REPORT ON GEOPHYSICAL INVESTIGATIONS IN McCART TOWNSHIP, PORCUPINE MINING DIVISION, ONTARIO

Introduction

The ground surveyed consisted of nine mining claims numbered P.64643 to P.64645 and P.64650 to P.64655, situated in the South Half of Concession V and the northern part of Concession IV, Lots 7 and 8 in McCart Township. The claims are recorded in the names of J. Chevalier, 211 MacDougall Street, South Porcupine, Ontario, and C. Watson, 83-4th Street, Kirkland Lake, Ontario. The claims have been optioned by O'Brien Gold Mines, Limited, 140 Wellington Street, Ottawa 4, Ontario, and the investigations described in this report were carried out on behalf of this organization.

The line cutting on the property was started in November 1964 and the surveys were completed in December.

The property is directly accessible by a gravel-surfaced concession road between Concession 4 and Concession 5, which leaves the Trans Canada Highway (Highway 11) at Nellie Lake and passes through the centre of the property.

Previous Work

Except for a short distance at the western end of the claim block, where a picket line grid covering the adjoining property overlapped our survey area, no evidence of previous work was encountered on the property.

General Geology

Ontario Department of Mines Preliminary Map P.16, published in 1956, shows an anticlinal axis in pillowed andesite extending in an east-west direction across the northern portion of the property. To the north and southeast the lava formations are bordered by intrusive peridotite. M. B. Baker, in Ontario Bureau of Mines 26th Annual Report, 1917, page 271, describes massive sulphide occurrences along a sharp serpentine andesite contact in the southeastern quarter of Lot 7, Concession 5 in McCart Township.

Geophysical Surveys

The objectives of the geophysical surveys were to locate on the ground conductive zones, the presence of which in the area had been revealed by a preceding airborne E.M. and magnetic survey. The ground surveys consisted of magnetic and electromagnetic surveys. The actual area surveyed extended eastwards beyond the limits of the ground under option to O'Brien Gold Mines, Limited. This was done to include in the surveyed area the massive sulphides mentioned by M. B. Baker in his report of 1917 , and thus be able to compare any conductors of unknown sources against one caused by a known sulphide mass. A picket line grid was cut to cover the nine claims. The lines were cut at 400 foot intervals, which were decreased to 200 foot intervals once the conductive zones had been located. Stations on the picket lines were marked every 100 feet. The northern east-west claim boundary in Concession 5 was used for a base line, and the road between Concessions 4 and 5 served as a tie line.

(a) Magnetic Survey

The instrument used in the survey was a Sharpe Model A3 magnetometer. The readings were taken in scale divisions and had to be converted to gammas later. For the magnetic intensity of this particular area the magnetometer had a sensitivity of 26 to 29 gammas per scale division. Although the manufacturer's instructions advise that diurnal corrections are not critical for this instrument, base stations were established along the southern tie line, with readings there being taken at one to two hour intervals.

The results of this survey are presented in the form of magnetic profiles, which are plotted to a scale of 1"=2,000 gammas. The reading of 56,500 gammas was selected for the background value, and this permitted most of the magnetic values to be presented as positive, i.e. to be plotted on the geophysical plans to the left of the picket lines. The readings were taken first at 100 foot intervals, and in the magnetically anomalous areas at 50 and 25 foot intervals.

(b) Electromagnetic Survey

A McPhar dual frequency 1,000/5,000 c.p.s. vertical loop E.M. system was used in the survey. The power for the transmitter was supplied by a gasoline engine powered 500 watt generator. For the duration of the survey the transmitter did not operate at 5,000 c.p.s. and consequently the results obtained are for 1,000 c.p.s. only. The transmitting coil locations are termed "setups" each one being marked on the maps with a triangle and bearing a code letter. Several picket lines were traversed with the receiving coil when the transmitting coil was at any one location. Readings on these lines were taken at 100

foot intervals and on the geophysical plans they are related to the corresponding setups by the code letters at the end of each series of readings.

The measurements are termed "dip angles" and are recorded in degrees. These angles measure the amount of distortion of the primary (applied) electromagnetic field by secondary fields associated with currents induced in sub-surface electrical conductors. The recorded values have been profiled in the E.M. profile plans to a scale of 1"=20°. The northerly dips have been considered negative and are plotted below the picket lines. A total of 16 different setups were made and all picket lines except for the last few lines at either end of the grid were read from several transmitter locations.

