



INTRODUCTION

This writer carried out a detailed geologic survey in the field during May 19-23, 1966, and the results of the survey have been plotted on a plan 1" = 100 ft. This scale was chosen to coincide with a plan of the detailed magnetic survey and an I.P. survey over the same area, carried out recently.

GENERAL GEOLOGY

The most detailed government geologic map of the general area is O.D.M. Map 2046, scale 1" = 4 miles, of the Timmins - Kirkland Lake area. The G.S.C. aeromagnetic map 291G, scale 1" = 1 mile, also covers this area. The rocks underlying the general area are of precambrian age.

A narrow belt of Keewatin rocks occurs between two granitic batholiths and trends northerly along the Township boundary between Bartlett and Geikie Townships, then it trends northwesterly across the S/W corner of Douglas Township, and then trends W/N/W into McArthur Township. This belt of Keewatin rocks consists of basic volcanics, talc-carbonate rocks, iron formation, rhyolitic tuffs and peridotite. The peridotite trends northerly, and at the Texmont property (previously the Fatima property) a deposit of nickel occurs in the peridotite in Geikie Township at its western boundary 2 miles south of its N/W corner, and is reported to be in the order of 5 million tons of 1.03% nickel as indicated by diamond drilling. The peridotite is very sparsely mineralized with sulphides. Much of the nickel mineralization occurs as disseminated pentlandite and millerite, with the pyrrhotite content relatively low for a nickel deposit. The mineralized area of peridotite is highly magnetic and occurs adjoining a band of less magnetic iron formation.

The area covered in this mapping adjoins to the north of the Texmont property, and occurs as an extension of the same belt of Keewatin rocks.

LOCAL GEOLOGY

ROCK TYPES

(1) Talc-Carbonate Rock - This rock is composed of about 90% talc, 8% carbonate, and 2% coarse cubes of pyrite. The Origin of this rock is indefinite. It is a very massive and altered basic rock. This rock occurs in the western portion of the mapped area, it appears to trend northerly as a formation. The rock generally forms low topographic features. This rock exhibits low to medium range magnetics.

(2) Rhyolite-Tuff - This rock is a well banded tuff of light green color. Its average trend is N-40°-W and it dips 30° to the northeast. The bands consist of light colored silicious rhyolitic rock up to 3/4 inch wide, separated by very narrow sericitic-chloritic bands. The rock is resistant to erosion and forms a ridge up to 300 feet high. Between 1 and 3% pyrite occurs disseminated in the formation. The magnetic survey indicates low magnetics over the rhyolite-tuff.

(3) Peridotite - This is a dark, fine grained, dense and highly magnetic rock. On surface exposures serpentine alteration along roughly polygonal fractures is evident. Some of the more magnetic areas of the rock exhibit a polarity which indicates that much of the magnetite has been oriented parallel to some paleomagnetic field during cooling of the intrusive or more likely during recrystallization caused by metamorphism. The magnetic survey over the peridotite indicates highly variable magnetics. The locally higher magnetics appear to occur adjoining interpreted E/W faults.

C. J. Kuylen

INTRODUCTION



42A03NE0017 63.1926 DOUGLAS

020

During the period January 27 - April 15, 1966, a program of exploration was carried out on the 36 claims in Douglas and McArthur Twp., optioned by Lakehead Mines Ltd. The survey work was directed and performed for Lakehead Mines Ltd. by the Denison Mines Ltd. exploration crew.

Based on the location of the claims as related to interpretations of geology, the 36 claims have been separated into three groups and explored in different programs.

(1) Main Group - Douglas & McArthur Twp. 16 claims

Nos. P.82723-24-25-26-27-28-29-30-31

P.82733-34-35-36-37-38-39

(2) North Group - McArthur Twp. 6 claims

Nos. P.82705-06-07-08-09-10

(3) East Group - Douglas Twp. 14 claims

Nos. P.82711-12-13-14-15-16-17-18-19-20-21-22

P.82732, P.82740

GENERAL GEOLOGY

The Lakehead Mines Bar-Mil claim group is located chiefly in the southeast corner of Douglas Twp. This Bar-Mil group adjoins to the north of the Texmont Nickel property in Geilde Twp. A new drilling program of drilling on the old Fatima Nickel deposit during 1965-66 has been successful in expanding the tonnage to several million tons of nickel ore of about 1% nickel.

The Texmont nickel deposit occurs associated with metamorphosed highly magnetic peridotite. There appears to be an association of more abundant magnetite with the nickel mineralization. A study of G.S.C. aeromagnetic map 291 G. indicates that the magnetic peridotites associated with the Texmont nickel deposit can be traced northwards across the S/W corner of the Bar-Mil ground. The Texmont nickel deposit occurs a little less than 2 miles south of, and strikes northerly towards the S/E corner of the Bar-Mil ground.

Interpretations of the magnetic surveys indicate a favourable geologic and structural situation on Claims P.82735, 34, where highly magnetic, northerly trending, peridotites, have been displaced by a series of easterly trending faults. This area will be mapped in detail as soon as the snow disappears.

(1) MAIN CLAIM GROUP

Main claim group - 16 claims - P.82723-30 (inclusive)

P.82732-39 (inclusive)

See plan of magnetic survey - 1" = 200 ft.

See plan of detailed magnetic survey - 1" = 100 ft.

See plan of electromagnetic survey - 1" = 200 ft.

MAGNETIC SURVEY

METHOD AND UNIT

A Sharpe Model MF-1 Fluxgate magnetometer was used to read the out picket lines. The readings were recorded to the nearest half division (10 gammas) and were plotted to the closest 10 gamma interval.

The readings were plotted in gammas above or below an arbitrary base level. The plotted readings indicate changes in the vertical component of the magnetic field. The readings were taken at 50 ft. intervals between stations along lines most of which were cut 200 ft. apart.

RESULTS OF MAGNETIC SURVEY

The magnetic readings were plotted on a plan, scale 1" = 200 feet, and contoured at 200 gamma intervals.

A triangular area with its base on line OCN from 10W-20E, and its apex at 10 W on line 30 N, has numerous highly magnetic northerly trending anomalies. This triangular area was contoured in detail on a plan 1" = 100 ft. A system of E-W faults was recognized that have displaced the blocks in a series of westerly movements with each more northerly block. The block 8 N - 14 N contains the strongest localization of magnetic anomalies, and indicates that the magnetic mineralization is related to the faulting through metamorphism, or as a source channelway in primary mineralization or later mineral reorganization. All magnetic anomalies above 5000 gammas in the area between lines 8 N to 14 N and 10 W to 4 E deserve further detailed investigation by geologic mapping, I.P. surveys and diamond drilling.

The N-W corner of this group (the N-W corner of Claim P.82723) also contains a narrow northerly trending strongly magnetic feature.

The remainder of the area shows a low flat magnetic relief typical of a granitic intrusive area broken only by two linear magnetic features that are very likely diabase dykes.

ELECTROMAGNETIC SURVEY

Main group - 9 claims - P.82723, P.82727-28-29-30,
P.82733-34-35-36

METHOD AND UNIT

The SE-200 portable electromagnetic unit was used in the survey. The SE-200 consists of two portions, the transmitting unit and receiving unit. The transmitter unit includes a transmitter coil, a transmitter oscillator to produce 1250 c.p.s. sine wave alternating current in the transmitter coil, and a battery pack for power source. Two spirit levels at right angles permit the plane of the transmitting coil to be held vertical or horizontal, as desired.

The receiving unit consists of a receiving coil which can be turned to resonate at the frequency of the transmitted signal, a high gain amplifier which boosts the signal output from the coil, a pair of earphones by which one may judge how the receiving signal is varying, and a clinometer by which the tilt of the plane of the coil can be measured.

When the transmitter passes over a conductor, the transmitted audio frequency alternating magnetic field causes eddy currents to flow through the conductor. These eddy currents set up a secondary magnetic field which distorts the original magnetic field. This electromagnetic induction method detects the presence of a subsurface conductor by measuring the distortion of the transmitted field.

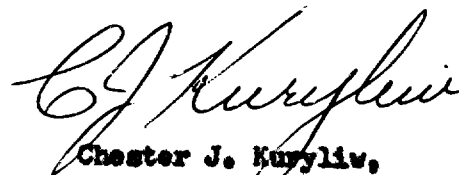
The broadside method (also called the parallel line method) was used on lines 200 feet apart on stations at 100 foot intervals. The two coils move progressively up two parallel lines separated by 200 feet, with both coils being at the same "latitude" relative to the grid. In every case the transmitter coil was located 200 feet south of the receiver coil.

