

# GM 32499

TURAM ELECTROMAGNETIC SURVEY, SENNEVILLE GRID

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Énergie et Ressources  
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Québec 

# GEOSEARCH CONSULTANTS LIMITED

Turam Electromagnetic Survey  
for  
CANADIAN OCCIDENTAL PETROLEUM LTD.  
Senneville Grid  
Senneville Township, Quebec  
(To Accompany Map 76-50)

February 3, 1976.

Ministère des Richesses Naturelles, Québec	
SERVICE DE LA	
DOCUMENTATION TECHNIQUE	
14 FEV 1977	
Date:	.....
No GM:	32499

## INTRODUCTION

A Turam electromagnetic survey was carried out for Canadian Occidental Petroleum Ltd. on a grid located at Val Senneville, Quebec in January, 1976.

The area surveyed consists of the southerly portions of Lots 31 to 39, Range IV, Senneville Township. It is located 8 miles northeast of Val d'Or and is accessible from Highway 64.

The purpose of this survey was to locate subsurface geo-electrical conductors which might prove to be base metal orebodies. One conductor was located. The accompanying map shows the area surveyed and the results obtained.

A technical data sheet is appended to this report.

## METHOD AND INTERPRETATION OF RESULTS

### Turam Electromagnetic Survey

The model 2S Turam equipment was used for this survey. It was manufactured and developed in Sweden by the ABEM Instrument Group of the Craelius Company.

In common with other electromagnetic inductive systems the Turam method is based on the fact that a secondary current is induced in an electrical conductor when the conductor is subjected to an electromagnetic field. This secondary current creates its own electromagnetic field which, together with the primary applied field, produces a resultant electromagnetic field. This resultant field, which can be detected and measured, differs both in phase and amplitude from the calculated primary field; these differences may indicate the presence of a conductor.

The primary alternating field is created by the use of a large horizontal rectangular loop, energized by a current at 660 Hz or 220 Hz. The receiving system consists of two coils 100 feet apart, connected to a compensator-amplifier which measures the complex field-strength ratios and phase-differences between successive points on traverses outside and perpendicular to a long side of the primary loop. Both the phase-difference readings and the reduced field-strength ratios are plotted as curves at points mid-way between the coil positions. The reduced ratios are the measured ratios divided by the normal ratios. The normal ratios may be calculated from the geometry of the primary loop and from the location of the points at which the readings were taken in relationship to the loop.

The conductivity of steeply dipping conductors may be estimated from the following chart:

Ratio Anomaly > 1.00	Negative Phase-difference	Conductivity
Very small or nil	Small to medium	Very poor
Small	Medium to large	Poor
Large	Medium	Good
Large	Small	Very good

In areas of conductive overburden, the amplitudes of anomalous readings, both the phase and the ratio, increase as their distance from the primary loop increases.

RESULTS

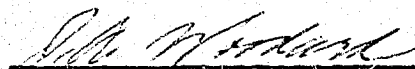
One conductor was located between Lines 12W and 24W. It is strongest on Line 20W where the conductivity appears to be moderately high. The curves associated with the conductor on Line 24W suggest a relatively deep conductive source. The indication on Line 12W is very weak and may be due to conductive overburden rather than representing the eastern extremity of the conductor.

A power line parallel with the base line interfered with the readings from 0 to 4N, so this area should not be considered to be adequately covered.

RECOMMENDATIONS

The conductor on Line 8+30N is recommended for drilling. The indicated conductor location is probably only accurate to within  $\pm$  50 feet.

GEOSEARCH CONSULTANTS LTD.



J. A. Woodard, P. Eng.  
Geophysicist.

GEOPHYSICAL TECHNICAL DATA

TURAM ELECTROMAGNETIC SURVEY

INSTRUMENT: ABEM TURAM Model 2S

ACCURACY: One unit field-strength ratio per scale division  
One-half degree phase-difference per scale division

METHOD: In line receiver coils along lines outside and  
perpendicular to the primary rectangular transmitting  
loop

COIL CONFIGURATION: Co-planar

PARAMETERS MEASURED: Field-strength ratios and phase-differences  
in degrees

FREQUENCIES: 660 Hz or 220 Hz

RECEIVER COIL SEPARATION: 100 feet

NUMBER OF READINGS AT 100' STATIONS: 368

TOTAL NUMBER OF READINGS: 386            LINE SPACING: 400 feet

PROFILE SCALE: Ratio - 1 inch to 20  
Phase - 1 inch to 10 degrees