A Geophysical Report on The Tchentlo Lake Property

of

LOMITA MINING CORPORATION LIMITED

by

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A REPORT ON

MAGNETIC, ELECTROMAGNETIC

AND

INDUCED POLARIZATION SURVEYS

Tchentlo Lake Area, British Columbia

FOR

LOMITA MINING CORPORATION LIMITED

Vancouver, British Columbia

BY

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INTRODUCTION

Between June 15th and July 7th, 1971, Peter E. Walcott & Associates Limited carried out an induced polarization (I.P.) survey over part of a property, located in the Nation Lakes District of British Columbia, optioned by Lomita Mining Corporation Limited.

The survey was carried out over handcut picket lines which were turned off at right angles from N 70° W baseline, and which were chained and picketed at 100 foot intervals.

Measurements (first to fourth separation) of apparent resistivity and frequency effect (the I.P. response parameter) were made using the "dipole - dipole" method of surveying with a 300 foot dipole and frequencies of 0.3 and 5 c.p.s.

Progress of the survey was considerably hampered by inclement weather (it rained nearly every day), difficulty in making good electrical contacts in outcrop or near outcrop areas, and severe ground noise.

The I.P. data are presented in contour form on individual line profiles contained in this report, and also in contour form on plan maps of the line grid, Maps W-132-1 to -12, that accompany this report.

In addition this report contains a discussion of the results obtained on ground magnetic and E.M. 16 surveys conducted by Lomita Mining Corporation during the same period. The results of these surveys are presented in contour form on Maps W-132-13 to -15.

PROPERTY, LOCATION & ACCESS

The property is located in the Omineca Mining District of British Columbia and consists of the following mineral claims:

Claim Name	Record Number
BALL 1 - 6	63540 - 45
BAL 7 - 10	80368 - 71
BAL 11 - 15	73757 - 61
HI 1 - 10	63622 - 31
HI 27 - 30	63983 - 86
TC 1 - 10	76031 - 40
PJ 1 - 20	80372 - 91
A Fr's 1 - 5	80363 - 67
A 1 - 6	to be issued
NOR Fr's 1, 7	" " "
NOR 8, 11 - 16	" " "

The claims are situated on the north shore of Tchentlo Lake, some 65 miles northwest of the settlement of Fort St. James, British Columbia.

Access is obtained by means of float plane from Fort St. James.

PREVIOUS WORK

Previous work done on the property consists of:

(1) Geological mapping.

(2) Geochemical sampling.

(3) Extensive trenching.

The results of this work are well documented in a report for Tchentlo Lake Mines by A.J. Sinclair, P.Eng. dated April 1970.

PURPOSE

The purpose of the survey was to

(1) investigate by geophysical techniques the molybdenum - copper geochemical anomaly and the showings.

(2) attempt to outline areas of sulphide mineralization as suggested by the geological environment.

GEOLOGY

The reader is referred to a report dated November 1971 by M.R. Swanson M.Sc. and J.G. Simpson Ph.D., P.Eng. of Lomita Mining Corporation Ltd.

SURVEY SPECIFICATIONS

The induced polarization (I.P.) survey was carried out using a system manufactured by McPhar Geophysics Limited of Don Mills, Ontario. Measurements with this sytem are made in the frequency domain.

The system consists basically of three units, a receiver, a transmitter and a motor generator. - The transmitter, which obtains its power from the 2.5 kw 400 cycle generator driven by a gasoline engine, injects current into the ground at two electrodes C_1 and C_2 at two preselected frequencies, while the receiver, a very stable and sensitive potentiometer tuned to the frequency selected, makes measurements of observed voltages across the potential electrodes P_1 and P_2.

The data recorded in the field consists of careful measurements of the current (I) flowing through electrodes C_1 and C_2, the voltage (V) appearing between the potential electrodes P_1 and P_2 on the low frequency, and the "percentage apparent frequency effect" appearing between P_1 and P_2 (the receiver is designed to measure directly

$$\text{the \%age F.E.} = \frac{(P_a \text{ low} - P_a \text{ high}) \times 100)}{P_a \text{ high}}$$

The apparent resistivity (P_a) in ohm-feet is proportional to the ratio of the measured voltage and current, the proportionality factor depending on the geometry of the array used. In practise $\frac{P_a}{2\pi}$ is plotted.

A third parameter termed the "metal factor" is also calculated by dividing the apparent frequency effect by $\frac{P_a}{2\pi}$ and multiplying by 1000.

The survey was carried out using the "dipole - dipole" electrode array. This electrode configuration and the methods of presenting the results are illustrated in the appendix. Depth penetration with this array is increased or decreased by increasing or decreasing "a" and/or n.

