COMBINED GEOPHYSICAL SURVEY

KOZOWY OPTION CONTACT BAY AREA DRYDEN, ONTARIO

HOLLINGER MINES LIMITED

INTRODUCTION

Occurrences of copper - nickel mineralization have been discovered. Claims were staked to cover this discovery. The purpose of the combined survey is to acquire additional information about these deposits as well as the surrounding area meanwhile obtaining sufficient assessment credits to protect the property.

The survey was conducted using a relatively sensitive magnetometer and a high power vertical-loop electromagnetic apparatus. Both instruments permitted observations to be taken along established lines oriented to form a grid pattern covering the entire property.

The known areas of mineralization failed to respond as significant conductors but are associated with magnetic features. Varying strike directions are revealed by the magnetic results but unfortunately the geological contacts, are difficult to discern. Elsewhere, ten conductive anomalies have been detected varying in character from poor to interesting. The entire group of 20 claims has been covered by both survey methods.

Further work is warranted.

PROPERTY LOCATION & ACCESS

The Kozowy Option contains 20 contiguous claims. They are:

K-40072 - 40080 inclusive
K-40210
K-40505 and K-40506
K-41961 - 41963 inclusive
K-42883 - 42887 "

This property is between Eagle and Wabigoon lakes ten miles south of the town of Dryden in the District and Mining Division of Kenora. The area is unsurveyed but the sixth meridian survey line is within one mile to the east of the extreme east boundary of the property.

There is an all-weather road bisecting the claim group that originates from highway 594 at a point 6 miles southwest of Dryden.

PERSONNEL

Three men were employed on the survey. W. King and the writer performed the electromagnetic work while the magnetometer was read by A. F. Bessette who was employed on a contract basis.

FIELD PRODUCTION

The survey, conducted from the town of Dryden, was commenced on the 28th of November 1968. The magnetic survey was completed on the evening of the 2nd of December, but the electromagnetic survey was discontinued on the evening of the 29th due to instrument break-down. Repairs were made on the 30th and when work was resumed on December 1st it continued until completion at noon on the 3rd day of December.

All observation were taken along lines 400 feet apart, at stations separated by 100 feet or less. The production was as follows:

Electromagnetic survey:	High frequency readings	1,028
	Low " "	329
	Miles covered	18.6
Magnetic survey:	Number of readings	1,069
	Miles covered	20.7

HISTORY

To my knowledge, previous work in the area is limited to prospecting, mapping and possibly some geophysics on portions of the group. Shallow holes were drilled with a portable coring machine last summer near the areas of known mineralization. There is no evidence of deeper drilling on the property.

GEOLOGY

Within the group, the bedrock is approximately 60 percent drift covered. The nature of the overburden is not well known to the author but is suspected of being sandy clay with local concentrations of gravel or boulders.

From geological mapping (public data) a body of basic rock is shown to extend from the southeast into the central portion of the property. It is one mile wide where it enters the group and appears to intrude the basic volcanic rocks that form the remaining outcrops.

PROCEDURE

Both surveys were conducted along chained picket lines that had previously been cut. Two seperate grids were layed out. One grid covering the six claims in the northeast corner was surveyed from an east striking base line while the remaining claims were covered by east and west lines surveyed from a base line with a north bearing.

For the magnetic survey, a few primary base stations were established between which second order base stations valves were assigned by occupying every station twice. These are along the surveyed base lines. During the performance of the survey the base stations were read at regular intervals to measure both the instrument drift and magnetic divrnal. All field notes were corrected accordingly before preparing the contour maps.

The vertical loop electromagnetic survey employed the fix transmitter fan method configuration and was carried out so as to cover the entire distance of all the lines. To this end, predetermined transmitter locations were assigned so that portions of lines not exceeding 2400 feet could be read at distances 400 feet 800 feet and 1200 feet from the transmitter position.

DESCRIPTION OF INSTRUMENTS

(a) MAGNETOMETER: The survey was performed using an 172.4 torsion wire magnetometer (serial No. 4539) that measures the vertical component of the earth's magnetic field. It is manufactured by ABEM of Stockholm Sweden.

