



Mineral Deposit Series Report No. 32

# Mineral Deposits and Occurrences in the Island Lake Area, NTS 53E/15, /16, 53F/13 and parts of 53E/9, /10, 53F/12

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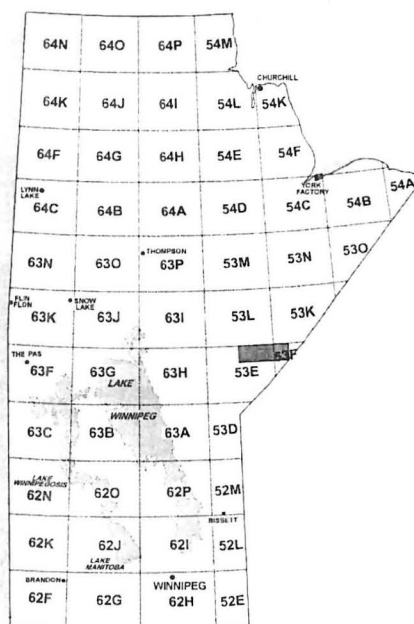
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## INTRODUCTION

This report and accompanying map are part of a Mineral Deposit Series presenting a uniformly organized and up-to-date collation and analysis of information on mineral occurrences in the Province of Manitoba. The series is intended: (1) to provide explorationists with a geoscientific database that can be used in mineral exploration; and (2) to provide a technical database for government use in resource evaluations, formulation of mineral and land use policies and the initiation of regional development programs.

### Methodology

The documentation program was initiated in the main mining districts of the province under the 1984-1989 Canada-Manitoba Mineral Development Agreement. Under this project mineral deposit geologists of the Geological Services Branch (now the Manitoba Geological Survey) have attempted to inspect and evaluate each known mineral occurrence. These site visits ranged from a preliminary half-day or less search of an area for old workings, to extensive geological mapping of selected occurrences for a week or more. In addition, for each occurrence the geologists have attempted to synthesize available data from published and unpublished sources. The Manitoba Mineral Inventory Card Index and the cancelled Assessment Files have been used extensively in the preparation of this report. Mineral occurrence documentations representing only cancelled assessment file compilations are identified as such under the heading 'Name'. Information for all other occurrences was acquired primarily by field examination supplemented by cancelled assessment file compilations.

### Deposit versus occurrence

Throughout this report mineralization is referred to as a deposit if tonnage and grade figures are known; all other mineralization is referred to as an occurrence.

### Massive sulphide versus solid sulphide

The use of 'massive sulphide' in the geological literature is confusing in that it is not always clear whether the authors are referring to a 'massive sulphide deposit' (cf. Sangster, 1972) or a section of sulphide-rich rock. In this publication 'massive sulphide' will be used in reference to a deposit type, i.e., a volcanogenic massive sulphide deposit type, rather than the nature of the mineralization. A volcanogenic or sedimentogenic massive sulphide deposit can contain a sulphide lens that locally contains as little as 10% sulphide minerals by volume. The alteration zones that are an integral part of many massive sulphide deposits rarely contain more than 50% sulphide minerals. Consequently, the use of 'solid sulphide' for 75% to 100% and 'near solid sulphide' for 50% to 75% sulphide minerals is adopted in place of the commonly used term 'massive' to describe the textural aspects of a sulphide mineralization.

## Format of mineral deposit maps

### Location

One of the incentives spurring mineral deposit documentation was the absence of accurate location maps for known mineral occurrences. Inaccurate land bases have previously resulted in failure to find old workings, surveys conducted in wrong areas, and even cancellation of intended surveys by explorationists. Consequently, considerable field time has been spent in establishing occurrence locations and attempts have been made to display exact locations both on the map and in the accompanying report.

The location number of the map is a unique reference number that will be used both in the report and the geologists' unpublished database. Where the volume of occurrence/deposit data within a 1:50 000 NTS map sheet is large enough to be more efficiently presented by dividing the map sheet in half or into quadrants (cf. Map MDS87-1, NTS 63K/13 SE) reference numbers will be consecutive only within the individual map sheet. Where the density of data warrants the publication of a 1:100 000 map sheet (e.g., this volume), location numbers are consecutive within each 1:50 000 area.

### Deposit types

In order to maintain a mineral deposit classification, which will be useful to both explorationists and metallogeneticists, a simplified descriptive classification was selected. This classification is based on the use of common deposit types for the classification of both deposits and occurrences. The classification of mineralization is based on the premise that the mineral explorationist requires information on metals and types of mineralization in an area as well as on the economic deposits (past, present and future producers).

All deposits and occurrences are classified according to the Deposit Type classification in Table 1.

The deposit type displayed on the map represents mineralization with the greatest economic potential, for example a disseminated narrow chalcopyrite layer is emphasized rather than a much thicker solid pyrite-graphite layer.

### Mineralization

A symbol is used to denote the percentage and/or type of mineralization present. At some localities more than one type of mineralization is present. The type of mineralization displayed in the symbol represents the mineralization with the greatest economic potential as indicated by the deposit type symbol. It should be noted that in the context of this report a "sulphide facies iron formation" is equivalent to a "sulphide stratum". For a discussion of sulphide stratum the reader is referred to Gale *et al.* (1980).

### Host rocks

In general, this description refers to the immediately underlying and overlying rock types. When a number of rock types are present in an extensive zone of mineralization, the most common rock types are indicated.



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**TABLE 1: MINERAL DEPOSIT TYPES**

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**STRATABOUND MASSIVE SULPHIDE-TYPE DEPOSITS**

- a) Volcanic rock associated
- b) Sedimentary rock associated
- c) Alteration zone associated with a or b

**CHEMICAL SEDIMENT-TYPE DEPOSITS**

- a) Sulphide facies iron formation
- b) Oxide facies iron formation
- c) Carbonate facies iron formation
- d) Silicate facies iron formation
- e) Other chemical sediments

**VEIN-TYPE DEPOSITS**

- a) Single vein
- b) Multiple veins or lenses
- c) Stockwork

**MAGMATOGENIC-TYPE DEPOSITS ASSOCIATED WITH MAFIC/ULTRAMAFIC ROCKS**

- a) Disseminated
- b) Layered
- c) Net textured
- d) Podiform

**DEPOSITS WITH PORPHYRY AFFINITIES****PEGMATITE-TYPE DEPOSITS****CLASTIC SEDIMENT-TYPE DEPOSITS****REPLACEMENT-TYPE DEPOSIT****DISSEMINATED MINERALIZATION - NOT CLASSIFIED**

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**Element**

This description allows for a maximum of three metals present in increasing order of abundance by volume. The precious and base metals are indicated in preference to elements such as iron and carbon.

In some instances it has been more efficient on the map and in the report to make reference to an area of mineralization rather than individual deposits or occurrences. All mineralization in the area delineated by a dotted line on the map is referenced in the report under the location number within that area.

**Format of mineral deposit reports****Location**

Each deposit or occurrence description will contain the unique reference number, deposit or claim name where applicable, UTM coordinates, general area description, the reference number of the airphoto on which the deposit can be located and a brief description of method(s) of access.

**Exploration Summary**

This section provides a summary of the extent of exploration and was compiled from Mineral Inventory Cards, cancelled Assessment Files, and maps and files from the Mining Recording Office.

**Geological Setting**

In this section the general geology of a deposit or occurrence is described. The information levels of the descriptions vary considerably and depend largely upon the extent of geological mapping during the documentation

project. For further details the reader should consult the references cited.

**Mineralization**

A detailed description of the mineralization provides readers with the opportunity to make their own evaluation of the significance of a mineral occurrence or deposit.

**Geochemical Data**

Most geochemical data included in this report are summarized from assays listed in drill logs submitted to fulfill assessment requirements. In addition, samples collected for geochemical analysis from site visits are described in this section.

**Classification**

In this section the geologist may indicate the reasons for the classification appearing on the Mineral Deposit Map. For those localities containing more than one deposit type, the deposit types not shown on the map are documented here.

**References**

These include both published and unpublished sources. For published and assessment report information the reader should obtain the desired material directly from the source. The mineral deposit geologists will endeavor to supply copies of unpublished material on a deposit by deposit basis. References listed at the end of each occurrence description may also include sources of additional information not directly cited in the text.

**Abbreviations**

The following abbreviations are used throughout the occurrence descriptions:

AEM	airborne electromagnetic
A.F.	assessment file(s)
AFMAG	audiofrequency magnetic
AMAG	airborne magnetic
apy	arsenopyrite
Ag	silver
Au	gold
bn	bornite
cm	centimetre
c	carbonatized
Cd	cadmium
Co	cobalt
conc	concentration
cp	chalcopyrite
Cu	copper
DDH	diamond-drill hole(s)
EM	electromagnetic
fsh	fuchsite
g/t	grams per tonne
hem	hematite
HLEM	horizontal loop electromagnetic
if	iron formation
m	metre
MAG	magnetic

MDS	Mineral Deposit Series
mb	molybdenite
Mo	molybdenum
Ni	nickel
Pb	lead
ppb	parts per billion
ppm	parts per million
po	pyrrhotite
py	pyrite
qtz	quartz
shr	sheared
to	tourmaline
tr	trace
VL-EM	vertical loop electromagnetic
VLF-EM	very low frequency electromagnetic
Zn	zinc

### Acknowledgments

During the course of the mineral occurrence documentation in the Island Lake area a number of seasonal assistants provided valuable help that I would like to acknowledge herewith. In addition I would like to acknowledge the hospitality and friendship of R. Birch in Garden Hill and

the participation of H. P. Gilbert, who was instrumental in assembling the map, and contributed both geological and geochemical data and expertise to this report. N. MacLellan's organizational capabilities and able assistance and M.A. Cameron's attention to detail helped to bring this project to completion. I would also like to acknowledge the following individuals for their assistance in the preparation of this report:

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### NOTE:

This mineral deposit report and the accompanying map are intended to be active documents that can be updated as new information becomes available. Although revisions of the publication are anticipated, any additional unpublished information may be obtained by contacting the author or the Director, Manitoba Geological Survey.

## GEOLOGY OF NTS AREAS 53E/9, 53E/10, 53E/15, 53E/16, 53F/12, 53F/13

The geological base for mineral deposit map sheets NTS 53E/9, 53E/10, 53E/15, 53E/16, 53F/12, 53F/13 is compiled from several geological maps:

- 1) Island Lake, 1:63 360 scale by Godard (1963c);
- 2) York Lake, 1:63 360 scale by Godard (1963d);
- 3) Sagawitchewan Bay, 1:63 360 scale by Godard (1963e);
- 4) Island Lake, 1:253 440 scale by Quinn (1960);
- 5) Compilation of the geology and exploration work in the Island Lake area, 1:25 000 scale by Theyer (1980b);
- 6) Cochrane Bay, 1:20 000 scale by Neale and Weber (1981a);
- 7) Island Lake - Sinclair-Savage Islands, 1:20 000 scale by Neale (1981);
- 8) Waasagomach Bay, 1:20 000 scale by Weber *et al.* (1982);
- 9) Garden Hill, 1:20 000 scale by Neale *et al.* (1982);
- 10) St. Theresa Point, 1:20 000 scale by McGregor and Weber (1982, 1-3);
- 11) Island Lake, 1:20 000 scale by Gilbert *et al.* (1982);
- 12) Island Lake, 1:20 000 scale by Gilbert *et al.* (1983);
- 13) McGowan Lake, 1:20 000 scale by Weber (1983);
- 14) Krolman Lake, 1:20 000 scale by Weber (1983);
- 15) Loonfoot Island, 1:20 000 scale by Gilbert (1984b);
- 16) Loonfoot Island, 1:20 000 scale by Gilbert (1985a);
- 17) Meegeesiwaseeson Island, 1:20 000 scale by Gilbert (1985d);
- 18) Geology, Island Lake, Manitoba-Ontario, 1:250 000 scale by Ermanovics *et al.* (1987).

The map area is underlain by Archean supracrustal and intrusive rocks of the Sachigo subprovince of the Superior Province of northeast Manitoba. The Archean supracrustal rocks of the Island Lake greenstone belt consist of polydeformed greenschist facies ultramafic to intermediate and subordinate felsic volcanic rocks and associated iron formation, argillite and wacke. This sequence is unconformably overlain by a succession of exclusively clastic sedimentary rocks.

Wright (1928a) subdivided the volcano-sedimentary rocks of the Island Lake greenstone belt into the basal volcano-sedimentary Hayes River Group, unconformably overlain by the dominantly sedimentary rocks of the "Island Lake Series". Weber *et al.* (1982), refined the stratigraphic subdivision of the Island Lake greenstone belt, introducing the terms "Early Supracrustal Rocks" to replace "Hayes River Group"; and "Late Metasedimentary Rocks" to replace "Island Lake Series". However, in this report, only the terms "Early", "Late" and "Post-tectonic Plutonic Rocks" (Weber *et al.*, 1982) are adopted. The widely known terms "Island Lake Group" modified from Wright's (1928) "Island Lake Series" as proposed by Weber (1982) and "Hayes River Group" are used in the interest of clarity and terminological continuity.

The Hayes River Group dated at more than 2886 Ma (Turek *et al.*, 1986), consists largely of fine grained massive to schistose mafic volcanic rocks classified as tholeiitic basalt (Currie, 1984). Furthermore Currie (1984) states, that pillows, amygdulites, flow top breccia and other primary volcanic features are locally recognized, but are obliterated adjacent to

surrounding tonalite. Metre-thick discontinuous felsic volcanic rock units are interlayered with the mafic rocks.

The largely volcanic rocks of the lower Hayes River Group are overlain by a sedimentary rock suite that consists of greywacke and thin discontinuous lenses of pebbly conglomerate, iron formation and black slate. There appears to be only one mafic to felsic volcanic cycle. The supracrustal rocks of the greenstone belt are spatially and temporally connected with tonalitic to granodioritic batholiths. Rocks of similar composition are intercalated with the supracrustal rocks as concordant sills. The shape and disposition of the batholiths appears to be controlled by the original shape of the supracrustal rock belts.

The Bella Lake batholith is separated by a regolith from the overlying Island Lake Group; however, migmatized contacts with rocks of the Island Lake Group were also recognized (Currie, 1984).

The stratigraphic base of the Island Lake Group is a fluvial clastic rock succession, including detritus of tonalitic and mafic volcanic provenance overlain by fluvial clastic rocks derived from distal felsic volcanic edifices. The fluvial regime grades into a marine sequence dominated by turbidity current deposits. Rocks of the Island Lake Group are locally intruded by a tonalite-quartz diorite stock, and mafic dykes equivalent to Molson dykes occur in the northern part of the lake. A K-Ar age of 2592 Ma, determined on hornblende of the regolith in Collins Bay, gives a minimum age for the Island Lake Group. The lithological similarities between some of the sedimentary members of the Island Lake and Hayes River groups and the lack of positive structural evidence preclude, in many cases, positive assignment to either group.

Ames (1975) investigated and sampled ultramafic rocks of the Island Lake area, including the Linklater Island, Fleet Point, Asbestos Islands, Trinity Shoals, Stevenson Island, Jubilee Island, Henderson (formerly High Rock Island), Wapus Bay and Loonfoot Island areas. He concluded that the ultramafic rocks occupy a conformable stratigraphic position between sedimentary and volcanic rocks of the Hayes River group, and may be consanguineous with Hayes River volcanism. He distinguished between porphyritic komatiitic flows, differentiated tholeiitic sills and "transitional" komatiitic to tholeiitic sills characterized by megacrystic olivine crystal suspensions.

According to Theyer (1985), Island Lake ultramafic rocks occur:

- a) associated with epiclastic sedimentary rocks, mafic volcanic flows and gabbro at or close to the boundary between the Hayes River Group and the Island Lake Group;
- b) in locations where the nature of associated rocks is unknown since they are covered with water or in faulted contact; and
- c) in ultramafic rocks on Jubilee Island interpreted to be the stratigraphically lower part of a mafic to ultramafic sill.

According to Park and Ermanovics (1978) and Fyson *et al.* (1978), the structural history of the Island Lake greenstone belt includes at least two periods of deformation. D<sub>1</sub> produced



northeast-southwest to east-west synclines and foliation under greenschist to lower amphibolite metamorphic facies. Igneous intrusion of the early plutonic suite partially controlled the direction of the D<sub>1</sub> deformation. D<sub>2</sub> deformation produced small, steeply dipping folds with east-west striking axial planes producing crenulation cleavage that locally affected the "Late Plutonic suite". A late deformation resulted in broad high-strain zones marked by gneissic and mylonitic belts.

The mineral exploration history of the Island Lake area can be subdivided into four periods: gold prospecting beginning in 1928; exploration for copper and nickel in the mid 1950s; porphyry copper and VMS type deposits in the early 1970s and a second gold exploration phase commencing in 1981.

Prospecting for gold commencing in 1928 resulted in the discovery of two gold-bearing quartz vein districts (Island Lake Gold Mine [Location 1, NTS 53E/16] and Jack of Hearts [Location 1, NTS 53E/9]). After closure of the Island Lake Gold Mine in 1935, the public's interest shifted to the development of a gold-bearing quartz vein on Henderson Island. A shaft was sunk and drifting of the 68 m level was undertaken in 1937; however, the project was abandoned that year.

Systematic exploration for nickel-copper deposits started in the mid-1950s. An AEM survey by the Canadian Nickel Company Limited in 1957 and drilling of selected anomalies led to the discovery of "low grade" (Quinn, 1960) Ni-Cu mineralization in ultramafic rocks in northwestern Island

Lake. In 1969 Sherritt Gordon Mines Limited performed an AEM survey over the Island Lake greenstone belt. Nickel-copper exploration was revived in the early 1970s and concentrated on targets in eastern Island Lake. Barringer Research Limited and Canadian Occidental Petroleum searched in the early 1970s for porphyry copper-molybdenum mineralization in granitoid plutons (Bella Lake pluton) and VMS deposits in the Jubilee and Confederation Island area. The middle and latter 1970s witnessed a revival of VMS and porphyry copper exploration spearheaded by the Exploration Operations Branch of Manitoba Mineral Resources Division.

Interest in the belt's gold potential led BP Minerals to the Island Lake greenstone belt in 1981. Investigations concentrated initially on the eastern part of Island Lake (Jack of Hearts area) and Sagawitchewan Bay. Subsequent exploration re-evaluated the Island Lake Gold Mine and its vicinity.

Midway Lake Minerals Corporation commenced a re-evaluation of the Ministik gold occurrence on Henderson Island (Location 2, NTS 53E/16) in 1984. Bighorn Development Corporation and Wydmar Resources optioned this property, and rehabilitated the shaft and underground workings, and constructed a pilot mill. Activities on this project were cancelled in 1989. The most recent recorded mineral exploration was by Corona Corporation in 1990 for gold in the area east of the Jack of Hearts mineral occurrence.

## SELECTED REFERENCES

- Ames, A.  
1975: Ultramafic rocks of the Island Lake greenstone belt, northeastern Manitoba; University of Toronto, B.Sc. Thesis (unpublished), 64 p.
- Currie, K.L.  
1984: Geology, Island Lake, Manitoba-Ontario: map notes; Geological Survey of Canada, Open File Report 1120.
- Ermanovics, I.F., Herd, R.K. and Currie, K.L.  
1987: Geology, Island Lake, Manitoba-Ontario (53E); Geological Survey of Canada, Map 1646A, 1:250 000.
- Ermanovics, I.F., Park, G., Hill, J. and Goetz, P.A.  
1975: Geology of Island Lake map-area (53E), Manitoba and Ontario; in Geological Survey of Canada, Report of Activities, Part A, Paper 75-1, p. 311-316.
- Ermanovics, I.F. and Wanless, R.K.  
1983: Isotopic age studies and tectonic interpretation of Superior Province in Manitoba; Geological Survey of Canada, Paper 82-12, 23p.
- Fyson, W.K., Herd, R.K. and Ermanovics, I.F.  
1978: Diapiric structures and regional compression in an Archean greenstone belt, Island Lake, Manitoba; Canadian Journal of Earth Sciences, v. 15, no.11, p. 1817-1825.
- Gale, G.H., Baldwin, D.A. and Koo, J.  
1980: A geological evaluation of Precambrian massive sulphide deposit potential in Manitoba; Manitoba Energy and Mines, Economic Geology Report ER79-1, 137 p.
- Gilbert, H.P.  
1984a: Island Lake project; in Manitoba Energy and Mines, Mineral Resources Division, Report of Field Activities, 1984, p. 120-125.  
1984b: Loonfoot Island, Manitoba Department of Energy and Mines, Preliminary Map 1984 I-1, 1:20 000.  
1985a: Loonfoot Island, Manitoba Department of Energy and Mines, Preliminary Map 1985 I-3, 1:20 000.  
1985b: Geological investigations in the Island Lake-Stevenson Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Mineral Resources Division, Report of Field Activities, 1985, p. 187-199.  
1985c: Island Lake, Manitoba Department of Energy and Mines, Preliminary Map 1985 I-3, 1:20 000.  
1985d: Meegeesiwaseeson Island, Manitoba Department of Energy and Mines, Preliminary Map 1985 I-4, 1:20 000.
- Gilbert H.P., Neale, K.L., Weber, W, Corkery, M.T and McGregor, C.R.  
1982: Island Lake, Manitoba Department of Energy and Mines, Preliminary Map 1982 I-4, 1:20 000.
- Gilbert H.P., Neale, K.L., Weber, W, Corkery, M.T and McGregor, C.R.  
1983: Island Lake, Manitoba Department of Energy and Mines, Preliminary Map 1983 I-1, 1:20 000.
- Gilbert, H.P. and Weber, W.  
1983a: Island Lake project; in Manitoba Energy and Mines, Mineral Resources Division, Report of Field Activities, 1983, p. 63-69.  
1983b: The stratigraphy and structure of part of the Island Lake greenstone belt, Manitoba; (abs.) in Geological Association of Canada, Mineralogical Association of Canada, Canadian Geophysical Union, 1983 Joint Annual Meeting, Programme with Abstracts, v. 8, p. A27.
- Godard, J.D.  
1963a: Geology of the Island Lake-York Lake area; Manitoba Mines and Natural Resources, Mines Branch, Publication 59-3, 45p.  
1963b: Geology of the Sagawitchewan Bay area; Manitoba Mines and Natural Resources, Mines Branch, Publication 60-2, 28p.  
1963c: Island Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3A, 1:63 360.  
1963d: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.  
1963e: Sagawitchewan Bay; Manitoba Mines and Natural Resources, Mines Branch, Map 60-2, 1:63 360.
- Herd, R.K., Chandler, F.W. and Ermanovics, I.F.  
1976: Weathering of Archean granitoid rocks, Island Lake, Manitoba; in Geological Association of Canada-Mineralogical Association of Canada, 1976 Annual Meetings, Program with Abstracts, v. 1, p. 72.
- Herd, R.K., Currie, K.L. and Ermanovics, I.F.  
1987: Geology, Island Lake, Manitoba-Ontario; Geological Survey of Canada, Map 1646A, 1:250 000.
- Herd, R.K. and Ermanovics, I.F.  
1976: Geology of Island Lake map area (NTS 53E), Manitoba and Ontario; in Geological Survey of Canada, Report of Activities, Part A, Paper 76-1A, p. 393-398.
- McGregor C.R. and Weber W.  
1982: St. Theresa Point, Manitoba Department of Energy and Mines, Preliminary Map 1982 I-3, 1:20 000.

- McMurphy, R.C.:  
 1944: Geology of the Island Lake area of Manitoba; The Precambrian, September 1944, p. 4-9.
- Neale K.L.  
 1981: Island Lake-Sinclair-Savage Islands, Manitoba Department of Energy and Mines, Preliminary Map 1981 I-2, 1:20 000.
- Neale, K.L. and Weber, W.  
 1981a: Island Lake - Cochrane Bay, Manitoba Department of Energy and Mines, Preliminary Map 1981 I-1, 1:20 000.  
 1981b: Island Lake (parts of 53E/15 and 16); in Manitoba Department of Energy and Mines, Mineral Resources Division, Report of Field Activities, 1981, p. 39-42.
- Neale, K.L., Weber, W. and McGregor, C.R.  
 1982: Garden Hill, Manitoba Department of Energy and Mines, Preliminary Map 1982 I-2, 1:20 000.
- Park, R.G. and Ermanovics, I.F.  
 1978: Tectonic evolution of two greenstone belts from the Superior Province of Manitoba; Canadian Journal of Earth Sciences, v. 15, no. 11, p. 1808-1816.
- Quinn, H.A.  
 1960: Geology, Island Lake, Manitoba-Ontario; Geological Survey of Canada, Preliminary Series Map 26-1960, 1:253 440.
- Quinn, H.A. and Meinert, R.J.  
 1959: The Island Lake Series, Island Lake, Manitoba; Precambrian, v. 52, no. 4, p. 15-25.
- Richardson, D.J. and Ostry, G.  
 1987: Gold deposits of Manitoba; Manitoba Energy and Mines, Economic Geology Report ER86-1, 91p.
- Sangster, D.F.  
 1972: Precambrian volcanogenic sulphide deposits in Canada: a review; Geological Survey of Canada, Paper 72-22, 44 p.
- Theyer, P.  
 1977: Evaluation of nickel environments; in Manitoba Mines, Resources and Environmental Management, Mineral Resources Division, Report of Field Activities, 1977, p. 116-121.  
 1978: Stratigraphic position of ultramafic lenses in the Island Lake area; in Manitoba Mines, Resources and Environmental Management, Mineral Resources Division, Report of Field Activities, 1978, p. 106-108.  
 1979: Ultramafic occurrences and stratigraphic relationships in the Island Lake and Bigstone Lake areas; in Manitoba Mines, Resources and Environmental Management, Mineral Resources Division, Report of Field Activities, 1979, p. 39-40.
- 1980a: Stratigraphic setting of selected ultramafic bodies in the Superior and Churchill provinces and certain aspects of nickel-copper deposits in the Thompson Nickel Belt; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER79-2, 71 p.  
 1980b: Ultramafic rocks, nickel occurrences and interpreted stratigraphic relationships; Manitoba Energy and Mines, Mineral Resources Division, Map ER79-2-1 to ER79-2-13, 1:50 000.  
 1980c: Stratigraphic investigations of the Island, Stevenson, Ponask, Bigstone and Knight Lake area and of the Island Lake gold mine; in Manitoba Energy and Mines, Mineral Resources Division, Report of Field Activities, 1980, p. 38-42.  
 1981: Mineral deposit studies - Superior Province a) Island Lake; b) Bird River Sill; in Manitoba Energy and Mines, Mineral Resources Division, Report of Field Activities, 1981, p. 74-77.  
 1982: Island Lake area and Bird River Sill; in Manitoba Energy and Mines, Mineral Resources Division, Report of Field Activities, 1982, p. 55-57.  
 1983: Gold mineralization in the Island Lake area, Manitoba (abs.); Canadian Mining and Metallurgical Bulletin, v. 76, no. 851, p. 78,80.  
 1985: Ultramafic rocks of the Island Lake area; Manitoba Energy and Mines, Geological Paper 84-1, 29 p.
- Turek, A., Carson, T.M., Smith, P.E., Van Schmus, W.R. and Weber, W.  
 1986: U-Pb zircon ages for rocks from the Island Lake greenstone belt, Manitoba; Canadian Journal of Earth Sciences, v. 23, p. 92-101.
- Weber, W.  
 1983a: McGowan Lake, Manitoba Department of Energy and Mines, Preliminary Map 1983 I-2, 1:20 000.  
 1983b: Krolman Lake, Manitoba Department of Energy and Mines, Preliminary Map 1983 I-3, 1:20 000.
- Weber, W., Gilbert, H.P., Neale, K.L. and McGregor, C.R.  
 1982: Island Lake Project; in Manitoba Mineral Resources Division, Report of Field Activities, 1982, p. 34-43.
- Weber, W., McGregor, C.R. and Neale, K.L.  
 1982: Waasagomach Bay, Manitoba Department of Energy and Mines, Preliminary Map 1982 I-1, 1:20 000.
- Wright, J.F.  
 1928a: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt.B, p. 54-80.  
 1928b: Island Lake area, northeast Manitoba; Geological Survey of Canada, Map 211A, 1:126 720.



## **Section 1**

### **MINERAL DEPOSITS AND OCCURRENCES IN THE ISLAND LAKE AREA (NTS 53E/15)**



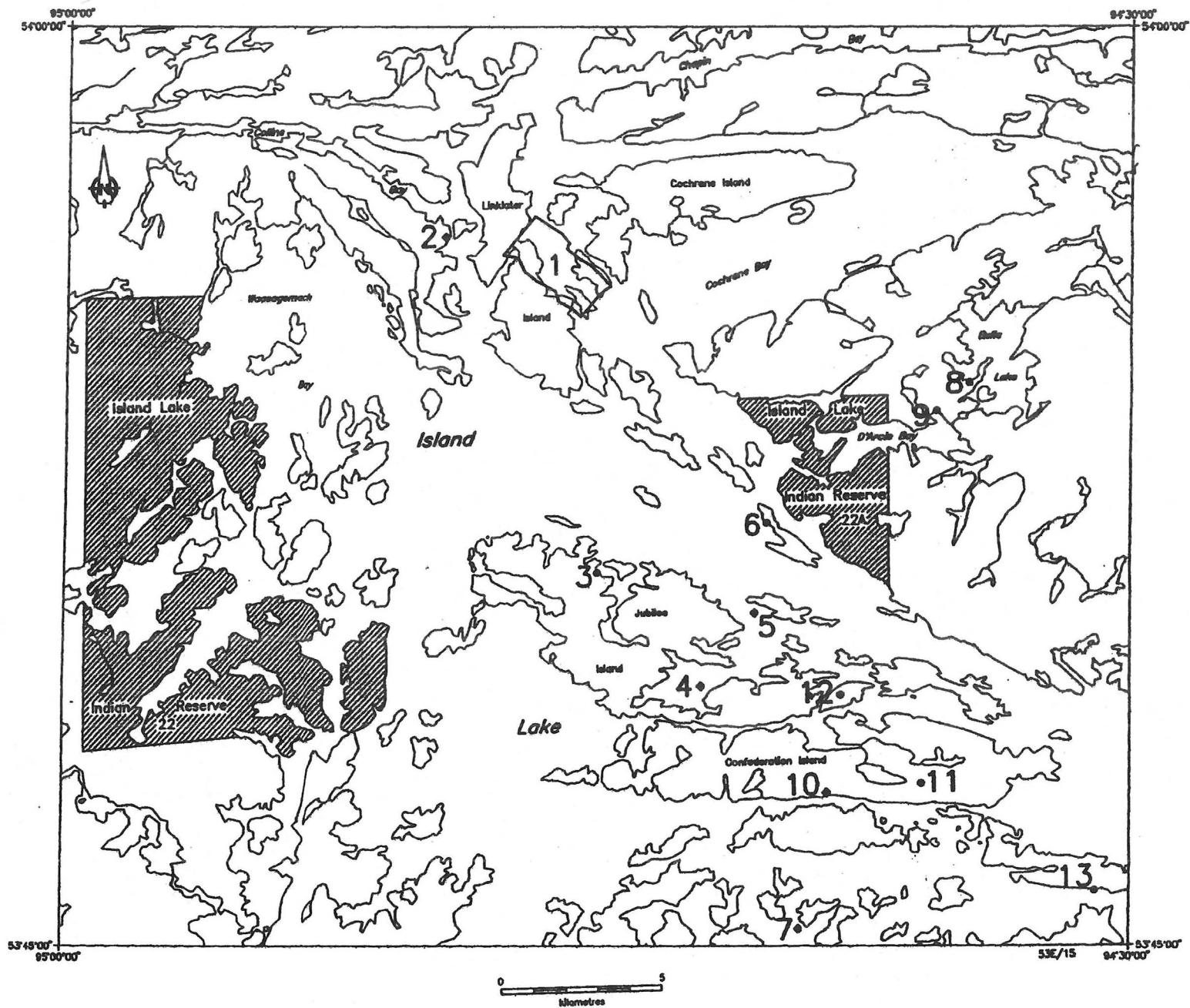
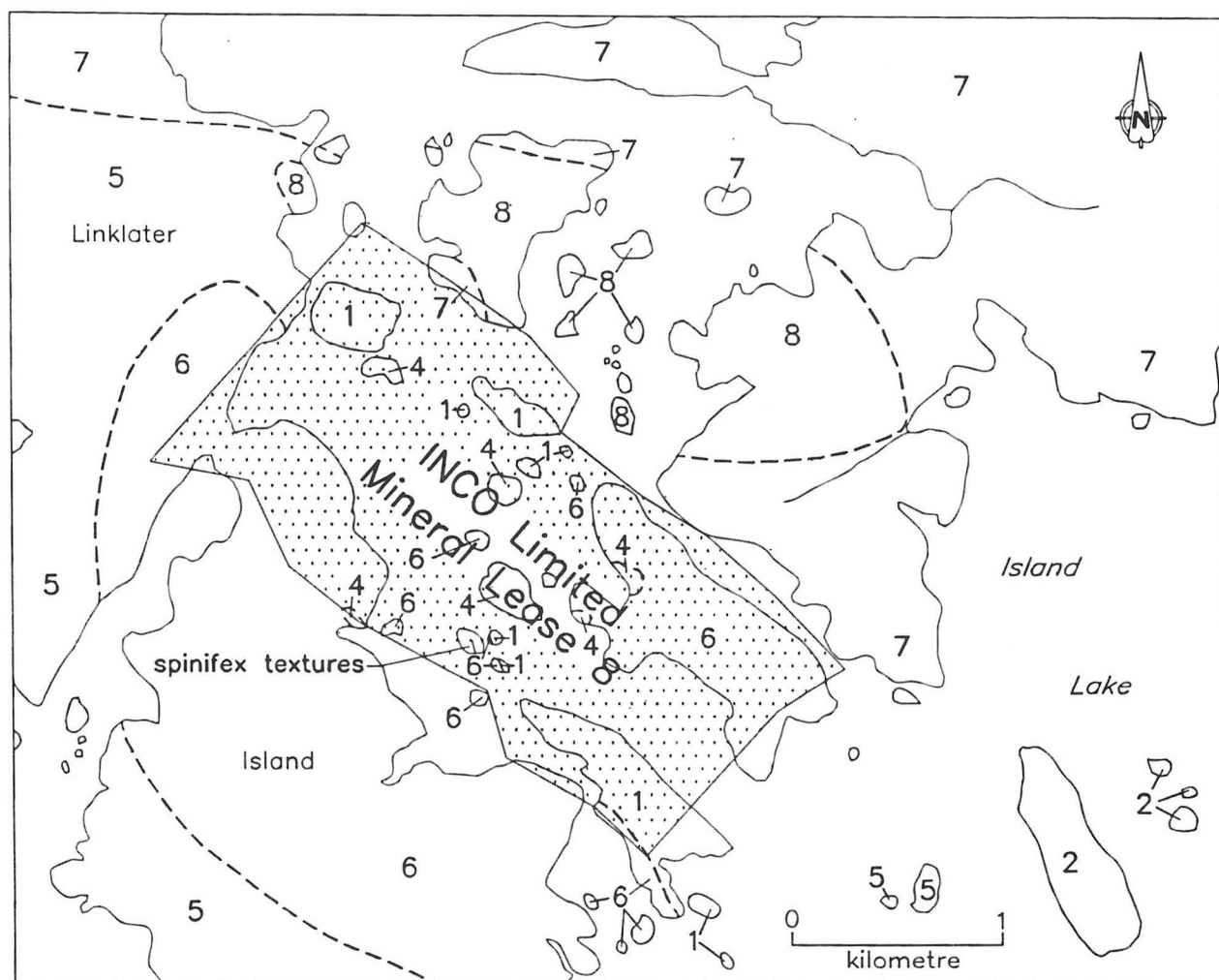


Figure 1: Location of mineral deposits and occurrences Island Lake Area (NTS 53E/15).



53E/15-1-1

Late Intrusive Rocks

8 Tonalite, monzonite

Island Lake Group

7 Polymictic conglomerate, wacke

Early Intrusive Rocks

6 Quartz feldspar porphyry

5 Mafic intrusive rocks

4 Ultramafic intrusive and extrusive rocks

Hayes River Group

3 Greywacke, argillite, conglomerate

2 Felsic to intermediate volcanic rocks

1 Mafic to intermediate volcanic flows

--- Geological contact (approximate)

□ Occurrence location

Figure 7: Geological setting of INCO Limited Mineral Lease 8. Geology compiled from Godard, (1963c); Theyer, (1980); Weber et al. (1982).



## MINERAL DEPOSITS AND OCCURRENCES IN THE ISLAND LAKE AREA (NTS 53E/15)

LOCATION: 1

NAME: INCO Mineral Lease

UTM: 5977457N/383990E

ACCESS: Via boat or float plane

AREA: Northwestern Island Lake (Fig. 1)

AIRPHOTO: A23514-89

### EXPLORATION SUMMARY:

A detailed review of the exploration history is given in Mineral Inventory Card 53E/15 Ni1. This property was first staked in 1952 and optioned by the Canadian Nickel Company Limited who conducted an AEM survey over the area in 1957 as Airborne Permit 19 (A.F. 91624). Results of this survey led to the staking of a group of claims that were assigned to the International Nickel Company of Canada, Limited in 1958. Approximately 12 800 m of diamond drilling were completed from 1956 to 1960. In 1972, International Nickel Company of Canada Limited conducted an AEM survey under Airborne Permit 102 (A.F. 91694). In 1976 the status of an Explored Area Lease (E.A.L. 13) was granted for a group of claims and subsequently was converted into a Mineral Lease (M.L.-8) in 1995 (Fig. 7).

### GEOLOGICAL SETTING:

The area of the occurrence is underlain by mafic to felsic volcanic flows and fragmental rocks, and related intrusive rocks of the Hayes River Group (Wright, 1928) (Fig. 7). Theyer (1977) noted spinifex-textured ultramafic rocks on an island east of Linklater Island. Descriptions and geochemical data are given by Theyer (1980, 1985).

### MINERALIZATION:

In 1977 a 4.5 m thick pyrite-bearing zone was noted in a trench on claim Nickel 1 by personnel of the Manitoba Government (Solkoski and Mabbula, unpublished field notes). The Ni-Cu mineralization is hosted in ultramafic intrusive and related extrusive rocks of the group of Early Intrusive Rocks (Weber *et al.*, 1982).

### GEOCHEMICAL DATA:

Up to 6800 ppm Ni, 1650 ppm Cr and 520 ppm Cu were assayed in an ultramafic rock sample from the area (Theyer, 1982). Geochemical data for the above mentioned spinifex-textured ultramafic rock are given by Theyer (1980, 1985).

### CLASSIFICATION:

Magmatogenic type deposit associated with mafic/ultramafic rocks; disseminated.

### REFERENCES:

Assessment Files 91624, 91694

Manitoba Energy and Mines, Mines Branch.

Godard, J.D.

1963: Island Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3A, 1:63 360.

Mineral Inventory Card 53E/15 Ni

Manitoba Energy and Mines, Geological Services Branch.

Theyer, P.

1977: Evaluation of nickel environments; in Manitoba Mines, Resources and Environmental Management, Mineral Resources Division, Report of Field Activities, 1977, p. 116-121.

1980: Ultramafic rocks, nickel occurrences and interpreted stratigraphic relationships; Manitoba Energy and Mines, Mineral Resources Division, Map ER79-2-1 to ER79-2-13, 1:50 000.

1982: Island Lake area and Bird River Sill; in Manitoba Energy and Mines, Mineral Resources Division, Report of Field Activities, 1982, p. 55-57.

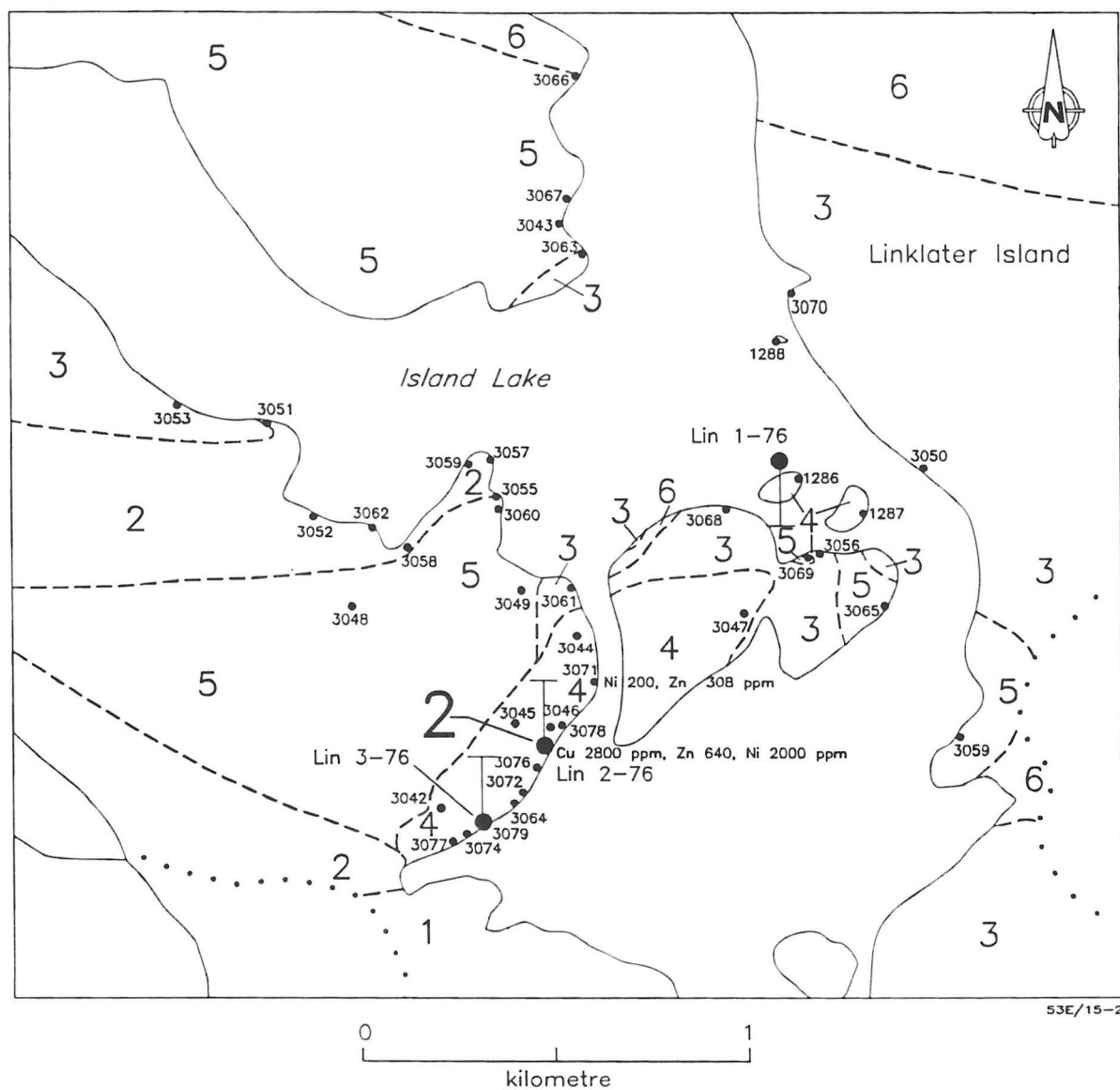
1985: Ultramafic rocks of the Island Lake area; Manitoba Energy and Mines, Geological Paper 84-1, 29p.

Weber, W., Gilbert, H.P., Neale, K.L. and McGregor, C.R.

1982: Island Lake Project; in Manitoba Mineral Resources Division, Report of Field Activities, 1982, p. 34-43.

Wright, J.F.

1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



#### Island Lake Group

6 Polymictic conglomerate

#### Early Intrusive Rocks

5 Mafic intrusive rocks

4 Ultramafic intrusive, subvolcanic and extrusive rocks

#### Hayes River Group

3 Greywacke, chert, siltstone, argillite

2 Felsic to intermediate flows

1 Mafic volcanic flows and related intrusive rocks

--- Geological contact (approximate)

● Drillhole, Canadian Occidental Petroleum Limited (A.F. 91502)

● Chip sample

... Limit of mapping

2 Occurrence location

Figure 8: Geological setting of occurrence 2. Geology compiled from Godard, (1963b); Theyer, (1980); Weber et al. (1982).

LOCATION: 2

NAME: (A.F.-Mineralization intersected by diamond drilling)  
UTM: 5978296N/380563E  
ACCESS: Via boat or float plane  
AREA: Island Lake west (Fig. 1)  
AIRPHOTO: A23513-73

#### EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). Canadian Occidental Petroleum Limited Minerals Division, staked an area west of Linklater Island and conducted geological mapping (1:4800 scale) and a rock geochemical survey in 1974, (A.F. 91502). International Nickel Company of Canada Limited had identified the area as partially underlain by a sulphide-bearing ultramafic complex. The geological and geochemical surveys were followed by an EM and MAG survey in 1975 and by a three-hole (502 m) drilling program in 1976 (A.F. 92061).

#### GEOLOGICAL SETTING:

The area of the occurrence is partially underlain by cherty and siliceous siltstone and argillite of the group of the Hayes River Group (Wright, 1928; Fig. 8), intruded by mafic dykes. It is also underlain by ultramafic intrusive and related subvolcanic or extrusive rocks of the group of Early Intrusive Rocks (Weber *et al.*, 1982; Fig. 8). Theyer (1985) sampled and described the ultramafic rocks.

DDH Lin 1 (183 m) intersected dark grey-green peridotite. DDH Lin 2 (169 m) intersected a medium- to coarse-grained dark grey peridotite. DDH Lin 3 (151 m) intersected grey "porphyritic" peridotite (A.F. 91502).

#### MINERALIZATION:

DDH Lin 1 intersected a 6 mm bleb of pyrrhotite surrounded by native copper. DDH Lin 2 intersected randomly distributed minor to trace chalcopyrite in fractures and blebs. DDH Lin 3 intersected minor pyrite and chalcopyrite in blebs and as fracture coatings (A.F. 91502).

#### GEOCHEMICAL DATA:

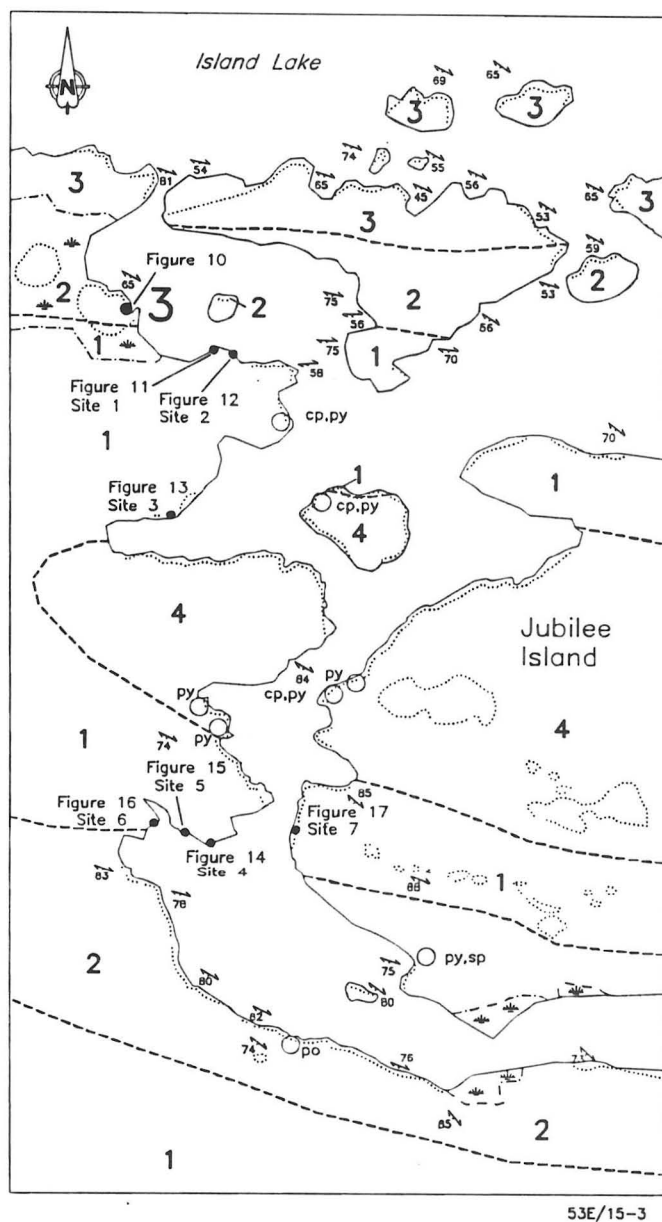
Rock chip geochemistry by Canadian Occidental Petroleum Limited Minerals Division indicated maximum concentrations of 2000 ppm Ni and up to 2800 ppm Cu in samples collected from the peridotite on surface. Assays of the drill core returned up to 2240 ppm Ni and up to 700 ppm of Cu (A.F. 92061).

#### CLASSIFICATION:

Disseminated mineralization - not classified.

#### REFERENCES:

- Assessment Files 91502, 91624, 91694, 92061  
Manitoba Energy and Mines, Mines Branch.
- Godard, J.D.  
1963a: Geology of the Island Lake-York Lake area; Manitoba Mines and Natural Resources, Mines Branch, Publication 59-3, 45p.  
1963b: Island Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3A, 1:63 360.
- Theyer, P.  
1980: Ultramafic rocks, nickel occurrences and interpreted stratigraphic relationships; Manitoba Energy and Mines, Mineral Resources Division, Map ER79-2-1 to ER79-2-13, 1:50 000.  
1985: Ultramafic rocks of the Island Lake area; Manitoba Energy and Mines, Geological Paper 84-1, 29 p.
- Weber, W., Gilbert, H.P., Neale, K.L. and McGregor, C.R.  
1982: Island Lake Project; in Manitoba Mineral Resources Division, Report of Field Activities, 1982, p. 34-43.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



### Early Intrusive Rocks

4 Granodiorite, tonalite

### Hayes River Group

3 Greywacke, sandstone and siltstone

2 Felsic to intermediate volcanic rocks

1 Mafic volcanic rocks

----- Geological contact (approximate)

..... Rock outcrop

70 Foliation (inclined)

Swamp

○ py Mineral occurrence

● Site 3 Rock chip sample

R.D.P. Canadian Joint Venture  
(A.F. 92210)

●3 Occurrence location

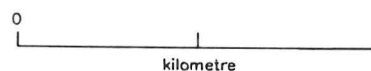


Figure 9: Geological setting of occurrence 3. Geology modified after A.F. 92989.

LOCATION: 3

NAME:

UTM: 5967931N/385002E

AREA: Western Island Lake (Fig. 1)

ACCESS: Via boat or float plane

AIRPHOTO: A23514-98

#### EXPLORATION SUMMARY:

A detailed review of the exploration history is given in Mineral Inventory Card 53E/15 Cu1. This property was first staked in 1955. The Canadian Nickel Company Limited conducted an AEM survey over the area in 1957 under Airborne Permit 19 (A.F. 91624). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area in 1970 under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). Detailed geological mapping (1:60 scale) and trenching were done for RDP Canadian Joint Venture by Barringer Research Limited in 1970 and 1971 (A.F. 92210). Prospecting, trenching and sampling were conducted on the property in 1979 (A.F. 92240). Geological mapping (1:50 and 1:100 scale) and rock sampling were carried out by Noranda Exploration Company Limited in 1981 (A.F. 92989). Also in 1981, L.W. Chornoby conducted "dozens of assays with a chemical kit" detecting "mineral" in the Jubilee Island area (A.F. 92440). The claims were cancelled in 1983.

#### GEOLOGICAL SETTING:

The area of the occurrence is underlain by fine grained, white- to green- and grey-weathering, intermediate to felsic volcanic rocks, characterized by approximately 25% quartz and feldspar phenocrysts. Other geologically and mineralogically similar fracturebound sulphide-bearing sites in this area are underlain by mafic, in places pillowed, volcanic rocks (Fig. 9). These rocks belong to the Hayes River Group (Wright, 1928). Interbedded sedimentary rocks, comprising conglomerate, greywacke, argillite, slate and chert, overlie the mafic to intermediate volcanic rocks. Narrow north-trending diabase dykes crosscut all rock units. Prominent east-trending shears aligned parallel to the foliation are associated with mineralized quartz veins.

**Location 3** (Fig. 9, 10) consists of two trenches adjacent to the shore. The trench farther from the shore (6 x 1.5 x 1 m) is completely covered with rubble. The trench adjacent to the shore (6 x 1 x 1 m) is largely covered with rubble. It is underlain by slates, and massive to layered fine grained quartz feldsparphyric volcanic rock ("Intermediate ash tuff and intermediate flows tuff" A.F. 92989) and minor quartz veins up to 2 cm thick.

**Site 1** (Fig. 9, 11) is a northeast-trending trench (16 x 2 x 2 m) located adjacent to the shore. The trench is sunk in intensely fractured, fine-to medium-grained, massive mafic rock with numerous southeast-trending quartz veins.

**Site 2** (Fig. 9, 12) is an east-trending trench (7 x 2 x 2 m) at the lakeshore approximately 40 m east of site 1. The

trench is underlain by medium- to coarse-grained andesite characterized by a sericitized shear zone.

**Site 3** (Fig. 9, 13) consists of two northeast-trending trenches (7 x 5 x 2 m; 12 x 1.5 x 1 m), 2 m apart. The trenches are underlain by andesite and minor quartz-feldspar porphyry. Quartz veins exposed in the trenches are associated with prominent shear zones.

**Site 4** (Fig. 9, 14) is a 9.5 x 2 x 1.5 m, northeast oriented, largely rubble-filled trench at the shoreline, underlain by intermediate tuff.

**Site 5** (Fig. 9, 15) is a north-trending largely rubble filled, 6.3 x 2.5 x 1 m trench located adjacent to the lake shore. The underlying rocks are massive andesite and intermediate tuff.

**Site 6** (Fig. 9, 16) is a northeast-trending trench (13 x 2 x 1 m) in massive to pillowed andesite and minor quartz veins.

**Site 7** (Fig. 9, 17) is three adjacent trenches (6.5 x 4.5 x 2 m; 1.5 x 1.5 x 1 m; 8 x 1.5 x 2 m) underlain by massive andesite, tuff and quartz-feldspar porphyry (A.F. 92989).

#### MINERALIZATION:

Most of the mineralization is fracture bound, parallel to the foliation and associated with quartz veins. The highest mineral concentrations are preferentially associated with quartz-filled fractures.

**Location 3** (Fig. 9, 10) is characterized by rusty weathering intermediate tuff that contains up to 5% disseminated pyrite.

**Site 1** (Fig. 9, 11) is characterized by seams, clusters and disseminations of chalcopyrite, pyrite and pyrrhotite with minor malachite.

**Site 2** (Fig. 9, 12) is characterized by 5 to 15% euhedral, large (1 cm) pyrite cubes and minor pyrrhotite and chalcopyrite.

**Site 3** (Fig. 9, 13) is characterized by seams and layers of chalcopyrite and pyrite, and minor disseminated pyrrhotite and malachite. Quartz-feldspar porphyry contains seams of pyrite and chalcopyrite.

**Site 4** (Fig. 9, 14) is characterized by layers and disseminations of chalcopyrite and pyrite preferentially located in andesite tuff.

**Site 5** (Fig. 9, 15) is characterized by seams and disseminations of chalcopyrite and pyrite with minor bornite. Numerous quartz fragments in andesite are rimmed by pyrite and chalcopyrite.

**Site 6** (Fig. 9, 16) is characterized by seams and disseminations of chalcopyrite, pyrrhotite and pyrite associated with quartz veins along shears.

**Site 7** (Fig. 9, 17) is characterized by seams, blebs and disseminations of pyrite, chalcopyrite and pyrrhotite with minor molybdenite and bornite, preferentially associated with quartz veins, andesite tuff and by disseminated pyrite and chalcopyrite in quartz-filled fractures within quartz-feldspar porphyry (A.F. 92989).

#### GEOCHEMICAL DATA:

Location 3 yielded a grab sample containing 11% Cu, 0.9% Zn, 0.69 g/t Au and 17.5 g/t Ag. Chip samples yielded assays up to two orders of magnitude lower than the assays recorded on Fig 10. Assays of chip and grab samples from the other trenches are recorded on the respective figures (A.F. 92989).

#### CLASSIFICATION:

Vein type deposit; multiple veins or lenses; generally associated with quartz-filled fractures.

#### REFERENCES:

Assessment Files 91624, 91684, 91694, 92210, 92240, 92440, 92989  
Manitoba Energy and Mines, Mines Branch.

Gilbert H.P., Neale, K.L., Weber, W., Corkery, M.T and McGregor, C.R.

1983: Island Lake, Manitoba Department of Energy and Mines, Preliminary Map 1983 I-1, 1:20 000.

Mineral Inventory Card 53E/15 Cu1

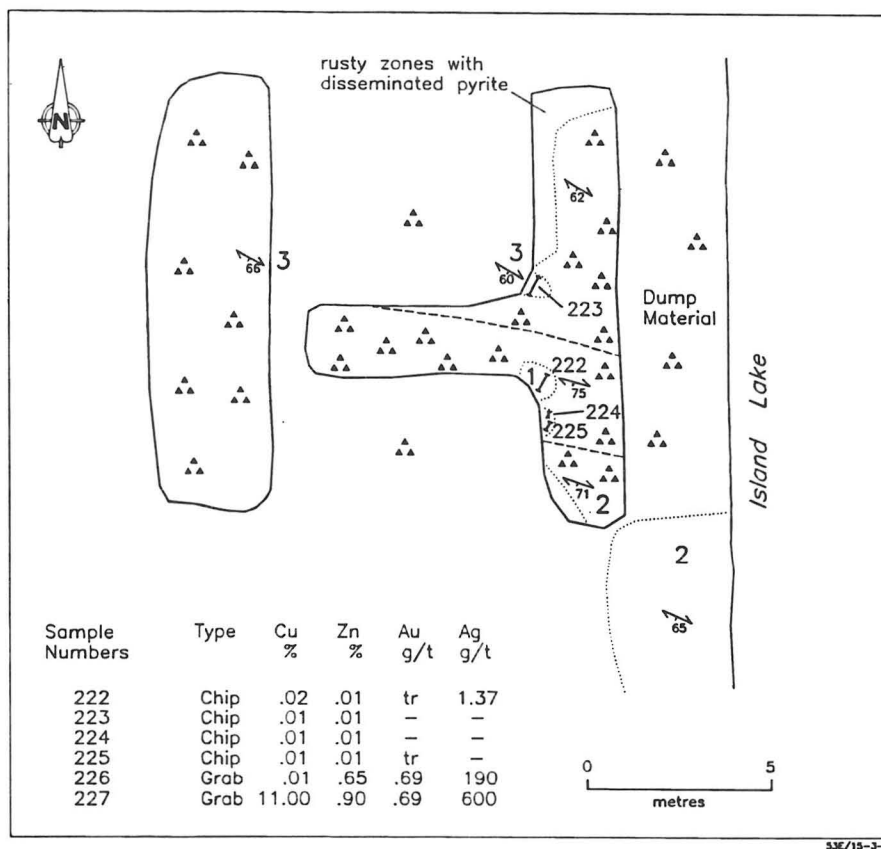
Manitoba Energy and Mines, Geological Services Branch.

Weber, W., Gilbert, H.P., Neale, K.L. and McGregor, C.R.

1982: Island Lake Project; in Manitoba Mineral Resources Division Report of Field Activities, 1982, p. 34-43.

Wright, J.F.

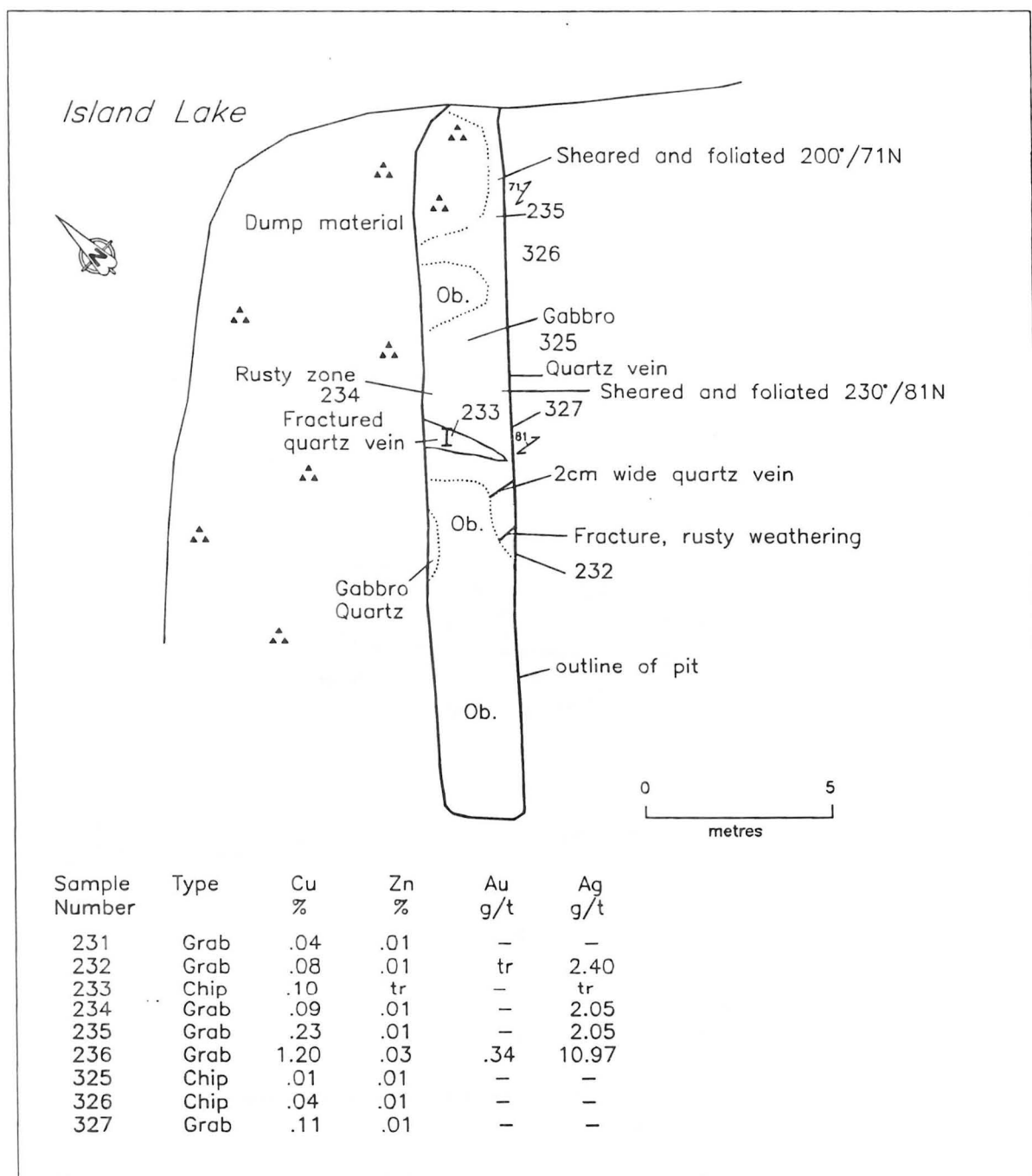
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



- 3 Intermediate ash tuff
- 2 Intermediate flows tuff
- 1 Phyllitic slate (schistose)

- 65 Foliation (inclined)
- Chip sample interval
- Geological contact (approximate)
- Margin of rubble
- Rubble

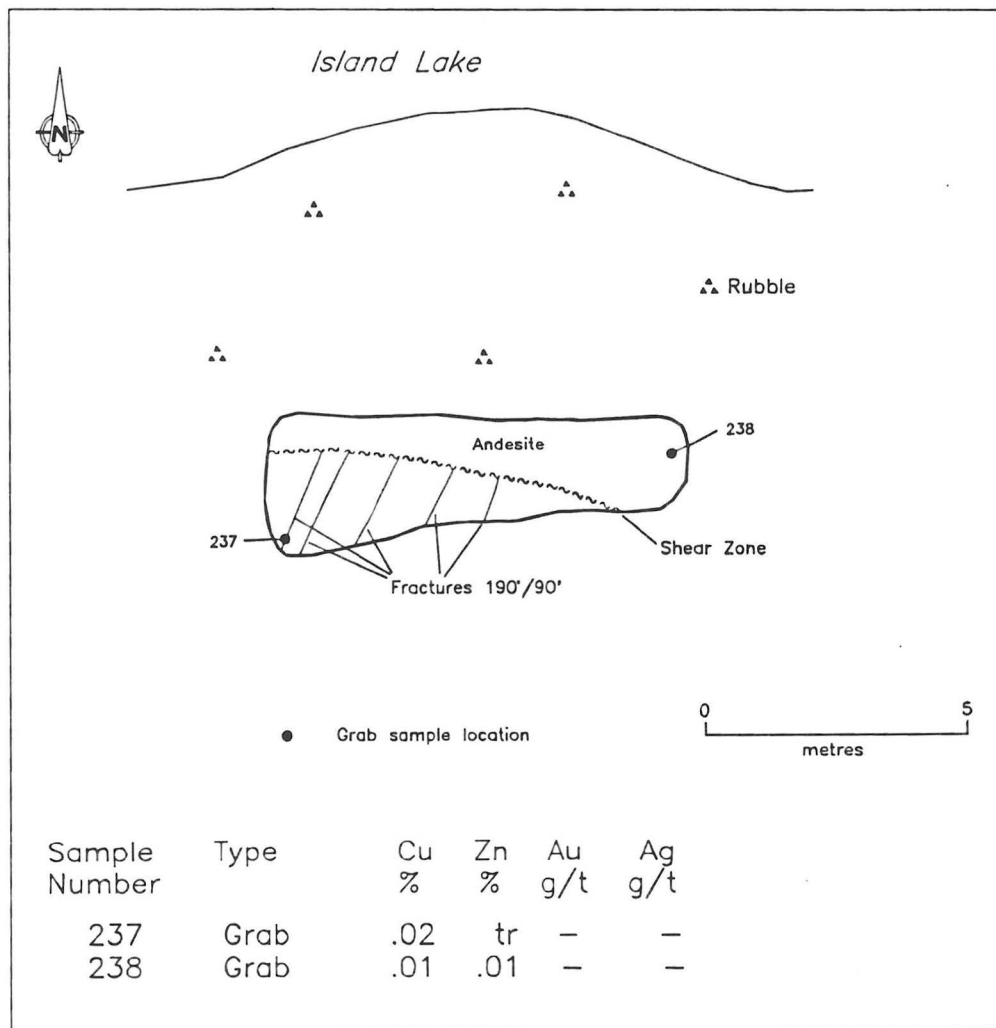
Figure 10: Detailed geological sketch map of occurrence 3. Geology modified after A.F. 92989.



53E/15-3-3

- Geological contact (defined)
- $\nearrow_{81}$  Foliation (inclined)
- I Sample interval
- ▲▲ Rubble
- Ob. Overburden
- Outcrop

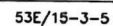
Figure 11: Detailed geological sketch map of occurrence 3, site 1. Geology modified after A.F. 92989.







53E/15-3-4

Figure 12: Detailed geological sketch map of occurrence 3, site 2. Geology modified after A.F. 92989.





-  Sample interval  
 Geological contact (defined, approximate)  
 Margin of rubble  
 Rubble

21

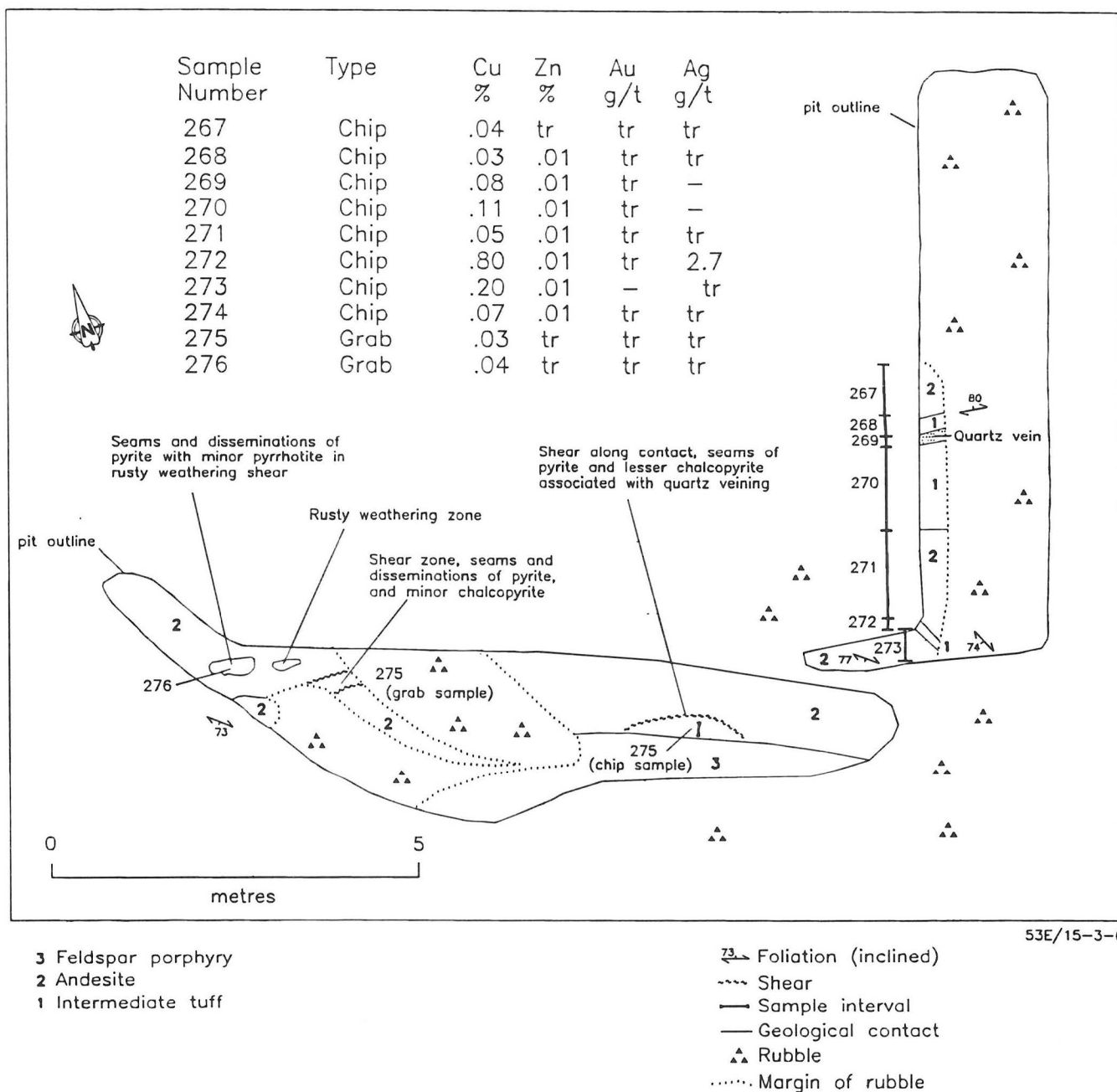
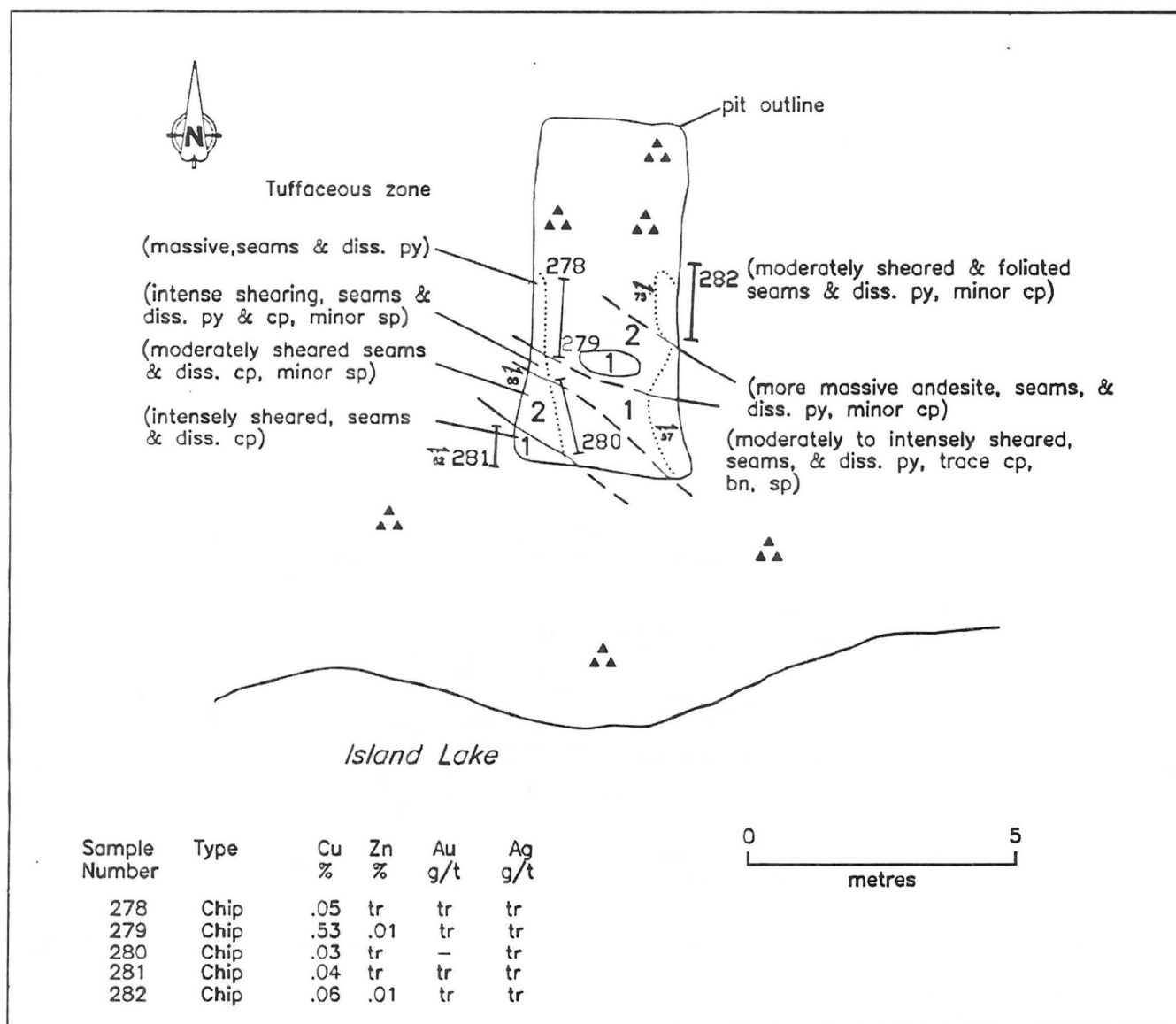


Figure 14: Detailed geological sketch map of occurrence 3, site 4. Geology modified after A.F. 92989.



