MAGNETOMETER SURVEY

PRICE-FRIPP TWP. CLAIM GROUP

HOLLINGER CONSOLIDATED GOLD MINES, LIMITED

AREA SURVEYED

During the period May 24th - July 7th, 1961, a magnetometer survey of 34 claims:-

P-50451 to P-50482, incl.,
and P-50598 and P-50599,
in Price and Fripp Townships, Porcupine Mining Division, was carried out. Instrument operator was R.S. Brazeau and R. Denomme acted as helper. The survey was performed with an Askania Torsion Magnetometer Gfz with a sensitivity of 13.21 gamma per scale division.

The magnetic readings are plotted and contoured on the following map: "Magnetometer Survey, Price and Fripp Twps., Ontario".

The main base station was established at chainage 0 + 00 on Picket Line 0, and base stations were also located at the intersections of the picket lines and No. 1 baseline. The base stations are shown in red on the map.

Lines were cut at 400' spacings, and stations were located at 100' intervals.

A total of 35.6 miles of lines were cut and the number of stations read totals 1609.

RESULTS OF THE SURVEY AND CORRELATION WITH GEOLOGY

The accompanying geological report and map shows that the central and western part of the property is underlain by andesite, fine to coarse grained, schistose to massive hornblendite, with interlayered metasediments, and paragneiss.

West of No. 1 baseline, and trending southeastwards from
Katoshaskepeko Lake, is a sill-like body of ultrabasic rock now altered to massive serpentinite, talc serpentine schist and serpentinous chlorite schist. Within the south part of the claim group, small irregular masses of granite and migmatite occur, and the northeastern part of the group appears to be underlain by granite. Several north-south trending quartz diabase dikes intrude the earlier rocks.

The normal background magnetic level lies below 43,000 gamma, with a large proportion of this below 42,500 gamma.

A study of the accompanying geological map shows that these areas of normal magnetic intensity are underlain by granite, andesitic lava, and metamorphosed equivalents, hornblendite, paragneiss, and quartz diabase.

**ANOMALY 1**

Trending southward along the east side of Katoshaskepeko Lake, passing through XL-12 from 400° W to 1600° W, and extending southward to XL-64, is a zone of magnetic intensity between 43,000 and 44,000 gamma. Occasional peaks above 44,000 gamma occur. The center line axis of the zone would cross the picket lines as follows:

XL-0 @ the center of Katoshaskepeko Lake; XL-4 @ the centre line of the Lake; XL-12 @ 1000° W; XL-16 @ 950° W; XL-20 @ 900° W; XL-24 @ 800° W; XL-28 @ 750° W; XL-32 @ 1100° W; XL-36 @ 1000° W; XL-40 @ 950° W; XL-44 @ 850° W; XL-48 @ 850° W; XL-52 @ 850° W; XL-56 @ 850° W; XL-60 @ 950° W; and XL-64 @ 950° W.

The axis of a narrow subsidiary anomaly extends through XL-36 @ 1700° W; XL-40 @ 1650° W; XL-44 @ 1500° W; XL-48 @ 1300° W; and XL-52 @ 1200° W. A peak of 48,272 gamma occurs on the subsidiary anomaly at 1700° W on XL-36.

Inspection of the geological map shows that this anomaly coincide with a mapped ultrabasic sill, now highly serpentinized and containing
exsolved magnetite. The narrow subsidiary anomaly coincides with a tongue of the ultrabasic body surrounding a hornblendite inclusion.

ANOMALY 2

The axis of this linear magnetic anomaly crosses XL-80 @ 150' W of No. 1 baseline; XL-84 @ 200' W; XL-88 @ 250' W; XL-92 @ 200' W; XL-96 @ 200' W; XL-100 @ 200' W; and XL-104 @ 250' W. The largest part of the anomaly lies between 43,000 and 44,000 gamma. A peak of 46,929 gamma occurs at 200' W on XL-80 and another of 52,462 gamma at 0 + 00' on XL-88. In the vicinity of XL-84 and 88, outcrops of hornblendite, migmatite and quartz diabase coincide with the anomalous zone. These rock types do not give rise to anomalies elsewhere on the claim group, so the actual cause of the above normal magnetic intensity is unknown.

