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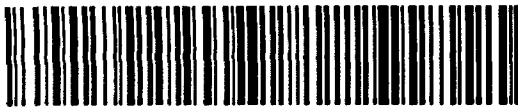
Report on Geophysical Surveys
PICK MINES LIMITED
Shakespeare Township
Sudbury Mining Division, Ontario

BY

A. C. A. HOWE INTERNATIONAL LIMITED
JAMES E. TILSLEY, F. G. A. C., P. ENG.

REPORT NO. 152
TORONTO, ONTARIO

September 27, 1968



411055W0103 0028 SHAKESPEARE

010C

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SUMMARY

Magnetic, electromagnetic and gamma ray spectrometer surveys have been carried out over the property of Pick Mines Limited located in Shakespeare Township, Sudbury Mining Division, Ontario.

The Magnetic Survey indicated the limits of the meta gabbro (amphibolite) rocks which underlie the claims.

The Electromagnetic Survey did not indicate any significant anomalies. The strong inphase anomalies shown on the attached map is caused by a conductive lake bottom/outcrop interface which occurs along the lakeshore.

The Gamma Ray Spectrometer Survey did not show any anomalous radioactivity.

Based on the results of the geophysical surveys no additional work, other than geological mapping of the outcrop areas, is recommended. Information gathered during geological mapping will be correlated with the geophysical data and final recommendations will be submitted with the geological report.

PROPERTY

The surveys being reported cover a portion of the property consisting of all or portions of 23 unpatented mineral claims located in Shakespeare Township, Sudbury Mining Division, Ontario and more fully described as listed below:

| <u>Claim No.</u> | <u>Lot</u> | <u>Concession</u> | <u>Area</u> |
|------------------|------------|-------------------|-------------|
| 145213 | SE 1 S 7 | VI | 40 |
| 14 | NE 1 S 7 | VI | 40 |
| 15 | SW 1 S 6 | VI | 40 |
| 16 | NW 1 S 6 | VI | 40 |
| 17 | NE 1 S 6 | VI | 40 |
| 18 | SE 1 S 6 | VI | 40 |
| 19 | NW 1 S 5 | VI | 40 |
| 20 | SW 1 S 5 | VI | 40 |
| 145349 | SW 1 N 6 | VI | 40 |
| 50 | NE 1 N 6 | VI | 40 |
| 51 | SE 1 N 6 | VI | 40 |
| 52 | NW 1 N 5 | VI | 40 |
| 53 | SW 1 N 5 | VI | 40 |
| 54 | NE 1 N 6 | V | 40 |
| 55 | NW 1 N 5 | V | 40 |
| 57 | NW 1 S 7 | VI | 40 |
| 58 | SW 1 N 7 | VI | 40 |
| 145430 | NE 1 N 7 | V | water only |
| 146093 | SW 1 N 7 | V | 40 |
| 145360 | NE 1 N 7 | VI | 40 |
| 145361 | SE 1 N 7 | VI | 40 |
| 145362 | NW 1 N 6 | VI | 40 |
| 146082 | NW 1 N 7 | V | water only |

LOCATION

Approximate co-ordinates: 46° 21' 30" N
81° 52' 30" W

The property is located in lots 5, 6, and 7, Concessions V and Vi, Shakespeare Township, Sudbury Mining Division, Ontario. The claims lie six miles due north of Webbwood, a village on Highway No. 17 and about 46 miles west of Sudbury.

ACCESS

The claims are readily accessible by road. A township road follows the line between lots 6 and 7. The distance via this road from Webbwood is 7.0 miles.

The claims cover a section of Lake Agnew (Spanish River) and can also be reached in summer by boat from any point on the lake.

The Canadian Pacific Railway main east-west line and the Trans Canada Highway passes through Webbwood. There is a railway station and siding in the village.

TOPOGRAPHY

The land portion of the claims is rough, the ground being hilly with vertical or nearly vertical faces rising 20' to 50'. The elevation of Agnew Lake is 857 feet AMSL. The hills rise to 150' to 200' above the lake level.

CLIMATE

The climate is temperate, tending toward sub-arctic.

The mean summer temperature is 65.3° F (July) and the mean winter temperature is 8.4° F (January). Summer maximums up to 99° F and winter minimums of -47° F have been recorded in the area.

Total annual precipitation is 31.60 inches of water, made up of 23.80 inches of rain and 78 inches of snow (7.8 inches H₂O Equiv.).

HISTORY

Prospecting for and development of mineral resources has been done in Shakespeare Township since 1900. In 1903 - 1905 a gold mine was operated in lot 5, Concessions I and II. Copper and copper-nickel prospects have been investigated in lot 2, Concession III and lots 1 and 2, Concession V respectively.

Exploration for uranium was done during 1952 to 1957.

During 1953 - 54 exploration of local quartz pebble conglomerate beds in Mississagi quartzite located in lot 4, Concession V and lot 5, Concession VI was done. Trenching, geological and geophysical surveys and 3 drill holes were completed.

Values ranging from 0.03% U_3O_8 and 0.05% ThO_2 to 0.56% U_3O_8 and 0.09% ThO_2 across thickness of 0.75 to 2.0 feet were reported.

In 1956 - 1957 uranium bearing quartzite beds were cut by drilling carried out in lots 8 and 9, Concession I. Basement was not reached by any of the four holes completed. The 1.5 foot quartzite bed mentioned above contained 0.003% U_3O_8 .

In 1966 uranium values up to 9 lbs. U_3O_8 per ton across 4 feet are reported from shear zones in Mississagi quartzite. The shear zones are reported to be up to 30' in width. This work was done in the north east part of the township.

There is no record of work being performed on the ground held by Pick Mines Limited.

GENERAL GEOLOGY

The township has not yet been mapped in detail. The geology in general terms is as follows: Shakespeare Township is underlain by Precambrian rocks which are subdivided as shown in Table I.

TABLE I

| <u>AGE</u> | <u>ROCK TYPES</u> |
|---------------|---|
| Recent | Stream gravels and fine sediments. |
| Pleistocene | Glacial drift, lacustrine clays. |
| Post Huronian | Basic intrusives: gabbro and diorite. |
| Huronian | Bruce group - Mississagi formation, quartz and pebble conglomerate. |
| Pre Huronian | Older granitic rocks: gneiss (Granite) basic intrusives. |

The older granitic rocks underlie most of the western 2/3, as well as the north half of the south-east quarter of the township. The south half of the SE quarter of the township is underlain by Huronian sediments which have been intruded in part by Post Huronian basic rocks.

The north half of the township shows mainly basic intrusive cutting Mississagi quartzites. The sediments strike generally north-north east and dip about 30° to the north.

The intrusives generally trend parallel to the strike of the sediments.

GEOLOGY OF THE PROPERTY

Fifteen of the 23 claims in the group are water claims. The remaining claims show exposures of basic intrusives on the west part of the group and Mississagi quartzites on the eastern half.

The relationship between these formations where their outcrop is covered by water is not established.

SURVEYS COMPLETED

The Magnetic Survey was done using a Sharpe MF 1 Fluxgate Magnetometer.

Determinations of the vertical component of the earth's magnetic field were made on north-south grid lines spaced at 400' intervals with regular stations each 100'. In areas of rapid change in the magnetic intensity intermediate stations were established to more accurately define the magnetic profile to facilitate interpretations.

Details of the instrument used are annexed to this report as Appendix A.

The Electromagnetic Survey was done on the same control grid as the Magnetic Survey.

The instrument used was a Geonics Ltd., Model EM-16 unit. Electromagnetic determinations were made at regular 100' intervals with closer spacings in areas of rapid change in the values being measured.

The operation and technical details relevant to the instrument are attached as Appendix B.

The Gamma Ray Spectrometer Survey used the control grid established for the Magnetic and Electromagnetic Surveys.

The instrument used was a Model GIS-2 Gamma Ray Spectrometer manufactured by Sharpe Instruments Ltd., Toronto.

Determination of gamma radiation intensity and energies were made at regular 100 foot intervals. Technical details are attached as Appendix C.

