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MINING LANDS SECTION

GEOPHYSICAL REPORT (Magnetic & Electromagnetic Surveys) on properties held by Messrs. D. Jones and T. Kioke Jr. for <u>CROSS LAKE MINERALS LTD.</u> in Fox Township, Porcupine Mining Division and Stimson Township, Larder Lake Mining Division District of Cochrane, Ontario by J.W. Newsome, Ph.D. February 28, 1999 1 2. 1322 2. 1322 2. 1322 2. 1322 2. 1322 2. 1322 3. 1990 1 Qual 2, 8733

Nore: Report of Work for Fox Twp is in file 2.13619



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APPENDIX II ("BLOCK B") Figures 8, 9 and 10

APPENDIX III ("BLOCK C") Figures 11, 12 and 13

ABSTRACT

Total field magnetics and horizontal loop electromagnetic surveys were conducted by Robert S. Middleton Exploration Services Inc., Timmins, Ontario, between February 18 and 25, 1990, on three separate claim groups held by Messrs. David Jones and Tom Kioke Jr., both residents of Timmins, in Fox Township, Porcupine Mining Division and Stimson Township, Larder Lake Mining Division, Ontario. All claims are currently held in trust to be transferred to Cross Lake Minerals Ltd., on who's behalf the surveys were conducted. The purpose of the surveys was to ground truth several airborne EM anomalies considered to be caused by sulphide mineralization with possible base and/or precious metals potential.

The three separate claim groups are denoted Blocks 'A', 'B' and 'C'. Several weak to strong electromagnetic anomalies, some proximal to magnetic high signatures (ultramafic rocks?) and interpreted structural lineaments, were defined on Blocks 'B' and 'C' (and possibly 'A').

A two-phased proposed work program of additional claim staking, continued geophysical surveying and initial diamond drill testing of anomalies is recommended at a total budget of approximately \$128,390.

INTRODUCTION

At the request of the directors of Cross Lake Minerals Ltd., ground geophysical surveys consisting of total field magnetics and horizontal loop electromagnetics were conducted on three separate claim groups in Fox Township, Porcupine Mining Division and Stimson Township, Larder Lake Mining Division, Ontario (Figures 1 and 2). The surveys were performed between February 18 and 25, 1990, by Robert S. Middleton Exploration Services Inc., Timmins, Ontario, to verify and delineate several airborne EM anomalies as shown on O.G.S. Map 81220 (Figure 4) considered as potential base and/or precious metals sulphide targets associated with mafic to ultramafic rocks.

PROPERTY DESCRIPTION, LOCATION AND ACCESS

The property consists of 3 separate claim groups, hereafter referred to as Blocks A,B and C, comprised of 4,7 and 8 contiguous 40-acre unpatented claims respectively, (Figure 3). The claims which comprise the various blocks along with the recorded claim holders and recording dates are as follows:

Block A - Fox Township

<u>Claim No.</u>	<u>Recorded Holder</u>	Recording Date		
P1113589	David Jones	June 27, 1989		
P1113590	David Jones	June 27, 1989		
P1113591	David Jones	June 27, 1989		
P1113592	David Jones	June 27, 1989		
	— ••			

<u>Block B</u> - Fox and Stimson Townships

<u>Claim No.</u>	<u>Recorded_Holder</u>	<u>Recording Date</u>
P1128614	Tom Kioke Jr.	February 15, 1990
P1128615	Tom Kioke Jr.	February 15, 1990
L1128616	Tom Kioke Jr.	February 15, 1990
L1128617	Tom Kioke Jr.	February 15, 1990
L1128618	Tom Kioke Jr.	February 15, 1990
L1128619	Tom Kioke Jr.	February 15, 1990
L1128620	Tom Kioke Jr.	February 15, 1990





Block C - Stimson Township

<u>Claim No.</u>	Recorded Holder	Recording Date		
L1113593	David Jones	June 26, 1989		
L1113594	David Jones	June 26, 1989		
L1113595	David Jones	June 26, 1989		
L1113596	David Jones	June 26, 1989		
L1113597	David Jones	June 26, 1989		
L1113598	David Jones	June 26, 1989		
L1113599	David Jones	June 26, 1989		
L1113600	David Jones	June 26, 1989		

Claim Block A is located in the southeast sector of Fox Township near the hamlet of Norembega. Access is provided via Highway 574 from Cochrane, located approximately 29 kms to the northwest, to Norembega and from there eastward via snowmobile for a distance of approximately 1 km along a powerline which traverses the southwest corner of claim no. P1113589.

Claim Block B is accessed from Block A via snowmobile by continuing along the powerline for a distance of approximately 1.6 kms to the intersection of the Fox-Stimson Township line and from there northward for a distance of approximately 3.4 kms to where the township line intersects the no.3 post of claim no. L1128618.

Claim Block C is located in central Stimson Township. Access to the claims is provided either by helicopter or from the town of Iroquois Falls, located some 27 kms to the south, via the Abitibi Price forest access road to a point east of Dowie Lake and from there westward via snowmobile across the lake and down a creek flowing west from the southwest corner of the lake for a distance of approximately 2.5 kms to where the creek enters onto claim no. L1113597.

The terrain encompassing the three claim blocks is generally flat, poor to moderately drained and covered by stands of dominantly black spruce. Bedrock outcrops are non-existent due to a pervasive mantle of Pleistocene-age glacial and lacustrine sediments.

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<u>GEOLOGY</u>

The regional and property bedrock geology, interpreted primarily from airborne geophysical data and supported by regional geological data including mapping and diamond drilling, suggests that the property is underlain by mafic metavolcanic and ultramafic rocks. All rock types are cut by younger, north trending diabase dykes. The metamorphic grade is thought to be upper greenschist to lower amphibolite facies as suggested by diamond drill data from the southeastern sector of Stimson Township. Airborne EM anomalies occur within all three claim blocks and may represent massive to semi-massive or stringer-type sulphide mineralization.

SURVEY STATISTICS AND PERSONNEL

The surveys, requiring 8 days to complete (excluding line cutting), comprised a total of 41.2 kms of total field magnetics (Block A =8.8 kms, Block B =15.2 kms and Block C =17.2 kms) with readings taken at 12.5 to 25m intervals along 100 m-spaced lines as well as grid base lines and tie lines and a total of 34.0 kms of MaxMin II horizontal loop electromagnetics (Block A =7.2 kms, Block B = 12.4 kms and Block C = 14.4 kms) with 3 frequency readings (444Hz, 1777Hz and 3555Hz) using a 200m coil separation being taken at 25m intervals along 100m spaced lines. The surveys were conducted by Tom McAllister, Brent McAllister and Denis Crowley, all residents of Timmins, Ontario.

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SURVEY PROCEDURE

MAGNETICS

<u>Theory</u>

The magnetic method is based on measuring alteration in the shape and magnitude of the earth's naturally occurring magnetic field caused by changes in the magnetization of the rocks in the earth.

These changes in magnetization are due mainly to the presence of the magnetic minerals, of which the most common is magnetite, and to a lesser extent ilmenite, pyrrhotite, and some less common minerals.

Magnetic anomalies in the earth's field are caused by changes in two types of magnetization: induced and remanent (permanent). Induced magnetization is caused by the magnetic field being altered and enhanced by increases in the magnetic susceptibility of the rocks, which is a function of the concentration of the magnetic minerals.

Remanent magnetism is independent of the earth's magnetic field, and is the permanent magnetization of the magnetic particles (magnetite, etc.) in the rocks. This is created when these particles orient themselves parallel to the ambient field when cooling. This magnetization may not be in the same direction as the present earth's field, due to changes in the orientation of the rock or the field.

The most common method of measuring the total magnetic field in ground exploration is with a proton precession magnetometer. This device measures the effect of the magnetic field on the magnetic dipole of hydrogen protons. This dipole is caused by the "spin" of the proton, and in a magnetometer these dipoles in a sample of hydrogen-rich fluid are oriented parallel to a magnetic field applied by an electric coil surrounding the sample. After this magnetic field is removed, the dipoles begin to precess (wobble) around their orientation under the influence of the ambient earth's magnetic field. The frequency of this precession is proportional to the earth's magnetic field intensity.

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Field Method

The magnetics data were collected with a Geonics G-816 proton precession magnetometer, which measures the absolute value of the total magnetic field of the earth to an accuracy of $\pm 1n$ Tesla. The magnetometer is carried down the survey line by a single operator, with the sensor mounted on a short pole to remove it from the surface geologic noise. Readings are normally taken at 25m intervals, and at 12.5m intervals where the operator observes a high gradient (anomaly).

The readings are corrected for changes in the earth's total field (diurnal drift) by repeating readings at base stations and "tie points" several times each day. This recorded drift is then applied to the data as a correction.

MAX-MIN II

<u>Theory</u>

The Max-Min II is a frequency domain, horizontal loop electromagnetic (HLEM) system, based on measuring the response of conductors to a transmitted, time varying electromagnetic field.

The transmitted, or primary EM field is a sinusoidally varying field at any of five different frequencies. This field induces an electromotive force, (emf), or voltage, in any conductor through which the field passes. This is defined by:

 $\oint E.dl = \underbrace{\downarrow \phi}_{i} \quad (the \ Faraday \ Induction \ Principle)$

where E is the electric field strength in volts/metre (and so $\oint E.dl$ is the emf around a closed loop) and \oint is the magnetic flux through the conductor loop. This emf causes a "secondary" current to flow in the conductor in turn generating a secondary electromagnetic field.

This changing secondary field induces an emf in the receiver coil (by the Faraday law) at the same frequency, but which differs from the primary field in magnitude and phase. The difference in phase (the phase angle) is a function of the conductance of the conductor(s), both the target and the overburden and host rock.

The magnitude of the secondary is also dependent on the conductance, and also on the dimensions, depth, and geometry of the target, as well as on the interference from overburden and the host rock.

These two parameters (phase angle and magnitude) are measured by measuring the strength of the secondary field in two components: the real field or that part "in-phase" with the primary field; and the imaginary field, or that part in "quadrature" or 90 degrees out of phase from the primary field.

The magnitude and phase angle of the response is also a function of the frequency of the primary field. A higher frequency field generates a stronger response to weaker conductors, but a lower frequency tends to pass through weak conductors and penetrate to a greater depth. The lower frequency also tends to energise the full thickness of a conductor, and gives a better measure of its true conductivity-thickness product (conductance).

For these reasons two or more frequencies are usually used; the lower for penetration and accurate measure of good conductors, and the higher frequency for strong response to weak conductors.

Distinction between conductive targets, overburden, and host rock responses are made by studying the shape of the secondary field, and the difference in the frequency responses.

The transmitted primary field also creates an emf in the receiver coil, which is much stronger than the secondary, and which must be corrected for by the receiver. This is done by electronically creating an emf in the receiver, whose magnitude is determined by the distance from receiver to transmitter as set on the receiver, and whose phase is derived from the receiver via an interconnecting wire.

Field Method

The Max-Min II survey was carried out in the "maximum coupled" mode (horizontal coplanar). The transmitter and receiver are carried in-line down the survey line separated by a constant distance (in this case 200m) with the receiver leading. Three transmitter frequencies were used: 444Hz, 1777Hz and 3555Hz and readings were taken every 25m. The transmitter and receiver are connected by a cable, for phase reference and operator communication.

<u>Note:</u> the data relating to the 3555 Hz frequency has not been included in this report.

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INTERPRETATION AND RECOMMENDATIONS

BLOCK 'A' (Figures 5, 6 and 7 - Appendix I)

The magnetic signature of Block 'A' is represented by three parallel, linear, north-trending magnetic high domains which follow along survey lines L1E, L5E and L8E and are interpreted to be the response of diabase dykes, (Figure 5 - Appendix I). The intervening magnetic low areas are interpreted to be underlain by mafic metavolcanic rocks based on regional mapping and diamond drill data.

Electromagnetically, all readings south of a line between 3N on Line L0 and 0+75N on line L8E are considered to be affected by the railroad and powerlines which transect the southern portion of the claim group near its southern boundary. Consequently, all EM readings in this area may be erroneous, (Figues 6&7 - Appendix I).