ANOMALY 3

The axis of this major anomaly occurs as follows:-

XL-8 @ 2750' W; XL-12 @ 2750' W; XL-16 @ 2850' W; XL-20 @ 3100' W; XL-24 @ 3050' W; XL-28 @ 3000' W; XL-32 @ 3100' W; XL-36 @ 3150' W; XL-40 @ 3050' W; XL-44 @ 3100' W; XL-48 @ 3100' W; XL-52 @ 3150' W; XL-56 @ 3175' W; XL-60 @ 3250' W; XL-64 @ 3150' W; XL-68 @ 3100' W; XL-72 @ 2975' W; XL-76 @ 2900' W; XL-80 @ 2950' W; XL-84 @ 2950' W; XL-88 @ 2500' W; XL-92 @ 2250' W; XL-96 @ 2250' W.

This anomalous zone consists of a number of linear magnetic closures with parallel axes, and coincides with a zone of hornblendite, with which occur numerous thin interlayered bands of metasediments. Some of the metasedimentary bands consist of banded cherty magnetic iron formation. Iron formation seems to grade into non-magnetic metasediments in places. The iron formation in places contains pyrite. The anomalous magnetic intensities on the zone are caused by the layers of magnetite or sulphide-bearing iron formation. The offset between XL's 84 and 88, is probably due to faulting.

A narrow subsidiary anomaly diverges from the main zone at 2300' W
on XI-32, and extends intermittently to 1600' W on XL-76. This coincides with a thin band of banded iron formation.

A diabase dike mapped at 5100' W on XI-36, 5000' W on XL-32, and 4900' W on XI-28, gives rise to a magnetic anomaly with intensities up to 43,685 gamma. Similarly on XI-16 @ 4000' W, XL-12 @ 3800' W, and XI-8 @ 3700' W, a narrow quartz diabase causes a linear magnetic closure with the highest intensity being 41,168 gamma.

ANOMALY 4

This broad, rather irregular zone of magnetic intensities lying for the most part between 43,000 and 44,000 gamma, with occasional peaks above 44,000 gamma, does not coincide with areas of rock outcrops. The cause is unknown and the surrounding geology suggests that the zone might be underlain by granite. The general similarity to Anomaly 1 suggests the possibility of an ultrabasic intrusive. The axis of the anomalous zone occurs roughly as follows:

XI-28 @ 700' E of No. 1 Baseline; XI-32 @ 500' E; XI-36 @ 600' E; XI-40 @ 600' E; XI-44 @ 700' E; XI-48 @ 800' E; XI-52 @ 900' E; XI-56 @ 1000' E; XI-60 @ 1300' E; XI-64 @ 1500' E; XI-68 @ 1700' E; XI-72 @ 1750' E; XI-76 @ 1750' E; and XI-80 @ 1900' E.

Other isolated subsidiary peaks do not coincide with rock outcrop areas.

G.D. Robinson.
REPORT 1

ELECTROMAGNETIC SURVEY

PRICE-FRIPP TOWNSHIP GROUP

HOLLINGER CONSOLIDATED GOLD MINES, LTD.

AREA SURVEYED

During the period May 24th - July 7th, 1961, an electromagnetic survey of 34 claims:

- P-50451 to P-50482, incl.;
- and P-50598 and P-50599,

in Price and Fripp Townships, Porcupine Mining Division, was carried out.

Instrument operator was R.S. Brazeau and R. Denomme acted as helper.

A total of 35.6 miles of line were cut and 1609 stations read.

TYPE OF INSTRUMENT USED

The survey was performed with a Ronka Mark III dual frequency electromagnetometer which indicates the in-phase and out-of-phase components of the resultant electromagnetic field. Low frequency is 876 c.p.s. and high frequency is 2400 c.p.s. With this instrument, the in-phase and out-of-phase dials are calibrated to indicate the per cent variation of the in-phase and out-of-phase voltages of the received signal from the voltage of the primary signal.

In this particular survey, the coil separation was 200', and at each station the in-phase and out-of-phase components were determined for the high frequency only, since this is the most sensitive. The percentages, or dial readings, were plotted directly on the map, at the positions corresponding to the center of the cable.

