



42E10NW0049 2.1089 MCBEAN LAKE

010

GEOLOGICAL & MAGNETOMETER SURVEYS
ON THE THERESA PROPERTY, GERALDTON AREA, ONTARIO

PERFORMED FOR

PROTO EXPLORATIONS & HOLDINGS INC.

During the period May to October 1972, a program of geological mapping, and a magnetometer survey was carried out on claims covering the former gold producer, Theresa Gold Mines, and surrounding area. The work was carried out under the supervision of the writers, and was done on behalf of Proto Explorations and Holdings Inc. who hold the ground under option. The following is a resume of observations and results.

PROPERTY

The Proto option is some 20 miles east of the former gold-mining town of Geraldton, in northwestern Ontario, and eight miles south of the Village of Long Lac. Long Lac is on the main line of the CNR, and on Highway #11. Access to the claims is via a good all weather gravel road extending between Long Lac and Terrace Bay.

The property consists of forty contiguous unpatented mining claims numbered TB 335295 to 335334 inclusive, and encompasses approximately 1600 acres. It is situated immediately south of Indian Reserve #77 and straddles the east boundary of Abrey Township, with some 15 claims in that township and the balance in the unsurveyed area to the east.

WORK DONE

In June a line-cutting crew cut an east-west base line roughly

bisecting the property. From this base line north-south picket lines were cut to the property boundaries at 300 foot intervals. All lines were chained and picketed at 100 foot intervals. A total of 54 miles of line were cut.

In June and July a magnetometer survey was carried out over the entire property, with readings taken at 100 foot intervals on all lines and at intervening points as required. Instrument used was a Sharpe MFI vertical component flux gate magnetometer, with a sensitivity of 20 gammas per scale division. A total of 3045 readings were taken. Field work was by M. Channing; interpretation and report are by the writers. Results, corrected for diurnal variation are plotted and contoured on 200 feet to 1 inch plans accompanying this report.

From July through September outcrop geology of the property was mapped by pace and compass methods using the line grid as control. Field work was by R. Liard, P.Eng., T. O'Connor, P.Eng., and L.G. Phelan, P.Eng. Results and interpretation are shown on 200 foot to the inch plans accompanying this report.

TOPOGRAPHY

The Making Ground River, a slow stream about 80 feet wide, flows northly through the property. About $3/4$ of the property and the bulk of the intrusive to be described below lies to the west of the river.

East of the river rock outcrops are prominent along north to northeast trending ridges which rise about 25 feet above spruce and alder swamps.

In the north central part of the area west of the river maximum

relief is about 100 feet. These hills feature southeast facing scarps where outcrop is prominent, and incised north trending valleys, resulting in blocks of high ground and outcrop rising above well drained spruce swamps.

The entire property has been cut over. The present second growth mixed bush is of no value.

GENERAL GEOLOGY

The property lies at the eastern end of the 'Leitch - Little Long Lac' gold-bearing sedimentary belt. This prominent metasedimentary horizon, infolded within steeply dipping volcanic strata, is up to 8 miles wide and can be followed west for 72 miles to Lake Nipigon. Gold occurrences are widespread along the belt and substantial production was achieved in the Beardmore and Geraldton areas.

Locally the sediments are all of clastic origin, having been derived from granites or other acid rocks. These sediments are to some extent interbedded with the volcanics that enclose them.

Granitic intrusive bodies are common in the area. Dikes, sills and small bosses of acid porphyries intrude both sediments and volcanics. North trending diabase dikes cut all other formations.

At the narrows in Long Lake, conglomerates are represented by elongated cobbles in a fine schisted, sericitic groundmass which is similar in appearance to the alteration of strata presumed to have been very fine impure quartzites. In many cases the fine fractions of these acid meta-sediments cannot be distinguished from the sericite schist which is the alteration product of intrusive rhyolites. These latter rocks are usually

mapped as acid porphyries and often exhibit quartz eyes. The schistosity at this locality is more intense than at the Proto property seven miles to the east, which is directly on strike. Here gold occurrences are associated with the 'porphyry' intrusives, which are intimately associated with sheared metasediments.

GEOLOGY OF THE PROPERTY

At the east end of the sedimentary horizon mentioned above lies a quartz diorite - granodiorite mass about 2 miles by $1\frac{1}{2}$ miles in size. The Proto property covers the great bulk of this intrusive (the balance lies within the Indian Reserve to the north) and the sediments and volcanics which lie along its east, south, and western margins. In the intrusive, near its southeast contact, are located the three shafts and the underground workings of the former Theresa Gold Mines.