An 11-12 channel airborne EM anomaly within Block 'A' shown on Figure 4 is postulated to occur within the vicinity of 4N on line L2E. However, such an anomaly is not readily apparent on the ground survey data. The hint of a weak (4% in-phase response on 444 Hz frequency), 1-line anomaly occurs on line L2E with conductor axis at approximately 5+50N and may represent the airborne EM response, (Figure 6 - Appendix I). Otherwise, the remainder of the property does not appear to have any significant electromagnetic responses. However, the saw-tooth nature of the data shown on Figures 6 and 7 (Appendix I) suggests operator error. Given this finding, along with the limiting or negative effects that the railway and powerlines had on the electromagnetic survey, further examination of the claims using IP survey method is warranted.

<u>BLOCK 'B'</u> (Figures 8, 9 and 10 - Appendix II)

The interior portion of the claims of Block 'B' is bounded to the east and west by linear, north trending magnetic high signatures interpreted to be caused by diabase dykes, (Figure 8 -Appendix II). Similarly, within a 100-200 metre wide zone across the northern boundary of the 3 northern-most claims occurs another area of high magnetic signature. This magnetic high domain is interpreted to be caused by ultramafic bedrock when the claim group's location is considered relative to the regional magnetic picture displayed on OGS Map 81220 (Figure 3) and regional diamond drill data. The remaining area covered by the claim group is relatively magnetically quiet

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and is interpreted to be underlain primarily by mafic metavolcanic rocks based on the regional dominance of this rock type.

Electromagnetically, only one very strong anomaly (21% in-phase response on 444 Hz freqency) was detected on all three frequencies within Block 'B'. This anomaly, denoted conductor axis "1" on Figures 8, 9 and 10 - Appendix II, trends basically east-west for a detectable strike length of 500m with an apparent vertical dip and follows the base line between lines LAE and L8E between claim nos. 1128617 and 1128618. It corresponds to the three 11-12 channel airborne EM anomalies shown within the southern sector of the claim group in Figure 4. Conductor 1's strong response within a magnetically quiet domain suggests that it may be caused by an intraformational graphitic unit (possibly fault related). However, given that the property and local bedrock geology is only speculative, a massive sulphide occurrence within felsic to mafic metavolcanic rocks as the source of the anomaly cannot be completely ruled out and thus this anomaly should be diamond drill tested.

Two weaker EM anomalies, best detected on the higher frequencies (but still discernable on 444 Hz frequency) occur on claim no. 112814 at approximately 6N between lines L0 and L3E, denoted conductor axis no. "2" (2% in-phase response on 444 Hz) and on claim no. 1128620 at approximately 2+75Non line L12E, denoted conductor axis "3" (7% in-phase response on 444 Hz). These EM anomalies, however weak, are situated along the southern flank of the magnetically interpreted ultramafic unit and may represent semi-massive or stringer-type sulphide mineralization along the mafic volcanic - ultramafic rocks contact and thus warrant further consideration. Both conductors appear to be vertical and correspond to 7-8 to 11-12 channel airborne EM anomalies shown to trend along the southern flank of the magnetic high domain on either side and into Block 'B' in Figure 4. BLOCK 'C' (Figures 11, 12 and 13 - Appendix III)

The prominent magnetic features of Block 'C' are represented by two north by northwesterly trending sub-parallel linear magnetic high trends interpreted to represent a diabase dyke for the most westerly feature and either a second diabase dyke for the eastern magnetic linear or part of an ultramafic body which is interpreted to underlie the major portion of claim no. 1113600 (Figure 11, Appendix III). The trace of these magnetic linear trends appear to be somewhat staggered, the result of interpreted off-setting faults oriented generally along east-west or northwest-southeast axes. A third magnetic linear trend displaying this off-set feature occurs in the northeast sector of claim no. 1113593 and is interpreted to represent the trace of another diabase dyke.

Several weak to moderate one and two-line electromagnetic anomalies occur within the claim group and are denoted anomaly axes nos. 1,2,3,4 and 5 on Figures 11, 12 and 13 - Appendix III.

Anomaly No.1 is a moderately strong (10-14% in-phase response on 444 Hz frequency), 2line anomaly located at approximately 5+75N on lines LAE and L5E. The interesting feature of this anomaly is that it appears as two, south dipping, converging anomalies on 444 Hz frequency, one striking to the northeast and the other striking east-west, but only as a single northeast trending anomaly on 1777 Hz frequency, suggesting that the east-west trending anomaly may be deep seated. Anomaly No.1 lies along the north flank of the ultramafic body and may be related to an interpreted northeasterly trending fault and thus warrants diamond drill testing.

Anomaly No.1 corresponds to two 11-12 channel airborne EM anomalies centrally located within the 4 northern claims of Block 'C' as shown in Figure 4.

Anomaly No.2 is a weak (3% in-phase response on 444 Hz frequency), 1-line anomaly with conductor axis at 4N on line L3E, but appears to continue east for 3 lines to line L6E on 1777 Hz frequency with conductor axis at approximately 3+65N. This anomaly is considered of low priority at this time but should be further examined by IP survey method before a decision is made on its merits.

Anomaly No.3 is a weak to strong (2-15% in-phase response on 444 Hz frequency), south dipping, 2-line anomaly with conductor axis at approximately 0+37N on lines L6E and L7E. It is

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proximal and parallel to an interpreted, major, east-west trending fault and thus warrants diamond drill testing.

Anomaly No.4 is a northeast trending, moderate to strong (5-15% in-phase response on 444 Hz frequency), south dipping, 2-line anomaly with conductor axis from 2S to 1S on lines L8E and L9E respectively. It is similar to Anomaly No.3 in that it lies off the edge of a magnetic high (ultramafic or diabase?) and is proximal to the same major, east-west trending fault. It may represent a splay of this fault zone with a semi-massive/stringer-type sulphide mineralized horizon and thus warrants diamond drill testing. Anomaly No.4 is correlated with a 7-8 and an 11-12 channel airborne EM anomalies located in the central portion of the 4 southern claims of Block 'C' as shown in Figure 4.

Anomaly No.5 is a very weak (2% in-phase response on 444 Hz frequency), 1-line anomaly with conductor axis at approximately 3+37S on line L5E. As this anomaly occurs only on one line and is very weak on the 444 Hz frequency, it is considered of little consequence.

SUMMARY

BLOCK 'A'

No electromagnetic responses worthy of diamond drill testing were recorded during this survey. However, given the possibility of a weak EM response on line L2E at 5+50N, the possibility of operator error and the limiting effects of the railway and powerlines, an I.P. survey to better determine the merits of the claim group is warranted.

BLOCK 'B'

One strong electromagnetic anomaly detected on Block 'B' warrants diamond drill testing. This anomaly, denoted conductor axis No.1 on Figures 8, 9 and 10, has its strongest response on 444 Hz frequency on line L7E at baseline. Two other weak but significant EM anomalies, denoted conductor axes 2 and 3 on Figures 8, 9 and 10, also warrant further consideration. As these anomalies are located near the east and west margins of the claims group and Figure 4 suggests that these anomalies may be part of or the extremities of longer, airborne EM anomalies, it is recommended that additional claims be staked to cover the trend of these airborne EM responses before EM anomalies 2 and 3 are diamond drill tested. On completion of the staking of the additional claims, ground geophysical surveys (magnetics, electromagnetic and IP over the weaker EM responses), should be completed before drill targets are selected.

BLOCK 'C'

Five weak to moderately strong electromagnetic anomalies occur within claim Block 'C'and are denoted as anomalies 1-5 on Figures 11, 12 and 13. Anomaly Nos. 1 (located at approximately 5+75N on lines L4E and L5E), 3 (located at approximately 0+37N on lines L6E and L7E) and 4 (located between 2S and 1S on lines L8E and L9E respectively) are all viable targets worthy of diamond drill testing, given their proximity to magnetic high (ultramafic?) signatures and major structural lineaments. Anomaly Nos. 2 and 5 may be of significance, but should first be surveyed by I.P. method before their merits are considered. It is also advisable to conduct I.P. surveys over the other 3 EM anomalies, as well as their strike extensions and interpreted fault zones, before the final decision on initial diamond drill target selections is made. <u>PROPOSED EXPLORATION PROGRAM AND BUDGET</u> (for Blocks 'A', 'B' and 'C' combined)

<u>Phase I</u>

Stabing (Rlock 'R')	·
8 claims @ \$125/claim	\$ 1,000,00
Linecutting (Block 'R')	¥ 2,000.00
15 kms @ \$295 /km'	4 495 00
Magnetic Survey (Black 'R')	4 , 420.00
15 kms @ \$110 lkm	1 650 00
Electromagnetic Survey (Block 'B')	2,000.00
12 kms @ \$184./km	2,202,00
IP Survey (Blacks A B and C)	2,200.00
14 production days $@$ \$1,450 /day +	·
6 mob-demoh days @ \$1,000/day	26 300 00
Report (combined geophysical surveys)	4,000,00
Sub-Total	\$ 39,583.00
Contingency: 10%	3,958,00
PHASE I TOTAL	\$ 43.541.00
Phase II: Initial Diamond Drill Testing of Blocks 'A', 'B' and 'C'	
<u>Phase II:</u> Initial Diamond Drill Testing of Blocks 'A', 'B' and 'C' 2,500 feet diamond drilling @ \$25./foot	\$ 62,500.00
<u>Phase II:</u> Initial Diamond Drill Testing of Blocks 'A','B' and 'C' 2,500 feet diamond drilling @ \$25./foot Assaying	\$ 62,500.00
<u>Phase II:</u> Initial Diamond Drill Testing of Blocks 'A','B' and 'C' 2,500 feet diamond drilling @ \$25./foot Assaying 125 samples @ \$20./sample	\$ 62,500.00 2,500.00
Phase II: Initial Diamond Drill Testing of Blocks 'A','B' and 'C' 2,500 feet diamond drilling @ \$25./foot Assaying 125 samples @ \$20./sample Geologist: core logging & supervision	\$ 62,500.00 2,500.00
Phase II: Initial Diamond Drill Testing of Blocks 'A','B' and 'C' 2,500 feet diamond drilling @ \$25./foot Assaying 125 samples @ \$20./sample Geologist: core logging & supervision 18 days @ \$300./;day	\$ 62,500.00 2,500.00 5,400.00
Phase II: Initial Diamond Drill Testing of Blocks 'A','B' and 'C' 2,500 feet diamond drilling @ \$25./foot Assaying 125 samples @ \$20./sample Geologist: core logging & supervision 18 days @ \$300./;day Subsistence: room & board, transportation, etc.	\$ 62,500.00 2,500.00 5,400.00
Phase II: Initial Diamond Drill Testing of Blocks 'A','B' and 'C' 2,500 feet diamond drilling @ \$25./foot Assaying 125 samples @ \$20./sample Geologist: core logging & supervision 18 days @ \$300./;day Subsistence: room & board, transportation, etc. 18 days @ \$150./day	\$ 62,500.00 2,500.00 5,400.00 2,700.00
Phase II: Initial Diamond Drill Testing of Blocks 'A','B' and 'C' 2,500 feet diamond drilling @ \$25./foot Assaying 125 samples @ \$20./sample Geologist: core logging & supervision 18 days @ \$300./;day Subsistence: room & board, transportation, etc. 18 days @ \$150./day Report Find Sumplies	\$ 62,500.00 2,500.00 5,400.00 2,700.00 3,000.00
Phase II: Initial Diamond Drill Testing of Blocks 'A','B' and 'C' 2,500 feet diamond drilling @ \$25./foot Assaying 125 samples @ \$20./sample Geologist: core logging & supervision 18 days @ \$300./;day Subsistence: room & board, transportation, etc. 18 days @ \$150./day Report Field Supplies Sub Total	\$ 62,500.00 2,500.00 5,400.00 2,700.00 3,000.00 <u>1,000.00</u>
Phase II: Initial Diamond Drill Testing of Blocks 'A','B' and 'C' 2,500 feet diamond drilling @ \$25./foot Assaying 125 samples @ \$20./sample Geologist: core logging & supervision 18 days @ \$300./;day Subsistence: room & board, transportation, etc. 18 days @ \$150./day Report Field Supplies Sub-Total Contingenery 100	\$ 62,500.00 2,500.00 5,400.00 2,700.00 3,000.00 1,000.00 \$ 77,100.00
Phase II: Initial Diamond Drill Testing of Blocks 'A','B' and 'C' 2,500 feet diamond drilling @ \$25./foot Assaying 125 samples @ \$20./sample Geologist: core logging & supervision 18 days @ \$300./;day Subsistence: room & board, transportation, etc. 18 days @ \$150./day Report Field Supplies Sub-Total Contingency: 10%	\$ 62,500.00 2,500.00 5,400.00 2,700.00 3,000.00 1,000.00 \$ 77,100.00 7,710.00
Phase II: Initial Diamond Drill Testing of Blocks 'A','B' and 'C' 2,500 feet diamond drilling @ \$25./foot Assaying 125 samples @ \$20./sample Geologist: core logging & supervision 18 days @ \$300./;day Subsistence: room & board, transportation, etc. 18 days @ \$150./day Report Field Supplies Sub-Total Contingency: 10% PHASE II TOTAL	\$ 62,500.00 2,500.00 5,400.00 2,700.00 3,000.00 1,000.00 \$ 77,100.00 7.710.00 \$84,810.00
Phase II: Initial Diamond Drill Testing of Blocks 'A','B' and 'C' 2,500 feet diamond drilling @ \$25./foot Assaying 125 samples @ \$20./sample Geologist: core logging & supervision 18 days @ \$300./;day Subsistence: room & board, transportation, etc. 18 days @ \$150./day Report Field Supplies Sub-Total Contingency: 10% PHASE II TOTAL TOTAL PHASE I & II BUDGET	\$ 62,500.00 2,500.00 5,400.00 2,700.00 3,000.00 1,000.00 \$ 77,100.00 7,710.00 \$84,810.00 \$128,351.00

