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Summary

Hardiman Bay Mines Limited holds a group of mining claims in Horwood Township, Sudbury Mining Division, Ontario, which has undergone preliminary exploration. The results of diamond drilling, geological mapping, and magnetic surveying indicate that further work is justified. An electromagnetic survey, at an approximate cost of \$4,500 is recommended for the purpose of locating conductive zones that may reflect base metal deposits. Prospecting for gold by means of diamond drilling is also recommended, conditional on a possible concurrent drilling program undertaken primarily for base metal exploration.

Property

Twelve contiguous unpatented mining claims, number S-119686, S-132912 - 132917 incl., S-132919 - S-132923 incl., comprise the property of approximately 480 acres, which are held in good standing until October 13, 1966 by Hardiman Bay Mines Limited.

Location and Access

Located in the southwestern quarter of Horwood Township, Sudbury Mining Division, Ontario, the property lies three miles to the west of Horwood Lake and about one mile north of the township's southern boundary, at a distance of approximately 65 air miles southwest of Timmins.

Access from Timmins is by way of Highway 101 to Foleyet, thence by means of a lumber road to Wade's Camp on Hardiman Bay, an arm of Horwood Lake. From Wade's Camp transportation requires the use of boat or barge down Hardiman Bay a distance of about five miles to Orofino Mines Landing, from which a good dirt road leads about two miles to a point about one mile north of the property.

Surface Conditions

The relief is low. Swamps are prevalent on the western claims, where only a few low ridges exist. The eastern claims lie on slightly higher ground. Minor streams traverse the western area, and small lakes occur near the boundaries.

The vegetation consists chiefly of typical northern Ontario spruce, jack pine, poplar and birch.

Other than a tractor road entering the centre of the property, there are no surface improvements.

History of the Property

The property has no known mining exploration history previous to 1961, when it was staked, although it is highly probable that itinerant prospectors examined all surface outcrops in the general vicinity. The claims were acquired by Hardiman Bay Mines Limited in 1962.

Recent Work Performed

During July and August 1963, five diamond drill holes totalling 1,046 feet were completed on Claim No. S-132917. The westward extension of a gold-bearing quartz network was thus investigated at shallow depth.

In the Autumn of 1965, Sulmac Exploration Services Limited conducted a magnetic survey over a grid of picket lines established for this purpose. Several magnetic anomalies were outlined.

In May 1966, Mr. R. H. Duthie, a geologist employed by Sulmac Exploration Services Limited, performed a geological survey over the claims. The geological map accompanying this report is the result of the survey.

Regional Economic Geology

The property is situated within the southwest extension of a complex regional belt of folded and faulted Early Pre-Cambrian (Archaen) volcanic and sedimentary rocks invaded by intrusions of diverse classification from granite to ultrabasic. Except for an area of Late Pre-Cambrian (Proterozoic) rocks branching southward from the Early Pre-Cambrian belt, and except for Palaeozoic rocks overlying a few small areas of the belt, the entire complex is irregularly enveloped and embayed by Pre-Cambrian intrusives of the Canadian Shield. The belt extends eight hundred miles from

well northeast of Chibougamau in Quebec to well southwest of Timmins in Ontario. About 30 miles southwest of Timmins, the belt contracts narrowly in Hillary Township, where it may actually be non-existent, only to dilate farther to the southwest.

Major ore bodies of precious and base metals, chiefly gold, copper and zinc, occur in the regional belt. The more important ore bodies are the gold mines of the Val d'Or, Kirkland Lake, and Timmins areas and the base metal mines of the Chibougamau, Mattagami, Rouyn, and Timmins areas. Minor economic base metal and gold deposits, as well as iron and asbestos producers, have also been established in this favourable belt of rocks.

Southwest of the Hillary Township contraction only two ore bodies, the asbestos of Reeves Township and the iron of Kukatush, have been developed to the production stage. Further exploration of this large area, which includes the property, may result in the discovery of large gold and base metal ore bodies.

General Local Geology

The general geology of the Horwood Lake area is described by W. D. Harding, Vol. XLVI, Part 11, 1937, Ontario Department of Mines. The oldest Pre-Cambrian rocks of the area are the predominant basic volcanics of the Keewatin

group, which include minor sedimentary beds, all of which are highly metamorphosed. These have been intruded by Haileyburian diorite, Algoman granitic plutonics and Keweenawan diabase dikes. The following Table of Formations indicates the chronological order of their emplacement if read from bottom to top. All belong to the Pre-Cambrian system.