The instrument has a sensitivity of 9.9 gammas per scale division. The readings are taken by rotating a micrometer screw until a torgue applied to the torsion wire is sufficient to return the magnet to a "null" position thus compensating for the magnetic influence. At every station it is necessary to level the instrument on a tripod and orient it in a constant direction to minimize the effects of improper internal leveling.

(b) ELECTROMAGNETIC INSTRUMENT:

The instrument employed is a dual frequency vertical loop type electromagnetic unit, manufactured

by Crone Geophysics of Port Credit Ontario.

It consists of a transmitting coil shaped in the form of a diamond and suspended by a mast in a vertical plane. The circumference of the coil is approximately 22 feet. A 12 volt battery supplies the power to an oscillator which in turn causes the coil to resonate at two seperate frequencies i.e. 2400 and 480 hertz. The power output is approximately 1000 watts. The resultant nearby fields are measured by means of a small receiving coil after the signal has been amplified and fed to ear phones. The minimum-noise or null position of the plane of the receiving coil when rotated about a horizontal axis determines the measurement for a given station as a dip angle in degrees above or below the horizontal.

It is imperative, where a conductive body is coupled to the primary field from the transmitter, that the plane of the transmitting coil bisect the axis of rotation for a tilt angle measurement at the receiving coil. To this end, a graduated sheet of aluminum fastened rigidly to the mast makes it possible for the plane of the coil to be rotated in any given azimuth as determined by the relative position of the receiver.

DESCRIPTION OF ANOMALIES

(a) MAGNEDIC SURVEY: 42 separate magnetic peaks have been indicated by the magnetic survey. The cause of these anomolies is not known but is likely due to local concentrations of magnetite. Some may be due to pyrrhotite.

The accompanying magnetic contor map does however reveal varying trends that might prove valuable information. In the Northeast corner of the property, the magnetic trends are 45 degrees while in the center of the group they represent North bearing structures. In the Southern portion of the survey area, the anomalies once again strike approximately 45 degrees.

(b) ELECTROMAGNETIC SURVEY: 10 conductors, labelled A to J on the accompanying plan of the electromagnetic results, have been detected by the reconnaissance survey. None of these conductive anomalies displays the characteristics of a good conductive body such as massive sulphides or graphite. They are all capable however of representing bodies of disseminated sulphides and

in particular pyrrhotite where the conductor is directly associated with one of the magnetic peaks. Some conductive clays have also been known to be the origin of similar anomalies.

ANOMALY A is the strongest anomly on the property. It occurs on the center of a Northeast trending slough in the Northern part of the group. The conductor appears to have a strike length of at least 1000 feet and is associated with a weak magnetic trend which in turn is part of a much longer magnetic feature (7,200 feet) that also contains anomalies B,C and G.

ANOMLY B occures along the edge of the slough mentioned above. The cross-over angles are sharp and this fact tends to preclude the possibility of a causative source within the overburden. Like anomaly A, the trend is to the Northeast. Although a cross-over has been obtained on only one line, the nature of the profiles on the adjacent line 400 to the North is such as to indicate that this anomaly continues and joins with Anomaly A.

ANOMALY C displays poor association with the magnetic trend but does appear to be an extension of anomaly B. Cross-overs were obtained on two adjacent lines so this would suggest at strike length of at least 600 feet. No low frequency responses were obtained indicating the conductor to be of low conductivity.

ANOMALY D is the only conductor directly associated with a positive magnetic anomaly. The conductor lies in the Northeast corner of the property and strikes a few degrees east of North. This anomaly has been detected on two adjacent profiles and continues beyond the property boundary to the north. On one profile read 1200 feet distant from the transmitter, the dip angles were quite high but this is due to the effect of the steep side of an outcrop where it drops into a long slough

ANOMALY E is a weak single line anomaly lying between anomlay D and the West boundary of the property. There is no signifant magnetic feature associated with this conductor but the low frequency response follows the high frequency faithfully enough to suggest a possible bedrock feature of better conductivity.

ANOMOLY F occurs as a single cross-over in an area of considerable exposed rock. A small shear zone would suffice to explain the prescense of this anomaly.

ANOMALY G as previously mentioned could be the extreme northeast extension of anamoly A. The cross-over is very weak and occurs in a 70 foot wide slough. This slough could contain a mineralized shear zone.