Respectfully submitted

F. W. Newsome

J.W. Newsome, Ph.D.

CERTIFICATION

I, Johial W. Newsome, Ph.D., of 141 Second Avenue, in the City of Timmins, Province of Ontario, certify as follows concerning my report on the Fox and Stimson Townships properties of Cross Lake Minerals Ltd. and dated February 28, 1990.

- 1) I am a graduate of the University of Western Ontario, London, Ontario, with a BSc degree in Geology (1976) and a graduate of the University of East Anglia, Norwich, England, with a Ph.D. degree in Environmental Sciences (1987).
- 2) I have been practising my profession in Canada for the past fourteen years.
- 3) I am and have been employed since May 01, 1987 by Robert S. Middleton Exploration Services Inc. located in the City of Timmins, Province of Ontario.
- 4) I have no direct or indirect interest in the properties, leases or securities of Cross Lake Minerals Ltd., nor do I expect to receive any.
- 5) The attached report is a product of:

- a) Examination and interpretation of data contained therein.
- b) Literature review and personal knowledge of the subject area.

Dated this 28th day of February, 1990 TIMMINS, Ontario

Johial W. News

Johial W. Newsome, Ph.D.







SPECIFICATIONS:

Frequenclest	222, 444, 888, 1777 and 3555 Hz.	Repeatability	±D.25% to ±1% normally, depend
Modes of Operation:	MAX: Transmitter coil plane and re- ceiver coil plane horizontal (Max-coupled; Horizontal-loop mode). Used with referceble.	Transmitter Output	on conditions, frequencies and separation used. - 828Hz : 220 Atm ² - 444Hz : 200 Atm ²
	MIN: Transmitter collplane horizon- tal and receiver coll plane var- tical (MIn-coupled mode). Used with reference cable.	Receiver Botteries	B88Hz : 120 Atm ² 1777Hz : 60 Atm ² 3555Hz : 30 Atm ²
	V.L. : Transmitter collplane verti- cal and receiver collplane hori- zontal (Vertical-loop mode). Used without reference cable, in parallel lines	Thornwitten	Life: approx. 35hrs. continuous ty (alkalina, 0.5 Ah), less in (weather.
Coll Separations:	25.50 100 150 200 & 250m (MMII)	Batteriest	12V BAh Gel-type recharge
	or 100, 200, 300, 400,600 and BOD ft. (MMIIF). Coll separations in VL.mode not re- stricted to fixed values.	Reference Coble :	Light weight 2-conductor te cable for minimum friction. Unst ed. All reference cables opti
Parameters Read:	 In-Phase and Quadrature compo- nents of the secondary field in MAX and MIN modes. 	Voice Link:	Built-in intercom system voice communication between
	- Tilt-engle of the totel field in V.L. mode .		ceiver and transmitter operation MAX and MIN modes, vie ference cable,
Readouter	 Automatic, direct readout on 90mm (3.5") edgewise meters in MAX and MIN modes. No null- ing or compensation necessary. 	Indicator Lights:	Built-in signal and reference v Ing lights to indicate errons readings.
	• Tilt angle and null in 90mm edga- wise maters in V.L.mode.	Temperature Range	n - 40°C to +60°C (- 40°F to +14
Scale Rangest	In Phase: \$20%, \$100% by push-	Receiver Weight	16kg (13 lbs.)
NOW ALSO ±4%	Quedreture: 220%, 2100% by push-	Transmitter Weight	# 13kg (29 lbs.)
QUADRATURE FULL SCALE.	button switch. Tilt: ±75% slope. Null (VL): Sensitivity edjusteble by separation switch.	Shipping Weight	I Typically BOkg (135 lbs.), der Ing on quantities of refere cable and batteries inclu Shipped in two field/shipping c
Readability:	In-Phase and Guadrature: 0.25% to 0.5%; Tilt: 1%.	Specifications subje	ct to change without notific:



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APPENDIX II

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The Model G-816 is a complete portable magnetometer for all man-carry field applications. As an accurate yet simple to operate instrument, it features an outstanding combination of one gamma sensitivity and repeatability, compact size and weight, operation on standard universally available flashlight batteries, ruggedized packaging and very low price.

The G-816 magnetometer allows precise mapping of very small or large amplitude anomalies for ground geophysical surveys, or for detail follow-up to aeromagnetic reconnaissance surveys. It is a rugged, light-weight, and versatile instrument, equally well suited for field studies in geophysics, research programs or other magnetic mapping application where low cost, dependable operation and accurate measurements are required.

For marine, airborne or ground recording systems consider GeoMetrics Models G-801, G-803, and G-826A.

-



'Hands-free'' Back Pack Sensor

Based upon the principle of nuclear precession (proton) the G-816 offers absolute drift-free measurements of the total field directly in gammas. (The proton precession method is the officially recognized standard for measurement of the earth's magnetic field.) Operation is worldwide with one gamma sensitivity and repeatability maintained throughout the range. There is no temperature drift, no set-up or leveling required, and no adjustment for orientation, field polarity, or arbitrary reference levels. Operation is very simple with no prior training required. Only 6 seconds are required to obtain a measurement which is always correct to one gamma, regardless of operator experience. Only the Proton Magnetometer offers such repeatability-an important consideration even for 10 gamma survey resolution.



Complete Field Portable System

The Model G-816 comes complete, ready for portable field operation and consists of:

- 1. Electronics console with internally mounted and easily replaced "D" cell battery pack.
- 2. Proton sensor and signal cable for attachment to carrying harness or stall.
- 3. Adjustable carrying harness.
- 4. 8 foot collapsible aluminum staff.
- 5. Instruction manual, complete set of spare batteries, applications manual, and rugged field suitcase.

Price and lease rates on the G-B16 magnetometer are available upon request.

GEOMETTICS, INC. 375 JAVA DRIVE

SPECIFICATIONS ·

	Sensitivity:	±1 gamma throughout	range	
	Range:	20,000 to 100,000 gam	nmas (worldwi	de)
	Tuning:	Multi-position switch wi cator light on display	th signal ampli	lude Indi-
	Gradient Tolerance:	Exceeds 800 gammas/	n -	•
	Sampling Rate:	Manual push-button, seconds	one reading	each 6
ihe Ital	Output:	5 digit numeric display gammas	with readout d	irectly in
the one out or eld	Power Requiremenis:	Twelve self-contained 1. sally available flashlight stale or replacement sig cator light on display.	5 volt ''D'' cel -type batteries pnified by flast	l, univer- . Charge ing Indi-
ery ère ect ihe or- on.	·	Ballery Type Alkaline Premium Carbon Zinc Standard Flashlight NOTE: Ballery lile decre sture operation.	Number of F over over over eases with low	Readings 10,000 4,000 1,500 Iemper-
	Temperalure Range:	Console and sensor: — Battery Pack: O ^o to tu tic	40° to +85°C to +50°C (lin -15°C; lower re battery be on-optional)	nited use tempera- It opera-
•	Accuracy (Toial Field):	±1 gamma through O° range	10 +50°C 1em	nperalure
eld	Sensor:	High signal, noise cano mounted on separate st ing harness	celling, interch aff or attached	angeably to carry-
sily 'ry-	Size:	Console: 3.5 x 7 x 10.5 Sensor: 3.5 x 5 inches Staff: 1 inch diameter (3 cm x 2.44	inches (9 x 18 5 (9 x 13 cm) er x 8 ft length m)	x 27 cm)
	Weight:	Console (w/batteries): Sensor & signal cable:	Lbs. 5.5 4	Kgs. 2.5 1.8
ies,		Aluminum staff: Ti	olal: 11.5	<u>0.9</u> 5.2
818	All magnetom year warranty not to exceed	eters and parts are beginning with the filteen months from	covered by date of rece the shippin	a one eipt but g date,
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MINING LANDS SECTION

GEOPHYSICAL REPORT (Magnetic & Electromagnetic Surveys) on claims held by Mr. P. Mathews for <u>CROSS LAKE MINERALS LTD.</u> in Stimson Township, Larder Lake Mining Division District of Cochrane, Ontario by J.W. Newsome, Ph.D. March 30, 1990





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ABSTRACT

Total Field Magnetics and horizontal loop electromagnetic surveys were conducted by Robert S. Middleton Exploration Services Inc., Timmins, Ontario, between March 12 and 13,1990, on three claims held by Mr. Peter Mathews of Timmins in Stimson Township, Larder Lake Mining Division, Ontario. The claims are currently held in trust for Cross Lake Minerals Ltd., on who's behalf the surveys were conducted. The purpose of the survey was to ground truth a weak airborne EM anomaly located with the claims.

The weak airborne EM anomaly was not detected by the ground geophysical survey. It's cause may be due to overburden effects or disseminated sulphide mineralization that does not reflect a ground electromagnetic response. Thus, an IP survey is warranted before the merits of the 3 claims may be considered.

INTRODUCTION

At the request of the directors of Cross Lake Minerals Ltd., ground geophysical surveys consisting of total field magnetics and horizontal loop electromagnetics were conducted on 3 claims in Stimson Township, Larder Lake Mining Division, Ontario (Figures 1 and 2). The surveys were performed between March 12 and 13, 1990 by Robert S. Middleton Exploration Services Inc., Timmins, Ontario, to verify and delineate an airborne EM anomaly shown on O.G.S. Map 81220 (Figure 4) considered to possibly be caused by sulphide mineralization associated with mafic metavolcanic rocks.

PROPERTY DESCRIPTION, LOCATION AND ACCESS

The property consists of 3 contiguous, unpatented 40-acre claims located in central Stimson Township, west of and adjacent to 8 other claims in which Cross Lake Minerals Ltd. has a beneficial interest. The 3 claims are further described as follows:

<u>Claim No.</u>	<u>Recorded_Holder</u>	Recording Date
1130459	Peter Mathews	March 6, 1990
1130460	Peter Mathews	March 6, 1990
1130461	Peter Mathews	March 6, 1990

Access to the 3 claims is provided either by helicopter or from the town of Iroquois Falls, located some 27 kms to the south, via the Abitibi Price forest access road to a point east of Dowie Lake and from there westward via snowmobile across the lake and down a creek flowing west from the southwest corner of the lake for a distance of approximately 3 kms to the property.