RESULTS OF E-M SURVEY

The E-M survey located several conductors in the area bound by lines 4N - 14N and 00E - 13E. A confused picture is evident due to the presence of more than one conductor, and to fault displacements of the

conductors. This area will be covered by a detailed survey over closely spaced lines and stations to resolve the complex but highly favourable indications.

Detailed geologic mapping and an I.P. survey will be undertaken soon after break-up, and before any diamond drill program is undertaken.



Chester J. Kuryliv,
Consulting Geologist,
April 15, 1966.

(II) THE NORTH CLAIM GROUP

The north claim group - 6 claims, McArthur Twp.

Claims P.82705-10 (inclusive)

See plan of magnetic survey - 1" = 200'

See plan of electromagnetic survey - 1" = 200'

MAGNETIC SURVEY

METHOD AND UNIT

A Sharpe Model MF-1 Fluxgate magnetometer was used to read the cut picket lines. The readings were recorded to the nearest half division (10 gammas) and were plotted to the closest 10 gamma interval.

The readings were plotted in gammas above or below an arbitrary base level. The plotted readings indicate changes in the vertical component of the magnetic field. The readings were taken at 100 ft. stations along compass lines 400 ft. apart. A base line along the centre of the small group served as a line of control points.

RESULTS OF THE MAGNETIC SURVEY

The magnetic readings were plotted on a plan, scale 1" = 200', and contoured at 100 gamma intervals. The magnetic level of the readings indicate the ground is underlain by E-W trending rocks, probably andesitic volcanics. One small magnetic anomaly, probably a small gabbroic intrusion, occurs at 4S on line 32W.

C. J. Kuyper

(III) THE EAST CLAIM GROUP

East Claim Group (14 claims) (Douglas Twp.)

Claim Nos. P.82711-22 (inclusive)

P.82732

P.82740

See plan of Magnetic survey - 1" = 200'

MAGNETIC SURVEY

METHOD AND UNIT

A Sharpe Model MF-1 Fluxgate magnetometer was used to read the out picket lines. The readings were recorded to the nearest half division (10 gammas) and were plotted to the closest 10 gamma interval.

The readings were plotted in gammas above or below an arbitrary base level. The plotted readings indicate changes in the vertical component of the magnetic field. The readings were taken at 100 ft. intervals between stations along compass lines 400 ft. apart. Base lines 3000 ft. apart served as control points.

RESULTS OF MAGNETIC SURVEY

The magnetic readings were plotted on a plan, scale 1" = 200', and contoured at 200 gamma intervals. The whole area has a low flat magnetic relief typical of granitic areas, with the exception of three narrow linear magnetic features that are very likely diabase dykes.

The area covered does not indicate any ground favourable to mineral exploration.

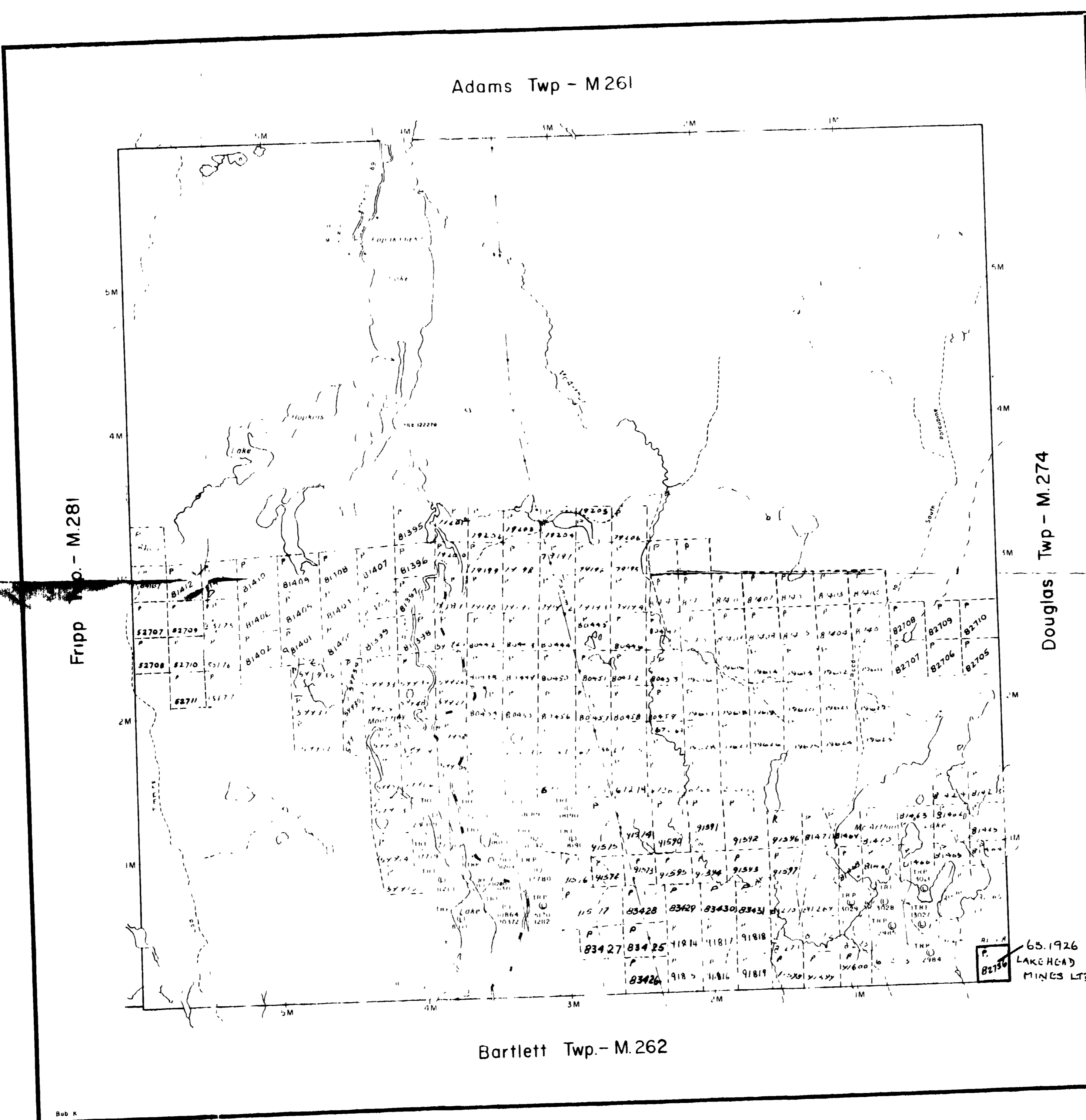
C. J. Kuryliw
C. J. Kuryliw,
Consulting Geologist,
April 15, 1966.

TRIM LINE

8E5M

8E5M

Adams Twp - M.261



THE TOWNSHIP OF
OF
McARTHUR

DISTRICT OF
TIMISKAMING

PORCUPINE
MINING DIVISION

SCALE 1-INCH = 40 CHAINS

LEGEND

- | | |
|-----------------------|-----|
| PATENTED LAND | Ⓟ |
| CROWN LAND SALE | Ⓢ |
| LEASES | Ⓛ |
| LOCATED LAND | Ⓛ |
| LICENSE OF OCCUPATION | Ⓛ |
| MINING RIGHTS ONLY | MRO |
| SURFACE RIGHTS ONLY | SRO |
| ROADS | — |
| IMPROVED ROADS | — |
| KING'S HIGHWAYS | — |
| RAILWAYS | — |
| POWER LINES | — |
| MARSH OR MUSKEG | — |
| MINES | — |
| CANCELLED | — |

NOTES

This township lies within the
TEMAGAMI PROVINCIAL FOREST

40' Surface Rights Reservation around
all lakes and rivers

ONT. DEPT. OF MINES
MINING LANDS BR
THIS MAP FOR CHECKING
PURPOSES ONLY - MUST
NOT BE SOLD.