ANOMALY H occurs only the east boundary near a strong magnetic feature and within a low swampy area containing a creek. It is felt that this latter surficial feature is responsible for the cross-over at this locality.

ANOMALY I also occurs near the east boundary of the property but associated with a strong magnetic feature. This association is not direct but appears to be with the contact between the magnetic body and the adjacent rocks. The cross-overs obtained on two adjacent lines are weak and display poor conductivity. The strike of the anomaly is Northeast and extends beyond the property.

ANOMALY J is possibly the most intriguing anomaly on the property. It occurs in the extreme Southwest corner of the property and is associated with a weak magnetic trend. The high frequency cross-over on line 605 is very sharp suggesting a definite bedrock source. The ratio between the high and low frequency suggests poor conductivity. On line 565, where the low frequency cross-over differs from the one on the high frequency but is directly associated with a magnetic peak.

RECOMMENDATION

Electromagnetic anomalies A, B, C, D, I, and J, are worthy of further attention. Detail grids should be cut with lines normal to the respective strikes of the anomalies. Detail vertical loop electromagnetics and magnetics should follow plus at least one additional geophysical or geochemical method. Gravity need not be considered here, but the induced polarization method should prove more valuable than the electromagnetic methods.

CONCLUSIONS

Work completed thus far on this property and the subsequent proposed follow-up will undoubtedly lead to the performance of limited diamond drilling. Should these results prove encouraging, all the magnetic and electromagnetic anomalies should be closely reviewed.

Respectfully submitted,

H. Z. TITTLEY

May 17th, 1969.

AREA OF CLAIM MAP

CONTACT BAY
WABIGOON LAKE

DISTRICT OF KENORA

KENORA MINING DIVISION

SCALE: 1-INCH = 40 CHAINS

LEGEND

PATENTED LAND	P.
CROWN LAND SALE	C.S.
LEASES	L.
LOCATED LAND	Loc.
LICENSE OF OCCUPATION	L.O.
MINING RIGHTS ONLY	M.R.O.
SURFACE RIGHTS ONLY	S.R.O.
ROADS	
IMPROVED ROADS	
KING'S HIGHWAYS	
RAILWAYS	
POWER LINES	
MARSH OR MUSKEG	
MINES	
CANCELLED	C.

NOTES

400' Surface rights reservation around all lakes and rivers.

All Islands in Wabigoon Lake withdrawn from staking under Sec 39 Sub. C. of Mining Act

Roads indicated Dryden Paper Co Private Road may be used by Prospectors only after permission is obtained from Dryden Paper Co. Dryden, Ont.

DATE OF ISSUE
SEP 12 1969
ONTARIO DEPT. OF MINES

x - claims covered
● - claims recorded.

PLAN NO. M.2737

DEPARTMENT OF MINES
— ONTARIO —

AUBREY TWP.
FOR STATUS REFER TO TWP. PLAN No. M.1944

VAN HORNE
FOR STATUS REFER TO TWP. PLAN No. M.2053

Wabigoon Lake

Larson Bay

Contact Bay

Trap Lake

Dore Lake

Pritchard Lake

Flambeau L.

Bob Lake

Guy Lake

Burr L.

Mallon L.

Eagle L.

Granville Is.

Anderson Is

Mile 71 Lake

Butler Lake M.2723

Buchan Bay M.1288

Ukik Lake M.2668

93°00'

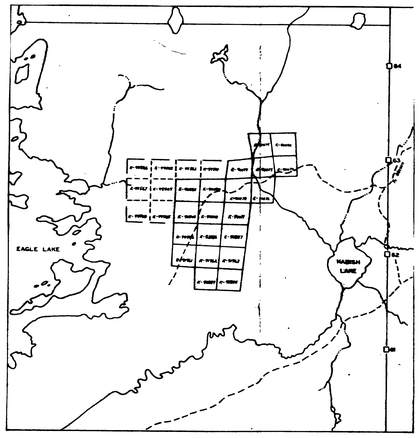
92°45'

49°45'

49°37'30"

200

496324



INDEX MAP
SCALE 1" TO 2640'