53E/15-3-7

- 2 Intermediate tuff  
1 Andesite

- 80 Foliation (inclined)  
--- Geological contact (defined, approximate)  
— Sample interval  
▲▲ Rubble  
○ Outcrop

Figure 15: Detailed geological sketch map of occurrence 3, site 5. Geology modified after A.F. 92989.

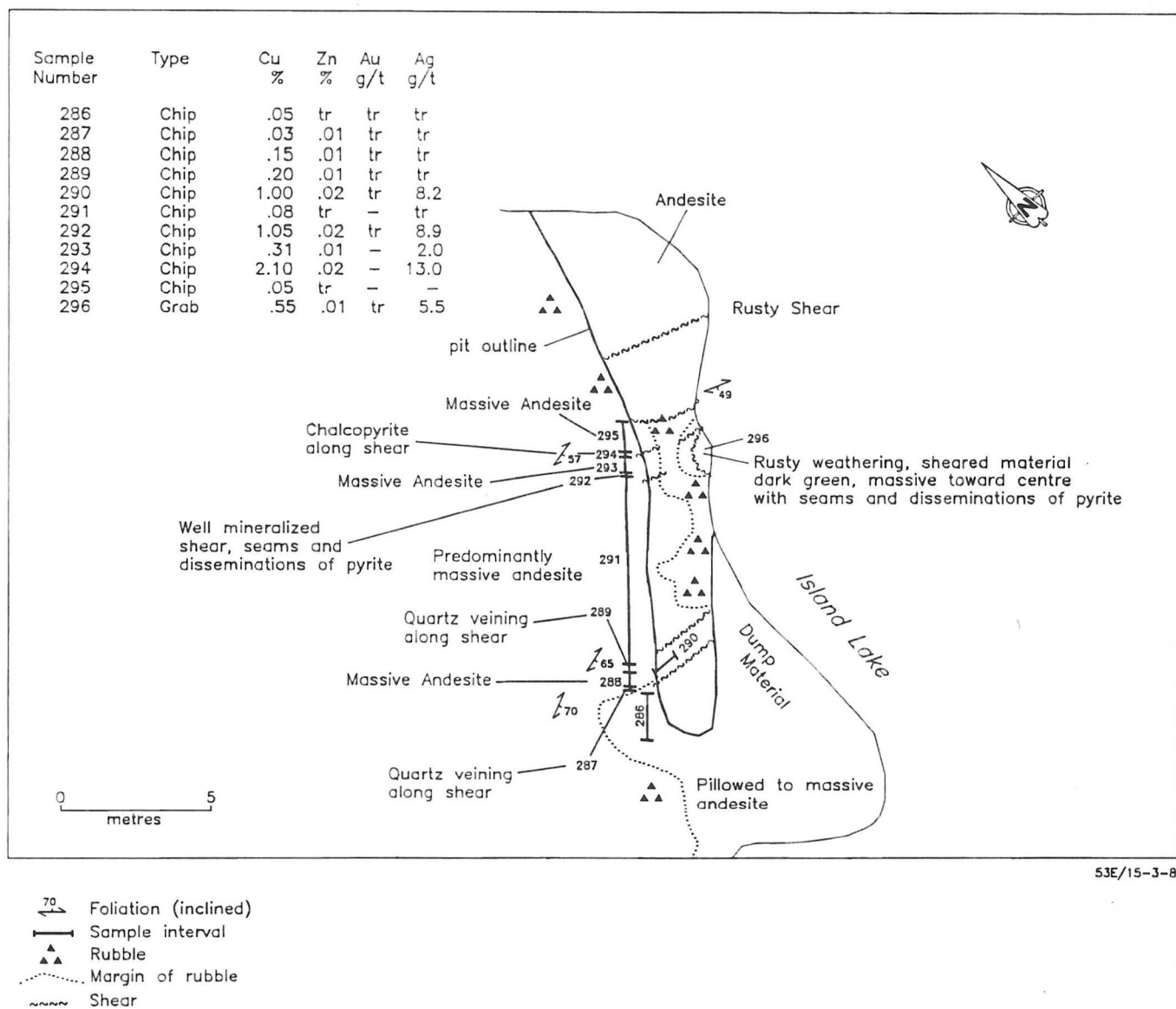


Figure 16: Detailed geological sketch map of occurrence 3, site 6. Geology modified after A.F. 92989.

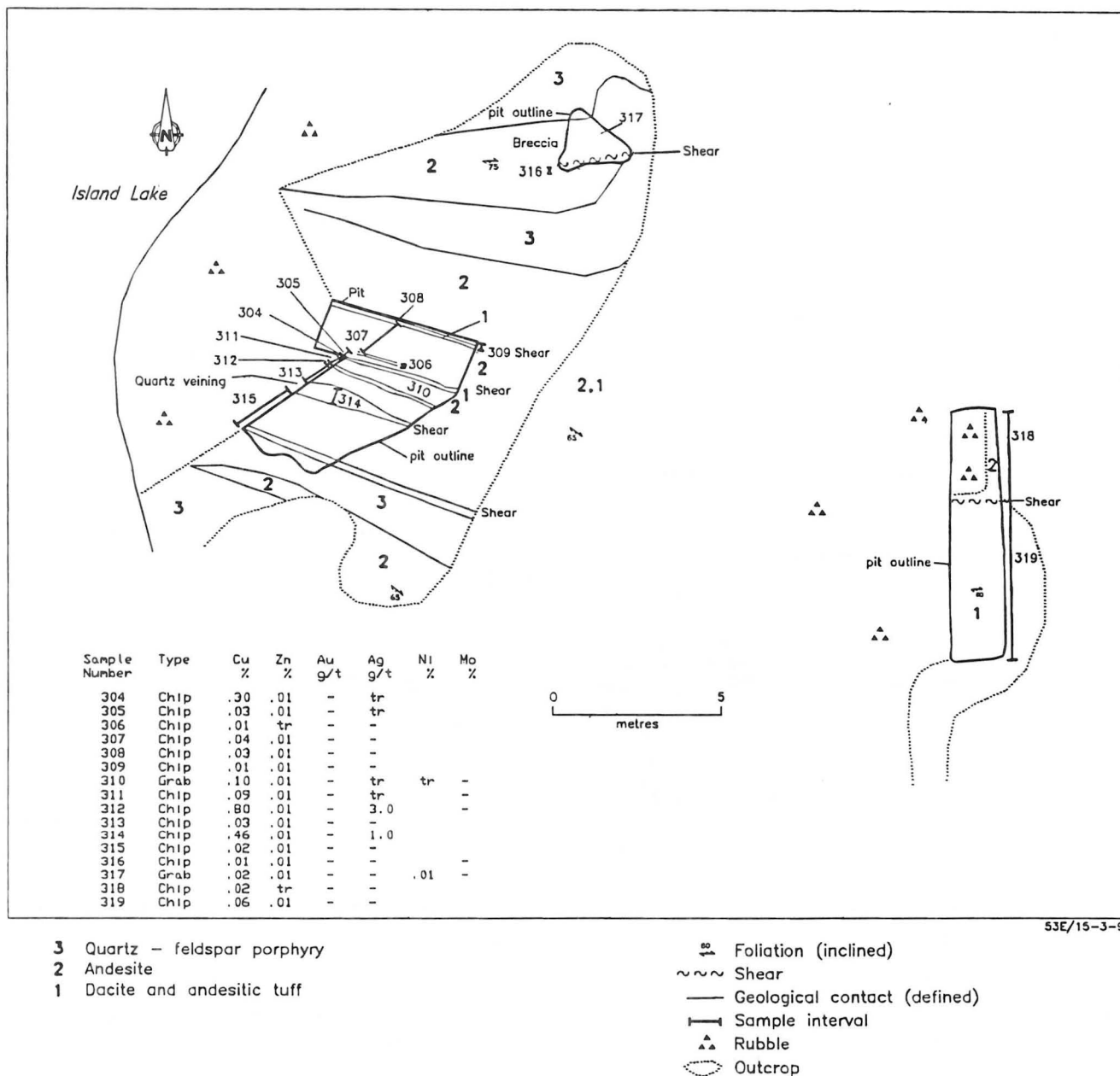


Figure 17: Detailed geological sketch map of occurrence 3, site 7. Geology modified after A.F. 92989.

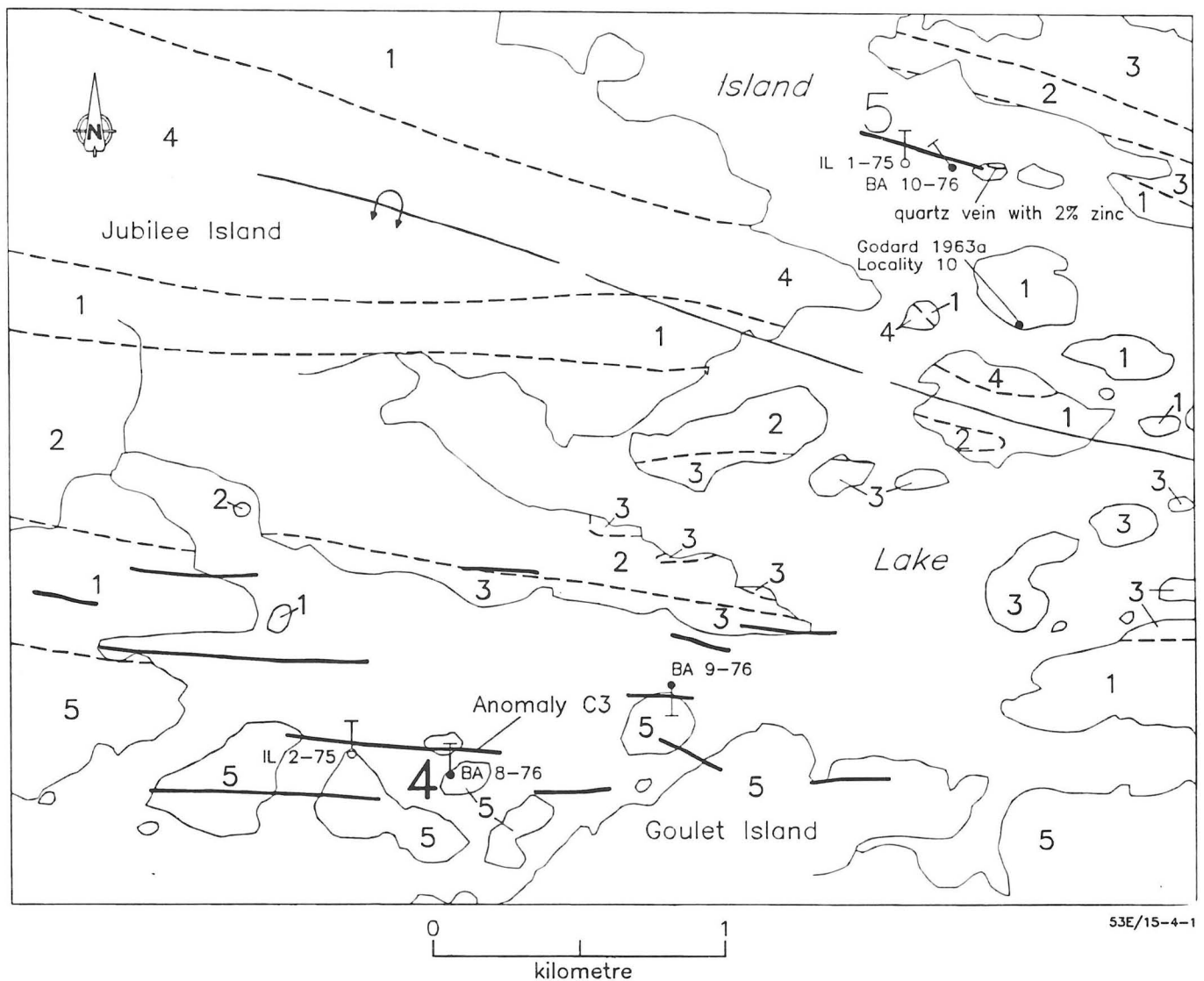


Figure 18: Geological setting of occurrence 4. Geology compiled from Godard (1963); Theyer (1980); Weber et al. (1982); Gilbert et al. (1983).

LOCATION: 4

NAME: (A.F.-Mineralization intersected by diamond drilling)  
UTM: 5964503N/388259E  
ACCESS: Via boat or float plane  
AREA: Western Island Lake (Fig. 1)  
AIRPHOTO: A23565-193

EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the area in 1957 under Airborne Permit 19 (A.F. 91624). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area in 1970 under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). Canadian Occidental Petroleum Limited conducted a MAG and HLEM survey in 1974 (A.F. 92244) and drilled two holes (204 m) to investigate two discrete HLEM anomalies (A.F. 92318).

GEOLOGICAL SETTING

The area of the occurrence is underlain by mafic and ultramafic intrusive rocks of the group of Early Intrusive Rocks (Weber *et al.*, 1982) and by mafic volcanic and sedimentary rocks of the Hayes River Group (Wright, 1928) (Fig. 18). DDH BA 8-76 (111 m) intersected gabbro, serpentinized peridotite, argillite and ended in andesite. This drillhole was drilled to intersect anomaly C3 that had been tested in 1975 by DDH IL 2-75, collared some 200 m west. DDH BA 9-76 (93 m) intersected mafic tuff, argillite with interlayered mafic tuff, mafic tuff interlayered with cherty beds and ended in gabbro (A.F. 92318).

MINERALIZATION:

DDH BA 8-76 intersected up to 15% pyrrhotite and chalcopyrite from 87.7 m to 95.2 m depth in mafic volcanic rock. The ratio of pyrrhotite to chalcopyrite is 15:1.

DDH BA 9-76 intersected disseminated pyrrhotite and chalcopyrite in mafic tuff (A.F. 92318).

GEOCHEMICAL DATA:

Drill core samples of DDH BA 8-76 contained 3 ppm to 1160 ppm copper and 43 ppm to 1025 ppm zinc.

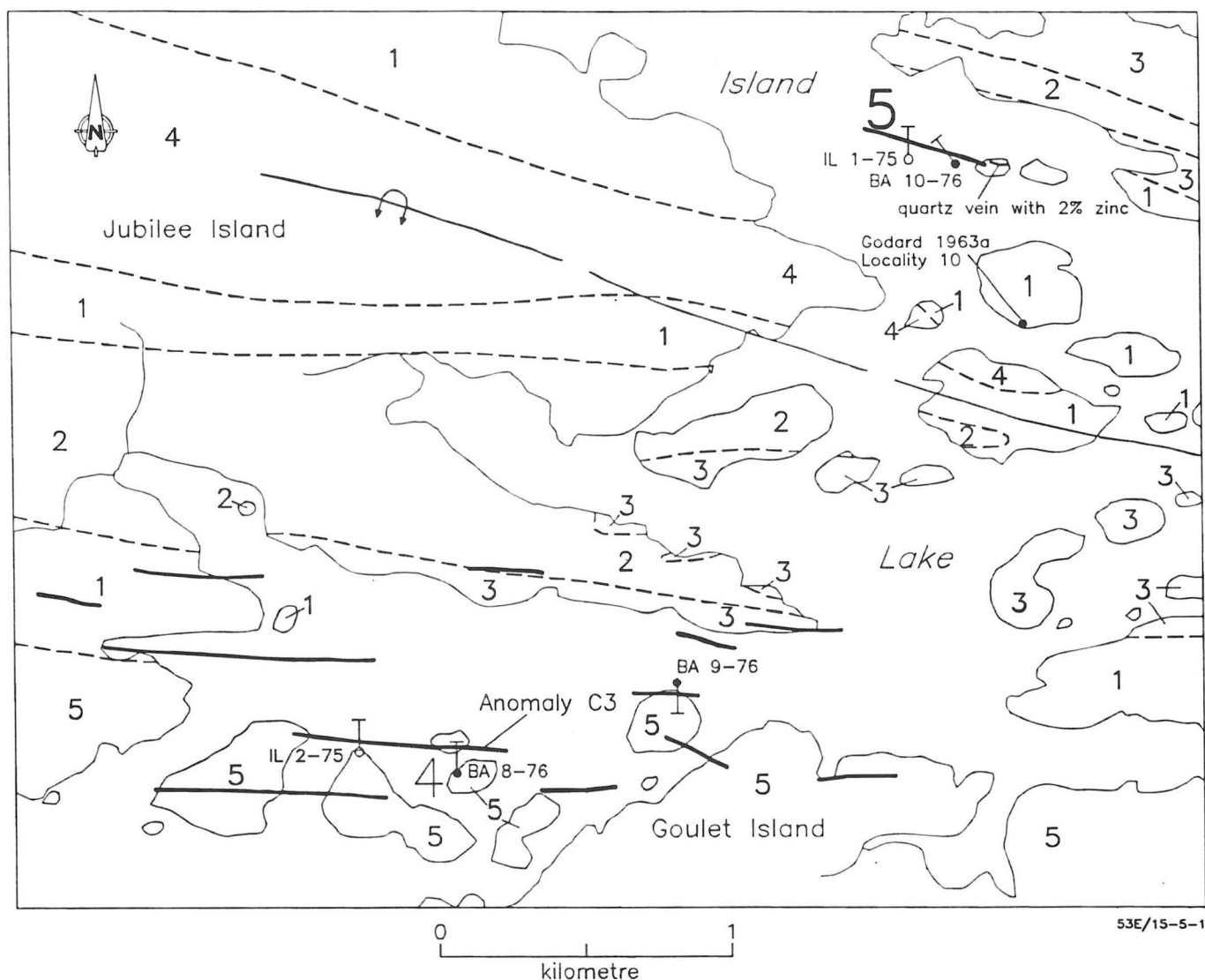
Drill core samples of DDH BA 9-76 returned concentrations of copper that range from 4 ppm to 2710 ppm and of zinc from 43 ppm to 600 ppm (A.F. 92318).

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

- Assessment Files 91624, 91684, 91694, 92244, 92318  
Manitoba Energy and Mines, Mines Branch.
- Gilbert, H.P., Neale, K.L., Weber, W., Corkery, M.T., and McGregor, C.R.  
1983: Island Lake; Manitoba Energy and Mines, Preliminary Map 1983 I-1, 1:20 000.
- Godard, J.D.  
1963: Island Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3A, 1:63 360.
- Theyer, P.  
1980: Ultramafic rocks, nickel occurrences and interpreted stratigraphic relationships; Manitoba Energy and Mines, Mineral Resources Division, Map ER79-2-1 to ER79-2-13, 1:50 000.
- Weber, W., Gilbert, H.P., Neale, K.L. and McGregor, C.R.  
1982: Island Lake Project; in Manitoba Mineral Resources Division Report of Field Activities, 1982, p. 34-43.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



#### Early Intrusive Rocks

5 Mafic intrusive rocks

4 Tonalite, granodiorite

#### Hayes River Group

3 Greywacke, siltstone, argillite

2 Felsic to intermediate volcanic rocks

1 Mafic volcanic flows and  
related intrusive rocks

--- Geological contact (approximate)

— EM conductor (A.F. 92318)

↪ Anticline (overturned)

Drillhole: Canadian Occidental  
Petroleum Limited

● (A.F. 92318)

○ (A.F. 92319)

5 Occurrence location

Figure 19: Geological setting of occurrence 5. Geology compiled from Godard (1963b); Theyer (1980); Weber et al. (1982); Gilbert et al. (1983).



LOCATION: 5

NAME: (A.F.-Mineralization intersected by diamond drilling)  
UTM: 5966694N/389795E  
ACCESS: Via boat or float plane  
AREA: Western Island Lake (Fig. 1)  
AIRPHOTO: A23566-196

#### EXPLORATION SUMMARY:

A detailed review of the exploration history is given in Mineral Inventory Card 53E/15 Zn1. Canadian Nickel Company Limited conducted an AEM survey over the area in 1957 under Airborne Permit 19 (A.F. 91624). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area in 1970 under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). Canadian Occidental Petroleum Limited conducted a geological, rock geochemical and geophysical survey (MAG and HLEM) in 1974 (A.F. 92318, 92319) and drilled two holes (217 m total) to investigate an HLEM anomaly (A.F. 92318).

#### GEOLOGICAL SETTING:

The area of the occurrence is underlain by mafic volcanic and sedimentary rocks of the Hayes River Group (Wright, 1928); (Fig. 19). DDH IL 1-75 (109 m) intersected a succession of felsic to intermediate volcanic rocks. DDH BA 10-76 (108 m) intersected andesite and several thin layers of quartz-feldspar porphyry (A.F. 92318). Theyer (unpublished field notes, 1990) noted a 35 cm thick layer of east-striking sedimentary rock in a sequence of mafic pillowed flows.

#### MINERALIZATION:

DDH IL 1-75 intersected disseminated pyrrhotite and pyrite, and two cm-thick layers of near-solid pyrrhotite, pyrite, chalcopyrite and sphalerite. Sulphide concentrations do not exceed 5% total volume over 2 m length. DDH BA 10-76 intersected up to 1% pyrrhotite, chalcopyrite and pyrite. Two 4 mm-thick veins contain 60% sphalerite and 20% pyrrhotite are reported (A.F. 92318). Godard (1963a, b) designated a pyrite-bearing quartz vein as (mineralized) Locality 10 on map 59-3 and described it as a 10 cm thick northeast-striking quartz vein traceable over 5 m on strike. A geological and geochemical survey identified seven mineralized sites in the vicinity of this location. The most notable was a quartz-carbonate vein of unspecified thickness in andesite, mineralized with sphalerite and chalcopyrite.

Theyer (unpublished field notes, 1990) noted approximately 1% disseminated pyrite in a sedimentary rock layer.

#### GEOCHEMICAL DATA:

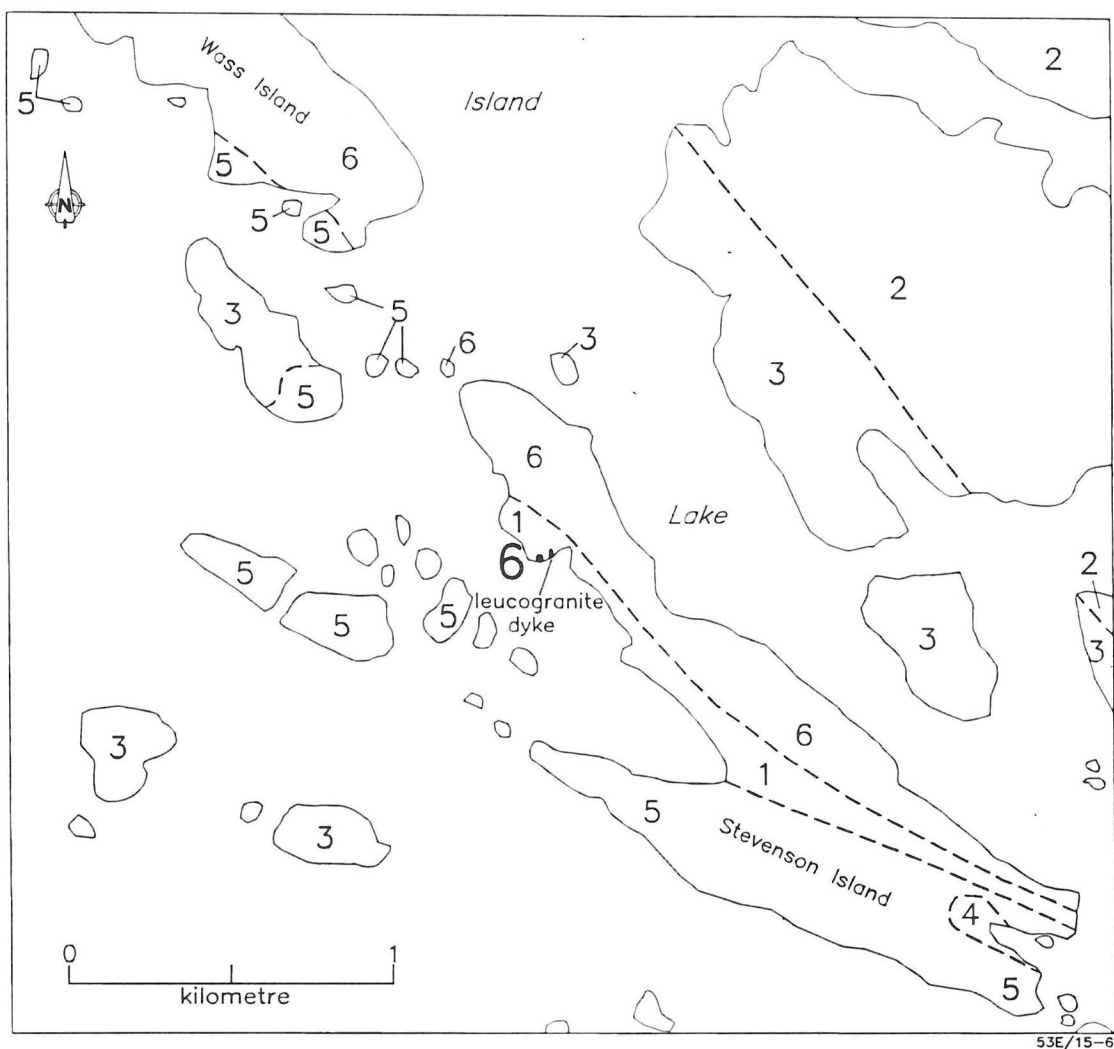
Godard (1963a) reported that a grab sample from the quartz vein assayed 15.8 g/t Au and 13.4 g/t Ag. Drill core samples from DDH IL 75-1 returned 8 ppm to 5300 ppm copper and 18 ppm to more than 2% zinc. The unusually high concentration of zinc was from a several cm thick, near solid-sulphide layer. A high concentration of zinc (2%) was reported from a quartz-carbonate vein that contains sphalerite and chalcopyrite (A.F. 92318).

#### CLASSIFICATION:

Vein type deposit; single veins. Both the Au and Ag bearing vein and the near solid-sulphide vein bearing high Cu and Zn concentrations are noteworthy mineral occurrences.

#### REFERENCES:

- Assessment Files 91624, 91684, 91694, 92318, 92319  
Manitoba Energy and Mines, Mines Branch.
- Gilbert, H.P., Neale, K.L., Weber, W., Corkery, M.T., and McGregor, C.R.  
1983: Island Lake; Manitoba Energy and Mines, Preliminary Map 1983 I-1, 1:20 000.
- Godard, J.D.  
1963a: Geology of the Island Lake-York Lake area; Manitoba Mines and Natural Resources, Mines Branch, Publication 59-3, 45p.  
1963b: Island Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3A, 1:63 360.
- Mineral Inventory Card 53E/15 Zn1  
Manitoba Energy and Mines, Geological Services Branch.
- Theyer, P.  
1980: Ultramafic rocks, nickel occurrences and interpreted stratigraphic relationships; Manitoba Energy and Mines, Mineral Resources Division, Map ER79-2-1 to ER79-2-13, 1:50 000.
- Weber, W., Gilbert, H.P., Neale, K.L. and McGregor, C.R.  
1982: Island Lake Project; in Manitoba Mineral Resources Division Report of Field Activities, 1982, p. 34-43.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



Late Metasedimentary Rocks

6 Quartz feldspar porphyry

--- Geological contact (approximate)

• 6 Occurrence location

Early Intrusive Rocks

5 Mafic intrusive rocks and  
minor related felsic phases

4 Ultramafic intrusive rocks: related  
subvolcanic or extrusive rocks

Hayes River Group

3 Conglomerate

2 Greywacke, siltstone, argillite

1 Mafic volcanic rocks

Figure 20: Geological setting of occurrence 6. Geology compiled from Godard, (1963b); Theyer, (1980); Neale et al. (1982); Weber et al. (1982).

LOCATION: 6

NAME: Saga

UTM: 5969388N/390291E

ACCESS: Via boat or float plane

AREA: Western Island Lake (Fig. 1)

AIRPHOTO: A23566-197

#### EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). In the same year the Canadian Nickel Company Limited followed the airborne survey with a ground magnetic survey over the ILE claims that partially cover this area (A.F. 91151). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area in 1970 under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the Island Lake area in 1972 under Airborne Permit 102 (A.F. 91694). A MAG and VLF-EM survey was conducted over the SAGA claims in 1974 by Central Geophysics Limited on behalf of the claim holders (A.F. 92341). Three shallow overburden and rubble-filled trenches are present in the area of the occurrence in 1990 (P. Theyer, unpublished field notes).

#### GEOLOGICAL SETTING:

The occurrence is underlain by mafic intrusive rocks of the Hayes River Group (Wright, 1928). A coarse grained leucogranite dyke is exposed on the shore in the vicinity of the trenches. The location of these small and shallow trenches is indicated by the occurrence location symbol (Fig. 20).

#### MINERALIZATION:

The amphibolite schist in the vicinity of the leucogranite contained up to 1% pyrite. Godard (1963a, b) designated a pyrite-bearing quartz vein as (mineralized) Locality 12 on map 59-3A. The exact location of this vein is unknown and is thus not shown on Figure 20.

#### GEOCHEMICAL DATA:

Godard (1963a) reported that a sample of mineralized quartz vein assayed 2.7 g/t Au and nil Ag. Eight gold assays on rock samples from the island north of Stevenson Island were performed using a portable chemical kit. The results of these assays were negative (A.F. 92437).

#### CLASSIFICATION:

Disseminated mineralization - not classified.

#### REFERENCES:

Assessment Files 91151, 91624, 91684, 91694, 92341, 92437

Manitoba Energy and Mines, Mines Branch.

Godard, J.D.

1963a: Geology of the Island Lake-York Lake area; Manitoba Mines and Natural Resources, Mines Branch, Publication 59-3, 45p.

1963b: Island Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3A, 1:63 360.

Neale, K.L., Weber, W. and McGregor, C.R.

1982: Garden Hill, Manitoba Department of Energy and Mines, Preliminary Map 1982 I-2, 1:20 000.

Theyer, P.

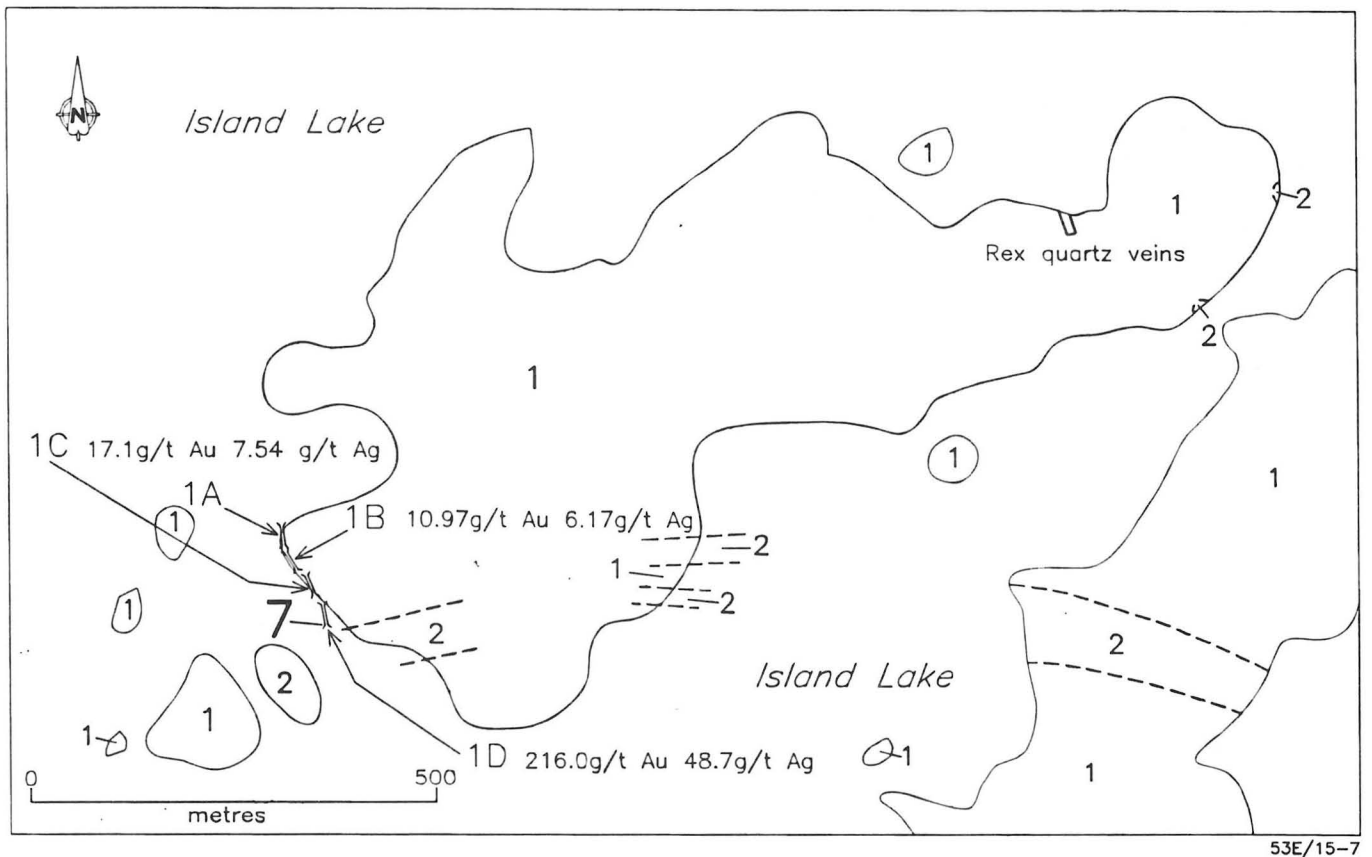
1980: Ultramafic rocks, nickel occurrences and interpreted stratigraphic relationships; Manitoba Energy and Mines, Mineral Resources Division, Map ER79-2-1 to ER79-2-13, 1:50 000.

Weber, W., Gilbert, H.P., Neale, K.L. and McGregor, C.R.

1982: Island Lake Project; in Manitoba Mineral Resources Division Report of Field Activities, 1982, p. 34-43.

Wright, J.F.

1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



53E/15-7

#### Early Intrusive Rocks

2 Mafic intrusive rocks

1 Tonalite, granodiorite; minor diorite and felsic porphyry; related migmatite

--- Geological contact

☐= Trench (large, small)

7 Occurrence location

Figure 21: Geological setting of occurrence 7. Geology compiled from Godard (1963); Theyer (1980); Weber et al. (1982); Gilbert et al. (1983).

LOCATION: 7

NAME: Climpy

UTM: 5957020N/391228E

ACCESS: Via boat or float plane

AREA: Island Lake west (Fig. 1)

AIRPHOTO: A23065-102

#### EXPLORATION SUMMARY:

A detailed review of the exploration history is given in Mineral Inventory Card 53E/15 Ag2. The area of this occurrence was first staked in 1949. Prospecting and trenching of several trenches took place between 1951 and 1955. Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). The occurrence was restaked in 1973 and in 1979. Noranda Exploration Company Limited conducted a mapping and sampling program in 1980 and retrieved four channel samples in 1981. In 1985, interests in this property were transferred to Midway Lake Minerals Corporation, Wydmar Resource Enterprises Limited and Bighorn Development Corporation. A 20 x 8 x 5 m trench that uncovered two adjacent quartz veins (Rex quartz veins) occur approximately 35 m south of the northeastern shore of an island (Fig. 1). There is evidence that prospecting and blasting were done on the western shore, where four partially submerged trenches were excavated to sample a barely visible northeast-striking quartz vein (Climpy quartz vein), (P. Theyer, 1990, unpublished field notes).

#### GEOLOGICAL SETTING:

The area of the occurrence is underlain by early plutonic (Weber *et al.*, 1982), massive granodiorite and tonalite (Fig. 21) that are intruded by east-trending diabase and southeast-trending monzonite dykes. A trench approximately 35 m south of the northeastern shore of the island uncovered two, north-northwest striking, 1 to 1.5 m thick quartz veins separated by an approximately 1.5 m thick chlorite schist layer. The quartz is milky white to dark coloured and sugary and contains abundant lensoid to elongated cm-thick chloritic inclusions. A second notable quartz occurrence consists of an approximately 1 m thick, northeast-striking vein (Climpy quartz vein) in pink granodiorite. The quartz veins appear to be of limited extent, since inspection of the shores of this and adjacent islands, failed to disclose further quartz veins.

#### MINERALIZATION:

Quartz of the northeastern (Rex) quartz veins contains up to 5% disseminated pyrite. Up to 10% disseminated and seams of pyrite and minor chalcopyrite were observed in

chloritized granodiorite. Quartz exposed in four pits (1A, 1B, 1C, 1D), (Fig. 21) sunk along part of the western shore of the island, contains up to 10% pyrite, minor molybdenite, chalcopyrite and malachite (A.F. 92398).

#### GEOCHEMICAL DATA:

A 22.8 kg channel sample collected across a 25 cm thick quartz vein at pit 1A assayed 1 g/t Au and 1.3 g/t Ag. A 74.5 kg channel sample cut across a 56 cm thick quartz vein at pit 1B assayed 3.4 g/t Au and trace Ag. A 65.9 kg channel sample cut across a 39 cm thick quartz vein at pit 1C assayed 3.4 g/t Au and 1.3 g/t Ag. A 60.9 kg channel sample cut across a 30 cm thick quartz vein at pit 1D assayed 21.5 g/t Au and 10.6 g/t Ag (A.F. 92398).

#### CLASSIFICATION:

Vein type deposit - multiple veins and lenses.

#### REFERENCES:

- Assessment Files 91624, 91694, 92398  
Manitoba Energy and Mines, Mines Branch.
- Gilbert, H.P., Neale, K.L., Weber, W., Corkery, M.T., and McGregor, C.R.  
1983: Island Lake; Manitoba Energy and Mines, Preliminary Map 1983 I-1, 1:20 000.
- Godard, J.D.  
1963: Island Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3A, 1:63 360.
- Mineral Inventory Card 53E/15 Ag2  
Manitoba Energy and Mines, Geological Services Branch.
- Theyer, P.  
1980: Ultramafic rocks, nickel occurrences and interpreted stratigraphic relationships; Manitoba Energy and Mines, Mineral Resources Division, Map ER79-2-1 to ER79-2-13, 1:50 000.
- Weber, W., Gilbert, H.P., Neale, K.L. and McGregor, C.R.  
1982: Island Lake Project; in Manitoba Mineral Resources Division, Report of Field Activities 1982, p. 34-43.

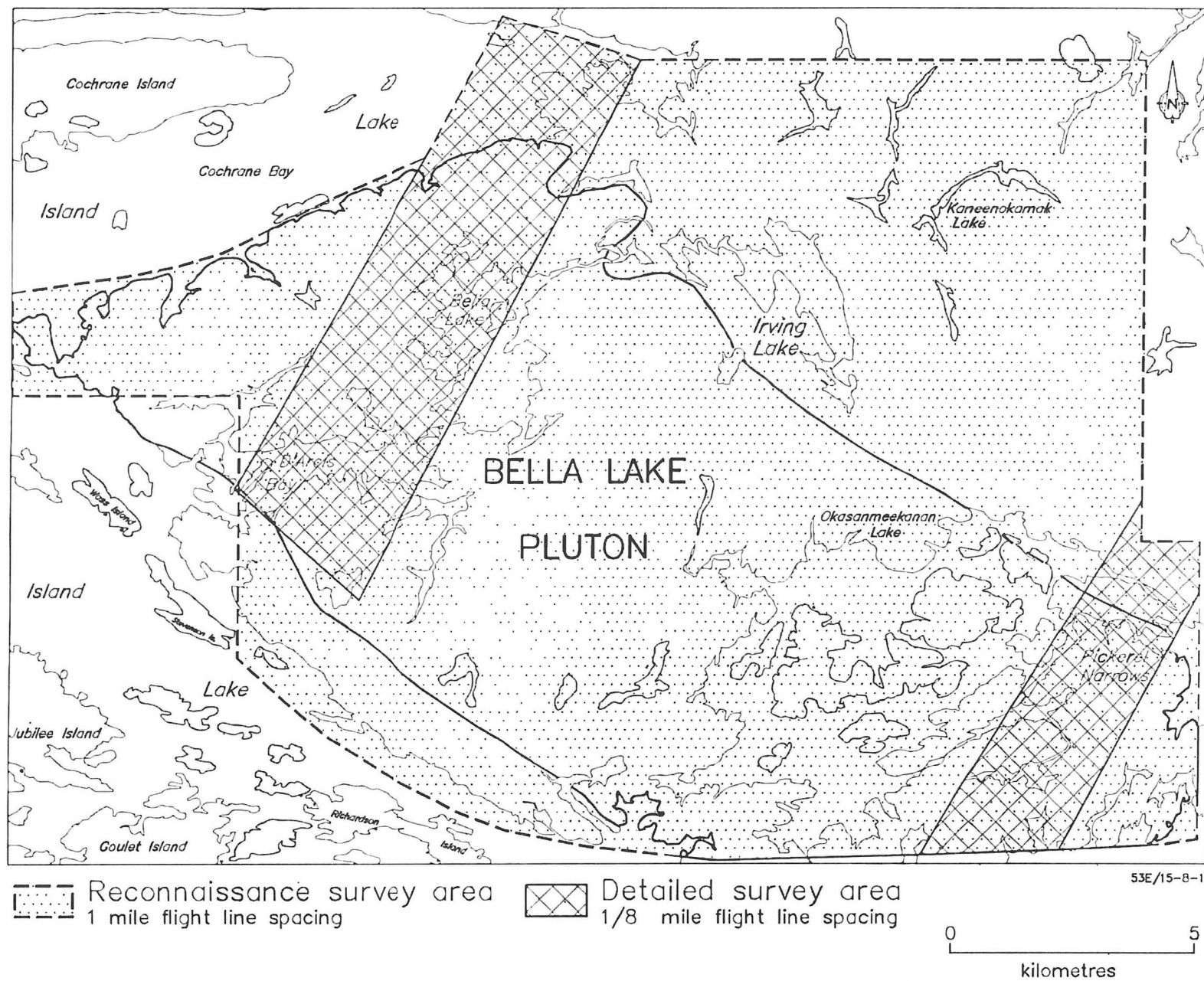


Figure 22: Reconnaissance and detailed airborne electromagnetic surveys in the area of occurrence 8.



LOCATION: 8

NAME: Bella Lake

UTM: 5973474N/396518E

ACCESS: Via boat or float plane

AREA: North-central Island Lake (Fig. 1)

AIRPHOTO: A23065-93

#### EXPLORATION SUMMARY:

McMurchy (1944) reported that in the vicinity of Bella Lake, T. Wass (a prospector) discovered an up to 10 m wide zone in granite with quartz lenses and stringers that locally contained considerable amounts of tourmaline and oxidized pyrite. Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). T. A. Hamilton, a prospector at Island Lake, discovered a number of chalcopyrite-molybdenite occurrences in the D'Arcis Bay region of the Bella Lake pluton. Barringer Research Limited conducted a geochemical survey over the Western Canadian Shield in 1969. A sample collected from the northern shoreline of Irving Lake that contained anomalous concentrations of Cu Mo and Ni motivated Barringer Research Limited to define an area to be geophysically surveyed in reconnaissance style, followed by detailed surveys in two areas (Fig. 22). Geochemical sampling defined a "persistent geochemical anomaly" (A.F. 91786). Additional detailed rock geochemical surveys and a helicopter-borne MAG, EM, and Hg-detection survey (Airtrace) were conducted over the Bella Lake and the Pickerel Narrows areas in 1970 (Fig. 22). Detailed rock geochemistry, soil, silt and stream sediment geochemistry were carried out and/or repeated about D'Arcis Bay and the eastern and northern shoreline of Bella Lake in 1971 (A.F. 91786). These surveys were followed by reconnaissance mapping (1:15 840 scale) south and west of Irving Lake, a geochemical sediment sampling program in the southeast arm of D'Arcis Bay and a geochemical bedrock survey of the northeastern shore of Bella Lake in 1972 (A.F. 91786). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 (Airborne Permit 102) (A.F. 91694). The Exploration Operations Branch of Manitoba Mines, Resources and Environmental Management staked Mineral Exploration Permit No. 2, mapped and geochemically sampled the Bella Lake pluton in 1975 (Fig. 23). A concentric alteration aureole with an outer propylitic-pyritic shell and an inner potassic zone was proposed by R. Haskins (A.F. 90001). Based on the evidence of this proposed alteration pattern and the occurrence of fracture-bound Cu-Mo mineralization in the D'Arcis Bay region of the Bella Lake pluton, the tentative potential for the Bella Lake pluton to host Cu-Mo porphyry type mineralization was proposed and tested by drilling in 1976 (Fig. 23) (A.F. 90001).

#### GEOLOGICAL SETTING:

The Bella Lake pluton is a multi-phase intrusive complex. The principal rock is granodiorite intruded by sheets and lenses of quartz monzonite. A younger syenite-diorite complex underlying the central part of the Bella Lake complex intrudes the granodiorite and monzonite. Narrow aplite sheets

(5 to 30 cm thick) are common; pegmatites are rare. A zoned alteration pattern in which an outer propylitic halo surrounds a central largely unaltered core was described (A.F. 90001). All rocks are members of the group of Late Intrusive Rocks (Weber *et al.*, 1982).

#### MINERALIZATION:

Pyrite and minor chalcopyrite occur near the contacts between the Bella Lake granites and volcanic strata of the Island Lake greenstone belt. Mineralization within the Bella Lake granite is concentrated about the northeast arm of D'Arcis Bay (Location 9). Chalcopyrite, pyrite, malachite and molybdenite occur in shears and fracture planes filled with quartz and tourmaline. (A.F. 91786).

An area 1800 m long by 300 m wide was described as mineralized with undetermined amounts of copper. A second zone described as predominantly mineralized with molybdenite outcrops east of the copper zone (A.F. 90001; no maps available). Pyrite, bornite and molybdenite are associated with orthoclase and quartz-bearing veinlets in the centre of the Bella Lake intrusion. A 1800 x 300 m copper mineralization-bearing zone and a molybdenite-bearing zone to the east of the copper-bearing zone was distinguished (A.F. 90001).

#### GEOCHEMICAL DATA:

Concentrations of copper in rock samples collected from the northeast shore of Bella Lake by Magenta Exploration Limited, on behalf of Barringer Exploration Limited, ranged from 5 to 100 ppm; concentrations of cobalt ranged from 8 to 16 ppm; concentrations of molybdenum ranged from <2 to 12 ppm; concentrations of zinc ranged from 23 to 62 ppm; concentrations of nickel ranged from 8 to 30 ppm, and concentrations of lead ranged from 14 to 24 ppm (A.F. 91786).

Twenty-three shallow holes (Fig. 23) drilled in granite of the Bella Lake pluton returned 0.005% to 0.065% Cu and up to 0.06% Mo (Table 2) (A.F. 90001). Rock samples collected by Exploration Operations in that area assayed up to 3850 ppm Cu and 958 ppm Mo (A.F. 90001). A complete listing of the assay results is included in Table 18 (Appendix 1).

#### CLASSIFICATION:

Disseminated mineralization - not classified. The evidence to classify this as a deposit with porphyry affinities is unconvincing.

#### REFERENCES:

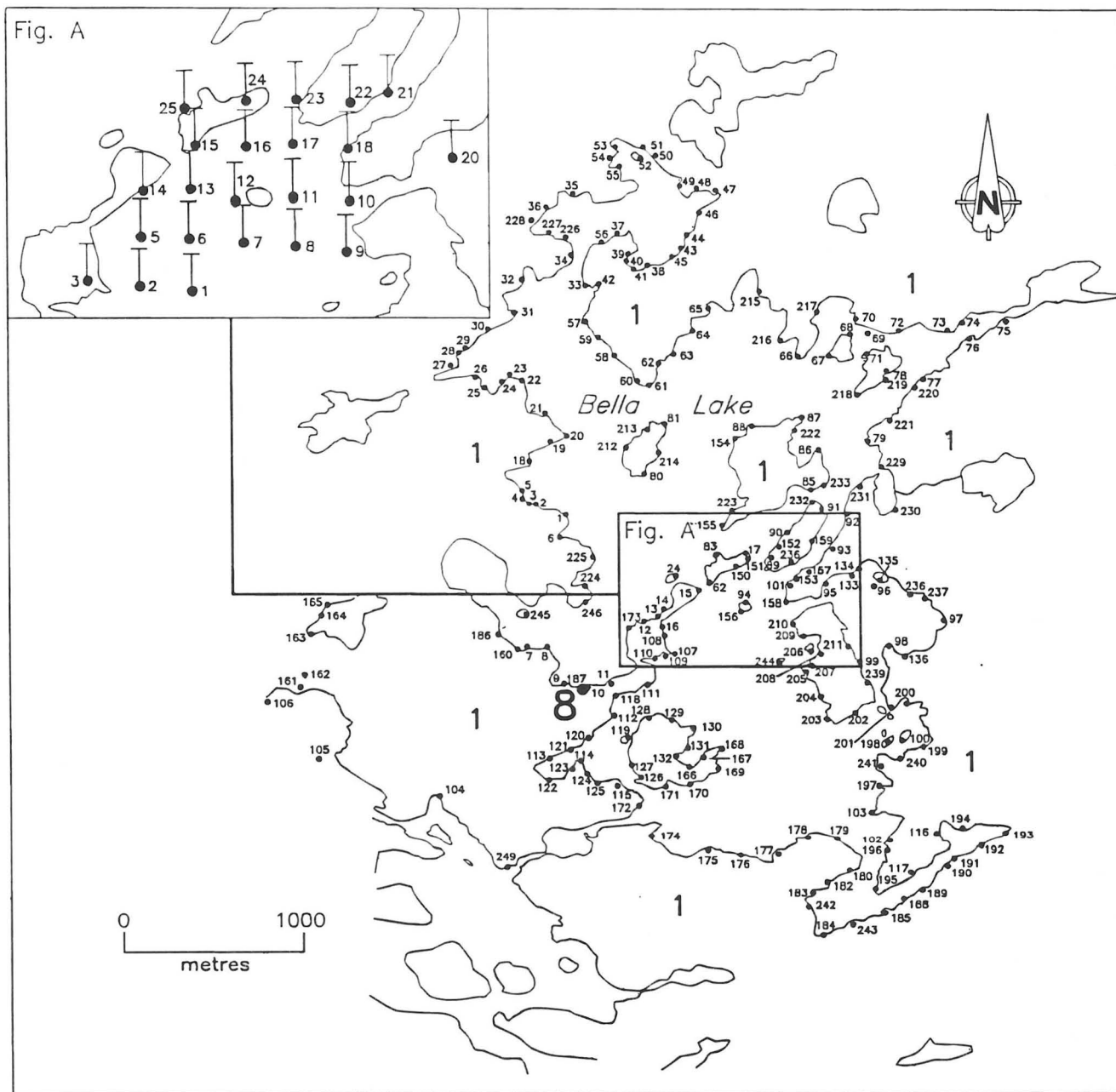
Assessment Files 90001, 91624, 91694, 91786

Manitoba Energy and Mines, Mines Branch.

McMurchy, R.C.

1944: Geology of the Island Lake area of Manitoba; The Precambrian, September 1944, p. 4-9.

Weber, W., Gilbert, H.P., Neale, K.L. and McGregor, C.R.  
1982: Island Lake Project; in Manitoba Mineral Resources Division Report of Field Activities, 1982, p. 34-43.



53E/15-8-2

Late Intrusive Rocks

1 Granodiorite, quartz monzonite

• Sample site

—• Drill hole (A.F. 90001)

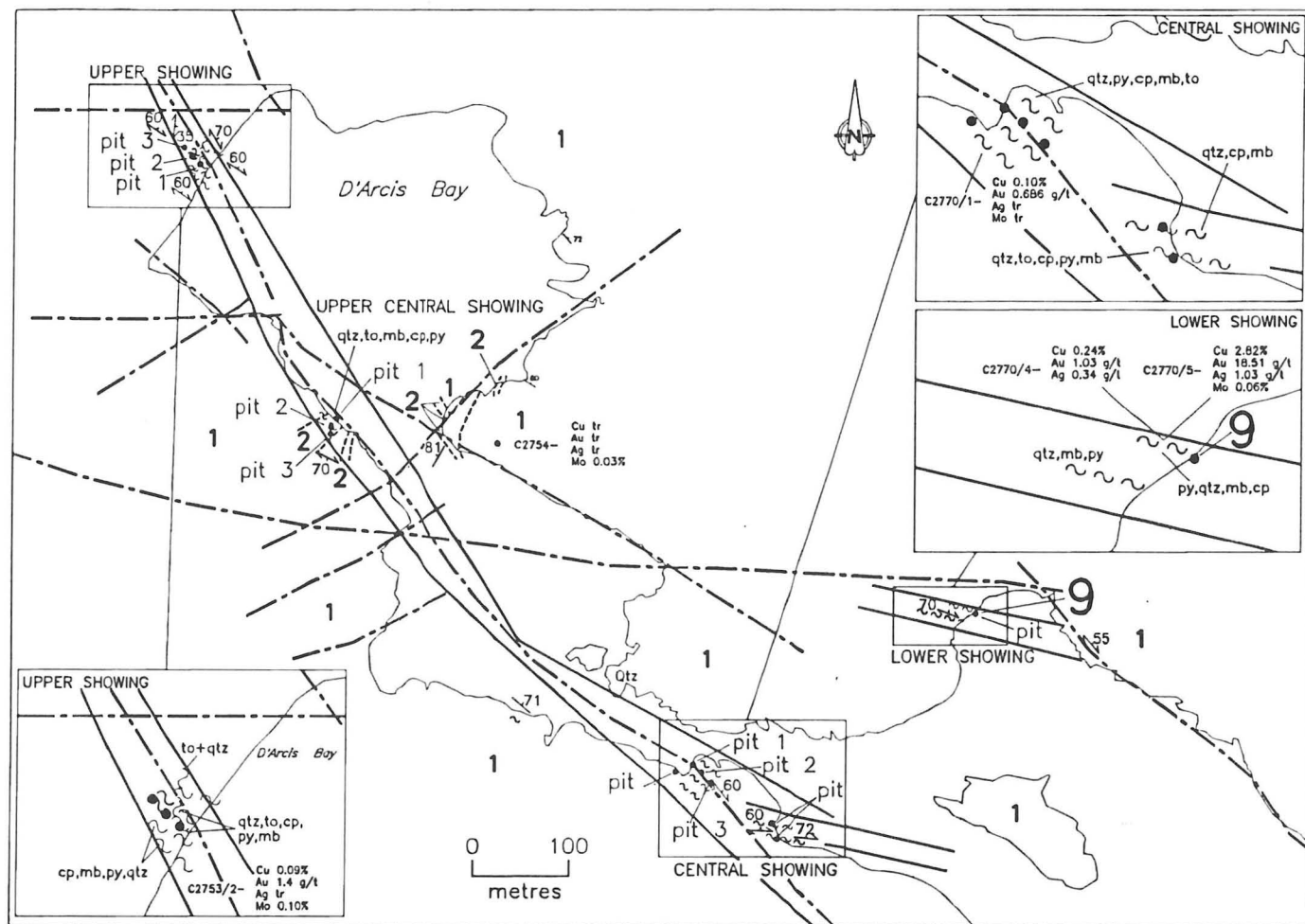
•8 Occurrence location

Figure 23: Geological setting of occurrence 8, lithogeochemical sample sites and location of drillholes. Modified after A.F. 90001.



**Table 2**  
**Range of Cu and Mo assays of several drill cores**  
**from the Bella Lake pluton (A.F. 90001)**

DDH No.	from (m)	to (m)	Cu	Mo
		(%)	(%)	
5A	0	1.5	0.010	<0.001
5B	1.5	3	0.065	<0.001
5C	3	4.5	0.005	<0.001
5D	4.5	6.7	0.010	<0.001
13A			0.015	<0.001
13B	0	1.5	0.010	<0.001
13C	1.5	3	0.005	<0.001
13D	3	5	0.035	0.06
13E	5	5.3	0.005	<0.001
13F	5.3	5.5	0.010	<0.001
13G	5.5	6.1	0.010	<0.001
14A	0	0.3	0.015	<0.001
14B	0.3	1.8	0.015	<0.001
14C	1.8	3.3	0.015	<0.001
14D	3.3	4.9	0.005	<0.001
14E	4.9	6.1	0.025	<0.001
15A	1.8	3.3	0.005	<0.001
15B	3.3	4.9	0.005	<0.001
15C	4.9	6.4	0.005	<0.001
15D	6.4	7.9	0.010	<0.001
15E	7.9	8.3	0.005	<0.001
16A	7.9	9.5	0.035	<0.001
16B	9.5	10.9	0.025	0.001
16C	10.9	12.5	0.010	<0.001
16D	12.5	14.0	0.015	<0.001
17A	0	1.5	<0.005	<0.001
17B	1.5	3	<0.005	<0.001
17C	3	4.5	0.005	<0.001
17D	4.5	6.1	0.005	<0.001
17E	6.1	7.6	0.010	<0.001
17G	7.6	9.1	0.005	<0.001
17H	9.1	10.6	0.005	<0.001
17I	10.6	12.4	0.005	<0.001



53E/15-9-1

2 Aplite  
1 Granite

----- Geological contact (approximate)  
-- Fault (assumed)  
— Limit of Cu + Mo mineralization  
~~ Shear zone

71 Foliation (inclined, vertical)  
72 Schistosity and gneissosity  
pit • R.D.P. Canadian Joint Venture  
(A.F. 93664)  
•9 Occurrence location

Figure 24: Geological setting of occurrence 9.

LOCATION: 9

NAME: Lomond

UTM: 5972715N/395490E

ACCESS: Via boat or float plane

AREA: North-central Island Lake (D'Arcis Bay) (Fig. 1)

AIRPHOTO: A23065-60

#### EXPLORATION SUMMARY:

A complete review of the deposit history is contained in Mineral Inventory Card 53E/15 Mo1. McMurphy (1944) described that T. Wass (a local prospector) discovered a zone up to 10 m wide in granite with lenses and stringers of quartz, in places bearing considerable amounts of tourmaline and oxidized pyrite. Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). T. A. Hamilton, a prospector at Island Lake, discovered a number of chalcopyrite-molybdenite occurrences in the D'Arcis Bay region of the Bella Lake pluton (Fig 24). Several tonalite, quartz diorite and granodiorite plutons in the Island Lake greenstone belt were investigated for their potential to contain porphyry copper type deposits. Barringer Research Limited conducted in 1969 a geochemical survey over the Western Canadian Shield. A sample collected from the northern shoreline of Irving Lake, containing anomalous concentrations of Cu, Mo and Ni, motivated Barringer Research Limited to conduct detailed geochemical sampling that defined a "persistent geochemical anomaly" (A.F. 91786). Additional rock geochemical surveys and a helicopter-borne MAG, EM, and Hg-detection survey (Airtrace) were conducted over the Bella Lake area in 1970. Detailed rock geochemistry, soil and silt geochemistry were carried out and/or repeated about D'Arcis Bay and the eastern and northern shoreline of Bella Lake in 1971. These surveys were then followed by geological mapping (1:15 840 scale) south and west of Irving Lake, a geochemical sediment sampling program in the southeast arm of D'Arcis Bay and a geochemical bedrock survey of the northeastern shore of Bella Lake in 1972 (A.F. 91786). A detailed geological mapping (1:2400 scale) and rock sampling program was conducted over the northwestern arm of D'Arcis Bay to evaluate the Cu-Mo occurrences identified by T. Wass (A.F. 93664). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694).

#### GEOLOGICAL SETTING:

Location 9 consists of two prominent northwest-striking quartz-bearing mineralized fractures, up to 1 m thick in granite of the Bella Lake pluton (Fig 24) (A.F. 93664). Locally these fractures contain tourmaline. The geology of the Bella Lake pluton was described in the "Geological Setting" of Location 8.

#### MINERALIZATION:

Quartz and tourmaline are associated with disseminations and up mm-thick layers of pyrite, chalcopyrite and with knots and pockets of molybdenite in places (A.F. 93664).

#### GEOCHEMICAL DATA:

Approximately fifteen metre-long channel samples were collected across the three mineralized occurrences at D'Arcis Bay (A.F. 91786).

Geochemical data of channel and grab samples collected by Barringer Research Limited are listed in Tables 3, 4, 5, 6, and 7 (A.F. 91786).

**Table 3**  
**Geochemical data for channel samples collected from the "Upper Showing"**

Sample No.	Au (g/t)	Ag (g/t)	Mo (%)	Pb (%)	Zn (%)	Ni (%)	Cu (%)
C-46	tr.	tr.	nil	-	-	-	-
C-48	tr.	tr.	nil	-	-	-	0.01
C-49	tr.	tr.	0.04	-	-	-	0.02
C-50	1.37	0.69	0.36	-	-	-	0.55

**Table 4**  
**Geochemical data for channel samples collected from the "Central Showing"**

Sample No.	Au (g/t)	Ag (g/t)	Mo (%)	Pb (%)	Zn (%)	Ni (%)	Cu (%)
4754	0.34	tr.	nil	-	-	-	0.01
4756	0.34	tr.	nil	-	-	-	0.05
4752	1.37	120.69	0.06	-	-	-	0.60
4753	0.69	21.94	0.03	-	-	-	0.28

**Table 5**  
**Geochemical data for channel samples collected from the "Lower Showing"**

Sample No.	Au (g/t)	Ag (g/t)	Mo (%)	Pb (%)	Zn (%)	Ni (%)	Cu (%)
C-41	8.23	104.23	0.03	-	-	-	0.13

**Table 6**  
**Geochemical data for rock samples collected from the "Upper Showing"**

Sample No.	Au (g/t)	Ag (g/t)	Mo (%)	Pb (%)	Zn (%)	Ni (%)	Cu (%)
C-2	2.74	59.66	0.01	0.05	<0.01	-	0.67
C-3	tr.	tr.	0.64	<0.01	<0.01	-	<0.01
C-6	tr.	tr.	0.02	<0.01	<0.01	-	0.02
C-7	0.34	tr.	0.14	<0.01	<0.01	-	0.11
C-14	nil	tr.	<0.01	<0.01	<0.01	-	<0.01
C-17	tr.	tr.	0.20	0.01	<0.01	-	<0.01
C-19	tr.	tr.	<0.01	<0.01	<0.01	-	<0.01
C-8	nil	tr.	0.01	<0.01	<0.01	0.02	<0.01
C-12	0.34	tr.	0.84	0.02	<0.01	-	<0.01

**Table 7**  
**Geochemical data for rock samples collected from the**  
**"Central Showing"**

Sample No.	Au (g/t)	Ag (g/t)	Mo (%)	Pb (%)	Zn (%)	Ni (%)	Cu (%)
C-1	0.69	36.34	0.20	0.03	<0.01	-	0.05
C-9	tr.	tr.	<0.01	<0.01	<0.01	-	<0.01
C-11	tr.	tr.	<0.01	0.01	<0.01	-	0.06
C-5	0.34	tr.	0.18	<0.01	<0.01	-	0.48
C-18	5.49	209.83	0.06	0.07	<0.01	-	2.58
C-10	nil	tr.	<0.01	<0.01	<0.01	-	<0.01

**CLASSIFICATION:**

Vein type deposit - multiple veins in a regional fracture zone.

**REFERENCES:**

Assessment Files 91624, 91694, 91786, 93664

Manitoba Energy and Mines, Mines Branch.

McMurphy, R.C.:

1944: Geology of the Island Lake area of Manitoba;  
The Precambrian, September 1944, p. 4-9.

Mineral Inventory Card 53E/15 Mo1

Manitoba Energy and Mines, Geological Services  
Branch.

LOCATION: 10

NAME: Tom

UTM: 5961082N/392147E

ACCESS: Via boat or float plane

AREA: Central Island Lake (Fig. 1)

AIRPHOTO: A23065-98

#### EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the Island Lake area in 1970 under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the Island Lake area in 1972 under Airborne Permit 102 (A.F. 91694). A MAG and HLEM survey was conducted in 1974 over the eastern part of the area (Grid H) by Barringer Research Limited on behalf of Canadian Occidental Petroleum Limited (A.F. 92244). In 1987, Bighorn Development Corporation conducted prospecting, trenching rock sampling and assaying programs (A.F. 92870).

#### GEOLOGICAL SETTING:

The area of the occurrence is underlain by mafic volcanic rocks and pegmatitic granites of the Hayes River Group (Wright, 1928)(Fig. 25).

#### MINERALIZATION:

A north-striking sulphide-bearing quartz vein exposed for 22 m on strike was partially trenched and sampled (A.F. 92870) (Fig. 26).

Unquantified amounts of chalcopyrite, pyrite and pyrrhotite, plus minor galena, bornite and sphalerite were reported to occur in a quartz vein that crosscuts andesite and pegmatitic granite (A.F. 92870).

#### GEOCHEMICAL DATA:

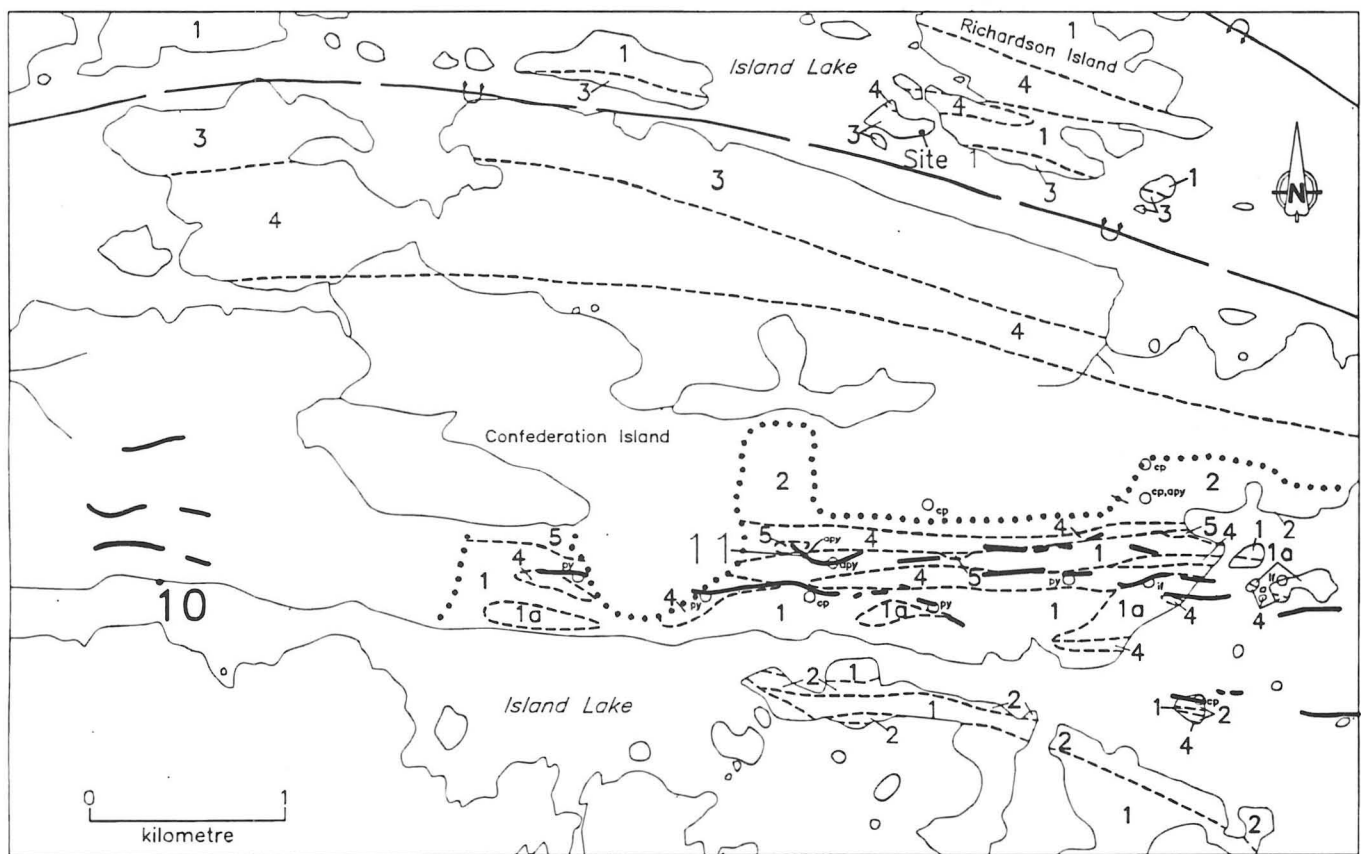
Figure 26 lists Au, Ag and Cu concentrations contained in samples from the Tom 4 trench.

#### CLASSIFICATION:

Vein type deposit - single vein.

