REPORT

ON

GEOLOGICAL AND GEOPHYSICAL EXPLORATION PROGRAM

ON

MASSEY TOWNSHIP PROPERTY

by

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Timmins, Ontario

October 1, 1991

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INTRODUCTION

The following is a report on an exploration program, which was carried out on a 240 acre property, in the northwest part of Massey Township in the Porcupine Mining Division during the period of July 14 to September 19, 1991.

The property was staked subsequent to the preliminary phase of the program, which consisted of prospecting along the lower zone of the Kamiskotia Gabbroic complex, in the western half of Massey Township. This was done by using a number of old lumbering roads leading off a good secondary road which connects to Highway 101 about 30km to the east.

It has been established that the claim block straddles the contact between the lower zone of the intrusive and its lower contact breccia, and contains three airborne electromagnetic anomalies near or on this contact. One of these is an 11-12 channel conductor.

Ground electromagnetic (Max-Min) and magnetometer surveys were carried out along north-south control lines, along with some detail work in one of the anomalous areas. Geological mapping was done over the grid using the control lines. At least one anomalouss area was detected, which warrents further examination for both geophysical and geological reasons. Several geologists including

John L. Kirwan were consulted in regard to interpretation of data obtained in these surveys.

This report discusses the geology of the general area, based upon a thesis submitted to the University of Toronto by C. Tucker Barrie in 1990, which includes the Kamiskotia Gabbroic complex, and the local geology as well as the results of the exploration programs carried out on the property.

REGIONAL GEOLOGY (see Regional Geology Map)

The Kamiskotia Gabbroic complex is a large intrusive sill of late Archean age, whose center lies about 32km west of the city of Timmins, at the western end of the Abitibi greenstone belt, in Northeastern Ontario. The intrusive covers a surface area of about 179km^2 and is believed to have a thickness of several kilometers. It has a cap zone of granophysic rocks of intermediate to felsic composition, and is underlain by metavolcanic flows and tuffs of mafic composition, the top of which is a cherty oxide-sulfide iron formation (Carscallen assemblage). Four tonalite to granodiorite plutons have beem emplaced into the base or margins of the sill during its crystallization period.

The gabbroic complex has three stratigraphic units below the cap zone. These are:

a) an upper zone of locally layered anorthosite gabbro containing an abundance of iron-titanium oxides and hornblende gabbro.

b) a middle zone of norite gabbro and anorthosite gabbro with sporadic iron-titanium oxides.

c) a lower zone of locally layered troctolite, olivine norite and olivine gabbro.

A large number of diabase dikes, which strike from 340° to 350°, cross the area, and extend southward to the Destor Fault zone.These dikes can be traced on aeromagnetic maps and air photographs, where they show up as pale linears. The dikes fill old fault planes which have left-handed displacements.

The lower zone and its contact breccia are exposed along the southern and western margins of the intrusive mass, where the stratigraphic succession is near vertical and faces north and east.

It crosses the south boundary of Massey Township in a northerly direction, then swings to the northwest crossing most of the western part of the township.

LOCAL GEOLOGY (see Geology of Massey Property)

The claim block lies across the contact between the lower zone of the intrusive and its lower contact breccia, at its northwestern end. Here, the overburden is quite thin, there being a fair number of outcrop areas on the property. The most prominant of these is a long ridge, which crosses the central point of the property near its medial line. This is caused by a large diabase dike, about 50 meters wide, which strikes between 345° and 350°, and has a near vertical dip. Two other similar dikes are present, one just inside the east boundary and the other along the west boundary.

Both contacts of the central dike were located on surface in several places between the base line and 400N. The diabase is relatively unaltered except for some saussuritized "goose eggs", and has the typical aphanitic texture in the chill zones, near the contacts. There are well developed mylonite zones, particularly along the eastern contact, with felsic layers containing pink feldspar and biotite and gneissic material parallel the dike's contact. It is apparent that this dike has been intruded into a large fault zone with a left handed displacement of several hundred meters, and that the dike itself has been displaced (also left handed) some 30 or 40 meters by east-west faults, in at least three places.

Several, less prominent outcrop areas contain a medium to coarse grained, equigranular rock made up of a chalky white feldspar matrix containing black hornblende crystals, in approximately equal proportion, with small amounts of greasy intertitial quartz. This unit is believed to represent the lower part of the lower zone of the Kamiskotia Gabbroic complex and is refered to, in this report, as "metagabbro". Metamorphism of pyroxenes to hornblende and sometimes to tremolite, and of anorthite to albite and zoisite appear to have occured. the metamorphism is most intense near the contact with the basal breccia and diminishes away from the contact, the rock grading into gabbro, containing anorthite, pyroxene and minor olivine.

Lying in contact with the metagabbro, and stratigraphically below it, is the lower contact breccia. It is exposed in several places, in the western part of the property. This unit consists of a metagabbro matrix containing large numbers of inclusions of various types and sizes. Fragments of granitic gneiss, diorite, metavolcanics from mafic to felsic, and hornblende gneiss are present. The contact dips about 80° to the east and has been observed in two places, just north of the base line. Near the contact, the breccia has undergone a considerable amount of alteration, particularly hematization, for some 10 to 15 meters.

There are several exposures of metavolcanic rocks in the northwest corner of the claim block. These are believed to be part of the lower mafic volcanics, which underlie the sill, despite the fact that most of the rocks appear to be felsic. There is a large fragmental member along the southern part of this formation, which actually might be part of the lower contact breccia. Because of the steep easterly dip of the observed contacts, it is believed that this portion of the sill has undergone isoclinal folding and that the metavolcanics are part of a "window" where the sill has been penetrated by erosion.

GEOPHYSICS

During the period of August 12 to August 16, a horizontal loop Max-Min, electromagnetic survey was carried out over the claim block, along north-south control lines, 100 meters apart. The frequencies employed were 444 HZ, and 1777 HZ, at a 100 meter seperation. The survey, conducted by Timmins Geophysics, detected an anomalous zone at 15 north on line 475 W and at 460 W on the base line. The conductivity is moderately strong, indicating a zone about 5.0 meters wide at a depth of from 25 meters to 40 meters. A second zone was detected at 175 north and 250 north on line 75 W. This zone apparently runs north south, parallel to the control line. Therefore, it cannot be interpreted. The data is presented on the sheet entitled "HLEM Survey".

A magnetometer survey was done on the property from August 19 to August 23, using a fluxgate instrument, which measures vertical field intensity to a precision of + or - 5 gamma. Unfortunately, the north-south control lines were the wrong choice since the general strike is almost in the same direction. However, the survey was useful in locating some of the contacts between lithological units and a magnetic high which coincides with one of the electromagnetic anomalies described in the previous paragraph. (see "Magnetics".)

DETAIL WORK

From August 23 to August 30, a detail geophysical program was carried out over the anomalous area along east-west compass lines at 100 N, 50 N, OO, 50 S, 100 S and 150S. A Crane Radem unit was used with transmission from the station at Annapolis Maryland, frequency 21.4 K Hz, and magnetometer readings were taken with the fluxgate, at 12.5 meter intervals. The results of this survey show a conductor in excess of 250 meters long, displaced near is center by an east-west fault. North of the base line the conductor lies between 475 W and 575 W, but south of the base line, it lies between 375 W and 475 W. The data was Frazer filtered, and is presented on the sheet entitled "V.L.F. Survey, Detail". It appears that the Max-Min traverses were conducted over the weakest part of the anomaly with the strongest conductivity lying between lines 375 E and 475 E, from the base line to 150 m south.

The magnetometer detail shows magnetic highs of from 1000 gamma to 2000 gamma, with corresponding lows on both sides. These highs coincide closely, but not exactly with the V.L.F. conductor. The magnetics, which are shown on the sheet entitled 'Magnetic Survey, Detail" also show clearly that a displacement of some 35 meters has taken place near the base line. It is at the point of displacement in the conductor that the Max-Min traverse passed.

Further surface prospecting was done subsequent to the detail Geophysics. Two small exposures of a gossan zone, which parallels the conductor axis, some five or six meters to the east, were uncovered, one at 50 N and the other at 25 N. This zone lies at the contact between the metagabbro and its contact breccia, and dips about 80° east. Samples from the gossan, which appears to consist mainly of iron oxides, have been sent for analysis of trace elements. Also, a small outcrop has been uncovered at 462 west near the base line, near the point of displacement of the conductor axis, indicated by the magnetics. The outcrop consists of contact breccia and contains disseminated sulfides in the matrix; these include pyrite, chalcopyrite and bornite in small fractures.