Discussion of Results

The western half of the property between L-0 and L26E is flat and low-laying, with no outcrops. There is also no magnetic relief over this area. Eastwards from L26E are peridotite outcrops and the magnetic relief is very high and very erratic. Four definite conductors and one probable conductor were outlined by the electromagnetic survey. Slight shifting in the cross-over positions occurred with changes in the transmitter locations. The strong magnetism of the underlying ultrabasic rocks masks any magnetic highs that might be associated with these conductive zones.

Conductor A: Line 22E to Line 26E, 5 + 00S to 5 + 50S
Fair response. No magnetic relief. The conductor occurs in swampy area away from outcrops.

Conductor B: Line 28E to Line 32E, 5 + 00S to 5 + 50S.
Strong response. The conductor is situated in a "magnetic low" on the south flank of a moderate magnetic anomaly.

Conductor C: Line 36E to Line 40E, 9 + 00S to 10 + 00S. Strong to fair response. The conductor coincides with a magnetic anomaly of about 2,000 gammas.

Conductor D: Line 44E to Line 52E, 11 + 25S to 7 + 50S. Very strong response. Highly erratic magnetic profiles. The conductor probably outlines the sulphide body described by Baker.

Conductor E: Line 30E to Line 36E, 19 + 00S to 25 + 00S. Good response on Line 30E. Because of the poor response on the more easterly lines this has been classified as a probable conductor only. The conductive zone forms an angle of 45° with the north-south picket lines, and the poor results may be caused by this improper coupling.

The lack of dip angle values for the 5,000 c.p.s. frequency makes it difficult to speculate about the exact source of the sub-surface conductivity. However, since all but Conductor A occur in outcrop areas, geological investigations, once the ground is free of snow, might shed some light on possible causes of the conductivity.

Summary

Magnetic and electromagnetic ground surveys were carried out over nine mining claims in McCart Township, situated in Concessions 4 and 5. Four definite and one probable electromagnetic conductors were located in the eastern half of the surveyed area. No magnetic relief was encountered

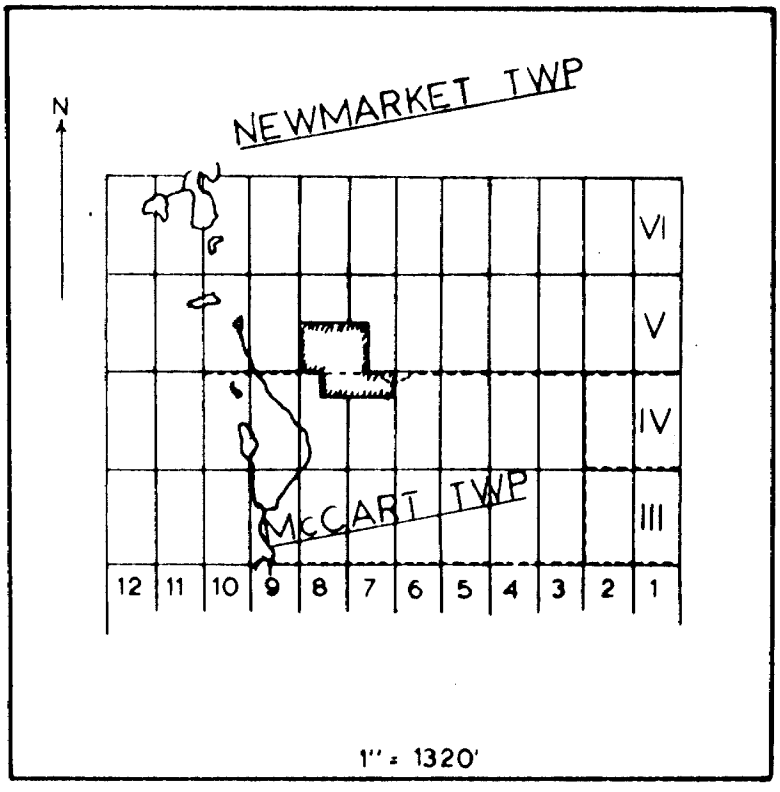
over the western half of the nine claim block. In the eastern half, where there are outcropping ultrabasic rocks, the magnetic relief is very high and very erratic. To determine the possible causes of the conductivity, geological investigations would be in order.