Table of Formations

Keweenawan	Diabase
(Intrusive contact)	
Algoman	Quartz veins Quartz - feldspar porphyry Granite, syenite
(Intrusive contact)	
Haileyburian	Diorite
(Intrusive contact)	
Keewatin	Sedimentary rocks Volcanic rocks

Geology of the Property

On the property, overburden of unknown thickness mantles most of the underlying Keewatin metamorphosed basalt. The recent geological survey disclosed numerous small basalt outcrops in the western and central area. Two small acidic plugs or short dykes, one being granite and the other quartz-porphyry, intrude the basalt near the centre of the property.

These acid rocks represent the Algomian intrusives, which are generally believed to be the source of quartz and gold mineralization in the region.

On Claim No. S-119686, a magnetic anomaly reflects an easterly striking structure. The form of the anomaly suggests that a northerly trending fault offsets an easterly striking dyke, which may be diabase, but direct evidence of the inferred diabase and possible fault was not found during the geological survey. A narrow iron formation in the Keewatin basalt offers an equally tenable explanation for the anomaly, and a fold rather than a fault may possibly cause the change in its direction. A fold would be favourable for base metal ore deposition, and the possibility of pyrrhotite occurring with economic sulphides must be investigated.

A scarp trending southward into the property may reflect a pre-mineralization fault. If it traverses the property its extension lies east of a gold-bearing quartz network on Claim No. S-132917. The possible intersection of the easterly-striking quartz zone with the possible fault may be a locus of stronger gold mineralization. This intersection, if it exists in fact, is to be found east of the quartz zone, but its exact location cannot be ascertained from present knowledge.

Mineralization

A network of quartz stringers, striking N 45° E, occupies a zone 10 feet wide and 60 feet long on Claim No. S-132917. At the surface this zone carried minor pyrite, carbonate, and gold, with the best chip sample over a width of four feet running 0.38 ounces of gold per ton. Five diamond drill holes were bored in the westerly extension of this zone with the object of testing the occurrence at shallow depth. The results of the drilling were negative, but a possible easterly extension of the zone has not been tested. Elsewhere on the property, minor pyrite occurs in metamorphosed basaltic outcrops.

Conclusions

The probability of easily locating an economic deposit of gold on this partially explored property is not strong. Nevertheless, gold ore may exist. The most promising locus for gold mineralization is the juncture of the known quartz network and the inferred southerly-striking fault. The exact location of this locus, if it exists, has not been determined, but it may occur within a zone extending N 45° E from the gold-bearing quartz showing. It is in this zone that any further prospecting for gold should be concentrated.

An offset or folded magnetic feature on Claim No. 119686 may possibly reflect a structure containing base metal ore. Sulphides may occur elsewhere on the property in the volcanic rocks underlying the overburden.

Recommendations

It is recommended:

- (1) That an electromagnetic survey be performed over the established picket lines and that any anomalies interpreted as reflections of possible sulphide ore bodies be tested by diamond drilling.
- (2) That the possible juncture of the known gold-bearing quartz network with the inferred south-striking fault be sought by diamond drilling in the area lying immediately northeast of the showing, subject to possible concurrent drilling arising from electromagnetic surveying.
- (3) That, in order to reduce costs of diamond drilling, action on the second recommendation be deferred until after conductive zones are indicated by electromagnetic surveying.

Estimate of Costs

The total cost of the recommended electromagnetic survey would be approximately \$4,500. As a programme of diamond drilling would depend on the results of the electromagnetic survey, and as resumed exploration of the gold structure would depend on concurrent drilling for base metals, an estimate of drilling costs is premature at this date.

Respectfully submitted,

SULMAC EXPLORATION SERVICES LIMITED



C. T. Ritchie, B.Sc., P.Eng.

June 14, 1966



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GEOPHYSICAL REPORT
ON PROPERTY OF
HARDIMAN BAY MINES LTD.

HORWOOD TOWNSHIP
SUDBURY MINING DIVISION
PROVINCE OF ONTARIO

Summary and Recommendations

A ground magnetometer survey was carried out over a group of claims held by Hardiman Bay Mines Ltd. and located in Horwood Township, Sudbury Mining Division, Ontario.

The survey showed the western half of the property to exhibit moderately high magnetic relief with several magnetic highs in contrast to the flat magnetic relief of the eastern half. As some ambiguity exists as to the cause of the magnetic highs, it is recommended that a geological examination of the magnetic contacts and outcrops of the western half be carried out, followed by an electromagnetic survey to try and detect the presence of sulphide mineralization.

The cost of such a programme would be in the order of \$6,000.00.

Introduction

From October 17th to November 24th, 1965, Sulmac Exploration Services Limited carried out a ground magnetometer survey over a group of claims held by Hardiman Bay Mines Ltd. and located in Horwood Township, Sudbury Mining Division, Ontario.

The survey was run over a north-south grid, the picket lines being turned off every 400 feet from an east-west baseline, and chained at 100 foot intervals. Readings were taken every 100 feet using a Sharpe Fluxgate magnetometer with additional readings every 50 feet where deemed necessary.