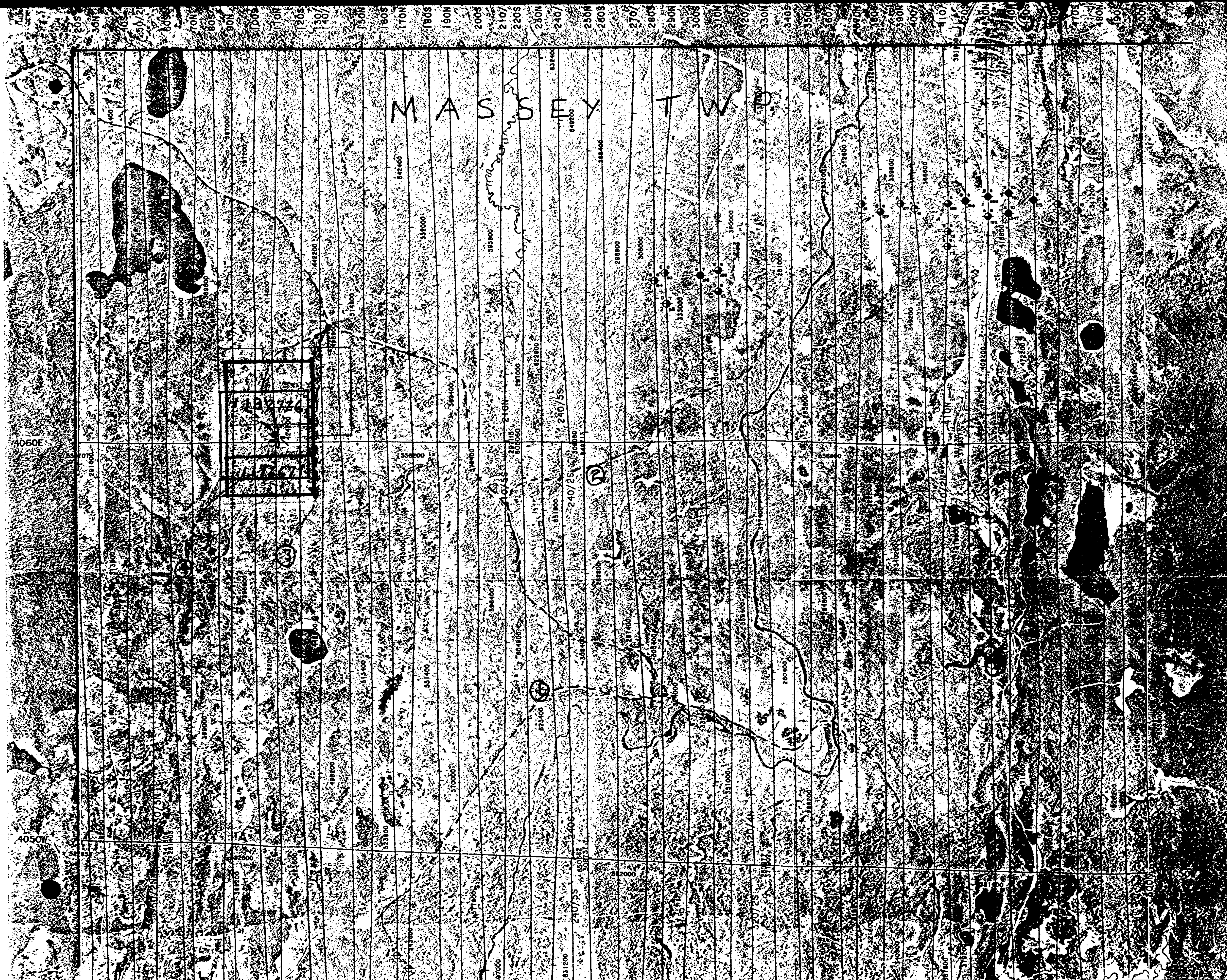
CONCLUSIONS

A zone of anomalous electromagnetic conductivity, in excess of 250 meters long, having close magnetic coincidence, has been detected and outlined, in the central portion of the property, between 100 north and 150 south. It lies within the contact breccia, about six meters west of the lower contact of the Kamiskotia Gabbroic Complex, and is completely covered by shallow overburdon. This is undoubtedly the cause of the 11-12 channel response in the airborne E-M survey of 1988. The geological environment precludes the possibility of graphite as the cause of the anomalous conductivity and suggests that the anomoly is the reflection of a sulfide body.

Large mafic intrusives, such as this one, often have nickel-copper sulfide deposits near there bases, particularly within their lower contact breccias. (for example, the North Range deposits of the Sudbury Basin). Also, there are a number of nickel-copper occurances along the southern edge of the gabbro sill, in Whiteside Township. For these reasons, it is apparent that the anomalous zone, previously described, warrents subsurface examination. Since it is unlikely that this zone has other than a single cause, it can be tested by one diamond drill hole. This hole should be collared at 50 S, 400 W, and drilled in a direction of 255° (S-75°-W), at -45° for a length of 300 feet (90 M).

Submitted by,

John R. Boissoneault P.Eng.
Geologist, Engineer



ONTARIO GEOLOGICAL SUR
GEOPHYSICAL/GEOCHEMICAL
MAP 81075

TIMMINS AREA
MASSEY TOWN

Airborne Electromagnet

APPENDIX (3)

DISTRICTS OF COCHRANE AND

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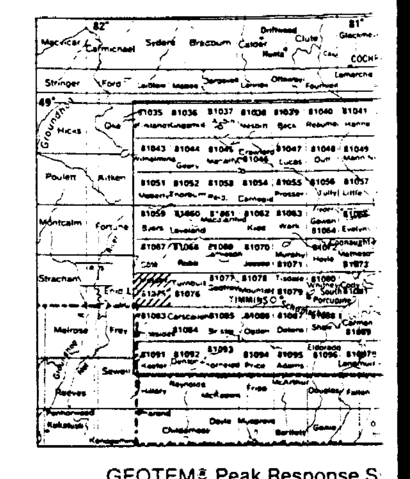
NTS References **42 A/12 42**
ODM-GSC Aeromagnetic Map 23
O.G.S. Geological Compilation Map



GEOTEM® Peak Response S

ANOMALY	DECAY INTERVAL CLASSIFICATION
	1-2 Channel (350, 450 microseconds)
	3-4 Channel (550, 670 microseconds)
	5-6 Channel (790, 910 microseconds)
	7-8 Channel (1050, 1190 microseconds)
	9-10 Channel (1350, 1510 microseconds)
	11-12 Channel (1680, 1870 microseconds)

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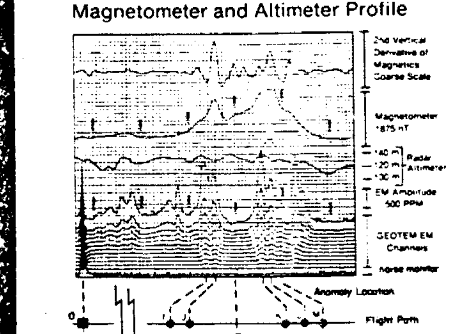

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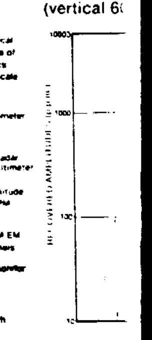
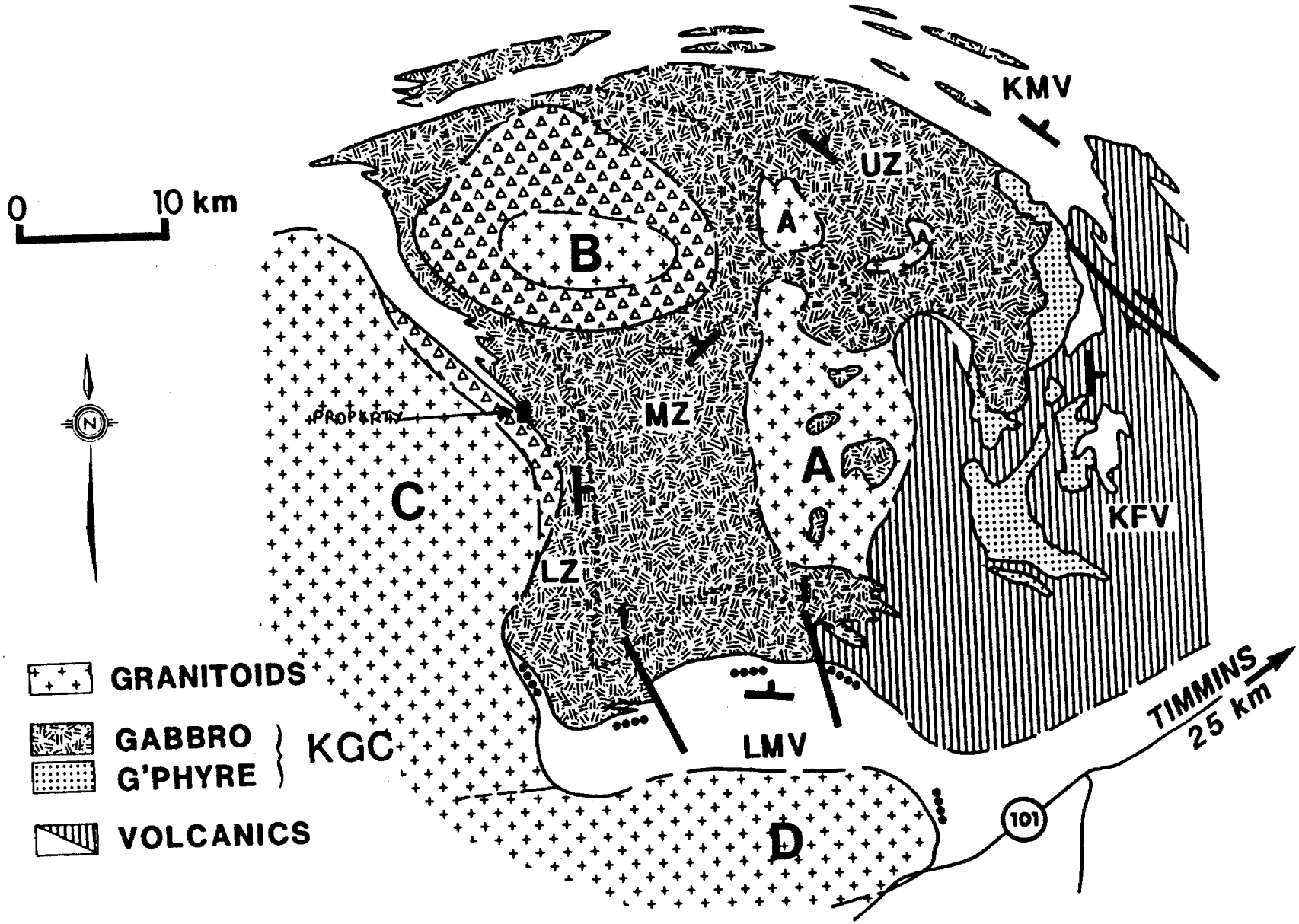