TABLE OF FORMATIONS

Diabase

Aplitic, granitic and porphyry dikes, quartz veins.

Quartz diorite - Granodiorite and phases: fine dioritic, gneissic, pink granitic, biotite rich, quartz rich, porphyritic.

Intrusive Rhyolite; schist, sericitic.

Amphibolite gneiss, schist and metavolcanics (and sediments).

Amphibolite

Andesite and diorite flows, agglomerate, tuff.

Basaltic flows, chlorite schist.

Greywacke; massive, chloritic.

Sericite - talc schist, fine impure quartzite and arkose.

Siliceous conglomerate

DESCRIPTION OF FORMATIONS

Sediments and Intrusive Rhyolite

Finely foliated, chloritic, massive greywacke occurs along the south boundary of the property at the extreme east and west ends. West of the river, along the south property boundary, sediments and interbedded meta-volcanics are in contact with the intrusive along their formational strike, which is a little north of east. The sericite schists, fine quartzites, and metaporphyries of this area are similar to the rocks of a 400 foot wide sedimentary horizon which strikes northeast from the east bank of the river. This sericitic material is difficult to distinguish from the rhyolitic sills and the matrix of the porphyries occasionally found scattered throughout the property. Some of the mapped rhyolites are probably sedimentary inclusions and interbeds, while a great deal of the mapped metasediment may be intrusive into volcanics and granodiorites but only one cross-cutting dike was noted. It may be that much of what is mapped as acid intrusive is altered and remobilized sediment.

VOLCANICS

Northeast striking andesite - diorite flows are in strike contact with the intrusive along its southeast boundary. These fine diorites are the common inclusion in the intrusive. Gneissic, amphibolitic metavolcanics, in part metasediment, occur along the south intrusive contact. A lenticular bed of talc - sericite schist near the south west corner of the property contains a small sphalerite occurrence which has been trenched and sampled. Andesites, and andesite schists to the north, are in irregular contact with the intrusive along its west boundary. The contact features a series of embayments of one rock type within the other which are up to seven

hundred feet wide and up to one half mile long.

Fine diorite inclusions from a few inches to at least 50 feet wide and up to several hundred feet long are seen in the intrusive. These and possibly some of the fine dioritic and mafic phases of the intrusive are considered to be remnants of the andesite - diorite flows. The inclusions tend to occur in zones within the intrusive and their contacts are often a locus for shears, commonly healed by vein quartz. All of the inclusions are conformable to the regional strike.

INTRUSIVES

A north striking diabase dike up to 150 feet wide cuts the large intrusive and the volcanic formations but appears to terminate to the south against the fine siliceous sedimentary horizon which is enclosed by volcanics in the extreme easterly part of the property.

The main intrusive, generally varying from quartz diorite to granodiorite, also occurs as quartz-rich and/or mafic-rich variants and other aspects as indicated in the table of formations. The zonal variation as well as inclusion orientation follows the regional formational strike which is a little north of east at the west boundary and changes to northeast at the northeast corner of the property. The greatest strike change occurs at the river. Some variants are seen to be lenticular, others resemble bedded strata in that they may extend uniformly for thousands of feet along strike. This differentiation is purely visual and is not based on detailed petrographic analysis. However, the general impression is that the intrusive is composed of sill-like variants that may reflect assimilated sediments and volcanics. As will be seen all of the known mineralization of economic

interest within the intrusive is situated within a long narrow and extremely variable zone containing multiple inclusions and/or dikes, paralleling the southeast contact of the intrusive.

STRUCTURAL GEOLOGY

Schistosity conforms to the formational strike which swings to the northeast, at the northeast corner, from about east - west at the southwest corner of the property. Dips are steep and variable. The volcanics and sediments along the southeast intrusive contact dip north: some inclusions within the intrusive are known to dip steeply south.

Three north-trending faults are postulated. The Making Ground River appears to follow the surface trace of a 400 foot wide fault zone. Some left hand displacement and dragging along this fault is indicated but not definite. The problem is of interest as gold bearing horizons, apparently within the same zone, are known on each side of the fault and possibly within the fault zone itself. The various possibilities will only be resolved from sub-surface work as there is no outcrop in the area of interest. Two similarly-oriented faults are postulated circa 3900W and 5400W. Displacement appears to be left-hand on at least the first of these.