Rolands Benkis

Rolands A. Benkis, B.Sc.,
Geologist

Ottawa, Ontario,

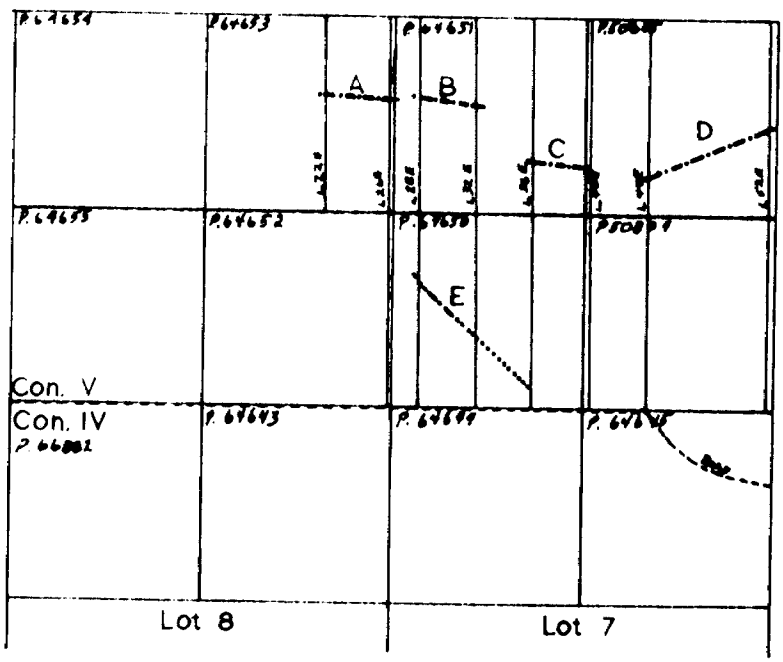
20th May 1965.



