42A11NW0563 2.384 KIDD

010

EM-16

ELECTROMAGNETIC SURVEY

KIDD #1 GROUP

KIDD TOWNSHIP

Hollinger Mines Limited

April 26, 1971.

ELECTROMAGNETIC SURVEY

KIDD #1 GROUP

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HOLLINGER MINES LIMITED

Introduction:

During the period April 14 and 15, 1971 an electromagnetic survey was performed over the Kidd #1 Group in Kidd Township. An EM-16 survey was used as a faster and cheaper method of outlining the more important anomalous zones. The property consists of four claims, numbered P-255743-746 inclusive, occupying the S½ of Lot 2 Concession II.

Location and Access:

The claim group is located approximately thirteen miles north of Timmins in southeastern Kidd Township. Access is via Highway 655 to a winter road approximately two miles east of the property by snowmobile. The winter road is impassable during the summer months, which warrants helicopter transport to the grid.

Topography:

The group is situated in a topographic low, an open, muskeg type swamp. As a result of lumbering operations in the area no trees remain, only low shrubs. Depths of overburden in this area are usually greater than 150 feet.

Geology:

The Ontario Department of Mines Preliminary Map of Kidd Township infers that the property is underlain by Keewatin sediments. The group is located in the northwest portion of a large sedimentary basin which covers parts of Kidd, Wark, Murphy and Jessop Townships. The basin expands to the southeast, containing siltstone, greywacke, graphitic and argillaceous sediments. North of the property in Concession 111, the basin ends, in contact with massive volcanic flows and pyroclastics. The volcanics range in composition from acidic tuffs to intermediate and basic flows and pyroclastics.

Due to the lack of outcrop in the area, geologic information is sketchy, and no overall trend of the rocks appears to be established. This is further complicated by the normal structural attributes of a sedimentary basin, making it very difficult to establish a consistent trend. A general east to southeast trend is indicated by geophysics, which corresponds with the trend of the sedimentary basin. An east-west trend of the rocks, with a northerly dip may be adopted upon reviewing of previous information.

Previous Work:

In 1964, Bruce Presto Mines Limited filed one diamond drill hole on their four claims southwest of the Hollinger property. The hole encountered greywacke and dacitic tuff with some graphite. Mineralization was confined to pyrite and pyrrhotite with locally some chalcopyrite.

In 1964, Kirkland Minerals Corporation Limited drilled

four holes into three conductors, in the north ½ of Lot 5 Con. 1. Although the geophysical method employed was not released in the drill report, the conductors appear to strike north to northeast. The first conductor was drilled in two directions, both southeast and northwest, encountering siltstone and greywacke. The conductor consists of a shear zone containing some graphite, pyrite and pyrrhotite. The southeast hole intersected the conductor at 321 feet while the northeast hole intersected the conductor at 112 feet, indicating that the zone was dipping steeply to the northwest. The second conductor, further north, was found to be essentially the same as the previous conductor. The hole was characterized by greywacke, siltstone and slate sediments with a weakly mineralized, conductive shear zone. The third conductor is again attributed to a mineralized shear zone. The rocks encountered in this hole are somewhat more interesting. Dr. H. D. Carlson relogged the hole, changing the andesitic volcanics of Kirkland Mines to sheared sediments. The description follows:

'light, greyish green, aphanitic, slightly schistose, rather soft rock with an abundance of small black spots up to 1/16 inches in diameter which oxidize to a reddish brown on the outside of the drill core.' 1.

In 1964, Chance Mining and Exploration worked on the eight claim Hamcon #1 Group, north of the Hollinger property. After an airborne electromagnetic survey, ground magnetic (MZ-4) and electromagnetic (Turam) surveys were conducted. A one hundred gamma magnetic anomaly trending east-west along the central part of the claim group is outlined, followed by an electromagnetic conductor a bit further south.

1. Resident Geologist File, T-1433, Kirkland Mines-Kidd Township.

Two holes were drilled into the conductor. The first encountered andesite, argillite, greywacke and acid tuff - all sections containing some graphitic bands. The second hole, drilled in 1967, intersected greywacke, argillite and rhyolite. In both holes the conductor was attributed to a zone containing pyrite and graphite.

In 1965, Texas Gulf Sulphur Company Limited performed airborne and ground electromagnetic surveys on four claims further north. A two thousand foot long, east-west trending conductor was outlined and two holes were drilled. The first hole was abandoned due to the great depth of overburden. The second hole encountered mostly graphitic tuff, some andesite and andesitic tuff with minor pyrite mineralization.