DESCRIPTIVE NOTES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MAGNETICS

COMPUTER CONTOURS

MASSEY PROPERTY

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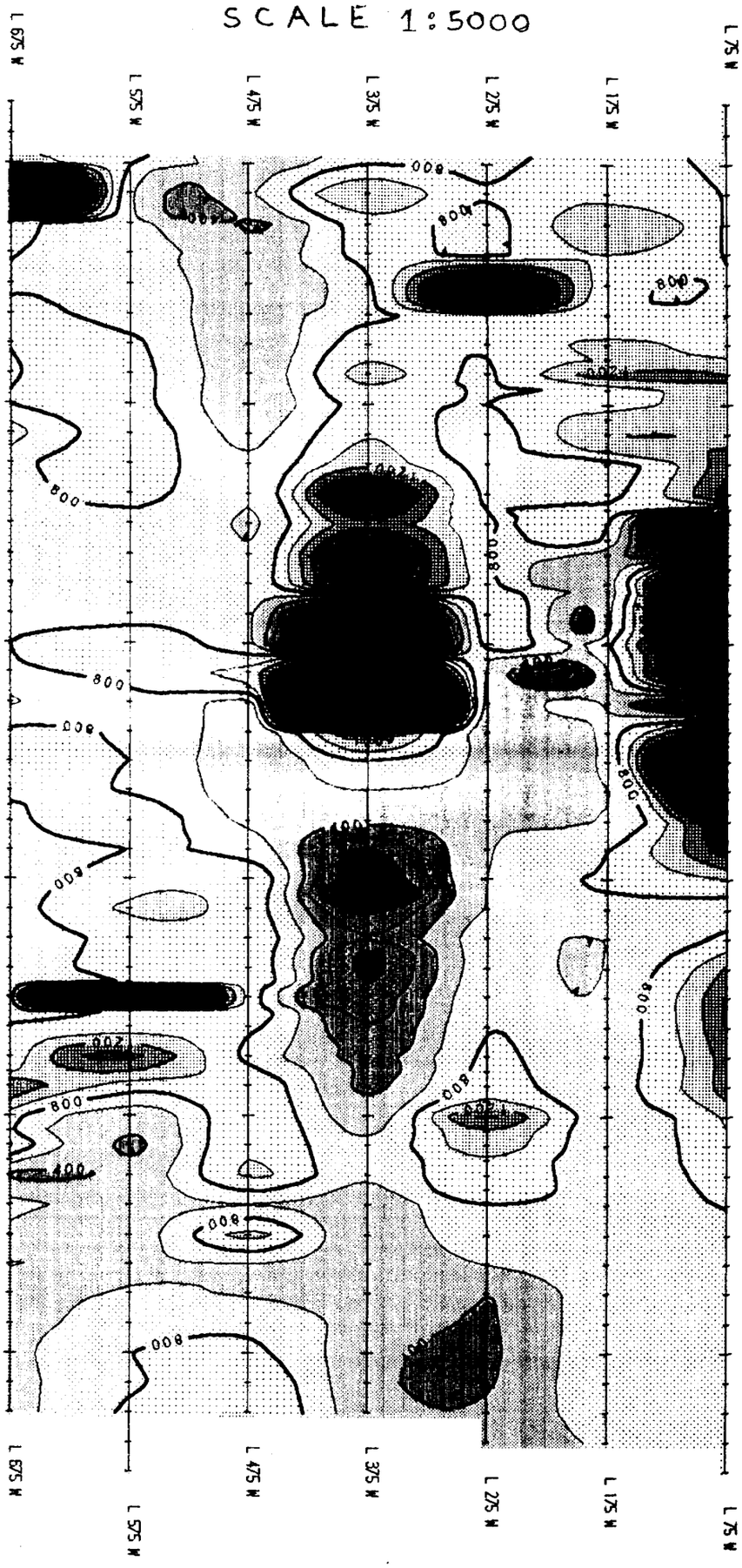


APPENDIX

APPENDIX II

EARTH RESOURCE ASSOCIATES (ERA)

1111 Government Road
Porcupine, Ontario

P.O. Box 2150,
Timmins, Ontario,
Canada P4N 7X8
705 235-2777

Old Meredith Road,
P.O. Box 985,
Centre Harbor, NH 03226
USA

603 253-6107

August 22, 1991

Mr. John Boissoneault,
670 Spruce St. N.
TIMMINS, Ont. P4N 6P3

Dear John-

Re: Massey Township, Porcupine Mining Division, Ontario,
Claims: 1182726 (4 Claim Block), 1176671 (2 Claim Block)

Thank you for the opportunity of visiting these claims, examining the outcrops, looking at the geophysical results, and searching out other pertinent data on the ground. You have asked me to express an opinion about the geological setting of the property and the economic potential of it; this letter will be an attempt to do so, but it promises to be a long one, I'm afraid.

1. AVAILABLE INFORMATION

Ontario Geological Survey Compilation Map 2205 at a scale of 1 inch to 4 miles shows the area to be underlain entirely by Intermediate Pyroclastic Rocks peripheral to a granitic body to the northeast and a gabbroic body to the southeast.

A map bearing the name of C.T.Barrie, dated 1988, at a scale of 1:200,000 is available from your own researches which shows the ground to be underlain, on its northeastern half, by the "Kamiskotia Gabbroic Complex (2706 ± 2 Ma) and Related Gabbroic Rocks"; on its southwestern part by a "Contact Intrusive Breccia Zone"; and in between these two units by a zone, in wedge form thickening to the northwest, described as "Lower Mafic Volcanic Rocks". Strikes and dips, northwest from the property show the schistosity as striking to the northwest and dipping steeply to the northeast, with lineations dipping to the northeast, except to the northeast of the property where they dip to the northwest at about 35°. See Figure 1, page 2 below.

Geological Survey of Canada Aeromagnetic Maps at a scale of 1 inch to 1 mile are available with different presentation standards:

a. the older series on which the flight lines are not shown and the data are contoured at a 100 gamma interval. These were flown by the old Dominion Gulf Company about 40 years ago. See Fig.2, page 3.
b. the newer series derived from north-south flight lines at half mile intervals and contoured at 10 gammas. See Figure 3, page 4 below.

The older maps were flown at a terrain clearance of 500 feet; the newer ones flown at a terrain clearance of 1000 feet.

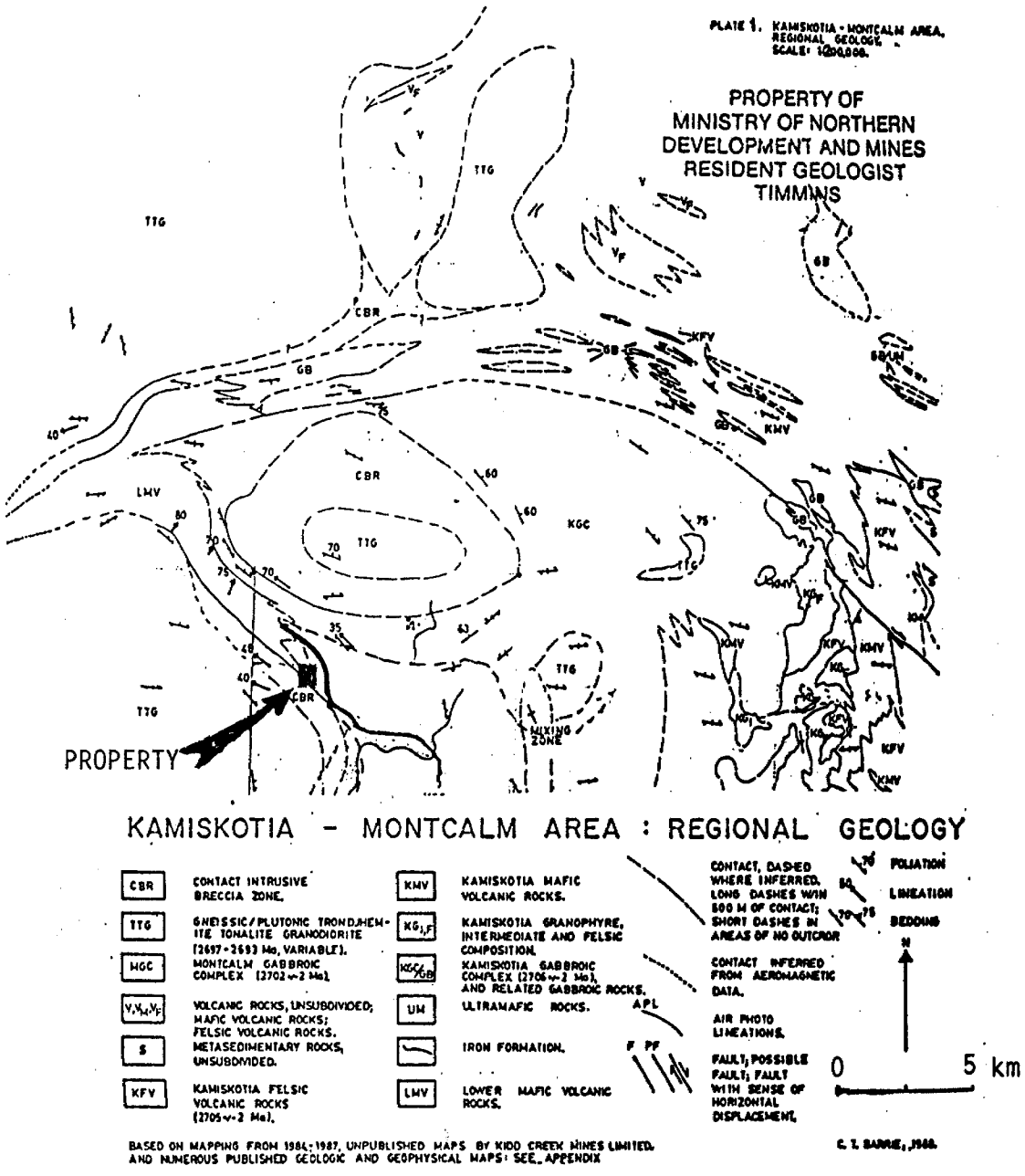


FIGURE 1

Summary Geological Map of Massey-Turnbull Area, and Northward, from the Report by C.T.Barrie, 1988