Shearing at formational contacts and along inclusions is present but not common.

The following tectonic sequence is suggested:

- (a) Intense folding of volcanic - sedimentary strata: stresses taken up by mineral alteration and foliation. Gold is present as sedimentary deposits and may be reconcentrated.

- (b) Emplacement, largely by assimilation, of granodiorites. Re-concentration of gold?
- (c) North - south fracturing of all strata. Complimentary shearing as above.
- (d) Alteration and some mobilization, (possibly with solution addition), of siliceous sedimentary strata. Formation and some emplacement of 'porphyries'. Healing of north - south fractures in sediments. Lastly, emplacement of quartz veins, some with gold, along shears and fractures.
- (e) Emplacement of diabase along north - south fractures.

ECONOMIC GEOLOGY

A small zinc occurrence in sediments has been mentioned above.

Quartz veins, small masses and zones of veinlets in shears can be seen throughout the intrusive and to a lesser extent in the sediments and volcanics. Veins vary from minute stringers to zones up to five feet wide.

Of interest are veins in shears along contacts of or cross-cutting diorite inclusions in the intrusive. A zone of these inclusions about 1000 feet wide extends 7600 feet to the southwest from a prospect shaft at the northeast corner of the property and includes the main production shaft and a second prospect shaft, and their underground workings. The central or main shaft, 700 feet east of the river, was used for the production of gold from at least two vein systems (the #4 and 5) which were oriented along and normal to average formational strike. There is no surface indication of either productive horizon immediately above the workings. A 300 foot gold-bearing vein exposure at the line 24E cuts across sheared inclusions and may represent the upward extension of the #4 productive horizon. The other #5, zone conforms in part to the strike of the river fault which may have been its control, and in part to the regional strike.

The south shaft lies at the northeast end of a vein outcrop coinciding with a sheared diorite-granodiorite contact, and is gold-bearing. This and /or similar subparallel veins can be traced intermittently for several thousand feet. Values elsewhere than in the immediate area of the south shaft were low and spotty.

MAGNETOMETER SURVEY

The gold of the area has no particular magnetic association, and the purpose of the survey was to assist in interpreting the geology. In this context results were very informative insofar as they confirm and extend the geological observations and contribute structural information otherwise only inferred or not exposed at all.

The dominant magnetic feature is a broad irregular cluster of highs occupying roughly the area west of the Making Ground River and north of the base line. This corresponds to the core of the granodiorite stock described under Geology.

East and south of this high area is a zone about 1500 feet wide which is magnetically intermediate in permeability, and which ^{corresponds} to the extremely variable margin of the granodiorite, which is commonly more silicic than the core, and which contains very numerous inclusions of volcanics and sediments. This is the same area described under Economic Geology in which all known gold occurrences are found.

South and east of this again is a magnetically low area corresponding to the interbedded volcanics and sediments.

In the vicinity of the main shaft and the camp the numerous small

and irregular highs and lows can be attributed to old abandoned cars and other iron debris.

A zone of intense magnetic highs is found in the extreme south-westerly portion of the property. While there is a north-striking diabase dike known just off and parallelling the west boundary, and an east-striking mafic intrusive dike within this high area, no really satisfactory explanation is known for the extensive and extreme high. Various sources might be postulated, but it is believed the source is discontinuous iron formation lenses interbedded with the volcanics and sediments, or possibly a very mafic intrusive, which is buried or just west of the claim boundary.

Three very abrupt and prominent north-south magnetic discontinuities are evident, one coinciding with the Making Ground River and the others roughly coinciding with lines 36 and 54 west. Each of these is interpreted as representing faulting and in each case there is some geological confirmation in the form of offsetting or of abrupt termination of various horizons.

CONCLUSIONS & RECOMMENDATIONS

On the basis of the above results and the prospecting, trenching, and studies of old records completed during the same period, a diamond drilling program of 5000 to 8000 feet has been recommended to test the various potentially ore-bearing areas situated along the favorable southeast margin of the granodiorite intrusive.