In 1966, Conduc Mines Limited held three four claim groups in southeast Kidd Township, one of which is the present Hollinger property. The two southern groups were surveyed with airborne magnetics and electromagnetics, later ground work consisting of magnetic (MF-1) and electromagnetic (SE 200 and McPhar SS15) surveys. The magnetics showed a poor northeasterly trend, with two very weak electromagnetic conductors. No drilling was recorded. Magnetic (MF-1) and electromagnetic (SE200) surveys were conducted over the present Hollinger property in 1966. A 150 gamma magnetic anomaly, trending east-west was outlined which turned northwest at the west boundary. No electromagnetic conductors were found, hence no diamond drilling.

Personnel:

The field survey was performed by W. H. King, including the later plotting and drafting of plans. Interpretation of the anomalies was done by the author. All personnel are employed by Hollinger Mines Limited.

Instrument Used:

The survey was conducted using an EM-16 electromagnetic receiver manufactured by Geonics Limited of Toronto. The inclinometer on the unit (Serial number 28) is calibrated in percent, such that all readings are recorded to the nearest unit percent.

See accompanying manufacturer's brochure.

Survey Method

All of the instrument readings were obtained along cut and measured picket lines, spaced 400 feet apart, striking at 333 degrees. The operator made the observations on a signal received from a transmitting station near Cutler, Maine (NAA). This locality bears approximately 100 degrees from the survey area. Individual stations were taken at one hundred foot intervals, the operator maintaining a consistent orientation with the transmitter by facing north. The data was organized such that the negative readings are plotted on the right side of the line, towards the transmitter, at an EM scale of one inch equals twenty percent.

A total of 207 stations were read over 4.47 miles of picketed lines. This 4,47 miles of line includes the 2960 foot base line, which is not read with the instrument, but used for control purposes only.

Results of the Survey:

The reconnaisance EM-16 survey conducted, depicts forty three anomalous readings, out of which fourteen anomalies are interpreted. The trend of the conductors is nearly east-west, which is somewhat consistent with the scant amount of geological information available. The great depth of overburden present (estimated as being approximately 200 feet) greatly restricts the efficiency of the instrument, which is relected in the weak anomalous responses.

Description of the Anomalies:

For convenience, the anomalous zones are lettered on the accompanying map and will be referred to accordingly.

The first group of conductors; A,B,C,F,G,H,J,L,M; are all very poor and are attributed to either the bedrock-overburden interface or conductive overburden. They are characterized by small changes in the in-phase with the quadrature readings being a reverse polarity. Such conductors are also characterized by a long cross-over interval.

The second group of conductors; D,E; show similar attributes of the first group of conductors. The exception is the shorter crossover interval and the much greater in-phase change. This is generally indicative of a poor to good conductor underlying conductive overburden.

The third group of conductors includes I,K and N which are long conductors with much different characteristics than the previous two groups. Here the crossover interval is of medium length

but the quadrature values follow the in-phase readings. This is indicative of a poor to medium conductor which may be attributed to either graphitic material and/or sulphides.

Conclusions:

A lower frequency electromagnetic survey should be employed, to compile more information on the responses and causes of the anomalous zones. This would eliminate the overburden conductors and concentrate on the bedrock sources of possible economic value.

Bibliography:

1. Ontario Department of Mines Preliminary Map P.486
"Kidd Township"; 1968; 1 inch = ¼ mile.
Compiled by P. T. George and E. J. Leahy.

2. Assessment files - Resident Geologist.

Dan R. Alexander

HOLLINGER MINES LIMITED
TIMMINS, ONTARIO

TYPE OF INSTRUMENT USED - EM-16

The survey was performed using an EM-16 (electromagnetometer) receiver. The instrument has two receiving coils built into it (one coil has normally vertical axis and the other has normally horizontal axis). The signal from the vertical axis coil is read on an "in phase" inclinometer and the signal from the horizontal axis coil is read from a "quadrature" dial. The range of measurements are $\pm$ 150% on the "in phase" inclinometer and $\pm$ 40% on the "quadrature" dial.