24W 20W 16W 12W 8W 4W 0 4E 8E 12E

00 BASE LINE

00 BASE LINE

K-40072
K-40074
K-40075
K-40077
K-40073
K-42888
K-40080
K-40078
K-40076
K-40205
K-40210
K-40079

0
4S
8S
12S
16S
20S
24S
28S

N

NOTE : INSTRUMENT USED ABEM MP4
SENSITIVITY 99 ℽ / SCALE DIVISION

LEGEND
OBSERVATIONS IN GAMMAS
CONTOURS AT 100 GAMMA INTERVAL
CONTOURS AT 25 GAMMA INTERVAL
CLAIM POST

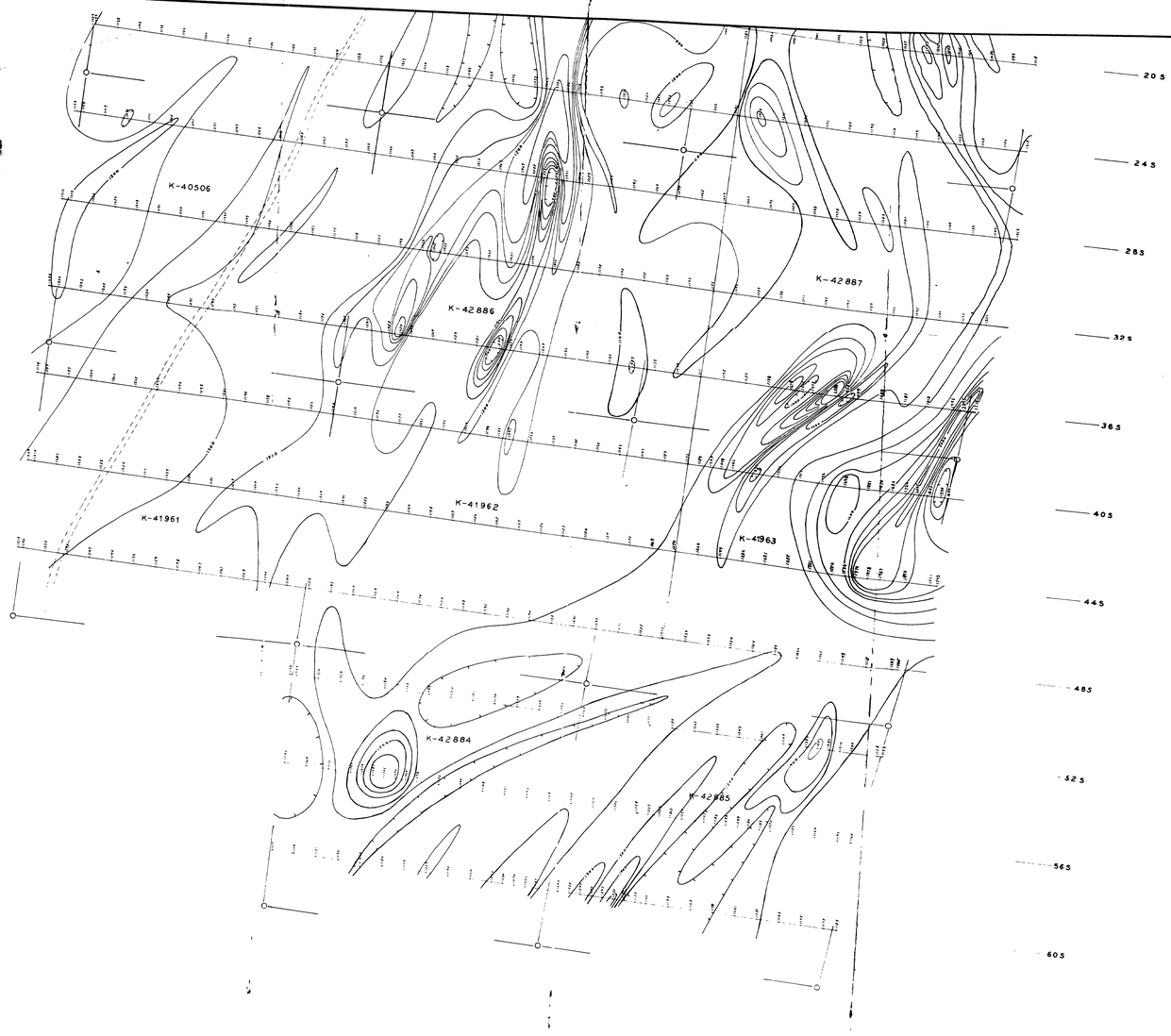
63.2513

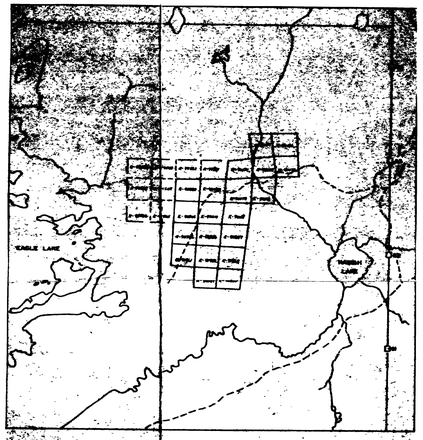
GEOMAGNETIC SURVEY

HOLLINGER MINES LIMITED
TIMMINS, ONTARIO

63.2513

210





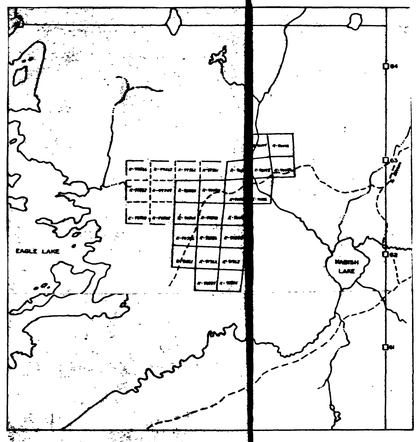
INDEX MAP
SCALE 1" TO 2640'

N

NOTE : INSTRUMENT USED ABEM MK 4
SENSITIVITY 99 γ / SCALE DIVISION

LEGEND
OBSERVATIONS IN GAMMAS
CONTOURS AT 100 GAMMA INTERVAL
