THE HANNA MINING COMPANY

MIDLOTHIAN TOWNSHIP

LARDER LAKE MINING DIVISION

10

ELECTROMAGNETIC REPORT

by

BEVERLY L. HODGINS

INTRODUCTION

The Midlothian property was acquired in January, 1973 to explore for base metal deposits in the favourable geological units.

Application was then made to the Ministry of Natural Resources of Ontario for assistance under the Mineral Exploration Assistance Program. The application was approved in a formal agreement in which the Government agreed to pay 1/3rd of specified exploration costs up to a maximum of $20,753.67.

An additional 8 claims were acquired in May 1973 and the Assistance Agreement was modified to allow for the additional expense, up to $22,828.67.

Finally, on August 27, 1973, 11 claims adjoining Hanna's property were optioned from John Larche of Timmins, and these were included in the agreement with the Government, but the maximum amount of assistance remained at $22,828.67.

A grid was established over the property and a program consisting of geological mapping, magnetometer and electromagnetic surveys was carried out during the period May through December, 1973.

PROPERTY:

The property consists of 124 contiguous unpatented claims. They were acquired by staking on behalf of The Hanna Mining Company and by option.

Staker	Claims	Transfer Recorded
Hugh Carlson	70	January 30, 1973
Leo Marino	35	January 30, 1973
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The claims are held in the name of:

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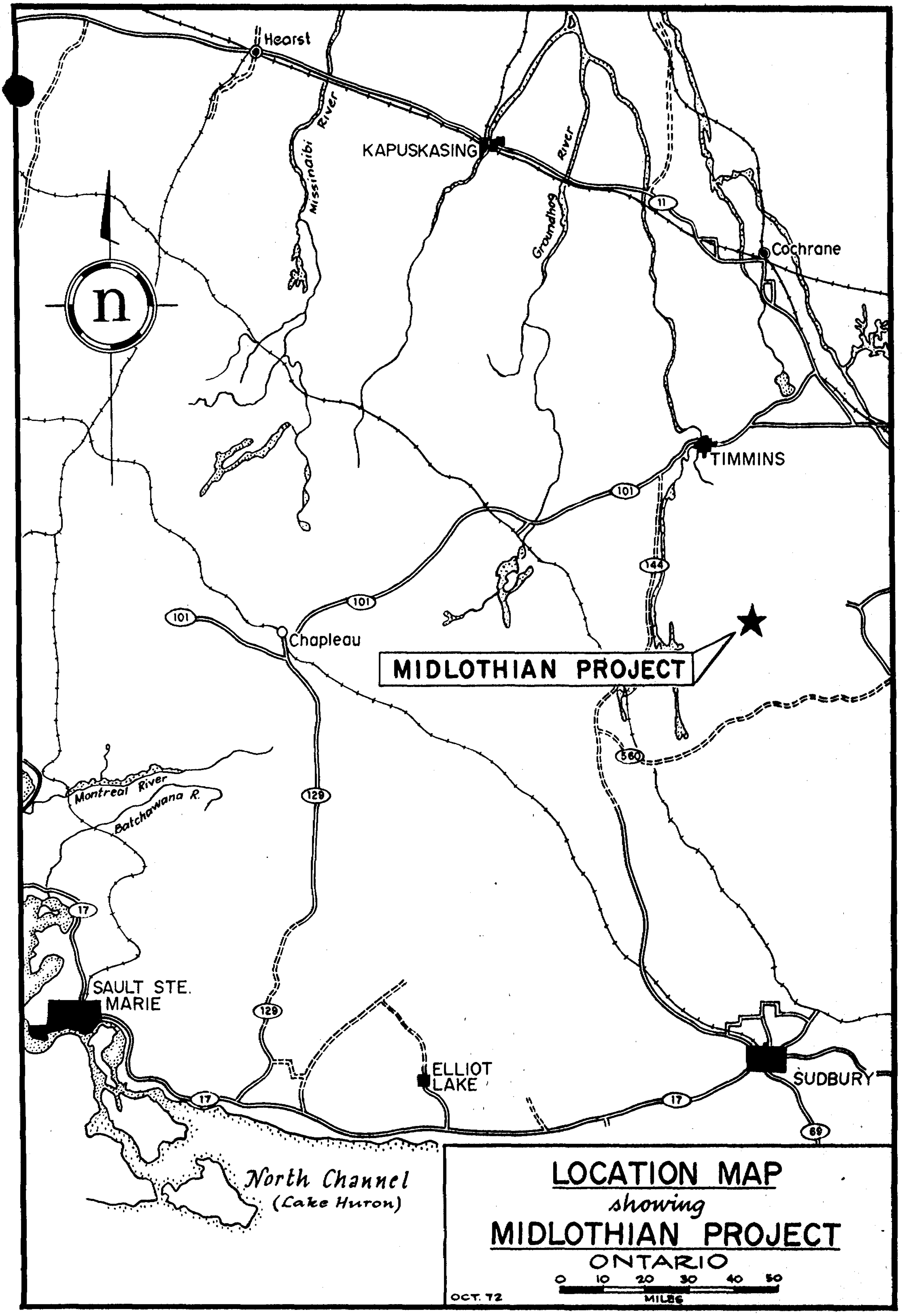

LOCATION MAP
showing
MIDLOTHIAN PROJECT
ONTARIO

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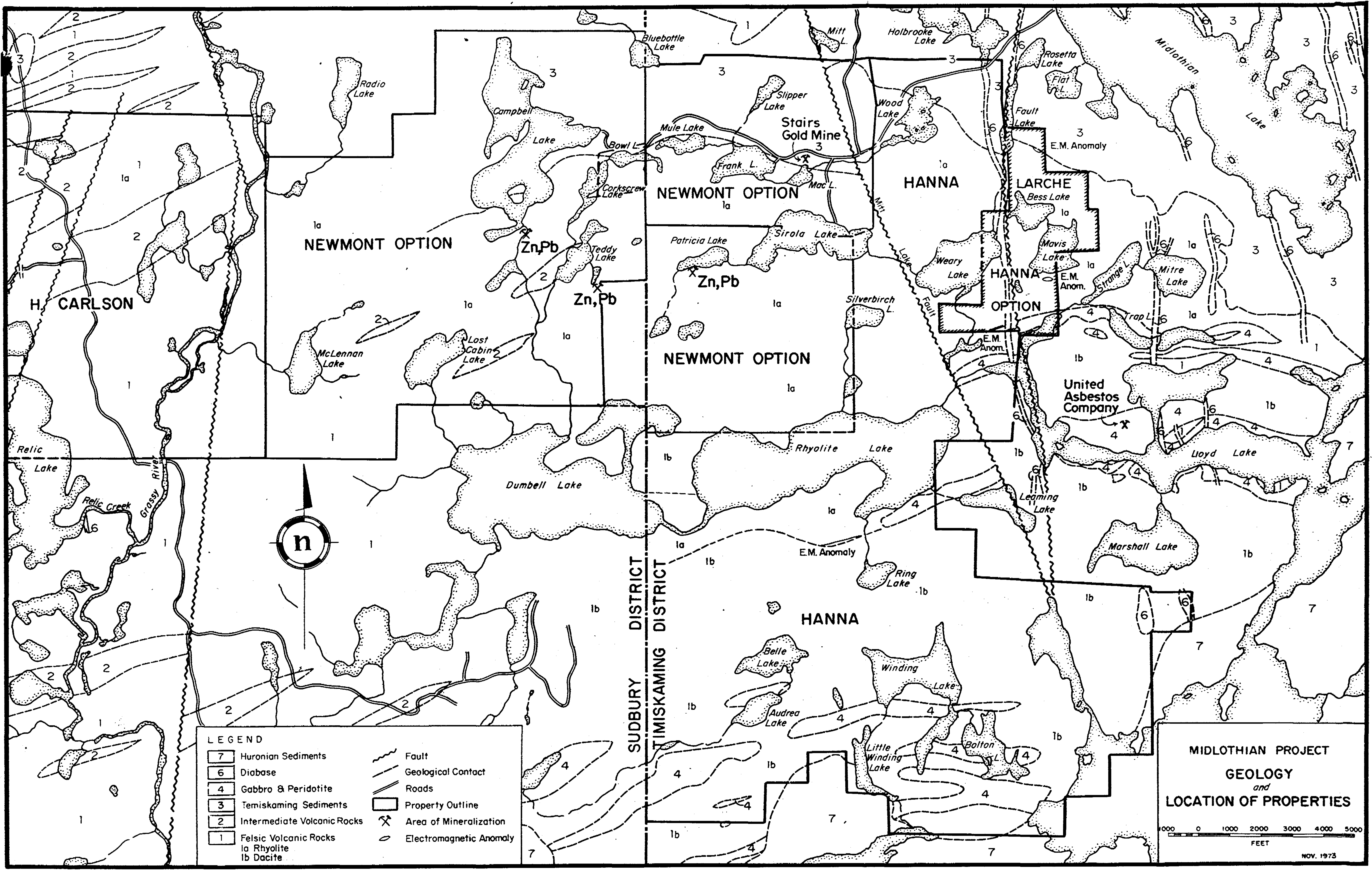

MIDLOTHIAN PROJECT

GEOLOGY
and
LOCATION OF PROPERTIES

The claims are numbered L353651, L354171 to L354180 inclusive; L363524 to L363582 inclusive; L366986 to L367020 inclusive; and L373057 to 373064 inclusive.

The property optioned from John Larche comprises 11 claims in Midlothian Township, Larder Lake Mining Division. The claims are numbered L333617 - L333624 inclusive, L333750, L353155 and L353156.

LOCATION AND ACCESS: → File 2.1380

The property, located in the west part of Midlothian Township, extends to within a claim of the north and south township boundaries. It includes Wood Lake, Ring Lake, Belle Lake, Bess Lake, Andrea Lake, Bolton Lake, Winding Lake, and parts of Holbrook Lake, Sirola Lake, Weary Lake, Silverbirch Lake, Lloyd Lake, Mavis Lake, Rhyolite Lake, Dumbell Lake and Upper Winding Lake.

The north part of Midlothian Township can be reached via motor vehicle from either Matachewan or Timmins.

The total distance from Timmins is 60.5 miles and part of this distance is on rather rough road. The route starts at the south end of Pine Street and follows a Forest Access Road to the turn-off into the Texmont Nickel property, a distance of 27 miles. From that point the road is not maintained for 10 miles until it meets a logging road to Matachewan. At 14.5 miles on the logging road toward Matachewan is the road to the old Stairs Mine which provides access to the Stairs property in Midlothian Township and to Sirola Lake, a distance of 9 miles from the Matachewan turn-off. A 5-mile extension of the Stairs Mine road from Sirola Lake to Lloyd Lake, built by United Asbestos in 1972, crosses the north part of the property.

The property can be reached from Matachewan by two different routes, via the Stairs Mine Road and via the Wilson Logging Camp road.

It is 17 miles west of Matachewan to the end of highway 566 and an additional 15 miles west along a logging road to the Stairs Mine Road turn-off. Sirola Lake is 9 miles south of the turn-off along the Stairs Mine Road.

The Wilson Logging Camp Road branches south for 10 miles from the end of highway 566. A new road (1973) has been constructed from Wilson Camp for 5 miles west to the United Asbestos property. The total distance from Matachewan to Lloyd Lake is 32 miles.

A road .5 miles north of Stairs Mine, which is one mile north of Sirola Lake, turns east to Midlothian Lake and crosses the north boundary area of the property.

A camp was established at Sirola Lake and it was used as a base to cover the north part of the property.

The south part of the property is accessible by boat on Lloyd Lake. A good portage between Lloyd Lake and Rhyolite Lake provides easy access to the west part of the property.

A camp erected on the southwest bay of Lloyd Lake was used as a base to cover the south part of the property.

PREVIOUS WORK: (ODM Assessment Files; Marshall, 1947; Bright, 1970)

Gold and Asbestos

The presence of gold and asbestos mineralization has been the main stimulus for the previous exploration work in the area.

The first reported period of exploration work took place in 1909 when gold was first discovered in the township. Two other periods of major activity followed. The discovery of gold in the Frank Lake area in 1944 by Upper Canada Mines Ltd. renewed interest in the area.

The optioning of the same gold showing in 1962 by Stairs Exploration and Mining Company Limited followed by underground development again renewed interest.

Much of the area has been thoroughly prospected. Stripping and trenching and locally some diamond drilling has been carried out to test areas of interest.

Minor exploration work on an asbestos occurrence in an ultramafic sill north of Lloyd Lake was carried out about 1920.

Little subsequent activity was noted in the area until the early 1950's when geological mapping, magnetic surveys, stripping, trenching and diamond drilling were carried out. The ownership of the property has undergone several changes. In 1973 the present owners, United Asbestos Company, decided to proceed with the development of the deposit.

Field evidence indicates that other areas of high magnetic relief in the township were checked for asbestos occurrences, probably during the 1950's.

A lot of the work completed does not seem to have been reported and/or recorded in the assessment files.

A number of old trenches, old picket lines and rusted tools were noted on the property during this past summer's program.

Base Metal Activity Exploration Programs

Exploration activities for base metal deposits have been sporadic. A number of airborne geophysical surveys have been carried out over parts of the property but little ground follow-up work is indicated.

In 1963 Stairs had an airborne geophysical survey carried out which covered the north part of the property. Their follow-up program in 1966 tested several of the conductive zones in the Campbell-Frank Lakes area and the Mavis-Strange Lakes area with drilling and/or stripping. Marcasite and graphite zones were noted in both of the conductors.

There is no record of ground follow-up programs within the area of Hanna's Midlothian property.

A Canadian Aero airborne geophysical survey carried out for B. W. Lang in 1963 covered an area adjacent to the northeast boundary area.

In 1968 Timiskaming Nickel Limited had an airborne geophysical survey flown by Lockwood Surveys Ltd. over a part of the east boundary area between Sirola and Rhyolite Lakes. Drill holes north of Leaming Lake intersected peridotite and rhyolite with graphite and pyrite. No follow-up ground work has been reported in the area of the Midlothian property.

Ground Surveys

In 1965 Cominco reported three drill holes that tested a conductor delineated by ground geophysical surveys west of Lloyd Lake. This area is at the south end of the Midlothian property. The defined conductor consists of graphite in an argillitic schist unit that is part of an intermediate volcanic sequence.

In 1972 Carman Bay Explorations carried out magnetometer and EM16 surveys over the west part of Rhyolite Lake. They delineated 6 conductive zones. No follow-up of these zones has been reported.

PRESENT WORK:

Grid

The land portion of the transit-controlled grid was cut by Thorex Limited of Thunder Bay. The grid was extended over the ice-covered lakes by Hanna personnel.

North of Wood Lake, tie line 00 was established using a Brunton compass to determine true north. A baseline at 1000 feet south of the north property boundary was turned off at 90^{o} to tie line 00 and extended to the east and west. Picket lines were turned off to the north and south at 400 foot intervals and cut either to the property boundaries or the lake shores.

On the south shore of Wood Lake on tie line 00 a Polaris shot was used to accurately determine true north. Tie line 00 was then extended to 25200 south of the north boundary at a bearing of 180^{o}. That part of tie line 00 north of Wood Lake is $2^{o}30'$ west of north.

Baselines were established at 2000 foot intervals from 1000 south and they were cut as noted above.

The tie line and baselines were offset around the larger lakes to maintain accurate chainage. A stadia rod was used on the east-west baselines to determine the distances across the narrower lakes.

The grid was extended over the ice-covered lakes during December to complete the detailed coverage of the property.

All lines were chained and pickets were spaced at 100 foot intervals.

A total of 17.57 miles of transit-controlled base line, 12.6 miles of transit-controlled tie line, and 104.22 miles of picket line were run on the property.

EQUIPMENT AND METHODS:

An ABEM Gun and a Crone CEM unit were used to survey the property. A Turam survey was then completed to resurvey the north part of the property to check for"deep-seated" conductive zones that the previous EM surveys might have missed.

The ABEM Gun, a "horizontal loop" unit, measures two frequencies, a low frequency at 880 Hz and a high frequency at 3520 Hz. For this survey high frequency readings were taken at 100 foot intervals with a 200 foot coil spacing. In anomalous zones, readings were taken at 50 foot intervals on both high and low frequency.

Where topography varies by more than 10 feet over a 200-foot distance, it is necessary to apply a correction factor to the in-phase readings. The procedure used by The Hanna Mining Company is to take all readings with the receiver and transmitter in a vertical position, estimate the difference in elevation between the coils and then apply a correction factor according to graphs provided by the manufacturer.

The Crone CEM which was used as a horizontal shoot back unit measures three frequencies -- low frequency 390 Hz, intermediate frequency 1830 Hz and high frequency 5010 Hz. For this survey, readings were taken at 100 foot intervals with a 200 foot spacing between the transceivers using the intermediate frequency. In anomalous zones both intermediate and low frequencies were read at 50 foot intervals.

The Crone readings are not affected by elevation differences between the transceivers. For this reason the unit was used over the south part of the grid because hills rise to more than 100 feet above the lakes,and cliffs rise to more than 50 feet above the surrounding topography.

Areas of rugged topography that had been previously surveyed with the ABEM Gun were resurveyed with the CEM unit.

The Turam Survey was carried out by Geosearch Consultants Limited. Their survey procedures and results are given in their reports and shown on maps 74-91 to 74-94, two copies of which are attached to this report.

The Turam Survey covered only the north part of the grid from the north boundary south to base line 170 south. This area was previously surveyed with the ABEM Gun.

PERSONNEL:

The electromagnetic survey was carried out over the Midlothian property during the periods May 22 to Aug.25 and December 3 to 18, 1973 by:

B. L. Hodgins, #805, 69 Yonge Street, Toronto, Ont.
J. Hendry, 342 King St. N., Waterloo, Ont.
M. Seabrook, Apt.214, 315 Glendale, St.Catharines, Ont.
F. Facey-Crowther, R.R.#1, Vineland Station, Ont.
M. Linekar, 132 O'Donohue Dr., Garson, Ont.

On the Larche option an ABEM Gun electromagnetic survey was carried out by Nelson Hogg, assisted by Alex Batise, during the period October 1 to October 3, 1973. Their addresses are given below:

Nelson Hogg, The Hanna Mining Company,
#805, 69 Yonge St., Toronto, Ont. M5E 1K3
Alex Batise, Matachewan, Ontario.

GEOLOGY:

The general geology of the Midlothian Township area and the detailed geology of the Midlothian property are described in a separate geological report.

Briefly, the area is underlain by felsic to intermediate volcanic and sedimentary rocks of Archean age. They are isoclinally folded and intruded by two ages of mafic to ultramafic sills and dikes.

Younger, nearly flat-lying sediments of the lower Proterozoic - Cobalt Group - occur in the east and south parts of Midlothian Township and they underlie the south boundary area of the property.

RESULTS OF ELECTROMAGNETIC SURVEYS:- Midlothian Property

Two zones of conductivity were delineated by the survey. They are as follows:

(a) On lines 12+00E and 16+00E at 247+50 south.
(b) Between lines 00 and 64W in the vicinity of 160+00 south.

(a) The conductor delineated on lines 12 west and 16 west had been previously defined and drilled by Cominco in 1965 as is reported under "Previous Work".

(b) The long conductive zone south of Rhyolite Lake locally has good electromagnetic characteristics on both the in-phase and out-of-phase components. It has a coincident magnetic anomaly on line 16 west. The other lines do not appear to have magnetic association.

The conductor in the west part of the zone coincides with a cliff escarpment and the ABEM Gun survey results do not show characteristic conductor profiles. No interpretation for the characteristics of the conductor can be made on many of the surveyed lines.

Immediately east of line 16 west, the conductor seems to extend over an outcrop area. The host rock is a fine grained Rhyolite tuff with finely disseminated sulphides, to 10-15 percent, mainly as pyrite with occasional specks of pyrrhotite.

Numerous other ABEM Gun anomalous zones are shown on the maps. Many of them seem to be caused mainly by rugged topographic changes as noted above. They are characteristically high on the in-phase component and near background on the out-of-phase component.

There are anomalies that have near background to low negative in-phase readings and high negative out-of-phase readings. None of these anomalies have been explained.

Larche

On the Larche option, three zones of conductivity were located by the electromagnetic survey. Two of these were found on one line only, and one was located on 2 lines. They are located as follows:

(a) Line 48+00 East 3200 South
(b) Line 48+00 East 7300 South
(c) Line 28+00 East 9100 South
  Line 32+00 East 89+50 South

The conductor on line 48+00 east at 3200 south is on the contact between rhyolitic rocks and conglomerate, but there is no rock exposure in the area of the conductor. The Turam survey indicated this anomaly to have poor conductivity.

The conductor on line 48+00 east at 7100 south is on a prominent hill, and may be partly caused by topography. However, it has strong out-of-phase readings which should not be affected by the topography, but may reflect overburden conditions. The Turam survey indicated this anomaly to have poor conductivity.

The conductor on lines 28+00 East and 32+00 East in the vicinity of base line 90 South has good electromagnetic characteristics on both in-phase and out-of-phase values. It is in flat ground. As noted in the Turam report this anomaly was extended westward by the Turam Survey. The anomaly was delineated on lines 24+00E, 20+00E and 16+00 East.

REFERENCES:

Marshall, H.I.
1947: Geology of Midlothian Township, District of Timiskaming; Ontario Dept. Mine, V LVI, pt V, p.1-24. Accompanied by map 1947-4, scale 1 inch to 1000 feet.

Bright, E.G.
1970: Geology of Halliday and Midlothian Townships, District of Timiskaming; Ontario Dept. Mine, GR79-1970. Accompanied by map 2187, scale 1 inch to 1/2 mile.

O.D.M.
1963: Timmins-Kirkland Lake Sheet, Districts of Cochrane, Sudbury and Timiskaming, Geological Compilation Series. Map No.2046, scale 1" to 4 miles.

Peach, P.
Midlothian Project - Study of Thin Sections, August 1973, Private Report to The Hanna Mining Company.

Gittins, J.
Midlothian Project - Study of Thin Sections, January 1974, Private Report to The Hanna Mining Company.

Beverly L. Hodgins
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Beverly L. Hodgins

Jan. 30, 1979
....
date

GEOSEARCH CONSULTANTS LIMITED

TURAM ELECTROMAGNETIC SURVEY

for

THE HANNA MINING COMPANY

on the

MIDLOTHIAN PROJECT

LARDER LAKE MINING DIVISION

ONTARIO.

(To Accompany Maps 74-91 to 74-94)

January 17, 1974.

INTRODUCTION

A Turam electromagnetic survey was carried out for The Hanna Mining Company on the north portion of the Midlothian Project in December, 1973.

The property is located in Midlothian Township, 20 miles west of Matachewan from where it is accessible by road.

The purpose of this survey was to locate sub-surface geo-electrical conductors which might prove to be base metal orebodies. Several conductors were located. The accompanying maps show the areas surveyed and the results obtained.

METHOD AND INTERPRETATION OF RESULTS

Turam Electromagnetic Survey

The model 2S Turam equipment was used for this survey. It was manufactured and developed in Sweden by the ABEM Instrument Group of the Craelius Company.

In common with other electromagnetic inductive systems the Turam method is based on the fact that a secondary current is induced in an electrical conductor when the conductor is subjected to an electromagnetic field. This secondary current creates its own electromagnetic field which, together with the primary applied field, produces a resultant electromagnetic field. This resultant field, which can be detected and measured, differs both in phase and amplitude from the calculated primary field; these differences may indicate the presence of a conductor.

The primary alternating field is created by the use of a large horizontal rectangular loop, energized by a current at 660 Hz or 220 Hz. The receiving system consists of two coils 100 feet apart, connected to a compensator-amplifier which measures the complex field-strength ratios and phase-differences between successive points on traverses outside and perpendicular to a long side of the primary loop. Both the phase-difference readings and the reduced field-strength ratios are plotted as curves at points mid-way between the coil positions. The reduced ratios are the measured ratios divided by the normal ratios. The normal ratios may be calculated from the geometry of the primary loop and from the location of the points at which the readings were taken in relationship to the loop.

The conductivity of steeply dipping conductors may be estimated from the following chart:

Ratio Anomaly > 1.00	Negative Phase-difference	Conductivity
Very small or nil	Small to medium	Very poor
Small	Medium to large	Poor
Large	Medium	Good
Large	Small	Very good

In areas of conductive overburden, the amplitudes of anomalous readings, both the phase and the ratio, increase as their distance from the primary loop increases.

A total of 16 primary loops were used for this survey, positioned to the south of the areas surveyed. A coil interval of 100 feet was used with a frequency of 660 Hz, except for a minor number of readings at 220 Hz, as indicated on the maps.

RESULTS

Map 74-91

No conductors were located. Several phase anomalies are apparent which are deemed to be caused by slight overburden conductivity. A large phase anomaly was obtained on Line 20E at 20+50S. The readings from the previous horizontal loop electromagnetic survey at this point should be compared with the Turam results.

Map 74-92

A conductor was located from Line 16E at 95+50S to Line 40E at 88+50S. The conductor is strongest on Lines 20E and 24E where the conductivity is only moderately high. A similar conductor with lower amplitudes was located on Line 44E at 74S.

Map 74-93

A long conductive zone which may or may not be a single conductor extends from Line 68W at 163+50S to Line 4E at 151+50S on Map 74-94. The strongest portions are on Lines 20W, 24W, 28W, 52W and 56W, where the depths appear to be shallow.

A number of poorly defined indefinite conductors have been indicated on the map between 150S and 159S. The primary loop was not in an optimum location to define conductors in this area; the strong conductor to the south interfered with the readings.

A weak conductor has been indicated near the centre of Rhyolite Lake on Lines 20W and 24W. This may be a bedrock conductor at depth, or alternately, a broad weakly conductive zone. It does not appear to be a prime drilling target.

Map 74-94

A well-defined conductor with high conductivity was located on Line 20E at 137S. Several broad phase anomalies were obtained over Rhyolite Lake. These are deemed to be caused by conductive lake-bottom sediments.

RECOMMENDATIONS

The strongest conductors as discussed under "Results" are suitable drilling targets. In comparing the horizontal loop results from a previous survey and the results from this survey, it should be noted that the Turam method emphasizes long conductors and that conductor locations are more accurately defined by the horizontal loop method.

Respectfully submitted,

GEOSEARCH CONSULTANTS LTD.

J. A. Woodard

J. A. Woodard, P. Eng.,
Consulting Geophysicist.

THE HANNA MINING COMPANY

MIDLOTHIAN TOWNSHIP

LARDER LAKE MINING DIVISION

MAGNETOMETER SURVEY

by

BEVERLY L. HODGINS

INTRODUCTION

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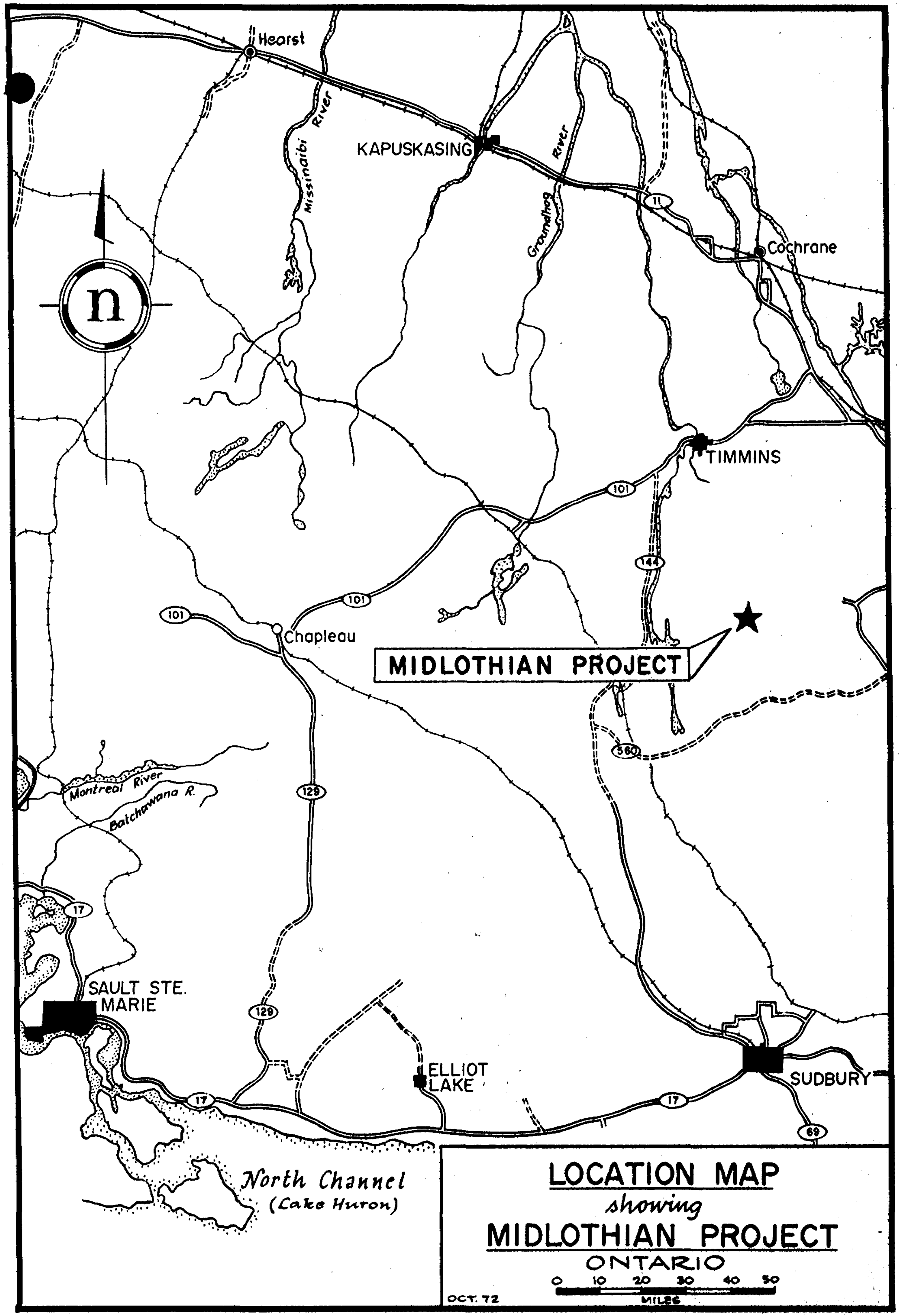

LOCATION MAP

showing

MIDLOTHIAN PROJECT

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All lines were chained and pickets were spaced at 100 foot intervals.

A total of 17.57 miles of transit-controlled base line, 12.6 miles of transit-controlled tie line, and 104.22 miles of picket line were run on the property.

EQUIPMENT AND METHODS:

The survey was carried out with MF-2 Scintrex Fluxgate magnetometers which have a range to ± 300,000 gammas using 5 scales, 1000-3000, 10K, 30K, 100K, and 300K. One scale division on the most sensitive scale equals 10 gammas.

Readings were taken at 100 foot stations along Base Station lines. A double circuit technique was used to determine base stations along these lines that could be tied to station 0+00 on tie line 00 that was arbitrarily determined to be 200 gammas.

Picket lines were read at 50 foot intervals except in anomalous area where the readings were taken at 25 foot intervals. These readings were tied to base stations on the grid and corrected to them so that results could be contoured.

PERSONNEL:

The magnetometer survey was carried out during the periods May 23, 1973 to October 5, 1973 and December 1 to 18, 1973 by the following personnel:

B. L. Hodgins, The Hanna Mining Company,
Room 805, 69 Yonge Street, Toronto, Ont.
J. Hendry, 342 King Street North, Waterloo, Ontario.
R. Facey-Crowther, R.R.#1, Vineland Station, Ontario.

The drafting and interpretation was completed by B.L.Hodgins with assistance from R. Facey-Crowther and Des O'Shannessy of 80 Richmond St. West, Toronto.

The magnetometer survey of the 11 Larche claims was done by Nelson Hogg, The Hanna Mining Company, Room 805, 69 Yonge Street, Toronto in the period September 29 - October 2, 1973.

GEOLOGY:

The general geology of the Midlothian Township area and the detailed geology of the Midlothian property are described in a separate geological report.

Briefly, the area is underlain by felsic to intermediate volcanic and sedimentary rocks of Archean age. They are isoclinally folded and intruded by two ages of mafic to ultramafic sills and dikes.

Younger, nearly flat-lying sediments of the lower Proterozoic-Cobalt Group- occur in the east and south parts of Midlothian Township and they underlie the south boundary area of the property.

MAGNETOMETER SURVEY RESULTS:

The magnetometer survey was found to be very useful in defining the limits of the mafic and ultramafic intrusive bodies which often occupy low drift-covered ground. It also helps to define diabase dikes and cross faults that displace the stratiform rock units.

The Archean volcanic and sedimentary rocks have low magnetic susceptibility and they cannot be distinguished in the contoured magnetic results.

The mafic to ultramafic intrusives have a high magnetic susceptibility that ranges to 30,000 gammas above background. The magnetometer survey was directly useful in outlining these rock units and indirectly in locating faults which displace them.

A narrow zone of high magnetic relief to 30,000 gammas characterizes a mafic to ultramafic sill that was delineated in the east central part of the property. Two left lateral faults that offset the sill, the Fault Lake fault and the Mitt Lake fault, have been interpreted.

The Fault Lake zone which is intruded by a pair of diabase dikes about 300 feet apart trends from Holbrook Lake southward through Lloyd Lake.

The ultramafic sill in the block west of the Fault Lake fault, which has been offset 800 feet south, trends west from the north shore of the Lloyd Lake bay to the west side of Weary Creek Lake where it is terminated by the Mitt Lake fault which trends N20^{o}W. A diabase dike which intrudes this fault zone to the northwest has moderate magnetic relief.

The ultramafic sill in the block west of the Mitt Lake fault has been offset 3700 feet south. The sill has been delineated from the east property boundary westward to line 1200 west, south of baseline 15000 south.

The Mitt Lake fault appears to underlie Hanna Bay of Lloyd Lake where a change in geological structure and magnetic relief is observed. The N50^{o}-60^{o}E magnetic trends formed by several narrow bands of high magnetic relief, about 1000 gammas above background, are terminated by the fault zone. Mafic to ultramafic rocks are known to occur in the area but none were directly related to the magnetic trends.

The Fault Lake fault is interpreted geologically to intersect the Mitt Lake Fault in the vicinity of the north part of Hanna Bay.

A possible southwest extension of the Fault Lake fault through the southeast tip of Bolton Lake coincides with a prominent topographic linear and a linear that terminates the east-trending zones of high magnetic relief in the south boundary area. Gabbro, which is exposed in this area, is probably the magnetic source that causes the anomalies.

A diabase dike adjacent to line 4000 west, between 17000 south and 19000 south, seems to be the cause of the magnetic relief of 600 gammas above background along the line.

A fault zone west of Winding Lake was interpreted from geological data. A magnetic anomaly between lines 4000 west and 7200 west from 15800 south to 16700 south terminates against any extension of this fault. The magnetic relief ranges to 2000 gammas above background. The area has only limited outcrop and no explanation for the anomaly was observed.

A number of other areas that had anomalous magnetic readings were not explained by the field work. They include anomalies and anomalous zones in the following locations:

(a) Lines 1200 and 1600 east between 15000 south and 16000 south.
(b) Lines 8000 west at 18700 south.
(c) South east shore area of Ring Lake.
(d) Lines 2000 east at 18000 south.
(e) Lines 4800 to 6000 west between 17500 and 18800 south.
(f) South of baseline 23000 south between lines 4800 and 8400 west.

The single line anomaly on line 1600 west at 16000 south coincides with the ABEM Gun anomaly. No magnetic source for the anomaly is evident from the field work.

There is no magnetic correlation with the other electromagnetic anomalies on the Midlothian property.

REFERENCES:

Marshall, H.I.
1947: Geology of Midlothian Township, District of Timiskaming; Ontario Dept. Mine, V LVI, pt V, p.1-24. Accompanied by map 1947-4, scale 1 inch to 1000 feet.

Bright, E.G.
1970: Geology of Halliday and Midlothian Townships, District of Timiskaming; Ontario Dept. Mine, GR79-1970. Accompanied by map 2187, scale 1 inch to 1/2 mile.

O.D.M.
1963: Timmins-Kirkland Lake Sheet, Districts of Cochrane, Sudbury and Timiskaming, Geological Compilation Series. Map No. 2046, scale 1" to 4 miles.

Peach, P.
Midlothian Project - Study of Thin Sections, August 1973, Private Report to The Hanna Mining Company.

Gittins, J.
Midlothian Project - Study of Thin Sections, January 1974, Private Report to The Hanna Mining Company.

Beverly L Hodgins
Beverly L. Hodgins

Jan 25, 1974
date

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THE HANNA MINING COMPANY

MIDLOTHIAN TOWNSHIP

LARDER LAKE MINING DIVISION

GEOLOGICAL REPORT

by

BEVERLY L. HODGINS

INTRODUCTION

The Midlothian property was acquired in January, 1973 to explore for base metal deposits in the favourable geological units.

Application was then made to the Ministry of Natural Resources of Ontario for assistance under the Mineral Exploration Assistance Program. The application was approved in a formal agreement in which the Government agreed to pay 1/3rd of specified exploration costs up to a maximum of $20,753.67.

An additional 8 claims were acquired in May 1973 and the Assistance Agreement was modified to allow for the additional expense, up to $22,828.67.

Finally, on August 27, 1973, 11 claims adjoining Hanna's property were optioned from John Larche of Timmins, and these were included in the agreement with the Government, but the maximum amount of assistance remained at $22,828.67.

A grid was established over the property and a program consisting of geological mapping, magnetometer and electromagnetic surveys was carried out during the period May through December, 1973.

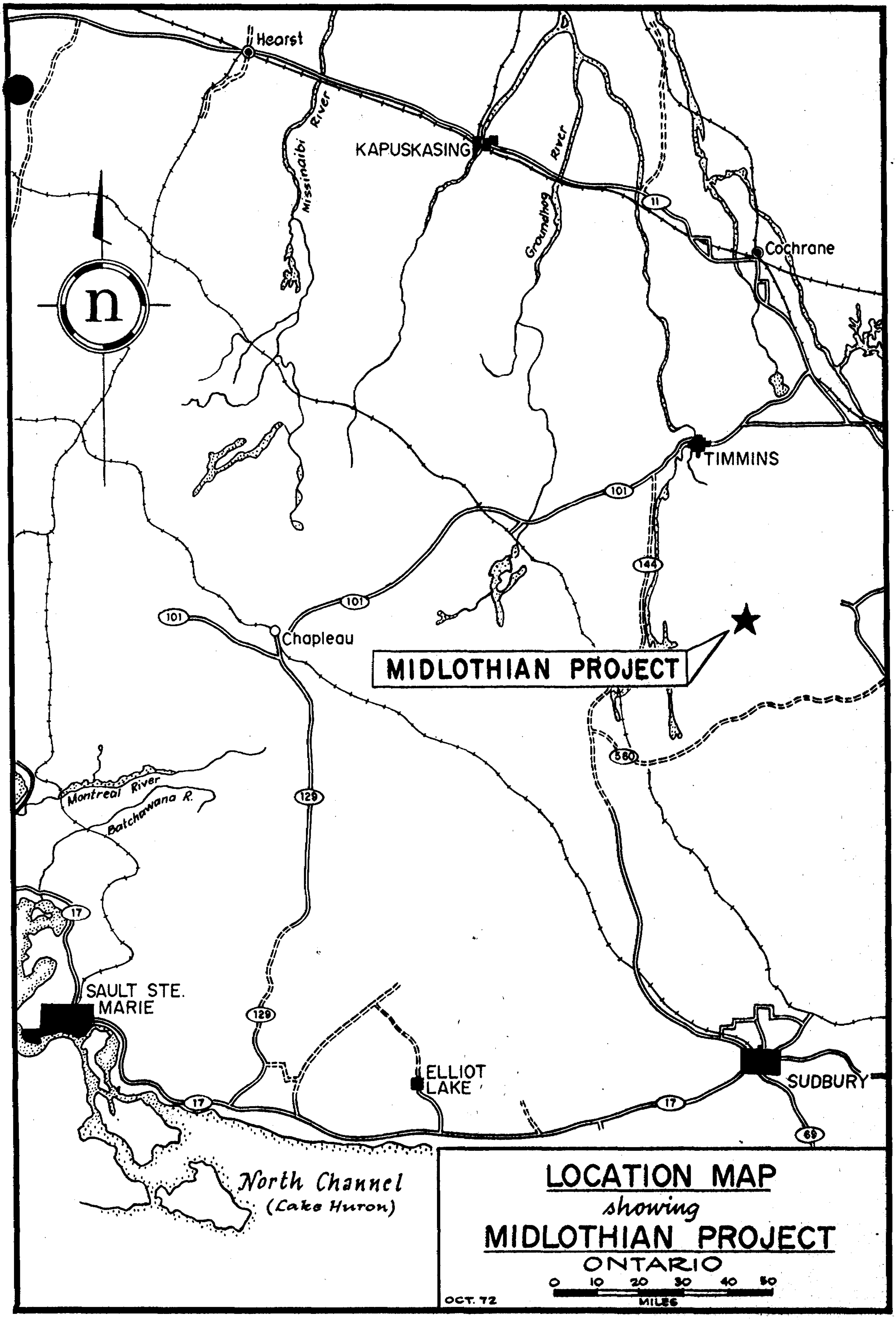
PROPERTY:

The property consists of 124 contiguous unpatented claims. They were acquired by staking on behalf of The Hanna Mining Company and by option.

