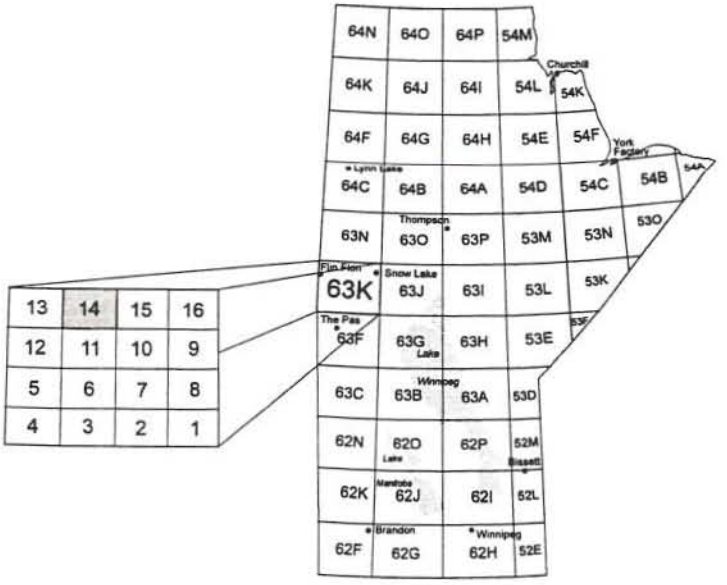
Manitoba
Energy and Mines
Geological Services

Mineral Deposit Series Report No. 8

Mineral Deposits and Occurrences in the Cockeram Lake Area, NTS 64C/15

by K.J. Ferreira and D.A. Baldwin
Winnipeg, 1997



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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 data base that can be used in mineral exploration; and (2) to provide a technical data base for other government users 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. Compilation of the manuscripts continued during the period 1989-93 with funding provided through the Canada-Manitoba Partnership Agreement on Mineral Development. Under this project mineral deposit geologists of the Geological Services Branch 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 In addition, for each occurrence the geologists have attempted to synthesize available data from published and unpublished sources.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 the 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 and are commonly supplemented by cancelled assessment file compilations.

Information has been collated and maps prepared with the assistance of junior staff geologists and summer assistants. Senior mineral deposit geologists have provided the deposit classifications and text for the report.

The locations of all mineral deposits and occurrences are presented in Figure 1.

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%-100% and 'near solid sulphide' for 50%-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 the 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 carried out 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 on the map is a unique reference number that will be used both in the report and the geologists' unpublished data base. These numbers are consecutive within each 1:50 000 NTS map sheet (but not within portions of a map sheet such as Map MDS87-1).

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.

TABLE 1: MINERAL DEPOSIT TYPES

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

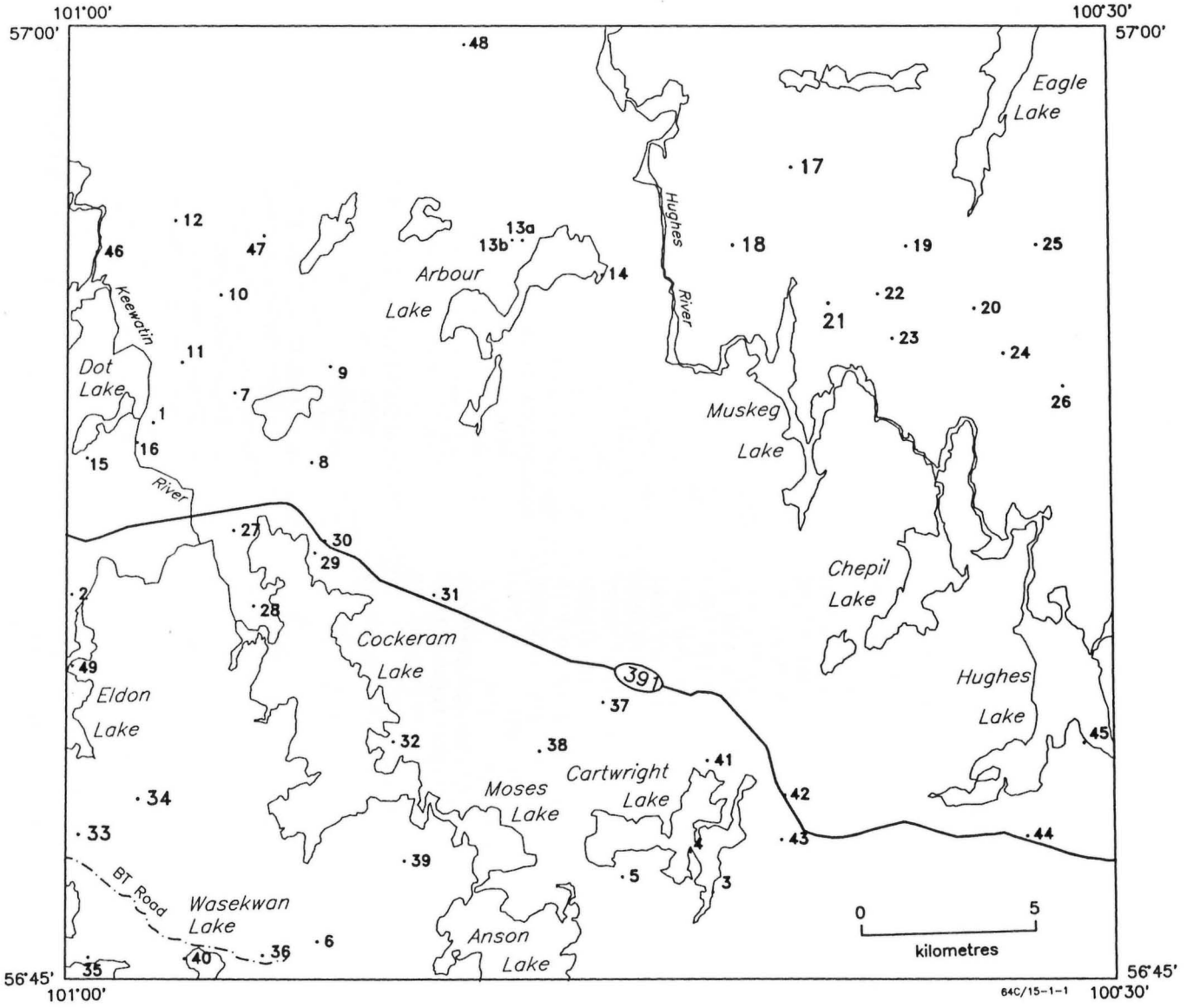

Figure 1: Location of mineral deposits and occurrences (NTS 64C/15).

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.

Elements:

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 deposit 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. Information for this section 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 the reader with the opportunity to make his/her own evaluation of the significance of a mineral occurrence or deposit.

Geochemical Data:

In addition to detailed geological mapping around individual mineral occurrences, rock samples were routinely collected from outcrops in the vicinity of the occurrences.

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 desired material directly from the source. The mineral deposit geologists will endeavour 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:

A.F.	assessment file
AEM	airborne electromagnetic
asp	arsenopyrite
bn	bornite
c.g.	coarse grained
cp	chalcopyrite
DDH	diamond-drill hole(s)
diss.	disseminated
EM	electromagnetic
f.g.	fine grained
HLEM	horizontal loop electromagnetic
IP	induced polarization
m.g.	medium grained
MMR	Manitoba Mineral Resources Ltd.
mod.	moderate
mt	magnetite
SGM	Sherritt Gordon Mines Ltd.
tr.	trace
g/t	grams per tonne
oz/ton	ounces per ton
po	pyrrhotite
py	pyrite
VLF-EM	very low frequency electromagnetic

ACKNOWLEDGEMENTS

Geological field documentation for the Lynn Lake region was carried out under the direction of Dr.D.A. Baldwin. Dr. M.A.F. Fedikow coordinated investigations of mineralization along the Agassiz Metallotect. D. Parbery and K.J. Ferreira carried out mineral deposit documentation for these programs from 1984 to 1987. D.C. Peck conducted additional mineral deposit studies on the Cartwright Lake rhyolite in 1995. D. Parbery prepared an initial draft field compilation. K. Ferreira carried out additional data compilation and preparation of the final manuscript.

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B. Lenton drafted the figures. E. Truman, D. Zerr, J. Morales and C. Dyck drafted the accompanying map. S. Henrie prepared printer-ready copy using desktop publishing software. Drs. M.A.F. Fedikow, G.H. Gale and W.D. McRitchie provided technical and general review.

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, Geological Services Branch.

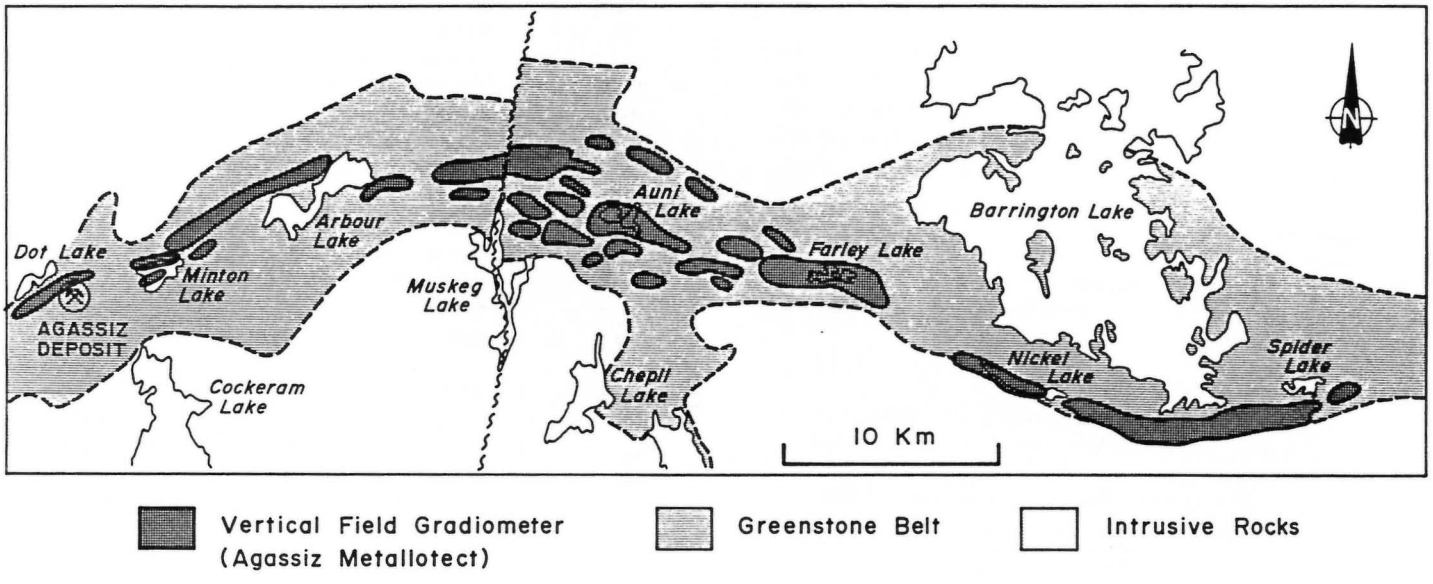

Figure 2: Location of Agassiz Metallotect (from Fedikow, 1986).

GENERAL GEOLOGY OF THE COCKERAM LAKE AREA, NTS 64C/15

The geological base for Mineral Deposit Map No 8 (NTS 64C/15) is taken from the 1:50 000 map of Gilbert *et al.* (1980). Norman (1934) and Milligan (1960) conducted previous regional geological mapping. The Cockeram Lake area is underlain by rocks of the Proterozoic Lynn Lake greenstone belt, abutted to the north and south by large granodiorite to tonalite plutons. Supracrustal rocks of the Lynn Lake greenstone belt include volcanic and volcanic-derived sedimentary rocks of the Wasekwan Group (Bateman, 1945). A major erosional unconformity separates rocks of the Wasekwan Group from younger sedimentary rocks of the Sickle Group (Norman, 1934).

The Wasekwan Group consists mainly of basaltic flows and breccia, subordinate tuff and felsic volcanic rocks; epiclastic rocks are rare. The earliest volcanic episodes (1910 Ma, Baldwin *et al.*, 1987) are synchronous with early volcanism in the Flin Flon greenstone belt to the south (Gordon *et al.*, 1990). The Wasekwan Group is subdivided into northern and southern belts that are separated by felsic to intermediate plutons. The northern belt comprises mainly tholeiitic, high alumina and picritic basalt with lesser intercalated felsic volcanic rocks, volcaniclastic sedimentary rocks and iron formation (Gilbert *et al.*, 1980; Syme, 1985). In the Cockeram Lake area, the northern belt extends from Dot Lake to Key Lake, through the areas of Minton and Arbour lakes, north of Muskeg Lake, to Auni Lakes and Key Lake (Gilbert *et al.*, 1980).

In the Cockeram Lake - Pole Lake area, the southern belt consists of >2000 m tholeiitic basalt overlain by a 2700 m thick discontinuous calc-alkaline suite of rhyolite, dacite and andesite with subordinate volcaniclastic greywacke and siltstone. To the east, in the Hughes Lake area the 2450 m thick calc-alkaline suite is overlain by 1060 m of aphyric basalt; >200 m pebble conglomerate, hornblende greywacke and siltstone; and 1200 m intermediate and felsic volcanic rocks. The southern belt extends from south of Eldon Lake to the Hughes Lake - Stan Lake area; it extends south of Cockeram Lake through the Cartwright Lake area. Correlation of units between the northern and southern belts is not certain (Gilbert *et al.*, 1980).

Sickle Group sandstone and conglomerate unconformably overlie rocks of the Wasekwan Group. A basal conglomerate with clasts derived from volcanic, intrusive and sedimentary rocks is overlain by an arkosic sequence dominated by medium grained sandstone and minor pebbly sandstone (Gilbert *et al.*, 1980). Only a small area of Sickle Group rocks, consisting of arkosic and pebbly sandstone occurs in the Hughes Lake area. A sequence of conglomerate and greywacke that may be either Sickle Group or Wasekwan Group overlies rocks of the northern belt (Gilbert *et al.*, 1980).

Mafic to felsic plutons were intruded during and after volcanism that produced the Wasekwan Group, and after deposition of the Sickle Group. The latest plutonism occurred at 1876 Ma, contemporaneous with early volcanism in the Rusty Lake greenstone belt to the east (Baldwin *et al.*, 1987).

The Lynn Lake greenstone belt has undergone medium- to high-grade regional metamorphism. Upper greenschist facies assemblages are present in the Cartwright-Hughes Lake area and east of Tulune Lake. Middle amphibolite facies assemblages are dominant throughout most of the greenstone belt (Gilbert *et al.*, 1980).

Five episodes of deformation have been identified in the Lynn Lake area. D_1 produced regional foliation (S_1) and major, tight to isoclinal folds with east- to northeast-striking, steeply dipping axial planes. Major D_1 folds occur throughout the southern belt and in the northern belt east of Muskeg Lake. Northwest-trending D_2 faults truncated by the Sickle Group and post-Sickle D_3 thrust faults that occur in other parts of the Lynn Lake belt have not been recognized in the Cockeram Lake area. D_4 faulting and shearing produced east- and northeast-trending faults at Cartwright Lake and north- and east-trending domes and basins at Hughes Lake. A second regional post-Sickle foliation coplanar to S_1 developed during D_5. Brittle D_5 structures define the Johnson Shear Zone, which extends across the map area from Foster Lake to Stan Lake (described further below). Late faults include the north-trending fault that transects the map area through Muskeg Lake (Gilbert *et al.*, 1980).

The Agassiz Metallotect (Fedikow, 1984; Fig. 2, 3), which extends 70 km from Margaret Lake (NTS 64C/14) to Spider Lake (NTS 64C/16), is a prominent metallogenetic component of the northern belt. It is characterized by a unique stratigraphy that corresponds to multi-channel INPUT anomalies: variably silicified, carbonatized and chloritized high Mg (16.0%)-Ni (800 ppm)-Cr (2000 ppm) picritic basalt; sulphide-, silicate- and oxide-facies iron formation; clastic sedimentary rocks, including siltstone, calcareous greywacke and silicified tuff; and felsic volcanic rocks (Fedikow, 1986; Fedikow *et al.*, 1986; Fedikow *et al.*, 1990; Parbery, 1992). A series of *en echelon* shear zones, spatially related to the Agassiz Metallotect, has been recognized in the areas of the MacLellan and Dot Lake gold deposits. A major lineament is visible on airphotos and satellite imagery of the Farley Lake area (NTS 64C/16) (Fedikow *et al.*, 1990). Gold mineralization at locations 1, 7, 13, 14, 15, 16, 18 and 24 is associated with the Agassiz Metallotect in NTS 64C/15.

The Johnson Shear Zone (Bateman, 1945), a major easterly-trending zone of late structural deformation, extends along the southern boundary of the southern belt. It is up to 0.5 km wide, and extends 35 km from Gemmell Lake (NTS 64C/14) to One Island Lake (NTS 64C/16) with local bifurcation (Gilbert *et al.*, 1980). Pronounced foliation, shear textures, brecciation, fractures, alteration and mineralization, truncation of lithologic units, and obliteration of primary features characterize the zone (Fedikow *et al.*, 1991; Fedikow *et al.*, 1986; Gilbert *et al.*, 1980). Local occurrences of 1 to 25 cm wide zones of pseudotachylite and breccia in a pseudotachylite matrix are separated by 1 to 20 m wide zones of less deformed rock. These zones suggest that the Johnson Shear Zone consists of numerous, widely spaced, narrow zones along which intense shearing took place (Baldwin, 1989). The area directly south of Reservoir Lake along the creek from Foster Lake is the type section of the Johnson Shear Zone, as described by Bateman (1945). Gold mineralization at the Burnt Timber, T1A Zone, and Cartwright deposits, and the Johnson Vein and Central Manitoba occurrences is associated with the Johnson Shear Zone in NTS 64C/15. In addition to these deposits the Johnson Shear Zone hosts at least 25 other gold prospects and showings (M. Eastwood, Black Hawk Mining Inc., written communication, 1996).

The Lynn Lake Rhyolitic Complex comprises north-facing pyroclastic rocks, felsic flows and minor interlayered amphibolite. The complex is approximately 18 km long, extending from Frances Lake (NTS 64C/14) to Cockeram Lake, and up to 3 km thick (Baldwin, 1983). Baldwin (1983) subdivides the complex into three units, of which only the central unit occurs within the area of NTS 64C/15. The central unit consists of quartz and plagioclase phyric pyroclastic rocks, especially thin bedded tuff and lesser lapilli tuff and pyroclastic flows. The Lynn Lake Rhyolitic Complex is host to several massive sulphide type deposits, including the Frances Lake deposit and Nicoba occurrence in NTS 64C/14 and the Y deposit (Location 2, this volume).

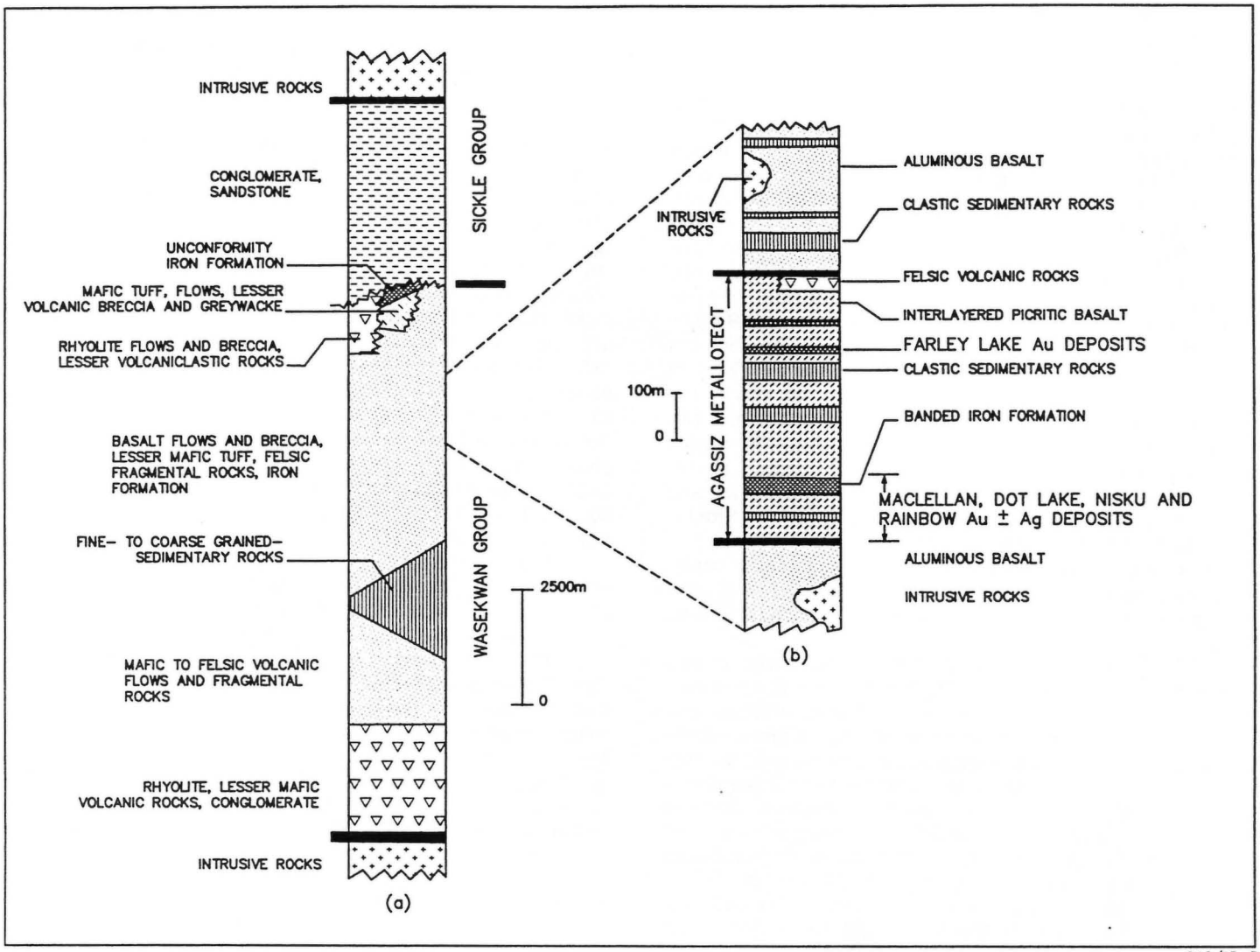

Figure 3: Schematic stratigraphic section of (a) the northern belt of the Lynn Lake greenstone belt and (b) the Agassiz Metallotect (from Fedikow et al., 1991). All of the divisions shown in (a) are not present everywhere throughout the northern belt. In addition, Wasekwan Group rocks are intruded by subvolcanic plutons that are not depicted in the stratigraphic section.

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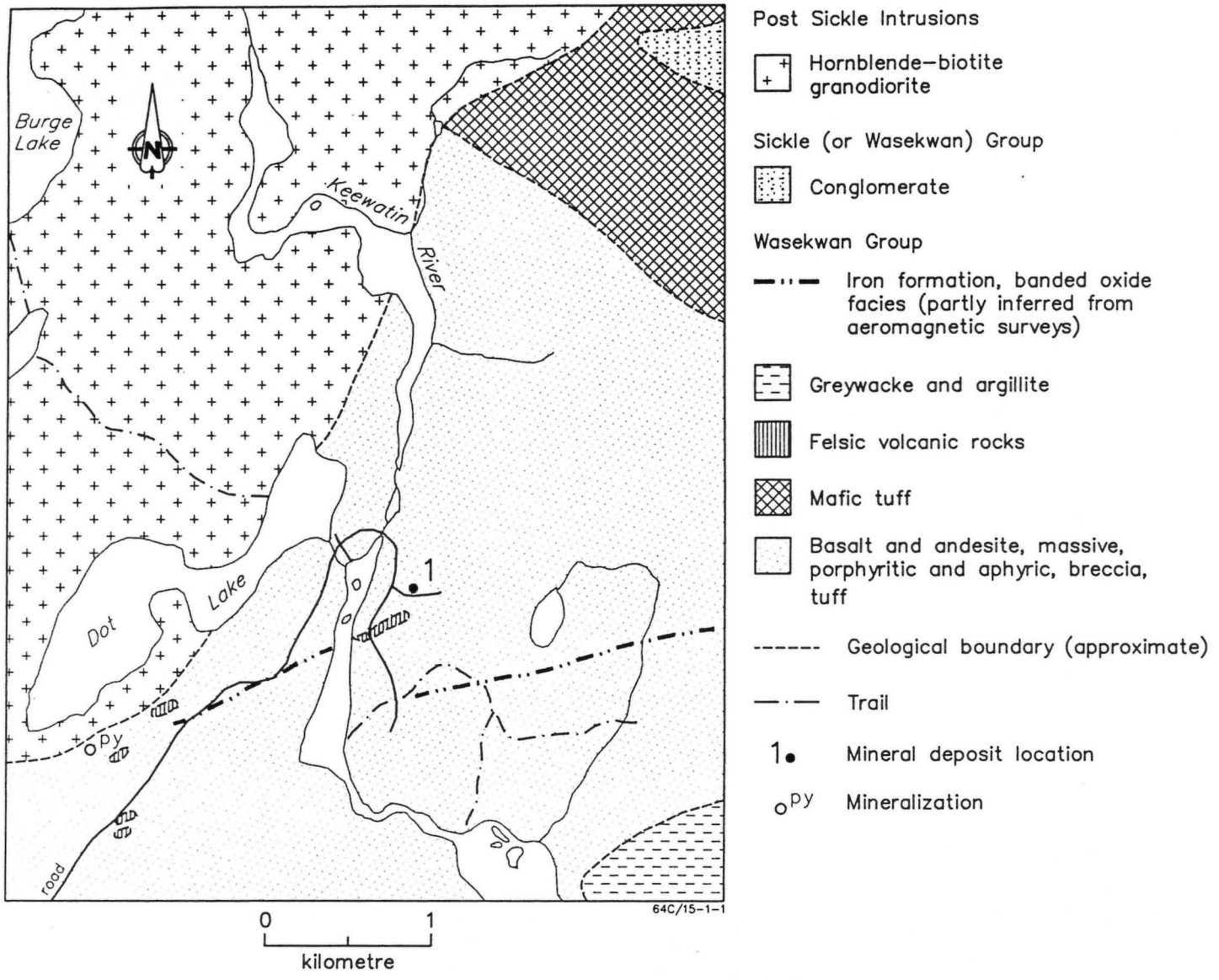

Figure 1-1: Geological setting of the MacLellan Mine (1) (after Gilbert et al., 1980).

MINERAL DEPOSITS AND OCCURRENCES IN THE COCKERAM LAKE AREA (NTS 64C/15)

LOCATION: 1

NAME: MacLellan; Agassiz
UTM: 6307261N/380701E
ACCESS: Gravel road from Provincial Road 391

AREA: 0.5 km east of Dot Lake; 7 km northeast of the town of Lynn Lake (Fig. 1-1)
AIRPHOTO: A23828-74

EXPLORATION SUMMARY:

Summaries of exploration history are given by Richardson and Ostry (1987), Fedikow (1986a), Milligan (1960, p. 235, 236), and Mineral Inventory Card 64C/15 Au1.

The area was first staked as the J.J. claims in 1946 by J.W. Boiley and J.G. Webb, and the claims were transferred to R. Rundle, who optioned the property to Noranda Mines Ltd. (Milligan, 1960, p. 235, 236; Richardson and Ostry, 1987; Mineral Inventory Card 64C/15 Au1). Noranda carried out a magnetometer and geological (1:2400) survey on the J.J., Dot and Pot claim groups in 1948 (A.F. 91471). The option was cancelled in 1948.

Trenches and pits (exact number, location not known) were put down on the J.R. claims by R. Rundle and J.W. Rundle between 1950 and 1955 (Milligan, 1960, p. 236). Agassiz Mines Limited was incorporated to explore these claims (Mineral Inventory Card 64C/15 Au1) and drilled a total of 648 m (2127 ft.) in 1955 to test magnetic anomalies previously outlined by Noranda (Milligan, 1960, p. 236). This drilling showed that most of the magnetic anomalies were explained by magnetite in mafic flows. Two of the holes spaced 30 m apart "showed a low content of gold, silver, and zinc, and nickel up to 0.12%". Parts of core from DDH 3, located at the claim boundary between J.R. 3 and J.R. 8, assayed up to 4.5% Zn, up to 2.5 g/t Au and up to 11.1 g/t Ag from "the upper part of the hole". Parts assayed up to 43.8 g/t Ag with "a low nickel and copper content, with some gold" from "the lower part" of the hole of DDH 3. An EM survey was conducted in 1955 (Milligan, 1960, p. 236).

In 1956, Newkirk Mining Corporation Limited optioned the property, and assigned it to Aumaque Gold Mines Limited. Work done in 1956 included a resistivity survey and a 25-hole drill program (total 3373 m) to test EM conductors and resistivity anomalies (Milligan, 1960, p. 236).

Central Manitoba Mines Limited optioned the property in 1958 (renamed Consolidated Manitoba Mines Limited in 1964). Twenty drillholes totalling 2568 m were drilled in 1958-59. The option lapsed in 1959 (Mineral Inventory Card 64C/15 Au1).

Rayrock Mines Ltd. conducted an inconclusive geophysical survey (unspecified) over part of the property in 1960 (Mineral Inventory Card 64C/15 Au1).

Agassiz Mines Ltd. drilled 52 holes totalling 12 446 m from 1965 to 1967 and outlined three parallel mineralized veins. Independent consultants estimated initial tenors of (a) 1.235 Mt grading 11.1 g/t Au (uncut) or 9.0 g/t Au (cut) and (b) 1.380 Mt grading 10.0 g/t Au (uncut) or 8.8 g/t Au (cut). In addition, the deposit contained 31.3 g/t Ag and "minor" Zn and Pb (Mineral Inventory Card 64C/15 Au1). In 1969, a 149 m shaft was sunk. Agassiz Mines Limited changed its name to Royal Agassiz Mines Limited. By 1971, a total of 21 336 m of drilling in 105 holes and 712 m lateral underground work had been done. Royal Agassiz estimated 2 097 000 t grading 10.0 g/t Au and 37.6 g/t Ag, consisting of 1 425 000 t drill-indicated and 672 000 t geologically inferred reserves (Mineral Inventory Card 64C/15 Au1).

Bulora Corporation Limited entered into a joint venture in 1973; the option ended in 1975. In 1976, Royal Agassiz transferred its controlling interest to Bulora Corp. Ltd. (Mineral Inventory Card 64C/15 Au1). In 1979 the property was transferred to Comiesa Corporation, who optioned it to SGM later that year (Fedikow, 1986a).