#### REFERENCES:

- Assessment Files 91624, 91684, 91694, 92244, 92870  
Manitoba Energy and Mines, Mines Branch.
- Godard, J.D.  
1963: Island Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3A, 1:63 360.
- Theyer, P.  
1980: Ultramafic rocks, nickel occurrences and interpreted stratigraphic relationships; Manitoba Energy and Mines, Mineral Resources Division, Map ER79-2-1 to ER79-2-13, 1:50 000.
- Weber, W., Gilbert, H.P., Neale, K.L. and McGregor, C.R.  
1982: Island Lake Project; in Manitoba Mineral Resources Division Report of Field Activities, 1982, p. 34-43.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



53E/15-10

### Early Intrusive Rocks

- 5 Quartz porphyry
- 4 Mafic intrusive rocks

### Hayes River Group

- 3 Greywacke, siltstone, argillite
- 2 Felsic volcanic rocks
- 1 Mafic volcanic flows and related intrusive rocks
  - a) mafic volcanic flows with tuffaceous interlayers

- Geological contact (approximate)
- EM conductor (A.F. 92139)
- .... Limit of mapping
- ⌒ Anticline (overturned)
- ⌒ Syncline (overturned)
- <sub>py</sub> Mineralization
- 10 Occurrence location

Figure 25: Geological setting of occurrence 10. Geology compiled from Godard (1963), Theyer (1980), Gilbert et al. (1983) and A.F. 92139.

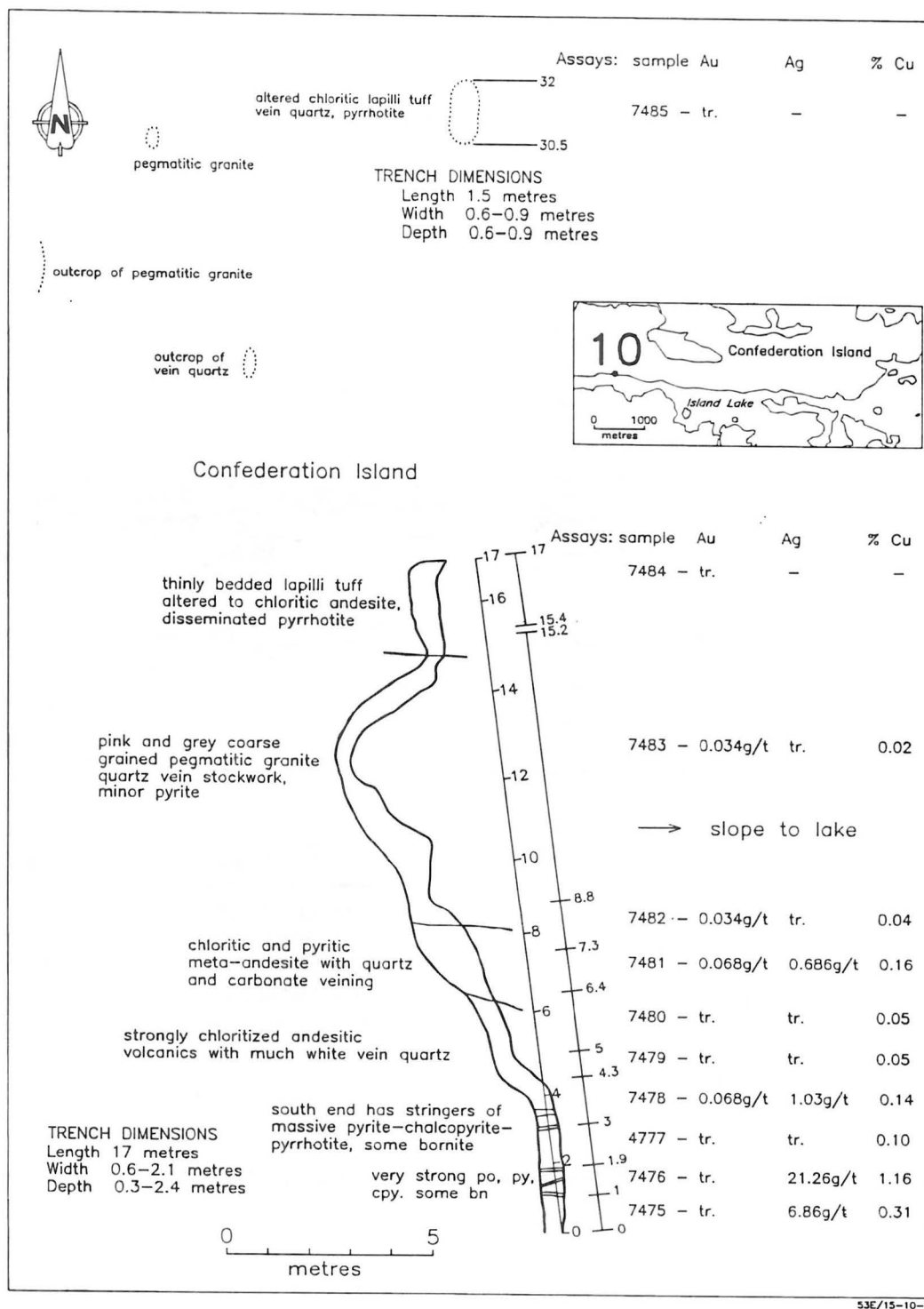
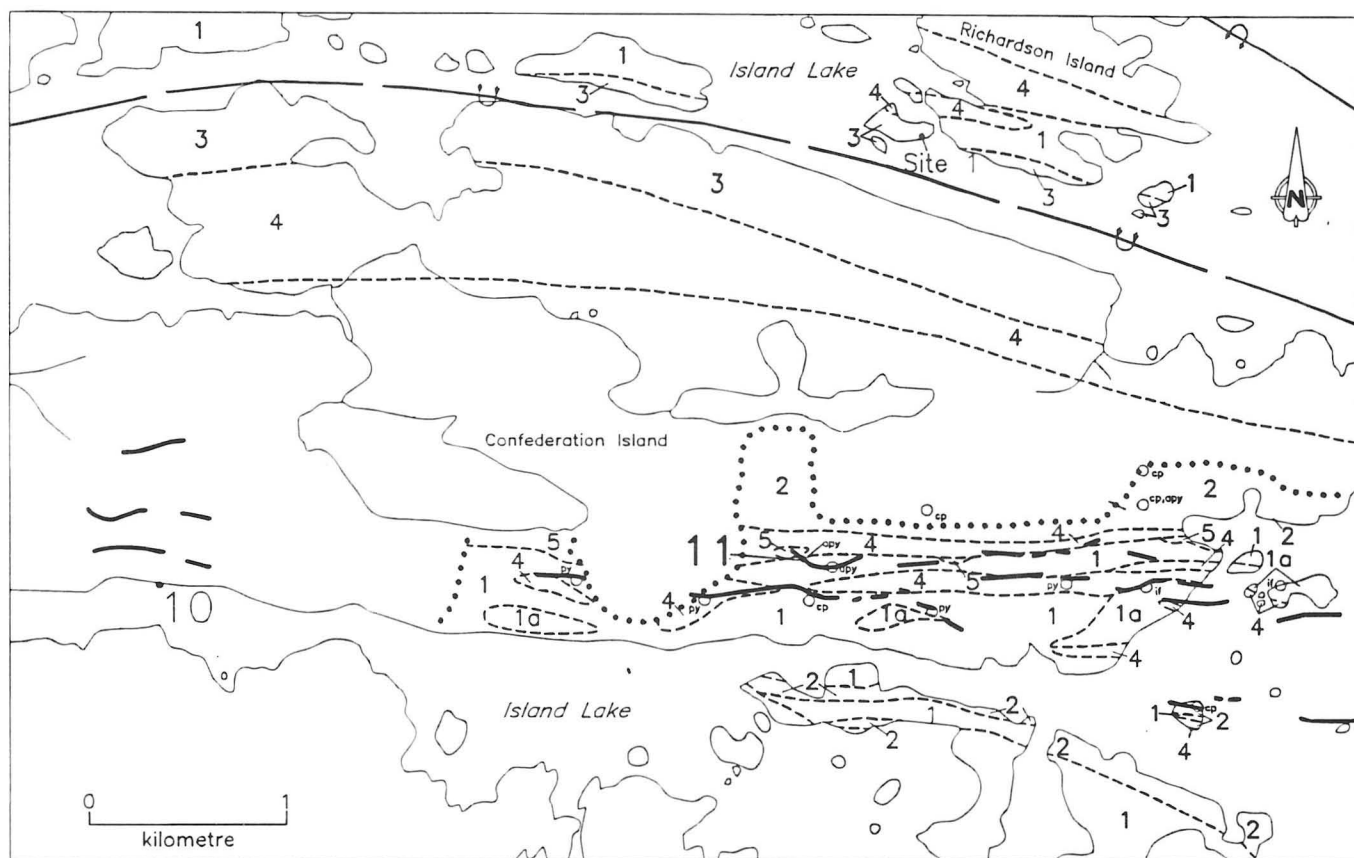


Figure 26: Detailed geology of occurrence 10. Figure modified after A.F. 92870.



### Early Intrusive Rocks

- 5 Quartz porphyry
- 4 Mafic intrusive rocks

### Hayes River Group

- 3 Greywacke, siltstone, argillite
- 2 Felsic volcanic rocks
- 1 Mafic volcanic flows and related intrusive rocks
  - a) mafic volcanic flows with tuffaceous interlayers

- Geological contact (approximate)
- EM conductor (A.F. 92139)
- .... Limit of mapping
- ⌋ Anticline (overturned)
- ⌋ Syncline (overturned)
- <sub>py</sub> Mineralization
- 11 Occurrence location

Figure 27: Geological setting of occurrence 11. Geology compiled from Godard (1963b); Gilbert et al. (1983) and A.F. 92139.



LOCATION: 11

NAME:

UTM: 5961215N/394927E

ACCESS: Via boat or float plane

AREA: Central Island Lake (Fig. 1)

AIRPHOTO: A23065-99

#### EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the Island Lake area in 1970 under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the Island Lake area in 1972 under Airborne Permit 102 (A.F. 91694). A MAG and HLEM survey was conducted in 1974 over the eastern part of the area (Grid J) by Barringer Research Limited on behalf of Canadian Occidental Petroleum Limited (A.F. 92244). In 1977, the Exploration Operations Branch of the Manitoba Department of Mines, Resources and Environmental Management conducted prospecting, line cutting, staking, MAG and VLF-EM surveys (Petak, 1976) followed by a VL-EM survey and a bedrock geochemical survey (A.F. 92139).

**Site 1**, located on the south shore of an island north of northeastern Confederation Island (Fig. 27), was described by Godard (1963a) as "Locality No 9". This site was recorded as a copper occurrence by Petak (1976, Fig. EO-11-3). The geological data were compiled in Mineral Inventory Card 53E/15 Pyr2. Gilbert *et al.* (1983) conducted geological mapping and the site was inspected by P. Theyer in 1990 (unpublished field notes).

#### GEOLOGICAL SETTING:

The area of the occurrence is underlain by mafic volcanic rocks and feldspathic wacke, interbedded with siltstone and argillite. These rocks belong to the Hayes River Group (Wright, 1928).

**Site 1**, according to Godard (1963a), is underlain by andesitic rock. However, Gilbert *et al.* (1983) recorded feldspathic wacke, siltstone and argillite, and P. Theyer (1990, unpublished field notes) noted quartzofeldspathic and quartzitic wacke intruded by quartz-feldspar porphyry.

#### MINERALIZATION:

The occurrence is a 2 cm thick arsenopyrite-bearing seam contained in a 9 cm thick east-striking silicified zone traceable for approximately 18 m on strike in mafic volcanic rocks.

**Site 1**, is "well mineralized with fine disseminated pyrite with minor pyrrhotite and chalcopyrite" (Godard, 1963a). P. Theyer (unpublished field notes, 1990) observed rusty spots adjacent to fractures, probably attributable to oxidized pyrite.

#### GEOCHEMICAL DATA:

Samples from the mineralized seam assayed up to 1.37% Zn, 2.4% Pb, 0.02% Cu, 2 g/t Au and 24 g/t Ag (Table 8).

**Site 1**, According to Godard (1963a), an assayed sample assayed trace Au.

**Table 8**  
**Geochemical analyses for rock samples from**  
**Confederation Island (A.F. 92139)**

Sample No.	Cu (ppm)	Zn (ppm)	Co (ppm)	Ag (ppm)	Pb (ppm)
9			54		
16		650			50
17	460	168			
55	750				
84	570				
93		13700		27	24000
94		1920			1900
95		11800		13	11400
96					870
97		550		13	6500
119	670				105
120	450				49
144	430		55		
317		213			
318	400	570	106		
319		290	68		
321	700	480	53		
322	390	8300	188		42
328	440		59		
333	750	212			
336		180			
337			340		
398		186			
399A		211			
401			49		
402			186		
404		260	1000		
421		2190	127		
422		1050	77		
423			85		
440		380	75		

CLASSIFICATION:

Vein type deposit - single vein.

REFERENCES:

Assessment Files 91624, 91684, 91694, 92139, 92244.

Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P., Neale, K.L., Weber, W., Corkery, M.T., and McGregor, C.R.

1983: Island Lake; Manitoba Energy and Mines, Preliminary Map 1983 I-1, 1:20 000.

Godard, J.D.

1963a: Geology of the Island Lake-York Lake area; Manitoba Mines and Natural Resources, Mines Branch, Publication 59-3, 45p.

1963b: Island Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3A, 1:63 360.

Mineral Inventory Card 53E/15 Pyr2

Manitoba Energy and Mines, Geological Services Branch.

Petak, H.W.

1976: EO-11 Island Lake; in Manitoba Department of Mines, Resources and Environmental Management, Mineral Resources Division, Report of Field Activities, 1976, p. 71-73.

Theyer, P.

1980: Ultramafic rocks, nickel occurrences and interpreted stratigraphic relationships; Manitoba Energy and Mines, Mineral Resources Division, Map ER79-2-1 to ER79-2-13, 1:50 000.

Weber, W., Gilbert, H.P., Neale, K.L. and McGregor, C.R.

1982: Island Lake Project; in Manitoba Mineral Resources Division Report of Field Activities, 1982, p. 34-43.

Wright, J.F.

1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.

LOCATION: 12

NAME: Apex

UTM: 5964011N/392649E

ACCESS: Via boat or float plane

AREA: Central Island Lake (Fig. 1)

AIRPHOTO: A23065-97

#### EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the Island Lake area in 1970 under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the Island Lake area in 1972 under Airborne Permit 102 (A.F. 91694). The occurrence is located on Goulet Island and was trenched and drilled (8 holes 408 m) by R. Birch (prospector) in 1980 and 1981 (A.F. 93138). The geology of the area was mapped (1:20 000 scale) by Gilbert *et al.* (1983) and inspected by P. Theyer in 1990 (unpublished field notes).

#### GEOLOGICAL SETTING:

The area of the occurrence is underlain by mafic volcanic rocks of the group of the Hayes River Group (Wright, 1928), and by mafic intrusive rocks of the group of Early Intrusive Rocks (Weber *et al.*, 1982), (Fig. 28).

Drillholes 1 through 8 intersected mafic volcanic rocks and/or quartz-feldspar porphyry (A.F. 93138).

#### MINERALIZATION:

Drillholes 1 through 8 intersected minor scattered pyrite and/or pyrrhotite (A.F. 93138).

#### GEOCHEMICAL DATA:

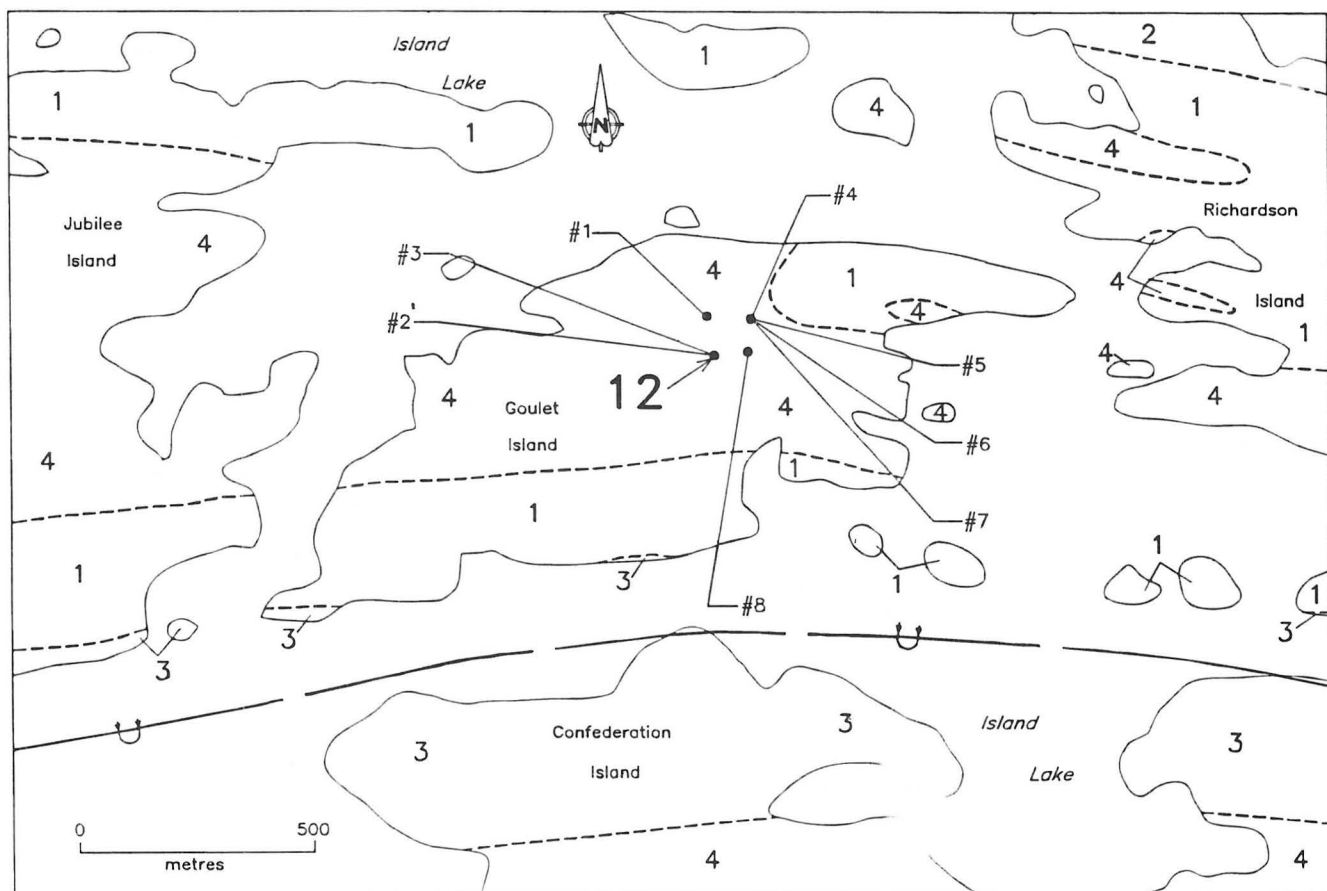
Eight core samples submitted for assay, assayed nil to trace Au.

#### CLASSIFICATION:

Disseminated mineralization - not classified.

#### REFERENCES:

- Assessment Files 91624, 91684, 91694, 93138  
Manitoba Energy and Mines, Mines Branch.
- Gilbert, H.P., Neale, K.L., Weber, W., Corkery, M.T., and McGregor, C.R.  
1983: Island Lake; Manitoba Energy and Mines, Preliminary Map 1983 I-1, 1:20 000.
- Godard, J.D.  
1963: Island Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3A, 1:63 360.
- Theyer, P.  
1980: Ultramafic rocks, nickel occurrences and interpreted stratigraphic relationships; Manitoba Energy and Mines, Mineral Resources Division, Map ER79-2-1 to ER79-2-13, 1:50 000.
- Weber, W., Gilbert, H.P., Neale, K.L. and McGregor, C.R.  
1982: Island Lake Project; in Manitoba Mineral Resources Division Report of Field Activities, 1982), p. 34-43.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



53E/15-12

### Early Intrusive Rocks

4 Mafic intrusive rocks

### Hayes River Group

3 Wacke, siltstone, argillite

2 Felsic to intermediate volcanic flows and fragmental rocks; related intrusive rocks

1 Mafic volcanic flows and related intrusive rocks

--- Geological contact (approximate)

⌋ Syncline (overturned)

• Drillhole (A.F. 93138)

**12** Occurrence location

Figure 28: Geological setting of occurrence 12. Geology compiled from Godard, (1963); Theyer, (1980); Weber et al. (1982); Gilbert et al. (1983).

LOCATION: 13

NAME:Ministik; Juniper  
UTM: 5958026N/400212E  
ACCESS: Via boat or float plane  
AREA: Henderson Island (Fig. 1).  
AIRPHOTO: A23068-67

#### EXPLORATION SUMMARY:

A review of the exploration history is given in Mineral Inventory Card 53E/15 Au1. First staking of this property, followed by trenching and rock sampling, by Ministik Lake Gold Mines Limited took place in 1934. Eleven channel samples were taken across a quartz vein along 137 m strike length. In 1937, a two compartment shaft was sunk to a depth of 72 m. Work was subsequently discontinued and the claims lapsed. Ministik Lake Gold Mines restaked the area in 1950 and undertook a 3 hole (393 m) drilling program (A.F. 91150). Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area in 1970 under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). Barringer Research Limited conducted a combined MAG and EM survey over part of the occurrence on behalf of Canadian Occidental Petroleum Limited in 1974 (A.F. 92244). The property was restaked, trenched and sampled in 1978 (A.F. 92336), geologically investigated in 1979 (Theyer, 1979) and geologically mapped in 1983 (Gilbert and Weber, 1983). In 1984, the Midway Lake Minerals Corporation initiated overburden stripping, trenching and sampling along the main (north-striking) quartz vein, as well as 100 km of line cutting on Henderson Island (Wydmar Development Corporation, Annual Report 1987). In 1986, Wydmar Resource Enterprises Limited and Bighorn Development Corporation acquired an interest in the property and carried out a 75-hole drilling program and rock sampling.

#### News releases reported:

- a) discovery of five quartz vein systems, two of which were traced over 610 m on strike. Two of the veins were mineralized with abundant sulphide mineralization (Northern Miner, July 7, 1986);
- b) a "geological inventory" of 326 000 tonnes grading 15.4 g/t Au was estimated (Northern Miner, November 3, 1986);
- c) visible gold was observed over at least 9 m during trenching and rock sampling the newly discovered Juniper quartz vein (Fig. 29) (Wydmar Development Corporation, Annual Report 1987);
- d) core samples from 8 drillholes returned gold assays ranging from trace to 121.5 g/t and silver assays ranging from trace to 19.9 g/t (Wydmar Development Corporation, Annual Report, 1987);
- e) a total of 139 diamond-drillholes (10 510 m) had been drilled on various properties in the Island Lake area from 1985 to 1987 (Wydmar Development Corporation, Annual Report 1987);

- f) a pilot mill (23 t/day capacity) was installed on the site in 1987. A 163 t bulk surface sample was milled and assayed; four tonnes of concentrate processed out of this sample, purportedly assayed 617 g/t and 1024 g/t Au (Bighorn Development Corporation, news release, October 12, 1988).

A 0.95 tonne underground bulk rock sample from the 67 m level mined in 1987 was split into three containers. The containers "fell off the back of a truck on the way to a custom mill. It (the containers with the sample?) has not been seen since" (Winnipeg Free Press, March 30, 1988). Further news releases by the Bighorn Development Corporation and/or Wydmar Development Corporation indicated that the mill processed from 9 to 13 tonnes a day (March 22, 1988) and that the companies were negotiating a \$ 6 million placement to put the mine into production at a capacity of 180 t/day (June 20, 1988).

In 1986, Claude Resources Incorporated staked one claim both immediately west and east of the Ministik Mine and undertook prospecting, rock sampling and a MAG and VLF-EM survey in 1988 (A.F. 93392). Additional prospecting was undertaken in 1993 (A.F. 93393). Abandoned and vandalized buildings and equipment were observed at the former plant site during geological investigations (Theyer, 1990).

#### GEOLOGICAL SETTING:

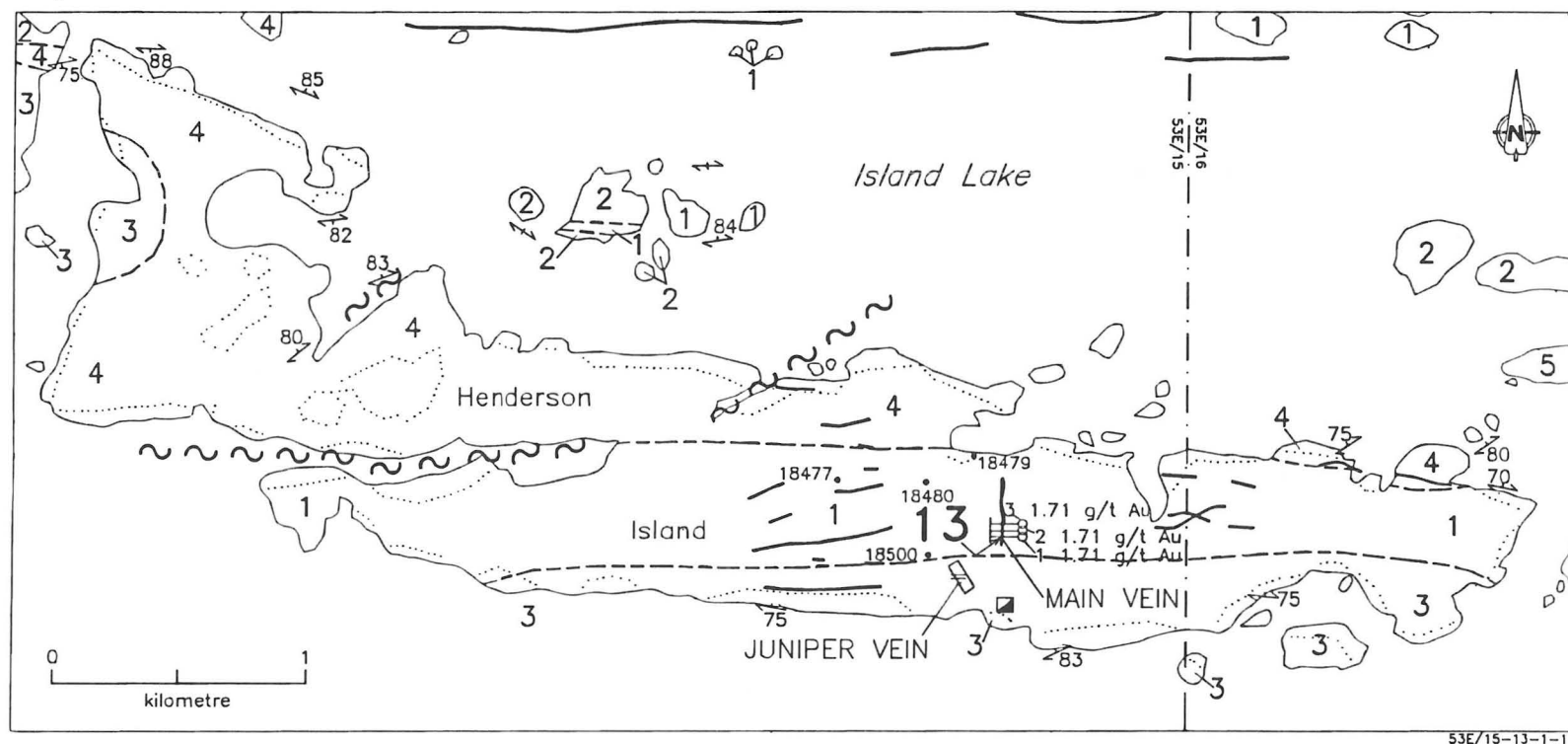
The Ministik mine shaft near the south shore of Henderson Island was sunk to access sulphide-bearing parts of the "Main vein" (Fig. 29). This north-striking quartz vein is exposed over a strike length of approximately 180 m. In the north it terminates at a roughly east-striking unit of silicate-facies iron formation up to 10 m thick. The southern end of the vein was intersected in holes collared approximately 45 m north of the island's south shore Bighorn Development Corporation, news release, April 1, 1987). The Main vein is hosted by a north-striking right-lateral fault and ranges from 0 to 200 cm wide; average width is approximately 60 cm. Quartz-filled tension fractures are oriented approximately 45° to the direction of the main vein.

According to Theyer (1990) the quartz vein is hosted by, from south to north: Granitoid rocks largely covered with rubble, a mafic rock suite that encompasses finegrained to aphanitic intrusive(?) rocks interlayered with banded wacke. Adjacent to these rocks are shear-folded pillowed basalt and mafic volcanic breccia of the Hayes River Group (Wright, 1928).

Zone 1 ("Juniper vein") consists of two major and several narrow short quartz veins hosted by a fractured mafic gneiss (Fig. 30). The mafic gneiss is cut by mafic massive dykes and minor quartz-feldspar porphyry dykes.

#### MINERALIZATION:

Quartz in the Main vein is generally barren, with the exception of abundant joints and fractures coated with tourmaline and mineralized with pyrite and traces of galena and pyrrhotite.



- Early Intrusive Rocks
- 4 Mafic intrusive rocks
- 3 Tonalite, granodiorite
- Hayes River Group
- 2 Felsic to intermediate volcanic flows and fragmental rocks; related intrusive rocks
- 1 Mafic volcanic flows and related intrusive rocks
- Geological contact (approximate)
- ..... Outcrop
- EM conductor, Canadian Occidental Petroleum Limited (A.F. 92244, 93392)
- ~ ~ ~ Shear
- 85° Foliation (inclined, vertical)
- ⊕ Drillhole, Ministik Lake Gold Mines (A.F. 91150)
- 18480 Rock sample (A.F. 93393)
- Ministik mine shaft
- ⚡ Trench exposing the Juniper Vein
- 13** Occurrence location

Figure 29: Geological setting of occurrence 13 (Ministik; Juniper).

Three to 5% disseminated pyrite, minor pyrrhotite and trace arsenopyrite are concentrated in the quartz exposed in the pit (Fig. 30).

Quartz in the Juniper vein contains approximately 1% pyrite.

#### GEOCHEMICAL DATA:

Eleven channel samples collected across the length of the quartz vein in 1937 returned an average of 44.2 g/t Au. Quartz intersected in drill core returned from 0.34 to 1.71 g/t Au (A.F. 91150). Grab samples collected in 1951 from the quartz vein returned 76 g/t Au and 19 g/t Ag. A channel sample across a 66 cm thick portion of the quartz vein yielded 4.1 g/t Au and 5.1 g/t Ag (Godard, 1963).

Assays of drill core by Wydmar Resources Enterprises and Bighorn Development Corporation returned 3.43, 3.77 and 9.26 g/t Au (The Northern Miner, April 2, 1986). Bighorn Development Corporation announced extensive sampling of the entire exposed portion of the main vein, returning an average 13.4 g/t Au across 1.86 m average vein width (Bighorn Development Corporation, Annual Report 1987.) (Note: the average quartz vein width along the entire strike length was computed as no more than 0.6 m); (P. Theyer; 1990, unpublished field notes).

Four bulk samples collected from the Main vein assayed 10.59, 14.43, 42.86 and 19.20 g/t Au (The Northern Miner, July 7, 1986).

Significant drill intersections (drillhole locations not in public domain) are summarized in an undated pamphlet by Bighorn Development Corporation.

Drillhole	From (m)	To (m)	Au (g/t)
85-5	28.3	30.6	10.9
85-6	47.8	49.5	1.7
85-7	12.0	12.3	10.5
85-8	44.6	44.9	5.1
85-9	15.5	15.7	11.2
85-10	28.5	29.7	26.2
85-12	18.4	19.9	12.0
86-13	12.2	13.7	12.7
86-16	19.3	21.8	1.7
86-17	34.1	35.7	3.0
86-18	69.9	72.7	16.01

Drillcore from zone 1 (Juniper vein) returned trace to 121.5 g/t Au (Wydmar Development Corporation, Annual Report 1987).

Significant drill intersections (drillhole locations not in public domain) returned:

Drillhole	From (m)	To (m)	Au (g/t)
85-1	18.0	20.6	4.3
85-2	24.2	26.3	5.2
85-4	5.5	12.0	7.1

Concentrations of Au, Ag, Cu and Pb in rock grab samples from the vicinity of the Juniper vein (Fig. 30) (A.F. 93392).

Sample No.	Au (g/t)	Ag (g/t)	Cu (%)	Pb (%)	Zn (%)
45702	14.06	20.91	0.07	0.29	0.01
45703	1.30	8.23	tr.	0.01	0.01

Concentrations of Au and Ag in rock grab samples from the area of Location 13 (Fig. 29) (A.F. 93393).

Sample No.	Au (g/t)	Ag (g/t)
18477	nil	nil
18478	nil	nil
18479	nil	nil
18580	tr.	nil

Concentrations of Au, Ag, Zn, Ni, Pb, Co, Cd and Cu in rock grab samples from the area of Location 13 (Fig. 29) (A.F. 93393).

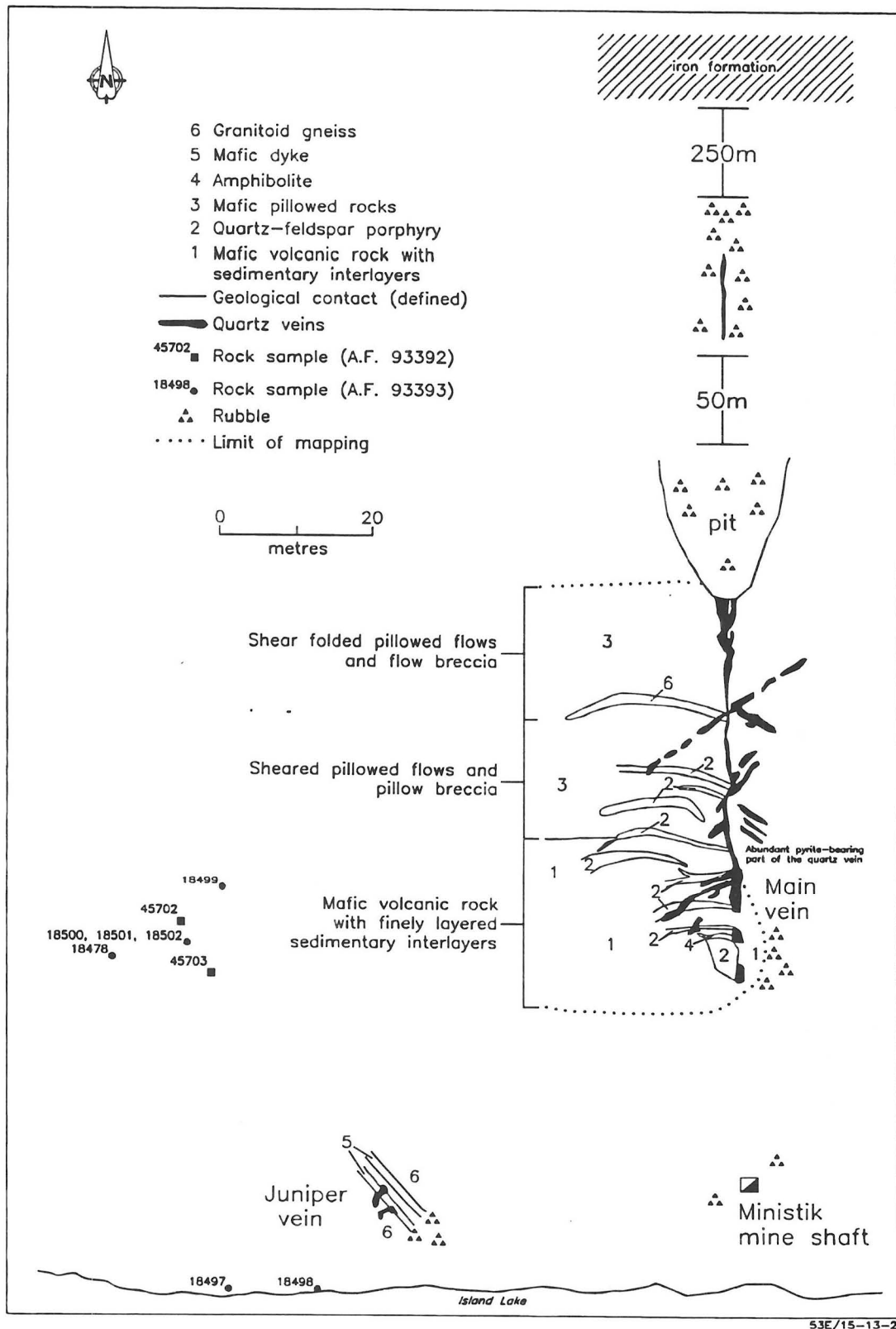
Sample No.	Au (g/t)	Ag (g/t)	Zn (%)	Ni (%)	Pb (%)	Co (%)	Cd (%)	Cu (%)
18497	tr.	3.09	0.01	tr.				0.01
18498	nil	2.06	0.01	tr.				tr.
18499	nil	nil	tr.	0.01				0.02
18500	nil	nil	tr.	tr.				0.01
18501	0.34	5.14	1.92	0.01	0.95	tr.	0.02	0.06
18502	7.89	1.03						

#### CLASSIFICATION:

Vein type deposit - multiple quartz veins and lenses.

#### REFERENCES:

- Assessment Files 91150, 91624, 91684, 91694, 92244, 92336, 93392, 93393  
Manitoba Energy and Mines, Mines Branch.
- Bighorn Development Corporation  
News Releases, March 22, 1988; June 20, 1988 and October 12, 1988, Calgary.
- Gilbert, H.P. and Weber, W.  
1983: Island Lake project; in Manitoba Energy and Mines, Mineral Resources Division, Report of Field Activities, 1983, p. 63-69.
- Godard, J.D.  
1963: Geology of the Island Lake-York Lake area; Manitoba Mines and Natural Resources, Mines Branch, Publication 59-3, 45p.
- Mineral Inventory Card 53E/15 Au1  
Manitoba Energy and Mines, Geological Services Branch.
- Northern Miner  
April 2, 1986, Toronto.
- Northern Miner  
July 7, 1986, Toronto.



53E/15-13-2

Figure 30: Schematic geology of the Ministik main vein and the Juniper vein. From Theyer, (1990).



Northern Miner

November 3, 1986, Toronto.

Theyer, P.

- 1979: Ultramafic occurrences and stratigraphic relationships in the Island Lake and Bigstone Lake areas; in Manitoba Mines, Resources and Environmental Management, Mineral Resources Division, Report of Field Activities, 1979, p. 39-40.
- 1990: Mineral occurrence studies and documentation in the Island Lake area (NTS 53E); in Manitoba Energy and Mines, Mineral Resources Division, Report of Field Activities, 1990, p. 125-127.

Weber, W., Gilbert, H.P., Neale, K.L. and McGregor, C.R.

- 1982: Island Lake Project; in Manitoba Mineral Resources Division Report of Field Activities, 1982, p. 34-43.

Winnipeg Free Press

March 30, 1988, Winnipeg.

Wydmar Development Corporation

Annual Report 1987, Calgary.

Wright, J.F.

- 1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



## **Section 2**

### **MINERAL DEPOSITS AND OCCURRENCES IN THE YORK LAKE AREA (NTS 53E/16)**



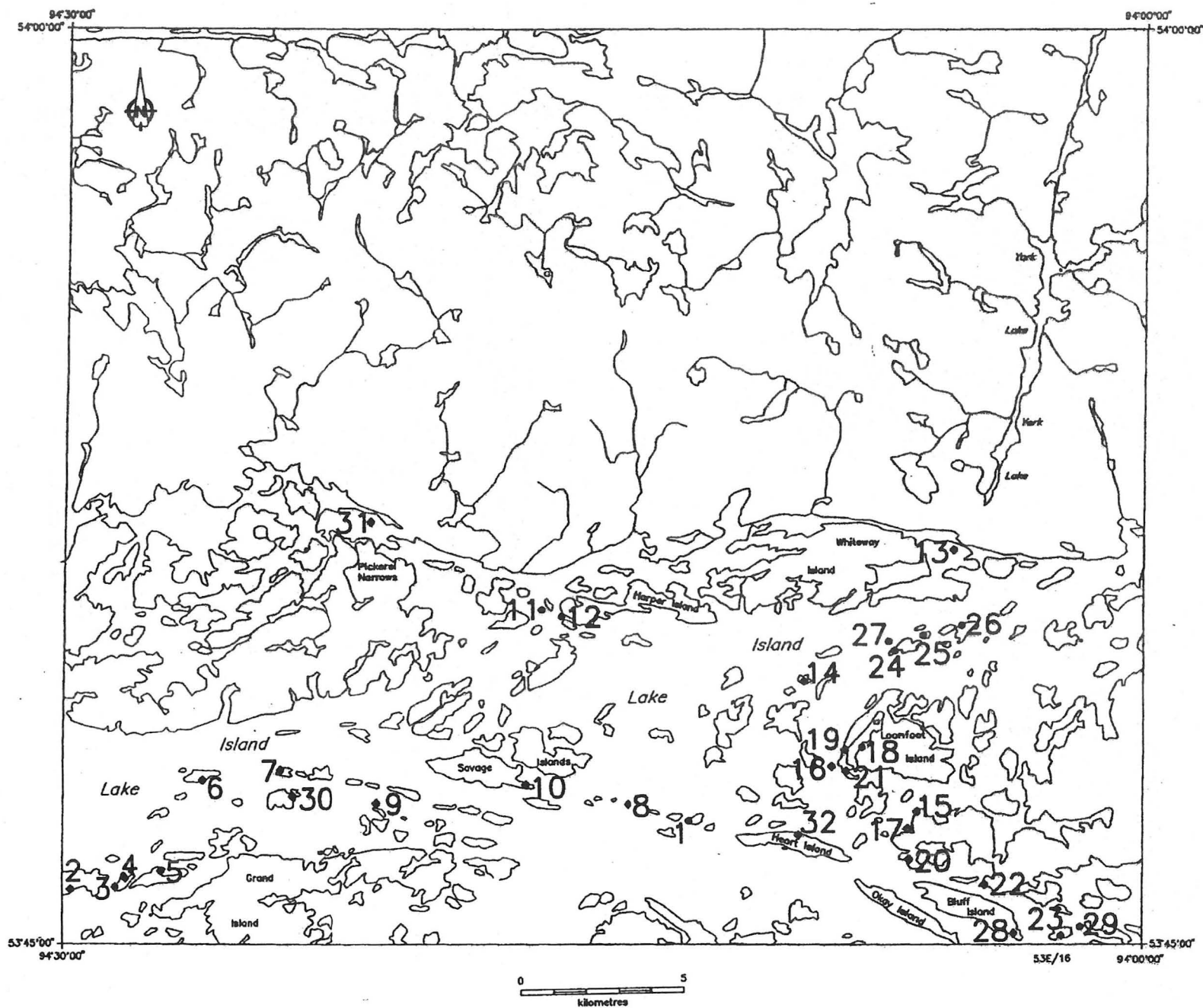
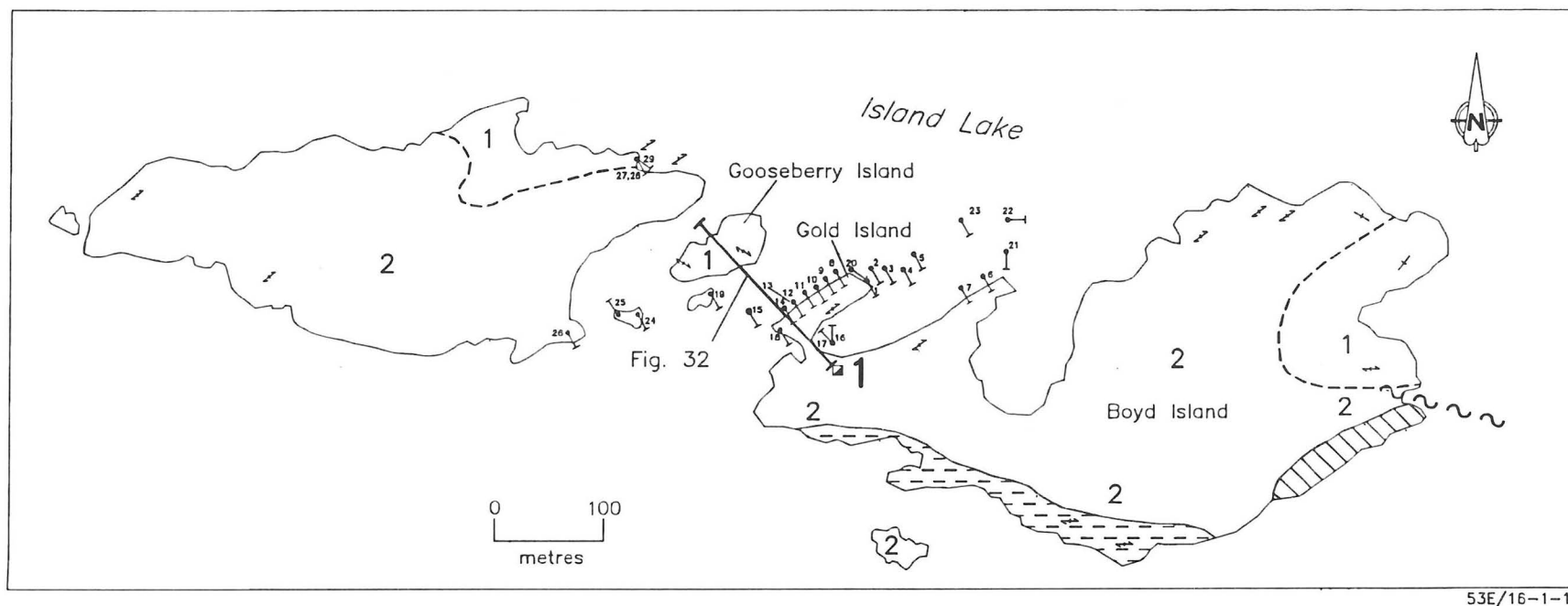


Figure 2: Location of mineral deposits and occurrences York Lake area (NTS 53E/16).



### Hayes River Group

- 2 Greywacke, siltstone, argillite  
 1 Felsic to intermediate volcanic flows; related intrusive rocks

- Geological contact  
 ~ ~ ~ Foliation (inclined, vertical)  
 + Bedding (vertical)  
 ~ ~ ~ Shear zone  
 ▣ Mine shaft  
 ⚡ Drillhole, Ventures Limited (A.F. 91550)  
 [ ] Bleaching and pyritization  
 [ ] Carbonatization  
**1** Occurrence location

Figure 31: Geological setting of occurrence 1 (Island Lake Gold Mine).

## MINERAL DEPOSITS AND OCCURRENCES IN THE YORK LAKE AREA (NTS 53E/16)

LOCATION: 1

NAME: Island Lake Gold Mine

UTM: 5959855N/420312E

ACCESS: Via boat or float plane

AREA: North-central Island Lake (Fig. 2)

AIRPHOTO: A23507-98

### EXPLORATION SUMMARY:

An extensive review of the exploration history is given in Mineral Inventory Card 53E/16 Au1. The original discovery of gold on "Gold Island" was made in 1931 by H.S. Cowan and J.G. Reahill. A 1370 m long and up to 3.5 m wide quartz vein was traced and sampled. The property was optioned by Ventures Limited and a 27-hole (1654 m) drilling program was conducted in that year (A.F. 91550). Shaft sinking commenced in 1932 and was completed in 1933 at a depth of 79 m. Gold ore was beneficiated in a cyanide mill from 1934 until operations were closed due to exhaustion of the deposit in 1935. Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Canadian Aero Mineral Surveys Limited carried out an airborne EM and MAG survey over the area on behalf of Kerr Addison Mines Limited in 1965 (A.F. 91144). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area in 1970 under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694).

### GEOLOGICAL SETTING:

Several geologists described the former mine site and mineralization: McMurchy (1944), Godard 1963a), Chastko and Gibson (1977), Stewart (1980), and Theyer (1981). Most recent geological mapping (1:20 000) is presented by Gilbert (1985).

Boyd (Mine) Island and the islands to the west are underlain by metamorphosed felsic volcanic and related igneous rocks and greywacke, siltstone and argillitic rocks of the Hayes River Group (Wright, 1928) (Fig. 31). Quartz porphyry and quartz-feldspar porphyry stocks and dykes crosscut these rock units. According to Stewart (1980), the deposit is located at or near the contact between argillaceous metasediment and a sericitic schist interpreted to be derived from an altered felsic rock. A cross section from Gold Island to Gooseberry Island shows the location of the shaft, the underground workings and the ore-bearing quartz vein (Fig. 32). Lensoid carbonate bodies that may be of primary or secondary origin are prominent. Carbonatization, bleaching and pyritization are ubiquitous, but very intense along a shear zone along the south shore of Boyd Island.

Lead isotope dating undertaken on a sample of galena from this deposit yielded a date of 2700 Ma "or a little less" (R. Thorpe, 1983, pers. comm.).

### MINERALIZATION:

Gasparrini (1980) investigated four polished sections prepared from a gold and silver-bearing rock sample collected from the Island Lake Gold Mine rock pile. She concluded that a) gold occurs as grains ranging from 1 to 100 microns, b) silver occurs with gold and to a lesser extent with tetrahedrite, and c) grain size, abundance and association of the precious metals with quartz and pyrite are factors that make the studied sample an excellent prospect for the recovery of precious metals.

### GEOCHEMICAL DATA:

The Island Lake Gold Mine produced 7 819 tonnes of ore yielding 198.8 kg gold for an average grade of 25.4 g/t gold (Stewart, 1980).

### CLASSIFICATION:

Vein type deposit - single vein.

### REFERENCES:

- Assessment Files 91144, 91550, 91624, 91684, 91694  
Manitoba Energy and Mines, Mines Branch.
- Chastko, L.C. and Gibson, J.C.  
1977: Precious metals exploration NTS 53E and 53L; in Manitoba Mines, Resources and Environmental Management, Mineral Resources Division, Report of Field Activities, 1976, p. 74-75.
- Gasparrini, C.  
1980: Study of the gold and silver distribution in a sample of "waste" from the gold mine of Island Lake in Northern Manitoba; Report no. 203, Minmet Scientific Limited, Toronto.
- Gilbert, H.P.  
1985: Meegeesiwaseeson Island; Manitoba Energy and Mines, Preliminary Map 1985 I-4, 1:20 000 scale.
- Godard, J.D.  
1963: Geology of the Island Lake-York Lake area; Manitoba Mines and Natural Resources, Mines Branch, Publication 59-3, 45p.
- McMurchy, R.C.  
1944: Geology of the Island Lake area of Manitoba; The Precambrian, September 1944, p. 4-9.
- Mineral Inventory Card 53E/16 Au1  
Manitoba Energy and Mines, Geological Services Branch.
- Manitoba Mines Branch  
1935: Island Lake Gold Mine; Annual Report, 1934-1935, Winnipeg.

The Northern Miner

- 1935: Island Lake's Loop Vein, in The Northern Miner, April 11, 1935, Toronto.

Stewart, J.S.

- 1980: Gold Mines of Manitoba; Manitoba Department of Energy and Mines, Mineral Resources Division, Educational Series ES80-1, 16p.

Theyer, P.

- 1981: Mineral deposit studies - Superior Province a) Island Lake; Bird River Sill; in Manitoba Energy and Mines, Mineral Resources Division, Report of Field Activities, 1982, p. 74-77.

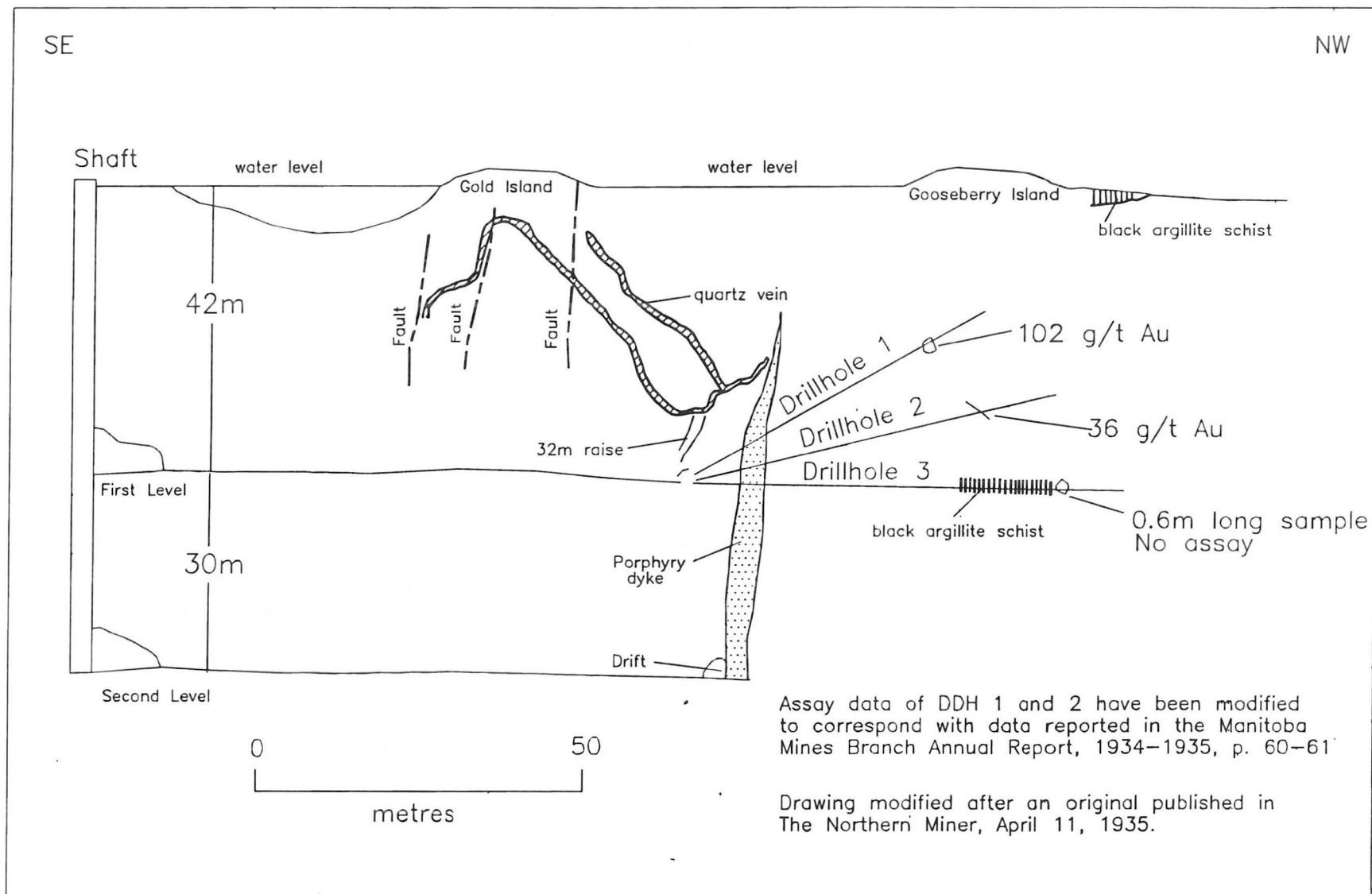
Weber, W., Gilbert, H.P., Neale, K.L. and McGregor, C.R.

- 1982: Island Lake Project; in Manitoba Mineral Resources Division Report of Field Activities, 1982, p. 34-43.

Wright, J.F.

- 1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.





53E/16-1-2

Figure 32: Geological cross section of occurrence 1 (Island Lake Gold Mine).

LOCATION: 2

NAME:

UTM: 5958207N/401585E

ACCESS: Via boat or float plane

AREA: Central Island Lake (Fig. 2).

AIRPHOTO: A23068-67

#### EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area in 1970 under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). Barringer Research Limited conducted in a combined MAG and EM survey over part of the occurrence on behalf of Canadian Occidental Petroleum Limited in 1974 (A.F. 92244). In 1984, Midway Lake Minerals Corporation initiated overburden stripping, trenching and sampling as well as 100 km of line cutting on Henderson Island (Annual Report 1987, Wydmar Development Corporation). Claude Resources Incorporated conducted an EM and MAG survey, prospecting and rock sampling east and west of the Ministik property (Location 13, NTS 53E/15) in 1988 (A.F. 93392). P. Dunlop prospected the area in 1991 (A.F. 93393).

#### GEOLOGICAL SETTING:

The occurrence is in white to grey carbonate-bearing quartz exposed for approximately 3 m in an east-striking trench excavated in granitoid rocks of the group of Late Intrusive Rocks (Weber *et al.*, 1982) (Fig. 33).

#### MINERALIZATION:

Pyrite, 1%, and a mineral tentatively identified as sphalerite were reported (A.F. 93393).

#### GEOCHEMICAL DATA:

**Table 9**  
**Concentrations of Au, Ag, Cu and Pb in rock samples collected by Claude Resources from Location 2 (Fig. 33) (A.F. 93392)**

Sample No.	Au (g/t)	Ag (g/t)	Cu (%)	Pb (%)	Zn (%)
45704	0.62	tr.	tr.	0.01	tr.
45705	0.21	3.09	tr.	0.02	0.01
45706	0.82	tr.	tr.	0.01	tr.

**Table 10**  
**Concentrations of Au, Ag, Zn, Ni, Pb, Co, Cd and Cu in rock samples collected by P. Dunlop from the area of Location 2 (A.F. 93393)**

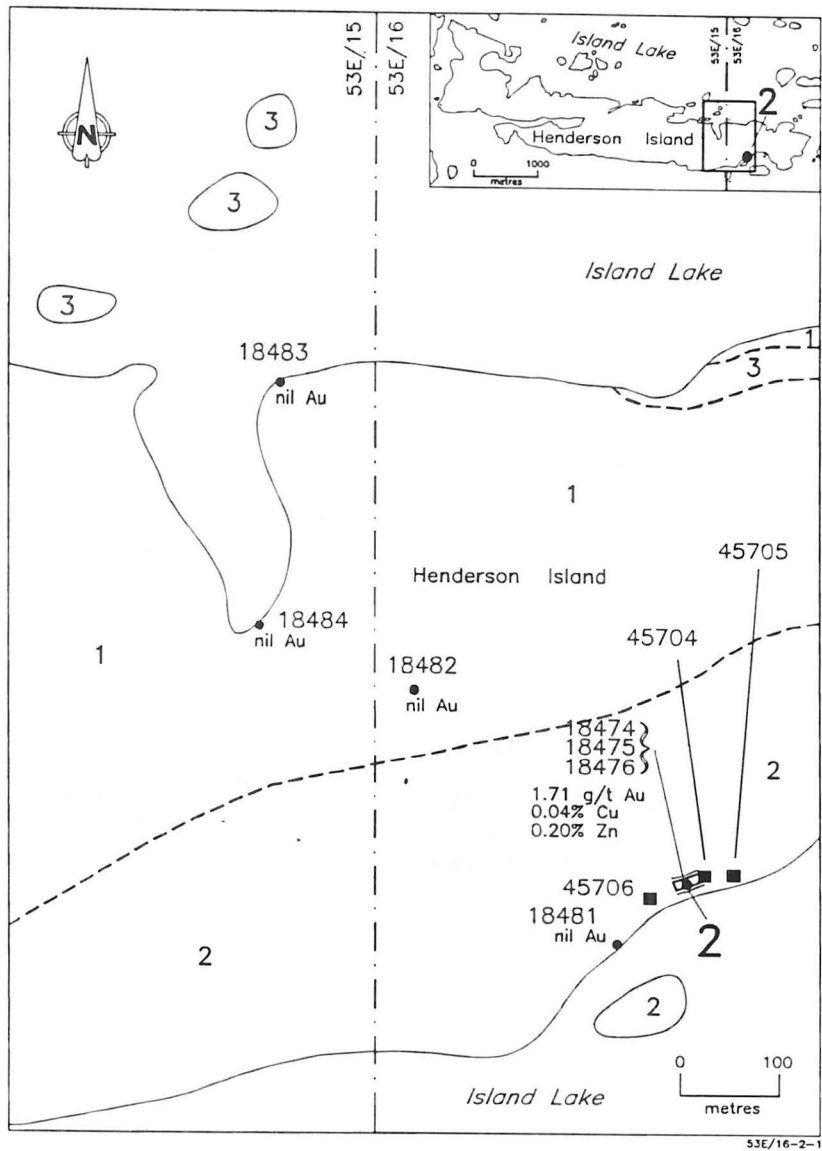
Sample No.	Au (g/t)	Ag (g/t)	Zn (%)	Cd (%)
18474	nil	nil	-	-
18475	nil	nil	0.20	0.04
18476	1.71	nil	tr.	tr.
18481	nil	nil	-	-
18482	nil	nil	-	-
18483	nil	nil	-	-
18484	nil	nil	-	-

#### CLASSIFICATION:

Vein type deposit - single vein.

#### REFERENCES:

- Assessment Files 91624, 91684, 91694, 92244, 93392, 93393  
Manitoba Energy and Mines, Mines Branch.
- Gilbert, H.P., Neale, K.L., Weber, W., Corkery, M.T., and McGregor, C.R.  
1983: Island Lake; Manitoba Energy and Mines, Preliminary Map 1983 I-1, 1:20 000.
- Godard, J.D.  
1963a: Geology of the Island Lake-York Lake area; Manitoba Mines and Natural Resources, Mines Branch, Publication 59-3, 45p.  
1963b: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.
- Theyer, P.  
1980: Ultramafic rocks, nickel occurrences and interpreted stratigraphic relationships; Manitoba Energy and Mines, Mineral Resources Division, Map ER79-2-1 to ER79-2-13, 1:50 000.
- Weber, W., Gilbert, H.P., Neale, K.L. and McGregor, C.R.  
1982: Island Lake Project; in Manitoba Mineral Resources Division Report of Field Activities, 1982, p. 34-43.
- Wydmar Development Corporation  
1987: Annual Report, Calgary, 1987.



- Early Intrusive Rocks
- 3 Mafic intrusive rocks
  - 2 Tonalite, monzonite, granite
- Hayes River Group
- 1 Mafic to intermediate volcanic flows
- Geological contact (approximate)
- ▭ Trench
- Quartz vein east
- Rock sample, Claude Resources (A.F. 93392)
  - Rock sample (A.F. 93393)
  - 2 Occurrence location

Figure 33: Geological setting of occurrence 2. Geology compiled from Godard, (1963b); Theyer, (1980); Gilbert et al. (1983).

LOCATION: 3

NAME:

UTM: 5958338N/402879E

ACCESS: Via boat or float plane

AREA: Eastern Island Lake (Fig. 2)

AIRPHOTO: A23535-234

EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area in 1970 under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694).

GEOLOGICAL SETTING:

The area of the occurrence is underlain by aphyric basalt of the Hayes River Group (Wright, 1928). Tonalite and quartz diorite of the group of Late Intrusive Rocks (Weber *et al.*, 1982) outcrop in the vicinity (Fig. 34).

MINERALIZATION:

A 1 m by 15 cm thick sulphide lens containing approximately 10% coarse euhedral pyrite and two fist- to head-sized pockets with near-solid pyrite (P. Theyer, 1990, unpublished field notes). H.P. Gilbert, (1985, unpublished notes) recorded and sampled pyrite, pyrrhotite, +/- rare chalcopyrite and malachite.

GEOCHEMICAL DATA:

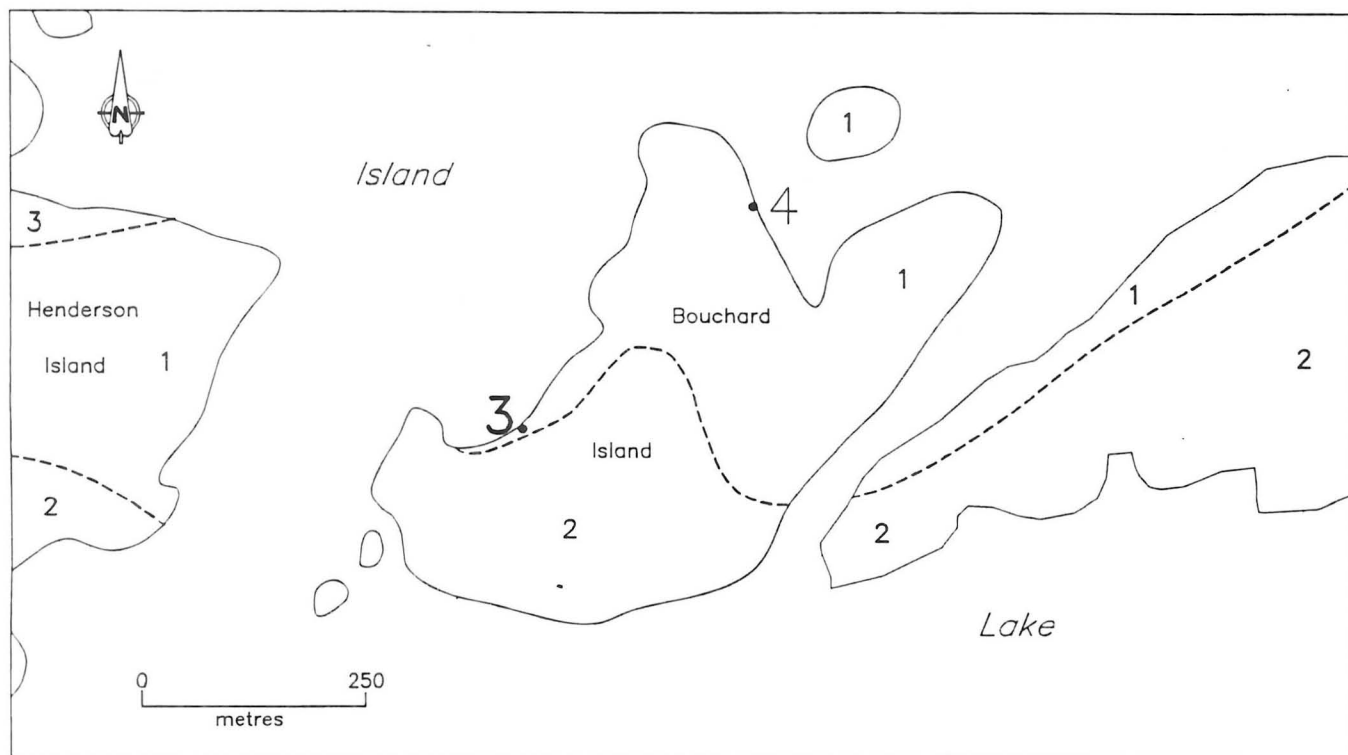
An assay of a mineralized rock sample containing near solid pyrite returned trace Au, nil Ag, 0.15% Cu, 0.06% Ni and 4 ppm Mo (H.P. Gilbert, 1985, unpublished field notes).

CLASSIFICATION:

Vein type deposit - single vein.

REFERENCES:

- Assessment Files 91624, 91684, 91694  
Manitoba Energy and Mines, Mines Branch.
- Gilbert, H.P.  
1985: Meegeesiwaseeson Island; Manitoba Energy and Mines, Preliminary Map 1985 I-4, 1:20 000.
- Godard, J.D.  
1963: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.
- Weber, W., Gilbert, H.P., Neale, K.L. and McGregor, C.R.  
1982: Island Lake Project; in Manitoba Mineral Resources Division Report of Field Activities, 1982, p. 34-43.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



#### Early Intrusive Rocks

3 Mafic intrusive rocks

2 Tonalite, quartz diorite

#### Hayes River Group

1 Mafic volcanic flows and related intrusive rocks

---- Geological contact (approximate)

•3 Occurrence location

Figure 34: Geological setting of occurrence 3. Geology compiled from Godard, (1963) and Gilbert, (1985).

LOCATION: 4

NAME:

UTM: 5958517N/403225E

ACCESS: Via boat or float plane

AREA: Eastern Island Lake (Fig. 2)

AIRPHOTO: A23535-234

#### EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area in 1970 under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). Gilbert (1985d) observed a rusty zone near the shore.

#### GEOLOGICAL SETTING:

The area of the occurrence is underlain by aphyric basalt and amphibolite of the Hayes River Group (Wright, 1928) (Fig. 35).

#### MINERALIZATION:

A small rust stained area in the basalt contains minor disseminated pyrite and trace pyrrhotite and chalcopyrite (H.P. Gilbert, 1985, unpublished field notes).

#### GEOCHEMICAL DATA:

A grab sample assayed trace Au, nil Ag, 0.23% Cu, 124 ppm Ni and 4 ppm Mo.

#### CLASSIFICATION:

Disseminated mineralization - not classified.

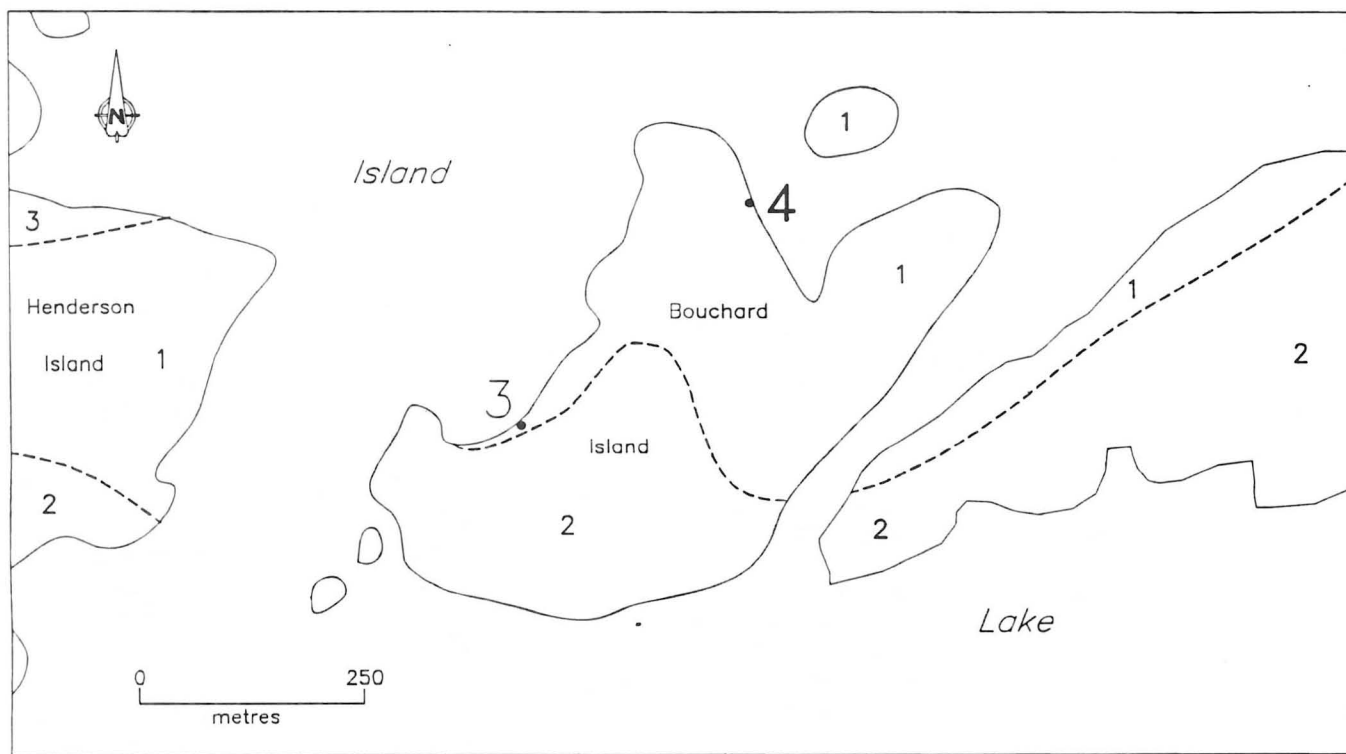
#### REFERENCES:

Assessment Files 91624, 91684, 91694

Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P.

1985: Meegeesiwaseeson Island; Manitoba Energy and Mines, Preliminary Map 1985 I-4, 1:20 000.



