



Report on the Geological and Geophysical Surveys
Langmuir Township - Porcupine Mining Division - Ontario

for

McWATTERS GOLD MINES LIMITED
and
QUEBEC MANITOU MINES LIMITED

SUMMARY

The property of McWatters Gold Mines Limited and Quebec Manitou Mines Limited consists of 54 unsurveyed and unpatented mining claims situated in the southwest quarter of Langmuir Township, Porcupine Mining Division, Ontario.

Access to the property is readily achieved by a road or water route southeasterly from South Porcupine, Ontario. From South Porcupine to the centre of the claim group it is 14 miles.

Geologically, the claim group is situated at the southeast end of a large elliptical basin-shaped structure, whose outside margin is rimmed by a zone of ultra basic (peridotite-dunite(?) composition) intrusive rocks some two miles wide. At the southeast end of this structure, a stock of granite, three miles in diameter, is present. The subject property straddles some 3.1 miles of this belt of ultra-basic intrusives, approximately one mile south of the granite contact. The other stratified enclosing rocks are Keewatin type lava flows, acid to basic in composition, iron formation, pyroclastics and probably some clastic sedimentary material. Dikes of olivine diabase, quartz diabase and porphyries are the youngest intrusive rocks present.

The strike of the stratified rocks is N80°E in the western part of the property and it swings to N40°E in the eastern part. The peridotite bodies, four or more in number, conform to this structural trend.

Numerous small and large faults are interpreted to be present on the property.

Pyrite, pyrrhotite and minor chalcopyrite was found in several locations on the property. However in each instance values in copper and nickel were too low to be of economic importance.

Previous work on the property appears to have been solely that of prospecting and trenching no attempt having been made to investigate the overburdened favorable geological conditions for economic base metal mineralization.

The current exploratory effort by the subject companies consisted of detailed magnetic, electromagnetic and geological surveys of the property at a picket line interval of 400 feet.

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CONCLUSIONS

The electromagnetic survey delineated 14 separate fair to good conductive zones. These are designated as EM1 to EM14. Thirteen of these electromagnetic anomalies, EM1, EM2 and EM4 to EM14, exhibit fair to good magnetic susceptibility.

Twelve of these coincident electromagnetic and magnetic anomalies, EM1, EM2, EM4 to EM 10, EM12, EM13, and EM14, are interpreted to represent sulphide mineralization, principally of the pyrrhotite-pyrite type, although commercial sulphides such as chalcopyrite, sphalerite and pentlandite may also be present. Of the twelve anomalies, two of the zones represented by them appear to consist solely of barren pyrite-pyrrhotite mineralization in Iron formation. The other ten are covered by overburden to depths of 50 feet or more. They are situated in a favorable geological environment and consequently are considered top priority targets to be investigated by diamond drilling for concentrations of economic base metal mineralization.

Anomaly EM4 appears to represent the eastward extension of a sulphide zone sampled by the writer in 1955 on claim TRP-24222. An assay of 0.38% nickel was obtained. It is considered that this zone could have nickel possibilities.

Anomaly EM11 shows poor conductivity and high magnetic susceptibility characteristics and it appears to be caused by magnetite. However, chromite, an ore of the metal chromium, is usually found associated with magnetite, particularly when it is found associated with ultra-basic intrusive rocks.

There are four separate bodies of peridotite on the property and where these were examined, no chrysotile asbestos was observed. However, a major part of these bodies is covered by overburden and concentration of such mineralization could well be present. Generally such areas are characterized by zones of high magnetic intensity, which are not present on the property.

RECOMMENDATIONS

It is recommended that 14 diamond drill holes, totalling 4100 feet, be drilled on the property to investigate the fair to good anomalous conditions for base metal mineralization.

The particulars of these holes, as to location, dip, length, bearing, order of drilling the anomalies, is shown in the appendix to this report.

PROPERTY and LOCATION

The property, jointly owned by McWatters Gold Mines Limited and Quebec Manitou Mines Limited, consists of 54 contiguous, unsurveyed and unpatented mining claims, numbered P-50838 to P-50891 inclusive.

The claim group is situated in the southwest quarter of Langmuir Township, Porcupine Mining Division in the Province of Ontario.

The west boundary of the property is the township line common to both Langmuir and Eldorado Townships. The Fork and Nighthawk Rivers flow west and northerly respectively and these rivers are situated to the south and east of the claim group. Patented claims P-131, P-524 and P-3354 lie in the east central part of the McWatters-Quebec Manitou holdings.

ACCESS

The property is easily reached from South Porcupine, Ontario by two routes, a distance of 14 and 25 miles in a southerly direction.

The first means of access is entirely by water from the junction of highway 11 and the Nighthawk River, in a southerly direction, a distance of about 25 miles.

The other route is directly south from South Porcupine, Ontario by gravel road to Croteau Creek and hence by bush road to the property. This route is a distance of 14 miles.