From 1979 to 1985, SGM conducted diamond drilling, shaft deepening, and increased drifting (Richardson and Ostry, 1987). In 1985, Kilborn Engineering estimated mineable ore reserves of 1.49 Mt grading 7.17 g/t Au (Richardson and Ostry, 1987). In 1985, SGM transferred the MacLellan property and its other gold projects in the Lynn Lake area to a new subsidiary, SherrGold Inc. (Western Commerce and Industry Magazine, October, 1986). The MacLellan mine started production in 1986 (Richardson and Ostry, 1987). The mine closed at the end of 1989 (Bamburak, 1990). Prior to mine closure, 980 000 tonnes grading 5.4 g/t Au were mined from the MacLellan deposit. The MacLellan deposit contains geological resources of 932 000 tonnes grading 6.0 g/t Au; the Nisku deposit contains geological resources of 114 900 tonnes grading 7.7 g/t Au (Granduc Mining Corporation, 1995 Annual Report).

Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). An airborne EM survey was conducted over this area by Canadian Nickel Company Limited in 1954 (A.F. 91615). SGM conducted an aeromagnetic survey over the area from 1957 to 1961 (A.F. 91622). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

GEOLOGICAL SETTING:

The MacLellan deposit occurs within a unique stratigraphic sequence known as the Agassiz Metallotect within Wasekwan Group rocks of the northern belt of the Lynn Lake greenstone belt. The Agassiz Metallotect comprises interlayered biotitic and siliceous siltstones, picritic basalts, oxide-, silicate- and sulphide-facies iron formations, and minor felsic volcanic rocks. Thicker sequences of fragmental aluminous basalt and mafic polymictic debris flows underlie and overlie these rocks (Fig. 2, 1-1, 1-2, 1-3; Fedikow, 1986a; Fedikow *et al.*, 1986; Fedikow *et al.*, 1990).

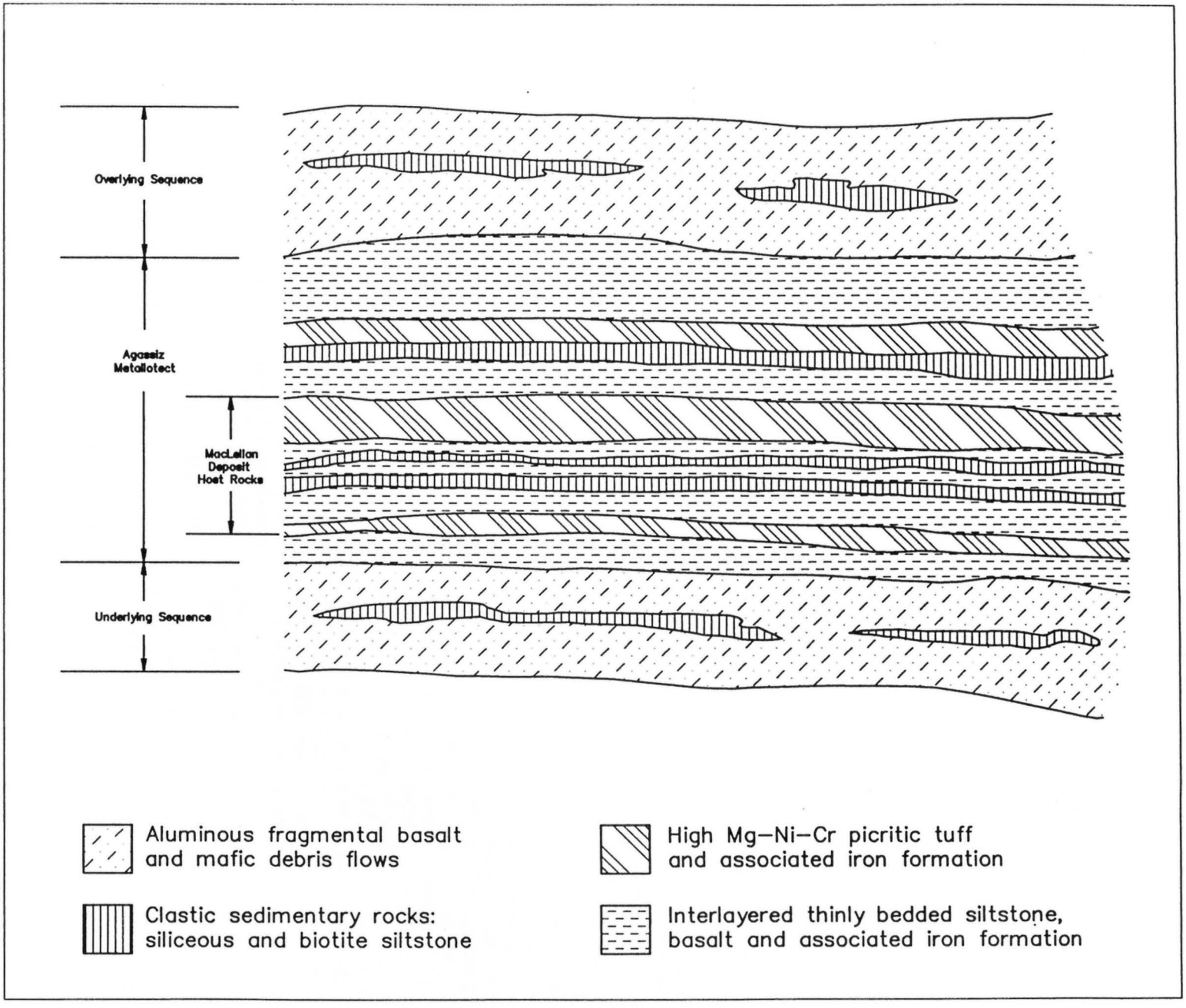

Figure 1-2: Schematic illustration of the MacLellan Au-Ag deposit host rocks (Agassiz Metallotect) and the overlying and underlying rock sequences (after Fedikow, 1986).

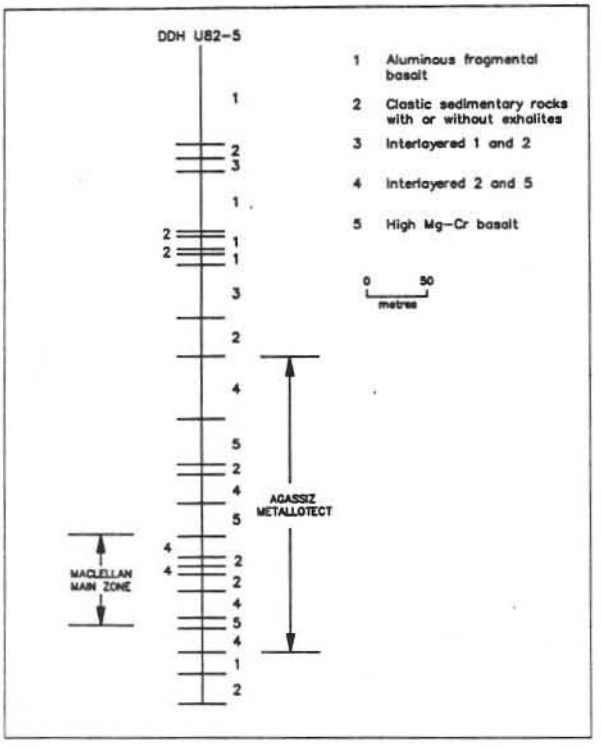

Figure 1-3: Simplified stratigraphic section through the MacLellan Au-Ag deposit based on DDH U82-5 (from Fedikow, 1986).

The description of host rocks to the MacLellan deposit is summarized from Fedikow (1986a) and Fedikow and Gale (1982). Their work was based on field examination of drill core and sparse outcrops, and limited follow-up petrographic and lithogeochemical work. The deposit is stratabound in a sequence of fine grained, thin bedded, clastic and chemical sedimentary rocks interlayered with picritic basalt flows and minor picritic tuff (Fig. 1-2, 1-3). The sedimentary unit is approximately 1500 m in strike length and has a maximum thickness of 10 to 20 m. Individual layers of siltstone, iron formation and basalt are 1 cm to 3 m thick, and are crosscut by carbonate-quartz-sulphide veins.

Mineralized zone. Clastic sedimentary rocks include siltstone, magnetite-bearing siliceous siltstone, and biotitic sulphidic siltstone. Iron formations are laterally discontinuous, tightly folded, 1 to 10 cm layers. Oxide facies iron formation consists of bands of chert and magnetite laminae with rare arsenopyrite and pyrrhotite. Silicate facies iron formation is a chlorite-garnet (almandine)-actinolite assemblage with iron- and base metal sulphides. Sulphide facies iron formation consists of solid pyrite and pyrrhotite rhythmically layered with biotite-rich laminae; commonly these layers are tightly folded. High Mg-Ni-Cr (picritic) basalt flows and tuff within the mineralized zone are 1 to 3 m thick. Locally within the mineralized zone these basalts are silicified and carbonatized, and in places contain 1 cm garnets. Mineralization in the picritic basalts consists of disseminated arsenopyrite, galena, iron sulphides, and sphalerite layers (Fedikow, 1986a).

Hanging wall and footwall rocks. The hanging wall and footwall rocks to the MacLellan deposit are 3 to 8 m thick picritic flows and tuff. The picritic rocks are characterized by 3 to 5 mm amphibole grains (in part, pseudomorphs after clinopyroxene) in a fine- to coarse-grained groundmass consisting of chlorite with minor garnet, quartz, plagioclase, rutile, ilmenite and magnetite. The picrites in the hanging wall and footwall are notably thicker bedded and less amphibole rich than in the mineralized zone. Hanging wall and footwall rocks contain quartz-carbonate veins with accessory pyrite (Fedikow, 1986a).

The clastic and chemical sedimentary rocks are strongly foliated (N65°E) parallel or at low angles to layering (Fedikow and Gale, 1982; Fedikow, 1986a). Fedikow and Gale (1982) attribute the greater intensity of foliation in the sedimentary rocks to differences in competency between the sedimentary rocks and the underlying and overlying basalts and schist. Fedikow (1986a) notes that at least three deformational events have affected the unit, and postulates that some of the fragmental textures are deformation-induced transposed layering.

Fedikow and Gale (1982) identify four types of alteration that form discrete and overlapping alteration zones, visible in drill core and outcrop. Carbonatization is manifested as carbonatized basalt, shear coatings, quartz-carbonate veins, and patches and disseminations of carbonate. Silicification is observed in silicified siltstones and hanging wall basalt, and as diffuse fronts from shear zones. Chloritization is recognized in shears and in the footwall actinolite-chlorite unit. Biotitization formed secondary biotite bands in siltstone. Samson and Gagnon (1995) recognize two hydrothermal assemblages: (1) Quartz-amphibole veins with associated amphibole alteration occur mostly in the high Mg-Ni-Cr basalt, but also in the other rock types. These veins are 0.5 to 5 cm wide, 5 to 30 cm long, are subparallel to foliation, and occur separately and as sheeted vein systems. Associated amphibolitization mostly forms <5 to 10 cm haloes around veins, but may be larger and more diffuse, particularly in the high Mg-Ni-Cr basalt. (2) Carbonate±quartz veins and irregular carbonate alteration zones occur within the quartz-amphibole alteration assemblages and crosscut foliation in the sedimentary rocks. Lithogeochemical correlation matrices demonstrate potassic metasomatism, albitization, tourmalinization and carbonatization in wall rocks to the MacLellan Main zone (Fedikow, 1992).

Shear zones postdate metamorphism and predate quartz-amphibole alteration (Samson and Gagnon, 1995).

MINERALIZATION:

The MacLellan deposit consists of three discrete deposits: Rainbow (*a.k.a.* West), MacLellan (*a.k.a.* Main, Central), and Nisku (*a.k.a.* East) (Fig. 1-4; Fedikow, 1986a; Fedikow *et al.*, 1990). Fedikow (1986a) claims that the highest gold and silver values in the MacLellan deposit are associated with zones of silicification and mobilization adjacent to carbonate-quartz-sulphide veins. High assays are obtained where these veins crosscut the sulphidic siltstone, and "persistent but lower" amounts of gold are from silicified arsenopyrite-galena-bearing high Mg-Ni-Cr basalt (Fedikow, 1986a).

The Rainbow deposit consists of two *en echelon* lenses of quartz and quartz-carbonate veins with <10% disseminated pyrite, pyrrhotite, and lesser sphalerite and galena. Each lens is up to 15 m wide and approximately 150 m long. The MacLellan zone/deposit is northeast-striking, west-plunging, 10 to 20 m thick, and 350 m in strike length. Pyrite, pyrrhotite, sphalerite, galena, arsenopyrite and minor chalcopyrite form solid sulphide layers, zones of disseminated sulphides, and rinds and fracture fillings in quartz and quartz-carbonate veins. A late brittle shear zone, known locally as the North Shear, truncates the deposit to the north. Gold mineralization exhibits similar styles in the MacLellan and Rainbow deposits (Fedikow, 1986a; Fedikow *et al.*, 1991). Gold and gold-silver alloys occur as (1) small irregularly shaped grains or veinlets generally <10 µm, (2) rims on, or fracture fillings in, galena, arsenopyrite and pyrrhotite, (3) inclusions in arsenopyrite, pyrrhotite and galena, (4) anhedral grains associated with arsenopyrite and galena, and (5) sutured grains associated with galena (Augsten *et al.*, 1986).

The Nisku deposit consists of disseminated to solid sulphide layers and conformable lenses of pyrite, pyrrhotite, arsenopyrite, sphalerite and galena. The sulphides are hosted by variably silicified, biotitized, and carbonatized picritic basalt. Auriferous quartz veins crosscut arsenopyrite, sphalerite and galena mineralization (Fedikow, 1986a; Fedikow *et al.*, 1991).

Samson and Gagnon (1995) identify five distinct types of sulphide mineralization. (1) *Sedimentary sulphides* consist of pyrite, subordinate pyrrhotite and minor chalcopyrite. They only have been observed from the Nisku deposit. (2) *Quartz-biotite-sulphide veins* consist of quartz ± biotite ± gahnite with pyrite and/or pyrrhotite, and variable amounts of sphalerite, galena, arsenopyrite, chalcopyrite and boulangerite. These predeformational veins are generally 0.1 to 5 cm wide and 5 to 30 cm long, up to 15 cm wide and up to >5 m long, and are commonly truncated by shear bands and shear zones. These veins form stockworks in places, and are most common in the sedimentary rocks. (3) *Arsenopyrite ± quartz veins* are tabular to irregular zones with indistinct subparallel walls. They are subparallel to stratigraphy and foliation, subvertically north-dipping, 0.1 to 25 cm wide, and may form sheeted arrays up to 7 m across. Some of the larger arsenopyrite ± quartz veins truncate foliation and quartz-biotite-sulphide veins, and replace metamorphic mineral assemblages. Arsenopyrite ± quartz veins, apparently distinct from the MacLellan/Main deposit, occur mostly in the sedimentary unit. Fedikow (1986a) and Fedikow and Gale (1982) interpreted this style of mineralization as mineralized sedimentary layers because of the parallelism with stratigraphy and foliation, the state of deformation and the diffuse contacts. Samson and Gagnon (1995) note that Fedikow (1986) and Fedikow and Gale (1982) made their interpretation mostly from observation of drill core, and that in underground exposure the mineralization more closely resembles veins. (4) *Vein and disseminated sulphides.* Narrow (<1 cm) undeformed veins consisting of pyrite, pyrrhotite, chalcopyrite, sphalerite and galena are parallel or oblique to foliation in sedimentary rocks, quartz-amphibole veins, and amphibolitized rocks. Sulphides are also disseminated in biotite-rich bands of the sedimentary unit and in the quartz-amphibole veins and amphibole alteration zones described below. These sulphides are late replacements of silicates. (5) *Barren white quartz veins* 5 to 30 cm wide, are related to late fault zones that extend up to 5 m beyond the immediate host rocks into the hanging and foot walls. *Quartz ± sulphide veins* are oblique to the fault zones and foliation, abut the barren veins in fault zones, and are more irregular than the barren veins. Minor galena, sphalerite, pyrite and arsenopyrite occur near the vein margins in the quartz ± sulphide veins that crosscut other vein sets. They are

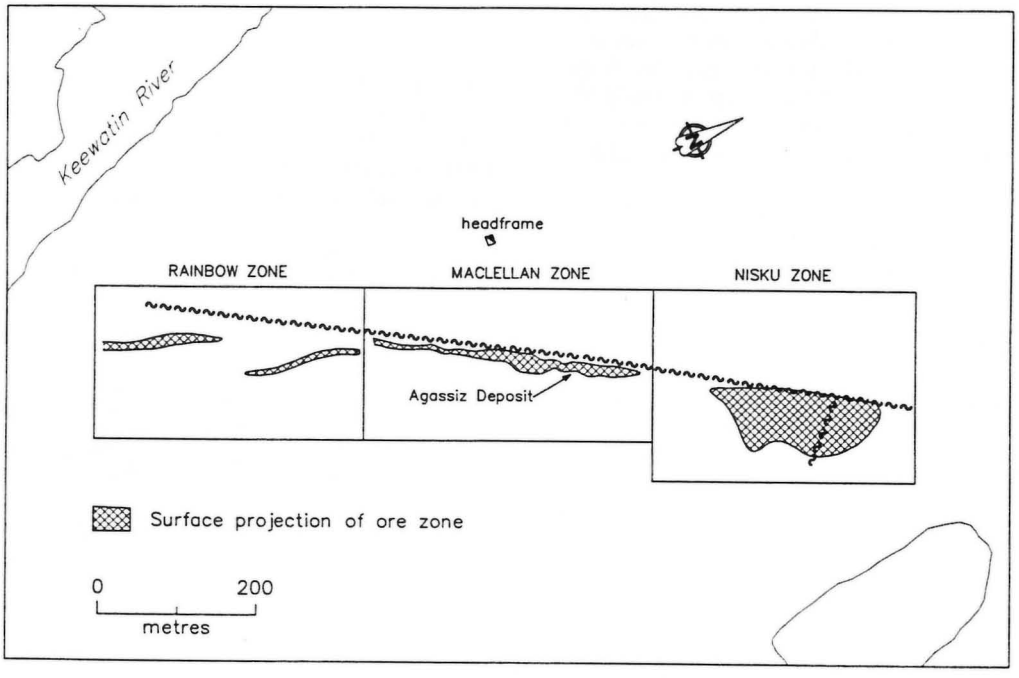

Figure 1-4: Subdivision of zones of the MacLellan deposit (after Fedikow, 1986).

undeformed, irregular, oblique to fault zones and are not obviously altered (Samson and Gagnon, 1995). Samson and Gagnon (1995) assert that the auriferous lenses are quasi-conformable veins and replacement zones, emplaced and/or transposed parallel to the dominant metamorphic fabric.

Biotite siltstone contains a greater proportion of iron sulphides than other siltstones. The siliceous siltstone contains disseminated pyrite, pyrrhotite, arsenopyrite, sphalerite and galena (Fedikow, 1986a).

Gold occurs in the MacLellan deposit as small inclusions or dissolved in iron sulphides or arsenopyrite (Samson and Gagnon, 1995). Chalcopyrite, magnetite and tetrahedrite-freibergite are minor. Marcasite, titanite, gahnite, pyrargyrite, polybasite, geocronite, pentlandite, argentopentlandite, breithauptite, ullmannite, native gold, electrum and aurian silver are rare (Augsten, 1985; Augsten *et al.*, 1986). Augsten's (1985) identification of argentopentlandite is the first reported occurrence of this mineral in a gold deposit. Hitherto, argentopentlandite had been identified only in nickel ores from Sudbury and rock from the ultramafic Bird River Sill (southeastern Manitoba) (Augsten *et al.*, 1986). Augsten *et al.* (1986) point out that the Agassiz deposit is unusually enriched in lead and zinc compared with other Precambrian gold deposits.

GEOCHEMICAL DATA:

The grade and tonnage for the MacLellan, Nisku and Rainbow zones are given in Table 1-1.

Table 1-1
Grade and tonnage for the MacLellan, Nisku (Granduc Mining Corporation, 1995 Annual Report) and Rainbow zones (Fedikow *et al.*, 1990)

Zone	Tonnage	Grade
MacLellan	932 000	6.0 g/t Au
Nisku	114 900	7.7 g/t Au
Rainbow	539 000	8.57 g/t As

High As concentrations coincide with high Au, but the reverse is not true. High Au tends to occur in the quartz-biotite-sulphide veins in the sedimentary rocks, arsenopyrite, and sulphide veins. Silver is mostly concentrated in the quartz-biotite-sulphide veins in the sedimentary rocks and the late sulphide veins. Gold and silver contents do not necessarily correlate. The sedimentary sulphides and sulphide-rich schists generally contain low Au and Ag (Samson and Gagnon, 1995).

Sulphur isotope values do not distinguish among the types of mineralization, with one exception: the source of sulphur for arsenopyrite ± quartz veins was different from the source for the other types. The $\delta^{34}S$ data support the possibility that remobilization of original exhalative sulphides has provided the sulphur for later stages of mineralization (Searcy, 1993).

Nielsen and Fedikow (1987) present results of a till geochemical survey over the MacLellan Mine - Dot Lake area. A heavy metal dispersion train 150 to 200 m long was outlined down ice (south) from the MacLellan deposit.

Fedikow (1985, 1986a) deliniated vegetation geochemical anomalies directly over the deposit and west to the Dot Lake area. Fedikow (1986b) and Fedikow and Amor (1990) tested Hg-vapour surveys over the deposit.

CLASSIFICATION:

Vein type deposit; multiple veins.

On the basis of discriminant analysis of drill core samples of picritic basalt and outcrop examination, Fox and Johnston (1980) recognize dark green, highly foliated actinolite-chlorite schist underlying the deposit as hydrothermally altered high-magnesian volcanic flows. The schist can be traced laterally into relatively unaltered picritic basalt. They propose an exhalative model for the deposit, and postulate the picritic basalt as the metal source for the auriferous and nickel-bearing mineralization. Fedikow and Gale (1982) supported an exhalative model for the MacLellan deposit on the basis of the deposit's stratabound nature and the intense alteration stratigraphically below the deposit. They postulated that zones of silicification or quartz veining may represent a discordant feeder zone or stockwork that has been deformed into alignment with the mineralized zones. They noted that the absence of a massive sulphide lens could be due to either an insufficient hiatus in volcanism to allow for a significant thickness to accumulate or to downslope wasting of exhaled fluids. Fedikow (1992) detected multi-element geochemical haloes that extend up to 200 m into the footwall and hanging wall of the MacLellan Main zone.

Fedikow (1986a) suggested a multi-phase model for the origin of the deposit where gold-bearing iron and base metal sulphides were syngenetically deposited. Interaction with seawater scavenged gold (and nickel and chrome?) from the high Mg-Ni-Cr basalts. Auriferous sulphides were mobilized into dilatant zones accompanying deformation.

Augsten *et al.* (1986), in their opaque mineralogy study, point out that the presence of pentlandite, argentopentlandite, breithauptite and ullmannite indicates nickel enrichment in the deposit. They consider this to be evidence that the metals were derived, at least partially, from the leaching of the high Mg-Ni-Cr picritic basalts. They also observe an intimate association of sulphosalt minerals and native alloys with galena, and suggest this is evidence that Pb, Sb, Ag and Au may have been post-depositionally mobilized during metamorphism or deformation.

Work by Samson and Gagnon (1995) and thesis work by Gagnon (1991), is based on underground mapping of the main conveyor drift of the MacLellan Main Zone, supplemented by drill core and surface observations. They assert that the gold and silver are epigenetic in origin and unrelated to the sedimentary sulphides and chloritic alteration in the picritic basalt. They identify an initial episode of gold and silver mineralization accompanying the formation of quartz-biotite-sulphide veins, prior to peak metamorphism. A second episode is associated with synmetamorphic arsenopyrite-quartz veins that replaced silicate mineralogy, which had included sillimanite and staurolite. Late gold-bearing vein and disseminated sulphides occur in post-metamorphic quartz-amphibole veins and amphibole alteration. Shear zones are not genetically related to mineralization or vein formation (Samson and Gagnon, 1995).

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A Window of Golden Opportunity
Western Commerce and Industry Magazine, October, 1986, p. 4-13.

LOCATION: **2**

NAME: Y; Elb 138
UTM: 6302320N/378168E
ACCESS: Private road along dyke on tailings pond, accessed from Provincial Road 391

AREA: West of the Lynn River and north of Eldon Lake (Fig. 2-1), within the tailings dump of the Farley Mine
AIRPHOTO: A23828-76

EXPLORATION SUMMARY:

J. Lindal staked the area around the Y deposit, assigned it to E.L. Brown in 1946, and reassigned it to SGM in 1949. SGM leased the area in 1949 and renewed the lease in 1970 (Mineral Inventory Card 64C/15 Zn2). At least 18 holes were drilled by SGM from 1979 to 1982. A 23.5 m long trench was excavated by SGM and Manitoba Energy and Mines in 1983 to expose overburden-covered mineralization intersected in drill core (Fig. 2-2).

Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). Canadian Nickel Company Limited carried out an airborne EM survey over this area in 1954 (A.F. 91615). SGM conducted an aeromagnetic survey over the area from 1957 to 1961 (A.F. 91622). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey in 1973 (A.F. 91699). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

GEOLOGICAL SETTING:

The Y-deposit occurs within the Lynn Lake Rhyolitic Complex (Fig. 2-1; Baldwin, 1983).The rhyolite is in contact with Wasekwan Group mafic to intermediate volcanic rocks to the north, and is intruded by felsic to intermediate plutonic rocks to the south (Fig. 2-1; Gilbert *et al.*, 1980).

The Y deposit is hosted by subaqueous pyroclastic rhyolite with turbidite-structured layers. This is part of the central unit of the Lynn Lake Rhyolitic Complex; the lower and upper units of this complex do not occur within NTS 64C/15 (Baldwin, 1983). Two types of alteration are present in rocks in the trench: (1) garnet, gahnite, plagioclase, chlorite, anthophyllite, biotite and minor sulphides and (2) rusty weathered sericitic rock with streaks and patches of the first alteration assemblage (Fig. 2-2).

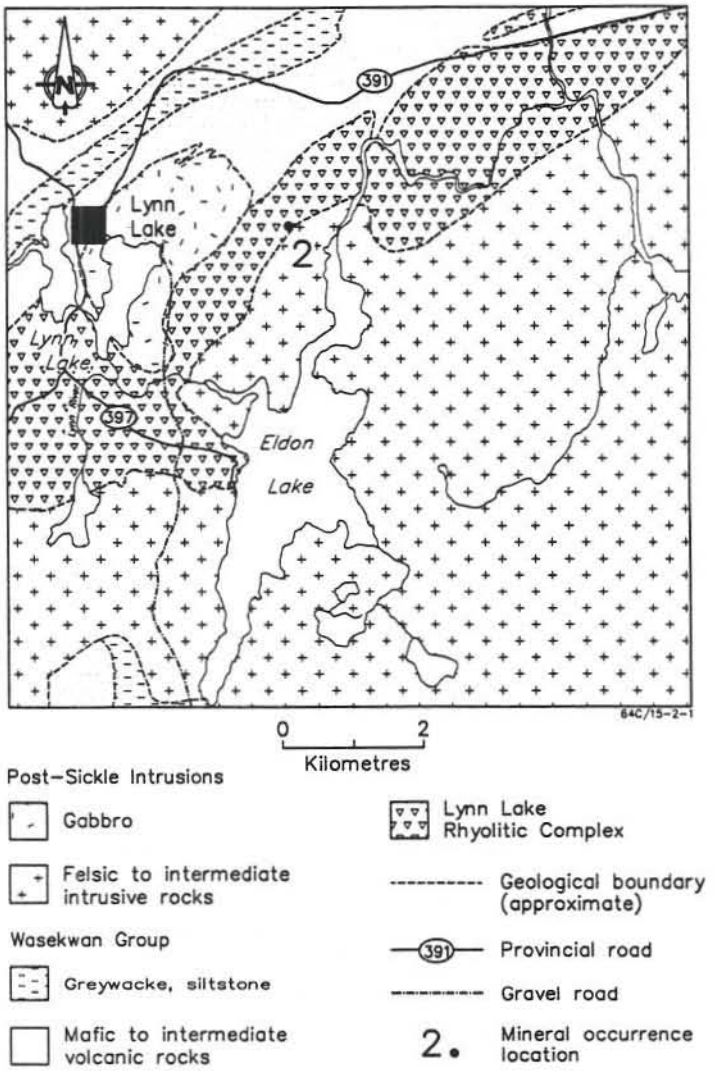

Figure 2-1: Geological setting of the Y deposit (location 2) (after Gilbert et al., 1980).

MINERALIZATION:

The Y deposit consists of stratabound solid pyrite and pyrrhotite lenses with subordinate sphalerite, gahnite, chalcopyrite, galena, and arsenopyrite. The sequence strikes ≈120° and dips ≈55°S (SGM, written communication). The relative location of drill-intersected sulphide lenses is shown in Figure 2-3. Lithologic descriptions of core from eight of the holes depicted in Figure 2-3 are presented in Figures 2-4 to 2-11; complete drill logs are not available.

Drill logs indicate that a mottled, fine grained silicic rock, in part with quartz and feldspar crystals, overlies fine grained, dark grey silicic rock that contains 2 to 30% pyrrhotite, pyrite, chalcopyrite, sphalerite and up to 10% chlorite or sericite, up to 5% gahnite, and trace garnet. Garnet-pyrite layers from DDH 394 are 10 to 20 cm thick and contain up to 75% garnet. Sulphide minerals are disseminated, wisps, irregular veinlets, and near solid to solid lenses. Staurolite- and biotite-rich layers are present locally. Minor amounts of sulphides occur throughout the silicic-sericitic rock. Some mineralized sections exhibit Zn-Cu (metal) zonation (G.H. Gale, Manitoba Energy and Mines, unpublished data).

The 23.5 m trench exposes near solid to solid sulphide comprising 75% to 90% pyrite, pyrrhotite, chalcopyrite, sphalerite, arsenopyrite and gahnite.

GEOCHEMICAL DATA:

The Y deposit contains 45 360 tonnes of 4.5% Zn and 1.0% Pb (SGM, pers. comm.).

Table 2-1 presents a major element analysis for a sample of the garnetite layer.

Table 2-1
Major element analysis of a core sample from the garnetite layer, DDH 80-1 @ 46.63 m, Y deposit. All results in weight percent. Analyses done at Manitoba Energy and Mines Analytical Laboratory, Winnipeg.

SiO_2	40.1
Al_2O_3	7.7
$Fe_2O_3^T$	24.6
CaO	3.0
MgO	4.1
Na_2O	0.0
K_2O	0.0
TiO_2	0.3
P_2O_5	0.02
MnO	21.0
LOI	0.9
Total	**101.7**

CLASSIFICATION:

Stratabound massive sulphide type deposit; volcanic rock associated.

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Manitoba Energy and Mines, Geological Services Branch.