The in-phase to out-of-phase ratios were calculated for conductive areas by dividing the % departure of the in-phase from the normal background
by the % departure of the out-of-phase from the normal background.

RESULTS OF THE SURVEY

Examination of the accompanying map shows that except for the conductor to be discussed as Anomaly 1, west of No. 2 Baseline, the property is non-conductive. In a few instances, variations in the in-phase are noticeable, but not accompanied by variations in the out-of-phase, so these are probably caused by a slight misorientation of the coils due to topography. In a few other instances, as at 2900' W of No. 1 Baseline on XL-52, a small positive in-phase corresponds to a small negative out-of-phase. This is characteristic of the type of anomaly obtained over magnetite bearing rocks. Examinations of the geological map, shows that at this point, there occurs a thin band of magnetic iron formation.

ANOMALY 1

This axis of this anomaly crosses the picket lines as follows: -

XL-8 @ 2850' W of No. 1 Baseline; XL-12 @ 2900' W; XL-16 @ 2850' W; XL-20 @ 2850' W; XL-24 @ 2900' W; and XL-28 @ 2900' W.

In-phase : out-of-phase ratios were determined as follows: -

XL-8, Ratio = 4.0; XL-12, Ratio = 1.8; XL-16, Ratio = 4.5; XL-20, Ratio = 5.7; XL-24, Ratio = 7.4.

The above ratios are indicative of the presence of sulphides.

An examination of the geological map shows that the conductor axis coincides with a thin band of iron formation, known to contain massive pyrite on XL-16. The cause of the conductor is the pyrite bearing banded iron formation.

G.D. Robinson.
ELECTROMAGNETIC SURVEY
PRICE-FRIPP TOWNSHIP GROUP
HOLLINGER CONSOLIDATED GOLD MINES, LTD.

AREA SURVEYED

During the period May 24th - July 7th, 1961 an electromagnetic survey of 34 claims:

P-50451 to P-50482, incl.,

and P-50598 and P-50599,

in Price and Fripp Townships, Porcupine Mining Division, was carried out.

Instrument operator was R.S. Brazeau and R. Denomme acted as helper.

A total of 35.6 miles of line were cut and 1609 stations read.

TYPE OF INSTRUMENT USED

The instrument used in this survey is the Sharpe SE-200 unit, manufactured and distributed by Sharpe Instruments, Ltd. It is a light-weight, portable, two-man device designed to compare the relative strength of anomalous eddy current signals to the signals received directly from the transmitter, by determining the amount of tilt in degrees the combined signal has from the vertical or horizontal. The magnitude of these eddy currents will be indicative of the degree of anomalous electrical conductivity which is present.

The SE-200 instrument is composed essentially of two light circular coils, one being the transmitter with power supply, which broadcasts an audio signal of approximately 1000 cycles per second, and the other being the receiver with headphones, amplifier and clinometer, which indicates the null position and the amount of tilt in degrees of the resultant electromagnetic field, as well as the null width of signal.
In the survey under discussion, the "broadside" or "parallel line" method of surveying was used with the transmitter plane vertical.

RESULTS OF THE SURVEY

With the exception of Anomaly 1, which will be described below, the survey has not indicated any anomalous conductivity on the property.

ANOMALY 1

The axis of this anomaly crosses the picket lines as follows:

XL-16 @ 2850' W of No. 1 baseline; XL-20 @ 2850' W; XL-24 @ 2850' W.

On XL-16, the conductor is represented by a true cross-over with a maximum tilt angle of 17°. On XL-20, West dips up to 6° were recorded but there is no cross-over. On XL-24, a true cross-over occurs, with maximum tilt angle of 15°. On XL-28, at 2800' W, a tilt angle of 4° occurs and on XL's 8 and 12 "no nulls" were obtained with the minimum signal position at 0°, at 2800' West. These weak indications probably represent extensions to the strong central part of the conductor.

Comparing this conductor with that indicated by the Ronka survey (Report No. 2) it is apparent that the two coincide and are caused by the same pyrite-bearing banded iron formation.