CONTOURS AT 25 GAMMA INTERVAL
CLAIM POST

KOWKASH SECTION
03.2513
GEOMAGNETIC SURVEY
HOLLINGER MINES LIMITED
TIMMINS, ONTARIO



INDEX MAP
SCALE 1" TO 2640'

24 W 20 W 16 W 12 W 8 W 4 W 00 4 E 8 E 12 E

00 BASE LINE

K-40074 K-40072 K-40075 K-40073 K-40077 K-42883 K-40080 K-40078 K-40076 K-40505 K-40210 K-40079 K-40506

A B C D E F G H

4 S 8 S 12 S 16 S 20 S 24 S

N

LEGEND

PROFILE SCALE

HIGH-FREQUENCY CONDUCTOR

LOW FREQUENCY CONDUCTOR

TRANSMITTER POSITION

TRANSMITTER SET-UP

LOW FREQUENCY X-OVER

HIGH-FREQUENCY X-OVER

480 Hz profile
1920 Hz profile

HOLLINGER MINES LTD

KOZOWY OPTION

CONTACT BAY AREA

DRYDEN, ONT

V.E.M. SURVEY

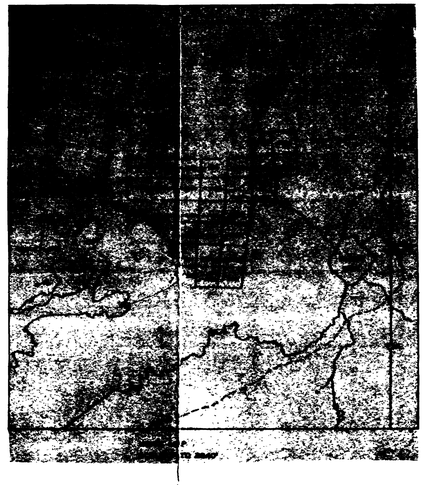
SCALE 1" TO 200'