TOPOGRAPHY

The claim group occupies an area of relatively low relief, which forms part of a gently rolling peneplain. There are areas attaining relief of 50 to 100 feet above the low ground. The first and most prominent lies in the northwest corner of the claim group. Another follows northeasterly from this point to approximately the west part of claim P-50864. Other elevated areas are present on patented claims P-524 and P-131 and just south of patented claim P-3354.

These elevated areas trend about N50°E and rock outcrop is exposed in these areas. However, about 70 percent of the claim group is relatively flat, overburdened and swampy. The swamps are wet and travel is exceedingly difficult.

Glacial deposits consist mostly of morainal sand and gravel and lacustrine clay.

The claim group is drained by several small creeks which flow into the Fork and Nighthawk Rivers.

The area has been lumbered several times and growth constitutes a mixed bush, consisting mostly of alders and balsam, with minor spruce,

birch, cedar and pine. There are a few good stands of spruce, particularly in the west part of the property and pulp operations have been concentrated in this area for the past few years.

Two old lumber camps are situated on claim P-50857.

HISTORY

No previous ground geophysical survey work has been done on the claim group. An airborne magnetometer survey was conducted, during 1947 to 1949, of Langmuir township and surrounding townships by the Dominion Gulf Company. The results of this, particularly of Langmuir township, are published on two maps numbered 293G and 294G, by the Department of Mines and Technical Surveys.

Other work on the claim group has consisted of prospecting and trenching. Numerous pits were found and these appear to have been excavated in the search for gold and asbestos. Pits are located on claims P-50876, P-50861, P-50873 and P-50884.

GEOLOGY

Regional - Striking in a N50°W direction and lying in the townships of Eldorado, Carman, Adams, Langmuir, Deloro and parts of Whitney and Tisdale is a broad basin-shaped structure. It is about 14 miles long and 8 miles wide. The outer rim of this basin-shaped structure is characterized by a zone of basic intrusive rocks (mainly peridotite in composition) approximately two miles wide.

The rocks inside this basin-shaped structure consist mainly of Keewatin acid to basic lava flows, some fragmentals and interbanded with both clastic and pyroclastic sedimentary rocks. At the southeast end of the basin structure and inside it a stock of granite some 3 miles in diameter intrudes the Keewatin rocks. The basic rocks, as well as the Keewatins, are wrapped around this intrusive granite body.

The peridotite can be considered as the "rim" of the basin. The rocks outside the basin are generally similar to those inside it.

Olivine diabase and quartz diabase intrude the above described rocks. The widest and most continuous of these basic intrusives is the Keweenaw olivine diabase. They strike N75°E and attain a width of 700 feet. The quartz diabase dikes, Matachewan in age, are much narrower, of the order of 100 to 200 feet, and strike in a north-south direction.

The subject property is situated at the extreme southeast end of the basin structure, straddling the rim of ultra basic rocks and about three-quarters of a mile from the granite contact.

Property - The consolidated outcropping rocks on the property consist of early Precambrian Keewatin type lava flows and iron formation. They are

intruded by peridotite, altered to serpentine, quartz diabase and quartz feldspar porphyry.

The following table of formations has been drawn up to show the general sequence of rocks:

Legend

Pleistocene and Recent	-	glacial deposits and swamp.
Keweenawan	-	olivine diabase.
Algoman	-	Granite, Syenite, Quartz Porphyry and Quartz Feldspar Porphyry.
Haileyburian	-	Peridotite, Serpentinite.
Keewatin	-	Iron formation, slate, greywacke Agglomerate, tuff Andesite, basalt Dacite, dacite porphyry Rhyolite, rhyolite porphyry, trachyte.

The distribution of rock outcrops is shown on the accompanying plan to the scale of one inch equals 400 feet.

A brief description of the main rock types observed on the property is as follows:

(a) Acid lavas - The rocks mapped in this category consist solely of light grey rhyolite. They are hard, highly siliceous and slightly schistose. Rhyolite outcrops in the north part of claim P-50861. In addition about 900 feet southeast of post 3 of claim P-50838, rhyolite outcrops along the shore of the Fork river,

From magnetic data, it would appear that the south part of the property is underlain by acid type rocks.

(b) Intermediate Lavas - The rocks in this category were mapped as dacite. They are light grey to greenish in color, very massive looking and hard. No structures such as pillows, amygdules, etc. were observed. However, occasional bombs or angular fragments were observed in a few outcrops.

(c) Basic Lavas - The rocks mapped in this category are mostly andesite. They are light to dark green in color, relatively soft and exhibit pillow structure. They are the most altered of the Keewatin flows and alteration is principally due to chlorite, carbonate and serpentine. On weathered surface these dark green rocks exhibit a faint feathery or fern-like pattern an inch in width and up to 1.5 to 3.0 feet in length. Distorted pillows were observed on claims P-50850 and P-50877.