Principle of Operation

The EM-16 uses very low frequency transmitting stations operating for communication with submarines for the transmitted signal. These V.L.F. stations have a vertical antenna which creates a concentric horizontal magnetic field around them. When these magnetic fields meet conductive bodies, there are secondary fields set up around these bodies. The EM-16 measures the vertical component of these secondary fields ("in phase" measures the vertical real component and the "quadrature" measures the vertical component shifted through 90°).

Three transmitting stations are used in performing surveys in central Canada. These stations are NAA Cutler, Maine, NPG Seattle, Washington, and NSS Annapolis, Maryland, with frequencies of 17.8 kc, 18.6 kc and 21.4 kc respectfully.

The station selected should be the station whose direction is parallel to the strike of geological structure in the area being surveyed.

The station used in this survey was NAA.

Operation

When the selection of the station to be used in a survey is made the proper selector unit is plugged in and the instrument is turned until the signal is minimum (this will occur when the instrument is pointing towards the station) and then the instrument is turned 90° (instrument is now oriented along the lines of the primary magnetic field).

To take a reading the instrument is swung back and forth in a vertical plane to obtain minimum signal (sound) intensity in the earphone. When this position is obtained the "quadrature" dial is adjusted to obtain the minimum signal strength (null point). The readings on the inclinometer and the "quadrature" dial are recorded. Readings are normally taken at 100'

stations with intermediate readings in conductive areas. The readings should always be taken with the instrument oriented in the same direction for one survey.

Interpretation

A conductor occurs when a cross-over from positive in phase to negative in phase occurs (or when in phase increases above background to a maximum and decreases below background to a minimum). The instrument is so constructed that in general the lower end of the vertical axis coil will point towards conductor. The axis of a conductor occurs at a point half way between the maximum and minimum points on the in phase measured along the profile line. The depth from ground surface to a point close to the upper edge of the conductive body is determined by measuring the horizontal distance between the maximum and minimum point on the in phase.

The quadrature profile is used in determining the characteristics of the conductive body. A quadrature profile which follows the in phase profile (relatively) indicates a poor conductor. A quadrature profile which follows the in phase profile with a small change in absolute values indicates a good conductor. A quadrature component which shows a reverse polarity indicates conductive overburden on top of a deeper (better) conductor.

PERFORMANCE & C

900

ASSESSMENT WORK DETAILS

Township or Area Kidd

Type of Survey Geophysical Electromagnetic
A separate form is required for each type of survey

Chief Line Cutter or Contractor R. Collins
Name
26 Maple St. South Timmins
Address

Party Chief W. H. King
Name
c/o Hollinger Mines Ltd. Timmins
Address

Consultant
Name
Address

COVERING DATES

Line Cutting April 7-14, 1971

Field April 14-15, 1971
Instrument work, geological mapping, sampling etc.

Office April 19-20, 1971

INSTRUMENT DATA

Make, Model and Type EM 16 #28

Scale Constant or Sensitivity
Or provide copy of instrument data from Manufacturer's brochure.

Radiometric Background Count

Number of Stations Within Claim Group 207

Number of Readings Within Claim Group 207

Number of Miles of Line cut Within Claim Group 4.47

Number of Samples Collected Within Claim Group

List numerically

P-255743
255744
255745
255746

If space insufficient, attach list

RECEIVED
APR 28 1971
PROJECTS SECTION

TOTAL 4 claims

CREDITS REQUESTED	20 DAYS per claim	40 DAYS per claim	Includes (Line cutting)
Geological Survey	☐	☐	
Geophysical Survey	☐	☒	Show Check ✓
Geochemical Survey	☐	☐	

DATE April 23, 1971

SIGNED W. H. Hansen

Send in duplicate to:
FRED W. MATTHEWS
SUPERVISOR-PROJECTS SECTION
DEPARTMENT OF MINES &
NORTHERN AFFAIRS
WHITNEY BLOCK
QUEEN'S PARK
TORONTO, ONTARIO

Performance and coverage credits do not apply to airborne surveys

SUBMISSION OF GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL SURVEYS AS ASSESSMENT WORK

In order to simplify the filing of geological, geochemical and ground geophysical surveys for assessment work, the Minister has approved the following procedure under Section 84 (8a) of the Ontario Mining Act. This special provision does not apply to airborne geophysical surveys.