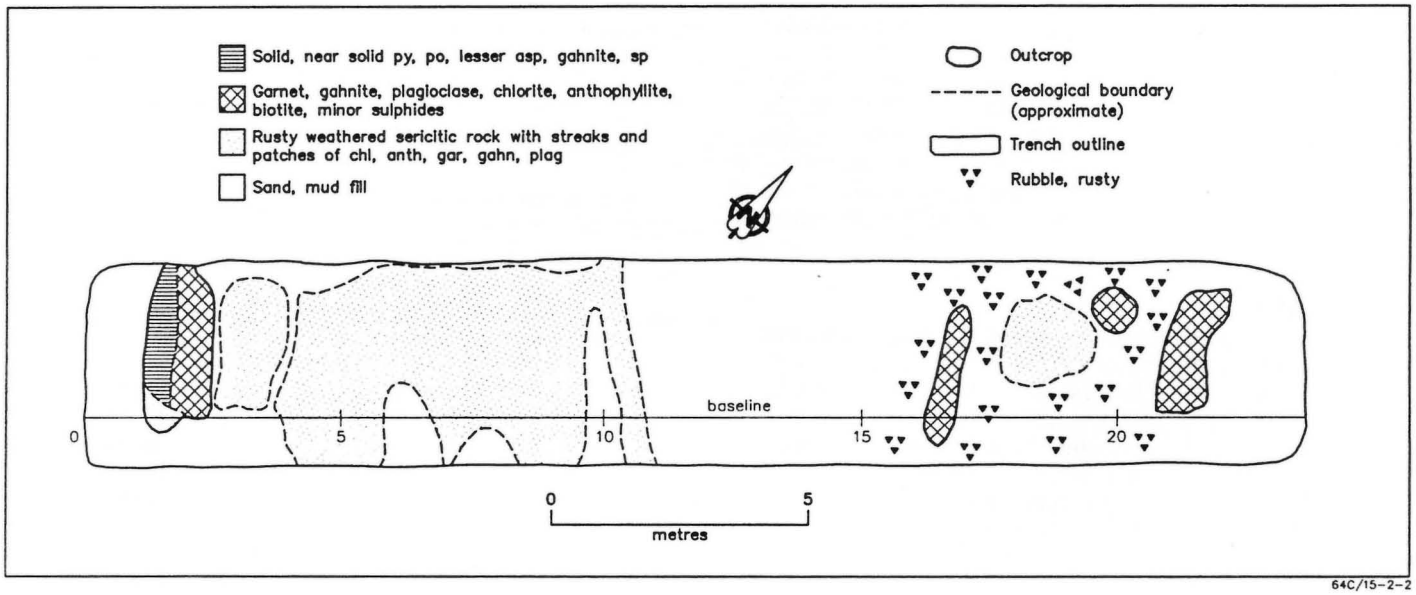


Figure 2-2: Plan map of the trench at the Y deposit (location 2) (Geology by D. Baldwin, 1983).

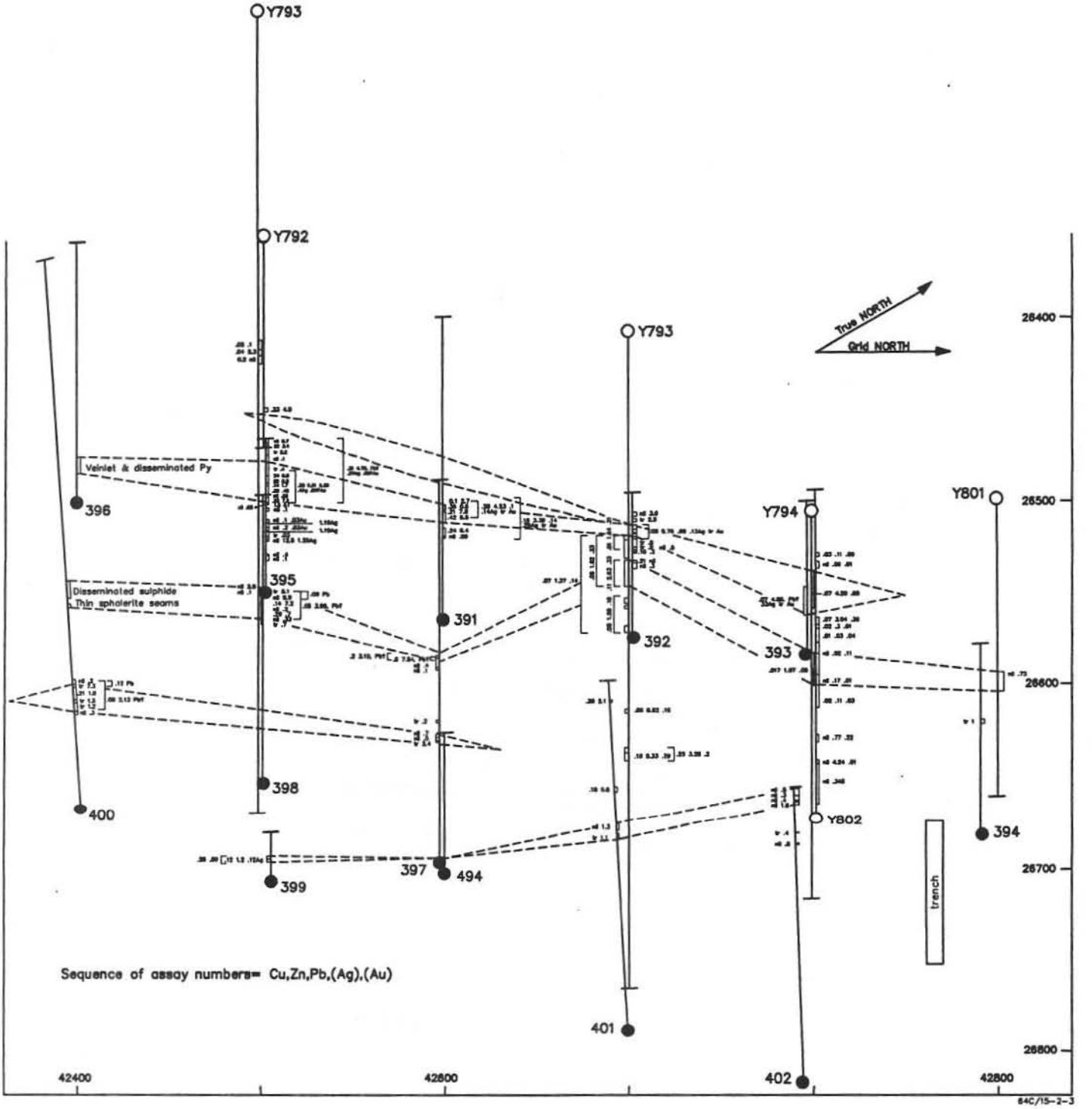


Figure 2-3: Plan of drillholes at the Y deposit (2) (SGM, unpublished data).

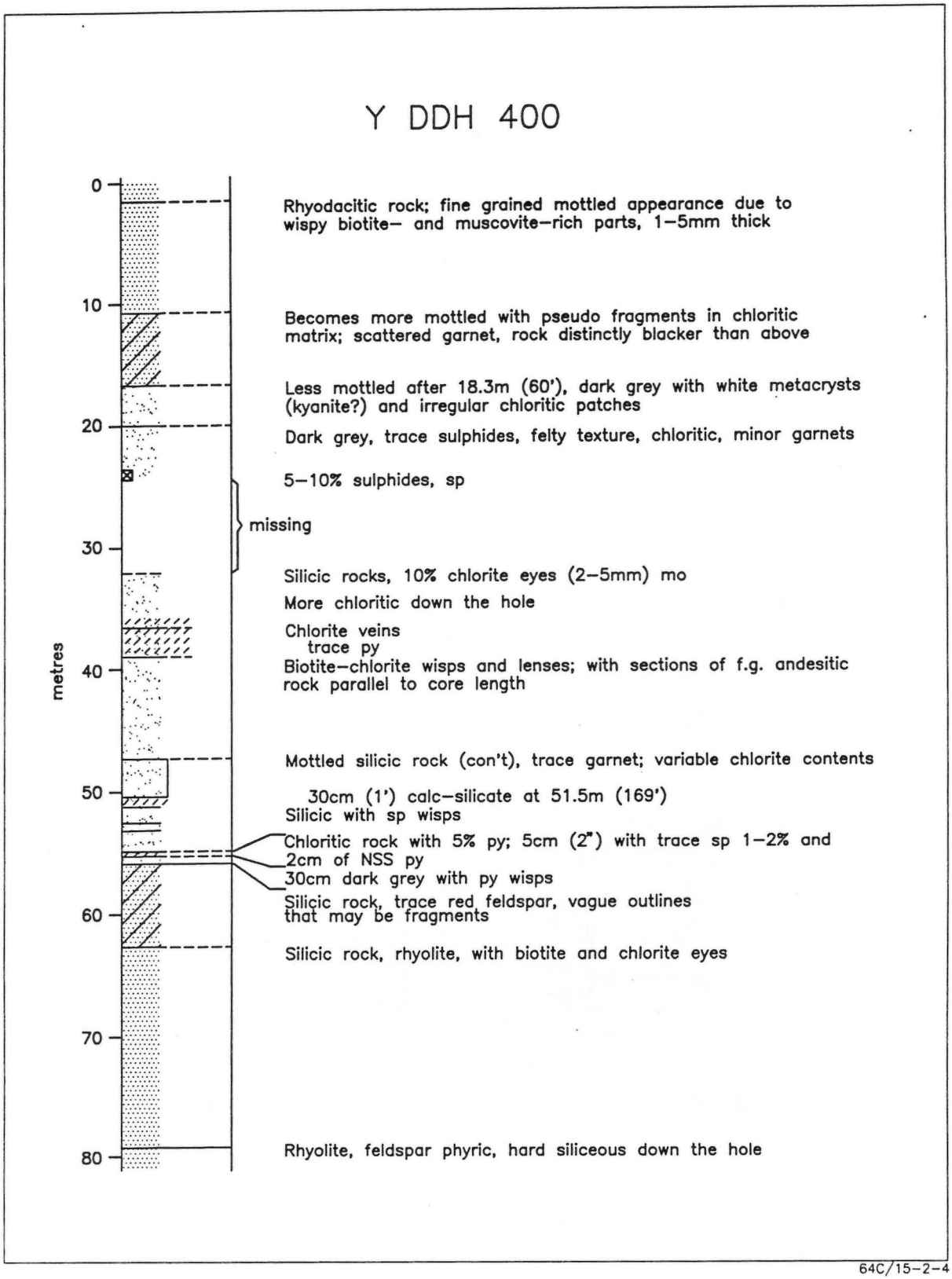


Figure 2-4: Description of drill core from DDH 400 (G.H. Gale, Manitoba Energy and Mines, unpublished data, 1982). Dip of hole not known; core axis angles not recorded. See Figure 2-3 for location of drillhole.

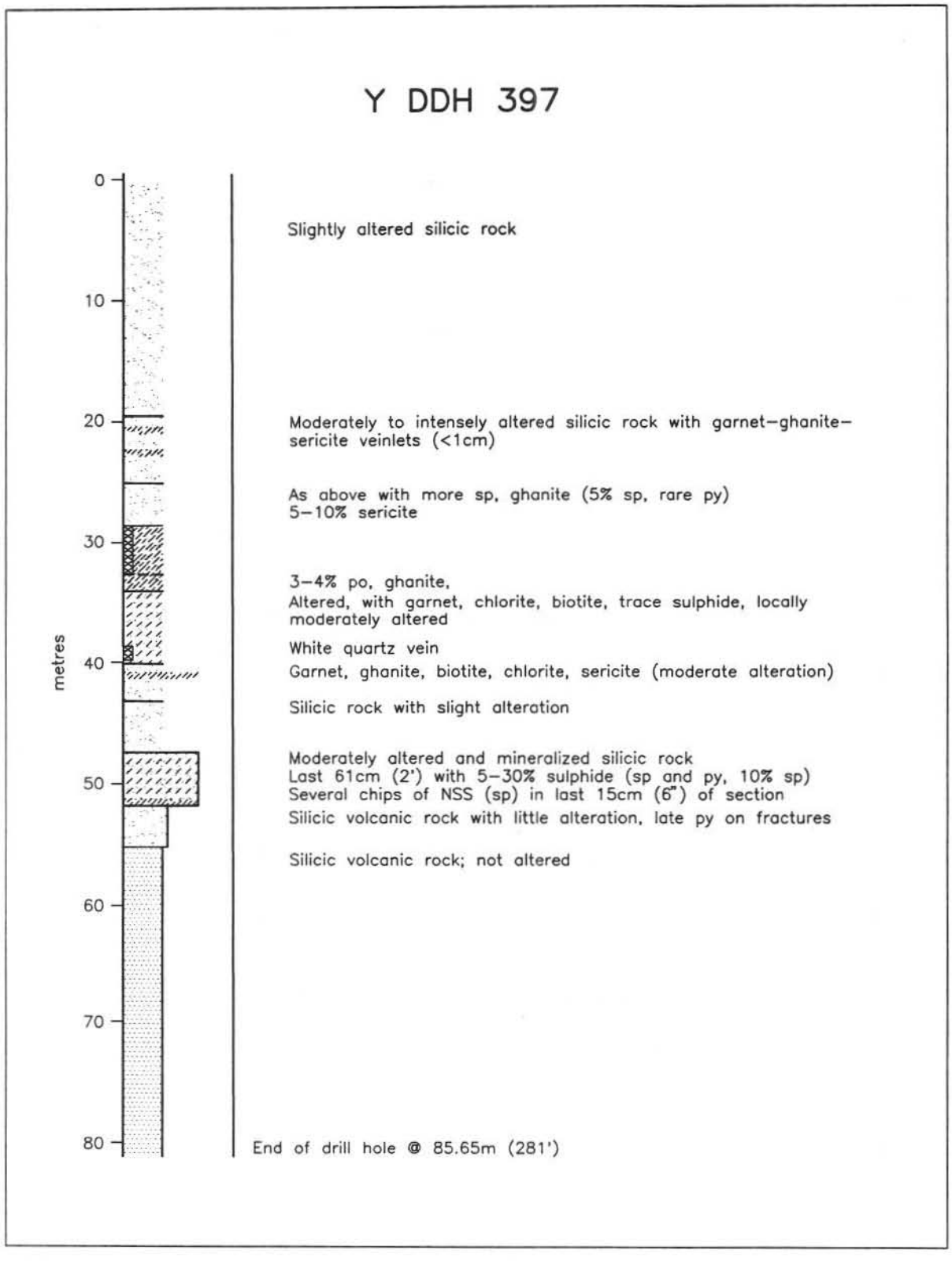


Figure 2-5: Description of drill core from DDH 397 (G.H. Gale, Manitoba Energy and Mines, unpublished data, 1982). Dip of hole not known; core axis angles not recorded. See Figure 2-3 for location of drillhole.

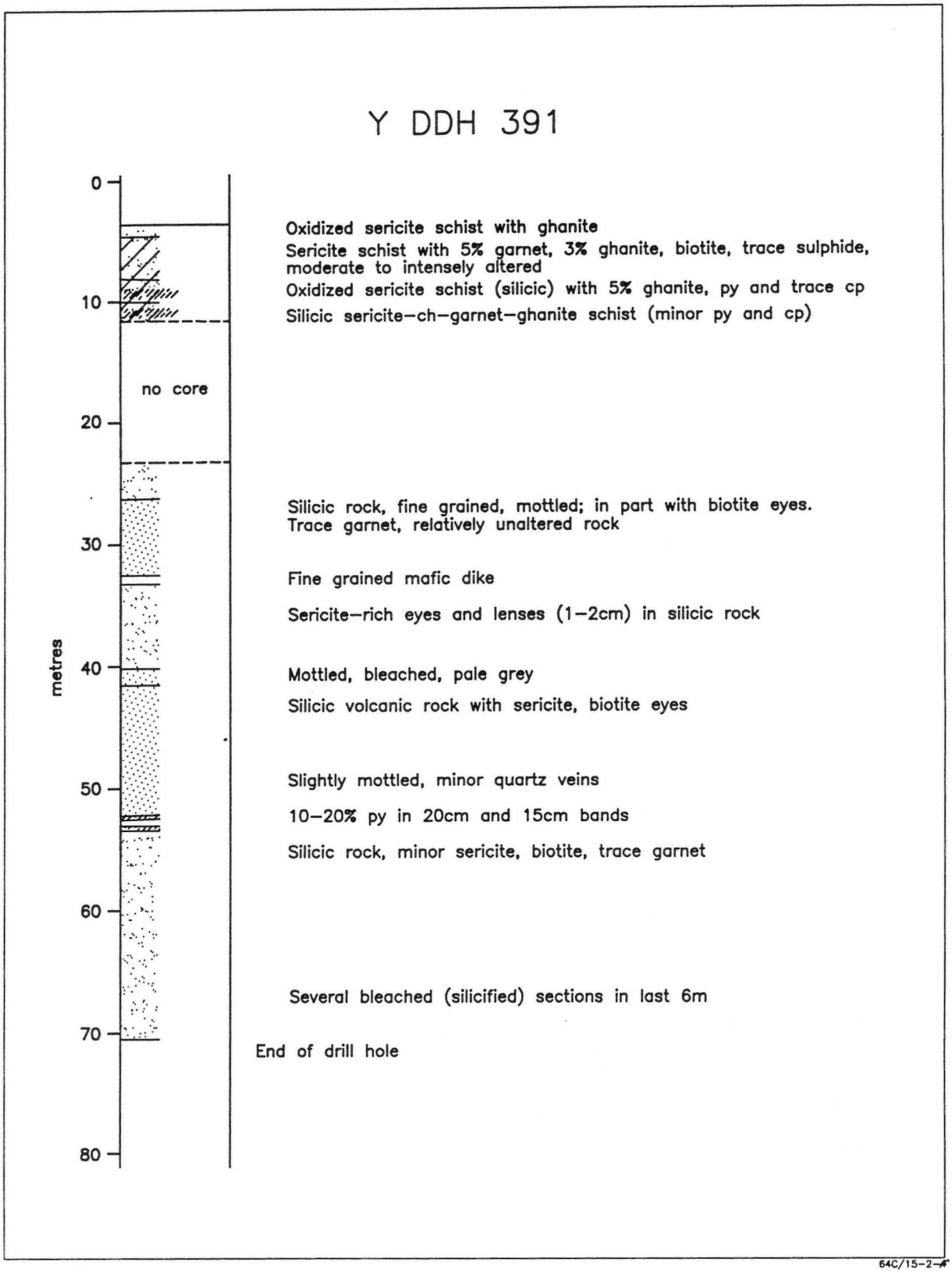


Figure 2-6: Description of drill core from DDH 391 (G.H. Gale, Manitoba Energy and Mines, unpublished data, 1982). Dip of hole not known; core axis angles not recorded. See Figure 2-3 for location of drillhole.

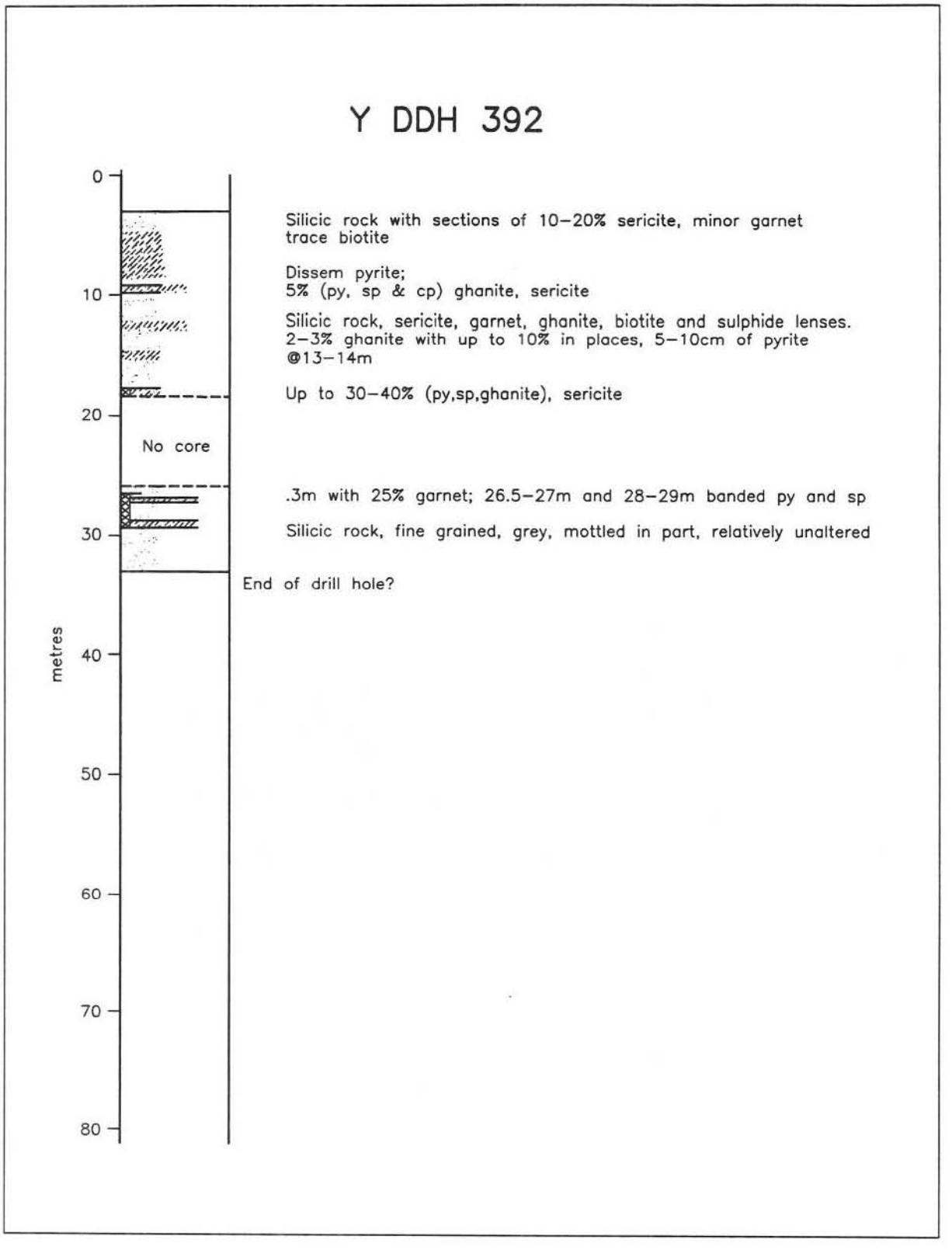


Figure 2-7: Description of drill core from DDH 392 (G.H. Gale, Manitoba Energy and Mines, unpublished data, 1982). Dip of hole not known; core axis angles not recorded. See Figure 2-3 for location of drillhole.

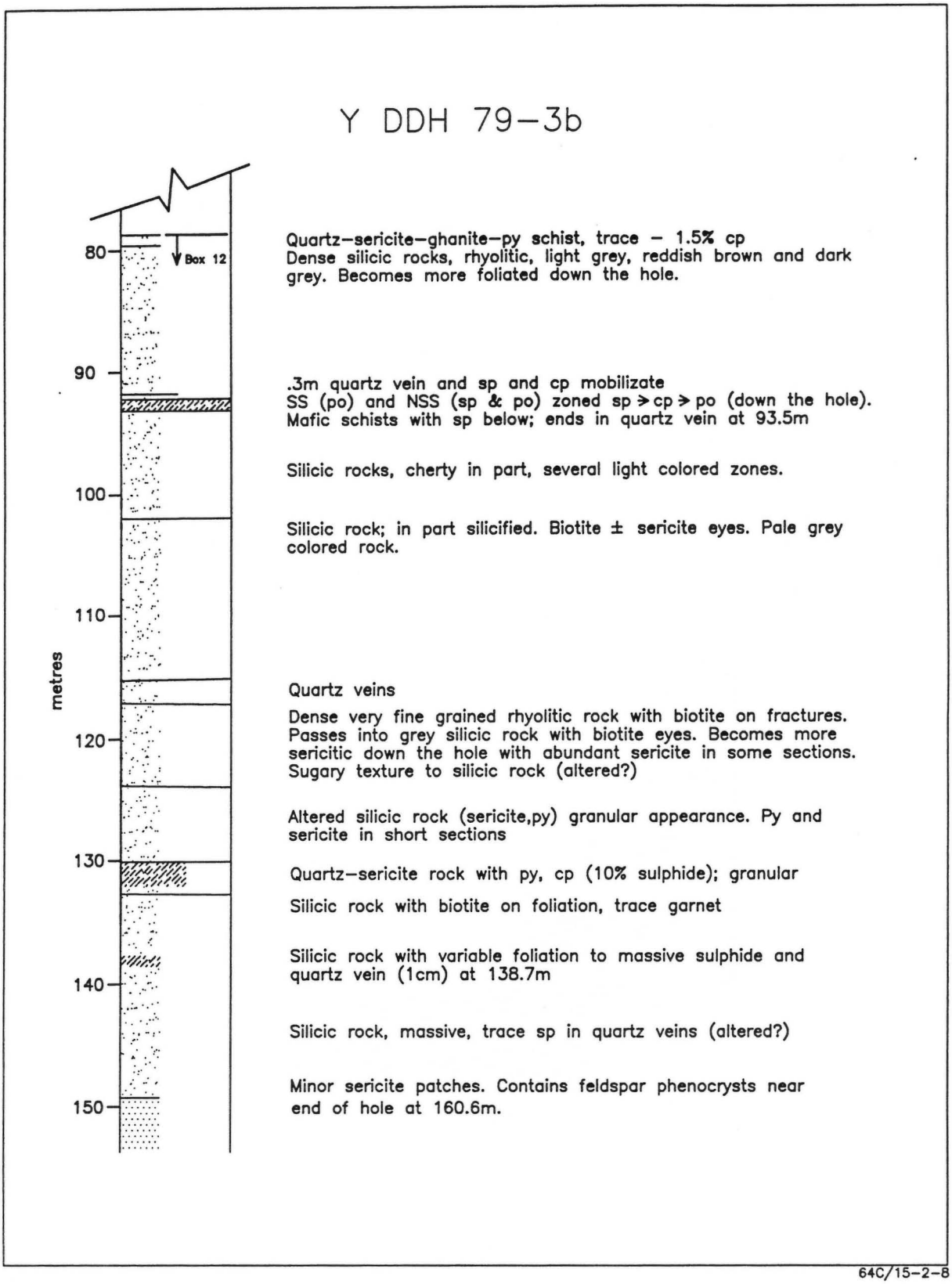


Figure 2-8: Description of drill core from DDH 79-3 (G.H. Gale, Manitoba Energy and Mines, unpublished data, 1982). Dip of hole not known; core axis angles not recorded. See Figure 2-3 for location of drillhole.

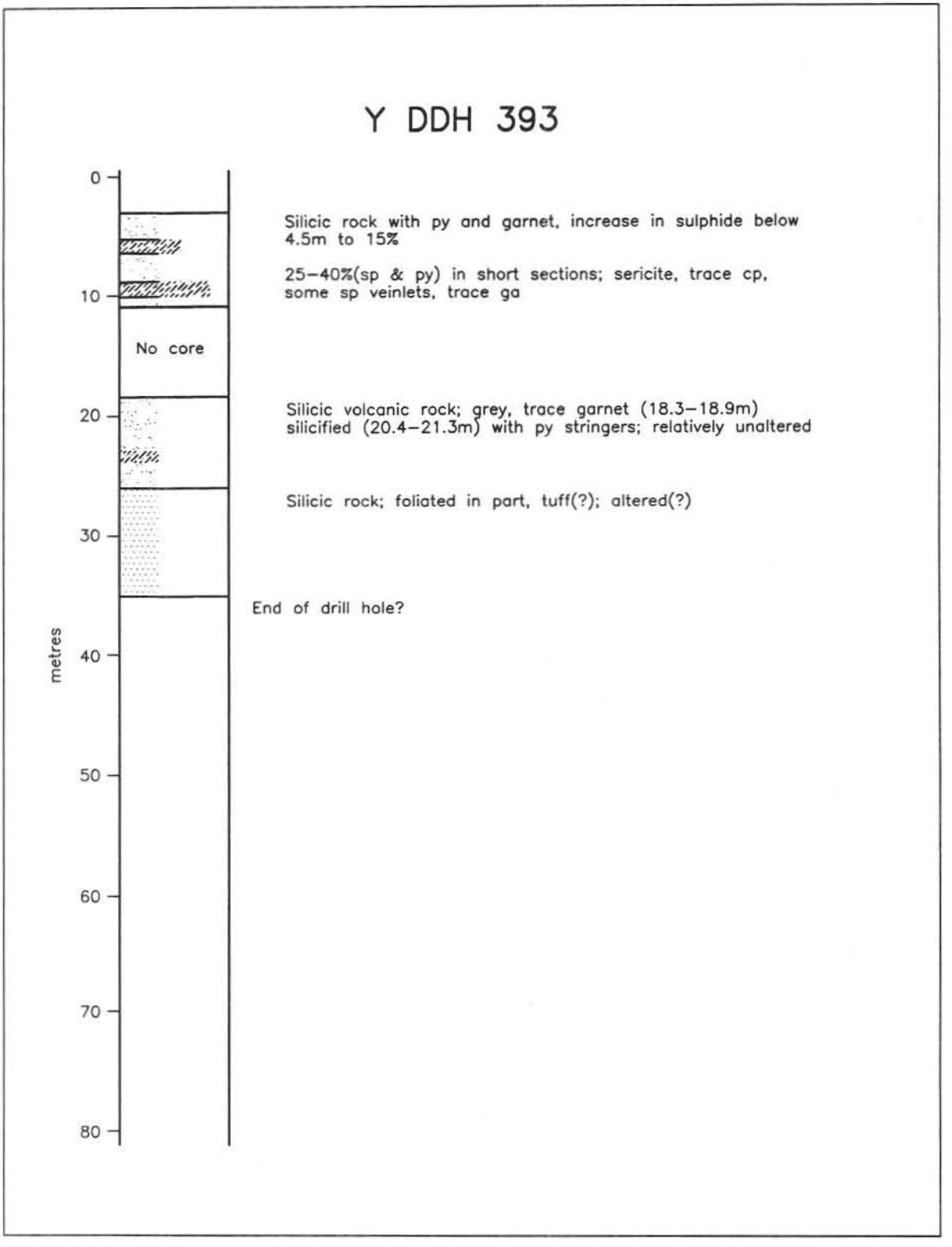


Figure 2-9: Description of drill core from DDH 393 (G.H. Gale, Manitoba Energy and Mines, unpublished data, 1982). Dip of hole not known; core axis angles not recorded. See Figure 2-3 for location of drillhole.