Alteration of these basic rocks has been quite severe and because of small outcrop areas, it was sometimes quite difficult to be sure of identification. In addition, they are quite schistose and in certain instances they probably could be described as hornblende, chlorite serpentine and carbonate schists.

(d) Iron Formation - Two main areas of iron formation were mapped on the property. These are on claims P-50857, P-50886, P-524 and P-131. The iron formation is from 70 to 120 feet in width, steep in dip, highly contorted and in places the thinner beds are severely brecciated. The iron formation consists of beds of fine silica, some chert and magnetite. The two bands mapped are interpreted to be the same stratigraphic horizon.

Pyrite and pyrrhotite occur as massive pods and stringers which replace the more chloritic facies of the iron formation.

(e) Peridotite - four bodies of peridotite occur on the property. These bodies strike east-west in the west part of the property and swing into a northeast striking direction in the easterly section of the property. The rock ranges from a black fine-grained type to a green coarse-grained type with magnetite. It has been highly altered to serpentine and picrolite fibre was observed in many outcrops.

(f) Granite and allied porphyries - Two segments of a dike of sheared quartz feldspar porphyry were mapped on the property. The rock is sheared and in part resembles the Pearl Lake porphyry of the Timmins area.

(g) Quartz Diabase - Two dikes of quartz diabase were mapped. In addition several others were inferred from the magnetic data.

STRUCTURAL GEOLOGY

Because of the paucity of outcrop, the various rock types were rather difficult to trace for any distance. In addition, primary structures were not observed in too many places. As a consequence, it is impossible at this time to come to a conclusion as to any structures in the Keewatin rocks. Also the presence of abundant intrusive bodies, with accompanying alteration, compounds to the complexities.

The general strike of the rocks in the west part of the property is N80°E and this direction swings to N40°E in the eastern part of the property. This strike change conforms more or less to the regional trend. Where attitudes could be determined, dips were steep to the north.

Several small faults and shears were observed, particularly in basic lavas and offsetting the quartz diabase dikes. Larger faults were interpreted from magnetic data. These strike in three main directions, north-south, east-west and northwest-southeast.

The basic lavas are generally quite schistose and direction of schistosity varies from N80°E to N50°W.

ECONOMIC GEOLOGY

Magnetite, pyrite, pyrrhotite, chalcopyrite and asbestos mineralization was found on the property.

Magnetite mineralization was observed in the peridotite bodies and iron formation.

Chalcopyrite was observed in the form of blebs and weak disseminations in a shear zone in rhyolite and quartz diabase dikes usually accompanied by pyrite and pyrrhotite. In this instance content was too low to be of any economic value. In addition, values in nickel were not detected here.

Pyrite-pyrrhotite was found as disseminations and massive pods in the iron formation on claim P-50857 and patented claim P-131. No values in nickel were obtained. Disseminated pyrite mineralization was observed in many quartz-bearing shears, in lavas and in quartz feldspar porphyry.

Asbestos, of the picrolite variety rather than the chrysotile type, was observed in many places in the peridotite outcrop.

Chromite, an ore of chromium was not recognized, although it is usually found in serpentized peridotite associated with magnetite.

GEOPHYSICAL SURVEYS

E. M. SURVEY - This survey was conducted using a Ronka Mark 4, horizontal loop electromagnetic unit utilizing a coil separation of 200 feet and a frequency of 876 cycles per second. Usually one traverse was run over anomalous zones utilizing a 300-foot coil separation.

This method measures the in-phase and out-of-phase components of the secondary magnetic field in terms of percent of normal or uniform field. Ratios of in-phase to out-of-phase readings are considered to give indication of conductivity of causative bodies and ratios greater than 1.0 are considered worth investigating.

MAGNETIC SURVEY - The magnetic survey was conducted using a Sharpe A-2 vertical force magnetometer. The instrument constant was 20.0 gammas per scale division.

Results of both surveys are shown on plans of one inch equals 400 feet which accompany this report.

DISCUSSION OF RESULTS

Fourteen separate zones of electrical conductivity were outlined on the property and all but one conductor exhibits some association with magnetic data.

EM anomaly #1 was outlined in the northwest corner of claim P-50861. It is a narrow zone of medium magnitude and exhibits good conductivity. It is coincident with a broad magnetic zone. This zone is limited in length.

Outcrop lies immediately to the west and a narrow shear containing pyrite-pyrrhotite with minor chalcopyrite was observed at this point. It appears that this has caused the anomaly. Magnetite occurring as blebs and stringers is present in the rhyolitic lavas. It is considered that a trench across the zone is warranted.

EM anomaly #2 lies in the west central part of claim P-50861. It has a minimum length of 500 feet, whereupon it strikes off into neighboring claim P-49118. Conductivity ratios vary from 1.5 to 1.9. The conductive zone varies in width up to a maximum of 30 feet. It is coincident with a high magnetic zone and appears to lie wholly in the peridotite intrusive. It is interpreted to represent sulphide mineralization in a north dipping shear zone.