Staker	Claims	Transfer Recorded
Hugh Carlson	70	January 30, 1973
Leo Marino	35	January 30, 1973
Don Hurd	8	May 22, 1973

The claims are held in the name of:

The Hanna Mining Company,
Room 805, 69 Yonge Street,
Toronto, Ontario M5E 1K3

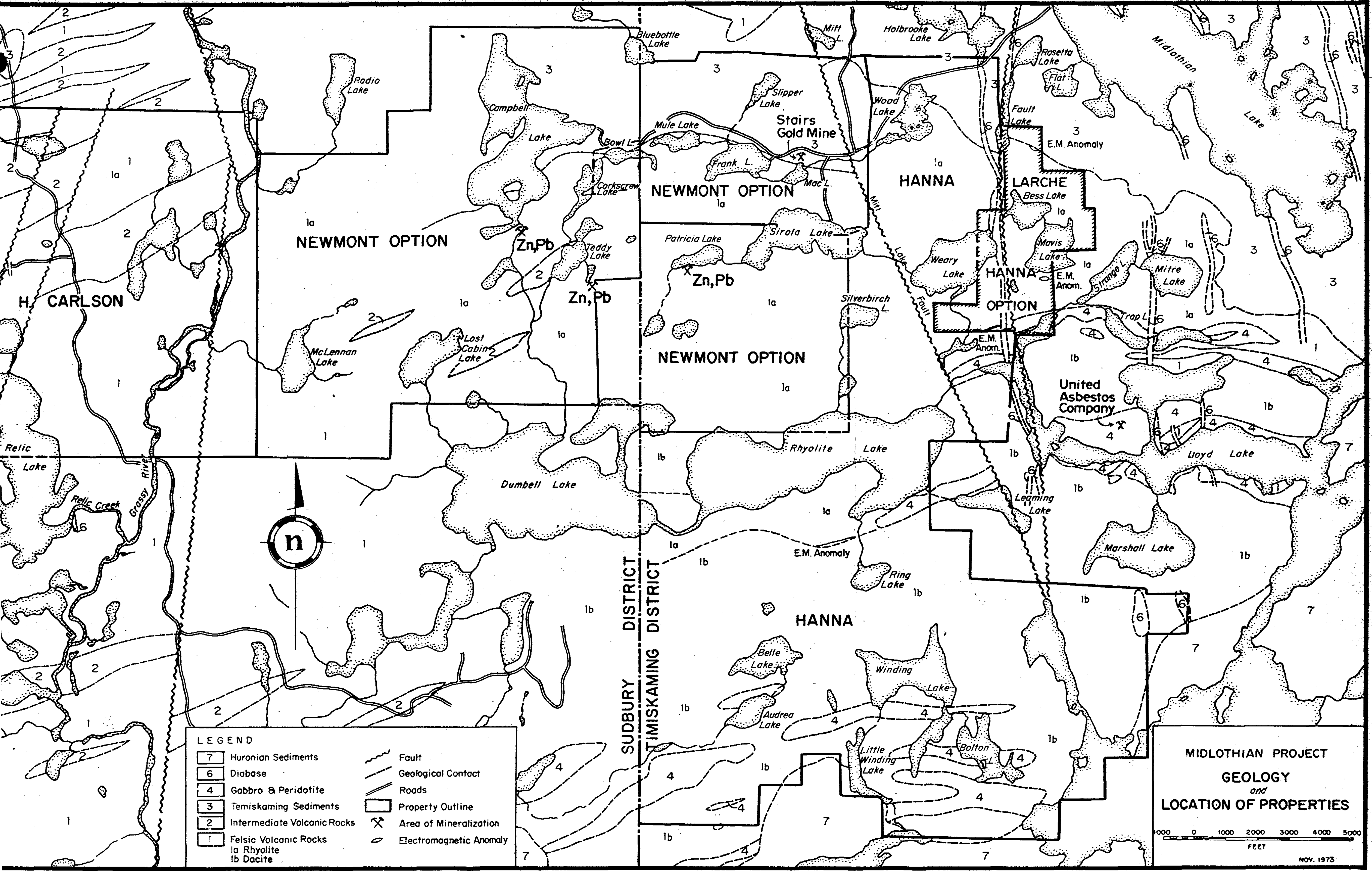


LOCATION MAP

showing

MIDLOTHIAN PROJECT

ONTARIO


MIDLOTHIAN PROJECT
GEOLOGY and LOCATION OF PROPERTIES
1000 0 1000 2000 3000 4000 5000
FEET
NOV. 1973
LEGEND
7 Huronian Sediments
6 Diabase
4 Gabbro & Peridotite
3 Temiskaming Sediments
2 Intermediate Volcanic Rocks
1 Felsic Volcanic Rocks
Ia Rhyolite
Ib Dacite
Fault
Geological Contact
Roads
Property Outline
Area of Mineralization
Electromagnetic Anomaly
NEWMONT OPTION
NEWMONT OPTION
NEWMONT OPTION
H. CARLSON
HANNA
HANNA
HANNA OPTION
LARCHE
United Asbestos Company
Stairs Gold Mine
Zn,Pb
Zn,Pb
Zn,Pb
E.M. Anomaly
E.M. Anom.
E.M. Anom.
E.M. Anomaly
SUDBURY DISTRICT
TIMISKAMING DISTRICT
Bluebottle Lake
Mitt L.
Holbrooke Lake
Rosetta Lake
Flat L.
Midlothian Lake
Radio Lake
Campbell Lake
Bowl L.
Mule Lake
Slipper Lake
Frank L.
Mac L.
Wood Lake
Fault Lake
Bess Lake
Mavis Lake
Corkscrew Lake
Teddy Lake
Patricia Lake
Sirola Lake
Weary Lake
Strange L.
Mitre Lake
Trap L.
Silverbirch L.
Mitt Lake Fault
McLennan Lake
Lost Cabin Lake
Rhyolite Lake
Lloyd Lake
Leaming Lake
Marshall Lake
Dumbell Lake
Relic Lake
Relic Creek
Grassy River
Ring Lake
Belle Lake
Winding Lake
Audrea Lake
Little Winding Lake
Bolton L.
n

The claims are numbered L353651, L354171 to L354180 inclusive; L363524 to L363582 inclusive; L366986 to L367020 inclusive; and L373057 to 373064 inclusive.

The property optioned from John Larche comprises 11 claims in Midlothian Township, Larder Lake Mining Division. The claims are numbered L333617 - L333624 inclusive, L333750, L353155 and L353156.

LOCATION AND ACCESS:

File 2.1380

The property, located in the west part of Midlothian Township, extends to within a claim of the north and south township boundaries. It includes Wood Lake, Ring Lake, Belle Lake, Bess Lake, Andrea Lake, Bolton Lake, Winding Lake, and parts of Holbrook Lake, Sirola Lake, Weary Lake, Silverbirch Lake, Lloyd Lake, Mavis Lake, Rhyolite Lake, Dumbell Lake and Upper Winding Lake.

The north part of Midlothian Township can be reached via motor vehicle from either Matachewan or Timmins.

The total distance from Timmins is 60.5 miles and part of this distance is on rather rough road. The route starts at the south end of Pine Street and follows a Forest Access Road to the turn-off into the Texmont Nickel property, a distance of 27 miles. From that point the road is not maintained for 10 miles until it meets a logging road to Matachewan. At 14.5 miles on the logging road toward Matachewan is the road to the old Stairs Mine which provides access to the Stairs property in Midlothian Township and to Sirola Lake, a distance of 9 miles from the Matachewan turn-off. A 5-mile extension of the Stairs Mine road from Sirola Lake to Lloyd Lake, built by United Asbestos in 1972, crosses the north part of the property.

The property can be reached from Matachewan by two different routes, via the Stairs Mine Road and via the Wilson Logging Camp road.

It is 17 miles west of Matachewan to the end of highway 566 and an additional 15 miles west along a logging road to the Stairs Mine Road turn-off. Sirola Lake is 9 miles south of the turn-off along the Stairs Mine Road.

The Wilson Logging Camp Road branches south for 10 miles from the end of highway 566. A new road (1973) has been constructed from Wilson Camp for 5 miles west to the United Asbestos property. The total distance from Matachewan to Lloyd Lake is 32 miles.

A road .5 miles north of Stairs Mine, which is one mile north of Sirola Lake, turns east to Midlothian Lake and crosses the north boundary area of the property.

A camp was established at Sirola Lake and it was used as a base to cover the north part of the property.

The south part of the property is accessible by boat on Lloyd Lake. A good portage between Lloyd Lake and Rhyolite Lake provides easy access to the west part of the property.

A camp erected on the southwest bay of Lloyd Lake was used as a base to cover the south part of the property.

PREVIOUS WORK: (ODM Assessment Files, Marshall, 1947; Bright, 1970)

Gold and Asbestos

The presence of gold and asbestos mineralization has been the main stimulus for the previous exploration work in the area.

The first reported period of exploration work took place in 1909 when gold was first discovered in the township. Two other periods of major activity followed. The discovery of gold in the Frank Lake area in 1944 by Upper Canada Mines Ltd. renewed interest in the area.

The optioning of the same gold showing in 1962 by Stairs Exploration and Mining Company Limited followed by underground development again renewed interest.

Much of the area has been thoroughly prospected. Stripping and trenching and locally some diamond drilling has been carried out to test areas of interest.

Minor exploration work on an asbestos occurrence in an ultramafic sill north of Lloyd Lake was carried out about 1920.

Little subsequent activity was noted in the area until the early 1950's when geological mapping, magnetic surveys, stripping, trenching and diamond drilling were carried out. The ownership of the property has undergone several changes. In 1973 the present owners, United Asbestos Company, decided to proceed with the development of the deposit.

Field evidence indicates that other areas of high magnetic relief in the township were checked for asbestos occurrences, probably during the 1950's.

A lot of the work completed does not seem to have been reported and/or recorded in the assessment files.

A number of old trenches, old picket lines and rusted tools were noted on the property during this past summer's program.

Base Metal Activity Exploration Programs

Exploration activities for base metal deposits have been sporadic. A number of airborne geophysical surveys have been carried out over parts of the property but little ground follow-up work is indicated.

In 1963 Stairs had an airborne geophysical survey carried out which covered the north part of the property. Their follow-up program in 1966 tested several of the conductive zones in the Campbell-Frank Lakes area and the Mavis-Strange Lakes area with drilling and/or stripping. Marcasite and graphite zones were noted in both of the conductors.

There is no record of ground follow-up programs within the area of Hanna's Midlothian property.

A Canadian Aero airborne geophysical survey carried out for B. W. Lang in 1963 covered an area adjacent to the northeast boundary area.

In 1968 Timiskaming Nickel Limited had an airborne geophysical survey flown by Lockwood Surveys Ltd. over a part of the east boundary area between Sirola and Rhyolite Lakes. Drill holes north of Leaming Lake intersected peridotite and rhyolite with graphite and pyrite. No follow-up ground work has been reported in the area of the Midlothian property.

Ground Surveys

In 1965 Cominco reported three drill holes that tested a conductor delineated by ground geophysical surveys west of Lloyd Lake. This area is at the south end of the Midlothian property. The defined conductor consists of graphite in an argillitic schist unit that is part of an intermediate volcanic sequence.

In 1972 Carman Bay Explorations carried out magnetometer and EM16 surveys over the west part of Rhyolite Lake. They delineated 6 conductive zones. No follow-up of these zones has been reported.

PRESENT WORK:

Grid

The land portion of the transit-controlled grid was cut by Thorex Limited of Thunder Bay. The grid was extended over the ice-covered lakes by Hanna personnel.

North of Wood Lake, tie line 00 was established using a Brunton compass to determine true north. A baseline at 1000 feet south of the north property boundary was turned off at 90° to tie line 00 and extended to the east and west. Picket lines were turned off to the north and south at 400 foot intervals and cut either to the property boundaries or the lake shores.

On the south shore of Wood Lake on tie line 00 a Polaris shot was used to accurately determine true north. Tie line 00 was then extended to 25200 south of the north boundary at a bearing of 180°. That part of tie line 00 north of Wood Lake is 2°30' west of north.

Baselines were established at 2000 foot intervals from 1000 south and they were cut as noted above.

The tie line and baselines were offset around the larger lakes to maintain accurate chainage. A stadia rod was used on the east-west baselines to determine the distances across the narrower lakes.

The grid was extended over the ice-covered lakes during December to complete the detailed coverage of the property.

All lines were chained and pickets were spaced at 100-foot intervals.

A total of 17.57 miles of transit-controlled base line, 12.6 miles of transit-controlled tie line, and 104.22 miles of picket line were run on the property.

PERSONNEL:

Geological mapping was carried out during the periods May 22 to October 5, 1973 by the following:

N. Hogg, geologist, #805, 69 Yonge Street, Toronto, Ontario
B. L. Hodgins, geologist, "
J. H. Lake, geologist, "
D. Edwards, geologist, "
H. Willson, student assistant, Box 99, Grimsby, Ontario

The drafting interpretation and colouring were completed by The Hanna Mining Company's staff geologists.

GENERAL GEOLOGY:

Midlothian Township has been mapped by Marshall (1947) and by Bright (1970) for the Ontario Department of Mines. The general geology of the area is best shown on map 2046 (1963) of the Ontario Department of Mines.

Consolidated rocks of the area are of Precambrian age. Archean volcanic and sedimentary rocks occur in easterly trending, isoclinally folded belts which form a westerly extension of the Kirkland Lake geosyncline. However, these highly folded rocks are unconformably overlain by Proterozoic rocks of the Huronian Cobalt Group, including the Gowganda conglomerate formation. These younger formations conceal the geologically favourable Archean rocks in the east part of Midlothian Township, and cause uncertainty in the correlation and projection of favourable units. It is noteable that there are no significant exposures of felsic intrusive rocks in the Archean of Midlothian Township.

TABLE OF FORMATIONS

Cenozoic

Sand, gravel, swamp deposits.

Precambrian

Proterozoic

Huronian

Cobalt Group - Gowganda Formation, Conglomerate, graywacke, Argillite, Intrusive Contact

Archean

Matachewan - Diabase.
Intrusive Contact

Ultramafic and Mafic Intrusive Rocks:-

Lamprophyre -

Serpentinite derived from dunite and peridotite.
Gabbro, diorite.

Intrusive Contact

Metasediments:-

Graywacke, arkose, argillite

Felsic Metavolcanics:-

Rhyolite flows, flow breccia, tuff breccia, agglomerate, chert.

Trachyte.

Undifferentiated Felsic Volcanic rocks.

Intermediate and Mafic Metavolcanics:-

Dacitic and Andesitic flows, pillow lava, tuffs and pyroclastics.

There is a transitional change in composition of the volcanic rocks from north to south. Intermediate volcanics including dacite and andesite increase toward the south in Midlothian Township, with minor amounts of interbedded felsic tuff, breccia and massive lava. Pillowed lavas and water-lain tuffs provide good evidence for the attitude of the intermediate volcanic units.

Overlying these is a thick mass of felsic volcanic rocks, some 2½ miles thick. These rocks are mainly rhyolitic in composition, but some units are trachytic. They include flow breccia, tuff breccia, agglomerate, massive rhyolite, and quartz porphyry. No good waterlain tuffs were observed - crude banding seen in some of the fine grained massive units and in some breccias is probably flow banding. A small exposure of black, finely laminated chert, occurs at the south end of Fault Lake. Graphitic bands are reported in these felsic rocks in Halliday Township and in the west part of Midlothian, but in the area covered by Hanna's claims there is no evidence that the felsic volcanic rocks are water-lain.

The felsic volcanic rocks are overlain by metasediments similar to the Timiskaming sediments of the Kirkland Lake area. On a regional scale there is an erosional unconformity between the metavolcanic and metasedimentary units, and in some places there is an angular unconformity. In Midlothian Township, however, the only good evidence of an unconformable relationship is the character of pebbles and cobbles in the conglomerate. These include most of the underlying varieties of volcanic rock, and some that resemble the ultramafic intrusive rocks. On the other hand, the upper member of the felsic volcanic rocks, a rhyolite with prominent quartz-eyes and fragments of fuchsite, has a conformable relationship with the sediments.

Close to the lower contact of the sediments, the conglomerate is generally an unsorted, closely packed assemblage of angular volcanic pebbles and cobbles up to 18 inches in diameter. Farther from the contact, there is more evidence of sorting, with occasional beds of arkosic graywacke. The pebbles of ultramafic rock are an interesting feature of the conglomerate. Both Marshall (1947) and Bright (1970) consider the ultramafics to be younger than the sedimentary rocks, and they are shown thus in the table of formations in this report. However, it seems probable that some ultramafics may be flows or sills contemporaneous with the volcanic rocks of the area.

The mafic to ultramafic intrusives include rocks ranging from dunite to diorite in composition. Olivene is almost completely altered to varieties of serpentine. The largest body of ultramafic rock is at the north end of Lloyd Lake, where United Asbestos, Inc. is developing an asbestos mine. The edges of the serpentinite mass are gabbroic, but there is no evidence of differentiation such as would be expected in a thick ultramafic sill.

The ultramafic rocks generally occur in bands of 100 to 500 feet thick, striking in a direction slightly north of east or east-west. This is the direction of strike in the pillowed dacites and tuffs in the south part of the township. Some gabbroic bodies have greater widths than the serpentinites.

Narrow dikes of lamprophyre, seldom more than 20 feet thick, are common in the felsic volcanic rocks and sediments. Most common is a fine grained pink variety consisting of albite and small blades of biotite altered to chlorite. These dikes strike in an east-west direction, and do not follow either the direction of shearing or bedding.

Dikes of diabase post-date folding and faulting of the Archean rocks and often occupy major north-south faults in the area. They have great continuity along strike, but are generally less than 200 feet thick.

Rocks of the Huronian Cobalt Group overlie the Archean formations in the east part of Midlothian Township, which is close to the northern limit of the Cobalt Group in this area. The Gowganda conglomerate forms impressive hills of nearly flat-lying massive beds, covering the steeply dipping Archean rocks. The Huronian cover is probably quite thin on average, but some hills are 600 - 800 feet above the general terrain. In the search for stratiform massive sulphide deposits in the Archean volcanics, the Gowganda formation presents an obstacle to the effective use of geophysical equipment.

Extensive sand deposits occur in eastern Midlothian Township, in Doon Township to the east, and in Halliday Township to the west. However there is little overburden in most of Midlothian Township, and exposures of bedrock are abundant.

STRUCTURE

The volcanic and sedimentary rocks are isoclinally folded and steeply dipping. The main body of sedimentary rocks in Midlothian Township trends south of east and is probably a major syncline comparable to the Kirkland Lake synclinal structure.

Structure in the felsic volcanic rocks is difficult to determine because breccias and unsorted pyroclastics predominate. However, a fragmental quartz porphyry and a massive, fine-textured rhyolitic unit near the top of the felsic volcanic mass, are conformable with the sedimentary contact.

The intermediate volcanic rocks further from the sedimentary contact show better evidence of attitude, and they have a trend which is slightly north of east. Therefore, on a regional scale it seems that there is an angular uniformity between sediments and older volcanic rocks.

Several zones of strong shearing and carbonate alteration are a prominent feature of the area. These zones are in places a mile wide, trending in a N 50^{o}E direction across sediments and volcanic units. Locally the shearing and alteration are strong enough to obliterate the original character of the rock, and are accompanied by veins of massive carbonate that weather to a smooth, deep brown surface.

Several prominent faults striking in a northerly direction displace the Archean rocks and are sometimes filled with diabase. The Mitt Lake fault has a left-hand horizontal displacement of more than 1/2 mile, and the Fault Lake fault has a left hand horizontal displacement of nearly 1000 feet.

ALTERATION:

The regional metamorphism is in the lower greenschist facies of quartz, albite, muscovite, chlorite and epidote. The felsic volcanic rocks are almost completely sericitized and the intermediate to mafic volcanic rocks are almost completely chloritized.

Chlorite replaces the ferromagnesian minerals in the felsic rocks.

Pervasive epidote alteration is commonly associated with the diabase dikes and it had been observed in adjacent host rocks.

Carbonatization is also commonly present in all of the lithologies. It is however of particular interest because it is the most prevalent constituent of the gold and sulphide bearing pervasive shear zones that occur in the felsic volcanic units and in the Timiskaming-like sedimentary assemblage.

DETAILED GEOLOGY:

The Midlothian property covers the contact between the Archean sedimentary and felsic volcanic rocks in the north and it extends southward about five miles through a succession of felsic through intermediate volcanic rocks to cover the contact between the intermediate volcanic rocks and the Proterozoic Cobalt sediments.

The contact between the felsic and sedimentary rocks in the north trends in a S55^{o} E direction from the north boundary of the property.

The contact between the volcanics and the Cobalt sediments to the south was not mapped. However, traverses across the area indicate that the contact is irregular along a westerly trend.

Meta Volcanic Units

Mafic to Intermediate Volcanics

No definitive data were observed to indicate the stratigraphic succession of the volcanic rocks. It sould seem though, that from the character and distribution of the volcanic rocks, the oldest units are the mafic to intermediate units which underlie the south part of the property including the area east of the Mitt Lake Fault, south of the creek flowing from Lloyd Lake to Rhyolite Lake.

The intermediate sequence includes an interstratified succession of chloritized massive to pillowed amygdaloidal flows, flow breccias, tuff breccias, agglomerates and water-lain tuff.

The volcanic rocks are light gray to gray-green on the fresh surface and dark green-gray to dark brownish gray on the weathered surface.

The flows vary in size and they appear to consist of two parts, a lower and an upper part. The lower part was mapped in the field as quartz diabase and gabbro. Individual flows range to 2 miles in length and 800 feet in thickness and the units are characteristically massive with coarse grained basal (?) zones grading to finer grained zones. Some flows are mainly fine grained.

These massive flow units have a low magnetic susceptibility similar to pillowed flows above and below them. Mafic rocks in the area that are known to be intrusive are characterized by an erratic high magnetic relief.

The upper part of the flows consists of pillowed, amygdaloidal fine grained flows and flow breccias of indeterminate thickness. The amygdules vary from fine to coarse, to 2 inches diameter, and they are filled mainly with quartz. However, carbonate and pyrite fillings are not uncommon. The pillow shapes are irregular and few locations were noted where good attitude determinations could be made. The length of the pillows range from about one foot to about five feet. Many flows were observed with broken up pillow selvages.

A thin section of a pillowed amygdaloidal flow unit along the Winding Lake shore west of line 16 east was checked by Dr. J. Gittins (1973) and the rock was determined to be an intermediate fine grained porphyritic volcanic rock. The thin section was noted to have micro phenocrysts of quartz and feldspar with the feldspar falling mainly in the oligoclase composition range. Minor alkali feldspars were noted. The quartz content was determined to be less than five percent.

The composition of the fragments and matrix which make up the flow breccia units that are interstratified with the pillowed flows are similar. Some of the flow breccia units are in part pyroclastic. The pyroclastic fragments include tear shape bombs that range in length to 18-20 inches.

The tuff units include thin inter-lain tuff beds, tuff breccias and thick unsorted agglomerates. An agglomerate forms a distinctive unit west of Winding Lake between lines 800N and 2400 west. It ranges up to 600 feet in thickness and it is composed of an unsorted assemblage of light coloured intermediate pyroclastic material and a fine grained volcanic matrix. The fragments, which locally make up 100 percent of the unit, are rounded to subrounded and range up to two feet in diameter. This unit forms a marker horizon that was used to interpret a fault, N 30° W between 1200 west and 1600 west on base line 210 south.

Transitional Zone

Intermediate tuff becomes more abundant northward and locally consists of cherty tuff bands that are usually less than one foot in thickness.

The tuff becomes more felsic in composition from base line 17000 South to 15000 South.

Felsic volcanic rocks predominate to the north of the ultramafic sill and the tuff zone along strike to the west through to the sedimentary contact.

Felsic Metavolcanic units

A massive fine grained felsic tuff, light gray to gray, underlies the vicinity of the projected trace of the ABEM conductor east of line 1600 west 16000 south. Disseminated pyrite to 5-10 percent is present throughout.

To the north an agglomerate sequence overlies the felsic tuffs and the intrusive sill. The agglomerate has been mapped along the south, east and north shores of Rhyolite Lake. It is displaced by a fault west of Winding Lake bearing N30°W, which has a left-hand displacement of 1000 feet. The agglomerate unit is still present across the fault, indicating that the unit has a thickness greater than 1500 feet. It is terminated to the east by the Mitt Lake Fault east of Rhyolite Lake.

The sequence locally consists of massive and fine grained units. However, it is mainly a breccia unit with varying amounts and sizes of pyroclastics. The subrounded to angular fragments vary up to a foot in length and they comprise up to 90 percent of the unit. The matrix is usually fine grained and it is a fine breccia locally. The colour varies with alteration, sericitization, saussuritization and chloritization and it can vary from white to a dark greenish gray. In some locations the dark coloured rocks, which have abundant fine matrix, were identified as intermediate tuff breccias. Tuff breccia in this sense refers to a fragment size range, between tuff and agglomerate.

The felsic volcanic system that overlies the agglomerate sequence, extends northward about two miles, to the north end of Wood Lake. The system is a complex of flows, flow breccias, tuff, tuff breccias and locally agglomerates. The stratigraphy of these rock units has not been defined because of the limited exposures and the limited extent over which any one unit seems to exist. Many of the units could not be traced from one line to the next, a distance of 400 feet.

The composition and character of the rocks are variable. Field data and thin section data indicate that the rocks range from trachyte to rhyolite in composition and from micro porphyritic massive crystalline rock units to units consisting of a closely packed assemblage of agglomerate material.

Intermediate volcanic flow breccias and tuff breccias were noted locally. The determination in the field of the intermediate composition was based on the presence of chlorite. The consideration as to whether the chlorite is a result of alteration of primary minerals or a result of secondary alteration because of the introduction of solutions into the system is not always defineable. Thus some of the intermediate volcanics are in fact chloritized felsic volcanics.

Locally carbonatized shear zones have obliterated the primary mineralogy and in some locations the shear zones are filled by massive carbonate.

This lithologic complex may represent an area near or at a volcanic source where vents were emitting a discontinuous lava flow that was interrupted by explosive activity. The extruded rocks were being altered by fumarolic activity and surficial waters. The very limited occurrences of water-lain tuff indicate the environment to be sub aerial.

The upper part of the felsic complex is a rhyolitic zone. The zone has a S55^{O}E trend and seems to be uncomformable to the underlying rocks.

The lower unit in the rhyolite zone is a fine grained rhyolite that has a porcellanic appearance on weathered outcrops. It occurs south of Weary Lake, east of the Mitt Lake Fault and the rhyolite is about 500 feet thick. In thin section the rock is porphyritic and the phenocrysts are obscured by sericitization. Although it appears massive in outcrop, in thin section the rock is finely brecciated.

The upper rhyolitic unit is characterized by abundant quartz eyes to 1/4 inch in diameter. The unit is mainly a breccia unit that in thin section "shows all the characteristics of a welded tuff..." (Peach - 1973). It consists of angular fragments of quartz feldspar porphyry, trachyte (Peach -1973- thin section), fuchsite and black chert in a matrix of "a very fine grained...intensely sericitized...divitrified glass...." (Peach-1973). The unit has a minor amount of "quartz-feldspar porphyry or rhyolite porphyry" that consists of "quartz and alkaline feldspar in an interlocking mosaic of very fine grain size" (Peach-1973).

The rhyolite zone is conformably overlain by Timiskaming-like sediments. A black pyritic chert unit noted at the south west end of Fault Lake appears to be along the contact zone between the two units.

Metasediments

The sedimentary unit is a closely packed unsorted conglomerate assemblage near the contact. The conglomerate consists mainly of rounded to angular felsic volcanic clasts that range to 18 inches in diameter along with fuchsite and black chert fragments and sulphide nodules. To the north, away from the contact, the sedimentary unit grades locally into graywackes and arkoses.

The carbonatized shear zones through the sediments are locally siliceous with minor development of quartz veins. Minor pyrite was observed.

The Fault Lake fault offsets the sedimentary contact at the south end of Fault Lake with a left hand horizontal movement of about 1000 feet.

Mafic to Ultramafic Intrusives

The mafic to ultramafic asbestos bearing sill that underlies the adjoining United Asbestos property to the east trends westward across the Midlothian property.

The sill has been offset to the south at the Fault Lake fault and the Mitt Lake fault. The sill has a high magnetic susceptibility and its limits were defined by the magnetometer survey.

The composition of the sill ranges from gabbro to dunite. The olivine has been altered to varieties of serpentine. Locally minor cross fiber and slip fiber were noted.

Several lamprophyre dikes "minettes" (Peach - 1973) were mapped. The massive fine grained dike has a light gray weathered surface and a gray fresh surface with pink feldspars.

Several dikes of diabase were mapped on the property. Prominent dikes occupy the fault zones through Fault Lake and Mitt Lake. Other dikes are parallel and they trend in a northerly direction.

The dikes are commonly epidotized and they have altered the host rocks to varying degrees with epidote.

STRUCTURE:

The volcanic assemblage is complexly folded and faulted and the stratigraphy has not been defined because of the limited structural data observed in the field.

The sequence of intermediate to mafic volcanics consist in part of water-lain tuff and pillowed flows. Tops and dip information have been noted. An anticlinal axis is indicated, from the pillow facings, to trend north of and subparallel to baseline 190 south. The limited data on the south flank of the fold indicates a normal succession with no complex folding. The north flank revealed less data; however, the data mapped indicate a complexly folded succession.

The complexity of the structure is further enhanced by the presence of the N30°W fault west of Winding Lake that has a left hand horizontal displacement of about 1000 feet.

There are numerous other linears such as cliff faces, depression, etc. that in some locations probably represent faulting.

In the overlying felsic volcanic units very little structure was observed in the field. The trends of the felsic units appear to vary slightly from west to south of west.

The felsic assemblage in the east part of the property was faulted by the Mitt Lake fault and the Fault Lake fault. The trend of the volcanics between the fault seems to be south of east.

Several pervasive shear zones that have carbonate alteration trend N45°to 40°E. They occur in the felsic volcanic units and in the overlying sediments. No major displacements along the shear zones have been noted.

The fine grained rhyolite and quartz eye rhyolite breccia seem to overlie unconformably the felsic assemblage noted above and to trend, parallel to the overlying Timiskaming-like sedimentary assemblage. The trend of the rhyolite sediment contact and the trend of the rock units is S50°-55°E. Limited structural data were observed in both the rhyolite and the sediments.

The structural relationship between the sediments and the underlying volcanics is not known. It is suggested that the sediments occupy a sycline or an old basin in the underlying volcanics.

Faulting

Evidence for faulting has been observed in the geological and magnetometer data. Marked offsets occur along the Fault Lake fault, Mitt Lake fault and Winding Lake faults as has been noted above. Other faults are probably present but no evidence was observed to indicate their locations.

ECONOMIC GEOLOGY:

Base Metals

No significant economic mineralization was noted during the geological survey.

Pyrite and pyrrhotite are accessory minerals in all of the volcanic rocks. Massive nodular "marcasite" on line 1600 east at 2000 south was trenched by previous workers in the area. This occurrence appears to be limited in extent because the ABEM Gun did not pick up any response over the area.

Massive pyrite nodules 2 to 3 inches in diameter are common locally in the Timiskaming-like sediments.

The sulphides in the vicinity of the EM anomaly east of line 1600 west at 16000 south were sampled across a length of 29.5 ft. Three samples 1609, 1610 and 1611 returned trace values for copper and zinc.

A mafic rock sample from line 80 west between 21000 south and 23000 south, that had about three percent pyrrhotite, was assayed for nickel. Only a trace amount of nickel was noted.

Gold

Gold is known to be associated with the silicious carbonatized shear zone in the conglomerates. Low gold values were assayed from samples of the shear zone northeast of Wood Lake in the vicinity of line 1600 west and 600 south. Two samples 1613 and 1614 returned values of 0.02 and 0.10 oz. gold per ton.

Asbestos

Harsh cross-fiber asbestos veins were noted in narrow bands less than a foot thick in a shear zone south of Rhyolite Lake in the vicinity of line 800 west.

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* Peach, P.
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Midlothian Project - Study of Thin Sections, January 1974, Private Report to The Hanna Mining Company.

Beverly L. Hodgins
Beverly L. Hodgins

Jan 30, 1974
date

APPENDIX "A"

MIDLOTHIAN PROJECT

STUDY OF THIN SECTIONS

by

Peter Peach

Brock University

August, 1973

The rock is fine grained, slightly porphyritic with a matrix of: -

Quartz, mainly in irregular shaped grains with sutured margins.

Alkaline Feldspar; with a refractive index lower than quartz, it is completely untwinned, partly intergrown with the quartz and is either orthoclase or untwinned albite.

Sericite; a fairly uniform distribution of flakes and not obviously related to the present feldspar. It may represent however primary plagioclase as albite completely altered.

Chlorite; a small amount of magnesium poor variety as very small flakes uniformly distributed.

The phenocrysts, which have relatively low abundance, consist of: -

Quartz; in fractured and separated rounded grains with strain shadows.

Orthoclase; showing some carlsbad twinned subhedral crystals which appear to be slightly zoned.

There are some patches and veins of carbonate and the rock is peppered with fine grained leucoxene recrystallized from rutile.

There seems to be no doubt that the rock is a rhyolite although no flow texture remains. There is no sign of any plagioclase more calcic than albite and no alteration products such as zoisite or epidote. This indicates that no plagioclase as calcic as Andesine was originally present.

H-3

The rock is distinctly porphyritic in which the matrix is composed of: -

Plagioclase; in well developed laths having a low index and with extinction angles up to 12° indicating albite/oligoclase composition. An_{10}

Quartz; in patches of grains with sutured boundaries is present, in small amounts.

Sericite; in both uniformly distributed flakes and in patches accompanying carbonate.

Leucoxene or rutile in a peppering of minute grains. No identifiable primary or secondary ferromagnesian minerals can be found.

The phenocrysts which are generally euhedral, are slightly zoned. They are almost completely sericitized and no twinning can be seen in the relic feldspar of most of the grains. Unfortunately there is insufficient primary material left to determine if any are sanidine, they have the shape suggestive of orthoclase and may be such. There are a number of lath shaped plagioclase phenocrysts with good twinning in the patches of relic feldspar which is close to An_{10} in composition.

There are a very few rounded and corroded quartz phenocrysts. The rock is permeated with carbonate possibly related to fracturing.

There are a few "clots" or patches of magnesium rich chlorite and some patches of sulphide - obviously pyrite.

Overall the rock would be classified as a trachyte porphyry. The absence of zoisite or epidotite suggests that there was little lime in the original plagioclases although it is impossible at this stage to say how much of the carbonate represents lime from the feldspar.

The matrix shows very good flow or trachytic texture. See photomicrograph H-3.

H-4

The rock has the peculiar texture associated with volcanic glass to which the term "pilotaxitic" is applied. It consists of a fairly uniform pasty mass of sericitized microscopic laths having the suggestion of flow texture in places in other places they have a "felted" appearance. These are undoubtedly sericitized feldspar microlites of the devitrification phase of the glass. There is a suggestion in places of the concentric pattern of lithophysae. The whole mass is permeated by a dusting of black material - carbon or iron oxide - of unresolvable size.

There are typical vesicular openings filled with carbonate.

Very small grains of quartz are regularly scattered throughout and there are some "knots" of magnesium rich chlorite uniformly distributed, looking as if derived from biotite.

The rock seems to be a sericitized, devitrified pitchstone or glassy rhyolite.

The photomicrograph H-4 shows the edge of one of the calcite filled vesicle with slight mantling in the ground - mass texture around the vesicle.

L-2 : L-4

These are considered together because L-4 is a beautiful quartz feldspar porphyry and L-2 is an agglomerate or tuff derived from it.

L-4

The rock consists of a matrix made up of: -

Quartz and alkaline feldspar in an interlocking mosaic of very fine grain size. The alkaline feldspar is generally lower in refractive index than the quartz, it is mostly untwinned but there are sufficient grains with twinning to be sure that in part the material is albite, about An_{5-10}.

Small rhomb shaped flakes of biotite or a secondary mineral derived therefrom.

Patches of sericite mostly pseudomorphous after the alkaline feldspar.

Some limonite or hematite.

In the matrix are phenocrysts of: -

Alkaline feldspar. Mostly these are in good enhedral grains, very highly sericitized and some at least are definitely sanidine (having a very small axial angle).
There are some well twinned plagioclose phenocrysts, also highly sercitized having the composition Albite An_8.

Quartz. These range in size from small to very large (0.5 to 50 mm in diameter) and are from almost enhedral to subhedral rounded. They show strain shadows and have been re-sealed with secondary quartz. The rock shows some signs of silicification with secondary quartz forming comb-like rims around some of the feldspar phenocrysts.
The rock generally is a very definite Quartz-feldspar Porphyry or Rhyolite Porphyry.

L-2

The agglomerate shows all of the characteristics of a welded tuff consisting mainly of angular fragments of the quartz-feldspar porphyry (such as L-4 above) together with some fragments of trachyte similar to H-3. There is between the fragments in some places a very fine grained material which has been intensely sericitized and which is most certainly devitrified glass, possibly the "welding" glass.

The rock contains a great deal of hematite or limonite and smaller amounts of carbonate both of which are associated with the sericite. There is a tendency for the limonite to dominate, with an apparent texture, the real texture of the rock.

L-3

This is related to both L-2 and L-4 in that it is essentially quartz-feldspar porphyry and is probably a tuff or breccia. The uncertainty lies in the fact that it has been almost completely sericitized. In the phenocrysts the small amount of primary plagioclase visible is Albite An$_{5-10}$. The feldspar in the matrix is all altered leaving only vague relics. The rock is much more highly sericitized than is either L-2 or L-4 but in addition there has been a great deal of replacement by carbonate. There is a lot of carbonate in a zone of fracturing which has been resealed by carbonate and secondary quartz. Secondary feldspar has been developed where this fracturing has intersected phenocrysts of orthoclase. There are a few grains of biotite which have been altered to iron oxide and chlorite. Overall the rock looks like a highly sericitized carbonated version of L-2.

L-5

A fine relative fresh lamprophyre, probably a 'minette'.

It consists of soda rich plagioclose of Albite composition An_{2-5} (index lower than 1.54); patches of orthoclase; chlorite pseudomorphous after biotite some of the grains of which were quite large; chlorite pseudomorphous after olivine; chlorite which may be after biotite interstitial to the feldspar. The rock is possibly 30% to 40% chlorite.

The pinkish colour of the rock, is probably due to a brown colour of the chlorite.

L-58

The rock looks a little like W-4 but without the chlorite. It appears to be a fragmental in which sericitization all but obliterates the original fragment outlines so that only ghosts of the fragments remain. Mostly the outlines of the fragments can be seen only because of changes in texture or of variations in the amount of quartz. Consequently the differences between the fragments is often quite subtle. (See photomicrograph L-58.) Commonly there is black carbon dust? around the boundaries outlining the grains. This may indicate some original glass as in H-4. The fragments all seem to be rhyolite and in some there is vague outlines of phenocrysts which have been completely sericitized. Quartz is the most abundant mineral together with alkaline untwinned feldspar probably orthoclose. Some of the fragments have unaltered plagioclose which was determined to be albite An_{5-10}. The rock is almost completely devoid of chlorite although some does appear in a few of the fragments.

The rock has been brecciated subsequent to sericitization and resealed with quartz and carbonate, some of which appears to be calcite, but either ankerite or siderite is also present and shows oxidation around the borders and in fractures in the grains. There seems to be two phases of the carbonate mineralization. The calcite closely follows the quartz and is intimately mixed with it, the iron bearing carbonate invades this and shows cross cutting relationships with the other.

W-3 and W-4

W-3 and W-4 are similar and appear to be phases of the same rock.

W-3

The rock is an agglomerate or tuff in which can be distinguished vaguely angular fragments, of rhyolite, rhyolite porphyry, feldspar porphyry a little like that in H-3. The difference between the fragments is slight but shows up in the matrix which differs one from another only in the ratio of quartz to feldspar with quartz being most abundant. Most of the feldspar is untwinned and in irregular shaped and sized grains, lower in refractive index than the quartz and is probably orthoclase, no grains were seen sufficiently large to determine sanidine. The few twinned plagioclose grains indicate a composition on the boundary between albite and oligoclase An_{10}. Some fragments show vaguely flow texture and less quartz than the others suggesting a trachytic phase. The bulk of the rock is a very fine grained silty material composed of a mosaic of fine quartz and feldspar, the grains having sutured boundaries. This silt surrounds the lava fragments, and fragments of coarse feldspar so that the rock possibly is a water laid or wind blown tuff with a matrix of acidic volcanic dust.

The section W-3(b) shows the boundary between a rhyolitic and trachytic (?) fragment. The rock has been replaced in patches and around grain boundaries by carbonate which is probably siderite or ankerite and this in turn oxidised to hematite and limonite. The photomicrograph W-3 shows light red limonite in rhomb-shaped pseudomorphs after the carbonate.

The section W-4 is similar to W-3 except that it has been considerably sericitized to the point of completely eliminating the feldspars in the fragments. The fragments are very vague and show only because of the angularity of their outlines and by texture differences. There is a considerable amount of chlorite some of which is in clots having vague outlines as if they are pseudomorphous after a pre-existing mineral but mostly as a fairly uniform distribution through each of the fragments. It differs somewhat in amount from fragment to fragment. Much of it is undoubtedly secondary and probably introduced because it appears relatively abundantly accompanying sericite within the relics of large feldspar phenocrysts.

The chlorite in clots does not seem to be pseudomorphous after biotite because there is no remaining biotite cleavage as is normally the case.

The degree of sericitization and the destruction of the primary features make it possible to identify the rock only tentatively as a rhyolite or rhyolite porphyry agglomerate or tuff.

W-53

The rock is fairly uniform, even textured, fine grained, consisting of a groundmass and ghosts of what appear to be phenocrysts. The groundmass consists of sericite about 90% and untwinned alkaline feldspar about 10%, together with very small amounts of chlorite and leucoxene. There is no relic primary texture such as flow texture. It is not even possible to tell whether plagioclose had originally been present. The ghostly phenochrysts differ from the matrix only in that they consist entirely of sericite. They do however have definite boundaries with crystal shapes. Quartz is present only as a single small phenocryst? and associated with or in a series of small facture filling. There is some silicification along the sides of the fracture.

By comparison with the other rocks this looks like a trachyte porphyry but so completely sericitized as to be indeterminate. The rock is fractured and resealed with quartz and siderite or ankerite some of which is oxidised.

W-48 B

The rock is distinctly porphyritic with euhedral to subhedral phenocrysts of feldspar only.

The matrix consists of sericite (more than 75%) in which can be seen no vestiges of primary structure or texture. And some grains of untwinned alkaline feldspar which, with refractive index less than 1.54 is probably orthoclose. A peppering with rutile some of which has opague white leucoxene mixed with it. The amount of this is considerable and may be between 5% and 8%. Some of the patches of grains of this are opaque white but most show indistinctly the high index and high birefringence of the rutile. Patches of epidote/clinozoisite are common, and there is a small amount of calcite or dolomite as well as iron carbonate with oxidised rims. Chlorite is present in very minor amounts in irregularly disseminated flakes.

The phenocrysts are entirely of orthoclase and are only slightly sericitized in contrast with the matrix.

The rock has some affinity with H-3 but this is a subjective judgement.

It is probably a porphyritic trachyte or feldspar porphyry.

8W -775

SEP 10 1973

W - 43. The rock consists of a sericitic and carbonate matrix with a large number of ghosts of phenoctysts having the general shape of feldspars. There are no primary minerals present.

A few coroded remnants within some of the larger phenocrysts indicate plagioclase about An$_{10}$ but there is no certainty that this is primary. It is usually accompanied by carbonate and the very heavy sericitization. Mostly the smaller phenocrysts are changed to a featureless mass of sericite.

There are a number of rounded features accompaning the phenocryst ghosts. These have cores of chlorite surrounded by sericite and may be vesicles as in W-76 but this is by no means certain.

A very great many patches having vague indefinite boundaries are composed of fine grained cherty quartz.

Mostly the matrix is fine grained sericite, carbonate and chlorite with an overall dusting of rutile and/or leucoxene, and magnetite.

It would be impossible to be certain of the original composition of the rock. The lack of zoisite-epidote, and any fibrous amphiholes suggests that it was originally rhyolite, and the vague pattern of the phenocrysts suggests a tuff. Beyond that is impossible.

No definite relationship can be seen to W-76.

W - 76 Sow - 227 + 505

This is quite a surprising rock! It is essentially a "crowded" porphyritic vesicular volcanic glass. The glass certainly has been devitrified but the fine grained material to which it is changed is still sufficiently fine grained to be unidentifiable.

The rock consists of:--

1. Euhedral (very sharp well shaped crystals) crystals, of plagioclase-Albite-oligoclase. An_{10}. Most of these are fresh but there is much sericitic alteration of the well twinned elogate prisms. (see photomicrograph)
2. Some twinned elogate crystals with small optic axial angle which are undoubtedly sanidine.
3. Rounded grains of quartz. Some of these are vesible fillings but some are in subhedral phenocrysts. Some of the plagioclase grains have been replaced by quartz.
4. Irregular small grains of chlorite. These look as if they are the alteration of biotite flakes and as they are not particularly abundant. They are generally in the matrix although some appear as patches within the quartz filled vesicles.
5. These are all contained in a devitrified and somewhat sericitized glass which shows in places the pattern commonly associated with microlites. The glass is generally featureless except that there is a vague tendency to form rims around both the phenocrysts and the vesibles.
6. There are some sheafs of needle-like crystals contained with the quartz vesicle filling but are too small for identification.

