INTRODUCTION

A COMBINED ELECTROMAGNETIC - MAGNETOMETER SURVEY WAS CARRIED OUT ON THE PROPERTY OF MAKKAY MINING CORPORATION LIMITED IN THOMAS TOWNSHIP.

LINE CUTTING BEGAN IN JANUARY, 1965 AND THE GEOPHYSICAL WORK WAS COMPLETED AT THE END OF FEBRUARY. AS INSTRUCTED, LINES AT 200 INTERVALS WERE SURVEYED IN THE SOUTH HALF OF THE PROPERTY, AND LINES AT 400 INTERVALS WERE SURVEYED ON THE NORTH HALF OF THE PROPERTY.

THE OBJECT OF THE SURVEY WAS TO LOCATE POSSIBLE BASE METAL SULPHIDE DEPOSITS AND STRUCTURAL CONDITIONS, THROUGH THE MAGNETOMETER SURVEY, WHICH MAY BE FAVOURABLE TO THE DEPOSITION OF GOLD OR BASE METALS.

PROPERTY, LOCATION AND ACCESS

THE PROPERTY, A CONTIGUOUS BLOCK, CONSISTS OF THIRTY-THREE UNPATENTED MINING CLAIMS, FORMING APPROXIMATELY 1,320 ACRES, LOCATED IN THE NORTH-CENTRAL SECTION OF THOMAS TOWNSHIP, PORCUPINE MINING DIVISION. THE CLAIMS ARE REGISTERED WITH THE ONTARIO DEPARTMENT OF MINES AS FOLLOWS:- P 57333; P 56070 TO P 56073 INCLUSIVE; P 71454 TO P 71466 INCLUSIVE; P 71487 TO P 71492 INCLUSIVE; AND P 63784 TO P 63792 INCLUSIVE.

ACCESS TO THE PROPERTY IS BY THE GIBSON LAKE ROAD FROM HIGHWAY NO. 101, A DISTANCE OF ABOUT EIGHT MILES.

HISTORY OF THE PROPERTY

RECORDS AT THE ONTARIO DEPARTMENT OF MINES RESIDENT GEOLOGIST'S OFFICE IN TIMMINS, ONTARIO, INDICATE THAT THE SOUTH-CENTRAL PART OF THE PROPERTY, TERMED THE FOSTER - TROUT CREEK GROUP, WAS PROSPECTED IN 1923. OF 26 GOLD SAMPLES, THE BEST ASSAY WAS $6.20 OVER 1.2 FEET.

AND THE NEXT BEST ASSAYED $2.00 OVER ONE FOOT. THESE VALUES WOULD REPRESENT GOLD AT $20.00 PER OZ.

SUBSEQUENTLY ALMOST ALL OF THE AREA COVERED BY THE MARKAY PROPERTY WAS HELD BY JOHN LELIEVER. EXTENSIVE STRIPPING AND TRENCHING WAS CARRIED OUT BY THE LELIEVER INTERESTS. ONLY A FEW OF THESE TEST PITS WERE LOCATED DURING THE SURVEY BECAUSE OF DEEP SNOW. IT IS PROBABLE THAT THE TEST PITS WERE SAMPLED FOR GOLD.

TOPOGRAPHY AND GENERAL GEOLOGY

ACCORDING TO MAP NO. 49h OF THE LANGMUIR-SHERATON AREA BY THE O.D.M., OUTCROP OCCUPIES ABOUT 25 PER CENT OF THE AREA. GROWTH CONSISTS OF MAINLY SPRUCE AND POPLAR.

THE ROCKS ON THE PROPERTY CONSIST OF RUST-WEATHERING CARBONATE ROCK AND CARBONATIZED KEEWATIN LAVA AND FRAGMENTALS, CUT BY A FEW NARROW DYKES OF DARK COLOURED FELSITES. DR. L. C. BERRY, IN HIS REPORT ON THE LANGMUIR-SHERATON AREA, ALSO STATES THAT NARROW QUARTZ-TOURMALINE STRINGERS ARE PRESENT IN THE NORTHWEST TRENDING FELSITE DYKES AND CARBONATE ROCK.