LOCATION PLAN

R. B.

63.1556



PLAN OF E.M. CONDUCTORS

McCART TOWNSHIP ONTARIO

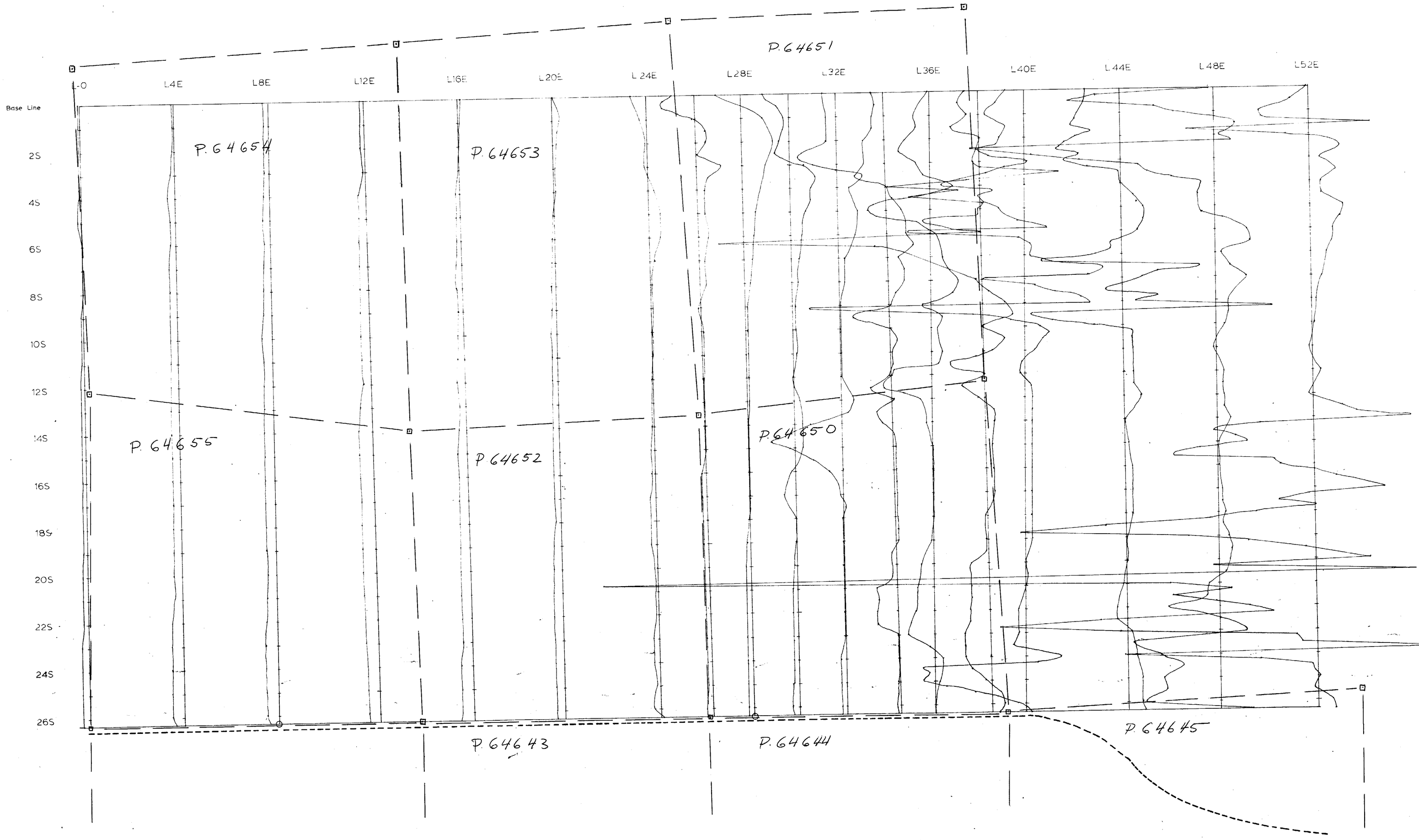
1" = 1320'