The results of the survey and the interpretation are shown on the accompanying map with the results of the survey being presented in contoured form. The map is at a scale of 1" = 200'.

Purpose

The purpose of the survey was to examine the magnetic rock units to see if there is any structure that could be favourably associated with mineralization.

Property & Location

The property is located in Horwood Township, Sudbury Mining Division, Ontario.

The survey was carried out over the following mineral claims:

S 132912 - 17 inclusive

S 132919 - 23 inclusive

S 119686

The claims are situated some sixty-five miles southwest of Timmins, in the southwest quarter of Horwood Twp. Access is either by float aircraft to Horwood Lake 3/4 of a mile east of the property, or by road to Jack Wade's camp and thence 5 miles by boat down Horwood Lake to Orofino Landing. However, as freeze-up conditions existed at the time the job was undertaken, access was provided solely by helicopter.

Survey Specifications

The survey was done using a Sharpe Fluxgate magnetometer. This measures variation in the vertical component of the earth's magnetic field to an accuracy of ± 10 gammas. Corrections for diurnal variations were made by tying-in to previously established base stations at time intervals not exceeding two hours. Readings with this instrument were taken every 100 feet along the picket lines with additional readings at 50 feet where necessary. In all, a total of 594 readings, or 11.9 miles, were done.

General Geology

The consolidated rocks of the area consist largely of early pre-Cambrian Keewatin lavas and sediments which have been intruded first by Haileyburian diorite, then by Algomian granite, and again late in pre-Cambrian time by diabase.

The Algomian mineralization is important. Mineralized quartz veins, sulphide bearing porphyry dykes, and shear zones containing both quartz and sulphides have been found at scattered locations throughout the area.

Discussion of Results

The results of the magnetometer survey showed the eastern half of the property to exhibit very little magnetic relief in contrast to the moderately high relief of the western half.

Thus, it appears that while the eastern half is underlain by one magnetic rock type with considerable thickness of overburden, the western half is underlain by more than one magnetic rock type with only a thin layer of overburden.

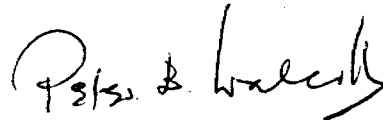
Several magnetic highs are noted in the western half as outlined on the interpretation map. One of these, M₁, is interpreted as being caused by a diabase dyke offset by faulting, whereas a certain ambiguity exists as regards the cause of the others. This ambiguity could be partially resolved by a geological examination of the outcrops (if any exist, as the survey was done over a cover of snow) and magnetic contacts.

Conclusion and Recommendations

It is suggested that further work consist of a geological examination of the western half of the property, followed, if warranted, by an electromagnetic survey to try and detect the existence of sulphide mineralization. This phase of exploration would require an approximate expenditure of \$6,000. Based on results of this programme, diamond drilling would be recommended, if warranted.

Respectfully submitted,

SULMAC EXPLORATION SERVICES LIMITED



Peter E. Walcott, B.A.Sc., P.Eng.
Geophysicist.