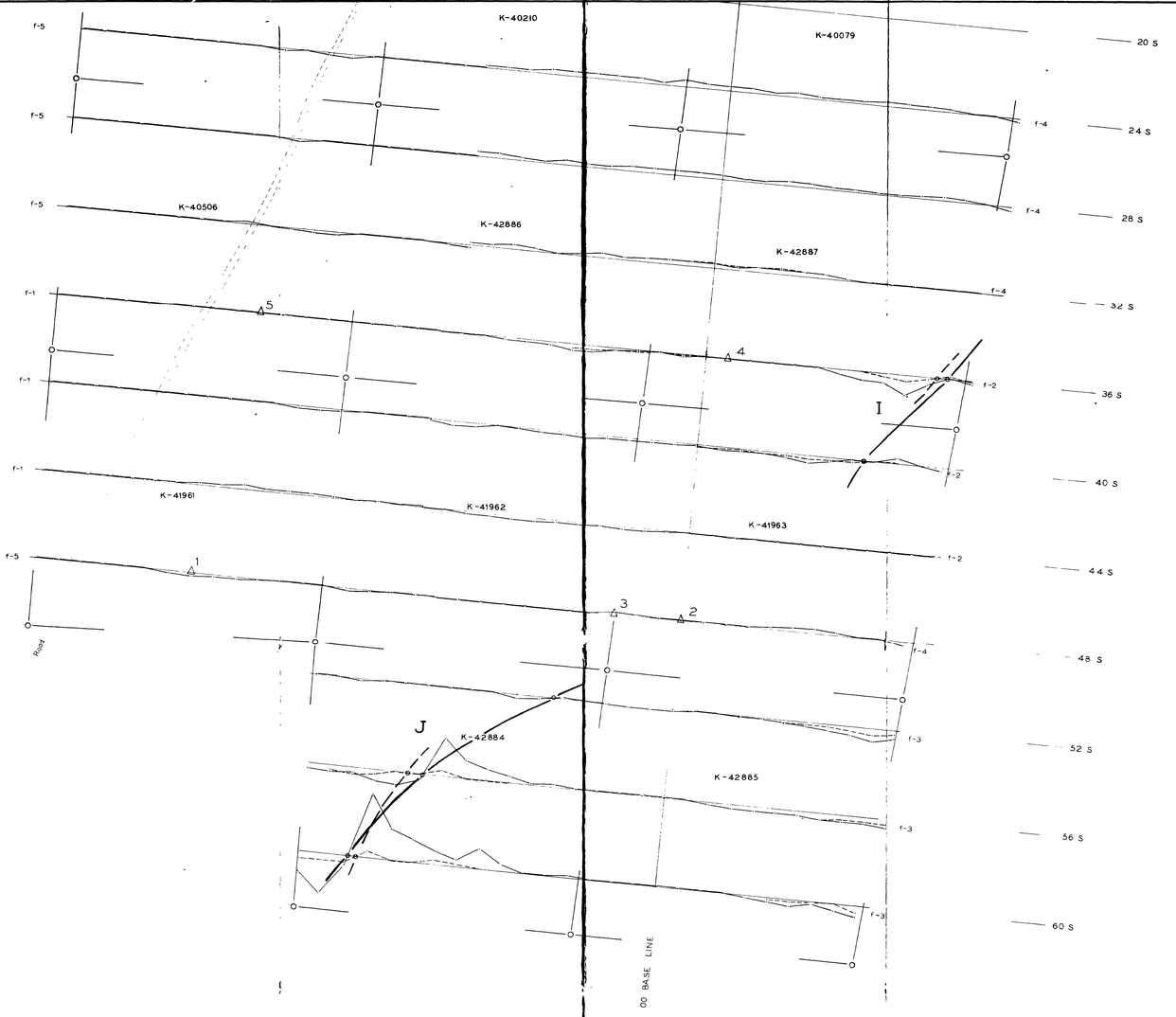
HOLLINGER MINES LIMITED
TIMMINS, ONTARIO

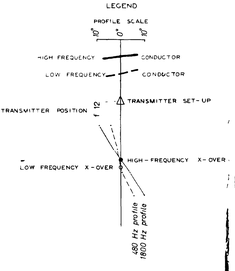
NORTH SHEET

63-2513

230







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KOZOWY OPTION

CONTACT BAY AREA

DRYDEN ONT

V.E.M. SURVEY

SCALE 1" TO 200'

HOLLINGER MINES LIMITED
TIMMINS, ONTARIO

SOUTH SHEET

63.2513

240