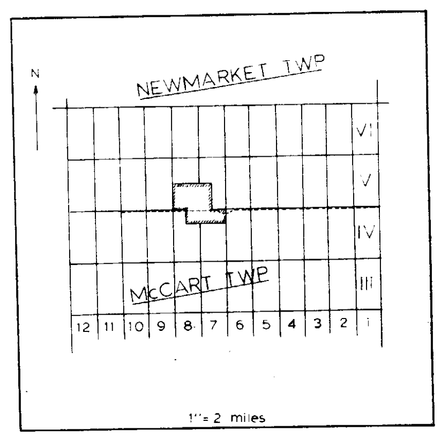
Conductor Axes

Definite : —·—·—

Probable : ·····

R.B.





Road ———
Station Intervals 25, 50, and 100'
Background Value 56,500 ɣ
Base Station ○

May 19/65
R. Bouton

O'BRIEN GOLD MINES LTD.

MAGNETIC PROFILES (N1/2)

CHEVALIER'S CLAIMS
McCART TOWNSHIP ONTARIO

Mag	R.B.	Nov-Dec 1964	1"=200' / 1"=2000'
Plotted	R.B.	Dec 1964	
Drawn	G.M.	May 1965	

63-1556

P.64654 P.64653 P.64651 P.64655 P.64652 P.64650 P.64643 P.64644 P.64645

Base Line

5S

10S

15S

20S

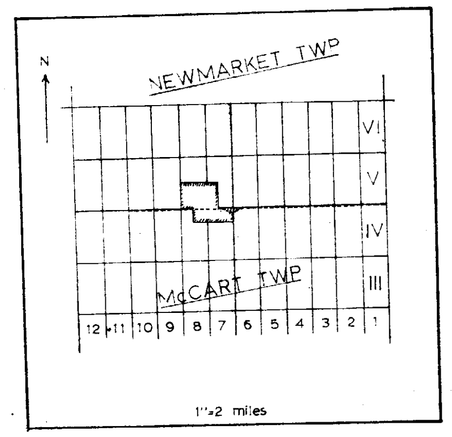
25S

Road

L-0 L8E L16E L24E L32E L40E L48E

Transmitter Location

10°W



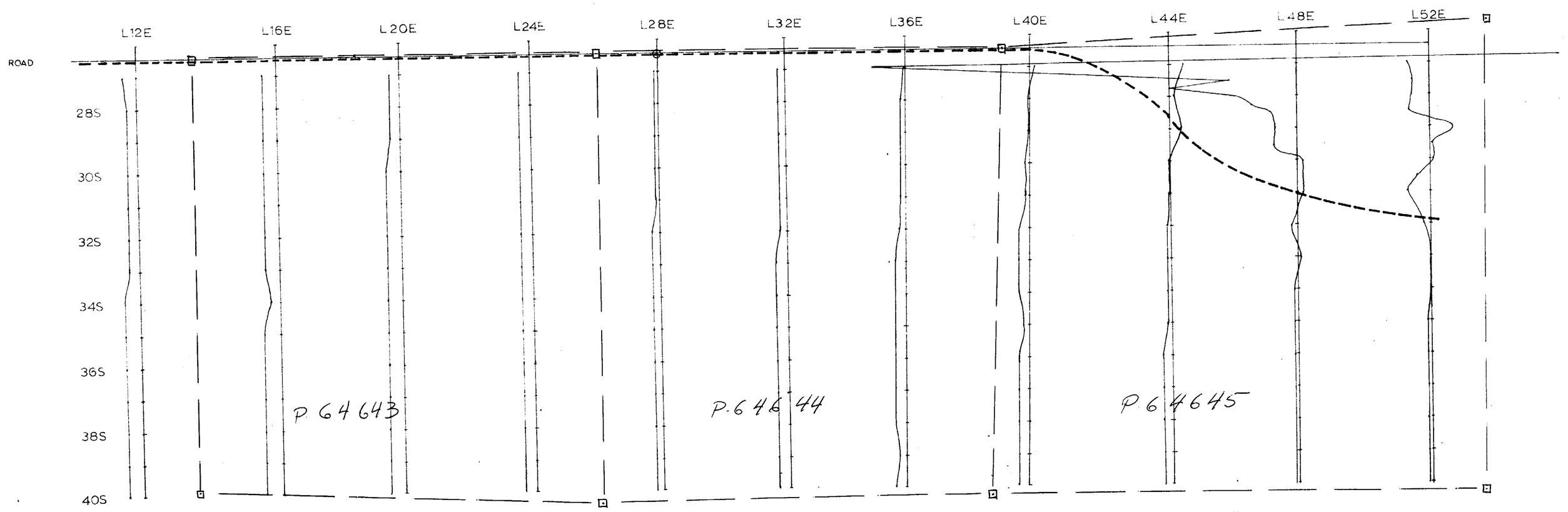
May 19/65
R. Bowman

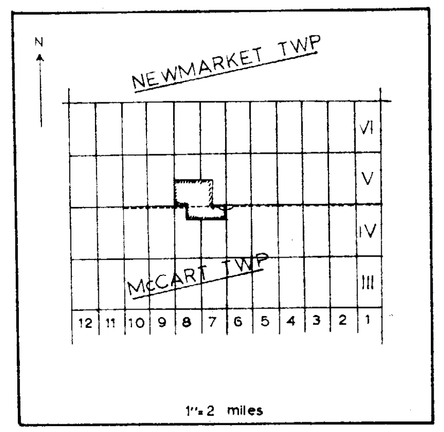
O'BRIEN GOLD MINES LTD.