Respectfully submitted,


L.G. Phelan, M.A.Sc., P. Eng.
Consulting Geologist


R. Liard, B.A.Sc., P. Eng.
Consulting Engineer

Toronto, Ontario
22 November, 1972

RECEIVED

DEC 8 - 1972

GEOPHYSICAL - GEOLOGIC TECHNICAL DATA STATEMENT



42E10NW0049 2.1089 MCBEAN LAKE

900

DEC 7 1972

PM

10 11 12 1 2 3 4 5 6

PROJECTS SECTION

TO BE ATTACHED AS AN APPENDIX TO TECHNICAL REPORT FACTS SHOWN HERE NEED NOT BE REPEATED IN REPORT TECHNICAL REPORT MUST CONTAIN INTERPRETATION, CONCLUSIONS ETC.

Type of Survey Geological & Magnetometer
Township or Area McBean Lake Area & Abrey Twp.
Claim holder(s) Proto Explorations & Holdings Inc.
10th Floor, 366 Bay St., Toronto
Author of Report L. G. Phelan and R. Liard
Address 10th Floor, 360 Bay St., Toronto
Covering Dates of Survey June - October, 1972
Total Miles of Line cut 54 1/2

MINING CLAIMS TRAVERSED List numerically

- TB 335295 (prefix) TB 335316 (number)
TB 335296 TB 335317
TB 335297 TB 335318
TB 335298 TB 335319
TB 335299 TB 335320
TB 335300 TB 335321
TB 335301 TB 335322
TB 335302 TB 335323
TB 335303 TB 335324
TB 335304 TB 335325
TB 335305 TB 335326
TB 335306 TB 335327
TB 335307 TB 335328
TB 335308 TB 335329
TB 335309 TB 335330 covered
TB 335310 TB 335331
TB 335311 TB 335332
TB 335312 TB 335333
TB 335313 TB 335334
TB 335314
TB 335315

If space insufficient, attach list

SPECIAL PROVISIONS CREDITS REQUESTED

DAYS per claim

ENTER 40 days (includes line cutting) for first survey.

ENTER 20 days for each additional survey using same grid.

Geophysical
- Electromagnetic 40
- Magnetometer
- Radiometric
- Other
Geological 20
Geochemical

AIRBORNE CREDITS (Special provision credits do not apply to airborne surveys)

Magnetometer Electromagnetic Radiometric
(enter days per claim)

DATE: Dec, 4, 1972 SIGNATURE: L. G. Phelan
Author of Report or Agent

PROJECTS SECTION

Res. Geol. Qualifications 63A.389

Surveys 63.2990 not for assessment

Checked by performed in 1964 date

GEOLOGICAL BRANCH

Approved by date

GEOLOGICAL BRANCH

Approved by date

TOTAL CLAIMS 40

OFFICE USE ONLY

Show instrument technical data in each space for type of survey submitted or indicate "not applicable"

GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS

Number of Stations 2,851 Number of Readings 3,045
Station interval 100'
Line spacing 300'
Profile scale or Contour intervals 0, 200, 300, 400, 600, 800, 1000, 1500, 2000 gammas
(specify for each type of survey)

MAGNETIC

Instrument Sharpe MF1 vertical component magnetometer
Accuracy - Scale constant 20 gammas per scale division
Diurnal correction method Loops closing on base line stations
Base station location Permanent station at camp - all 300' interval hubs on base line tied into base station camp (Lin 00) BL.

ELECTROMAGNETIC

Instrument
Coil configuration
Coil separation
Accuracy
Method: [] Fixed transmitter [] Shoot back [] In line [] Parallel line
Frequency
(specify V.L.F. station)
Parameters measured

GRAVITY

Instrument
Scale constant
Corrections made
Base station value and location
Elevation accuracy

INDUCED POLARIZATION -- RESISTIVITY

Instrument
Time domain Frequency domain
Frequency Range
Power
Electrode array
Electrode spacing
Type of electrode

AREA OF
Mc BEAN LAKE
 DISTRICT OF
 THUNDER BAY
 THUNDER BAY
 MINING DIVISION
 SCALE: 1-INCH=40 CHAINS

LEGEND

PATENTED LAND	● or ⊙
CROWN LAND SALE	C.S.
LEASES	⊙
LOCATED LAND	L.O.
LICENSE OF OCCUPATION	L.O.
MINING RIGHTS ONLY	M.R.O.
SURFACE RIGHTS ONLY	S.R.O.
ROADS	—
IMPROVED ROADS	—
KING'S HIGHWAYS	—
RAILWAYS	—
POWER LINES	—
MARSH OR MUSKES	—
MINES	⊙
CANCELLED PATENTED S.R.O.	⊙