December 7, 1965

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

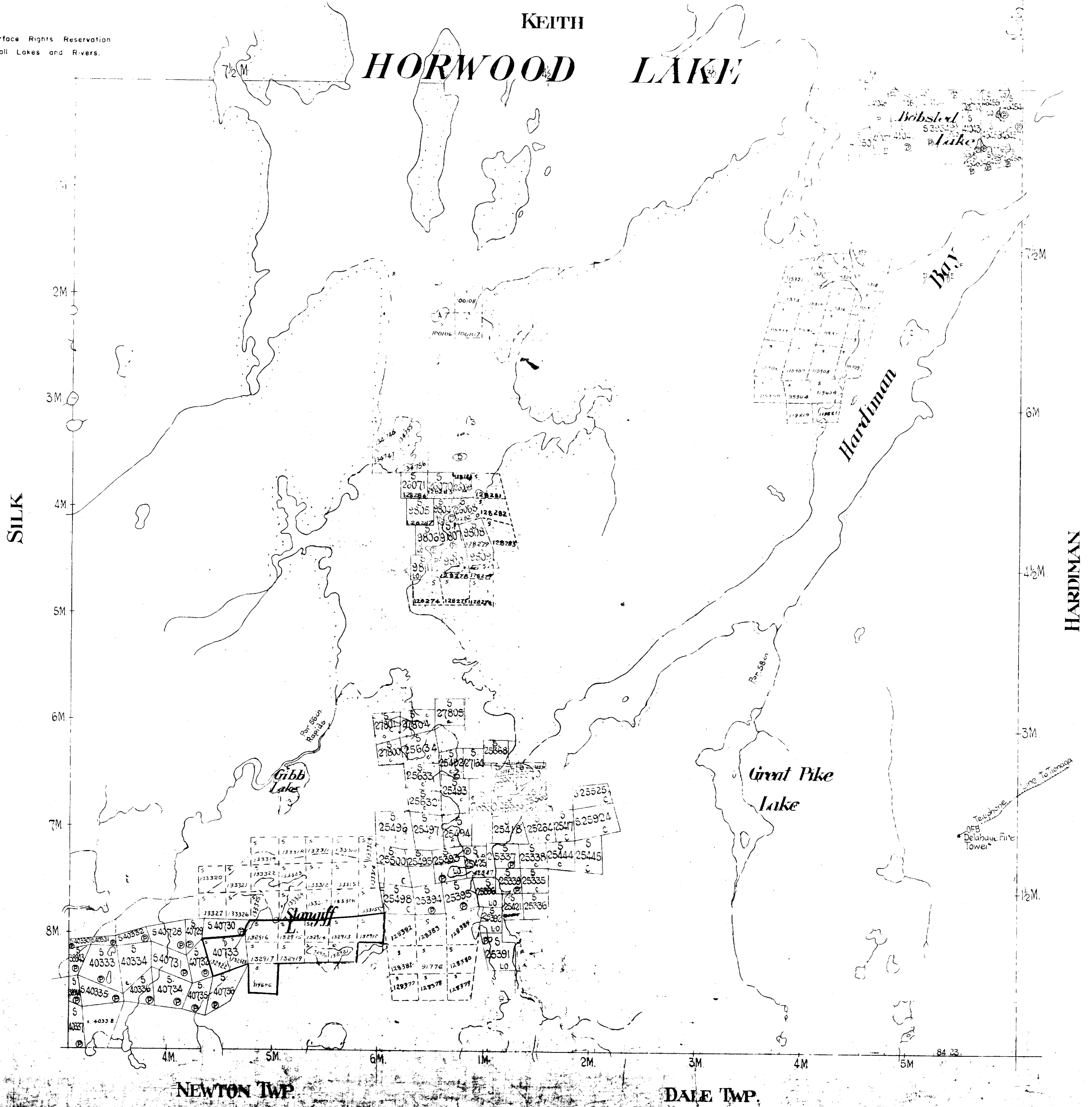
DATE OF ISSUE
NOV 17 1966
ONTARIO DEPT. OF MINES

HORWOOD TWP

SUDBURY MINING DIVISION
DISTRICT OF SUDBURY

Scale: 40 Chains - 1 Inch

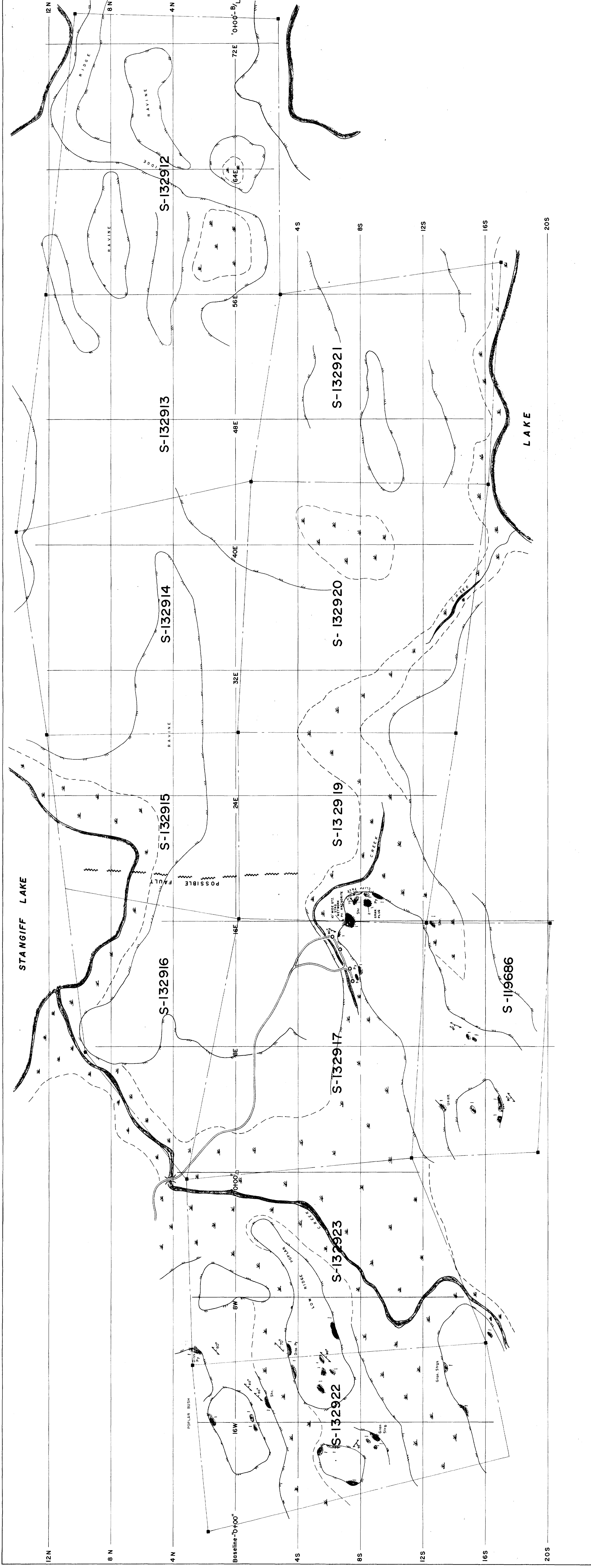
NOTE
400' Surface Rights Reservation
around all Lakes and Rivers.