RESULTS OF SURVEYS

The Magnetic Survey indicated only one distinct magnetic feature which is interpreted to represent a fresh gabbroic phase of the amphibolite body exposed in the western part of the survey area. Other magnetic features probably reflect composition changes in the Amphibolite and contacts between the Amphibolite and the sediments and gneisses believed to underlie the balance of the claim group. Unfortunately there is as much variation in the magnetic intensities within the Amphibolite body as between it and the surrounding rocks. Meaningful interpretation of geological contacts is difficult.

Water depths were established during the survey and are shown on the enclosed magnetic map. Variations in magnetic intensity is shown to be more directly related to changes in lithology than to distance between the instrument and the sub outcrop (i. e. water depth).

The Electromagnetic Survey has shown conductive zones within the western part of the claim group. The conductive zones appear to be relatively close to surface, gently dipping and unsupported by magnetic features. This indicates the conductive zones are probably related to a rock-overburden (lake bottom) interface and not of economic importance.

The Gamma Ray Spectrometer Survey did not indicate any areas in which anomalous gamma radiation exists.

CONCLUSIONS

None of the geophysical surveys showed areas in which additional work appears warranted.

RECOMMENDATIONS

No additional work based on the results of geophysical surveys can be recommended at this time.

Results on hand should be correlated with geological mapping and prospecting of the shore line and outcrop areas within the claim group and the decision concerning further work based on this information.

Respectfully submitted,

A. C. A. HOWE INTERNATIONAL LIMITED,


J. E. Tilsley, F.G.A.C., P. Eng.

DATED AT TORONTO, ONTARIO THIS 27th DAY OF SEPTEMBER, 1968.

TECHNICAL DETAILS

GEONICS LIMITED E.M. 16

The E.M. 16 Unit acts as a receiver measuring the vertical components of the secondary magnetic fields induced in conductive bodies by an alternating horizontal magnetic field originating from VLF-transmitting stations. The instrument utilizes vertical and horizontal coils to measure the in-phase and quadrature components of the secondary field. Dials on the inclinometer permit the in-phase component to be read in positive or negative percentages and in degrees.

Frequency range: 15 - 25 kHz

Accuracy of readings: $\pm 1\%$ resolution

Range of Measurements: In-phase $\pm 150\%$ or $\pm 90^\circ$
Quadrature $\pm 40\%$

DESCRIPTION OF METHOD

To use this instrument, survey lines are selected approximately along the lines of the primary magnetic field, (i.e. right angles to the station providing the primary field). Readings of the in-phase and quadrature components are obtained by minimizing the sound intensity in the headphones through swinging the instrument back and forth and by adjustment of the quadrature component dial on the instrument. Readings were taken with the operator facing in the same direction in order not to reverse the polarity of the readings.

Plotting the survey results, conductors are indicated by the amplitude and position of high and low readings.

SHARPE VERTICAL INTENSITY FLUXGATE MAGNETOMETER MF-1

S P E C I F I C A T I O N S

MODEL MF-1 Standard surveying and prospecting magnetometer with self-levelling sensor.

| | | |
|----------------|---------------------|---------------------|
| <u>Ranges:</u> | Plus or minus -- | <u>Sensitivity:</u> |
| | 1,000 gammas f. sc. | 20 gammas per div. |
| | 3,000 " " | 50 " " |
| | 10,000 " " | 200 " " |
| | 30,000 " " | 500 " " |
| | 100,000 " " | 2,000 " " |

Meter: Taut-band suspension. 1,000 gamma scale: 1 7/8" long
- 50 div. 3,000 " " 1 11/16" long
- 60 div.

Accuracy: 1,000 to 10,000 gamma ranges \pm 0.5% of full scale
30,000 to 100,000 " " \pm 1% of full scale

Operating Temperature: - 40° C to 40° C
- 40° F to 100° F

Temperature Stability: Less than 2 gammas per °C (1 gamma/°F)

Bucking Adjustments: 10,000 to 75,000 gammas by 9 steps of approxi-
(Latitude) mately 8,000 gammas and fine control by 10-turn potentiometer. Convertible for Southern hemisphere or \pm 30,000 gammas equatorial.

Batteries: 12 X 1.5 V-flashlight batteries ("C" cell type)
(AC Power supply available)

Consumption: 50 milliamperes

Dimensions: Instrument: 6½" X 3½" X 12½" - 165 X 90 X 320 mm
Battery pack: 4" X 2" X 7" - 100 X 50 X 180 mm
Shipping Container: 10" diam. X 16" - 255 mm diam. X 410 mm

Weights: Instrument: 5 lbs. 12 oz. - 1.6 kg.
Battery Pack: 2 lbs. 4 oz. - 1 kg.
Shipping Container: 13 lbs.

GENERAL SPECIFICATIONS

Gamma Ray Spectrometer, Model GIS-2

The instrument is a scintillometer having a variable threshold discriminator adjustable between 0.30 and 3.0 thousand electron volts.

The detector is a 2" x 2" sodium iodide crystal coupled to a photomultiplier tube.

The measuring unit is fitted with a meter with ranges of 0 to 10 - 30 - 100 - 300 - 1000 - 3000 - 10000 counts per second.

The meter accuracy is 5% of full scale.

The meter time constant - 2, 8, 16 seconds.

The High Voltage supply for the photomultiplier tube (detector) is electronically regulated - 1000 V regulation 0.25%.

Temperature Range:

Electronics: -40°C to $+55^{\circ}\text{C}$

Crystal Photomultiplier: -25°C to $+55^{\circ}\text{C}$

Power Supply:

12 size C flashlight cells

2 size AA penlight cells

Regulation 2%

Battery operating life 3 x 8 hr. days

Dimensions

Probe: 10" x 5" x 3" wt. 4 lbs.

6" x 6-3/4" x 3-5/8" wt. 3 lbs.

Dunlop Twp. (M.771)