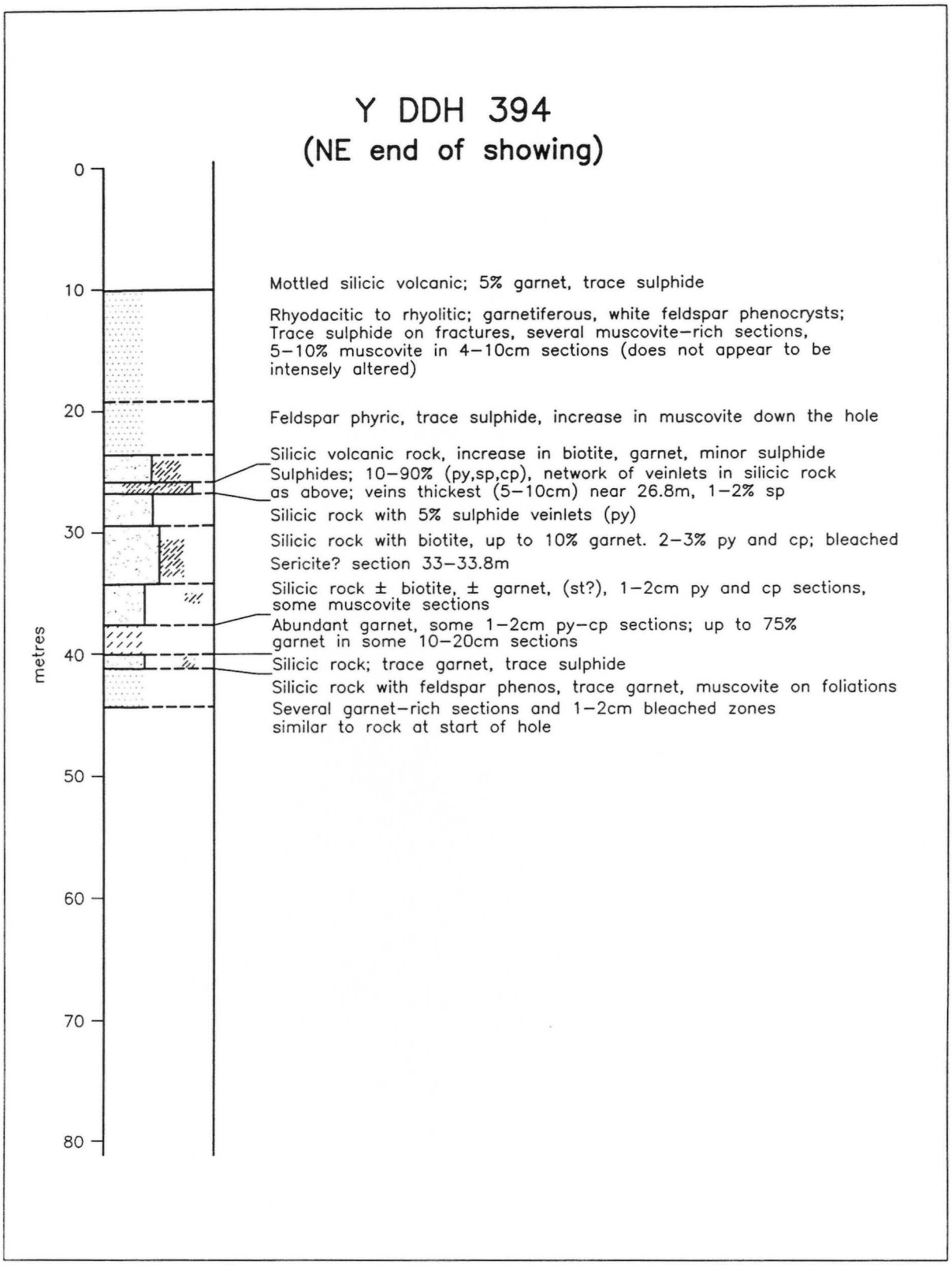


Figure 2-10: Description of drill core form DDH 394 (G.H. Gale, Manitoba Energy and Mines, unpublished data, 1982). Dip of hole not known; core axis angles not recorded. See Figure 2-3 for location of drillhole.

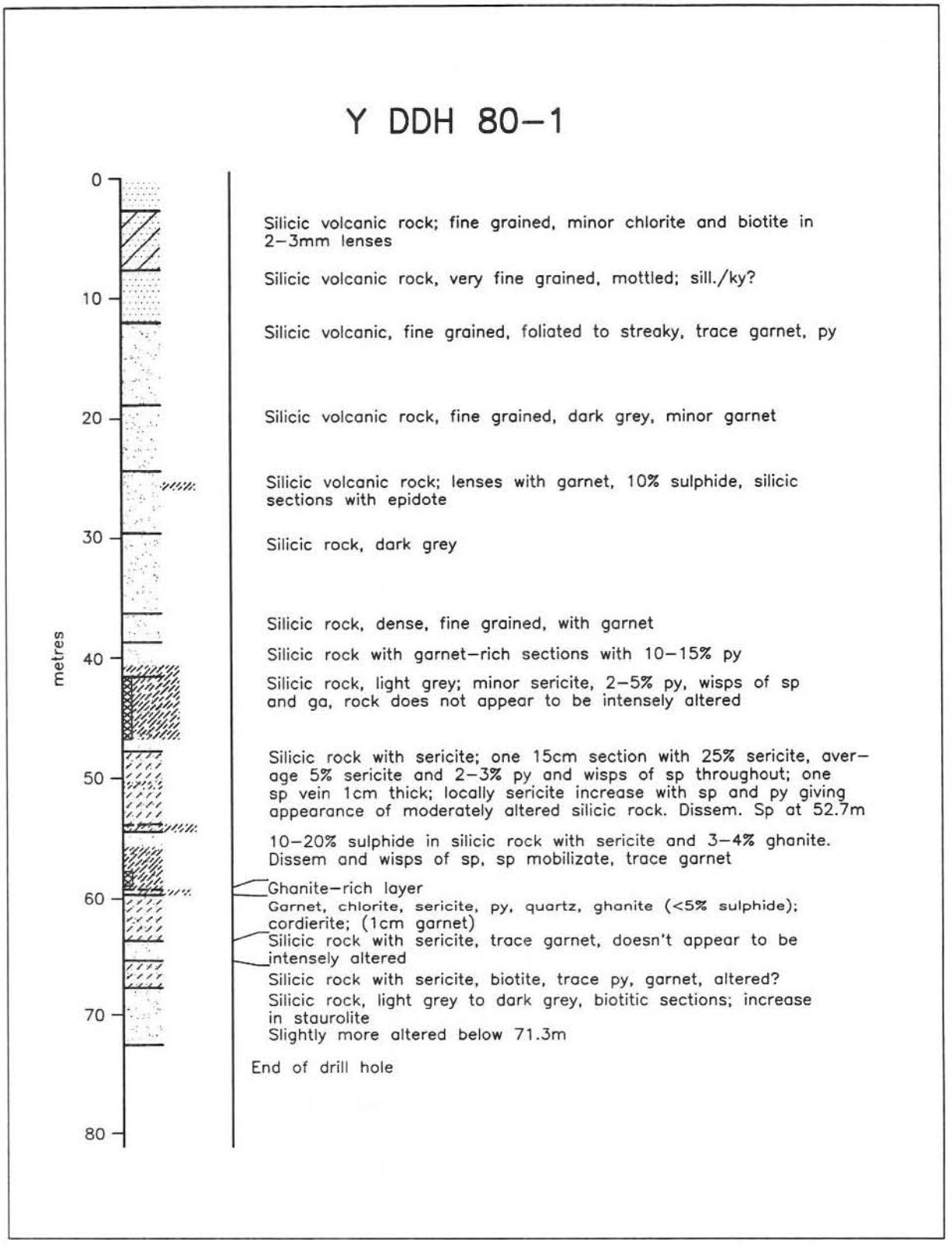
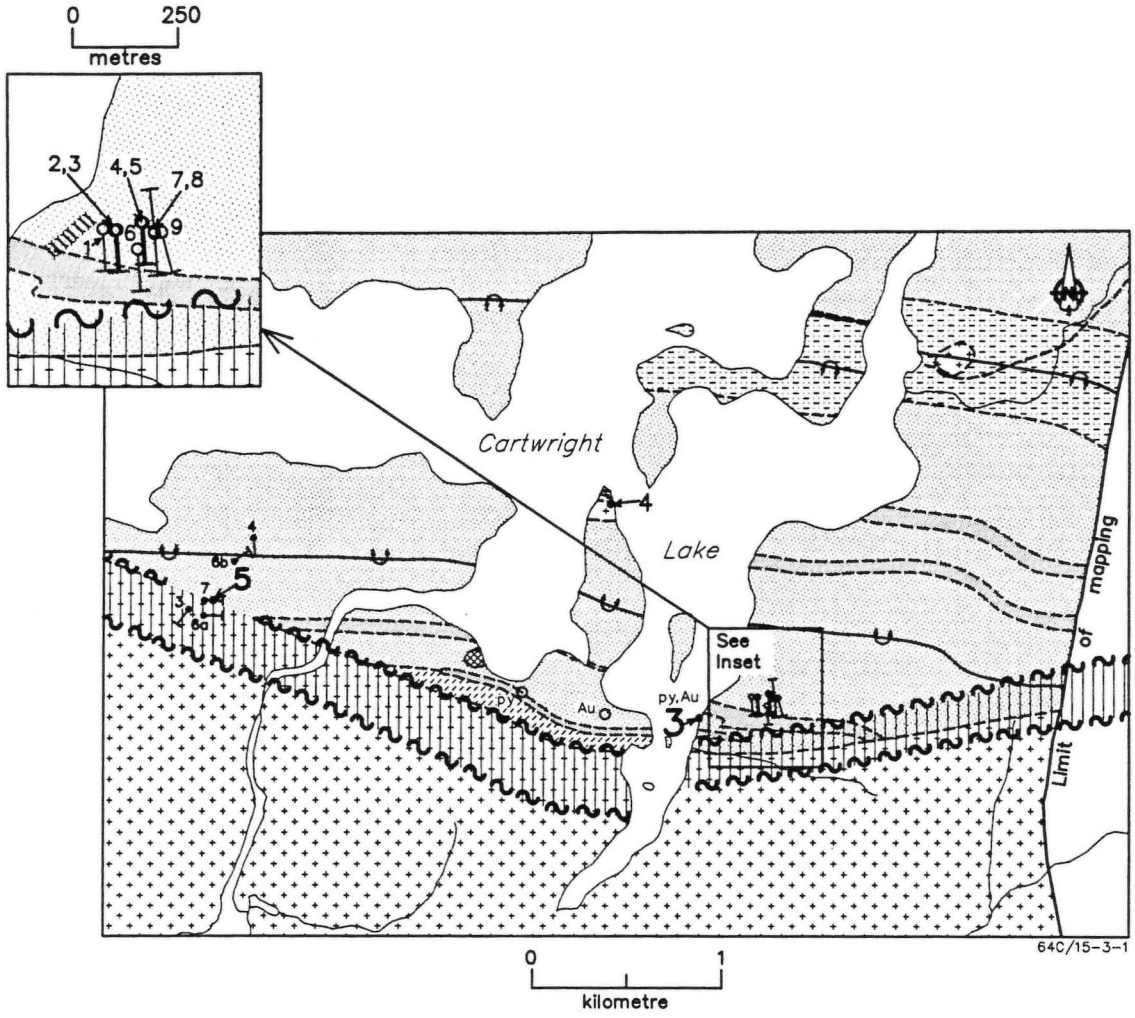


Figure 2-11: Description of drill core from DDH Y80-1 (G.H. Gale, Manitoba Energy and Mines, unpublished data, 1982). Dip of hole not known; core axis angles not recorded. See Figure 2-3 for location of drillhole.



Pre–Sickle Intrusions

- Quartz diorite, granodiorite, tonalite, sheared granodiorite, gneiss
- Gabbro

Wasekwan Group

- Intermediate volcanic rocks; andesite, tuff
- Mafic and intermediate sedimentary rocks; greywacke, mudstone
- Felsic volcanic rocks; dacite, rhyolite, lapilli tuff, rhyolite porphyry
- Cartwright Lake mafic volcanic rocks; basalt, andesite, tuff
- ----- Geological boundary (approximate)
- Johnson Shear zone
- Syncline (overturned)
- Anticline (overturned)
- Drillholes (A.F. 91291)
- Drillholes (A.F. 91290)
- Trench (A.F. 91292)
- o^{py} Mineralization
- **3.** Mineral occurrence location

Figure 3-1: Geological setting of occurrences 3, 4 and 5 (after Gilbert et al., 1980, and Peck, 1986).

LOCATION: **3**

NAME: Bonanza; Cartwright; Giant
UTM: 6293174N/396610E
ACCESS: By float/ski plane, or by traverse and boat from Provincial Road 391

AREA: Southeast shore of Cartwright Lake (Fig. 3-1)
AIRPHOTO: A24299-87

EXPLORATION SUMMARY:

Gold was discovered in the Cartwright Lake area in 1934. The location was first staked as the Hanson claims by S. Akers for P. Durie in 1934. Other claim groups staked in the immediate vicinity at that time were the Kakut claims, staked by J. Moar and J.R. Cryderman; the Cameron-Clarke claims, staked by A.J. Clarke and F. Cameron; and the Leach claims, staked by E.A. Leach and J. Owens (Milligan, 1960, p. 221, 222). Granville Gold Mines, Limited was incorporated in 1934 to develop the Hanson and Kakut groups (Bateman, 1945). Trenching was done throughout the 1930's on these claims, but the results of these operations were not recorded (Milligan, 1960, p. 222). Various parties held ground in the area since the initial staking; these dealings are summarized in Mineral Inventory Card 64C/15 Au3.

Torwin Prospecting Syndicate carried out a geological mapping (1:4800) program on the Mac claims in 1947 (A.F. 91292). The locations of eight trenches, put down by former unnamed owners, are shown in A.F. 91292.

Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). Canadian Nickel Company Limited carried out an airborne EM survey over this area in 1954 (A.F. 91615). SGM conducted an aeromagnetic survey over the area from 1957 to 1961 (A.F. 91622). Nine holes totalling 214 m were drilled on claims Giant 1 and Giant 2 by A.W. White in 1952 (A.F. 91290).

Selco Exploration Company Limited conducted an airborne EM survey over Airborne Permit 31 in 1960 (A.F. 91626). Mattagami Lake Mines Limited conducted an airborne INPUT and magnetometer survey in 1973 (A.F. 91826). SGM conducted an airborne EM and magnetometer survey in 1973 (A.F. 91699). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

In 1987, SherrGold Inc. estimated drill-inferred geological resources of 655 000 tonnes grading 2.40 g/t Au (Canadian Mines Handbook 1987-88; Bamburak, 1990) based on results of a 1986 drill program (Richardson and Ostry, 1987).

GEOLOGICAL SETTING:

The area is underlain by Wasekwan Group mafic to felsic volcanic rocks and volcanic-derived sedimentary rocks. The supracrustal sequence is folded into an overturned anticline-syncline pair with east-trending axial planes (Fig. 3-1; Gilbert *et al.*, 1980; Peck, 1986). Rocks at Cartwright Lake exhibit shearing and cataclastic textures of the Johnson Shear Zone (Gilbert *et al.*, 1980; Peck, 1984, 1985, 1986). The Wasekwan Group rocks are intruded in the south by pre-Sickle Group mafic plutons (Gilbert *et al.*, 1980).

Detailed geological mapping (1:2400) of the Cartwright Lake area was conducted by Peck (1984, 1985, 1986) (Fig. 3-2, 3-3). The mineralized zone occurs within an intensely fractured rhyolite porphyry sill on the east side of the southeasternmost bay of Cartwright Lake (Milligan, 1960; Peck, 1986; Fig. 3-2, 3-3). The sill has a minimum strike length of 1500 m, a maximum thickness of approximately 20 m, and has been drilled to a depth of 150 m (Peck, 1986). The sill consists of several felsic lenses conformably intercalated with mafic volcanic and sedimentary rocks (Milligan, 1960; Peck, 1986). On outcrop, the sill appears as oval felsic pods, <1 m to several metres in length, elongated parallel to the margins of the sill. The pods are separated by slaty mafic material that appears to have been ductilely bent around more brittle felsic pods during deformation. The rhyolite porphyry is pink to buff with up to 50% medium grained quartz and feldspar crystals, but also includes glassy aphanitic equigranular zones. Parts of the rhyolite porphyry are altered green to red, only along the margins of boudins (Peck, 1986).

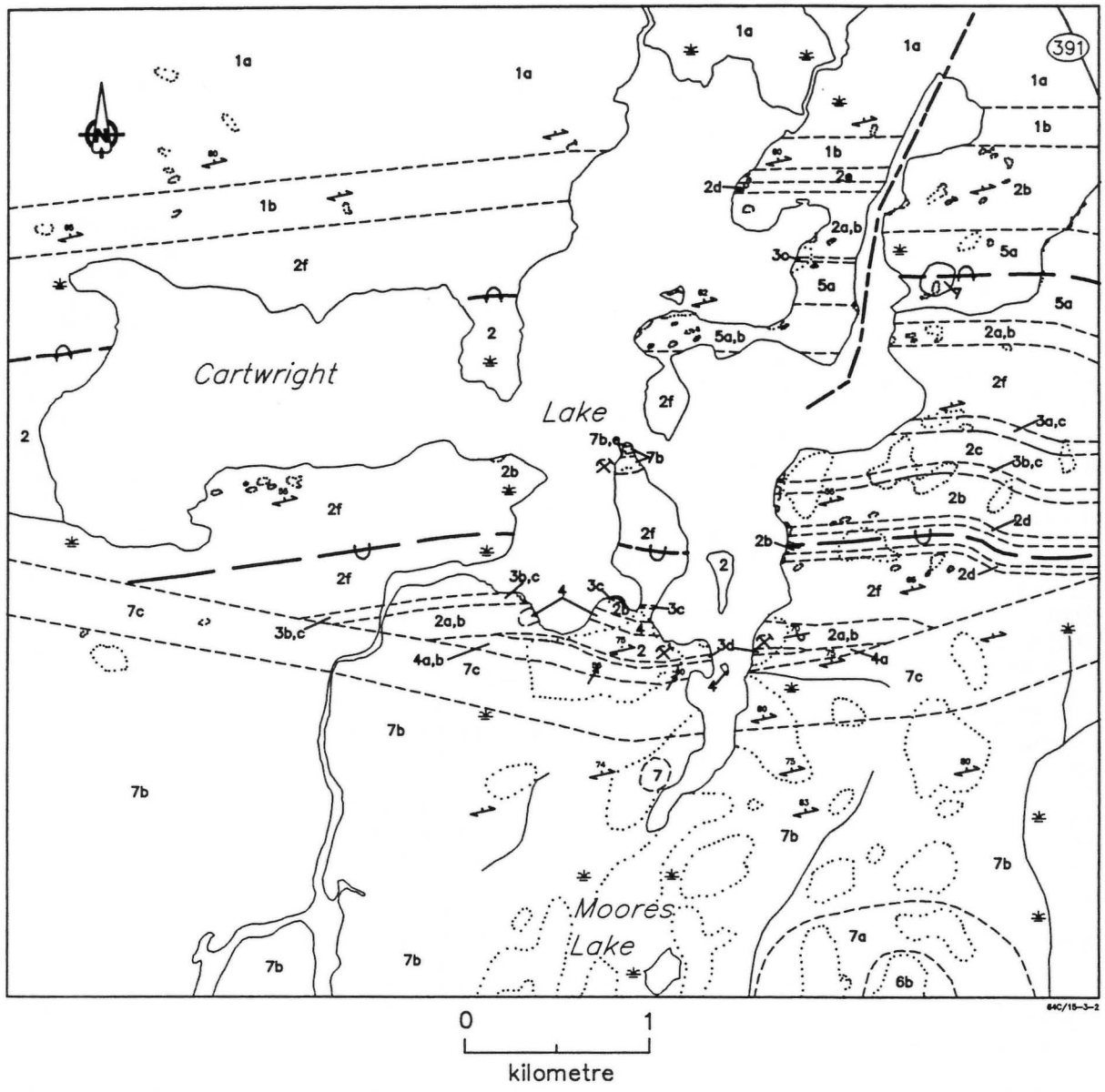
Mafic sedimentary rock exposures immediately south of the sill consist of quartz-poor mudstone. Interbedded mafic flows and pyroclastic rocks occur north of the sill (Milligan, 1960; Peck, 1986). Drill logs describe rocks immediately underlying the sill as altered to a schistose talcose rock, and those overlying the sill as altered in places to pinkish, hard, fine grained rock (A.F. 91290).

MINERALIZATION:

Descriptions of the mineralization are provided in Bateman (1945), A.F. 91292, Milligan (1960), and Peck (1984, 1985, 1986). Summaries are provided by Fedikow *et al.* (1986), Richardson and Ostry (1987), and Fedikow *et al.* (1991). The following description is summarized from Peck (1986).

Gold is submicroscopic, associated with ubiquitous pyrite-rich (or rarely, galena-rich) quartz veins that fill fractures in the rhyolite porphyry sill. The sill hosts two styles of quartz veins. The older veins are ovoids of milky white quartz, commonly <40 cm in diameter, and are devoid of sulphides or gold. The quartz-sulphide veinlets are younger, thin (generally <2 cm thick), discontinuous over lengths >1 m, and form a fracture filling network that resembles a stockwork. The quartz-sulphide veins commonly contain up to 30% pyrite crystals and crystal aggregates with local concentrations of galena, and rare chalcopyrite, arsenopyrite, and bornite. Gangue minerals include quartz, ferroan calcite, ankerite, dolomite, biotite, muscovite, tourmaline (dravite), magnetite, fluorite, and microscopic chlorite, talc/sericite and albite. The quartz-sulphide veins are in sharp contact with the host rocks and lack alteration haloes (Peck, 1986).

Drill logs from A.F. 91290 record minor to "heavily mineralized" pyrite in the porphyry sill, and mostly minor pyrite in the surrounding volcanic rocks.



Pre–Sickle Intrusive Rocks

7 Intermediate intrusive rocks
- a) diorite
- b) quartz diorite, grandiorite, tonalite
- c) sheared grandiorite gneiss

6 Mafic intrusive rocks
- a) gabbro
- b) pyroxenite

Wasekwan Group

5 Intermediate metavolcanic rocks
- a) andesite
- b) tuff

4 Mafic and sedimentary rocks
- a) greywacke, mudstone
- b) magnetite, rich mudstone

3 Felsic metavolcanic rocks
- a) dacite
- b) massive and hyaloclastic rhyolite
- c) lapilli tuff
- d) rhyolite–porphyry

2 Cartwright Lake mafic volcanic rocks
- a) high–Mg tholeiitic basalt
- b) normal tholeiitic basalt
- c) basaltic–andesite
- d) heterolithic volcanic breccia
- e) tuff
- f) undifferentiated

1 Cockeram Lake mafic volcanic rocks
- a) tholeiitic basalt
- b) transitional basalt

Geological boundary (approximate)

Bedding (tops known/overturned)

Foliation (dip unknown, dip known)

Lineation

Fault, approximate

Overturned anticline and syncline

Outcrop

Mineral occurrence location

Swamp

Figure 3-2: Detailed geology of the Cartwright Lake area (Peck, 1986).

GEOCHEMICAL DATA:

SherrGold Inc. estimated drill-inferred geological resources of 655 000 tonnes grading 2.40 g/t Au to 213 m (Canadian Mines Handbook 1987-88; Bamburak, 1990).

Table 3-1 presents comparative results from Peck (1986) for Au, Ag, Cu, Pb, Zn and As in rock samples from nonmineralized and auriferous zones.

Torwin Prospecting Syndicate's assays of trench samples "showed encouraging values in gold", and mentions results of earlier drilling "...with inconclusive results" (A.F. 91292). Bateman (1945) reports channel sampling results by Granville Lake Mines, Limited up to 11.65 g/t Au over 9.1 m, and by A.M. Bateman of 10.38 g/t Au over 6.1 m in 1935. Fourteen chip samples collected from trenches contained 0.24-5.35 g/t Au (Baldwin, 1983; Fig. 3-4).

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. Auriferous sulphide-bearing quartz veins occur in a rhyolite porphyry sill.

Peck (1986) suggests that mafic inclusions, which are ubiquitous in the rhyolite porphyry sill at the Cartwright deposit but absent at the Tutor occurrence (Location 4), are the source of material for the more complex mineralogical assemblage at the Cartwright deposit.

Table 3-1
Geochemical data derived from nonmineralized and sulphide-rich rock samples from the Bonanza claims (Peck, 1986)

Element Analyzed	Background Values				Auriferous Zone
	Mafic volcanic rock	Felsic volcanic rock	Mudstone	Intermediate intrusive rock	Quartz-sulphide veins in granodiorite
Au (ppb)					
N	18	12	48	17	75
Mean	22	16	57	11	1200
Range	6-55	6-32	13-2000	5-30	160-10000
Ag (ppm)					
N	3	6	48	3	75
Mean	1	1	1	1	1
Range	1	1	1	1	1-7
Cu (ppm)					
N	25	6	54	20	75
Mean	62	10	99	37	65
Range	6-374	1-25	34-278	15-63	23-231
Pb (ppm)					
N	3	6	48	3	75
Mean	2	3	3	2	88
Range	2	2-13	1-50	2	1-1800
Zn (ppm)					
N	25	6	54	20	75
Mean	128	40	116	77	33
Range	71-162	18-76	64-6100	55-95	9-158
As (ppm)					
N	18	12	12	17	16
Mean	5	1	2	1	1
Range	1-16	1-4	1-6	1-3	1-4

N = number of samples

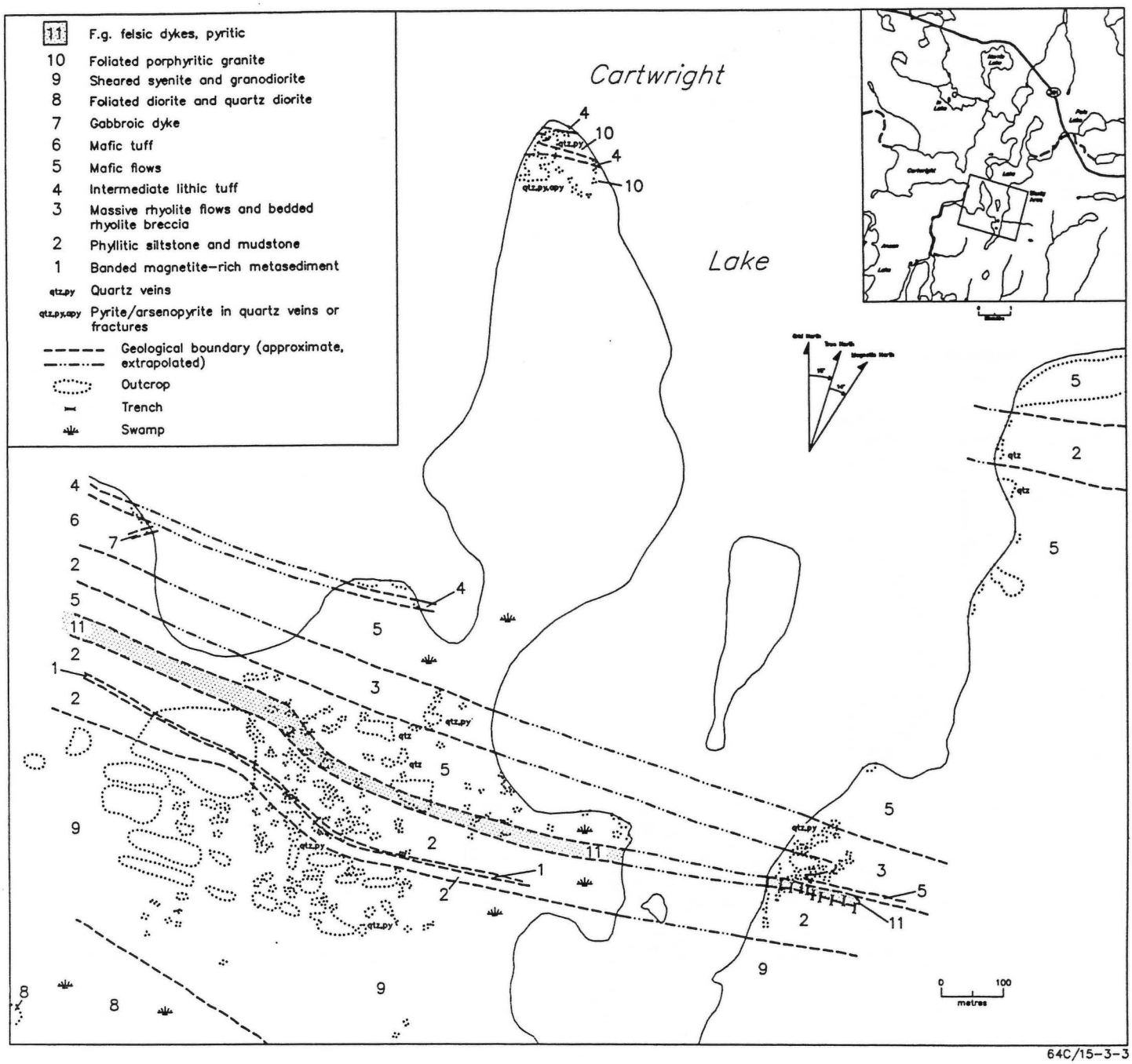


Figure 3-3: Geology of the southeast part of Cartwright Lake (Peck, 1985).

REFERENCES:

Assessment Files 91290, 91292, 91615, 91616, 91622, 91626, 91699, 91826, 91989, 91992
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Northern Miner Press Limited, Toronto, p. 350-351.

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1991: The Johnson shear zone: a regional metallogenetic feature in the Lynn Lake area; Manitoba Energy and Mines, Mineral Deposit Thematic Map Series, Map 91-1, 1:50 000.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

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Peck, D.C.
1984: An investigation of gold mineralization at Cartwright Lake, Manitoba; **in** Manitoba Energy and Mines, Report of Field Activities 1984, p. 25-28.
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1986: The geology and geochemistry of the Cartwright Lake area: Lynn Lake greenstone belt, northwestern Manitoba; University of Windsor, M.Sc. Thesis (unpublished), 270p.

Richardson, D.J. and Ostry, G.
1987: Gold deposits of Manitoba; Manitoba Energy and Mines, Economic Geology Report ER86-1, p. 61-65, 67.