A PROMINENT EAST-NORTHEAST TRENDING DIABASE DYKE IS LOCATED SOUTH OF THE PROPERTY.

NORTH OF THE PROPERTY, APPROXIMATELY THREE MILES, BROULAN REEF MINES HAS OUTLINED A GOLD-BEARING FELSITE DYKE APPROXIMATELY 50 FEET WIDE. THE GOLD VALUES, ALTHOUGH LOW, OF THE ORDER OF ONE TENTH OF AN OZ., ARE UNIFORMLY DISTRIBUTED THROUGHOUT THE DYKE.

ELECTROMAGNETIC - MAGNETOMETER SURVEY RESULTS AND INTERPRETATION

THE SURVEY WAS CONDUCTED ALONG NORTH-SOUTH LINES SPACED AT 200 AND 400 FOOT INTERVALS AS SHOWN ON THE ACCOMPANYING MAPS AT A SCALE OF ONE INCH TO THREE HUNDRED FEET. A DUAL FREQUENCY CRONE

E.M. UNIT AND A SHARPE MF-1 FLUXGATE MAGNETOMETER WERE USED FOR THE SURVEY.

FOUR MAGNETIC ANOMALOUS CONDITIONS WERE OUTLINED ON THE PROPERTY, TERMED M1 TO M4 INCLUSIVE, AS SHOWN ON THE ENCLOSED MAP. THE MAIN TREND OF THE MAGNETIC CONTOURS IS IN A NORTH-NORTHWEST DIRECTION AND THE BACKGROUND MAGNETIC RELIEF IS OF THE ORDER OF 150 TO 250 GAMMAS.

IN THE EXTREME SOUTHEAST CORNER OF THE PROPERTY IS LOCATED THE NORTH EDGE OF AN EAST-NORTHEAST TRENDING MAGNETIC ANOMALY. THE ANOMALY, TERMED M4, INDICATES THAT A DIABASE DYKE, AS SHOWN ON THE ONTARIO DEPARTMENT OF MINES GEOLOGICAL PLAN IS LOCATED JUST SOUTH OF THE PROPERTY.

EXTENDING FROM THE BASE LINE ON LINE 33 EAST IS LOCATED A LONG, NARROW, ALMOST NORTH STRIKING ANOMALY, TERMED M3. THIS ANOMALY, AVERAGING ABOUT 200 GAMMAS ABOVE BACKGROUND, PROBABLY REPRESENTS A MORE BASIC VOLCANIC FLOW OR PERHAPS A DIABASE DYKE. IT TERMINATES ABOUT 3,000 FEET SOUTH OF THE BASE LINE AND THE CHARACTER OF THE MAGNETIC CONTOURS INDICATES A DIP TO THE EAST.

THE ANOMALY, TERMED M1, NEAR THE CENTRE OF THE PROPERTY, ATTAINS A MAGNITUDE OF 1,400 GAMMAS THE HIGHEST ON THE CLAIM GROUP. THIS LONG, NARROW, MAGNETIC HIGH STRIKES NORTH-NORTHWEST AND DIPS EAST, AS INDICATED BY THE MAGNETIC CONTOURS. IT PROBABLY REPRESENTS A BASIC VOLCANIC FLOW OR MAGNETITE-BEARING DIABASE DYKE.

THE SIGNIFICANT FEATURE OF ANOMALY M1 IS ITS TERMINATION BY ANOMALY M2, STRIKING ABOUT NORTHEAST. THE INTERSECTION OF THE TWO MAGNETIC HIGHS, NAMELY M1 AND M2, FORMS AN X WHICH IS INDICATED ON THE MAP BY A CIRCLE. THIS AREA OF STRUCTURAL DISRUPTION WOULD

REPRESENT A ZONE OF WEAKNESS AND, THEREFORE, AN IMPORTANT LOCI FOR THE DEPOSITION OF MINERAL DEPOSITS.