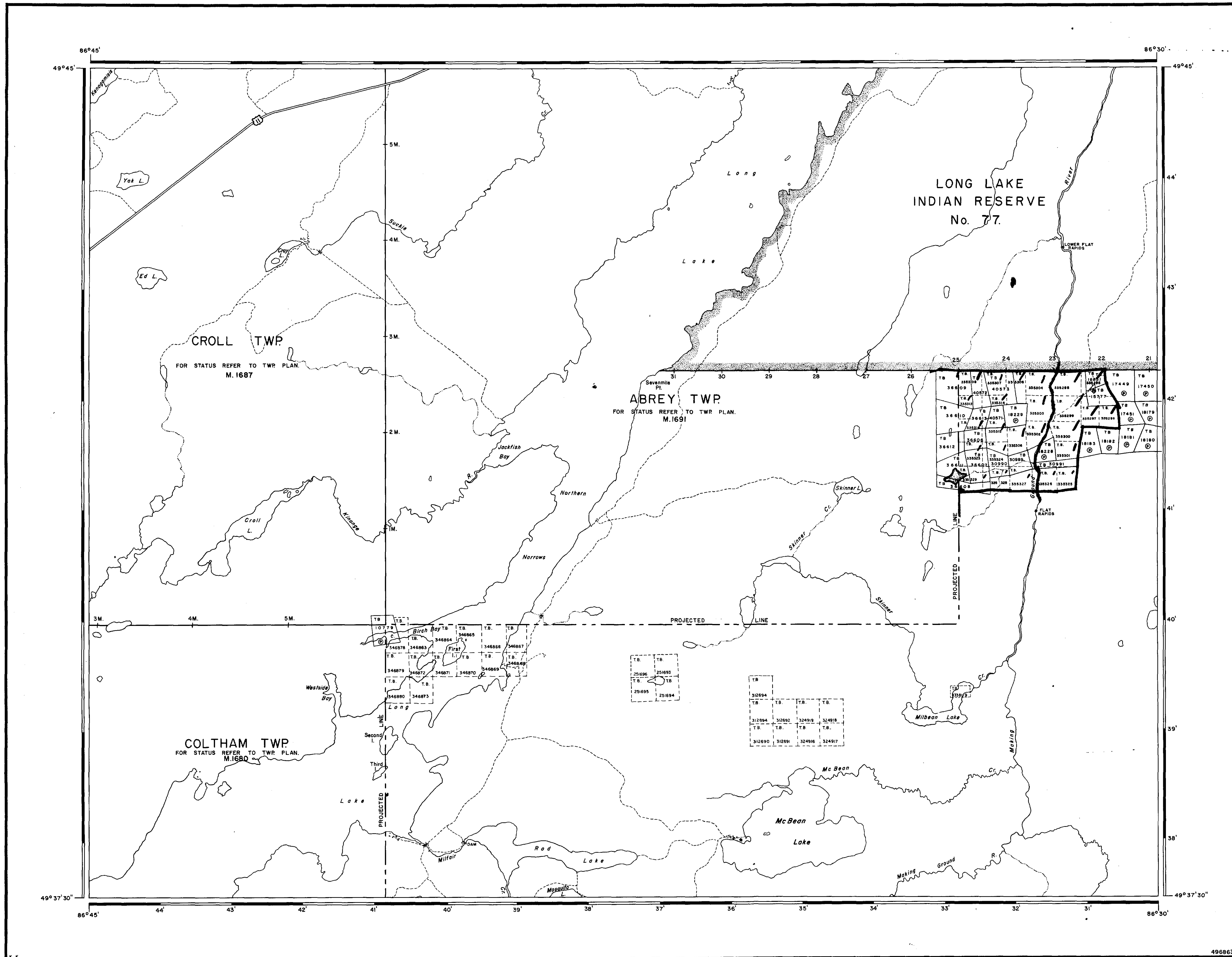
NOTES

400' surface rights reservation along the shores of all lakes and rivers.