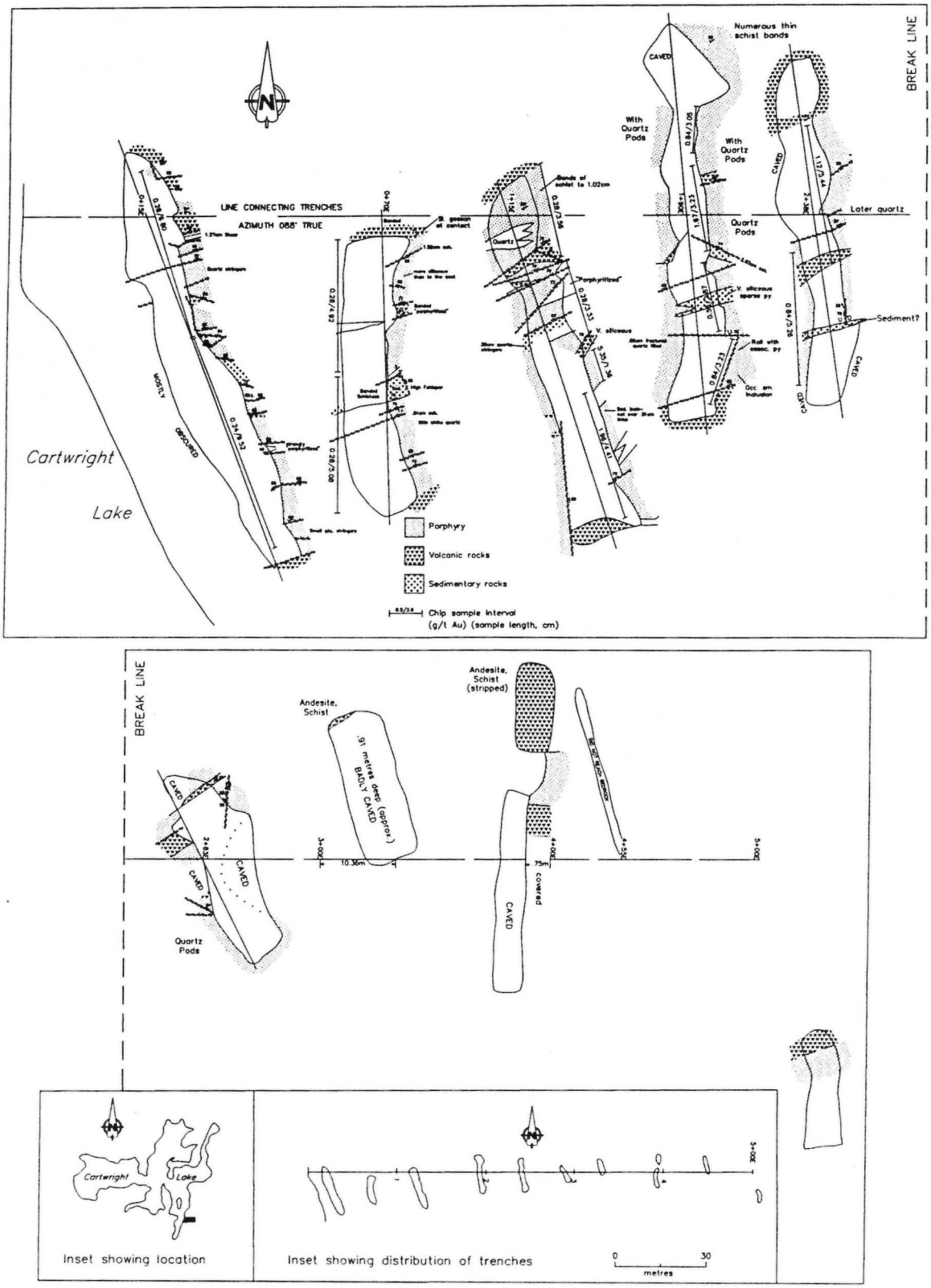

Figure 3-4: Map of trenches at the Cartwright Lake deposit (4). Geology by Milligan (1960). Samples collected by Manitoba Energy and Mines in 1982; assay results reported by Baldwin (1983).

LOCATION: 4

NAME: Tutor
UTM: 6294359N/395979E
ACCESS: Float plane, or by boat from Provincial Road 391

AREA: Northern tip of peninsula along south shore of Cartwright Lake (Fig. 3-1)
AIRPHOTO: A24297-48

EXPLORATION SUMMARY:

Gold was discovered in the Cartwright Lake area in 1934. The Hanson claims were first staked by S. Akers for P. Durie in 1934. Other claim groups staked in the immediate vicinity at that time were the Kakut claims, staked by J. Moar and J.R. Cryderman; the Cameron-Clarke claims, staked by A.J. Clarke and F. Cameron; and the Leach claims, staked by E.A. Leach and J. Owens (Milligan, 1960, p. 221, 222). Granville Gold Mines, Limited was incorporated in 1934 to develop the Hanson and Kakut groups (Bateman, 1945). Trenching was done throughout the 1930's on these claims, but the results of these operations were not recorded (Milligan, 1960, p. 222). Various parties held ground in the area since the initial stakers; these dealings are summarized in Mineral Inventory Card 64C/15 Au3.

Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). Canadian Nickel Company Limited carried out an airborne EM survey over this area in 1954 (A.F. 91615). SGM conducted an aeromagnetic survey over the area from 1957 to 1961 (A.F. 91622).

Selco Exploration Company Limited conducted an airborne EM survey over Airborne Permit 31 in 1960 (A.F. 91626). Mattagami Lake Mines Limited conducted an airborne INPUT and magnetometer survey in 1973 (A.F. 91826). SGM conducted an airborne EM and magnetometer survey in 1973 (A.F. 91699). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

SGM and SherrGold Inc. conducted preliminary mapping, diamond drilling, ground magnetometer, IP and geochemical surveys in the Cartwright Lake area in the 1980's, concentrated mostly in the area of the Cartwright deposit (see location 3), but including the area of the Tutor occurrence (Peck, 1986).

GEOLOGICAL SETTING:

The area is underlain by Wasekwan Group mafic to felsic volcanic rocks and volcanic-derived sedimentary rocks. The supracrustal sequence is folded into an overturned anticline-syncline pair with east-trending axial planes (Fig. 3-1; Gilbert *et al.*, 1980; Peck, 1986). Rocks at Cartwright Lake exhibit shearing and cataclastic textures of the Johnson Shear Zone (Gilbert *et al.*, 1980; Peck, 1984, 1985, 1986). The Wasekwan Group rocks are intruded in the south by pre-Sickle Group mafic plutons (Gilbert *et al.*, 1980). Detailed geological mapping (1:2400) of the Cartwright Lake area was conducted by Peck (1984, 1985, 1986) (Fig. 3-2).

Granodiorite, the host rock for one of the styles of mineralization at this occurrence, is medium grained, equigranular, massive to weakly gneissic with local augen structures. It also contains a series of boudinaged aplite dykes, <1 to 3 m long, 20 to 50 cm wide, parallel to the gneissose foliation (Peck, 1986).

Tholeiitic basalt, the host for the other style of mineralization at this occurrence, comprises interbedded basalt flows, mafic tuff and mafic volcanic breccia. At the northern end of the peninsula where the Tutor occurrence is located, mafic tuff consists of blocky, mostly massive, pale green layers, generally <6 m thick, with rare thin bedded zones (Peck, 1986).

MINERALIZATION:

Two styles of mineralization are present at this location: (1) auriferous quartz-pyrite veins in granodiorite and (2) auriferous pyrite along contorted S_1 foliation surfaces in altered tholeiitic basalt.

Gold is associated with minor pyrite and trace galena in a sheeted quartz vein network in parts of the granodiorite. The veins strike 320°, 350° to 010°, and 050° to 070°; they are 5 to 20 cm wide and <1 m long (Peck, 1986).

Up to 30% pyrite grains and crystal aggregates occur along contorted relict S_1 foliation surfaces in tholeiitic basalt. Pyrite is associated with chlorite, albite, quartz, epidote, calcite, opaques, and rarely with chalcopyrite, tourmaline and fluorite. This is interpreted as a hydrothermal alteration assemblage in a shear zone along the basalt-granodiorite contact. Submicroscopic gold is associated with pyritic basalt. This style of mineralization was intersected in drill core in 1985 by SherrGold Inc., and is not observed in outcrop (Peck, 1986).

GEOCHEMICAL DATA:

Table 4-1 presents a comparison between mineralized and nonmineralized granodiorite from the Tutor occurrence (Peck, 1986).

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. Auriferous sulphide-bearing quartz veins fill fractures in granodiorite. Peck (1986) notes that the orientation of quartz veins is characteristic of joint complexes that form during cooling along the margins of a pluton. He also suggests that mafic inclusions, which are ubiquitous in the rhyolite porphyry sill at the Cartwright deposit but absent at the Tutor occurrence, are the source of material for the more complex mineralogical assemblage at the Cartwright deposit (Location 3).

The auriferous pyrite in tholeiitic basalt is disseminated mineralization not classified.

Table 4-1
Geochemical data derived from nonmineralized and sulphide-rich rock samples from occurrence 4 (Tutor) (Peck, 1986)

Element Analyzed	Nonmineralized Granodiorite	Auriferous Granodiorite
Au (ppb)		
N	17	17
Mean	11	500
Range	5-30	62-3000
Ag (ppm)		
N	3	17
Mean	<1	<1
Range	<1-1	<1-3
Cu (ppm)		
N	20	17
Mean	37	52
Range	15-63	39-95
Pb (ppm)		
N	3	17
Mean	<2	7
Range	<2	<2-17
Zn (ppm)		
N	20	17
Mean	77	31
Range	5-95	7-75
As (ppm)		
N	17	10
Mean	1	1
Range	1-3	1-3

N = number of samples

REFERENCES:

Assessment Files 91615, 91616, 91622, 91626, 91699, 91826, 91989, 91992
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1984: An investigation of gold mineralization at Cartwright Lake, Manitoba; **in** Manitoba Energy and Mines, Report of Field Activities 1984, p. 25-28.
1985: Geological investigations at Cartwright Lake, Manitoba; **in** Manitoba Energy and Mines, Report of Field Activities 1985, p. 37-40.
1986: The geology and geochemistry of the Cartwright Lake area: Lynn Lake greenstone belt, northwestern Manitoba; University of Windsor, M.Sc. Thesis (unpublished), 270p.

LOCATION: **5**

NAME:
UTM: 6293694N/393969E
ACCESS: Float plane, or by boat from Provincial Road 391, and traverse from Cartwright Lake

AREA: Southwest of Cartwright Lake (Fig. 3-1)
AIRPHOTO: A24297-48

EXPLORATION SUMMARY:

Gold was discovered in the Cartwright Lake area in 1934 (Milligan, 1960, p. 222). Various parties held ground in the area since the initial stakers; these dealings are summarized partly in Mineral Inventory Card 64C/15 Au3.

Five drillholes (DDH 3, 4, 6a, 6b, 7; total 295 m) were drilled on claim M.D.S. 1 for J.A. Syme and Vaughan Thompson in 1953 (A.F. 91291). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). Canadian Nickel Company Limited carried out an airborne EM survey over this area in 1954 (A.F. 91615). SGM conducted an aeromagnetic survey over the area from 1957 to 1961 (A.F. 91622).

Selco Exploration Company Limited conducted an airborne EM survey over Airborne Permit 31 in 1960 (A.F. 91626). Mattagami Lake Mines Limited conducted an airborne INPUT and magnetometer survey in 1973 (A.F. 91826). SGM conducted an airborne EM and magnetometer survey in 1973 (A.F. 91699). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

SGM and SherrGold Inc. conducted preliminary mapping, diamond drilling, ground magnetometer, IP and geochemical surveys in the Cartwright Lake area in the 1980's, concentrated mostly in the area of the Cartwright deposit (see location 3), but including the area of Location 5 (Peck, 1986).

GEOLOGICAL SETTING:

The area is underlain by Wasekwan Group mafic to felsic volcanic rocks and volcanic-derived sedimentary rocks. The supracrustal sequence is folded into an overturned anticline-syncline pair with east-trending axial planes (Fig. 3-1; Gilbert *et al.*, 1980; Peck, 1986). Rocks at Cartwright Lake exhibit shearing and cataclastic textures of the Johnson Shear Zone (Gilbert *et al.*, 1980; Peck, 1984, 1985, 1986). The Wasekwan Group rocks are intruded in the south by pre-Sickle Group mafic plutons (Gilbert *et al.*, 1980). Detailed geological mapping (1:2400) of the Cartwright Lake area was conducted by Peck (1984, 1985, 1986) (Fig. 3-2).

Drillholes intersected quartz-feldspar porphyry, tuff, aplite, quartz-hornblende schist, mafic volcanic rocks and schist (part with carbonate or quartz stringers), and local light grey quartzite (*author's note:* rhyolite?). DDH 6a also intersected a 1.8 m core length of barren quartz (A.F. 91291).

MINERALIZATION:

A 0.6 m core length of near solid pyrite occurs at the contact between sheared mafic volcanic rocks with minor pyrite and a 2.1 m core length of barren quartz from DDH 7. A 6.0 m core length of quartz-feldspar porphyry from DDH 3 is described as "heavily mineralized"; minor pyrite occurs elsewhere in quartz-feldspar porphyry, tuff and aplite from DDH 3 and "greenstone" from DDH 7. Traces of chalcopyrite and pyrite were noted in "greenstone" with numerous quartz stringers from DDH 6a. Mineralization was not noted in logs for DDH 4 or 6b (A.F. 91291).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

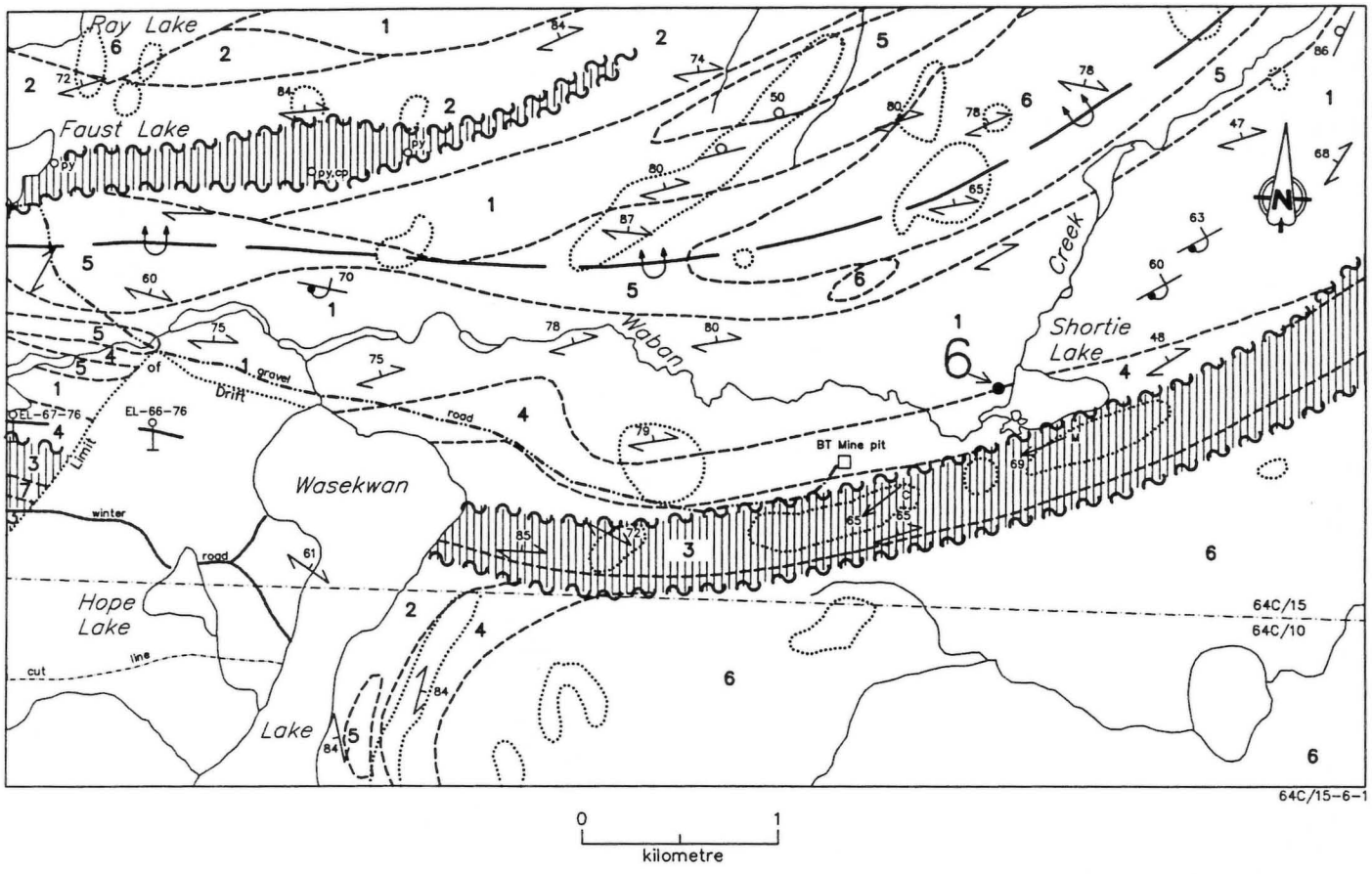
REFERENCES:

Assessment Files 91291, 91615, 91616, 91622, 91626, 91699, 91826, 91989, 91992
Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Mineral Inventory Card 64C/15 Au3
Manitoba Energy and Mines, Geological Services Branch.

Peck, D.C.
1984: An investigation of gold mineralization at Cartwright Lake, Manitoba; **in** Manitoba Energy and Mines, Report of Field Activities 1984, p. 25-28.
1985: Geological investigations at Cartwright Lake, Manitoba; **in** Manitoba Energy and Mines, Report of Field Activities 1985, p. 37-40.
1986: The geology and geochemistry of the Cartwright Lake area: Lynn Lake greenstone belt, northwestern Manitoba; University of Windsor, M.Sc. Thesis (unpublished), 270p.



Intrusive Rocks

7 Granite, granodiorite

6 Diorite, quartz diorite; hornblende–biotite tonalite

5 Gabbro, diabase

Wasekwan Group

4 Hornblende greywacke, siltstone; mafic mudstone

3 Massive porphyritic and aphyric basalt and andesite; mafic tuff

2 Massive basalt; autoclastic breccia; porphyritic and aphyric basalt

1 Massive basalt; pillowed basalt

Geological boundary (approximate)

Johnson Shear zone

Axial trace of anticline (overturned)

Pillows, tops known (inclined)

Pillows, tops unknown (dip unknown)

Foliation (inclined, dip unknown)

Outcrop

EM conductor (A.F. 90992)

Drillhole (A.F. 90992)

Microcrenulation (inclined)

Mineral lineation (inclined)

Mineralization

Occurrence location

Figure 6-1: Geological setting of the Burnt Timber deposit (location 6) (after Gilbert et al., 1980).

LOCATION: **6**

NAME: BT; Burnt Timber
UTM: 6292028N/385060E
ACCESS: Gravel road

AREA: 4 km east of Wasekwan Lake (Fig. 6-1)
AIRPHOTO: A23828-114

EXPLORATION SUMMARY:

SGM carried out a geological mapping survey (1:6000) on the Faust claims between Foster and Wasekwan lakes in 1945 (A.F. 90992).

Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5 in 1954 (A.F. 91615). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). Sherritt Gordon Mines Limited conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Mattagami Lake Mines Limited conducted an airborne INPUT and magnetometer survey in 1973 (A.F. 91826). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

Granges Exploration Aktiebolag drilled DDH EL-66-77 and EL-67-77 (total 106 m) on CB 7269 in 1977 (A.F. 92699).

The remainder of this description was provided by A.M. Eastwood of Black Hawk Mining Inc. in 1996.

The BT gold deposit was discovered in 1988 by LynnGold Resources Inc. (operator) and Trans America Industries Ltd. during systematic drill testing of prospective induced polarization (IP) geophysical anomalies along the Johnson Shear Zone. The discovery diamond-drill hole, W8814, intersected 1.2 g/t gold over 27.4 metres (0.035 oz/ton gold over 90 feet).

Following the discovery, the BT gold deposit was delineated by a total of 135 diamond-drill holes (~14,440 metres) during 1988 and 1989. In late 1988, geological reserves were estimated at 1.0 million tonnes grading 3.8 g/t gold to a maximum depth of 122 metres below surface based on 69 diamond-drill holes. Subsequently, LynnGold completed metallurgical tests and feasibility studies to determine the economics of mining the deposit by conventional open pit mining methods. With the shutdown of LynnGold's MacLellan Mine operations at Lynn Lake in 1989, there was no further development activity on the BT deposit for the next three years.

After the 1989 shutdown, DCC Equities Ltd. had acquired LynnGold's assets. In 1992, Cazador Explorations Limited entered into a joint venture agreement with DCC. Following a positive feasibility study and some additional drill testing of the deposit (33 diamond-drill holes in 1993), Cazador brought the BT gold deposit into production on August 1, 1993. Milling of the BT ore commenced on September 13, 1993 and the first gold pour by Cazador occurred on October 1, 1993. Open pit mineable reserves at start-up were estimated at 1,232,000 tonnes grading 2.85 g/t gold using a 1.7 g/t gold cutoff.

In November 1993, Granduc Mining Corporation was formed through the amalgamation of Cazador Explorations Limited, the former operator of the BT deposit, and Granduc Mines Limited. Commercial production by Granduc commenced on June 1, 1995. On July 1, 1996, Granduc and Black Hawk Mining Inc. merged on a share-for-share basis.

The deposit was mined by open pit and the ore was hauled 18 km on an all-season gravel road for processing at the 1400 tonne per day gold mill at Lynn Lake. Mine design for the BT gold deposit originally consisted of four optimized pits with the fourth being an ultimate pit (Stages I to IV). Stages I and II, overburden stripping and mining of the main zone, were completed by June, 1995. Stage III, the eastern extension of the main zone, was mined until the end of June, 1996 when the mine closed. The bottom four benches in Stage III were mined using a dragline which allowed mining of two additional benches, the 255 and 250 Benches, below the final pit design.

Mining activities at the BT deposit were conducted over a 2_ year period between August 1, 1993 and June 16, 1996. The deposit was mined by open pit at a mining rate of 7,000 tonnes per day. With a 4:1 stripping ratio, total production of gold-bearing ore was approximately 1,400 tonnes per day. The mine operated twenty-four hours per day, 363 days per year in two alternating twelve hour shifts. Mining activities at the deposit ceased on June 16, 1996 and milling of the ore was completed by June 30, 1996.

Drilling and blasting at the pit was carried out by an independent contractor. Production drilling was based on a 12' x 14' staggered blast hole pattern throughout the Stage III pit using a Krupp drill to drill 6" diameter blast holes. In the ore zones, supplementary 3" diameter sample holes, equally spaced within the 12' x 14' pattern to provide tighter grade control, were drilled using a Gardner-Denver drill. In small discontinuous 'high grade' ore zones, 4" diameter blast holes drilled on a 9' x 9' pattern provided tighter grade control.

GEOLOGICAL SETTING:

This description was provided by A.M. Eastwood of Black Hawk Mining Inc. in 1996.

The BT deposit is hosted by a highly altered and deformed sequence of mafic metavolcanic and metasedimentary rocks, locally intruded by felsic porphyry. Massive and variably foliated basalt (North Wall Basalts) are the principal lithology. They become increasingly altered (silicified + carbonatized) and mineralized (primarily pyrite) towards the T1 Fault. Shear laminated, mylonitic, silicified metasediments(?) and mafic volcanic rocks lie adjacent to the T1 Fault and contain the bulk of the gold mineralization. The primary fabric within the mine sequence has been obliterated by a penetrative schistosity and pervasive silicification. Barren ultramafic dykes and associated talc-chlorite + carbonate schists crosscut most lithologies including the ore zone(s). The footwall rocks on the south side of the T1 Fault are dark green, variably altered basalt (South Wall Basalts) with lesser gabbro and minor metasediments or metavolcanic tuff. In the open pit and

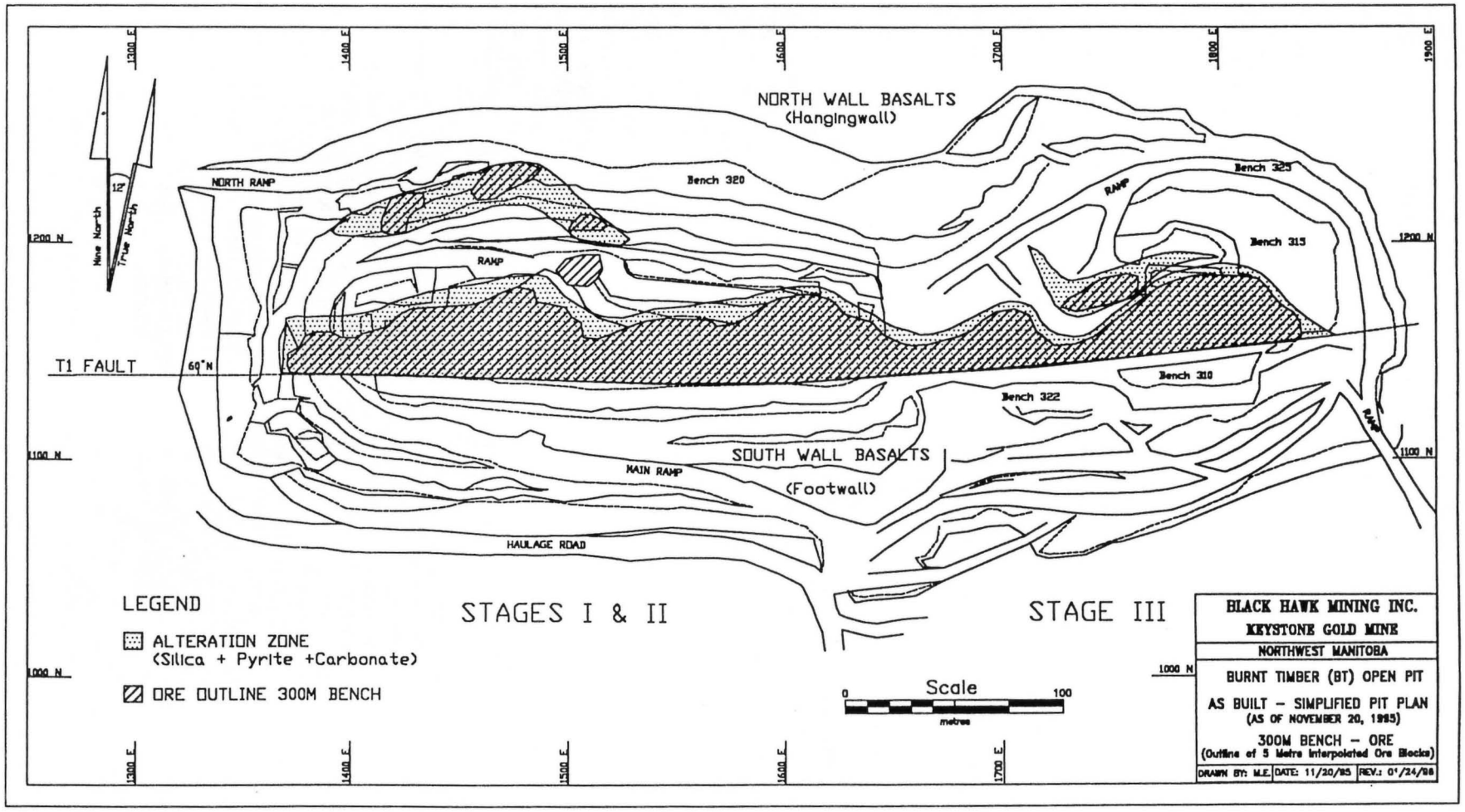


Figure 6-2: Plan view of the BT open pit showing the general ore outline and alteration zone on the 300 m bench. (Courtesy of A.M. Eastwood, Black Hawk Mining Inc.).

in drill core, the T1 Fault is a sharp planar feature marked by a zone, one to three metres wide, of chloritic gouge.

The BT deposit lies in the hanging wall of the T1 Fault (Fig. 6-2), a post-mineralization brittle fault with a strike of N70°-80°E and a dip of about 60°N that was emplaced along the southern margin of the E-W trending, regional Johnson Shear Zone. The Johnson Shear is a wide zone of intense brittle/ductile deformation characterized by faulting, shearing, mylonitization and associated silica and carbonate alteration.

MINERALIZATION:

This description was provided by A.M. Eastwood of Black Hawk Mining Inc. in 1996.

Gold mineralization is associated with pale grey, strongly silicified and carbonatized mafic metavolcanic and metasedimentary rocks containing 1 to 5% disseminated and fracture-controlled pyrite, locally up to 10%, with minor associated galena, chalcopyrite and trace amounts of sphalerite locally. The main gold-bearing zones, which are located in the hanging wall within about 40 metres of the T1 Fault, are generally well fractured and/or brecciated with abundant chlorite + carbonate + pyrite along foliation and joint surfaces. These strongly silicified gold-bearing pyritic zones form irregular, elongate, north-dipping lenses which exhibit fairly good grade continuity and distribution.

Narrow, high grade, boudinaged, commonly 'horse-tail shaped', foliation (S_1)-parallel, mineralized (pyrite ± galena) quartz veins occur throughout the deposit, but are more common in the ore zones towards the east end. Further into the hanging wall, north of the main lenses, narrow, foliation-parallel, high grade, intensely silicified, laminated shear zones up to 3 metres wide locally return gold values up to 200 g/t gold in grab samples. As with the enclosing lithologies, the mineralized lenses have been folded into a series of north-east-plunging open drag folds (F_2). More pronounced folding in the eastern portion of the pit has resulted in lower grades and poorer continuity of mineralization than in the western and central pit areas.

Visual grade control is possible within the main ore zones with quartz veins in the narrow, high grade, laminated shear zones to the north. Typically, this ore is fine grained, light greenish-grey to whitish-grey, shear laminated and moderately to intensely silicified with up to 5% disseminated and fracture-controlled pyrite and trace amounts of galena along foliation and fracture planes. In both the silicified wall rocks and the quartz veins, the gold grades are generally higher in samples with both pyrite and galena mineralization. Outside and peripheral to the main ore zones, low grade (<2.0 g/t gold) ore material is difficult to identify visually, and grade control is based principally on the blast hole assay grades.

GEOCHEMICAL DATA:

This description was provided by A.M. Eastwood of Black Hawk Mining Inc. in 1996.

Prior to production beginning in September 1993, the open pit reserves at the BT deposit were estimated at 1,232,000 tonnes grading 2.85 g/t gold, using a 1.7 g/t cutoff containing some 112,900 ounces (3 200 715 g) of gold. Total gold production from the BT deposit was 77 947 ounces of gold; yearly production figures are tabulated in Table 6-1. Estimated resources remaining outside the final pit limits amount to some 1 014 000 tonnes grading 2.9 g/t Au, which are currently uneconomic.

CLASSIFICATION:

Vein type deposit; multiple veins.