DATE OF ISSUE

AUG 2 1967

ONTARIO DEPT. OF MINES

PLAN NO - M.298

DEPARTMENT OF MINES

— ONTARIO —

Bartlett Twp - M.262

Douglas Twp - M.274

Frigg Twp - M.281

McARTHUR TWP

McARTHUR TWP



TRIM LINE

200

8E5M

8E5M

W.S.S.M

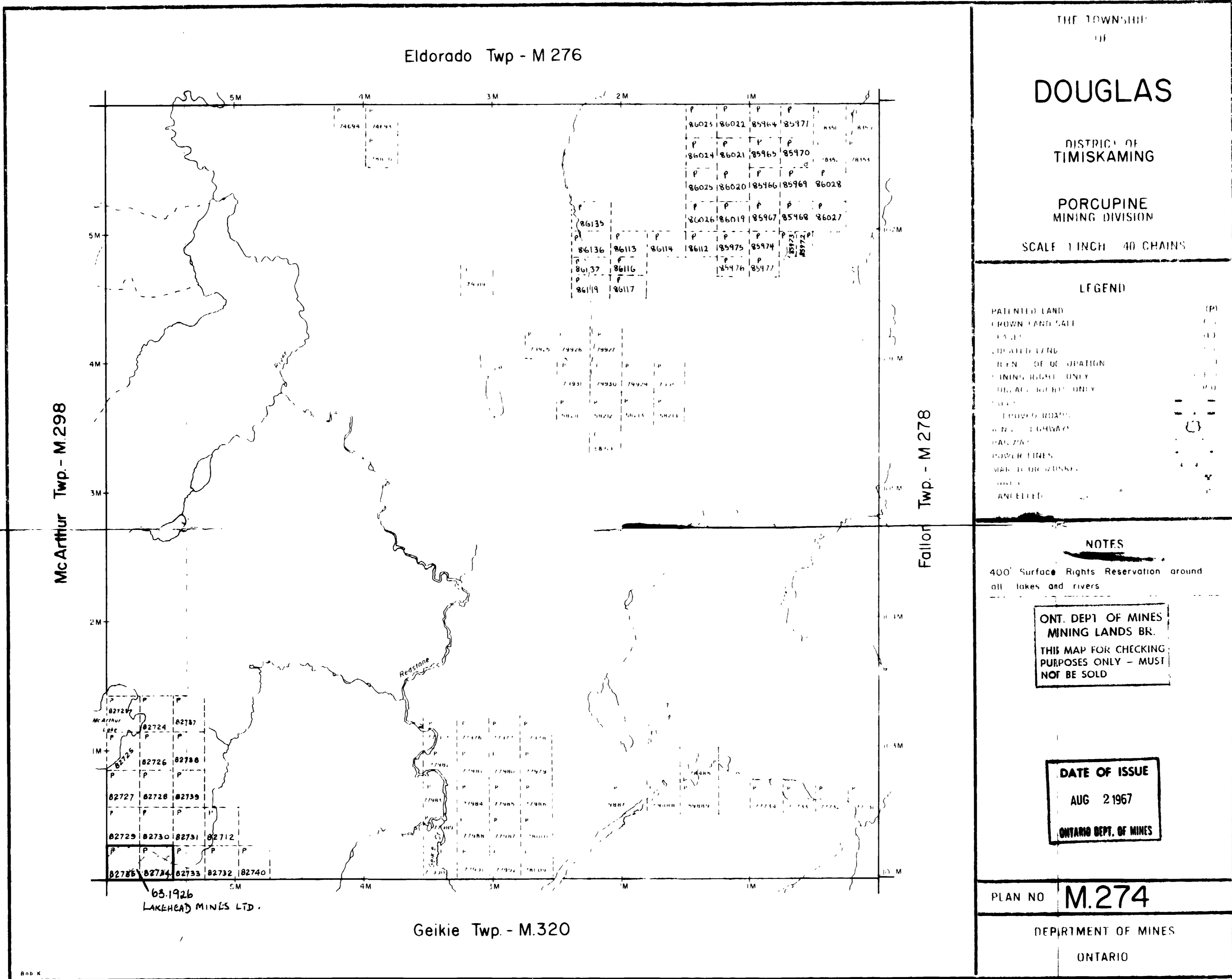
DOUGLAS TWP

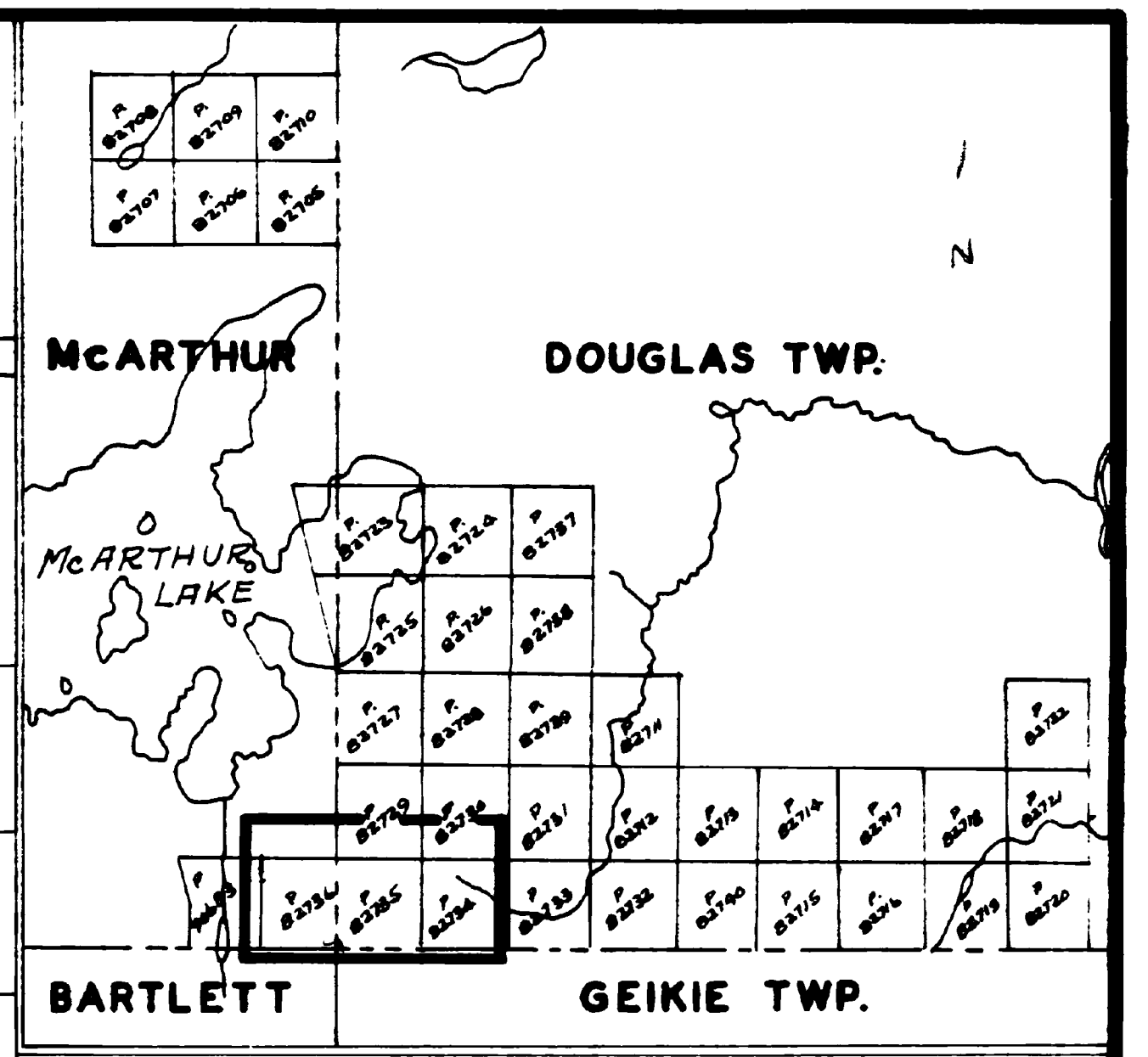
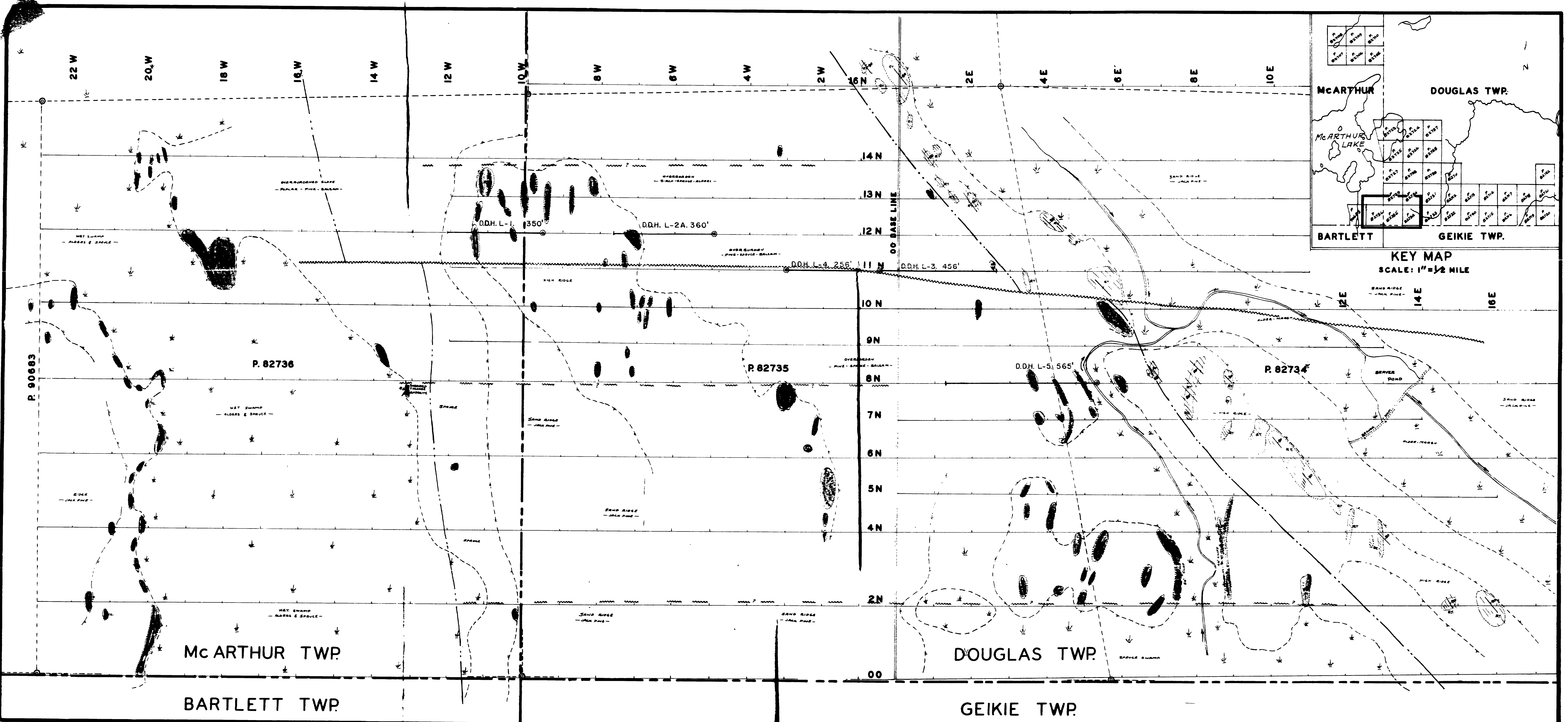
W.S.S.M