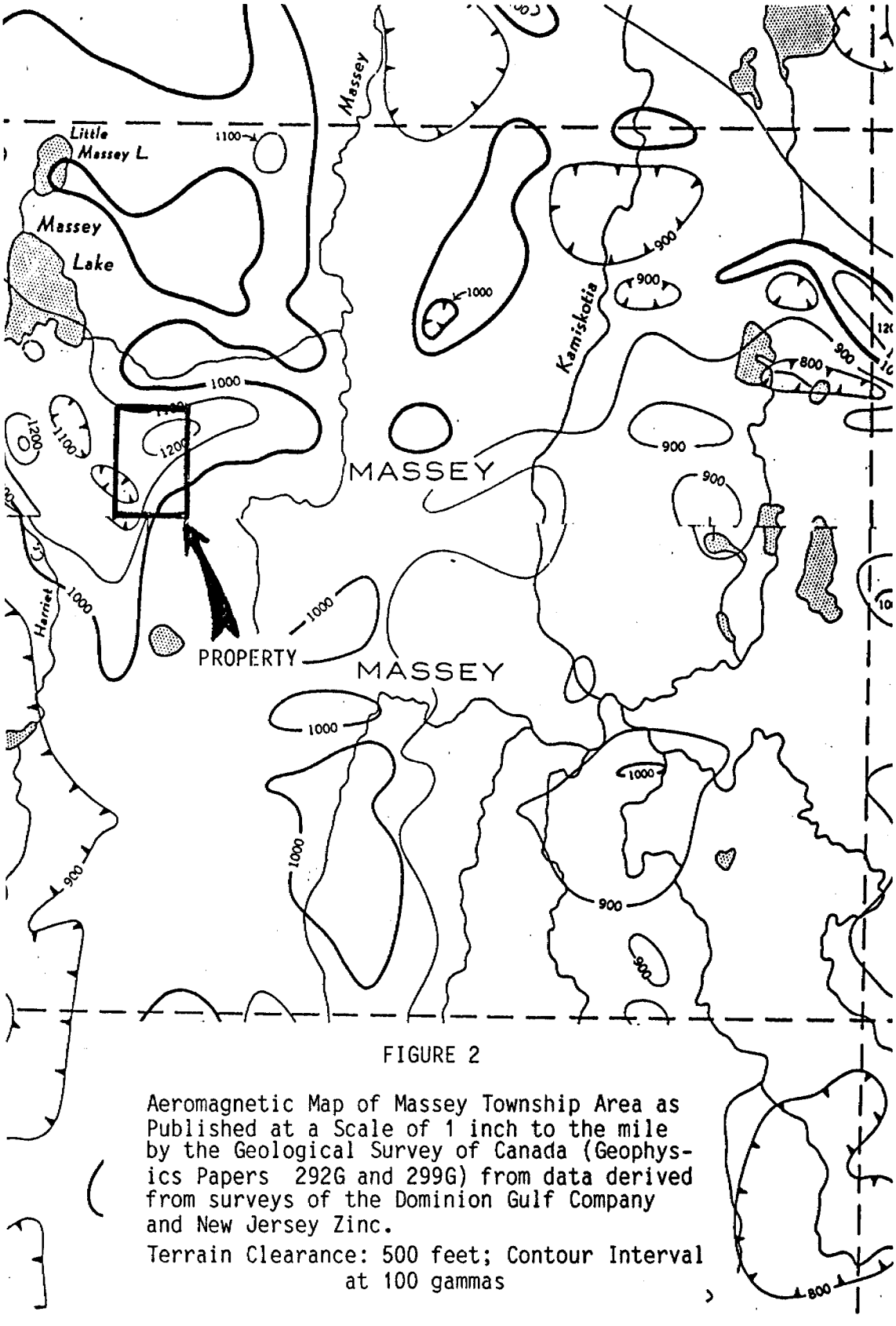


FIGURE 2

Aeromagnetic Map of Massey Township Area as Published at a Scale of 1 inch to the mile by the Geological Survey of Canada (Geophysics Papers 292G and 299G) from data derived from surveys of the Dominion Gulf Company and New Jersey Zinc.

Terrain Clearance: 500 feet; Contour Interval at 100 gammas

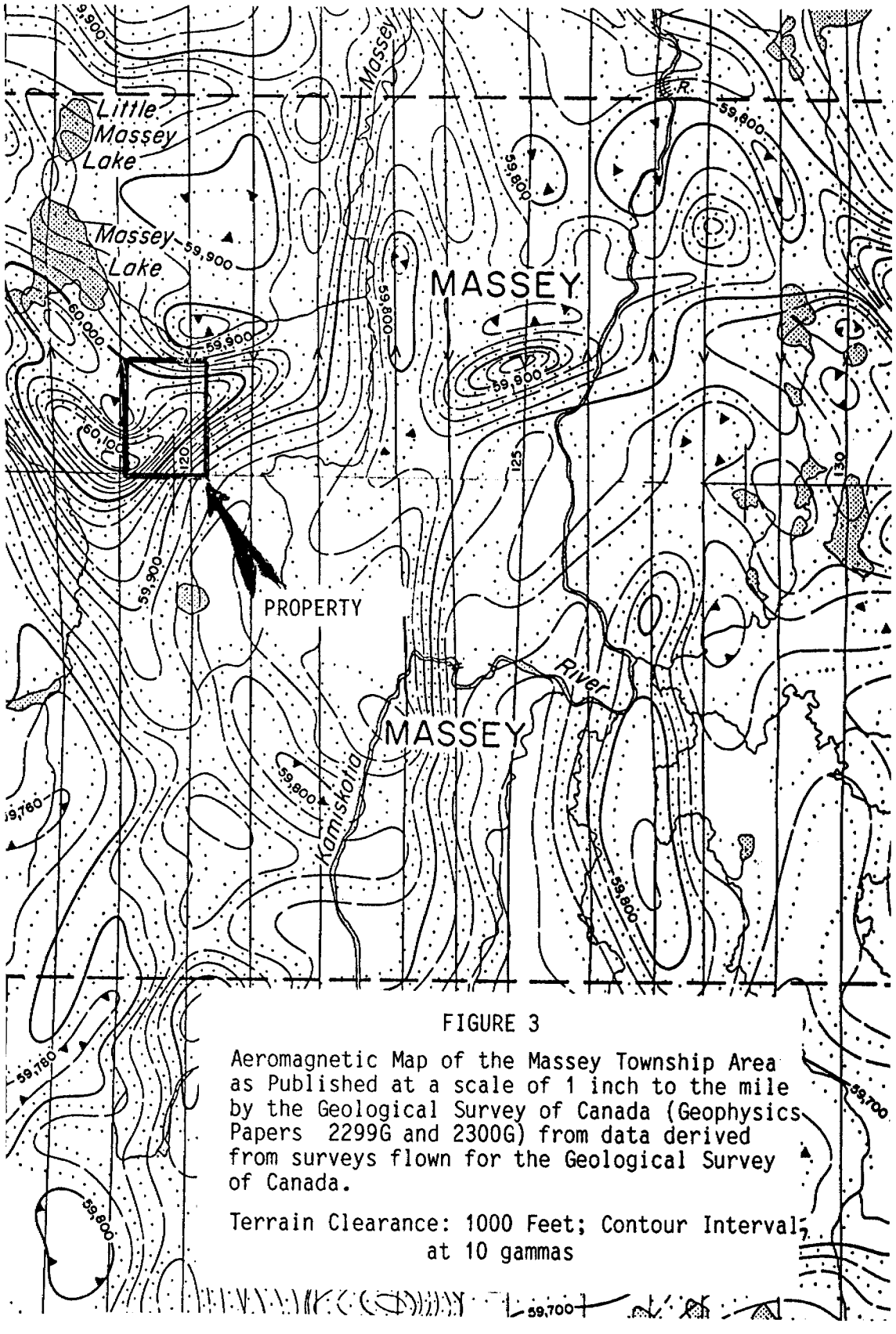


FIGURE 3

Aeromagnetic Map of the Massey Township Area as Published at a scale of 1 inch to the mile by the Geological Survey of Canada (Geophysics Papers 2299G and 2300G) from data derived from surveys flown for the Geological Survey of Canada.

Terrain Clearance: 1000 Feet; Contour Interval at 10 gammas

Ontario Ministry of Northern Development and Mines Airborne magnetic and electromagnetic surveys (combined onto Map 81075 at a scale of 1:20,000) show the present area in considerable detail. See Figure 4, page 6 below. The aeromagnetic data, which were recorded digitally, have been made available by Urquhart Dvorak (a computer graphics firm of Toronto) in various formats, of which the Second Derivative, and Second Derivative Shadowgraphic presentations are geologically the most useful. The latter is reproduced below as Figure 5, page 7. Electromagnetic responses are also indicated on Figure 5, 3 of which occur on the present claim group.

Air photograph coverage is abundantly available for the area, Figure 6, page 8 below, being an example from some years back (Photo 61-4821-61-145 of the Ontario Lands and Forests Branch).

Word done in 1991, or currently in progress on your claims includes:
a. ground magnetometer surveys,
b. ground electromagnetic (MaxMin) surveys,
c. RADEM VLF electromagnetic surveys, and
d. field geology.

On August 20 I was able to spend a day with you on the ground, examining the principal areas of outcrop and electromagnetic responses.

2. INTERPRETATION OF THE DATA

i. Aeromagnetic Maps. The older aeromagnetic data show the present claims to be on the limb of a generally east-west striking component of an otherwise ameboid magnetic body. This body terminates more or less along, or just west from, Massey Creek, from which combined aeromagnetic and physiographic data a north-south fault may be interpreted.

The younger aeromagnetic data (Figure 3 above) show more detail: the east-west unit in the vicinity of the claim block is more broken up, and forms an open horseshoe shape, with its two arms pointing northwestward and northeastward, and the suggestion of at least one north-south fault being present. What might be called the Massey Creek Fault is well-defined, with strong north-south isomagnetic lines and a coincident "low", and north-south ridges appear eastward which are probably due to diabase dikes. Such dikes are known to be abundant in this area west from Timmins and have been described elsewhere, including by the present writer (Kirwan, J.L., 1968: The Mattagami River Fault System. CIMM Annual General Meeting, Montreal).