If, in the opinion of the Minister, a ground geophysical survey meets the requirements prescribed for such a survey, including:

(a) substantial and systematic coverage of each claim
(b) line spacing not exceeding 400 foot intervals
(c) stations not exceeding 100 foot intervals or
(d) the average number of readings per claim not less than 40 readings

it will qualify for a credit of 40 assessment work days for each claim so covered. It will not be necessary for the applicant to furnish any data or breakdown concerning the persons employed in the survey except for the names and addresses of those in charge of the various phases (linecutting contractor, etc.). It will be assumed that the required number of man days were spent in producing the survey to qualify for the specified credit.

Each additional ground geophysical survey using the same grid system and otherwise meeting these requirements will qualify for an assessment work credit of 20 days.

A geological survey using the same grid system, and meeting the requirements for submission of geological surveys for maximum credits will qualify for an assessment work credit of 20 days. If line cutting has not previously been reported with any other survey and is reported in conjunction with the geological survey a credit of 40 days per claim will be allowed for the survey.

Similarly, a geochemical survey using the same grid system with the average number of collected samples per claim being not less than 40 samples, and meeting the requirements for the submission of geochemical surveys for maximum credits, will qualify for an assessment work credit of 20 days. If line cutting has not previously been reported with any other survey and is reported in conjunction with the geochemical survey a credit of 40 days per claim will be allowed for the survey.

Credits for partial coverage or for surveys not meeting requirements for full credit will be granted on a pro-rata basis.

If the credits are reduced for any reason, a fifteen day Notice of Intent will be issued. During this period, the applicant may apply to the Mining Commissioner for relief if his claims are jeopardized for lack of work or, if he wishes, may file with the Department, normal assessment work breakdowns listing the names of the employees and the dates of work. The survey would then be re-assessed to determine if higher credits may be allowed under the provisions of subsections 8 and 9 of section 84 of the Mining Act.

If new breakdowns are not submitted, the Performance and Coverage credits are confirmed to the Mining Recorder at the end of the fifteen days.

Hollinger Consolidated Gold Mines
LIMITED
TIMMINS, ONTARIO

Mr. F. W. Matthews,

Supervisor, Projects Section,
Whitney Block, Queen's Park,
Department of Mines and Northern Affairs,
TORONTO 182, Ontario.

CARNEGIE TWP. - M.441

MACHAR TWP. - M.440

MARK TWP. - M.317

JESSOP TWP. - M.289

VI
V
IV
III
II
I

12 11 10 9 8 7 6 5 4 3 2 1

48°37'30"
81°20'06"

THE TOWNSHIP
OF
"Claim Map"
KIDD

DISTRICT OF
COCHRANE

PORCUPINE
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 along the shores of all lakes and rivers.