W.S.S.M

DOUGLAS TWP

W.S.S.M





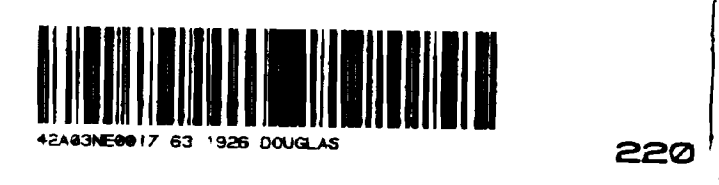
LAKEHEAD MINES LTD.
 BAR-MIL OPTION
 DOUGLAS & McARTHUR TWP.S, ONT.
 PLAN OF GEOLOGIC SURVEY

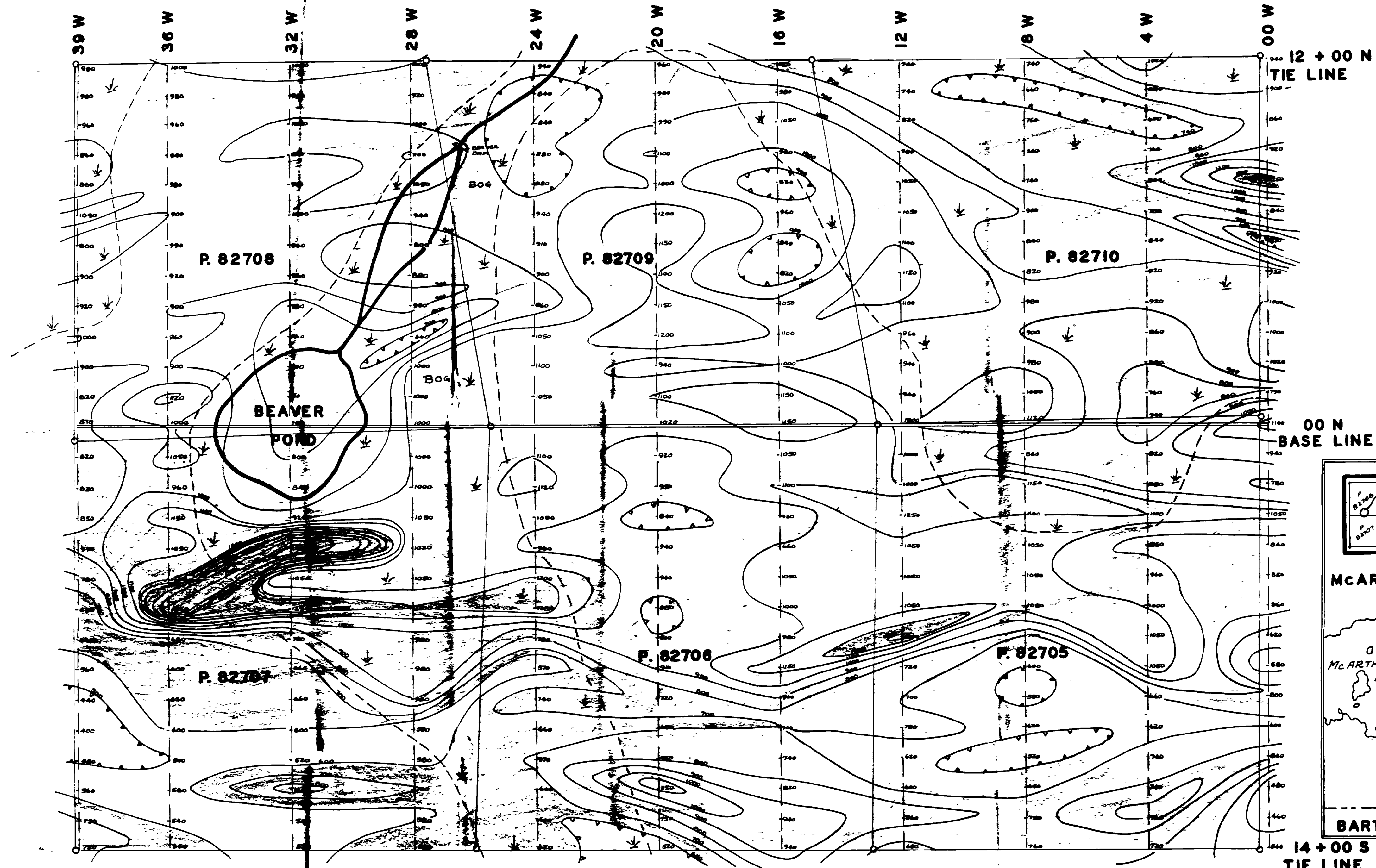
SCALE: 1" = 100'