THE ELECTROMAGNETIC SURVEY, HOWEVER, DOES NOT INDICATE THE PRESENCE OF ANY WELL-DEFINED CONDUCTIVE ZONE IN THIS AREA. SEVERAL WEAK RESPONSES ADJACENT AND SOUTH OF THE AREA MAY PERHAPS INDICATE THE PRESENCE OF CONDUCTORS PARALLELING THE PICKET LINES OR ROUGHLY CORRESPONDING TO THE GENERAL STRIKE. THE PROFILES OF THESE WEAKLY CONDUCTIVE ZONES, SHOWN ON THE MAP OF THE ELECTROMAGNETIC SURVEY, FAIL TO SHOW ANY DEFINITE TREND.

ON LINES 29 EAST AND 35 EAST ARE PRESENT TWO SIMILARLY WEAK CONDUCTIVE ZONES, WHICH HAVE BEEN PROFILED ON THE ACCOMPANYING MAP. ALTHOUGH EACH OF THESE CONDUCTIVE ZONES MAY BE CAUSED BY CONDUCTIVE OVERBURDEN, THEY MUST BE GIVEN CONSIDERATION SINCE THE PICKET LINES SO CLOSELY PARALLEL THE STRIKE OF THE ROCKS. THE ELECTROMAGNETIC UNIT IS ALMOST INEFFECTIVE IN SUCH A CASE.

SURVEY METHOD AND INSTRUMENT DATA

THE CRONE E.M. UNIT, USED IN THE SURVEY, IS COMPRISED OF TWO SIMILAR COIL UNITS WHICH BOTH TRANSMIT AND RECEIVE ON A FREQUENCY OF 1800 OR 480 CYCLES PER SECOND. THE COILS ARE GENERALLY MAINTAINED AT A DISTANCE OF 200 FEET ALONG THE SURVEY LINES.

IN THIS TYPE OF SURVEY THE RESULTANT READING IS A MEASUREMENT IN DEGREES AND AN ANOMALY IS USUALLY A RESULTANT READING GREATER THAN PLUS OR MINUS THREE DEGREES. INITIALLY THE SURVEY IS CONDUCTED USING THE HIGH FREQUENCY, WHICH IS MORE SENSITIVE. ANY ANOMALOUS CONDITIONS ARE CHECKED BY THE LOW FREQUENCY EQUIPMENT THEREBY OFTEN ELIMINATING THOSE ANOMALIES WHICH MAY BE CAUSED BY CONDUCTIVE OVERBURDEN. THE ABILITY TO TRANSMIT AND RECEIVE ON BOTH COILS ELIMINATES THAT ERROR RESULTING FROM IMPROPER COIL ORIENTATION OVER IRREGULAR TERRAIN.

A SHARPE MF-1 FLUXGATE MAGNETOMETER WAS USED IN THE MAGNETIC SURVEY. THIS INSTRUMENT MEASURES THE VERTICAL COMPONENT OF THE EARTH'S MAGNETIC FIELD IN GAMMAS. BASE STATIONS FOR DETERMINING THE MAGNETIC DIURNAL VARIATIONS WERE ESTABLISHED ALONG THE SOUTH TIE LINE AT 200 FOOT INTERVALS. MAGNETIC READINGS WERE TAKEN AT 50 FOOT INTERVALS ALONG THE CROSS LINES.

CONCLUSIONS AND RECOMMENDATIONS

THE MAGNETOMETER SURVEY INDICATES A GENERAL NORTH-NORTHWEST STRIKE AND EAST DIP OF THE UNDERLYING ROCKS. ANOMALIES M1 AND M3 SPECIFICALLY INDICATE THIS ATTITUDE, AND THESE ANOMALIES ARE INTERPRETED TO BE EITHER CONFORMABLE MAGNETITE-BEARING DIABASE DYKES OR BASIC VOLCANIC FLOWS. AN EAST-NORTHEAST TRENDING DIABASE DYKE IS LOCATED SOUTH OF THE PROPERTY.