The most recent aeromagnetic data (Figure 4 above) show the ground in yet more detail than the above surveys. The aeromagnetic units are broken into several distinct bodies, strongly suggesting that several north-south faults are present and, southward from the claim group, into aeromagnetic valleys and ridges which suggest the presence of both north-south faulting and similarly-oriented diabase dikes.

ii. Electromagnetic Maps. These show the presence of at least 2, and perhaps 3, areas of bedrock conductivity. This conductivity may be due to the presence of sulfide mineralization, graphitic shears, or ionized areas of fault gouge. These possibilities will be discussed below.

iii. Air Photographs. The air photograph reproduced below as Figure 6 shows several sets of whitish north-south oriented linears which are almost certainly due to diabase dikes in the area. On the claim block itself,

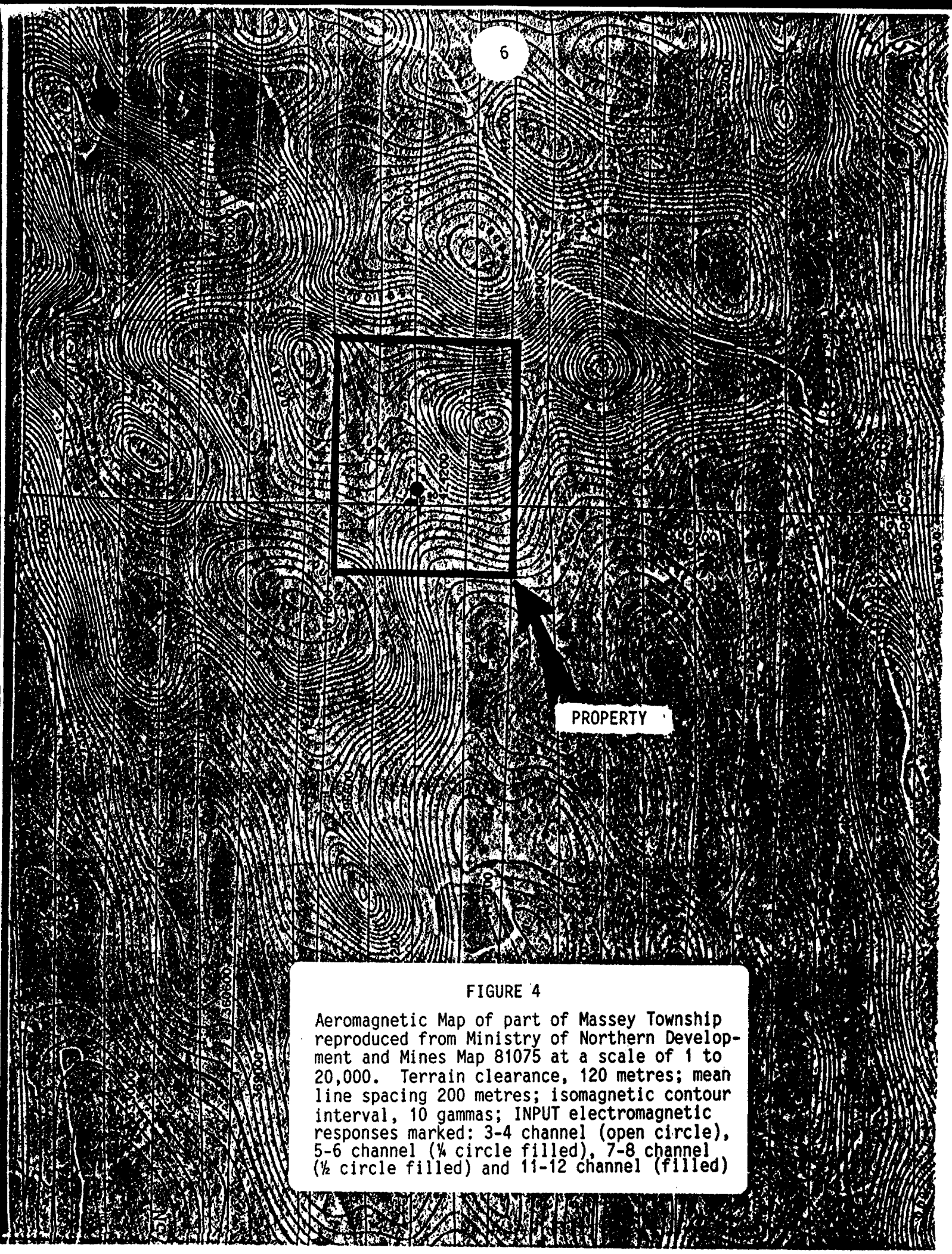


FIGURE 4

Aeromagnetic Map of part of Massey Township reproduced from Ministry of Northern Development and Mines Map 81075 at a scale of 1 to 20,000. Terrain clearance, 120 metres; mean line spacing 200 metres; isomagnetic contour interval, 10 gammas; INPUT electromagnetic responses marked: 3-4 channel (open circle), 5-6 channel (¼ circle filled), 7-8 channel (½ circle filled) and 11-12 channel (filled)

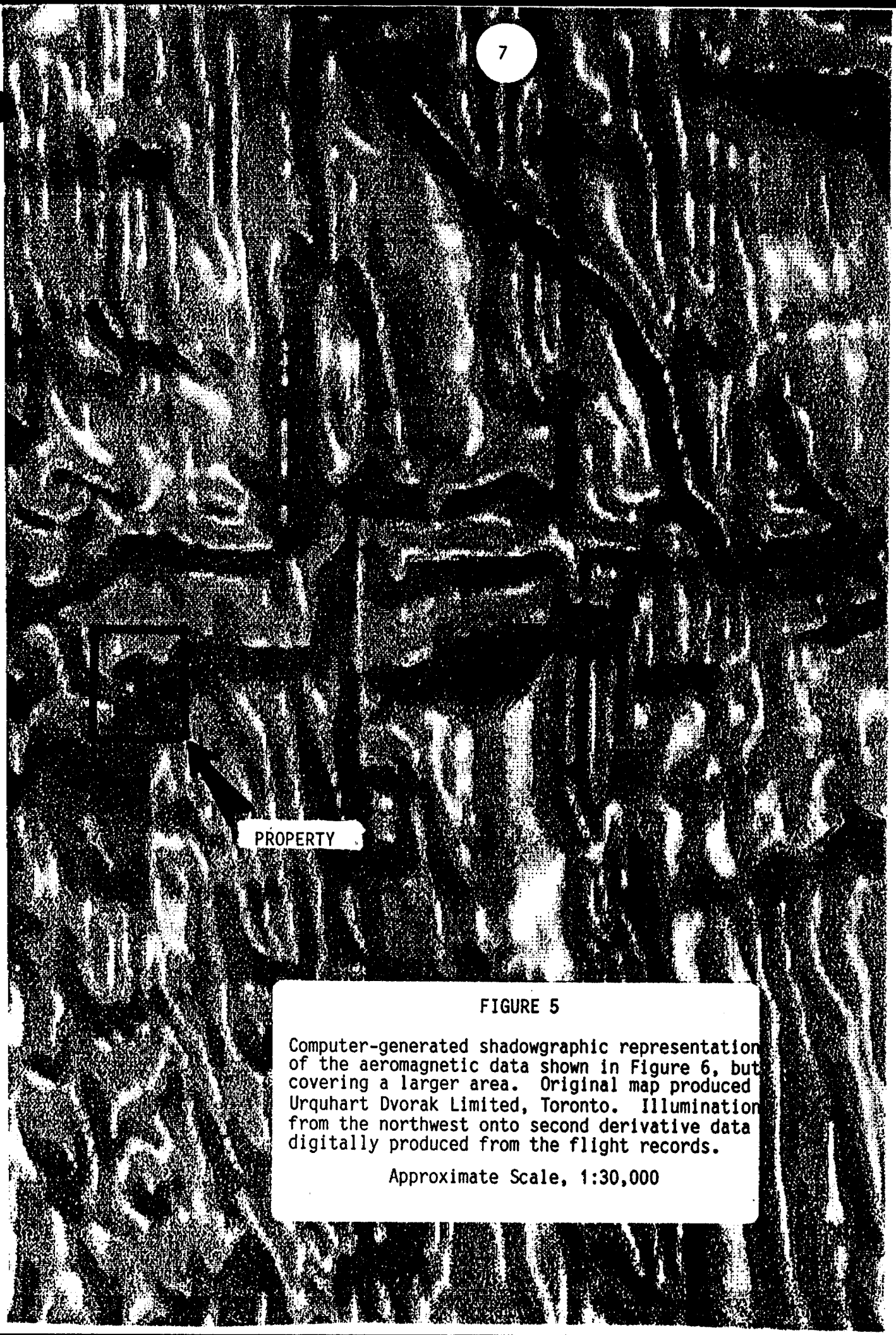


FIGURE 5

Computer-generated shadowgraphic representation of the aeromagnetic data shown in Figure 6, but covering a larger area. Original map produced Urquhart Dvorak Limited, Toronto. Illumination from the northwest onto second derivative data digitally produced from the flight records.