The terrain encompassing the 3 claims is relatively flat, poor to moderately drained and covered by a stand of dominantly black spruce. Bedrock outcrops are non-existent due to a pervasive mantle of Pleistocene-age glacial and lacustrine sediments.







<u>GEOLOGY</u>

The regional and property bedrock geology, interpreted primarily from airborne geophysical data and supported by regional geological mapping and diamond drill data, suggests that the 3 claims are underlain by mafic metavolcanic rocks. A weak airborne EM anomaly within the claim group may represent disseminated or stringer-type sulphide mineralization. Diamond drill data from the southeastern sector of Stimson Township suggests a metamorphic grade of upper greenschist to lower amphibolite facies for the host mafic metavolcanic rocks.

SURVEY STATISTICS AND PERSONNEL

The surveys, requiring 2 days to complete, (excluding line cutting) comprised a total of 6.8 kms of total field magnetics with readings taken every 25m along 100m spaced lines, including base line and tie lines, and 6.0 kms of MaxMin II horizontal loop electromagnetics with 3 frequency readings (444Hz, 1777Hz and 3555Hz) using a 200m coil separation being taken at 25m intervals along 100 m-spaced lines. The surveys were conducted by Tom McAllister and Denis Crowley, both residents of Timmins, Ontario.

<u>Note:</u> the data relating to the 3555 Hz frequency has not been included in this report.

SURVEY PROCEDURES

MAGNETICS

<u>Theory</u>

The magnetic method is based on measuring alteration in the shape and magnitude of the earth's naturally occurring magnetic field caused by changes in the magnetization of the rocks in the earth.

These changes in magnetization are due mainly to the presence of the magnetic minerals, of which the most common is magnetite, and to a lesser extent ilmenite, pyrrhotite, and some less common minerals.

Magnetic anomalies in the earth's field are caused by changes in two types of magnetization: induced and remanent (permanent). Induced magnetization is caused by the

magnetic field being altered and enhanced by increases in the magnetic susceptibility of the rocks, which is a function of the concentration of the magnetic minerals.

Remanent magnetism is independent of the earth's magnetic field, and is the permanent magnetization of the magnetic particles (magnetite, etc.) in the rocks. This is created when these particles orient themselves parallel to the ambient field when cooling. This magnetization may not be in the same direction as the present earth's field, due to changes in the orientation of the rock or the field.

The most common method of measuring the total magnetic field in ground exploration is with a proton precession magnetometer. This device measures the effect of the magnetic field on the magnetic dipole of hydrogen protons. This dipole is caused by the "spin" of the proton, and in a magnetometer these dipoles in a sample of hydrogen-rich fluid are oriented parallel to a magnetic field applied by an electric coil surrounding the sample. After this magnetic field is removed, the dipoles begin to precess (wobble) around their orientation under the influence of the ambient earth's magnetic field. The frequency of this precession is proportional to the earth's magnetic field intensity.

Field Method

The magnetics data were collected with a Geonics G-816 proton precession magnetometer, which measures the absolute value of the total magnetic field of the earth to an accuracy of $\pm 1n$ Tesla. The magnetometer is carried down the survey line by a single operator, with the sensor mounted on a short pole to remove it from the surface geologic noise. Readings are normally taken at 25m intervals, and at 12.5m intervals where the operator observes a high gradient (anomaly).

The readings are corrected for changes in the earth's total field (diurnal drift) by repeating readings at base stations and "tie points" several times each day. This recorded drift is then applied to the data as a correction.

-3-

<u>MAX-MIN_II</u>

<u>Theory</u>

The Max-Min II is a frequency domain, horizontal loop electromagnetic (HLEM) system, based on measuring the response of conductors to a transmitted, time varying electromagnetic field.

The transmitted, or primary EM field is a sinusoidally varying field at any of five different frequencies. This field induces an electromotive force, (emf), or voltage, in any conductor through which the field passes. This is defined by:

 $\oint E.dl = \underbrace{\partial \phi}_{\partial t} \quad (the \ Faraday \ Induction \ Principle)$

where E is the electric field strength in volts/metre (and so $\oint E.dl$ is the emf around a closed loop) and \oint is the magnetic flux through the conductor loop. This emf causes a "secondary" current to flow in the conductor in turn generating a secondary electromagnetic field.

This changing secondary field induces an emf in the receiver coil (by the Faraday law) at the same frequency, but which differs from the primary field in magnitude and phase. The difference in phase (the phase angle) is a function of the conductance of the conductor(s), both the target and the overburden and host rock.

The magnitude of the secondary is also dependent on the conductance, and also on the dimensions, depth, and geometry of the target, as well as on the interference from overburden and the host rock.

These two parameters (phase angle and magnitude) are measured by measuring the strength of the secondary field in two components: the real field or that part "in-phase" with the primary field; and the imaginary field, or that part in "quadrature" or 90 degrees out of phase from the primary field.

The magnitude and phase angle of the response is also a function of the frequency of the primary field. A higher frequency field generates a stronger response to weaker conductors, but a lower frequency tends to pass through weak conductors and penetrate to a greater depth. The lower frequency also tends to energise the full thickness of a conductor, and gives a better measure of its true conductivity-thickness product (conductance).

For these reasons two or more frequencies are usually used; the lower for penetration and accurate measure of good conductors, and the higher frequency for strong response to weak conductors.

Distinction between conductive targets, overburden, and host rock responses are made by studying the shape of the secondary field, and the difference in the frequency responses.

The transmitted primary field also creates an emf in the receiver coil, which is much stronger than the secondary, and which must be corrected for by the receiver. This is done by electronically creating an emf in the receiver, whose magnitude is determined by the distance from receiver to transmitter as set on the receiver, and whose phase is derived from the receiver via an interconnecting wire.

Field Method

The Max-Min II survey was carried out in the "maximum coupled" mode (horizontal coplanar). The transmitter and receiver are carried in-line down the survey line separated by a constant distance (in this case 200m) with the receiver leading. Three transmitter frequencies were used: 444Hz, 1777Hz and 3555Hz and readings were taken every 25m. The transmitter and receiver are connected by a cable, for phase reference and operator communication.

INTERPRETATION AND CONCLUSIONS

Magnetically, the 3 claims are relatively quiet except for a slight increase in the magnetic response from approximately 6+50S on line L0 to 11+50S on L100E and the extreme northeast corner outside of claim no. 1130459 between baseline and 1+00S on line L500E. These magnetic high responses are interpreted to be caused by diabase dykes, based on the regional magnetic signature as shown in Figure 4. The remainder of the property is interpreted to be underlain by mafic metavolcanic rocks based on regional mapping and diamond drill data.

Given that the claims were staked in the location as shown, the weak airborne EM anomaly shown on Figure 4 is postulated to occur in the vicinity of 8+005 to 9+005 around lines L100E and L200E. However, the ground electromagnetic survey failed to delineate this airborne response. This failure may be due to the fact that the airborne response is caused by overburden effects or

-5-



represents disseminated sulphide mineralization that does not reflect the airborne EM response on the ground electromagnetic survey. Thus an I.P. survey is warranted to test whether in fact the airborne EM anomaly does exist and may be caused by disseminated sulphide mineralization or whether it is merely an overburden response.

<u>BUDGET</u>

I.P. Survey

3 days production @ \$1,450./day + 2 days mob/demob @ \$1,000./day

Helicopter 8 hours @ \$550./hour

Geophysical Report

Subtotal

Contingency: 10%

Total

Respectfully submitted নত ASSOCIATION Ne h er or ocicy J.W. Newsome, Ph.D. CANA J. W. NEWSOME Ph. D. FELLOW

\$ 6,350.00

4,400.00

3.000.00

1.375.00

\$13,750.00

\$15,125.00

CERTIFICATION

I, Johial W. Newsome, Ph.D., of 141 Second Avenue, in the City of Timmins, Province of Ontario, certify as follows concerning my report on the Stimson Township property of Cross Lake Minerals Ltd. and dated March 30, 1990..

- 1) I am a graduate of the University of Western Ontario, London, Ontario, with a BSc degree in Geology (1976) and a graduate of the University of East Anglia, Norwich, England, with a Ph.D. degree in Environmental Sciences (1987).
- 2) I have been practising my profession in Canada for the past fourteen years.
- 3) I am and have been employed since May 01, 1987 by Robert S. Middleton Exploration Services Inc. located in the City of Timmins, Province of Ontario.
- 4) I have no direct or indirect interest in the properties, leases or securities of Cross Lake Minerals Ltd., nor do I expect to receive any.
- 5) The attached report is a product of:
 - a) Examination and interpretation of data contained therein.
 - b) Literature review and personal knowledge of the subject area.

Dated this 30th day of March, 1990 TIMMINS, Ontario

ASSOCIATIO T.W. UN CON Johial W. Newsome, (Ph.D. CPZA J. W. NEWSOME Ph. D. FELLOW

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SPECIFICATIONS:

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Frequencies	222,444,888,1777 and 3555Hz.	Repeatability	±0.25% to ±1% normally, dependent
Nodes of Operation	MAX: Transmitter coll plane and ra- ceiver coll plane horizontal (Max-coupled; Horizontal-loop	Transmitter Output	aeparation used.
	MIN: Transmitter coll plane horizon- tal and receiver coll plane ver- tical (Min-coupled mode),		 B88Hz : 120 Atm² 1777Hz : 60 Atm² 3555Hz : 30 Atm²
	V.L. : Transmitter collplane verti- cal and receiver collplane hori- zontal (Vartical-loop mode), Used without reference cable, in parallel lines.	Receiver Batteries	19V trans. radio type batteries Life: approx. 35hrs. continuous ty (alkaline, 0.5 Ah), less in (weather,
Coll Separations:	25,50,100,150,200 & 250m (MMI)	Batterlesi	12V 8Ah Gel-type recharge bettery. (Chargen suppli
,	BOD ft. (MMIF). Coll separations in VL.mode not re- stricted to fixed values.	Reference Coble :	Light weight 2-conductor te cable for minimum friction. Unst ed. All reference cables opti-
Parametera Readi	 In-Phase and Quadrature components of the secondary field in MAX and MIN modes. 	Volce Links	Built-In Intercom system voice communication betweer
	 Tilt-angle of the total field in V.L. mode. 		In MAX and MIN modes, vis ference cable.
Readoutet	- Automatic, direct readout on 90mm (3.5") edgewise meters in MAX and MIN modes. No null- ing or compansation necessary,	Indicator Lights:	Built-in signal and reference v ing lights to indicate erront readings.
	 Tilt angle and null in 90mm edga- wise meters in V.L.moda. 	Temperature Ronge	31 - 40°C to + 80°C (- 40°F to +14
Scale Ranges (In Phase: \$20%, \$100% by push-	Receiver Weight	i Bkg (13 lbs.)
NOW ALSO 444	button switch. Guedrature: ±20%, ±100% by push.	Transmitter Weight	: 13kg (29 lbs.)
QUADRATURE FULL SCALE.	button switch. Tilt: ±75% slops. Null (V.L): Sensitivity edjusteble by separation switch.	Shipping Weight	H Typically 60kg (135 lbs.), der Ing on quantities of refere cable and batteries inclu Shipped in two field/shipping ci
Readability;	In Phase and Quadrature: 0.25 % to 0.5 %; Tilt: 1%.	Specifications subje	ict to change without notifici

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APPENDIX II



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- 3. Adjustable carrying harness.
- 4. 8 foot collapsible aluminum staff.

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5. Instruction manual, complete set of spare batteries, applications manual, and rugged field suitcase.

Price and lease rates on the G-816 magnetometer are available upon request.