M. 936

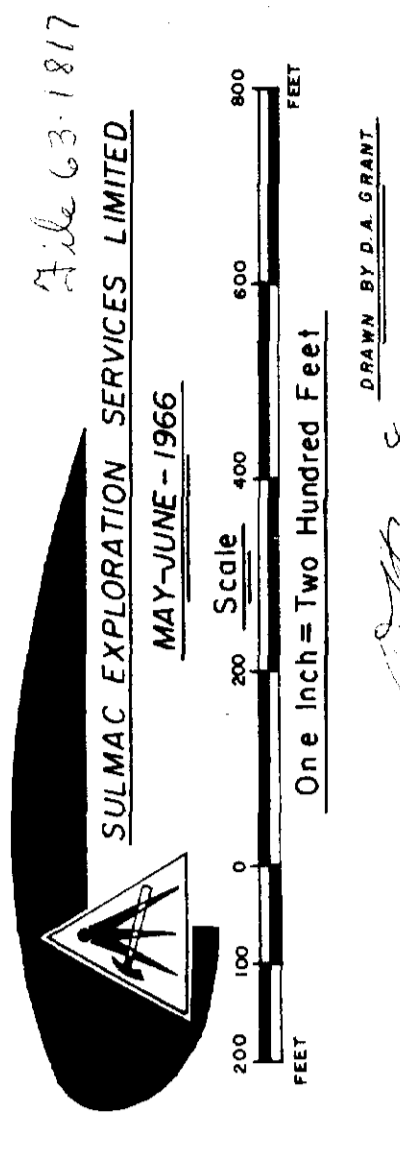


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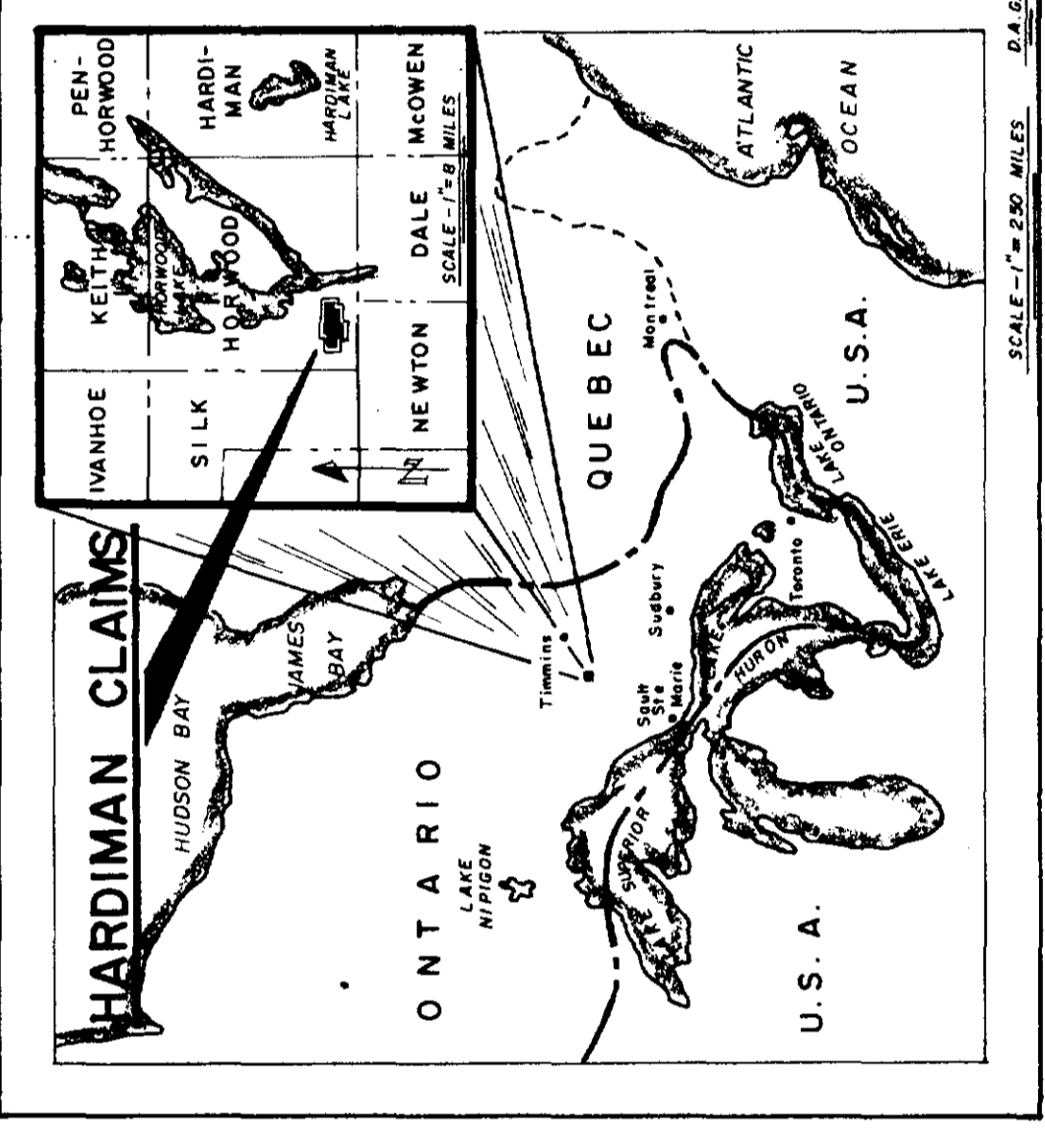