G.D. Robinson.
REPORT NO. 4

GEOLOGICAL SURVEY

PRICE-FRIPP TOWNSHIPS GROUP

HOLLINGER CONSOLIDATED GOLD MINES, LTD.

AREA SURVEYED, LOCATION, ACCESSIBILITY

During the period June 22nd to July 29th, 1961, a geological survey of the following 34 claims was carried out:

P-50598 and P-50599,

and P-50451 to P-50482, inclusive.

The claims are located in Price and Fripp Townships, Porcupine Mining Division, Ontario, and registered in the name of Hollinger Consolidated Gold Mines, Ltd., Timmins, Ontario. The survey is being submitted as assessment work by the Company.

The claim group is accessible by aircraft from South Porcupine airbase, at a distance of 16 air miles. A jeep road from Timmins passes along the east side of the Grassy River, one mile to the west.

PERSONNEL EMPLOYED ON THE SURVEY

A two-man geological mapping party was employed. John L. Kirwan, B.Sc., (Carleton) was party leader and responsible for the mapping. John Shaw, a third-year geology student at Queen's University, was employed as assistant.

RESULTS OF THE SURVEY

The results of the geological mapping are shown on the accompanying map "Geology of the Price-Fripp Claim Group", Scale 1" = 400 feet.

Traversing was carried out on picket lines spaced 400' apart, with stations at 100' intervals.
## Table of Formations

### Late Precambrian:

- **D** = Quartz diabase dikes.

### Algoman:

- **G₁** = Fine grained (splatitic) granite, with minor medium-grained granite.
- **G₂** = Syenite, syenite gneiss, some paragneiss and quartz syenite.
- **G₃** = Migmatite, injection gneiss and tectonic breccias

### Algoman or Pre-Algoman:

- **Sp** = Massive serpentinite, minor diorite, hornblende, talc serpentinite and serpentinosous chlorite schist.

### Early Precambrian:

- **QP** = Quartz or feldspar-rich paragneiss.
- **IF** = Banded, cherty, magnetic iron formation, grading into **CH**.
- **CH** = Banded chemical, detrital and tuffaceous metasediments, chiefly cherts, hornblendites, and feldspathic rocks.
- **H** = Hornblende schist **H₁**, feldspathic hornblende schist **H₂**, massive varieties of **H₁** and **H₂** (**H₃ & H₄**), banded hornblende, **H₅**.
- **A** = Andesite, **A₁**; fine-grained hornblendite or hornblende schist, **A₂**; fine-grained chloritic schist, **A₃**; fine-grained feldspathic hornblende schist, **A₃a**; well-banded fine-grained chloritic and hornblende schists, **A₄**; undifferentiated chlorite, biotite, sericite, epidote, hornblende assemblages, **A₅**.

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## Early Precambrian

### Andesite and Related Rocks

This unit consists of very fine grained massive and schistose rocks, sometimes showing pillow structures and usually composed mainly of hornblende. These rock types are designated on the map by the symbol **A₁** (massive andesite), **A₂** (fine-grained hornblende or hornblende schist),
A3a (fine-grained feldspathic hornblende schist), and, where altered varieties were encountered, A3 (fine-grained chloritic schist), A4 (well-banded fine-grained chloritic and hornblendic schists) and A5 (undifferentiated chlorite, biotite, sericite, epidote, hornblende assemblages, fine-grained). These rocks which represent the less strongly metamorphosed volcanics occur as discontinuous zones within the more highly altered material. Some of these rocks do, however, represent sills.

**Hornblendites**

These rocks are the highly metamorphosed equivalents of the "andesites" and consist of similar mineral assemblages but in grain sizes ranging up to one inch. Also, many of the coarser varieties are schistose and some contain pink feldspars so that they appear to be syenites. The varieties noted are hornblende schist (H1), feldspathic hornblende schist (H2), the massive types of H1 and H2 (H3 and H4) and banded varieties of H1 and H2 (H5).

**Sedimentary Rocks and Tuffs**

Well-banded, sometimes crenulated chert-bearing sedimentary rocks are common. The varieties are: CH -- bands of chert, hornblendite or very fine-grained feldspars (the cross-bedding seen in the field at one location may indicate that these are altered siltstones and not chemical precipitates, although the crossbeds were questionable); CR -- the same except that the weathered surface was rusty; and IF, which is the same except that bands of magnetic iron oxides or sulphides, or both, are present.