53E/16-4

Early Intrusive Rocks

3 Mafic intrusive rocks

2 Tonalite, quartz diorite

Hayes River Group

1 Mafic volcanic flows and related intrusive rocks

---- Geological contact (approximate)

• 4 Occurrence location

Figure 35: Geological setting of occurrence 4. Geology compiled from Godard, (1963) and Gilbert, (1985).

LOCATION: 5

NAME: (A.F.-Mineralization intersected by drilling)  
UTM: 5958697N/404188E  
ACCESS: Via boat or float plane  
AREA: South central Island Lake (Fig. 2)  
AIRPHOTO: A23535-233

#### EXPLORATION SUMMARY:

A complete review of the exploration history is given in Mineral Inventory Card 53E/16 Ni2. First staking of this property was by A.E. Storey in 1935; the claims were cancelled in 1936. Canadian Nickel Company Limited conducted an AEM survey in 1957 (A.F. 91624). Trenching and pitting were undertaken from 1959 to 1965 (Mineral Inventory Card 53E/16 Ni2). Phelps Dodge Corporation of Canada Limited optioned the property and conducted a 7-hole (197 m) drilling program in 1960 (A.F. 91156). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area in 1970 under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). Barringer Research Limited conducted an HLEM and MAG survey in 1974. A rubble-filled trench is located on the shore of the island (Fig. 36) (P. Theyer, 1990, unpublished field notes).

#### GEOLOGICAL SETTING:

The area of the occurrence is underlain by aphyric basalt of the Hayes River Group (Wright, 1928) (Gilbert, 1985) (Fig. 36).

DDH Ni #1 intersected 31.4 m of hornblende schist with talcose interlayers. DDH Ni #2 intersected 31 m of hornblende schist and gneiss; it ended in peridotite. DDH Ni #3 intersected 31 m of hornblende schist, granodiorite and serpentinized peridotite. DDH Ni #4 intersected 10.7 m of hornblende schist. DDH Ni #5 intersected 31 m of feldspar porphyry, hornblende schist, diorite and amphibolite. DDH Ni #6 intersected 30.8 m of pegmatitic gneiss, amphibolite, hornblende gneiss and andesite (A.F. 91156).

#### MINERALIZATION:

DDH Ni #2 intersected 5.8 m of hornblende schist containing up to 7% pyrite. DDH Ni #3 intersected 4.6 m of amphibolite with up to 7% pyrite and pyrrhotite. DDH Ni #5 intersected 1.2 m of diorite with up to 3% pyrrhotite. DDH Ni #6 intersected minor core lengths with minor pyrite (A.F. 91156).

#### GEOCHEMICAL DATA:

None.

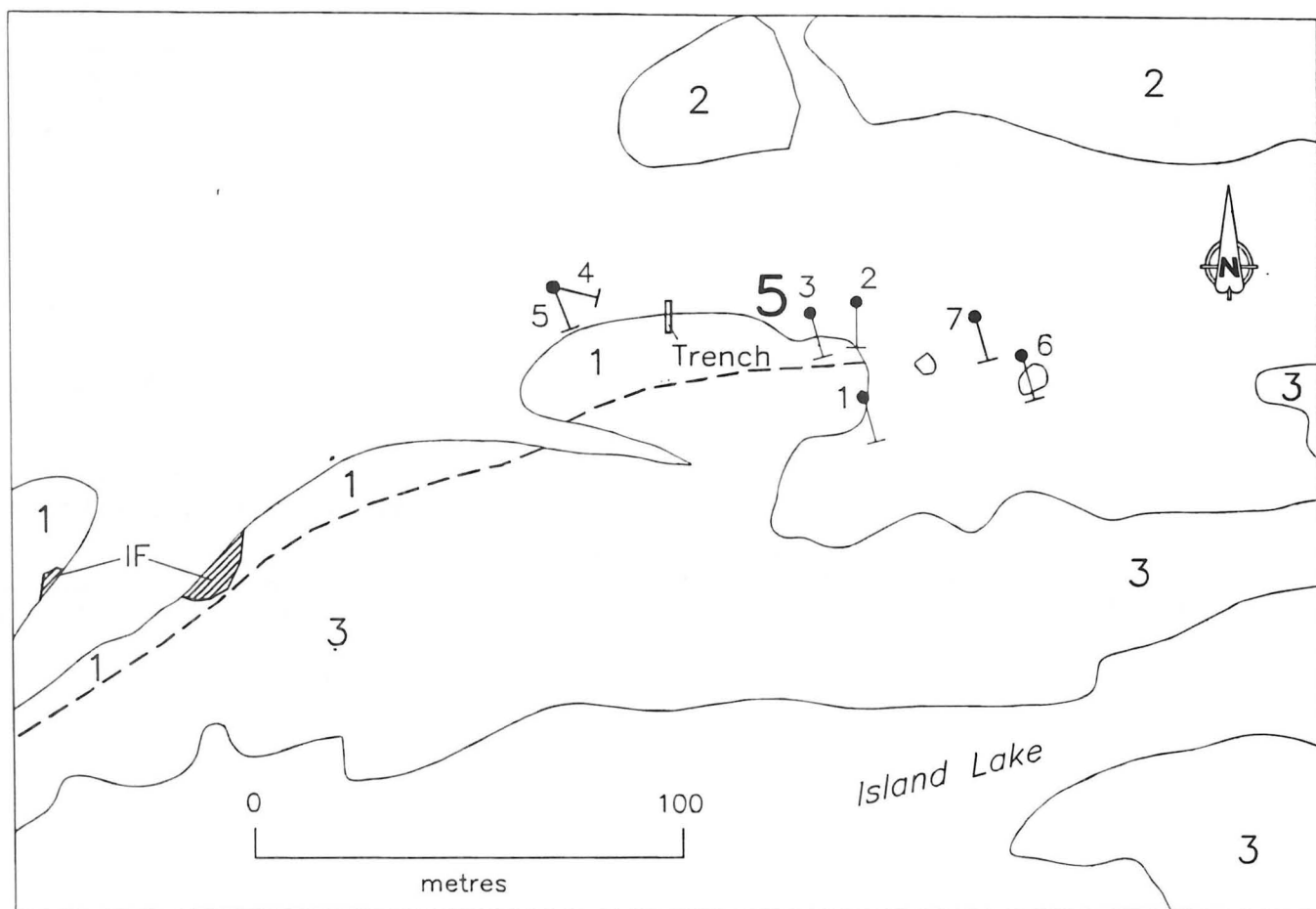
#### CLASSIFICATION:

Disseminated mineralization - not classified.

#### REFERENCES:

- Assessment Files 91156, 91624, 91684, 91694  
Manitoba Energy and Mines, Mines Branch.
- Gilbert, H.P.  
1985: Meegeesiwaseeson Island; Manitoba Energy and Mines, Preliminary Map 1985 I-4, 1:20 000.
- Godard, J.D.  
1963: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.
- Mineral Inventory Card 53E/16 Ni2  
Manitoba Energy and Mines, Geological Services Branch.
- Weber, W., Gilbert, H.P., Neale, K.L. and McGregor, C.R.  
1982: Island Lake Project; in Manitoba Mineral Resources Division Report of Field Activities, 1982, p. 34-43.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.





53E/16-5

#### Late Intrusive Rocks

3 Tonalite, monzonite, granite

#### Early Intrusive Rocks

2 Mafic intrusive rocks

#### Hayes River Group

1 Mafic volcanic flows and related intrusive rocks

--- Geological contact (approximate)

IF  Iron Formation

● Drillhole, Phelps Dodge Corporation (A.F. 91156)

5 Occurrence Location

Figure 36: Geological setting of occurrence 5. Geology compiled from Godard (1963) and Gilbert (1985).

LOCATION: 6

NAME:

UTM: 5961307N/405594E

ACCESS: Via boat or float plane

AREA: Eastern Island Lake (Fig. 2)

AIRPHOTO: A23535-184

#### EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area in 1970 under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694).

#### GEOLOGICAL SETTING:

The area of the occurrence is underlain by feldspathic greywacke and argillite of the Hayes River Group (Wright, 1928) (Fig. 37).

#### MINERALIZATION:

Up to 5%, disseminated, euhedral up to 5 mm pyrite crystals occur in an approximately 5 m thick, rust stained layer of friable, intensely weathered greywacke (P. Theyer,

1990, unpublished field notes). H.P. Gilbert (1985, unpublished field notes) observed and sampled rocks containing pyrite plus/minus rare chalcopyrite and malachite.

#### GEOCHEMICAL DATA:

An assay of a grab sample returned trace Au, 2 ppm Ag, 80 ppm Cu, 87 ppm Ni, 260 ppm Zn, <2 ppm Pb and 9 ppm Mo (H.P. Gilbert, 1985, unpublished field notes).

#### CLASSIFICATION:

Disseminated mineralization - not classified.

#### REFERENCES:

Assessment Files 91624, 91684, 91694

Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P.

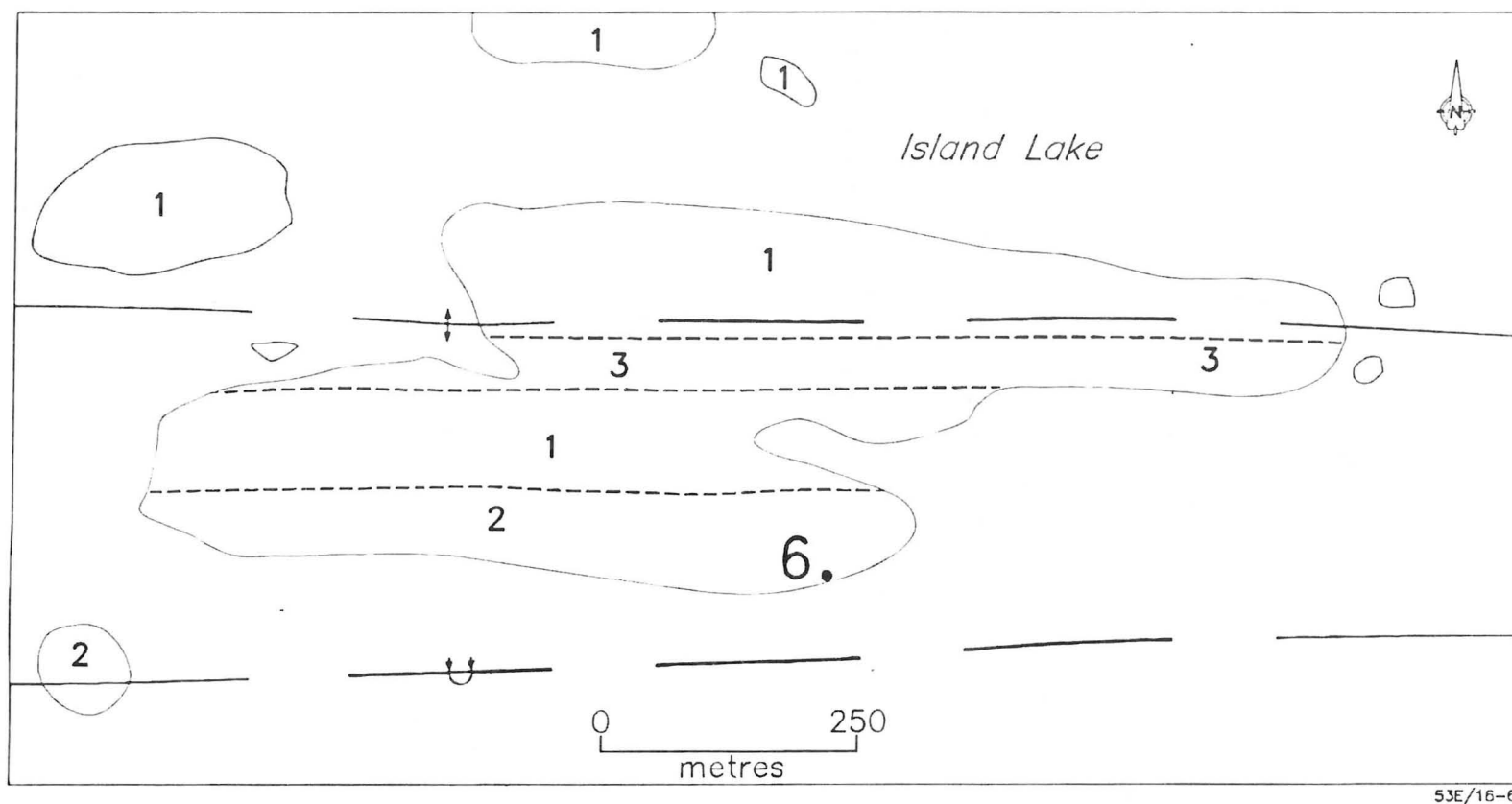
1985: Meegeesiwaseeson Island; Manitoba Energy and Mines, Preliminary Map 1985 I-4, 1:20 000.

Godard, J.D.

1963: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.

Wright, J.F.

1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



Early Intrusive Rocks

3 Mafic intrusive rocks

Hayes River Group

2 Greywacke, siltstone, argillite

1 Mafic volcanic flows and  
related intrusive rocks

--- Geological contact (approximate)

⊥ Anticline

⊥ Syncline (overturned)

• 6 Occurrence location

Figure 37: Geological setting of occurrence 6. Geology compiled from Godard, (1963) and Gilbert, (1985).

LOCATION: 7

NAME:

UTM: 5961616N/407946E

ACCESS: Via boat or float plane

AREA: Central Island Lake (Fig. 2)

AIRPHOTO: A23535-102

EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area in 1970 under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the Island Lake area in 1972 under Airborne Permit 102 (A.F. 91694). Gilbert (1985) geologically mapped the area at 1:20 000 scale and reported sulphides.

GEOLOGICAL SETTING:

The area of the occurrence is underlain by mafic volcanic rocks and greywacke, interbedded with siltstone and argillite. These rocks are part of the Hayes River Group (Wright, 1928) (Fig. 38).

MINERALIZATION:

Minor disseminated pyrite, chalcopyrite and malachite occur in mafic volcanic rocks.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 91624, 91684, 91694

Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P.

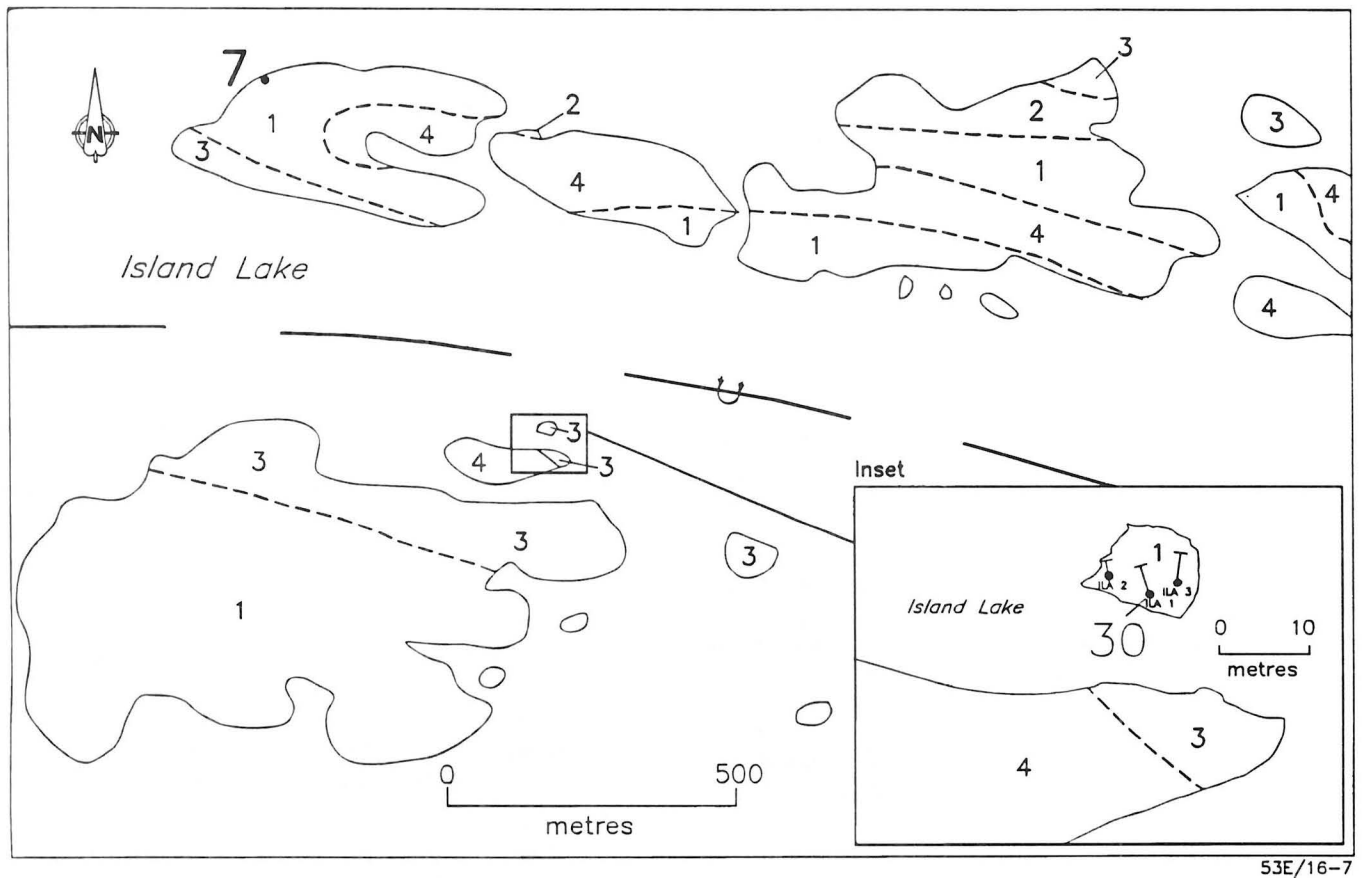
1985: Meegeesiwaseeson Island; Manitoba Energy and Mines, Preliminary Map 1985 I-4, 1:20 000.

Godard, J.D.

1963: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.

Wright, J.F.

1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



53E/16-7

Early Intrusive Rocks

4 Mafic intrusive rocks

Hayes River Group

3 Greywacke, siltstone, argillite

2 Felsic to intermediate volcanic rocks

1 Mafic to intermediate volcanic rocks

--- Geological contact (approximate)

⌋ Anticline (overturned)

• Drillhole, Phelps Dodge Corporation  
(A.F. 91157)

•7 Occurrence location

Figure 38: Geological setting of occurrence 7. Geology compiled from Godard, (1963) and Gilbert, (1985).

LOCATION: 8

NAME: Chain Islands

UTM: 5960324N/418701E

ACCESS: Via boat or float plane

AREA: East Island Lake (Fig. 2).

AIRPHOTO: A23068-117

#### EXPLORATION SUMMARY:

Vulcan Syndicate drilled five holes (1126 m) in 1946 to test the gold potential of the area west of the former Island Lake Gold Mine (A.F. 91159). Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694).

#### GEOLOGICAL SETTING:

Five drillholes were collared west (Fig. 39), and three were collared east, of Boyd Island which is the site of the Island Lake Gold Mine (NTS 53E/16, Location 1, Fig. 31). The area of the occurrence is underlain by sedimentary rocks. Felsic volcanic rocks were intersected in drillholes. These rocks are part of the Hayes River Group (Wright, 1928). Greywacke, siltstone and argillite are predominant (Fig. 39) (Gilbert, 1985b).

DDH S-1 and DDH S-2 (Fig. 39) intersected black slaty to sericitic schist, in places carbonatized; mafic dykes ("lamprophyres"); and thin quartz and quartz porphyry layers. DDH S-3 intersected black slaty schist that contains numerous quartz veinlets, sericitic schist and felsic porphyritic rocks and mafic dykes ("lamprophyres"). DDH S-4 intersected a mafic intrusive rock and a suite of intermediate rocks and black slates. DDH S-5 intersected sericitic to quartz-sericitic schists, greywacke, quartzite and black slate (A.F. 91159).

#### MINERALIZATION:

Gilbert (1985a) mentioned "minor mineralized pyrite +/- rare chalcopyrite and malachite in the greywacke zone south of Chain Islands". DDH S-1 intersected minor disseminated pyrite in quartz-sericite schist. DDH S-2 intersected minor disseminated pyrite and trace galena in black slaty schist. DDH S-3 intersected black slaty schist with minor pyrite. DDH S-4 intersected disseminated pyrite, pyrrhotite and chalcopyrite in a mafic massive intrusive(?) rock in the upper part of the hole. Deeper intersections cut through black to grey schists with disseminated pyrite. DDH S-5 intersected sericitic schist with pyrrhotite as fracture fillings and black slaty schist with disseminated pyrite (A.F. 91159).

#### GEOCHEMICAL DATA:

Thirty seven drill core samples from DDH S-1 to DDH S-5 were analyzed; most of the samples assayed trace Au and a few assays returned 1.03 g/t Au (A.F. 91159) (Geochemical data listed in Table 11).

**Table 11**  
**Gold concentrations in drill core samples from the Chain Islands (A.F. 91159)**

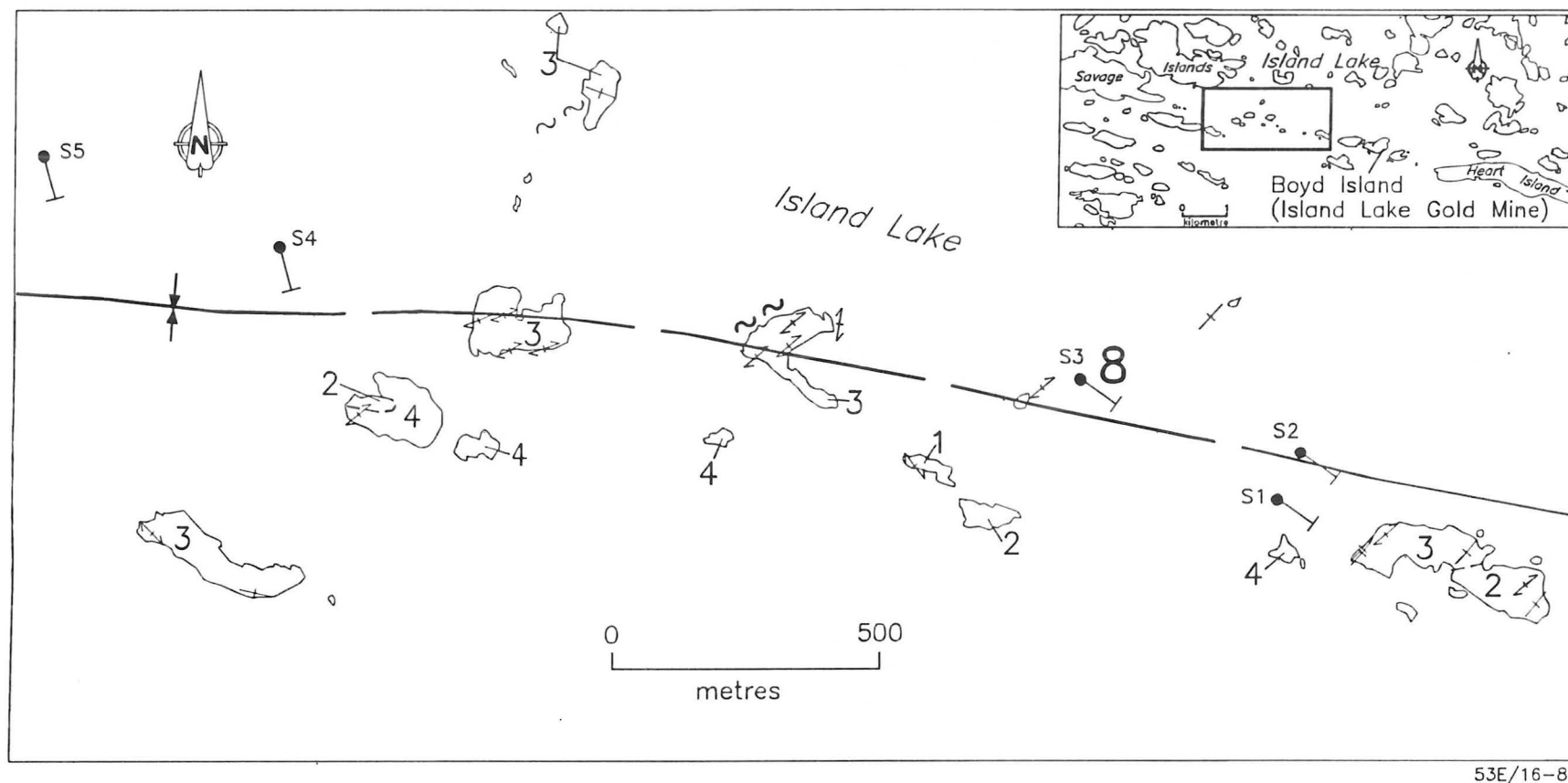
Sample No.	DDH	from	to (m)	Au (g/t)
V100	1	26.9	27.3	tr.
V101	1	54.2	55.1	tr.
V102	1	101.7	102.1	tr.
V103	1	130.1	131.1	0.34
V104	1	175.2	175.3	0.34
V105	2	80.7	80.8	tr.
V106	2	82.4	83.3	tr.
V107	2	86.3	86.7	1.03
V108	2	89.7	90.1	tr.
V109	2	119.4	120.1	0.34
V110	2	143.5	143.8	tr.
V111	2	144.4	144.5	tr.
V112	2	150.7	150.8	0.34
V113	2	150.9	151.3	tr.
V114	2	151.4	151.9	tr.
V115	2	185.1	185.4	1.03
V117	3	15.3	16.2	0.34
V118	3	67.1	67.3	tr.
V119	3	196.1	197.1	0.34
V120	3	218.1	218.3	0.34
V130	5	122.1	123.1	tr.
V131	5	131.3	131.5	tr.

#### CLASSIFICATION:

Disseminated mineralization - not classified.

#### REFERENCES:

- Assessment Files 91159, 91624, 91694  
Manitoba Energy and Mines, Mines Branch.
- Gilbert, H.P.  
1984: Island Lake project; in Manitoba Energy and Mines, Mineral Resources, Report of Field Activities, 1984, p. 120-125.  
1985a: Geological investigations in the Island Lake-Stevenson Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 187-199.  
1985b: Meegeesiwaseeson Island; Manitoba Energy and Mines, Preliminary Map 1985 I-4, 1:20 000.
- Godard, J.D.  
1963: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



53E/16-8

Early Intrusive Rocks

4 Mafic intrusive rocks

Hayes River Group

3 Greywacke, siltstone, argillite

2 Felsic volcanic rocks

1 Mafic volcanic flow and  
related intrusive rocks

--- Geological contact (approximate)

↓ Syncline

~ ~ Shear

↔ Foliation (vertical)

+ Bedding (vertical)

—● Drillhole, Vulcan Syndicate (A.F. 91159)

8 Occurrence location

Figure 39: Geological setting of occurrence 8. Geology compiled from Godard (1963) and Gilbert (1985b).

LOCATION: 9

NAME:

UTM: 5960569N/410922E

ACCESS: Via boat or float plane

AREA: Eastern Island Lake (Fig. 2)

AIRPHOTO: A23535-56

#### EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area in 1970 under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694).

#### GEOLOGICAL SETTING:

The area of the occurrence is underlain by greywacke, siltstone and thin layers of silicate facies cherty iron formation of the Hayes River Group of (Wright, 1928) (Fig. 40).

#### MINERALIZATION:

Minor pyrite, pyrrhotite and sphalerite are concentrated predominantly in fractures within the greywacke (P. Theyer, 1990, unpublished field notes). Gilbert (1985a) observed and sampled pyrite-, chalcopyrite- and sphalerite-bearing greywacke in the vicinity of the iron formation.

#### GEOCHEMICAL DATA:

A grab sample assayed 0.7 g/t Au, <1 ppm Ag, 201 ppm Cu, 83 ppm Ni, 125 ppm Zn, <2 ppm Pb and 5 ppm Mo (H.P. Gilbert, 1985, unpublished notes).

#### CLASSIFICATION:

Disseminated mineralization - not classified.

#### REFERENCES:

Assessment Files 91624, 91684, 91694

Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P.

1985a: Geological investigations in the Island Lake-Stevenson Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 187-199.

1985b: Meegeesiwaseeson Island; Manitoba Energy and Mines, Preliminary Map 1985 I-4, 1:20 000.

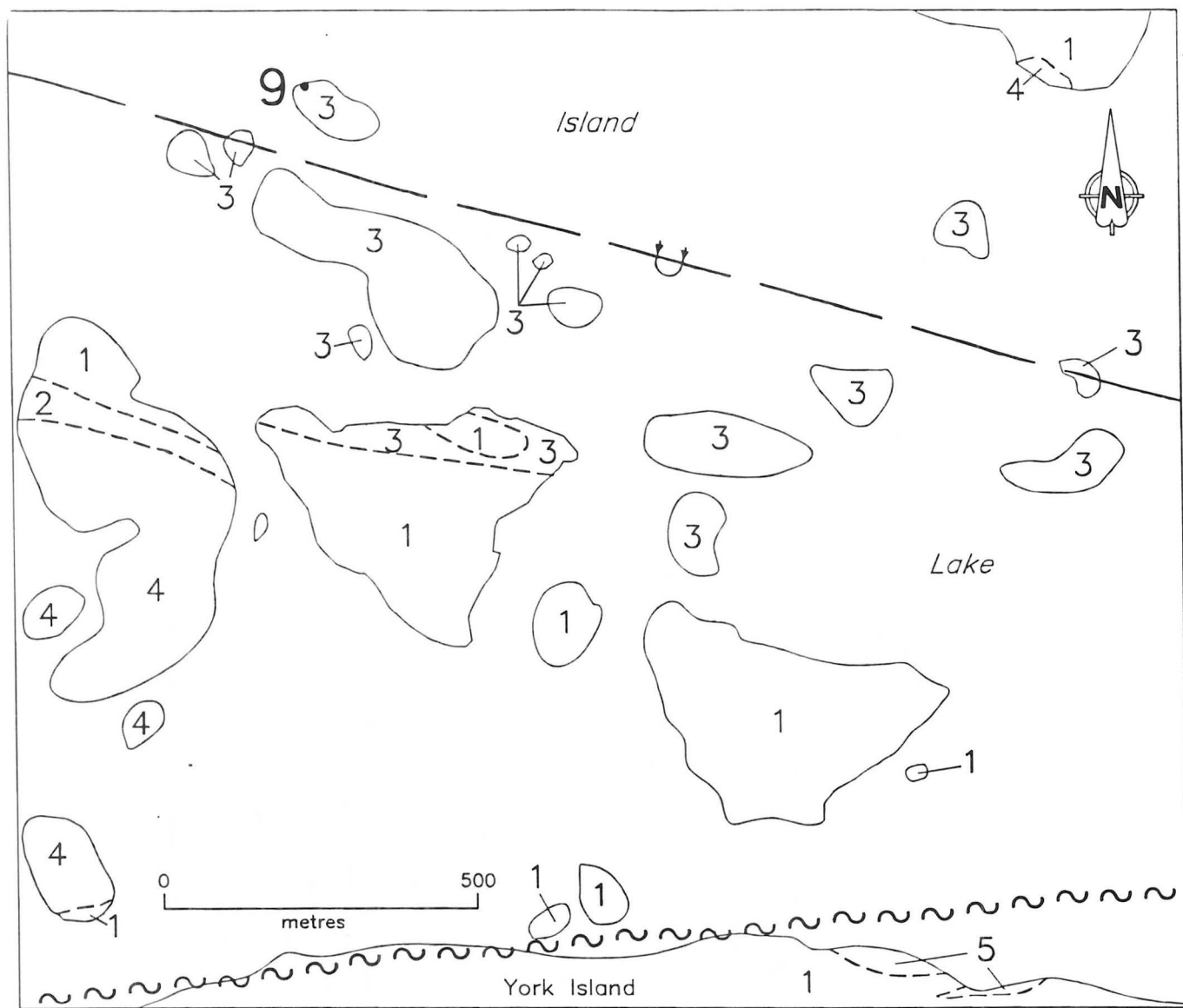
Godard, J.D.

1963: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.

Wright, J.F.

1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.





53E/16-9

# Early Intrusive Rocks

5 Ultramafic intrusive rocks

4 Tonalite, granodiorite

# Hayes River Group

3 Greywacke, siltstone, argillite

2 Intermediate volcanic breccia

1 Mafic volcanic flows and related intrusive rocks

--- Geological contact (approximate)

~~~ Shear

⌒ Syncline (overturned)

•9 Occurrence location

Figure 40: Geological setting of occurrence 9. Geology compiled from Godard, (1963) and Gilbert, (1985b).

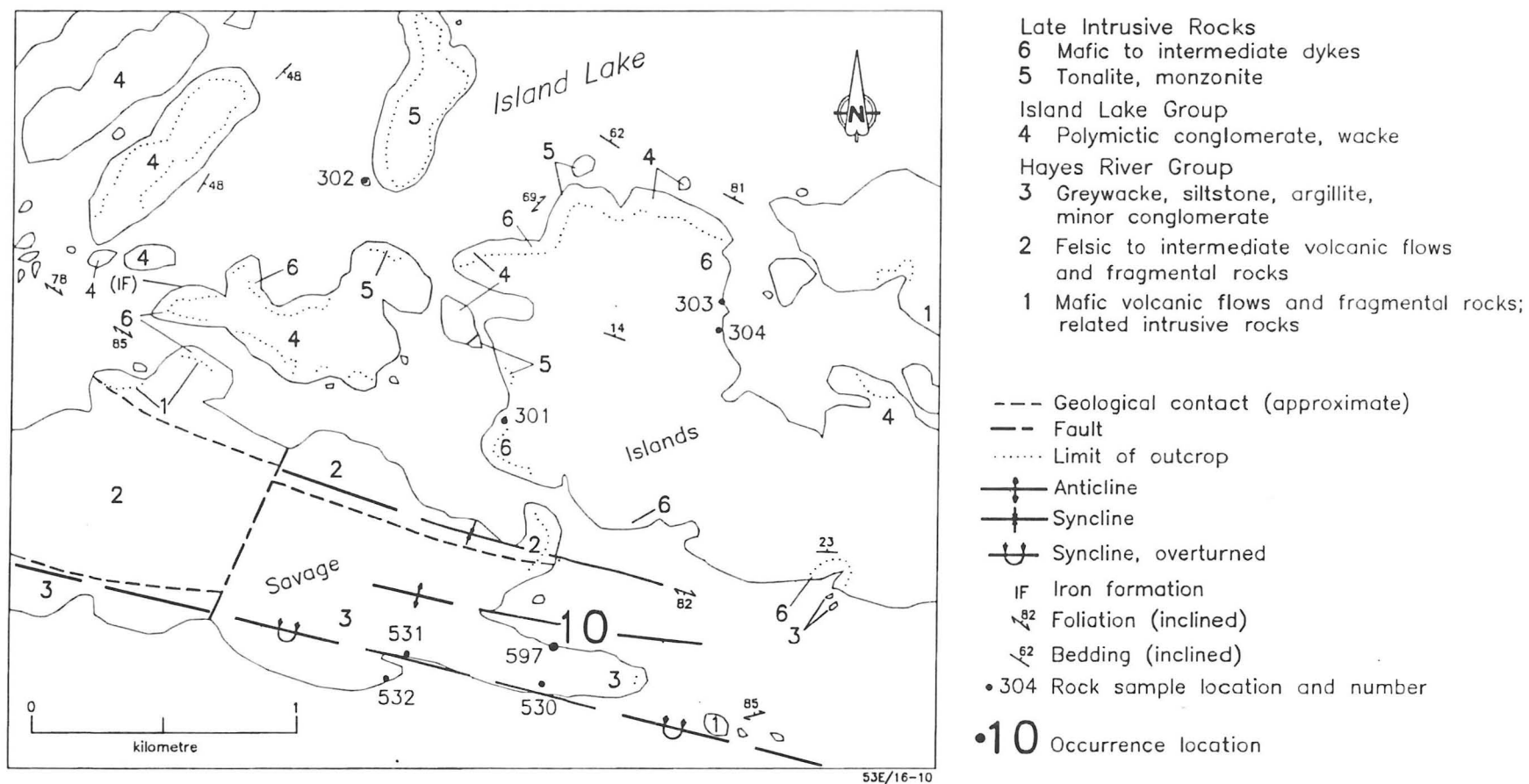


Figure 41: Geological setting of occurrence 10. Geology compiled from Godard (1963b), Neale (1981) and Gilbert (1985b).

LOCATION: 10

NAME:

UTM: 5960992N/415497E

ACCESS: Via boat or float plane

AREA: Eastern Island Lake (Fig. 2)

AIRPHOTO: A23536-196

EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area in 1970 under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). In 1981, BP Minerals Limited conducted geological reconnaissance and staking; in 1983 this company conducted geological mapping and rock chip sampling (A.F. 93230).

GEOLOGICAL SETTING:

The area of the occurrence is underlain by greywacke, siltstone, argillite and felsic, intermediate and mafic volcanic rocks of the Hayes River Group (Wright, 1928) (Gilbert, 1985b). Carbonate veins occur at the fringe or adjacent to the contact of felsic dykes with surrounding sedimentary rocks (A.F. 93230) (Fig. 41).

MINERALIZATION:

Carbonate veins that contain small quantities of sulphides and/or fuchsite in the Sinclair-Savage Island area were mapped by Neale (1981) and described by Weber and Neale (1981). Gilbert (1985a) mentioned "minor mineralized zones (Pyrite plus/minus rare chalcopryrite and malachite) occur in argillite in the south zone of Savage Island". Up to 2% disseminated arsenopyrite, pyrite, and galena occur in sheared carbonatized veins (A.F. 93230) (Theyer, 1990).

GEOCHEMICAL DATA:

The concentrations of gold in the sulphide-bearing carbonatized zones ranges from 5 to 590 ppb; As, from 2 to 266 ppb; Cu, from 9 to 127 ppb; Pb, from 4 to 180 ppb; Zn, from 12 to 133 ppb and Sb, 2 ppb (A.F. 93230).

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 91624, 91684, 91694, 93230

Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P.

1985a: Geological investigations in the Island Lake-Stevenson Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 187-199.

1985b: Meegeesiwaseeson Island; Manitoba Energy and Mines, Preliminary Map 1985 I-4, 1:20 000 scale.

Godard, J.D.

1963a: Geology of the Island Lake-York Lake area; Manitoba Mines and Natural Resources, Mines Branch, Publication 59-3, 45p.

1963b: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.

Neale K.L.

1981: Island Lake-Sinclair-Savage Islands, Manitoba Department of Energy and Mines, Preliminary Map 1981 I-2, 1:20 000.

Neale, K.L. and Weber, W.

1981: Island Lake (parts of 53E/15 and 16); in Manitoba Department of Energy and Mines, Mineral Resources Division, Report of Field Activities, 1981, p. 39-42.

Theyer, P.

1980: Stratigraphic investigations of the Island, Stevenson, Ponask, Bigstone and Knight Lake area and of the Island Lake gold mine; in Manitoba Energy and Mines, Mineral Resources Division, Report of Field Activities, 1980, p. 38-42.

1990: Mineral occurrence studies and documentation in the Island Lake area (NTS 53E); in Manitoba Energy and Mines, Mineral Resources Division, Report of Field Activities, 1990, p. 125-127.

Wright, J.F.

1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.

LOCATION: 11

NAME:

UTM: 5966353N/416215E

ACCESS: Via boat or float plane

AREA: East Island Lake (Fig. 2)

AIRPHOTO: A23068-113

EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area in 1970 under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694).

GEOLOGICAL SETTING:

The occurrence is in tonalite of the group of Early Intrusive Rocks (Weber *et al.*, 1982);(Fig. 42). North- and west-striking fractures are mineralized.

MINERALIZATION:

Minor pyrite and trace pyrrhotite are present on fracture planes. Malachite-staining occur in places (P. Theyer, 1990, unpublished field notes). Gilbert (1985b) mentioned and sampled "prominent malachite staining in tonalite" (west of Harper Island).

GEOCHEMICAL DATA:

A grab sample assayed 0.3 g/t Au, 17 g/t Ag, 85 ppm Ni, 43 ppm Zn, <2 ppm Pb and 77 ppm Mo (H.P. Gilbert, 1985, unpublished notes and data).

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 91624, 91684, 91694

Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P.

1985a: Loonfoot Island, Manitoba Department of Energy and Mines, Preliminary Map 1985 I-3, 1:20 000.

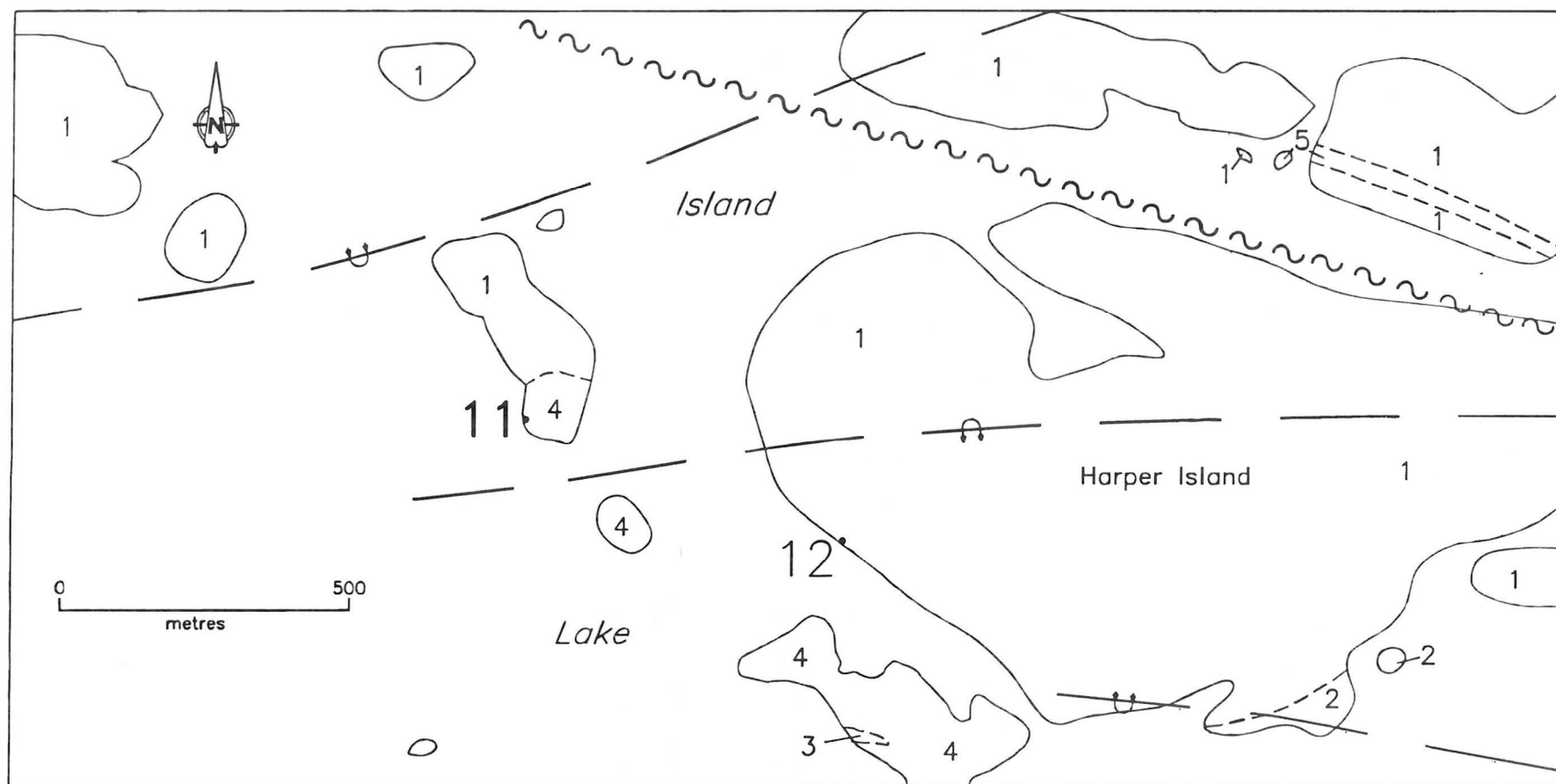
1985b: Geological investigations in the Island Lake-Stevenson Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 187-199.

Godard, J.D.

1963: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.

Weber, W., Gilbert, H.P., Neale, K.L. and McGregor, C.R.

1982: Island Lake Project; in Manitoba Mineral Resources Division Report of Field Activities, 1982, p. 34-43.



53E/16-11

### Early Intrusive Rocks

5 Mafic intrusive rocks

4 Tonalite, granodiorite

### Hayes River Group

3 Greywacke, siltstone, argillite

2 Intermediate volcanic rocks

1 Mafic volcanic flows and related intrusive rocks

--- Geological contact (approximate)

~~~~~ Shear

⌒ Anticline (overturned)

⌒ Syncline (overturned)

• 11 Occurrence location

Figure 42: Geological setting of occurrence 11. Geology compiled from Godard, (1962b) and Gilbert, (1985b).

LOCATION: 12

NAME:

UTM: 5966042N/416674E

ACCESS: Via boat or float plane

AREA: Harper Island West (Fig. 2).

AIRPHOTO: A23068-113

EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area in 1970 under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694).

GEOLOGICAL SETTING:

The area of the occurrence is underlain by aphyric basalt of the Hayes River Group (Wright, 1928). Tonalite and plagioclase porphyry dykes of the group of Early Intrusive Rocks occur in the immediate vicinity (Weber *et al.*, 1982) (Fig. 43).

MINERALIZATION:

A northeast-striking fracture zone approximately 30 cm thick is rust stained and contains up to 5% pyrite (P. Theyer, 1990, unpublished field notes). Gilbert (1985b) mentioned and sampled "prominent malachite staining in basalt adjacent to tonalite and plagioclase porphyry dykes at the west end of Harper Island".

GEOCHEMICAL DATA:

An assay of a grab sample from the mineralized zone returned 0.3 g/t Au, 5 ppm Ag, 0.21% Cu, 100 ppm Ni, 56 ppm Zn, <2 ppm Pb and 773 ppm Mo (H.P. Gilbert, 1985, unpublished notes).

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 91624, 91684, 91694

Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P.

1985a: Loonfoot Island, Manitoba Department of Energy and Mines, Preliminary Map 1985 I-3, 1:20 000.

1985b: Geological investigations in the Island Lake-Stevenson Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 187-199.

Godard, J.D.

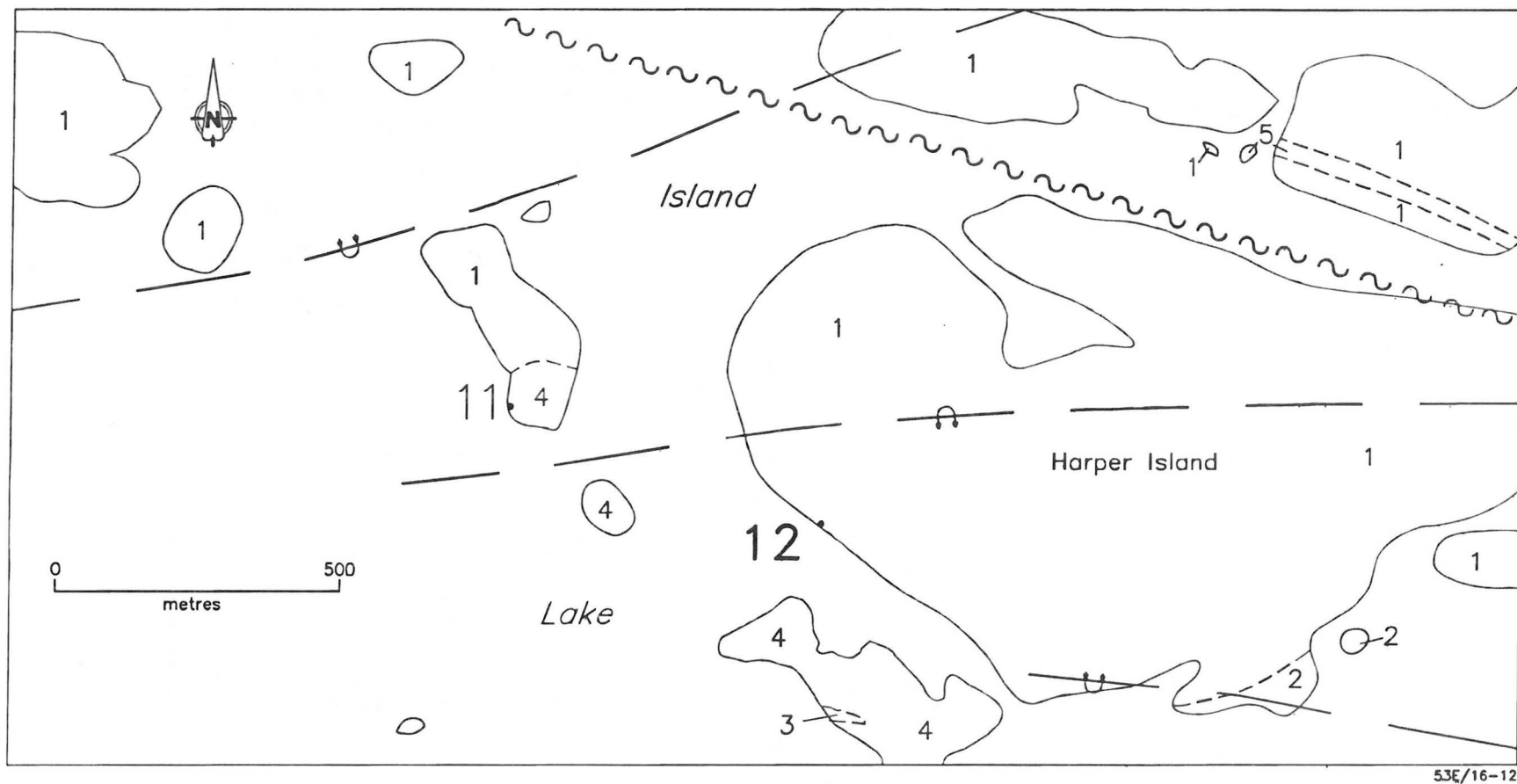
1963: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.

Weber, W., Gilbert, H.P., Neale, K.L. and McGregor, C.R.

1982: Island Lake Project; in Manitoba Mineral Resources Division Report of Field Activities, 1982, p. 34-43.

Wright, J.F.

1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



53E/16-12

### Early Intrusive Rocks

5 Mafic intrusive rocks

4 Tonalite, granodiorite

### Hayes River Group

3 Greywacke, siltstone, argillite

2 Intermediate volcanic rocks

1 Mafic volcanic flows and related intrusive rocks

--- Geological contact (approximate)

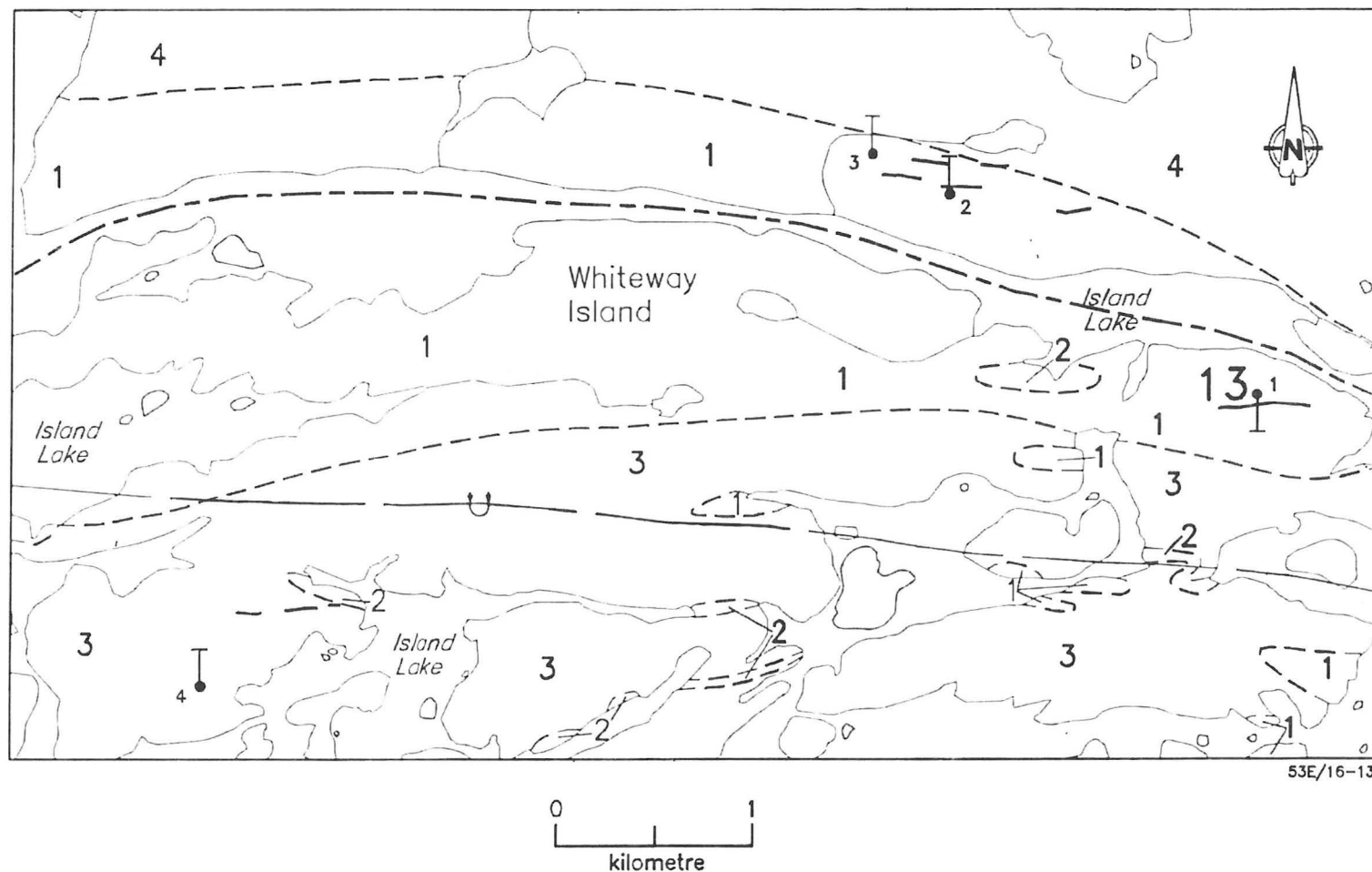
~~~~~ Shear

⌒ Anticline (overturned)

⌒ Syncline (overturned)

• 12 Occurrence location

Figure 43: Geological setting of occurrence 12. Geology compiled from Godard, (1963) and Gilbert, (1985a).



- Late Intrusive Rocks  
 4 Tonalite, granodiorite, granite  
 Early Intrusive Rocks  
 3 Mafic intrusive rocks  
 Hayes River Group  
 2 Greywacke, siltstone, argillite  
 1 Mafic to intermediate rocks  
 and related intrusive rocks

- Geological contact (approximate)  
 --- Fault (inferred)  
 U Syncline (overturned)  
 — EM conductor, Kerr Addison Mines  
 Limited (A.F. 91160)  
 • Drillhole, Kerr Addison Mines Limited  
 (A.F. 91402)  
**13** Occurrence location

Figure 44: Geological setting of occurrence 13. Geology compiled from Godard (1963) and Gilbert (1985).



## LOCATION: 13

NAME: (A.F.-Mineralization intersected by diamond drilling)  
UTM: 5967865N/428425E  
ACCESS: Via boat or float plane  
AREA: North-central Island Lake (Fig. 2).  
AIRPHOTO: A23506-197

## EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Canadian Aero Mineral Surveys Limited carried out an airborne EM and MAG survey over the area on behalf of Kerr Addison Mines Limited in 1965. In this survey, all anomalies considered to be of sufficient interest to warrant drilling were then ground-proofed with an EM survey (A.F. 91160). Anomaly 16, located on northeastern Whiteway Island, was classified as a localized conductor with an associated MAG anomaly. In 1966, Kerr Addison Mines Limited staked four claims (Group I) over the anomaly and drilled DDH No 1 (21.3 m) (A.F. 91402). Other anomalies staked in the area were claim group H, in which DDH 2 (17.6 m) and DDH 3 (20.5 m) were drilled to intersect the source of anomalies 11 and 12, classified as strong conductors with direct magnetic correlation; and claim group F, in which DDH No 4 (30.5 m) was drilled to intersect the source of anomaly 5, classified as a strong conductor with direct magnetic correlation (A.F. 91652 report; A.F. 91144 map). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694).

## GEOLOGICAL SETTING:

The area of the occurrence is underlain by mafic volcanic rocks of the Hayes River Group (Wright, 1928) and by mafic intrusive and related rocks (Gilbert, 1985a) (Fig. 44). DDH 1 intersected silicified andesite, massive sulphide, graphite and ended in andesite. DDH 2 intersected andesitic tuff, silicified andesite, solid sulphide and ended in silicified andesite. DDH 3 intersected massive andesite and sedimentary rocks, amphibolite, greywacke, and ended in amphibolite. DDH 4 intersected diorite, rhyolite and ended in andesite (A.F. 91402).

## MINERALIZATION:

Silicified andesite intersected by DDH 1 from 10.7 m to 11.4 m contained up to 10% pyrite and pyrrhotite. A section of solid pyrite and pyrrhotite occurred from 14.5 m to 16.3 m core length. Andesite at the bottom of the hole contained minor pyrite and pyrrhotite. Andesite intersected by DDH 2 included a layer of solid pyrite from 14.0 m to 17.6 m; The balance of the hole intersected andesite with minor pyrite and pyrrhotite. DDH 3 intersected volcanic and sedimentary rocks with minor pyrite and pyrrhotite. DDH 4 intersected intrusive rocks with 1 to 2% pyrrhotite and very minor chalcopyrite (A.F. 91402).

## GEOCHEMICAL DATA:

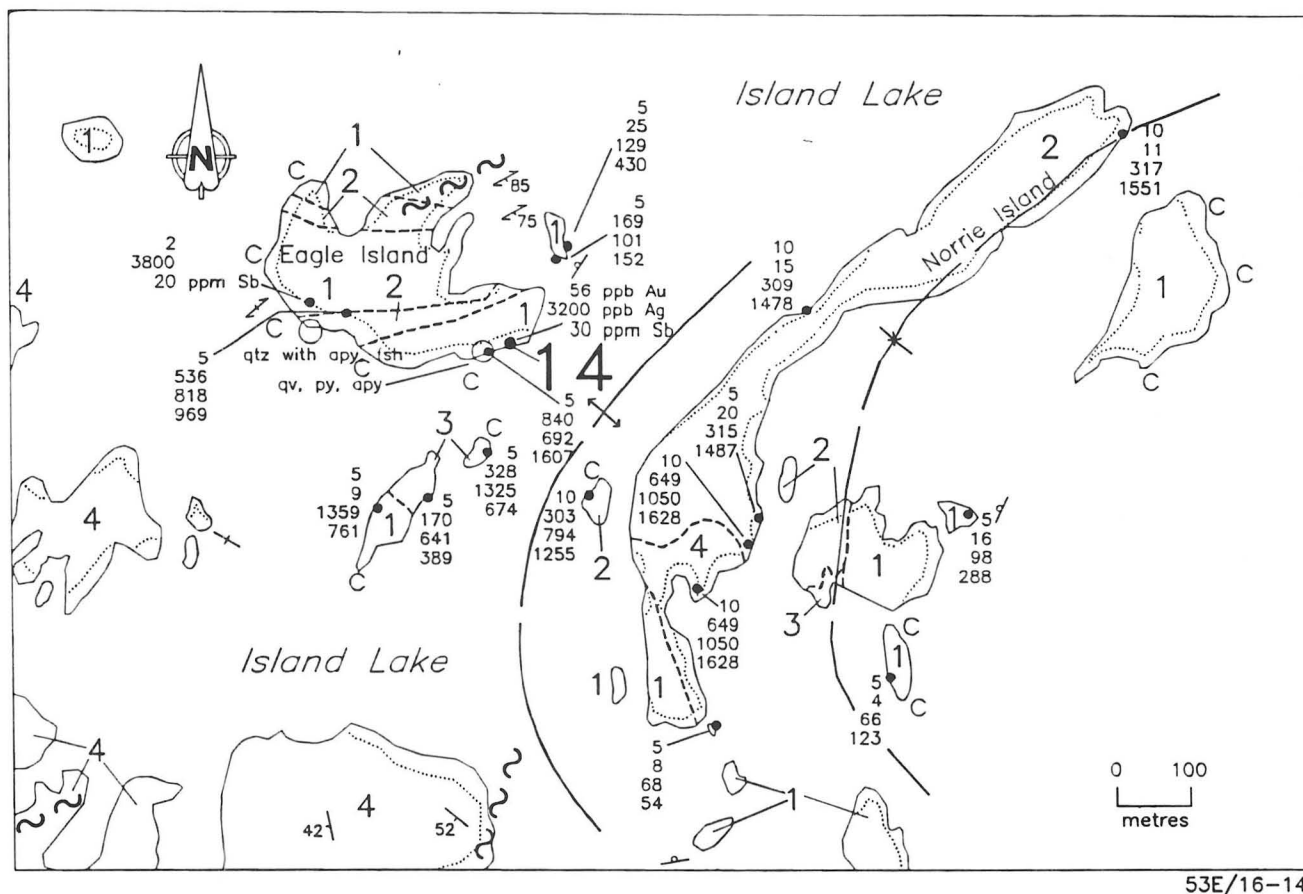
An assay of a core sample from DDH 3 assayed nil Au, 0.01% and 0.03% Cu and 0.06% Ni. No other geochemical data is available (A.F. 91402).

## CLASSIFICATION:

Chemical sediment type deposit - sulphide facies iron formation.

## REFERENCES:

- Assessment Files 91144, 91160, 91402, 91624, 91652, 91694  
Manitoba Energy and Mines, Mines Branch.
- Gilbert, H.P.  
1985: Loonfoot Island, Manitoba Department of Energy and Mines, Preliminary Map 1985 I-3, 1:20 000.
- Godard, J.D.  
1963: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



- Island Lake Group
- 4 Polymictic conglomerate
- Early Intrusive Rocks
- 3 Mafic intrusive rocks
- 2 Ultramafic rocks
- Hayes River Group
- 1 Mafic volcanic rocks
- Geological contact (approximate)
- ..... Limit of outcrop
- ~~~ Shear
- 75 → Foliation (inclined, vertical)
- 52 → Bedding (inclined, vertical)
- ↖ Pillow lavas (tops unknown)
- qv, py, apy Mineral occurrence
- C Carbonatization
- ✚ Fold axis (synclinal)
- ✚ Fold axis (anticlinal)
- Rock chip analyses: (A.F. 93230)
- 5 Au, ppb
- 328 As, ppm
- 1325 Ni, ppm
- 674 Cr, ppm
- 14 Occurrence location

Figure 45: Geological setting of occurrence 14. Geology compiled from Godard (1963) and Gilbert (1985).

LOCATION: 14

NAME: Eagle Claims

UTM: 5963781N/424017E

ACCESS: Via boat or float plane

AREA: Eastern Island Lake; west of Loonfoot Island (Fig. 2)

AIRPHOTO: A23507-53

#### EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Canadian Aero Mineral Surveys Limited carried out an airborne EM and MAG survey over the area on behalf of Kerr Addison Mines Limited in 1965 (A.F. 91144). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area in 1970 under Airborne Permit 91 (A.F. 91684). Cominco Limited conducted a VLF-EM and MAG survey in 1972 (A.F. 92324). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). Neale (1981) geologically mapped (1:20 000) the area. In 1981, BP Minerals Limited conducted geological reconnaissance and staking; in 1982 and 1983 this company continued with geological mapping (1:10 000) and a geochemical survey included rock chip and humus samples (A.F. 93230).

#### GEOLOGICAL SETTING:

The area of the occurrence is underlain by aphyric pillowed and massive basalt (Gilbert, 1985a) of the Hayes River Group (Wright, 1928) (Fig. 45). Serpentinized peridotite and talc-carbonate schist are part of the group of Early Intrusive Rocks (Weber *et al.*, 1982). Carbonatization is widespread in the vicinity of the occurrence. Metre-thick quartz-carbonate veins occur on the southern shore of "Eagle" island (A.F. 93230).

#### MINERALIZATION:

Minor disseminated arsenopyrite, pyrite and minor fuchsite are present in carbonate-quartz veins (A.F. 93230). Neale (1981) mapped fuchsite and, in places, arsenopyrite-bearing carbonate-quartz veins in this area.

#### GEOCHEMICAL DATA:

Grab samples of the carbonate-quartz veins collected by BP Minerals Limited from "Eagle Island" assayed up to 56 ppb Au, 3200 ppm As and 30 ppm Sb (A.F. 93230).

#### CLASSIFICATION:

Disseminated mineralization - not classified.

#### REFERENCES:

- Assessment Files 91144, 91624, 91684, 91694, 92324, 93230  
Manitoba Energy and Mines, Mines Branch.
- Gilbert, H.P.  
1985: Loonfoot Island; Manitoba Energy and Mines, Preliminary Map 1985 I-3, 1:20 000 scale.
- Godard, J.D.  
1963: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.
- Neale, K.L.  
1981: Island Lake - Sinclair-Savage Islands; Manitoba Energy and Mines Preliminary Map 1981 I-2, 1:20 000.
- Neale, K.L. and Weber, W.  
1981: Island Lake (parts of 53E/15 and 16); in Manitoba Department of Energy and Mines, Mineral Resources Division, Report of Field Activities, 1981, p. 39-42.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.

LOCATION: 15

NAME: (A.F.-Mineralization intersected by diamond drilling)  
UTM: 5959963N/427339E  
ACCESS: Via boat or float plane  
AREA: Central Island Lake (Fig. 2)  
AIRPHOTO: A23506-197

EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Canadian Aero Mineral Surveys Limited carried out an airborne EM and MAG survey over the area on behalf of Kerr Addison Mines Limited in 1965. Anomaly 32 was classified as a localized strong conductor without an associated MAG anomaly. In this survey, all anomalies considered to be of sufficient interest to warrant drilling were then ground-proofed with an EM survey (A.F. 91160). In 1966, Kerr Addison Mines Limited staked four claims (Group E) over the anomaly and drilled DDH 5 (35 m) (A.F. 91652 report; A.F. 91144 map). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694).

GEOLOGICAL SETTING:

The area of the occurrence is underlain by mafic volcanic rocks of the Hayes River Group (Wright, 1928) (Fig. 46).

DDH 5 intersected fine grained rhyolite, a 0.6 m layer of disseminated sulphide, and ended in rhyolite (A.F. 91402).

MINERALIZATION:

DDH 5 was mineralized from 3.6 m to 4.2 m with up to 20% pyrrhotite and trace chalcopyrite; the remainder of the core contained minor pyrrhotite and trace chalcopyrite (A.F. 91402).

GEOCHEMICAL DATA:

Two samples from DDH 5 assayed nil Au, 0.03% and 0.04% Cu and 0.68% Zn (A.F. 91402).

CLASSIFICATION:

Chemical sediment type deposit - sulphide facies iron formation.

REFERENCES:

- Assessment Files 91144, 91160, 91624, 91652, 91694  
Manitoba Energy and Mines, Mines Branch.
- Gilbert, H.P.  
1985: Loonfoot Island, Manitoba Department of Energy and Mines, Preliminary Map 1985 I-3, 1:20 000.
- Godard, J.D.  
1963: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.

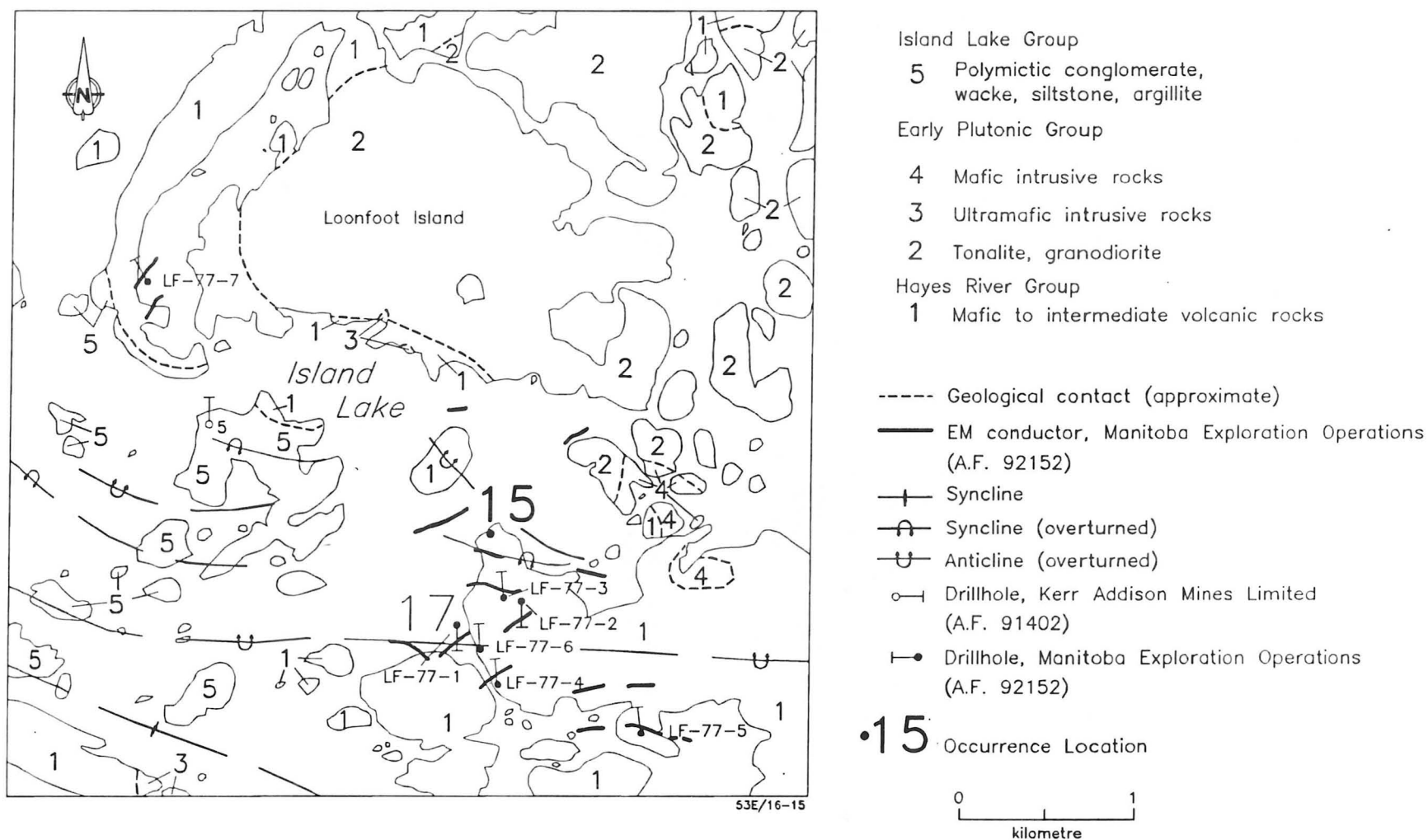


Figure 46: Geological setting of occurrence 15. Geology compiled from Godard (1963) and Gilbert (1985).

LOCATION: 16

NAME:

UTM: 5961402N/424822E

ACCESS: Via boat or float plane

AREA: Eastern Island Lake; west of Loonfoot Island (Fig. 2)

AIRPHOTO: A23506-235

EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Canadian Aero Mineral Surveys Limited carried out an airborne EM and MAG survey over the area on behalf of Kerr Addison Mines Limited in 1965 (A.F. 91144). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area in 1970 under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). Exploration Operation Branch of Manitoba Department of Mines, Resources and Environmental Management prospected, geologically mapped and staked the area in 1976 and 1977; the site of this occurrence was marked "Cp" (presumably denoting a chalcopyrite occurrence) (Petak, 1976) (A.F. 92152). In 1981, BP Minerals Limited conducted geological reconnaissance and staking; in 1982 and 1983, it conducted geological mapping (1:10 000) and a geochemical survey including rock chip and humus sampling (A.F. 93230).