SHAKESPEARE

THE TOWNSHIP
OF

DISTRICT OF
SUDBURY

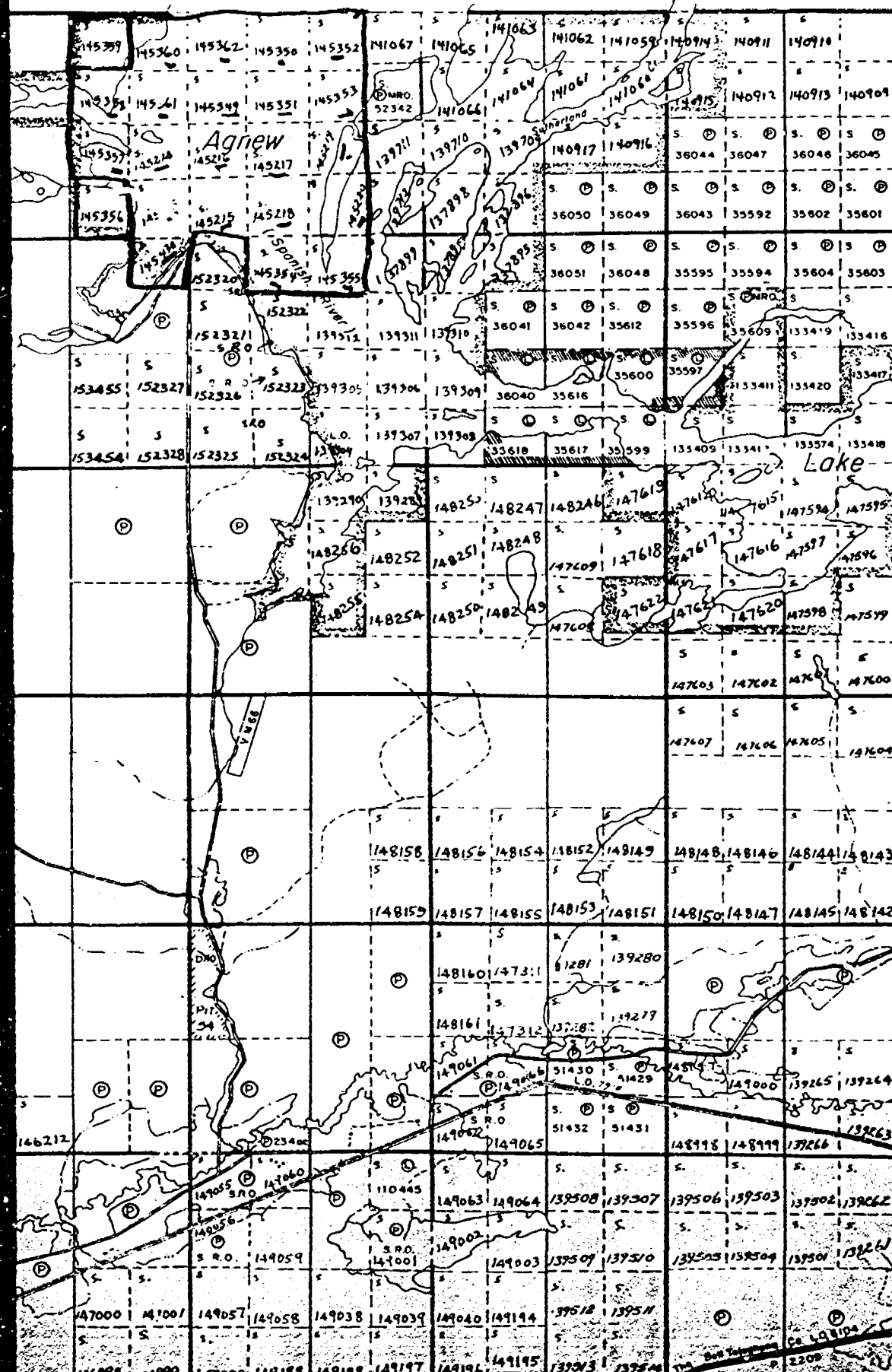


41105SW0103 0028 SHAKESPEARE

900

SUDBURY
MINING DIVISION

SCALE: 1-INCH 40 CHAINS



VI

V

IV

III

II

Baldwin Twp. (M.645)

LEGEND

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

NOTES

- 400' SURFACE RIGHTS RESERVATION AROUND ALL LAKES AND RIVERS.
- AREA SHOWN THUS: W.P.L. A. No. -69. MINING CLAIMS WITHIN THIS AREA ARE FOR MINING RIGHTS ONLY.
- AREA SHOWN THUS: M.R.O.

DATE OF ISSUE
DEC 4 - 1968

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

r having a
between 0.30
iodide crystal
h a meter with
000 - 10000
l scale.
16 seconds.
photomultiplier
- 1000 v regula-
tc +55°C
hr. days
lbs.
wt. 3 lbs.

Dunlop Twp (M.771)

THE TOWNSHIP
OF
SHAKESPEARE

PICK
MINES
LTD.