Both phenocrysts and matrix have been considerably sericitized. Overall the rock is an excellent porphyritic Rhyolite pitchstone, strongly vesicular, devitrified and sericitized. It is one of the freshest precambrian pitchstones encountered. The section looks somewhat homogeneous, however, because there are, otherwise unexplainable, changes in the direction of elongation of the phenocrysts in patches there is a suspicion (very slight) that the rock is a welded tuff. There is not enough evidence in the section for this but the hand specimen should show this in a gross way.

P. Bach

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4. Irregular small grains of chlorite. These look as if they are the alteration of biotite flakes and as they are not particularly abundant. They are generally in the matrix although some appear as patches within the quartz filled vesicles.
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41P14NE0027 2.1407 MIDLOTHIAN

900

GEOPHYSICAL – GEOLOGI
TECHNICAL DATA

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: Electromagnetic Survey
Township or Area: Midlothian
Claim holder(s): The Hanna Mining Company

Author of Report: B. L. Hodgins
Address: #805, 69 Yonge St., Toronto, Ont. M5E 1K3
Covering Dates of Survey: May 15, 1973 - Jan. 15, 1974
(linecutting to office)
Total Miles of Line cut: 145.02

SPECIAL PROVISIONS CREDITS REQUESTED

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

ENTER 20 days for each additional survey using same grid.

	DAYS per claim
Geophysical	
--Electromagnetic	~~20~~ 40
--Magnetometer	
--Radiometric	
--Other	
Geological	
Geochemical	

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

Magnetometer ______ Electromagnetic ______ Radiometric ______
(enter days per claim)

DATE: Jan 30, 1974 SIGNATURE: Beverly L Hodgins
Author of Report or Agent

MINING CLAIMS TRAVERSED
List numerically

(prefix) (number)

CLAIMS LISTED ON ATTACHED SHEET.

OJ

If space insufficient, attach list

TOTAL CLAIMS 113

OFFICE USE ONLY

PROJECTS SECTION

Res. Geol. ______ Qualifications & 2.267 on this file

Previous Surveys 2.101 (EM + Mag) different instruments
63.2317 (Air) and 63.1224 (Air)

Checked by ______ date ______

LD

~~GEOLOG~~ICAL BRANCH ______

Approved by ______ date ______

GEOLOGICAL BRANCH ______

Approved by ______ date ______

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

GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS

Number of Stations 6409 Number of Readings 6409

Station interval 100 foot, 50' in anomalous areas

Line spacing 400 feet

Profile scale or Contour intervals 1" = 200', reading values plotted at each station
(specify for each type of survey)

MAGNETIC

Instrument

Accuracy - Scale constant

Diurnal correction method

Base station location

ELECTROMAGNETIC

Instrument ABEM Gun Crone CEM

Coil configuration in line Horizontal Horizontal shoot back

Coil separation 200 feet 200 feet

Accuracy ± 2% ± 2°

Method: ☐ Fixed transmitter Crone ☒ Shoot back ABEM ☒ In line ☐ Parallel line

Frequency
(specify V.L.F. station)

Parameters measured ABEM - In phase, Quadrature, Crone - Dip Angle.

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

THE HANNA MINING COMPANY
MIDLOTHIAN TOWNSHIP

Claim No.	Days
L 353651	20
L 354171	"
L 354172	"
L 354173	"
L 354174	"
L 354175	"
L 354176	"
L 354177	"
L 354178	"
L 354179	"
L 354180	"
L 363524	"
L 363525	"
L 363526	"
L 363527	"
L 363528	"
L 363529	"
L 363530	"
L 363531	"
L 363532	"
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L 363552	"
L 363553	"
L 363554	"
L 363555	"
L 363556	"
L 363557	"
L 363558	"
L 363559	"
L 363560	"

Claim No.	Days
L 363561 1/3 not covered	20
L 363562	"
L 363563	"
L 363564	"
L 363565	"
L 363566	"
L 363567	"
L 363568	"
L 363569	"
L 363570	"
L 363571	"
L 363572	"
L 363573	"
L 363574	"
L 363575	"
L 363576	"
L 363577	"
L 363578	"
L 363579	"
L 363580	"
L 363581	"
L 363582	"
L 366986	"
L 366987	"
L 366988	"
L 366989	"
L 366990	"
L 366991	"
L 366992	"
L 366993	"
L 366994	"
L 366995	"
L 366996	"
L 366997	"
L 366998	"
L 366999	"
L 367000	"
L 367001	"
L 367002	"
L 367003	"
L 367004	"
L 367005	"
L 367006	"
L 367007	"
L 367008	"
L 367009	"
L 367010	"
L 367011	"
L 367012	"
L 367013	"

Claim No.	Days
L 367014	20
L 367015	"
L 367016	"
L 367017	"
L 367018	"
L 367019	"
L 367020	"
L 373057	"
L 373058	"
L 373059	"
L 373060	"
L 373061	"
L 373062	"
L 373063	"
L 373064	"

File 21407

GEOPHYSICAL – GEOLOGICAL – GEOCHEMICAL
TECHNICAL DATA STATEMENT

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 Turam Survey

Township or Area Midlothian

Claim holder(s) The Hanna Mining Company

Author of Report J.A.Woodard, Geosearch Consultants Ltd.

Address 100 University Ave., Toronto, Ont.

Covering Dates of Survey Nov.26, 1973 - Dec.18, 1973
(linecutting to office)

Total Miles of Line cut 51.2

SPECIAL PROVISIONS CREDITS REQUESTED

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

ENTER 20 days for each additional survey using same grid.

	DAYS per claim
Geophysical	
--Electromagnetic	20
–Magnetometer	
–Radiometric	
–Other	
Geological	
Geochemical	

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

Magnetometer ____ Electromagnetic ____ Radiometric ____
(enter days per claim)

DATE: Jan 30 1974 SIGNATURE:
Author of Report or Agent

MINING CLAIMS TRAVERSED
List numerically

(prefix) (number)

354171
354172
X354173 2/3 not covered
366986
366987
366988
366989
366990
366991
366992
366993
366994
366995
366996
366997
366998
366999
367000
367001
367002
367003
367004
367005
367006
367007
367008
367009 1/4
367010 1/4
367011 1/4
367012
367013
X367014 2/3
367015
X367016 2/3
367017
X367018 2/3
367019
X367020 2/3

333617
333618
333619
333620
333621
333622
333623
333624
353155
353156
353651
353750 33
373057
373058
373059
373060
373061
373062
373063
373064

Claims marked (X) 10 days each

Other claims 20 days each

If space insufficient, attach list

TOTAL CLAIMS 58

OFFICE USE ONLY

PROJECTS SECTION

Res. Geol. ____ Qualifications 63.1154

Previous Surveys ____

Checked by ____ date ____

GEOLOGICAL BRANCH ____

Approved by ____ date ____

GEOLOGICAL BRANCH ____

Approved by ____ date ____

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

GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS

Number of Stations 2704 Number of Readings 2704

Station interval 100 feet

Line spacing 400'

Profile scale or Contour intervals readings plotted at each station
(specify for each type of survey)

MAGNETIC

Instrument

Accuracy - Scale constant

Diurnal correction method

Base station location

ELECTROMAGNETIC

Instrument Turam

Coil configuration Horizontal Loop 2000' X 4000'

Coil separation 100'

Accuracy

Method: ☒ Fixed transmitter ☐ Shoot back ☒ In line ☐ Parallel line

Frequency 660 Hz - some 220 Hz
(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

File 2.1407

GEOPHYSICAL – GEOLOGICAL – GEOCHEMICAL
TECHNICAL DATA STATEMENT

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 Magnetometer Survey
Township or Area Midlothian
Claim holder(s) The Hanna Mining Company

Author of Report B. L. Hodgins
Address #805, 69 Yonge St., Toronto, Ont. M5E 1K3
Covering Dates of Survey May 15, 1973 - Jan.15, 1974
(linecutting to office)
Total Miles of Line cut 145.02

SPECIAL PROVISIONS CREDITS REQUESTED

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

ENTER 20 days for each additional survey using same grid.

	DAYS per claim
Geophysical	
--Electromagnetic	20
–Magnetometer	~~40~~ except L.363561/10 days
–Radiometric	
–Other	
Geological	
Geochemical	

g

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

Magnetometer ____ Electromagnetic ____ Radiometric ____
(enter days per claim)

DATE: Jan 30, 1974 SIGNATURE Beverly L Hodgins
Author of Report or Agent

OFFICE USE ONLY

PROJECTS SECTION
Res. Geol. ____ Qualifications on this file & 2.267
Previous Surveys ____

Checked by ____ date ____

GEOLOGICAL BRANCH ____

Approved by ____ date ____

GEOLOGICAL BRANCH ____

Approved by ____ date ____

MINING CLAIMS TRAVERSED
List numerically

(prefix) (number)

CLAIMS LISTED ON ATTACHED SHEET.

If space insufficient, attach list

TOTAL CLAIMS 113

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

GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS

Number of Stations 12,910 Number of Readings 12,910

Station interval 50 feet, 25' in anomalous areas

Line spacing 400 feet

Profile scale or Contour intervals 100 gammas to ± 1000 gammas, 1000 gammas to ± 10,000 gammas,
(specify for each type of survey) 10,000 gammas to ± 100,000 gammas.

MAGNETIC

Instrument MF-2 Fluxgate Magnetometer, Scintrex

Accuracy - Scale constant 10 gammas on 1000 scale

Diurnal correction method Closed picket line circuits to baseline stations that were determined by a double circuit technique.

Base station location 0+00/00 = 200 gammas.

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

THE HANNA MINING COMPANY
MIDLOTHIAN TOWNSHIP

Claim No.	Days
L 353651	40
L 354171	"
L 354172	"
L 354173	"
L 354174	"
L 354175	"
L 354176	"
L 354177	"
L 354178	"
L 354179	"
L 354180	"
L 363524	"
L 363525	"
L 363526	"
L 363527	"
L 363528	"
L 363529	"
L 363530	"
L 363531	"
L 363532	"
L 363533	"
L 363534	"
L 363535	"
L 363536	"
L 363537	"
L 363538	"
L 363539	"
L 363540	"
L 363541	"
L 363542	"
L 363543	"
L 363544	"
L 363545	"
L 363546	"
L 363547	"
L 363548	"
L 363549	"
L 363550	"
L 363551	"
L 363552	"
L 363553	"
L 363554	"
L 363555	"
L 363556	"
L 363557	"
L 363558	"
L 363559	"
L 363560	"
L 363561	½ covered/10 dys 40
L 363562	"
L 363563	"
L 363564	"
L 363565	"
L 363566	"
L 363567	"
L 363568	"
L 363569	"
L 363570	"
L 363571	"
L 363572	"
L 363573	"
L 363574	"
L 363575	"
L 363576	"
L 363577	"
L 363578	"
L 363579	"
L 363580	"
L 363581	"
L 363582	"
L 366986	"
L 366987	"
L 366988	"
L 366989	"
L 366990	"
L 366991	"
L 366992	"
L 366993	"
L 366994	"
L 366995	"
L 366996	"
L 366997	"
L 366998	"
L 366999	"
L 367000	"
L 367001	"
L 367002	"
L 367003	"
L 367004	"
L 367005	"
L 367006	"
L 367007	"
L 367008	"
L 367009	"
L 367010	"
L 367011	"
L 367012	"
L 367013	"
L 367014	40
L 367015	"
L 367016	"
L 367017	"
L 367018	"
L 367019	"
L 367020	"
L 373057	"
L 373058	"
L 373059	"
L 373060	"
L 373061	"
L 373062	"
L 373063	"
L 373064	"

File 2.1407

GEOPHYSICAL – GEOLOGICAL – GEOCHEMICAL
TECHNICAL DATA STATEMENT

TO BE ATTACHED AS AN APPENDIX TO TECHNICAL REPORT
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TECHNICAL REPORT MUST CONTAIN INTERPRETATION, CONCLUSIONS ETC.

Type of Survey Geological Survey
Township or Area Midlothian
Claim holder(s) The Hanna Mining Company

Author of Report B. L. Hodgins
Address #805, 69 Yonge St., Toronto, Ont. M5E 1K3
Covering Dates of Survey May 15, 1973 - Jan.15, 1974
(linecutting to office)
Total Miles of Line cut 145.02

SPECIAL PROVISIONS CREDITS REQUESTED

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

ENTER 20 days for each additional survey using same grid.

	DAYS per claim
Geophysical	
–Electromagnetic	
–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: Jan 30, 1974 SIGNATURE: Beverly Hodgins
Author of Report or Agent

MINING CLAIMS TRAVERSED
List numerically

(prefix) (number)

CLAIMS LISTED ON ATTACHED SHEET.

If space insufficient, attach list

TOTAL CLAIMS 113

OFFICE USE ONLY

PROJECTS SECTION

Res. Geol. ______ Qualifications on this file + 2.267

Previous Surveys ______

Checked by ______ date ______

GEOLOGICAL BRANCH ______

Approved by ______ date ______

GEOLOGICAL BRANCH ______

Approved by ______ date ______

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

GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS

Number of Stations__________ Number of Readings__________

Station interval__________

Line spacing__________

Profile scale or Contour intervals__________
(specify for each type of survey)

MAGNETIC

Instrument__________

Accuracy - Scale constant__________

Diurnal correction method__________

Base station location__________

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__________

THE HANNA MINING COMPANY
MIDLOTHIAN TOWNSHIP

Claim No.	Days
L 353651	20
L 354171	"
L 354172	"
L 354173	"
L 354174	"
L 354175	"
L 354176	"
L 354177	"
L 354178	"
L 354179	"
L 354180	"
L 363524	"
L 363525	"
L 363526	"
L 363527	"
L 363528	"
L 363529	"
L 363530	"
L 363531	"
L 363532	"
L 363533	"
L 363534	"
L 363535	"
L 363536	"
L 363537	"
L 363538	"
L 363539	"
L 363540	"
L 363541	"
L 363542	"
L 363543	"
L 363544	"
L 363545	"
L 363546	"
L 363547	"
L 363548	"
L 363549	"
L 363550	"
L 363551	"
L 363552	"
L 363553	"
L 363554	"
L 363555	"
L 363556	"
L 363557	"
L 363558	"
L 363559	"
L 363560	"

Claim No.	Days
X L 363561 ½ covered	20
L 363562 ¾ not covered	
L 363563	"
L 363564	"
L 363565	"
L 363566	"
L 363567	"
L 363568	"
L 363569	"
L 363570	"
X L 363571 ½	"
L 363572 ¾ not covered	
L 363573	"
L 363574	"
L 363575	"
X L 363576 ⅔	"
L 363577	"
L 363578	"
L 363579	"
X L 363580 ⅔	"
L 363581	"
L 363582	"
L 366986	"
L 366987	"
L 366988	"
L 366989	"
L 366990	"
L 366991	"
L 366992	"
L 366993	"
L 366994	"
L 366995	"
L 366996	"
L 366997	"
L 366998	"
L 366999	"
L 367000	"
L 367001	"
L 367002	"
L 367003	"
L 367004	"
L 367005	"
L 367006	"
L 367007	"
L 367008	"
L 367009	"
L 367010	"
L 367011	"
L 367012	"
L 367013	"

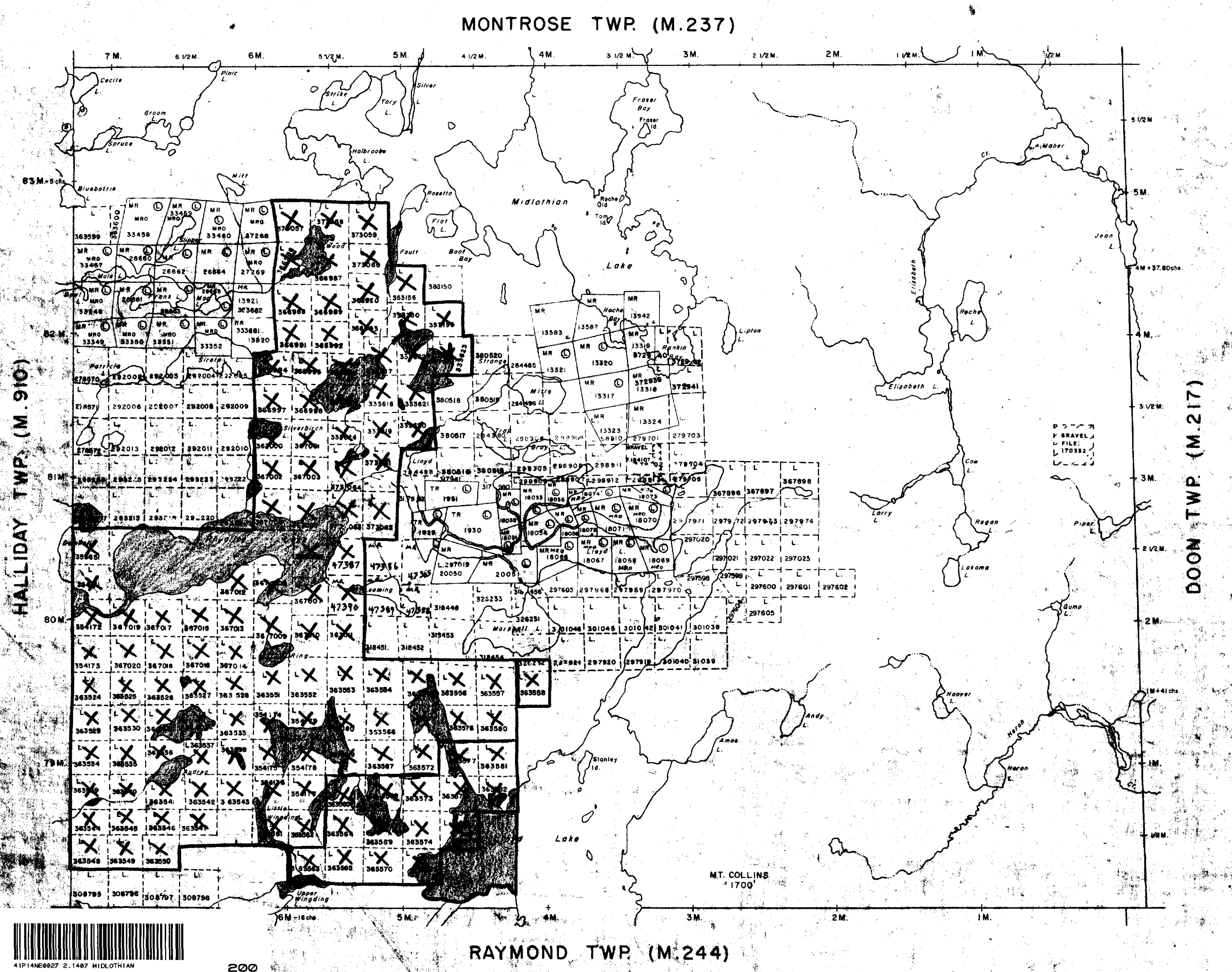
Claim No.	Days
L 367014	20
L 367015	"
L 367016	"
L 367017	"
L 367018	"
L 367019	"
L 367020	"
L 373057	"
L 373058	"
L 373059	"
L 373060	"
L 373061	"
L 373062	"
L 373063	"
L 373064	"

Circled claims (19)
not covered / No Credits

Claims marked (X)
10 days each

other claims
20 days each

J



THE TOWNSHIP OF

MIDLOTHIAN

DISTRICT OF TIMISKAMING

LARDER LAKE MINING DIVISION

SCALE: 1-INCH = 40 CHAINS

LEGEND

PATENTED LAND	Ⓟ
CROWN LAND SALE	C.S.
LEASES	Ⓛ
LOCATED LAND	Loc.
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 MUSKEG	
MINES	⚒
CANCELLED	C.

NOTES

400' surface rights reservation around all lakes and rivers.

MINING LANDS
DATE OF ISSUE
FEB - 8 1974
MINISTRY OF NATURAL RESOURCES

File - 2.1407

PLAN NO. M.235

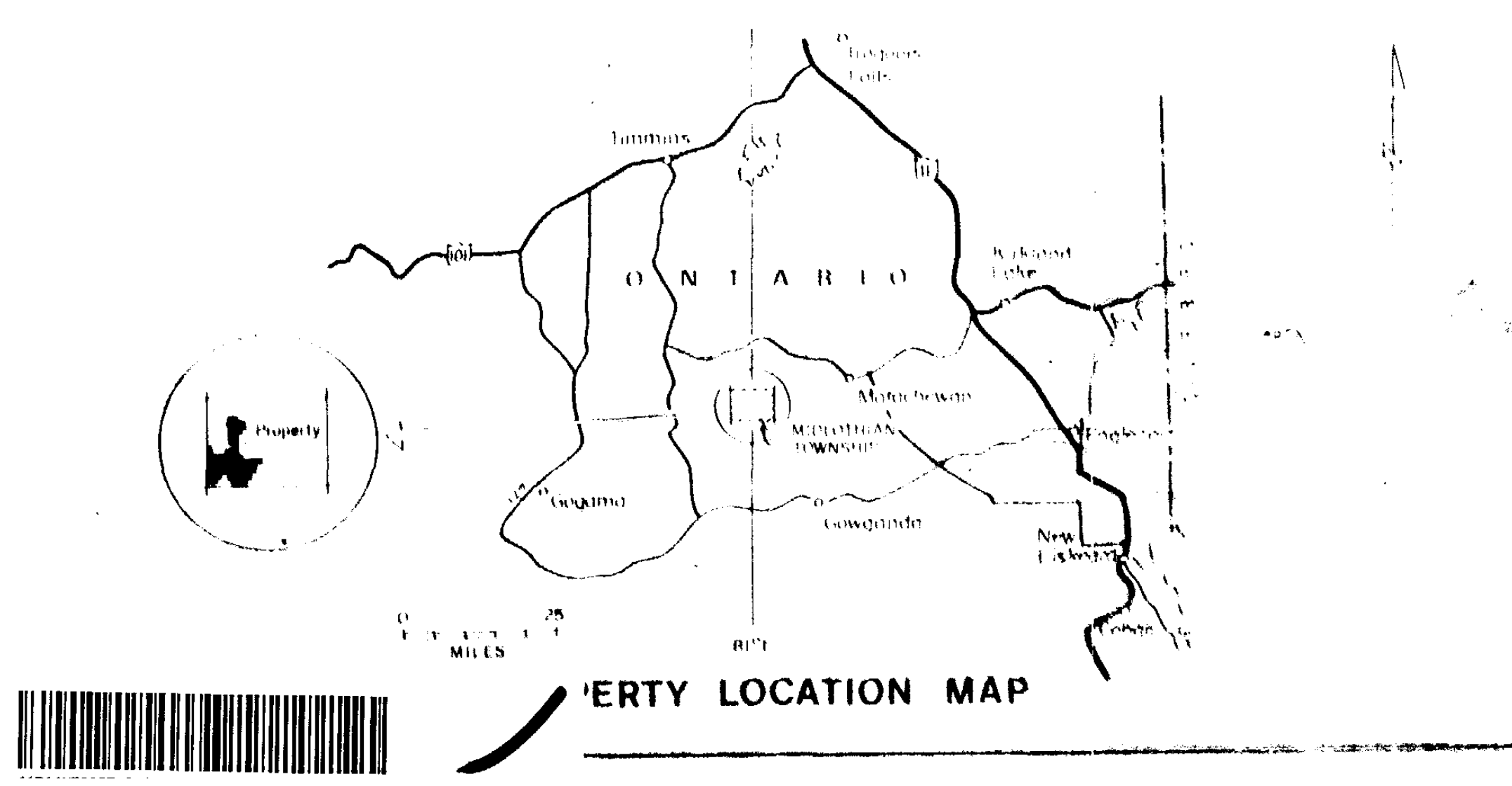
ONTARIO
MINISTRY OF NATURAL RESOURCES
SURVEYS AND MAPPING BRANCH

NOTE

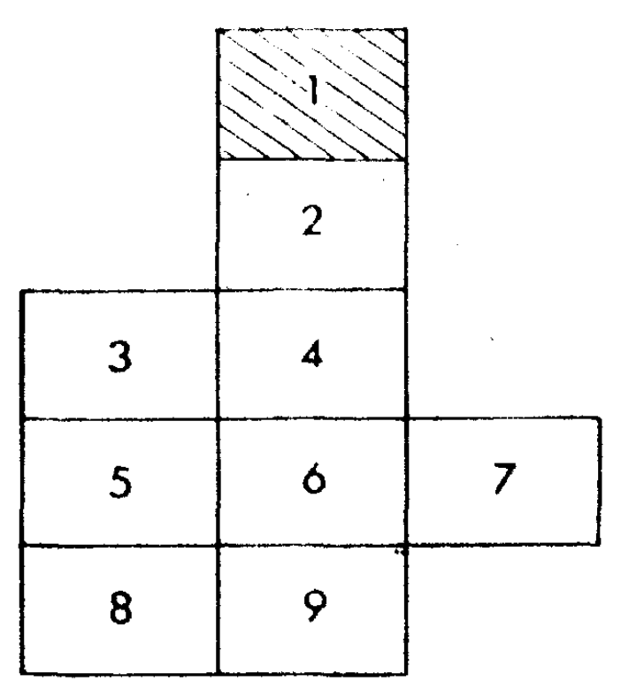
Mining Claims L.333617 to 24 inclusive
333750
353155 – 56

11 claims

Received credits for EM, Mag + Geological surveys on File 2.1380



PERTY LOCATION MAP



SHEET INDEX

LEGEND

- ▨ Quartz Veins (qv), Carbonate Veins (cb v)
- ▨ Diabase Dykes (I-Db)
- ▨ Lamprophyre (I-Lamp)
- ▨ Sediments- Conglomerate (S-Cg), Graywacke (S-Gw), Argillite (S-Argl)
- ▨ Basic and Intermediate Igneous Rocks- Gabbro (I-Gb), Diorite (I-Di)
- ▨ Ultramafic Rocks (I-Um), Serpentinite (I-Serp)
- qe ▨ Porphyritic Rhyolite (VRyqe), Porphyritic Rhyolite Breccia (VRybxqe)
- VRy ▨ Massive, Fine-Grained Rhyolite (VRy)
- VRybx ☐ Rhyolite Flow Breccia (VRybx)
- ☐ Rhyolite Tuff Breccia (VRytubx)
- VAbx ▨ Acid Volcanic Tuff Breccia (VAtubx)
- Vint ▨ Andesite (VAnd), Dacite (VDa), Flow Breccia, Tuff Breccia, Flow, Pillowed Flow, etc

SYMBOLS

- Swamp
- Small outcrop
- Outcrop
- Interpreted bedrock
- Top of bed
- Bedding, top unknown (inclined, vertical)
- Strike and dip of schistosity (inclined, vertical)
- Strike and dip of gneissosity (inclined, vertical)
- Fault, assumed
- Anticlinal axis
- Synclinal axis
- Mineral occurence
- Tractor road
- Diamond drill hole
- Geological boundary, defined
- Geological boundary, approximate
- Geological boundary, assumed

THE HANNA MINING COMPANY

MIDLOTHIAN PROJECT

LARDER LAKE MINING DIVISION
ONTARIO

GEOLOGIC MAP

SCALE 1" = 200'

200 0 200 400 600
Feet

REGISTERED PROFESSIONAL ENGINEER
MINING
NELSON HOGG
PROVINCE OF ONTARIO
Nelson Hogg

Work by John Rah Date January 29, 1974	Interpretation by John Rah Date January 29, 1974	Revised Revised N.T.S. No 41-P-15

#1

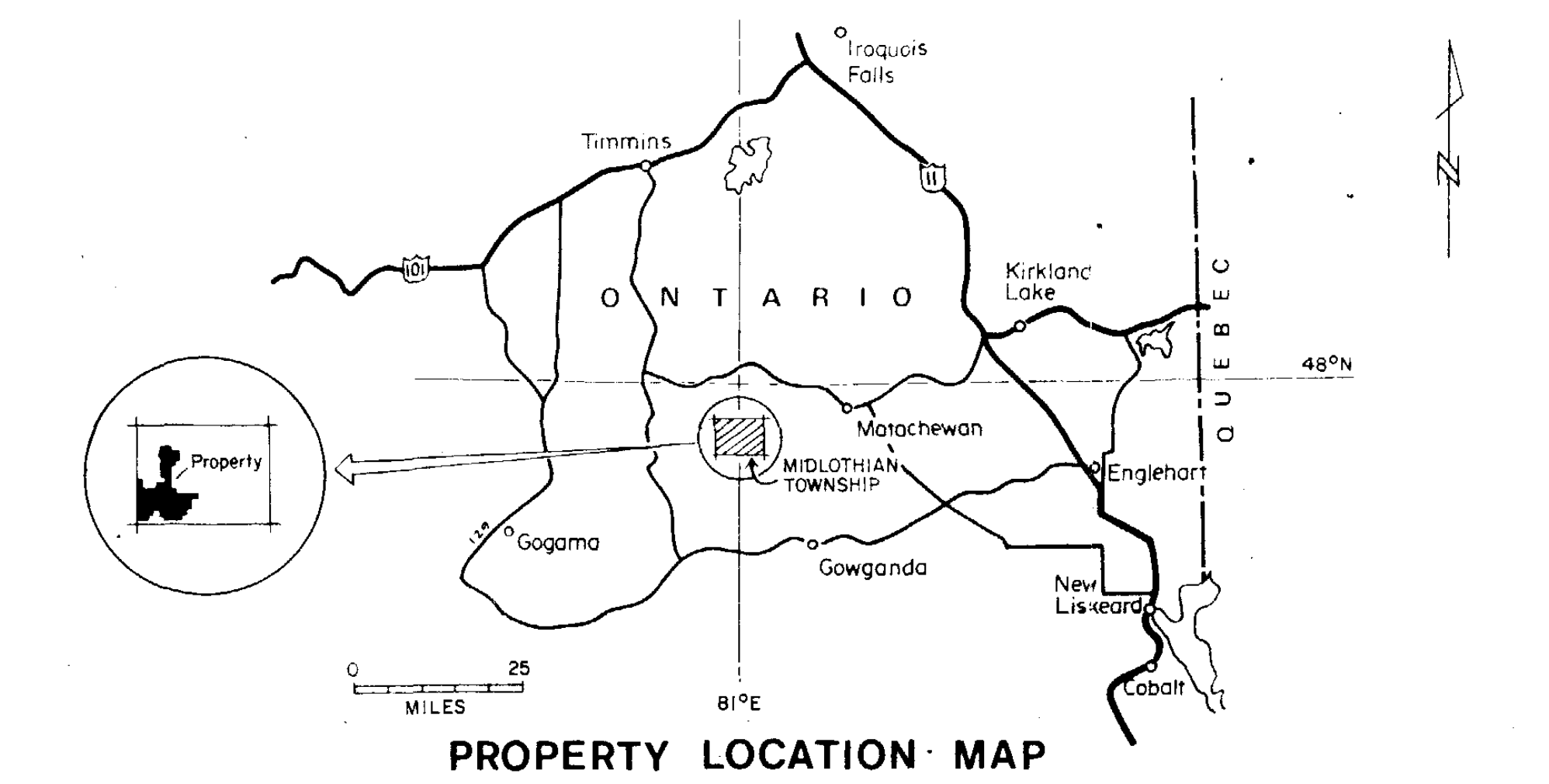
2.1407

LEGEND

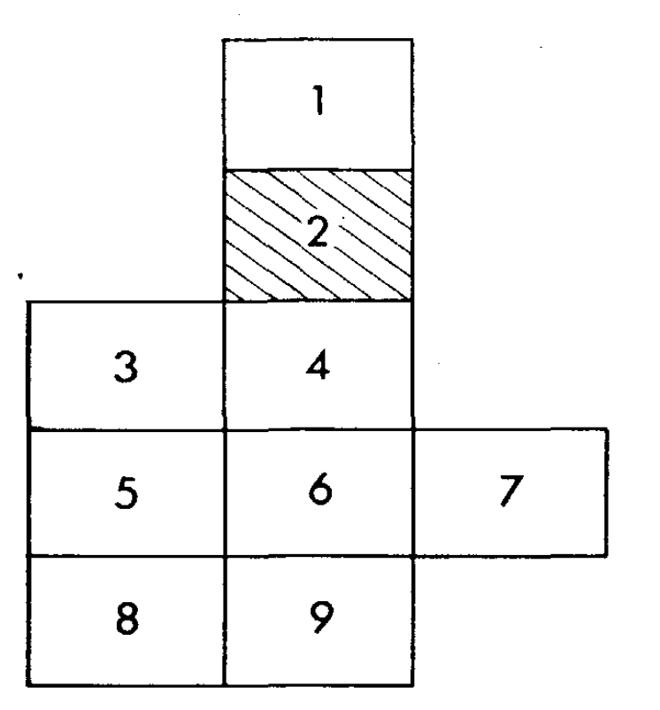
- Quartz Veins (qv), Carbonate Veins (cb v)
- Diabase Dykes (I-Db)
- Lamprophyre (I-Lamp)
- Sediments- Conglomerate (S-Cg), Graywacke (S-Gw), Argillite (S-Argl)
- Basic and Intermediate Igneous Rocks- Gabbro (I-Gb), Diorite (I-Di)
- Ultramafic Rocks (I-Um), Serpentinite (I-Serp)
- qe — Porphyritic Rhyolite (VRyqe), Porphyritic Rhyolite Breccia (VRybxqe)
- VRy — Massive, Fine-Grained Rhyolite (VRy)
- VRybx — Rhyolite Flow Breccia (VRybx)
- VRyTubx — Rhyolite Tuff Breccia (VRytubx)
- VAbx — Acid Volcanic Tuff Breccia (VAtubx)
- VInt. — Andesite (V And), Dacite (VDa), Flow Breccia, Tuff Breccia, Flow, Pillowed Flow, etc

SYMBOLS

- Swamp
- Small outcrop
- Outcrop
- Interpreted bedrock
- Top of bed
- Bedding, top unknown (inclined, vertical)
- Strike and dip of schistosity (inclined, vertical)
- Strike and dip of gneissosity (inclined, vertical)
- Fault, assumed
- Anticlinal axis
- Synclinal axis
- Mineral occurence
- Tractor road
- Diamond drill hole
- Geological boundary, defined
- Geological boundary, approximate
- Geological boundary, assumed
- Geological boundary as indicated by magnetic data



PROPERTY LOCATION MAP



SHEET INDEX

THE HANNA MINING COMPANY

MIDLOTHIAN PROJECT
LARDER LAKE MINING DIVISION
ONTARIO

GEOLOGIC MAP

SCALE 1" = 200'

200 0 200 400 600
Feet

NELSON HOGG

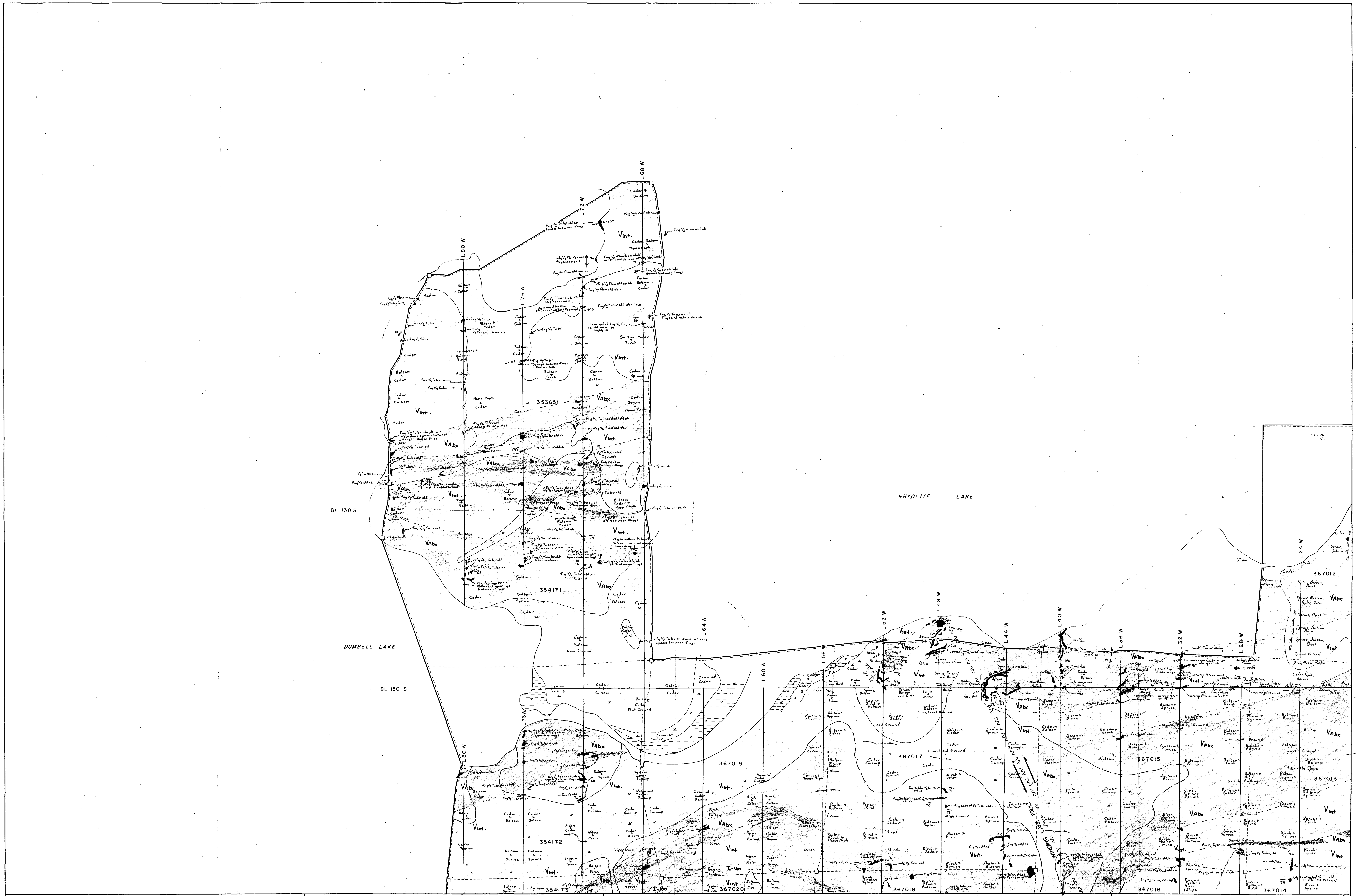
Work by John Lake Date January 29, 1974	Interpretation by John Lake Date January 29, 1974	Revised Revised N.T.S. No 41-P-15

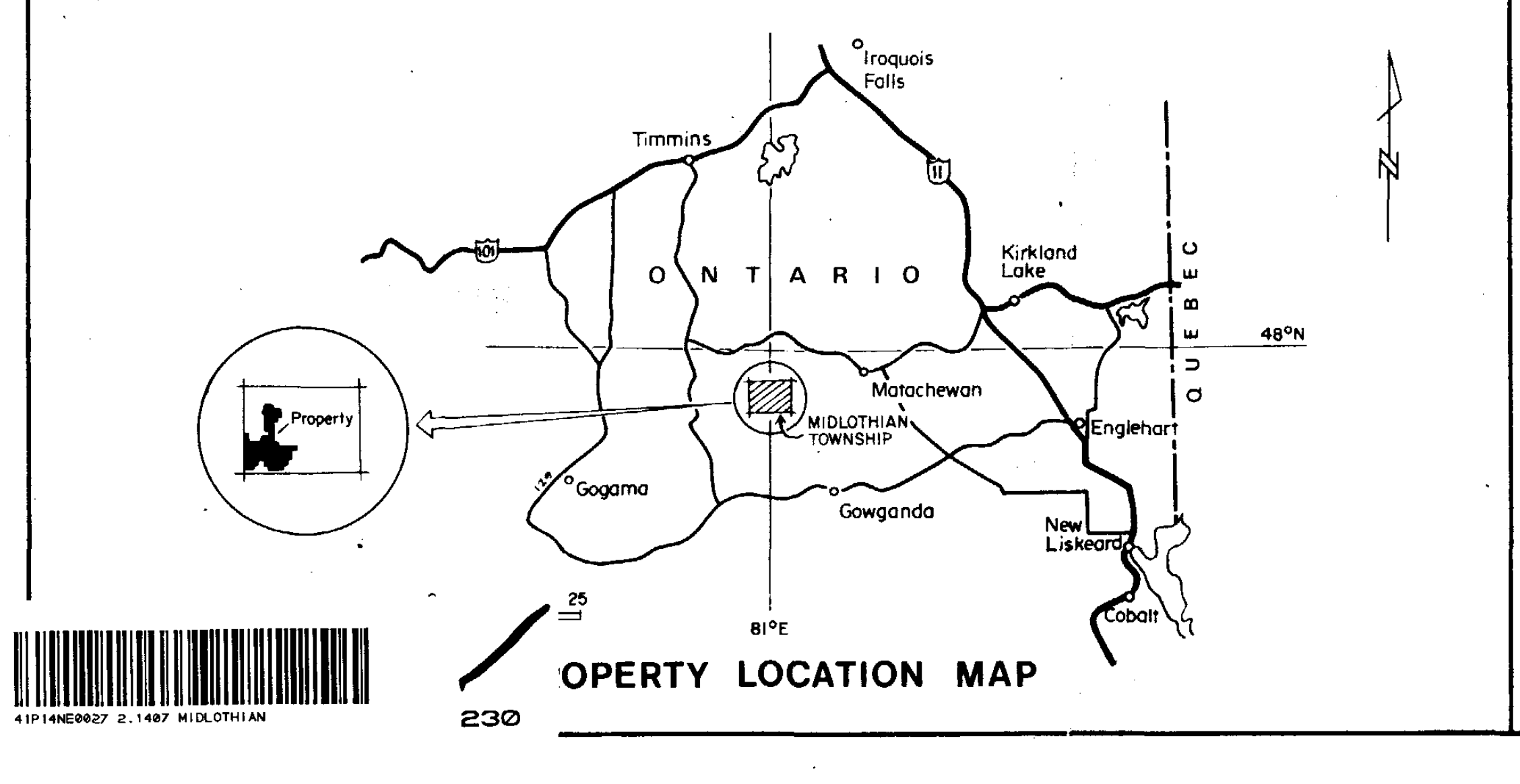
#2

2.1407

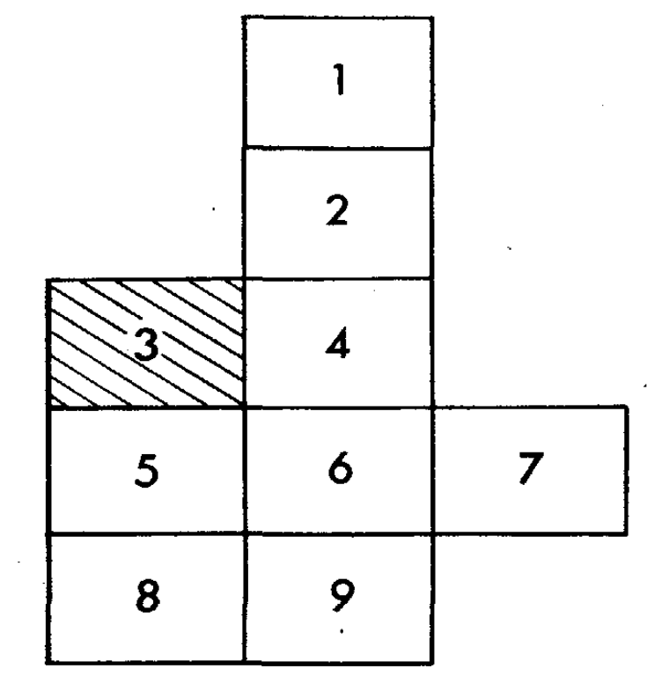
41P14NE0027 2.1407 MIDLOTHIAN

220





OPERTY LOCATION MAP



SHEET INDEX

LEGEND

	Quartz Veins (qv), Carbonate Veins (cb v)
	Diabase Dykes (I-Db)
	Lamprophyre (I-Lamp)
	Sediments - Conglomerate (S-Cg), Graywacke (S-Gw), Argillite (S-Argl)
	Basic and Intermediate Igneous Rocks - Gabbro (I-Gb), Diorite (I-Di)
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qe	Porphyritic Rhyolite (VRyqe), Porphyritic Rhyolite Breccia (VRybxqe)
VRy	**Massive, Fine-Grained Rhyolite (VRy)**
VRybx	**Rhyolite Flow Breccia (VRybx)**
VRyTubx	**Rhyolite Tuff Breccia (VRytubx)**
VAbx	**Acid Volcanic** Tuff Breccia (VAtubx)
VInt	Andesite (VAnd), Dacite (VDa), Flow Breccia, Tuff Breccia, Flow, Pillowed Flow, etc