REFERENCES:

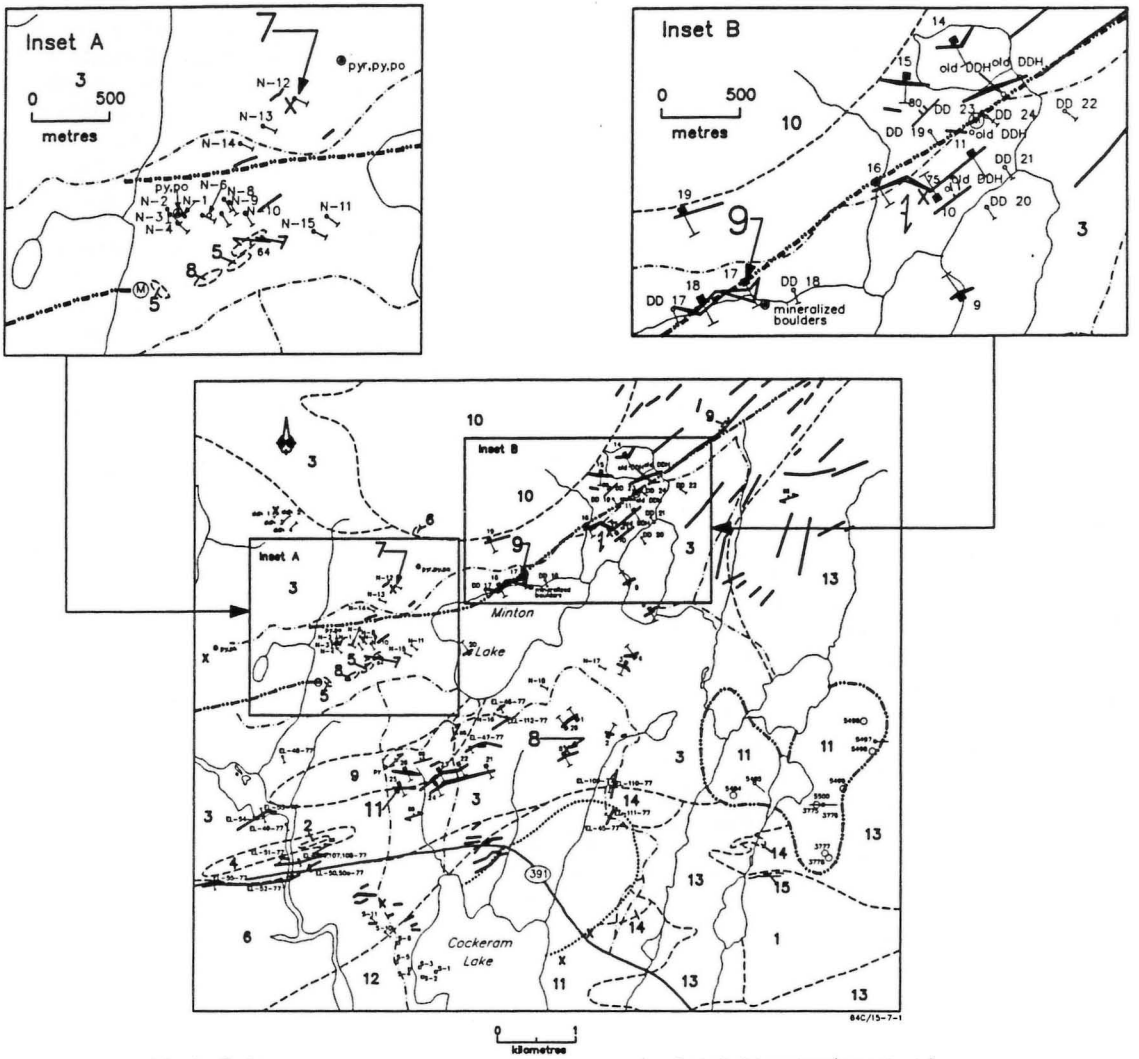
Assessment Files 90992, 91615, 91616, 91622, 91679, 91699, 91826, 91989, 91992, 92699
Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Table 6-1
Burnt Timber (BT) deposit production summary (1993-1996). (Courtesy of A.M. Eastwood, Black Hawk Mining Inc.).

	1993(1)	1994(1)	1995(1)	1996(2)
Tonnes Ore Mined	97,636*	370,468	423,553	234,123
Tonnes Waste Mined**	421,232	1,808,184	1,857,294	544,284
Tonnes Ore Milled	73,174	351,506	432,374	215,803
Head Grade (g Au/t)	3.24	2.71	2.36	2.75
Recovery (%)	84.7	86.6	87.8	86.2
Grams Au Produced	189,727	825,890	896,153	512,430
Ounces Au Producted	6,107	26,553	28.812	16,475

(1) 1993, 1994, 1995 Granduc Mining Corporation Annual Reports.
(2) Mill Production Sheets - Metallurgical Office, Keystone Gold.
* Tonnes Ore and Waste Mined for the period Oct. 1 - Dec. 31, 1993 only (from BT Pit production records).
** Tonnes Waste Mined includes low grade, overburden and rock.



Intrusive Rocks

15 Aplite, aplitic granite; pegmatite, graphic granite

14 Granite, granodiorite

13 Diorite, quartz diorite

12 Hornblende–biotite tonalite, quartz diorite

11 Gabbro, norite, diorite, ultramafic rock

Sickle or Wasekwan Group

10 Conglomerate, biotite greywacke matrix

Wasekwan Group

9 Biotite greywacke, siltstone, mudstone

8 Chert

7 Conglomerate with volcanic and sedimentary clasts

6 Massive porphyritic rhyolite

5 Massive porphyritic dacite

4 Tuff

3 Massive porphyritic and aphyric basalt and andesite

2 Mafic tuff

1 Wasekwan Group undivided

Geological boundary (approximate)

Iron formation

Limit of mapping

EM conductors (A.F. 91059, 91060, 91351, 91355, 92310, 92702)

Magnetic anomaly

Foliation (inclined, vertical)

Bedding, tops unknown (vertical)

Geology after Gilbert *et al.*, (1980).

Drillholes

(A.F. 91355)

(A.F. 91469)

(A.F. 91443)

(A.F. 92052)

(A.F. 92702)

(A.F. 91051)

(A.F. 91053)

(A.F. 91059)

Mineralization, location approximate (Milligan, 1960).

Mineral occurrence

Trail

7 Mineral occurrence location

Figure 7-1: Geological setting of occurrences 7, 8 and 9 (after Gilbert et al., 1980).

LOCATION: **7**

NAME: W.H.M. Group
UTM: 6308083N/383106E
ACCESS: Float plane to Minton Lake and traverse 0.8 km west

AREA: 0.7 km west of Minton Lake (Fig. 7-1)
AIRPHOTO: A23828-119

EXPLORATION SUMMARY:

Granville Lake Nickel Mines Limited carried out a magnetometer survey and drilled 15 holes (N-1 through N-15; total 1814 m) to test a nickeliferous hornblendite in 1947, and conducted a vertical loop EM survey in 1957 on the W.H.M. claims (A.F. 91355).

Noranda carried out a magnetometer and geological (1:2400) survey over the northwest part of the area in 1948 (A.F. 91471). Doramal Mines, Limited carried out a magnetometer survey and prepared a geological map (1:2400) of the Bang and D.D.M. claims in 1947 (A.F. 91442).

Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5 in 1954 (A.F. 91615). SGM conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). John Ziyone contracted J.P. Sheridan to carry out an EM survey on the Mink group in 1960 (A.F. 91060). Selco Exploration Company Limited conducted an airborne EM survey over Airborne Permit 31 in 1960 (A.F. 91626). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

Staking history is detailed in Mineral Inventory Card 64C/15 Ni1.

GEOLOGICAL SETTING:

The area is underlain by Wasekwan Group mafic volcanic rocks, minor iron formation, greywacke, siltstone, and dacite (Gilbert *et al.*, 1980; Fig. 7-1). This area is part of the Agassiz Metallotect (Fedikow, 1984; Fedikow, 1986; Fedikow *et al.*, 1990; see 'General Geology of NTS Area 64C/15'). A detailed map by Doramal Mines, Limited shows intermediate to mafic flows, tuff, breccia, and felsite dykes (A.F. 91442). Drillholes intersected magnetiferous amphibolitized mafic and felsic volcanic rocks, and amphibolite. Felsic volcanic rocks include massive, tuff, and breccia varieties (A.F. 91355).

MINERALIZATION:

Mineralization is hosted by mafic tuff with abundant recrystallized amphibole (specified in logs as hornblende in places). Quartz stringers, carbonate and/or silicification accompany the better mineralized sections. The presence of gold, nickel and copper, as well as magnetite, suggests that mineralization in these amphibolitized mafic rocks may be related to picritic basalt (*cf.* MacLellan deposit, location 1) or that these mafic rocks perhaps are picritic basalt.

Outcrops of slightly carbonatized massive mafic flows contain minor, fine grained, irregularly disseminated pyrrhotite, pyrite and chalcopyrite (A.F. 91442).

Table 7-1 summarizes mineralization intersected by drillholes.

GEOCHEMICAL DATA:

Table 7-1 summarizes assay results from drill core.

A grab sample described as 'hornblendite' with 3 to 5%, fine grained, disseminated iron sulphides contained 0.25% Ni (A.F. 91355). Milligan (1960, p. 232) noted that this rock type must contain considerable magnetite due to its extremely anomalous magnetic response, which had been identified in an early magnetometer survey.

CLASSIFICATION:

Disseminated mineralization not classified.

REFERENCES:

Assessment Files 91060, 91355, 91442, 91471, 91615, 91616, 91622, 91626, 91679, 91699, 91989, 91992
Manitoba Energy and Mines, Mines Branch.

Fedikow, M.A.F.
1984: Preliminary results of biogeochemical studies in the Lynn Lake area; Manitoba Energy and Mines, Open File Report OF84-1, 104p.
1986: Geology of the Agassiz stratabound Au-Ag deposit, Lynn Lake, Manitoba; Manitoba Energy and Mines, Open File Report, OF85-5, 80p.

Fedikow, M.A.F., Parbery, D. and Ferreira, K.J.
1990: Agassiz Metallotect - a regional metallogenic concept, Lynn Lake area; Manitoba Energy and Mines, Mineral Deposit Thematic Map Series; Map 89-1, 1:50 000.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

Mineral Inventory Card 64C/15 Ni1
Manitoba Energy and Mines, Geological Services Branch.

Table 7-1
Summary of mineralization and assay results from drillholes described in A.F. 91355

DDH	Intersection Length (m)	Mineralization	Host Rock	Ni (%)	Cu (%)	Au (g/t)	Comments	DDH Length (m)
N-1	1.5	Minor po-py	Amphibolitized andesite	0.11	0.05			88.1
	1.5	"Splashes" py-cp-mt	Rhyolite	nil	0.39			
N-3	0.9	"Fairly well mineralized"	Andesite, massive	tr.	tr.	12.0	Coarse amphibolitization	139.0
N-6	3.0	Minor f.g. diss. sulphides	Amphibolite	nil				170.7
N-7	0.7	"Considerable sulphides"	Intermediate to felsic tuff	nil	tr.	tr.	Minor to mod. sulphides in sections of this rock type, especially concentrated in fractures; no assays reported	138.4
N-8	0.3	Not specified	Andesite tuff with minor flows	tr.	0.22		Coarse hornblende; Minor sulphides locally elsewhere in core	149.7
N-9	0.8	Minor sulphides	Andesite tuff with minor flows			tr.	Zone of bluish quartz stringers	120.4
N-12	0.4	"Sulphides with quartz"	Andesite tuff	0.68	0.38	tr.		136.2
	0.6	"Sulphides with quartz"	Andesite tuff	1.30	0.32	0.3		
	0.4	"Sulphides with quartz"	Andesite tuff	0.13	0.19			
	1.2	Tr. to minor sulphides	Andesite tuff	0.12	0.35	tr.	"Considerable quartz"	
N-13	0.9	"Mineralized"	Silicified felsite dyke			tr.	In andesite	136.9
	1.1	Minor py, po, cp	Silicified andesite		0.54	tr.	Fractured Minor sulphides locally elsewhere in core	
N-15	0.9	20% py, f.g., diss.	Andesite tuff	tr.	tr.	tr.	Minor sulphides locally elsewhere in core	161.8
	0.3	Minor diss. py	Amphibolitized mafic massive flow	0.06	2.1	tr.		
	0.9	20% py, masses & diss.; minor po	Silicified andesite tuff	tr.	tr.	tr.		
	0.8	4% py, f.g., narrow seams parallel to schistosity, diss.	Andesite, massive, minor tuff	nil	tr.	tr.		
	0.7	Same	Andesite, massive. minor tuff	nil	tr.	12.0		

DDH N-2, N-4, N-5, N-10, N-14: no mineralization or only minor local sulphides noted in logs; no assays reported. DDH N-11 abandoned in overburden at 46.9 m.

LOCATION: **8**

NAME: George; G.T.
UTM: 6305997N/385271E
ACCESS: Traverse 1 km north from Provincial Road 391

AREA: South of Minton Lake (Fig. 7-1)
AIRPHOTO: A23828-118

EXPLORATION SUMMARY:

Conwest Exploration Co. Ltd. conducted a magnetometer survey and a 1:4800 geological mapping program over part of this location in 1946 (A.F. 91055). Granville Lake Nickel Mines Limited carried out a magnetometer survey and drilled DDH N-16, N-17 and N-18 totalling 353 m to test a nickeliferous hornblendite in 1947, and conducted a vertical loop EM survey in 1957 on the W.H.M. claims (A.F. 91355). Base Metals Mining Corporation conducted a magnetometer survey over part of the area in 1947 (A.F. 91057). Dennison Nickel Mines Limited carried out a magnetometer survey over part of the area in 1948 (A.F. 91051) and drilled two holes (DDH 1, 2; total 366 m) on claim GT 30 in 1948 (A.F. 91052).

Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5 in 1954 (A.F. 91615).

Lynwatin Nickel Copper Mines Limited drilled DDH 3, 4, 5, 6 and 7 (total 452 m) on the Geo (George) claims in 1957 (A.F. 91056). Red Bark Mines Ltd. conducted an EM and magnetometer survey on the Edo claims in 1957 (A.F. 91375). Evelynn Nickel Mines Ltd. conducted an EM and magnetometer survey over part of the area in 1957 (A.F. 91354). SGM conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Selco Exploration Company Limited conducted an airborne EM survey over Airborne Permit 31 in 1960 (A.F. 91626).

SGM drilled 25 holes totalling 1990 m to test EM conductors on the Min claims in 1968-69 (A.F. 91059). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

Rock Ore Exploration & Development Ltd., in joint venture with the Province of Manitoba, drilled DDH RO 75-1 (152 m) in 1975-76 (A.F. 93082). (See Location 13 for description of the remaining holes drilled during this program by Rock Ore.) Granges Exploration Aktiebolag drilled DDH EL-46-77 and EL-47-77 (total 93.0 m) to test EM conductors on CB 7434 in 1978 (A.F. 92310). Granges also drilled DDH EL-45-77 (70.7 m) on CB 7579 in 1977, DDH EL-109-80, EL-110-80, EL-111-80 (total 138 m) on CB 9394, and DDH EL-112-80 (38.4 m) on CB 7434 in 1980 (A.F. 92702).

SherrGold Inc. carried out magnetometer, VLF-EM and IP surveys on claim Minton 108 in 1987 (A.F. 93112). A.F. 92867 summarizes, but does not present, results of work by SGM on the Beluga claim (in joint venture with Novamin Resources Inc.), and the Punker and Blubber claims from 1984 to 1987: a Max-Min survey in 1984, mapping of the Beluga claim in 1984 (no outcrop located), magnetometer and HLEM surveys in 1987.

Staking history is detailed in Mineral Inventory Cards 64C/15 Cu3 and 64C/15 Ag2.

GEOLOGICAL SETTING:

The area is underlain by Wasekwan Group mafic volcanic rocks, minor greywacke and siltstone. Felsic volcanic rocks and a granodiorite intrusion occur to the south, closer to Cockeram Lake (Fig. 7-1; Gilbert *et al.*, 1980). Mafic flows with interbedded tongues of rhyolite or dacite occur locally (A.F. 91055).

DDH N-16, N-17 and N-18 intersected magnetiferous amphibolitized mafic and felsic volcanic rocks, and amphibolite. Felsic volcanic rocks include massive flows, tuff, and breccia (A.F. 91355).

DDH 1 and 2 intersected "partly altered andesitic agglomerate", fine grained grey tuffaceous rock, buff siliceous quartz porphyry, grey quartz porphyry, chlorite-biotite schist ("altered andesite"), interbanded buff silicified porphyry and chlorite-biotite schist (A.F. 91052). Overall, this is probably a sequence of felsic to intermediate fragmental rocks, including tuff and breccia, of which part is altered to chlorite-biotite schist.

DDH 5, 6, 7 intersected fine- to medium-grained, grey to green, massive and bedded rock with quartz-carbonate veinlets, siliceous or chloritic in places. Mafic dykes are present locally. DDH 3 intersected fine grained bedded argillite, coarse grained greywacke, coarse grained massive andesite tuff with quartz-carbonate "seams", and a dark grey volcanic flow rock. DDH 4 intersected impure quartzite and interbedded greywacke (A.F. 91056).

The 'Minton' drillholes intersected biotite quartzite, partly graphitic felsic to mafic volcanic rocks, and minor fine grained laminated sedimentary rocks (A.F. 91059).

DDH EL-46-77 and EL-47-77 intersected garnetiferous quartz-biotite gneiss (metasedimentary rock) intercalated with massive and tuffaceous felsic to intermediate volcanic rocks (A.F. 92310). DDH EL-45-77 intersected quartz-biotite gneiss (metasedimentary rocks), diorite, and generally massive intermediate to mafic volcanic rocks with local rhyolitic sections, and well banded rhyolite. DDH EL-109-80 intersected dark green amphibolite with minor grey siliceous sections and magnetiferous sections, and minor siliceous rhyodacite. DDH EL-110-80 intersected dark green amphibolite, minor quartz-biotite schist (metasedimentary rocks) and rhyolite. DDH EL-111-80 intersected partly silicified dark green amphibolite, rhyolite with minor sericite, and rhyodacite. DDH EL-112-80 intersected quartz-biotite schist, partly garnetiferous (A.F. 92702).

DDH RO 75-1 intersected mafic volcanic rocks and amphibolite, brown tuffaceous metasedimentary rocks and biotite-hornblende schist (A.F. 93082).

MINERALIZATION:

Table 8-1 summarizes mineralization intersected in drillholes.

Gilbert *et al.* (1980) show the location of a minor pyrite occurrence approximately halfway between Minton and Cockeram lakes (Fig. 7-1).

GEOCHEMICAL DATA:

Table 8-1 summarizes assay data from drill core.

CLASSIFICATION:

Massive sulphide type deposit; volcanic rock associated.

REFERENCES:

Assessment Files 91051, 91052, 91055, 91056, 91057, 91059, 91354, 91355, 91375, 91615, 91616, 91622, 91626, 91679, 91699, 91989, 91992, 92310, 92702, 92867, 93082, 93112

Manitoba Energy and Mines, Mines Branch.

Mineral Inventory Card 64C/15 Ag2

Manitoba Energy and Mines, Geological Services Branch.

Mineral Inventory Card 64C/15 Cu3

Manitoba Energy and Mines, Geological Services Branch.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.

1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Table 8-1: Summary of mineralization and assay results from drill logs, location 8.

DDH	Intersection Length (m)	Mineralization	Host Rock	Zn (%)	Ni (%)	Cu (%)	Co (%)	Au g/t	Ag g/t	Pb (%)	Mo (%)	Comments	DDH Length (m)	Reference
1	2.3	SS po, minor py, tr. cp	Tuff/"porphyry" contact	[Thirteen drill core assays for core samples from both DDH 1 and 2 returned nil to 0.16% Cu, nil to 0.13% Zn, nil to tr. Au.]									188.1	A.F. 91052
2	0.6	65% f.g. po, tr. cp	Silicified luffaceous rock									Tr. to minor py, po locally in three other places (each ~1 m) in core		
	0.8	65% po, py, minor cp	Silicified luff											
	2.1	50% po, minor py, tr. cp	Siliceous matrix											
	1.2	40% po, minor py, tr. cp	Tuffaceous rock											
3	3.0	"numerous fine seams" py, po	Argillite		0.01							Two continuous samples, each 1.5 m	86.6	A.F. 91056
					0.03									
	3.0	"numerous fine seams" py, po	Andesite luff		0.02									
	3.0	"numerous fine seams" py, po	Dk. grey schistose flow		0.04							Two continuous samples, each 1.5 m		
					0.03									
5	14.0	py, po (amount unspecified)	Grey to green rock, f.g. with quartz-carbonate seams		0.08		0.004	1.0	60.01			Three continuous samples, each 1.5 m from part of the 14.0 m zone	101.2	A.F. 91056
					0.07		0.002	0.3	60.01					
					0.08		0.004	0.3	64.47					
6	3.0	"numerous seams and streaks of mineralization"	"Dark grey fine grained intensely altered rock"		0.05		0.002	0.7	42.18			Two continuous samples, each 1.5 m	86.0	A.F. 91056
					0.05		0.004	0.3	67.21					
7	3.0	"fairly well mineralized"	Layered grey rock with dark grey f.g. dykes		0.09		0.003	0.3	20.57			Two continuous samples, each 1.5 m	95.1	A.F. 91056
					0.06		0.002	0.3	13.00					
EL-45-77	1.0-1.8	Four sections: <10% py, po	Rhyolite	0.02-0.10		0.03-0.04		<0.1	0.7-1.0				70.7	A.F. 92702
EL-46-77	0.3	50-75% po, tr. cp	Chloritized sericitized intermediate to mafic tuff	0.13		0.20		<0.1	2.1			Abundant quartz and rhyolite fragments	44.2	A.F. 92310
EL-47-77	0.8	50-75% po, 10-25% py; tr. sp, cp	Chloritized sericitized	0.32		0.11		0.03	2.1			Minor py, po throughout remainder of core	48.8	A.F. 92310
	0.7	25-50% po, py; tr. cp	massive felsic to intermediate volcanic rocks	0.21		0.09		0.03	1.7					
	0.2	25-50% po, 10-25% py, tr. cp	Quartz-biotite gneiss	0.17		0.11		0.03	1.0			Numerous narrow qtz. stringers		
	1.1	10-25% po, 1-2% py, tr. graphite	Felsic to intermediate volcanic rocks	0.10		0.04		0.03	1.4					
EL-109-80	2.6	2-3% po	Rhyodacile									No drill core assays	49.7	A.F. 92702
EL-110-80	0.6	10% py, po; tr. cp	Rhyolite/amphibolite contact	0.04		0.02		0.05	2.0			Continuous mineralized section	38.1	A.F. 92702
	0.9	NSS py, narrow bands po		0.18		0.01		0.05	2.0					
	0.5	5-10% py, po		0.03		0.01		0.05	1.5					
EL-112-80	0.3	30% po stringers, minor py	Quartz-biotite schist									Minor py, po throughout remainder of core	38.4	A.F. 92702
	0.2	20-30% po	Quartz-biotite schist											
	0.8	15-20% po, minor py	Quartz-biotite schist	0.10		0.03		0.05	2.0					
	0.8	10-15% po, minor py	Quartz-biotite schist		0.01	0.02		0.05	1.5					
Minton 1	1.0	20% po	Biotite quartzite, graphitic	0.67	0.04	0.18	0.03	tr.	nil	nil	nil		77.4	A.F. 91059
	0.6	15% po, py, cp	Biotite quartzite	0.22	0.02	0.07	0.01	0.7	0.7	nil	nil			
	1.8	30% po	NS graphite	0.65	0.03	0.12	0.04	nil	nil	nil	nil			
	1.6	20% po	Quartzite, f.g.	0.38	0.04	0.16	0.03	nil	nil	nil	nil			
	2.2	15% po	Andesite(?)	0.35	0.04	0.13	0.03	nil	nil	nil	nil			
Minton 2	1.3	15% py-po	Quartz-biotite tuff(?)	0.60	0.05	0.13	0.04	nil	1.4	nil			79.9	A.F. 91059
Minton 3	0.6	15% po-py	Quartzite, f.g.	0.45	0.03	0.11	0.02	nil	4.8	nil	nil		77.4	A.F. 91059
Minton 4	1.9	20-25% po, minor py, tr. cp	Mafic volcanic rocks	0.37	0.07	0.19		nil	2.7				82.6	A.F. 91059
	1.6	10-20% po, minor py	Mafic volcanic rocks	0.44	0.05	0.10		tr.	nil					
	0.2	35% po-py	Dacite/andesite	0.48	0.04	0.06		tr.	15.8					
Minton 5	3.7	5-25% po-py	Dacite tuff, graphitic									Assays missing from logs; Mineralization amounts missing from logs for first 59.0 m of core	75.6	A.F. 91059
Minton 21	1.2	35% po-py	NS graphite	0.54		0.12		nil	2.7				45.7	A.F. 91059
Minton 22	2.0	20-25% po-py	Dacite tuff, graphitic	0.22		0.08		nil	nil				57.0	A.F. 91059
	1.7	15-20% po-py	Dacite tuff, graphitic	0.22		0.10		nil	nil					
	1.8	20% po-py	Dacite tuff, graphitic	0.22		0.10		tr.	0.7					
	2.7	15% po-py, tr. cp	Dacite tuff, graphitic											
Minton 24	36.6-34.0	25% po-py	Dacite tuff, graphitic	0.27		0.07		nil	2.1				87.2	A.F. 91059
N-16	0.3	Local minor f.g. sulphides	Andesite luff-lapilli tuff					tr.					122.2	A.F. 91355
N-17	0.5	50% py, cp	Andesite luff		0.05	0.06		tr.					122.1	A.F. 91355
	1.2	75% py	Andesite luff		0.12	0.19		tr.						
RO 75-1	1.8	Po, py stringers in quartz veins, and diss. along foliation	Mafic tuff, thin banded	0.09	0.01	0.02		tr.	tr.			Drilled to test EM anomaly	151	93082
	0.8	SS po, minor py matrix	Breccia; biotite schist fragments	0.16	0.03	0.07		tr.	tr.					
	0.6	NSS po, minor py	Biotite-chlorite-po schist	0.08	0.01	0.02		tr.	tr.			thin banded		

DDH Minton 23, -25, -26 and -28 intersected only trace to minor pyrrhotite and pyrite. The remainder of core from drillholes contained trace to minor pyrrhotite ± pyrite ± chalcopyrite (A.F. 91059). Core from DDH N-18 contained only minor local sulphides noted in logs; no assays reported (A.F. 91355). DDH 4 intersected only trace to minor amounts of pyrite (A.F. 91056). DDH EL-111-80 intersected minor f.g. diss. py ± po in local sections (A.F. 92702).

Table 8-1: Summary of mineralization and assay results from drill logs, location 8 continued

Range of assays from remaining core samples (A.F. 91059):

DDH	Ni %	Cu %	Zn %	Co %	Au g/t	Ag g/t	Pb %	Mo %
Minton 1	0.01-0.05	0.02-0.21	0.04-0.38	0.01-0.03	nil to 0.7	nil to 11.0		
Minton 2	0.01-0.04	0.02-0.07	0.02-0.41	0.03-0.04	nil-tr.	nil-2.7	nil	
Minton 3	0.01-0.03	0.02-0.16	0.10-0.43	nil-0.01%	nil-nil	1.4-6.2	nil	nil
Minton 4	0.01-0.02	0.03-0.03	0.02-0.05		nil-tr.	nil-5.5		
Minton 21		0.03-0.05	0.05-0.47		nil-nil	nil-nil		
Minton 22		0.03-0.04	0.02-0.07		nil-nil	nil-8.9		
Minton 23		0.02-0.14	0.01-0.29		nil-nil	nil-3.5		
Minton 24		0.03-0.11	0.06-0.47		nil-tr.	nil-1.8		
Minton 25		0.03	0.05					
Minton 26		0.03-0.05	0.05-0.28		nil-tr.	nil-8.2		
Minton 28		0.03-0.04	0.03-0.06		nil-nil	nil-2.1		

Blank entries indicate no analyses.

LOCATION: **9**

NAME: (A.F. Mineralization intersected by diamond drilling)
UTM: 6308791N/385883E
ACCESS: Float plane to Minton Lake, and traverse to drill sites

AIRPHOTO: A23828-120
AREA: 150 m northeast of Minton Lake (Fig. 7-1)

EXPLORATION SUMMARY:

Trench excavation and a diamond drill program were reportedly conducted on the Gar claim group between Arbour Lake and Minton Lake, but results are not available (Milligan, 1960, p. 225). Doramal Mines, Limited carried out a magnetometer survey and prepared a geological map (1:2400) of the Bang and D.D.M. claims in 1947 (A.F. 91442).

Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5 in 1954 (A.F. 91615). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). Evelynn Nickel Mines Ltd. conducted an EM and magnetometer survey (A.F. 91351) and drilled eight holes totalling 558 m (A.F. 91443) on the Edo claims in 1957.

SGM conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Selco Exploration Company Limited conducted an airborne EM survey over Airborne Permit 31 in 1960 (A.F. 91626).

John Ziyone contracted J.P. Sheridan to carry out an EM survey on the Mink group, which also includes part of the area of Location 47, in 1960 (A.F. 91060). SGM drilled 25 holes totalling 1990 m to test EM conductors on the Min claims in 1968-69 (A.F. 91059).

Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Gigantes Exploration Company conducted an EM and magnetometer survey on CB 5397 and 5398, under option from Rock Ore Exploration & Development Limited, in 1973 (A.F. 92052). Maps in A.F. 92052 also show locations of four old drillholes. Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

GEOLOGICAL SETTING:

The area is underlain by Wasekwan Group mafic volcanic rocks, minor iron formation, greywacke, siltstone, and dacite (Gilbert *et al.*, 1980; Fig. 7-1). This area is part of the Agassiz Metallotect (Fedikow, 1984; Fedikow, 1986; Fedikow *et al.*, 1990; see 'General Geology of NTS Area 64C/15'). A detailed map by Doramal Mines, Limited shows intermediate to mafic flows, tuff, breccia, and felsite dykes (A.F. 91442).

The 'Minton' drillholes intersected biotite quartzite, (partly graphitic) felsic to mafic volcanic rocks, and minor fine grained laminated sedimentary rocks (A.F. 91059). DDH 17 through 24 intersected dacite and minor rhyolite flows, mafic flows, and argillite with quartzite bands (A.F. 91443).

MINERALIZATION:

Table 9-1 presents a summary of mineralization and assays for the 'Minton' drillholes.

Short (<1 m) sections of dacite contain pyrrhotite, part of which are solid sulphide. Pyrrhotite is commonly disseminated throughout the core. The rocks are silicified, contain irregular seams, veins and patches of quartz-carbonate alteration, and are chloritized in places. Core from most of the holes contains sheared, shattered or crushed sections. Core from DDH 22 includes a 6.4 m section of mafic volcanic rock fragments cemented by pyrite- and pyrrhotite-bearing quartz (A.F. 91443).

Figure 7-1 shows the location of mineralized boulders with minor, fine grained, irregularly disseminated pyrrhotite, pyrite and chalcopyrite (A.F. 91442).

GEOCHEMICAL DATA:

Table 9-1 presents a summary of mineralization and assays for the 'Minton' drillholes.

Drill core samples from DDH 17 through 24 assayed 0.06-0.10% Ni, trace Co, nil to 0.7 g/t Au, and nil to 6.9 g/t Ag (A.F. 91443).

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

Assessment Files 91059, 91060, 91351, 91354, 91442, 91443, 91615, 91616, 91622, 91626, 91679, 91699, 91989, 91992, 92052

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Fedikow, M.A.F.

1984: Preliminary results of biogeochemical studies in the Lynn Lake area; Manitoba Energy and Mines, Open File Report OF84-1, 104p.

1986: Geology of the Agassiz stratabound Au-Ag deposit, Lynn Lake, Manitoba; Manitoba Energy and Mines, Open File Report, OF85-5, 80p.

Fedikow, M.A.F., Parbery, D. and Ferreira, K.J.

1990: Agassiz Metallotect - a regional metallogenic concept, Lynn Lake area; Manitoba Energy and Mines, Mineral Deposit Thematic Map Series; Map 89-1, 1:50 000.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.

1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.