Approximate Scale, 1:30,000

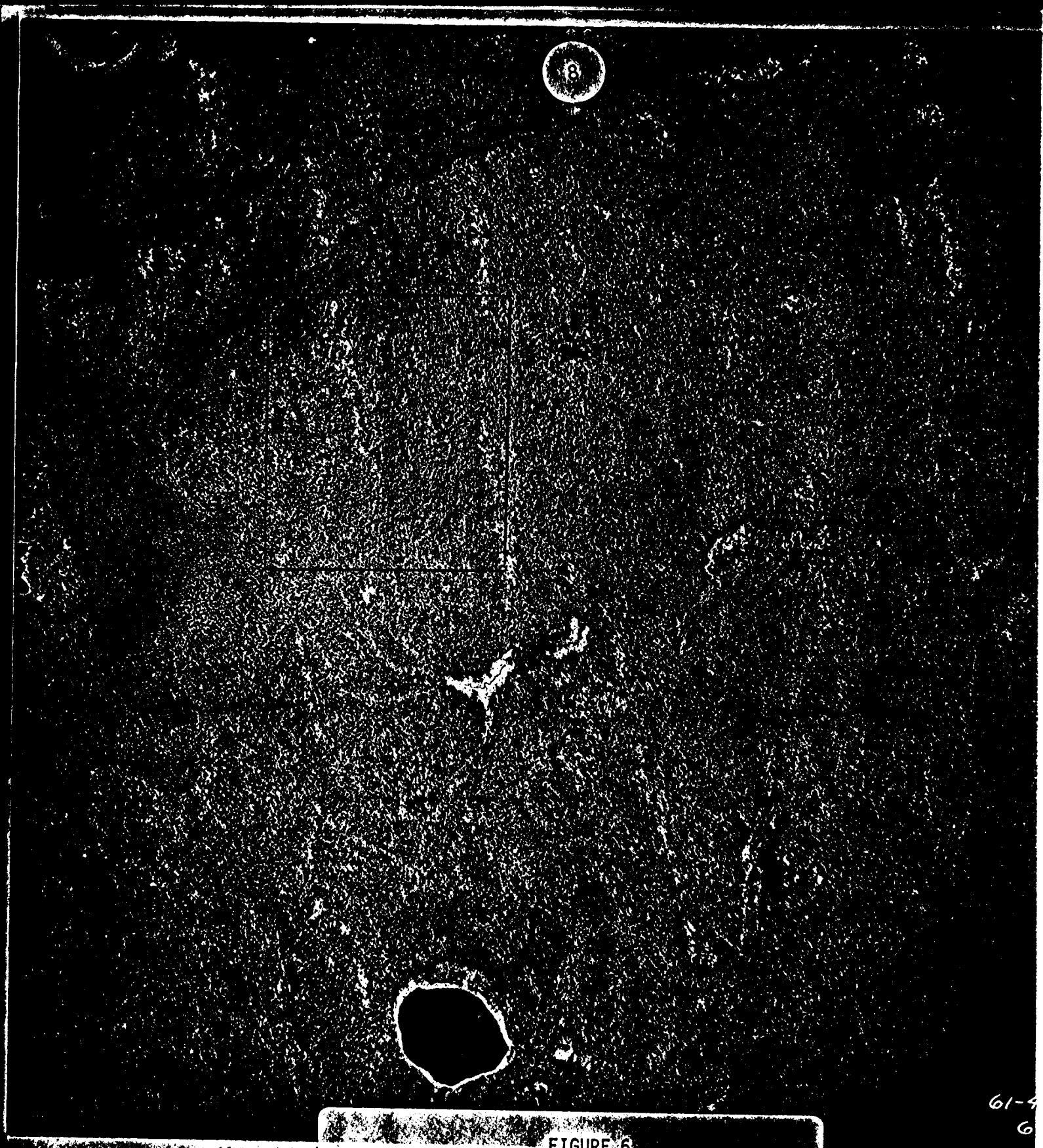


FIGURE 6

Ontario Lands and Forests Air Photograph, part of 61-4821-61-145, showing the present claim block, outlined in black. North-south light streaks are interpreted as due to the presence of diabase dikes; northeast-trending linears (eg. just touching the "8" label) are interpreted as due to regional faulting.

3 such areas exist:
a. along the eastern edge of the ground,
b. close to the central part of the claims, and
c. at the extreme southwestern part of the ground.
It should be noted, however, that the plotting of the ground on the air photograph is not necessarily accurate. Two east-west linears, one northward from the group, and the other southward, probably represent regional shears. These may have the same origin, and a similar economic potential, as the Destor-Porcupine Fault some miles farther to the east.

iv. Shadographic Maps. This presentation of the aeromagnetic data shows the most definitive geological information for the claim block that is available from any remotely sensed information which the author has access to. The second derivative version of the data goes a very long way to eliminate the ambiguity inherent in the aeromagnetic surveys, particularly errors in apparent strike of the rocks caused by deep burial or else alteration. Instead, the maps isolate the contacts of the rocks with surrounding units and trace them across areas of confusion. This point will be immediately apparent on Figure 5, particularly if it is compared with Figures 2 and 3, or its parent data on Figure 4.

Figure 5 shows, firstly, that the entire area is littered with north-south-trending magnetic units, which are almost without question due to diabase dikes. One such body trends to the northwest in the northeastern part of the Figure to reflect the direction of a known set of younger diabase dikes.

Eastward from, and trending across the claim group, a prominent east-west set of magnetic units exists,units which appear to have a stratiform persistency, and probably represent the general strike of the bedrock, especially if it is considered in a regional context. On the claims themselves, this east-west unit appears to bend to the southwest, but to do so in steps, thus suggesting the presence of north-south faults, mostly with left-handed displacement. This left-handed displacement has been shown to be typical of the faults in which the north-south diabases occur (Kirwan, 1968, quoted above). There is a hint of a northwest-trending magnetic unit at the northeast corner of the claim block, possibly due to another of the northwest-trending diabases mentioned above.

There are numerous interruptions to the north-south "grain" as seen on Figure 5, along nearly east-west lines or east northeasterly lines, at least one of which coincides with the linear mentioned above at the end of the section on air photographs. These appear to confirm the presence of east-west faults which weresuggested in the air photographs. The north-south diabases themselves appear to be offset along these interruptions, again with left-handed displacement, to suggest some relatively recent structural activity. The diabases, by cutting across the folds and intrusive bodies in the area (see OGS Map 2205) are themselves relatively young units in the history of the area; faults which offset them are obviously younger still.

FIELD EXAMINATION

The field visit which took place on August 20, 1991, was restricted to an area of considerable outcrop along a north-south ridge in the centre

of the claims in the vicinity of Line 375W, but extending to line 475W in the vicinity of the base line, and including Lines 275W and 175W.

Along Line 375W a prominent ridge of diabase exists, which shows well on the air photographs, but only poorly on the aeromagnetic maps. Both contacts of the diabase dike were located in outcrop, where chilling of the rock to develop aphanitic texture attests to the intrusive nature of the body. Country rocks ajacent to the diabase dike were seen to be:

a. on the east side, a well-layered granitic gneiss, the layers striking nearly north-south and dipping nearly vertically to follow the contact of the diabase dike. The rock exhibits well-developed felsic/mafic layering and shows local schlieren near the contact. The felsic layers are made up of fine-grained white to pink feldspar, and the dark layers contain abundant biotite as well as the felsic minerals.

b. on the west side, a chaotic assemblage of medium-grained feldspars, usually pink and with irregular edges apparently unrelated to the crystal or cleavage directions, set in a very fine grained groundmass of feldspar fragments and biotite. This unit is tentatively identified as a mylonite.

c. throughout the property a medium- to coarse-grained equigranular unit occurs which is made up of chalkywhite clumps of feldspar held between black hornblende crystals, the percentages of the two mineral types being almost equal, with a plus or minus 20% variation. A small amount of interstitial quartz is present. The whiteness of the feldspars (which sometimes is pink in the weathered part of the rock due to iron oxide staining) is thought to be due to saussuritization of plagioclase to produce a mixture of albite and zoisite, in which case the hornblende may owe its origin to uralization of pyroxene. Saussuritization releases quartz. The original rock may therefore have been a gabbro, either an intrusive sheet, or a metamorphosed basalt; the relatively coarse grain size suggests the former.

d. at several places on the property a fragmental unit was seen, which may be equivalent to Barrie's Contact Intrusive Breccia Zone (see LMV on Figure 1, page 2 above). This was not seen in sufficient detail to yield much of a description of the unit as a whole, or to see if it indeed formed the contact phase of an intrusive body.

It is apparent from the contrast of rock-types on either side of the diabase dike, from the existence of what is probably a mylonite at its contact, and from the parallelism of the layering of the rocks with the contact with the dike (north-south in an otherwise east-west belt) that the dike itself is in a fault zone of considerable magnitude. Although many--indeed, most--of the diabase dikes in the area are in fault zones with left-handed displacement, some are in faults with the opposite direction of offset. In the present case, field mapping (with attention to strikes and dips of the contact rocks to measure drag), matching of lithological units, or geopgysical interpretation of both the ground and the airborne results, may sort out this question.

It is also apparent from the existence of granitic gneisses that the rocks on the claim group and the surrounding country have been subjected to high-grade regional metamorphism--at least to the biotite facies--and are unlikely to contain unaltered volcanic or sedimentary rocks.

The ground was initially acquired to as to investigate the aero-electromagnetic responses reported on Map 81075. The potential of these responses, in terms of possible economic mineralization, will be discussed below. In the meantime it should be mentioned that the field examination reported here showed the presence of disseminated sulfide mineralization close to the areas of these responses.

GEOLOGICAL SYNTHESIS

1. The area of the claims is part of an east-west-trending belt of high-grade metamorphic rocks consisting of metagabbro and granitic gneiss; some contact breccia, or shatter breccia due to regional faulting, may be present. The rocks are part of an Archean basement complex, perhaps older than the rocks of the Timmins area to the east, if the inferences of uplift westward from Timmins as postulated by Kirwan in 1968 (see reference above) are valid. The rocks are tightly folded, with dips approaching vertical.

2. At least 2 regional shear zones, one immediately north of the claims and the other to the south, have affected the rocks. These are postulated as being similar to the Destor Porcupine Fault to the east, both in form and economic potential.

3. Gabbroic intrusives within the area may postdate the regional metamorphism which produced gneissification, and may have differentiated into ultra-mafic, sulfide, and mafic layers before that event.

4. Subsequent to the cessation of the major tectonic activity in the area, north-south faulting took place, into which diabase dikes were intruded; these dikes are very abundant in this area and probably represent over 10% of the total rock volume present. The faulting was severe, in places yielding mylonites and distortion, or drag, of the country rocks.

5. A later set of northwest-trending faults provided channelways for more diabasic intrusion. One such diabase may touch the northeastern corner of the present property (see Figure 5 above).

6. A yet later set of nearly east-west faults appears to have offset, dragged, or terminated many of the north-south diabase dikes (see dark linears on Figure 5).

The east-west regional trend as postulated here is very much at variance with the northwesterly trend shown by Barrie in Figure 1 above. It is thought that Barrie heavily depended on the published aeromagnetic maps (Figure 3) for his interpretation, to judge from the similarity of his geological trends with the geophysical trends shown on these maps. The second derivative data as shown on Figure 5, however, is thought to eliminate many of the ambiguities present in the older geophysical maps, and is therefor thought to be more dependable for interpreting the geological structure and suggesting the geological history.