SYMBOLS

Swamp
Small outcrop
Outcrop
Interpreted bedrock
Top of bed
Bedding, top unknown (inclined, vertical)
Strike and dip of schistosity (inclined, vertical)
Strike and dip of gneissosity (inclined, vertical)
Fault, assumed
Anticlinal axis
Synclinal axis
Mineral occurence
Tractor road
Diamond drill hole
Geological boundary, defined
Geological boundary, approximate
Geological boundary, assumed

THE HANNA MINING COMPANY

MIDLOTHIAN PROJECT

LARDER LAKE MINING DIVISION
ONTARIO

GEOLOGIC MAP

SCALE 1" = 200'

200 0 200 400 600
Feet

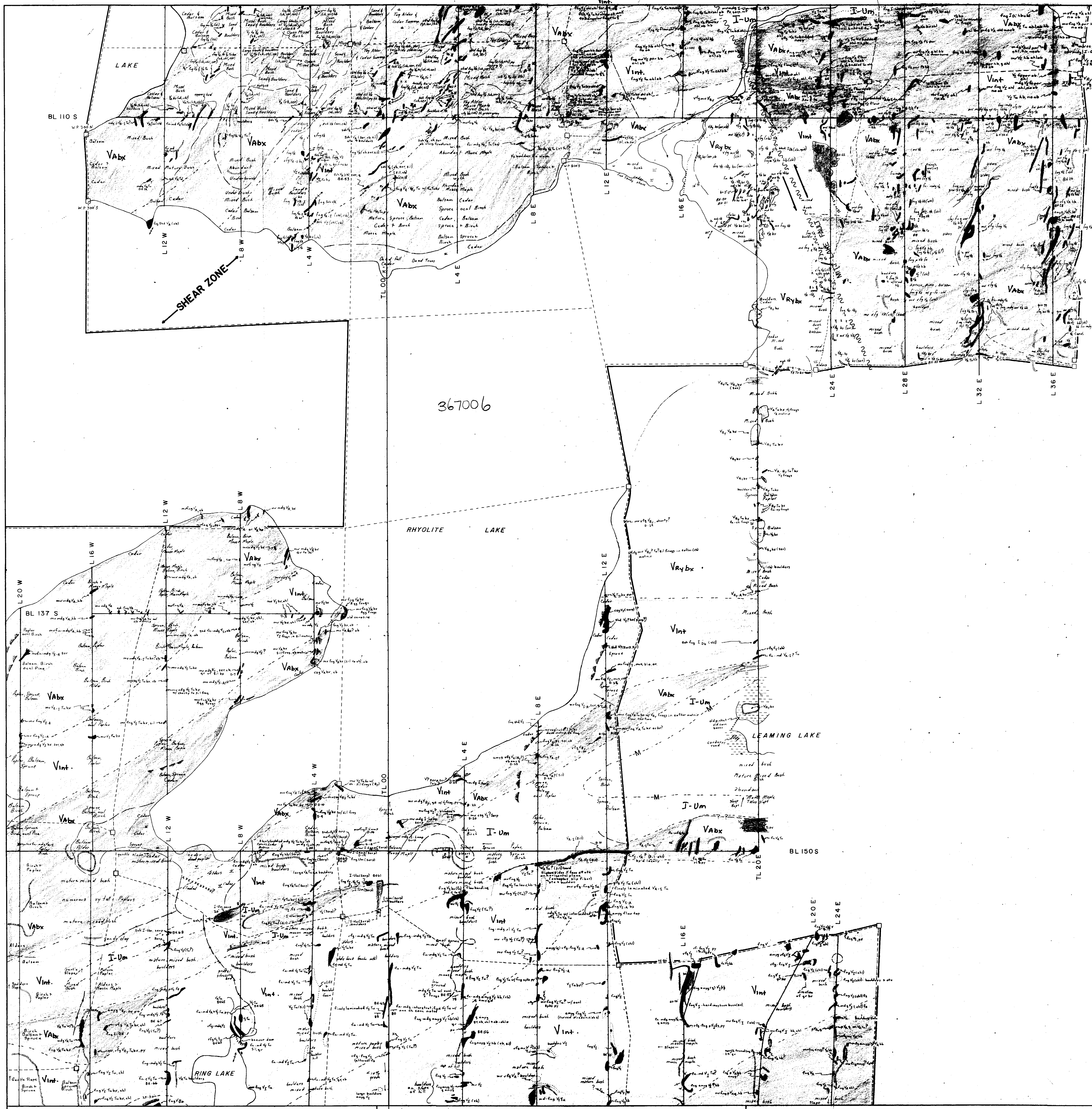
NELSON HOGG

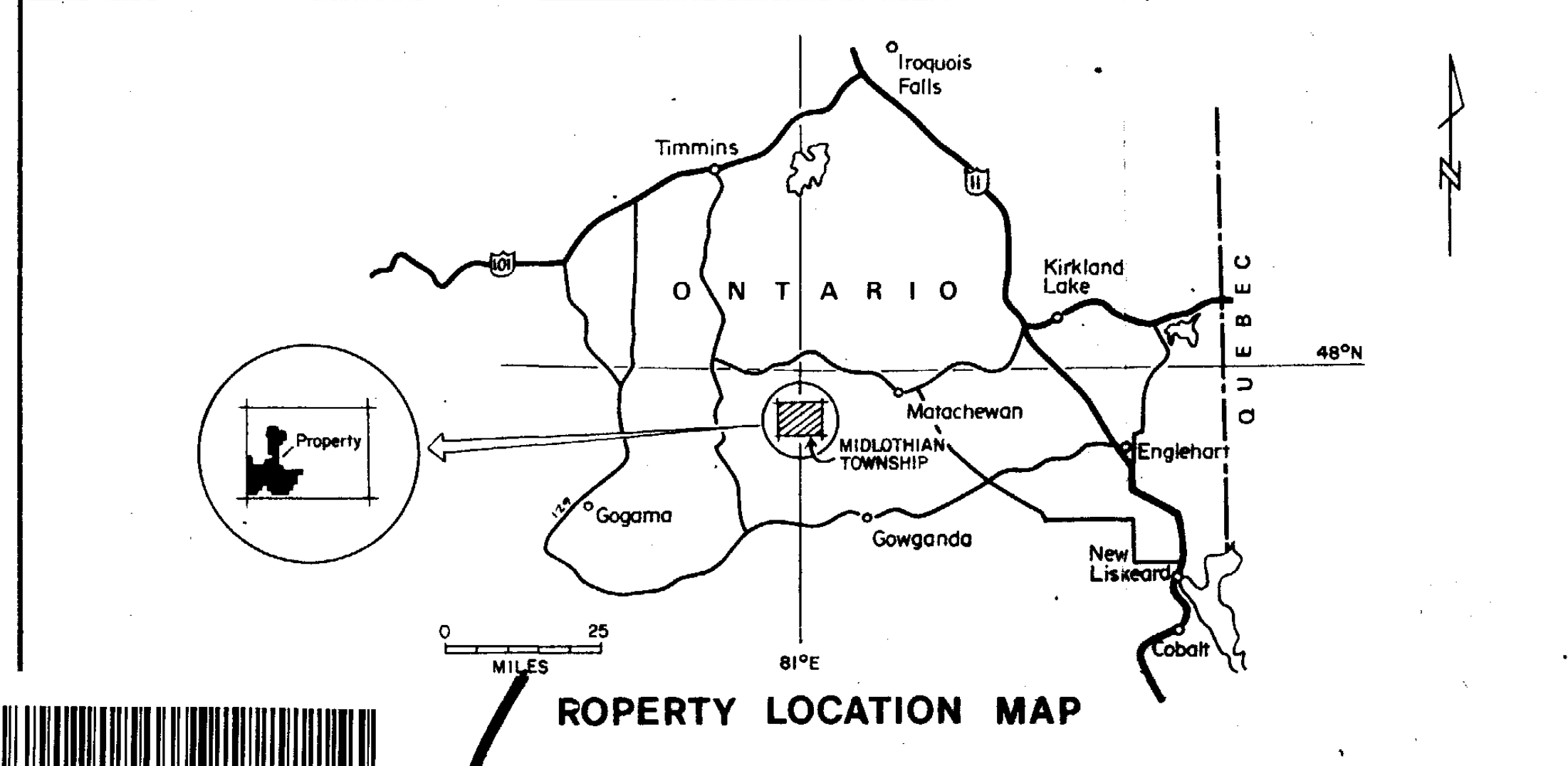
Work by John Lake Date January 29, 1974	Interpretation by John Lake Date January 29, 1974	Revised Revised N.T.S. No 41-P-15

*3

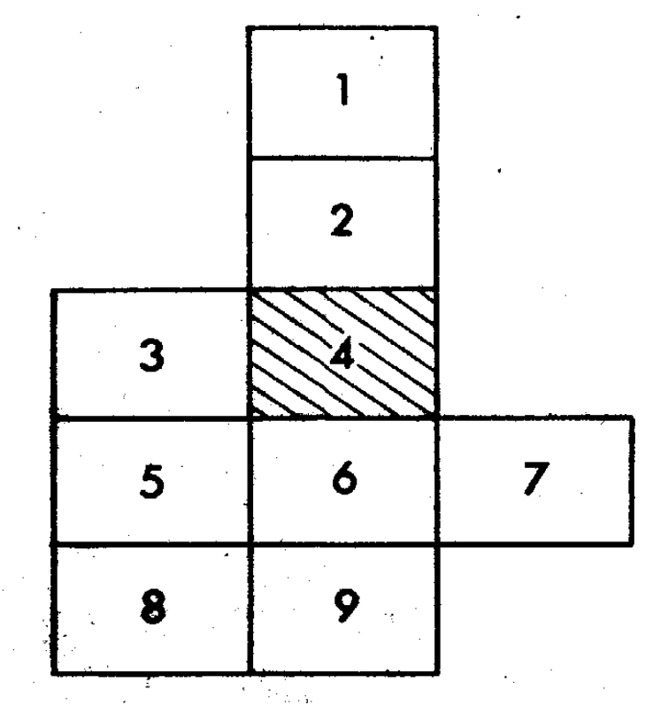
2.1407

230





PROPERTY LOCATION MAP



SHEET INDEX

LEGEND

- Quartz Veins (qv), Carbonate Veins (cb v)
- Diabase Dykes (I-Db)
- Lamprophyre (I-Lamp)
- Sediments- Conglomerate (S-Cg), Graywacke (S-Gw), Argillite (S-Argl)
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- qe Porphyritic Rhyolite (VRyqe), Porphyritic Rhyolite Breccia (VRybx qe)
- VRy Massive, Fine-Grained Rhyolite (VRy)
- VRy bx Rhyolite Flow Breccia (VRybx)
- VRy Tubx Rhyolite Tuff Breccia (VRytubx)
- VAbx Acid Volcanic Tuff Breccia (VAtubx)
- Vint Andesite (V And), Decite (VDe), Flow Breccia, Tuff Breccia, Flow, Pillowed Flow, etc

SYMBOLS

- Swamp
- Small outcrop
- Outcrop
- Interpreted bedrock
- Top of bed
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- Strike and dip of schistosity (inclined, vertical)
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THE HANNA MINING COMPANY

MIDLOTHIAN PROJECT

LARDER LAKE MINING DIVISION
ONTARIO

GEOLOGIC MAP

SCALE 1" = 200'

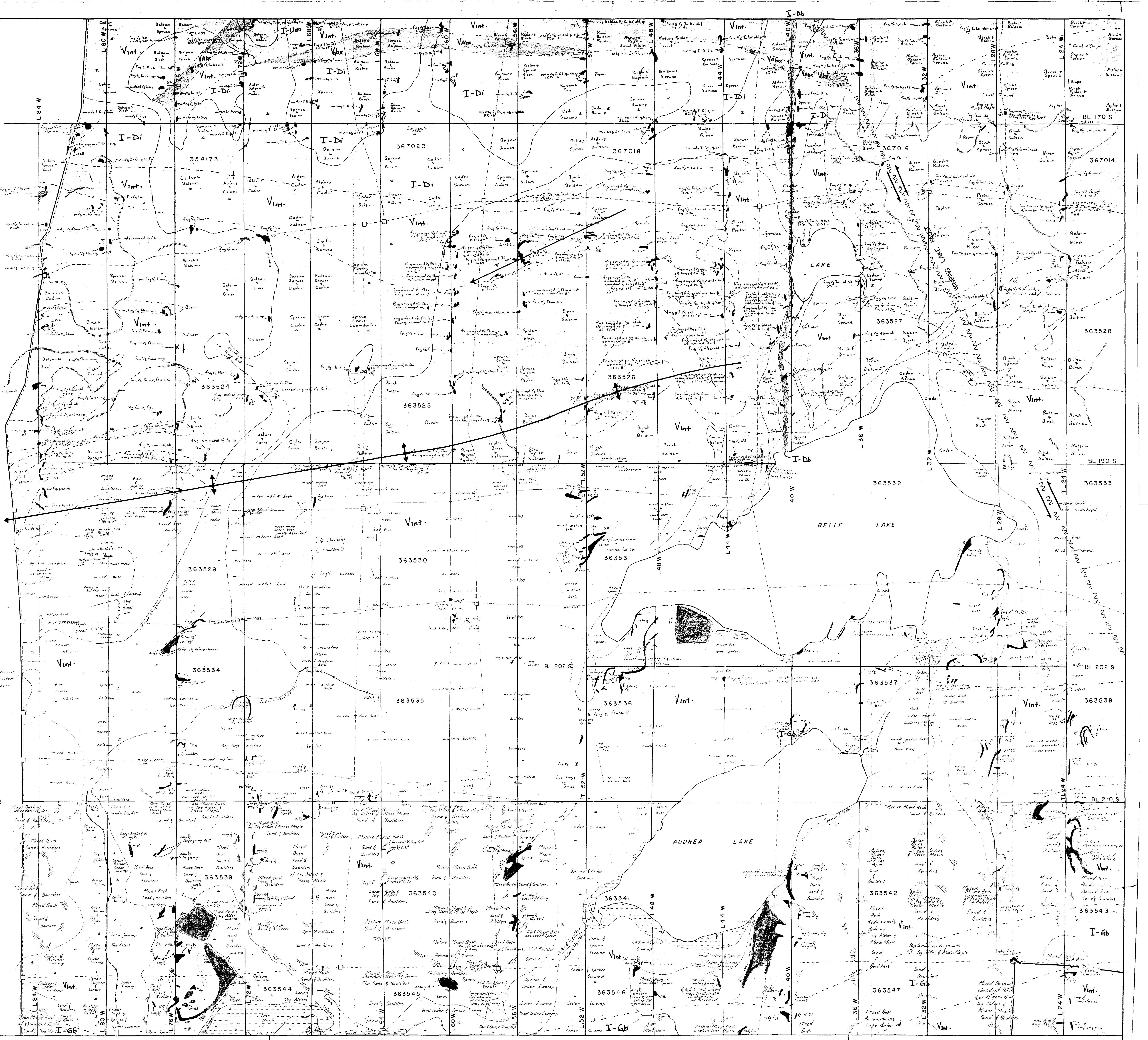
200 0 200 400 600
Feet

NELSON HOGG

Work by John Rake	Interpretation by John Rake	Revised
Date January 29, 1974	Date January 29, 1974	Revised N.T.S. No 41-P-15

240

2.1407



LEGEND

	▨	Quartz Veins (qv), Carbonate Veins (cb v)
	■	Diabase Dykes (I-Db)
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V_{Rybx}	☐	Rhyolite Flow Breccia (VRybx)
V_{RyTubx}	▨	Rhyolite Tuff Breccia (VRytubx)
V_{Abx}	■	Acid Volcanic Tuff Breccia (VAtubx)
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THE HANNA MINING COMPANY

MIDLOTHIAN PROJECT

LARDER LAKE MINING DIVISION
ONTARIO

GEOLOGIC MAP

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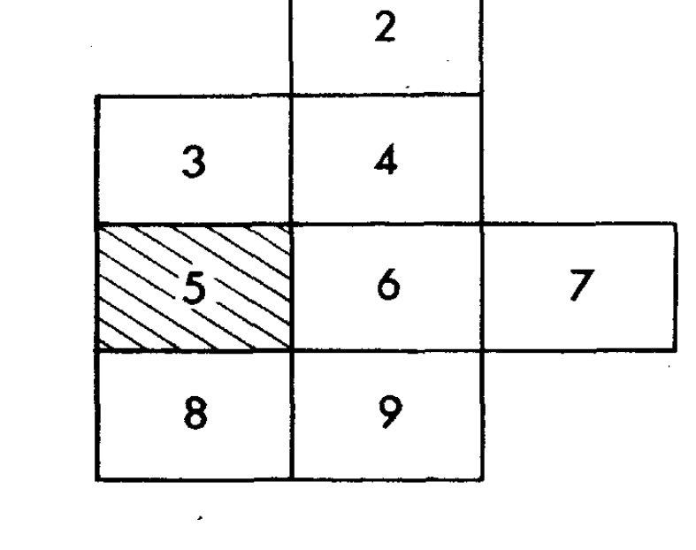
200 0 200 400 600
Feet

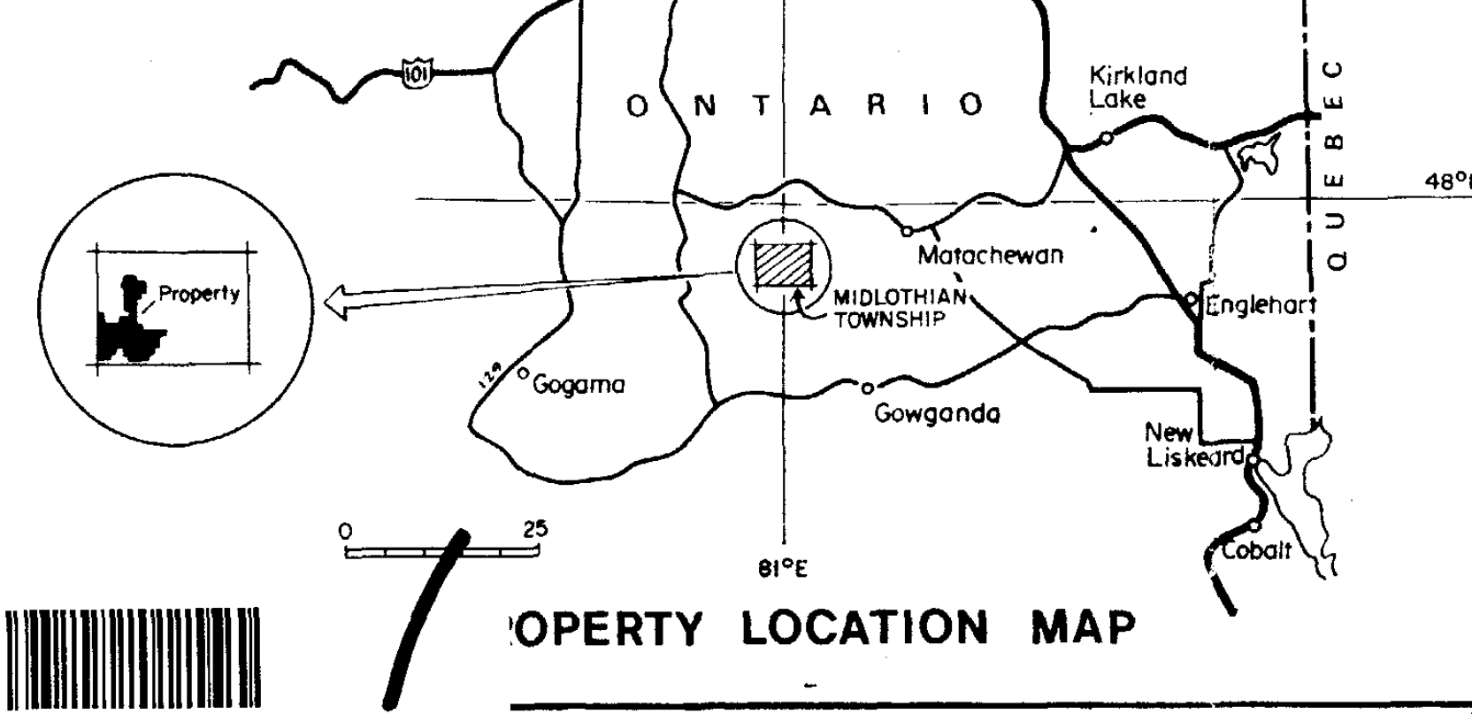
Work by John Lake Date January 29, 1974	Interpretation by John Lake Date January 29, 1974	Revised Revised N.T.S. No 41-P-15

NELSON HOGG

Nelson Hogg



SHEET INDEX

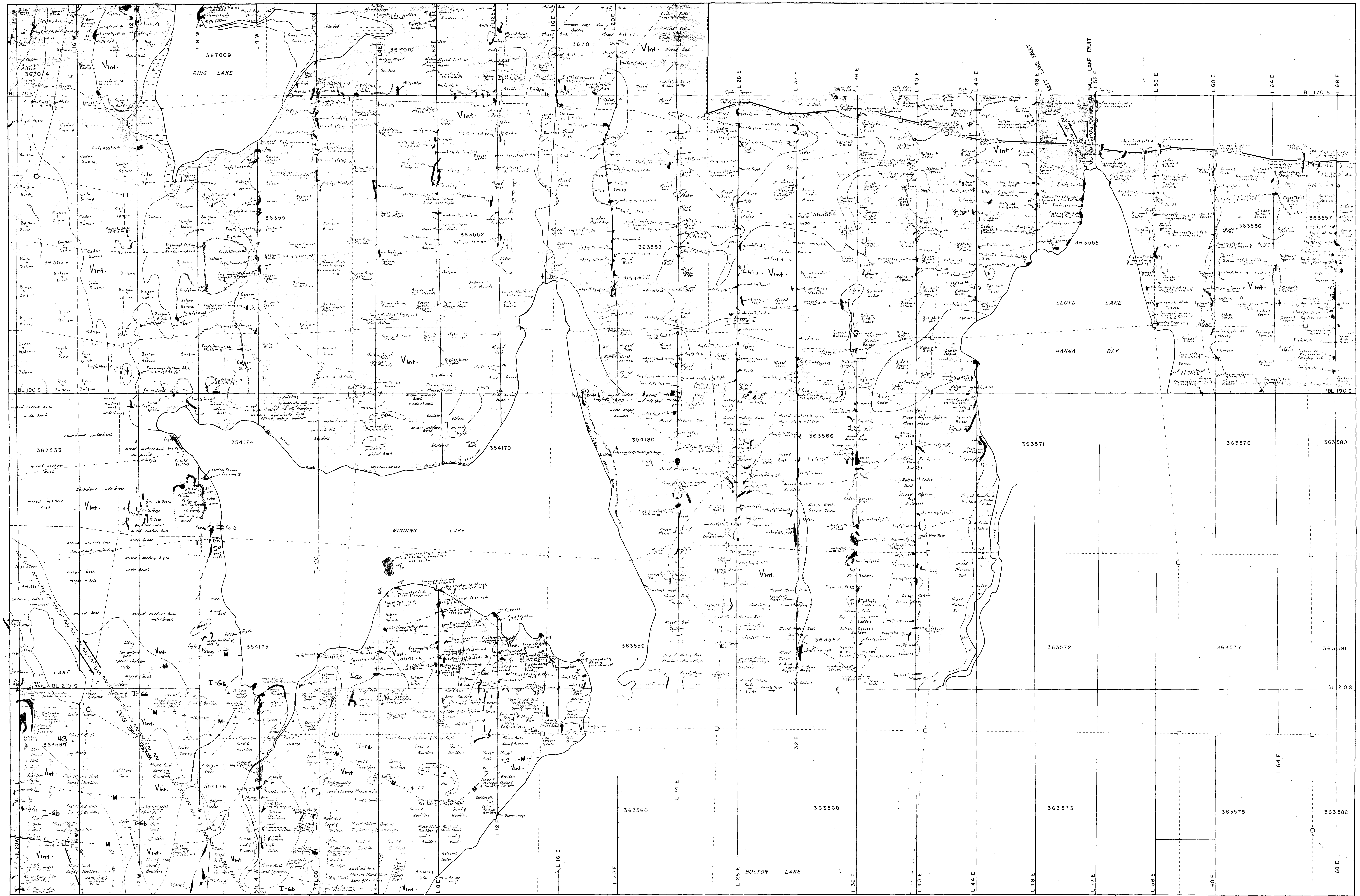


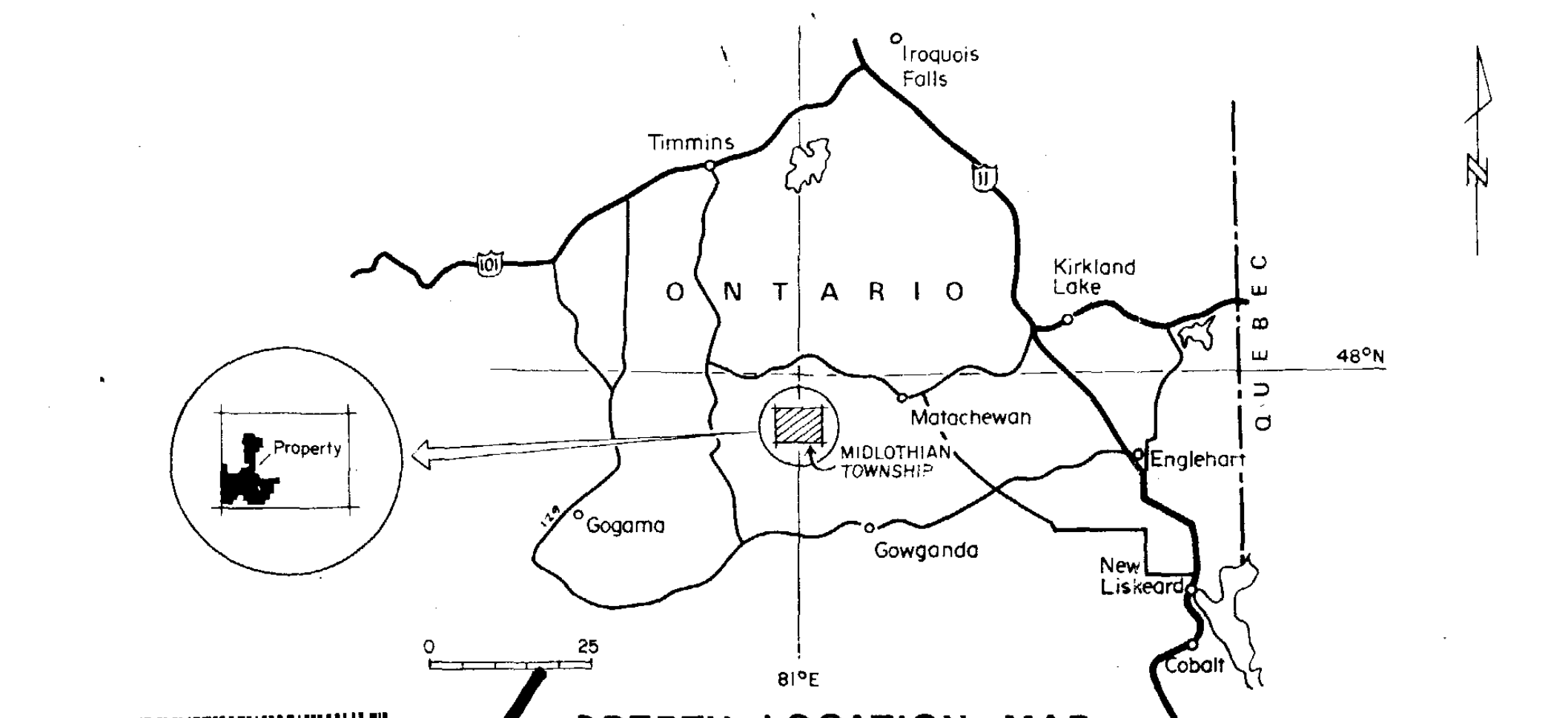
OPERTY LOCATION MAP

250

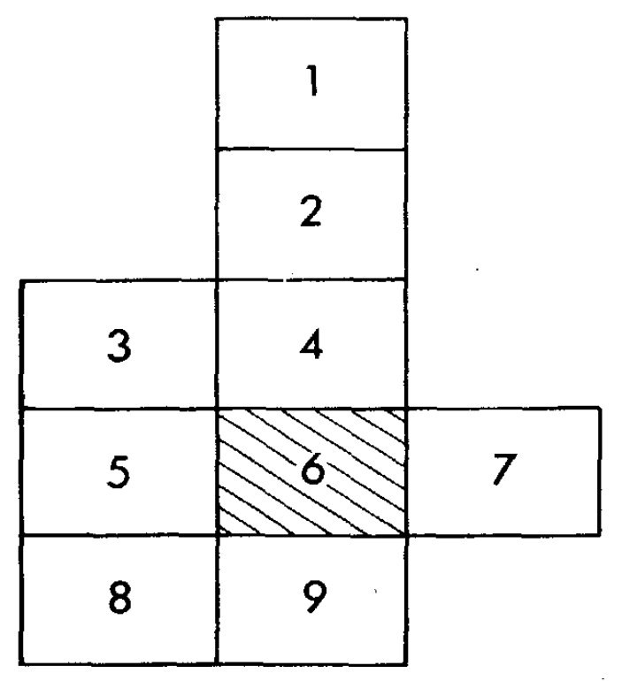
#5

2.1407





OPERTY LOCATION MAP



SHEET INDEX

LEGEND

▩	Quartz Veins (qv), Carbonate Veins (cb v)
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THE HANNA MINING COMPANY

MIDLOTHIAN PROJECT

LARDER LAKE MINING DIVISION
ONTARIO

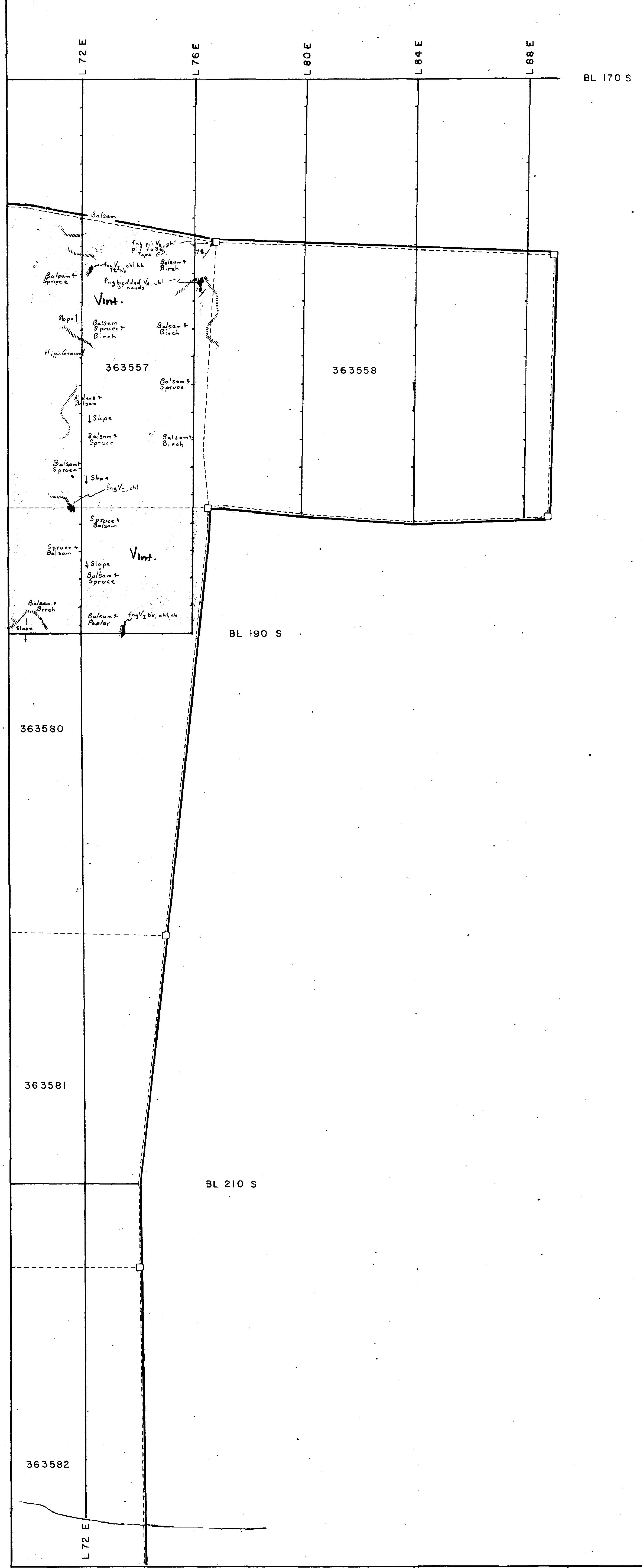
GEOLOGIC MAP

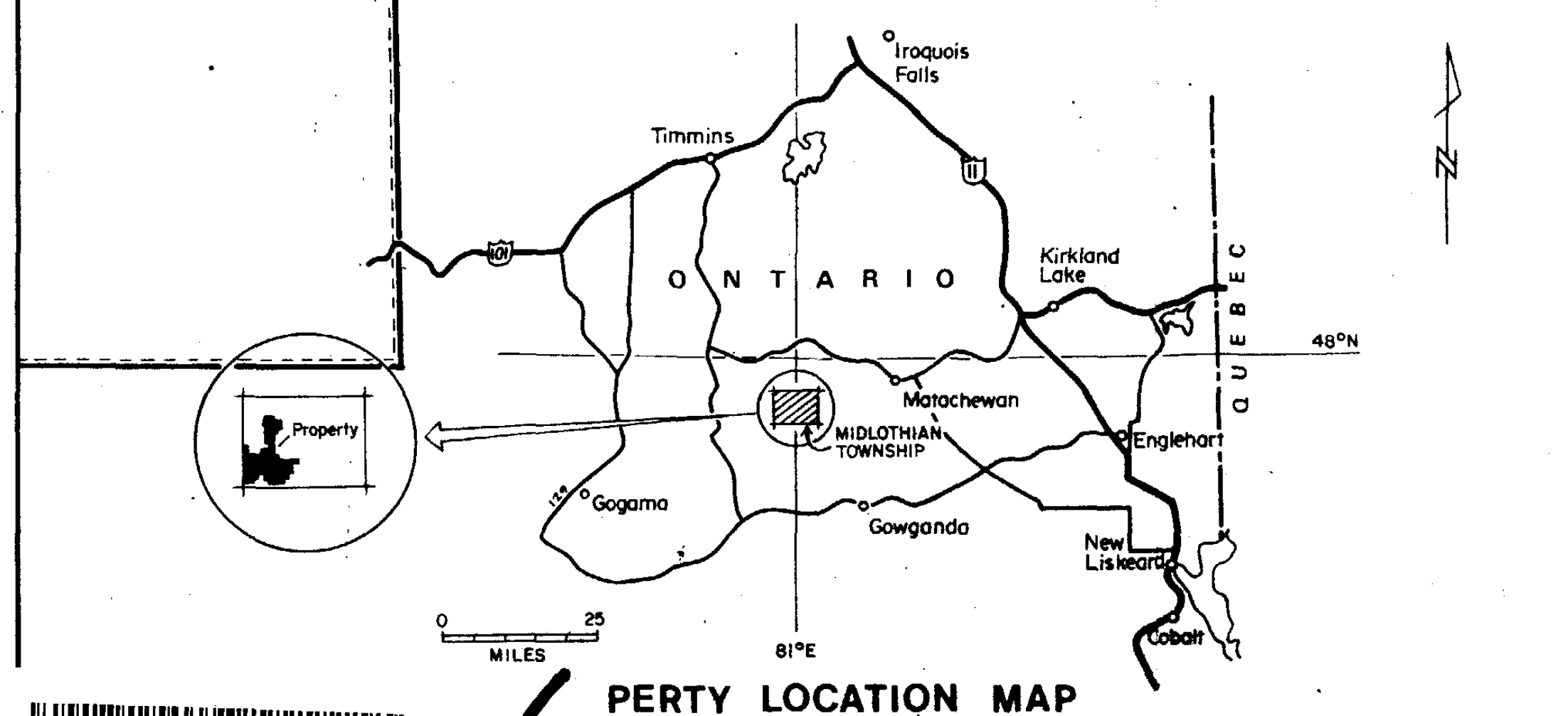
SCALE 1" = 200'

200 0 200 400 600
Feet

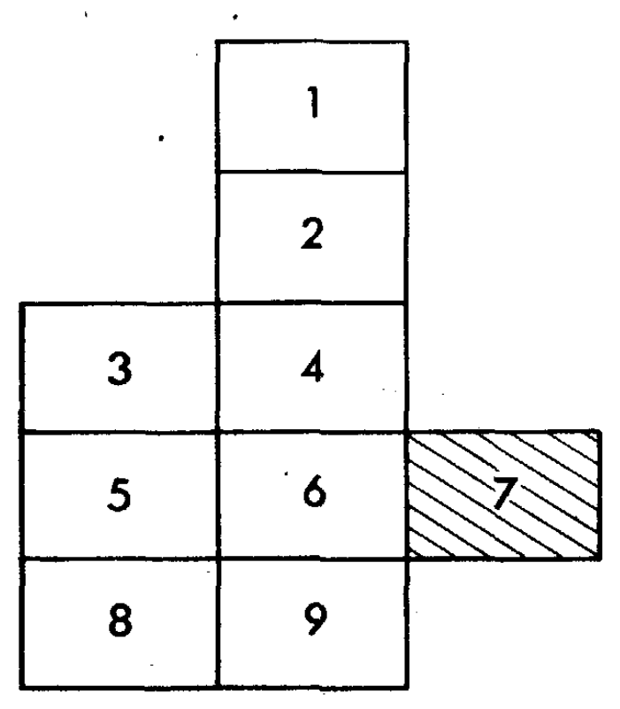
NELSON HOGG
Nelson Hogg

Work by John Lake Date January 29, 1974	Interpretation by John Lake Date January 29, 1974	Revised Revised N.T.S. No 41-P-15





PERTY LOCATION MAP



SHEET INDEX

LEGEND

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THE HANNA MINING COMPANY

MIDLOTHIAN PROJECT

LARDER LAKE MINING DIVISION
ONTARIO

GEOLOGIC MAP

SCALE 1" = 200'

200 0 200 400 600
Feet

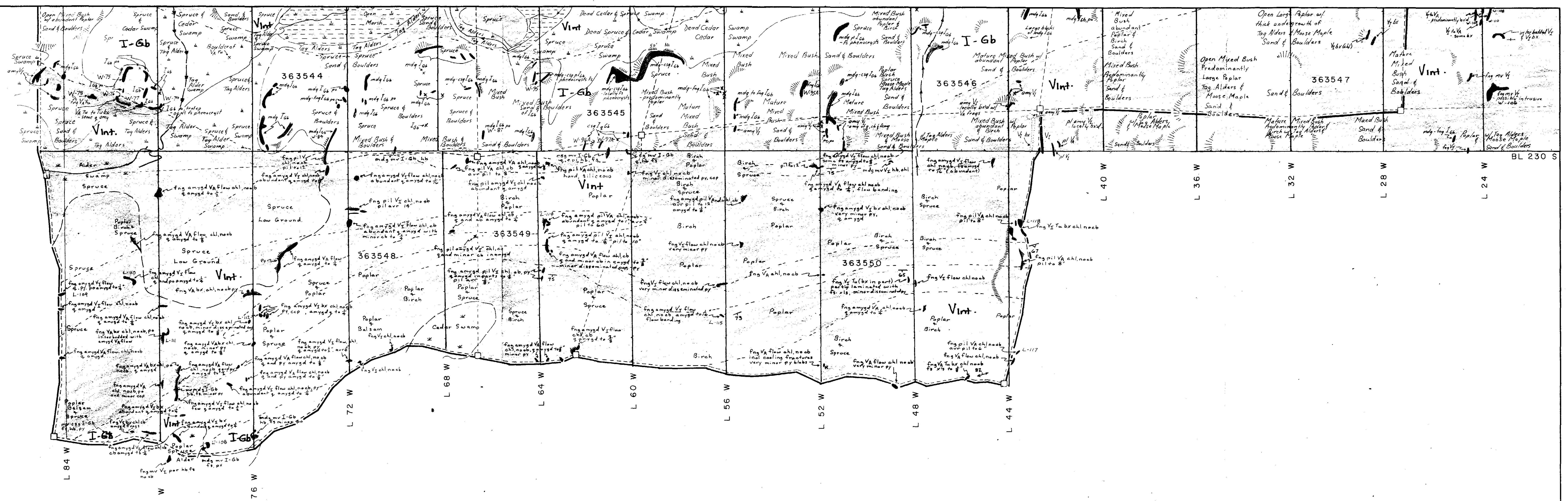
NELSON HOGG
Nelson Hogg

Work by John Lake	Interpretation by John Lake	Revised
Date January 29, 1974	Date January 29, 1974	Revised
		N.T.S. No 41-P-15

270

*7

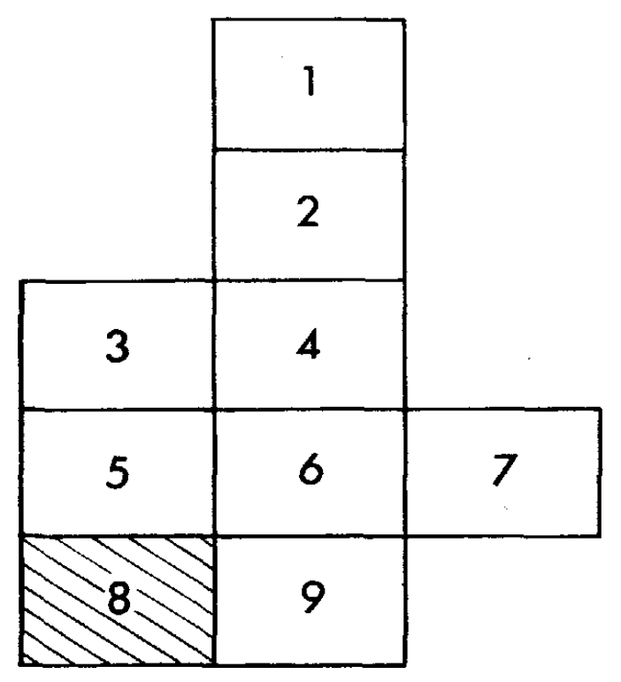
2.1407



OPERTY LOCATION MAP

41P14NE0027 2.1407 MIDLOTHIAN

280



SHEET INDEX

LEGEND

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LARDER LAKE MINING DIVISION
ONTARIO