GEOLOGICAL SETTING:

The area of the occurrence is underlain by cobble conglomerate that contain clasts of volcanic, sedimentary and granitoid rocks (Gilbert, 1985a) (Fig. 47). These rocks are part of the Island Lake Series (Wright, 1928).

MINERALIZATION:

Several metre-long fractures in the conglomerate contain minor pyrite.

GEOCHEMICAL DATA:

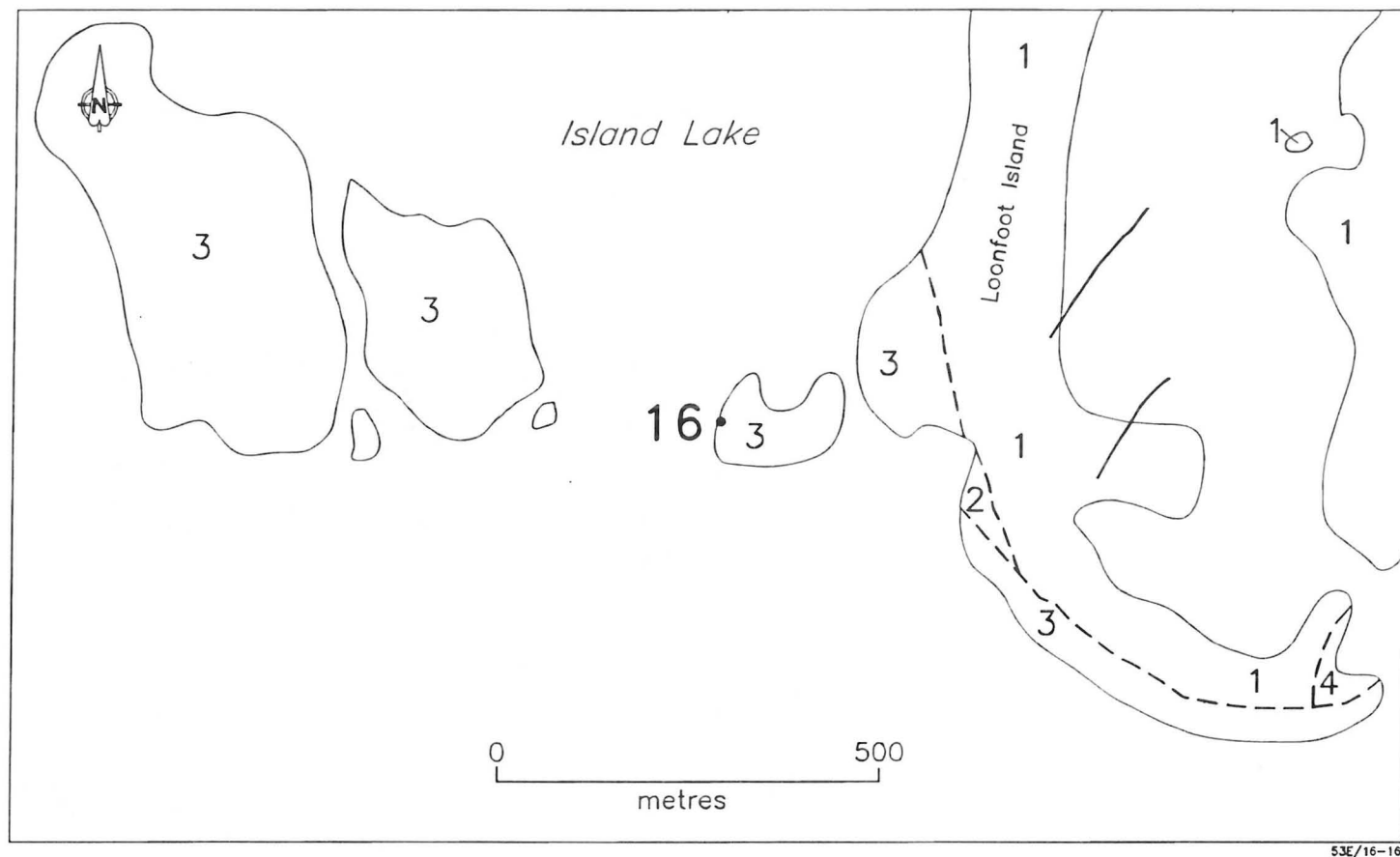
None available

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

- Assessment Files 91144, 91624, 91684, 91694, 92152, 93230  
Manitoba Energy and Mines, Mines Branch.
- Gilbert, H.P.  
1985: Loonfoot Island; Manitoba Energy and Mines, Preliminary Map 1985 I-3, 1:20 000 scale.
- Godard, J.D.  
1963: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.
- Petak, H.W.  
1976: EO-11 Island Lake; in Manitoba Department of Mines, Resources and Environmental Management, Mineral Resources Division, Report of Field Activities, 1976, p. 71-73.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



Late Intrusive Rocks

4 Felsic dyke

Island Lake Group

3 Greywacke, conglomerate, siltstone

Early Intrusive Rocks

2 Mafic intrusive rocks

Hayes River Group

1 Mafic volcanic flows and related intrusive rocks

--- Geological contact (approximate)

— EM conductor, Manitoba Exploration Operations (A.F. 92152)

•16 Occurrence location

Figure 47: Geological setting of occurrence 16. Geology compiled from Godard, (1963) and Gilbert (1985).

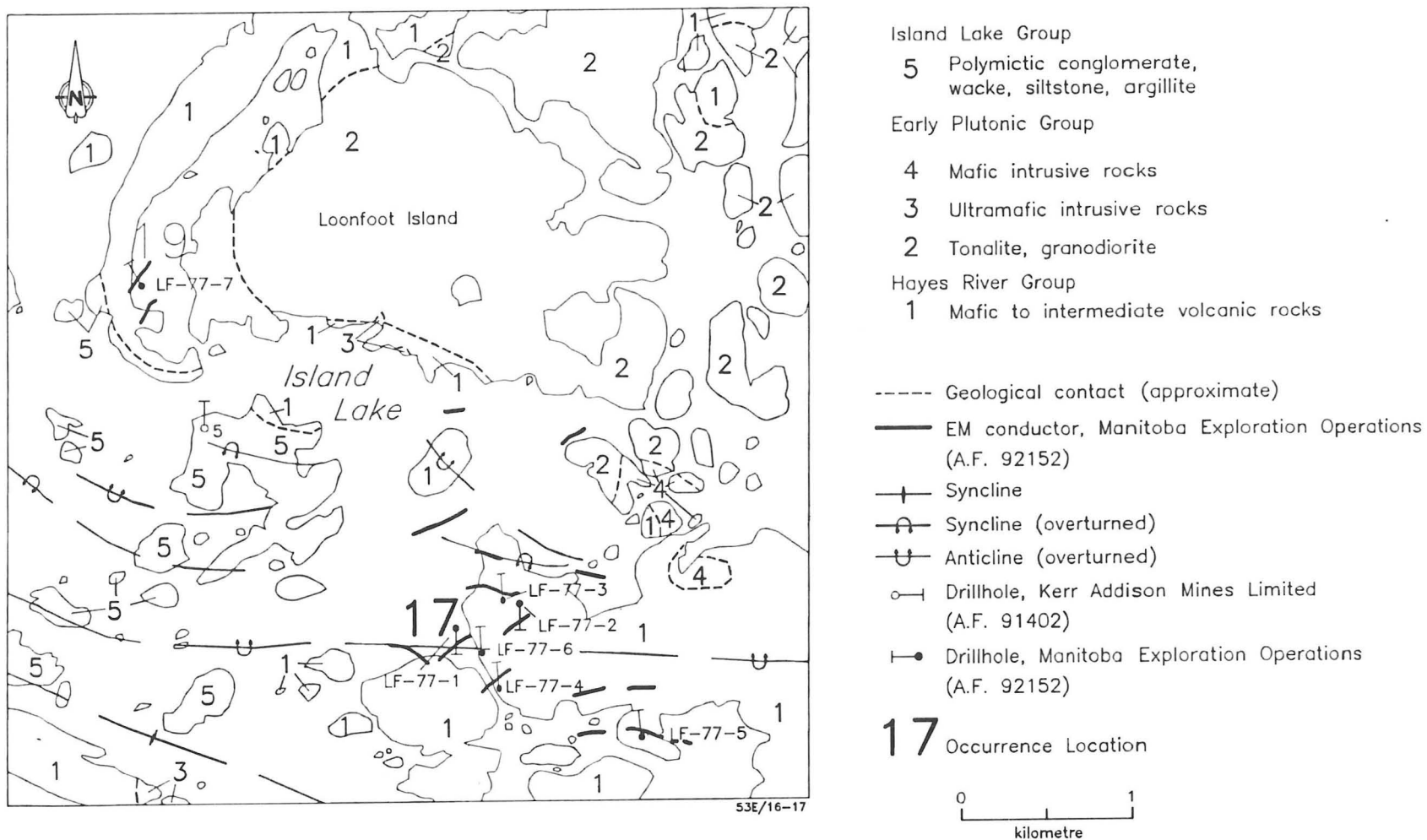


Figure 48: Geological setting of occurrence 17. Geology compiled from Godard (1963) and Gilbert (1985).



LOCATION: 17

NAME:

UTM: 5959425N/427036E

ACCESS: Via boat or float plane

AREA: Eastern Island Lake; south of Loonfoot Island (Fig. 2)

AIRPHOTO: A23506-187

#### EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Canadian Aero Mineral Surveys Limited carried out an airborne EM and MAG survey over the area on behalf of Kerr Addison Mines Limited in 1965 (A.F. 91144). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area in 1970 under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). Exploration Operation Branch of Manitoba Department of Mines, Resources and Environmental Management prospected, conducted a VLF-EM survey, geologically mapped and staked the area in 1976 and 1977 (Petak, 1976) (A.F. 92152).

#### GEOLOGICAL SETTING:

The area of the occurrence is underlain by pillowed basalt of the Hayes River Group (Wright, 1928) (Fig. 48). An approximately 50 m long exposure of undeformed, beige- to cream-colored, bleached and silicified pillowed basalt occurs adjacent to the shore. Most of the pillows are separated by cm-thick septa of fine grained, light grey to beige inter-pillow sediment.

DDH LF 77-1 intersected pillowed basalt and graphite-bearing argillaceous layers. DDH LF 77-2 intersected "probably pillowed rhyodacite" (pillowed basalt) and "brecciated sections" (probably flow breccia). DDH LF 77-3 intersected "brecciated metarhyodacite" (probably equivalent to the silicified altered basalt exposed on the shore). DDH LF 77-4 intersected buff to green "metarhyodacite". DDH LF 77-6 intersected "probably pillowed volcanic rocks" with minor quartz and carbonate veins (A.F. 92152).

#### MINERALIZATION:

Up to 2% disseminated pyrite and pyrrhotite occurs in the interpillow sedimentary rock. A 4 m thick zone with disseminated to near-solid pyrite, pyrrhotite and chalcopyrite was described by staff of Exploration Operations (A.F. 92152); this zone could not be found during a search of the area (P. Theyer, 1990, unpublished field notes).

DDH LF 77-1 intersected pyrite-bearing graphitic slate and argillite. DDH LF 77-2 intersected traces of pyrite in the pillowed basalt. DDH LF 77-3 intersected trace pyrite and pyrrhotite. DDH LF 77-6 intersected pyrrhotite traces in pillow selvages (A.F. 92152).

#### GEOCHEMICAL DATA:

An assay of a 1 m section "within the mineralized zone" reported 2% Cu and 1.7 g/t Au (A.F. 92152). Assay results of core from these holes are not recorded but a note "no mineralization of economic significance was intersected" was included in a report contained in A.F. 92152.

#### CLASSIFICATION:

Disseminated mineralization - not classified.

#### REFERENCES:

- Assessment Files 91144, 91624, 91684, 91694, 92152  
Manitoba Energy and Mines, Mines Branch.
- Gilbert, H.P.  
1985: Loonfoot Island, Manitoba Department of Energy and Mines, Preliminary Map 1985 I-3, 1:20 000.
- Godard, J.D.  
1963: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.
- Petak, H.W.  
1976: EO-11 Island Lake; in Manitoba Department of Mines, Resources and Environmental Management, Mineral Resources Division, Report of Field Activities, 1976, p. 71-73.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.

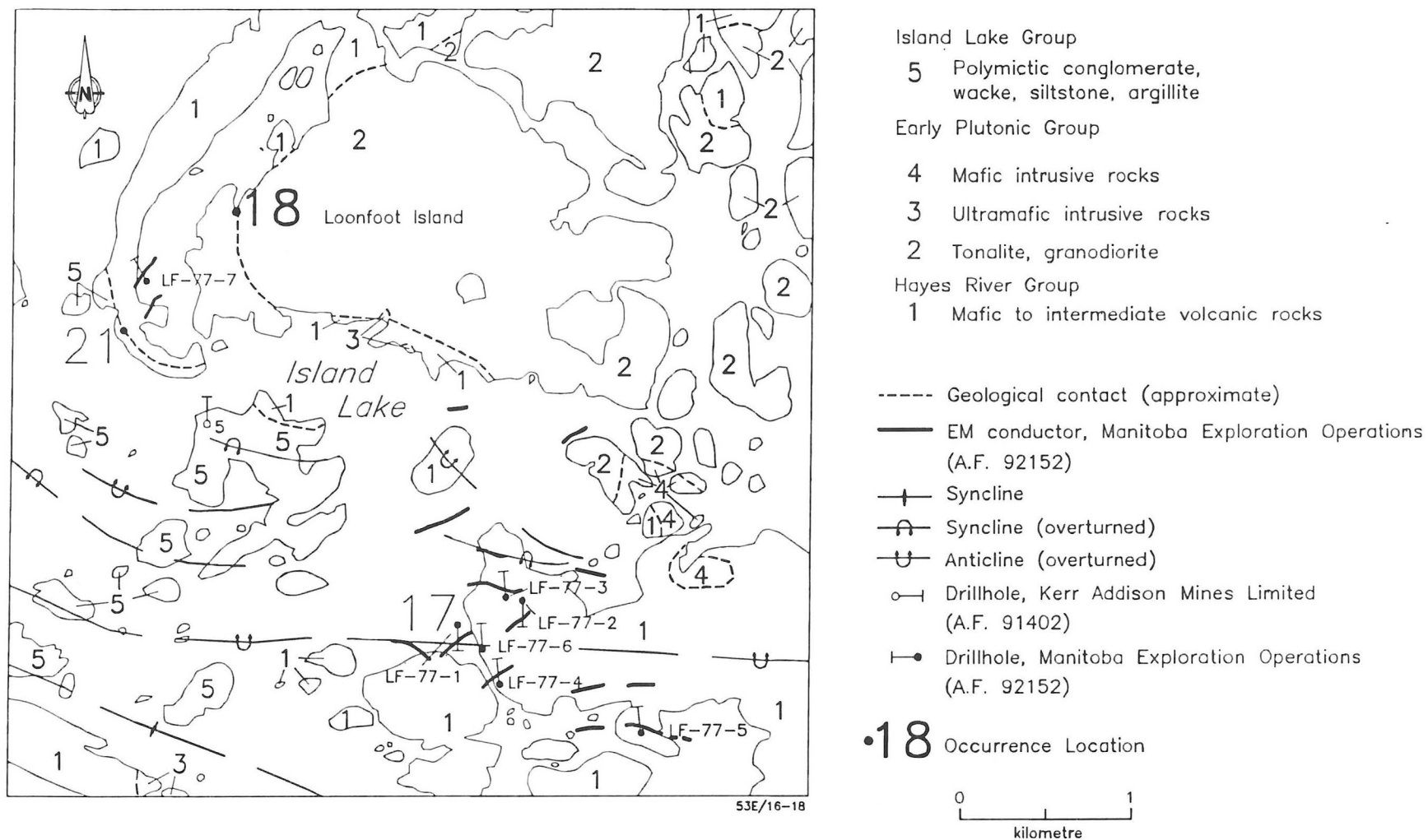


Figure 49: Geological setting of occurrence 18. Geology compiled from Godard (1963) and Gilbert (1985).

LOCATION: 18

NAME:

UTM: 5961891N/425735E

ACCESS: Via boat or float plane

AREA: Eastern Island Lake; Loonfoot Island (Fig. 2)

AIRPHOTO: A23506-235

#### EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Canadian Aero Mineral Surveys Limited carried out an airborne EM and MAG survey over the area on behalf of Kerr Addison Mines Limited in 1965 (A.F. 91144). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area in 1970 under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). The Exploration Operations Branch of Manitoba Department of Mines, Resources and Environmental Management prospected, geologically mapped, staked and conducted a VLF-EM survey over the area in 1976 and 1977 (Petak, 1976) (A.F. 92152). In 1981, BP Minerals Limited conducted geological reconnaissance and staking; in 1982 and 1983 BP Minerals conducted geological mapping and a geochemical survey, including rock chip and humus sampling (A.F. 93230).

#### GEOLOGICAL SETTING:

The occurrence is a quartz vein located at the contact between mafic volcanic rocks of the Hayes River Group (Wright, 1928) and granodiorite of the group of Early Intrusive Rocks (Weber *et al.*, 1982) (Fig. 49). The northeast-striking, 1.5 to 1.8 m thick quartz vein, exposed over a strike length of approximately 200 m, is mottled white and contains numerous pockets of ankerite. The granodiorite adjacent to the quartz vein exhibits signs of greisenization.

#### MINERALIZATION:

Pyrite accompanied by minor disseminated arsenopyrite occurs in cm-thick layers and up to fist-sized lenses.

#### GEOCHEMICAL DATA:

An assay of a grab samples from this quartz vein returned maximum concentrations of 1.1% As, 0.11% Zn,

20 g/t Ag and 1 g/t Au (Exploration Operations, A.F. 92152). BP Minerals Limited reported that a grab sample from the quartz vein assayed 50 ppb Au, 2 ppm Ag and 3505 ppm As (A.F. 93230).

A grab sample collected from a pyrite-bearing portion of the quartz vein assayed trace Au and nil Ag (P. Theyer, 1990, unpublished notes).

#### CLASSIFICATION:

Vein type deposit - single vein.

#### REFERENCES:

- Assessment Files 91144, 91624, 91684, 91694, 92152, 93230  
Manitoba Energy and Mines, Mines Branch.
- Gilbert, H.P.  
1985: Loonfoot Island, Manitoba Department of Energy and Mines, Preliminary Map 1985 I-3, 1:20 000.
- Godard, J.D.  
1963: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.
- Petak, H.W.  
1976: EO-11 Island Lake; in Manitoba Department of Mines, Resources and Environmental Management, Mineral Resources Division, Report of Field Activities, 1976, p. 71-73.
- Weber, W., Gilbert, H.P., Neale, K.L. and McGregor, C.R.  
1982: Island Lake Project; in Manitoba Mineral Resources Division, Report of Field Activities, 1982, p. 34-43.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.

LOCATION: 19

NAME: (A.F.-Mineralization intersected by diamond drilling)  
UTM: 5961638N/425166E  
ACCESS: Via boat or float plane  
AREA: Eastern Island Lake; west of Loonfoot Island (Fig. 2)  
AIRPHOTO: A23506-235

EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Canadian Aero Mineral Surveys Limited carried out an airborne EM and MAG survey over the area on behalf of Kerr Addison Mines Limited in 1965 (A.F. 91144). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area in 1970 under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). Exploration Operation Branch of Manitoba Department of Mines, Resources and Environmental Management prospected, geologically mapped, conducted a preliminary VLF-EM survey and staked the area in 1976 and 1977. DDH LF-77-7 (78.6 m) was drilled to test an EM anomaly designated as conductor C14 (A.F. 92152).

GEOLOGICAL SETTING:

The area of the occurrence is underlain by aphyric pillowed and massive basalt of the Hayes River Group (Wright, 1928) (Fig. 50). DDH LF-77-7 intersected volcanic rocks described as "metarhyodacite" and intercalated black slaty sedimentary rocks. The hole ended in felsic metavolcanic rocks (A.F. 92152).

MINERALIZATION:

Pyrrhotite and minor pyrite occur in bands and hairline fractures within the metasedimentary rocks intersected in DDH LF-77-7. Blebs and irregular pyrrhotite stringers occur within the felsic rocks near the bottom of the hole (A.F. 92152).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

- Assessment Files 91144, 91624, 91684, 91694, 92152  
Manitoba Energy and Mines, Mines Branch.
- Gilbert, H.P.  
1985: Loonfoot Island, Manitoba Department of Energy and Mines, Preliminary Map 1985 I-3, 1:20 000.
- Godard, J.D.  
1963: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, 1-80.

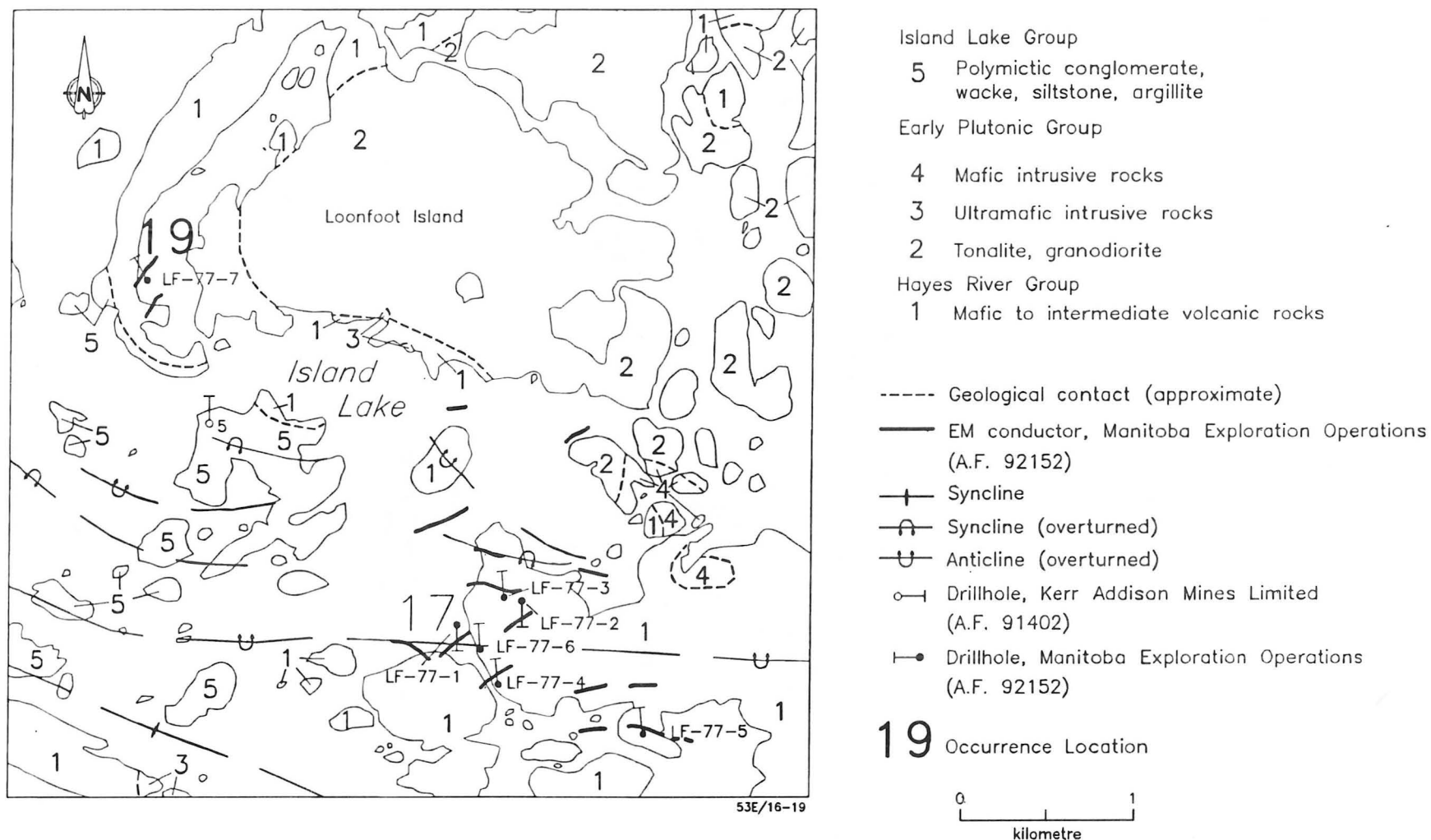


Figure 50: Geological setting of occurrence 19. Geology compiled from Godard (1963) and Gilbert (1985).

LOCATION: 20

NAME: (A.F.-Mineralization intersected by diamond drilling)  
UTM: 5958609N/427078E  
ACCESS: Via boat or float plane  
AREA: Eastern Island Lake; northwest of Bluff Island (Fig. 2)  
AIRPHOTO: A23506-186

EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Canadian Aero Mineral Surveys Limited carried out an airborne EM and MAG survey over the area on behalf of Kerr Addison Mines Limited in 1965. Anomaly 33 was classified as a probable formational conductor caused by graphite and bedded sulphides (A.F. 91144). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area in 1970 under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). Exploration Operations Branch of Manitoba Department of Mines, Resources and Environmental Management prospected, geologically mapped, conducted a preliminary VLF-EM survey and staked the area in 1976 and 1977. DDH LF-77-5 was drilled to test the EM anomaly. This anomaly had been recorded as "anomaly 33" in the airborne EM and MAG survey conducted for Kerr Addison Limited in 1965 (A.F. 92152). In 1981, BP Minerals undertook claim staking, a VLF-EM and MAG survey, reconnaissance mapping and prospecting, and a humus sampling program (A.F. 93230). Cobham River Mines Limited staked, prospected and collected rock samples 1987. The property was subsequently transferred to Corona Corporation in 1988 (A.F. 93498). Corona Corporation conducted a geophysical survey including airborne VLF-EM, MAG and EM surveys (A.F. 93500).

GEOLOGICAL SETTING:

The area of the occurrence is underlain by aphyric pillowed and massive basalt of the Hayes River Group (Wright, 1928) (Fig. 51).

DDH LF-77-5, drilled to intersect the sulphide-bearing layer, cut pillowed mafic rocks with intercalated black slaty argillite (A.F. 92152).

MINERALIZATION:

An approximately 5 m thick gossaniferous zone contains an approximately 15 cm thick sulphide-bearing zone. Pyrrhotite and minor pyrite occur in mm-thick layers and disseminations within an approximately 15 cm thick zone exposed on surface. DDH LF-77-5 intersected mafic volcanic rocks containing trace quantities of pyrrhotite and sedimentary rocks that contain layers with up to 15% pyrrhotite (A.F. 92152).

GEOCHEMICAL DATA:

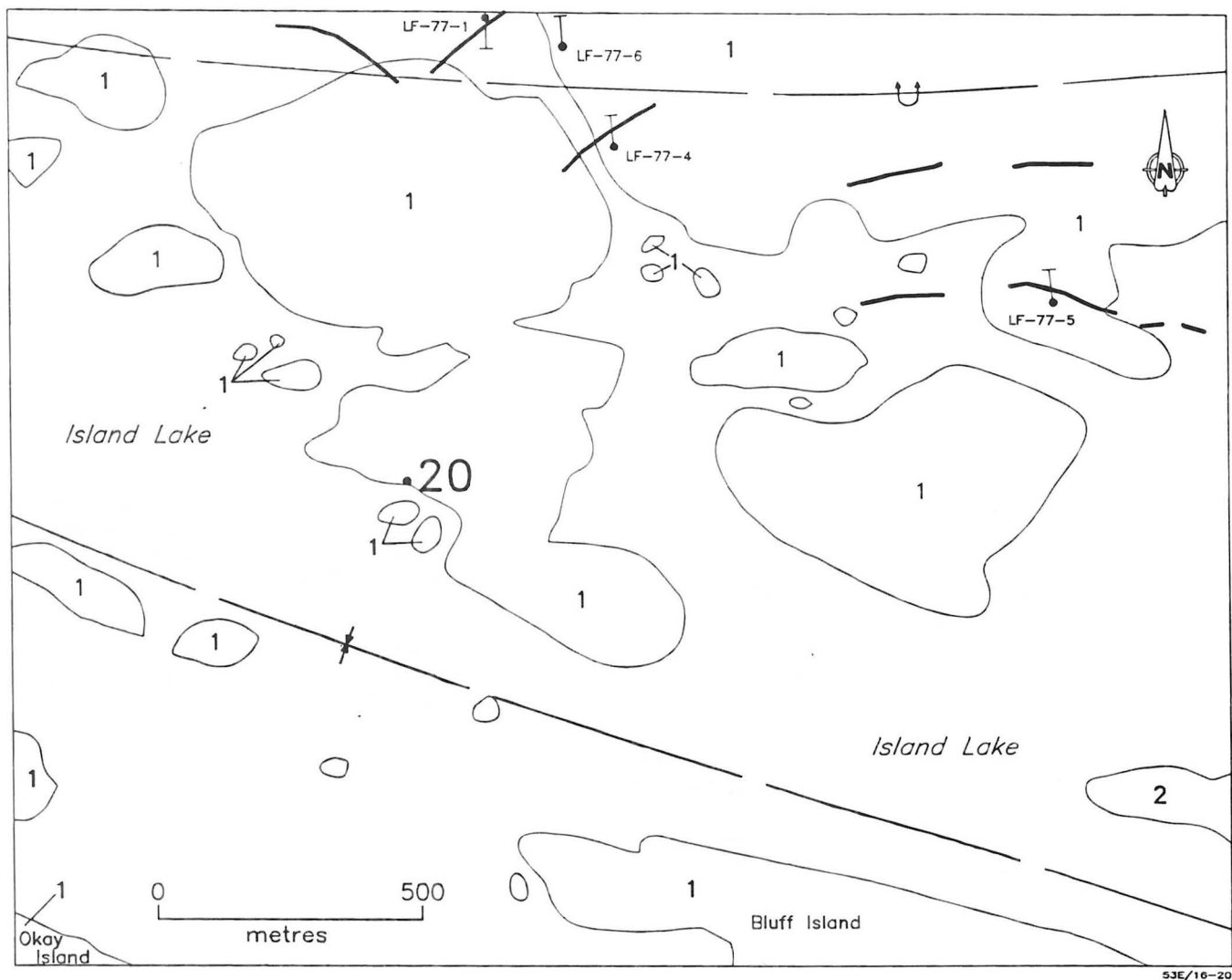
A grab sample of the sulphide-bearing zone assayed 0.076% Cu, 209 ppm Zn and 27 ppm Pb (H.P. Gilbert, 1984, unpublished notes).

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

- Assessment Files 91144, 91624, 91684, 91694, 92152, 93230, 93498, 93500  
Manitoba Energy and Mines, Mines Branch.
- Gilbert, H.P.  
1985: Loonfoot Island, Manitoba Department of Energy and Mines, Preliminary Map 1985 I-3, 1:20 000.
- Godard, J.D.  
1963: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



Early Intrusive Rocks  
 2 Ultramafic intrusive rocks  
 Hayes River Group  
 1 Mafic volcanic flows and  
 related intrusive rocks

— EM conductor, Manitoba Exploration  
 Operations (A.F. 92152)  
 —+— Syncline  
 —+— Syncline (overturned)  
 —•— Drillhole, Manitoba Exploration Operations  
 (A.F. 92152)  
 •20 Occurrence location

Figure 51: Geological setting of occurrence 20. Geology compiled from Godard (1963) and Gilbert (1985).

LOCATION: 21

NAME:

UTM: 5961188N/425263E

ACCESS: Via boat or float plane

AREA: Eastern Island Lake; north of Neville Island (Fig. 2)

AIRPHOTO: A23506-235

#### EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Canadian Aero Mineral Surveys Limited carried out an airborne EM and MAG survey over the area on behalf of Kerr Addison Mines Limited in 1965 (A.F. 91144). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area in 1970 under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). Exploration Operations Branch of Manitoba Department of Mines, Resources and Environmental Management prospected, geologically mapped, conducted a preliminary VLF-EM survey (Petak, 1976) and staked the area in 1976 and 1977.

#### GEOLOGICAL SETTING:

The area of the occurrence is underlain by aphyric pillowed and massive basalt of the Hayes River Group (Wright, 1928). Conglomerate of the Island Lake Group outcrops in the immediate western vicinity (Fig. 52).

#### MINERALIZATION:

An occurrence of "disseminated galena and sphalerite within altered intermediate volcanic rock" was described in a report by Exploration Operations (A.F. 92152). A carbonatized and slightly rusty, several metres long by approximately 1 metre wide area was interpreted to correspond to the occurrence described in (A.F. 92152).

#### GEOCHEMICAL DATA:

A grab sample collected by staff of Exploration Operations assayed 0.27% Zn, 0.23% Pb and 24.6 g/t Ag.

#### CLASSIFICATION:

Disseminated mineralization - not classified.

#### REFERENCES:

- Assessment Files 91144, 91624, 91684, 91694, 92152  
Manitoba Energy and Mines, Mines Branch.
- Gilbert, H.P.  
1985: Loonfoot Island, Manitoba Department of Energy and Mines, Preliminary Map 1985 I-3, 1:20 000.
- Godard, J.D.  
1963: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.
- Petak, H.W.  
1976: EO-11 Island Lake; in Manitoba Department of Mines, Resources and Environmental Management, Mineral Resources Division, Report of Field Activities, 1976, p. 71-73.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



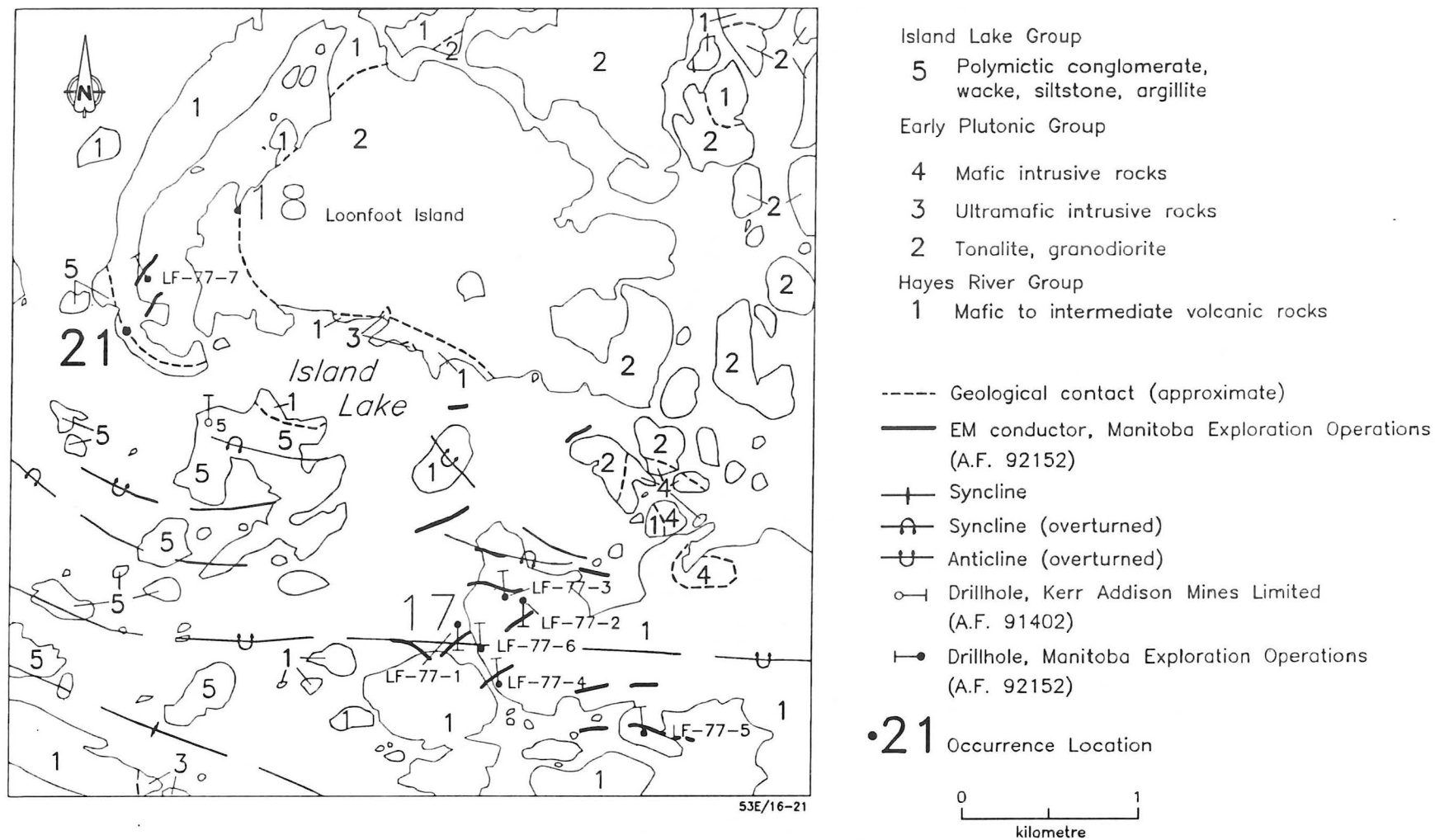


Figure 52: Geological setting of occurrence 21. Geology compiled from Godard, (1963) and Gilbert, (1985).

LOCATION: 22

NAME:

UTM: 5957808N/429245E

ACCESS: Via boat or float plane

AREA: Eastern Island Lake; north of Bluff Island (Fig. 2)

AIRPHOTO: A23506-143

#### EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Canadian Aero Mineral Surveys Limited carried out an airborne EM and MAG survey over the area on behalf of Kerr Addison Mines Limited in 1965 (A.F. 91144). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area in 1970 under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). Cominco Limited conducted a VLF-EM and MAG survey in 1972 (A.F. 92324). In 1981, BP Minerals Limited conducted geological reconnaissance and staking (A.F. 93230).

#### GEOLOGICAL SETTING:

The area of the occurrence is underlain by an approximately 16 m thick, east-striking, silicified, intensely carbonatized, light grey to buff layer hosted by mafic rocks of the group of Early Intrusive Rocks (Weber *et al.*, 1982) (Fig. 53). Intense carbonatization is indicated by a grooved and rounded weathered surface typical of high calcium carbonate-bearing rocks. Intense alteration also occurs approximately 150 m west in similar rocks that underlie the northern part of an island (P. Theyer, 1990, unpublished field notes).

#### MINERALIZATION:

Pyrite, pyrrhotite, galena and a steely grey whitish mineral tentatively identified as gersdorffite (H.P. Gilbert, 1985, unpublished field notes) occur in near-solid mm-thick layers, in pockets and as fracture coatings with fuchsite in cherty veins.

#### GEOCHEMICAL DATA:

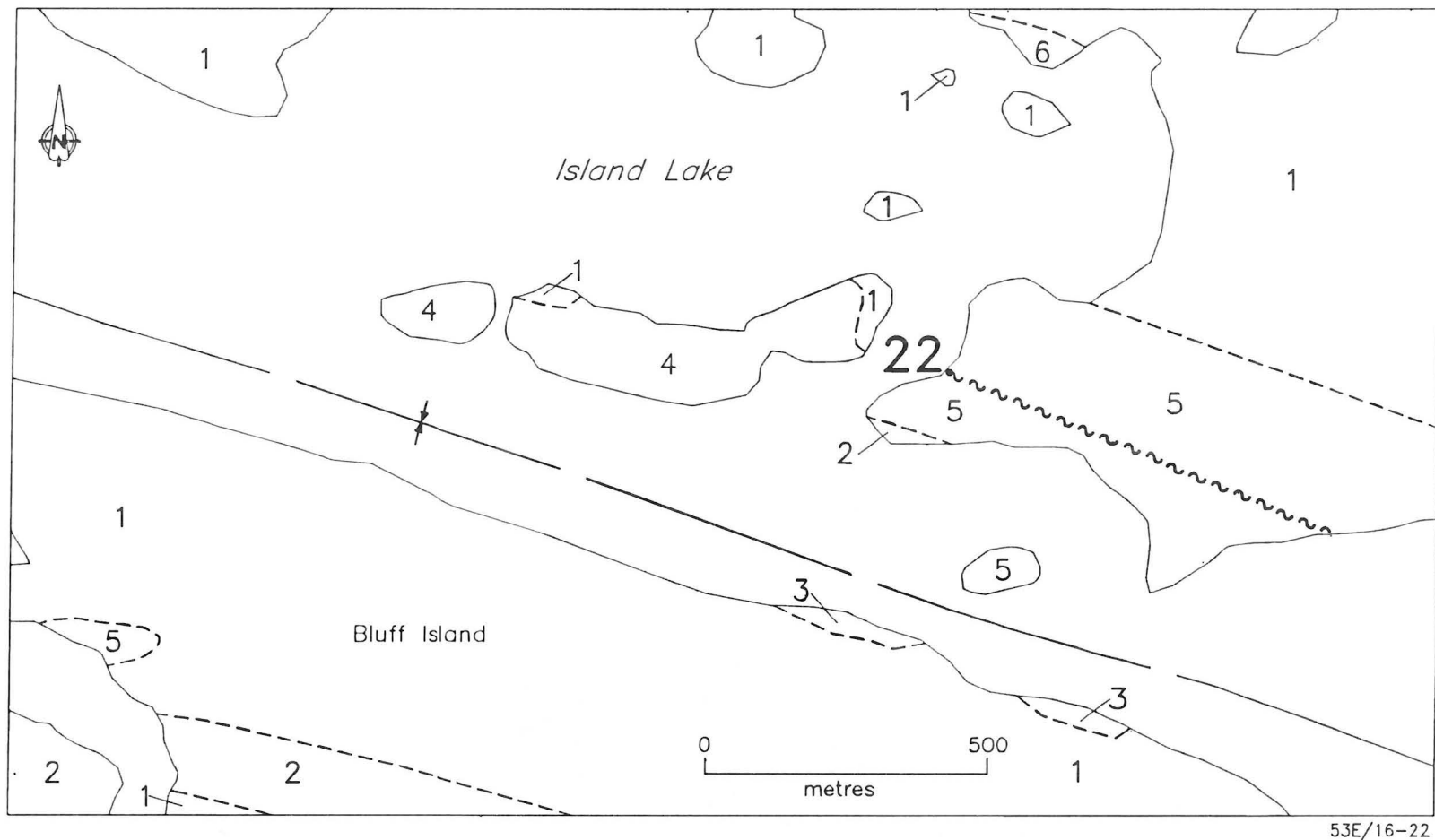
A grab sample collected from the mineralized altered zone assayed nil Au, 7 ppm Ag, 0.08% Cu, >0.1% Ni, 91 ppm Zn, >0.1% Pb and 4 ppm Mo (H.P. Gilbert, 1985, unpublished notes).

#### CLASSIFICATION:

Disseminated mineralization - not classified.

#### REFERENCES:

- Assessment Files 91144, 91624, 91684, 91694, 92324, 93230  
Manitoba Energy and Mines, Mines Branch.
- Gilbert, H.P.  
1985: Loonfoot Island, Manitoba Department of Energy and Mines, Preliminary Map 1985 I-3, 1:20 000.
- Godard, J.D.  
1963: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.
- Weber, W., Gilbert, H.P., Neale, K.L. and McGregor, C.R.  
1982: Island Lake Project; in Manitoba Mineral Resources Division, Report of Field Activities, 1982, p. 34-43.



53E/16-22

### Early Intrusive Rocks

- 6 Felsic dykes
- 5 Mafic intrusive rocks
- 4 Ultramafic intrusive rocks;  
related subvolcanic or extrusive rocks

### Hayes River Group

- 3 Greywacke, siltstone, argillite
- 2 Felsic to intermediate volcanic rocks
- 1 Mafic volcanic flows and  
related intrusive rocks

-- Geological contact (approximate)

~~ Shear

✚ Syncline

• 22 Occurrence location

Figure 53: Geological setting of occurrence 22. Geology compiled from Godard, (1963) and Gilbert, (1985).

LOCATION: 23

NAME: (A.F.-Mineralization intersected by diamond drilling)  
UTM: 5956232N/431672E  
ACCESS: Via boat or float plane  
AREA: South central Island Lake (Fig. 2)  
AIRPHOTO: A23506-144

EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Canadian Aero Mineral Surveys Limited carried out an airborne EM and MAG survey over the area on behalf of Kerr Addison Mines Limited in 1965. Anomaly 52 was classified as a localized strong conductor without an associated MAG anomaly. In this survey, all anomalies considered to be of sufficient interest to warrant drilling were then ground proofed with an EM survey (A.F. 91160). In 1966, Kerr Addison Mines Limited staked four claims (Group K) over the anomaly and drilled DDH 6 (20.6 m). (A.F. 91652 report; A.F. 91144 map; A.F. 91402 drill logs). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area in 1970 under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694).

GEOLOGICAL SETTING:

The area of the occurrence is underlain by mafic volcanic rocks of the Hayes River Group (Wright, 1928) (Fig. 54). DDH 6 intersected repeated metre-thick layers of graphitic tuff, and quartzite (A.F. 91402).

MINERALIZATION:

DDH 6 was mineralized with a 70 cm thick quartzite layer that contains up to 40% pyrite and pyrrhotite; the remainder of the core was mineralized with up to 5% pyrite (A.F. 91402).

GEOCHEMICAL DATA:

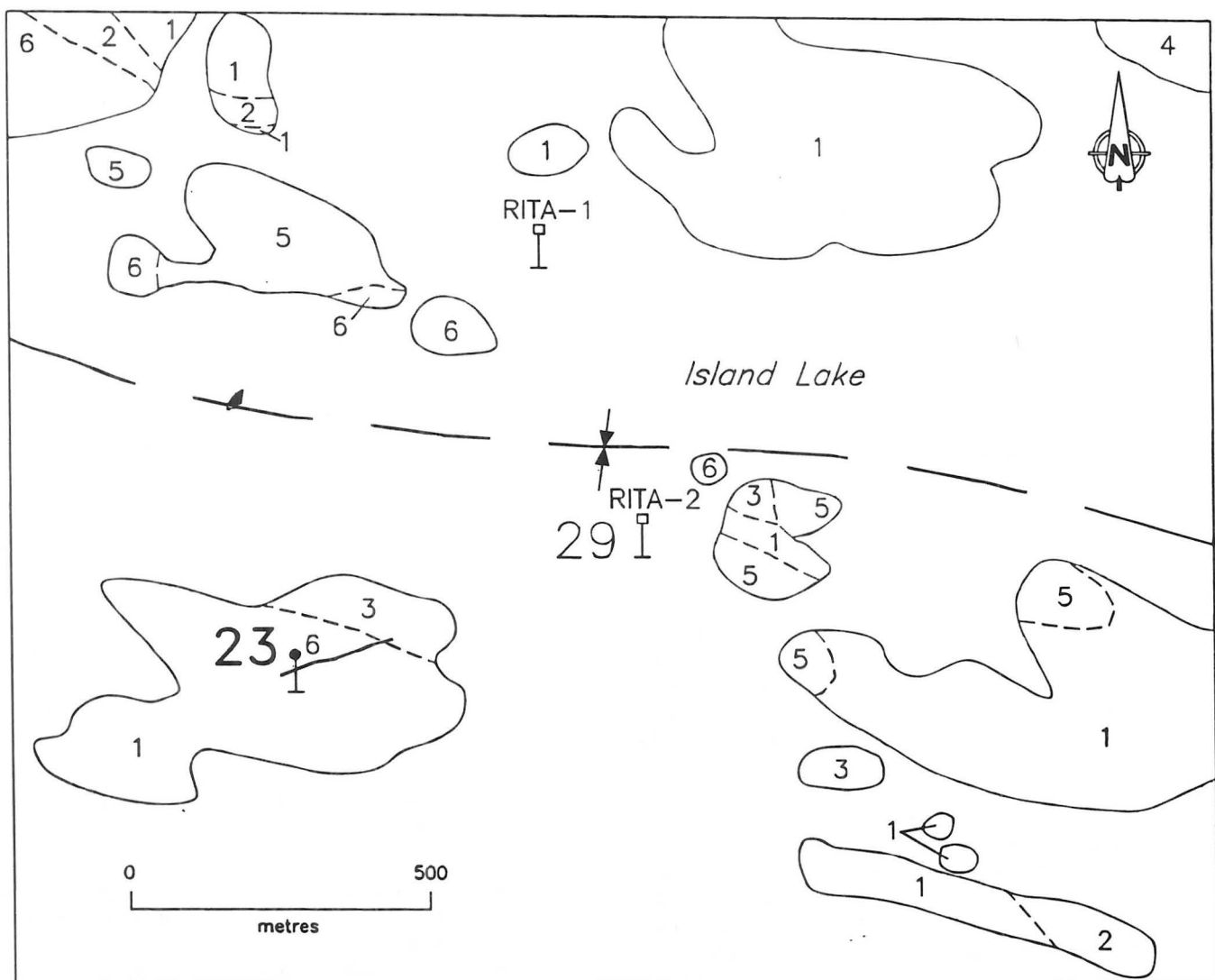
A 0.6 m long core sample of quartz veins with pyrite veinlets from DDH 6 assayed 0.68 g/t Au; a 0.4 m long core sample of the layer that contained up to 40% pyrite and pyrrhotite, assayed trace Au and 0.15% Zn (A.F. 91402).

CLASSIFICATION:

Chemical sediment type deposit - sulphide facies iron formation.

REFERENCES:

- Assessment Files 91144, 91160, 91402, 91624, 91652, 91684, 91694  
Manitoba Energy and Mines, Mines Branch.
- Gilbert, H.P.  
1985: Loonfoot Island, Manitoba Department of Energy and Mines, Preliminary Map 1985 I-3, 1:20 000.
- Godard, J.D.  
1963: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



53E/16-23

#### Early Intrusive Rocks

6 Mafic intrusive rocks

5 Ultramafic rocks

4 Tonalite, granodiorite

#### Hayes River Group

3 Greywacke, siltstone, argillite

2 Felsic to intermediate volcanic rocks

1 Mafic to intermediate volcanic rocks;  
related intrusive rocks

--- Geological contact (approximate)

— EM conductor, Kerr Addison Mines  
Limited (A.F. 91160)

↓ Syncline

⊥• Drillhole, Kerr Addison Mines  
Limited (A.F. 91402)

⊥□ Drillhole, Cominco Limited  
(A.F. 92288)

**23** Occurrence location

Figure 54: Geological setting of occurrence 23. Geology compiled from Godard, (1963), Gilbert, (1985) and W.B. Dunlop (pers. comm., 1996).

LOCATION: 24

NAME: (A.F.-Mineralization intersected by diamond drilling)  
UTM: 5964878N/426697E  
ACCESS: Via boat or float plane  
AREA: Eastern Island Lake; north of Loonfoot Island (Fig. 2)  
AIRPHOTO: A23506-191

EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). The area of the occurrence was first staked in 1958 and assigned to the Canadian Nickel Company Limited. An AEM and MAG survey conducted in that year disclosed an elongated anomaly assumed to be caused by a peridotite (Mineral Inventory Card 53E/16 Ni1). Godard (1963a) described the exploration history of this occurrence, and identified it as "locality No. 4". Canadian Aero Mineral Surveys Limited carried out an airborne EM and MAG survey over the area on behalf of Kerr Addison Mines Limited in 1965 (A.F. 91144). The area was then staked as the Pan group of claims in 1970 and assigned to Cominco Limited. Sheritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area under Airborne Permit 91 in 1970 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). Cominco Limited conducted a VLF-EM and MAG survey in 1972 (A.F. 92324); drilled four holes in 1972 (A.F. 92233), and six holes in 1974 to test I.P. anomalies (I.P. survey results are not on record) (A.F. 92288).

GEOLOGICAL SETTING:

The area of the occurrence is underlain by mafic volcanic rocks of the Hayes River Group (Wright, 1928) and by mafic intrusive rocks and ultramafic intrusive and related extrusive rocks of the group of Early Intrusive Rocks (Weber *et al.*, 1982) (Fig. 55).

Theyer (1977) investigated the area and reported on the petrography of ultramafic rocks (Theyer, 1985).

DDH P 1 intersected 146 m of serpentinized ultramafic rock; two distinctly different hues, (dark grey and bright green) were differentiated. DDH P 2 intersected 152 m of ultramafic rock.

DDH P 3 intersected 108 m of ultramafic and mafic interlayered rock. DDH P 4 intersected 90 m of ultramafic rock (A.F. 92233).

DDH Pan 5 intersected 57 m of mafic volcanic rocks and 175 m ultramafic peridotite to pyroxenite. DDH Pan 6 intersected 36 m of ultramafic rocks. DDH Pan 7 intersected 57 m of mafic volcanic rocks and 110 m of ultramafic rocks. DDH Pan 8 intersected 150 m of ultramafic rocks and, at the bottom of the hole, 5 m of mafic volcanic rocks. DDH Pan 9 intersected 126 m of ultramafic rocks and 4 m of mafic volcanic rocks at the end of the hole. DDH Pan 10 intersected 133 m of ultramafic rocks and 16 m of mafic volcanic rocks (A.F. 92288).

MINERALIZATION:

DDH Pan 5 intersected patchy and disseminated pyrite, magnetite and hematite. DDH Pan 6 intersected disseminated millerite? and magnetite. DDH Pan 7 intersected ultramafic rocks with disseminated sulphide. DDH Pan 8 intersected disseminated non-specified sulphide. DDH Pan 9 intersected minor unspecified sulphide. DDH Pan 10 intersected traces of disseminated sulphide.

GEOCHEMICAL DATA:

The highest concentration of Ni (1.8%) was analyzed in a 15 cm "massive sulphides" intersection from DDH P 3. Other notable assays are from DDH Pan 5: 0.3 m core at 73 m depth assayed 1.32% Ni, and at 160 m a 30 cm core with patchy chalcopyrite, assayed 2.48% Cu. DDH Pan 6 contained 0.3 m core containing 1.42% Ni and DDH Pan 8 assayed 1.2 m core with 1.41% Ni (A.F. 92233; 92288).

CLASSIFICATION:

Magmatogenic type deposit associated with mafic/ultramafic rocks - disseminated.

REFERENCES:

- Assessment Files 91144, 91624, 91684, 91694, 92233, 92288, 92324  
Manitoba Energy and Mines, Mines Branch.
- Gilbert, H.P.  
1985: Loonfoot Island, Manitoba Department of Energy and Mines, Preliminary Map 1985 I-3, 1:20 000.
- Godard, J.D.  
1963a: Geology of the Island Lake-York Lake area; Manitoba Mines and Natural Resources, Mines Branch, Publication 59-3, 45p.  
1963b: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.
- Mineral Inventory Card 53E/16 Ni1  
Manitoba Energy and Mines, Geological Services Branch.
- Quinn, H.A.  
1960: Geology, Island Lake, Manitoba and Ontario; Geological Survey of Canada, Preliminary Series Map 26-1960, 1:253 440.
- Quinn, H.A. and Meinert, R.J.  
1959: The Island Lake Series, Island Lake, Manitoba; Precambrian, v. 52, no. 4, p. 15-25.

Theyer, P.

1977: Evaluation of nickel environments; in Manitoba Mines, Resources and Environmental Management, Mineral Resources Division, Report of Field Activities, 1977, p. 116-121.

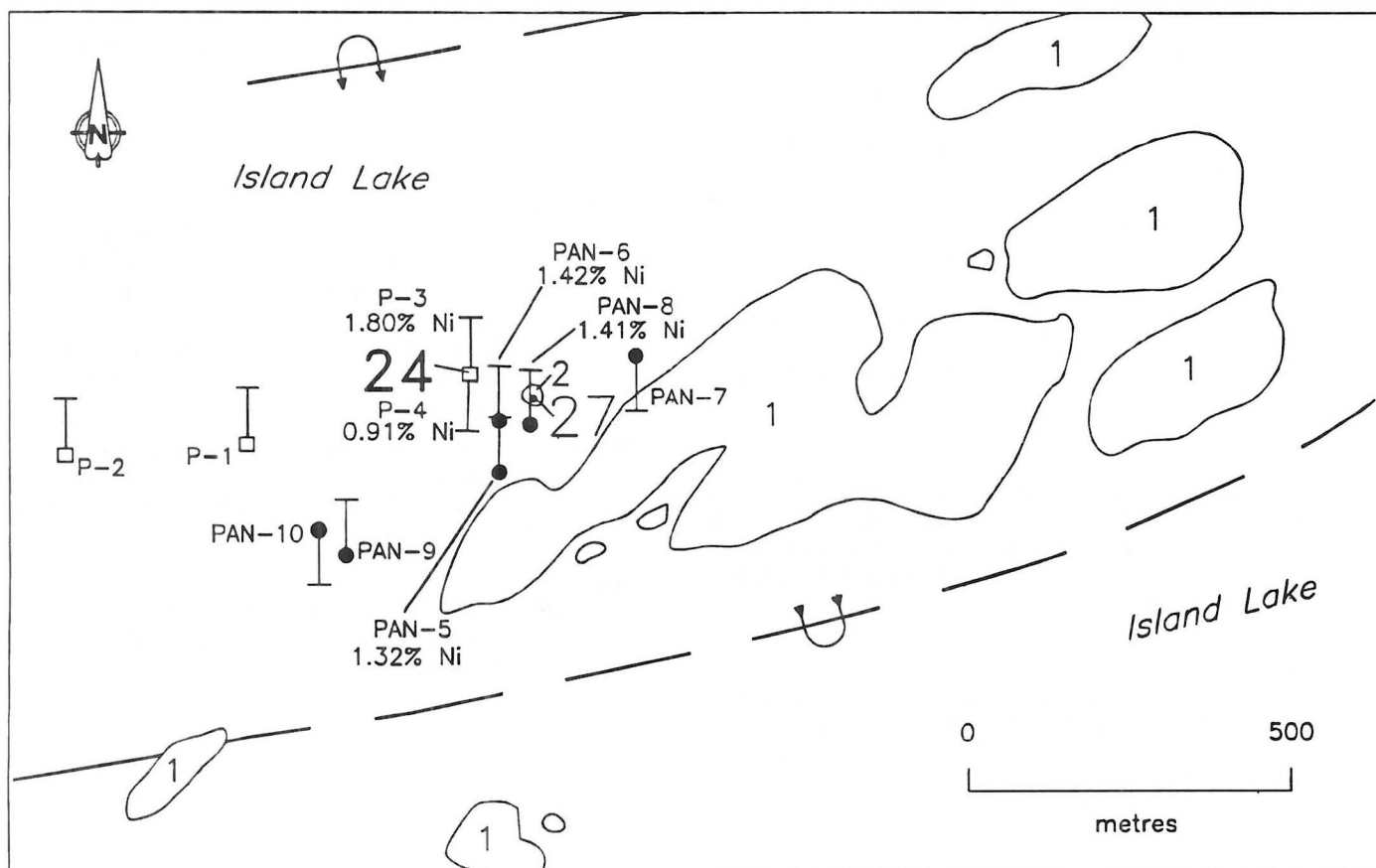
1985: Stratigraphic setting of selected ultramafic bodies in the Superior and Churchill provinces and certain aspects of nickel-copper deposits in the Thompson Nickel Belt; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER79-2, 71p.

Weber, W., Gilbert, H.P., Neale, K.L. and McGregor, C.R.

1982: Island Lake Project; in Manitoba Mineral Resources Division, Report of Field Activities, 1982, p. 34-43.

Wright, J.F.

1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



53E/16-24

Early Plutonic Rocks

2 Ultramafic intrusive rocks; related subvolcanic or extrusive rocks

Hayes River Group

1 Mafic to intermediate volcanic rocks; related intrusive rocks

Anticline (overturned)

Syncline (overturned)

□ Drillhole, Cominco Limited (A.F. 92233)

● Drillhole, Cominco Limited (A.F. 92288)

24 Occurrence location

Figure 55: Geological setting of occurrence 24. Geology compiled from Godard, (1963b) and Gilbert (1985).

LOCATION: 25

NAME:

UTM: 5965317N/427487E

ACCESS: Via boat or float plane

AREA: Eastern Island Lake; north of Loonfoot Island (Fig. 2)

AIRPHOTO: A23506-233

#### EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). The area of the occurrence was first staked in 1958 and assigned to the Canadian Nickel Company Limited. An AEM and MAG survey conducted in that year disclosed an elongated anomaly assumed to be caused by a peridotite (Mineral Inventory Card 53E/16 Ni1). Canadian Aero Mineral Surveys Limited carried out an airborne EM and MAG survey over the area on behalf of Kerr Addison Mines Limited in 1965 (A.F. 91144). The area was then staked as the Pan group of claims in 1970 and assigned to Cominco Limited. Sherritt Gordon Mines Limited conducted in 1970 an airborne EM and MAG survey over the area under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). Cominco Limited conducted a VLF-EM and MAG survey in 1972 (A.F. 92324).

#### GEOLOGICAL SETTING:

The area of the occurrence is underlain by mafic volcanic rocks of the Hayes River Group (Wright, 1928), and by mafic intrusive rocks and ultramafic intrusive and related extrusive rocks of the group of Early Intrusive Rocks (Weber *et al.*, 1982) (Fig. 56).

#### MINERALIZATION:

This occurrence is a several metres long rusty zone in a sericite-chlorite-quartz schist. Sheared aphyric basalt (Gilbert, 1985a), contains pockets, layers and disseminations of pyrite, pyrrhotite, chalcopyrite and trace malachite (P. Theyer 1990, unpublished data).

#### GEOCHEMICAL DATA:

A grab sample of the well mineralized portion of the shear zone assayed trace Au, 4 ppm Ag, 3.5% Cu, 0.02% Ni, 67 ppm Zn, <2 ppm Pb and 14 ppm Mo (H.P. Gilbert, 1985, unpublished data).

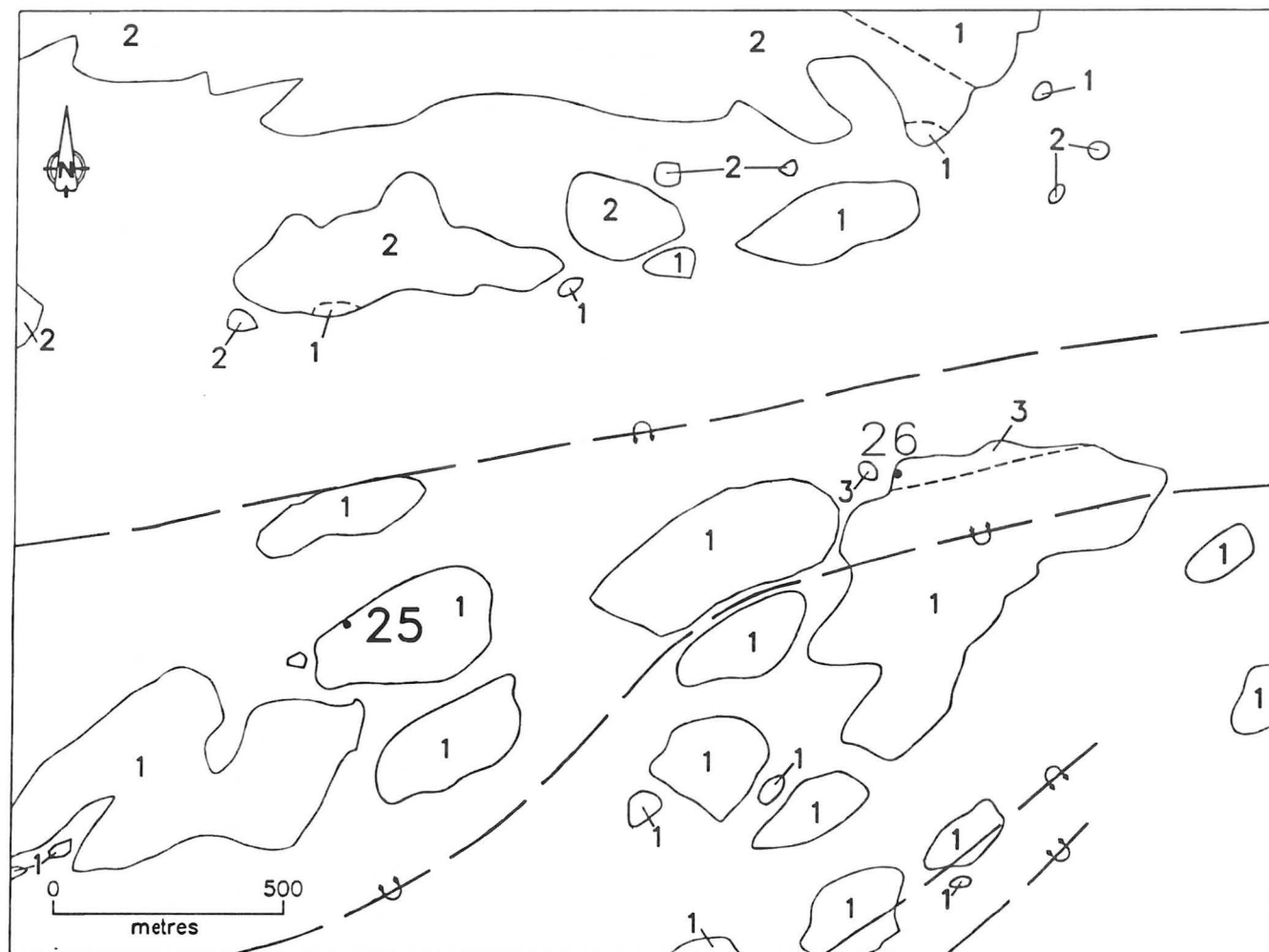
#### CLASSIFICATION:

Disseminated mineralization - not classified.

#### REFERENCES:

- Assessment Files 91144, 91624, 91684, 91694, 92324  
Manitoba Energy and Mines, Mines Branch.
- Gilbert, H.P.  
1985: Loonfoot Island; Manitoba Energy and Mines, Preliminary Map 1985 I-3, 1:20 000 scale.
- Godard, J.D.  
1963: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.
- Mineral Inventory Card 53E/16 Ni1  
Manitoba Energy and Mines, Geological Services Branch.
- Theyer, P.  
1977: Evaluation of nickel environments; in Manitoba Mines, Resources and Environmental Management, Mineral Resources Division, Report of Field Activities, 1977, p. 116-121.  
1985: Ultramafic rocks of the Island Lake area; Manitoba Energy and Mines, Geological Paper 84-1, 29p.
- Weber, W., Gilbert, H.P., Neale, K.L. and McGregor, C.R.  
1982: Island Lake Project; in Manitoba Mineral Resources Division Report of Field Activities, 1982, p. 34-43.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.





Island Lake Group  
 3 Polymictic conglomerate  
 Early Intrusive Rocks  
 2 Mafic intrusive rocks  
 Hayes River Group  
 1 Mafic volcanic flows and  
 related intrusive rocks

--- Geological contact (approximate)  
 ⌒ Anticline (overturned)  
 ⌒ Syncline (overturned)

• 25 Occurrence location

Figure 56: Geological setting of occurrence 25. Geology compiled from Godard, (1963) and Gilbert (1985).

LOCATION: 26

NAME:

UTM: 5965588N/428679E

ACCESS: Via boat or float plane

AREA: Eastern Island Lake; north of Loonfoot Island (Fig. 2)

AIRPHOTO: A23506-233

EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). The area of the occurrence was first staked in 1958 and assigned to the Canadian Nickel Company Limited. An AEM and MAG survey conducted in that year, disclosed an elongated anomaly assumed to be caused by a peridotite (Mineral Inventory Card 53E/16 Ni1). Canadian Aero Mineral Surveys Limited carried out an airborne EM and MAG survey over the area on behalf of Kerr Addison Mines Limited in 1965 (A.F. 91144). The area was then staked as the Pan group of claims and assigned to Cominco Limited in 1970. Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area under Airborne Permit 91 in 1970 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). Cominco Limited conducted a VLF-EM and MAG survey in 1972 (A.F. 92324); Staff of Manitoba Energy and Mines investigated the area (Theyer, 1977) and reported on the geology (Gilbert, 1985).

GEOLOGICAL SETTING:

According to Gilbert (1985) the area of the occurrence is underlain by polymictic pebble conglomerate of the Island Lake Series (Wright, 1928) (Fig. 57).

MINERALIZATION:

A rusty stain is exposed on a north-facing fracture plane. Oxidizing traces of pyrite on the fracture surface cause the rusty stain.

GEOCHEMICAL DATA:

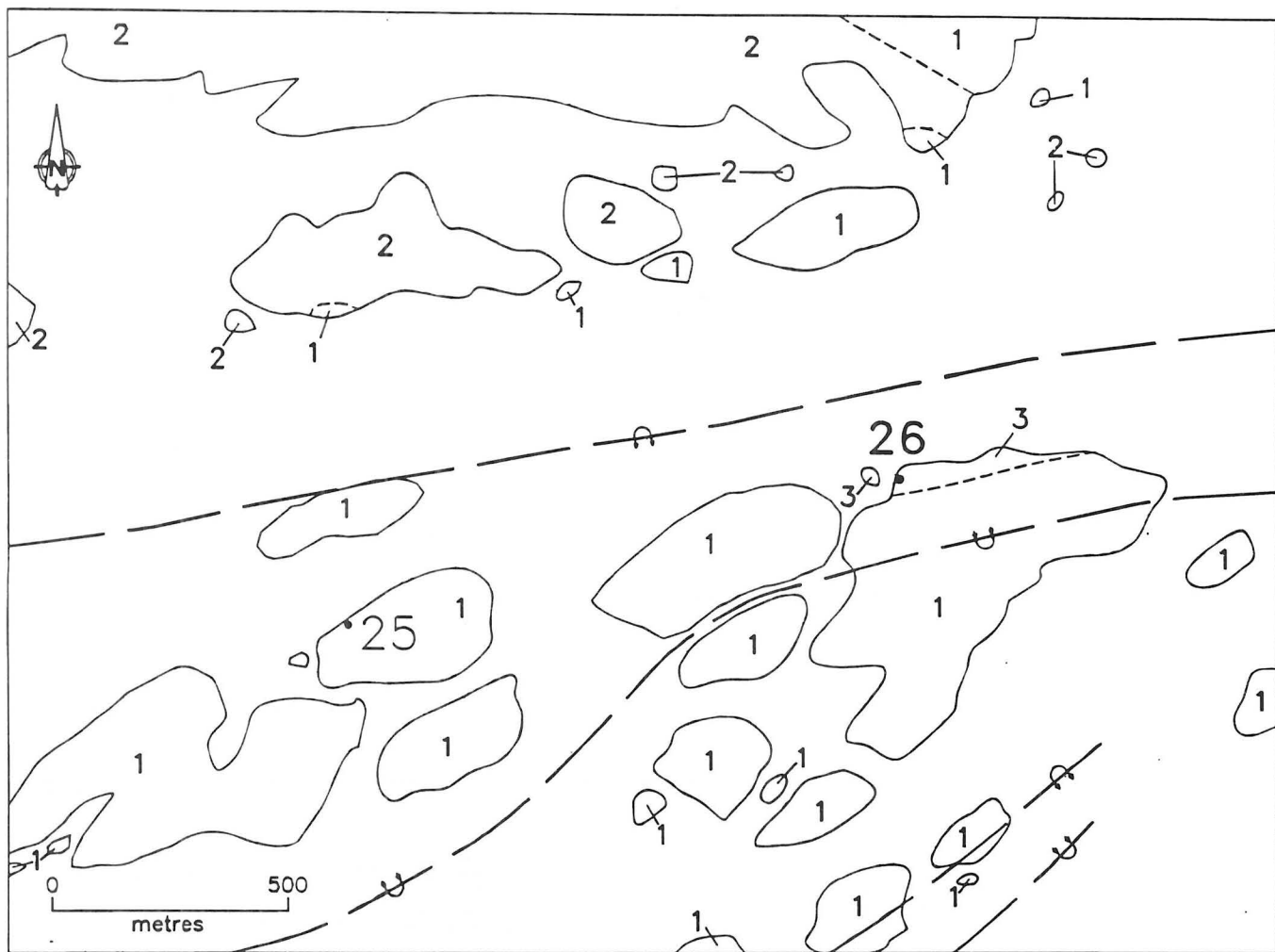
None.