ECONOMIC POTENTIAL

Electromagnetic conductors in Massey Township (Map 81075) are restricted to the northern third of the township. With interruptions, these conductors may be considered to be due to a single body, as the following description may indicate:

a. Starting at the eastern edge of the township, the conductors form an almost perfect line of conductivity for 12 of the first 14 flight lines, and mark the northern edge of a weak magnetic unit which strikes east-west, and crosses 2 intervening diabase dikes. On two of the flight lines (430N and 410/2N) multiple conductivity appears to have located the contacts of a diabase dike; multiple conductivity on line 440N is not explained, except that two sides of the east-west magnetic unit appear to have been found.

b. For 5 flight lines, in the vicinity of the Kamiskotia River, the electromagnetic responses are absent, possibly due to deep burial of the conductive unit.

c. The conductivity reappears for 4 flight lines (310N, 300S, 290N and 280S) where it again marks what appears to be the same magnetic unit, offset slightly to the south in the vicinity of the Kamiskotia River by an inferred north-south fault. Multiple conductivity on lines 310N and 390N may mark both sides of the magnetic unit.

d. For the next 15 lines the conductivity, if present, has not been detected, though the magnetic unit may be followed, with several left-handed offsets, onto the present claim group. Again, the area where the conductivity is not detected is in the vicinity of inferred north-south faults, which have already been mentioned, in the vicinity of Massey Creek.

Available inference, therefore, is that a single conductive zone of bedrock material, with coincident magnetic expression, exists in the northern part of Massey Township. Because of the high grade of the containing matamorphic rocks and the absence of other conductors in the area, it is my opinion that this conductivity is unlikely to be due to graphite, but instead may represent a more or less continuous body of sulfide mineralization. The magnetic associations may be the sulfide mineralization itself, or else a gabbroic source.

Within the present claim group, rocks in the vicinity of the known, and verified, conductor, consist of gabbroes with a small amount of contained sulfides. The implication is that the nearby, buried, conductive body may be entirely due to sulfide mineralization, with the obvious potential of economic concentrations of copper, nickel, or associated precious metals. Indeed, a small amount of chalcopyrite was seen in the rocks near the conductor in the vicinity of the base line.

The potential also exists for the conductive material on the claims to be due to sulfide segregations within the nearby gabbro, independent of material elsewhere in Massey Township. Such a gabbro in the adjoining township to the south (Whitesides Township) contains nickel-bearing, and cobalt-bearing sulfide bodies along its southwestern margin.

Geophysical work has been conducted on the claims, and additional surveys are in progress. The surveys include magnetometer, MaxMin vertical loop electromagnetic work, and RADEM Very Low Frequency electromagnetic surveys. These surveys have demonstrated the presence of conductive material in the bedrock at depths in the 25 to 50 metre range and thicknesses up to 5 metres. Heavy gossans are present in the areas of these conductors and southward from them. Highly variable magnetic responses are also present in the area.

The sum of information available for the claim block would indicate that the aeroelectromagnetic conductivity is due to buried sulfide mineralization which is associated with gabbroic bodies. The possibility of locating nickel-bearing, or copper-bearing mineralization is considered to be good, and the presence of cobalt or precious metals should also be anticipated.

It is the writer's professional opinion that the ground offers excellent potential for the location of such mineralization.

RECOMMENDATIONS

1. RADEM electromagnetic surveys should be continued so as to cover the entire claim block, using Cutler, Maine, and Annapolis, Maryland as signal sources, with in-phase, quadrature, and field strength measurements being made.
2. Prospecting of the area of sulfides and gossans should be continued, with some attempt at identifying the original sulfides now leached from the gossans, possibly using short diamond drill holes of the sort available from packsack drills or other small machines. Trace element analyses should be made of the gossans.
3. A detailed interpretation of the air photographs should be made for the claim block and some surrounding ground, using photographic enlargements taken from the original negatives.
4. Detailed interpretation of the Shadographic Maps should be made for the northern half of Massey Township so as to follow the inferred sulfide-bearing zone as a guide to future claimstaking. This work would involve examination of the Provincial Government's Assessment Files in Timmins for records of past work.
5. Geological mapping should be continued.
6. Diamond drilling to cross the inferred sulfides at their calculated depths should be undertaken as soon as calculations, made from field observations and geophysical results, will permit a determination of their strikes and dips.

Respectfully submitted,

John L. Kirkwan,
MSc PhD FRGS FGAC PE PEng

REGISTERED PROFESSIONAL ENGINEER
J. L. KIRWAN
PROVINCE OF ONTARIO

August 26, 1991

Ministry of Northern Development and Mines
Ontario

Temiskaming Testing Laboratories

P.O. Box 799
Presley St.
Cobalt, Ontario
P0J 1C0
(705) 679-8313

Report Number
CB 11860

Laboratory Report

Date Sept. 11, 199

Issued To: Pam Sangster, Staff Geologist, MNDM. 60 Wilson Ave. Timmins, Ont. P4N 2S7

Sample Number	Gold Oz. Per Ton	Silver Oz. Per Ton	Cu Ppm	Ni Ppm	Zn Ppm	Pb Ppm
LNL-91-66 G. fournier	Trace				95	
-67 "	Trace				57	
-68 "	Trace				57	
-69 "	Nil				29	
-70 Peter Olsse wski	Nil	Nil	101		13	<10
CL -71 John Boissoneault	Trace	Trace	61	22	89	108
-72 "			153	40	11	<10
-73 "			80	13	147	<10
-74 [redacted]	Nil				69	
-75 John Boissoneault.			67	14	29	<10

Fees Received Charged to Cost Code 04-3428-06

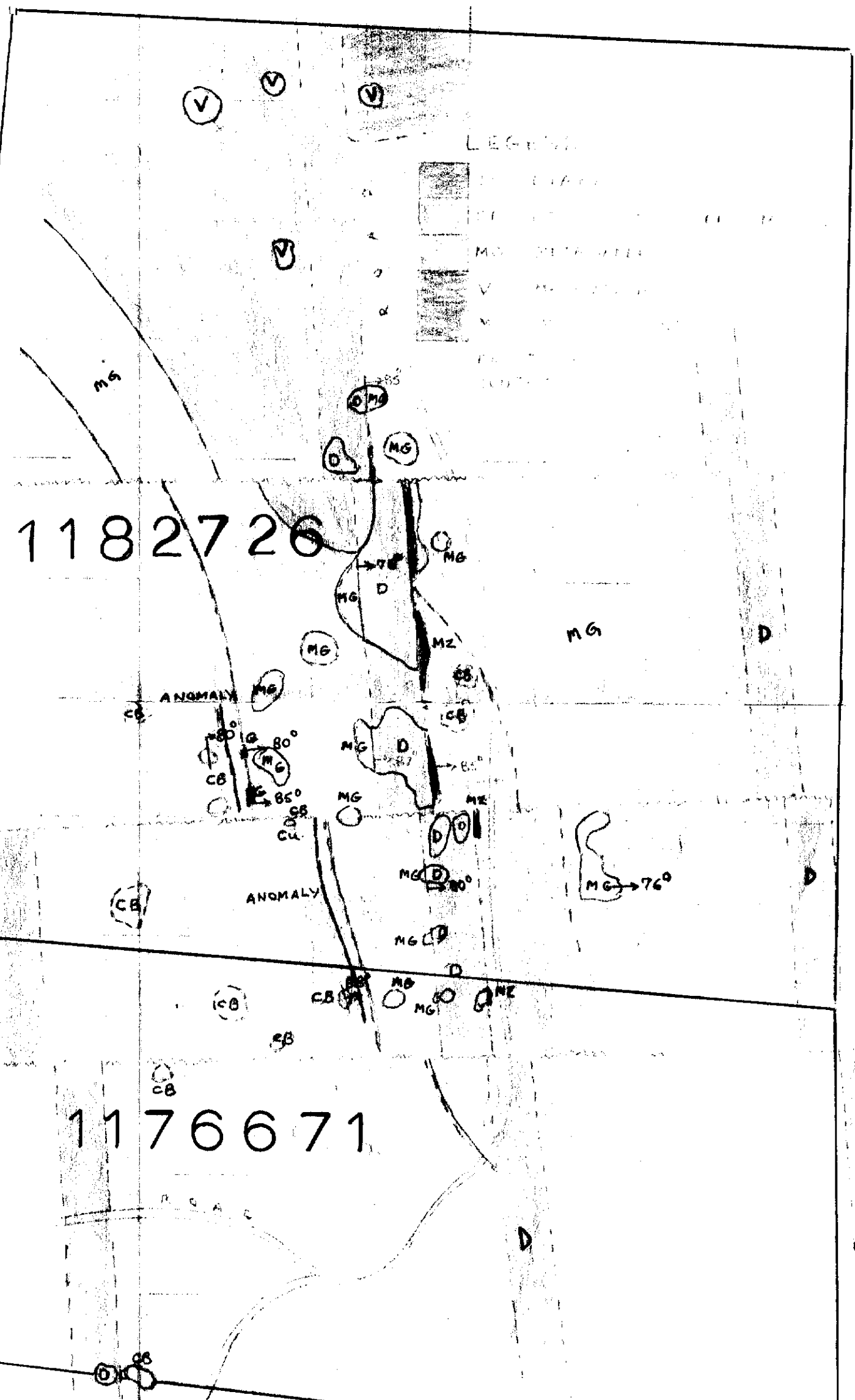
C. McNaught for J. Ireland
AI Manager

63.6262

GEOLOGY

MASSEY PROPERTY

SCALE: 1" = 100'



APPENDIX (3)