HARDIMAN BAY MINES LTD
 HORWOOD TOWNSHIP, DISTRICT OF SUDBURY, ONTARIO
 SUDBURY MINING DIVISION

GEOLOGICAL SURVEY

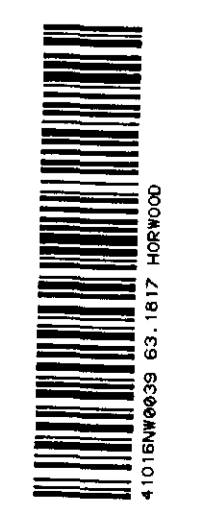
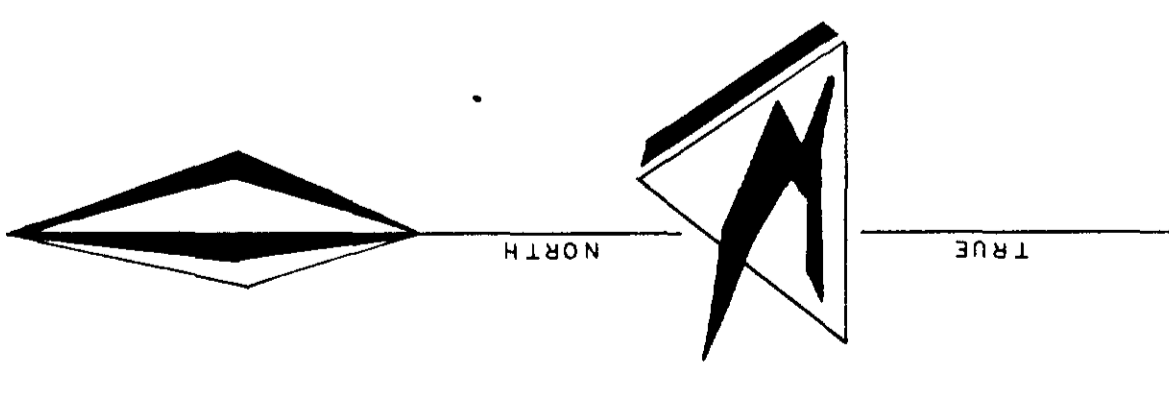