DISTRICT OF
SUDBURY

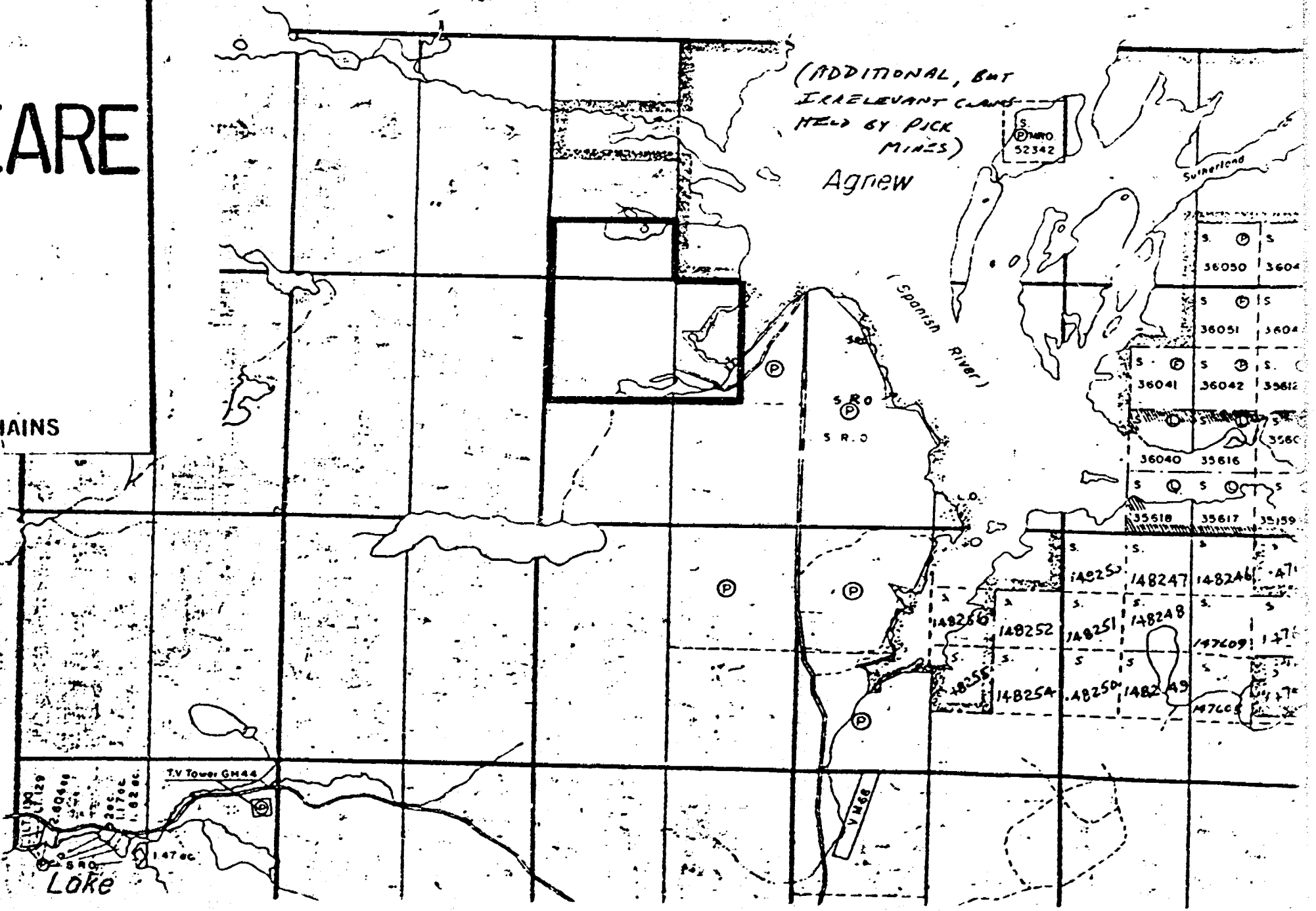
SUDBURY
MINING DIVISION

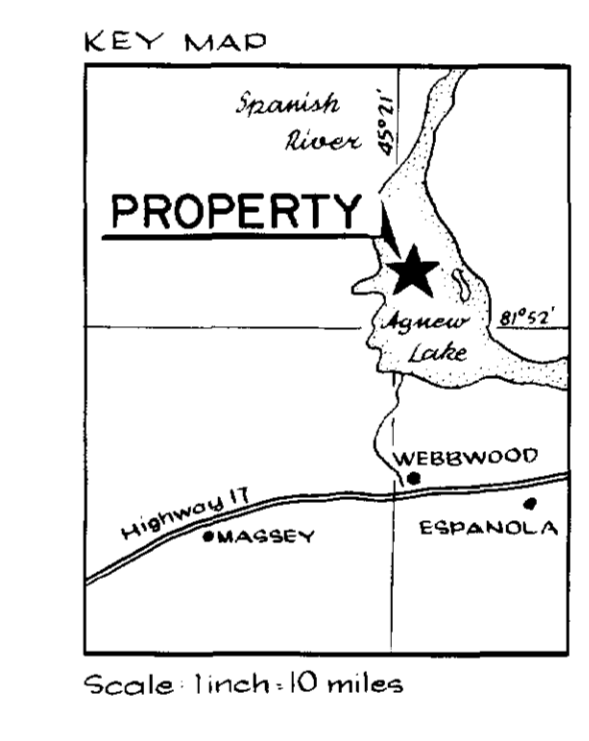
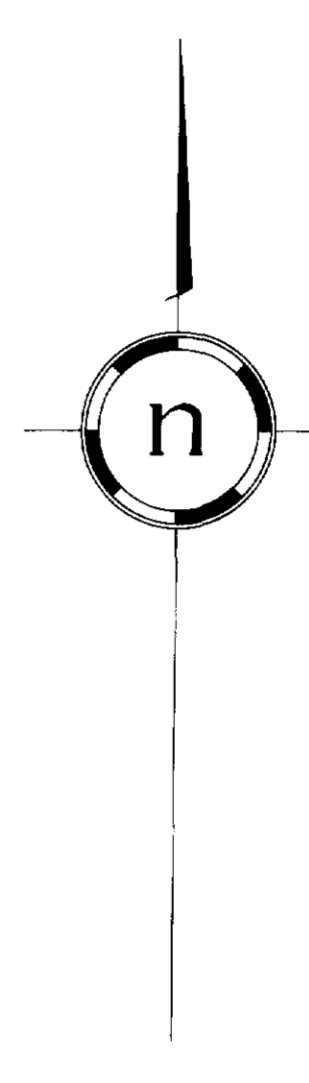
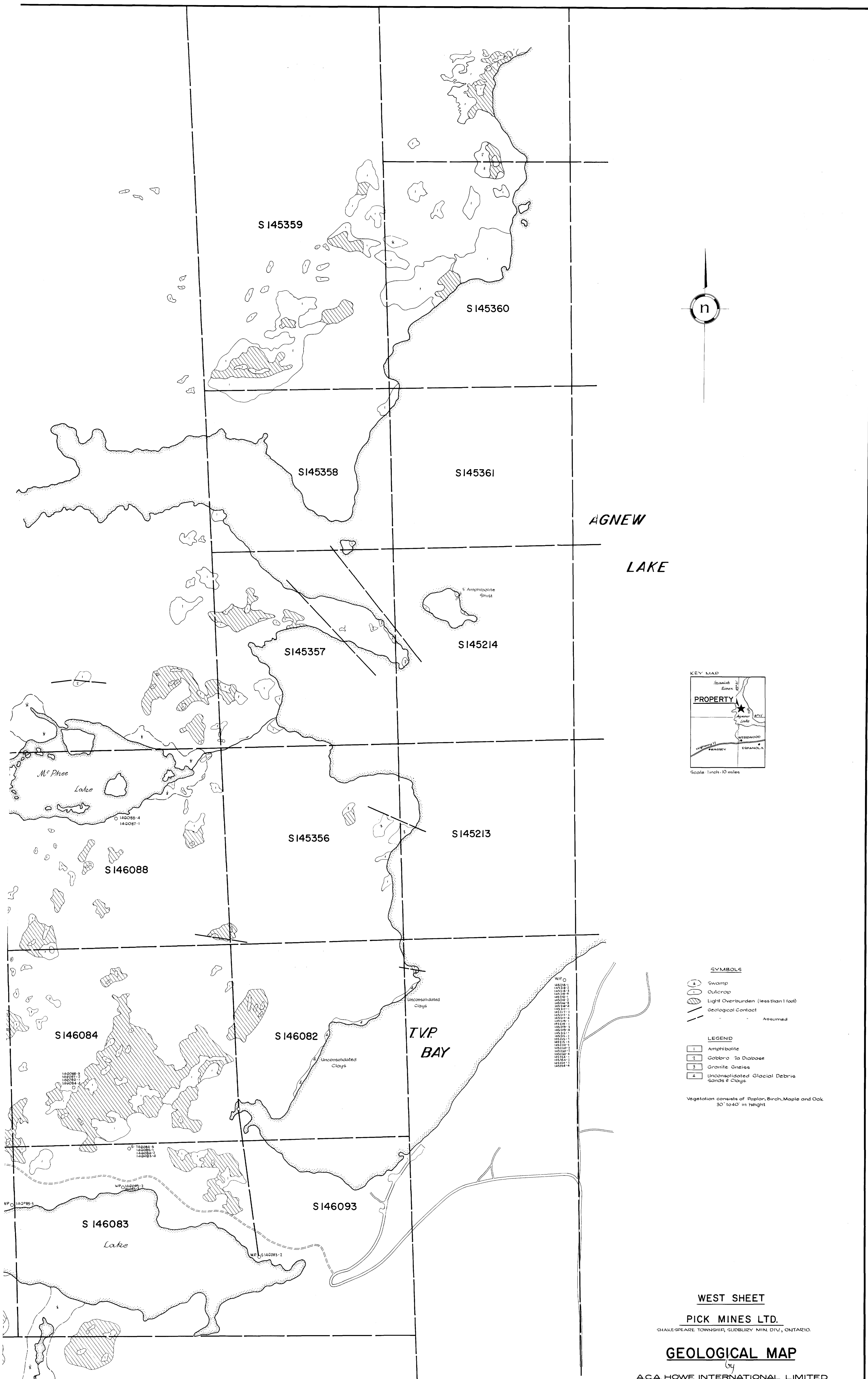
SCALE: 1-INCH 40 CHAINS

SHAKESPEARE TWP (M.771)

Gough Twp (M.890)

Gough Lake





- SYMBOLS**
- Swamp
 - Outcrop
 - ▨ Light Overburden (less than 1 foot)
 - Geological Contact
 - - - Assumed
- LEGEND**
- 1 Amphibolite
 - 2 Gabbro to Diabase
 - 3 Granite Gneiss
 - 4 Unconsolidated Glacial Debris Sands & Clays
- Vegetation consists of Poplar, Birch, Maple and Oak 30' to 40' in height

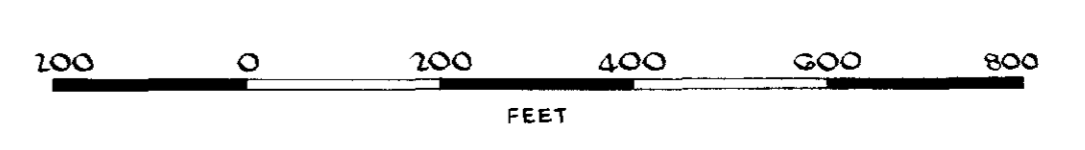
WEST SHEET

PICK MINES LTD.

SHAKESPEARE TOWNSHIP, SUDBURY MIN. DIV., ONTARIO.