June 1, 1966
 Chester J. Kingston

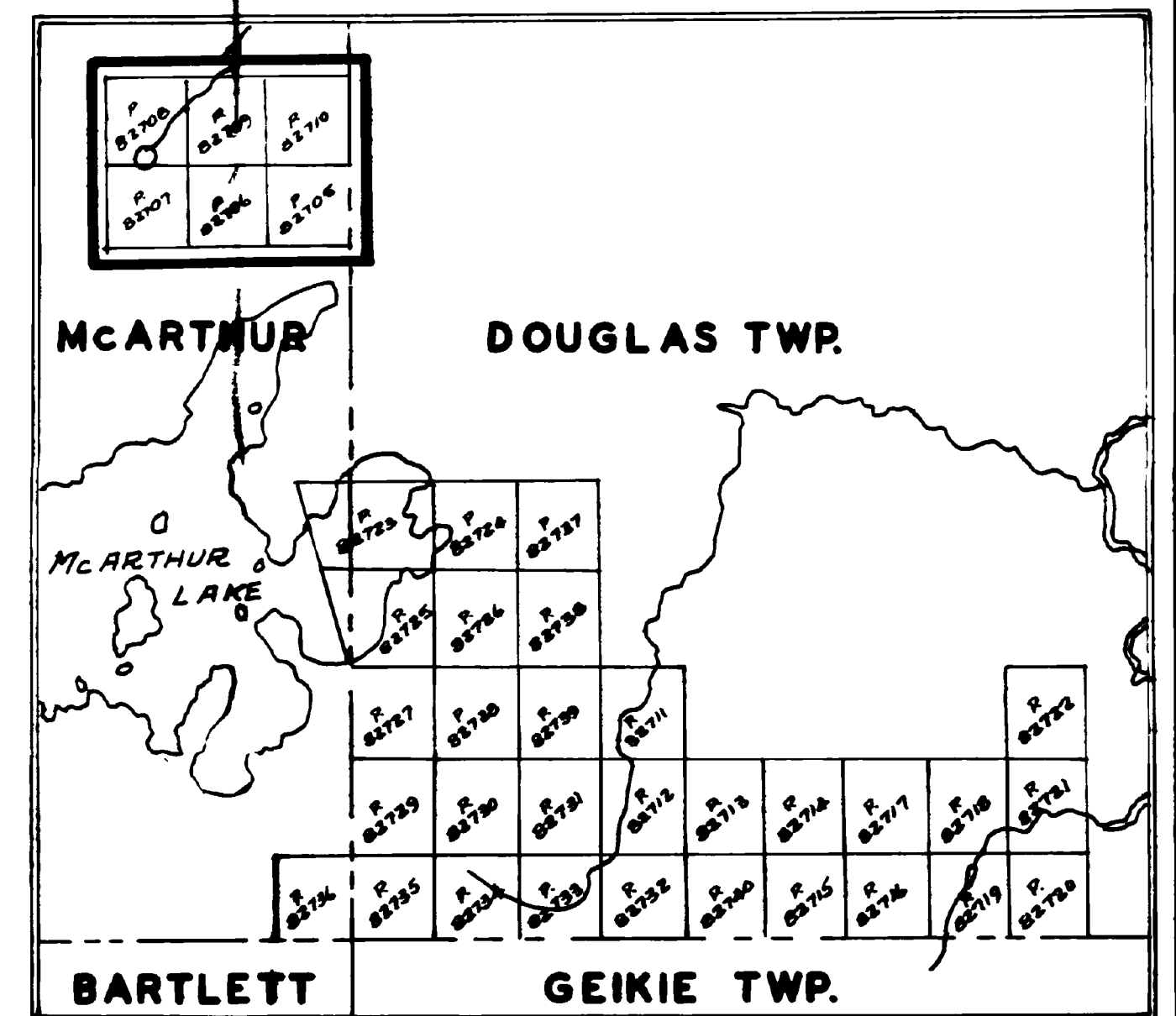
- LEGEND**
- KEEWATIN
 - PERIDOTITE - fine grained, dark, heavy, partly serpentinized, much fine magnetite.
 - INTRUSIVE CONTACT
 - RHYOLITE TUFF - a well banded tuff, lime-green colour, 1-3% fine disseminated pyrite, sericite and chlorite separate rhyolitic bands.
 - TALC-CARBONATE ROCK - a highly altered basic rock. About 90% talc, 8% carbonate, 2% coarse clasts, pyrite.

- SYMBOL**
- Rock outcrop
 - Edge of ridge
 - Swamp or muskeg
 - Fault interpreted from Geology and magnetics.
 - Fault interpreted from magnetics.
 - Geologic contact (approximate)
 - Strike and dip of bedding.