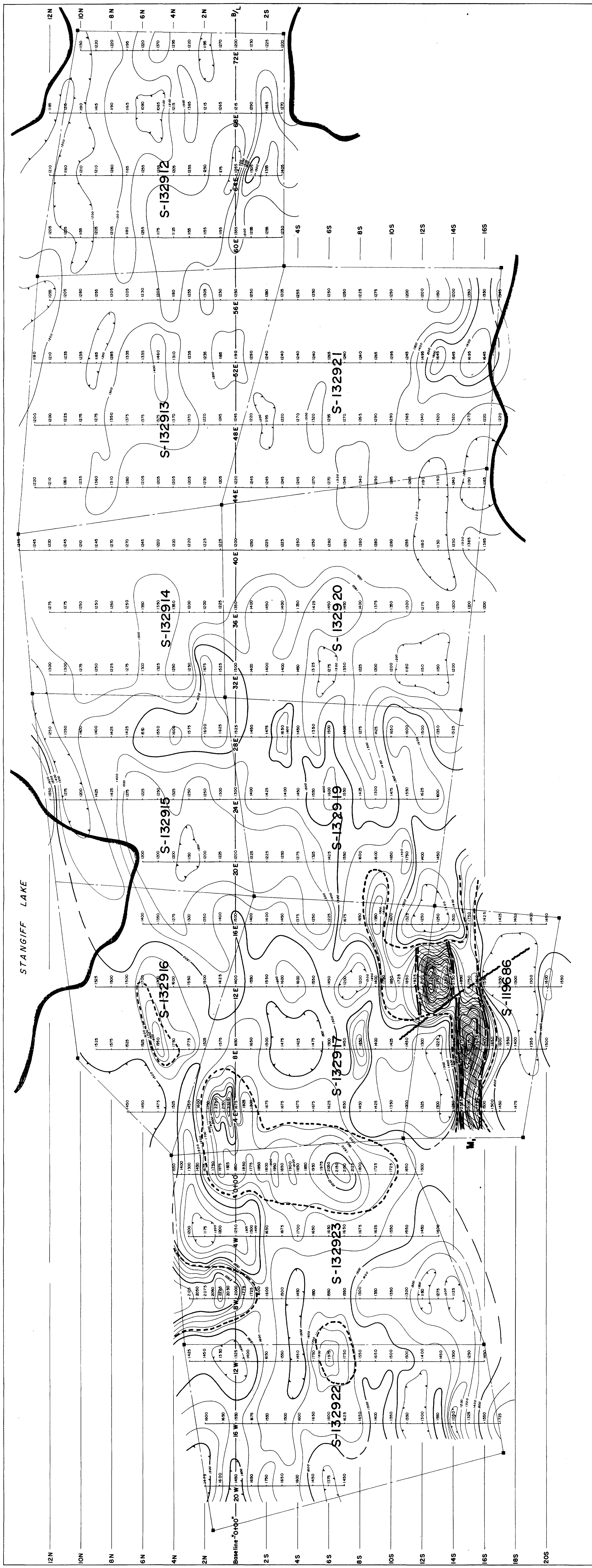
LOCATION MAP



LEGEND

- ABBREVIATIONS**
- Dns - DISSEMINATED
 - Py - PYRITE
 - Sh - SHALES
 - Sw - SWAMP
 - Uwp - UNALTERED
 - Qtz - QUARTZ
- SYMBOLS**
- CLIFF & RIDGE
 - FAULT
 - OUTLINE
 - SWAMP
 - UNALTERED
 - OUT CROP
 - SCHISTOSITY STRIKE, DIP
 - CLAIM POST & BOUNDARY
 - DIAMOND DRILL HOLE
 - ROAD
 - LINE OUTLINE
- GEOLOGY**
- 1 BASALT
 - 2 GRANITE
 - 3 QUARTZ PORPHYRY