Metrics, INC. 31

SPECIFICATIONS ·

	Sensilivity;	±1 gamma throughout	range				
	Range:	20,000 to 100,000 gan	nmas (worldwl	de)			
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	Sampling Rale:	Manual push-button, seconds	one reading	each 6			
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ihe one out or eld	Power Requirements:	Twelve self-contained 1, sally available flashlight state or replacement sig cator light on display.	5 volt "D" cell I-type batteries gnified by flash	, univer- . Charge ing Indi-			
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	Welght:	Console (w/batteries): Sensor & signal cable:	Lbs. 5.5 4	Kgs. 2.5 1.8			
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	Demont of Ma		240	(If numbe attach a 	er of mining cla	aims traversed exc	eeds space on this form.
Mining Act	Geophysical Ge	ological and i	Geochem	Nical Surveys)	Technica	I Reports and	maps in duplicate	should be submitted to
Type of Survey(s)				Mining Division		Township or A	Mineral Developm	ent and Lanos Branch:
GONIND GEODUNS	INS (MAGEF	m)		LADOSO LAIS	r.	STI	MSONI TU	
Recorded Holder(s) DAVID	JONES &	•					Prospector's Licent	ce No.
Address KIOKE	JR (for CR	coss Lake	MINER	ALS) K.I.	340	1	D198 Telephone No.	92,172,1190
P.O. Box 1637 Survey Company	TIMMINS	ONT	P4N	7ω8			(305)264	1-4246
R.S. MIDDLETO Name and Address of Author (o	DECREGRA 1 Geo-Technical Report)	TION SE	RUICE	s luc		[Date of Survey (fr	
J.W. NEWSON	E 40 P.O. R	ox 1637	TIMP	IINS ONE				Day Mo Yr
Credits Requested per Ea	ch Claim in Colum	ins at right	Mining	Claims Traversed	(List in n T	Numerical s	equence)	Mining Claim
	Geophysical	Days per Claim	Prefix	Number	Prefix	Numb	er Prefix	Number
For first survey:	- Electromagnetic	\sim	,	110 01.11				
Enter 40 days. (This includes line cutting)	Magnetometer			110-0016				
For each additional survey	Magnetometer	HO		1138617				
using the same grid:	- Uther		L	1128618				
Enter 20 days (for each)	Geological		L	1128619				
	Geochemical		L	1128620				
Man Days	Geophysical	Days per Claim		1113593				
Complete reverse side and	- Electromagnetic			1110000		1		
enter total(s) here	Magnetometer		- <u> </u>	1113594_		D	Palas	
	- Wagnetometer		L	1113595		K	FCEIA	ED
	- Other		1	1113596		ļ		
1	Geological		L	1113597	· .	J	UL 27 199	0
	Geochemical		L	1113598		MININO		
Airborne Credits		Days per Claim	,	1113500		mand	LANDS SE	CTION
Note: Special provisions	Electromagnetic			11.03.79		1		
credits do not apply to Airborne	Magnatomotor			113600		ļ		
Surveys.	Magnetometer				• ••••• ••••		· · · · · · · · · · · · · · · · · · ·	
	Other							
Total miles flown over cla	aim(s).					Totol o	umbas of	[]
Date Re	corded Holder or Ageni	t (Signature)				n nining	claims covered	13
Cartification Verifying Ben	awat Work				ļ	by this	report of work.	
		logae of the facto	cot forth in	the Report of Morth h	auroa pada	mod the world	k or witnessed sag	
after its completion and annexed	l report is true.						K OF WILLESSED Sam	
Name and Address of Person C	ertifying	(1 ·	·					
CLIFF DAVID	<u>40 k.o. Bo</u>	x 1637 Telephon	/ ///////	US CNT Date		C	ertified By (Signa	ture)
		(705)	J68-6	403 Juns	de la	OF C #	All En	र्ताः ।
		-		Received	Stimp	LARDE	RAKE	
For Office Use Only						MINING	DIVISION	
						JUN 2	9 1530	
Total Days Date Recorded	· Mining	Recorder C	for			₩₩11 <u>(</u>	1110	
	raan	\mathbf{r}	ŧ	$- \cap $			\sim	
780 June	s Recorded Provint	ial Manager, Mini	tto ng Lands	Her	ТІМ	Е <u>9.05</u>	Sam	
		· · · · · · · · · · · · · · · · · · ·	/	1	L			
21 October 1	4,1440 Kr	nCG	shub	K.				
1362 (89/06)	RJS							

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Ministry of Northern Development and Mines

Geophysical-Geological-Geochemical Technical Data Statement

File_2.13401

TO BE ATTACHED AS AN APPENDIX TO TECHNICAL REPORT FACTS SHOWN HERE NEED NOT BE REPEATED IN REPORT TECHNICAL REPORT MUST CONTAIN INTERPRETATION, CONCLUSIONS ETC.

Type of Survey(s) Should (SEUPHYSICS (MAGSEM) LINECUTTING	
Township or Area Fox TwoP	MINING CLAIMS TRAVERSED
Claim Holder(s) DAVID JONES / PETER JONES /	List numerically
TOM KIOKE JR.	
Survey Company R.S. MIDDLETON EXCLORATION SERVICES INC	L 1113589
Author of Report J.W. NEWSONE	(prenz) (number)
Address of Author Jo P.O. Box 1637 TIMMIUS ONT P4N7WB	1 1113501
Covering Dates of Survey JAN 15 - MAR 31/90 (linecutting to office)	
Total Miles of Line Cut 47.2 Km	<u>L</u> .111.35.9.2
	L1113593
SPECIAL PROVISIONS DAYS	1113594
<u>CREDITS REQUESTED</u> Geophysical per claim	1,002505
ENTER 40 days (includesElectromagnetic_20	
line cutting) for first –Magnetometer <u>40</u>	41/13596
survey. –Radiometric	L 11.1.3597
ENTER 20 days for eachOther	1 1113598
additional survey using Geological	
Geochemical	2 11135 99
AIRBORNE CREDITS (Special provision credits do not apply to airborne surveys)	<u>۲///3500</u>
Magnetometer Electromagnetic Radiometric (enter days per claim)	L1128614
DATE SECT 2190 SIGNATURE FROM ADINI	11128615
Agithor of Report or Agent	
Res Cool Outlifications 28737	
Previous Surveys	41128618
File No. Type Date Claim Holder	61128619
	11128(20
	611.30461
	TOTAL CLAIMS

OFFICE USE ONLY

GEOPHYSICAL TECHNICAL DATA

9	<u>GROUND SURVEYS</u> – If more than one survey, specif	y data for each type	of survcy								
N	Number of Stations88	Number of R	Readings	3							
s	Station interval 25 ^m	Line spacing	_100m								
F	Profile scale										
-	Contour interval										
r si	Instrument EDA OMNI TV										
Ĭ	Accuracy – Scale constant <u></u>										
N	Diurnal correction method BASELINE	Looping									
MAG	Base Station check-in interval (hours) <i>N/A</i>										
F -4	Base Station location and value \underline{A}/A										
<u>stric</u>	Instrument Groups EMAG APLX PRIVALL	RICS MAX- MINI	П.								
N	Coil separation 25^{m}			······································							
MAC		<u> </u>									
RO	Method:	Shoot back	In line	Parallel line							
<u>CT</u>	Frequency 444mHz /777mHz /17497mHz										
ELI	(specify V.L.F. station)										
	Parameters measured INPHASE / QUT OF PHA	ISE - (Gentrate	R E)								
	Instrument										
	Scale constant			·····							
건	Corrections made										
FX	Lorrections made										
GRA	Base station value and location										
	Elevation accuracy										
	Instrument	·····									
	Method 🔲 Time Domain	🗀 Frequ	uency Domain								
	Parameters – On time	Frequ	uency								
Я	Off time	Rang	e								
1 H	– Delay time										
STI	- Integration time										
ESI	Power	_									
R	Electrode array										
	Electrode spacing										
I	Type of electrode										

INDUCED POLARIZATION

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SELF POTENTIAL

Instrument	Range
Survey Method	

Corrections made_____

RADIOMETRIC

Instrument	
Values measured	
Energy windows (levels)	
Height of instrument	Background Count
Size of detector	
Overburden	
(ty	pe, depth - include outcrop map)
OTHERS (SEISMIC, DRILL WELL LOGGIN	IG ETC.)
Type of survey	
Instrument	
Accuracy	
Parameters measured	
Additional information (for understanding res	ults)
AIRBORNE SURVEYS	
Type of survey(s)	
Instrument(s)	
A coursey	ecify for each type of survey)
/sconacy{sc	ecify for each type of survey)

Sensor altitude_____

¥

(specify for each type of survey) Aircraft used_____

Navigation and flight path recovery method

Aircraft altitude_____Line Spacing_____Line Spacing______ Miles flown over total area_____Over claims only_____

GEOCHEMICAL SURVEY - PROCEDURE RECORD

Numbers of claims from which samples taken									
Total Number of Samples Type of Sample (Nature of Material) Average Sample Weight Method of Collection	ANALYTICAL METHODS Walues expressed in: per cent p. p. m. p. p. m. p. p. b. p. p. b.								
	Cu, Pb, Zn, Ni, Co, Ag, Mo, As,-(circle)								
Soil Horizon Sampled Horizon Development Sample Depth Terrain	Others Others tests) Field Analysis (tests) Extraction Method Analytical Method Reagents Used								
Drainage Development Estimated Range of Overburden Thickness	Field Laboratory Analysis Field Laboratory Analysis Kestraction Method Reagents Used								
SAMPLE PREPARATION (Includes drying, screening, crushing, ashing) Mesh size of fraction used for analysis	Commercial Laboratory (tests Name of Laboratory Extraction Method Analytical Method Reagents Used								
General	General								



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Figure 8

Date: Febr Operator:

•	
Diabase EM Anomaly	
Claim Post	
CONTOUR INTERVALS	
50 200 1000	
BASE LEVEL REMOVED: 58000nT INSTRUMENT : Geonics G-816 MAGNETIC DOMAIN	
MAGNETIC ANOMALY INTERPRETED CONTACT INTERPRETED FAULT	
SCALE 1:2500 2.134.01 2.134.01	
ROBERT S. MIDDLETON EXPLORATION SERVICES OSS LAKE MINERALS LID.	
TIMSON PROJECT, Grid A al Field Magnetic Survey Fox/Stimson Twps., Ontario	
T. McAllister Job #: M-370	