**Paragneisses**

Fine-grained quartz-rich and feldspar-rich paragneisses are apparently derived from any or all of the above rock types. Degree of metamorphism increases toward the southern end of the claim group, as does the quantity of paragneiss. The sedimentary rocks, in which quartz is abundantly present are the first to have changed (although these are continued, on the
map, through the paragneisses where possible) but the quartz-poor volcanics were altered later, probably by the introduction of quartz by the granites. At the extreme south of the area the paragneisses are so similar to granite in appearance that the distinction is arbitrary.

**ALGOMAN OR PRE-ALGOMAN**

**Ultrabasics**

Medium-grained serpentinite, presumably altered dunite, outcrops in a long depression, together with minor amounts of fine-grained diorite, medium to coarse-grained hornblendite, and talcose or chloritic serpentinite, on the northeast central part of the area, around Katoshaskepeko Lake. The band of ultrabasic peters out about half-way down the claim group, as does the associated depression and weak magnetic anomaly. However, similar magnetics appear over another depression along the eastern part of the area, in a region of no outcrop, possibly representing the continuation of the intrusives.

**ALGOMAN**

**Granites**

The northeastern part of the area is underlain by much aplitic granite. Southward, large outcrops of granite appear, also the fine-grained aplitic type. Normal, medium-grained granite is rare and occurs mainly in the south, in the interstices of tectonic breccias and in migmatites (both indicated $G_3$). The breccias are made up of pebbles of all sizes, of numerous rock types (independent of country rock) and usually rounded.

It would appear that the pebbles travelled some distance in order to produce the rounding and variety, possibly being injected with the granite along a fault plane, which would have produced the breccia in the first place. Some of the granites may be paragneisses, as may some of the syenite which outcrops near the ultrabasic. These are indicated on the map as $G_2$. 
LATE PRECAMBRIAN

Diabase

The locations of numerous, north-trending dikes of normal, fine to coarse-grained diabase may be seen on the accompanying map.

STRUCTURE

Numerous volcanic pillows show that the tops of the beds are toward the east. This is verified by a top determination based on current bedding. The beds are not overturned and dip is eastward, therefore, a syncline must exist towards the east. If the interpretation of drag-folds is to be trusted, then the nose of the syncline is southward (see drag-fold symbols on the map). However, the apparent plunge of the fold is southward, as shown by the drag-folds, jointing and lineations, therefore it appears that the fold axis has been overturned.

Northeast of Katoshaskepeko lake the pillows in one outcrop face westward, suggesting a synclinal axis down the lake. This may form a structural control for the serpentinite.

A few small faults were observed in individual outcrops, but only one large fault is inferred. In the southwest part of the area a bed of iron formation is offset several hundred feet and a fault is postulated to be the cause. However, much granite has swelled the rocks of that area and the displacement may have been produced by the granite. Breccia in the area supports the fault hypothesis and the granite may have come up along the fault. A prominent valley also occurs in the area.

ECONOMIC GEOLOGY

Representative samples of several zones of quartz stringers were assayed. All gave nil gold.

A sample of pyritiferous iron formation from 2900' West of No. 1 Baseline on XI-29 gave nil gold and 0.97% zinc. The sample came from an old pit.
At 3950 West of No. 1 Baseline on XI-36, small pods of galena occur in a two-inch zone of white pegmatite on a cliff face.

All of the iron formations contain small bands of ore-grade magnetite. These are not wide nor plentiful enough to be of economic significance.

**SUMMARY OF EXPLORATION**

Following the line-cutting on the group, magnetometer, in-phase and out-of-phase EM, and vertical loop EM surveys were carried out over the whole group. During the geological mapping program, many samples of various rock types were taken and assayed, but nothing of commercial significance was encountered.

The one good conductor extending from XI-8 to XI-28 appears to be caused by barren pyrite (except for a small amount of zinc) in iron formation. This conductor should be tested further, where covered, by trenching, pack-sack diamond drilling and sampling.

John L. Kirwan

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Timmins, Ontario

To

Mr. D.P. Douglas,
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