00 N
BASE LINE



14 + 00 S
TIE LINE

KEY MAP
1" = 1/2 MILE

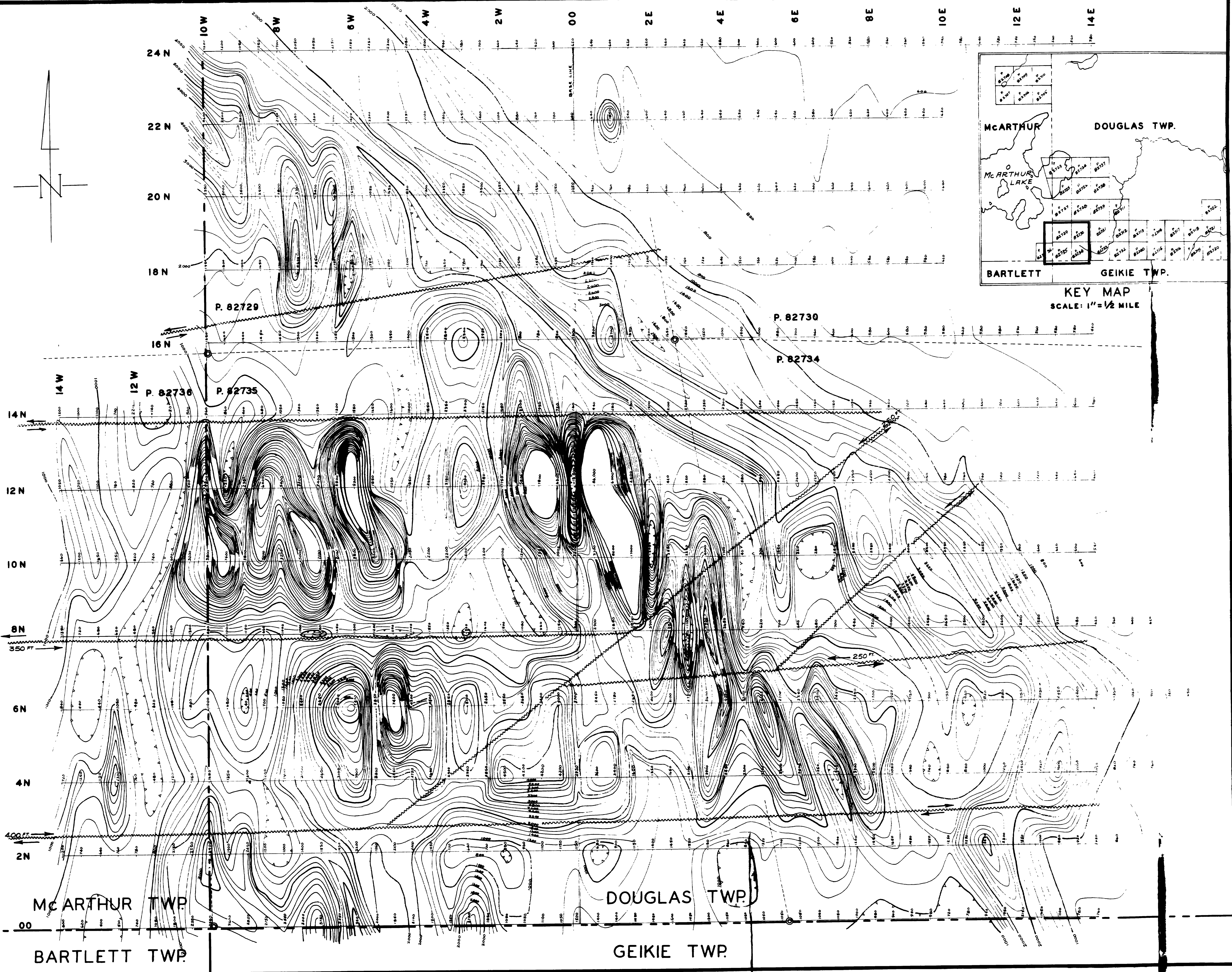


230

LAKEHEAD MINES LTD.
BAR-MIL OPTION
McARTHUR TWP., ONT.
PLAN of MAGNETIC SURVEY
NORTH GROUP

SCALE: 1" = 200'
CONTOUR INTERVAL = 200 GAMMAS

April, 1966 *Chester J. Kerylin*



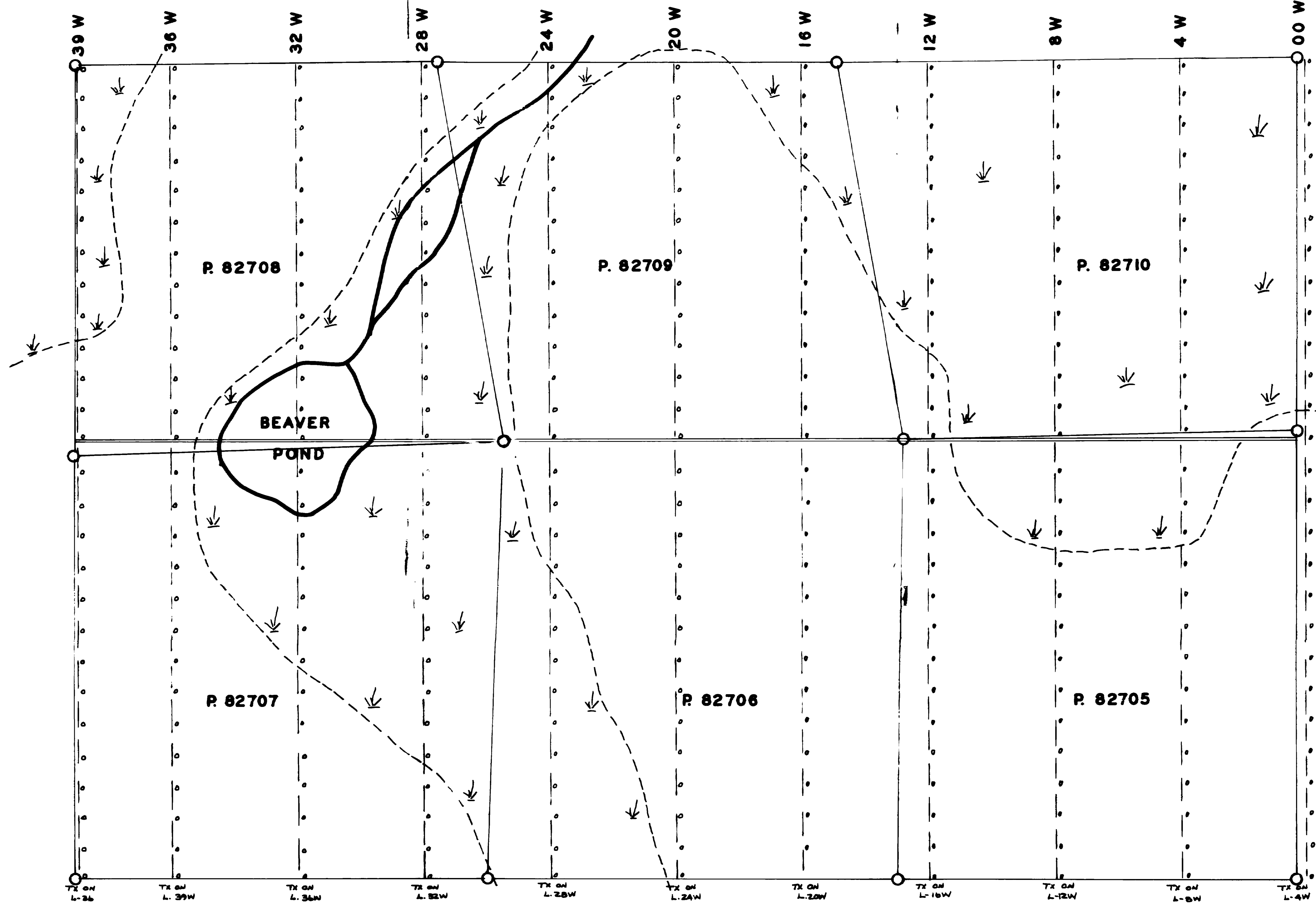
240

LAKEHEAD MINES LTD.
 BAR-MIL OPTION
 DOUGLAS & McARTHUR TWP.S, ONT.
DETAILED PLAN OF MAGNETIC SURVEY

SCALE: 1" = 100'
 CONTOUR INTERVAL = 200 GAMMAS

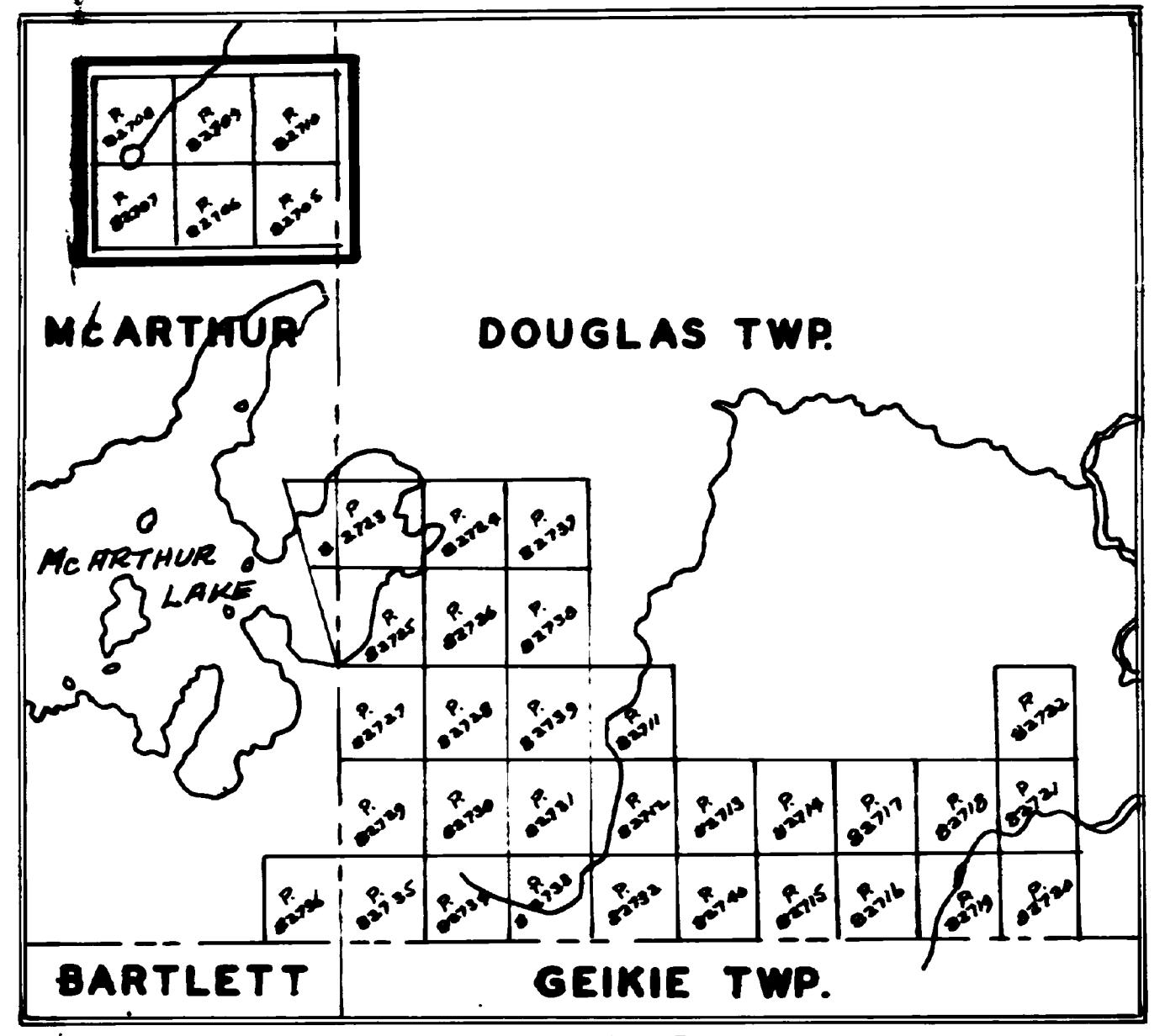
April, 1966.