z Z Z \mathbf{Z} z z 200 300 400 100 500 \circ ___ ____ ----0.9 2.0 700 N_ -2.0 70.0 $0_{1}0_{1}4.0$ -1.0 TO.0 -2.0 TH1.0 -3.0 T 310 -1.0 T2.0 -2.0 2.0 -2.0 0.0 0.4 Z.0 1.0 2.0 -1.0 +2.0 -2.0 41.0 -3.0 -3.0 -3.0 20 -2.0 11.0 -3.0 2 0.011.0 -3.0 + 12.0 -3.0+12.0 -3.þ†3| -2.0 + 2.0 -3.þ - 3. þ -2.0 -3.0 -3.0 00 600 N_ -9.4 2 0 -3.0410 -2.0 + 2.0 -1.0 1.0 -2.0 + 2 -2.0 -3.0 -4.0 7420 -3.0 1 1 0 -3.0 #-1.0 -1.0 0.0 -2.0 1.0 -3.0 110 -3.0 + 2.0 -3.0 + - 2.0 -2.0 fd.0 -3.0 1 1 0 -2.0 11.0 0.01 1.0 -3.0 0 0 -2.0 2.0 -3.0 -1.0 -2.041.0 -2.0 41.0 0.0+2.0 -3.0 +0.0 -3.0410 -3.0 -1.0 -2.0 1.0 500 N ____ -1.0 2.0 -3.0 + 2.0 1.0(13.0 -2.0 0.0 -3.0410 -2.9 2.0 -3.0 ++ .0 0.0 {3.0 0.0 3.0 -3.0 0.0 -3.0 + 2.0 -4.0 1-10 -2.011.0 -2.0 4.0 -2.04 .0 -1.0 -9.0 -3.0 + 42.0 -4.0 +42.0 -3.0+2.0 0.0 19.0 -1.0 10.0 -2.0 -3.0 -1.0 43.0 -1.011.0 -1.0,14.0 -3.0 -1.0 -2.0 0.0 -2.0 +1.0 400 N___ -1.0 2.0 -2.0 - 2.0 -2.0 11.0 -1.041.0 a.p | 3.0 -3.0 +-1.0 -2.0 10.0 -2.0 + .0 -1.0 0.0 -1.4 2.0 -1.0 2.0 -2.0 d.0 -2.041.0 -2.0 11.0 -3.0/10 -2.0 1.0 -1.0,+1.0 -1.0 11.0 -2.041.0 -2.04 .0 -1.0 +2.0 -1.0 0.0 -2.01 1.0 -2.0 40.0 -1.0 12.0 -2.0 +11.0 -2.0 + 2.0 -1.0 12.0 300 N_ -2.0 4.0 -1.0 +12.0 -2.0 40.0 -1.041.0 -1.0 2.0 -1.0 2.0 -1.0 2.0 -1.0 48.0 0.0 12.0 0.0 1.0 -1.0 12.0 0.b f 3.0 -2.0 +1.0 010 4.0 -1.0 8.0 -1.0 0.0 -1.0 12.0 -1.0 0.0 -2.0 11.0 aia +4.0 1.0 5.0 0.0 2.0 -1.0 10.0 -2.0 +1.0 -2.0 0.0 2.0 +5.0 0.0 3.0 1044.0 200 N ____ 1.0+4.0 -1.0/1.0 -2.0 +1.0 -2.0 0.0 0.0 2.0 2.0 5.0 1.0 3.0 -1.0 +8.0 0.0 2.0 -2.0 ++1.0 -2.0 +1.0 -1.0 2.0 3.0+6.0 0.0 - 3.0 -2.0 ++1.0 -1.0 fb. -2.0 40.0 -3.0 †0) -2.0 0.0 -2.0 .0 -1:0 4.0 0:0 4.0 -4.0 +12.0 100 N ____ -5.0 +1.0 -5.0 1.0 -5.0 -- 3.0 -11.0 -1.0 -8.0 +-\$.0 Ο Z z Z . ____] 100 200 300 -5.0 -2.0 -10.0 -5.0 -15.0 -5.0**i** ___ -----17.0 -6.0 0 _____ -5.0 -- 3,0 -9.0 -5.0 -18.0 -7. -3.0 77.0 -7.0 -4.0 -15.0 -6.0 -4.0 -12.0 -1.0 0.0 -9.0 -4.0 -1.0,41.0 0.0/1.0 -3.0 fo/o 100 S..... 1.043.0 2.0 3.0 3,0 3.0 3.0 -3.0 \$.0 +6.0 10 -5.0 3.0 -3.0 6.0 -6.0 **5.0**+6.0 2.0 2.0 9.0 +8.0 1.0 5.0 200 S ____ 1.0 -5.0 3. 2.0 40 6.0 2. 2.0 1.0 5.0 13.0 7.0 2.0 6.0 0.011.0 2 4 4.0 2.0 5.0 0.041.0 1.0 3.0 0.0 2.0 1.0-5.0 300 S ____ 0.d 2.0 Z Z Z 400 500 600 البسب ____

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z				•			
L 600	N 002	800 N	N 006	1000 N	1100 N	1200 N	
12.0 73.0 10.0+1.0 11.0 71.0	12.0π1.0 8.0 -1.0		5.0 -7.0 5.0 -7.0 5.0 -7.0			4.0 -14.0 -4.0 -14.0 0.0 -15.0	700 N
7.0 -510	10.0 +2.0 12.0 +2.0 10.0 -2.0	9.0 -6.0 9.0 -5.0 9.0 -6.0	6.07.0 6.07.0	6.07.0 4 011.0 3.013.0	14.0 12.0 \19.0 8.0 24.0 5.0	1.013.0 3.011.0 6.08.0/	600 N
6.08.0 6.09.0 6.09.0 7.09.0	7.0 -5.0 8.0 -8.0 6.0 -10.0 8.0 -8.0		10.0 8. 0 j 11.0 6. 10.0 5. 0 10.0 5. 0	-1.0 -15.0 -1.0 -15.0 0.014.0 2.013.0	18.0 -22.0 13.08.0 13.010.0 8.011.0	9.0 - 5.0 1 10.0 - 2.0 1 11.0 - 1.0 12.0 - 1.0	500 N
6.011.0 7.011.0 7.012.0	8.0 -10.0 7.0 -12.0 7.0 -13.0 7.0 -14.0	11.0 -6.0 12.0 -6.0 12.0 -6.0	11.0 -6.4 11.0 -6.4 10.0 -10.0 11.0 -8.0	3.014.0 3-013.0 4.013.0 4.014.0	6.0 -10.9 7.0 -9.0 5.0 -11.0 2.0 -14.0	14/0 4.0 150 4.0 73.0 6.0 1 19.0 7.0	400 N
11.0 -9.0 14.0 -7.0 16.0 -6.4 20.0 -40	8.015.0 9.014.0 12.014.0	12.0 -9.0 1 13.0 -10.0 1 14.0 -11.0 1 13.0 -13.0 7		6.0 -14.0 7.0 -13.0 7.0 -14.0 7.0 -15.0	2.014.0 5.013.0 6.013.0	18.0 -7.0 13.0 15.0	300 N
24.0 2.0 25.0 1.0 25.0 3.0	14.018.0 15.018.0 17.016.0	15.0 -12.0 1 13.0 -16.0 1 16.0 -15.0	15.011.0	7.0 -16.0	2.015.0 3.015.0 7.012.0	3 112.0 8.8 3 15.0 10.0 18.0 13.0	200 N
27.0 - 9. 0 25.0 - 9. 0 24.0 -5.0 11.0 -7.0	20.016.0 24.015.0 20.016.0 15.015.0	15.0 -18.0 17.0 -18.0 18.0 -18.0 15.0 -17.0	12.0 -16.0 13.0 -17.0 12.0 -17.0 10.0 -17.8	11.0 -15.0 8.0 -10.0 10.0 -17.0 11.8 -16.0	10.0 -10.0 12.0 -9.0 13.0 -10.0 15.0 -9.0	15.0 15.0 13.0 17.0 15.0 14.0 9.9 13.0	100 N
-1.0 8.0	+.015.0 -7.014.0 -13.013.0	7.0 -15.0 -9.0 -15.0 -11.0 -18.0	N 000 N	L 1000 N	L 1100 N	N 0027.0	0
-13.0 -12.0 -4.0 -12.0 7.0 -10.0	-16.0 -13.0 -12.0 -13.0 -2.0 -13.0	-14.0 -16.0 -11.0 -15.0 -4.0 -16.0			· · · · ·		
18.0 -7.0 25.0 -7.0 27.0 -7.0 27.0 -7.0	11.0 -10.0 20.0 -8.0/ 25.0 -5.0	6.0 16.0 14.0 16.0 19.0 15.0		,			100 S
25.0/ 1.0 26.0 - 3.0 25.0/ 1.0	26.0 +1.0 25.0 -2.0 27.0 -5.0	20.014.0 19.014.0 18.013.0		·			200 S
25.041.0	\$9.0 7.0 25.0 5.0	18.0 -13.0	· •				300 S
L 600 N	r 700 N	L 800 N				· · · · · · · · · · · · · · · · · · ·	

Figure 10

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1. e . . . MAX-MIN II HLEM LEGEND Profile Scale: 1 cm. = 10 % FREQUENCY : 1777Hz IN PHASE QUADRATURE COIL SEPARATION 200 . +1027 0 -10% CONDUCTOR AXIS - WEAK CONDUCTOR AXIS - STRONG 2.13401 Junkarsan SCALE 1 : 2 500 50 (entres) 100 50 0 ROBERT S. MIDDLETON EXPLORATION SERVICES For TOM KIOKE JR. Title STIMSON PROJECT, Block B Horizontal Loop EM Survey Fox/Stimson Twps., Ontario N.T.S.: 42 H/Z Date: February '90 Operators: McAllister Bros Job #: M-370



	0	N 001 -	- 200 N	N 000 -	400 N	- 500 N	- 600 N	N 002 -	800 N
800 N	_								-
	4.0 + 12.0	6.0m1.0	8.9 72.0	6.0 ₁ 1.0	19.07.0	\$.0 5.0	-1.0 772.0	2.0 0.0	2.9 3.0
	4 G + 1 2.0	7.071.0	7.01-1.0	5.0+2.0	19.0 7.0	60 4.0	-2.0 - 2.0	0.0 0.0	10-4.0
	5.0 0.0	6.0 0.0	7.0+2.0	6.0 ¹ 1.0	10.0 7.0	-2.0 2.0	-3.0 3.0	0.0 0.0	1. p-3. 0
700 N	6.0/1.0	6.0-0.0	7.011.0	6.0 1.0	10.0 5.0	-7.0 11.0	-3.0+12.0	1.0	0.01 1.0
	7/0 4.0	6.0 +-1.0	7.0 2.0	5.0 1.0	2.0 71.0	-11.0 12.0	-2.0 +1.0	1.0 1.0	1.0 0.0
	\$.0 -5.0	6.0 0.0	7.01 1.0	5.0 - 1.0	-5.0 -50	-12.0	-1.0 -1.0	1.0-2.0	0.0 [1.0
	6.0	7.011.0	8.01 1.0	5.0 +2.0	-7-0 -5-0	-11.9 2.0 1	-1.0 10.0	2.01 1.0	0.0 1.0
600 N	8.0 5.0	6.0 0.0	8.041.0	6.0 41.0	-9.0 -5.0	-12,0 4.0	-1.041.0	1.0 1.0	0.0 + 2.0
	B.0 -6.0	7.0 1.0	7.0 1.0	6.0	-10.0050	-12.005.0	1.0/3.0	2.0 1.0	0.0 12.0
	1.0 -5.0	7.011.0	8.011.0	5.0 + 1.0	-10.0 -5.0	-10.0 7.0	210 - 4.0	2.0 -2.0	-1.0
	7.0 4.0	7.0 1.0	9.0 2.0	\$.0 -0.0	-9.0 -40	-5.0 8.0	40-4.0	3.0 - 2.0	-1.0 - 8.0
500 N	7.0 2.0	7.011.0	8.0 2.0	5.0 1.0	-5.0 -30	2.9 7.0	6,0 4.0	3.0 - 2.0	-2.0 +3.0
	6.0 - 2.0	7.0 1.0	8.01-1.0	4 01 1.0	1.040.0	8.0 7.0	(7.0 5. 0	3. D] 1.0	-1.0 + 12.0
	5.0] 1.0	6.0+0.0	8.041.0	3.0+1.0	5. 0 - 2.0	(9,0 +4.0	6.0 6.0	3.01-1.0	-1.0 -12.0
	4.0.1.0	6.0 <mark>1</mark> 1.0	7.4+2.0	3.0-0.0	5.0 1.0	6.q-2.0	5.0-5.0	4 4 2.0	-1.0 -12.0
400 N	6.0 1.0	6.0 0.0	6.0 - 2.0	2.0 0.0	\$.0 1.0	5.0-0.0	\$.10 + 3. D	3.0 - 2.0	-1.0 +42.0
	1) 5.0 <mark>1</mark> +1.0	5.041.0	6.0 - 2.0	2.0 0.0 2	5-0+1-0	\$.041.0	4.0 ¹ .1.0	3.0 - 2.0	-1.0 -2.0
	\$.011.0	6.0 1.0	5.0 0.0	3.0 1.0	6.q+2.0	\$.0 <mark>,</mark> 1.0	3.0 0.0	3.0 - 2.0	-1.0 -1.0
	s. 0 - 1. 0	6.0, 1.0	4.0-0.0	40-2.0	6.0 - 2.0	40 2.0	3-0 - 2.0	3.0 - 2.0	-1.0
300 N	8. q - 2.0	6.0 1.0	4.0 -0.0	\$.D - 3.0	6.0 - 2.0	4.0 3.0	3 ¦0 + 4.0	2.0 - 2.0	0.0 0.0
	6.0 - 3.0	8.0 - 3.0	4,0 0.0	5,0 -4.0	6.þ+3.0	5.0	310 4.0	3.0 - 2.0	0.0 0.0
	/ 7.0 +3.0	710 - 4.0	\$.0 0.0	6 .0+5.0	6.0 +3.0	5.0+5.0	30-4.0	2.0 - 2.0	0.0/ 1.0
	7.0 +3.0	8-0-4.0	s.o +a.o	6,0 4.0	6.0 - 3. 0	40 4.0	3 0 - 4.0	3.0 - 2.0	0.041.0
200 N	7.0 +3.0	8,0 4.0	5.0 -1.0	6,0 - 4.0	5. D + 3.0	4.0-3.0	3.0 +3.0	3. D 111.0	1.0 1.0
						1			