In practise the equipment is set up at a particular station of the line to be surveyed; three transmitting dipoles are laid out to the rear, measurements are made for all possible combinations of transmitting and receiving dipoles, the latter consisting of two porous pots filled with an electrolyte copper sulphate solution "a" feet apart, up to the fourth separation, i.e. $n = 4$; the equipment is moved 3 "a" feet along the line to the next set-up.

SURVEY SPECIFICATIONS (cont'd)

A 300 foot dipole was used on the survey.

The magnetic survey was carried out using a Sharpe M.F.1 fluxgate magnetometer. This instrument measures variations in the vertical component of the earth's magnetic field to an accuracy of ± 10 gammas. Corrections for diurnal variations were made by tying-in to previously established base stations at intervals not exceeding two hours.

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 Ronka E.M. 16 unit. This unit utilizes the V.L.F. radio stations that exist for submarine communications whereby the receiver, i.e. the E.M. 16 unit, measures the vertical components of the secondary fields that might be induced by concentric horizontal magnetic fields created by the stations' vertical antennae.

The in-phase data was subjected to filtering to transform it into contourable form (the manipulation consisted of the application of a difference operator to transform zero crossings into peaks, and a low pass smoothing operator to reduce random noise).

Only the filtered in-phase data is presented in this report.

DISCUSSION OF RESULTS

The results of the geophysical surveys should be studied in conjunction with those of the geological and geochemical surveys as reported by Messrs. Swanson & Simpson.

The results of the magnetometer survey, as seen on Map W-132-13, showed the property to be underlain by four main magnetic rock units, Units M_1, M_2, M_3 and M_4 respectively.

Unit M_1, corresponds to the main quartz diorite intrusives, while Unit M_2 corresponds to a mapped younger quartz diorite.

Unit M_3 corresponds to a belt of highly mafic diorite and hornblendite containing and/or associated with magnetite rich veins, and exhibits a complex magnetic pattern. Its boundaries as drawn could be somewhat inaccurate depending on the direction of magnetization.

Unit M_4 is defined by a magnetic high located south of the main showings. This unit corresponds to the core of a tonalite dyke by extrapolation from the drilling results.

Simple quantitative analysis done on this anomaly at locations shown on the map, assuming an infinite dyke dipping to the north, yielded depth to the top of its surface, h, of 250 to 315 feet, widths, m, of 500 and 600 feet, and susceptibility contrasts, k, of 6.3×10^{-3} and 3.4×10^{-3} c.g.s. units respectively.

Two low intensity magnetic lows, associated with I.P. highs, were located in Unit M_1, south of its contact with Unit M_3.

Several northeasterly faults are apparent from the magnetics, the most easterly believed by the writer to indicate a major lineament that lines up with the shoreline of the bay, and which is observed on the airborne magnetics, on which the movement appears considerable.

Five susceptibility determinations were made on rock-types encountered in the drill holes. The results are tabulated below:

Sample No.	Location	Description	Magnetic Susceptibility
1	66/6 80'	typical diorite	1190×10^{-6} c.g.s. units
2	6	surface diorite in trench	1190×10^{-6} " "
3	66/3 747'	typical altered tonalite	$\simeq 0 \times 10^{-6}$ " "
4	66/7 291'	mafic tonalite	1190×10^{-6} " "
5	71 - 7 - 22	hybrid rock containing magnetite	5950×10^{-6} " "

DISCUSSION OF RESULTS cont'd

The E.M. 16 survey (Maps W-132-14 & 15) located the presence of numerous E.M. conductors on the property. While no attempt will be made here to explain the causative source of these anomalies (they could be caused by sulphide mineralization, faults, shear zones, etc. and were not investigated in the field) it is of interest to note that their conductive axes have two distinctive trends, i.e. NW and NNE trends respectively which show good agreement with the observed jointing and fracturing on the property (the writer is not claiming that all the anomalies are due to faulting and/or fracture controlled mineralization).

The results also indicated that a NNW striking major conductor axis shows excellent correlation with a geological fault interpreted from aerial photography on the north contact of the mafic diorite-hornblendite complex.

The survey also showed that NW conductor axes terminated on the major NE lineament interpreted from the magnetics.

The I.P. survey, as performed with a 300 foot dipole, showed most of that part of the property surveyed to exhibit moderate-high frequency effects, as can be seen from the accompanying profiles and maps (Maps W-132-5 to -12).

Two higher intensity areas are clearly discernible on the accompanying maps. The more southerly one is observed on all four separations and is located in the area around and beyond the main showings and geochemical anomalies. Its causative source is undoubtedly pyrite, the main constituent in the showings.

The more northerly anomaly is again obtained on all four separations, is coincident with the area of high magnetic relief, and is believed by the writer to be attributable mostly to magnetite.

A smaller less intense anomaly is located south of this major anomaly on Lines 40 E, 48 E and 55 E respectively. This anomaly has a location that corresponds with that of a magnetic low, and encloses an area in which NE and NW E.M. trends intersect and in which minor copper mineralization occurs.