MAGNETIC ANOMALY M1 IS INTERSECTED BY ANOMALY M2 NEAR THE CENTRE OF THE PROPERTY. THE AREA OF PROBABLE STRUCTURAL DISRUPTION MERITS DEFINITE ATTENTION IN THE SEARCH FOR MINERAL DEPOSITS, IN THIS CASE, PARTICULARLY GOLD. IT IS SIGNIFICANT THAT AN OLD ROCK TRENCH WAS LOCATED IN THE NORTH PART OF THIS AREA. THE CONTACTS OF THE MAGNETIC HIGHS NAMELY, M1, M2, AND M3, SHOULD ALSO BE INVESTIGATED SINCE THESE CONTACT ZONES OFTEN PROVIDE THE LOCI FOR MINERAL DEPOSITS.

ELECTROMAGNETIC INDICATIONS ON THE PROPERTY WERE WEAK. HOWEVER, INASMUCH AS THE STRIKE OF THE ROCKS CLOSELY PARALLELS THE DIRECTION OF THE PICKET LINES, A CONDITION UNFAVOURABLE FOR THE DETECTION OF CONDUCTIVE ZONES, SOME OF THE WEAK ELECTROMAGNETIC RESPONSES MAY BE SIGNIFICANT. IT IS, THEREFORE, PROPOSED THAT THOSE AREAS ON THE ELECTROMAGNETIC MAP, WHICH ARE PROFILED, BE INVESTIGATED.

THERE ARE, THEREFORE, THREE MAIN AREAS REQUIRING INVESTIGATION ON THE PROPERTY. THE MOST IMPORTANT IS THAT OUTLINED BY THE CIRCLE ON THE MAP OF THE MAGNETOMETER SURVEY. THE SECOND AREA OF INTEREST IS CONSTITUTED BY THE CONTACT ZONES OF THE MAGNETIC ANOMALIES M1 AND M3. WEAK ELECTROMAGNETIC RESPONSES ON CLAIMS P 71458, P 63789, P 56072 AND P 56070 FORM THE THIRD AREA OF INTEREST. THE MOST FEASABLE MEANS OF IMPLEMENTING THESE RECOMMENDATIONS WOULD BE A GEOLOGICAL SURVEY TOGETHER WITH STRIPPING WHERE PRACTICAL. TRENCHES WITHIN THESE AREAS OF INTEREST SHOULD BE RE-SAMPLED. SUBSEQUENT TO THIS INITIAL WORK, IT IS EXPECTED THAT DIAMOND DRILLING WILL BE REQUIRED TO INVESTIGATE THOSE AREAS WHERE DEEP OVERBURDEN PREVENTS SURFACE EXAMINATION.

ESTIMATED COST OF THE WORK RECOMMENDED IS AS FOLLOWS:

GEOLOGICAL SURVEY	$ 2,000.00
SAMPLING	1,000.00
DIAMOND DRILLING (2,000 FEET)	12,000.00
TOTAL	$15,000.00

RESPECTFULLY SUBMITTED,

SHIELD EXPLORATION AND DEVELOPMENT
MINING SYNDICATE LIMITED

R. J. BRADSHAW,
CONSULTING GEOLOGIST.

TIMMINS, ONTARIO
MARCH 12, 1965.

MACKLEM TOWNSHIP

THOMAS TOWNSHIP

BASE LINE

L0+0 L13E L17E L21E L25E L27E L29E L31E L33E L35E L37E L39E L41E L43E L45E L47E L49E L51E L53E L55E L57E L59E L61E L63E L65E L67E L69E L71E L73E L75E L77E L79E L81E L83E L85E L87E L89E L91E L93E L95E L97E L99E L101E L103E L105E