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SCALE 1" = 200'

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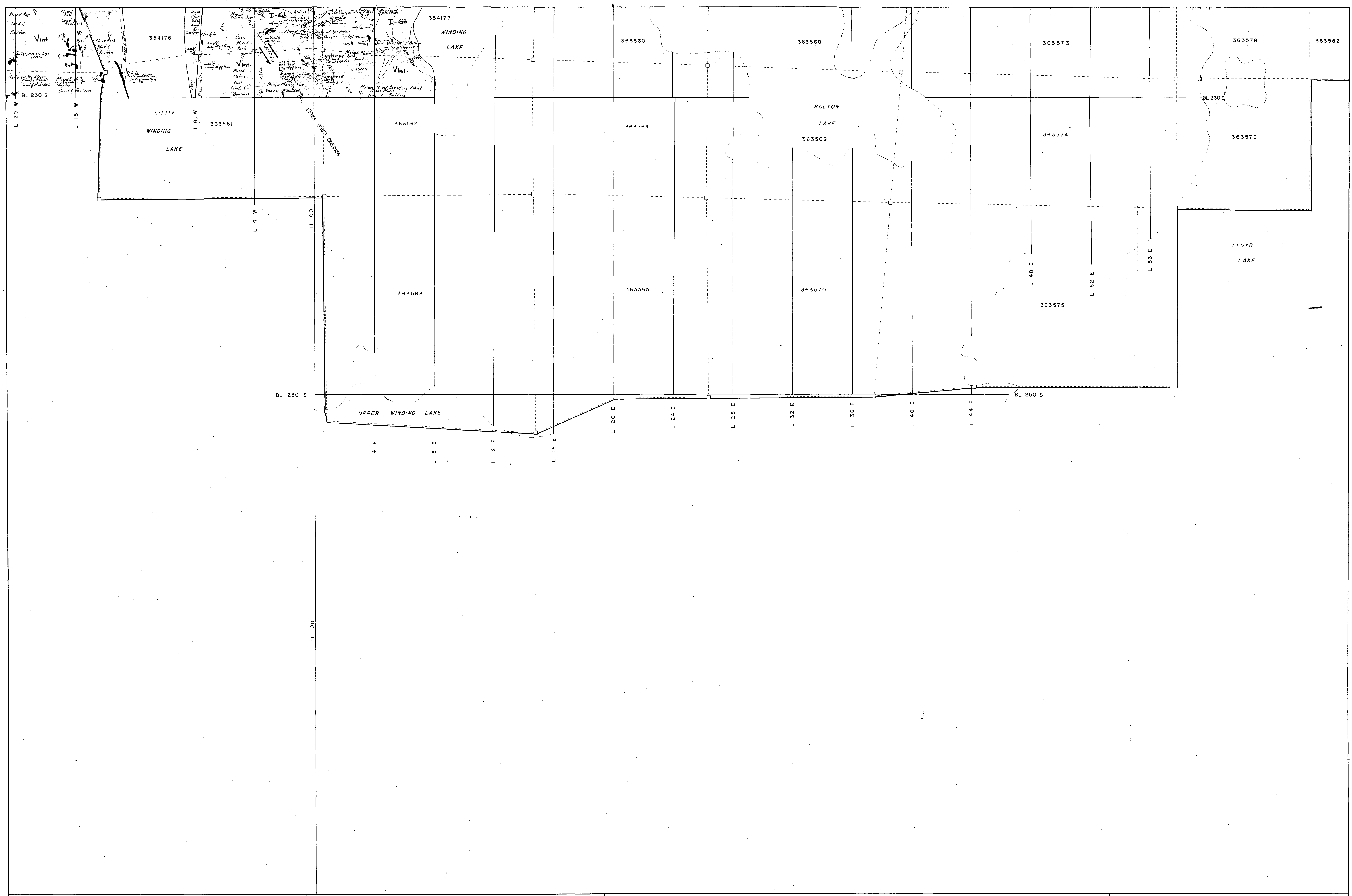
NELSON HOGG
Nelson Hogg

Work by John Lake	Interpretation by John Lake	Revised
Date January 29, 1974	Date January 29, 1974	Revised N.T.S. No 41-P-15

8

2.1407



LEGEND

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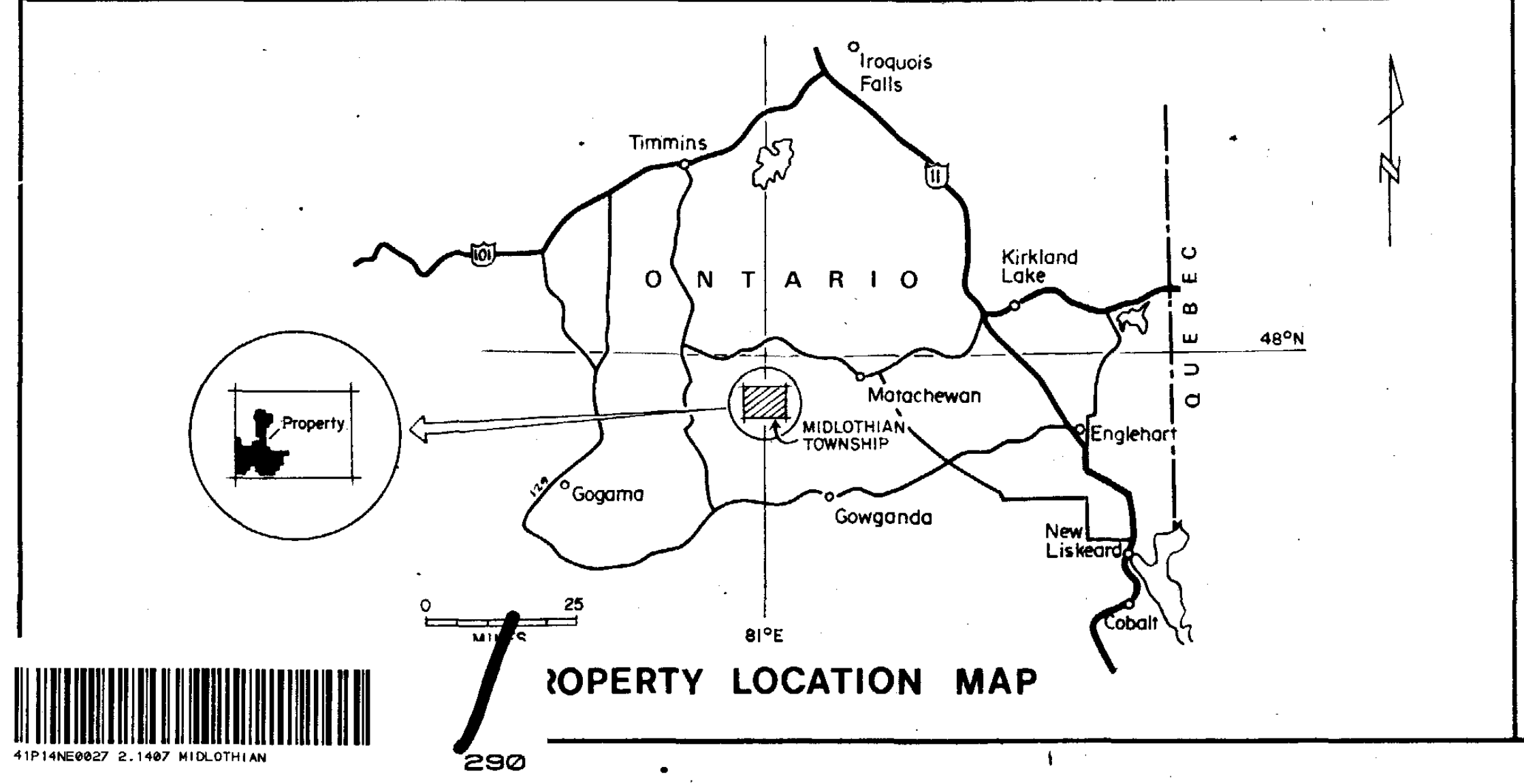
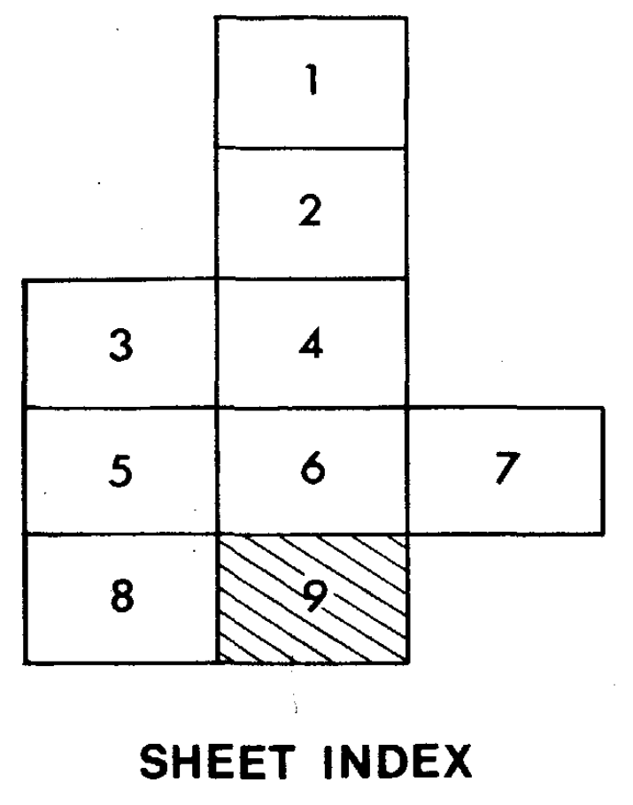


PROPERTY LOCATION MAP



SHEET INDEX

THE HANNA MINING COMPANY

MIDLOTHIAN PROJECT

LARDER LAKE MINING DIVISION
ONTARIO

GEOLOGIC MAP

SCALE 1" = 200'

200 0 200 400 600
Feet

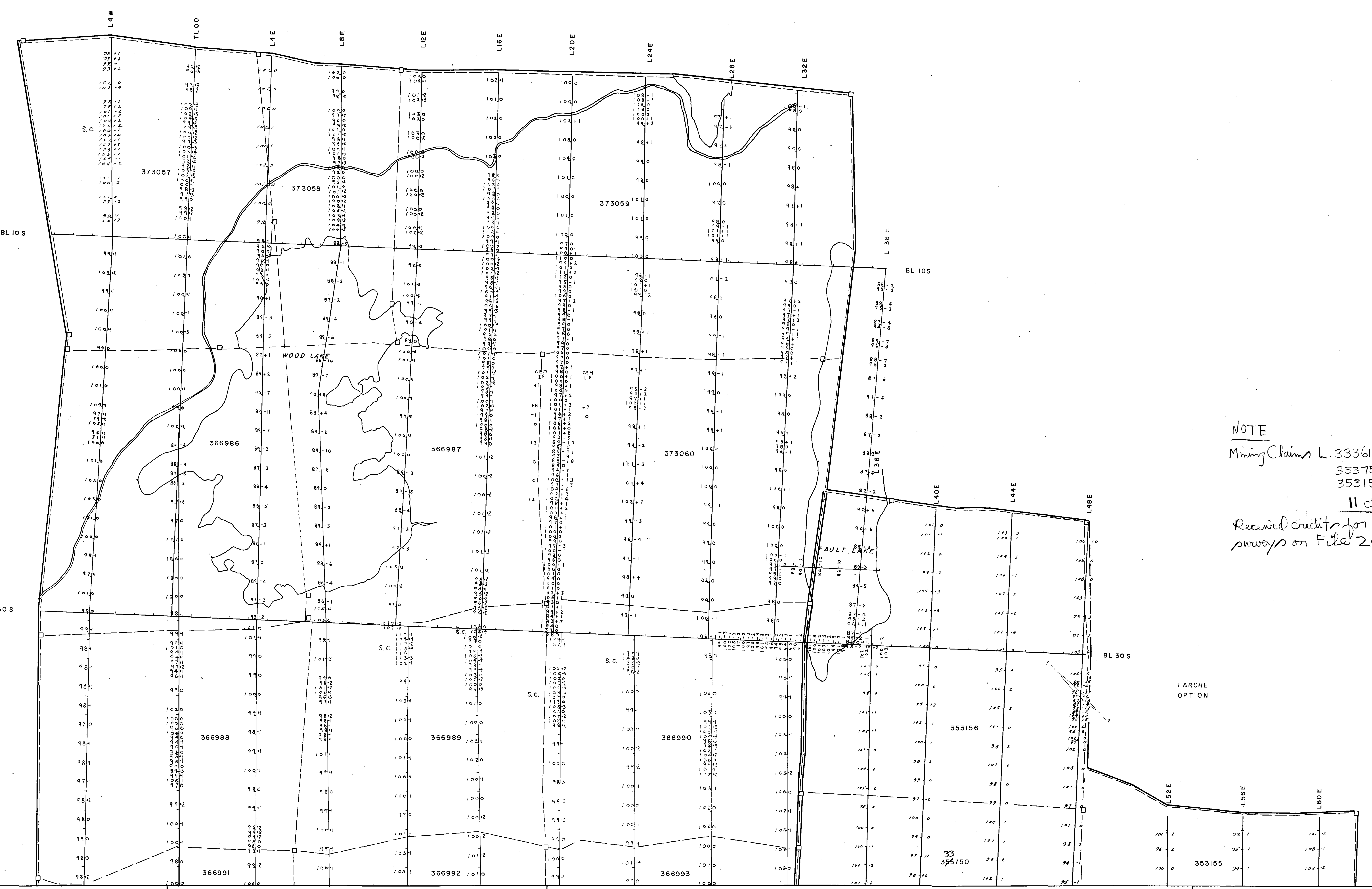
MINING
NELSON HOGG
Nelson Hogg

Work by John Lake Date January 29, 1974	Interpretation by John Lake Date January 29, 1974	Revised Revised N.T.S. No 41-P-15

#9

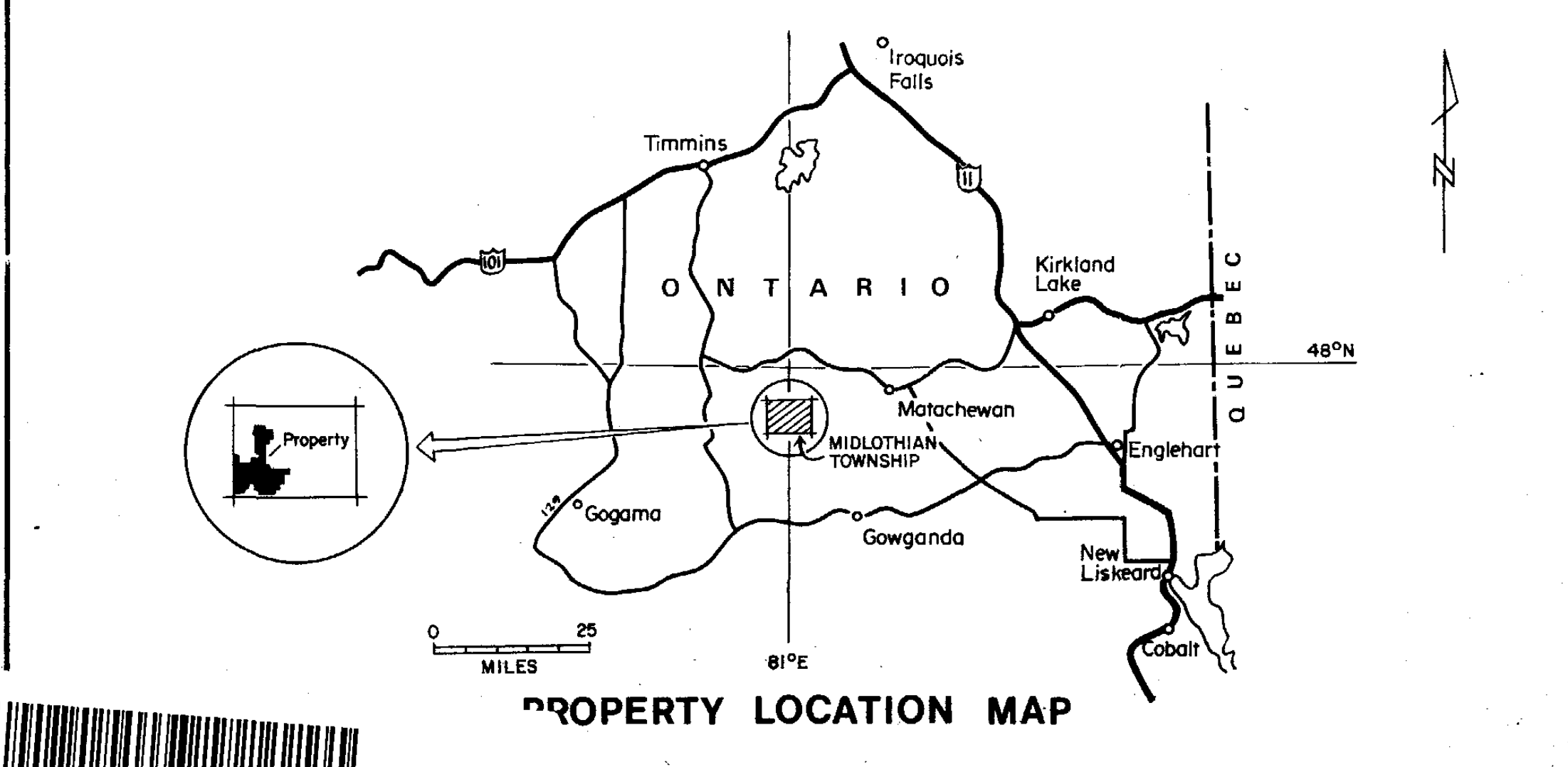
2.1407

290



NOTE
Mining Claims L.333617 to 24 inclusive
333750
353155 – 56
11 claims

Received credits for EM, Mag + Geological surveys on File 2.1380



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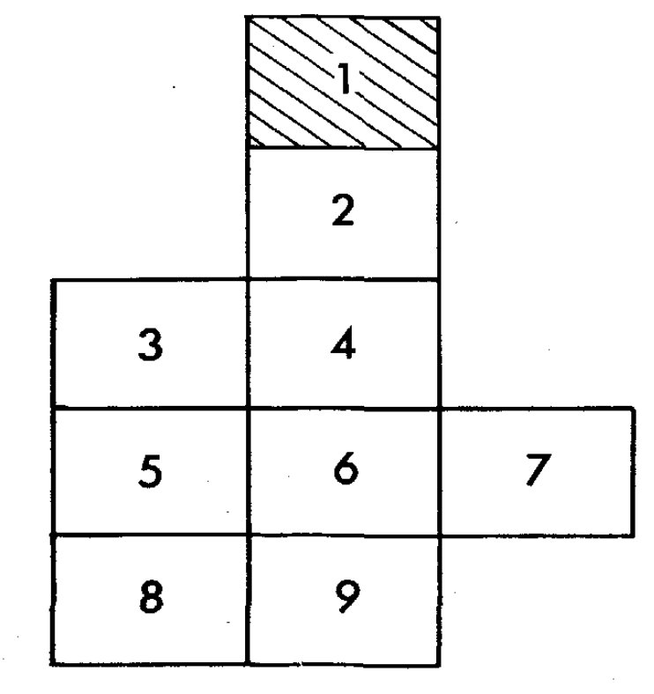


SHEET INDEX

LEGEND

SYMBOLS

	IN PHASE	OUT OF PHASE
High Frequency	100	0
Low Frequency	100	0
Only High Frequency taken	100	0

INSTRUMENT : ABEM GUN
High Frequency - 3520 cycles / second
Low Frequency - 880 cycles / second

THE HANNA MINING COMPANY

MIDLOTHIAN PROJECT
LARDER LAKE MINING DIVISION
ONTARIO

ELECTROMAGNETIC MAP

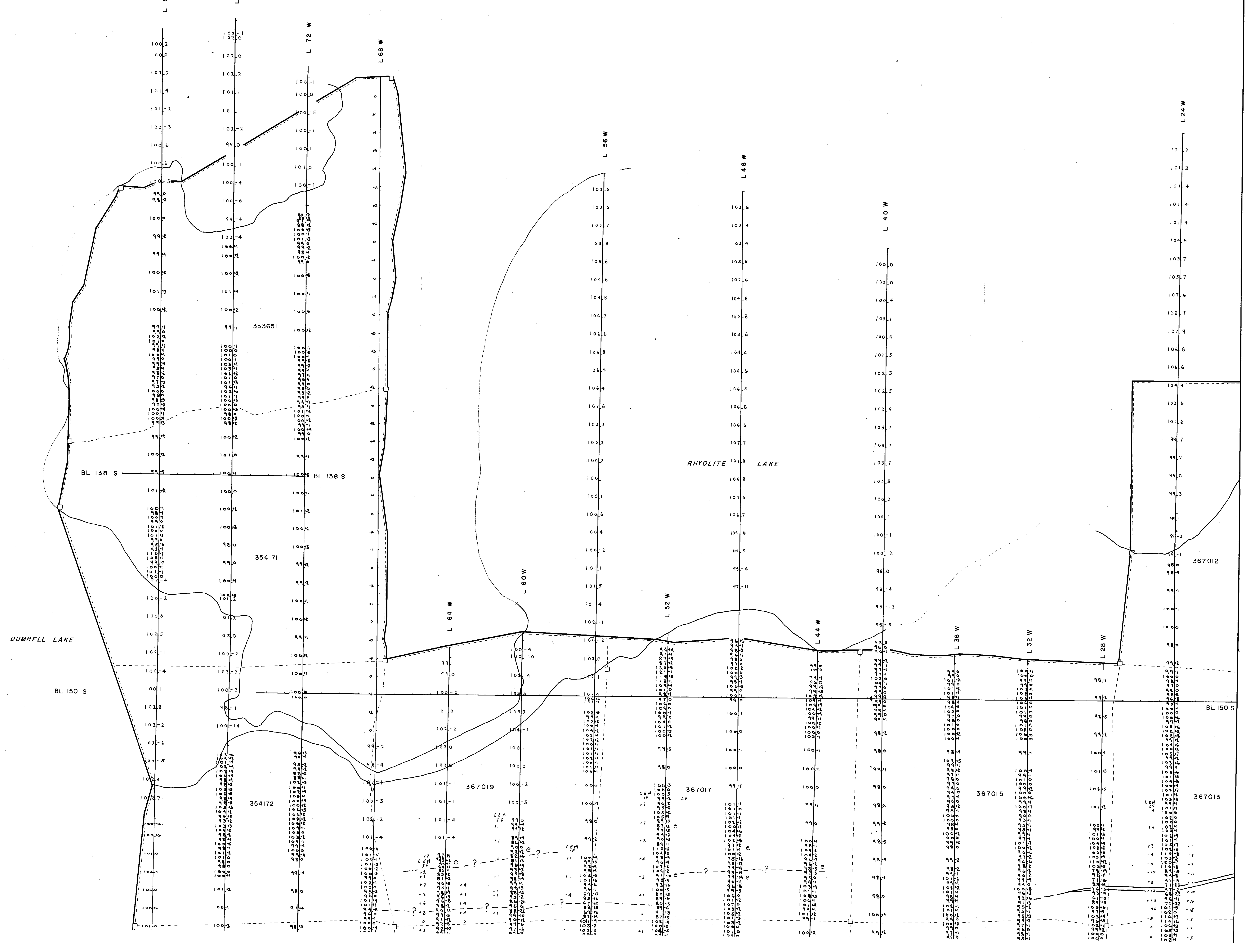
SCALE 1" = 200'

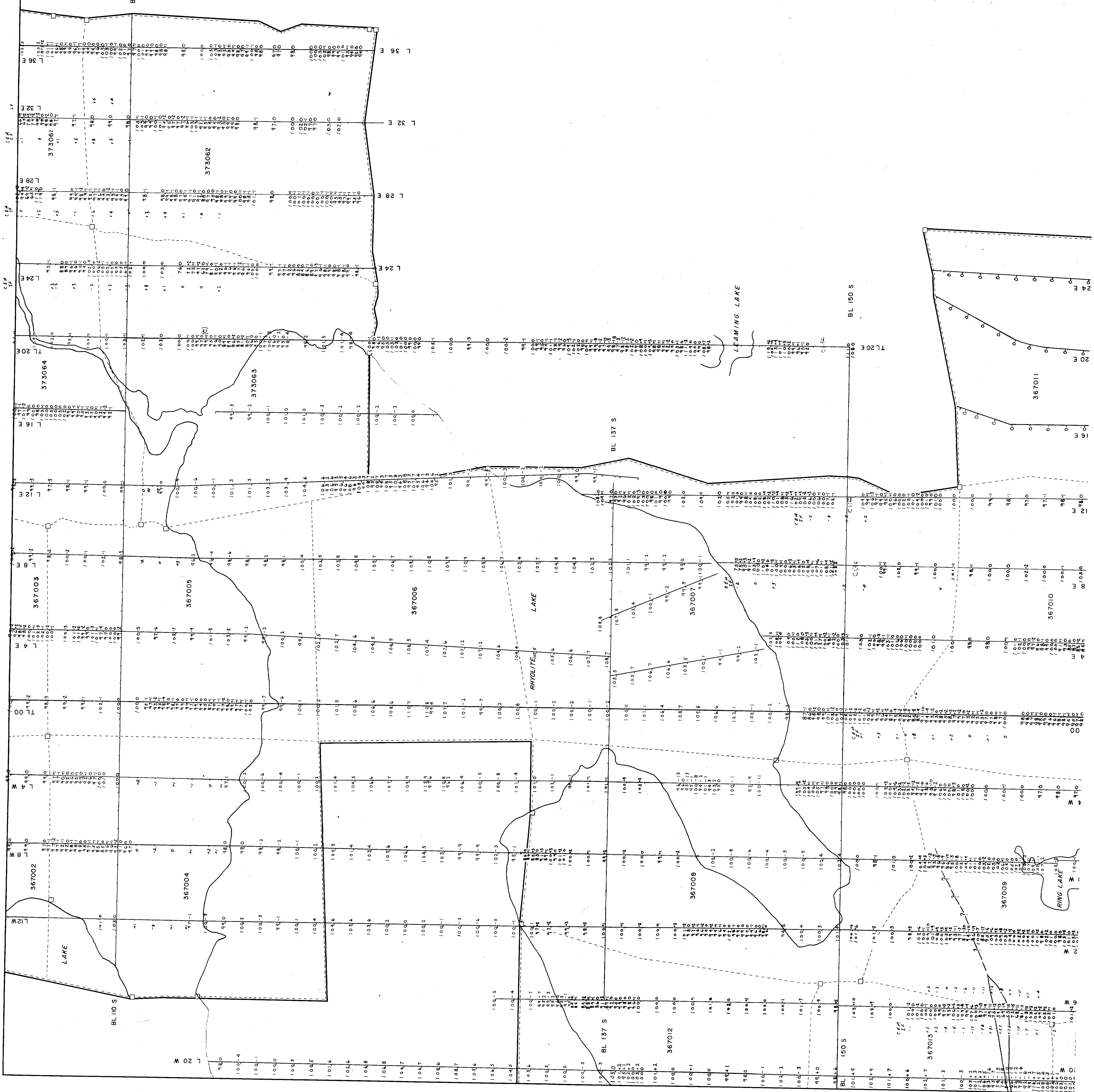
200 0 200 400 600
Feet

Work by	Interpretation by Beverly L. Hodgins	Revised
Date	Date Jan 30, 1974	Revised N.T.S. No 41-P-15

300


BL 50 S
BL 70 S
BL 90 S
L 12 W
L 8 W
L 4 W
TL 00
L 4 E
L 8 E
L 12 E
L 16 E
L 20 E
L 24 E
L 28 E
L 32 E
L 36 E
L 40 E
L 44 E
L 48 E
L 52 E
L 56 E
L 60 E
L 64 E
353155
335750
333623
333622
333617
333618
333621
333619
333620
333624
366991
366992
366993
366994
366995
366996
366997
366998
366999
367000
367001
367002
367003
373061
373064
BESS LAKE
MAVIS LAKE
WEARY LAKE
SIROLA LAKE
SILVERBIRCH LAKE
LLOYD LAKE
WEARY CREEK
S.C.


L 80 W
L 76 W
L 72 W
L 68 W
L 64 W
L 60 W
L 56 W
L 52 W
L 48 W
L 44 W
L 40 W
L 36 W
L 32 W
L 28 W
L 24 W
BL 138 S
BL 138 S
BL 150 S
BL 150 S
RHYOLITE LAKE
DUMBELL LAKE
353651
354171
354172
367019
367017
367015
367013
367012


BL 110 S
L 36 E
L 32 E
L 28 E
L 24 E
TL 20E
L 16 E
L 12 E
L 8 E
L 4 E
TL 00
L 4 W
L 8 W
L12W
L 20 W
BL 137 S
BL 150 S
LEAMING LAKE
LAKE
RHYOLITE LAKE
RING LAKE
373061
373062
373063
373064
367002
367003
367004
367005
367006
367007
367008
367009
367010
367011
367012
367013


BL 170 S
BL 190 S
BL 202 S
BL 210 S
TL 24 W
TL 52 W
L 24 W
L 28 W
L 32 W
L 36 W
L 40 W
L 44 W
L 48 W
L 52 W
L 56 W
L 60 W
L 64 W
L 68 W
L 72 W
L 76 W
L 80 W
L 84 W
367014
363528
363533
363538
363543
367016
363527
363532
363537
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367018
363526
363531
363536
363541
363546
367020
363525
363530
363535
363540
363545
354173
363524
363529
363534
363539
363544
LAKE
BELLE LAKE
AUDREA LAKE


L 68 E
L 64 E
L 60 E
L 56 E
L 52 E
L 48 E
L 44 E
L 40 E
L 36 E
L 32 E
L 28 E
L 24 E
L 20 E
L 16 E
L 12 E
L 8 E
L 4 E
TL 00
L 4 W
L 8 W
L 12 W
L 16 W
L 20 W
BL 170 S
BL 190 S
BL 210 S
363557
363580
363581
363582
363556
363576
363577
363578
363555
363571
363572
363573
LLOYD LAKE
HANNA BAY
363554
363566
363567
363568
BOLTON LAKE
363553
354180
363559
363560
367011
363552
354179
354178
354177
WINDING LAKE
367010
363551
354174
354175
354176
367009
RING LAKE
LITTLE WINDING LAKE
367014
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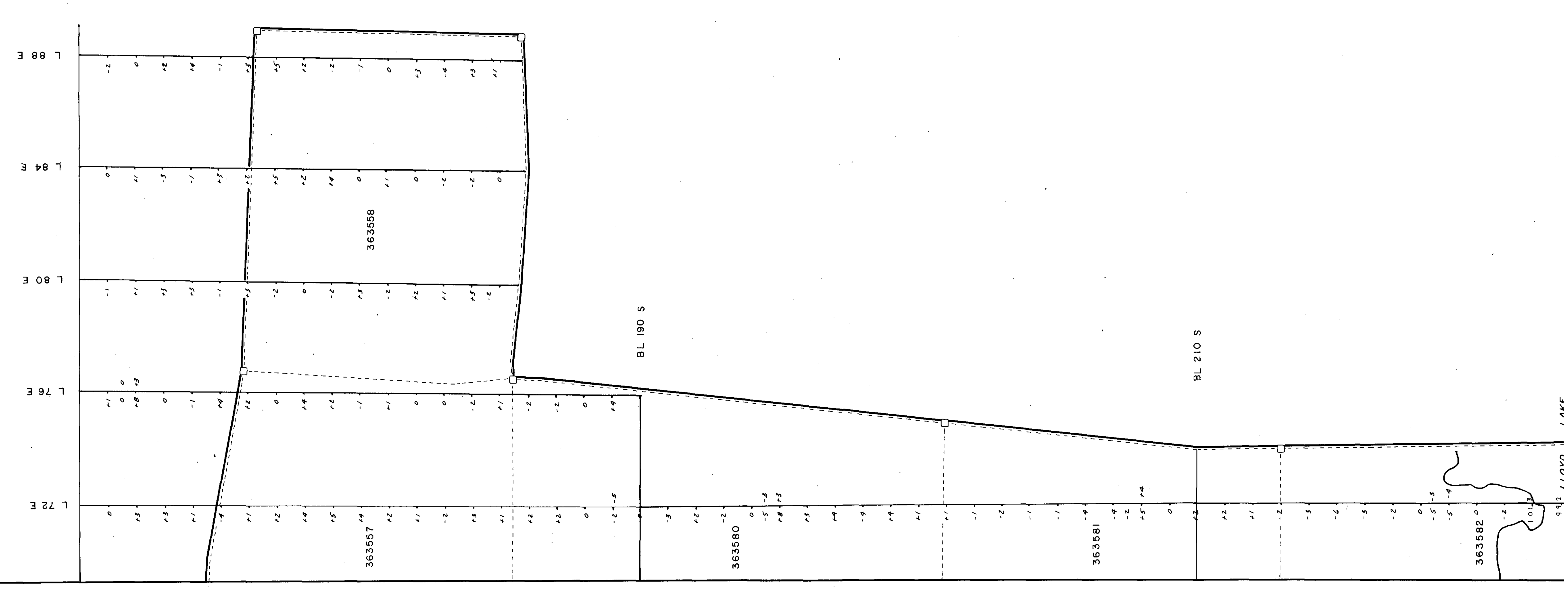
363538
LAKE
43
363534


BL 170 S
L 88 E
L 84 E
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L 76 E
L 72 E
BL 190 S
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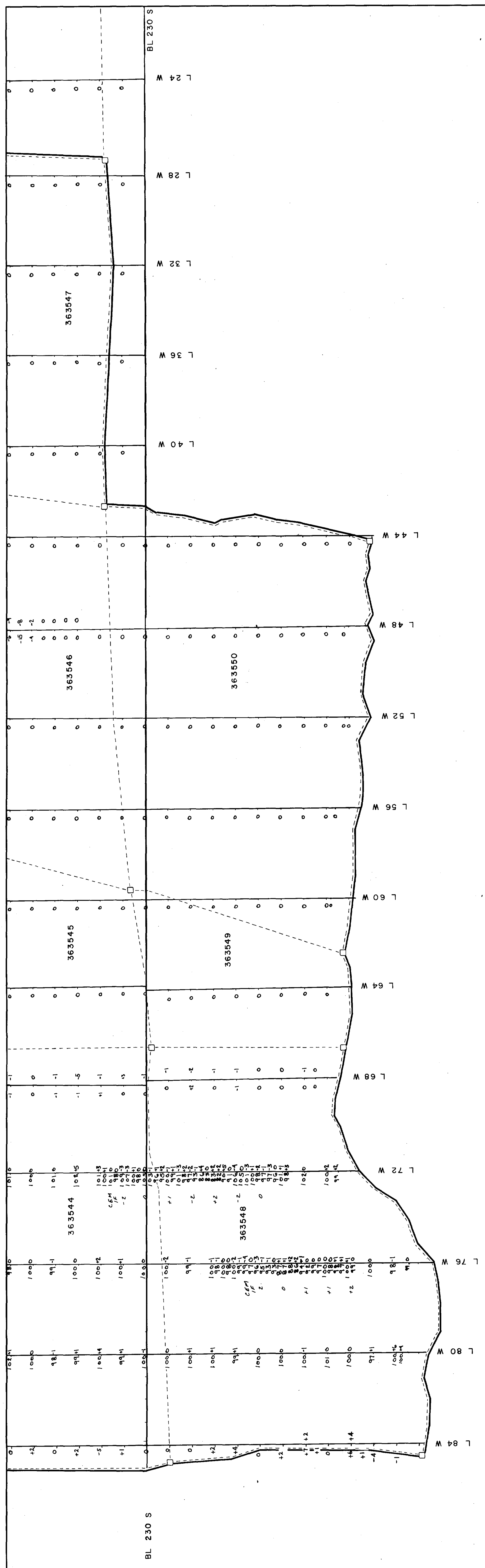
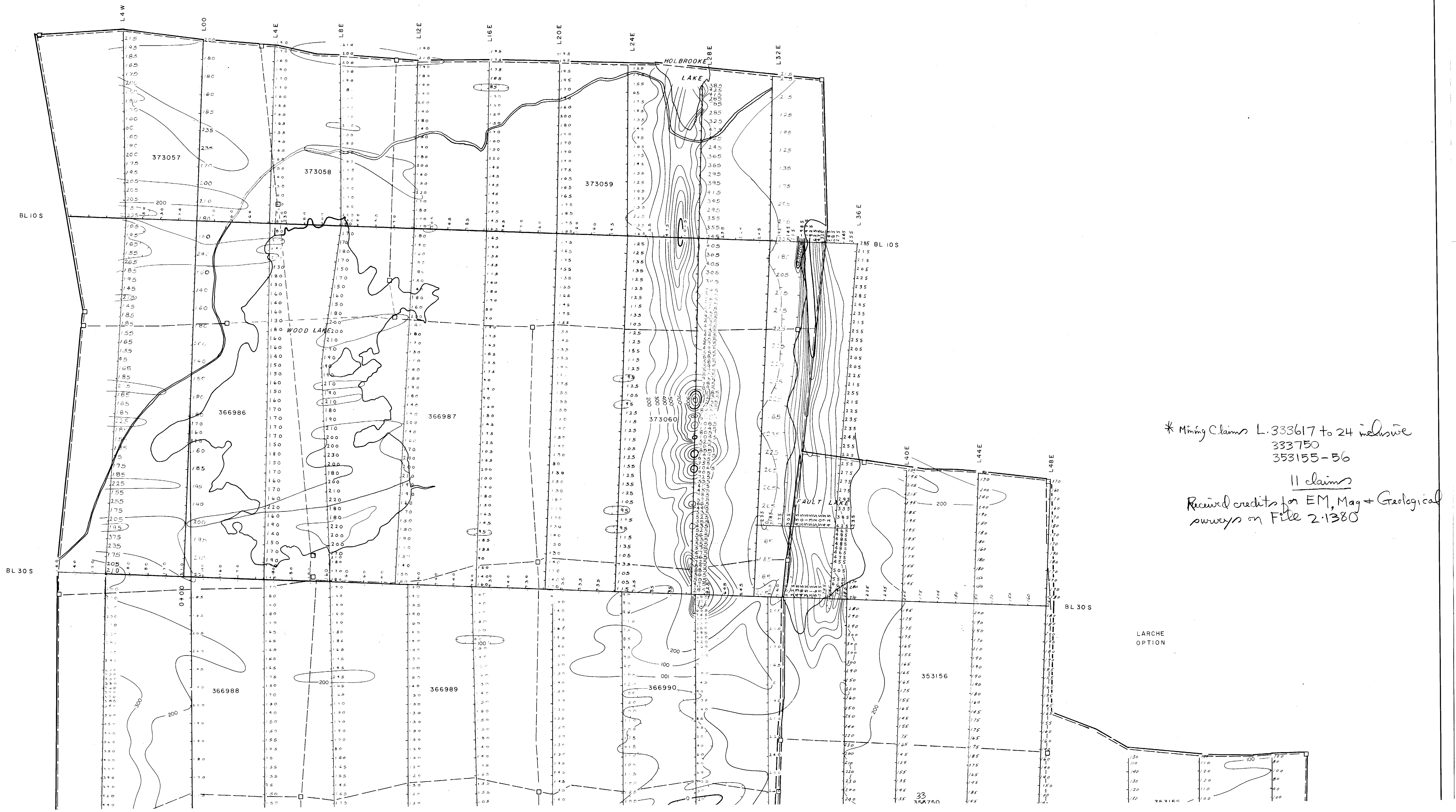
363581
363582


BL 230 S
L 24 W
L 28 W
L 32 W
L 36 W
L 40 W
L 44 W
L 48 W
L 52 W
L 56 W
L 60 W
L 64 W
L 68 W
L 72 W
L 76 W
L 80 W
L 84 W
363547
363546
363550
363545
363549
363544
363548
BL 230 S


L 68 E
L 64 E
L 60 E
L 56 E
L 52 E
L 48 E
L 44 E
L 40 E
L 36 E
L 32 E
L 28 E
L 24 E
L 20 E
L 16 E
L 12 E
L 8 E
L 4 E
TL 00
L 4 W
L 8 W
L 12 W
L 16 W
L 20 W
BL 230 S
BL 250 S
363582
363578
363579
LLOYD LAKE
363573
363574
363575
363568
BOLTON LAKE
363569
363570
363560
363564
363565
WINDING LAKE
354177
363562
363563
UPPER WINDING LAKE
354176
363561
LITTLE WINDING LAKE



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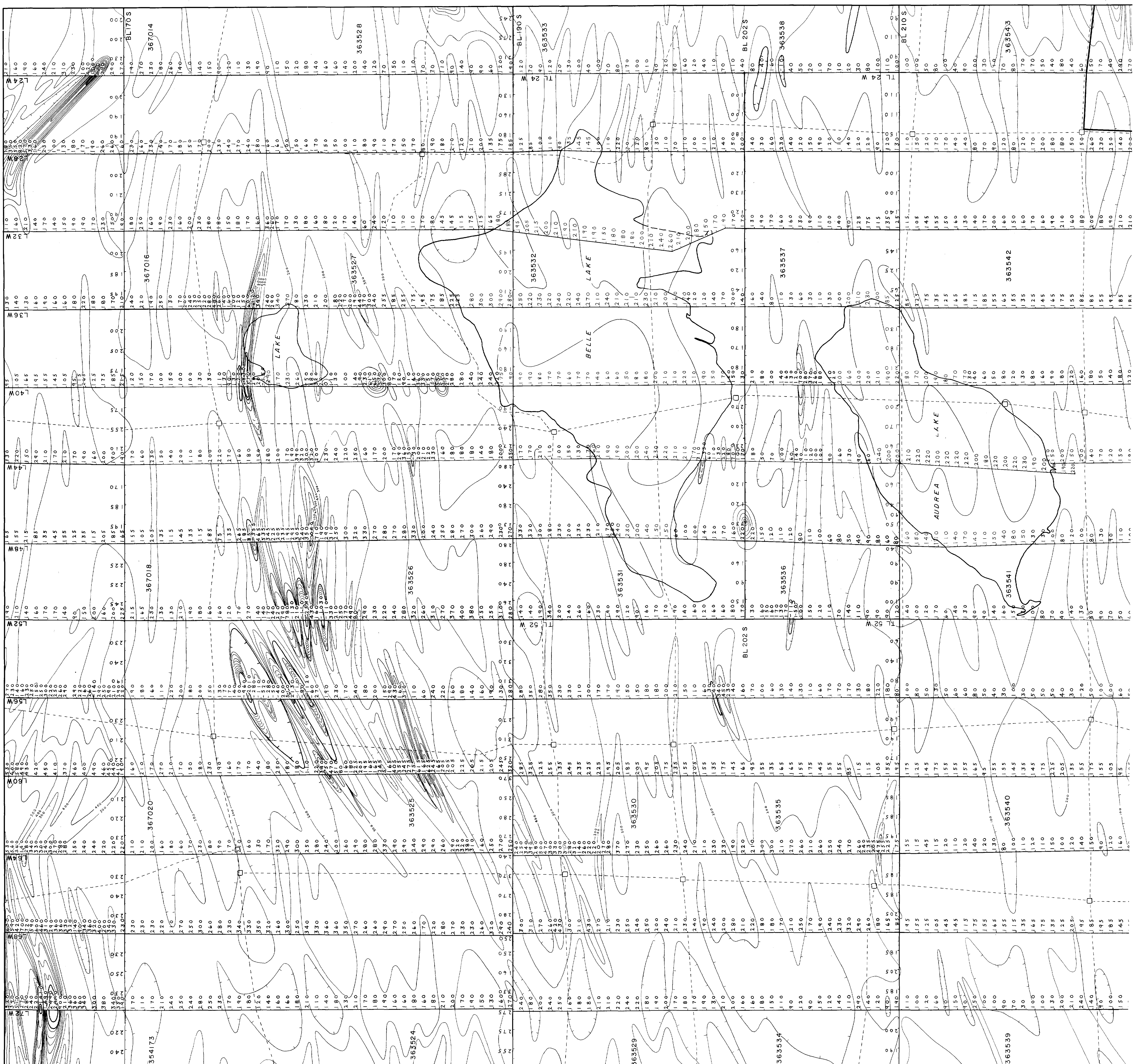
11 claims