1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

Table 9-1: Summary of mineralization and assay results for the 'Minton' drillholes (A.F. 91059)

DDH	Intersection Length (m)	Mineralization	Host Rock	Zn (%)	Ni (%)	Cu (%)	Au g/t	Ag g/t	Pb (%)	Comments	DDH Length (m)
Minton 8	0.5	15% po-py, tr. cp	Mafic volcanic rocks								
Minton 10	1.5	15% po-py	Dacite	0.16	0.03	0.05	tr.	13.7			71.3
	0.6	25-30% po-py	Dacite	0.32	0.02	0.06	tr.	4.8	nil		
Minton 11	2.0	20-25% po-py	Dacite							Assays missing from logs	75.6
Minton 12	1.3	20-25% po-py	Mafic volcanic rocks	0.12	0.03	0.10	tr.	4.1	nil		78.0
Minton 13	1.5	20-25% po-py	Dacite-andesite	0.17	nil	0.06	tr.	8.9			57.9
Minton 15	0.8	15-20% py-po	Dacite, dark grey, m.g.	0.28	0.03	0.12	tr.	4.8			67.4
Minton 16	0.3	15% py-po	Dacite, dark grey, m.g.-f.g.	0.20	0.03	0.07	tr.	0.7			64.0
	1.6	15-20% py-po	Dacite, dark grey, m.g.-f.g.	0.28	0.03	0.05	tr.	nil			
Minton 17	2.9	15-20% po-py, minor cp	Dacite (tuff?)	0.28	0.03	0.11	tr.	nil			159.7
	0.5	15% po,py, minor cp	Dacite, dark grey, f.g.	0.14	0.02	0.11	tr.	1.4			
	0.5	10-15% po-py	Metasedimentary rock	0.43	0.03	0.07	tr.	2.1		f.g., laminated	
Minton 18	0.5	20% po, py	Mafic volcanic rocks	0.36	0.05	0.13	tr.	4.1			87.8
	0.8	20-25% po, py	Mafic volcanic rocks	0.31	0.03	0.12	tr.	6.2		NSS in parts	
	1.0	20-25% po, py	Mafic volcanic rocks	0.35	0.03	0.13	tr.	4.1		2 - 2.5 cm SS sections	
	0.8	20% po, py, cp, sp	Mafic volcanic rocks	0.87	0.03	0.13	tr.	7.5		NSS in parts	

DDH Minton 9, -14, -19, -20 intersected only trace to minor pyrrhotite and pyrite. The remainder of core from drillholes contained trace to minor pyrrhotite ± pyrite ± chalcopyrite.

Range of assays from remaining core samples:

DDH	Ni %	Cu %	Zn %	Au g/t	Ag g/t
Minton 8	0.01	0.02	0.03	nil	2.1 g/t
Minton 9	0.01-0.01	0.03-0.04	0.05-0.13	tr.-tr.	nil-6.9
Minton 10	0.01-0.06	0.02-0.05	0.01-0.39	tr.-tr.	nil-12.3
Minton 12	0.01-0.02	0.04-0.13	0.02-0.17	nil-tr.	nil-3.4
Minton 13	nil-nil	0.02-0.04	0.04-0.15	nil-tr.	nil-9.6
Minton 14	0.01-0.03	0.03-0.12	0.03-0.16	nil-tr.	1.4-8.2
Minton 15	0.01-0.01	0.04-0.06	0.04-0.18	tr.-tr.	1.4-4.8
Minton 16	0.01-0.03	0.03-0.06	0.05-0.14	tr.-tr.	nil-4.1
Minton 17	0.01-0.04	0.03-0.27	0.05-0.19	tr.-tr.	nil-8.2
Minton 18	0.02-0.04	0.04-0.15	0.10-0.81	tr.-tr.	1.4-8.2
Minton 19	0.02-0.02	0.04-0.28	0.13-0.14	nil-tr.	nil-nil
Minton 20	0.01-0.02	0.03-0.05	0.05-0.28	nil-tr.	1.4-4.8

LOCATION: **10**

NAME: Gay
UTM: 6311126N/382616E
ACCESS: Road to the MacLellan Mine (Location 1) and traverse north, or by boat to the Keewatin River via Burge Lake and traverse east

AREA: Payne Lake (Fig. 10-1)
AIRPHOTO: A23828-121

EXPLORATION SUMMARY:

Noranda carried out a magnetometer and geological mapping (1:2400) survey on the J.J., Dot and Pot claim groups in 1948 (A.F. 91471). Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5 in 1954 (A.F. 91615). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). SGM conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Selco Exploration Company Limited conducted an airborne EM survey over Airborne Permit 31 in 1960 (A.F. 91626).

A.S. Dawson drilled one hole (65.5 m) on claim Gay 17 in 1967 (A.F. 91418). The location of a trench is also given in A.F. 91418.

Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

Staking history is detailed in Mineral Inventory Card 64C/15 Zn1.

GEOLOGICAL SETTING:

The area is underlain by Wasekwan Group mafic flows and tuff, Sickle or Wasekwan Group conglomerate, and post-Sickle Group hornblende-biotite granodiorite (Fig. 10-1; Gilbert *et al.*, 1980).

DDH 1 intersected intercalated oxide facies iron formation; greenish-grey mica-amphibole (or pyroxene)-feldspar hornfels (*author's note:* intermediate volcanic rock?); fine grained massive greywacke; and granite dykes. The oxide facies iron formation consists of banded magnetite, quartz, and soft green rock with abundant green mica. Rare laminae of specular hematite are also present. Five intersections of iron formation, 0.9 to 18.6 m in core length, were distinguished in the drill log (A.F. 91418).

MINERALIZATION:

Pyrite, <5%, is locally present in iron formation as stringers parallel to banding (A.F. 91418).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Chemical sediment type deposit; oxide facies iron formation.

REFERENCES:

Assessment File 91418, 91471, 91615, 91616, 91622, 91626, 91679, 91699, 91989, 91992
Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Mineral Inventory Card 64C/15 Zn1
Manitoba Energy and Mines, Geological Services Branch.

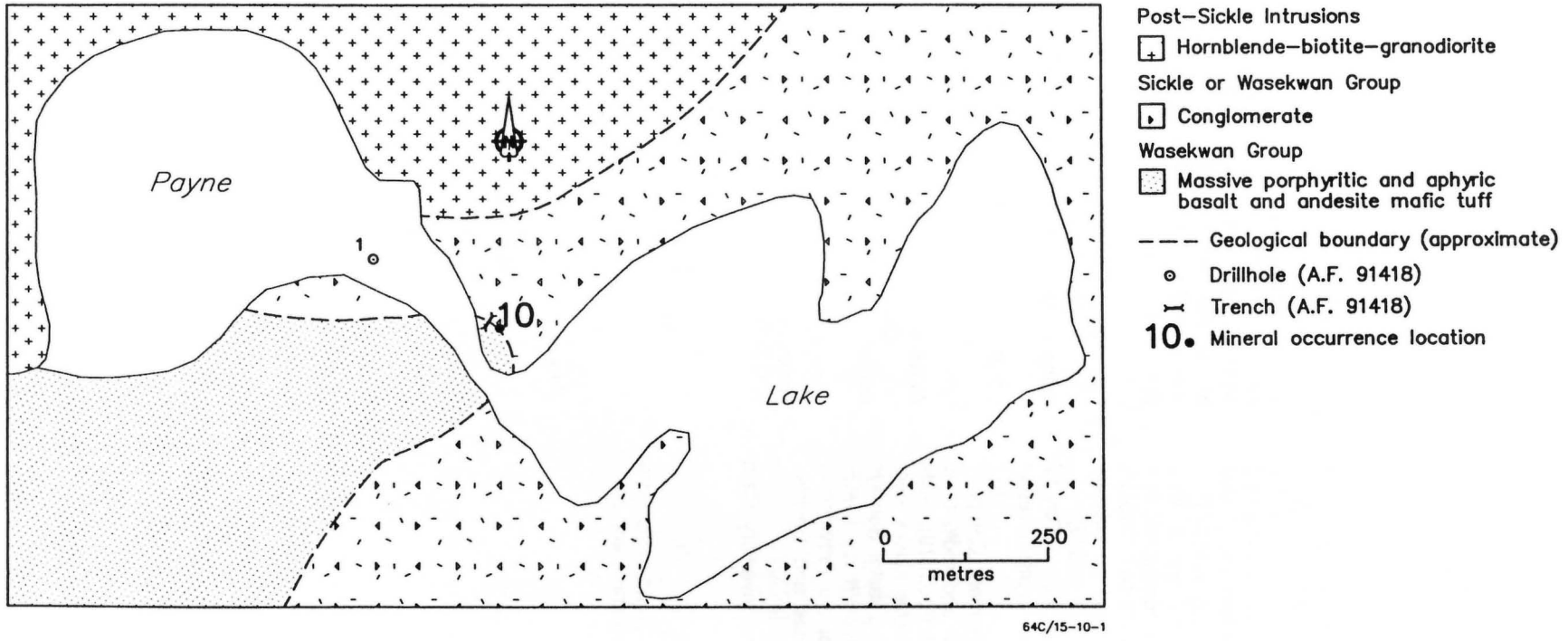


Figure 10-1: Geological setting of occurrence 10 (after Gilbert et al., 1980).

LOCATION: **11**

NAME: (A.F. - Mineralization intersected by diamond drilling)
UTM: 6309016N/381597E
ACCESS: Traverse 2 km north from the MacLellan Mine Road

AREA: Northeast of Dot Lake (Fig. 11-1)
AIRPHOTO: A23828-120

EXPLORATION SUMMARY:

Noranda carried out a magnetometer and geological (1:2400) survey on the J.J., Dot and Pot claim groups in 1948 (A.F. 91471). Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5 in 1954 (A.F. 91615). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). SGM conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622).

A.S. Dawson carried out an EM survey on the Gay claims in 1967 (A.F. 91470). Kennco Explorations (Canada) Limited drilled four holes totalling 306.3 m to test an EM anomaly on claims Gay 1 and -2 in 1968 (A.F. 91469).

Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

GEOLOGICAL SETTING:

The area is underlain by Wasekwan Group mafic volcanic flows, breccia and tuff. Minor sedimentary rocks occur to the north and south; the contact of the volcanic-sedimentary rocks with granodiorite is approximately 1 km to the west (Fig. 11-1; Gilbert *et al.*, 1980). Drillholes intersected mafic volcanic rocks intercalated with bedded siliceous greywacke (A.F. 91469).

MINERALIZATION:

Drill logs record several, 0.30 to 1.52 m thick sulphide-rich zones that contain up to 60% pyrite, pyrrhotite and local traces of chalcopyrite. Significant alteration appears to be absent: drill logs mention only minor local chlorite and quartz along fractures, local traces of sulphides, and local siliceous zones within greywacke and/or mafic volcanic rocks (A.F. 91469).

GEOCHEMICAL DATA:

Assays from drill core samples returned trace to 0.24% Cu, nil to 0.41% Zn, nil to 0.12% Ni, nil to 0.7 g/t Au, and nil to 2.1 g/t Ag over drill core lengths of 1.52 to 6.09 m (A.F. 91469).

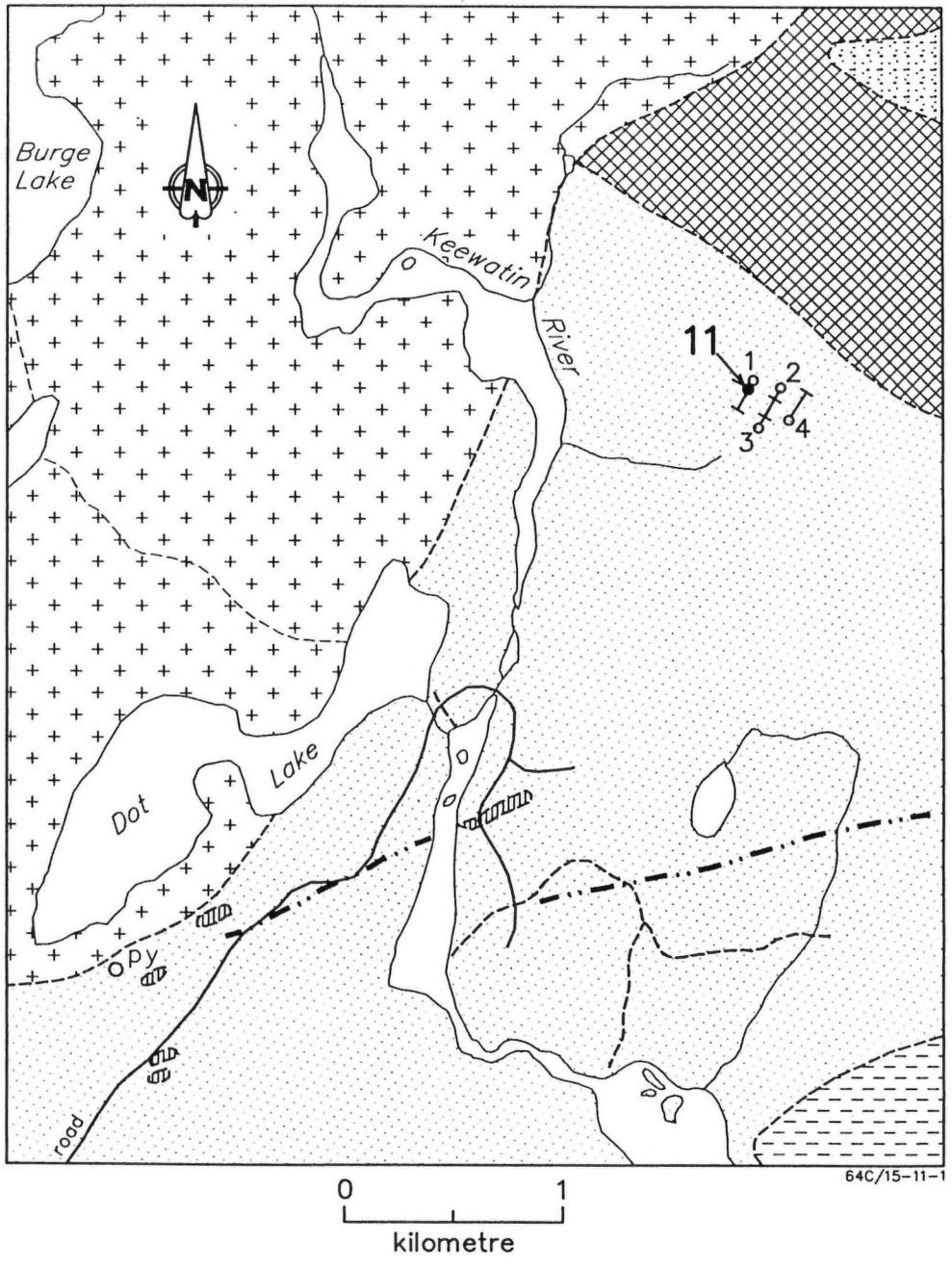
CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

Assessment Files 91469, 91470, 91471, 91615, 91616, 91622, 91679, 91699, 91989, 91992
Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.



Post Sickle Intrusions

Hornblende–biotite granodiorite

Sickle (or Wasekwan) Group

Conglomerate

Wasekwan Group

Iron formation banded oxide facies (partly inferred from aeromagnetic surveys)

Greywacke and argillite

Felsic volcanic rocks

Mafic tuff

Basalt and andesite, massive porphyritic and aphyric, breccia, tuff

Geological boundary (approximate)

Drillhole (A.F. 91469)

Trail

11• Mineral deposit location

Py Mineralization

Figure 11-1: Geological setting of occurrence 11 (after Gilbert et al., 1980).

LOCATION: **12**

NAME:
UTM: 6313162N/381508E
ACCESS: Road to Burge Lake, boat to the east end of the lake and traverse 3 km northeast

AREA: Northeast of Burge Lake (Fig. 12-1)
AIRPHOTO: A23828-73

EXPLORATION SUMMARY:

Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5 in 1954 (A.F. 91615). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). SGM conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622).

A follow-up ground EM survey was carried out over an airborne EM anomaly immediately northwest of the unnamed lake northwest of Payne Lake, and DDH Kew 1 (exact location not known; length 76.2 m) was drilled to test this anomaly in 1961 (SGM, unpublished data).

Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

Granges Exploration AB drilled DDH EL-30-77 (56.7 m) to test an EM conductor on CB 7592 in 1977 (A.F. 92698).

GEOLOGICAL SETTING:

The area is underlain by post-Sickle hornblende-biotite granodiorite (Gilbert *et al.*, 1980; Fig. 12-1). DDH Kew 1 intersected fine- to medium-grained quartz-biotite ± plagioclase gneiss (SGM, unpublished data). DDH EL-30-77 intersected quartz-biotite gneiss (metasedimentary rocks) and biotite granite (A.F. 92698).

MINERALIZATION:

Fine grained, parallel bands of pyrrhotite, chalcopyrite and pyrite (up to 20%, average 10% sulphide) were intersected over a 38 m section of gneissic rock in DDH Kew 1 (SGM, unpublished data). DDH EL-30-77 intersected four sections, 0.3 to 0.9 m in core length, with 20% to near solid graphite, 10 to 20% pyrrhotite and up to 2% pyrite (A.F. 92698).

GEOCHEMICAL DATA:

Twenty-two drill core assays from DDH Kew 1 have ranges of nil to 0.03% Cu, 0.01-0.12% Zn, nil to 0.02% Ni, nil to 0.012% Co, and nil Au. Three of the samples were also assayed for Pb; two of these contained nil Pb, and the third contained 0.21% Pb, 0.01% Cu, 0.06% Zn, nil Ni, 0.02% Co, and nil Au over a sample width of 1.5 m (SGM, unpublished data). Drill core assays from DDH EL-30-77 have ranges of 0.01-0.04% Cu, 0.02-0.06% Zn, 0.01% Ni, <0.1 g/t Au, 0.3-0.7 g/t Ag (A.F. 92698).

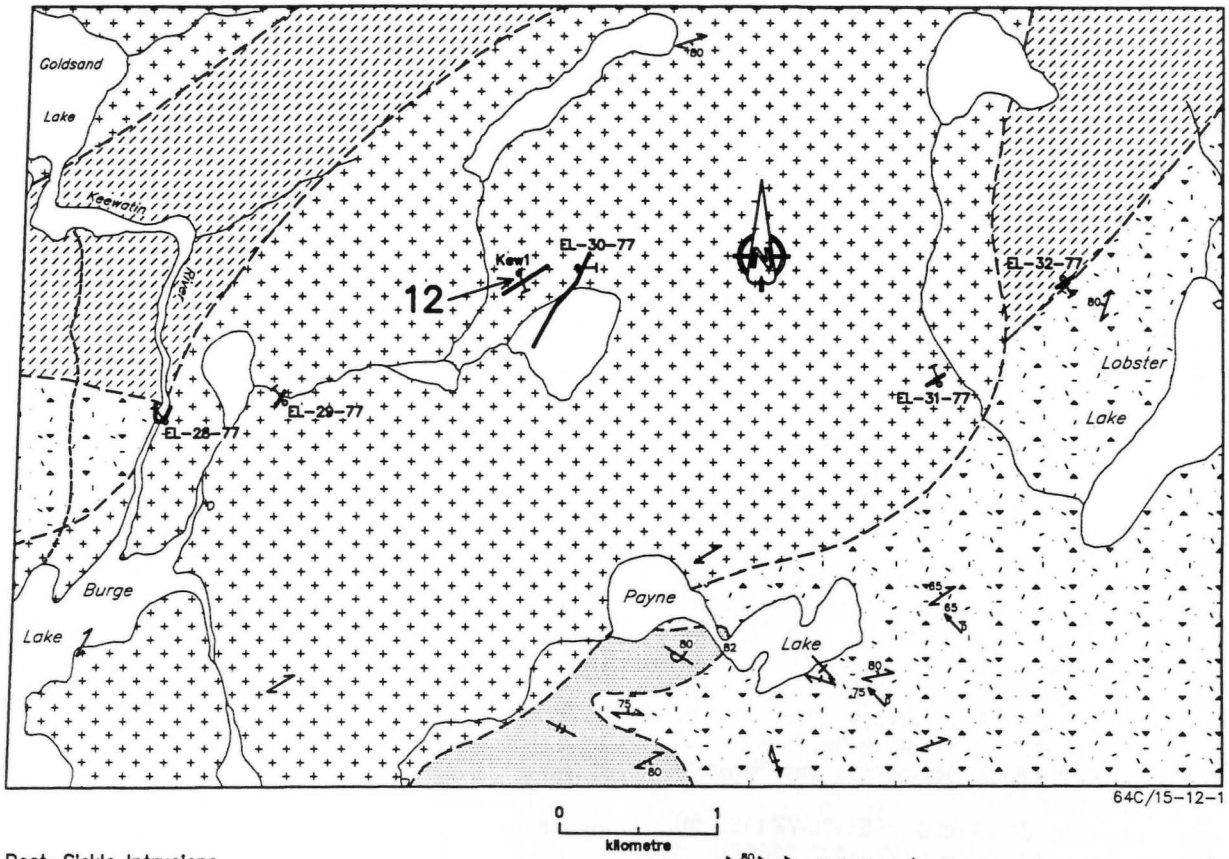
CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

Assessment Files 91615, 91616, 91622, 91679, 91699, 91989, 91992, 92698
Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.



Post–Sickle Intrusions

Hornblende–biotite granodiorite

Sickle or Wasekwan Group

Conglomerate

Wasekwan Group

Massive porphyritic and aphyric basalt and andesite, mafic tuff

Probable Wasekwan Group

Biotite–garnet metagreywacke *(Zed Lake greywacke)*

Foliation (inclined, vertical, dip unknown)

Bedding, tops known (vertical, overturned)

Bedding, tops unknown (inclined, vertical)

Linear structure: axis of deformed clast

EM conductor (A.F. 92698; SGM, unpublished data)

Drillholes:

Kew (SGM, unpublished data; location approximate)

EL (A.F. 92698)

12 Mineral occurrence location

Figure 12-1: Geological setting of occurrence 12 (after Gilbert et al., 1980).

LOCATION: **13**

NAME: Arbour Lake
UTM: 6312328N/391577E
ACCESS: Float plane to Arbour Lake and traverse 500 m northwest

AREA: Northwest of Arbour Lake (Fig. 13-1)
AIRPHOTO: A24299-112

EXPLORATION SUMMARY:

Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5 in 1954 (A.F. 91615). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). SGM conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Selco Exploration Company Limited conducted an airborne EM survey over Airborne Permit 31 in 1960 (A.F. 91626). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679).

Rock Ore Exploration & Development Ltd. conducted a geological reconnaissance, a horizontal loop EM survey and drilled two holes (total 667 m) in 1971 (A.F. 92967). The location of 15 pits and trenches and assay results for chip samples from some of these trenches is also given in A.F. 92967. Gigantes Exploration Company, a subsidiary of Cyprus Mines Corporation, conducted an EM and magnetometer survey on CB 2899, 3602, 3850-3852 and 4199, under option from Rock Ore Exploration & Development Limited, in 1972 (A.F. 91831). Gigantes Exploration Company drilled DDH 406-1-72, 406-2-72 (abandoned), 406-2A-72 (abandoned), 406-3-72, 406-4-72 totalling 638.6 m on CB 2899 in 1972 (A.F. 92978). Gigantes Exploration Company mapped the area at 1:4800 in 1972 (A.F. 93082). Gigantes Exploration Company drilled nine holes (DDH 406-5-73 through 406-13-73; total 1511 m) in 1973 and two holes (DDH 406-14-74 and 406-15-74; total 687 m) in 1974 on CB 2899 to test the western and vertical extensions, respectively, of a quartz-chalcopyrite-scheelite zone (A.F. 92977). Rock Ore Exploration & Development Ltd., in joint venture with the Province of Manitoba, completed eight drillholes (DDH RO 75-2 through RO 75-8; total 1817 m) in 1975-76 (A.F. 93082). Also under this joint venture, the Exploration Operations Branch of Manitoba Mineral Resources Division carried out an HLEM and magnetometer survey in 1976 (A.F. 93082). Rock Ore Exploration & Development Limited carried out vertical loop EM surveys in 1976 to check if any of the previously identified EM anomalies represented multiple parallel conductors; results of this check survey did not indicate multiple conductors (A.F. 93082). The location of DDH EL-41-77 is shown on a map in A.F. 92698, but a log was not provided; it is not known if the hole was drilled or merely proposed.

SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

SGM carried out an EM and magnetometer survey on CB 8997, at the east end of Arbour Lake, in 1981 (A.F. 92401).

Manitoba Mineral Resources Ltd., in joint venture with Rock Ore Exploration & Development Ltd., carried out prospecting and lithogeochemical, humus and till surveys on CB 2899, 3851 and 3852 in 1983 (A.F. 93092). Locations of several old holes drilled by Rock Ore are shown in maps in A.F. 93092, but logs are not included. Manitoba Mineral Resources Ltd. conducted an EM and magnetometer survey, resampled old drill core (DDH 406-14-74, drilled in 1974), and drilled three holes (DDH 21-1, 21-2, 21-3; total 420 m) in 1984 on CB 2899, 3851, and 3852, under option from Rock Ore Exploration and Development Ltd. (A.F. 92970).

Staking history is detailed in Mineral Inventory Card 64C/15 Cu1.

GEOLOGICAL SETTING:

The area is underlain by Wasekwan Group mafic to intermediate volcanic rocks, iron formation, rhyolite tuff, siltstone, mudstone and greywacke, and pre-Sickle felsic to intermediate intrusive rocks (Fig. 13-1; Gilbert *et al.*, 1980). This area is part of the Agassiz Metallotect (Fedikow, 1984; Fedikow, 1986; Fedikow *et al.*, 1990; see 'General Geology of NTS Area 64C/15'). Detailed geology includes a 125 m thick, north-younging supracrustal sequence that from south to north comprises (1) massive laminated pyritic siliceous greywacke or siltstone; (2) interlayered greywacke and basalt; (3) rhythmically banded siltstone with magnetite; and (4) dacite that hosts sulphide mineralization. This sequence is underlain and overlain by basalt. Quartz-feldspar porphyry and granitic dykes intrude these rocks (Fig. 13-2, 13-3; Fedikow, 1983).

'406-' Drillholes: DDH 406-1-72 intersected intermediate volcanic rocks; amphibolite; quartz-hornblende-biotite ± chlorite ± garnet schist and gneiss; quartz-biotite-sericite gneiss (described as "essentially a cherty quartzite with oriented discontinuous bands of biotite and sericite that impart gneissic structure" (*author's note:* probably altered rhyolite); chlorite-amphibole-biotite schist; quartzite (*author's note:* probably rhyolite); banded pyrrhotite-magnetite andesite, locally garnetiferous; amphibole-chlorite schist; and minor diorite. DDH 406-3-72 intersected andesite, calcarenite (*author's note:* silicate facies iron formation?), quartz-biotite-hornblende-chlorite schist, quartzite (*author's note:* probably rhyolite), and minor diorite, granite and granodiorite. DDH 406-4-72 intersected andesite, amphibole-biotite-chlorite schist, quartz-feldspar-hornblende-biotite schist, and minor quartz diorite and granodiorite (A.F. 92978). DDH 406-5-73 intersected mafic volcanic rocks, amphibolite, diorite, and quartz diorite with quartz veins. DDH 406-6-73 intersected quartz diorite and calcareous quartz-biotite-diopside-chlorite-sericite schist. DDH 406-7-73 intersected mafic volcanic rocks, amphibolite, quartz diorite, minor calcareous biotite-chlorite-actinolite schist (*author's note:* picritic basalt?), granite and granodiorite. DDH 406-8-73 intersected mafic volcanic rocks, amphibolite, granodiorite and granite. DDH 406-9-73 intersected

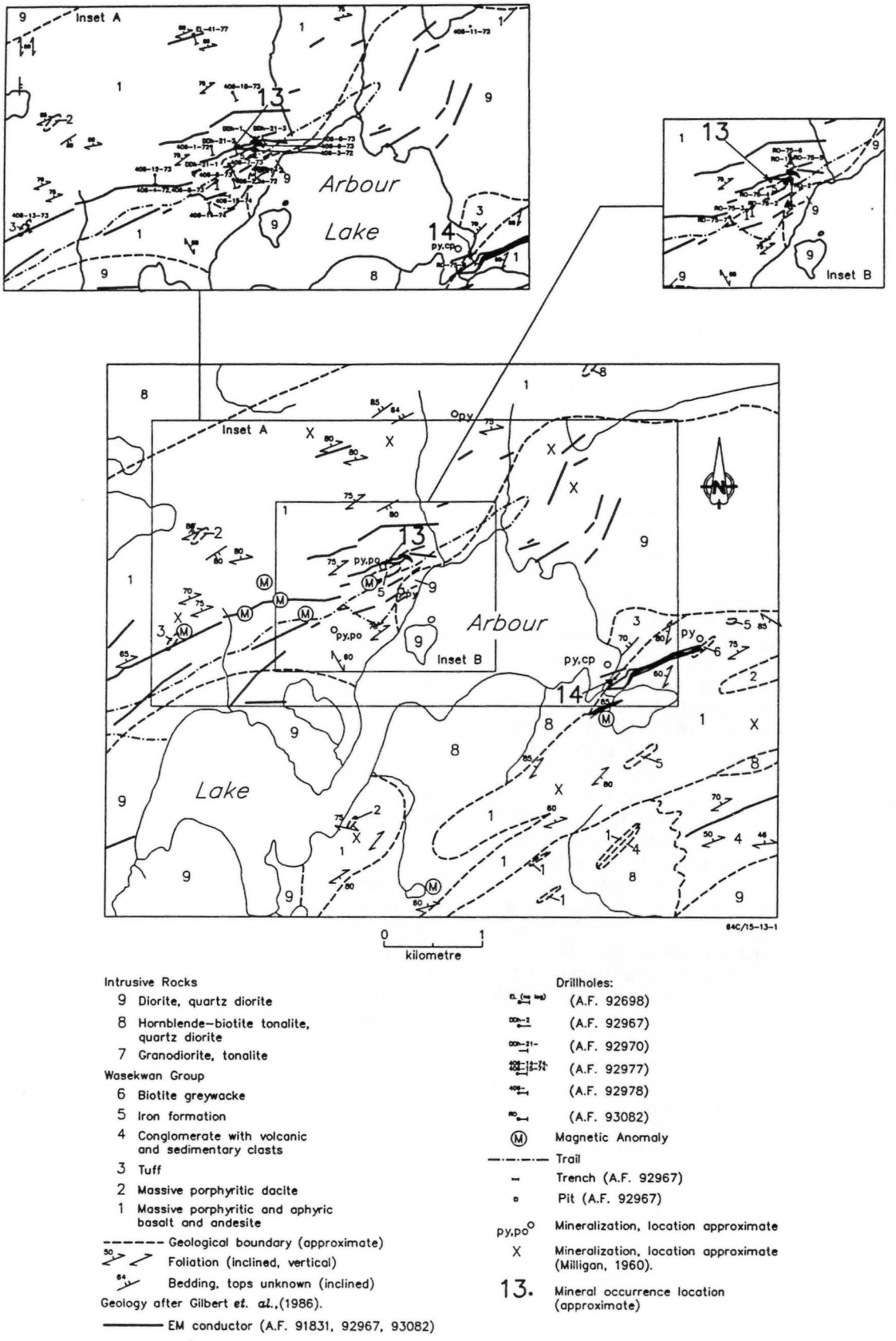


Figure 13-1: Geological setting of occurrences 13 (Arbour Lake) and 14 (after Gilbert et al., 1980).

amphibolite, granodiorite, calcareous tremolite-actinolite schist, hornblende-actinolite-biotite schist and actinolite-biotite-chlorite schist (*author's note:* picritic basalts?). DDH 406-10-73 intersected mafic volcanic rocks and amphibolite. DDH 406-11-73 intersected amphibolite and gabbro with amphibolite and actinolite-hornblende xenoliths. DDH 406-12-73 intersected quartz-feldspar-biotite-hornblende gneiss, quartz-biotite-hornblende schist, quartz diorite, amphibole-biotite schist, banded quartz-sericite-biotite schist, amphibolite, and banded garnetiferous pyrrhotite-magnetite amphibolite (iron formation). DDH 406-13-73 intersected amphibolite and felsic volcanic rocks. DDH 406-14-74 intersected hornblende-biotite-chlorite schist with carbonate veins and disseminations, diorite, and granite. DDH 406-15-74 intersected quartz diorite, a quartz vein (6.4 m core length @ 18° to core axis), chlorite-amphibole schist, quartz-hornblende-biotite-chlorite schist, and quartz-feldspar-biotite gneiss (A.F. 92977, 93082).