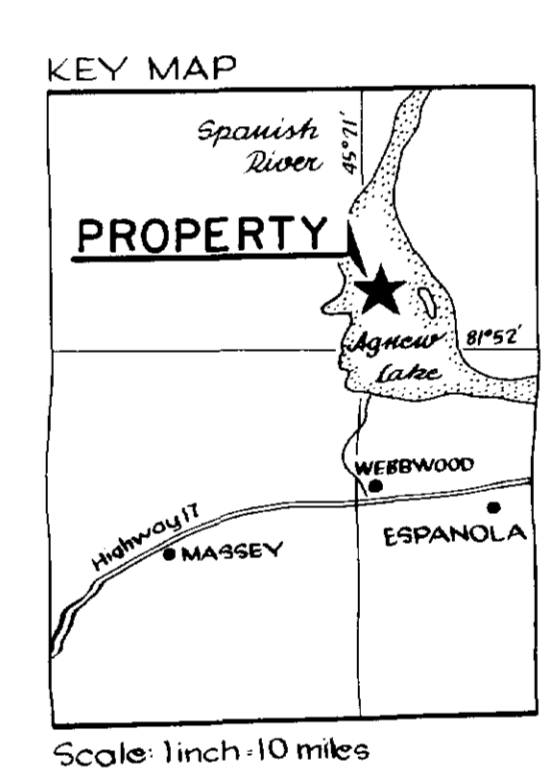
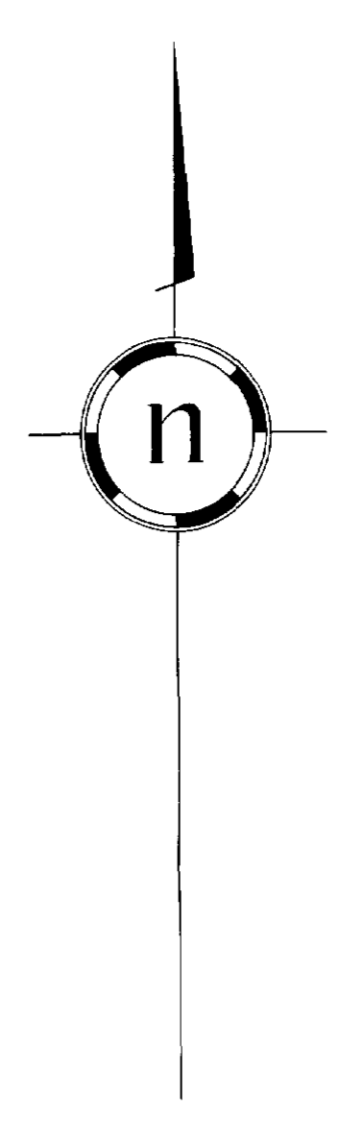
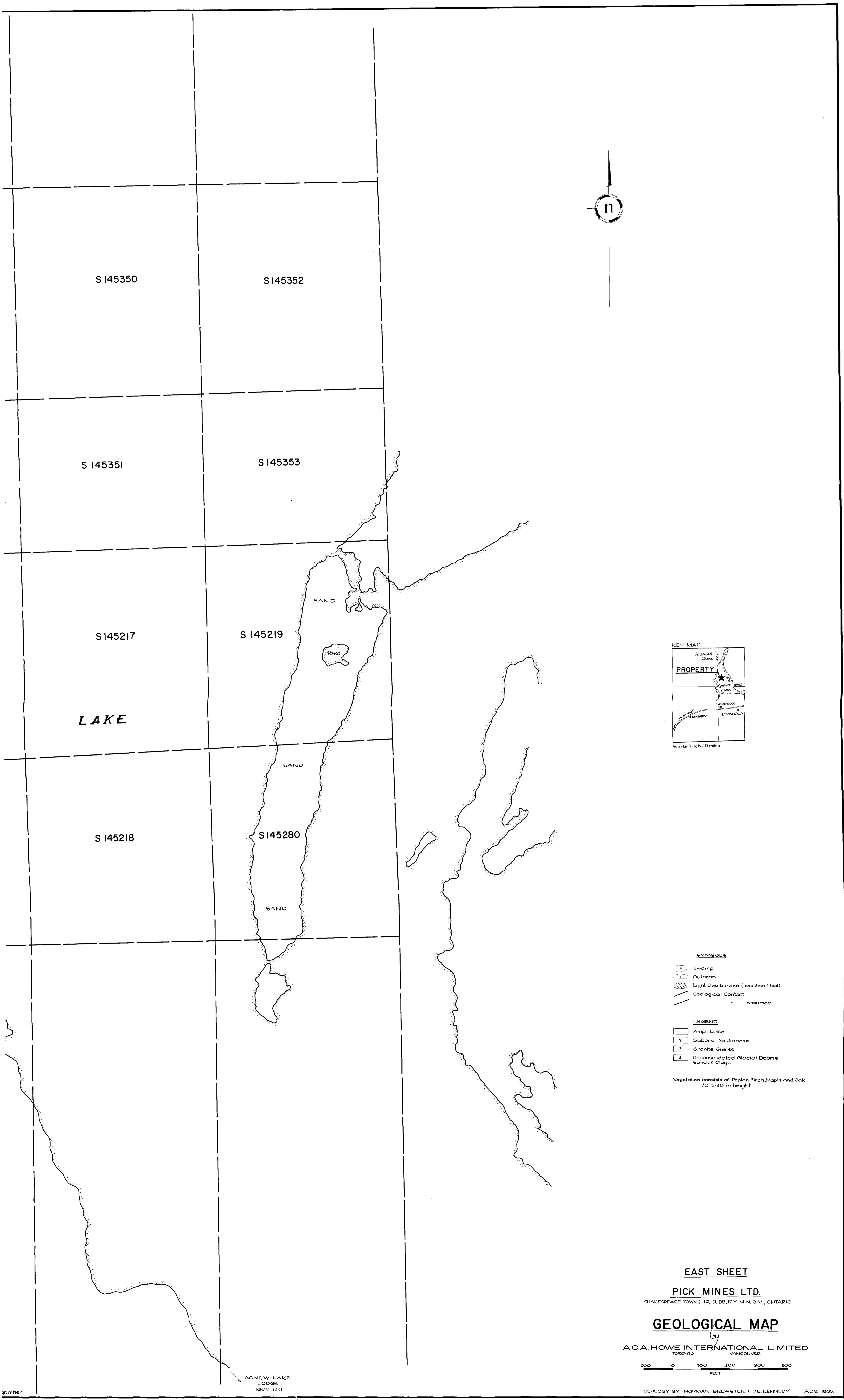
GEOLOGICAL MAP

by
A.C.A. HOWE INTERNATIONAL LIMITED
TORONTO VANCOUVER



GEOLOGY BY: NORMAN BREWSTER & DR. KENNEDY AUG. 1968

SHAKESPEARE-0028, #1



- SYMBOLS**
- Swamp
 - Outcrop
 - Light Overburden (less than 1 foot)
 - Geological Contact
 - Assumed

- LEGEND**
- Amphibolite
 - Gabbro & Diabase
 - Granite Gneiss
 - Unconsolidated Glacial Debris
Sands & Clays

Vegetation consists of Poplar, Birch, Maple and Oak
30' to 40' in height.

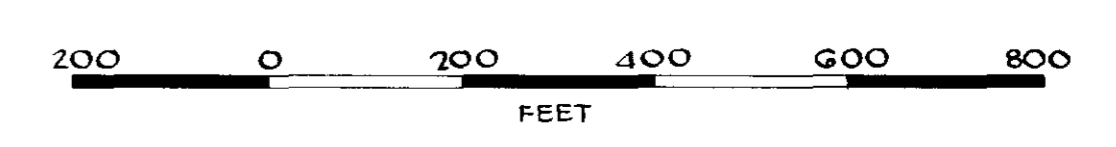
EAST SHEET

PICK MINES LTD.

SHAKESPEARE TOWNSHIP, SUBDIVISION MIN. DIV., ONTARIO.