Received credits for EM, Mag + Geological surveys on File 2.1380


BL50S
BL 70 S
BL 90 S
BL70S
BL90S
L64E
L60E
L56E
L52E
L48E
L44E
L40E
L36E
L32E
L28E
L24E
L20E
L16E
L12E
L8E
L4E
TL 00
L4W
L8W
L12W
MAVIS LAKE
LLOYD LAKE
BESS LAKE
WEARY LAKE
SILVERBIRCH LAKE
SIROLA LAKE
ARY CREEK LAKE
333623
353155
333622
333621
333620
33
338750
333617
333618
333619
373061
366993
366996
366999
333624
373064
366992
366995
366998
367001
367003
366991
366994
366997
367000
367002
600
400
300
200
100
0


L 24W
L 28 W
L 32 W
L 36 W
L 40 W
L 44 W
L 48 W
L 52 W
L 56 W
L 60 W
L 64 W
L 68W
L 72 W
L 76 W
L 80W
BL 150 S
BL 138 S
BL 150 S
RHYOLITE LAKE
DUMBELL LAKE
367012
367013
367015
367017
367019
353651
354171
354172


BL 110 S
L36E
L32E
L28E
L24E
L20E
L16E
L12E
L8E
L4E
L00
L4W
L8W
L12W
L 20 W
373061
373062
373063
373064
367002
367003
367004
367005
367006
367007
367008
367009
367010
367011
367012
367013
LEAMING LAKE
RHYOLITE LAKE
RING LAKE
LAKE
BL 150 S
L120E
137 S
150 S
BL 110 S


BL 170 S
BL 190 S
BL 202 S
BL 210 S
TL 24 W
TL 52 W
L24W
L28W
L32W
L36W
L40W
L44W
L48W
L52W
L56W
L60W
L64W
L68W
L72W
L76W
L80W
L84W
LAKE
BELLE LAKE
AUDREA LAKE
367014
363528
363533
363538
363543
367016
363527
363532
363537
363542
367018
363526
363531
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367020
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354173
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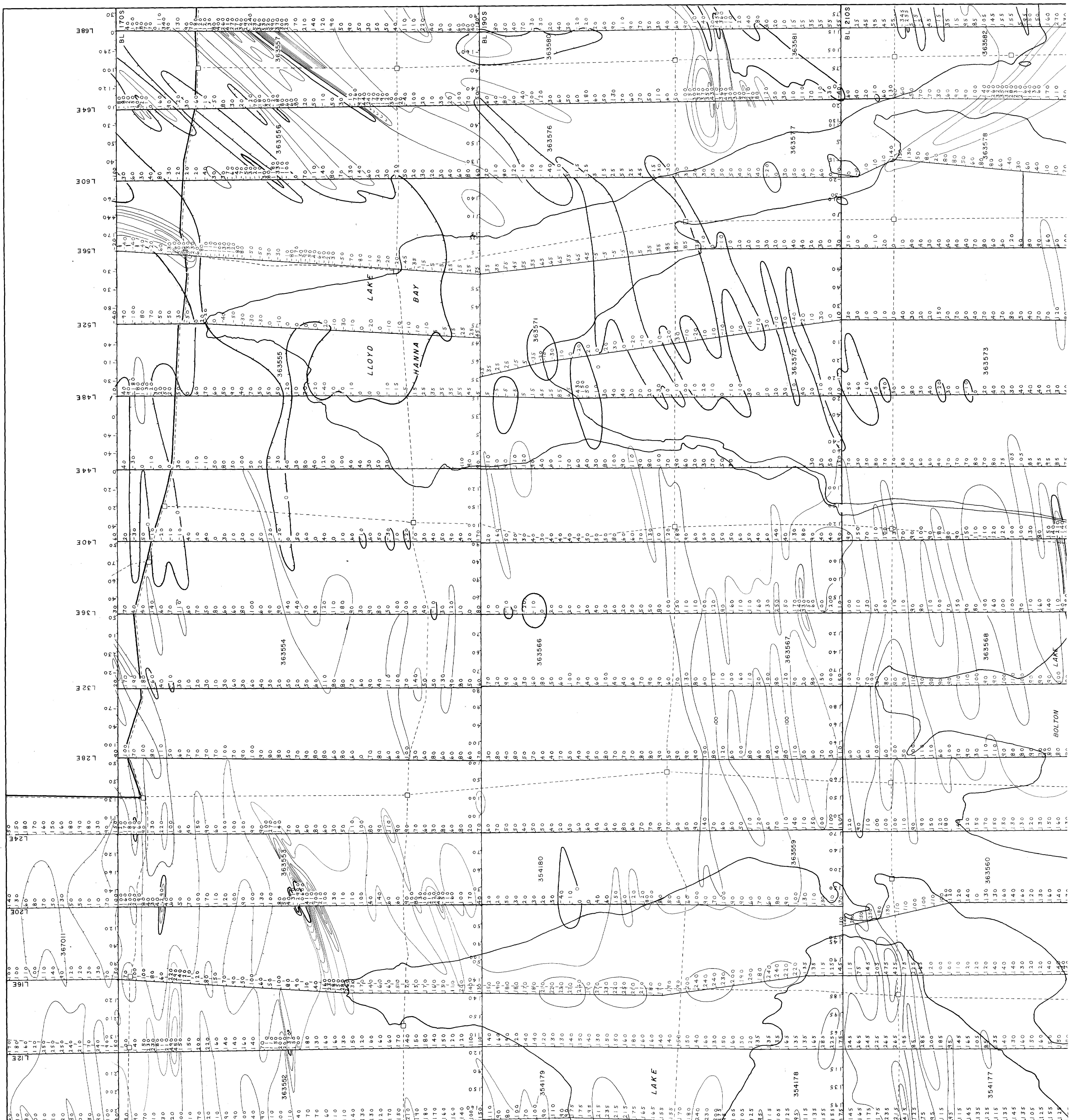
363529
363534
363539


L68E
L64E
L60E
L56E
L52E
L48E
L44E
L40E
L36E
L32E
L28E
L24E
L20E
L16E
L12E
L8E
L4E
L0
L4W
L8W
L12W
L16W
L20W
BL 170S
BL 190S
BL 210S
LLOYD LAKE
HANNA BAY
WINDING LAKE
RING LAKE
BOLTON LAKE
LITTLE WINDING
LAKE
363557
363556
363555
363554
363553
363552
363551
363528
367011
367010
367009
367014
363580
363576
363571
363566
354180
354179
354174
363533
363581
363577
363572
363567
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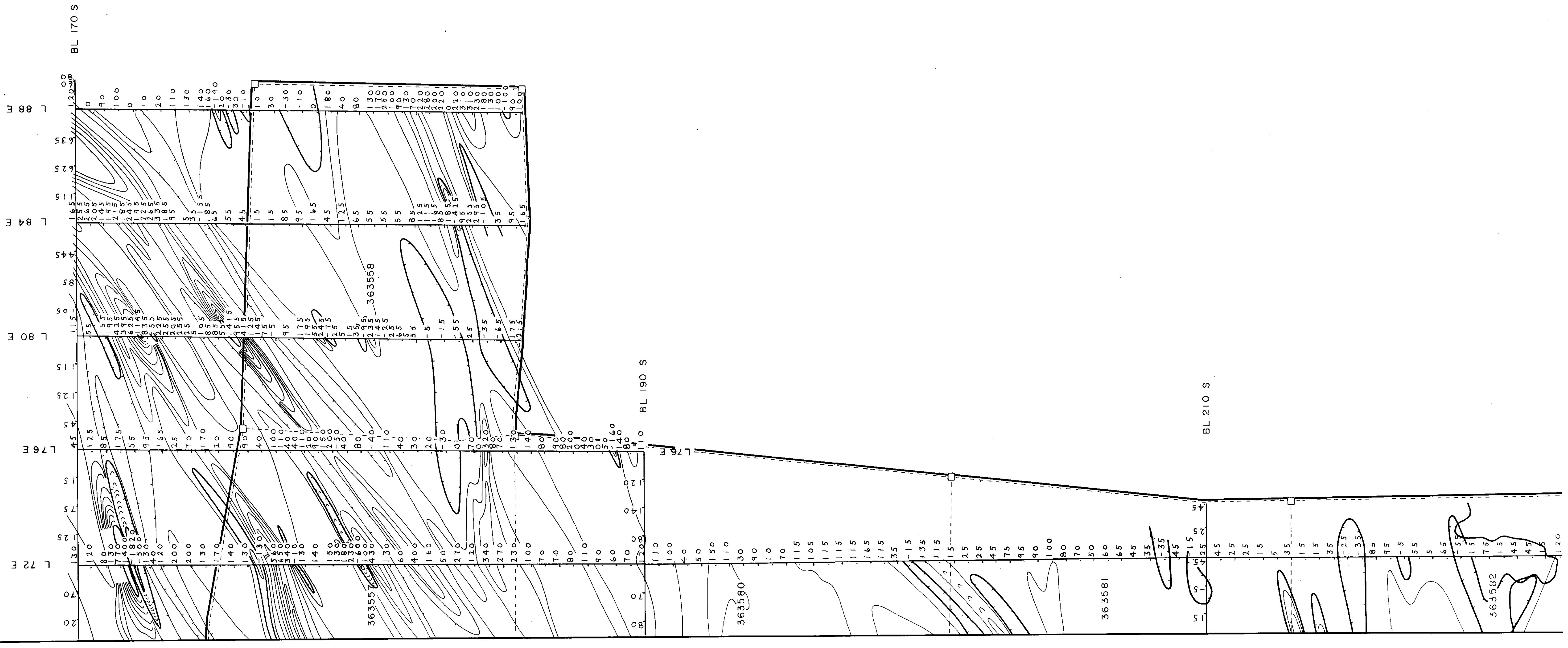
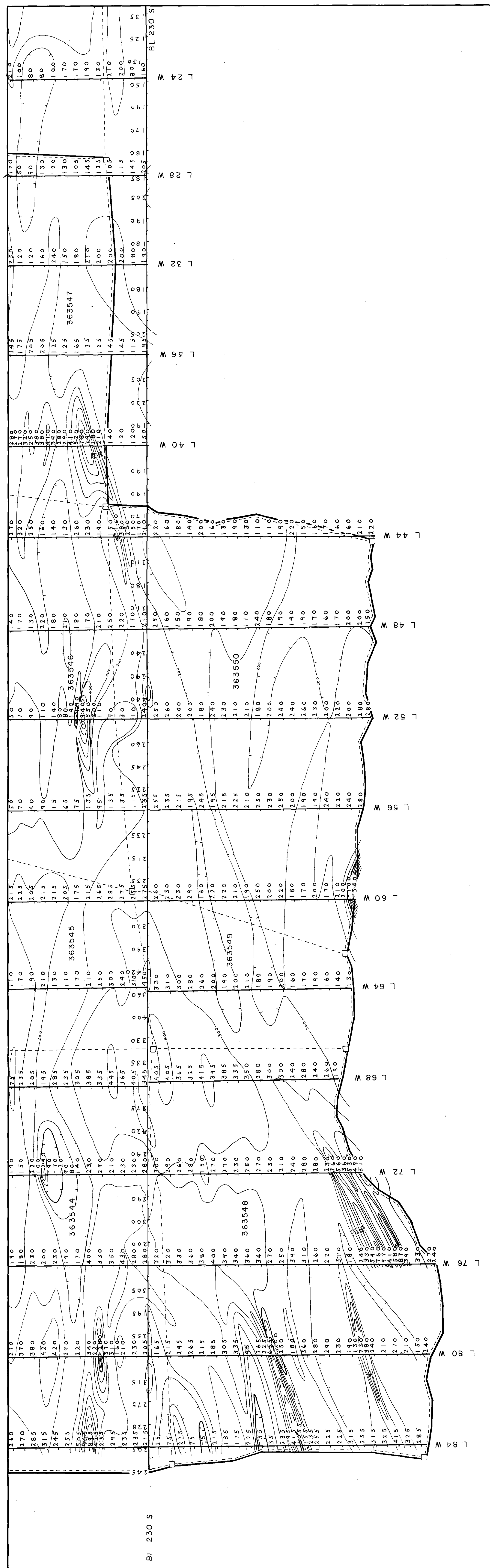
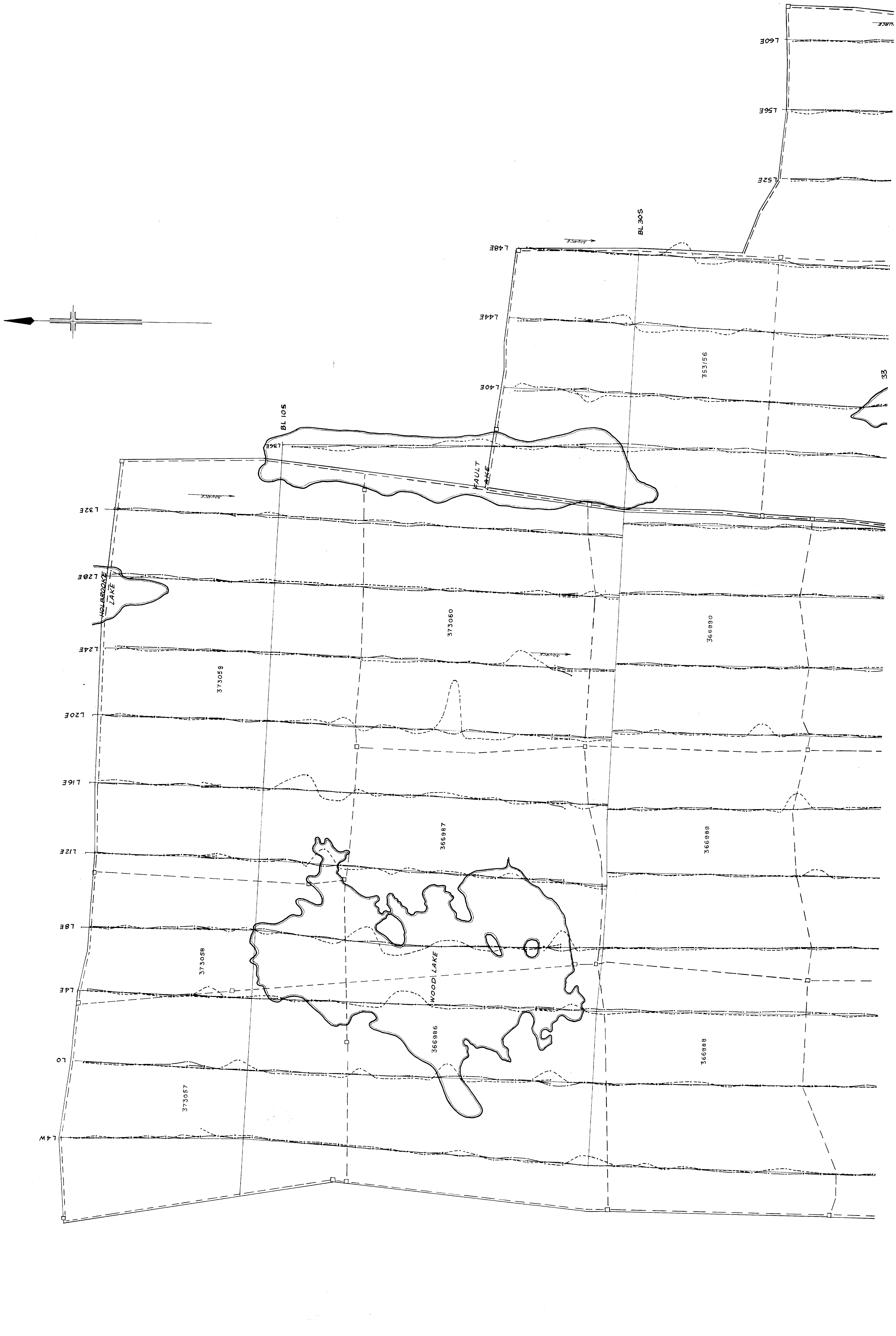
354178
354175
363538
363582
363578
363573
363568
363560
354177
354176
43

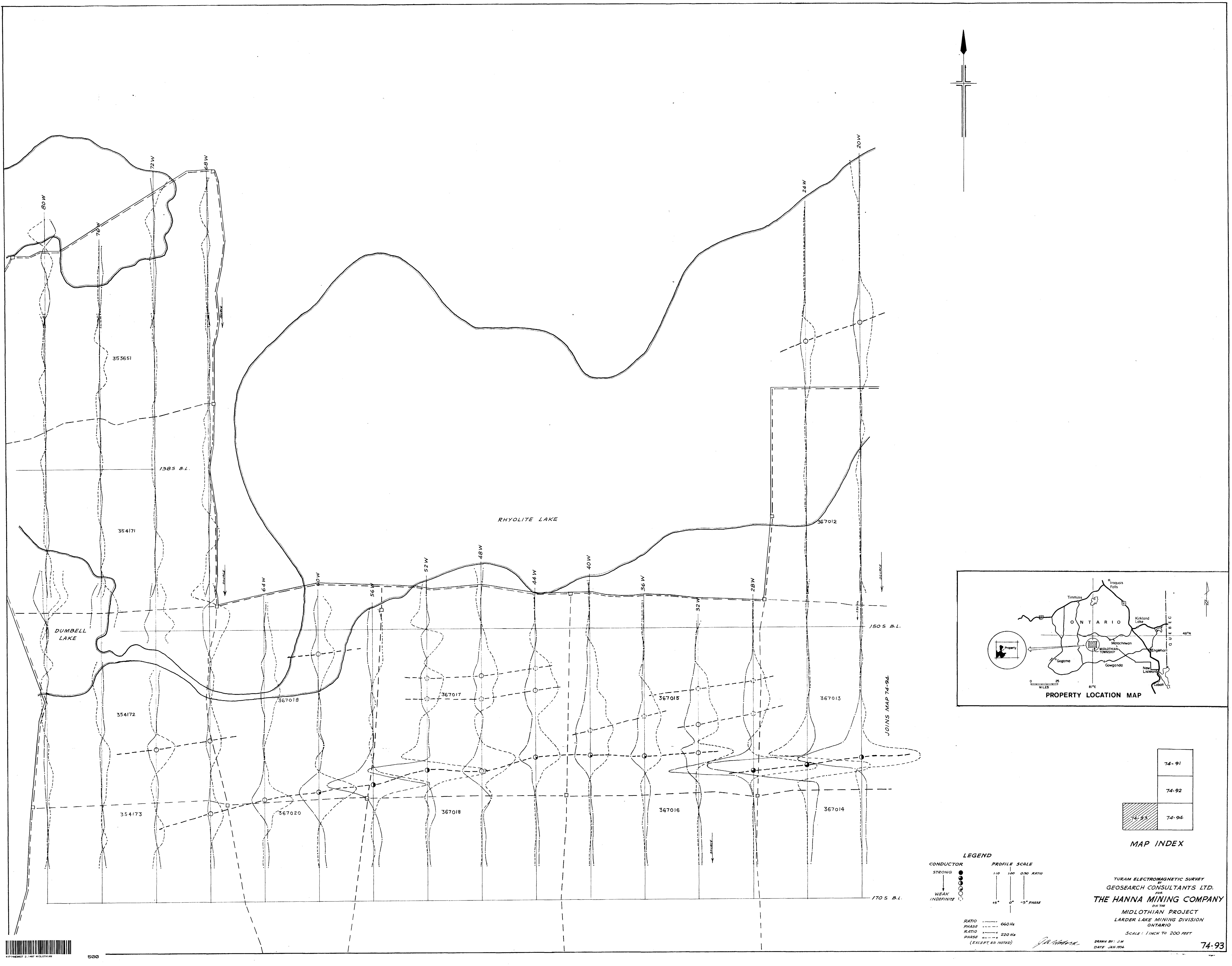

BL 170 S
BL 190 S
BL 210 S
L 88 E
L 84 E
L 80 E
L76E
L 72 E
363558
363580
363581
363582


BL 230 S
L 24 W
L 28 W
L 32 W
L 36 W
L 40 W
L 44 W
L 48 W
L 52 W
L 56 W
L 60 W
L 64 W
L 68 W
L 72 W
L 76 W
L 80 W
L 84 W
363547
363546
363545
363544
363550
363549
363548
BL 230 S


L 68 E
L 64 E
L 60 E
L 56 E
L 52 E
L 48 E
L 40 E
L 36 E
L 32 E
L 28 E
L 24 E
L 20 E
L 16 E
L 12 E
L 8 E
L 4 E
TL 00
L 4 W
L 8 W
L 12 W
L 16 W
L 20 W
BL 230 S
BL 250 S
363582
363578
363579
LLOYD
LAKE
363573
363574
363575
363568
363569
363570
BOLTON
LAKE
363560
363564
363565
WINDING
LAKE
354177
363562
363563
UPPER
WINDING
LAKE
354176
363561
LITTLE
WINDING
LAKE
NB BL 250 S
Land & Ice Baseline
are continuous.
Land part cut during
summer at wrong angle
from Tie Line 00 25000 S


L60E
L56E
L52E
BL 30S
source
L48E
L44E
353156
33
L40E
BL 10S
L36E
FAULT LAKE
L32E
source
L28E
HOLBROOKE LAKE
373060
366990
L24E
source
373059
L20E
L16E
366987
366989
L12E
L8E
WOOD LAKE
373058
L4E
366986
366988
L0
373057
L4W


JOINS MAP 74-91
L12W
L8W
L4W
L0
L4E
L8E
L12E
L16E
L20E
L24E
L28E
L32E
L36E
L40E
L44E
L48E
L52E
L56E
L60E
L64E
B.L. 50S
B.L. 70S
B.L. 90S
33
353750
353155
366993
366991
366992
333622
333623
BESS LAKE
MAVIS LAKE
SIROLA LAKE
366994
366995
366996
333617
WEARY LAKE
CREEK
SOURCE
333618
333621
366997
366998
366999
SILVERBIRCH LAKE
367000
367001
333624
333619
333620
LLOYD LAKE
373061
PROPERTY LOCATION MAP
Iroquois Falls
Timmins
ONTARIO
Kirkland Lake
QUEBEC
48°N
Property
Matachewan
MIDLOTHIAN TOWNSHIP
Englehart
Gogama
Gowganda
New Liskeard
Cobalt
81°E
0
25
MILES
N



PROPERTY LOCATION MAP

	74-91
	74-92
74-93	74-94

MAP INDEX

LEGEND

CONDUCTOR

STRONG ●
◕
◑
◔
WEAK ○
INDEFINITE ◌

PROFILE SCALE

1.10 1.00 0.90 RATIO

+5° 0° -5° PHASE

RATIO ·——· 660 Hz
PHASE ·- - -·
RATIO x——x 220 Hz
PHASE x- - -x
(EXCEPT AS NOTED)

TURAM ELECTROMAGNETIC SURVEY
BY
GEOSEARCH CONSULTANTS LTD.
FOR
THE HANNA MINING COMPANY
ON THE
MIDLOTHIAN PROJECT
LARDER LAKE MINING DIVISION
ONTARIO

SCALE : 1 INCH TO 200 FEET

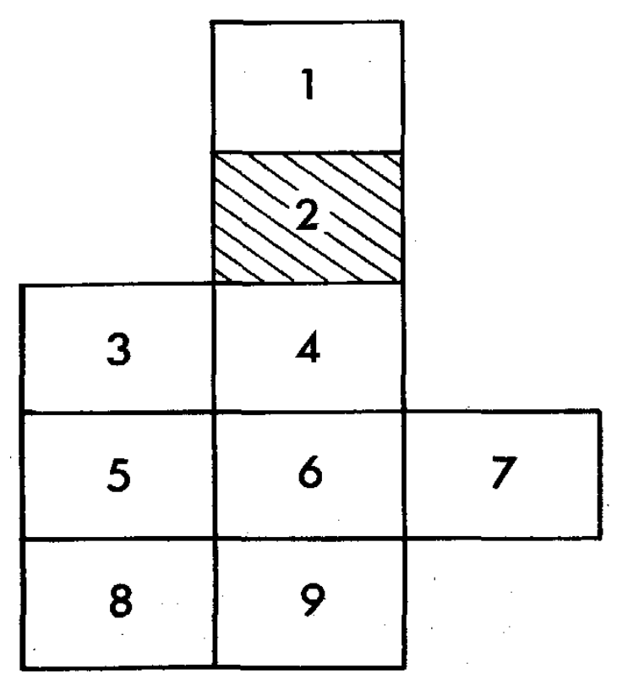
DRAWN BY: J.W
DATE: JAN. 1974

74-93

500


L36E
L32E
L28E
L24E
L20E
L16E
L12E
L8E
L4E
L0
L4W
L8W
L12W
L16W
B.L. 110S
B.L. 135S
B.L. 150S
373061
373062
373063
373064
JOINS MAP 74-92
367002
367003
367004
367005
367006
367007
367008
367012
367013
JOINS MAP 74-93
RHYOLITE LAKE
LEAMING LAKE
LAKE
SOURCE
CLIFFS
220 Hz

OPERTY LOCATION MAP



SHEET INDEX

LEGEND

High Frequency | Low Frequency

+2 | -1

Only High Frequency taken 0 |

INSTRUMENT : CRONE CEM

High Frequency - 1800 cycles / second

Low Frequency - 390 cycles / second

SYMBOLS

IN PHASE OUT OF PHASE

High Frequency 100 | 0

Low Frequency 100 | 0

Only High Frequency taken 100 | 0

INSTRUMENT : ABEM GUN

High Frequency - 3520 cycles / second

Low Frequency - 880 cycles / second

THE HANNA MINING COMPANY

MIDLOTHIAN PROJECT

LARDER LAKE MINING DIVISION
ONTARIO

ELECTROMAGNETIC MAP

SCALE 1" = 200'

200 0 200 400 600
Feet

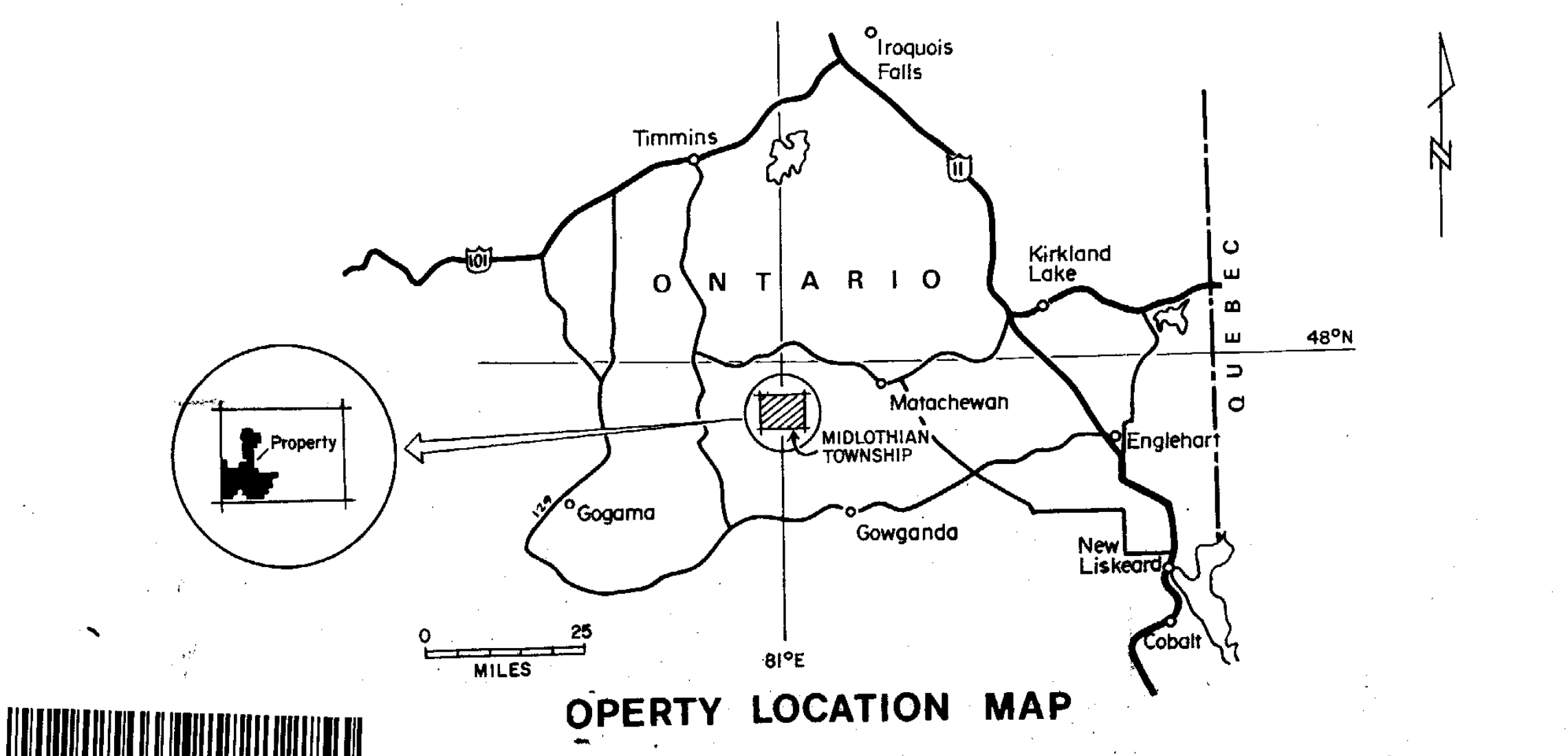
Work by
Date

Interpretation by Beverly L Hodges
Date Jan 30, 1974

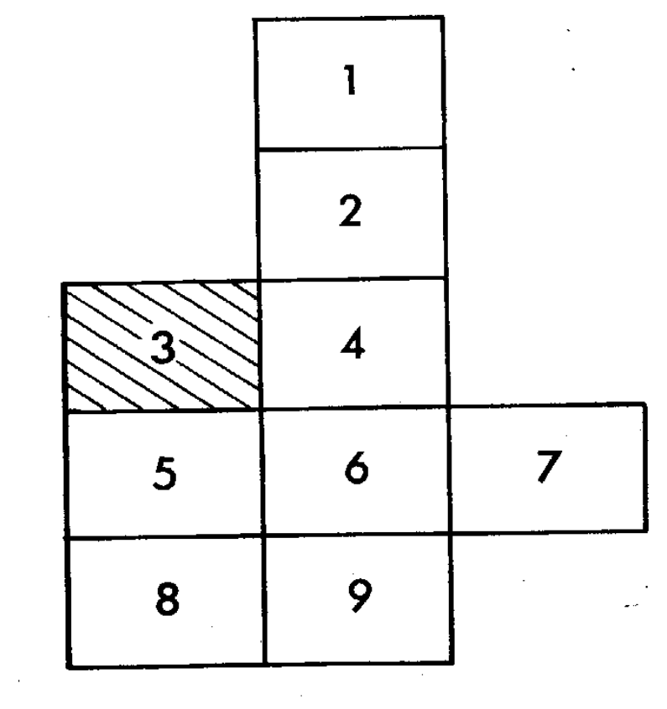
Revised
Revised
N.T.S. No 41-P-15

2

310



OPERTY LOCATION MAP



SHEET INDEX

LEGEND

High Frequency | Low Frequency

+2 | -1

Only High Frequency taken 0

INSTRUMENT : CRONE CEM

High Frequency - 1800 cycles / second

Low Frequency - 390 cycles / second

SYMBOLS

IN PHASE | OUT OF PHASE

High Frequency 100 | 0

Low Frequency 100 | 0

Only High Frequency taken 100 | 0

INSTRUMENT : ABEM GUN

High Frequency - 3520 cycles / second

Low Frequency - 880 cycles / second

THE HANNA MINING COMPANY

MIDLOTHIAN PROJECT
LARDER LAKE MINING DIVISION
ONTARIO

ELECTROMAGNETIC MAP

SCALE 1" = 200'

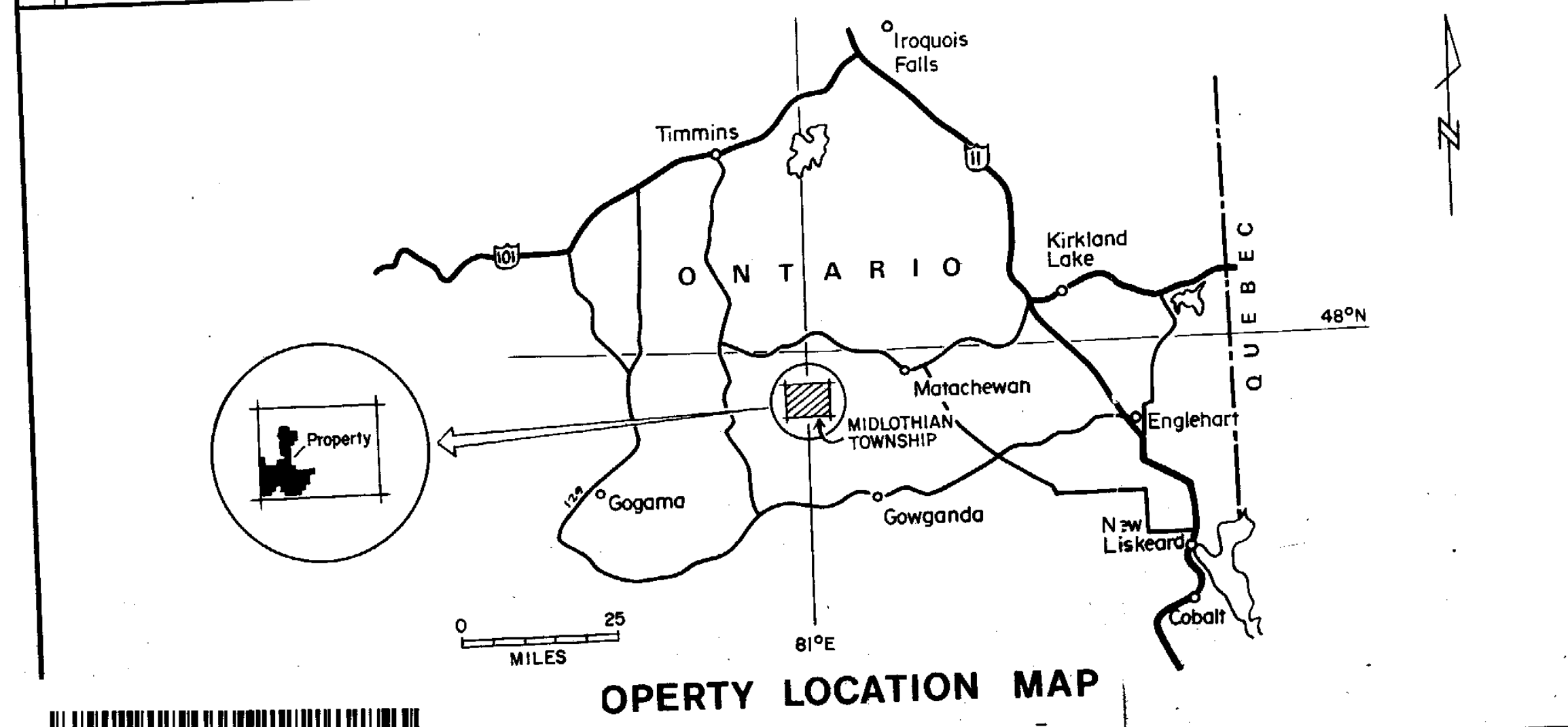
200 0 200 400 600
Feet

Work by	Interpretation by Beverly L Hodges	Revised
		Revised
Date	Date Jan 30, 1974	N.T.S. No 41-P-15

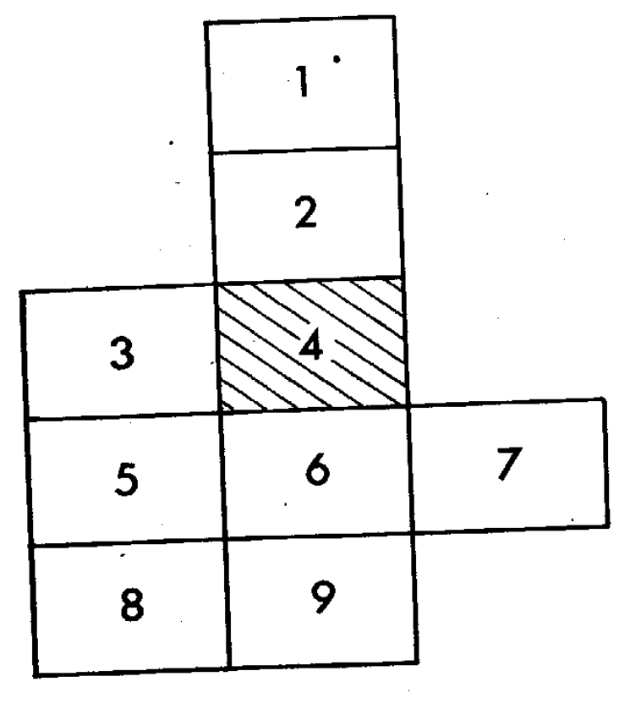
3

41P14NE0027 2.1487 MIDLOTHIAN

320



OPERTY LOCATION MAP



SHEET INDEX

LEGEND

SYMBOLS

High Frequency | Low Frequency

+2 | -1

Only High Frequency taken 0

INSTRUMENT : CRONE CEM

High Frequency - 1800 cycles / second

Low Frequency - 390 cycles / second

IN PHASE | OUT OF PHASE

High Frequency 100 | 0

Low Frequency 100 | 0

Only High Frequency taken 100 | 0

INSTRUMENT : ABEM GUN

High Frequency - 3520 cycles / second

Low Frequency - 880 cycles / second

THE HANNA MINING COMPANY

MIDLOTHIAN PROJECT

LARDER LAKE MINING DIVISION
ONTARIO

ELECTROMAGNETIC MAP

SCALE 1" = 200'

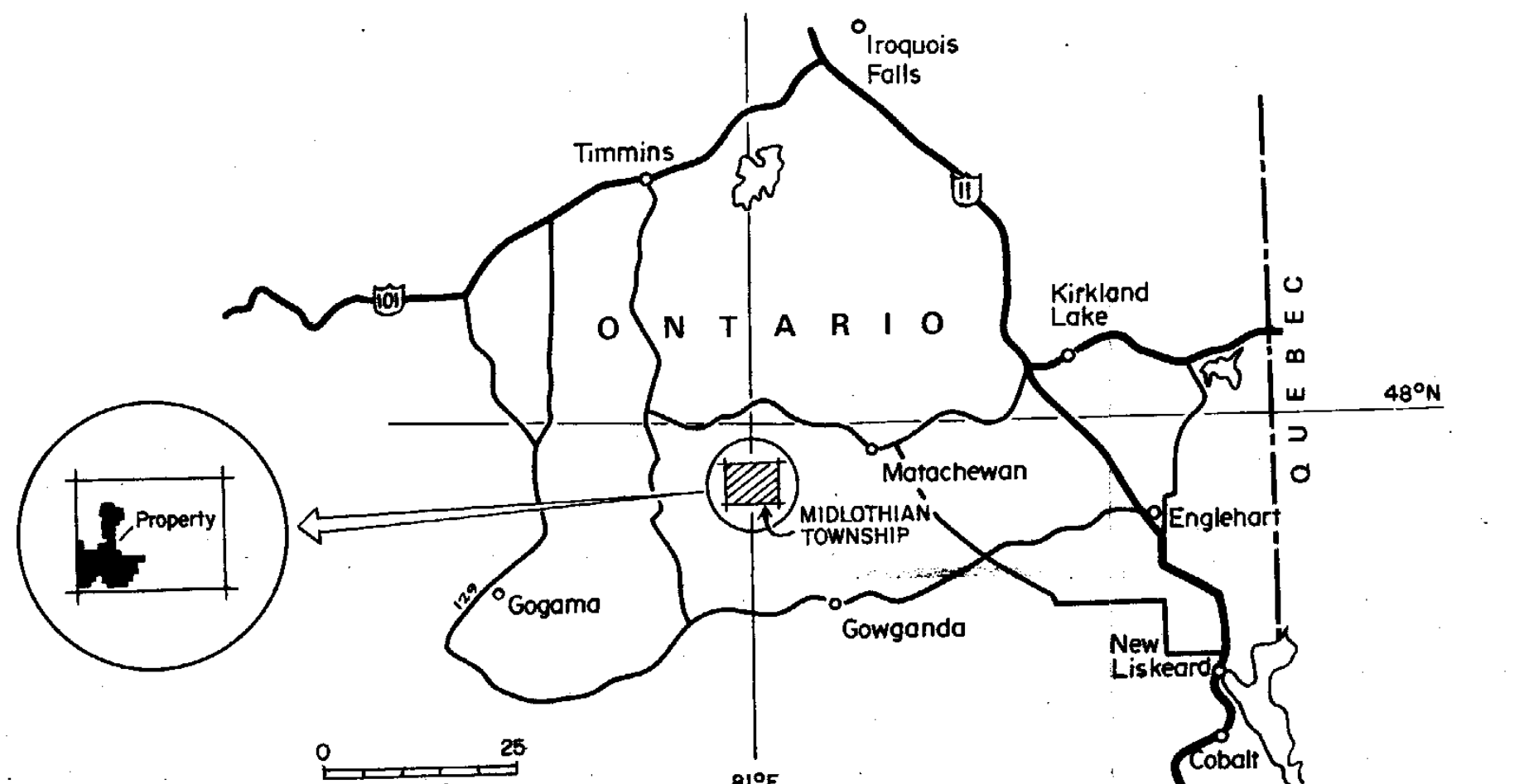
200 0 200 400 600
Feet

Work by Date	Interpretation by Beverly L Hodgins Date Jan 30, 1974	Revised Revised N.T.S. No 41-P-15