Charles J. Kuylen

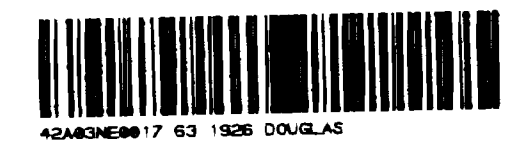


12 + 00 N
TIE LINE

00 N BASE LINE



KEY MAP
SCALE: 1" = 1/2 MILE



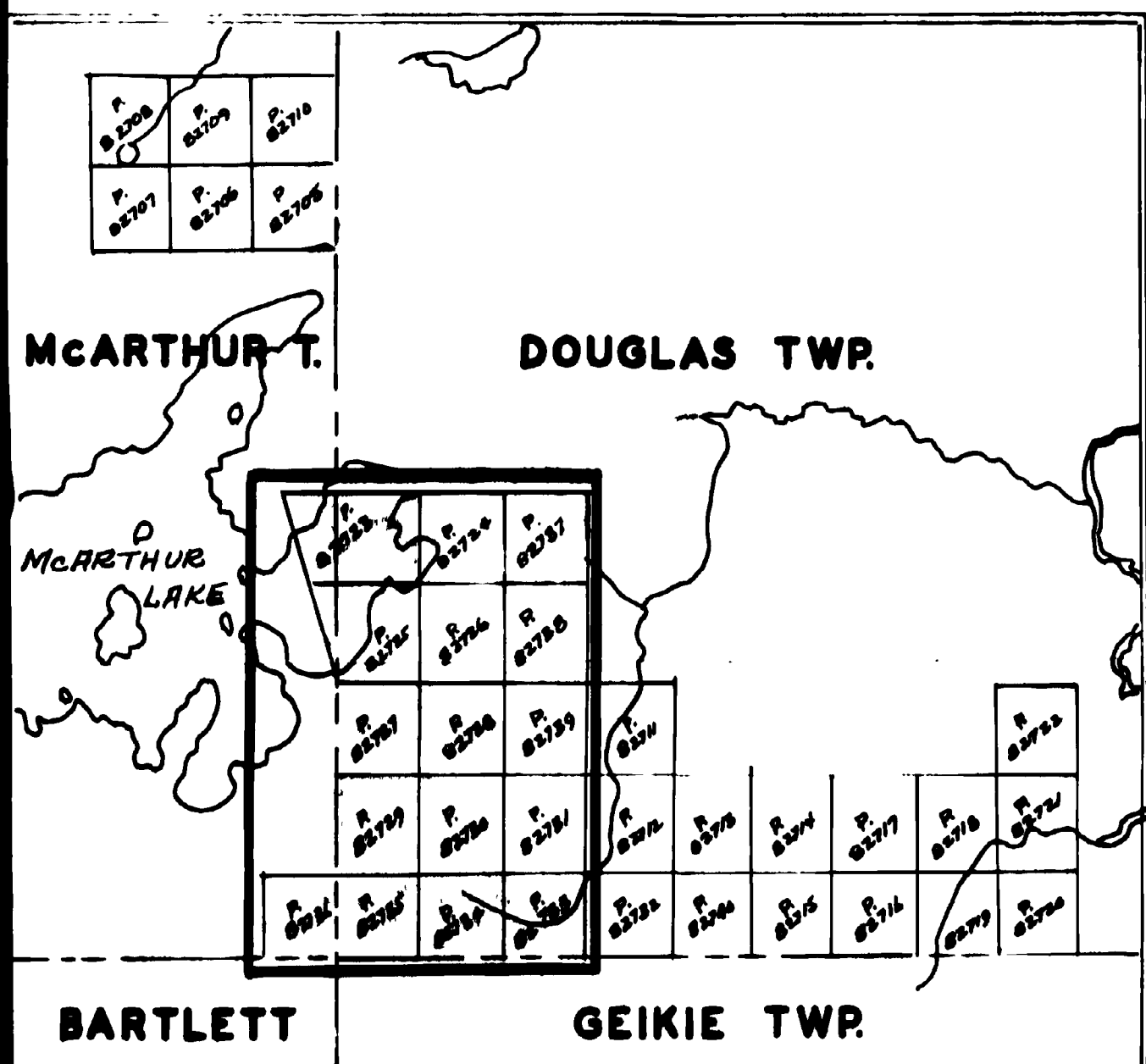
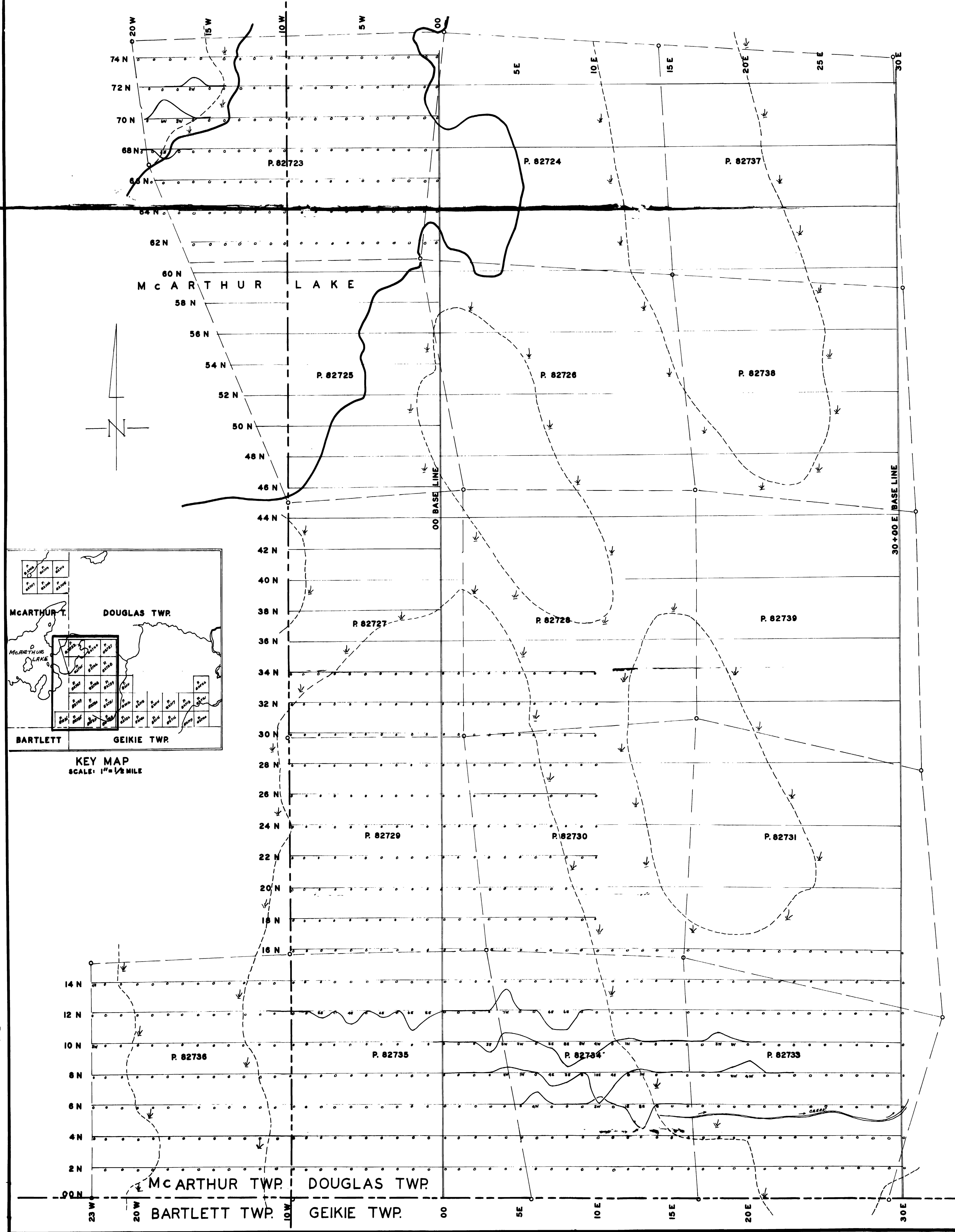
250

LAKEHEAD MINES LTD.
BAR-MIL OPTION
McARTHUR TWP., ONT.
PLAN OF E-M. SURVEY
NORTH GROUP

SHARPE, SE 200, E.M. INSTRUMENT.

SCALE: 1" = 200'

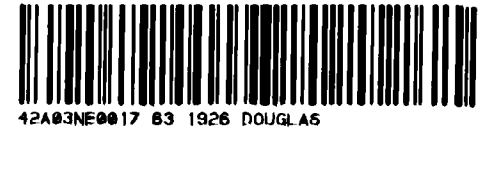
April, 1966 *Edward J. Kerrigan*



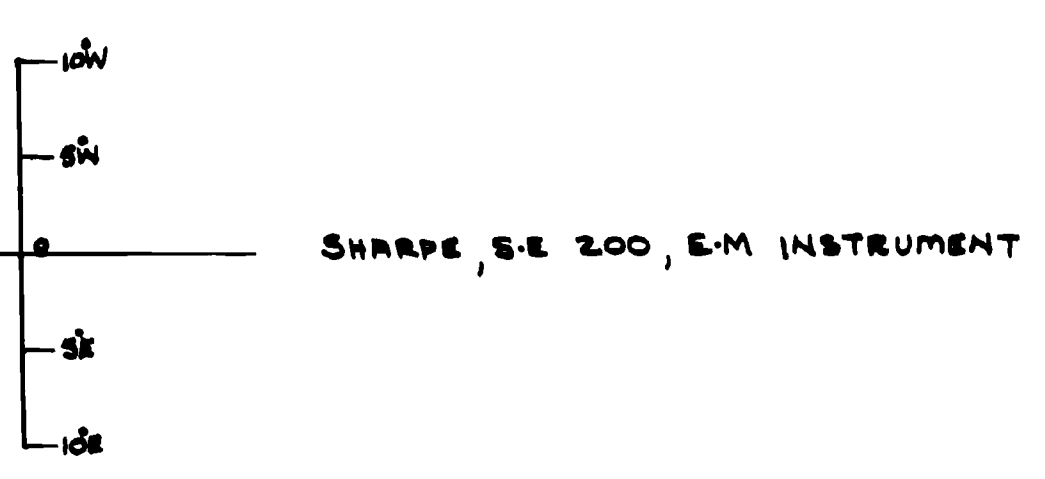
LAKEHEAD MINES LTD.
 BAR-MIL OPTION
 DOUGLAS & McARTHUR TWPS, ONT
 PLAN of E.-M. SURVEY