EM anomaly #3 lies in the north part of claim P-50855. It has a length of at least 400 feet and could extend westward into neighboring claims. Conductivity ratios are of the order of 1.1. Magnetic response over the zone is negligible. It is narrow and of limited depth.

EM anomalies #4, #5, #6, #7 and #8 all occur in the west central part of the property, lying south of the peridotite intrusive and in the Keewatin rocks. In all instances each conductive zone exhibits good magnetic properties.

EM anomaly #4 has a minimum length of 1800 feet, a width varying from 10 to 60 feet, sinuous in outline, striking nearly east-west, dipping steeply north to vertical. Along strike conductivity ratios vary from 0.6 to 4.0. Magnetic response over the zone varies from 800 to 6300 gammas. The zone is interpreted to represent predominantly sulphide mineralization with some magnetite. Depth of overburden over the zone is estimated to be in the order of 40 to 50 feet.

EM anomaly #5 has a minimum length of 1150 feet and a possible maximum length of 1450 feet. The width of the zone varies from 10 to 40 feet, strikes N70°E and dips steeply south to vertical. Conductivity ratios vary from 0.2 to 3.0. Depth to top of conductor is estimated at about 30 to 40 feet. Magnetic response over the zone varies from 920 to 3870 gammas. The coincident magnetic and conductive zone is interpreted to represent sulphide mineralization.

EM anomaly #6 has a minimum length of 800 feet and a possible maximum length of 1200 feet. It lies 300 ft. south of an elliptical body of peridotite. Conductivity ratios vary from 2.3 to 2.7, width from 10 to 30 feet, dip steeply south and the zone strikes N80°E. No accurate depth determinations to the top of the zone can be given. It is estimated to be at least 50 feet or more. Magnetic data varies from 813 to 900 gammas or 213 to 300 gammas above background. The coincident magnetic and conductive zone is interpreted to represent sulphide mineralization.

EM anomaly #7 was outlined for a minimum length of 400 feet and a possible maximum length of 800 feet. It lies southeast of EM#6. The width of the conductor varies from 20-30 feet, strikes due east-west, and dips steeply to the south. Conductivity ratios vary from 1.1 to 3.0. Depth to the top of the conductor is estimated to be of the order of 30-50 feet. Cause of this conductor appears to be sulphide mineralization accompanied by some magnetite.

EM anomaly #8 occurs about 1400 feet east of EM#7. The minimum length of the zone is 600 feet and it has a possible length of 800 feet or more.

The zone strikes $N60^{\circ}E$, width varies from 10 to 60 feet and dip is vertical to steeply south. Depth to top of conductor is estimated at less than 25 feet. The conductive zone is coincident with a magnetic zone which varies from 100 to 1100 gammas above background. Cause of this conductor appears to be sulphide mineralization with minor magnetite.

EM anomaly #9 has a minimum length of 200 feet with a possible length of 400 feet. It appears to strike $N40^{\circ}E$, dips vertically and is coincident with a magnetic response of 1128 gammas or about 450 gammas above background. It appears to be between the ends of two peridotite intrusive bodies. The magnitude of the electromagnetic response is low, but conductivity ratio is about 4.0 suggesting a good conductor. Sulphide mineralization can be expected as the cause of this conductor.

EM anomaly #10 was outlined for a length of about 1800 feet. It strikes $N40^{\circ}E$ and dip appears to be vertical with a possible dip change in an easterly direction to both steeply north and south. Conductivity ratios vary from 1.2 to 2.4 along strike and at section 12E it is coincident with a magnetic response of about 300 gammas above background. From section 16E to 28E it lies along the south flank of a strong magnetic high. Depth to top of conductor is estimated at about 50 feet. This conductive zone could be caused by a strong graphitic zone but the presence of sulphides should not be eliminated.

EM anomaly #11 was noted across one picket line only. The response obtained showed strong positive in-phase response and little to negative out-of-phase response. This is indicative of a body that is non-conductive, but which has significant magnetic susceptibility. In addition, the response is coincident with an over 10,000 gamma response, suggesting magnetite mineralization in or near a peridotite intrusive body. The zone could have chromite possibilities.

EM anomaly #12 is of short strike length and it appears to be the faulted or dragfolded extension of EM#10. It has a width of 20 feet, conductivity ratio of 1.5 and appears to dip steeply north. It is coincident with a magnetic response of 1471 gammas, or about 600 above background.

EM anomaly #13 has a length of 200 feet and occurs along the north edge of the iron formation on claim P-50857. Width of the zone is about 20 feet. Conductivity ratio of 1.8 was obtained over the zone. Some pyrite-pyrrhotite was observed in the iron formation and it is considered that the anomaly has an indicated good concentration of sulphides at this point.

From geophysical data the zone appears to dip south, although on surface formation dips north. It is assumed that the iron formation changes dip radically below surface.

