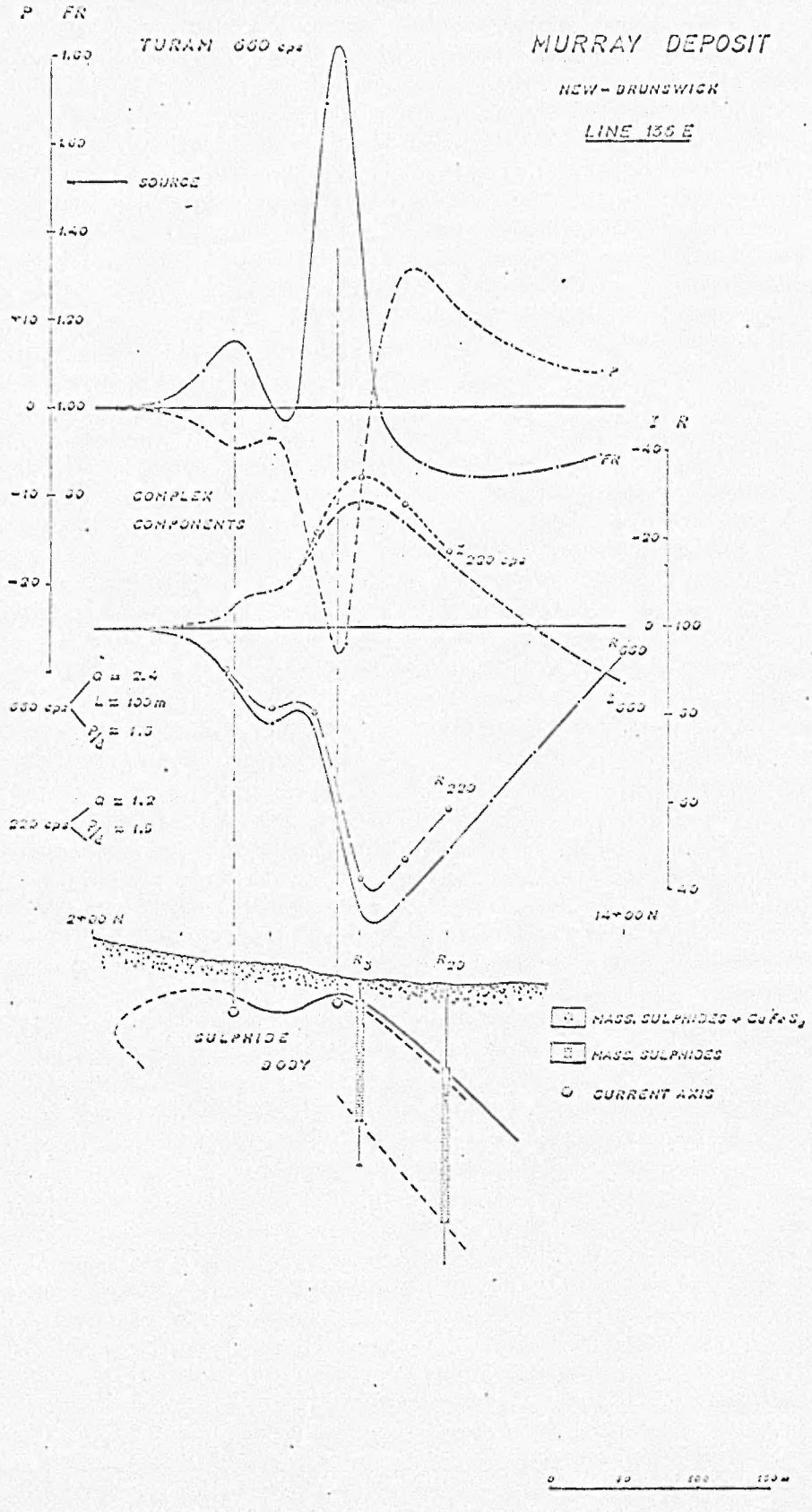

FIG. 5 TURAM SURVEY ON THE MURRAY GROUP, NEW BRUNSWICK. INTERPRETATION OF A TYPICAL SECTION. (R.A. Bosschart 1964)