LINE 675 W

LINE 575 W

LINE 475 W

LINE 375 W

LINE 275 W

LINE 175 W

LINE 75 W

600 N

400 N

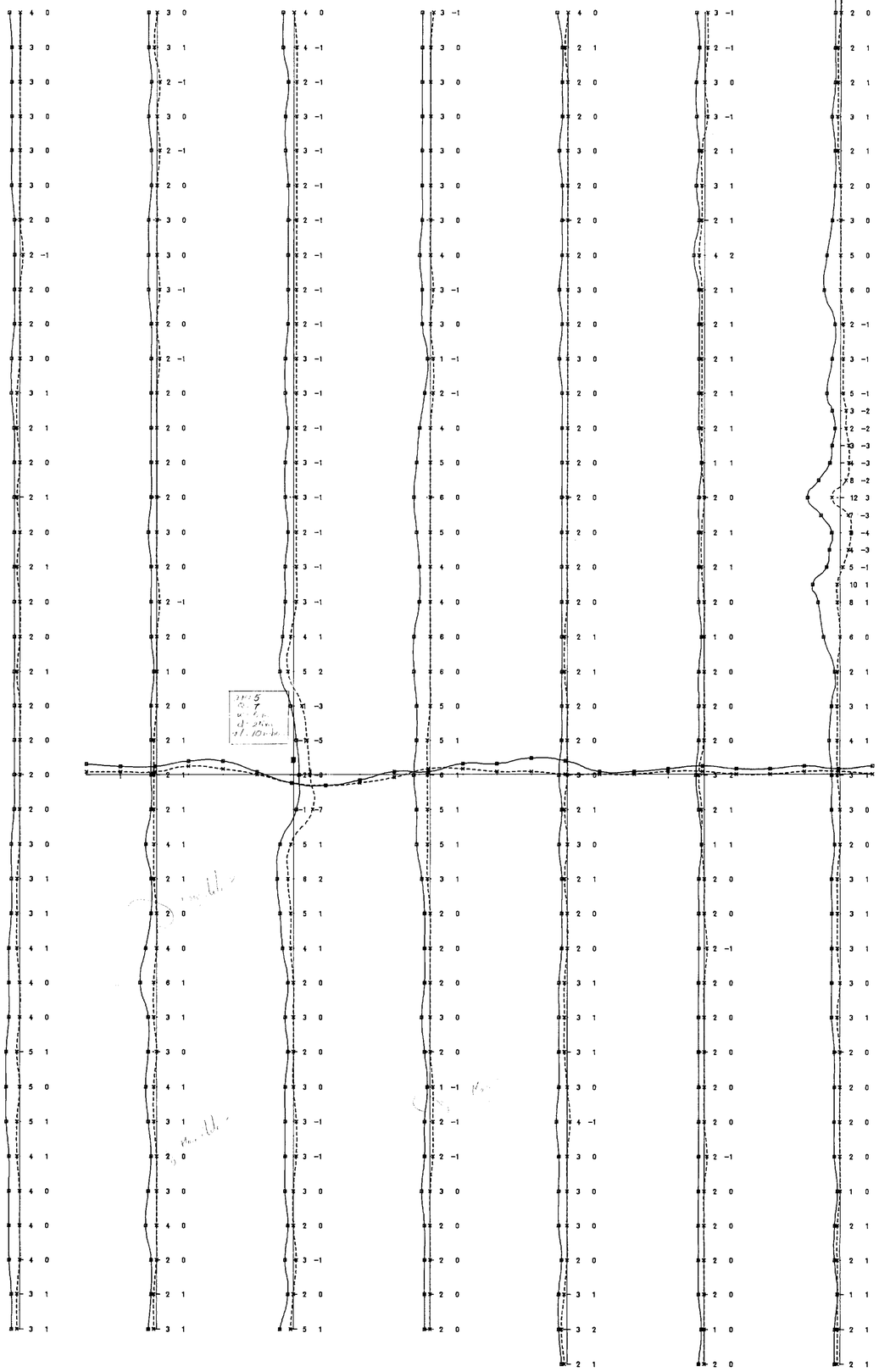
200 N

0

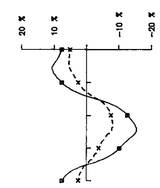
200 S

400 S

600 S



Instrument : Apex Parametrics MaxMin I
Frequency : 444 Hz
Coil Separation : 100 Metres
Profile Scale : 1 cm = 10%



In-phase
Quadrature

MASSEY PROJECT

HLEM SURVEY

MASSEY TOWNSHIP

SCALE : 1: 2000	DATE : AUGUST 1991
FILE : mass.hl	
WORK BY : *Timmins Geophysics Ltd.*	

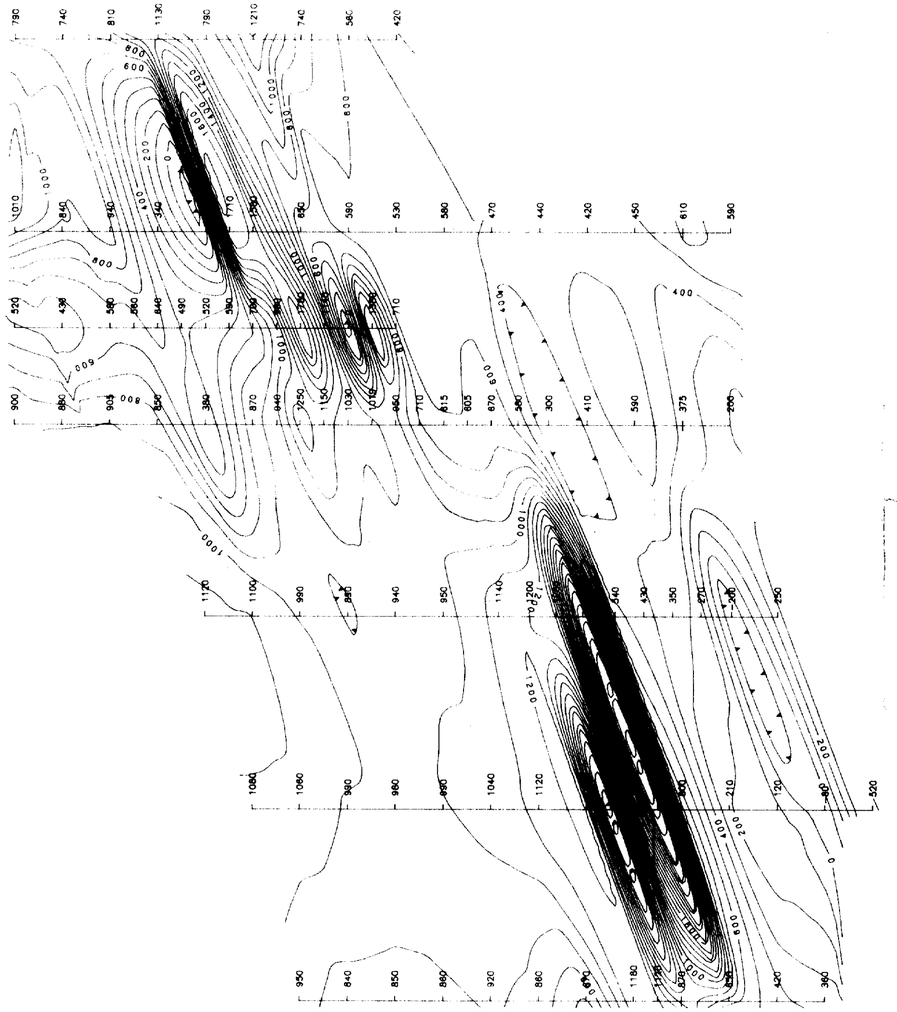
42A12SE8537 63.6262 MASSEY

210

63-6262

600 W

400 W



LINE 100 N

LINE 50 N

LINE 25 N

LINE 0

LINE 50 S

LINE 100 S

LINE 150 S

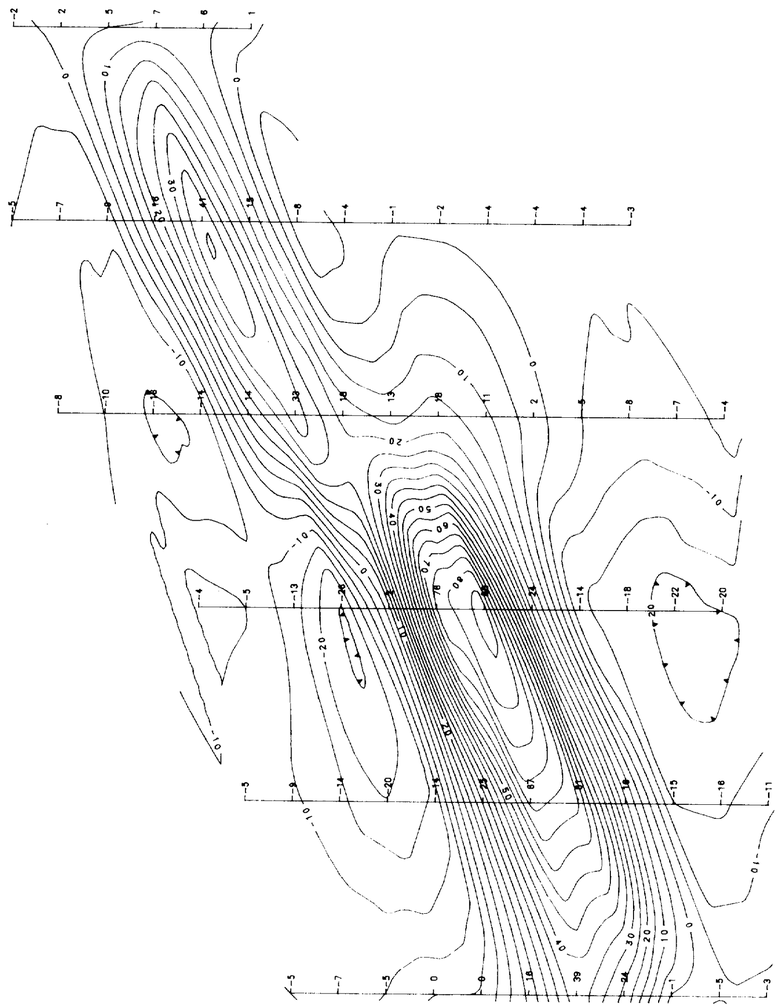
N

Instrument :
Type : Vertical Field Fluxgate
Contour Interval :100 gammas

MASSEY PROJECT	
MAGNETIC SURVEY	
MASSEY TOWNSHIP	
SCALE : 1: 1000	DATE : AUGUST 1991
FILE : MASEW.MAG	
WORK BY :	

600 W

400 W



LINE 100 N

LINE 50 N

LINE 0

LINE 50 S

LINE 100 S

LINE 150 S

Instrument : Crone Radem
Tx Station : Annapolis Maryland
Frequency : 21.4 kHz

600 W

400 W

MASSEY PROJECT

VLF SURVEY (Fraser Filtered)

MASSEY TOWNSHIP

90

SCALE : 1: 1000	DATE : AUGUST 1991
FILE : MAS.FRA	
WORK BY :	63.6262

APPENDIX (7)