4

41P14NE0027 2.1467 MIDLOTHIAN

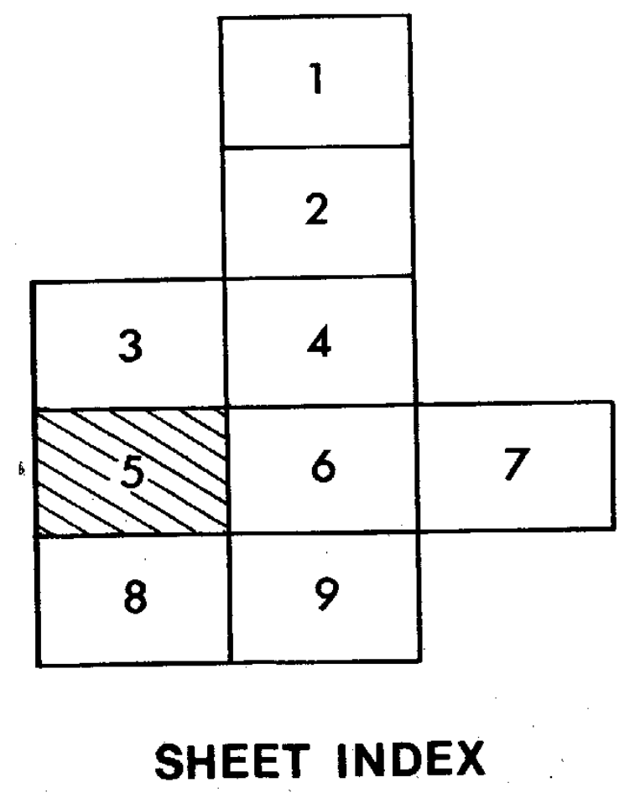
330



OPERTY LOCATION MAP

41P14NE0027 2.1407 MIDLOTHIAN

340



SHEET INDEX

LEGEND

SYMBOLS

	High Frequency	Low Frequency
	+2	-1
Only High Frequency taken	0	

INSTRUMENT : CRONE CEM
High Frequency - 1800 cycles / second
Low Frequency - 390 cycles / second

	IN PHASE	OUT OF PHASE
High Frequency	100	0
Low Frequency	100	0
Only High Frequency taken	100	0

INSTRUMENT : ABEM GUN
High Frequency - 3520 cycles / second
Low Frequency - 880 cycles / second

THE HANNA MINING COMPANY

MIDLOTHIAN PROJECT
LARDER LAKE MINING DIVISION
ONTARIO

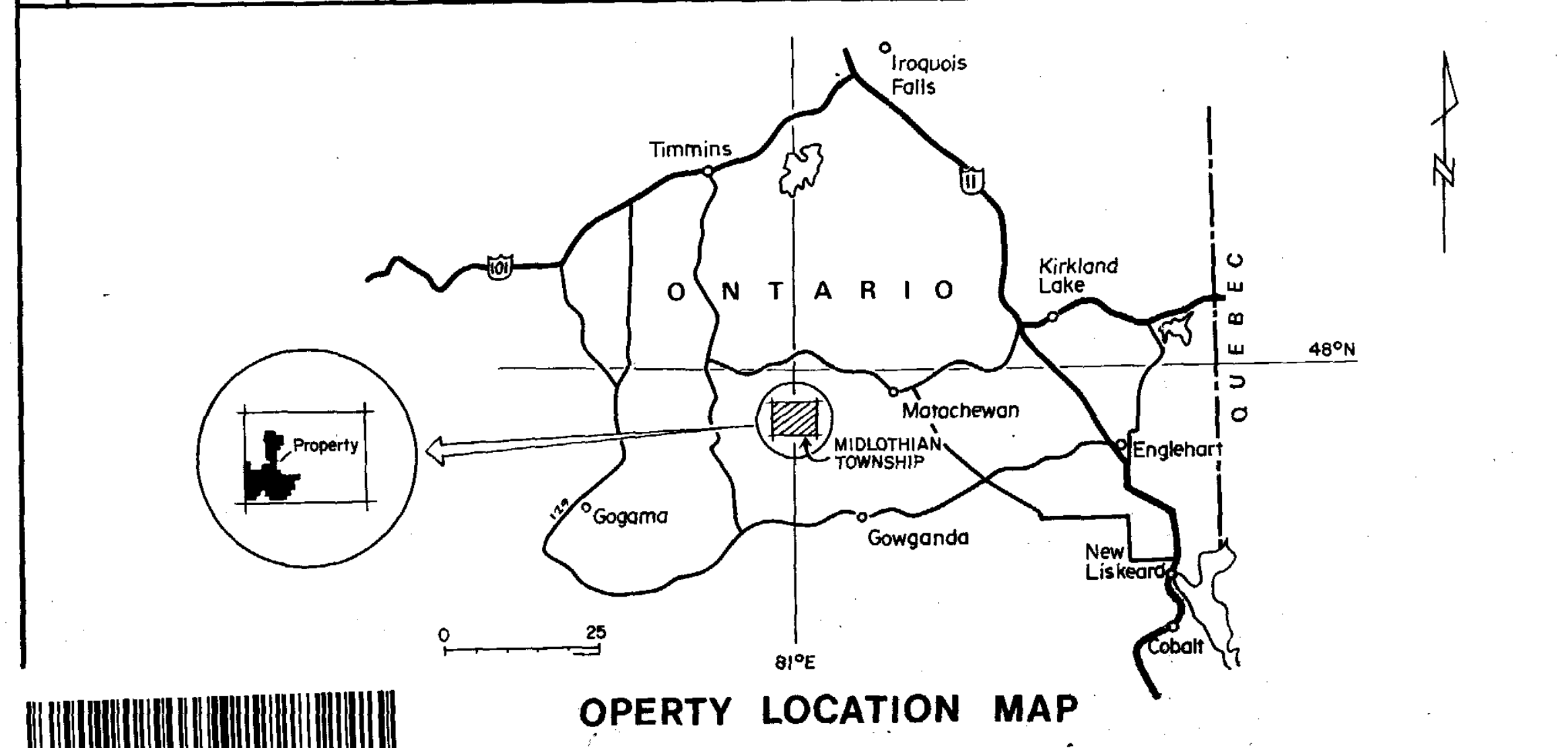
ELECTROMAGNETIC MAP

SCALE 1" = 200'

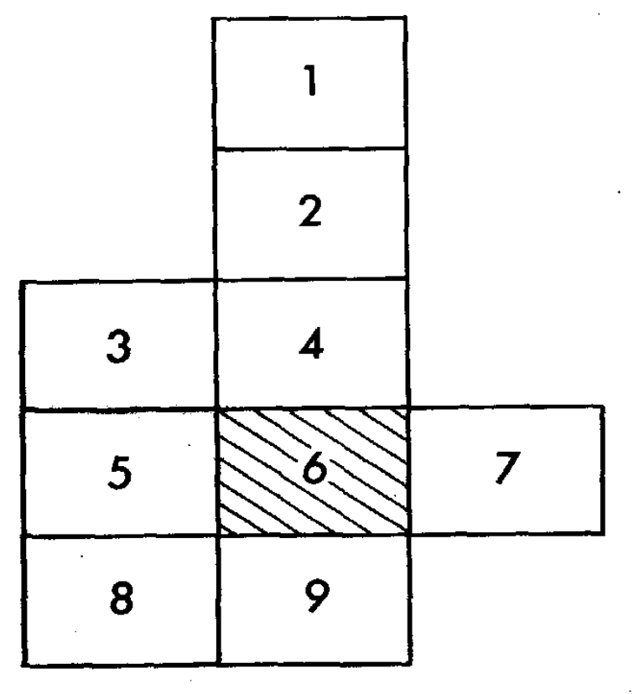
200 0 200 400 600
Feet

Work by	Interpretation by Beverly L. Hoffman	Revised
Date	Date Jan 30, 1974	Revised N.T.S. No 41-P-15

5



OPERTY LOCATION MAP



SHEET INDEX

LEGEND

SYMBOLS

High Frequency | Low Frequency

+2 ┼ -1

Only High Frequency taken   0 ┼

INSTRUMENT : CRONE CEM

High Frequency - 1800 cycles / second

Low Frequency - 390 cycles / second

IN PHASE | OUT OF PHASE

High Frequency 100 | 0

Low Frequency 100 | 0

Only High Frequency taken 100 ┼ 0

INSTRUMENT : ABEM GUN

High Frequency - 3520 cycles / second

Low Frequency - 880 cycles / second

THE HANNA MINING COMPANY

MIDLOTHIAN PROJECT

LARDER LAKE MINING DIVISION
ONTARIO

ELECTROMAGNETIC MAP

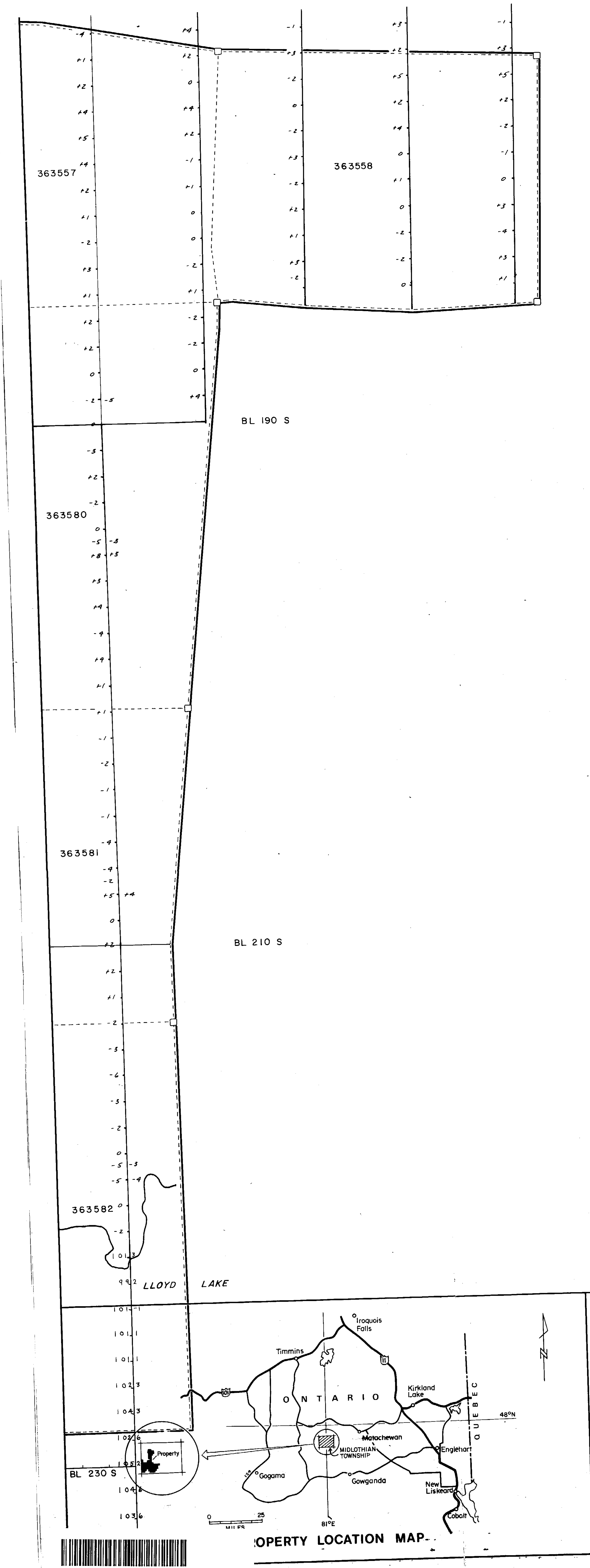
SCALE 1" = 200'

200 0 200 400 600
Feet

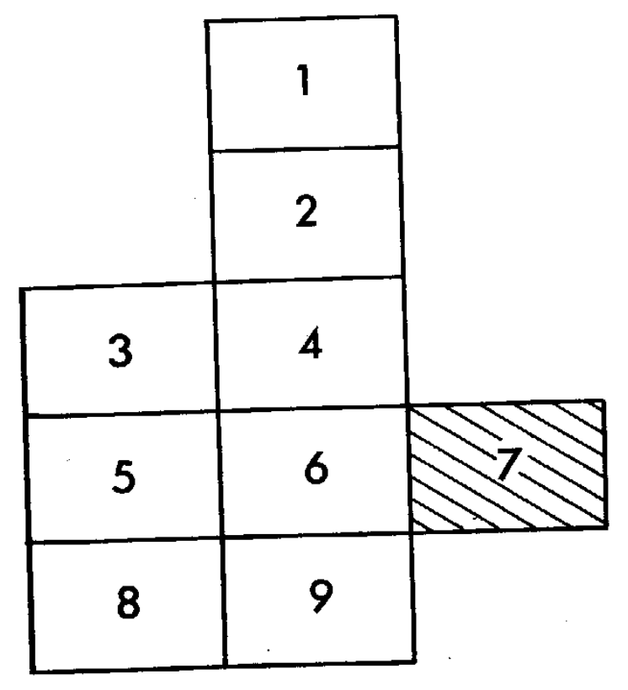
Work by Date	Interpretation by Burly L Hodge Date Jan 30, 1974	Revised Revised N.T.S. No 41-P-15

6

350



OPERTY LOCATION MAP.



SHEET INDEX

LEGEND

	High Frequency	Low Frequency
	+2	-1
Only High Frequency taken	0	

<u>INSTRUMENT</u> : CRONE CEM

High Frequency - 1800 cycles / second

Low Frequency - 390 cycles / second

SYMBOLS

	IN PHASE	OUT OF PHASE
High Frequency	100	0
Low Frequency	100	0
Only High Frequency taken	100	0

INSTRUMENT : ABEM GUN

High Frequency - 3520 cycles / second

Low Frequency - 880 cycles / second

THE HANNA MINING COMPANY

MIDLOTHIAN PROJECT
LARDER LAKE MINING DIVISION
ONTARIO

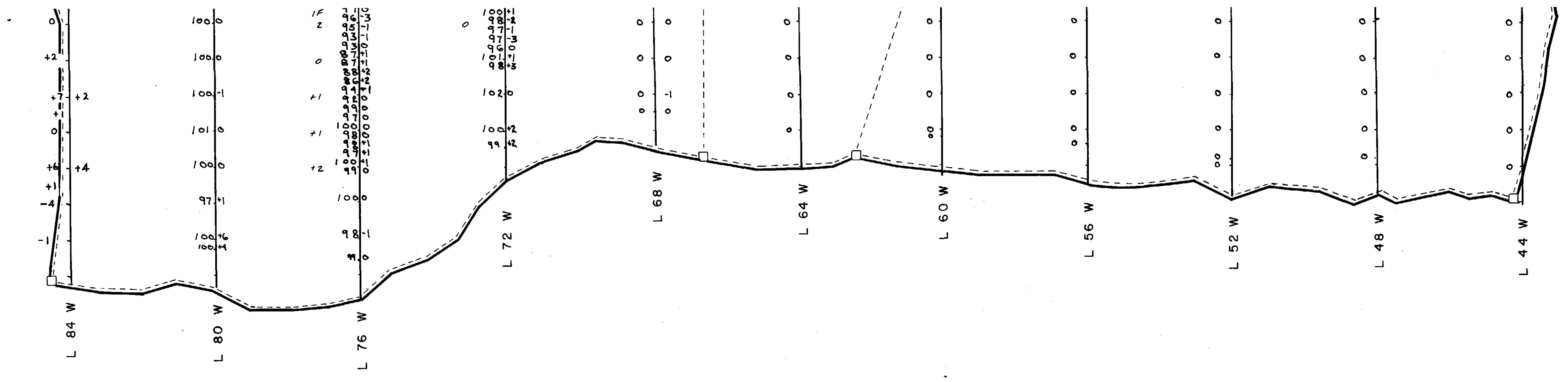
ELECTROMAGNETIC MAP

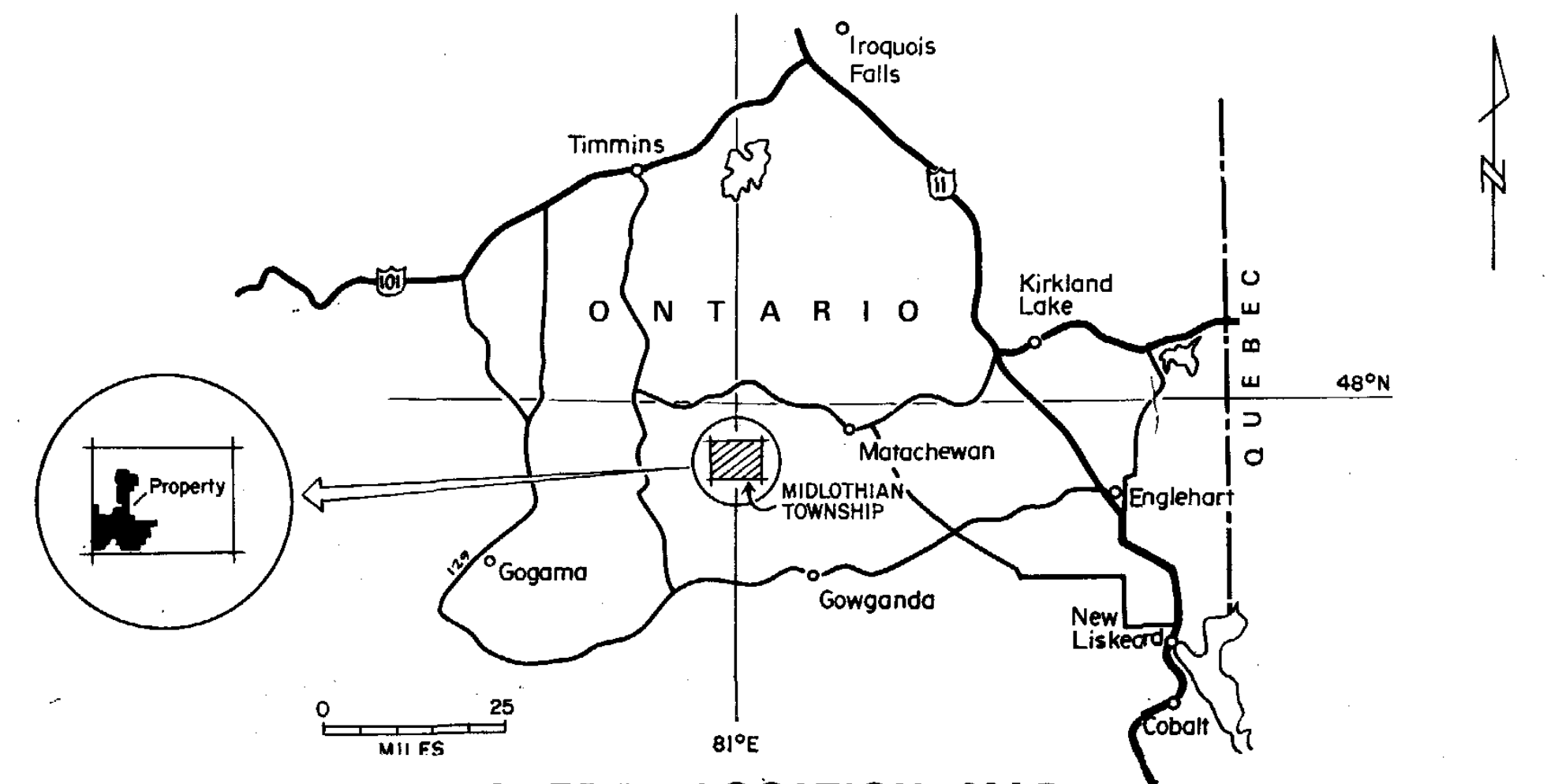
SCALE 1" = 200'

200 0 200 400 600
Feet

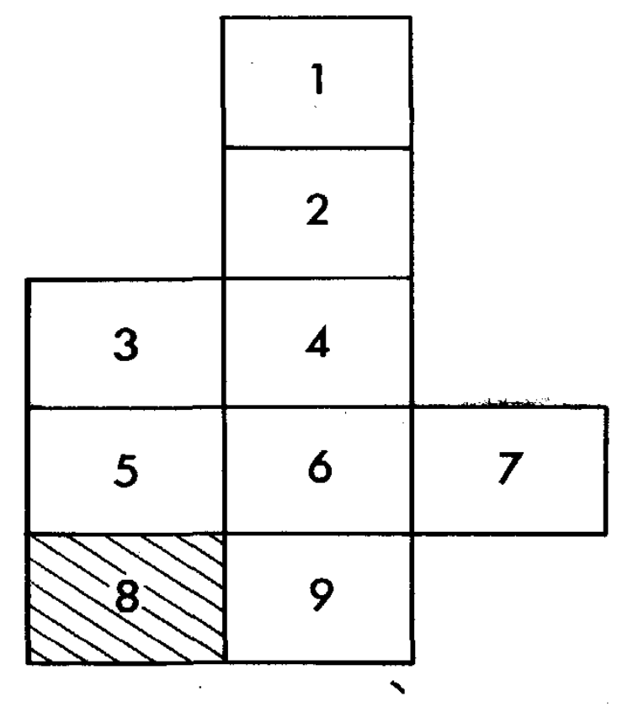
Work by Date	Interpretation by Beverly L Hodgins Date Jan 30, 1974	Revised Revised N.T.S. No 41-P-15

7.





OPERTY LOCATION MAP



SHEET INDEX

LEGEND

SYMBOLS

High Frequency / Low Frequency

+2 + -1

Only High Frequency taken · 0

INSTRUMENT : CRONE CEM

High Frequency - 1800 cycles / second

Low Frequency - 390 cycles / second

IN PHASE / OUT OF PHASE

High Frequency 100 0

Low Frequency 100 0

Only High Frequency taken 100 0

INSTRUMENT : ABEM GUN

High Frequency - 3520 cycles / second

Low Frequency - 880 cycles / second

THE HANNA MINING COMPANY

MIDLOTHIAN PROJECT
LARDER LAKE MINING DIVISION
ONTARIO

ELECTROMAGNETIC MAP

SCALE 1" = 200'

200 0 200 400 600

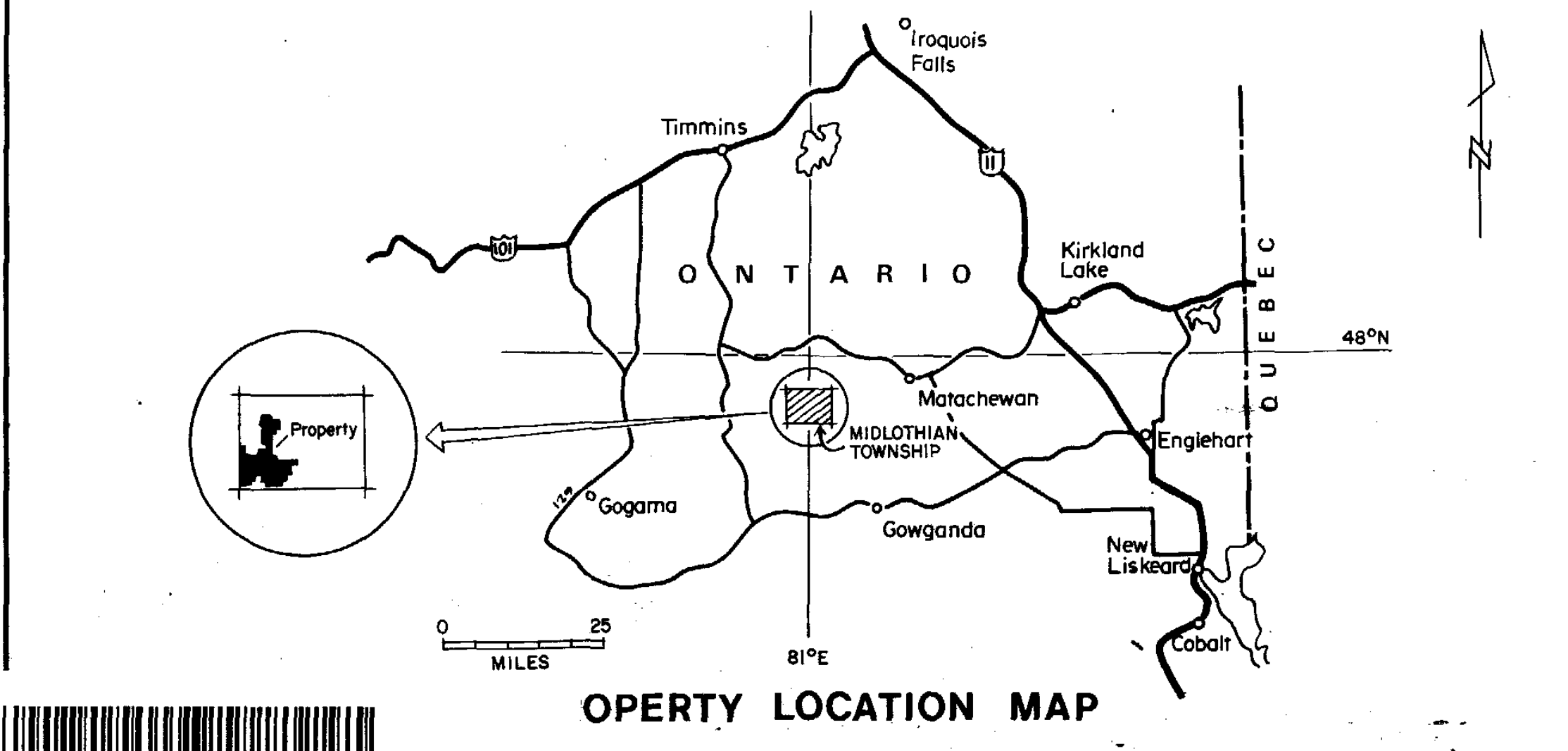
Feet

Work by	Interpretation by Beverly L Hodgins	Revised
		Revised
Date	Date Jan 30, 1974	N.T.S. No 41-P-15

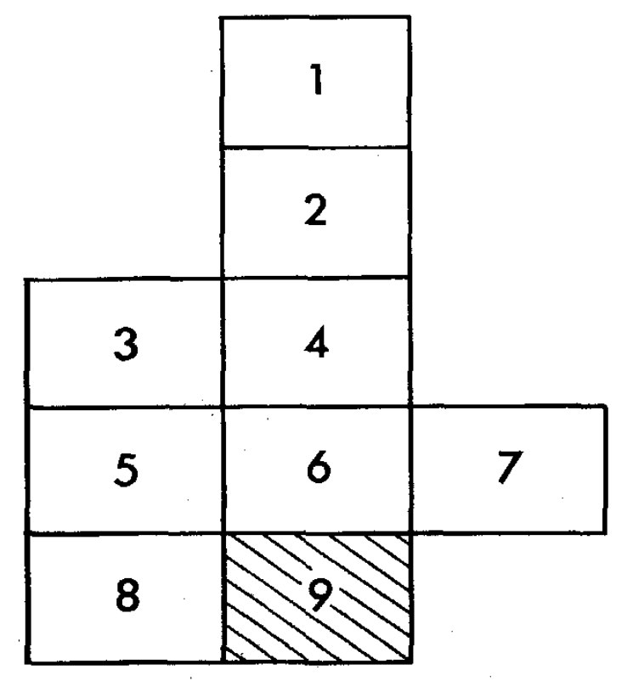
8

41P14NE0027 2.1407 MIDLOTHIAN

370



OPERTY LOCATION MAP



SHEET INDEX

LEGEND

SYMBOLS

	High Frequency	Low Frequency
	+2	-1
Only High Frequency taken	0	

<u>INSTRUMENT</u> : CRONE CEM

High Frequency - 1800 cycles / second

Low Frequency - 390 cycles / second

	IN PHASE	OUT OF PHASE
High Frequency	100	0
Low Frequency	100	0
Only High Frequency taken	100	0

<u>INSTRUMENT</u> : ABEM GUN

High Frequency - 3520 cycles / second

Low Frequency - 880 cycles / second

THE HANNA MINING COMPANY

MIDLOTHIAN PROJECT

LARDER LAKE MINING DIVISION
ONTARIO

ELECTROMAGNETIC MAP

SCALE 1" = 200'

200 0 200 400 600
Feet

Work by	Interpretation by Beverly L Hodges	Revised
		Revised
Date	Date Jan 30, 1974	N.T.S. No 41-P-15

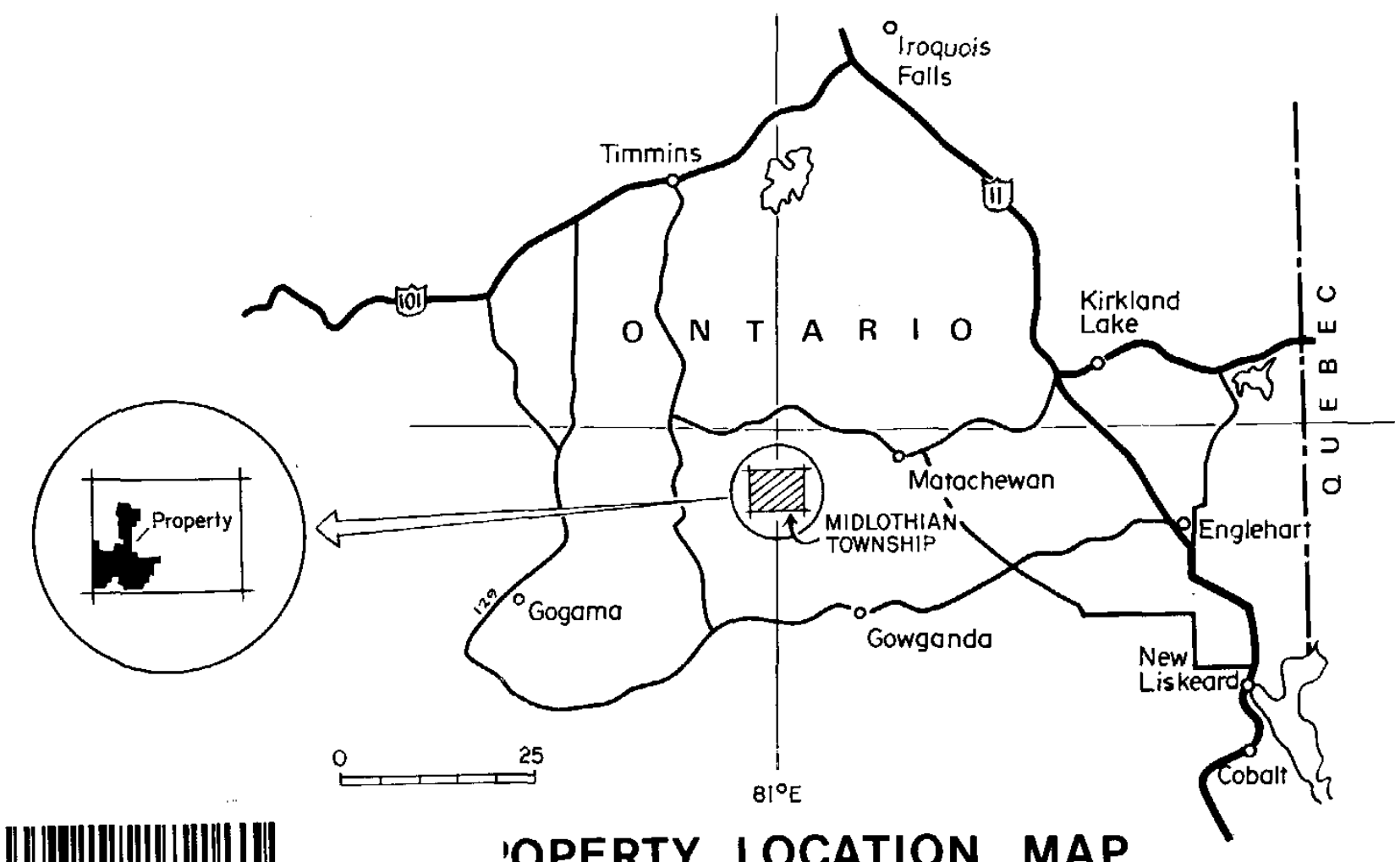
9

380

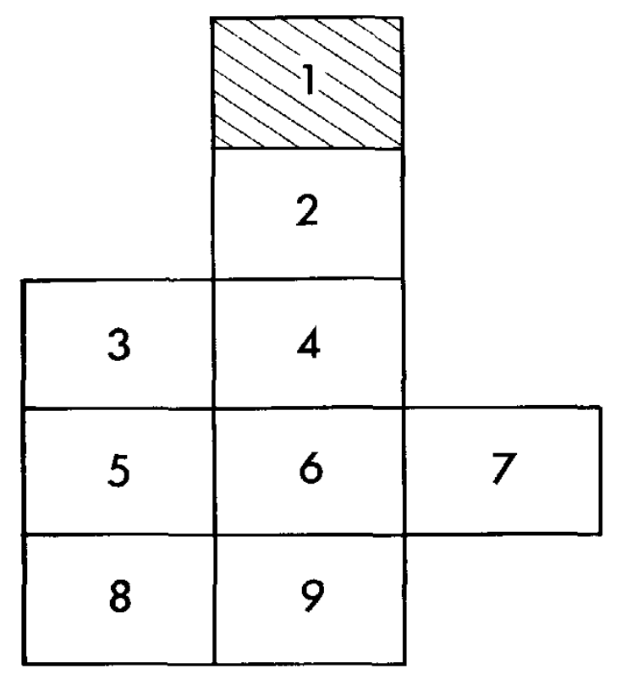
* Mining Claims L.333617 to 24 inclusive
333750
353155-56

<u>11 claims</u>

Received credits for EM, Mag + Geological
surveys on File 2.1380



OPERTY LOCATION MAP



SHEET INDEX

LEGEND

SYMBOLS

◯ HUNDRED GAMMA CONTOUR

⬭ THOUSAND GAMMA CONTOUR

◯ CLOSED MAGNETIC LOW

<u>INSTPUMENT</u> -

Scintrex MF 2 Fluxgate Magnetometer

THE HANNA MINING COMPANY

MIDLOTHIAN PROJECT
LARDER LAKE MINING DIVISION
ONTARIO

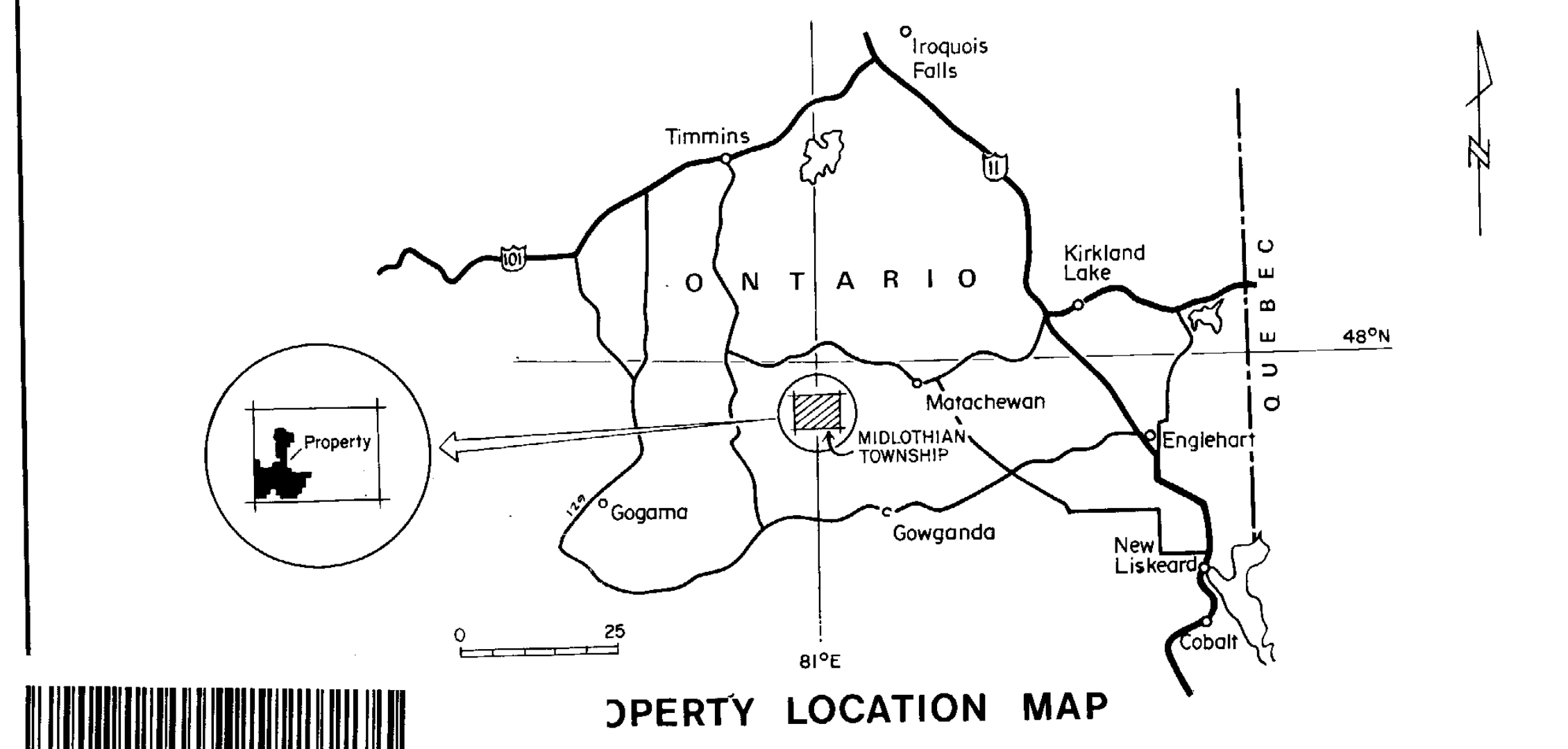
MAGNETOMETER MAP

SCALE 1" = 200'

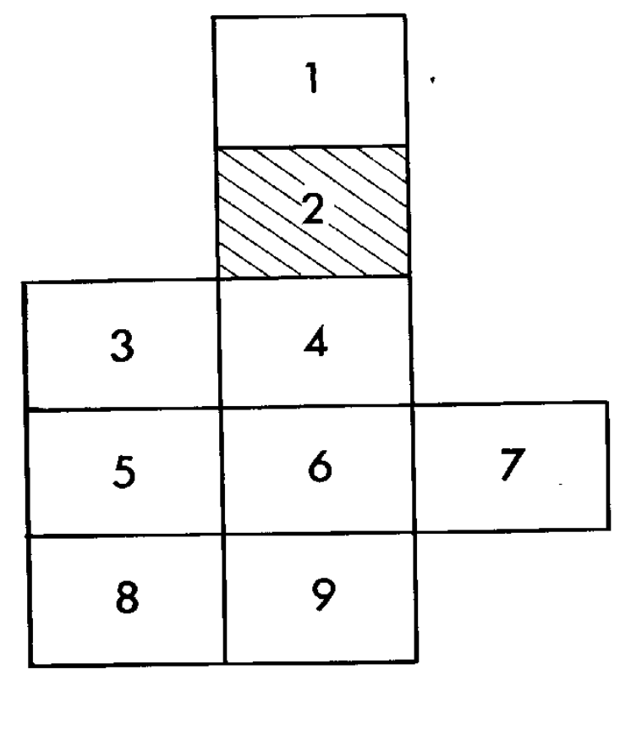
200 0 200 400 600
Feet

Work by Date	Interpretation by Russell L Hodgins Date Jan 20, 1974	Revised Revised N.T.S. No 41-P-15

390



OPERTY LOCATION MAP



SHEET INDEX

LEGEND

SYMBOLS

HUNDRED GAMMA CONTOUR

THOUSAND GAMMA CONTOUR

CLOSED MAGNETIC LOW

INSTRUMENT -
Scintrex MF 2 Fluxgate Magnetometer

THE HANNA MINING COMPANY

MIDLOTHIAN PROJECT

LARDER LAKE MINING DIVISION
ONTARIO

MAGNETOMETER MAP

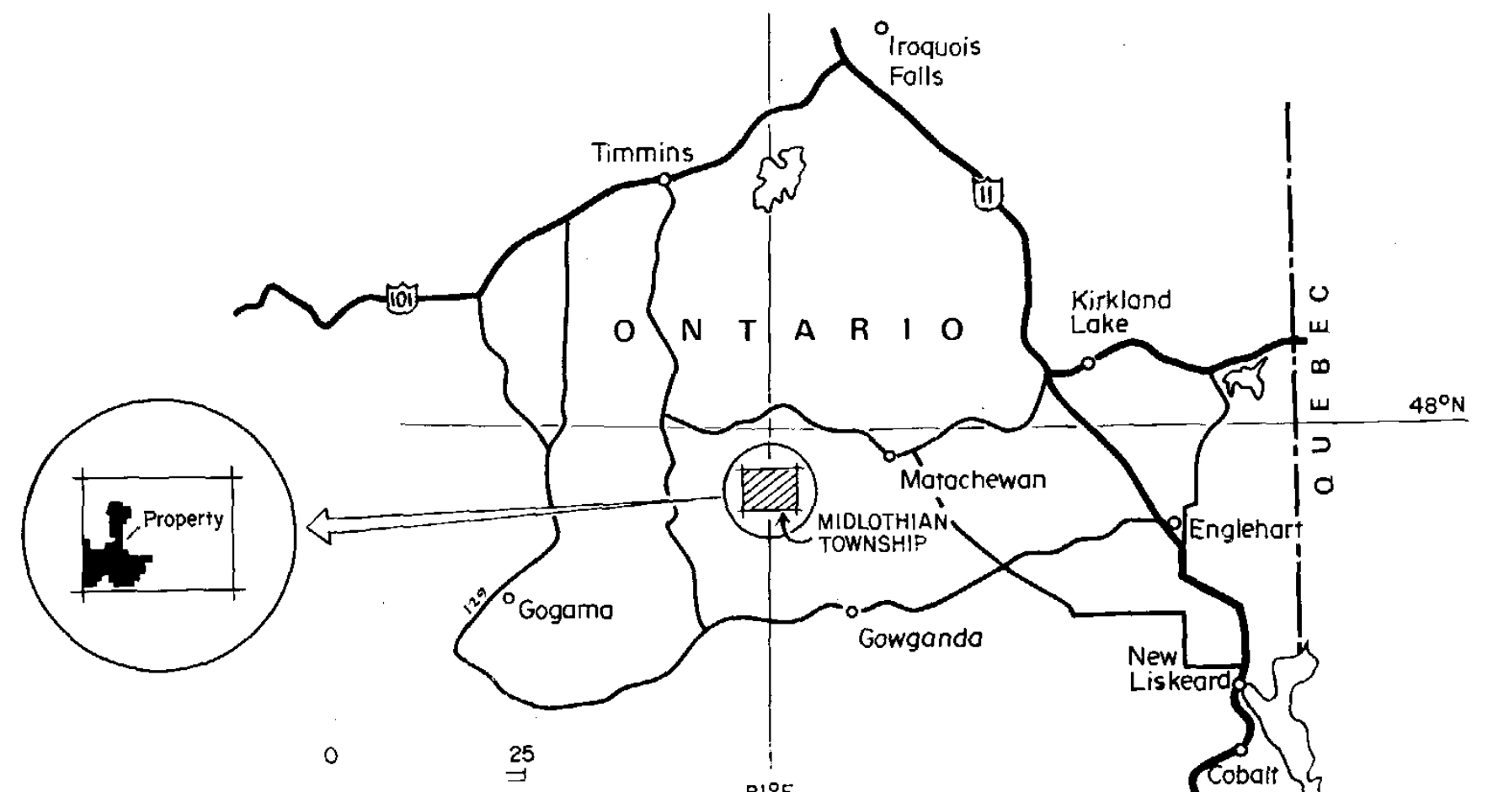
SCALE 1" = 200'

200 0 200 400 600
Feet

Work by Date	Interpretation by Date Jun 30, 1974	Revised Revised N.T.S. No 41-P-15