EM anomaly #14 was outlined on patented claims P-131 and P-524 and the eastern extremity of the zone occurs on claims P-50882 and P-50886. Electrical and magnetic qualities of the zone suggest sulphide mineralization in and along the south contact of the iron formation. Dip of the zone appears to vary along strike from steeply north to steeply south. Dragfolding of the iron formation would account for this.

The magnetometer survey has outlined several broad magnetic zones of varying intensity. In addition to those discussed, which are coincident with electromagnetic conductive zones, there are others which could represent non-conductive sulphide and magnetite mineralization.

However, most of the magnetic zones appear to be caused by magnetite mineralization in the serpentized peridotite, quartz diabase dikes and magnetite in highly serpentized basic lavas.

The most magnetic rocks on the property are the serpentized peridotites and iron formation.

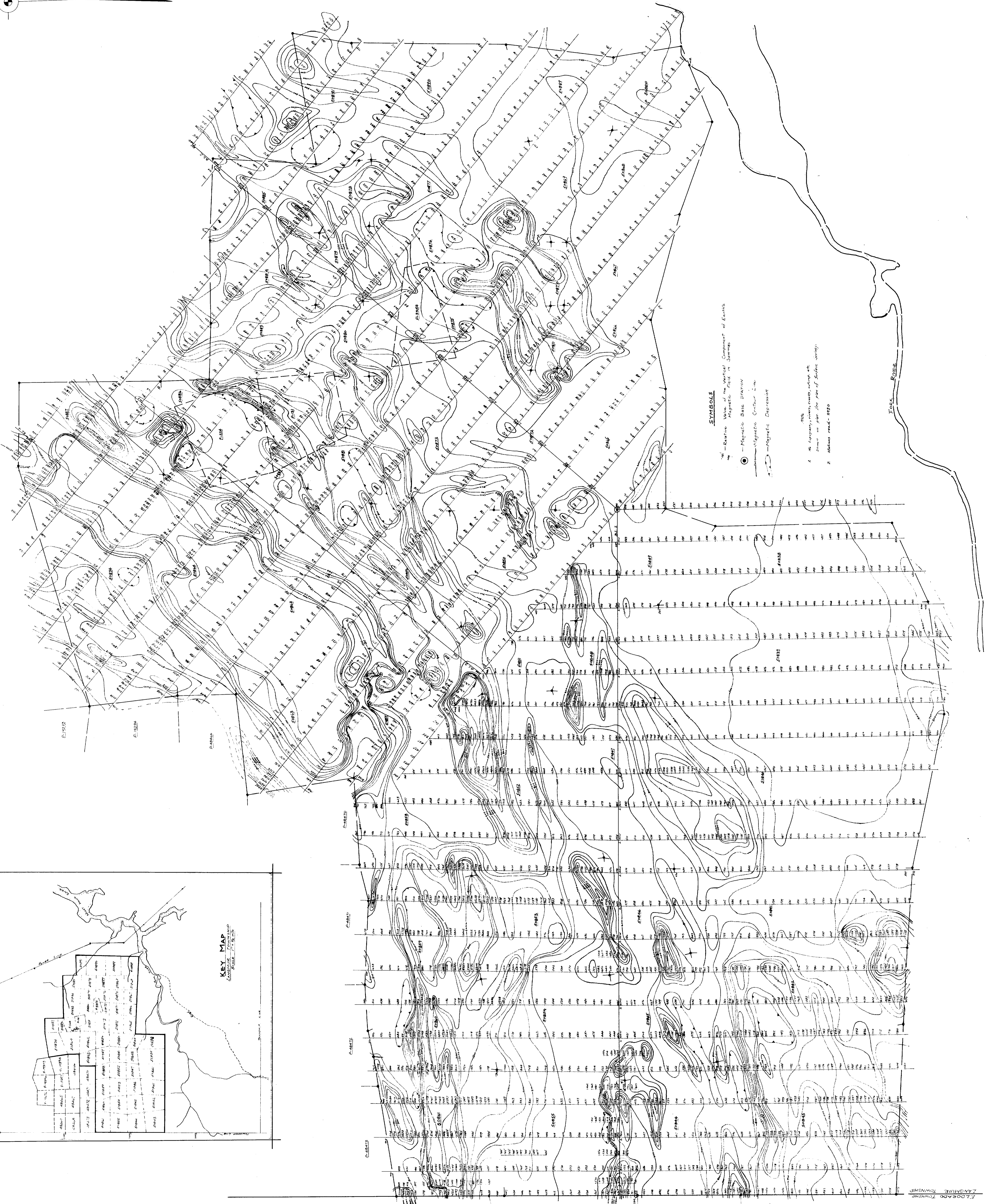
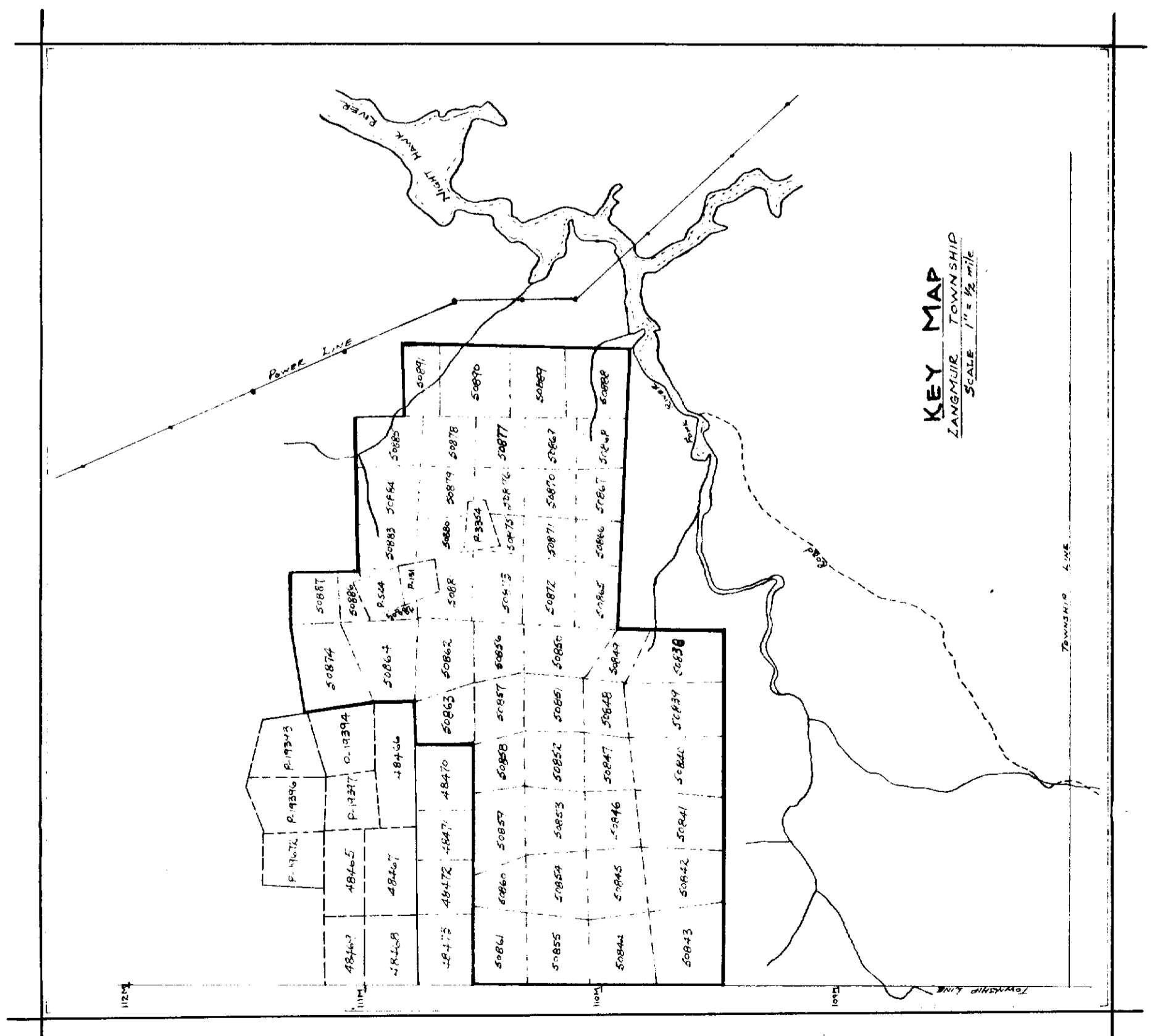
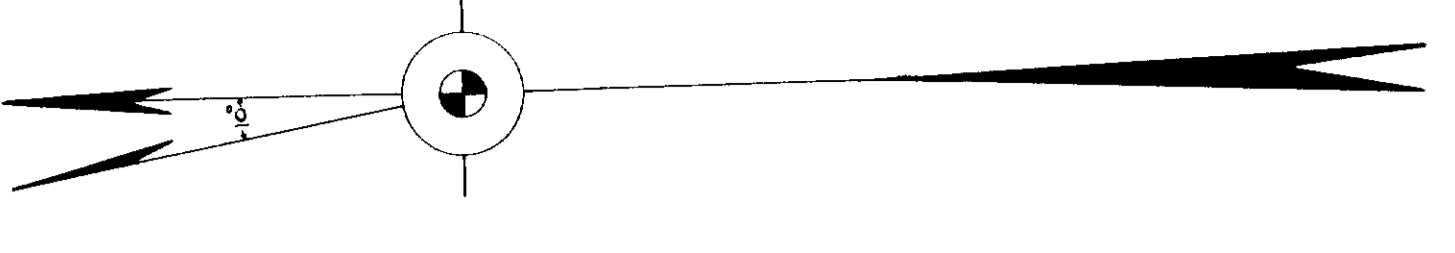
Respectfully submitted,