CLASSIFICATION:

Disseminated mineralization - not classified

REFERENCES:

- Assessment Files 91144, 91624, 91684, 91694, 92324  
Manitoba Energy and Mines, Mines Branch.
- Gilbert, H.P.  
1985: Loonfoot Island, Manitoba Department of Energy and Mines, Preliminary Map 1985 I-3, 1:20 000.
- Godard, J.D.  
1963: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.
- Mineral Inventory Card 53E/16 Ni1  
Manitoba Energy and Mines, Geological Services Branch.
- Theyer, P.  
1977: Evaluation of nickel environments; in Manitoba Mines, Resources and Environmental Management, Mineral Resources Division, Report of Field Activities, 1977, p. 116-121.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



53E/16-26

Island Lake Group

3 Polymictic conglomerate

Early Intrusive Rocks

2 Mafic intrusive rocks

Hayes River Group

1 Mafic volcanic flows and  
related intrusive rocks

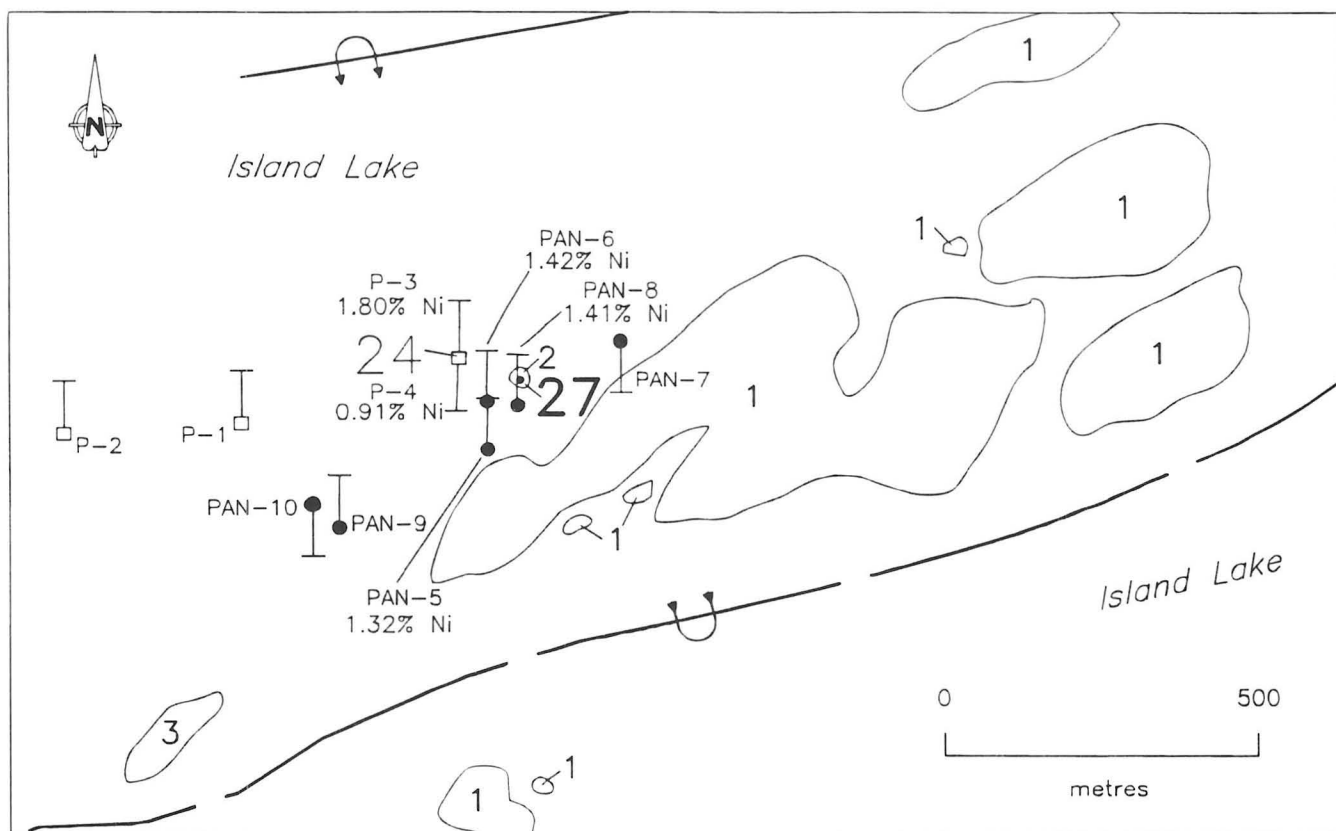
--- Geological contact (approximate)

⌒ Anticline (overturned)

⌒ Syncline (overturned)

• 26 Occurrence location

Figure 57: Geological setting of occurrence 26. Geology compiled from Godard, (1963) and Gilbert, (1985).



53E/16-27

Island Lake Group

3 Polymictic conglomerate

Early Plutonic Rocks

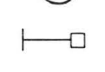
2 Ultramafic intrusive rocks; related subvolcanic or extrusive rocks


Hayes River Group

1 Mafic to intermediate volcanic rocks; related intrusive rocks

 Anticline (overturned)

 Syncline (overturned)

 Drillhole, Cominco Limited (A.F. 92233)

 Drillhole, Cominco Limited (A.F. 92288)

**•27** Occurrence location

Figure 58: Geological setting of occurrence 27. Geology compiled from Godard (1963) and Gilbert (1985a).

LOCATION: 27

NAME:

UTM: 5964929N/426603E

ACCESS: Via boat or float plane

AREA: Eastern Island Lake; north of Loonfoot Island (Fig. 2)

AIRPHOTO: A23506-191

EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). The area of the occurrence was first staked in 1958 and assigned to the Canadian Nickel Company Limited. An AEM and MAG survey conducted in that year, disclosed an elongated anomaly assumed to be caused by a peridotite (Mineral Inventory Card 53E/16 Ni 1). Qinn (1960) noted the presence of cobalt in a sample collected from an island underlain by pyrite-bearing ultramafic rocks. Godard (1963) assigned the designation "Locality No. 4" to this pyrite mineralization (Fig. 58) Canadian Aero Mineral Surveys Limited carried out an airborne EM and MAG survey over the area on behalf of Kerr Addison Mines Limited in 1965 (A.F. 91144). The area was then staked as the Pan group of claims in 1970 and assigned to Cominco Limited. Sherritt Gordon Mines Limited conducted in 1970 an airborne EM and MAG survey over the area under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). Cominco Limited conducted a VLF-EM and MAG survey in 1972 (A.F. 92324); drilled four holes in 1972 and six holes in 1974 to test I.P. anomalies in the vicinity of this island (I.P. survey results are not on record) (A.F. 92288). (Results of this drill program are reported under 53E/16, Location 24) Staff of Manitoba Energy and Mines investigated the area (Theyer, 1977), reported on the geology (Gilbert, 1985) and on the petrography of the ultramafic rocks (Theyer, 1985).

GEOLOGICAL SETTING:

The area of the occurrence is underlain by ultramafic intrusive and related subvolcanic and extrusive rocks (Weber *et al.*, 1982) (Fig. 58).

Mafic volcanic rocks were intersected in holes drilled in the vicinity by Cominco Limited. in 1974. (See 53E/16 Location 24, this report)

MINERALIZATION:

Mineralization consists generally of trace to 2% pyrite and pyrrhotite. Pentlandite and millerite were, in places, tentatively identified (A.F. 92233; 92288). Quinn and Meinert (1959) state that "the principal metallic mineral is pyrite" in the ultramafic rock, and that "irregularly distributed in certain areas of the pyrite are chalcopyrite and millerite". Theyer (1977) described up to 10% disseminated sulphide in the ultramafic rock; in order of decreasing abundance the mineralogy is pyrite, pyrrhotite, chalcopyrite and locally, pentlandite exsolutions in pyrrhotite.

Traces of pyrite and pyrrhotite occur on fracture planes (P. Theyer, 1990, unpublished data).

GEOCHEMICAL DATA:

A peridotite sample collected by Quinn (1960) assayed 0.72% Ni and 0.02% Co.

A grab sample assayed trace Au, 1 ppm Ag, 0.06% Cu, 35 ppm Ni, 86 ppm Zn, 7 ppm Pb and 18 ppm Mo (P. Theyer, 1990, unpublished data).

CLASSIFICATION:

Magmatogenic type deposit associated with mafic/ultramafic rocks - disseminated.

REFERENCES:

- Assessment Files 91144, 91624, 91684, 91694, 92288, 92324  
Manitoba Energy and Mines, Mines Branch.
- Gilbert, H.P.  
1985a: Loonfoot Island; Manitoba Energy and Mines, Preliminary Map 1985 I-3, 1:20 000 scale.  
1985b: Geological investigations in the Island Lake-Stevenson Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 187-199.
- Godard, J. D.  
1963: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.
- Mineral Inventory Card 53E/16 Ni1  
Manitoba Energy and Mines, Geological Services Branch.
- Quinn, H.A.  
1960: Geology, Island Lake, Manitoba-Ontario; Geological Survey of Canada, Preliminary Series Map 26-1960, 1:253 440.
- Quinn, H.A. and Meinert, R.J.  
1959: The Island Lake Series, Island Lake, Manitoba; Precambrian, v. 52, no. 4, p. 15-25.
- Theyer, P.  
1977: Evaluation of nickel environments; in Manitoba Mines, Resources and Environmental Management, Mineral Resources Division, Report of Field Activities, 1977, p. 116-121.  
1985: Ultramafic rocks of the Island Lake area; Manitoba Energy and Mines, Geological Paper 84-1, 29p.
- Weber, W., Gilbert, H.P., Neale, K.L. and McGregor, C.R.  
1982: Island Lake Project; in Manitoba Mineral Resources Division Report of Field Activities, 1982, p. 34-43.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.

LOCATION: 28

NAME:

UTM: 5956337N/430074E

ACCESS: Via boat or float plane

AREA: Eastern Island Lake (Fig. 2)

AIRPHOTO: A23506-143

EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Canadian Aero Mineral Surveys Limited carried out an airborne EM and MAG survey over the area on behalf of Kerr Addison Mines Limited in 1965 (A.F. 91144). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area in 1970 under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). In 1981, BP Minerals Limited conducted geological reconnaissance and staking A.F. 93230).

GEOLOGICAL SETTING:

The area of the occurrence is underlain by intermediate volcanic rocks of the Hayes River Group (Wright, 1928) (Fig. 59). An approximately 10 cm thick east-striking quartz vein is exposed on the southeastern shore of Bluff Island.

MINERALIZATION:

Trace disseminated pyrite occurs in the host rock in the vicinity of the quartz vein.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 91144, 91624, 91684, 91694, 93230

Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P.

1985: Loonfoot Island, Manitoba Department of Energy and Mines, Preliminary Map 1985 I-3, 1:20 000.

Godard, J.D.

1963: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.

Wright, J.F.

1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.

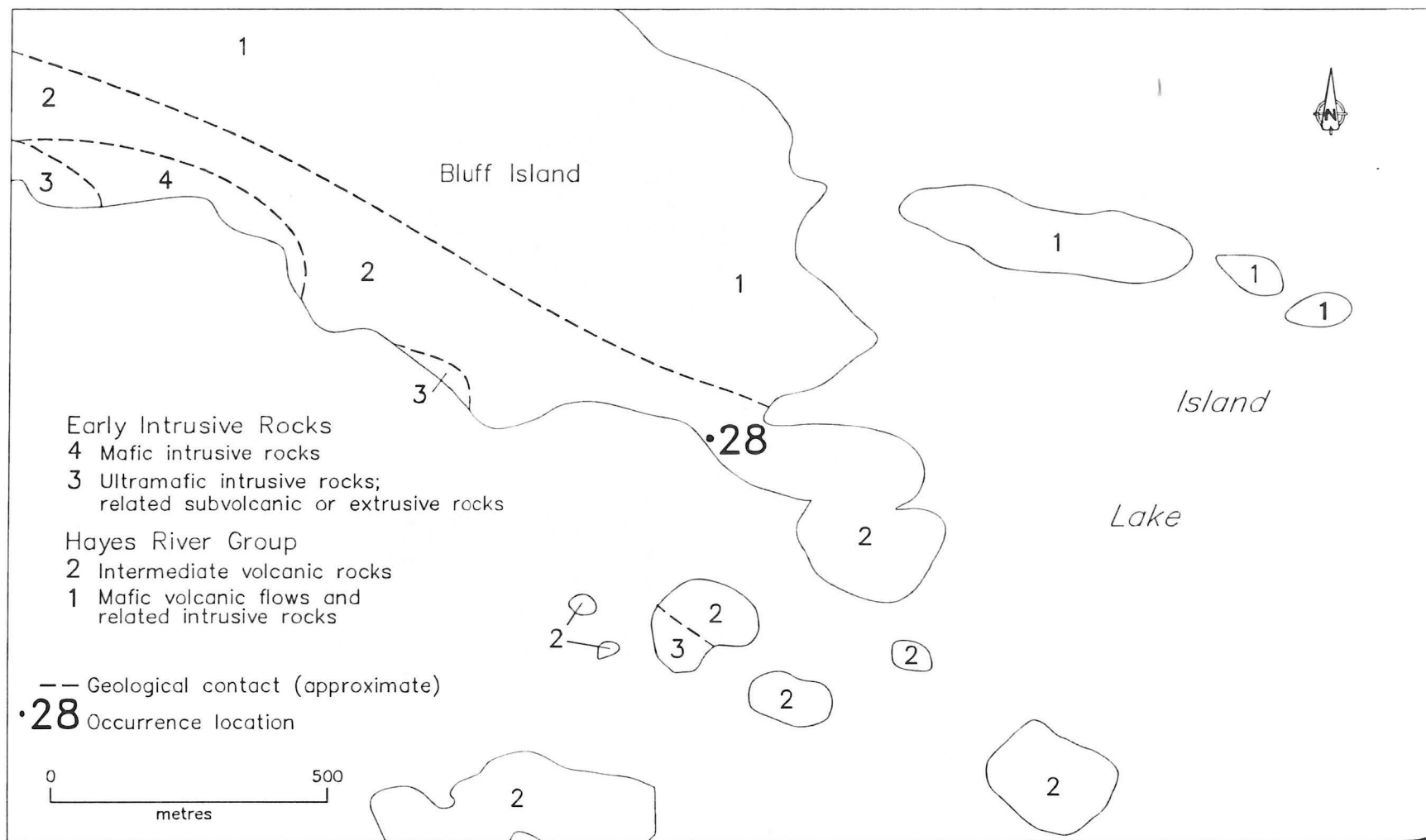


Figure 59: Geological setting of occurrence 28. Geology compiled from Godard, (1963) and Gilbert (1985).

LOCATION: 29

NAME: (A.F.-Mineralization intersected by diamond drilling)  
UTM: 5956448N/432161E  
ACCESS: Via boat or float plane  
AREA: Eastern Island Lake; north of Bluff Island (Fig. 2).  
AIRPHOTO: A23506-187

EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Canadian Aero Mineral Surveys Limited carried out an airborne EM and MAG survey over the area on behalf of Kerr Addison Mines Limited in 1965 (A.F. 91144). Kerr Addison Mines Limited drilled a hole (20.5 m) to test an EM and MAG anomaly (A.F. 91402) The Rita group of claims was first staked in 1970 and assigned to Cominco Limited.

Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area in 1970 under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). Cominco Limited conducted a VLF-EM and MAG survey in the area in 1972 (A.F. 92324); and drilled two holes (338 m) in 1974 (A.F. 92288).

GEOLOGICAL SETTING:

The islands in the area of the occurrence are underlain by mafic intrusive and ultramafic intrusive and related extrusive rocks of the group of Early Intrusive Rocks, (Weber *et al.*, 1982) (Fig. 60) and by mafic volcanic rocks of the Hayes River Group (Wright, 1928). Theyer (1980a) geologically mapped the area. DDH Rita 1 intersected dark coloured, graphitic, mafic volcanic rocks and 96 m of ultramafic rocks. DDH Rita 2 intersected mafic volcanic rocks and 46 m of ultramafic rocks (A.F. 92288). Kerr Addison Mines Limited DDH 6 intersected graphitic tuff and quartzite (A.F. 91402).

MINERALIZATION:

DDH Rita 1 intersected minor disseminated sulphides. DDH Rita 2 intersected bands, patches and disseminations of "minor to very minor" pyrite, pyrrhotite and magnetite (A.F. 92288).

Kerr Addison Mines Limited DDH 6 intersected up to 0.6 m thick layers of near solid pyrite (A.F. 91402).

GEOCHEMICAL DATA:

Kerr Addison Mines Limited DDH 6 intersected a 0.5 m thick quartz vein containing 0.7 g/t Au.

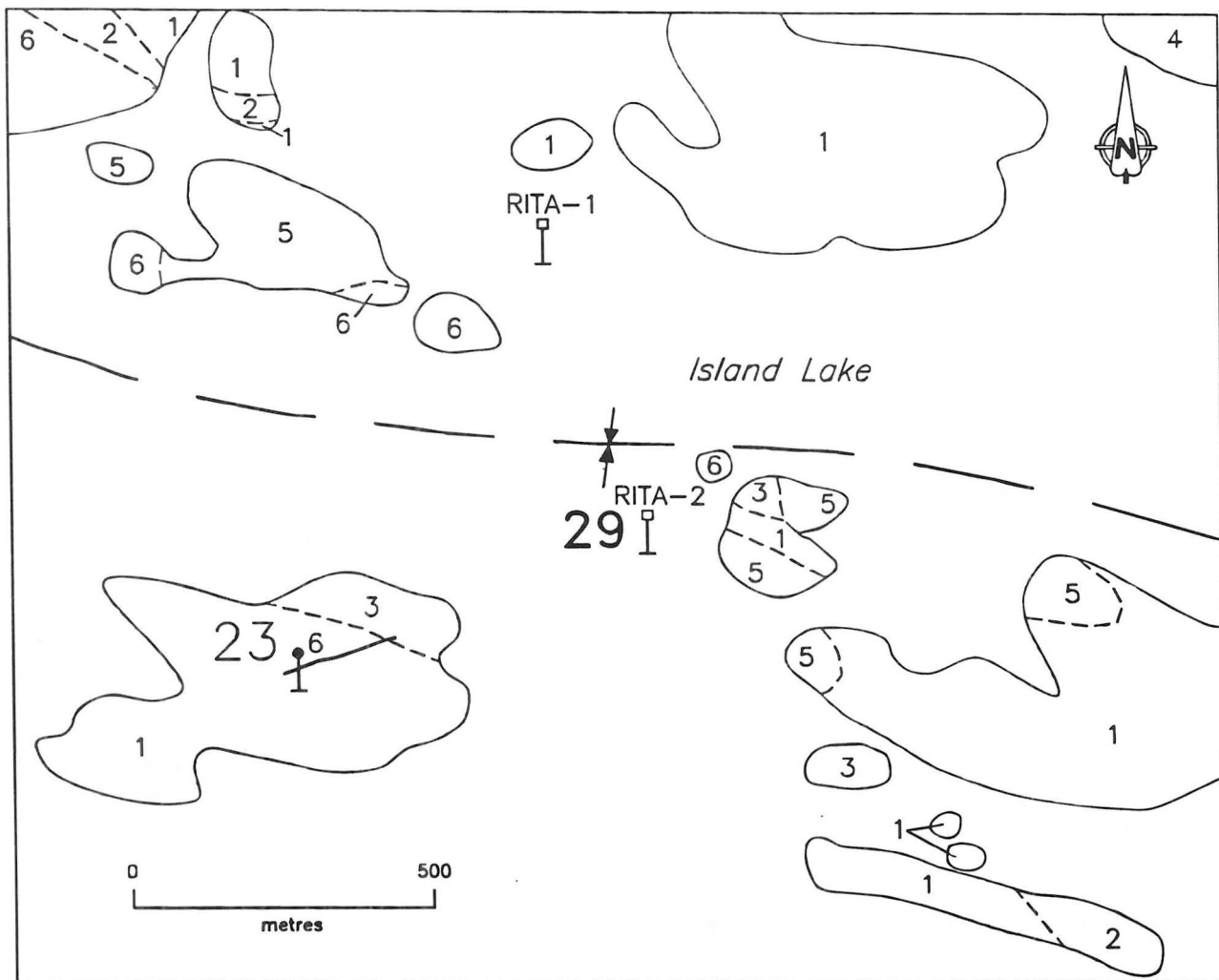
CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

- Assessment Files 91144, 91402, 91624, 91684, 91694, 92288, 92324  
Manitoba Energy and Mines, Mines Branch.
- Gilbert, H.P.  
1985: Loonfoot Island; Manitoba Energy and Mines, Preliminary Map 1985 I-3, 1:20 000 scale.
- Godard, J.D.  
1963a: Geology of the Island Lake-York Lake area; Manitoba Mines and Natural Resources, Mines Branch, Publication 59-3, 45p.  
1963b: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.
- Theyer, P.  
1980a: Stratigraphic setting of selected ultramafic bodies in the Superior and Churchill provinces and certain aspects of nickel-copper deposits in the Thompson Nickel Belt; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER79-2, 71p.  
1980b: Ultramafic rocks, nickel occurrences and interpreted stratigraphic relationships; Manitoba Energy and Mines, Mineral Resources Division, Map ER79-2-1 to ER79-2-13, 1:50 000.
- Weber, W., Gilbert, H.P., Neale, K.L. and McGregor, C.R.  
1982: Island Lake Project; in Manitoba Mineral Resources Division, Report of Field Activities, 1982, p. 34-43.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.





53E/16-29

#### Early Intrusive Rocks

6 Mafic intrusive rocks

5 Ultramafic rocks

4 Tonalite, granodiorite

#### Hayes River Group

3 Greywacke, siltstone, argillite

2 Felsic to intermediate volcanic rocks

1 Mafic to intermediate volcanic rocks;  
related intrusive rocks

--- Geological contact (approximate)

— EM conductor, Kerr Addison Mines  
Limited (A.F. 91160)

↓ Syncline

—● Drillhole, Kerr Addison Mines  
Limited (A.F. 91402)

—□ Drillhole, Cominco Limited  
(A.F. 92288)

**29** Occurrence location

Figure 60: Geological setting of occurrence 29. Geology compiled from Godard, (1963b), Theyer (1980) and Gilbert, (1985).

LOCATION: 30

NAME:

UTM: 5960858N/408383E

ACCESS: Via boat or float plane

AREA: Central Island Lake (Fig. 2)

AIRPHOTO: A23535-103

#### EXPLORATION SUMMARY:

A complete review of the exploration history is given in Mineral Inventory Card 53E/16 Pyr1. Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). The Phelps Dodge Corporation drilled three holes (66.6 m) in 1960 (A.F. 91157). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area in 1970 under Airborne Permit 91 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the Island Lake area in 1972 under Airborne Permit 102 (A.F. 91694). Gilbert (1985), geologically mapped (1:20 000 scale) and reported sulphides in the area.

#### GEOLOGICAL SETTING:

The area of the occurrence is underlain by greywacke, interbedded with siltstone and argillite (Fig. 61). These rocks belong to the Hayes River Group (Wright, 1928).

Mafic intrusive rocks of the group of Early Intrusive rocks (Weber *et al.*, 1982), occur to the north.

DDH ILA 1 intersected 24 m of light grey tuff. DDH ILA 2 intersected 1 m of light grey tuff (hole abandoned). DDH ILA 3 intersected 36 m felsic and sericitic tuff (A.F. 91157).

#### MINERALIZATION:

DDH ILA 1 intersected 9.7 m of massive tuff mineralized with up to 15% pyrrhotite. DDH ILA 3 intersected 4 m of sericitized tuff mineralized with up to 12% pyrrhotite (A.F. 91157).

#### GEOCHEMICAL DATA:

None.

#### CLASSIFICATION:

Disseminated mineralization - not classified.

#### REFERENCES:

Assessment Files 91157, 91624, 91684, 91694

Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P.

1985: Meegeesiwaseeson Island; Manitoba Energy and Mines, Preliminary Map 1985 I-4, 1:20 000.

Godard, J.D.

1963: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.

Mineral Inventory Card 53E/16 Pyr1

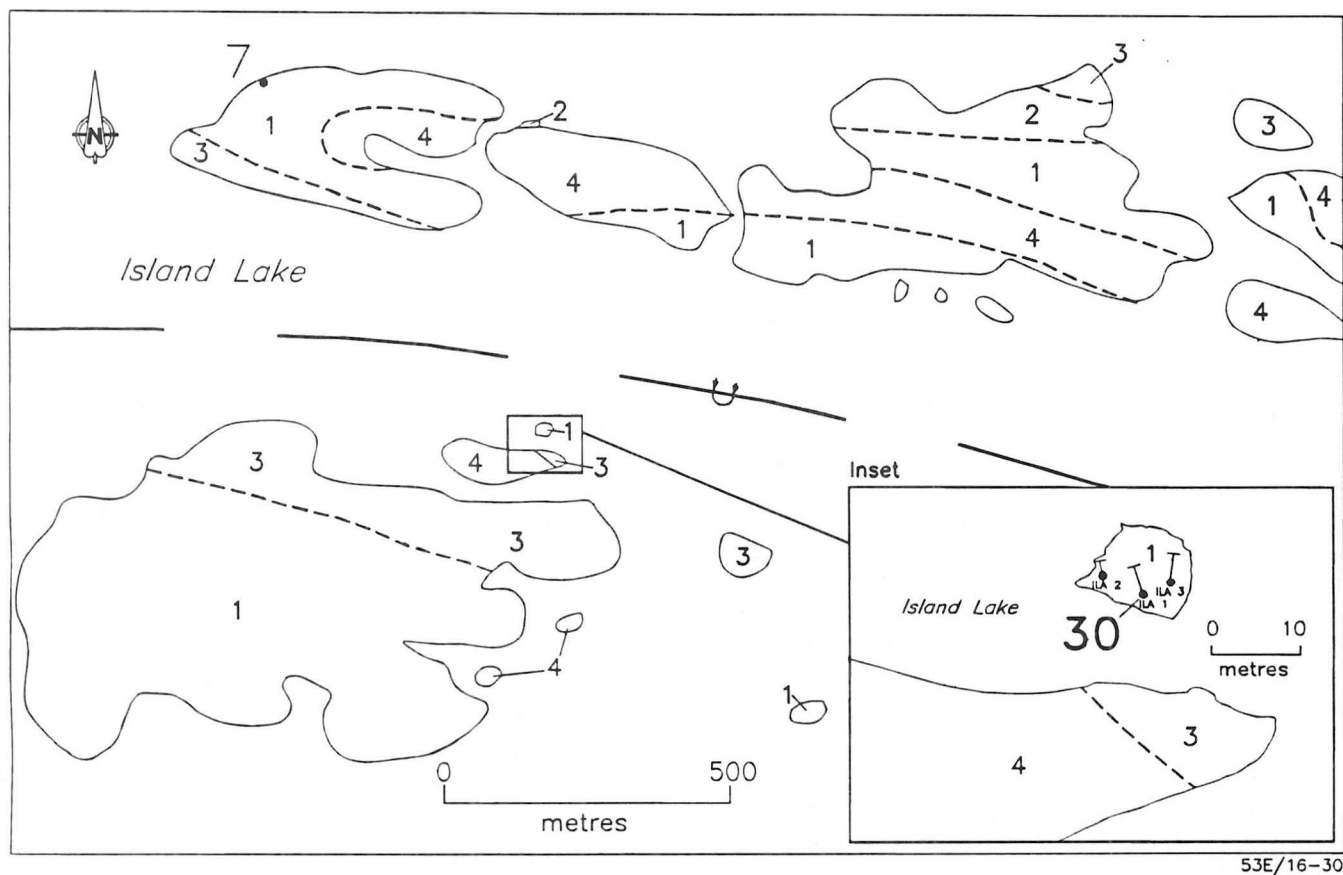
Manitoba Energy and Mines, Geological Services Branch.

Weber, W., Gilbert, H.P., Neale, K.L. and McGregor, C.R.

1982: Island Lake Project; in Manitoba Mineral Resources Division Report of Field Activities, 1982, p. 34-43.

Wright, J.F.

1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



53E/16-30

Early Intrusive Rocks

4 Mafic intrusive rocks

Hayes River Group

3 Greywacke, siltstone, argillite

2 Felsic to intermediate volcanic rocks

1 Mafic to intermediate volcanic rocks

--- Geological contact (approximate)

⌋ Anticline (overturned)

● Drillhole, Phelps Dodge Corporation  
(A.F. 91157)

**30** Occurrence location

Figure 61: Geological setting of occurrence 30. Geology compiled from Godard (1963) and Gilbert (1985).

LOCATION: 31

NAME: Pickerel Narrows

UTM: 5969015N/410895E

ACCESS: Via boat or float plane

AREA: North-central Island Lake (Fig. 2)

AIRPHOTO: A23535-61

#### EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area in 1970 under Airborne Permit 91 (A.F. 91684). Barringer Research Limited conducted in 1969 a geochemical survey over the Western Canadian Shield. A sample collected from the northern shoreline of Irving Lake, that contained anomalous concentrations of Cu Mo and Ni motivated Barringer Research Limited to conduct detailed geochemical sampling that defined a "persistent geochemical anomaly" (A.F. 91786). A multisensor reconnaissance (1 mile flightline spacing) followed by a detailed (1/8 mile flightline spacing) helicopter-borne MAG, EM, and Hg-detection survey (Airtrace) was conducted over the Irving Lake East area in 1970 (A.F. 92234 and 92235). These surveys were followed up by a ground geophysical survey (HLEM and MAG) in 1971 and by geological mapping (1:15 840 scale) south and west of Irving Lake, and in the Pickerel Narrows area (A.F. 92234). Two geophysical conductors identified in the Pickerel Narrows area were tested with five drillholes (A.F. 92234). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694).

#### GEOLOGICAL SETTING:

The area of the occurrence is underlain by mafic to intermediate volcanic rocks of the Hayes River Group (Wright, 1928) (Fig. 62).

DDH IL-W-1 (59 m) intersected massive and banded andesitic tuff. DDH IL-W-2 (31 m) intersected andesite and a 3 m thick layer of graphitic argillite. DDH IL-W-4 (67 m) intersected quartz-feldspar porphyry, schist, a 3 m thick, siliceous pyrite-bearing zone, and andesite. DDH IL-W-5 (41 m) intersected mafic volcanic rocks (A.F. 92234).

#### MINERALIZATION:

DDH IL-W-2 intersected up to 5% pyrite, pyrrhotite and scattered tiny specks of chalcopyrite in a 3 m thick section of graphitic argillite.

DDH IL-W-4 intersected up to 30% pyrite, pyrrhotite and chalcopyrite blebs in a 3 m thick felsic rock section (A.F. 92234).

#### GEOCHEMICAL DATA:

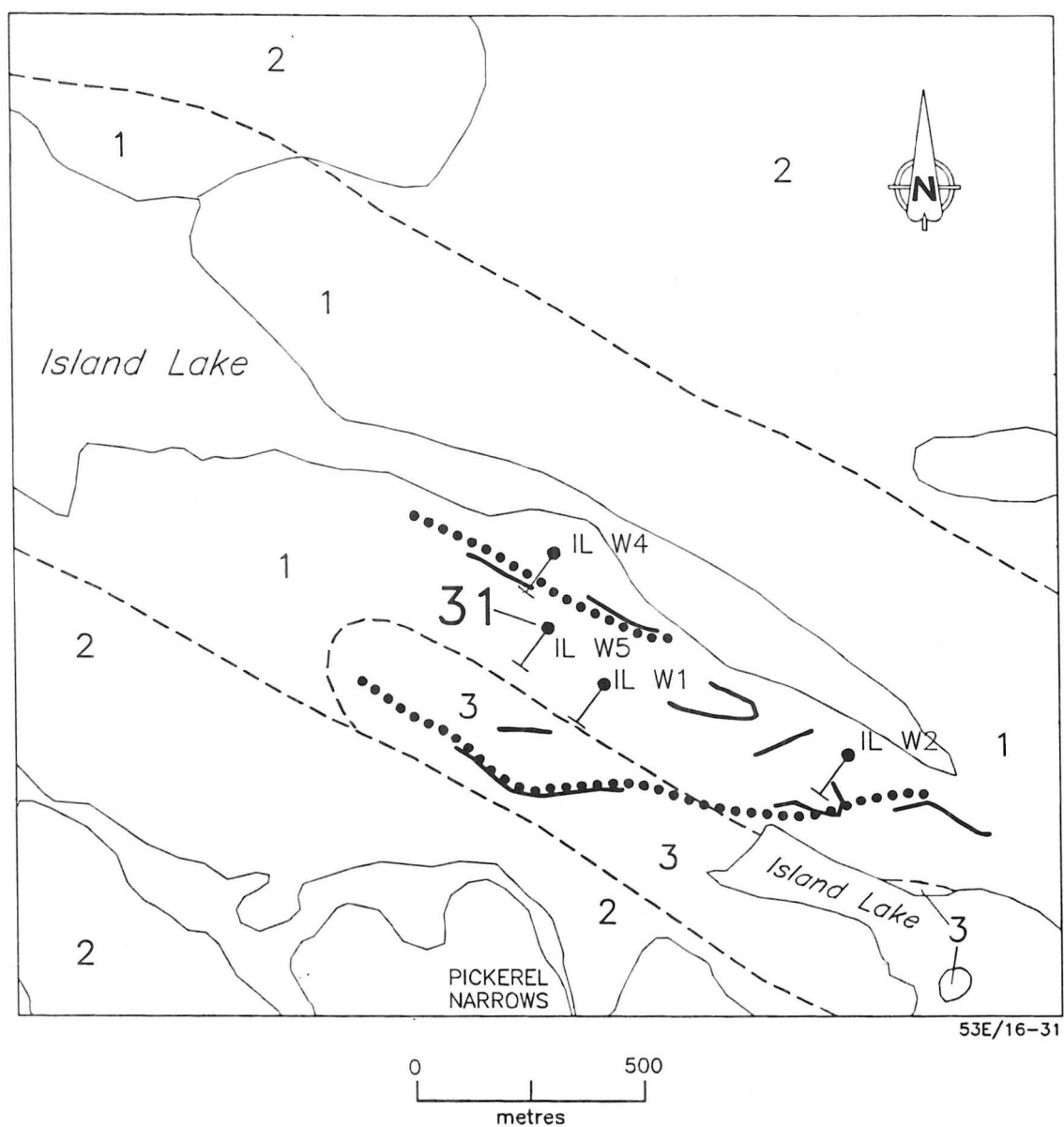
None.

#### CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

#### REFERENCES:

- Assessment Files 91624, 91684, 91694, 91786, 92234, 92235  
Manitoba Energy and Mines, Mines Branch.
- Gilbert, H.P.  
1985: Meegeesiwaseeson Island; Manitoba Energy and Mines, Preliminary Map 1985 I-4, 1:20 000.
- Godard, J.D.  
1963: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



Early Intrusive Rocks  
 3 Mafic intrusive rocks  
 2 Tonalite, granodiorite  
 Hayes River Group  
 1 Mafic to intermediate  
 volcanic rocks

----- Geological contact (approximate)  
 ——— EM conductor, R.D.P. Joint Venture  
 (A.F. 92235)  
 ..... Conductive layer with stringery  
 pyrite in graphitic argillite  
 —● Drillhole, R.D.P. Joint Venture  
 (A.F. 92234)  
 31 Occurrence location

Figure 62: Geological setting of occurrence 31. Geology compiled from A.F. 92234, Godard (1963) and Gilbert (1985).

LOCATION: 32

NAME: IXL Group

UTM: 5959427N/423720E

ACCESS: Via boat or float plane

AREA: Southeastern Island Lake (Fig. 2)

AIRPHOTO: A23507-49

#### EXPLORATION SUMMARY:

A comprehensive review of the exploration history is given in Mineral Inventory Card 53E/16 Au2. The Vulcan Syndicate drilled three holes (400 m) in 1946, to test the gold potential of the area north and south of Heart Island (A.F. 91159). The location of a gold occurrence on the IXL group of claims is illustrated on a map by Hollinger Consolidated submitted in 1948 (A.F. 91162).

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Godard (1963a) designated a pyrite-bearing quartz vein and stringers on Heart Island as (mineralized) Locality 14 on map 59-3 and mentioned that six drillholes (945 m) had been drilled at this occurrence, but no significant results had been reported. Canadian Aero Mineral Surveys Limited carried out an airborne EM and MAG survey over the area on behalf of Kerr Addison Mines Limited in 1965 (A.F. 91652 report; A.F. 91144 map). Sherritt Gordon Mines Limited conducted an airborne EM and MAG survey over the area in 1970 under Airborne Permit 91 (A.F. 91684). The International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). Staff of Manitoba Energy and Mines, mapped the geology (Gilbert, 1985) and during mineral investigations located a small pit at the southern shore of Heart Island (P. Theyer, 1990, unpublished field notes) (Fig. 63).

#### GEOLOGICAL SETTING:

The area of the occurrence is underlain by mafic to intermediate and minor felsic volcanic rocks of the Hayes River Group (Wright, 1928) (Fig. 63). DDH S-6 intersected quartz chlorite and quartz sericite schist. DDH S-7 intersected sericite schist, greywacke and "greenstone". DDH S-8 intersected 101 m of partially silicified greenstone (A.F. 91159).

#### MINERALIZATION:

According to Godard (1963a) quartz stringers and veinlets are well mineralized with pyrite. The author observed traces of pyrite in this area. "Spots with pyrite, pyrrhotite and chalcopyrite" were reported to occur in core from DDH S-8 (A.F. 91159).

#### GEOCHEMICAL DATA:

Table 12

##### Concentrations of gold in drill core samples (A.F. 91159)

| Sample No. | DDH | from  | to (m) | Au (g/t) |
|------------|-----|-------|--------|----------|
| V133       | 6   | 23.5  | 23.9   | tr       |
| V135       | 6   | 40.5  | 40.9   | tr       |
| V134       | 6   | 42.2  | 42.8   | tr       |
| V136       | 7   | 42.4  | 43.5   | tr       |
| V137       | 7   | 79.2  | 79.4   | tr       |
| V138       | 7   | 80.5  | 81.3   | tr       |
| V139       | 7   | 82.4  | 82.6   | tr       |
| V140       | 7   | 83.3  | 84.2   | tr       |
| V141       | 7   | 84.3  | 85.6   | tr       |
| V142       | 7   | 86.0  | 86.3   | tr       |
| V144       | 7   | 123.7 | 125.1  | tr       |
| V145       | 7   | 137.6 | 140.1  | tr       |
| V146       | 7   | 152.4 | 154.1  | tr       |
| V147       | 8   | 37.9  | 41.5   | tr       |

#### CLASSIFICATION:

Vein type deposit - single vein.

#### REFERENCES:

- Assessment Files 91144, 91159, 91162, 91624, 91652, 91684, 91694  
Manitoba Energy and Mines, Mines Branch.
- Gilbert, H.P.  
1985: Loonfoot Island; Manitoba Energy and Mines, Preliminary Map 1985 I-3, 1:20 000 scale.
- Godard, J.D.  
1963a: Geology of the Island Lake-York Lake area; Manitoba Mines and Natural Resources, Mines Branch, Publication 59-3, 45p.  
1963b: York Lake; Manitoba Mines and Natural Resources, Mines Branch, Map 59-3B, 1:63 360.
- Mineral Inventory Card 53E/16 Au2  
Manitoba Energy and Mines, Geological Services Branch.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.

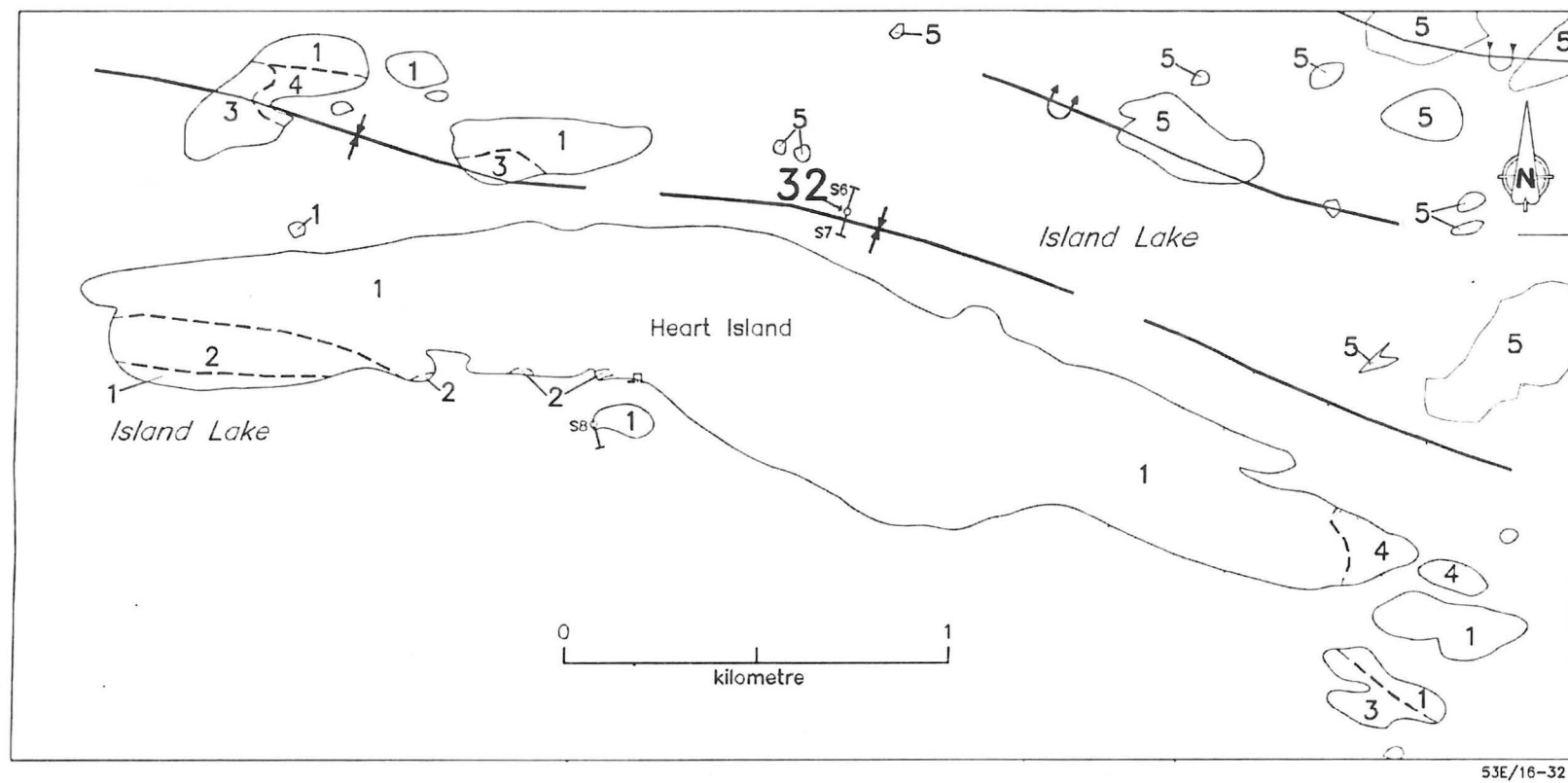


Figure 63: Geological setting of occurrence 32. Geology compiled from Godard (1963b) and Gilbert (1985).





### **Section 3**

## **MINERAL DEPOSITS AND OCCURRENCES IN THE ANGLING LAKE AREA (NTS 53F/13)**



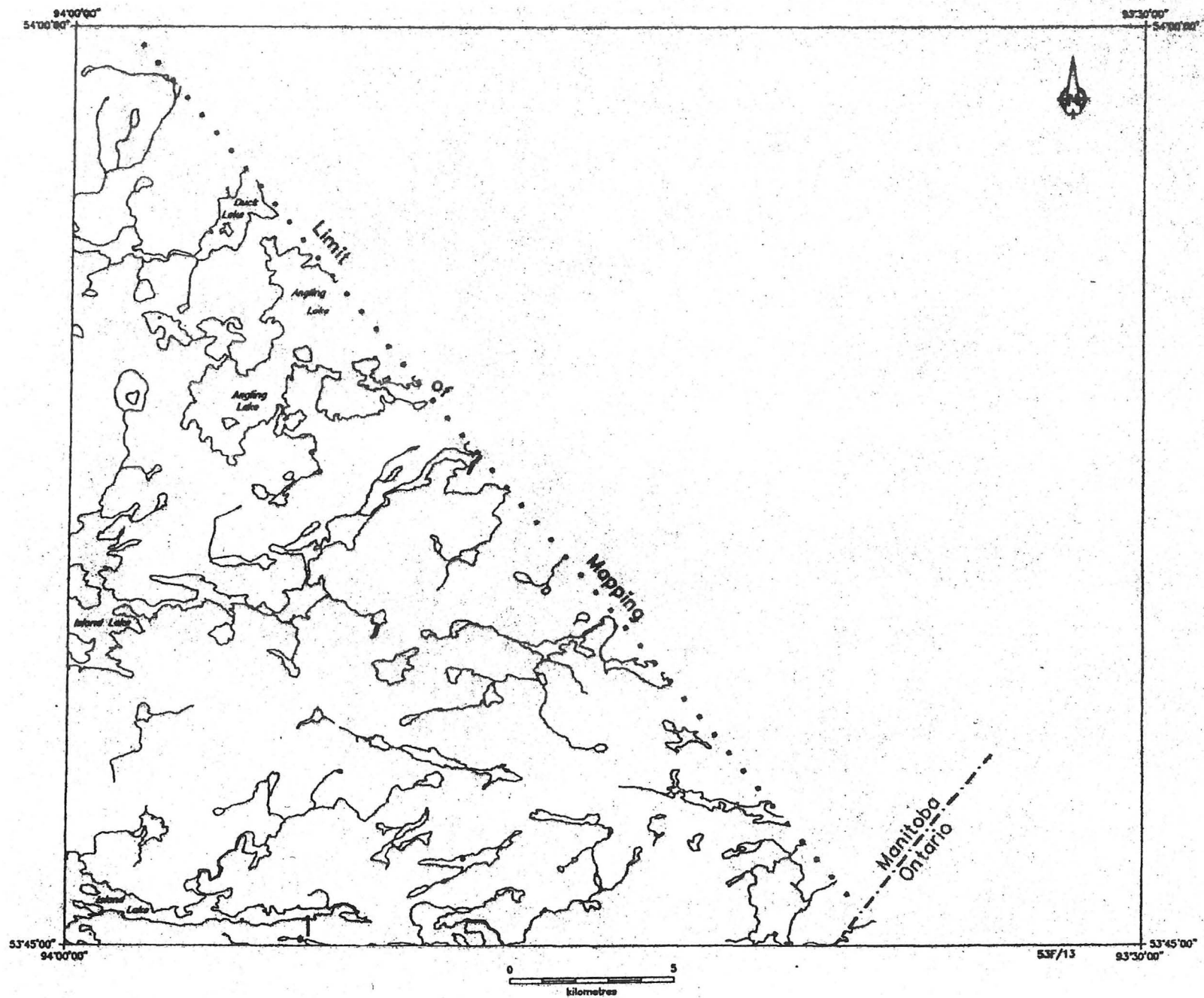
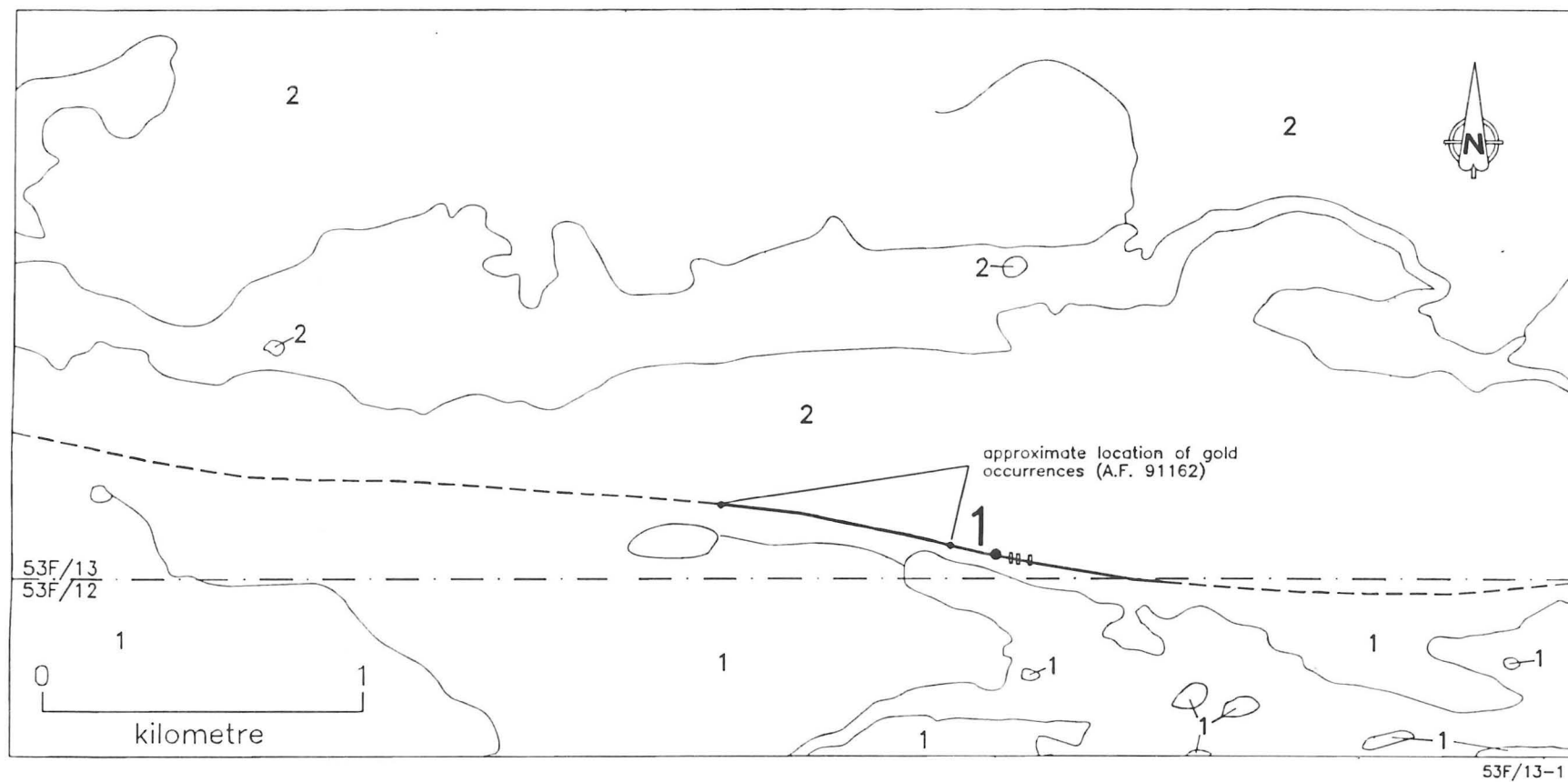


Figure 3: Location of mineral deposits and occurrences Angling Lake area (NTS 53F/13).



Early Intrusive Rocks

2 Tonalite, granodiorite

Hayes River Group

1 Mafic volcanic flows and related intrusive rocks

--- Geological contact (approximate)

— Quartz vein

▣ Pit

• 1 Occurrence location

Figure 64: Geological setting of occurrence 1. Geology compiled from Godard (1963b).

## MINERAL DEPOSITS AND OCCURRENCES IN THE ANGLING LAKE AREA (NTS 53F/13)

LOCATION: 1

NAME: "San Antonio" gold quartz vein

UTM: 5956078N/441576E

ACCESS: Via boat or float plane

AREA: Island Lake east; Sagawitchewan Bay (Fig. 3).

AIRPHOTO: A23067-14

### EXPLORATION SUMMARY:

A comprehensive review of the exploration history is given in Mineral Inventory Card 53F/13 Au1. The property was first staked in 1945 on behalf of San Antonio Gold Mines Limited. Godard (1963a, p 27) called this occurrence Locality 2, plotted the location on his geological map (Godard 1963b) and reported that an exploration subsidiary of San Antonio Gold Mines Limited drilled 57 holes and excavated 8 test pits with unknown results. A shear zone with two gold occurrences is recorded on a map dated 1948 by Hollinger Consolidated (A.F. 91162)(Fig. 64). Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Kerr Addison Mines Limited carried out an airborne EM and MAG survey over the area in 1965 (A.F. 91144). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). Cobham River Mines Limited staked and prospected the area in 1987 and described a poorly exposed, 0.3 m thick shear zone in mafic volcanic rocks. They also observed four shallow pits on the side of a hill excavated to uncover a 0.3 m thick quartz vein hosted by mafic rock (A.F. 93498). The property was transferred to Corona Corporation in 1988. Corona Corporation carried out an airborne VLF-EM, MAG and EM survey; follow-up work consisted of rock sampling (A.F. 93500). A recently excavated major pit (1 x 1 x 10.3 m) and three additional shallow pits were observed in 1990 (P. Theyer, 1990, unpublished field notes).

### GEOLOGICAL SETTING:

A quartz vein straddles the contact of pillowed mafic volcanic flows of the Hayes River Group (Wright, 1928), to the south, and granodiorite of the group of Early Intrusive Rocks (Weber *et al.*, 1982), to the north (Fig. 64). The occurrence consists of an approximately 25 cm thick, white to translucent quartz vein characterized by dark grey to black, sheared and chloritized inclusions. Pillowed mafic volcanic rocks exhibiting iron oxide staining in the vicinity of the quartz vein, are intruded by granodiorite.

### MINERALIZATION:

Godard (1963a) reported minor disseminated pyrite in the quartz vein. Staff of Cobham River Mines Limited reported minor pyrite and galena (A.F. 93498). Staff of Manitoba Energy and Mines observed up to 1% pyrite and traces of chalcopyrite in quartz of the vein (P. Theyer, 1990, unpublished field notes).

### GEOCHEMICAL DATA:

Three rock grab samples collected by Cobham River Mines Limited in 1989 from quartz veins, assayed 9.5, 16.6 and 54.8 g/t Au. A sample of wall rock, barren of sulphides assayed 190 ppb Au (A.F. 93498). A rock grab sample collected by Corona Corporation in 1989, assayed 3.5 g/t Au (A.F. 93500).

### CLASSIFICATION:

Vein type deposit - single vein

### REFERENCES:

- Assessment Files 91144, 91162, 91624, 91694, 93498, 93500  
Manitoba Energy and Mines, Mines Branch.
- Godard, J.D.  
1963a: Geology of the Sagawitchewan Bay area; Manitoba Mines and Natural Resources, Mines Branch, Publication 60-2, 28p.  
1963b: Sagawitchewan Bay; Manitoba Mines and Natural Resources, Mines Branch, Map 60-2, 1:63 360.
- Mineral Inventory Card 53F/13 Au1  
Manitoba Energy and Mines, Geological Services Branch.
- Weber, W., Gilbert, H.P., Neale, K.L. and McGregor, C.R.  
1982: Island Lake Project; in Manitoba Mineral Resources Division, Report of Field Activities, 1982, p. 34-43.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



## **Section 4**

### **MINERAL DEPOSITS AND OCCURRENCES IN THE WAPUS BAY AREA (NTS 53E/10)**





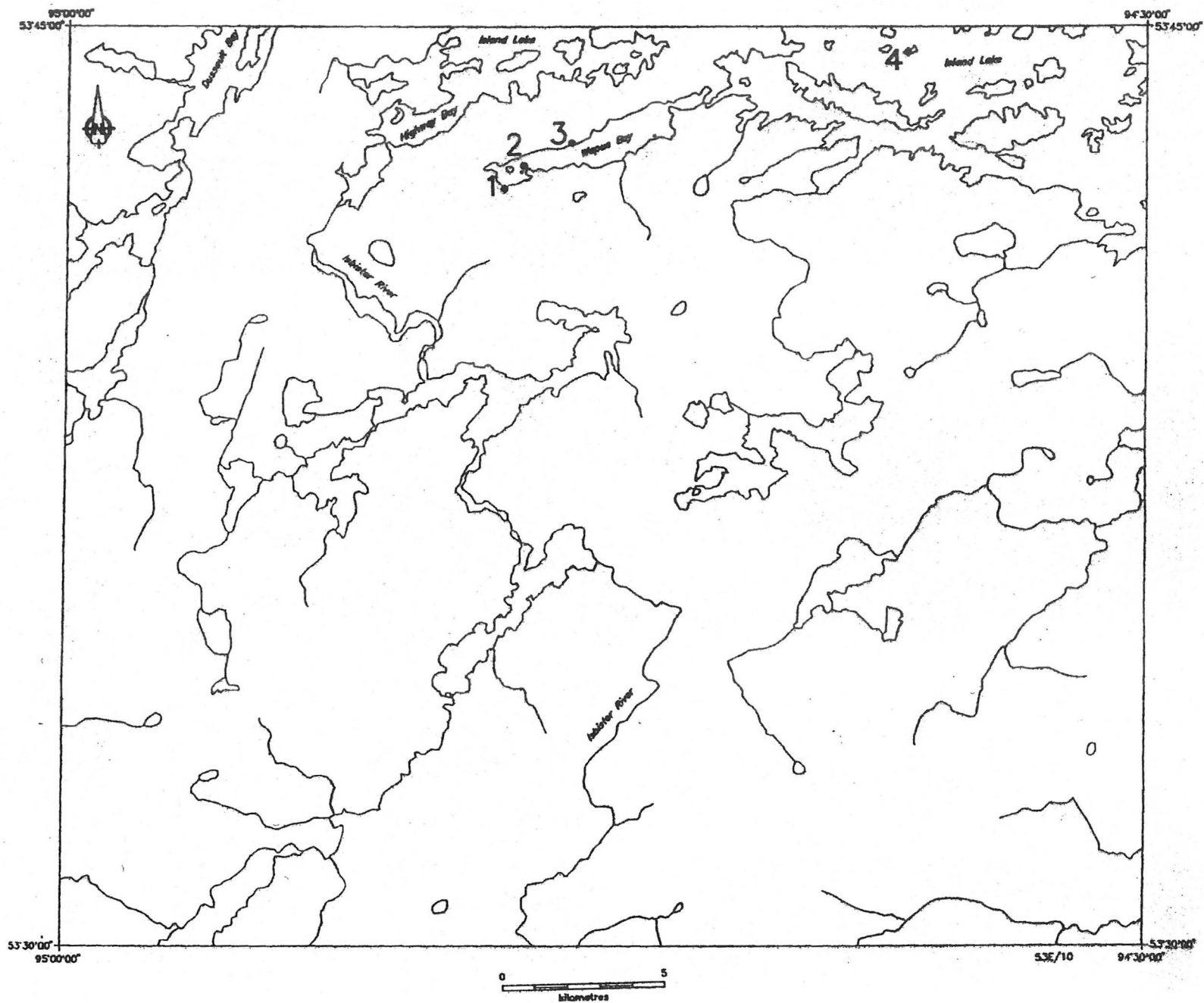
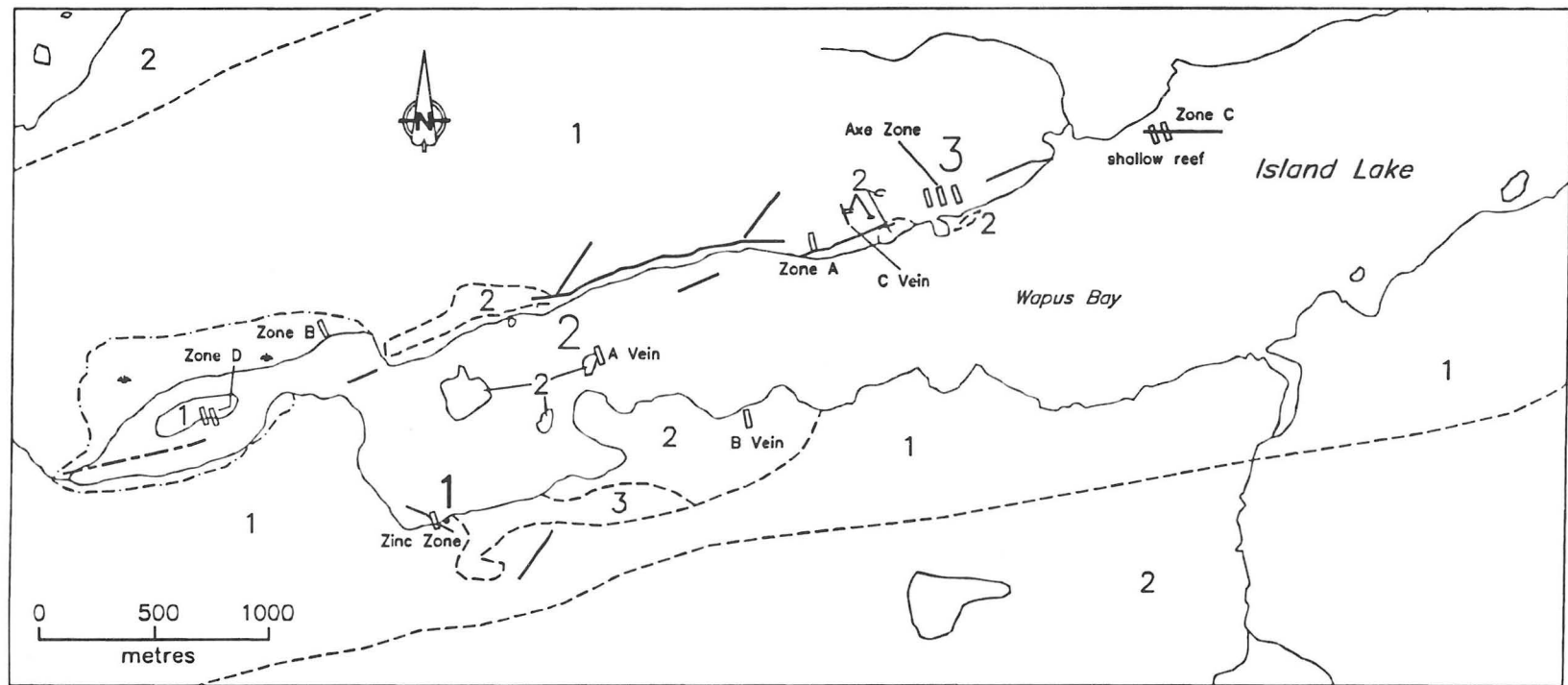


Figure 4: Location of mineral deposits and occurrences Wapusk Bay area (NTS 53E/10).



53E/10-1

### Early Intrusive Rocks

3 Gabbro

2 Tonalite, granodiorite

### Hayes River Group

1 Mafic volcanic flows and related intrusive rocks

--- Geological contact (approximate)

□ Trench

— EM conductor (A.F. 92952)

--- Fault

~ Swamp

•1 Occurrence location

Figure 65: Geological setting of occurrence 1. Geology modified from Quiet Bay Minerals Corporation (A.F. 92952).

## MINERAL DEPOSITS AND OCCURRENCES IN THE WAPUS BAY AREA (NTS 53E/10)

LOCATION: 1

NAME: Zinc zone

UTM: 5951871N/381478E

ACCESS: Via boat or float plane

AREA: Southwest Island Lake; Wapus Bay (Fig. 4)

AIRPHOTO: A23513-55

### EXPLORATION SUMMARY:

The Mackilmon group of claims (renamed the Raleigh 3400 to 3409 claims) that cover the western half of the property, were staked in the early 1930's. The approximate area of the occurrence was restaked in 1949 as the HAN group of claims. Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). A combined MAG and AEM survey was flown for Sherritt Gordon Mines Limited in 1969 and 1970 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). Ralph Birch staked in the area in the period from 1981 until 1984. The claims lapsed in 1986 and were restaked by Quiet Bay Minerals Corporation, which conducted line cutting, stripping, trenching, rock sampling, geological mapping and MAG and VLF-EM surveys (A.F. 92952). In 1990, the area was restaked as the Wap group of claims and a trenching, overburden stripping and rock sampling program was performed (A.F. 93323).

### GEOLOGICAL SETTING:

The area of the occurrence is underlain by mafic to intermediate volcanic and derived sedimentary rocks intruded by minor mafic to felsic intrusive rocks of the Hayes River Group (Wright, 1928). These rocks are characterized by narrow, intensely sheared, carbonatized, epidotized sulphide-bearing silicified zones. A major inferred east-trending fault and shear zone extend parallel to the axis of Wapus Bay. Occurrence 1 ("Zinc Zone") (Fig. 65) is a 1 m thick, 3 m long northeast-striking shear containing quartz veins within mafic volcanic rocks (A.F. 92952).

### MINERALIZATION:

A quartz-bearing shear zone, crosscutting the general rock fabric, contains pockets of near-solid pyrite and minor chalcopyrite, sphalerite and pyrrhotite (A.F. 92952).

### GEOCHEMICAL DATA:

Assay results of rock grab samples collected from occurrence 1 are presented in Table 13.

**Table 13**  
**Chemical analyses of rock grab samples**  
**from occurrence 1 (A.F. 92952)**

| Au<br>(ppb) | Ag<br>(ppm) | Cu<br>(ppm) | Pb<br>(ppm) | Zn<br>(ppm) |
|-------------|-------------|-------------|-------------|-------------|
| 200         | 0.8         | 31          | 100         | 19          |
| 150         | 1.3         | 68          | 45          | 16          |
| 100         | <0.2        | 35          | 5           | 9           |
| 45          | 1.6         | >5000       | 22          | >5000       |
| 30          | 1.0         | 1900        | 70          | >5000       |
| 40          | 1.3         | 2500        | 50          | >5000       |
| 60          | 0.2         | 360         | 3           | 380         |
| 70          | 0.4         | 350         | 2           | 220         |
| 65          | 0.4         | 520         | 2           | 190         |
| 15          | <0.2        | 110         | <1          | 95          |

### CLASSIFICATION:

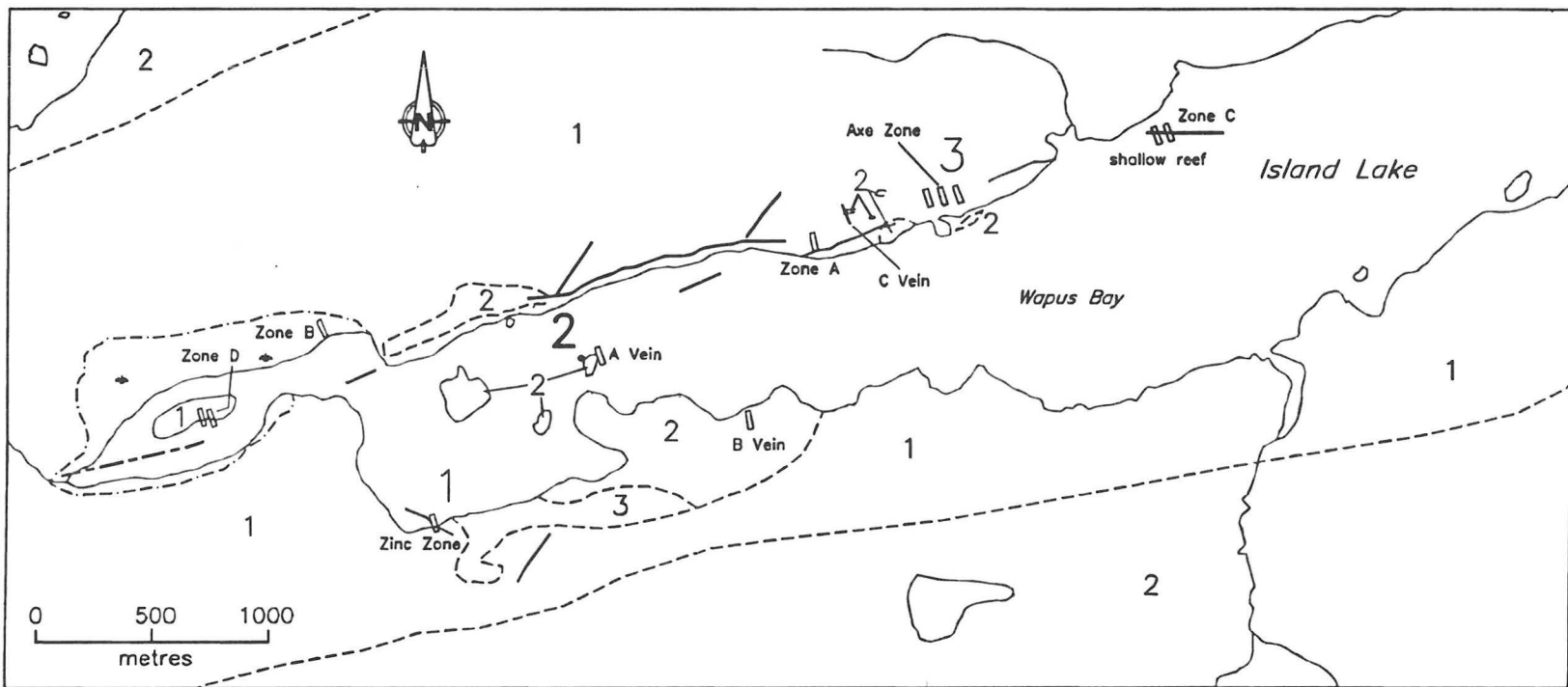
Vein type deposit - single vein.

### REFERENCES:

Assessment Files 91624, 91684, 91694, 92952, 93323  
Manitoba Energy and Mines, Mines Branch.

Wright, J.F.

1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



53E/10-2

### Early Intrusive Rocks

- 3 Gabbro
- 2 Tonalite, granodiorite

### Hayes River Group

- 1 Mafic volcanic flows and related intrusive rocks

--- Geological contact (approximate)

□ Trench

— EM conductor (A.F. 92952)

--- Fault

○ Swamp

• 2 Occurrence location

Figure 66: Geological setting of occurrence 2. Geology modified from Quiet Bay Minerals Corporation (A.F. 92952).

LOCATION: 2

NAME: A vein

UTM: 5952579N/382125E

ACCESS: Via boat or float plane

AREA: Southwest Island Lake; Wapus Bay (Fig. 4).

AIRPHOTO: A23513-55

#### EXPLORATION SUMMARY:

The Mackilmon group of claims (renamed the Raleigh 3400 to 3409 claims) staked in or about the early 1930s cover the western half of the property. The approximate area of the property was restaked in 1949 as the HAN group of claims. Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). A combined MAG and AEM survey of the area was flown for Sherritt Gordon Mines Limited in 1969 and 1970 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). R. Birch staked several claims in the area from 1981 until 1984. The claims lapsed in 1986 and the area was staked by N. Mackenzie of Quiet Bay Minerals Corporation. A prospecting program including linecutting, geological mapping, prospecting, MAG and VLF-EM surveys, trenching (1.8 x 0.6 x 0.4 m), stripping and rock sampling, were performed in 1986 (A.F. 92952). The claims lapsed at the beginning of 1990; were restaked in the same year as the Wap group of claims, and a trenching, rock sampling and prospecting program was undertaken (A.F. 93323).

#### GEOLOGICAL SETTING:

The area of the occurrence is underlain by mafic to intermediate volcanic and derived sedimentary rocks intruded by minor mafic to felsic intrusive rocks of the Hayes River Group (Wright, 1928). The host rocks are characterized by narrow, intensely sheared and carbonatized, epidotized and sulphide-bearing silicified zones. An inferred east-trending fault and shear zone extends parallel to the axis of Wapus Bay. Occurrence 2 (Fig. 66) is a quartz vein located in a shear zone crosscutting the general eastern trend of the volcanic rocks (A.F. 92952).