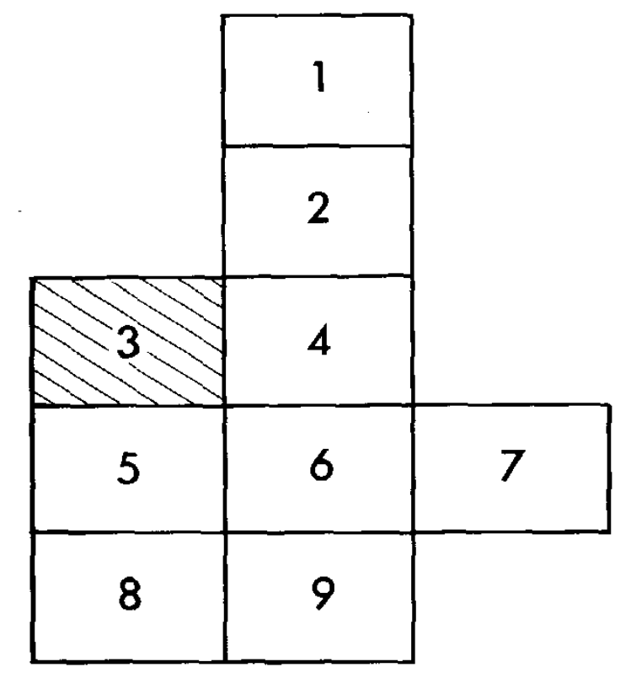
2

400



OPERTY LOCATION MAP

410



SHEET INDEX

LEGEND

SYMBOLS

◯	HUNDRED GAMMA CONTOUR
⬭	THOUSAND GAMMA CONTOUR
◌	CLOSED MAGNETIC LOW

INSTRUMENT -
Scintrex MF 2 Fluxgate Magnetometer

THE HANNA MINING COMPANY

MIDLOTHIAN PROJECT
LARDER LAKE MINING DIVISION
ONTARIO

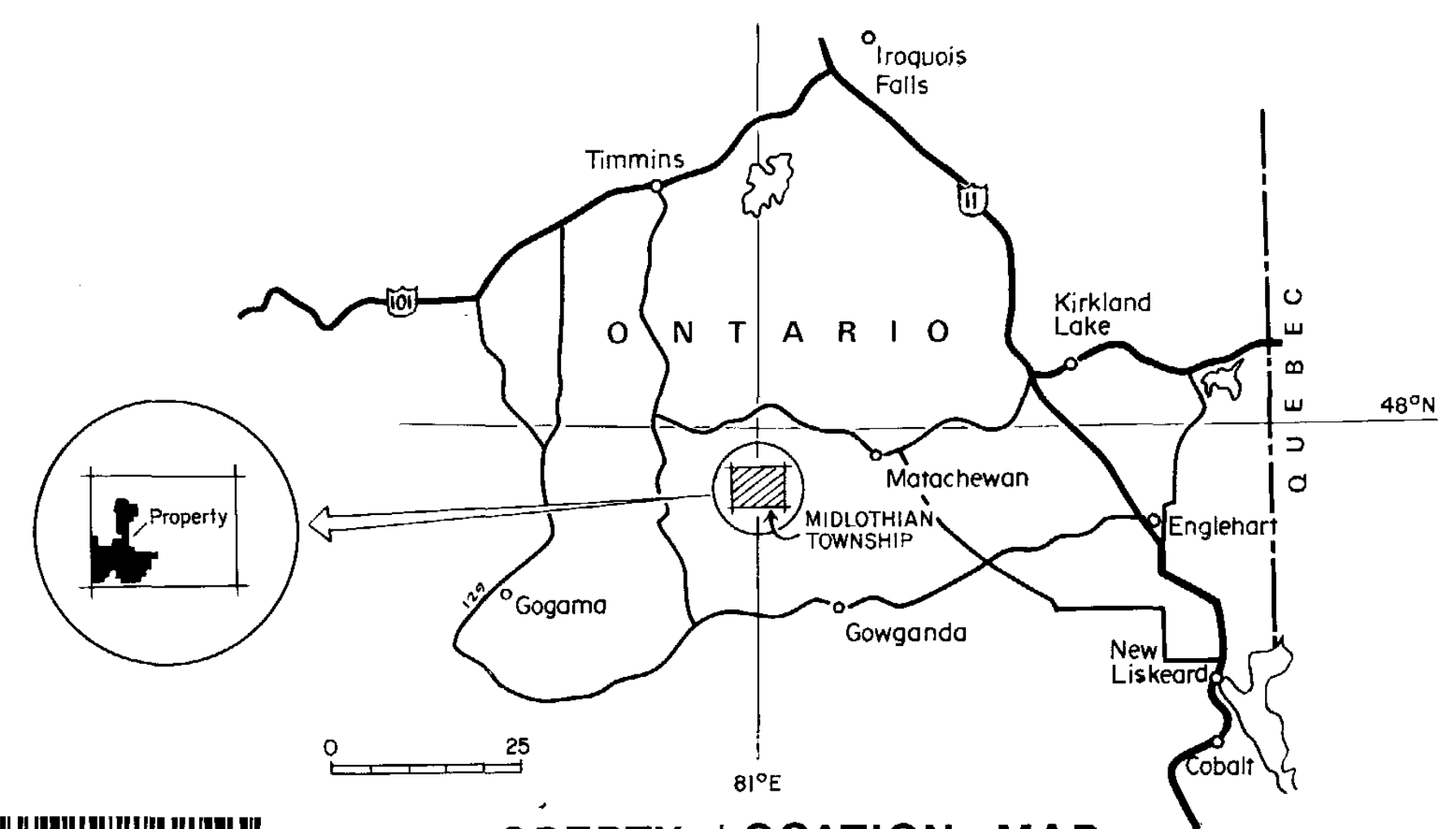
MAGNETOMETER MAP

SCALE 1" = 200'

200 0 200 400 600
Feet

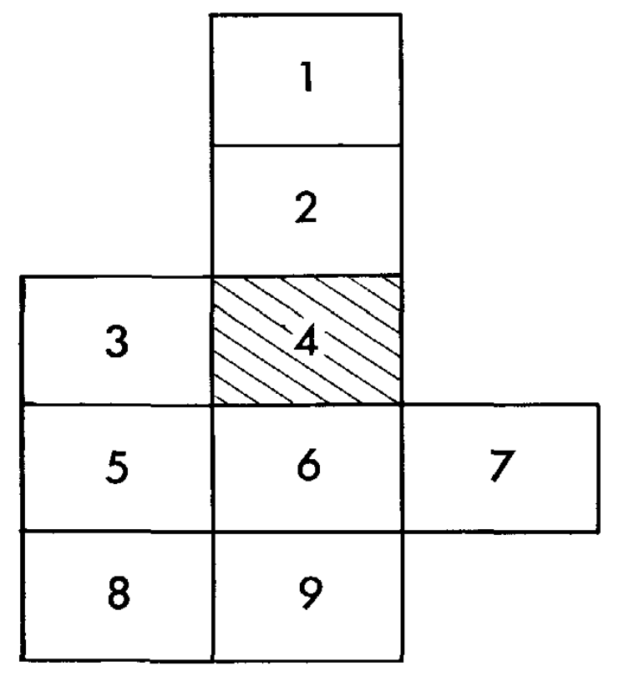
Work by Date	Interpretation by Beverly L Hodge Date Jan 30, 1974	Revised Revised N.T.S. No 41-P-15

3



OPERTY LOCATION MAP

420



SHEET INDEX

LEGEND

SYMBOLS

- HUNDRED GAMMA CONTOUR
- THOUSAND GAMMA CONTOUR
- CLOSED MAGNETIC LOW

INSTRUMENT -
Scintrex MF 2 Fluxgate Magnetometer

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SCALE 1" = 200'

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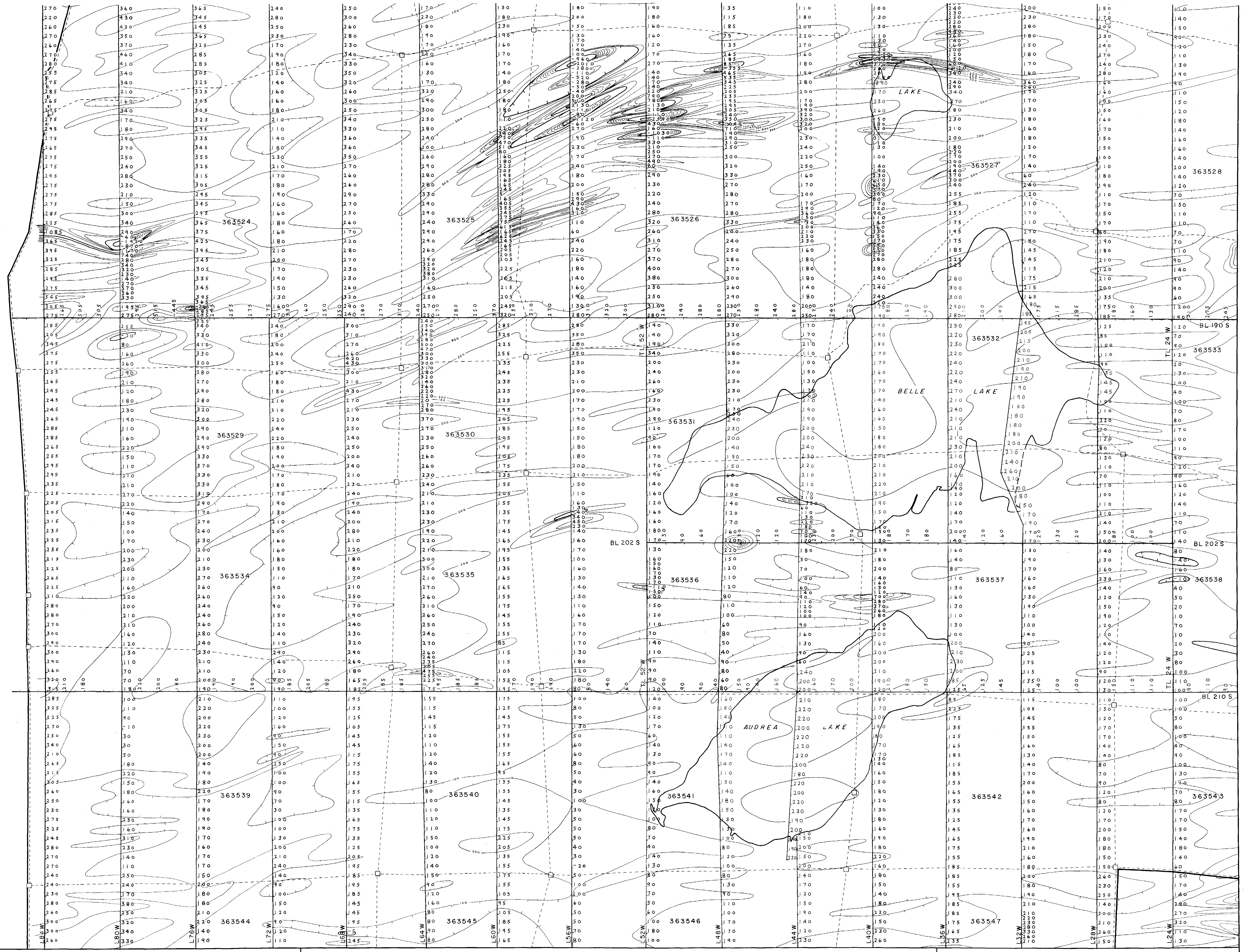
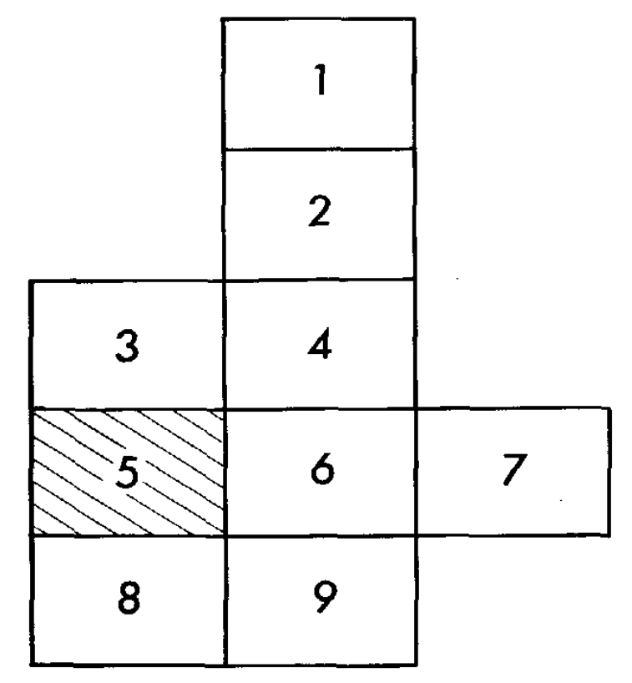
Work by Date	Interpretation by Date Jan 30, 1974	Revised Revised N.T.S. No 41-P-15

4



ROPERTY LOCATION MAP



SHEET INDEX

LEGEND

SYMBOLS

- HUNDRED GAMMA CONTOUR
- THOUSAND GAMMA CONTOUR
- CLOSED MAGNETIC LOW

INSTRUMENT -
Scintrex MF 2 Fluxgate Magnetometer

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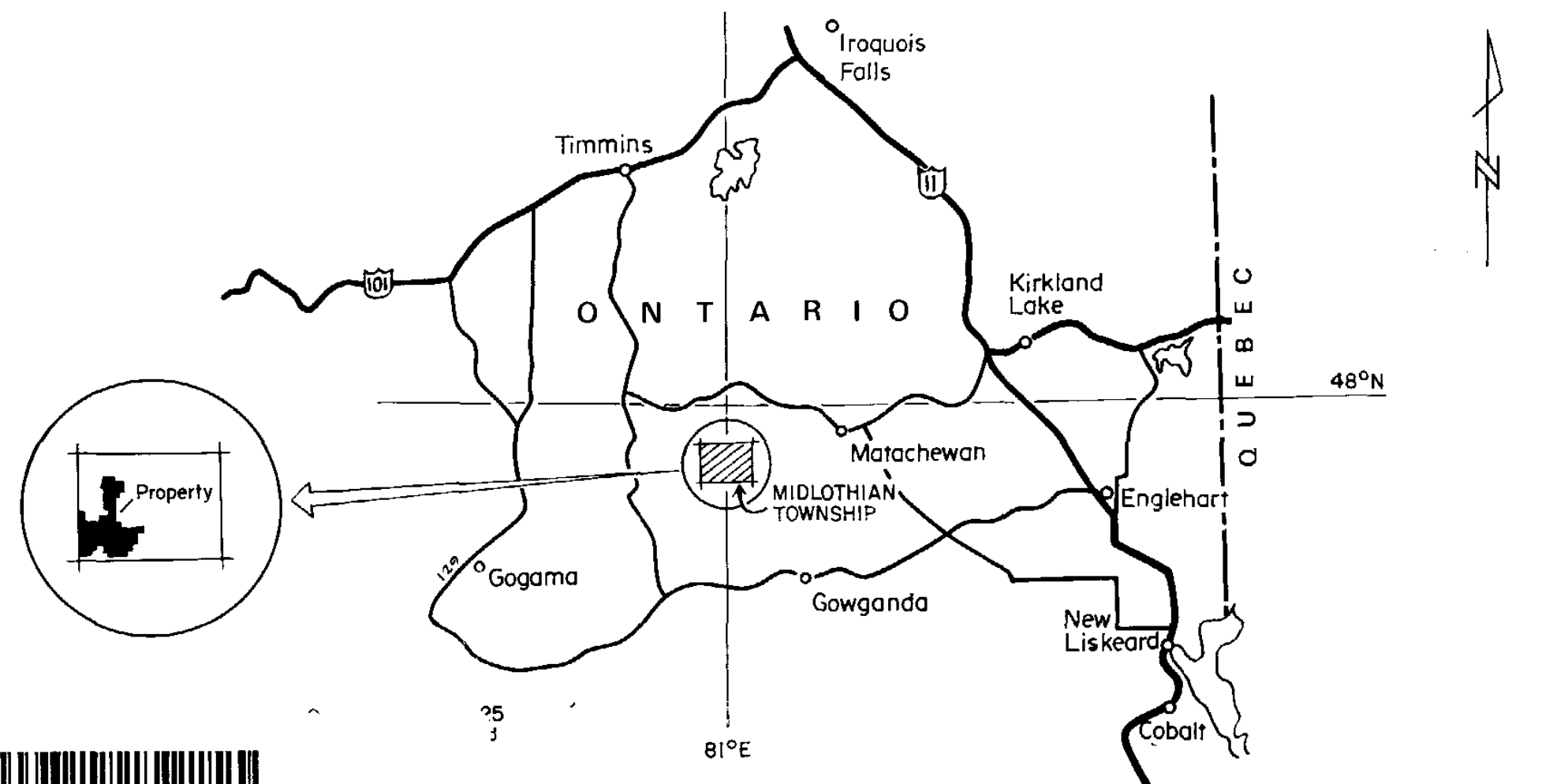
SCALE 1" = 200'

200 0 200 400 600
Feet

Work by Date	Interpretation by Date Jan 30, 1979	Revised Revised N.T.S. No 41-P-15

5

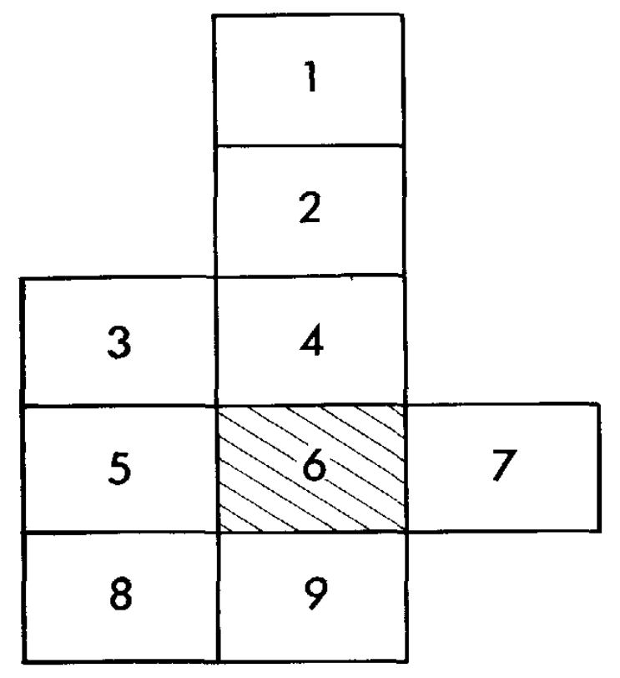
430



)PERTY LOCATION MAP

440

TL00



SHEET INDEX

LEGEND

SYMBOLS

- ⬭ HUNDRED GAMMA CONTOUR
- ⬭ THOUSAND GAMMA CONTOUR
- ⬭ CLOSED MAGNETIC LOW

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SCALE 1" = 200'

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Feet

Work by	Interpretation by	Revised
Date	Date Jan 30 1974	Revised
		N.T.S. No 41-P-15

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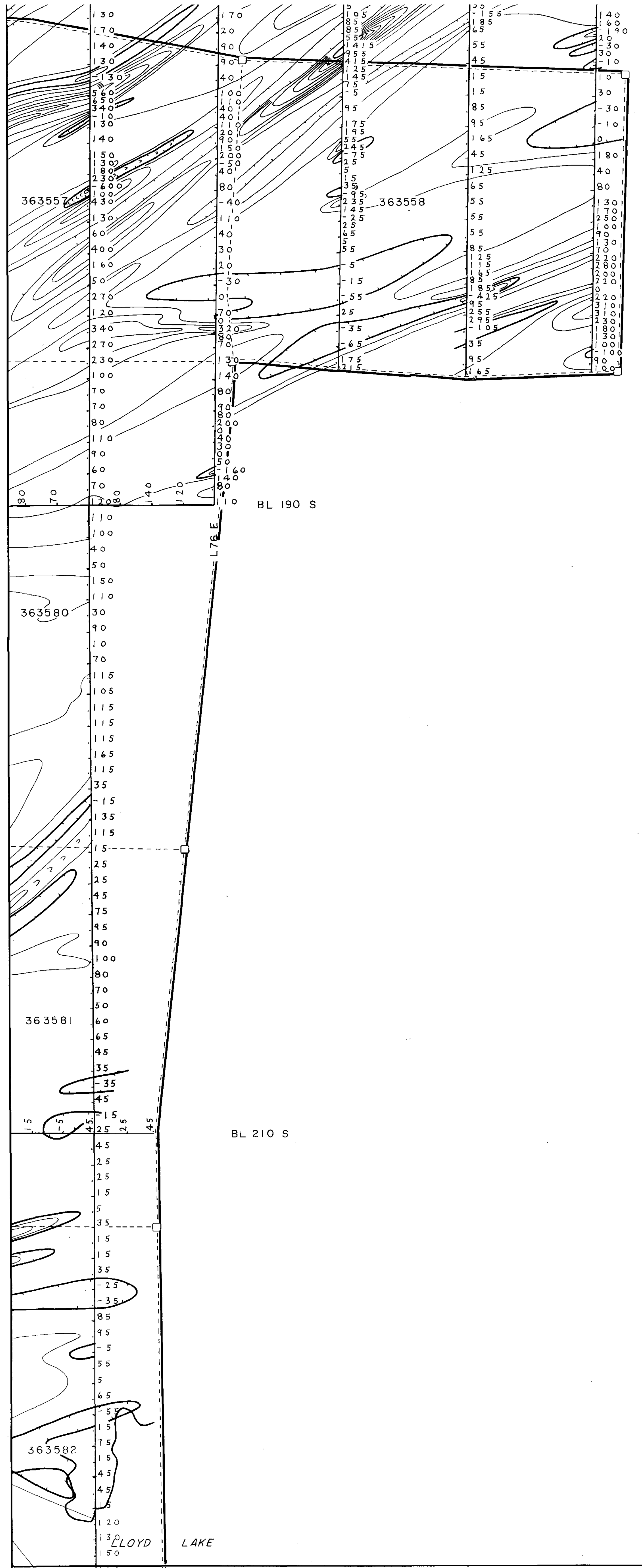

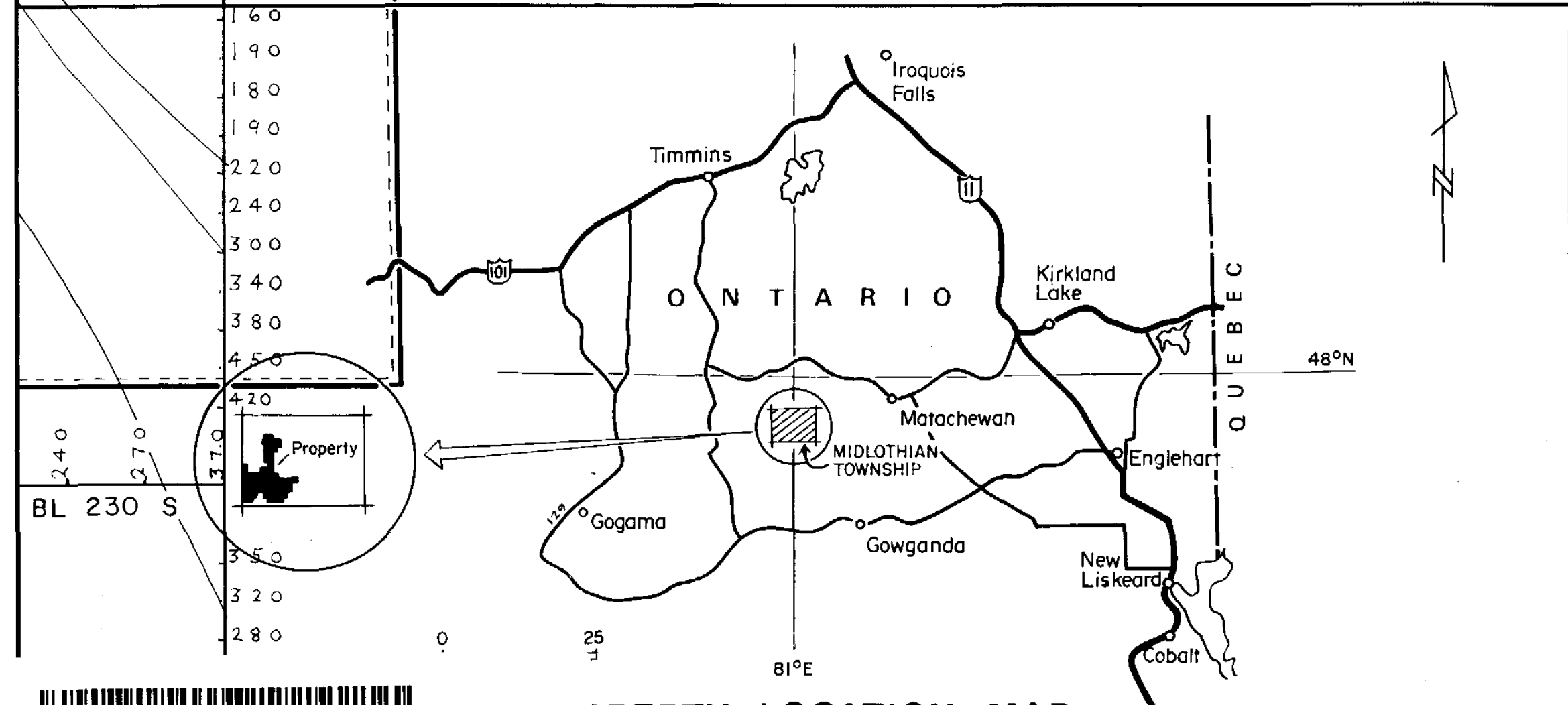

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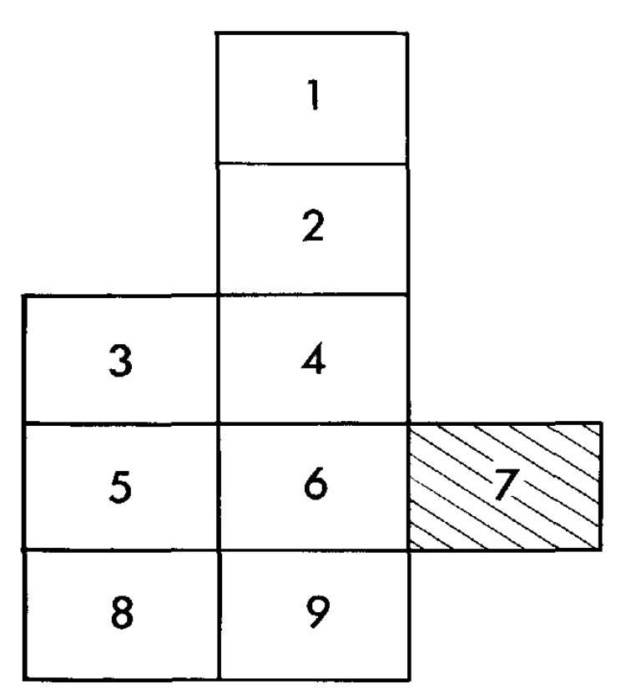

SHEET INDEX

LEGEND

SYMBOLS

- ⬭ HUNDRED GAMMA CONTOUR
- ⬬ THOUSAND GAMMA CONTOUR
- ⬭ CLOSED MAGNETIC LOW

<u>INSTRUMENT</u> -
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SCALE 1" = 200'

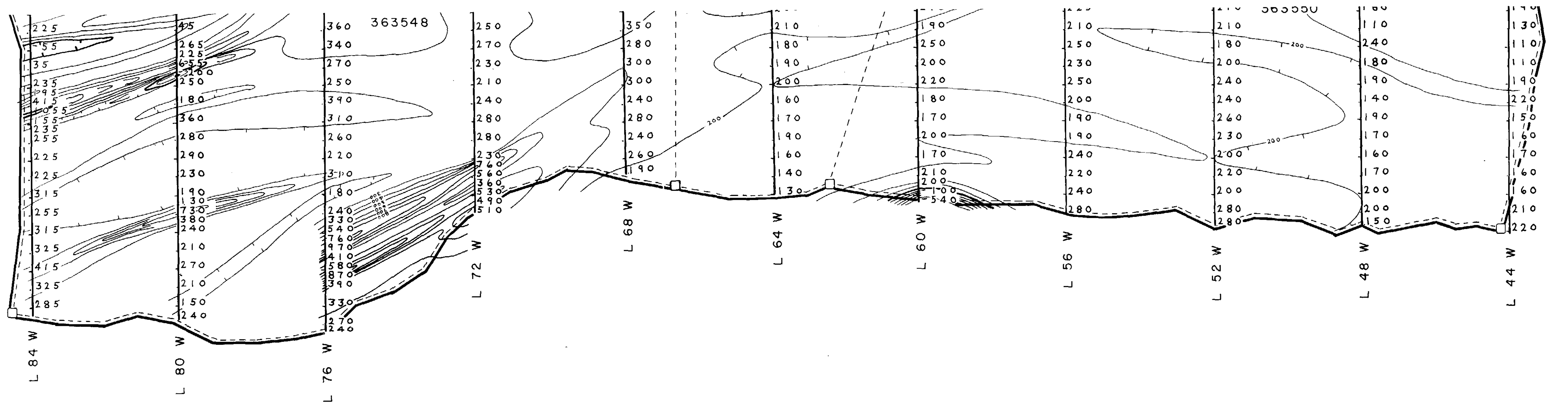
200 0 200 400 600
Feet

Work by	Interpretation by Bwuly L Hodge	Revised
		Revised
Date	Date Jan 30, 1974	N.T.S. No 41-P-15

7

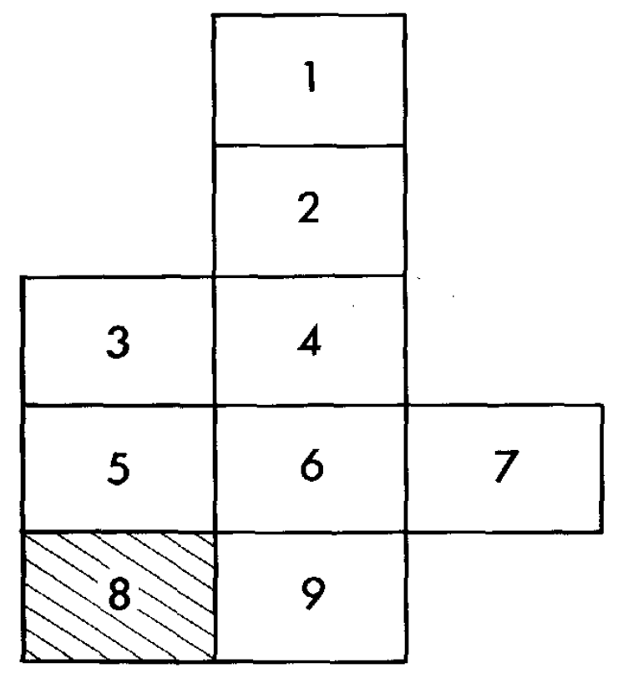
41P14NE0027 2.1407 MIDLOTHIAN

450



·PERTY LOCATION MAP

460



SHEET INDEX

LEGEND

SYMBOLS

HUNDRED GAMMA CONTOUR
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CLOSED MAGNETIC LOW

INSTRUMENT -
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MAGNETOMETER MAP

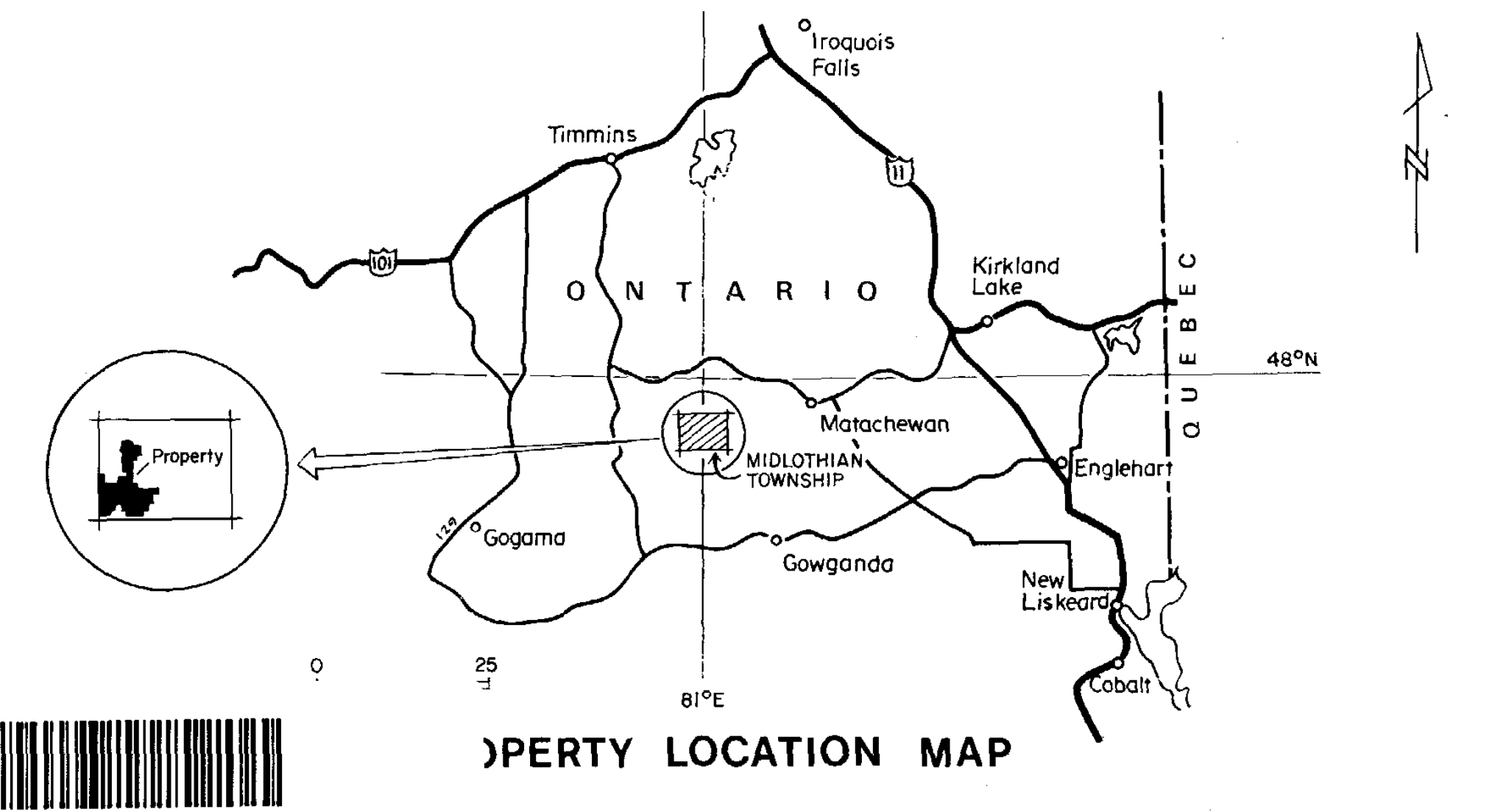
SCALE 1" = 200'

200 0 200 400 600
Feet

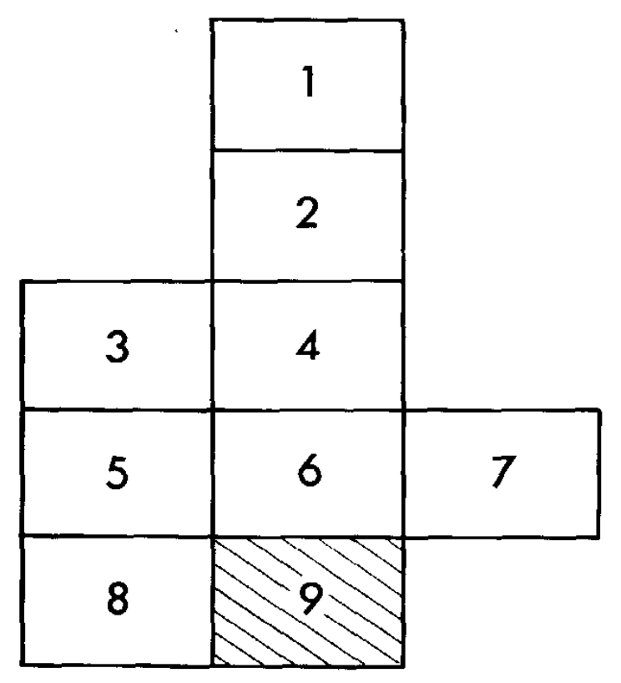
Work by	Interpretation by Beverly	Revised
Date	Date Jan 30, 1974	Revised N.T.S. No 41-P-15

8

NB BL 250 S
Land & Ice Baseline
are continuous.
Land part cut during
summer at wrong angle
from Tie Line 00 25000 S



PROPERTY LOCATION MAP



SHEET INDEX

LEGEND

SYMBOLS

- ◯ HUNDRED GAMMA CONTOUR
- ⬭ THOUSAND GAMMA CONTOUR
- ◌ CLOSED MAGNETIC LOW

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ONTARIO

MAGNETOMETER MAP

SCALE 1" = 200'

200 0 200 400 600
Feet

Work by	Interpretation by	Revised
Date	Date Jan 30, 1974	Revised N.T.S. No 41-P-15

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41P14NE0027 2.1407 MIDLOTHIAN

470

LEGEND

CONDUCTOR

STRONG ●
◕
◑
◔
WEAK ○
INDEFINITE ◌

PROFILE SCALE

1.10 1.00 0.90 RATIO
+5° 0° -5° PHASE

RATIO •——• 660 Hz
PHASE •- - -•
RATIO ×——× 220 Hz
PHASE ×- - -×
(EXCEPT AS NOTED)

J.W. Worland

TURAM ELECTROMAGNETIC SURVEY
BY
GEOSEARCH CONSULTANTS LTD.
FOR
THE HANNA MINING COMPANY
ON THE
MIDLOTHIAN PROJECT
LARDER LAKE MINING DIVISION
ONTARIO

SCALE: 1 INCH TO 200 FEET

DRAWN BY: J.W.
DATE: JAN. 1974

74-91

41P14NE0027 2.1407 MIDLOTHIAN

LEGEND

CONDUCTOR

STRONG ●
◕
◑
◔
WEAK ○
INDEFINITE ◌

PROFILE SCALE

1.10 1.00 0.90 RATIO
+5° 0° -5° PHASE

RATIO .——. 660 Hz
PHASE .- - -.
RATIO x——x 220 Hz
PHASE x- - -x
(EXCEPT AS NOTED)

J. W. Woodard

TURAM ELECTROMAGNETIC SURVEY
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FOR
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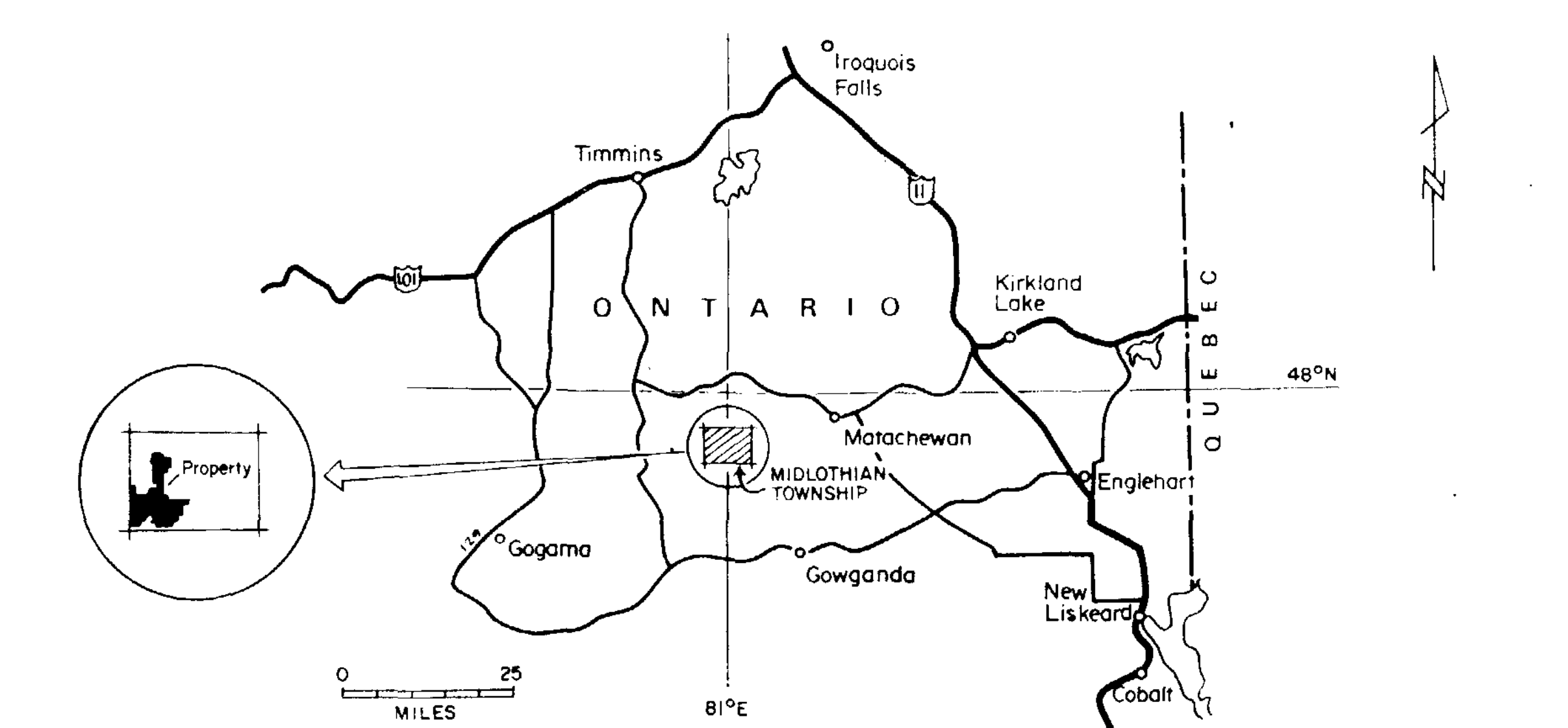
ON THE
MIDLOTHIAN PROJECT
LARDER LAKE MINING DIVISION
ONTARIO

SCALE: 1 INCH TO 200 FEET

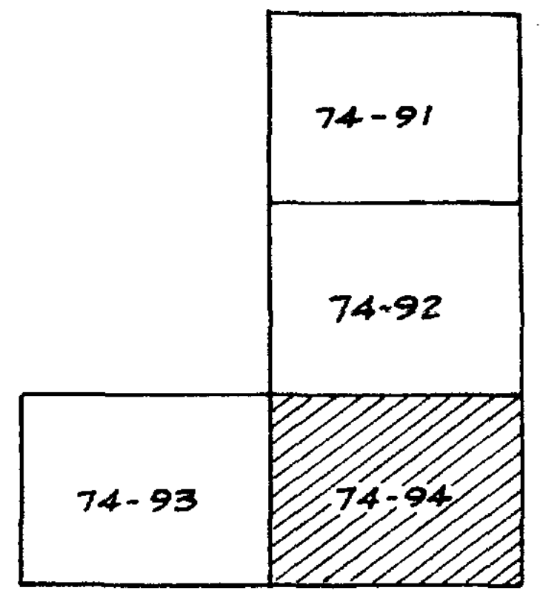
DRAWN BY: J.W.
DATE: JAN. 1974

74-92

490



PROPERTY LOCATION MAP



MAP INDEX

LEGEND

CONDUCTOR

STRONG ●
◕
◑
◔
WEAK ○
INDEFINITE ◌

PROFILE SCALE

1.10 1.00 0.90 RATIO
+5° 0° -5° PHASE

RATIO ·——· 660 Hz
PHASE ·---·
RATIO ×——× 220 Hz
PHASE ×---×
(EXCEPT AS NOTED)

J. W. Whitford

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SCALE : 1 INCH TO 200 FEET

DRAWN BY: J.W.
DATE: JAN. 1974

74-94