GEOLOGICAL MAP

A.C.A. HOWE INTERNATIONAL LIMITED
TORONTO VANCOUVER

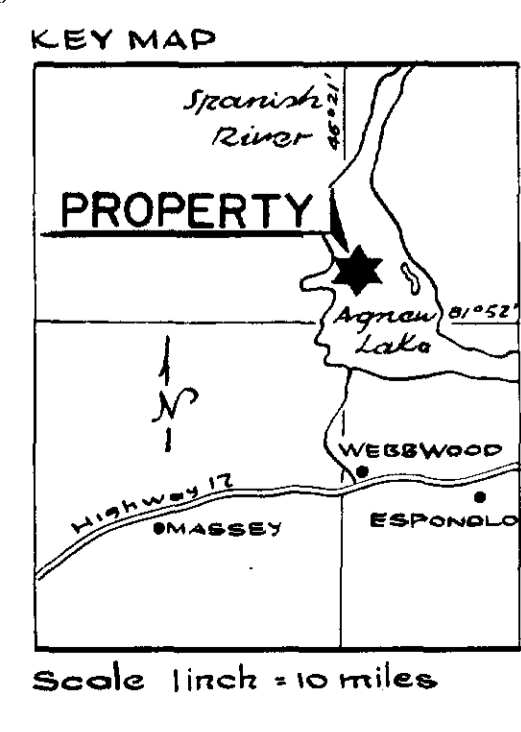
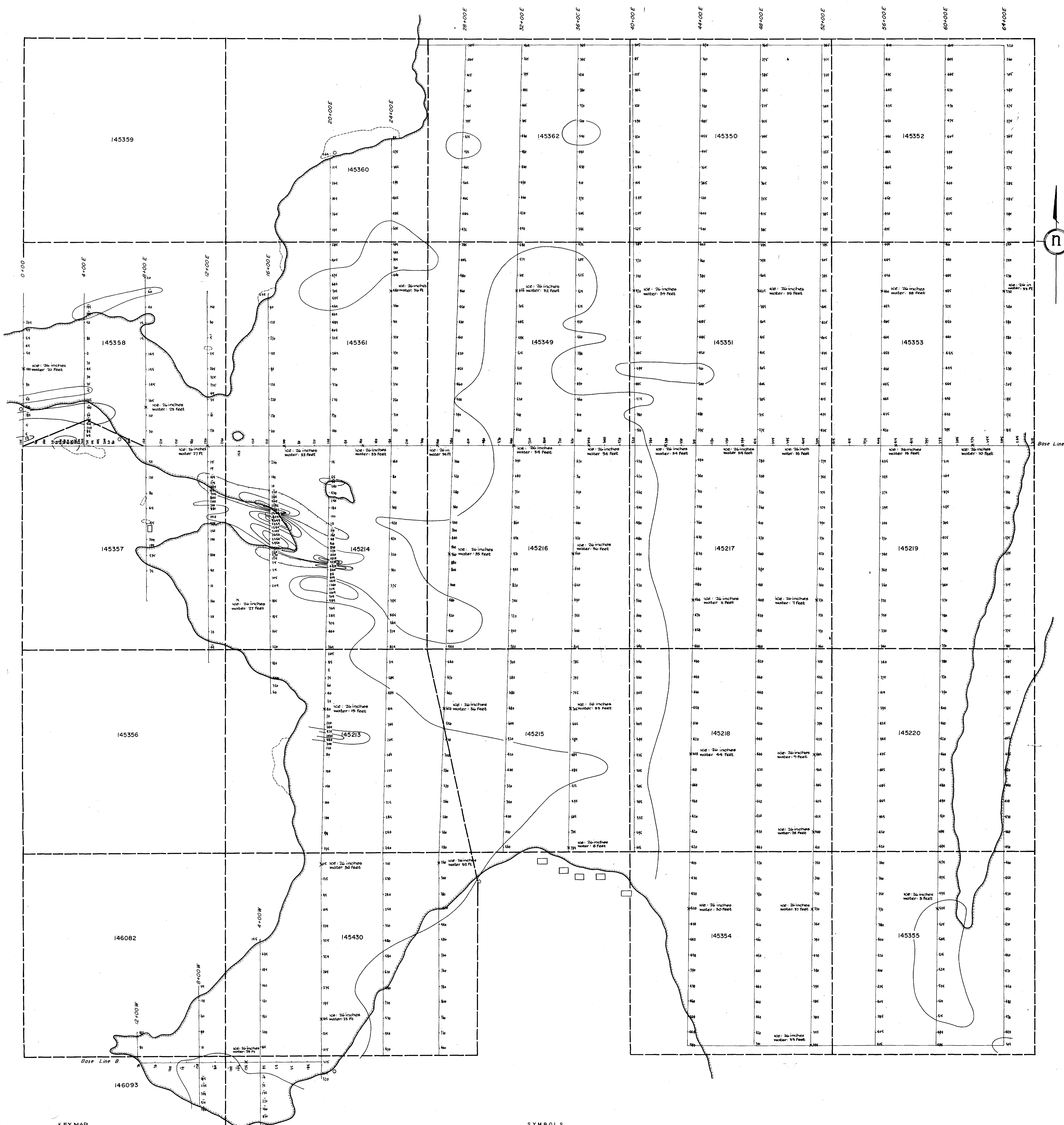


GEOLOGY BY: NORMAN BREWSTER & DR. KENNEDY AUG. 1968

30/11/68

AGNEW LAKE
LODGE
1000 Feet

SHAKESPEARE - 0028, #2



SYMBOLS

- Measurement station along picket line
- Relative value of the vertical component of the earth's magnetic field in gamma
- Magnetic contours 500 gamma contour interval
- Magnetic depression
- Claim posts

Instrument: Sharpe MF-1 fluxgate Serial # 606214

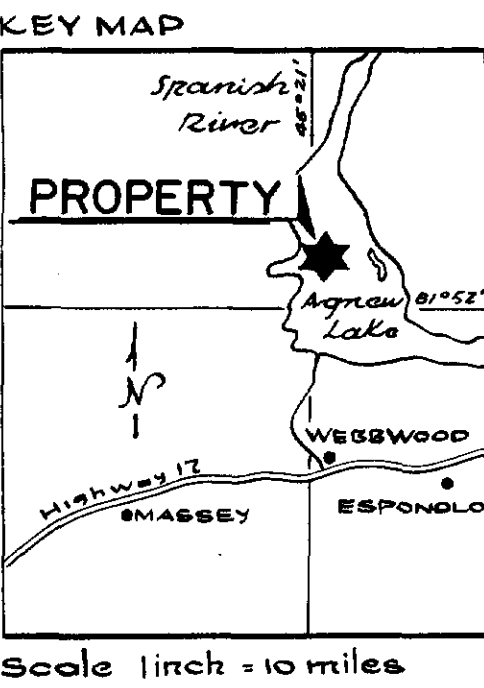
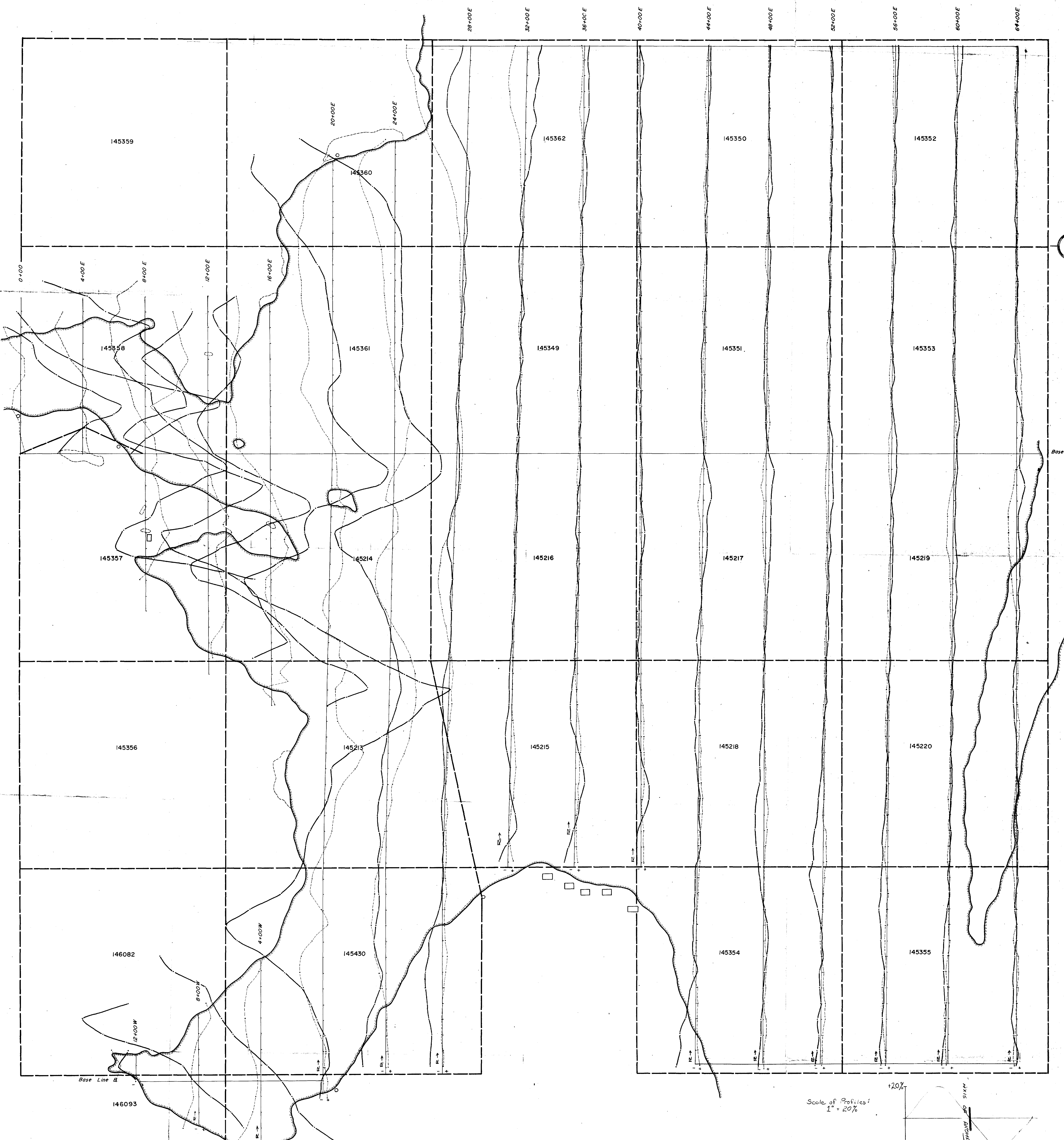
PICK MINES LIMITED
SHAKESPEARE TOWNSHIP-ONTARIO