#### MINERALIZATION:

The quartz of the vein contains approximately 5% pyrite in pockets and clusters; minor pyrrhotite and galena were also identified in addition.

#### GEOCHEMICAL DATA:

Twelve rock grab samples from occurrence 2 were analyzed for gold. Analytical results are listed in Table 14.

**Table 14**  
**Gold analyses in rock samples from occurrence 2**  
**(A.F. 92952)**

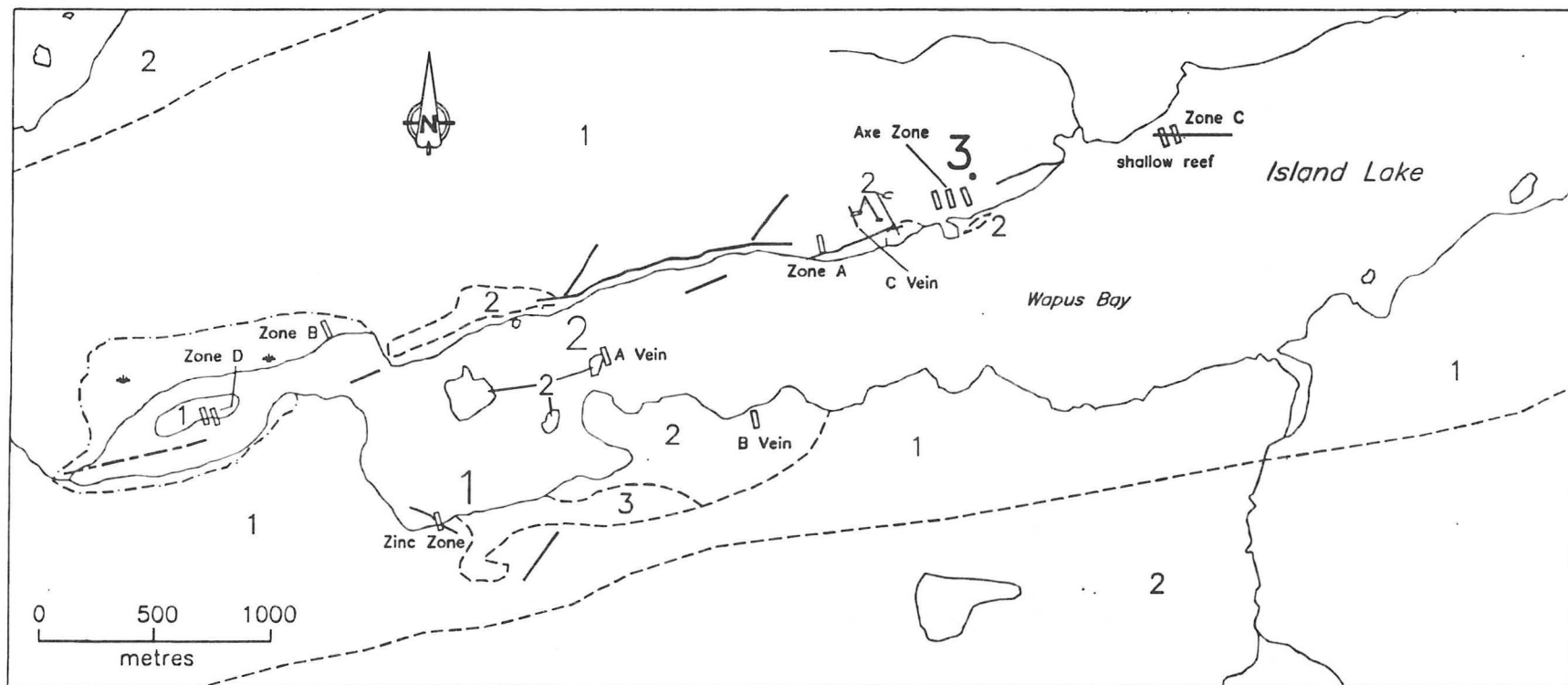
|       |
|-------|
| Au    |
| (g/t) |
| 30.5  |
| 1.02  |
| 6.51  |
| 0.69  |
| 23.31 |
| 17.14 |
| 2.40  |
| 1.54  |
| 0.86  |
| 7.20  |
| 0.34  |
| 7.20  |

#### CLASSIFICATION:

Vein type deposit - single vein.

#### REFERENCES:

- Assessment Files 91624, 91684, 91694, 92952, 93323  
Manitoba Energy and Mines, Mines Branch.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



53E/10-3

### Early Intrusive Rocks

3 Gabbro

2 Tonalite, granodiorite

### Hayes River Group

1 Mafic volcanic flows and related intrusive rocks

--- Geological contact (approximate)

□ Trench

— EM conductor (A.F. 92952)

--- Fault

○ Swamp

•3 Occurrence location

Figure 67: Geological setting of occurrence 3. Geology modified from Quiet Bay Minerals Corporation (A.F. 92952).

LOCATION: 3

NAME: Axe zone

UTM: 5953172N/383398E

ACCESS: Via boat or float plane

AREA: Southwest Island Lake; Wapus Bay (Fig. 4)

AIRPHOTOS: A23513-55, A23514-108

#### EXPLORATION SUMMARY:

On or about the early 1930s the Mackilmon group of claims later renamed the Raleigh 3400 to 3409 claims covering the western half of the property were staked. No records of assessment work exist, nor was there evidence of old exploration activities observed in this area. In 1949 the approximate area of the property was restaked as the HAN group of claims. Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). A combined MAG and AEM survey was flown for Sherritt Gordon Mines Limited in 1969 and 1970. Maps depicting the AEM anomalies are in (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). R. Birch staked several claims in the area in the period from 1981 until 1984. These claims lapsed in 1986 and the area was staked by N. Mackenzie of Quiet Bay Minerals Corporation. A prospecting program including linecutting, geological mapping (1:2 500 scale), prospecting, MAG and VLF-EM surveys, and digging and blasting of three several metres long and wide trenches, stripping and rock sampling were performed in 1986 (A.F. 92952). The claims lapsed at the beginning of 1990, however, the area was restaked as the Wap group of claims. A trenching, overburden stripping and rock sampling program was performed in 1990 (A.F. 93323) and the property was allowed to lapse in 1993.

#### GEOLOGICAL SETTING:

The area of the occurrence is underlain by mafic to intermediate volcanic and derived sedimentary rocks intruded by minor mafic to felsic intrusive rocks of the Hayes River Group (Wright, 1928). These rocks are characterized by narrow intensely sheared and carbonatized, epidotized and silicified zones. An approximately 5 to 7 m wide, in places sulphide-bearing amphibolitic rock layer underlies occurrence 3 and several additional, geologically comparable locations (Zones A; B; C and D). This layer has a strike length exceeding 3 km, inferred on the basis of evidence in outcrops and geophysical (VLF EM and MAG) anomalies (A.F. 92952) (Fig. 67).

#### MINERALIZATION:

Pyrite, pyrrhotite and minor chalcopyrite-bearing stringers occur stratabound in an amphibolitic host rock. Sulphide concentrations in these stringers range from 10 to 50%. This type of mineralization occurs north of Wapus Bay in occurrence 3 and Zone A, B and C (Fig. 67) (A.F. 92952).

Occurrence 3 is exposed in three trenches (4.8 x 2.3 x 0.8 m; 5.5 x 1.2 x 1.0 m; 3.5 x 0.75 x 0.5 m) sunk into amphibolitized mafic fine grained volcanic rock containing disseminated and layered pyrrhotite, pyrite and minor chalcopyrite.

Zone A is in a trench (2.5 x 0.5 x 0.45 m) exposing pyrrhotite- and pyrite-bearing amphibolitized mafic tuff that resembles the mineralized rock layer of occurrence 3.

Zone B is exposed in a trench (1.5 x 0.5 x 0.6 m) containing sulphide-bearing amphibolitized rocks.

Zone C is exposed in a trench (2.7 x 1 x 0.4 m) containing pyrite-bearing quartz-carbonate-chlorite rocks

Zone D is exposed in two trenches (2.2 x 2.6 x 0.4 m and 2.2 x 1.1 x 0.35 m) underlain by amphibolitic rocks mineralized with disseminated pyrite, pyrrhotite, minor chalcopyrite hematite and magnetite (A.F. 92952).

#### GEOCHEMICAL DATA:

A series of rock grab samples collected from occurrence 3 and zones A, B, C and D were routinely analyzed for Au. Many of these samples were, in addition, analyzed for Ag, Cu, Pb and Zn (A.F. 92952). The analytical results are listed in Table 15.

#### CLASSIFICATION:

Vein type deposit - multiple veins and lenses.

#### REFERENCES:

- Assessment Files 91624, 91684, 91694, 92952, 93323  
Manitoba Energy and Mines, Mines Branch.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.

**Table 15**  
**Chemical analyses of rock samples from occurrence 3**  
**and Zones A, B, C and D**

| Location 3  |             |             |             |             | ZONE A      |             |
|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Au<br>(ppb) | Ag<br>(ppm) | Cu<br>(ppm) | Pb<br>(ppm) | Zn<br>(ppm) | Au<br>(g/t) | Cu<br>(ppm) |
| 5           | <0.2        | 66          | 25          | 76          | 0.34        | 2200        |
| 10          | <0.2        | 17          | 5           | 17          | 0.02        | 1460        |
| 20          | <0.2        | 3           | 5           | 31          | nil         | 50          |
| 35          | 0.2         | 5           | 1           | 8           | tr.         | 1200        |
| 20          | <0.2        | 6           | 2           | 62          | tr.         | 520         |
| 5           | <0.2        | 84          | <1          | 21          | nil         | 30          |
| 10          | <0.2        | 6           | 9           | 8           | 1.02        | 170         |
| <5          | <0.2        | 1           | 2           | 7           | tr.         | 310         |
| 15          | <0.2        | 400         | 3           | 70          | tr.         | 60          |
| <5          | 0.4         | 19          | 19          | 40          | 0.34        | 90          |
| <5          | <0.2        | 1           | <1          | 13          | nil         | 710         |
| 10          | <0.2        | 1           | <1          | 4           | nil         | 50          |
| 5           | 0.4         | 320         | <1          | 52          | 0.68        | 840         |
| 120         | 0.6         | 490         | <1          | 96          | tr.         | 300         |
| <5          | <0.2        | 5           | 3           | 4           | ZONE B      |             |
| 370         | 1.1         | 110         | 6           | 11          | Au          |             |
| 70          | <0.2        | 51          | 12          | 26          | (ppb)       |             |
| <5          | <0.2        | <1          | 1           | 6           | nil         |             |
| <5          | <0.2        | 15          | 4           | 18          | nil         |             |
| 40          | <0.2        | 100         | 12          | 80          | tr.         |             |
| 55          | <0.2        | 8           | 2           | 6           | ZONE C      |             |
| 30          | 0.2         | 0           | <1          | 13          | Au          |             |
| <5          | <0.2        | 35          | <1          | 8           | (ppb)       |             |
| <5          | <0.2        | 13          | <1          | 6           | 0.341       |             |
| <5          | <0.2        | 4           | 2           | 3           | 0.03        |             |
| 250         | <0.2        | 4           | <1          | 4           | 0.69        |             |
| 25          | 0.4         | 75          | <1          | 14          | tr.         |             |
| 15          | <0.2        | 11          | 3           | 6           | tr.         |             |
| 55          | <0.2        | 180         | <1          | 41          | tr.         |             |
| 20          | 0.2         | 230         | <1          | 32          | 0.17        |             |
| Au (g/t)    |             |             |             |             | tr.         |             |
|             |             |             |             |             | tr.         |             |
|             |             |             |             |             | tr.         |             |
|             |             |             |             |             | 0.34        |             |
|             |             |             |             |             | tr.         |             |
|             |             |             |             |             | tr.         |             |
|             |             |             |             |             | tr.         |             |
|             |             |             |             |             | 0.68        |             |
|             |             |             |             |             | 1.02        |             |
|             |             |             |             |             | tr.         |             |
|             |             |             |             |             | tr.         |             |
|             |             |             |             |             | tr.         |             |
|             |             |             |             |             | tr.         |             |
|             |             |             |             |             | nil         |             |
|             |             |             |             |             | ZONE D      |             |
|             |             |             |             |             | Au          |             |
|             |             |             |             |             | (ppb)       |             |
|             |             |             |             |             | Ag          |             |
|             |             |             |             |             | (ppm)       |             |
|             |             |             |             |             | Cu          |             |
|             |             |             |             |             | (ppm)       |             |
|             |             |             |             |             | Pb          |             |
|             |             |             |             |             | (ppm)       |             |
|             |             |             |             |             | Zn          |             |
|             |             |             |             |             | (ppm)       |             |
|             |             |             |             |             | 25          | 0.8         |
|             |             |             |             |             | 40          | 0.4         |
|             |             |             |             |             | <5          | <0.2        |
|             |             |             |             |             | <5          | <0.2        |
|             |             |             |             |             | 20          | 0.4         |
|             |             |             |             |             | <5          | 0.2         |
|             |             |             |             |             | 80          | 0.2         |
|             |             |             |             |             | 20          | 0.2         |
|             |             |             |             |             | <5          | 0.2         |
|             |             |             |             |             | 20          | 0.2         |
|             |             |             |             |             | 25          | 1.4         |
|             |             |             |             |             | >5000       | 36          |
|             |             |             |             |             |             | 110         |
|             |             |             |             |             |             | 52          |
|             |             |             |             |             |             | 5           |
|             |             |             |             |             |             | 11          |
|             |             |             |             |             |             | 49          |
|             |             |             |             |             |             | 110         |
|             |             |             |             |             |             | 93          |
|             |             |             |             |             |             | 130         |
|             |             |             |             |             |             | 48          |
|             |             |             |             |             |             | 10          |
|             |             |             |             |             |             | 3200        |



LOCATION: 4

NAME: Providence

UTM: 5955330N/393530E

ACCESS: Via boat or float plane

AREA: Southwest Island Lake; Adjacent to the eastern  
end of Wapus Bay (Fig. 4)

AIRPHOTO: A23565-187

#### EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). An airborne radiometric survey by Geophysical Engineering and Surveys Limited (A.F. 91677) and an AEM and MAG survey for Cerro Mining Corporation of Canada (A.F. 91687) were flown over this area in 1971. The area of the occurrence was prospected and trenched (four trenches 1 x 1 x 1 m; 2 x 8 x 2.5 m; 2 x 1 x 1 m; 5 x 1 x 1 m) in 1986 (A.F. 92868).

#### GEOLOGICAL SETTING:

The area is underlain by granodiorite and tonalite of the group of Early Intrusive Rocks, in places intruded by diabase dykes of the group of Late Intrusive Rocks (Weber *et al.*, 1982)(Fig. 68).

#### MINERALIZATION:

Up to 1% disseminated pyrite and traces of arsenopyrite occur in the quartz veins. The host rock is barren of metallic minerals.

#### GEOCHEMICAL DATA:

Assay results of 20 grab samples collected from the area range from nil to 0.3 g/t Au, 1 to 730 ppm Cu, 3 to 190 ppm Zn and insignificant concentrations of Ag and Pb (A. F. 92868).

#### CLASSIFICATION:

Vein type deposit - multiple veins and lenses.

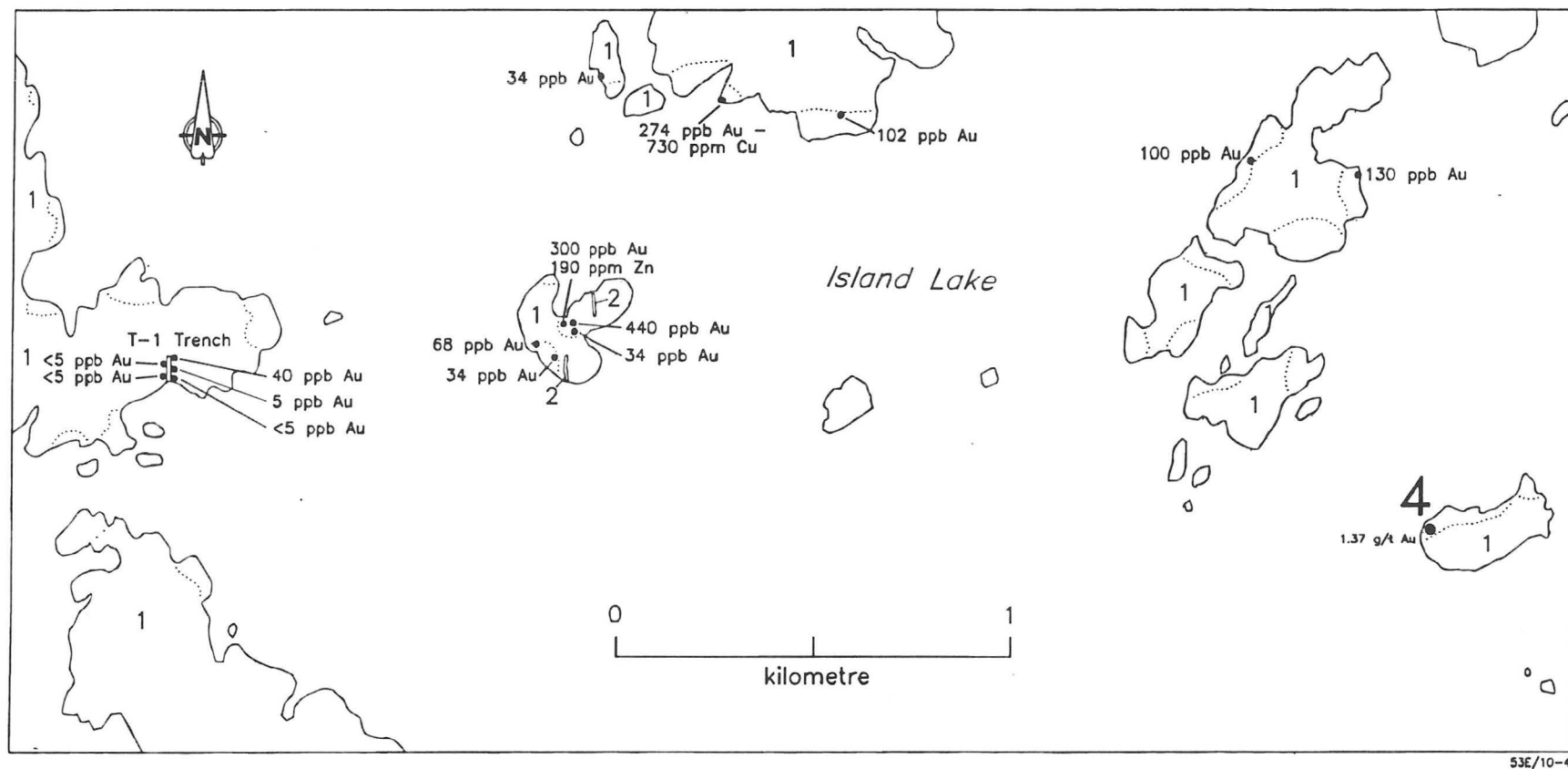
#### REFERENCES:

Assessment Files 91624, 91677, 91687, 92868

Manitoba Energy and Mines, Mines Branch.

Weber, W., Gilbert, H.P., Neale, K.L. and McGregor, C.R.

1982: Island Lake Project; in Manitoba Mineral Resources Division, Report of Field Activities, 1982, p. 34-43.



53E/10-4

Late Intrusive Rocks  
 2 Diabase dyke  
 Early Intrusive Rocks  
 1 Granodiorite, tonalite

..... Limit of outcrop  
 34 ppb Au • Rock sample and Au assay result  
 • 4 Occurrence location

Figure 68: Geological setting of occurrence 4. Geology modified after and Quiet Bay Minerals Corporation (A.F. 92868).

## **Section 5**

### **MINERAL DEPOSITS AND OCCURRENCES IN THE BENSON BAY AREA (NTS 53E/9)**



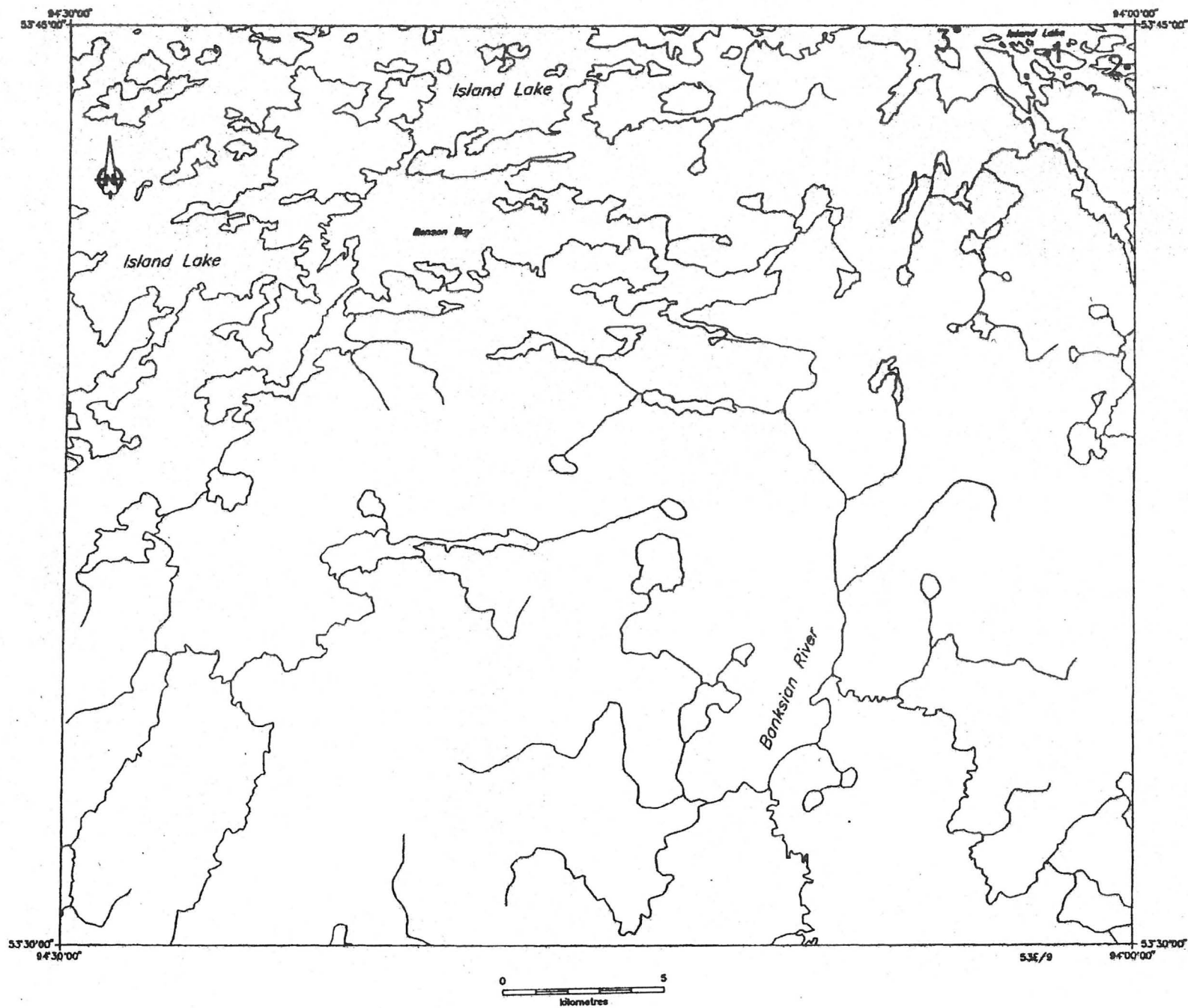


Figure 5: Location of mineral deposits and occurrences Benson Bay area (NTS 53E/9).

## MINERAL DEPOSITS AND OCCURRENCES IN THE BENSON BAY AREA (NTS 53E/9)

LOCATION: 1

NAME: Jack of Hearts

UTM: 5955223N/431047E

ACCESS: Via boat or float plane

AREA: Island Lake east (Fig. 5)

AIRPHOTO: A23506-144

### EXPLORATION SUMMARY:

A comprehensive review of the exploration history is given in Mineral Inventory Card 53E/9 Au1.

The area of this occurrence was staked prior to 1931. In 1931 part of the property was restaked as the Jack of Hearts and Jack of Hearts Nos. 1 and 4 claims and reassigned to Island Lake Mines Limited. The area was trenched and drilled by Ventures Limited (6 DDH, 410 m) from 1932 to 1934 (A.F. 91145). 63.5 tonnes of hand cobbled gold-bearing quartz were taken from two pits and processed in the mill of the Island Lake Gold Mine (NTS 53E/16, occurrence 1).

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). In 1965 Kerr Addison Mines Limited executed an AEM and AMAG survey over the area (A.F. 91144) and Sherritt Gordon Mines Limited performed an AEM survey. International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). In 1981, BP Minerals undertook claim staking, a VLF-EM and MAG survey, reconnaissance mapping and prospecting, and a humus sampling program (A.F. 93230). A regional geochemical rock sampling was undertaken by Manitoba Energy and Mines (Theyer, 1982). In 1983 BP Minerals contracted 106 m of trenching, channel sampling drilling and mapping on Pointer and adjacent islands (A.F. 92731). In 1984 BP Minerals commissioned a MAG and EM survey. Tygar Resources Inc. staked Pointer Island and Reahil Island in 1987 and transferred the property to Corona Corporation in 1989. Corona Corporation undertook overburden stripping and channel sampling, but concentrated on the north shore of Reahil Island; presumably to search the eastern extension of quartz veins underlying Pointer Island (A.F. 93500). The property reverted to Tygar Resources Inc. late in 1989.

Remnants of at least 10 overburden and rock trenches witness exploration dating back to the 1930's. An approximately 30 x 2 x 4 m trench on the northern shore of the island was observed in 1990 (Fig. Theyer, 1990, unpublished field notes). The trench exposes an approximately 70 cm thick, massive, milky white, east-striking quartz vein that is hosted by unaltered, slightly sheared mafic rocks. Based on the dimensions of this trench, the author assumes that this quartz vein is the source of 63.5 tonnes of gold ore mined in 1934 by Ventures Limited from a quartz vein known as the "Jack of Hearts" vein located on the north shore of this island (Mineral Inventory Card 53E/9 Au1).

### GEOLOGICAL SETTING:

The area of the occurrence is underlain by suite of mafic, intermediate and felsic volcanic and/or related intrusive rocks of the Hayes River Group (Wright, 1928), and by ultramafic intrusive and related subvolcanic and/or extrusive rocks intruded by mafic to felsic plutonic rocks. The Jack of Hearts quartz vein occurs at the sheared contact of massive coarse grained mafic intrusive rocks to the south and mafic carbonatized volcanic rocks in the northern part of Pointer Island.

Shear zones are characterized by sericite, chlorite and carbonate schists. This island is at the eastern end of an approximately 6 km long by 100 to 150 m wide silicified zone extending from Okay Island to the southeastern end of Sagawitchewan Bay (Fig. 69). Theyer (1982), described a typical exposure of the silicified zone, consisting of intensely silicified mafic volcanic(?) rocks resembling grey to buff coloured cherts. Circle-shaped patches of up to 20 cm diameter displaying greenish cherty quartz in outcrops were interpreted as artifacts of alteration. Gilbert (1984) described similar rocks occurring in the south limb of the Heart Island syncline at the east margin of the Loonfoot Island area, where he observed white, flinty, pillowed mafic flows in gradational contact with less altered amphibolitic basalts.

### MINERALIZATION:

The Jack of Hearts quartz vein is irregularly mineralized with trains, pockets and layers containing up to 15% fine to coarse- crystalline pyrite, 5% chalcopyrite and traces of galena hosted by massive, white quartz normally mineralized with minor disseminated pyrite.

Trench A exposed a 40 cm thick quartz vein mineralized with disseminated pyrite and chalcopyrite.

Trench B exposed three quartz veins several cm thick, containing minor pyrite.

Trench C exposed several quartz veins. The most prominent (50 cm true thickness) consists of white quartz mineralized with 15 to 20% pyrite and minor chalcopyrite and galena. The surface is stained with iron oxide and malachite.

Trench D uncovered quartz and quartz-carbonate veins ranging from 1 to 10 cm thickness. Pyrite mineralization ranges from nil to trace. Assays returned 5 to 80 ppb Au.

Trench E uncovered a 9 cm thick quartz vein containing pyrite, chalcopyrite and traces of galena.

Trench F, located at the northern shore of Pointer Island, uncovered a 15 cm thick massive white quartz vein containing pyrite, chalcopyrite and trace galena.

Up to 5% coarse crystalline pyrite is contained in the quartz vein of zone 1 (A.F. 92731).

### GEOCHEMICAL DATA:

Rock samples of the Jack of Hearts quartz vein consisting of 15 to 30 cm thick near solid sulphide layers, averaged about 25.7 g/t Au (Island Lake Mines Limited, Mining Engineering File). Ore samples of the Jack of Hearts

deposit analyzed in 1932 by the Ore Dressing and Metallurgical Laboratories in Ottawa, averaged 84.6 g/t Au, 344.2 g/t Ag, 2% Cu, 1.64% Pb, 0.57% Zn, 0.06% As (A.F. 92731).

A rock sample from the Jack of Hearts pit collected by BP Minerals Limited in 1981, assayed 6.17 g/t Au. Two rock samples collected from a location approximately 400 m west of the Jack of Hearts pit returned 9.3 g/t Au and 33.3 g/t Au and 155.6 g/t Ag and 82.6 g/t Ag (A.F. 92731).

Quartz samples from the Jack of Hearts pit collected by staff of Manitoba Energy and Mines (Theyer, 1982), assayed 36.3 g/t Au and 199.5 g/t Ag.

A rock sample collected from the quartz vein at zone 1 assayed 130 g/t Au (Theyer, 1982).

Two (31.7 tonnes each) ore samples from the Jack of Hearts vein tested in the mill of the Island Lake Gold Mine in 1934, assayed 10.3 and 36 g/tonne Au respectively (Mineral Inventory Card 53E/9 Au1).

Quartz exposed in trench A assayed 11 g/t Au and 43 g/t Ag. Assays of rock samples from quartz veins exposed in trench B ranged from 5 to 940 ppb Au. Samples of a quartz vein in trench C assayed an average of 45.5 g/t Au, 138 g/t Ag and concentrations of Cu ranging from 9552 to 17445 ppm and of Pb from 1161 ppm to 7623 ppm. A quartz vein in trench E assayed 945 ppb Au (A.F. 92731). Quartz samples from Corona Corporation's vein "Number Two" assayed 1.4 g/t Au (A.F. 93500).

#### CLASSIFICATION:

Vein type deposit - multiple veins and lenses.

#### REFERENCES:

Assessment Files 91144, 91145, 91624, 91694, 92731, 93230, 93500, Non-confidential parts of 70354  
Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P.

1984: Island Lake project; in Manitoba Energy and Mines, Mineral Resources, Report of Field Activities, 1984, p. 120-125.

Island Lake Mines Limited

Mining Engineering File; Manitoba Energy and Mines, Mines Branch.

Mineral Inventory Card 53E/9 Au1

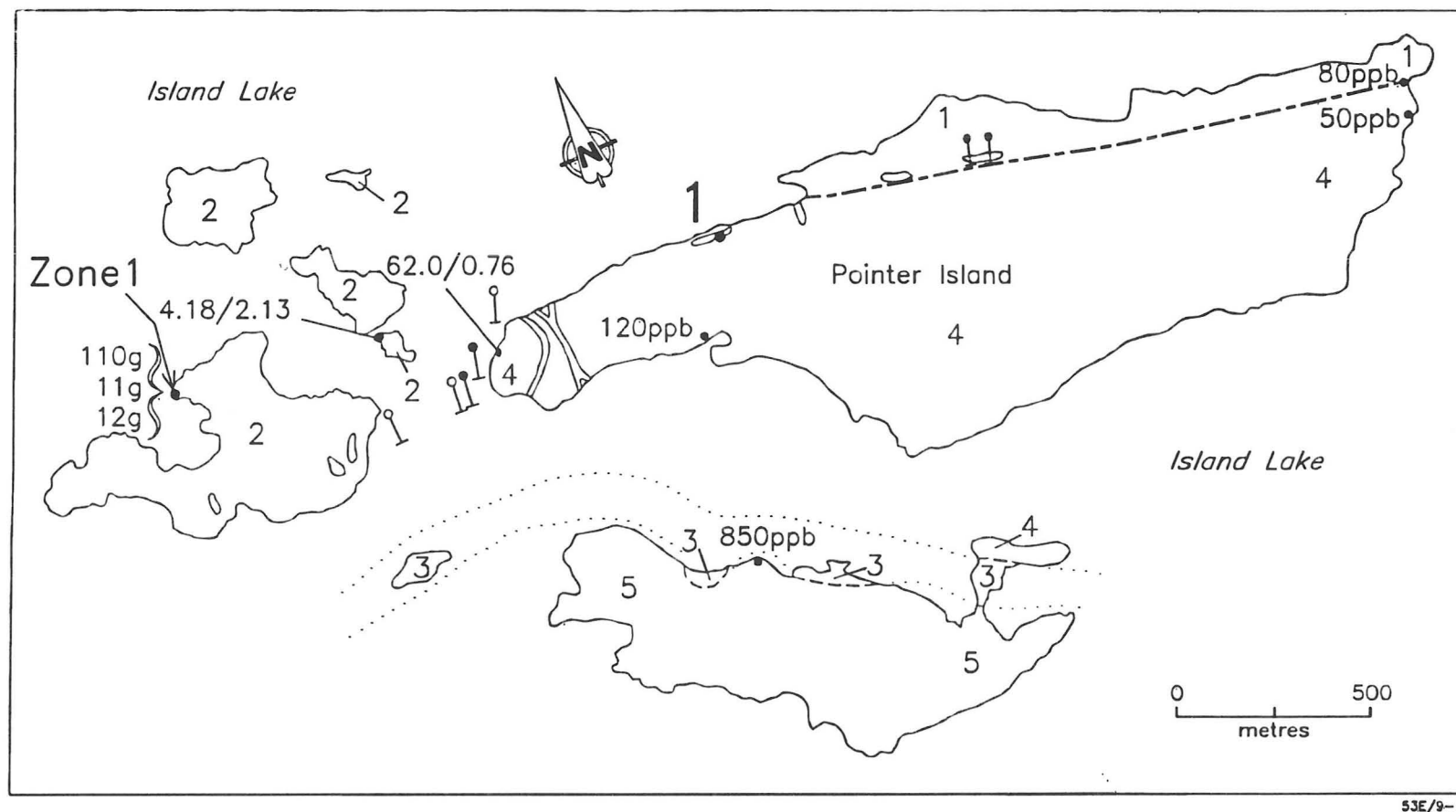
Manitoba Energy and Mines, Geological Services Branch.

Theyer, P.

1982: Island Lake area and Bird River Sill; in Manitoba Energy and Mines, Mineral Resources Division, Report of Field Activities, 1982, p. 55-57.

Wright, J.F.

1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



53E/9-1

### Early Intrusive Rocks

- 5 Tonalite, monzonite, granite
- 4 Mafic intrusive rock
- 3 Ultramafic intrusive; related subvolcanic or flow rocks

### Hayes River Group

- 2 Felsic to intermediate volcanic rocks
- 1 Mafic to intermediate volcanic rocks

--- Geological contact (known, inferred)

--- Fault

— Trench

—● Drillhole, Ventures Limited (A.F. 91145)

—○ Drillhole, BP Minerals Limited (A.F. 92731)

110g• Grab sample concentration of Au (grams/tonne)

4.18/2.13 Channel chip sample concentration of Au (g/tonne)/length(m)

•1 Occurrence location

Figure 69: Geological setting of occurrence 1. Geology modified from BP Minerals Limited (A.F. 92731).



## 2 Occurrence location

Figure 70: Geological setting of occurrence 2. Geology modified from Corona Corporation (A.F. 93500) and W.B. Dunlop (pers. Comm., 1996).

LOCATION: 2

NAME: (A.F.-Mineralization intersected by diamond drilling)  
UTM: 5954600N/433646E  
ACCESS: Via boat or float plane  
AREA: Island Lake east; near the eastern edge of NTS  
53E/9 (Fig. 5)  
AIRPHOTO: A23465-74

EXPLORATION SUMMARY:

A comprehensive review of the exploration history is given in Mineral Inventory Card 53F/12 Au2. In 1932 two claims were staked on Reahil Island and were assigned to the W.A.D. Syndicate in the following year. Three trenches were dug to seek the eastern extension of a gold-bearing quartz vein. In 1948 Hollinger Consolidated Gold Mines drilled five holes (94 m) into the "Main Showing" on the Sundog group of claims that included Reahil Island and part of southwest Sagawitchewan Bay (Fig. 53E/9-2);(A.F. 91162). Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Kerr Addison Mines Limited carried out an airborne EM and MAG survey over the area in 1965 (A.F. 91144). The International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). BP Minerals Limited conducted in 1981 geological mapping (1:5 000 scale, soil and lake bottom geochemical surveys and trenching (A.F. 92731). Cobham River Mines Limited staked Pointer Island and Reahil Island in 1987 and conducted prospecting, overburden stripping, blasting and sampling (A.F. 93498). In 1988 it transferred the property to the Corona Corporation. This company completed a geophysical survey including airborne VLF-EM, MAG and EM surveys (A.F. 93500); follow-up work included overburden stripping, prospecting, geological mapping and rock sampling concentrating on the north shore of Reahil Island (A.F. 93500).

Note: DDH 2,3 and 4 are located in NTS 53F/12 and described under NTS 53F/12 location 1.

GEOLOGICAL SETTING:

The area of the occurrence is underlain by mafic to intermediate volcanic rocks of the Hayes River Group (Wright, 1928). The volcanic rocks are schistose, sericitized, silicified and host numerous east-striking, anastomosing 1 to 3 m quartz-carbonate veins.

MINERALIZATION:

Drill core from DDH 1 and 5 was not described (Fig. 70);(A.F. 91162).

Trench D (Fig. 70) excavated by Corona Corporation in 1989 uncovered a 6 x 0.5 m quartz vein mineralized with trace sulphides.

GEOCHEMICAL DATA:

DDH 1 intersected: from 0 to 0.6 m, 3 g/t Au; from 0.6 m to 1.2 m, 42.1 g/t Au; from 1.2 m to 1.8 m, 24 g/t Au; from 1.8 to 2.4 m, 19.5 g/t Au; from 2.4 to 3 m, trace Au. Core from DDH 5 was not assayed (A.F. 91162).

Quartz samples from the vein exposed by Corona Corporation assayed gold concentrations ranging from 15 to 45 ppb Au (A.F. 93500).

CLASSIFICATION:

Vein type deposit - multiple veins.

REFERENCES

Assessment Files 91144, 91162, 91624, 91694, 92731, 93498, 93500

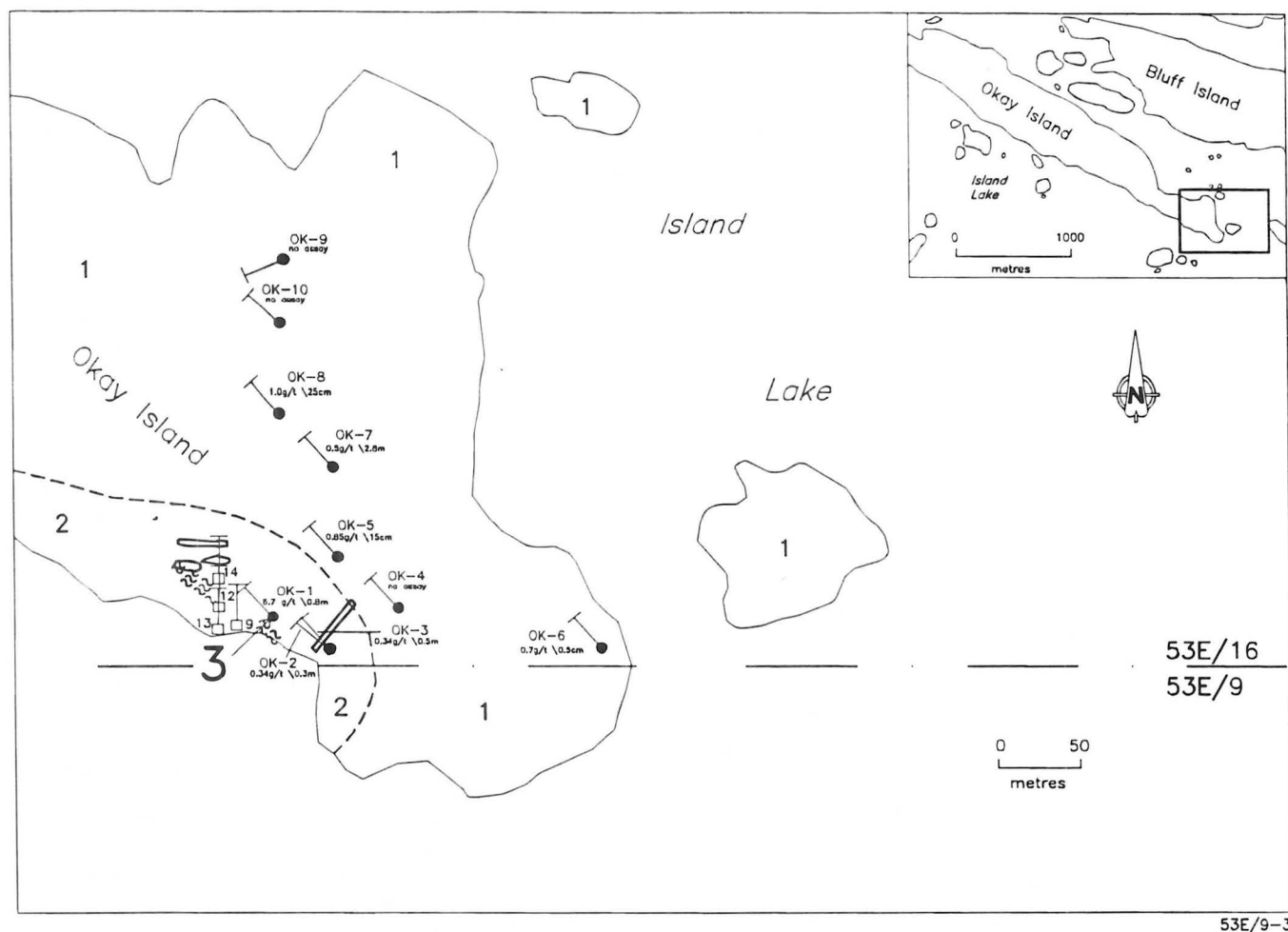
Manitoba Energy and Mines, Mines Branch.

Mineral Inventory Card 53F/12 Au2

Manitoba Energy and Mines, Geological Services Branch.

Wright, J.F.

1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



53E/9-3

Hayes River Group  
 2 Felsic to intermediate  
 volcanic rocks  
 1 Mafic to intermediate  
 volcanic rocks

--- Geological contact (approximate)  
 ~ Sheared quartz vein  
 = Trench  
 —●— Drillhole, g/t Au Mancree  
 Mines Limited (A.F. 93343)  
 —□— Drillhole, God's Lake Gold  
 Mine Limited (A.F. 91146)  
 3 Occurrence location

Figure 71: Geological setting of occurrence 3. Geology compiled from Godard (1963) and Gilbert (1985a).

### LOCATION: 3

NAME: Zolota (Alternative: Zolata)

UTM: 5955869N/428312E

ACCESS: Via boat or float plane

AREA: Southeast Island Lake; southeast Okay Island  
(Fig. 5)

AIRPHOTO: A23506-185

### EXPLORATION SUMMARY:

A review of the exploration history is given in Mineral Inventory Card 53E/16 Au3. Claims staked by W.F. Woods over the east end of Heart Island in 1932 were the first claims staked in the vicinity of Location 3. The target of this staking was an east-trending shear zone intermittently exposed over 610 m length near the south shore of Heart Island. This zone contains abundant quartz veins and stringers, in places mineralized with pyrite. Location 3 was restaked in 1937 for R.T. Pickard, and restaked in 1948 by J.G. Reahil. One hundred and one m<sup>3</sup> rock and overburden were removed from the occurrence in 1949. In 1950, God's Lake Gold Mines Limited drilled four holes (159 m) (AF 91146). Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). In 1965, Kerr Addison Mines Limited undertook an AEM/MAG survey over the area (A.F. 91652), and an AEM survey was undertaken over the area by Sheritt Gordon Mines Limited in 1970 (A.F. 91684). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). Theyer (1982) inspected the occurrence. Mancree Mines Limited prospected and sampled the occurrence in 1991, cut a 1.1 km baseline and conducted a 10 hole (289 m) drilling program in 1992 (A.F. 93343). Two trenches and rock rubble are present at occurrence 2 near the southeastern shore of Okay Island, approximately 150 m west of the eastern tip of the island.

### GEOLOGICAL SETTING:

The area of the occurrence is underlain by massive and, in places, partially altered and foliated andesite of the Hayes River Group (Wright, 1928; Fig. 71).

Abundant 1 cm to 0.5 m thick, discontinuous, quartz-ankerite and quartz stringers and veins occur in east-striking zones. The wall rocks of the quartz veins are characterized by alteration zones up to several metres thick consisting of bleached and silicified rock layers with fractures mineralized with tourmaline (Theyer, 1982).

The God's Lake Gold Mines Limited intersected "sheared andesite" in four holes drilled in 1950 (A.F. 91146).

Mancree Mines Limited intersected in a diamond drill program in 1992:

DDH OK-1 intersected mafic volcanic rock containing many narrow quartz veins and a 65 cm thick quartz vein.

DDH OK-2 intersected sheared andesite containing a 12 cm wide quartz vein.

DDH OK-3 intersected light to dark green andesite containing a number of quartz veinlets.

DDH OK-4 and OK-5 were drilled in an attempt to intersect the projected extension of the 30 cm thick quartz vein cut by DDH OK-3, but only quartz- and pyrite-filled fractures were intersected.

DDH OK-6 was drilled off the eastern tip of the island. Minor quartz veinlets up to 5 cm thick were intersected,

DDH OK-7 intersected andesite and an approximately 3 m thick shear zone impregnated with quartz.

DDH OK-8 intersected andesite and an approximately 2.7 m thick shear zone resembling the shear zone cut by DDH OK-7.

DDH OK-9 and DDH OK-10 intersected fractured andesite containing minor quartz veinlets (A.F. 93343).

### MINERALIZATION:

Quartz and quartz-ankerite veins containing up to 1% pyrite and traces of chalcopyrite and galena were observed in trenches adjacent to the southeastern shore of Heart Island (Fig. 71).

God's Lake Gold Mines Limited intersected "sheared andesite" containing "a little" and/or "some" pyrite and pyrrhotite in four holes drilled in 1950 (A.F. 91146).

A drilling program by Mancree Mines Limited in 1992 yielded the following results:

DDH OK-1 intersected 0.65 m white quartz of which the first 5 cm contained up to 20 % chalcopyrite.

DDH OK-2 intersected a 0.3 m thick quartz vein containing up to 20% chalcopyrite.

DDH OK-3 intersected a 0.5 m thick quartz vein containing minor pyrite and chalcopyrite.

DDH OK-4 intersected sheared andesite containing quartz veinlets and pyrite-filled fractures.

DDH OK-5 intersected rocks similar to DDH OK-4 and a 7 mm thick quartz-carbonate vein containing up to 20% pyrite.

DDH OK-6 intersected andesite with minor quartz veinlets containing up to 5 % chalcopyrite and pyrite.

DDH OK-7 intersected sheared andesite and a approximately 2.8 m long sheared andesite zone rehealed with quartz containing up to 25 % pyrite and chalcopyrite.

DDH OK-8 intersected sheared andesite with an approximately 2.7 m thick shear zone rehealed with quartz and approximately 40 % pyrite.

### GEOCHEMICAL DATA:

Assays of core drilled in 1950 ranged from trace to 3.08 g/t Au over 30 cm core length (A.F. 91146). Assays of core drilled in 1992 ranged from trace to 6.7 g/t Au over 80 cm length (A.F. 93343). (Highest concentrations are recorded on Fig. 53E/9-3-1).

Gold concentrations in grab samples collected by Mancree Mines Limited in 1991, are recorded in Table 16.

**Table 16**  
**Concentrations of Au in grab samples from occurrence 3**  
**(Zolota) (A.F. 93343)**

| Sample No. | Au (g/t) |
|------------|----------|
| 17601      | 0.34     |
| 17602      | 6.69     |
| 17603      | 0.34     |
| 17604      | 0.69     |
| 17605      | 0.51     |
| 17606      | 1.89     |
| 17607      | 1.37     |
| 17608      | 0.34     |
| 17609      | 0.69     |
| 17610      | 0.69     |
| 17611      | 0.17     |
| 17612      | 0.34     |
| 17613      | 0.34     |
| 17614      | tr.      |
| 17615      | 7.20     |
| 17616      | 2.40     |
| 17617      | 0.86     |
| 17618      | 0.86     |
| 17619      | 0.17     |
| 17620      | 0.34     |
| 17621      | 0.69     |
| 17622      | 0.51     |
| 17623      | tr.      |
| 17624      | tr.      |
| 17625      | 0.51     |
| 17626      | 0.34     |
| 17627      | 0.34     |
| 17628      | 0.34     |
| 17629      | 0.17     |
| 17630      | 0.34     |
| 17631      | 0.17     |
| 17632      | 1.03     |

**CLASSIFICATION:**

Vein type deposit - multiple veins and lenses.

**REFERENCES:**

Assessment Files 91146, 91624, 91652, 91684, 91694,  
93343

Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P.

1985a: Loonfoot Island, Manitoba Department of Energy  
and Mines, Preliminary Map 1985 I-3, 1:20 000.

Godard, J.D.

1963: York Lake; Manitoba Mines and Natural  
Resources, Mines Branch, Map 59-3B, 1:63 360.

Mineral Inventory Card 53E/16 Au3

Manitoba Energy and Mines, Geological Services  
Branch.

Theyer, P.

1982: Island Lake area and Bird River Sill; in Manitoba  
Energy and Mines, Mineral Resources Division,  
Report of Field Activities, 1982, p. 55-57.

Wright, J.F.

1928: Island Lake area, Manitoba; in Geological  
Survey of Canada, Summary Report, 1927, pt. B,  
p. 54-80.



## **Section 6**

### **MINERAL DEPOSITS AND OCCURRENCES IN THE HAYWARD LAKE AREA (NTS 53F/12)**





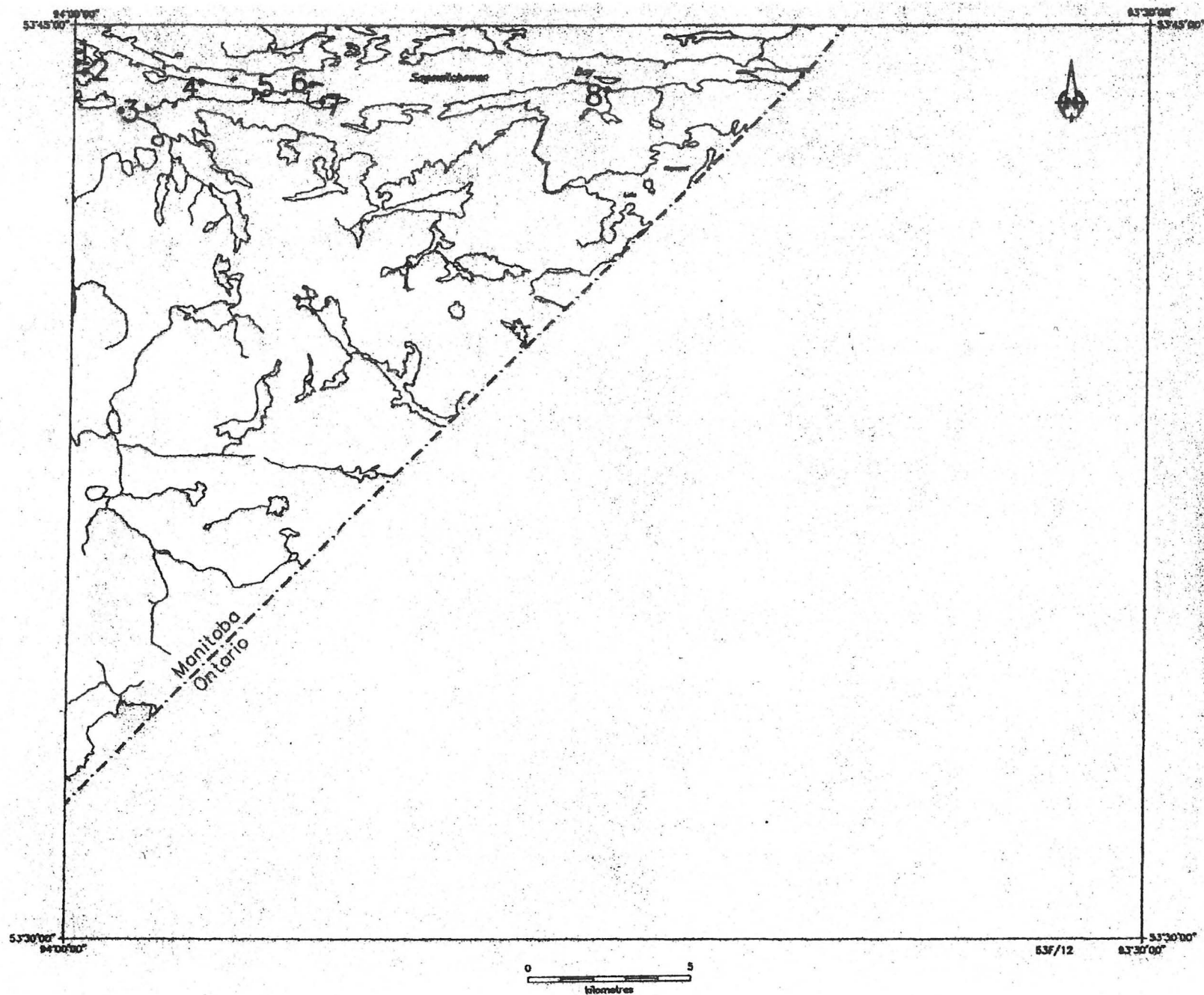
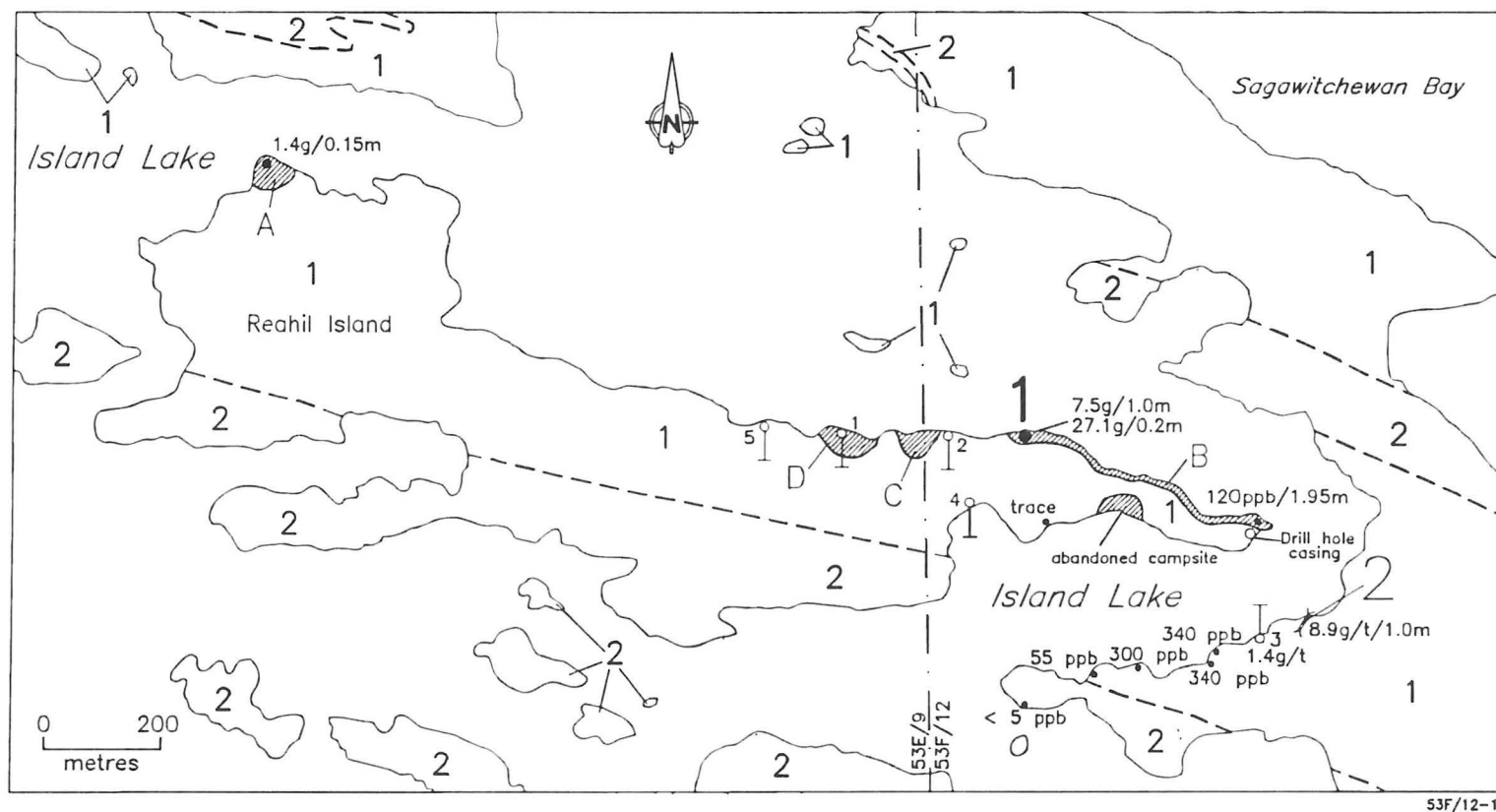


Figure 6: Location of mineral deposits and occurrences Hayward Lake area (NTS 53F/12).



- Early Intrusive Rocks  
 2 Mafic intrusive rocks  
 Hayes River Group  
 1 Mafic to intermediate volcanic rocks, flows, tuffs, breccias and related subvolcanic rocks  
 --- Geological contact (approximate)  
 —○ Drillhole, Hollinger Consolidated Gold Mines (A.F. 91162)  
 C Area stripped of overburden
- 1.4g/0.15m Channel chip sample, concentration of Au (g/tonne)/length(m)  
 Corona Corporation (A.F. 93500)
- 55 ppb Concentration of Au in grab sample  
 Cobham River Mines Limited (A.F. 93498)
- 8.9g/t/1.0m Pit; concentration of Au in channel sample  
 Hollinger Consolidated (A.F. 91162)
- 1 Occurrence location

Figure 72: Geological setting of occurrence 1. Geology modified from Corona Corporation (A.F. 93500) and W.B. Dunlop (pers. Comm., 1996).

## MINERAL DEPOSITS AND OCCURRENCES IN THE HAYWARD LAKE AREA (NTS 53F/12)

LOCATION: 1

NAME: Sundog

UTM: 5954773N/434166E

ACCESS: Via boat or float plane

AREA: Island Lake east; adjacent to the western edge of  
NTS 53F/12 (Fig. 6)

AIRPHOTO: A23465-74

### EXPLORATION SUMMARY:

A comprehensive review of the exploration history is given in Mineral Inventory Card 53F/12 Au2. In 1932 two claims were staked on Reahil Island and were assigned to the W.A.D. Syndicate in the following year. Three trenches were dug to seek the eastern extension of a gold-bearing quartz vein. In 1948 Hollinger Consolidated Gold Mines drilled five holes (94 m) on the "Sundog" group of claims that included Reahil Island and part of southwest Sagawitchewan Bay (Fig. 53E/9-1); (A.F. 91162). Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Godard (1963b) reported on the prospecting activities in this area. Canadian Aero Mineral Surveys Limited carried out an airborne EM and MAG survey over the area on behalf of Kerr Addison Mines Limited in 1965 (A.F. 91652 report; A.F. 91144 map). Kerr Addison Mines Limited conducted an airborne EM and MAG survey over the area in 1965 (A.F. 91144). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). BP Minerals Limited carried out geophysical and geochemical surveys and mapping in 1981 (A.F. 92731).

Cobham River Mines Limited staked, prospected and sampled Pointer Island, Reahil Island and Sagawitchewan Bay area in 1987. They identified and sampled a "main (quartz) vein" on northeast Reahil Island located in area "C" (Fig. 53E/9-1). The properties were subsequently transferred to Corona Corporation in 1988 (A.F. 93498). Corona Corporation conducted a geophysical survey including airborne VLF-EM, MAG and EM (A.F. 93500); follow-up work included stripping overburden in areas "A", "B", "C", and "D"; prospecting, detailed geological mapping of the trenches (1:100) and rock sampling; activities were concentrated on the northeast shore of Reahil Island (Fig. 72); (A.F. 93500).

### GEOLOGICAL SETTING:

The area of the occurrence is underlain by mafic to intermediate volcanic rocks of the Hayes River Group (Wright, 1928).

The volcanic rocks are moderately schistose, sericitized, silicified and carbonatized rocks hosting numerous east-striking, anastomosing 1 to 3 m long quartz-carbonate veins. Cobham River Mines Limited "main vein" on Reahil Island (located in area "C" on Fig. 72) consists of a vertically dipping, up to 2 m thick pinching and swelling and, in places, bifurcating quartz vein that is hosted by sheared mafic to

intermediate volcanic rock. Corona Corporation's "main vein" on Reahil Island consists of mm to 60 cm thick quartz-carbonate veins that are conformable to the schistosity, exposed in two trenches for up to 6 m along strike in area "C". Corona Corporation also described a white, massive quartz vein on the northeast corner of Reahil Island. It ranges from 1 to 1.5 m in thickness and is exposed over approximately 30 m along strike in area "B" (A.F. 93500); (Fig. 72).

### MINERALIZATION:

Sulphide mineralization in the quartz-carbonate veins consists of trace to 1% disseminated pyrite. In places, pyrite occurs in massive, several cm thick lenses and pockets. Sporadic occurrences of chalcopyrite, galena and sphalerite are present in the quartz-carbonate veins (P. Theyer, 1990, unpublished field notes). Minor pyrite was reported in the quartz vein exposed in area "B" by Corona Corporation (A.F. 93500); (Fig. 72).

### GEOCHEMICAL DATA:

DDH 2 by Hollinger Consolidated (Fig. 72) assayed a maximum of 2 g/t Au. DDH 4 returned trace amounts of Au. A 1.7 m chip sample across a quartz vein returned 16.5 g/t Au (A.F. 91162).

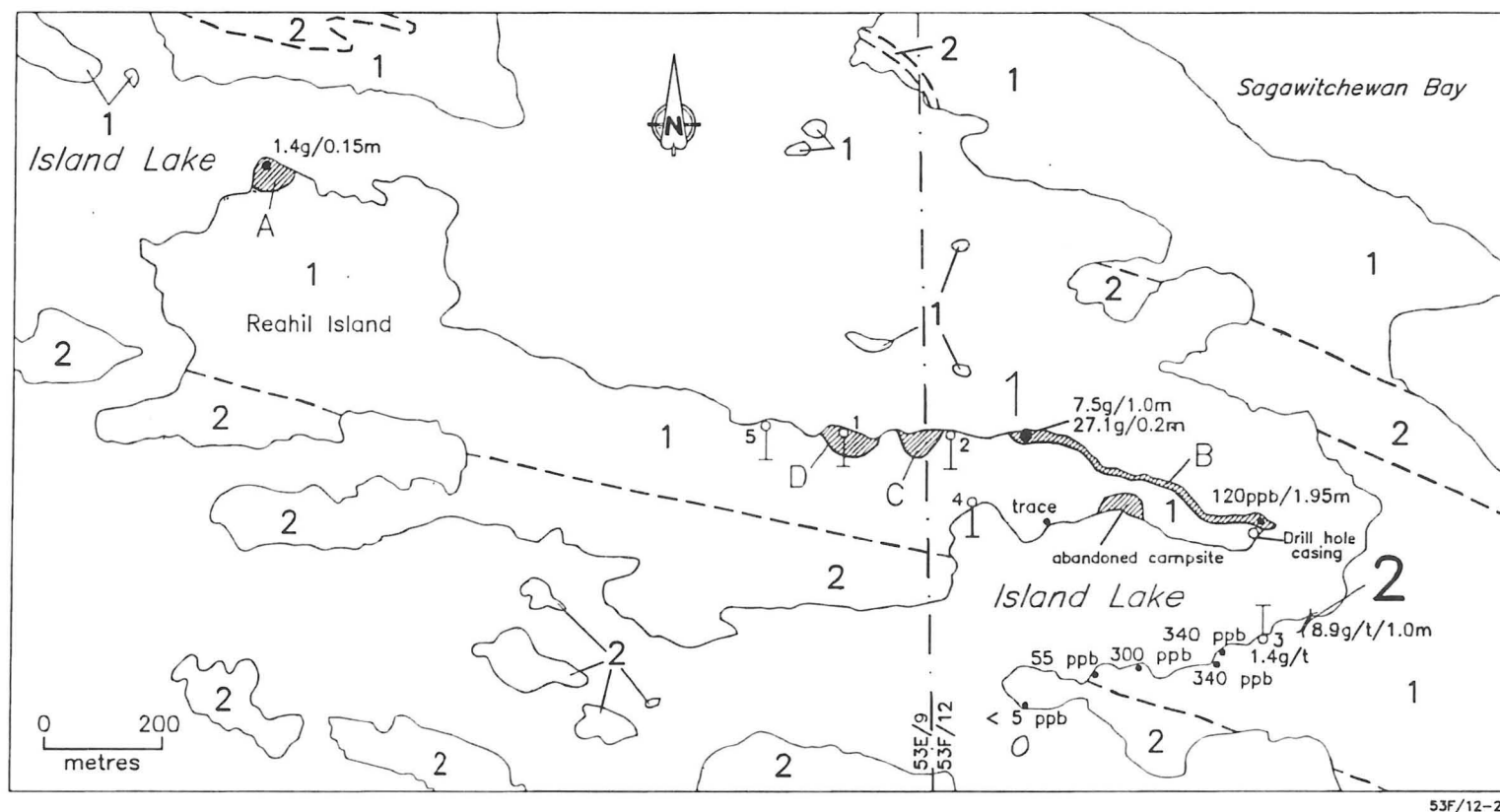
Assays of grab samples from the "main vein" of Cobham River Mines Limited ranged from 4.53 to 133.37 g/t Au. Channel samples collected by Corona Corporation across the quartz vein exposed in area B that appears to be the previously quoted Cobham River Mines "main vein" (Fig. 53E/9-1) assayed 5 to 290 ppb Au (A.F. 91162).

### CLASSIFICATION:

Vein type deposit - multiple veins.

### REFERENCES

- Assessment Files 91144, 91162, 91624, 91652, 91694, 92731, 93498, 93500  
Manitoba Energy and Mines, Mines Branch.
- Godard, J.D.  
1963a: Geology of the Sagawitchewan Bay area; Manitoba Mines and Natural Resources, Mines Branch, Publication 60-2, 28p.  
1963b: Sagawitchewan Bay; Manitoba Mines and Natural Resources, Mines Branch, Map 60-2, 1:63 360.
- Mineral Inventory Card 53F/12 Au2  
Manitoba Energy and Mines, Geological Services Branch.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



- Early Intrusive Rocks  
 2 Mafic intrusive rocks  
 Hayes River Group  
 1 Mafic to intermediate volcanic rocks, flows, tuffs, breccias and related subvolcanic rocks  
 --- Geological contact (approximate)  
 —○ Drillhole, Hollinger Consolidated Gold Mines (A.F. 91162)  
 C Area stripped of overburden
- 1.4g/0.15m Channel chip sample, concentration of Au (g/tonne)/length(m)  
 Corona Corporation (A.F. 93500)
- 55 ppb Concentration of Au in grab sample  
 Cobham River Mines Limited (A.F. 93498)
- 8.9g/t/1.0m Pit; concentration of Au in channel sample  
 Hollinger Consolidated (A.F. 91162)
- 2 Occurrence location

Figure 73: Geological setting of occurrence 2. Geology modified from Corona Corporation (A.F. 93500) and W.B. Dunlop (pers. Comm., 1996).

LOCATION: 2

NAME: (A.F.-Mineralization intersected by diamond drilling)  
UTM: 5954541N/434404E  
ACCESS: Via boat or float plane  
AREA: Island Lake east; southwest of Sagawitchewan Bay  
(Fig. 6)  
AIRPHOTO: A23465-74

EXPLORATION SUMMARY:

A comprehensive review of the exploration history is given in Mineral Inventory Card 53F/12 Au2. In 1948 Hollinger Consolidated Gold Mines drilled five holes (94 m) on the Sundog group of claims that included Reahil Island and part of southwest Sagawitchewan Bay (Fig. 53E/9-2); (A.F. 91162). Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Canadian Aero Mineral Surveys Limited carried out an airborne EM and MAG survey over the area on behalf of Kerr Addison Mines Limited in 1965 (A.F. 91652 report; A.F. 91144 map). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). BP Minerals carried out geological mapping (various scales) and prospecting in 1981 (A.F. 92731). Cobham River Mines Limited staked Pointer Island and Reahil Island in 1987 (A.F. 93498) and transferred the property to Corona Corporation in 1988. Corona Corporation completed a geophysical survey that included airborne VLF-EM, MAG and EM surveys (A.F. 93500); follow-up work included prospecting, geological mapping (1:1 000 scale) and rock sample programs that were concentrated on the north shore of Reahil Island and on an outcrop southeast of the east tip of this island (A.F. 93500).

GEOLOGICAL SETTING:

The area of the occurrence is underlain by moderately to extensively schistose, sericitized, silicified and carbonatized, mafic to intermediate volcanic rocks of the Hayes River Group (Wright, 1928). These rocks host a number of (1 to 5% of the surface) east-striking, anastomosing 1 to 3 m long by up to 1 m thick quartz-carbonate-(ankerite) veins (Fig. 73).

MINERALIZATION:

Traces of pyrite occur in a quartz-ankerite vein exposed southeast of Reahil Island.

GEOCHEMICAL DATA:

DDH 3 by Hollinger Consolidated intersected quartz stringers containing 3.4 g/t Au. A 1 m chip sample across a quartz vein assayed 8.9 g/t Au (A.F. 91162); (Fig. 73).