___800 N

___600 N

....500 N

___400 N

____300 N

____200 N



	600 S	4.0 4.0 2.0 4.0 2.0	40 4.0 50 4.0 1 40 - 3.0	3.0 + 2.0 3.0 + 2.0 4 0 + 2.0	2.0 2.0	3.0 + 2.0 3.0 + 1.0 3.0 + 1.0	2.0 0.0 2.0 0.0 1.0 0.0	2.0 2.0 2.0 1.0 2.0 2.0	1.0/2.0 3.0 2.0 2.0 3.0	
	700 S	3.0 + 2.0 3.0 + 2.0	4 0 + 3.0 4 0 + 3.0	1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0		3.0 1.0 3.0 1.0 3.0 1.0	2.0 0.0	2.0 2.0	2.0 2.0 2.0 2.0 2.0 2.0	2.13401 Jundersone
		× 2.0 200	S C C C C C C C C C C C C C C C C C C C	N 002	N.U2.U N 000 	L 900 N	L 1000 N	L 1100 N	L 1200 N	SCALE 1 : 2 500 50 0 50 (mair as) 100 150 200 DOREDT C NIDDI STAN
										EXPLORATION SERVICES
	280									STIMSON PROJECT, Block C Horizontal Loop EM Survey Fox/Stimson Twps., Ontario
42H025		 			11				Figure 12	Date: February '90 N.T.S.: 42 H/2 Operators: McAllister Bros Job #: M-371

			<u>,</u>	<u>, , , , , , , , , , , , , , , , , , , </u>				
	N O	v v O O	Z Z O	z ż o o	Z Q			
800 N		20.0 138.0 19.0 1-36.0	40 ¹⁰ 1-22 ¹⁰ 1 34.0 ^{1-15.0}	26 	₩ 23.0 [-6.9		800 N	
700 N	5.0 -41.0 14.0 -42.0 11.0 -40.0 11.0 -40.0	17.0 - 40.0 19.0 - 37.0 18.0 - 39.0 18.0 - 39.0	3810 -23.0 28.0 -17.0 37.0 -25.0 16.0 -17.0	3.0 -25.0 15.0 -20.0 1.0 -25.0 14.0 -20.0	24.0 -5.0		700 N	
700 K	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	18.0 -40.0 19.0 -30.0 18.0 -40.0 18.0 -40.0	29.0 -29.0 12.0 -30.0 -1.0 -19.0 -1.0 -18.0	8.0 -23.0 16.0 -19.0 11.0 -24.0 19.0 -17.0 12.0 -24.0 20.0 -17.0	i 17.0 -12.0 14.0 -17.0 11.0 -19.0		/ 00 N	·
600 N	$30.0 -36.0 \qquad \begin{pmatrix} 1 \\ 1410 -44.0 \\ 1 \\ 13.0 -45.0 \\ \end{pmatrix}$	17.0 -40.0 18.0 -42.0 12.0 -139.0	-3.0 -79.0 1 8.0 -11.0 -3.0 -77.0 12.0 -7.0	15.0 -20.0 20.0 -18.0 19.0 -17.0 19.0 -18.0	11.0 -19.0		600 N	
	31.0 -35.0 14.0 -45.0 28.0 -35.0 15.0 -45.0 25.0 -37.0 15.0 -44.0	18.0 -41.0 12.0 -36.0 19.0 -40.0 12.0 -36.0 20.0 -40.0 14.0 -36.0	-4.0 -25.0 17.0 -2.0 -2.0 -25.0 23.0 -2.0 -1.0 -24.0 28.0 1.0	23.0 -14.0 25.0 -12.0 26.0 -14.0 20.0 -20.0 20.0 -20.0	10.023.0 7.024.0 7.025.0			
500 N	20.0 - 38.0 18.0 - 38.0 14.0 - 44.0	20.0 - 39 .0 17.0 - 35 .0 20.0 - 39 .0 17.0 - 34 .0	30.0 -25.0 30.0 -5.0 34.0 -10/0	30.0 -14.0 / 20.0 -21.0 34.0 -11.0 / 18.0 -24.0	8.0 -25.0 8.0 -25.0			
400 N	14.0 -39.0 11.0 -43.0 14.0 -38.0 13.0 -42.0 15.0 -38.0 14.0 -38.0	$20.0 - \frac{1}{98.0} \qquad 14.0 - 33.0$ $20.0 - \frac{1}{736.0} \qquad 15.0 - 33.0$ $20.0 - 37.0 \qquad 13.0 - 33.0$	20.0 - 28.0 18.0 - 29.0 17.0 - 28.0 17.0 - 28.0 17.0 - 28.0	33.0 -11.0 18.0 -23.0 29.0 -13.0 20.0 -23.0 23.0 -18.0 21.0 -19.0	10.0 -24.0 10.0 -23.0 9.0 -24.0		400 N	• •
	17.0 -38.0 14.0 -40.0 16.0 -38.0 16.0 -40.0	18.0 -37.0 14.0 -32.0 14.0 -38.0 18.0 -32.0	18.0 -29.0 2 17.0 -25.0 17.0 -23.0 17.0 -23.0	18.0 -23.0 20.0 -20.0 16.0 -23.0 20.0 -20.0	9.0 -24.0			
300 N	16.0 -38.0 16.0 +40.0 18.0 -38.0 17.0 -39.0 20.0 -38.0 24.0 -38.0	13.0 -36.0 20.0 -29.0 11.0 -40.0 25.0 -28.0 12.0 -38.0 28.0 -28.0	20.027.0 19.0 - 20.0 22.025.0 24.0 - 16.0 25.023.0 28.0 - 13.0	21.0 -18.0 / 20.0 -20.0 25.0 -13.0 / 20.0 -19.0 25.0 -13.0 / 21.0 -19.0	12.0 -23.0 14.0 -22.0 15.0 -22.0		300 N	
200 N	20.0 -38.0 26.6 -38.0 22.0 -38.0 26.6 -38.0 21.0 -38.0 26.6 -38.0	14.0 -40.0 28.0 -27.0 13.0 -39.0 28.0 -28.0 18.0 -28.0 28.0 -28.0	24.0 -23.0 29.0 -12.0 23.0 -25.0 26.0 -14.0 24.0 -24.0 23.0 -17.0	25.0 -14.0 21.0 -20.0 25.0 -13.0 20.0 -20.0 23.0 -15.0 19.0 -22.0	17.0 -20.0		200 N	
	19.0 -38.0 26.0 -38.0 19.0 -38.0 26.0 -38.0	13.0 -40.0 23.0 -30.0 14.0 -41.0 20.0 32.0	26.0 -21.0 26.0 -22.0 20.0 -18.0 20.0 -17.0	23.0 -14.0 21.0 -15.0 16.0 -24.0 16.0 -25.0	19.0 -19.0			
100 N	17.0 -38.0 23.0 -38.0 17.0 -38.0 20.0 -38.0 15.0 -38.0 19.0 -38.0	14.0 -40.0 18.0 -33.0 14.0 -40.0 17.0 -33.0 14.0 -40.0 17.0 -33.0	25.0 -18.0 1 20.0 -17.0 27.0 -18.0 1 19.0 -18.0	15.0 -14.0 2.0 -14.0 2.0 -23.0 2.0 -23.0 15.0 -23.0 21.0 -23.0	16.0 -21.0 15.0 -24.0		100 N	-
	17.0 -38.0 17.0 -38.0 19.0 -38.0 19.0 -38.0	13.0) -40.0 15.0 -33.0 15.0 -33.0 19.0 -35.0	50.0 -16.0 18.0 -18.0 19.0 -18.0 19.0 -18.0	3 -1.0 -15.0 23.0 -22.0 0.0 -14.0 25.0 -18.0	13.0 -25.0			
D	19.0 ¹ -38.0 / 20.0 ¹ -38.0	i 15.0 ^{il} -38.0 i 12.0 ^{il} -35.0 i ∠ ∠ ∠	28.0 - 18.0 $20.0 - 18.0$ $20.0 - 18.0$ $20.0 - 18.0$ $20.0 - 18.0$ $20.0 - 18.0$ $20.0 - 18.0$	2.9 -15.0 25.0 -15.0 8.0 -14.0 28.0 -11.0 10.0 -13.0 30.0 -10.0	15.0 -24.0 17.0 -23.0 16.0 -21.0	000 N 100 N	200 x	
100 S		н 1 30 1 20		12.0 -17.0 12.0 -20.0 12.0 -7.0	13.0 -19.0 11.0 -19.0 30.0 -5.0	24.0 ₁ -8.0	21.0 T-13.0	
			30.0 -13.0 28.0 -14.0 29.0 -15.0	13.0 -19.0 3.0 -10.0 14.0 -19.0 3.0 -12.0 17.0 -17.0 6.0 -14.0	4 14.0 -17.0 19.0 -15.0 27.0 -9.0 22.0 -12.0 25.0 -11.0	24.0 -9.0 24.0 -10.0 25.0 -10.0 12.0 -17.0	19.0 14.0 16.0 15.0 14.0 16.0	
200 S			32.0 -14.0 28.0 -17.0	19.017.0 20.017.0 5.017.0	27.0-9.0 21.0-13.0 28.0-6.6 20.0-14.0	25.011.0 15.016.0 23.011.0 18.017.0	12.0 -17.0200 S	
300 S			19.0 -24.0 17.0 -25.0 17.0 -25.0	21.0 -18.0 24.0 -16.0 25.0 -17.0 25.0 -17.0	30.0 -40 20.0 -14.0 25.0 -7.0 20.0 -14.0 23.0 -8.0 20.0 -15.0	24.0 -10.0 19.0 -16.0 22.0 -12.0 19.0 -16.0 22.0 -12.0 21.0 -15.0	8.0 -20.0 10.0 -19.0 11.0 -19.0300 S	
			18.0 -26.0	23.0 -19.0 14.0 -14.0 29.0 -20.0 20.0 -14.0	21.0 -10.0 20.0 -15.0 20.0 -11.0 21.0 -14.0	23.0 -11.0 20.0 -16.0 23.0 -10.0 20.0 -14.0	12.0 -18.0	
400 S	•		15.0 -28.0 14.0 -30.0 17.0 -30.0	21.0 -22.0 19.0 -24.0 18.0 -25.0 18.0 -18.0	20.0 -13.0 21.0 -15.0 20.0 -14.0 20.0 -15.0 19.0 -15.0 22.0 -15.0	23.0 - 11.0 20.0 - 15.0 23.0 - 11.0 20.0 - 14.0 23.0 - 11.0 21.0 - 14.0	14.0 -17.0 19.0 -19.0 15.0 -17.0	MAX-MIN II HLEM LEGEND Profile Scale: 1 cm. = 10 % FREQUENCY : 1777Hz IN PHASE
500 ¢			20.0 -27.0 23.0 -27.0	17.0 -26.0 16.0 -28.0 17.0 -19.0	18.0 -16.0 20.0 -15.0 20.0 -15.0 20.0 -16.0	20.0 -14.0 20.0 -15.0 20.0 -14.0	14.0 -17.0	QUADRATURE
			20.0 -28.0 22.0 -28.0 24.0 -27.0	17.0 -28.0 18.0 -19.0 19.0 -27.0 20.0 -21.0 20.0 -27.0 21.0 -22.0	22.0 -16.0 19.0 -19.0 23.0 -16.0 20.0 -19.0 22.0 -18.0 20.0 -18.0	20.0 -15.0 20.0 -14.0 18.0 -17.0 19.0 -15.0 19.0 -17.0 18.0 -15.0	17.0 +-16.0 / 19.0 +-14.0 / 19.0 +-14.0 /	0 -10Z
600 S			25.0 26.0 25.0 32.0	22.0 -25.0 20.0 -25.0 20.0 -25.0 20.0 -25.0 20.0 -25.0	23.0 -20.0 (22.0 -16.0 (21.0 -23.0) 20.0 -20.0)	18.0 -18.0 15.0 -22.0 15.0 -22.0 19.0 -14.0	19.0 -14.0 19.0 -14.0 600 S	CONDUCTOR AXIS - WEAK
			22.0 -31.0 20.0 -32.0 20.0 -32.0	25.0 -25.0 22.0 -25.0 25.0 -26.0 20.0 -26.0 26.0 -27.0 17.0 -30.0	19.0 -25.0 20.0 -22.0 18.0 -28.0 20.0 -23.0 13.0 -30.0 18.0 -25.0	15.0 -23.0 15.0 -23.0 19.0 -15.0 19.0 -14.0 17.0 -22.0 20.0 -15.0	22.0 -11.0 22.0 -11.0 22.0 -12.0	
700 S			19.0 - 33.0 18.0 - 33.0	25.0 -27.0 11.0 -39.0 23.0 -29.0 9.0 -34.0	9.0	17.0 -23.0 17.0 -22.0 20.0 -13.0	20.0 -13.0700 S	2.13401 Jurlewoome
			· 18.0 *-34.0	13.U32.U ' 8.0 - 35.0	× 000 × 000 × 000 × 100 × 000 × 100 ×	L 1000 N	L 1200 N	SCALE 1 : 2 500 50 0 50 (metres) 100 150 200
			ل ے	ا ـــ الـــ				ROBERT S. MIDDLETON EXPLORATION SERVICES For DAVE JONES
					· · ·		~	Title STIMSON PROJECT, Block C Hor;zontal Loop EM Survey
42H02SE0004 2.13401 STIMSON	290						Figure 13	Fox/Stimson Twps., Ontario Date: February '90 N.T.S.: 42 H/2 Operators: McAllister Bros Job #: N-371