MAGNETOMETER SURVEY

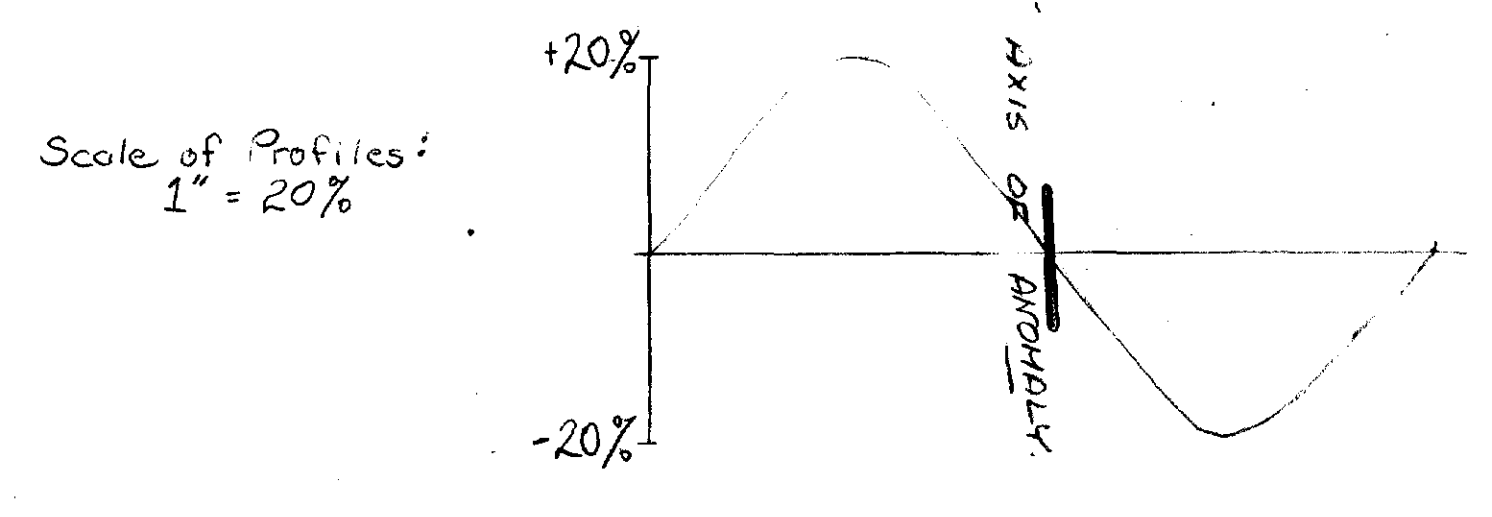
ACA.HOWE INTERNATIONAL LIMITED



SHAKESPEARE-0028 #3



SYMBOLS
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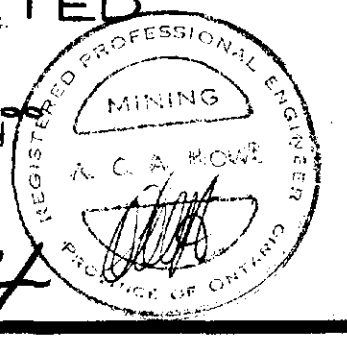


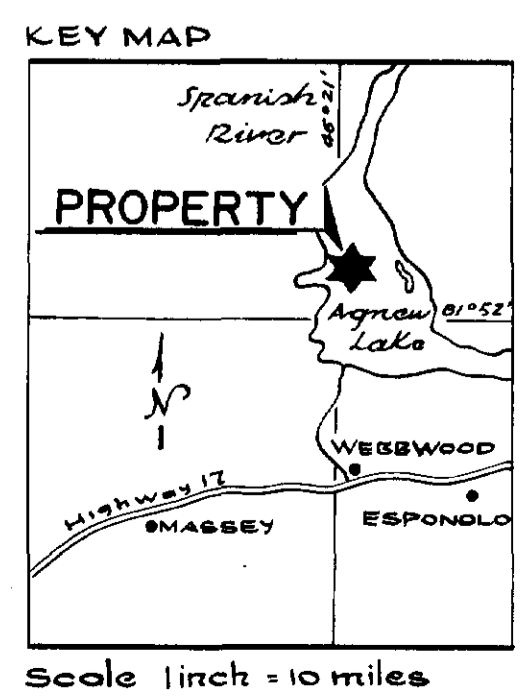
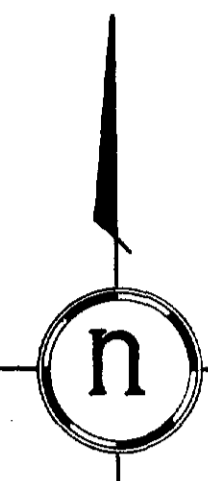
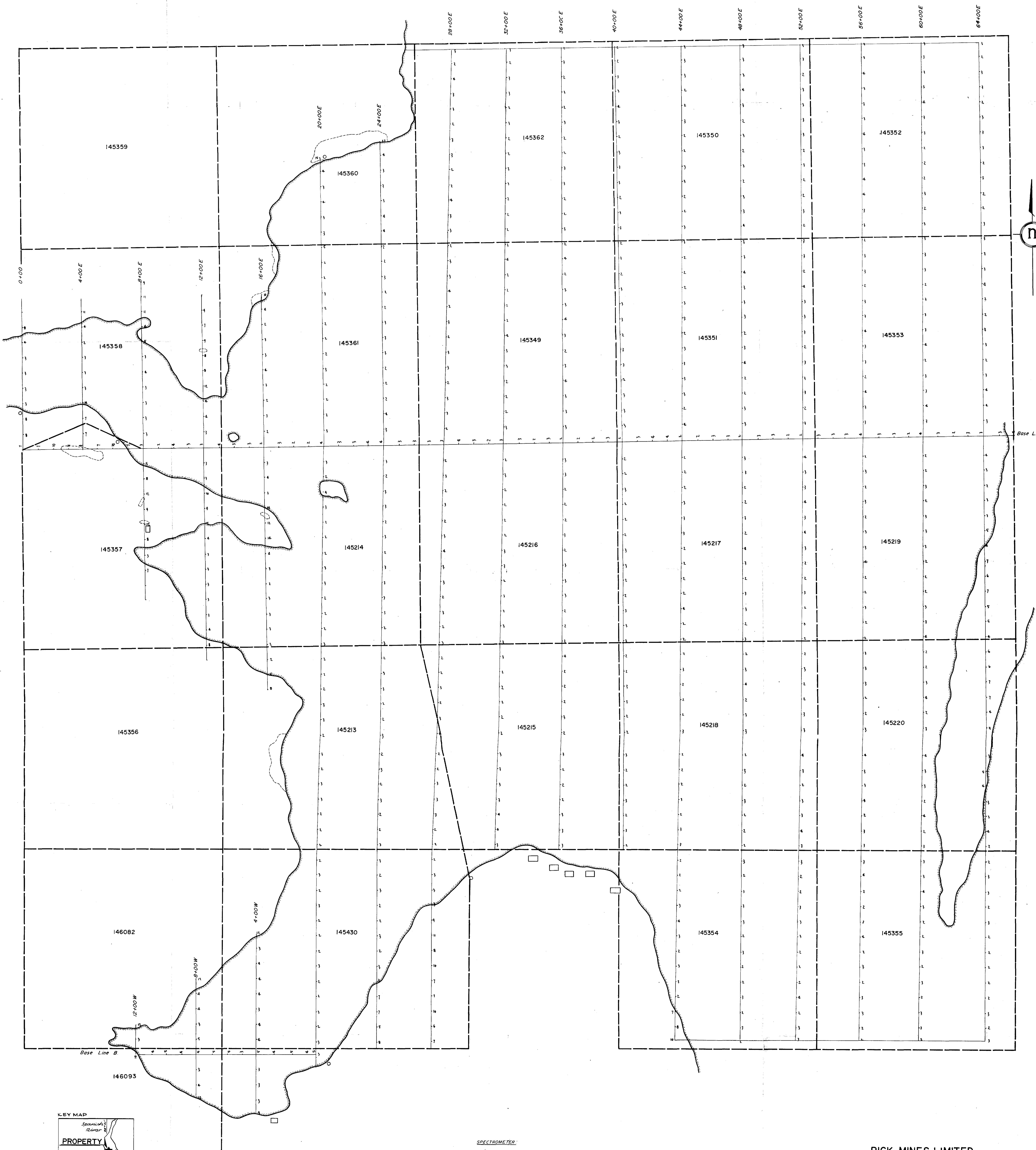
PICK MINES LIMITED
 SHAKESPEARE TOWNSHIP - ONTARIO