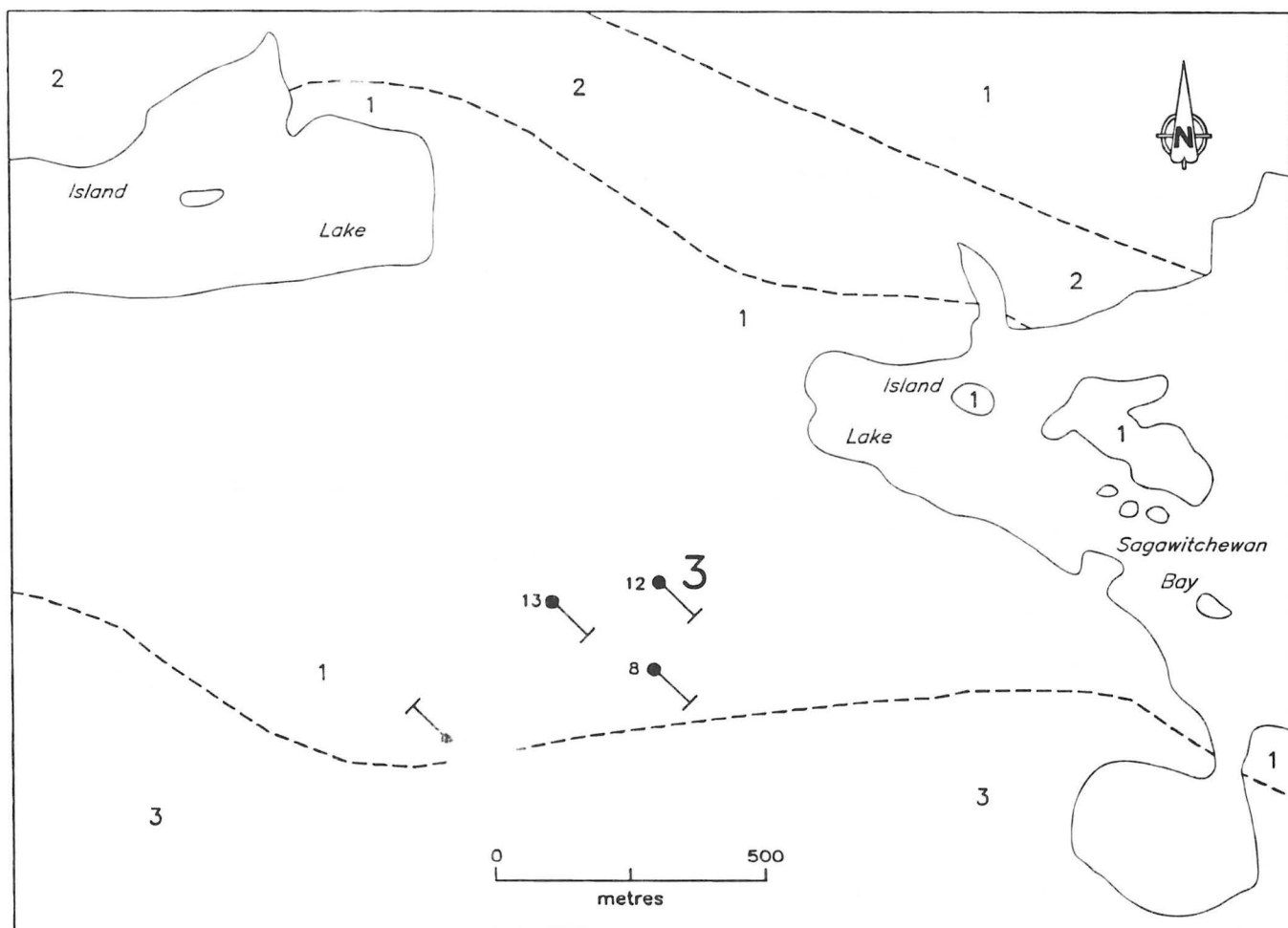
Gold concentrations ranging from <5 ppb to 340 ppb were reported occurring in quartz veins located on southeast Reahil Island and across the channel on southwestern Sagawitchewan Bay (A.F. 93498); (Fig. 73).

CLASSIFICATION:

Vein type deposit - multiple veins.

REFERENCES

- Assessment Files 91144, 91162, 91624, 91652, 91694, 92731, 93498, 93500  
Manitoba Energy and Mines, Mines Branch.
- Godard, J.D.  
1963: Sagawitchewan Bay; Manitoba Mines and Natural Resources, Mines Branch, Map 60-2, 1:63 360.
- Mineral Inventory Card 53F/12 Au2  
Manitoba Energy and Mines, Geological Services Branch.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



53F/12-3

**Early Intrusive Rocks**

3 Tonalite, granodiorite

2 Mafic intrusive rocks

**Hayes River Group**

1 Mafic volcanic flows and fragmental rocks

--- Geological contact (approximate)

● Drillhole, Kerr Addison Mines Limited  
(A.F. 91402)

**3** Occurrence location

Figure 74: Geological setting of occurrence 3. Geology compiled from Godard (1963).

LOCATION: 3

NAME: (A.F.-Mineralization intersected by diamond drilling)  
UTM: 5953378N/435563E  
ACCESS: Via boat or float plane  
AREA: Island Lake east; Sagawitchewan Bay (Fig. 6)  
AIRPHOTO: A23068-164

#### EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Canadian Aero Mineral Surveys Limited carried out an airborne EM and MAG survey over the area on behalf of Kerr Addison Mines Limited in 1965. Anomaly 67 was classified as a localized conductor without an associated MAG anomaly (A.F. 91652 report; A.F. 91144 map). In 1966, Kerr Addison Mines Limited staked six claims in the area of the anomaly (claim group "C"), conducted an EM survey (A.F. 91160) and drilled 117 m in four holes (A.F. 91402). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). The property was staked by Cobham River Mines in 1987 and transferred to Corona Corporation in 1988; no work was reported by this company for this area.

#### GEOLOGICAL SETTING:

The area of the occurrence is underlain by volcanic flows and fragmental rocks of the Hayes River Group (Wright, 1928). The southern boundary of the Island Lake greenstone belt, demarcated by late tonalitic, quartz dioritic and granitic intrusions, occurs nearby (Fig. 74).

DDH 7 intersected 21.3 m of fine grained andesite. DDH 8 (18 m) intersected mostly massive andesite, except for amphibolite in the last 3 metres. DDH 12 (43 m) intersected silicified andesite throughout its length. DDH 13 (35.4 m) intersected silicified andesite throughout most of the length, the hole ended in amphibolite (A.F. 91402).

#### MINERALIZATION:

A 5.2 m mineralized zone in fine grained andesite from DDH 7 contained up to 25% sulphides including pyrite, pyrrhotite and, in places, chalcopyrite. A 7.1 m weakly mineralized zone in massive andesite from DDH 8 contained trace to 5% pyrrhotite and pyrite; down hole, a 3.7 m

mineralized zone in massive andesite contained solid sulphide including pyrite, pyrrhotite and minor chalcopyrite. A 5.4 m mineralized zone in silicified andesite from DDH 12 contained near-solid pyrite, minor pyrrhotite and, in places, minor chalcopyrite. A 11.1 m mineralized zone in silicified andesite contains disseminations and/or stringers of up to 4% pyrrhotite, pyrite and minor chalcopyrite (A.F. 91402).

#### GEOCHEMICAL DATA:

A core sample from DDH 7 assayed 0.04% Cu, 0.18% Zn, nil Ni and nil Au. Two core samples from DDH 8 assayed up to 0.04% Cu, up to 0.2% Zn, nil Ni and nil Au. Five core samples from DDH 12 assayed up to 0.04% Cu, trace Zn, up to 0.02% Ni and nil Au. Two core samples from DDH 13 assayed up to 0.05% Cu, trace Zn, 0.02% Ni and nil Au (A.F. 91402).

#### CLASSIFICATION:

Stratabound massive sulphide type deposit - volcanic rock associated.

#### REFERENCES

- Assessment Files 91144, 91160, 91402, 91624, 91652, 91694  
Manitoba Energy and Mines, Mines Branch.
- Godard, J.D.  
1963: Sagawitchewan Bay; Manitoba Mines and Natural Resources, Mines Branch, Map 60-2, 1:63 360.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



LOCATION: 4

NAME: Cowen

UTM: 5954138N/438015E

ACCESS: Via boat or float plane

AREA: Island Lake east; Sagawitchewan Bay (Fig. 6)

AIRPHOTO: A23068-261

#### EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Canadian Aero Mineral Surveys Limited carried out an airborne EM and MAG survey over the area on behalf of Kerr Addison Mines Limited in 1965 (A.F. 91652 report; A.F. 91144 map). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). Cobham River Mines Limited staked, prospected and sampled the area in 1987 (A.F. 93498). The property was transferred to Corona Corporation in 1988. Corona Corporation conducted an airborne MAG, VLF-EM and EM survey over the area, and trenching and sampled selected mineral occurrences (A.F. 93500).

#### GEOLOGICAL SETTING:

The area of the occurrence is underlain by mafic volcanic flows and fragmental rocks of the Hayes River Group (Wright, 1928) (Fig. 75).

Cobham River Mines reported a 1 x 0.25 m exposure of a partially submerged quartz vein, that they considered to be the "Cowen showing" (A.F. 93498). Corona Corporation reported sampling "three narrow quartz veins" southwest of Indian Island, in the approximate area of the Cowen occurrence (A.F. 93500). A 110° striking shear zone in mafic volcanic rock is characterized by an approximately 1 m wide, bleached, sericite schist layer that hosts a quartz vein with ankerite and minor fuchsite in lenses and pockets.

#### MINERALIZATION:

Staff of Cobham River Mines Limited reported minor pyrite and fuchsite in a sampled quartz vein presumed to be the Cowen mineral occurrence (A.F. 93498). Approximately 1% pyrite and traces of galena occur in pockets and clusters (P. Theyer, 1990, unpublished field notes).

#### GEOCHEMICAL DATA:

Grab samples of quartz veins collected by Cobham River Mines Limited in 1989 assayed 60 and 110 ppb Au (A.F. 93498). Grab samples collected by Corona Corporation in 1989 assayed 110 to 240 ppb Au (A.F. 93500).

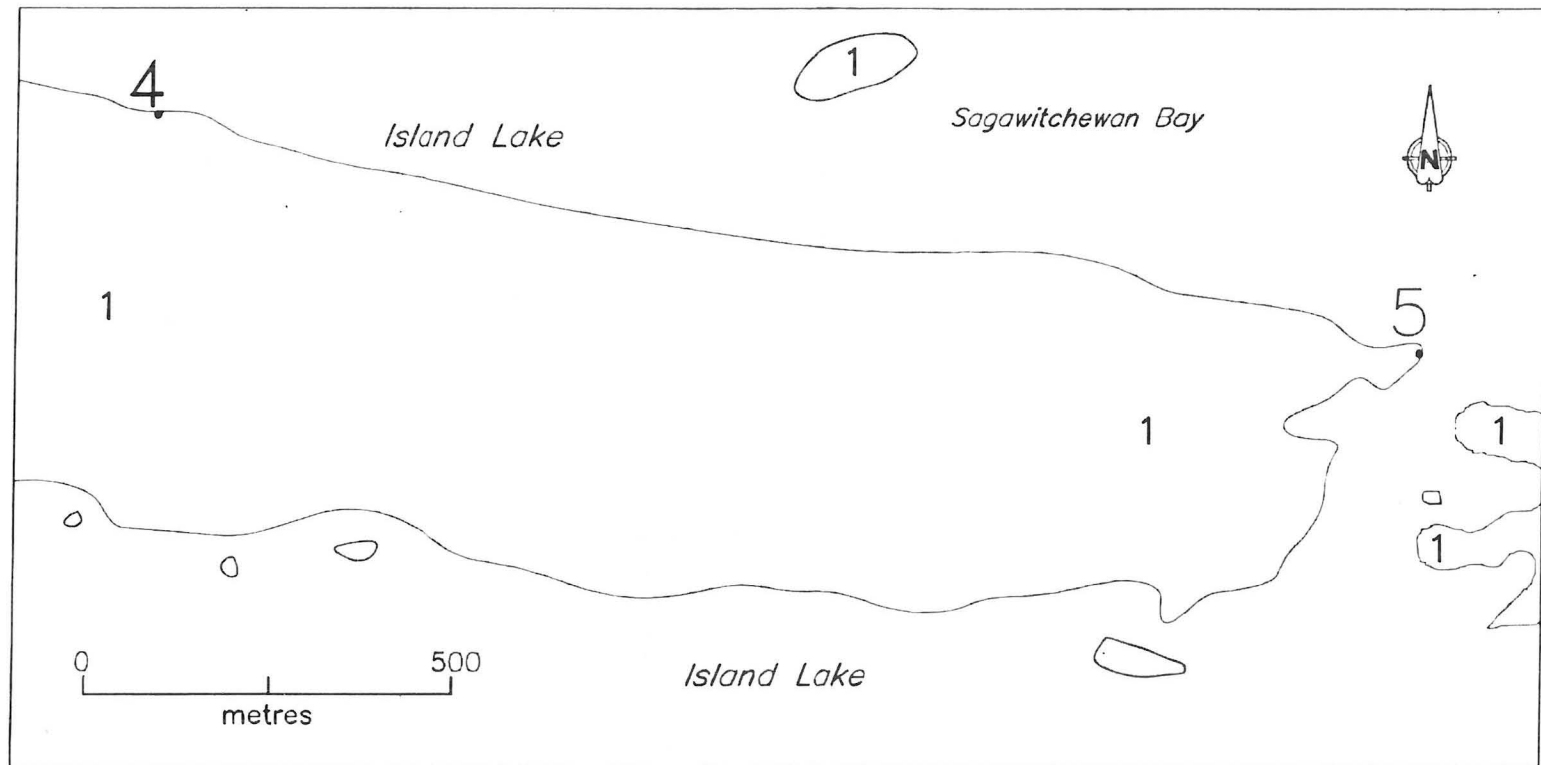
#### CLASSIFICATION:

Vein type deposit - multiple veins.

#### REFERENCES

- Assessment Files 91144, 91624, 91652, 91694, 93498, 93500  
Manitoba Energy and Mines, Mines Branch.
- Godard, J.D.  
1963: Sagawitchewan Bay; Manitoba Mines and Natural Resources, Mines Branch, Map 60-2, 1:63 360.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.





53F/12-4

Hayes River Group

1 Mafic volcanic flows and  
related intrusive rocks

• 4 Occurrence location

Figure 75: Geological setting of occurrence 4. Geology compiled from Godard, (1963).

LOCATION: 5

NAME:

UTM: 5953875N/439681E

ACCESS: Via boat or float plane

AREA: Island Lake east; Sagawitchewan Bay (Fig. 6)

AIRPHOTO: A23068-261

#### EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Canadian Aero Mineral Surveys Limited carried out an airborne EM and MAG survey over the area on behalf of Kerr Addison Mines Limited in 1965 (A.F. 91652 report; A.F. 91144 map). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). Cobham River Mines Limited staked, prospected, blasted and sampled the area in 1987 (A.F. 93498). The property was transferred to Corona Corporation in 1988. Corona Corporation conducted an airborne MAG, VLF-EM and EM survey over the area, and trenched and sampled selected mineral occurrences (A.F. 93500).

#### GEOLOGICAL SETTING:

The area of the occurrence is underlain by mafic volcanic flows and fragmental rocks of the Hayes River Group (Wright, 1928).

Cobham River Mines reported an east-striking quartz vein, up to 1 m thick, exposed for approximately 10 m on strike. The host rocks to this vein are mafic volcanic rocks (A.F. 93498). Corona Corporation reported sampling a narrow quartz vein exposed for several metres (A.F. 93500);(Fig. 76).

#### MINERALIZATION:

Cobham River Mines Limited reported "very minor" pyrite mineralization in vein quartz (A.F. 93498).

#### GEOCHEMICAL DATA:

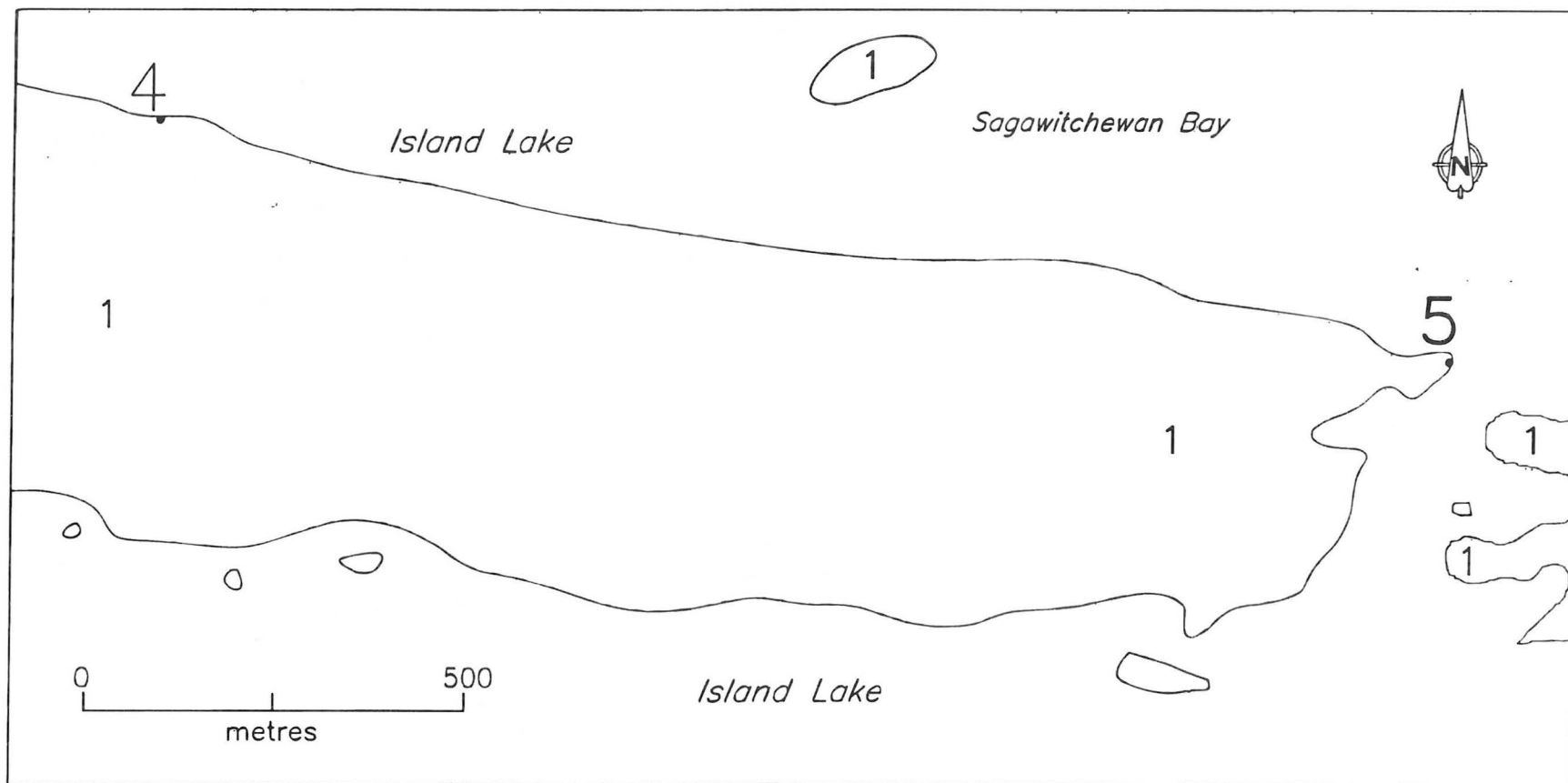
Four grab samples of the quartz vein collected by Cobham River Mines Limited in 1989 assayed trace to 170 ppb (A.F. 93498). A grab sample collected by Corona Corporation in 1989 assayed 140 ppb Au (A.F. 93500).

#### CLASSIFICATION:

Vein type deposit - single vein.

#### REFERENCES

- Assessment Files 91144, 91624, 91652, 91694, 93498, 93500  
Manitoba Energy and Mines, Mines Branch.
- Godard, J.D.  
1963: Sagawitchewan Bay; Manitoba Mines and Natural Resources, Mines Branch, Map 60-2, 1:63 360.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



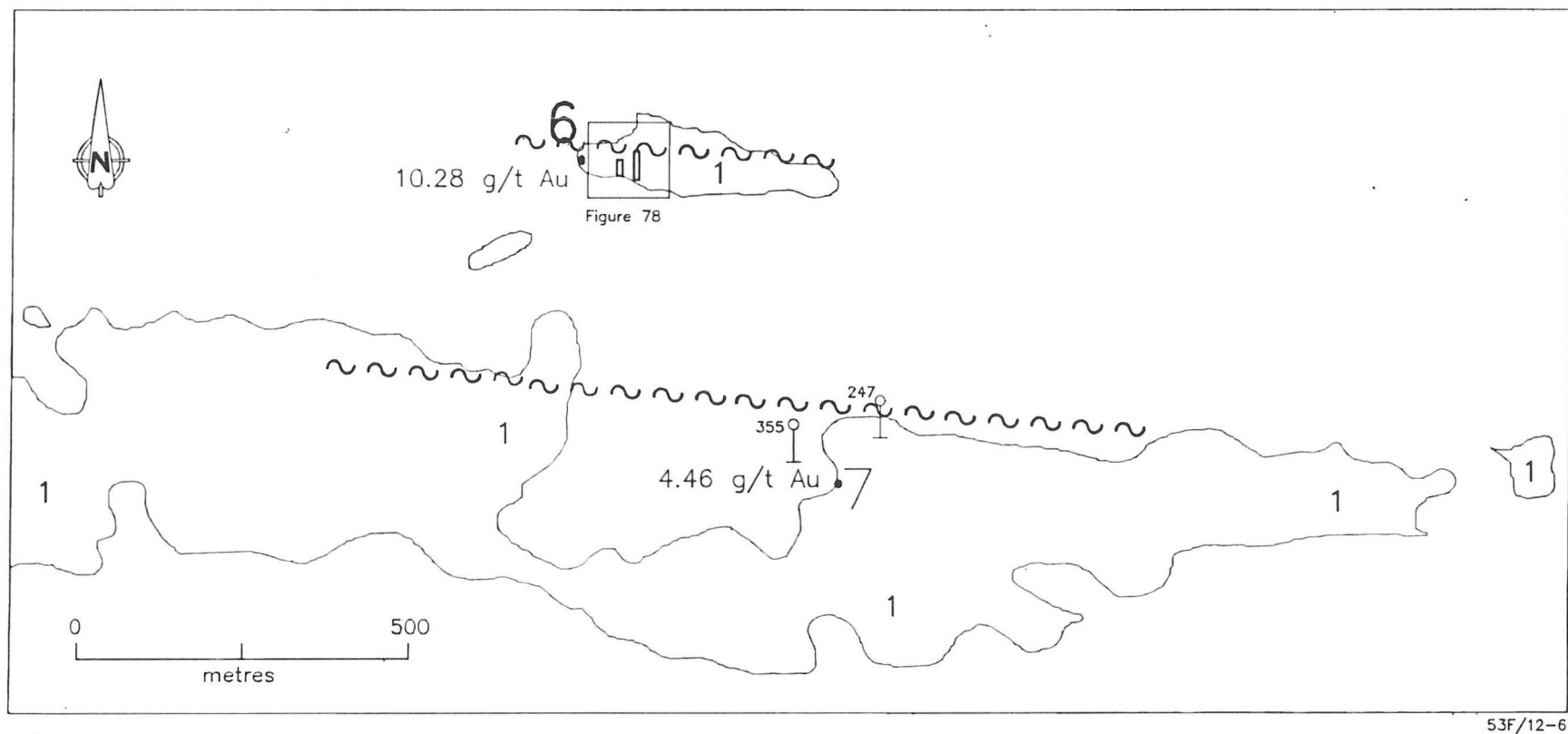
53F/12-5

Hayes River Group

1 Mafic volcanic flows and  
related intrusive rocks

• 5 Occurrence location

Figure 76: Geological setting of occurrence 5. Geology compiled from Godard, (1963).



53F/12-6

Hayes River Group

1 Mafic volcanic flows and  
related intrusive rocks

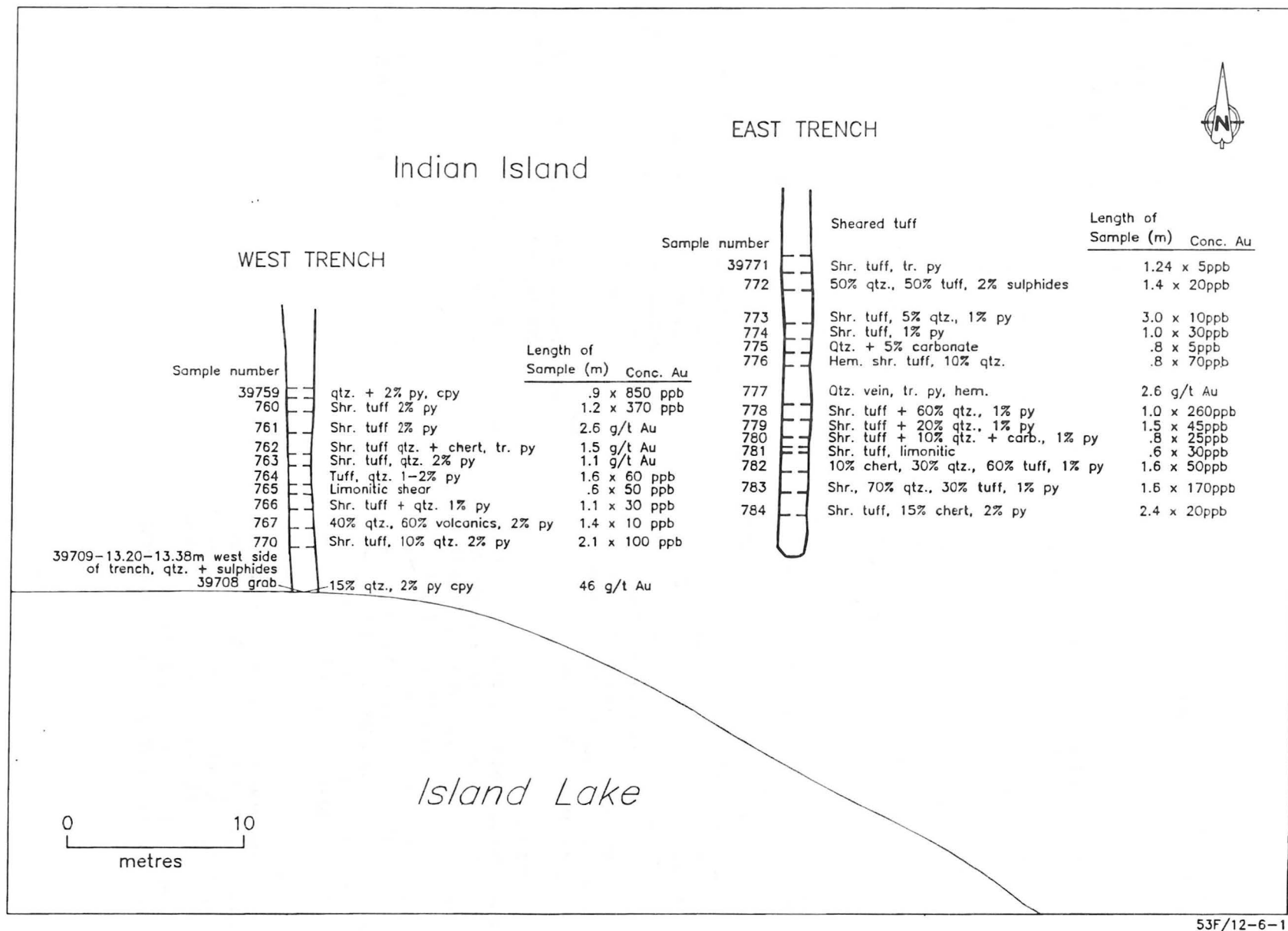
—○ Drillhole, Ventures Limited  
355 (A.F. 91161)

~~ Shear zone

= Trench

•6 Occurrence location

Figure 77: Geological setting of occurrence 6. Geology modified from Godard, (1963b) and Theyer (unpublished information).



53F/12-6-1

Figure 78: Location of trenches and assay results of occurrence 6. Compiled from Corona Corporation (A.F. 93500).

LOCATION: 6

NAME: Indian

UTM: 5954070N/441476E

ACCESS: Via boat or float plane

AREA: Island Lake east; Sagawitchewan Bay (Fig. 6)

AIRPHOTO: A23067-14

#### EXPLORATION SUMMARY:

A comprehensive review of the exploration history is given in Mineral Inventory Card 53F/12 Au1. Initial staking of the occurrence took place in 1932. The property was assigned to Ventures Limited which prospected, trenched and drilled two 184 m holes in 1935 (A.F. 91161). McMurphy (1944) reported sampling a quartz vein 0.5 m thick and at least 60 m long. The island was restaked for San Antonio Gold Mines Limited in 1945, and a subsidiary was created to explore the property; results are unknown. Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Godard (1963a) reported on prospecting activities on the island. Canadian Aero Mineral Surveys Limited carried out an airborne EM and MAG survey over the area on behalf of Kerr Addison Mines Limited in 1965 (A.F. 91652 report; A.F. 91144 map). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). Cobham River Mines Limited staked and prospected the island in 1987 (A.F. 93498). The property was transferred to Corona Corporation in 1988. Corona Corporation carried out an airborne VLF-EM, MAG and EM survey; follow-up work at this location included prospecting, cleaning of two rubble-covered trenches and rock sampling programs (A.F. 93399, 93500).

#### GEOLOGICAL SETTING:

The area of the occurrence is underlain by moderately to extensively schistose, sericitized, silicified and carbonatized mafic to intermediate volcanic rocks of the Hayes River Group (Wright, 1928). McMurphy (1944) reported that a quartz vein up to 0.5 m thick extends at least 60 m on strike on this island. The southern half of the island is underlain by sheared silicified, sericitized rock whereas the northern half is underlain by undeformed homogeneous fine grained mafic rocks (P. Theyer, 1980, unpublished field notes); (Fig. 77).

#### MINERALIZATION:

McMurphy (1944) reported quartz "well mineralized with pyrite". Pockets of earthy and coarsely crystalline pyrite occur randomly distributed in a sheared, silicified, iron oxide stained schist. Fuchsite is exposed in two trenches (P. Theyer, 1980, unpublished field notes). Corona Corporation produced detailed lithologic and rock sampling records of two trenches (A.F. 93399); (Fig. 78).

#### GEOCHEMICAL DATA:

McMurphy (1944) reports a grab sample of a quartz vein assaying approximately 300 ppb Au ("26 cents Au per ton"). Assays of two rust-stained quartz samples mineralized with pyrite by Cobham River Mines Limited returned 13.1 and 32.9 g/t Au (A.F. 93498). Rock samples collected by Corona Corporation from the westernmost trench contained from 10 ppb to 26 g/t Au (A.F. 93500); (Fig. 78). Noranda Exploration Company Limited reported that twelve rock samples collected from a quartz vein with trace chalcopyrite assayed from trace to 6.86 g/t Au. Additional grab samples include "quartz vein boulders" with 10% pyrite and trace galena and chalcopyrite that assayed 10.28 g/t Au, and quartz boulders with 3% pyrite that assayed 1.03 g/t Au (A.F. 93399).

#### CLASSIFICATION:

Vein type deposit - multiple veins or lenses.

#### REFERENCES

- Assessment Files 91144, 91161, 91624, 91652, 91694, 93399, 93498, 93500  
Manitoba Energy and Mines, Mines Branch.
- Godard, J.D.  
1963a: Geology of the Sagawitchewan Bay area; Manitoba Mines and Natural Resources, Mines Branch, Publication 60-2, 28p.  
1963b: Sagawitchewan Bay; Manitoba Mines and Natural Resources, Mines Branch, Map 60-2, 1:63 360.
- McMurphy, R.C.  
1944: Geology of the Island Lake area of Manitoba; The Precambrian, September 1944, p. 4-9.
- Mineral Inventory Card 53F/12 Au1  
Manitoba Energy and Mines, Geological Services Branch.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.

LOCATION: 7

NAME:

UTM: 5953618N/441796E

ACCESS: Via boat or float plane

AREA: Island Lake east; Sagawitchewan Bay (Fig. 6)

AIRPHOTO: A23067-15

EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Canadian Aero Mineral Surveys Limited carried out an airborne EM and MAG survey over the area on behalf of Kerr Addison Mines Limited in 1965 (A.F. 91652 report; A.F. 91144 map). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). Cobham River Mines Limited staked, prospected and rock sampled the area in 1987 (A.F. 93498). The property was transferred to Corona Corporation in 1988. Corona Corporation conducted an airborne MAG, VLF-EM and EM survey over the area and trenched and sampled of selected mineral occurrences (A.F. 93399, 93500). There is a sand- and clay- filled trench approximately 18 x 1 x 1 m in sheared mafic rock at this location (P. Theyer, 1990, unpublished field notes).

GEOLOGICAL SETTING:

The area of the occurrence is underlain by mafic volcanic flows and fragmental rocks of the Hayes River Group (Wright, 1928); (Fig. 79). Cobham River Mines observed thin (< 2 cm) and thick (up to 7.6 cm thick) quartz veins up to 1 m in length (A.F. 93498). Noranda Mines Limited reported that in this area an up to 100 m wide east-striking shearzone in mafic to intermediate volcanic rocks hosts sulphide-bearing quartz veins.

MINERALIZATION:

Cobham River Mines Limited reported minor pyrite and possible galena in vein quartz (A.F. 93498). Up to 3% pyrite and traces of galena were observed in chlorite schist that containing minor quartz veins (A.F. 93399). Up to 1% pyrite occurred in sheared mafic volcanic rock adjacent to the 18 x 1 x 1 m trench.

GEOCHEMICAL DATA:

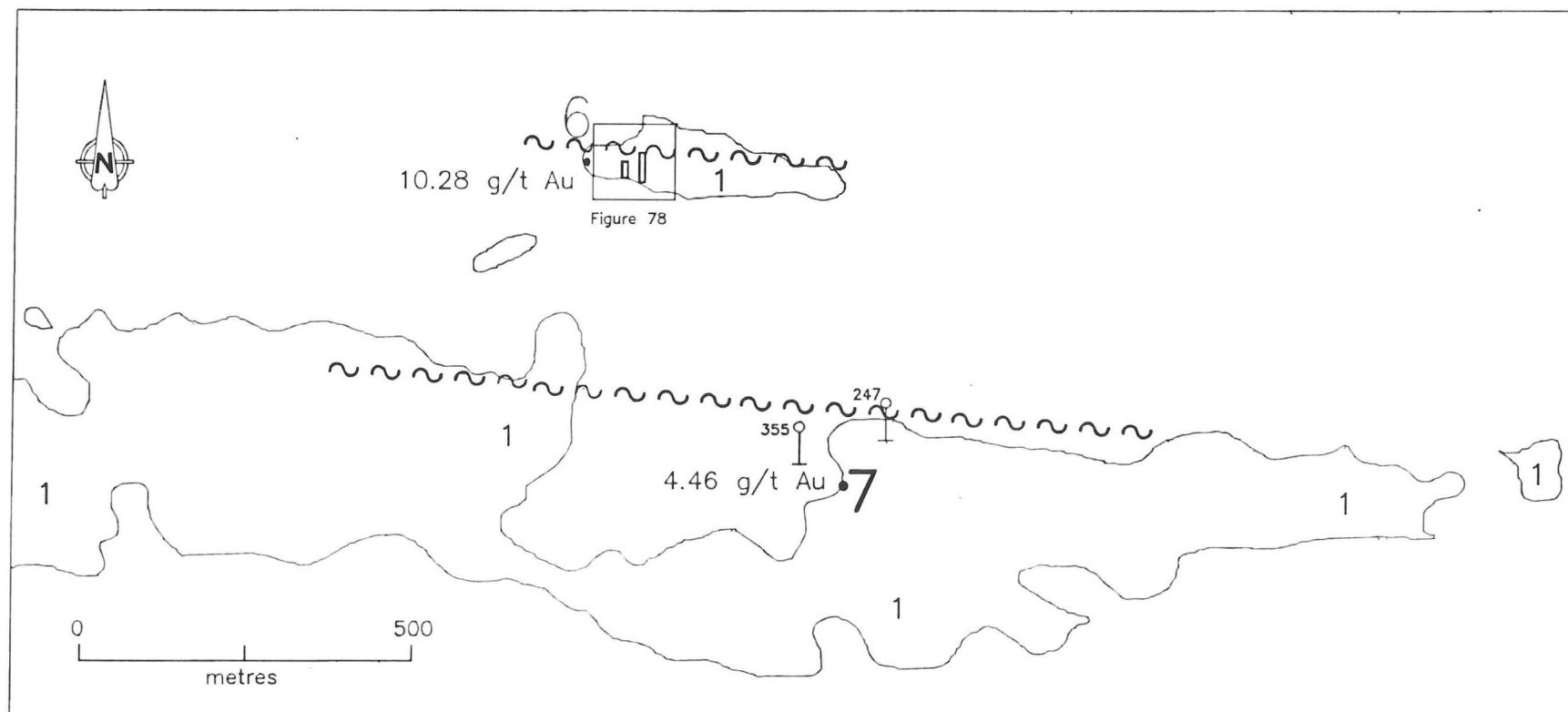
Grab samples of quartz veins collected by Cobham River Mines Limited in 1989 returned 60 and 110 ppb Au (A.F. 93498). Grab samples collected by Noranda Mines Limited in 1990 returned trace to 4.46 g/t Au (A.F. 93399).

CLASSIFICATION:

Vein type deposit - multiple quartz veins.

REFERENCES

- Assessment Files 91144, 91624, 91652, 91694, 93399, 93498, 93500  
Manitoba Energy and Mines, Mines Branch.
- Godard, J.D.  
1963: Sagawitchewan Bay; Manitoba Mines and Natural Resources, Mines Branch, Map 60-2, 1:63 360.
- Wright, J.F.  
1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



53F/12-7

Hayes River Group

1 Mafic volcanic flows and  
related intrusive rocks

—○ Drillhole, Ventures Limited  
(A.F. 91161)

~ ~ Shear zone

— Trench

• 7 Occurrence location

Figure 79: Geological setting of occurrence 7. Geology modified after Godard, (1963).



LOCATION: 8

NAME: (A.F.-Mineralization intersected by drilling)  
UTM: 5953777N/450549E  
ACCESS: Boat or float plane  
AREA: Island Lake east; Sagawitchewan Bay (Fig. 6)  
AIRPHOTO: A23067-33

#### EXPLORATION SUMMARY:

Canadian Nickel Company Limited conducted an AEM survey over the Island Lake area in 1957 under Airborne Permit 19 (A.F. 91624). Canadian Aero Mineral Surveys Limited carried out an airborne EM and MAG survey over the area on behalf of Kerr Addison Mines Limited in 1965 (A.F. 91652 report; A.F. 91144 map).

In 1966, Kerr Addison Mines Limited staked their Group "A" claims to cover 36 AEM anomalies in the eastern half of Sagawitchewan Bay (A.F. 91144) and drilled 32 holes (3010 m) to test most of these anomalies (A.F. 91402). International Nickel Company of Canada Limited conducted an AEM survey over the area in 1972 under Airborne Permit 102 (A.F. 91694). The property was staked by Cobham River Mines in 1987 and transferred to Corona Corporation in 1988.

#### GEOLOGICAL SETTING:

The area of the occurrence is underlain by mafic, intermediate and felsic volcanic flows and fragmental rocks; greywacke, siltstone argillite and by mafic intrusive rocks of the Hayes River Group (Wright, 1928). Graphitic and silicified tuff layers, in places containing disseminated to massive sulphides, appear to produce abundant AEM anomalies (A.F. 91144). The following are descriptions of drillholes that intersected sulphide-bearing strata. DDH 10 intersected graphitic tuff containing pyrrhotite and minor pyrite. DDH 11 intersected andesite and graphitic tuff. DDH 16 intersected andesite and a silicified zone containing semi-massive pyrrhotite. DDH 22 intersected andesite and rhyolite in places weakly graphitic and mineralized with disseminated to patchy pyrrhotite. DDH A-1, A-2, A-3, A-4 intersected rhyolite, dacite and up to 2 m thick near solid sulphide to solid sulphide layers.

DDH A-5 intersected interlayered rhyolite and amphibolite. DDH A-6, A-7, A-8, A-9 and A-10 intersected andesite, rhyolite and amphibolite. DDH A-16 intersected rhyolite. DDH A-17 intersected andesite, rhyolite and a felsic dyke. DDH A-19 intersected fine grained andesite, a layer of diorite and quartz biotite gneiss containing narrow bands of biotite. DDH A-23 intersected andesite and a silicified zone containing pyrite (A.F. 91402); (Fig. 80).

#### MINERALIZATION:

An 11 m section of graphitic felsic tuff from DDH 10 contained up to 3% pyrrhotite and pyrite. A 10.1 m section of graphitic andesite from DDH 11 contained pyrrhotite bands and blebs. A 3.5 m section of silicified rhyolite from DDH A-1 contained up to 2% pyrite and pyrrhotite lenses and stringers. A 1 m section of rhyolite from DDH A-2 contained a layer of solid pyrrhotite and minor pyrite layer. Rhyolite from DDH A-3

contained a 2 m sulphide-rich section with up to 50% pyrrhotite and minor pyrite. A 3 m section of graphite- and sulphide-bearing rhyolite from DDH A-4 contained pyrrhotite, pyrite and sphalerite. A total of 7 m of rhyolite from DDH A-5 contained up to 6% pyrrhotite. A 1.5 m section of rhyolite from DDH A-8 contained up to 5% pyrrhotite and pyrite in patches and veins. Rhyolite, graphite-bearing tuff and amphibolite from the 54.5 m long DDH A-9 contained 1% disseminated and, in places, blebby pyrite and pyrrhotite.

A 32.6 m section of rhyolite from DDH A-16 contained finely disseminated pyrite and locally solid pyrrhotite layers and, chalcopyrite and sphalerite blebs. A 11.5 m section of rhyolite and andesite from DDH A-17 contained up to 5% pyrrhotite and pyrite. A 11.6 m section of fine grained andesite from DDH A-18 contained pyrite and pyrrhotite in blebs and narrow veinlets. A 2.1 m mineralized zone in fine grained andesite from DDH A-19 contained narrow pyrite bands. A 2.7 m silicified, cherty zone in sheared andesite from DDH A-23 contained fine grained visible pyrite. A 4.1 m section of rhyolite from DDH A-25 contained 6 to 8% pyrrhotite stringers. A 13.1 m andesite and rhyolite section from DDH A-28 contained banded pyrite and pyrrhotite blebs. A 2.1 m graphitic tuff section from DDH A-30 contained an estimated 5 to 8% pyrrhotite and pyrite. A 24.3 m section of quartz-hornblende-biotite gneiss contained narrow sections with up to 5% pyrite and pyrrhotite (A.F. 91402).

#### GEOCHEMICAL DATA:

A 0.6 m drill core sample from DDH 22 assayed trace Au. A 3 m drill core sample from DDH A-1 assayed 0.3 g/t Au, trace Ag and trace Ni. A 1 m drill core sample from DDH A-2 assayed trace Au and trace Ni. A 2.5 m drill core sample from DDH A-3 assayed trace Au and trace Ni. A 1.5 m drill core sample from DDH A-5 assayed trace Au, trace Cu and trace Ni. Drill core samples from DDH A-8 assayed trace Au, up to 0.02% Cu and 0.02% Ni. A 0.3 m drill core sample from DDH A-10 assayed 0.01% Cu and 0.01% Ni. A 0.6 m drill core sample from DDH A-14 (location of drillhole collar undetermined) assayed 0.7 g/t Au, 0.02% Cu and 0.01% Ni. Drill core samples ranging from 0.3 m to 2.3 m from DDH A-15 (location of drillhole collar undetermined) assayed nil Au, nil Ag, up to 0.07% Cu and up to 0.02% Ni. A 1.5 m drill core sample from DDH A-18 assayed nil Au. A 2 m drill core sample from DDH A-19 assayed trace Au. Drill core samples ranging from 0.6 m to 1.2 m length from DDH A-20 assayed trace and nil Au, and nil Ni. A 1.5 m drill core sample from DDH A-21 assayed nil Au and nil Ni. A 2.7 m drill core sample from DDH A-23 assayed trace Au (A.F. 91402).

#### CLASSIFICATION:

Chemical sediment type deposit - sulphide facies iron formation.

#### REFERENCES

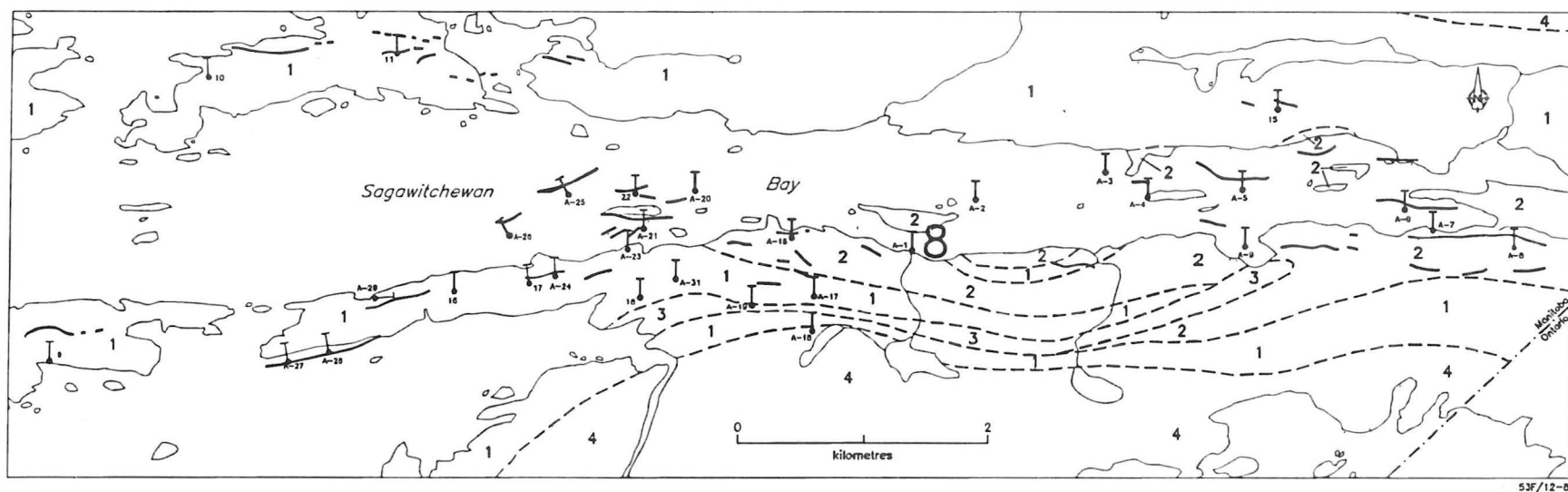
Assessment Files 91144, 91402, 91624, 91652, 91694  
Manitoba Energy and Mines, Mines Branch.

Godard, J.D.

1963: Sagawitchewan Bay; Manitoba Mines and Natural Resources, Mines Branch, Map 60-2, 1:63 360.

Wright, J.F.

1928: Island Lake area, Manitoba; in Geological Survey of Canada, Summary Report, 1927, pt. B, p. 54-80.



53F/12-8

Early Intrusive Rocks  
 4 Tonalite, monzonite, granite  
 3 Mafic intrusive rocks  
 Hayes River Group  
 2 Greywacke, siltstone, argillite  
 1 Mafic volcanic flows and  
 related intrusive rocks

-- Geological contact (approximate)  
 T Drillhole, Kerr Addison Mines  
 Limited (A.F. 91402)  
 — EM conductor (A.F. 91652)  
 8 Occurrence location

Figure 80: Geological setting of occurrence 8. Geology modified after Godard (1963).

## APPENDIX 1

A rock sampling program (Theyer, 1982), was conducted in areas considered to have a high potential to contain stratabound gold deposits. Rock samples were collected as bulked chip samples from an area ranging from 1 to 2 m radius. The samples were analyzed by Neutron Activation Services using Instrumental Neutron-Activation Analysis (INAA) technique for Au, As, Sb and W. Using this analytical method the lower limit of detection (LLD) for Au is 1 ppb; for As is 1 ppm; for W is 3 ppm and for Sb is 0.2 ppm. These elements (gold pathfinder elements) were analyzed since they tend to be associated with Au forming widespread haloes that on detection could lead to the discovery of concentrations of gold.

Concentrations of W appear to be unusually elevated, considering that most analyzed rock samples are mafic to intermediate volcanic rocks. It is suspected that these may be due to contamination in the sample preparation stage.

Although none of the rock samples contains anomalous concentrations of the analyzed elements (with the exception of W) the data is presented to add to the geochemical database of greenstone belts in the Superior Province.

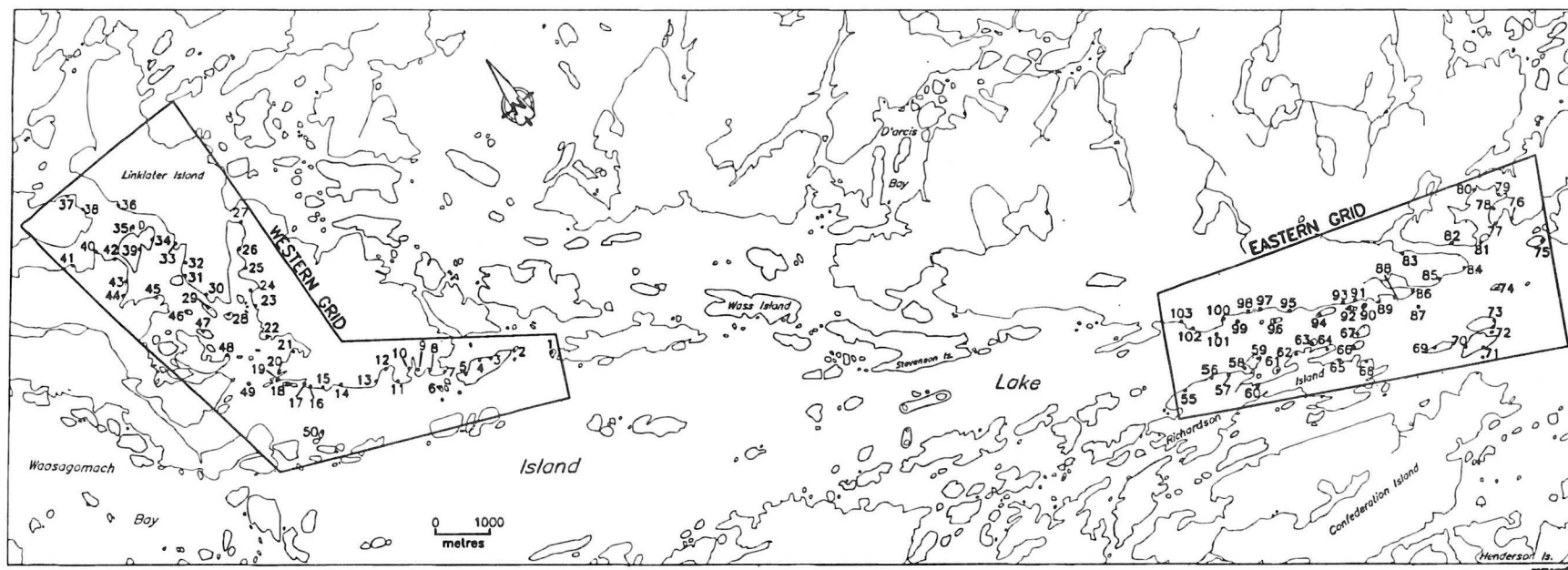


Figure 81: Rock sample locations and numbers.

**Table 17**  
**Analyses of As, W, Sb and Au in rock grab samples collected from the Western and Eastern grid (Fig. 81)**

WESTERN GRID

| Sample No.: | As<br>(ppm) | W<br>(ppm) | Sb<br>(ppm) | Au<br>(ppb) |
|-------------|-------------|------------|-------------|-------------|
| 51-WG-1     | 4           | 240        | 1.7         | 4           |
| 51-WG-2     | 12          | 150        | 1.2         | <1          |
| 51-WG-3     | 37          | 27         | 0.5         | 7           |
| 51-WG-4     | 11          | 220        | 1.3         | 10          |
| 51-WG-5     | 1           | 230        | 1.8         | 1           |
| 51-WG-6     | 19          | 44         | 1.2         | 2           |
| 51-WG-7     | 6           | 110        | 0.9         | 18          |
| 51-WG-8     | 11          | 140        | 1.6         | 1           |
| 51-WG-9     | 8           | 160        | 0.6         | <1          |
| 51-WG-10    | 10          | 230        | 1.0         | 2           |
| 51-WG-11    | 1           | 81         | 0.6         | 37          |
| 51-WG-12    | 15          | 170        | 0.9         | 6           |
| 51-WG-13    | 3           | 110        | <0.2        | <1          |
| 51-WG-14    | 33          | 150        | 1.0         | 1           |
| 51-WG-15    | 1           | 320        | 0.3         | 3           |
| 51-WG-16    | 21          | 350        | 0.8         | 3           |
| 51-WG-17    | 1           | 30         | 0.4         | 1           |
| 51-WG-18    | 2           | 200        | 0.2         | 1           |
| 51-WG-19    | 1           | 230        | 0.7         | <1          |
| 51-WG-20    | 8           | 140        | 0.3         | 3           |
| 51-WG-21    | 14          | 130        | 1.1         | 1           |
| 51-WG-22    | 25          | 120        | 1.3         | <1          |
| 51-WG-23    | 2           | 290        | 1.8         | <1          |
| 51-WG-24    | 1           | 65         | 1.6         | <1          |
| 51-WG-25    | 2           | 290        | 0.2         | <1          |
| 51-WG-26    | 13          | 230        | 1.5         | <1          |
| 51-WG-27    | 1           | 530        | 0.6         | <1          |
| 51-WG-28    | 6           | 110        | 0.9         | 1           |
| 51-WG-29    | 5           | 64         | 0.2         | <1          |
| 51-WG-30    | 2           | 180        | 0.7         | 1           |
| 51-WG-31    | 4           | 93         | 1.1         | <1          |
| 51-WG-32    | 110         | 260        | 1.9         | <1          |
| 51-WG-33    | 10          | 60         | 1.8         | 1           |
| 51-WG-34    | 5           | 130        | 1.1         | <1          |
| 51-WG-35    | 48          | 45         | 13.0        | <1          |
| 51-WG-36    | 11          | 150        | 0.7         | 1           |
| 51-WG-37    | 270         | 420        | 1.6         | 6           |
| 51-WG-38    | <1          | 100        | 0.4         | 3           |
| 51-WG-39    | 15          | 500        | 1.1         | <1          |
| 51-WG-40    | 10          | 250        | 2.0         | 1           |
| 51-WG-41    | 1           | 190        | 0.5         | <1          |
| 51-WG-42    | 2           | 72         | 0.4         | 1           |
| 51-WG-43    | 3           | 110        | 1.0         | 2           |
| 51-WG-44    | 14          | 78         | 0.7         | 10          |
| 51-WG-45    | 10          | 92         | 0.5         | <1          |
| 51-WG-46    | 12          | 130        | 0.4         | 2           |
| 51-WG-47    | 3           | 190        | 1.1         | 3           |
| 51-WG-48    | 2           | 120        | 1.0         | 2           |
| 51-WG-49    | 16          | 210        | 0.3         | 11          |
| 51-WG-50    | 6           | 160        | 0.2         | <1          |

## EASTERN GRID

| Sample No.: | As<br>(ppm) | W<br>(ppm) | Sb<br>(ppm) | Au<br>(ppb) |
|-------------|-------------|------------|-------------|-------------|
| 51-C-55     | 9           | 190        | 0.3         | <1          |
| 51-C-56     | 2           | 240        | 0.3         | <1          |
| 51-C-57     | 1           | 240        | 0.6         | 1           |
| 51-C-58     | 2           | 210        | 0.6         | 2           |
| 51-C-59     | 2           | 130        | 0.2         | <1          |
| 51-C-60     | 4           | 82         | 0.9         | 1           |
| 51-C-61     | 2           | 270        | 0.4         | 2           |
| 51-C-62     | 1           | 130        | 0.6         | 1           |
| 51-C-63     | 2           | 110        | 0.2         | <1          |
| 51-C-64     | 19          | 230        | 0.6         | 8           |
| 51-C-65     | 16          | 190        | 0.6         | 6           |
| 51-C-66     | 2           | 170        | 0.5         | <1          |
| 51-C-67     | 2           | 270        | 0.5         | <1          |
| 51-C-68     | <1          | 120        | 0.2         | 3           |
| 51-C-69     | 2           | 140        | 1.0         | <1          |
| 51-C-70     | <1          | 80         | 0.5         | 3           |
| 51-C-71     | 1           | 52         | 0.3         | 1           |
| 51-C-72     | 1           | 190        | 0.5         | <1          |
| 51-C-73     | 9           | 170        | 0.6         | 2           |
| 51-C-74     | 12          | 160        | 0.2         | 3           |
| 51-C-75     | 7           | 290        | 1.4         | 8           |
| 51-C-76     | 2           | 510        | 0.5         | <1          |
| 51-C-77     | 2           | 390        | <0.2        | 3           |
| 51-C-78     | 3           | 320        | 0.4         | 2           |
| 51-C-79     | 3           | 440        | 0.7         | <1          |
| 51-C-80     | 3           | 380        | 0.3         | <1          |
| 51-C-81     | 1           | 390        | 0.6         | <1          |
| 51-C-82     | 7           | 360        | 0.9         | 25          |
| 51-C-83     | 5           | 360        | 1.6         | 2           |
| 51-C-84     | 20          | 310        | 1.6         | 4           |
| 51-C-85     | 12          | 290        | 1.0         | 2           |
| 51-C-86     | <1          | 100        | 2.3         | <1          |
| 51-C-87     | 5           | 160        | 1.1         | <1          |
| 51-C-88     | 87          | 40         | 5.0         | <1          |
| 51-C-89     | 20          | 41         | 2.7         | <1          |
| 51-C-90     | 5           | 69         | 1.7         | <1          |
| 51-C-91     | 4           | 240        | 0.6         | 2           |
| 51-C-92     | 8           | 170        | 0.9         | <1          |
| 51-C-93     | 47          | 450        | 0.9         | 3           |
| 51-C-94     | 10          | 210        | 1.3         | 3           |
| 51-C-95     | 2           | 420        | <0.2        | <1          |
| 51-C-96     | 1           | 210        | 1.5         | <1          |
| 51-C-97     | 92          | 190        | 2.6         | <1          |
| 51-C-98     | 1           | 110        | 0.2         | <1          |
| 51-C-99     | 6           | 65         | 1.1         | 1           |
| 51-C-100    | 53          | 130        | 1.5         | <1          |
| 51-C-101    | 1           | 74         | 1.3         | <1          |
| 51-C-102    | 5           | 130        | 1.0         | 3           |
| 51-C-103    | 2           | 82         | 1.2         | <1          |

**Table 18**  
**Chemical analyses of rock samples from the Bella Lake pluton (Location 8; A.F. 90001).**  
**See NTS 53E/15, Location 8 and Figure 24 for sample locations.**

| Sample No. | Cu<br>(ppm) | Zn<br>(ppm) | Mo<br>(ppm) | W<br>(ppm) | Mn<br>(ppm) |
|------------|-------------|-------------|-------------|------------|-------------|
| 1          | 19          | 42          | 6           | <5         | 321         |
| 3          | 13          | 42          | 9           | <5         | 340         |
| 4          | 27          | 52          | 5           | <5         | 287         |
| 5          | 29          | 59          | 8           | <5         | 283         |
| 8          | 24          | 56          | 31          | <5         | 350         |
| 10         | 21          | 44          | 19          | <5         | 382         |
| 13         | 25          | 69          | 10          | <5         | 368         |
| 14         | 22          | 48          | 19          | <5         | 338         |
| 15A        | 60          | 55          | 19          | <5         | 361         |
| 15B        | 29          | 49          | 11          | <5         | 333         |
| 16         | 14          | 39          | 25          | <5         | 307         |
| 18         | 20          | 76          | 9           | <5         | 487         |
| 20         | 92          | 37          | 38          | <5         | 329         |
| 21         | 12          | 51          | 5           | <5         | 331         |
| 23         | 14          | 48          | 10          | <5         | 301         |
| 24         | 20          | 69          | 10          | <5         | 372         |
| 25A        | 15          | 50          | 6           | <5         | 306         |
| 25B        | 224         | 15          | 6           | <5         | 168         |
| 26         | 13          | 52          | 5           | <5         | 323         |
| 27         | 38          | 78          | 6           | <5         | 472         |
| 28         | 25          | 46          | 25          | <5         | 362         |
| 29         | 34          | 64          | 19          | <5         | 436         |
| 30         | 14          | 46          | 13          | <5         | 315         |
| 31         | 13          | 59          | 10          | <5         | 372         |
| 32         | 15          | 44          | 13          | <5         | 266         |
| 33A        | 28          | 51          | 8           | <5         | 324         |
| 33B        | 24          | 12          | 38          | <5         | 263         |
| 34         | 116         | 65          | 11          | <5         | 477         |
| 35A        | 65          | 30          | 19          | <5         | 350         |
| 37A        | 50          | 48          | 8           | <5         | 395         |
| 38         | 60          | 57          | 19          | <5         | 369         |
| 39         | 20          | 53          | 25          | <5         | 360         |
| 40A        | 28          | 61          | 9           | <5         | 490         |
| 40B        | 58          | 30          | 25          | <5         | 307         |
| 41         | 19          | 53          | 25          | <5         | 374         |
| 42         | 27          | 49          | 13          | <5         | 365         |
| 43         | 19          | 54          | 19          | <5         | 358         |
| 44A        | 21          | 44          | 25          | <5         | 335         |
| 44C        | 25          | 52          | 8           | <5         | 302         |
| 44D        | 34          | 41          | 25          | <5         | 416         |
| 45         | 18          | 57          | 13          | <5         | 346         |
| 46         | 47          | 24          | 11          | <5         | 200         |
| 49         | 30          | 35          | 25          | <5         | 299         |
| 51         | 70          | 33          | 25          | <5         | 301         |
| 53         | 36          | 26          | 19          | <5         | 238         |
| 54         | 29          | 46          | 25          | <5         | 437         |
| 56         | 15          | 50          | 13          | <5         | 503         |
| 57         | 16          | 51          | 13          | <5         | 346         |
| 58         | 9           | 52          | 8           | <5         | 352         |
| 59         | 9           | 43          | 6           | <5         | 278         |
| 61         | 15          | 72          | 8           | <5         | 362         |
| 62A        | 25          | 54          | 6           | <5         | 323         |



Table 18 (Cont'd)

| Sample No. | Cu<br>(ppm) | Zn<br>(ppm) | Mo<br>(ppm) | W<br>(ppm) | Mn<br>(ppm) |
|------------|-------------|-------------|-------------|------------|-------------|
| 62B        | 21          | 43          | 5           | <5         | 325         |
| 64         | 35          | 56          | 19          | <5         | 355         |
| 67         | 18          | 56          | 10          | <5         | 366         |
| 70         | 17          | 43          | 13          | <5         | 319         |
| 77A        | 17          | 41          | 10          | <5         | 290         |
| 90         | 22          | 40          | 13          | <5         | 310         |
| 94         | 15          | 6           | 9           | <5         | 116         |
| 96B        | 38          | 60          | 19          | <5         | 377         |
| 102        | 46          | 41          | 300         | <5         | 354         |
| 105        | 860         | 6           | 200         | <5         | 93          |
| 106        | 290         | 40          | 225         | <5         | 229         |
| 117A       | 54          | 51          | 13          | <5         | 321         |
| 117B       | 20          | 53          | 13          | <5         | 372         |
| 122        | 23          | 45          | 13          | <5         | 343         |
| 123        | 26          | 50          | 13          | <5         | 325         |
| 124A       | 46          | 52          | 11          | <5         | 332         |
| 124B       | 16          | 59          | 10          | <5         | 349         |
| 125        | 19          | 52          | 13          | <5         | 327         |
| 126        | 13          | 48          | 13          | <5         | 357         |
| 127        | 16          | 52          | 13          | <5         | 332         |
| 128A       | 21          | 45          | 10          | <5         | 322         |
| 128B       | 18          | 29          | 25          | <5         | 237         |
| 129        | 21          | 42          | 19          | <5         | 349         |
| 130A       | 32          | 55          | 13          | <5         | 332         |
| 130B       | 19          | 43          | 19          | <5         | 318         |
| 131        | 20          | 71          | 31          | <5         | 441         |
| 132A       | 18          | 44          | 9           | <5         | 342         |
| 132B       | 55          | 50          | 8           | <5         | 489         |
| 133        | 21          | 46          | 19          | <5         | 338         |
| 134        | 40          | 52          | 113         | 70         | 313         |
| 135        | 30          | 50          | 5           | <5         | 428         |
| 136        | 20          | 33          | 6           | <5         | 277         |
| 137A       | 91          | 37          | 6           | <5         | 342         |
| 137B       | 15          | 37          | 8           | <5         | 324         |
| 139        | 46          | 23          | 8           | <5         | 267         |
| 140        | 79          | 17          | 6           | <5         | 204         |
| 141        | 117         | 17          | 25          | <5         | 178         |
| 142        | 32          | 20          | 10          | <5         | 238         |
| 143        | 202         | 18          | 5           | <5         | 208         |
| 144        | 16          | 28          | 6           | <5         | 273         |
| 146        | 50          | 23          | 6           | <5         | 390         |
| 147        | 14          | 36          | 9           | <5         | 247         |
| 148        | 37          | 38          | 8           | <5         | 305         |
| 150        | 420         | 53          | 8           | <5         | 345         |
| 151        | 64          | 31          | 5           | <5         | 242         |
| 152        | 21          | 47          | 10          | <5         | 384         |
| 153        | 620         | 40          | 10          | <5         | 327         |
| 154        | 43          | 51          | 25          | <5         | 328         |
| 155        | 37          | 40          | 13          | <5         | 295         |
| 156        | 34          | 35          | 9           | <5         | 259         |
| 157        | 19          | 50          | 9           | <5         | 320         |
| 158        | 76          | 9           | 8           | <5         | 119         |
| 159        | 30          | 43          | 10          | <5         | 372         |
| 160        | 74          | 60          | 10          | <5         | 350         |

Table 18 (Cont'd)

| Sample No. | Cu<br>(ppm)      | Zn<br>(ppm) | Mo<br>(ppm) | W<br>(ppm) | Mn<br>(ppm) |
|------------|------------------|-------------|-------------|------------|-------------|
| 162        | 35               | 58          | 10          | <5         | 419         |
| 163        | 28               | 43          | 9           | <5         | 780         |
| 164        | 17               | 43          | 10          | <5         | 350         |
| 165        | 110              | 46          | 25          | <5         | 344         |
| 166        | 51               | 52          | 10          | <5         | 423         |
| 167        | 31               | 52          | 6           | <5         | 393         |
| 168        | 32               | 48          | 10          | <5         | 401         |
| 169        | 25               | 44          | 13          | <5         | 375         |
| 170        | 330              | 49          | 100         | <5         | 372         |
| 171        | 27               | 57          | 13          | <5         | 424         |
| 172        | 16               | 54          | 9           | <5         | 416         |
| 174        | 280              | 58          | 25          | <5         | 414         |
| 175        | 19               | 55          | 5           | <5         | 394         |
| 176A       | 18               | 49          | 9           | <5         | 396         |
| 176B       | 95               | 33          | 44          | <5         | 301         |
| 177        | 24               | 49          | 19          | <5         | 401         |
| 178A       | 22               | 41          | 9           | <5         | 365         |
| 178B       | 39               | 37          | 10          | <5         | 443         |
| 180        | 20               | 73          | 13          | <5         | 576         |
| 181        | 17               | 51          | 13          | <5         | 423         |
| 182        | 39               | 27          | 10          | <5         | 310         |
| 185        | 830              | 61          | 13          | <5         | 358         |
| 186        | 1050             | 69          | 11          | <5         | 383         |
| 187        | 3850             | 55          | 9           | <5         | 440         |
| 188A       | 78               | 53          | 13          | <5         | 426         |
| 188B       | 24               | 42          | 11          | <5         | 580         |
| 189        | 39               | 51          | 19          | <5         | 472         |
| 190        | 21               | 48          | 13          | <5         | 384         |
| 191        | 53               | 55          | 25          | <5         | 473         |
| 192        | 25               | 41          | 19          | <5         | 433         |
| 193        | 20               | 53          | 19          | <5         | 402         |
| 194        | 16               | 48          | 19          | <5         | 454         |
| 195        | 22               | 34          | 18          | <5         | 375         |
| 196A       | 14               | 44          | 16          | <5         | 405         |
| 196B       | 50               | 49          | 19          | <5         | 445         |
| 198A       | 29               | 59          | 10          | <5         | 477         |
| 198B       | 19               | 43          | 13          | <5         | 446         |
| 199        | 22               | 42          | 19          | <5         | 444         |
| 200A       | 37               | 49          | 19          | <5         | 447         |
| 200B       | 18               | 45          | 19          | <5         | 442         |
| 201        | 164              | 43          | 19          | <5         | 361         |
| 202        | 29               | 51          | 11          | <5         | 384         |
| 203        | 42               | 45          | 11          | <5         | 330         |
| 204        | 32               | 46          | 13          | <5         | 361         |
| 205        | 15               | 53          | 10          | <5         | 309         |
| 206        | 41               | 45          | 10          | <5         | 760         |
| 207        | 72               | 50          | 13          | <5         | 374         |
| 208        | 21               | 53          | 11          | <5         | 550         |
| 209A       | 71               | 47          | 8           | <5         | 299         |
| 209B       | (missing sample) |             |             |            |             |
| 210A       | 25               | 43          | 25          | <5         | 333         |
| 210B       | 41               | 49          | 13          | <5         | 379         |
| 211A       | 28               | 50          | 13          | <5         | 363         |
| 211B       | 22               | 52          | 11          | <5         | 311         |

Table 18 (Cont'd)

| Sample No. | Cu<br>(ppm) | Zn<br>(ppm) | Mo<br>(ppm) | W<br>(ppm) | Mn<br>(ppm) |
|------------|-------------|-------------|-------------|------------|-------------|
| 212        | 12          | 52          | 8           | <5         | 350         |
| 213        | 30          | 61          | 13          | <5         | 423         |
| 214        | 15          | 55          | 25          | <5         | 339         |
| 215        | 18          | 67          | 9           | <5         | 358         |
| 216A       | 19          | 45          | 25          | <5         | 300         |
| 216B       | 25          | 39          | 13          | <5         | 418         |
| 217        | 17          | 43          | 11          | <5         | 318         |
| 218        | 16          | 44          | 10          | <5         | 386         |
| 219        | 23          | 53          | 13          | <5         | 335         |
| 220        | 61          | 52          | 11          | <5         | 368         |
| 221        | 29          | 50          | 19          | <5         | 370         |
| 223A       | 19          | 35          | 25          | <5         | 300         |
| 223B       | 16          | 44          | 19          | <5         | 355         |
| 224        | 18          | 52          | 31          | <5         | 381         |
| 225A       | 26          | 45          | 19          | <5         | 300         |
| 225B       | 33          | 15          | 19          | <5         | 126         |
| 226        | 62          | 60          | 19          | <5         | 418         |
| 227        | 18          | 98          | 9           | <5         | 618         |
| 228        | 91          | 42          | 11          | <5         | 336         |
| 229        | 20          | 50          | 25          | <5         | 318         |
| 231A       | 17          | 45          | 13          | <5         | 299         |
| 231B       | 18          | 48          | 25          | <5         | 352         |
| 231C       | 21          | 12          | 38          | <5         | 237         |
| 232        | 31          | 56          | 10          | <5         | 426         |
| 233        | 45          | 48          | 31          | <5         | 350         |
| 234        | 37          | 49          | 19          | <5         | 361         |
| 235        | 24          | 18          | 13          | <5         | 188         |
| 236        | 18          | 49          | 13          | <5         | 344         |
| 237        | 29          | 53          | 13          | <5         | 409         |
| 238        | 22          | 50          | 13          | <5         | 360         |
| 239A       | 25          | 52          | 19          | <5         | 360         |
| 239B       | 18          | 6           | 13          | <5         | 88          |
| 240A       | 33          | 54          | 10          | <5         | 396         |
| 240B       | 30          | 81          | 13          | <5         | 470         |
| 241        | 28          | 45          | 25          | <5         | 388         |
| 242        | 19          | 40          | 10          | <5         | 362         |
| 243        | 19          | 51          | 25          | <5         | 341         |
| 244A       | 18          | 48          | 25          | <5         | 355         |
| 244B       | 23          | 55          | 13          | <5         | 453         |
| 245        | 22          | 50          | 25          | <5         | 285         |
| 247        | 15          | 64          | 19          | <5         | 412         |
| 249        | 30          | 55          | 13          | <5         | 383         |