Flooding Rights on Long Lake reserved to contour elevation 1030' - File No. 110752

DATE OF ISSUE
 DEC 12 1972
 ONT. DEPT. OF MINES
 AND NORTHERN AFFAIRS

NATIONAL TOPOGRAPHIC SERIES 42E 10
PLAN NO. M-1622
 MINISTRY OF
 NATURAL RESOURCES
 ONTARIO



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MC BEAN LAKE

MC BEAN LAKE

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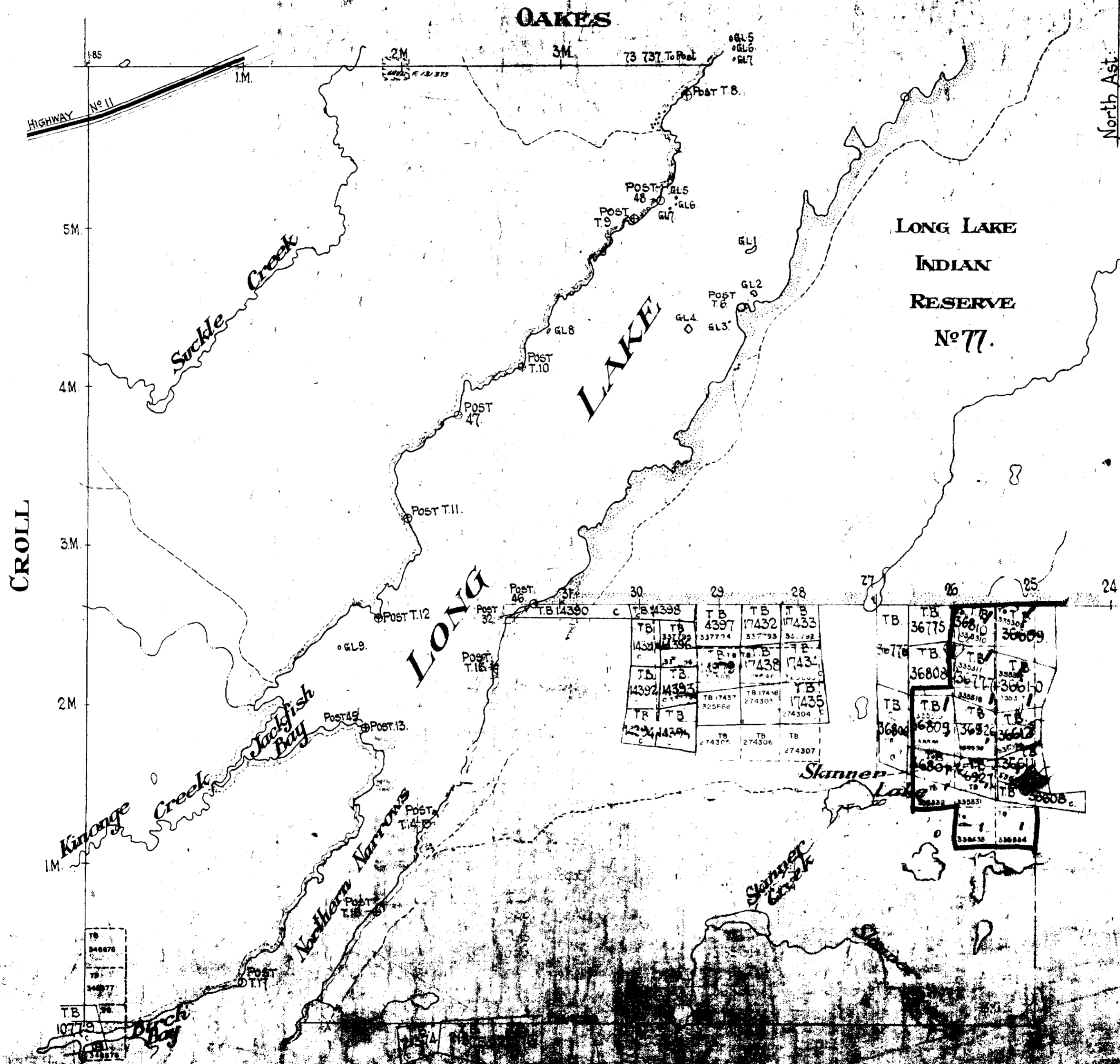
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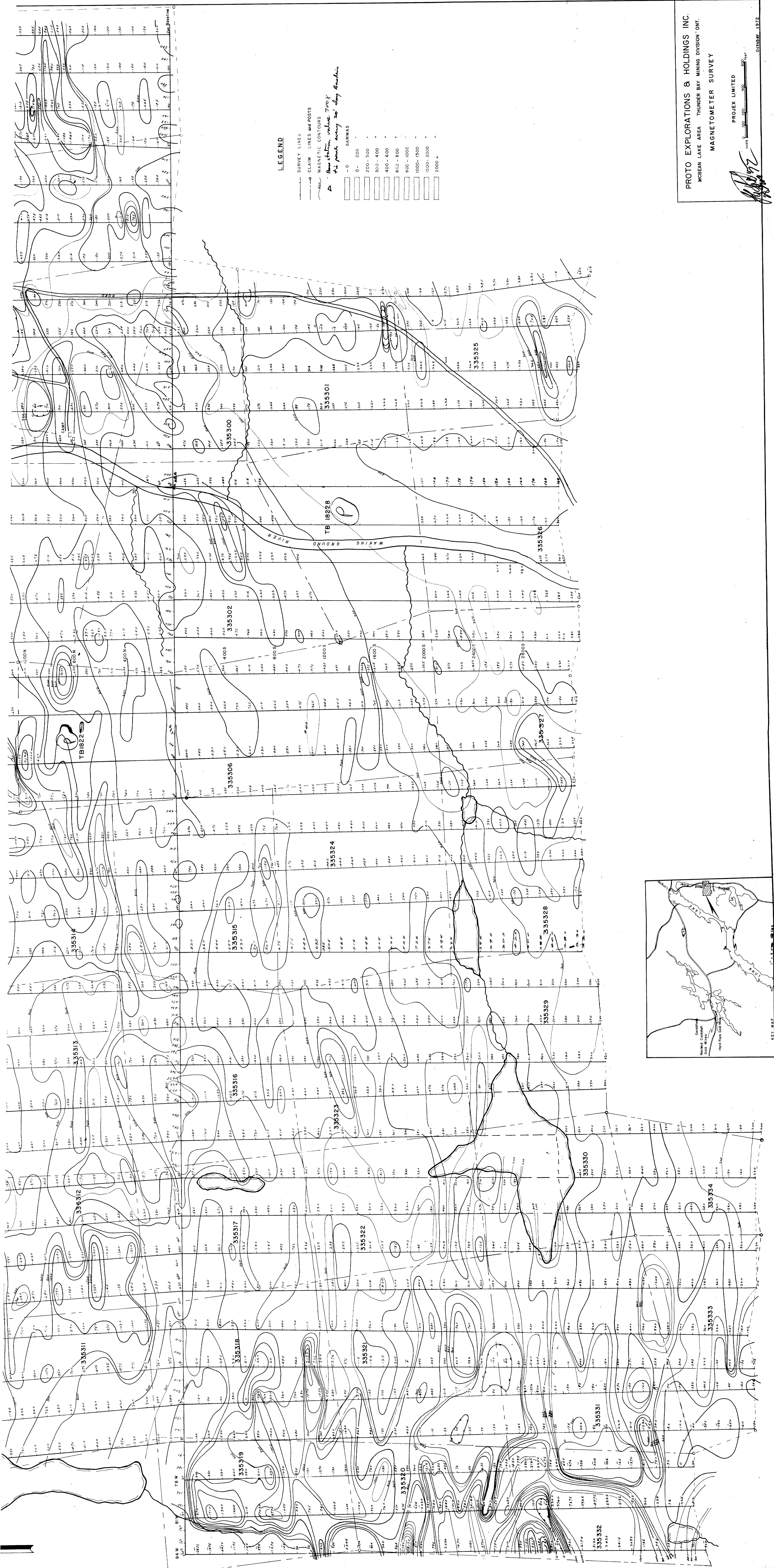


2-1089

DATE OF ISSUE
1912
DEPARTMENT OF MINES
AND TECHNICAL AFFAIRS

Scale 40 Miles





LEGEND

- SURVEY LINES
- - - CLAIM LINES AND POSTS
- MAGNETIC CONTOURS
- A Base station value 700γ
to point every 200 γ by Reader
- - 0 GAMMAS
- 0 - 200
- 200 - 300
- 300 - 400
- 400 - 500
- 500 - 600
- 600 - 800
- 800 - 1000
- 1000 - 1500
- 1500 - 2000
- 2000 +

PROTO EXPLORATIONS & HOLDINGS INC.
MCBEAN LAKE AREA THUNDER BAY MINING DIVISION ONT.
MAGNETOMETER SURVEY

PROJEX LIMITED

October 1972