ELECTROMAGNETIC SURVEY
 by
 A.C.A. HOWE INTERNATIONAL LIMITED



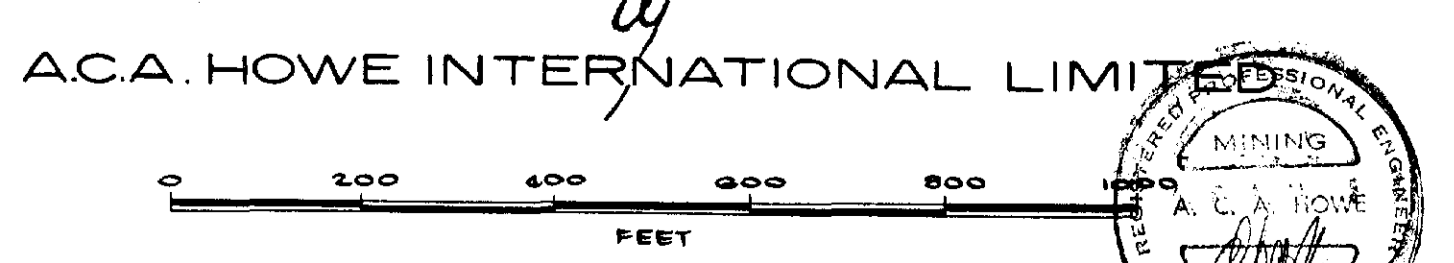
SHAKESPEARE-0028 #4



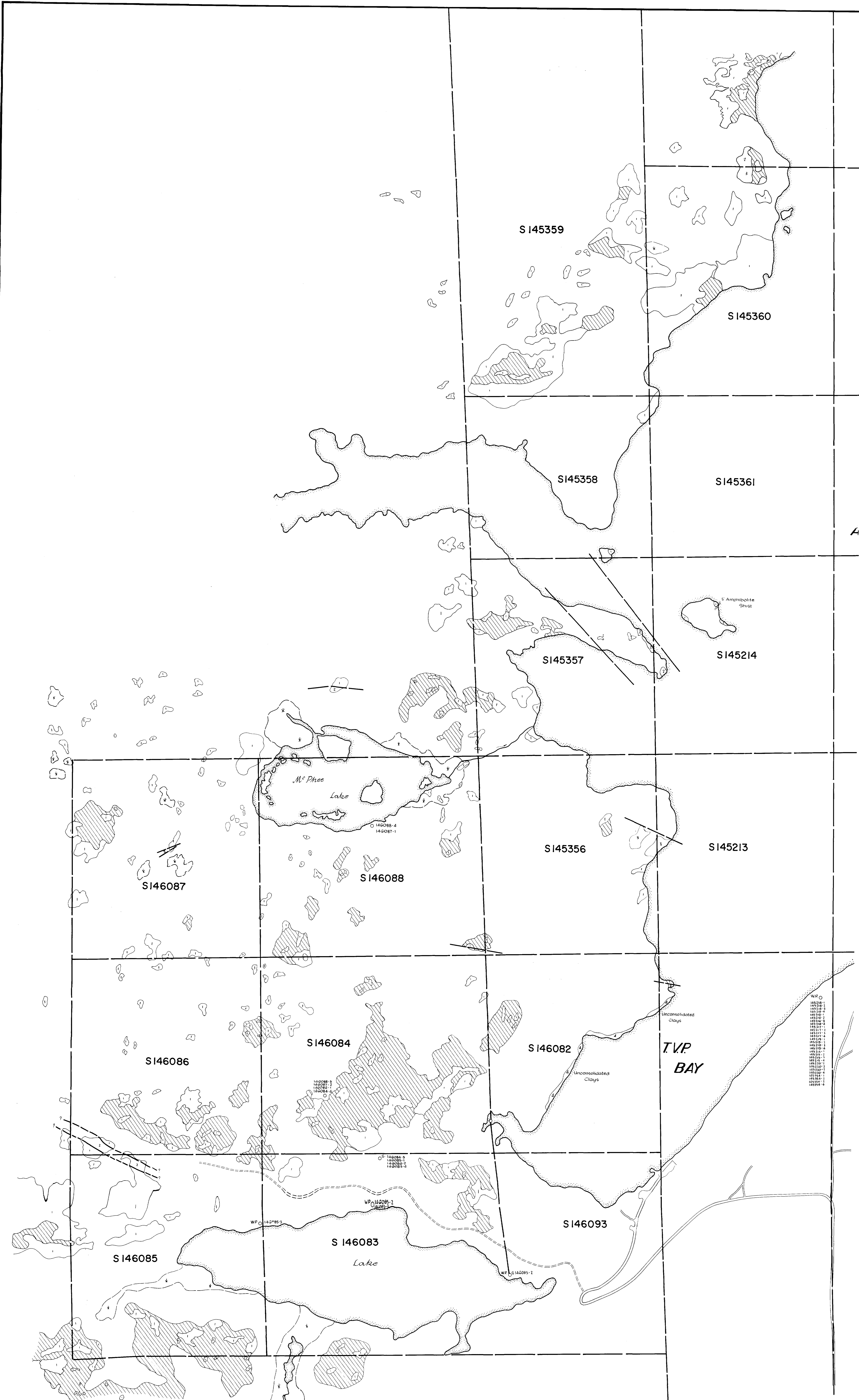


SPECTROMETER:
 Gain set at 12 cps
 All readings taken at:
 Time constant 2 seconds
 Threshold control 030

PICK MINES LIMITED
 SHAKESPEARE TOWNSHIP - ONTARIO
GAMMA RAY SPECTROMETER SURVEY



SHAKESPEARE-0028#5



A

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S 145362

S 145350

S 145352

S 145349

S 145351

S 145353

S 145216

S 145217

S 145219

AGNEW

LAKE

SAND

Pond

SAND

S 145215

S 145218

S 145280

SAND

AGNEW LAKE
LODGE
1000 Feet