DATE OF ISSUE
NOV 3 1971

PLAN NO. M.291

ONTARIO
DEPARTMENT OF MINES
AND NORTHERN AFFAIRS

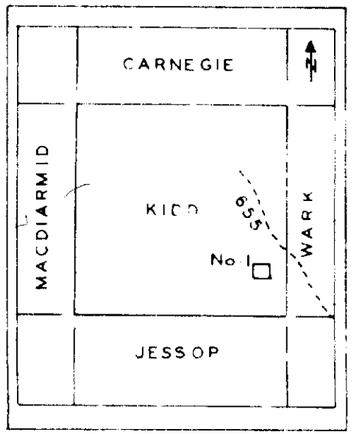
42A11NW0563 2.384 KIDD

200

LOT 3

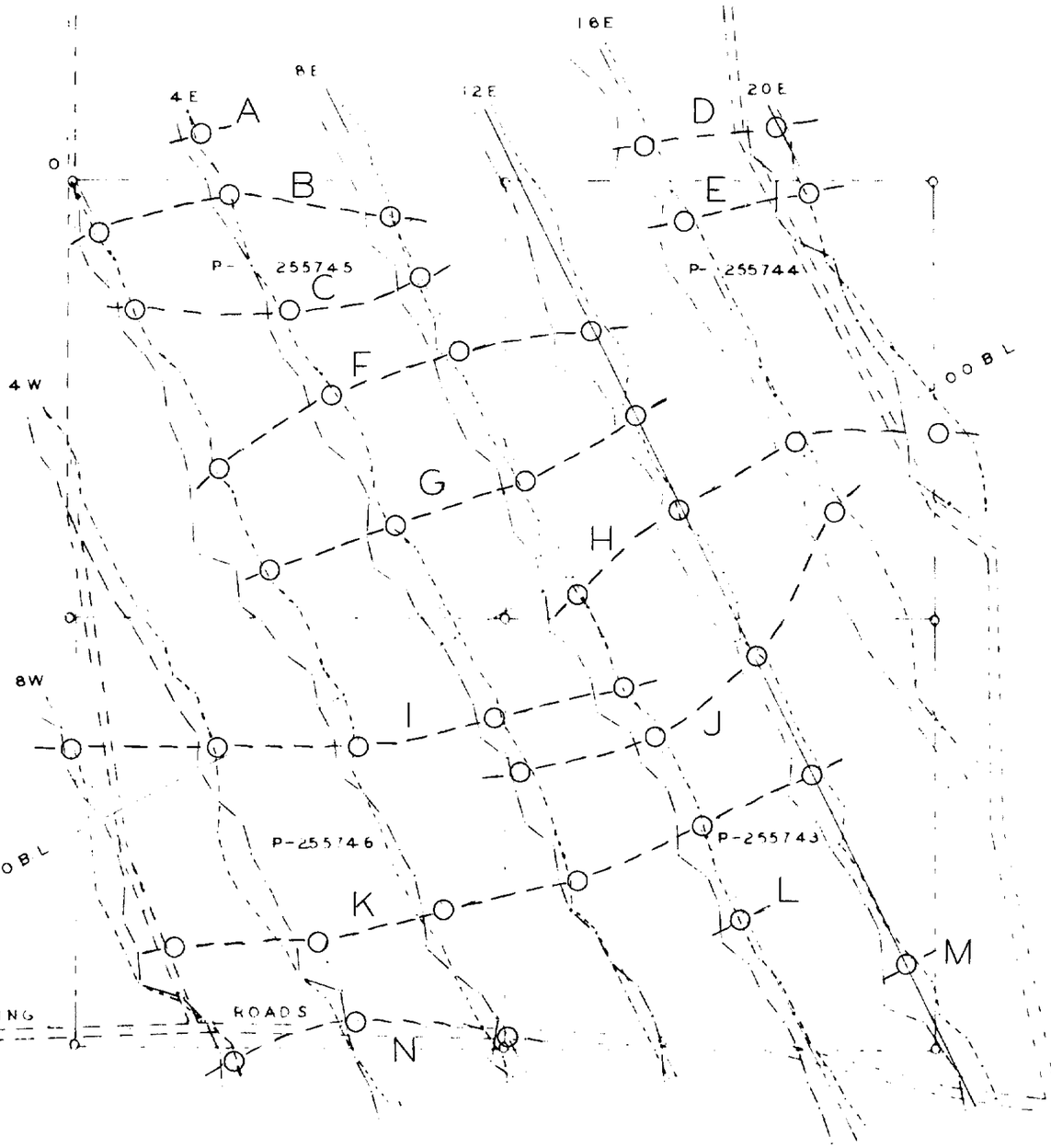
LOT 2

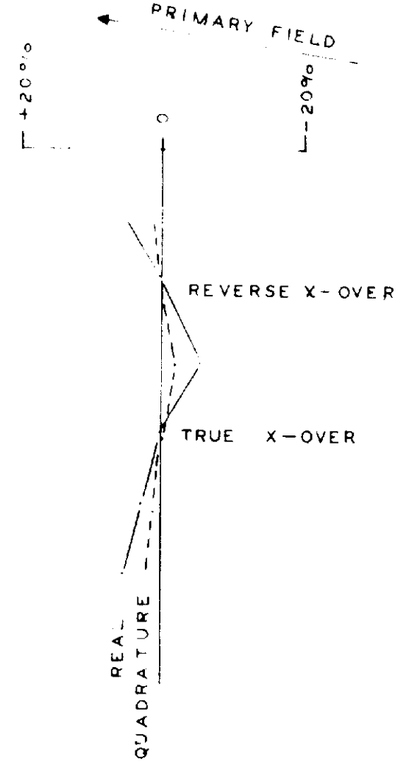
LOT 1



KEY

SCALE 1 INCH TO 1 MILES





PROFILE SCALE
1 INCH TO 20%
207 READINGS USING
STATION N.A.A.
AT 17.8 K.H.Z.

CON II
CON I

KIDD No. 1 GROUP
KIDD TWP ONT
E.M. 16 SURVEY
SCALE 1 INCH TO 400 FEET

Dave R. Alexander

HOLLINGER MINES LIMITED
TIMMINS, ONTARIO

42A11NW0563 2.384 KIDD