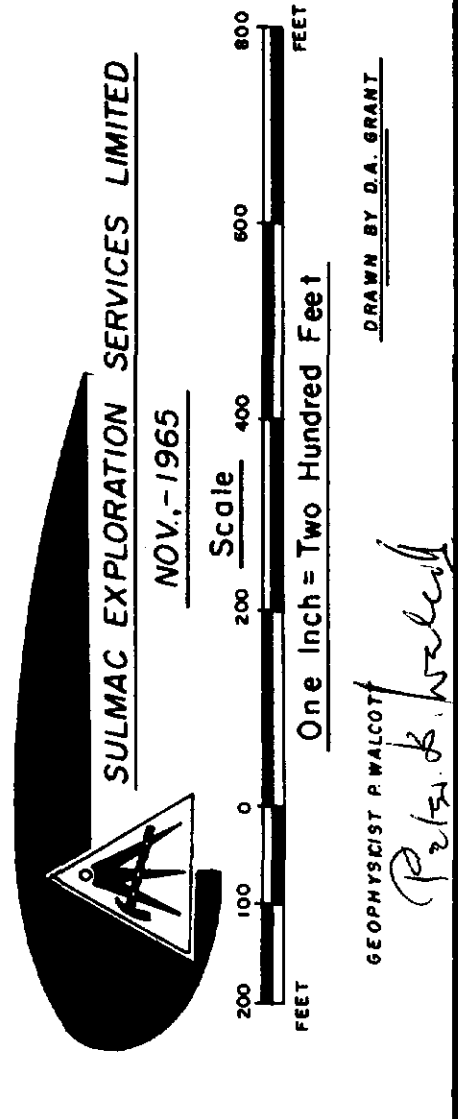




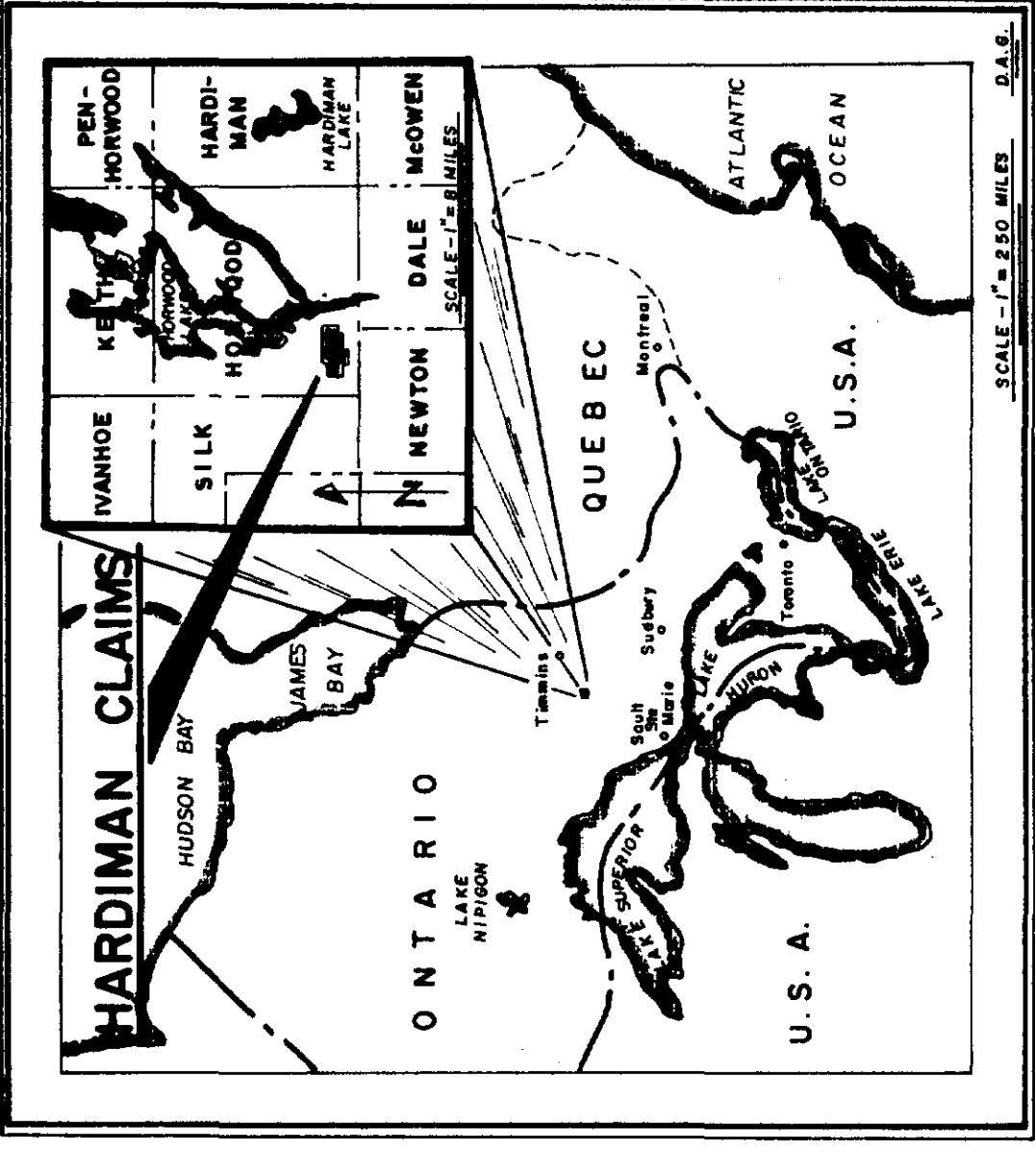
STANGIFF LAKE

HARDIMAN BAY MINES LTD
 HORWOOD, TOWNSHIP, DISTRICT OF SUDBURY, ONTARIO
 SUDBURY MINING DIVISION

MAGNETOMETER SURVEY



LOCATION MAP



LEGEND

MAGNETOMETER SURVEY
 Contour Interval 100 Gamma
 --- 500 Gamma Contour
 --- 100 Gamma Contour
 --- Magnetic Depression

MAP SYMBOLS
 - - - Claim Post and Claim Boundary
 — Lake Outline
 - - - Magnetic Contact
 - - - Interpreted Fault
 - - - Interpreted Dyke