P56673 RESTAKED P.82851

P56674 RESTAKED P.82850

P56675 RESTAKED P.82855

P56676 RESTAKED P.82856

P57335 RESTAKED P.83849

P71462

P71461

P71460

P71459

P71458

P71457

P71456

P71455

P71454

P71466

P71465

P71464

P71463

P71155

P63792

P63784

P63785

P63791

P63786

P63787

P63788

P63789

P71491

P71490

P71492

P71487

P71488

P71489

M1

M2

M3

M4

N

KEY MAP
1 Inch = 4 Miles

MURPHY HOYLE MATHESON GERMAN NIGHTHAWK HIGHWAY NO. 101 TISDALE TIMMINS WHITNEY COPY NIGHTHAWK LAKE MACKLEM CHAMBERS EXPORT MARKAY MINING CORPORATION LTD. DELORO SHAW CARMAN THOMAS

SYMBOLS

- Measurement station along picket lines
- -270 Relative value of the vertical component
- +325 of earth's magnetic field in gammas
- (200) Magnetic contours
- Magnetic depression
- Claim post and claim line
- Rock trench

INSTRUMENT
Sharpe MF-1 Fluxgate Magnetometer

MAGNETOMETER SURVEY

ON THE PROPERTY OF

MARKAY MINING CORPORATION LTD.

Thomas Township, Porcupine Mining Division, Ontario

By

SHIELD EXPLORATION & DEVELOPMENT MINING LTD.

SCALE
0 300 600 900
FEET

MARCH, 1965

BY: R.J.B.

Mar. 12, 1965

L0+0 MACKLEM TOWNSHIP L13E L17E L21E L25E L27E L29E L31E L33E L35E L37E L39E L41E L43E L45E L47E L49E L51E L53E L55E L57E L59E L61E L63E L65E L67E L69E L71E L73E L75E L77E L79E L81E L83E L85E L87E L89E L91E L93E L95E L97E L99E L101E L103E L105E BASE LINE

THOMAS TOWNSHIP

~~P56073~~ RESTAKED P. 82851

~~P56071~~ RESTAKED P. 82850

~~P57333~~ RESTAKED P. 82849

~~P56072~~ RESTAKED P. 82855

~~P56070~~ RESTAKED P. 82856

P71462 P71455 P63792 P63784 P71491 P71490

P71461 P71456 P63791 P63785 P71492

P71466 P71463 P71460 P71457 P63790 P63786 P71487

P71465 P71464 P71459 P71458 P63789 P63787 P71488

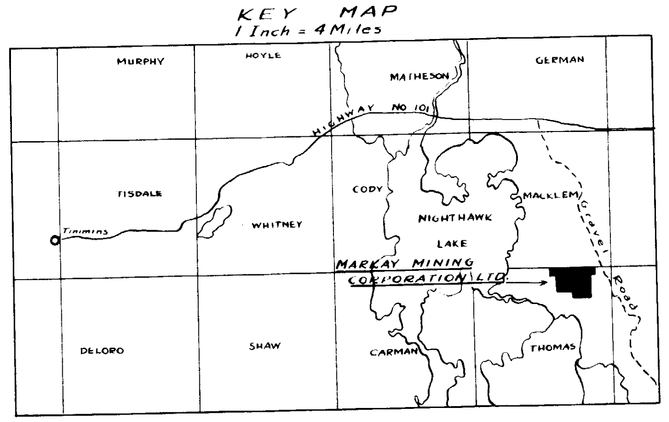
P71454 P63788 P71489

WHITE RIVER ROAD

TIE LINE

N

KEY MAP
1 Inch = 4 Miles



SYMBOLS

- Measurement station along picket lines
- Electromagnetic reading in degrees
- 3 High frequency
- -2 Low frequency
- Profile: resultant dip angle. (1" = 10°)
- 4 High frequency
- -2 Low frequency
- Electromagnetic Conductor
- Claim post & claim line
- Rock trench

ELECTROMAGNETIC SURVEY
Crone E.M unit: 200 foot coil separation
frequency: 1800 and 480 cps.

ELECTROMAGNETIC SURVEY

ON THE PROPERTY OF

MARKAY MINING CORPORATION LTD.

Thomas Township, Porcupine Mining Division, Ontario

By

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BY: R.J.B.

Nov 12, 1965