SIMARD, KNIGHT & ASSOCIATES

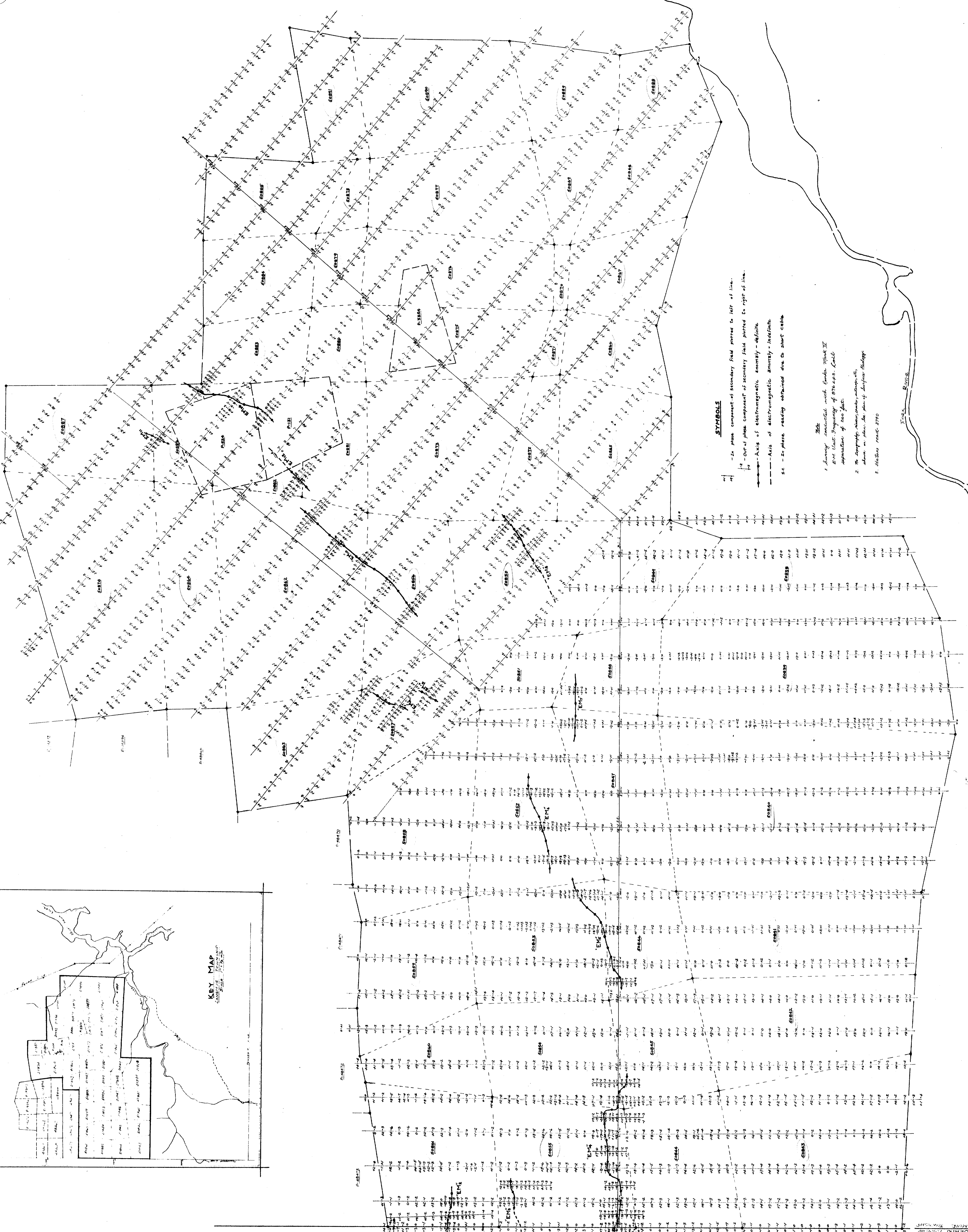
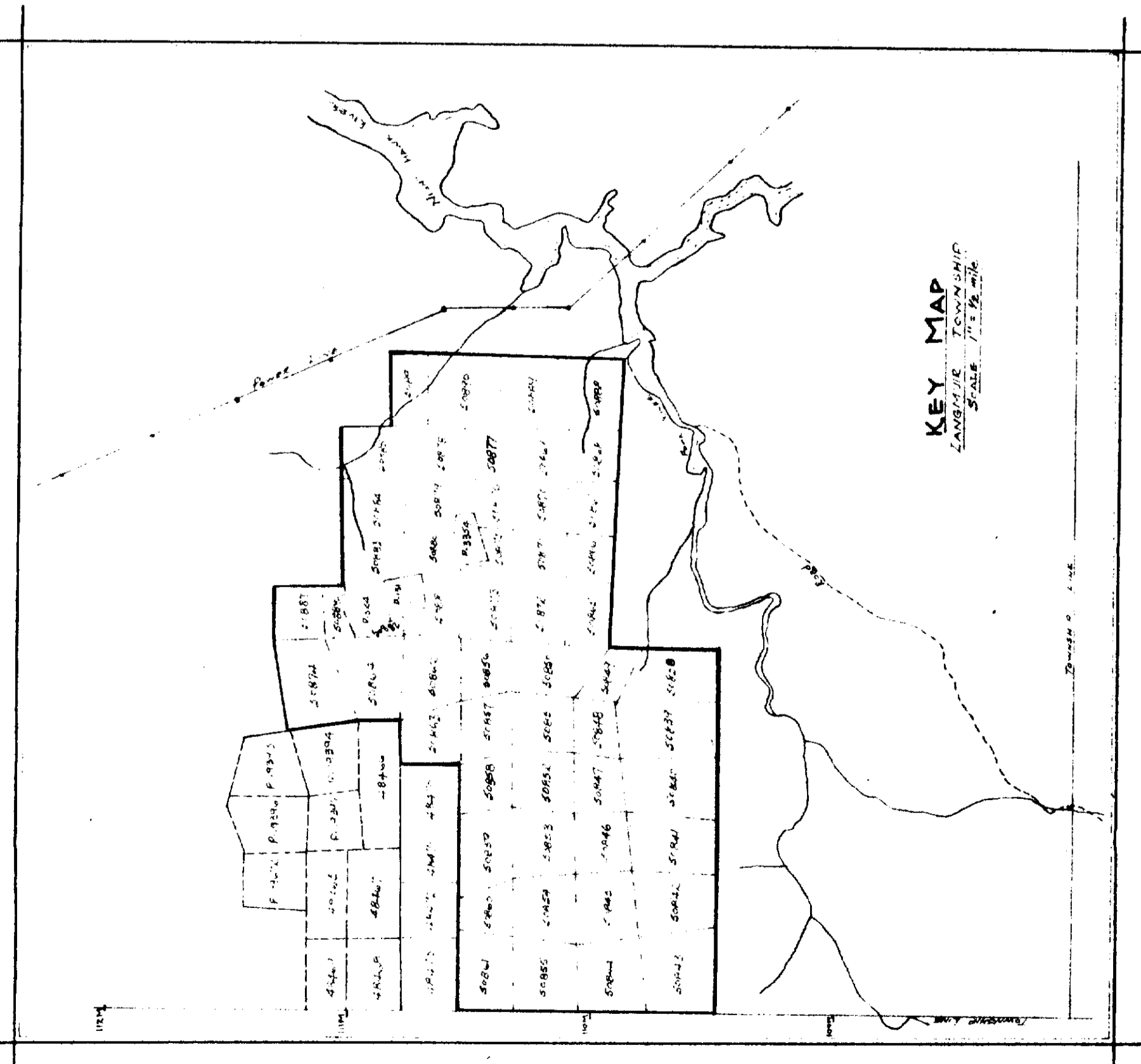
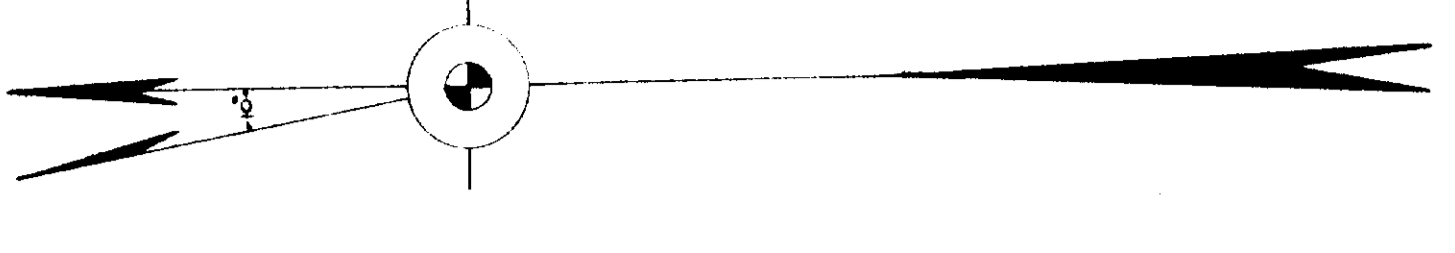
A handwritten signature in cursive script, appearing to read "Michael Zurowski".

Michael Zurowski.

Toronto, Ontario
November 9, 1961



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SYMBOLS

- In phase component of secondary field plotted to left of line.
- Out of phase component of secondary field plotted to right of line.
- Axis of electromagnetic anomaly - definite
- Axis of electromagnetic anomaly - indefinite
- Expl. resist. obtained due to short cable

THE

- Survey conducted with Geon Mark III
- EMC Cont. Frequency of 250 cps. Cable separation of 100 feet.
- The topography, magnetic anomalies, etc. shown on this plan is from the geophysical survey.
- Station road 2790