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		ш O	Ш О	ц	ш 0	ш 0	
	0	- 10	- 20	- 30	40	20	
0	5.0 72.0	7.0 2.0	\$.0 <u>1</u> 1.0	3.0 1-1.0	5+D T 4-D	1.0172.0	0
	5.0 +3.0	7.0+2.0	6.0 1.0	\$.0 0.0	40-4.0	2.0 2.0	
	6.9-2.0	7.0-3.0	6.0-2.0	s.041.0	4.0-4.0	3/0-4.0	
	6.0 2.0	7.0-3.0	7.0-2.0	4.0-0.0	4.µ - 3. C	4.0 + 4.0	
100 S	7.0 2.0	6.10 + 3.0	7.0 2.0	5.0 0.0	4 0 - 3.0	40+5.0	100 S
	6. q - 2.0	7.0 2.0	6.0 2.0	5.0 -1.0	4 0 2.0	.0 5.0	
	5.0 1.0	6.01 1.0	6.0-2.0	4 0 + 1.0	3.0 - 2.0	4.0 +4. D	
	6.0 -1.0	6.0-1.0	7.0+3.0	4.0 + 1.0	3.01-1.0	\$ L0 + 4.0	
200 S	6.0 - 2.0	6.0/ 1.0	6.0+2.0	s.0 10.0	3.0 -0.0	5.0	200 S
	5.0 -2.0	6.0 - 2.0	6.0+3.0	4.0 0.0	3. 0 -1.0	40+4.0	
	5.0+2.0	6.0 - 2.0	5.0 2.0	5.0 0.0	3.0 +1-1.0	3.0 +2.0	
	\$.0 + 2.0	7.0 2.0	6.0 - 2.0	6.0 1.0	3.011.0	2.0 1.0	
300 S	6.0 - 2.0	7.0 3.0	7.0+2.0	5.0 1.0	3.0 0.0	2.01+1.0	300 S
	5.0 - 2.0	7.0-3.0	6.0-3.0	5. 041.0	4041.0	3.0 ¹ 1.0	
	7.0-2.0	7 0 4.0	7.0-3.0	6.0-2.0	4 0 1 1.0	2.01-1.0	
	7.0-3.0	7.0 4.0	6.0-2.0	6.0 2.0	4.0/1.0	2.0 0.0	
400 S	6.0+3.0	6.0 - 5.0	6.0 - 2.0	6.0 - 2.0	5.0-2.0	2.0-0.0	400 S
	6 0 - 4.0	7 0 4.0	6.0 -2.0	6.0 - 2.0	5.0 3.0	3.0 0.0	
	6. 0 + 3.0	810 - 4.0	7.0-2.0	6.0 - 2.0	6.0 + 3.0	3.0 - 2.0	
	6.0 - 3.0	B 0 + 4.0	6.0+2.0	6.0 - 2.0	5. D-3.0	4 9 - 3.0	
500 S	6.0 2.0	7.0-3.0	6.0+2.0	6. 1 2. 0	\$.p+3.p	3.0 + 2.0	500 S
	6.0 2.0	6.0 2.0	6.4 2.0	6.0 2.0	\$.0 +3.0	40-2.0	
	5 .0 0 .0	7.0 2.0	6.0 +1.D	7.0-2.0	6 0 4.0	4 0 + 3.0	
	4 0 0.0	5.01 1.0	6.0 - 2.0	6.0 2.0	5. 0 - 3.0	4.0 - 4.0	
			1 1				



تبا LL.I ш LLI ш 200 500 L 100 300 400 0 لب... ___ ___ _ لــــ 0 ____ ____0 15.0₁-38.0 12.Q_T-35.0 2**8.**0 <u>+</u>-18.0 20.0_T-18.0 19.0 T-98.0 20.0₁-38.0 M 18.0 -38.0 20.0 +-18.0 25.0 - - 21.0 20.0 -38.0 16.0 -35.0 20.0 - 37.0 19.0 -38.0 17.0 -34.0 25.0 -21.0 26.0 -14.0 21.**0 - 38.0** 19.0 +-37.0 14.0 -35.0 20.0 -38.0 20.0 +-38.0 23.0 -- 24.0 27.0+-14.0 19.0 -37.0 ___100 S 100 S____ 23.0 -23.0 20.0 +-38.0 28.0+-14.0 14.0+-35.0 20.0 -38.0 19.0 -38.0 19.0 -38.0 19.0-37.0 20.0 +-26.0 (30.0 +-13.0 20.0 -38.0 17.0+-38.0 20.0 -37.0 28.0 -14.0 12.0 +-37.0 20.0 -27.0 16.0 -38.0 16.0 -38.0 20.0 -37.0 12.0 -37.0 17.0 -- 29.0 29.0 +-15.0 16.0 -- 38.0 17.0 +-38.0 ____200 S 200 S ____ 32.0 -14.0 19.0+-38.0 15.0 +-35.0 14.0 +-32.0 19.0 -38.0 17.0 -38.0 18.0 -38.0 20.0 -36.0 140 -95.0 12.0 -33.0 26.0 -17.0 18.0 -35.0 **19.0** +-24.0 19.0 - 37.0 14.0 -35.0 10.0 --34.0 19.0 -35.0 18.0 -- 38.0 19.0 +-37.0 18.0 -36.0 11,0 -- 34.0 17.0 -25.0 20.0+-37.0 17.0 -35.0 <u>___</u>300 S 300 S ____ 2210 -97.0 20.0 -38.0 18.0 -36.0 1410 - - 39.0 17.0 -25.0 18.0 +-96.0 23.0 -- 97.0 17 0 -33.0 8.0 -26.0 19.0 -37.0 19.**0 - 36.**0 17.0 -38.0 19.0 +-36.0 24,0+-36.0 20,0 -37.0 20.0 +-37.0 18.0 --33.0 17.0 -26.0 20,0 -38.0 15.0 +-28.0 24.0 -35.0 25.0 -36.0 20.0 - 35.0 19.0 -- 32.0 400 S____ ___400 S 4.0 -30.0 20,0 --33.0 27,0 -36.0 190 -38.0 20.0**1 - 36**.0 20.0 - 56.0 2\$.0+-37.0 19.0 +-38.0 20.0+-36.0 22,0 --32.0 17.0 -30.0 24.0 -35.0 17.0 -39.0 20.0 -36.0 23.0 - 33.0 20.0 -27.0 24.0 -35.0 27.0 - 37.0 20.0+-37.0 23.0 -27.0 20.0 - 37.0 21.0 -- 32.0 19.0 -38.0 24.0 +-95.0 ____500 S 500 S ____ 17 0 +-37.0 20.0 -36.0 24 0 -- 32.0 20.0 +-28.0 24.0 -37.0 22.0 +-36.0 17.0 -38.0 19.**0** |-38.0 24.0 -~32.0 22.0 -- 28.0 18.0 -37.0 19.0 -38.0 24.0 -27.0 16.0 -37.0 24.0 -32.0 12.0 -98.0 19.0 -38.0 20.**0**+-37.0 18.0 -37.0 21.0 -32.0 11.0 -38.0 15.0 +-39.0 18.0 -38.0 25.0 -26.0

600 S	14.0 38.0	17.039.0	19.01-38.0	15.0 -40.0	21.034.0	25.0 32.0	600 S	
	17.0 - 38.0	18.0 38.0	20.4 -38.0	16. ¢ +-39.0	17.0,35.0	22.0 31.0		
	20.0 38.0	20.0 -38.0	19.0 38.0	17.038.0	15.0 36.0	20,0 -32.0		
	22.0 37.0	20.0 -38.0	19.0 38.0	18.0 - ~38.0	14.0-36.0	20,032.0		
700 S	23.0 -36.0	22 0 - 38.0	20.0 38.0	17.0 39.0	14.037.0	19.1033.0	700 S	
	29.0 37.0	20.0 -38.0	19.0 -38.0	17.0 40.0	15.0 -36.0	18 033.0		MAX-MIN II HLEM LEGEND
	23.038.0	21.0 -38.0	18.0 40.0	17.0 39.0	16.0, -37.0	18.0 -34.0		Profile Scale: 1 cm. = 10 %
	23.038.0	20.0 38.0	14.0 -40.0	18.0 -38.0	17.9 -37.0			IN PHASE
800 S	20.038.0	20.0 38.0	13.0-42.0	24.0 + 195.0	201.0 +-37.0	200	<u> 800 s</u>	QUADRATURE
	17.0 38.0	19.040.0	15.0 -43.0	23.0 85.0	22.0 35.0	/		LOIL SEPARATION
	17.0 38.0	17.040.0	15.0 -42.0	23.0 - 36.0	23,036.0			
	17.038.0	15.041.0	16.0 42.0	22.0 +36.0	200 0 -35.0			-102
900 S	18.0 -38.0	16.440.0	17.0 -42.0	22.0 +35.0	20.0 - 36.0		900 S	
	20.0 -40.0	17.0 -40.0	20.0 -40.0	21.0 -37.0	20.0 -38.0			CONDUCTOR AXIS - WEAK
)	22.0 ~40.0	18.0 -40.0	19.0 -40.0	20.0 -97.0	20.0 -36.0			CONDUCTOR AXIS - STRONG
. (25.0 38.0	17.0-40.0	23.0 -40.0	20.0 38.0	20.4-36.0			
1000 S	25.0 39.0	18.0+-42.0	22.0 - 39.0	19.0 -40.0	19.0 -37.0		1000 S	
(24.040.0	17.0 -42.0	25.0 - 199.0	17.0-39.0	17.04-37.0		2	. 13401
	20.0 -40.0	20.0 -41.0	25.0	19.04-38.0	16.4 -37.0			
	20.0 -40.0	19.0 -42.0	24.0 + 39.0	18.0 -38.0	17.0 -37.0			JUN
1100 S	15.0 1-49.0	16.0 -41.0	24.0 1240.0	18.01-39.0	17.0 ¹¹ -36.0	i	1100 S	SCALE 1 : 2 500
	0	لمعا	LL.	لينا	المها			50 0 50 (metres) 100 150 200
	ن	100	200	300	400		r	FIGURE 7
		.		-	ــ			ROBERT S. MIDDLETON EXPLORATION SERVICES
								For PETER MATTHEWS
								STIMSON PROJECT, Block D
								Horfzontal Loop EM Survey
							ļ	Stimson Twp., Ontario
11 11 11 11 11 11 11 11 11 11 11 11 11	320							Operators: McAllister Bros. Job #: M-371