EM PROFILES (N1/2)
(1000 c/s)
CHEVALIER'S CLAIMS
McCART TOWNSHIP, ONTARIO

EM: R.B.	Dec. 1964	1" = 200'
Plotted: R.B.	Dec. 1964	1" = 20°

210



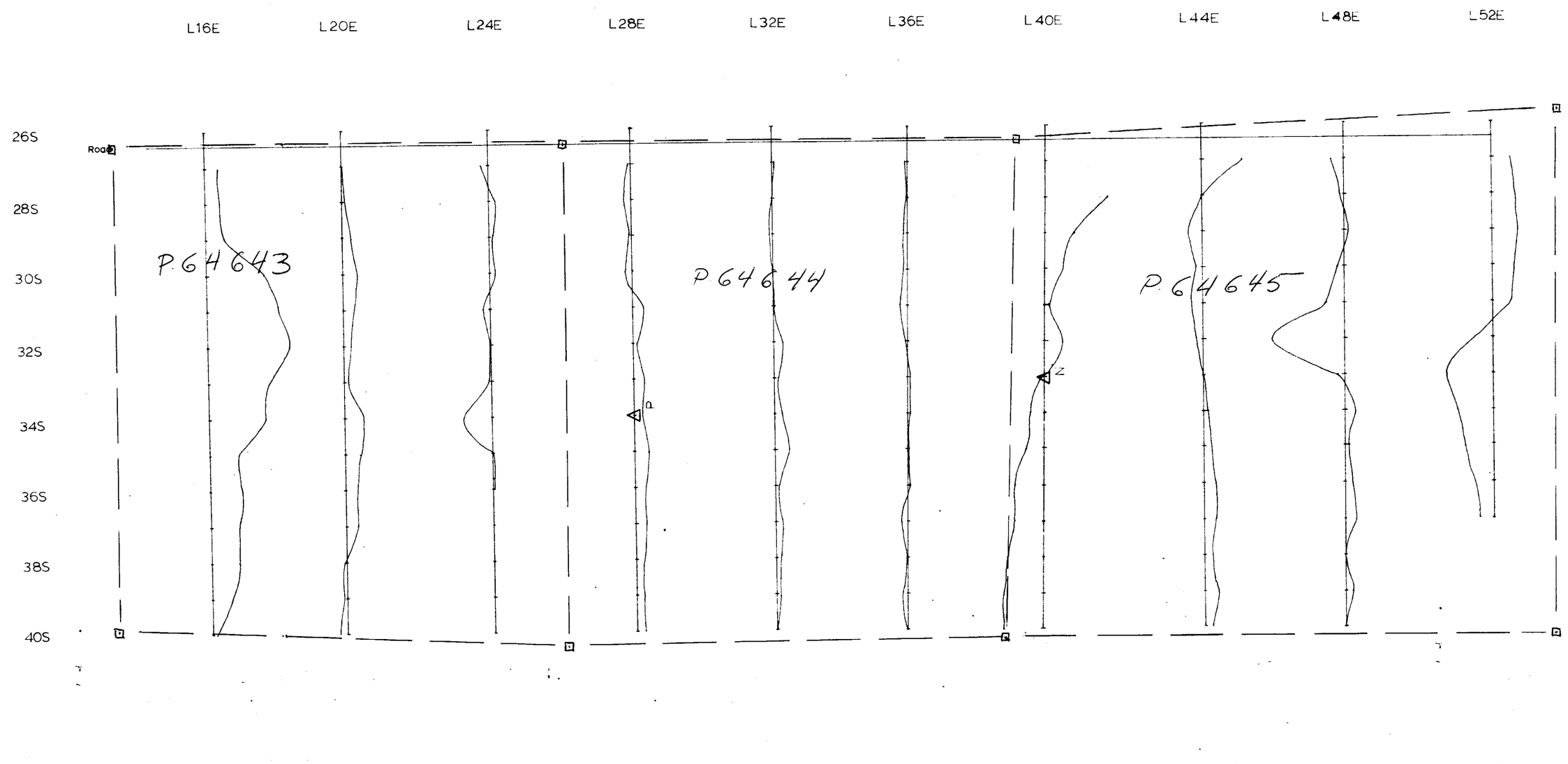


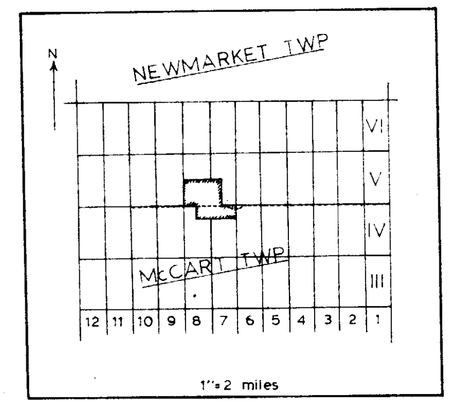
May 19/65
R. B. Bentley

Background Value 56,500 γ
Station Intervals 25', 50', and 100'
Base Station ⊙

O'BRIEN GOLD MINES LTD			
MAGNETIC PROFILES (S1/2) CHEVALIERS CLAIMS McCART TOWNSHIP ONTARIO			
Mag	R.B.	Dec. 1964	1" = 200'
Plotted	G.M.	May 1965	1"=2000'
Drawn	G.M.	May 1965	

63-1556





△ Transmitter
+ Receiver South
- Receiver North

May 19/65
R. Blanchette

O'BRIEN GOLD MINES LTD.		
EM PROFILES SOUTH HALF CHEVALIERS OPTION McCART TOWNSHIP ONTARIO		
EM: R.B.	Dec. 1964	1"=200' 1"=20°
Plotted: R.B.	Dec. 1964	
Drawn: G.M.	May 1965	