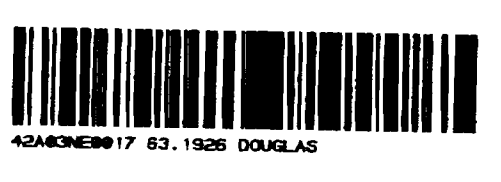
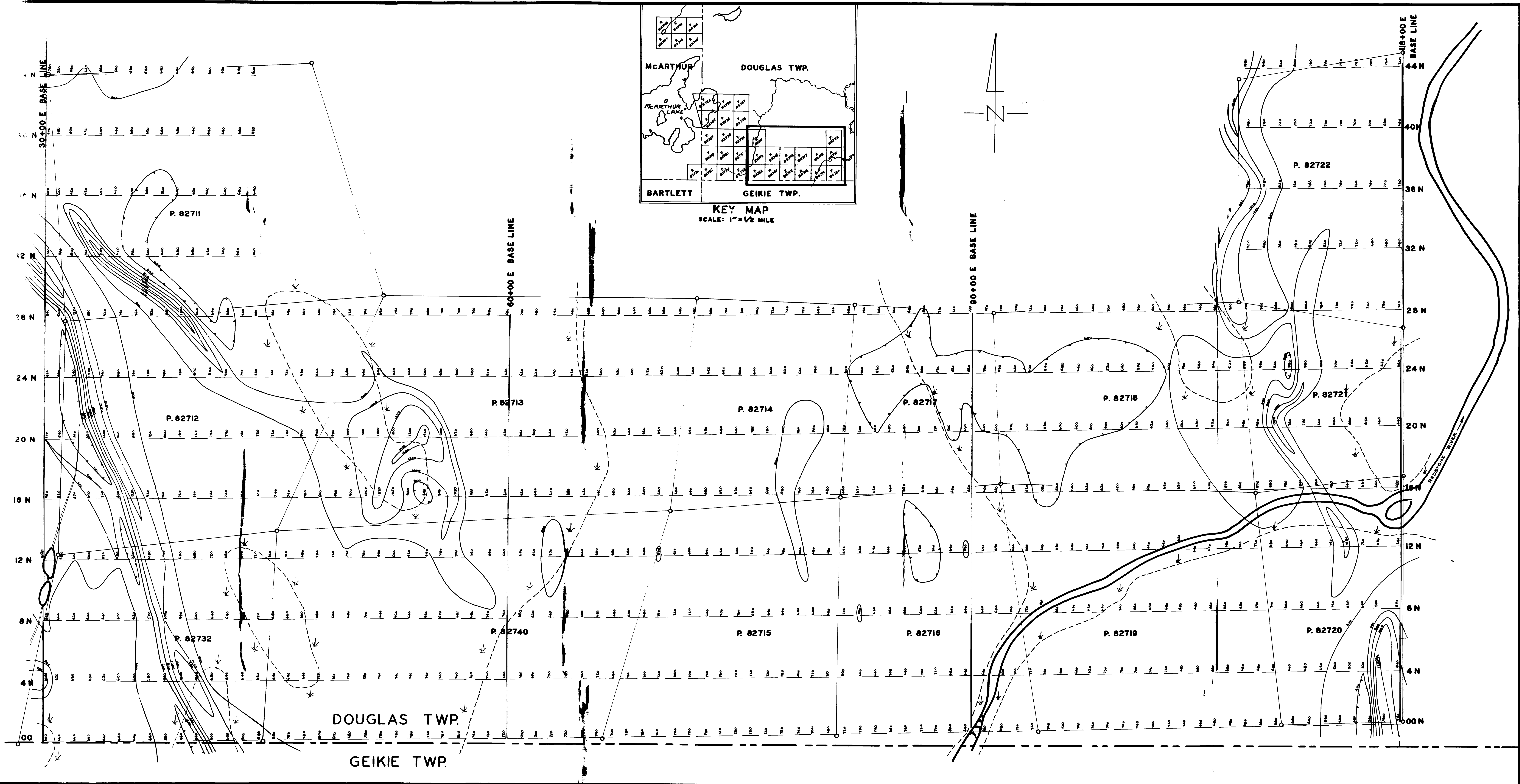
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April, 1960
 Edwin J. Kingston



280

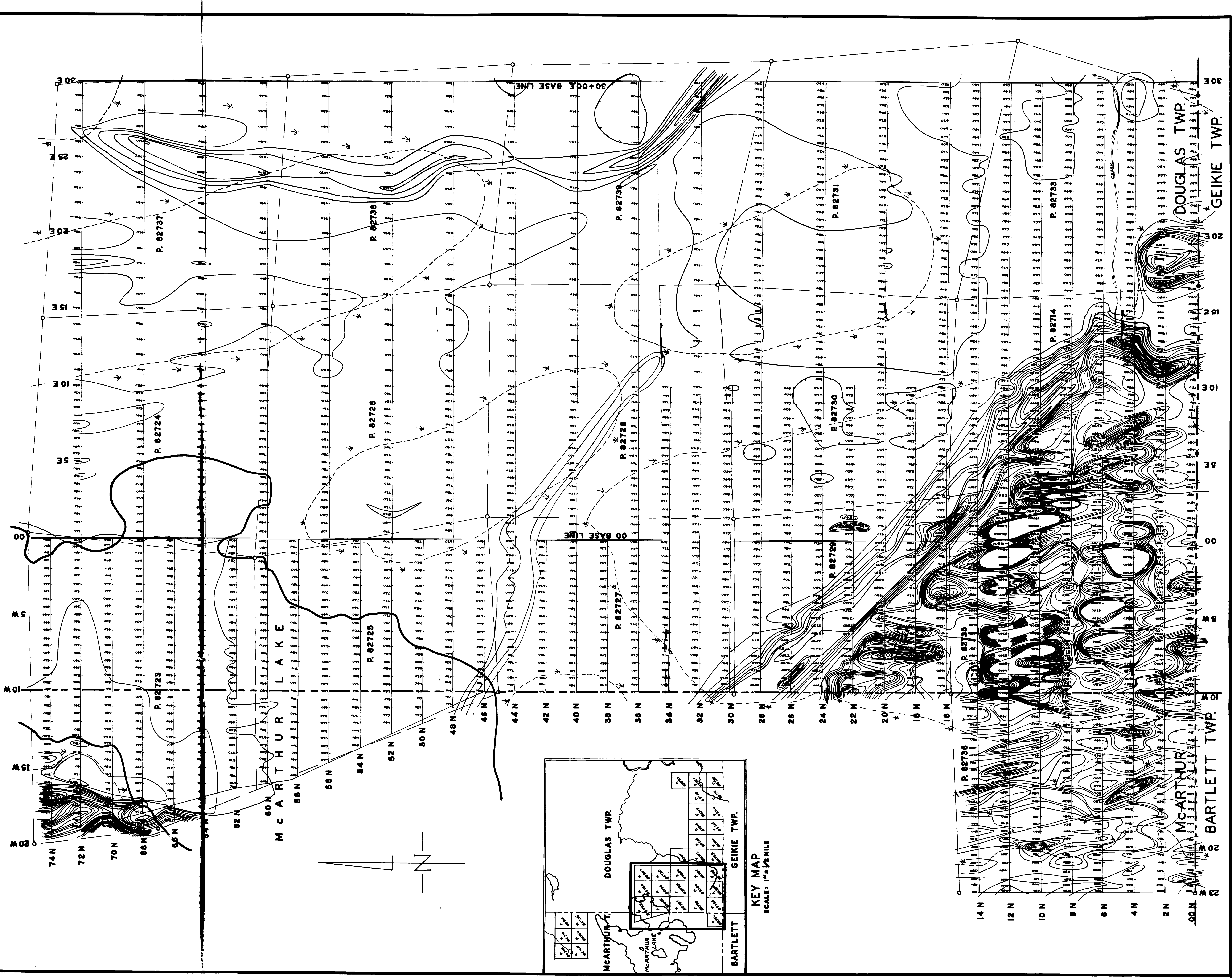




270

LAKEHEAD MINES LTD.
 BAR-MIL OPTION
 DOUGLAS TWP., ONT.
PLAN of MAGNETIC SURVEY
 EAST SHEET
 SCALE: 1" = 200'
 CONTOUR INTERVAL = 200 GAMMAS

April, 1966 *Sheila J. Kuyler*



250

LAKEHEAD MINES LTD.
 BAR-MIL OPTION
 DOUGLAS & MCARTHUR TWPS, ONT.
 PLAN OF MAGNETIC SURVEY

SCALE: 1"=200'

CONTOUR INTERVAL = 200 GAMMAS
Edward J. Rayburn
 April, 1964