High frequency effect readings are also obtained on Lines 0 and 8 E over the magnetic low to the north of the geochemical anomalies.

DISCUSSION OF RESULTS cont'd

The I.P. survey did not properly cover the area underlain by the projected sub-outcrop fo the tonalite dyke, the mineralizer for economic minerals in the geologists' opinion, as the survey was completed before the dyke was intersected and its significance understood. However the response on the n = 1 separation, which partially covers the area, drops off. This could be expected as the overburden thickness increases considerably south of the showings.

An area of low response, particularly on the n = 1 separation, is observed in the centre of the grid. This is believed by the writer to be partially attributable to an increase in the thickness of the conductive overburden, as indicated on the resistivity survey (Maps W-132-1 to -4) as well as to a decrease in percentage sulphides in the underlying rocks.

Low frequency effects are observed to the east of the interpreted major lineament. These were accompanied by lower resistivity values suggesting a different rock type with no accompanying sulphides and/or more probably a considerable increase in the thickness and conductivity of the overburden.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Between June 15th and July 7th, 1971, Peter E. Walcott & Associates Limited carried out an induced polarization (I.P.) survey over part of a property optioned by Lomita Mining Corporation Limited.

During this period Lomita Mining Corporation carried out magnetic and electromagnetic (E.M. 16) surveys in addition to its geological and geochemical investigations of the property.

The property is located on the north shore of Tchentlo Lake some 65 airmiles northwest of Fort St. James, British Columbia.

The magnetic survey showed the property to be underlain by four main magnetic rock units. One of these shows excellent correlation with the core of the tonalite dyke as indicated from the drilling results.

A major northeasterly lineament was apparent from the magnetics on which the movement appears considerable, as indicated on the airborne magnetics.

The E.M. 16 survey detected a number of conductors on the property, the axes of which had two dominant trends i.e. NW and NNE trends, the observed directions of jointing and fracturing on the property.

The I.P. survey indicated most of the property to exhibit moderate - high frequency effects.

Higher frequency effects were obtained over the area encompassing the main showings and the geochemical anomaly, and over an area of high magnetic activity to the north.

Good frequency response was obtained over two areas of lower magnetic intensity, one lying to the north of the geochemical anomaly, the other in an area in which minor copper mineralization was observed in trenching.

Low frequency effects were observed in association with lower resistivity values in the central and southern portions.

As a result the writer concludes that:

(1) Most of the I.P. response in Unit M_1 is probably due to pyrite with possible associated (?) copper and molybdenum mineralization.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS cont'd

(2) The high I.P. response within Unit M_2 is attributable to magnetite indicated by the magnetics and some possible pyrite.

(3) Unit M_4 is most probably caused by hybrid rocks or magnetic mafic diorite containing concentrations of pyrite and pyrrhotite as evidenced by the good agreement between the calculated and measured susceptibilities.

(4) Although most of the drilling to date has encountered pyrite mineralization in the zone of high I.P. response around the showings, the I.P. highs and magnetic lows on Lines 8 E and 48 E could have some economic significance.

He therefore suggests that:

1. The I.P. coverage be extended to the lake to investigate the interpreted tonalite dyke prior to further drilling.

2. The forementioned magnetic low - I.P. high associations be investigated by drilling.

Respectfully submitted,

PETER E. WALCOTT & ASSOCIATES LIMITED

Peter E. Walcott, P.Eng.
Geophysicist

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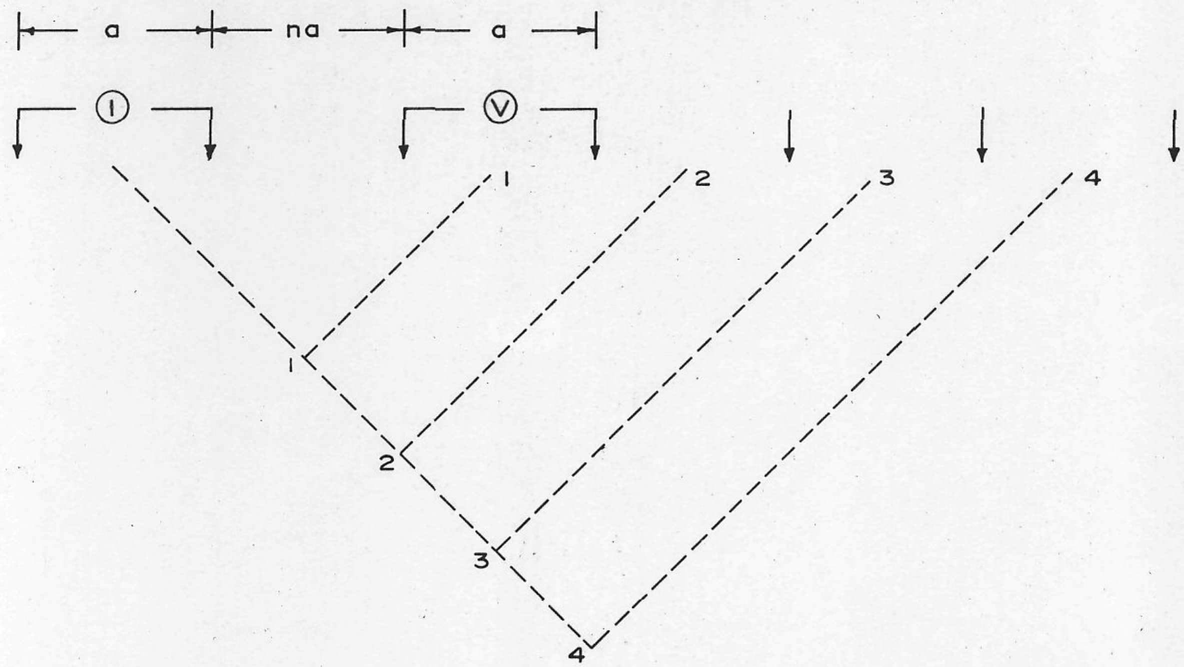
December 1971

DIPOLE-DIPOLE ARRAY



ANOMALOUS ZONE

POSSIBLE ANOMALOUS ZONE

LOMITA MINING CORPORATION

TCHENTLO LAKE, B.C.

LINE NO.– 40+00 W.

F. R.–5+0.3 C/SEC.

a = 300'

SCALE : 1" = 300'

LINE NO. 40+00 W.

LOMITA MINING CORPORATION

TCHENTLO LAKE, B.C.

-

LINE NO.-32+00W

F.R.-5+0.3 C/SEC.

a=300'

SCALE: 1"=300'

LINE NO. 32+00W

LOMITA MINING CORPORATION

TCHENTLO LAKE, B.C.

LINE NO.–24+00 W.

F. R.–5+0.3 C/SEC.

a = 300'

SCALE : 1" = 300'

LINE NO. 24+00 W.

LOMITA MINING CORPORATION

TCHENTLO LAKE, B.C.

LINE NO. – 16+00 W.

F.R – 5+0.3 C/SEC.

a = 300'

SCALE: 1" = 300'

LINE NO. 16+00 W.

LOMITA MINING CORPORATION

TCHENTLO LAKE, B.C.

LINE NO.— 8+00W.

F.R.—5+0.3 C/SEC.

a = 300'

SCALE : 1" = 300'

LINE NO. 8+00 W.

LOMITA MINING CORPORATION

TCHENTLO LAKE, B.C.

LINE NO.- 0+00

F.R.-5+0.3 C/SEC.

a=300'

SCALE: 1"=300'

LINE NO. 0+00

LOMITA MINING CORPORATION

TCHENTLO LAKE, B.C.

LINE NO.– 8+00 E.

F. R.–5+0.3 C/SEC.

a = 300'

SCALE : 1" = 300'

LINE NO. 8+00 E.

LOMITA MINING CORPORATION

TCHENTLO LAKE, B.C.

LINE NO.-16+00 E.

F.R.-5+0.3 C/SEC.

a=300'

SCALE: 1"=300'

LINE NO. 16+00 E.

LOMITA MINING CORPORATION

TCHENTLO LAKE, B.C.

LINE NO.– 24+00 E.

F. R.–5+0.3 C/SEC.

a = 300'

SCALE : 1" = 300'

LINE NO. 24+00 E.

LOMITA MINING CORPORATION

TCHENTLO LAKE, B.C.

LINE NO - 32+00E.

F R-5+0.3 C/SEC.

a = 300'

SCALE: 1" = 300'

LINE NO. 32+00 E.

LOMITA MINING CORPORATION

TCHENTLO LAKE, B.C.

LINE NO.— 40+00 E.

F. R.—5+0.3 C/SEC.

a = 300'

SCALE : 1" = 300'

LINE NO. 40+00 E.

LOMITA MINING CORPORATION

TCHENTLO LAKE, B. C.

LINE NO.– 48+00 E.

F. R.– 5+0.3 C/SEC.

a = 300'

SCALE: 1" = 300'

LINE NO. 48+00 E.

LOMITA MINING CORPORATION

TCHENTLO LAKE, B.C.

LINE NO.–56+00 E.

F. R.–5+0.3 C/SEC.

a = 300'

SCALE : 1"=300'

LINE NO. 56+00 E.

LOMITA MINING CORPORATION

TCHENTLO LAKE, B.C.

LINE NO.– 60+00 E.

F. R.–5+0.3 C/SEC.

a = 300'

SCALE : 1" = 300'