DDH 1 intersected garnetiferous, siliceous hornblende-biotite-bearing tuff, a minor gabbro dyke, diorite (recrystallized mafic volcanic rocks?), siliceous andesite, rhyolite, interbedded sedimentary and volcanic rocks, and greywacke. DDH 2 intersected tonalite, quartz veins and minor inclusions of medium grained, biotitic, black, soft, mafic volcanic rocks (A.F. 92967).

DDH 21-1 and 21-2 intersected massive and tuffaceous dacite and rhyodacite, felsic to intermediate volcanic rocks, sericitic or chloritic in places, minor mafic volcanic rocks, and banded oxide facies iron formation. DDH 21-3 also intersected minor felsic to intermediate dykes (A.F. 92970).

MINERALIZATION:

Two types of mineralization were intersected by drillholes: (1) pyrite, pyrrhotite ± chalcopyrite, sphalerite and galena, locally with precious metals, associated with banded volcanic and sedimentary rocks with iron formation; and (2) copper and gold in silicified quartz diorite (A.F. 93082). Mineralization described in drill logs is summarized in Table 13-1. In addition, minor pyrrhotite, chalcopyrite and pyrite occur as stringers, veinlets, blebs and disseminations elsewhere throughout the cores from all drillholes. Blebs and veinlets are commonly oriented parallel to foliation/layering. Rocks exhibit silicification, sulphidation, quartz ± carbonate veins and veinlets, biotite replacement of hornblende, local talcose zones, and local shear or fault zones (A.F. 93082).

The description of mineralization at surface is taken from Fedikow (1983). Three trenches expose near solid to solid pyrrhotite, pyrite, chalcopyrite and arsenopyrite. The mineralization occurs in tuffaceous siliceous rock at or near the contact between predominantly clastic sedimentary rocks and a sequence of porphyritic, amygdaloidal, fragmental and tuffaceous basalt (Fig. 13-3, 13-4). Three additional smaller trenches to the southwest are caved and filled with boulders. Overburden near these trenches is markedly iron stained. Irregular small lenses and veinlets of pyrrhotite and minor chalcopyrite occur in mafic volcanic rocks in outcrop.

Further south, near the contact between quartz diorite and basalt, a chalcopyrite-pyrite-sphalerite-bearing quartz vein occurs in intensely iron stained quartz diorite (Fedikow, 1983; Milligan, 1960, p. 215). Particularly siliceous portions of the quartz diorite contain 3 to 5% disseminated chalcopyrite (A.F. 93082).

GEOCHEMICAL DATA:

Drill core assays are summarized in Table 13-1. Numerous sections of iron formation and garnetiferous quartzite and quartz-hornblende schist from the '406-' drillholes apparently were not sampled (A.F. 93082).

Geochemical analyses of samples from trenches in volcanic-sedimentary rocks are presented in Table 13-2; sample locations are shown on Figure 13-4. Maximum values of geochemical analyses of samples collected from the trenches were 1920 ppm Cu, 5300 ppm Zn, 722 ppm Ni, and 0.7 g/t Au (M.A.F. Fedikow, unpublished data, 1988).

Geochemical analyses of samples from the trenches in quartz diorite are presented in Table 13-3 and sample locations shown on Figure 13-5. Sketches in a report from A.F. 92967 include notable assays from these trenches of (1) 1.7 g/t Au and 0.94% Cu over 0.6 m, (2) 1.4 g/t Au and 3.52% Cu over 0.5 m, (3) 0.7 g/t Au and 1.28% Cu over 1.1 m, and (4) 4.1 g/t Au and 1.64% Cu over 0.4 m (possibly equivalent to the trench from which Fedikow's sample 71-83-AL-113 was taken?). Assays of chip samples from other trenches near L52E assay up to 0.3 g/t Au, 22.3 g/t Ag and 0.12% Cu over 2.4 m (A.F. 92967).

Assay results from chip samples from trenches are shown on Figures 13-3, -3, and -4. Most notably, the trench where DDH 2 was subsequently sited yielded samples with copper contents that ranged from 0.94% to 3.52% over sample widths of 0.4 to 1.1 m (A.F. 92967).

MMR analyzed 221 composite drill core samples and 139 outcrop samples for Cu, Pb, Zn, Ni, Ag, Au, As and Cr; 135 humus samples for Au; and 45 B-horizon till samples for Zn, Au and As. A.F. 93092 mentions that assays up to 5.1 g/t Au had been obtained from DDH 1-72 (406-1-72?), 75-5 and 75-6 from earlier drill programs by Rock Ore. The lithogeochemical survey tested up to 4760 ppb Au in core from these holes, and bedrock, till and humus surveys show gold anomalies up-dip from the auriferous intersections. Lithogeochemical results confirm Cu-Ag-Au mineralization in a small quartz diorite body northwest of Arbour Lake. A composite core sample from DDH 406-14-74 yielded 3500 ppb Au over 6 m of previously unsampled mafic tuff (A.F. 93092).

CLASSIFICATION:

Stratabound massive sulphide type deposit; volcanic rock associated. Gold, silver and copper mineralization at Arbour Lake is associated with the Agassiz Metallotect.

In addition, gold, silver and copper occur in quartz veins and, to a lesser extent, as a disseminated sulphide halo in adjacent wall rocks. These veins are hosted by a small quartz diorite pluton that intrudes the volcanic-sedimentary sequence.

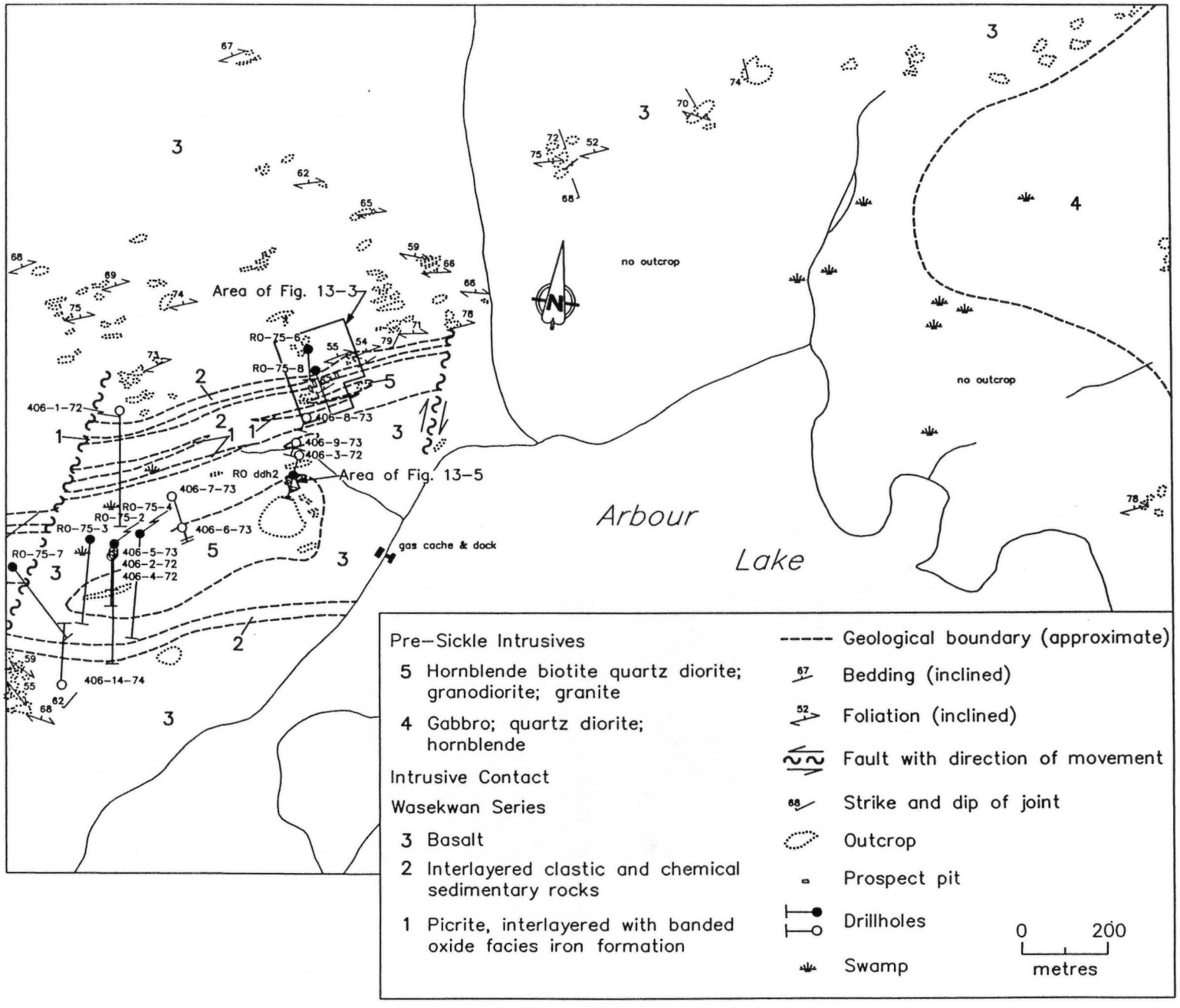


Figure 13-2: Detailed geology of the Arbour Lake area (occurrence 13).

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Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

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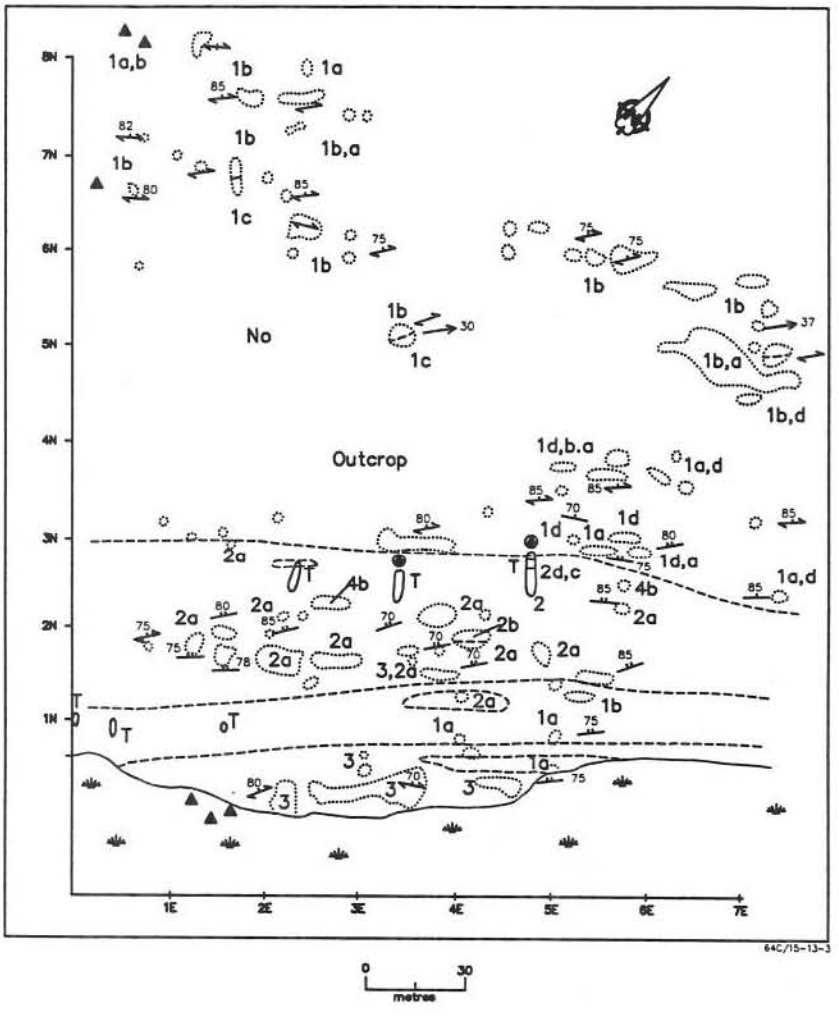

4 Intrusive rocks
- a) quartz–feldspar porphyry
- b) granite

3 Siliceous greywacke/siltstone

2 Interlayered clastic and chemical sedimentary rocks
- a) interlayered siliceous greywacke/siltstone and argillite
- b) banded oxide facies iron formation
- c) tuffaceous dacite
- d) pyrrhotite–pyrite–chalcopyrite–arsenopyrite

1 Basalt
- a) massive aphyric basalt
- b) porphyritic and amygdaloidal basalt
- c) autoclastic breccia
- d) tuff

------ Geological boundary (approximate)

Outcrop

Trench

Frost heaved blocks, iron stained

Foliation (inclined, vertical, dip unknown)

Foliation and primary parallel layering (inclined)

Bedding (tops known, inclined; tops unknown, vertical)

→ 30 Clast elongation

Swamp

Mineralization

Figure 13-3: Detailed geology in area of trenches at occurrence 13 (Arbour Lake) (after Fedikow, 1983). See Figure 13-2 for location of area.

Table 13-1: Summary of significant mineralization and assay results from drillholes

DDH	Intersection Length (m)	Mineralization	Host Rock	As ppm	Au ppb	Ag ppm	Comments	DDH Length (m)	Assessment File Number
21-1	0.8	10-15% po, £1% cp, <1% py	Chloritized andesite	11	5	0.1			
21-3	0.30	10-25% po, 1-2% cp, £1% py	Dacite tuff	<2	15	0.9	Tr. mb locally elsewhere	110	92970
	0.30	10-15% py, <2% po	Dacite fragments in sulphide matrix	<2	35	1.1	in core.		
	0.55	5-20% po, 5-8% py, <2% cp	Felsic fragments in sulphide matrix	2	35	1.3	2-10 mm fragments.		
	0.72	20-50% po, <8% py	Felsic fragments in sulphide matrix	<2	<25	1.0	Continuous zone;		
	0.09	not mineralized	Dacite-andesite, grey-green				continuous sample.		
	0.14	£8% mt, <3% py, <5% po	Banded iron formation				Chlorite, mt, dacite bands.		
	0.18	5-15% po, 2-3% cp, 1-2% py	Andesite tuff	<2	10	0.6	1495 ppm Cu		

DDH	Intersection Length (m)	Mineralization	Host Rock	Zn %	Ni %	Cu %	Au g/t	Ag g/t	Comments	DDH Length (m)	Assessment File Number
406-1-72	0.46	75-80% po, minor cp, sp; lower part banded	Andesite	0.03	0.03	0.60	0.7	1.4	Quartz gangue; 1.3 cm grey quartz band at upper contact.	240	92978
	3.81	Minor py, po, cp stringers, vug & fracture fillings, with narrow sections SS	Quartz vein with narrow sections of quartz-sericite schist	tr.	0.01	0.08	3.5	1.4	At contact: diorite/ banded po-mt-andesite; 68° to core axis; Directly down the hole from previous intersection.		
		7% po, minor cp	Laminated po-mt andesite						DDH tested Mag & EM anomaly.		
406-3-72	0.76	4% cp	Rhyolite[1]	0.04	tr.	0.65	1.4	11.6		139	92978
	0.61	1% cp	Rhyolite[1]	0.03	tr.	0.45	1.0	0.7	Continuous zone.		
	1.13	4% cp	Rhyolite[1]	0.07	tr.	1.40	1.4	34.6			
	0.61	5% po, py, cp	Diorite, siliceous	0.01	tr.	0.60	0.7	2.7			
									DDH tested mafic volcanic/ quartz diorite contact.		
406-4-72	0.61	4% po, "minor" cp	Amphibole-biotite-chlorite schist[2]	0.01	0.03	0.37	0.7	3.4	Continuous zone.	222	92978
	0.46	Minor po, py, cp	Amphibole-biotite-chlorite schist[2]	tr.	0.02	0.43	tr.	4.8			
	0.43	6% po, py	Amphibole-biotite-chlorite schist[2]	tr.	0.02	0.10	tr.	2.1	Sulphide vein @ 15° to core axis.		
	0.30	Minor cp, po, py	Amphibole-biotite-chlorite schist[2]	0.01	0.01	0.25	0.7	0.7			
	0.24	12% po, minor cp; part SS	Amphibole-biotite-chlorite schist[2]	0.01	0.02	0.40	0.7	2.1	Siliceous.		
	2.13	Minor py, cp	Amphibole-biotite-chlorite schist[2]	tr.	tr.	0.14	0.7	1.4	Sulphides assoc. with quartz veins & along fractures.		
	2.13	Minor py, cp	Amphibole-biotite-chlorite schist[2]	0.04	tr.	0.54	1.0	7.5	Continuous zone.		
	1.22	Minor py, cp	Amphibole-biotite-chlorite schist[2]	0.01	tr.	0.49	0.7	8.2			
									DDH tested mafic volcanic/ quartz diorite contact, Mag & EM anomaly.		
	1.52	Minor py, po, cp; part SS	Quartz diorite	tr.	nil	0.25	tr.	2.7	Continuous zone. Sulphides		
	1.52	Part SS; minor cp	Quartz diorite	tr.	tr.	0.33	0.7	5.5	assoc. with quartz veins &		
	1.52	<4% sulphides	Quartz diorite	0.04	tr.	0.40	0.7	2.1	along fractures.		
	0.91	Minor cp	Quartz diorite	tr.	tr.	0.16	0.7	2.1			
	0.61	Minor py, cp	Quartz diorite	tr.	tr.	0.15	0.7	0.7			

Table 13-1: Summary of significant mineralization and assay results from drillholes continued

DDH	Intersection Length (m)	Mineralization	Host Rock	Zn %	Ni %	Cu %	Au g/t	Ag g/t	W %	Sample Length (m)	Comments	DDH Length (m)	Assessment File Number
RO-1	4.8	20-60% po	Siliceous tuff, garnetiferous	0.15	0.07	0.06				1.3	Continuous sample.	37.5	92967
				0.36	0.12	0.25				1.3			
				0.36	0.10	tr.				1.5			
	0.3	Banded SS	Interbedded sedimentary & volcanic rocks								Not sampled.		
RO-2	0.4	Po, cp fracture filling	Quartz-hornblende diorite, c.g.	0.05		0.92		7.5		0.4	Fractures random, numerous.	29.4	92967
	0.9	"Heavy" sulphides at contacts and in minor fractures	Quartz vein	nil		0.29		1.4		1.0			
406-5-73	8.1	Minor to SS po, py, cp, scheelite	Quartz vein in quartz diorite/amphibolite	tr.	tr.	0.16	tr.	nil	0.01	1.5	25° to core axis.	330.1	93082
				tr.	tr.	0.30	1.0	24.0	tr.	1.5			
				tr.	0.01	0.20	0.3	9.6	0.02	1.5			
				tr.	0.01	0.23	tr.	6.9	0.04				
				0.01	0.01	0.27	0.3	3.8	0.01				
				0.02	0.01	0.13	0.6	6.2	nil				
	6.1	Up to 15% po, minor cp	Quartz vein	0.02	0.01	0.51	0.3	8.9	tr.	1.5	Arcuate contact.		
				0.01	0.02	0.50	0.6	nil	tr.	1.5			
				0.01	0.01	0.24	0.3	6.9	0.03	1.5			
				0.02	0.01	0.41	0.3	21.95	0.06	1.5			
	6.4	Minor to SS po, minor cp	Quartz vein	tr.	0.01	0.40	1.0	8.2	0.02	1.5			
				0.01	0.01	0.24	0.6	8.2	0.03	1.5			
				nil	0.01	0.14	0.6	5.5	0.06	1.5			
				0.01	0.01	0.47	0.6	34.98	0.02	1.5			
	6.7	Minor to mod. po, minor cp, minor scheelite	Quartz vein	tr.	0.02	0.48	0.6	1.4	0.04	1.5			
				0.01	0.01	1.35	0.3	6.9	0.01	1.5			
				tr.	0.02	0.76	0.6	3.4	0.02	1.5			
				0.01	0.01	0.52	0.6	80.58	0.05	1.5			
				0.01	0.01	0.33	0.3	3.8	0.22	1.5			
	14.3	Minor to mod. po, minor cp	Quartz vein	tr.	0.01	0.40	0.6	5.5	0.03	1.5			
				tr.	0.02	0.21	tr.	4.8	0.09	1.5			
				0.01	0.02	0.78	0.6	5.5	0.03	1.5			
				0.01	0.01	0.25	tr.	3.8	nil	1.5			
				0.01	0.02	0.82	0.3	3.8	tr.	1.5			
				tr.	0.02	0.50	0.3	36.35	tr.	1.5			
				tr.	0.01	0.40	0.6	4.8	tr.	1.5			
				tr.	tr.	0.10	0.3	4.1	tr.	1.5			
				tr.	0.01	0.15	0.6	3.8	tr.	1.5			
				tr.	0.01	0.15	tr.	2.1	tr.	1.5			
406-9-73	1.2	15% py	Quartz vein			tr.	0.7	nil		1.2	45° to core axis.	249	93082
406-12-73	1.5	Banded po, py, minor cp	Quartz-biotite-hornblende schist	0.04	0.02	0.03	tr.	2.7		1.5		90	93082
	1.5	Banded po	Banded po-mt amphibolite	0.06	0.02	0.04	tr.	3.1		1.5	Minor garnets.		
	4.9	Banded po	Banded mt-po amphibolite	0.12	0.02	0.09	tr.	7.5		1.5	Minor garnets.		
				0.06	0.02	0.07	tr.	2.1		0.6			
	6.4	Minor to mod. po	Banded mt-po amphibolite	0.07	0.03	0.03	tr.	nil		3.0			
				0.08	0.03	0.04	tr.	2.1		3.0			
				0.12	0.04	0.06	tr.	1.4		0.9			
	0.6	Minor po, py	Quartz diorite	0.05	0.03	0.03	8.6	2.1		0.6			
406-13-73	5.2	SS po, minor py, cp	Fault zone, felsic volcanic rocks	0.11	0.02	0.06	tr.	nil		3.0		112	93082
	-	Local bands SS	Felsic volcanic rocks										
406-15-74	6.4	4-30% po, 1-3% cp, <2% py, tr. scheelite	Quartz vein in quartz diorite		0.02	0.41	1.4	2.1		1.8	18° to core axis.	270	93082
					0.01	0.29	1.4	2.1		1.5			
					0.01	0.35	0.3	tr.		1.5			
					0.02	0.25	0.6	3.4		1.5			
RO 75-2		Po-cp ± py stringers, minor with £1 m SS sections throughout core	Biotite ± chlorite hornfels[2]								Drill to test Cu-Au in siliceous quartz diorite.	392	93082
	7.6	1.5 m SS po-cp, followed by cp-po veinlets & schlieren	Quartz vein, brecciated and healed	0.01		0.19	tr.	tr.		1.5	15°-30° to core axis.		
				0.01		0.29	0.7	1.4		1.5	Continuous sample.		
				0.01		0.25	0.3	4.1		1.5			
				0.01	tr.	0.19	0.3	2.1		1.5			
				0.01		0.04	tr.	nil		1.5			

Table 13-1: Summary of significant mineralization and assay results from drillholes continued

DDH	Intersection Length (m)	Mineralization	Host Rock	Zn %	Ni %	Cu %	Au g/t	Ag g/t	W %	Sample Length (m)	Comments	DDH Length (m)	Assessment File Number
RO 75-3	0.6	SS po-cp veins, 0.15-0.3 m	Biotite-hornblende schist[2]	0.02	0.07	0.20	0.6	tr.		1.5	Minor po-cp veinlets throughout most of core.	364.8	93082
	11.0	SS po-cp veins & stringers parallel to qtz. veins	Shear zone with quartz veins, chlorite, biotite	0.02	0.04	0.10	0.3	tr.		1.5			
				0.02	0.03	0.22	tr.	nil		1.5			
				0.02	0.01	0.08	0.3	nil		1.5			
				0.02	0.02	0.48	tr.	3.4		1.5			
				0.01	0.03	0.29	0.3	2.0		1.5			
				0.01	0.02	0.41	0.3	2.0		1.5			
				0.02	0.01	0.25	tr.	tr.		1.5			
RO 75-4	0.9	Diss. and SS po-py, minor cp	Biotite-rich hornblende diorite	0.03	0.01	0.04	tr.	tr.		1.5	Continuous section.	448.1	93082
	2.4	SS and diss. po, minor py	Biotite-hornblende-feldspar dyke	0.02	0.02	0.06	0.7	tr.		1.5			
	3.7	Narrow SS po-py-cp veins	Biotite quartz diorite	0.02	tr.	0.08	0.3	tr.		1.5			
				0.02	tr.	0.08	tr.	1.4		1.5			
				0.02	tr.	0.02	tr.	nil		1.5			
	0.6	SS po-cp-py veins	Quartz diorite/chloritic quartz vein	0.02	0.01	0.05	0.3	tr.		1.5			
	2.4	20% po-cp diss. blebs	Biotite quartz diorite	tr.	tr.	0.12	tr.	tr.		1.5			
	1.5	Po-cp blebs, stringers	Biotitic hornfelsed amphibolite	0.01	0.01	0.14	0.3	2.1		1.5			
RO 75-5	6.4	SS cp, py	Siliceous rhyolite agglomerate	0.40	0.05	0.12	0.3	1.4		1.5	Continuous sample.	185.0	93082
				0.45	0.06	0.25	0.3	1.4		1.5			
				0.34	0.05	0.05	0.3	1.4		1.5			
				0.07	0.02	0.05	tr.	tr.		1.5			
	1.5	Po-cp-py veins[1]	Banded tuff, dk. brown-grey	0.01	tr.	0.06	5.1	3.4		1.5			
	1.8	SS po-cp matrix	Siliceous tuff, lt. grey, magnetic	0.84	0.01	0.20	tr.	2.1		1.5			
	1.4	Minor po-cp blebs, stringers	Tuff, part magnetic	0.01	tr.	0.02	1.4	2.7		1.5	Continuous section.		
	3.2	Po-cp diss. and veins	Banded siliceous tuff, dk. grey-brown	0.01	tr.	0.02	1.0	tr.		1.5			
				0.02	tr.	0.02	tr.	nil		1.5			
RO 75-6	11.9	5-50% po, cp, py	Siliceous tuff	0.10	0.02	0.05	tr.	tr.		1.5	Continuous sample	121.9	93082
				0.17	0.04	0.06	nil	tr.		1.5			
				0.02	tr.	0.02	nil	nil		1.5			
				0.01	tr.	0.01	nil	nil		1.5			
				0.02	tr.	0.01	tr.	nil		1.5			
				0.02	0.01	0.01	tr.	nil		1.5			
				0.03	0.01	0.02	tr.	nil		1.5			
				0.08	0.05	0.08	tr.	tr.		1.5			
	6.4	SS po-cp	Grey siliceous rhyolite fragments, rhyolite tuff	0.05	0.01	0.03	tr.	tr.		1.5	Contiguous with previous zone; continuous sample		
				0.14	0.03	0.07	tr.	tr.		1.5			
				0.15	0.03	0.08	nil	tr.		1.5			
				0.46	0.05	0.07	nil	tr.		1.5			
	3.7	Bands of SS po-cp	Banded siliceous iron formation, biotite and mt bands, dark. green hornblende-rich bands, grey-white siliceous tuff bands	0.10	0.02	0.04	nil	nil		1.5	Contigous with previous zone; continuous sample		
				0.02	tr.	0.02	nil	nil		1.5			
	5.5	Bands of mt-po-cp	Banded oxide facies iron formation, bands of hornblende-rich amphibolite	0.05	0.02	0.03	nil	tr.		1.5	Continuous sample		
				0.03	0.01	0.03	tr.	nil		1.5			
				0.02	0.01	0.02	tr.	nil		1.5			
				0.01	tr.	0.02	tr.	nil		1.5			
RO 75-7	3.0	SS po-cp in quartz vein	Biotite-hornblende-feldspar metasedimentary rocks	tr.	tr.	0.01	nil	nil		1.5	Qtz. veins at 5° and 30° to core axis; continuous sample	304.2	93082
				tr.	tr.	0.05	nil	tr.		1.5			

[1] - "Quartzite" in drill logs

[2] - probable picritic basalt?

No samples were taken from DDH 406-6-73, 406-8-73, 406-10-73, 406-11-73 or 406-14-74 (A.F. 93082). DDH 406-6-73 intersected only minor pyrite locally. DDH 406-7-73, 406-8-73, 406-10-73, 406-11-73 and 406-14-74 intersected only minor pyrite, pyrrhotite and chalcopyrite throughout the core. DDH 406-14-74 intersected only local minor disseminated and stringer pyrrhotite and one 10 cm c.g. po vein (A.F. 93082).

Table 13-2

Geochemical analyses for samples from trenches at location 13. See Figure 13-4 for sample locations. Samples were collected by M.A.F. Fedikow, Manitoba Energy and Mines, 1983. Analyses performed by Manitoba Energy and Mines Analytical Laboratory, Winnipeg. Tungsten analyses were determined by emission spectroscopy.

Sample No.	Au g/t	Ag g/t	Cu ppm	Ni ppm	Zn ppm	Pb ppm	Co ppm	W ppm
Trench 1								
100	tr.	tr.	345	102	1750	<1	15	<10
101	tr.	nil	30	3	35	<1	4	<10
102	nil	nil	81	27	142	18	18	<10
Trench 2								
103	0.7	tr.	597	610	3140	<1	74	<10
104	0.7	tr.	965	434	3680	<1	50	<10
105	0.7	nil	716	610	5300	<1	76	<10
Trench 3								
106	0.7	nil	914	511	4900	<1	64	<10
107	tr.	tr.	1920	722	4930	<1	78	<10
108	tr.	nil	150	19	303	8	7	<10
109	tr.	tr.	744	709	4120	<1	86	<10

Table 13-3

Geochemical analyses of chip samples from vein-type mineralization in quartz diorite at occurrence 13 (M.A.F. Fedikow, unpublished data). See Figure 13-5 for sample locations. Tungsten was analyzed by emission spectroscopy. Samples 71-83-AL-111 and -113 were taken from a sulphidic quartz vein. Samples 71-83-AL-110, -112, -114 and -115 are rusty weathered quartz diorite.

Sample No.	Au g/t	Ag g/t	Ni ppm	Zn ppm	Pb ppm	Co ppm	W ppm	Cu ppm
71-83-AL-110	tr.	nil	18	121	1	26	10	403
71-83-AL-111	1.4	36.7	17	506	1	43	10	16100
71-83-AL-112	1.0	nil	4	145	1	31	10	1870
71-83-AL-113	0.03	0.17	3	22	1	7	50	971
71-83-AL-114	tr.	nil	4	95	1	26	10	570
71-83-AL-115	0.03	0.29	12	250	1	26	50	4840

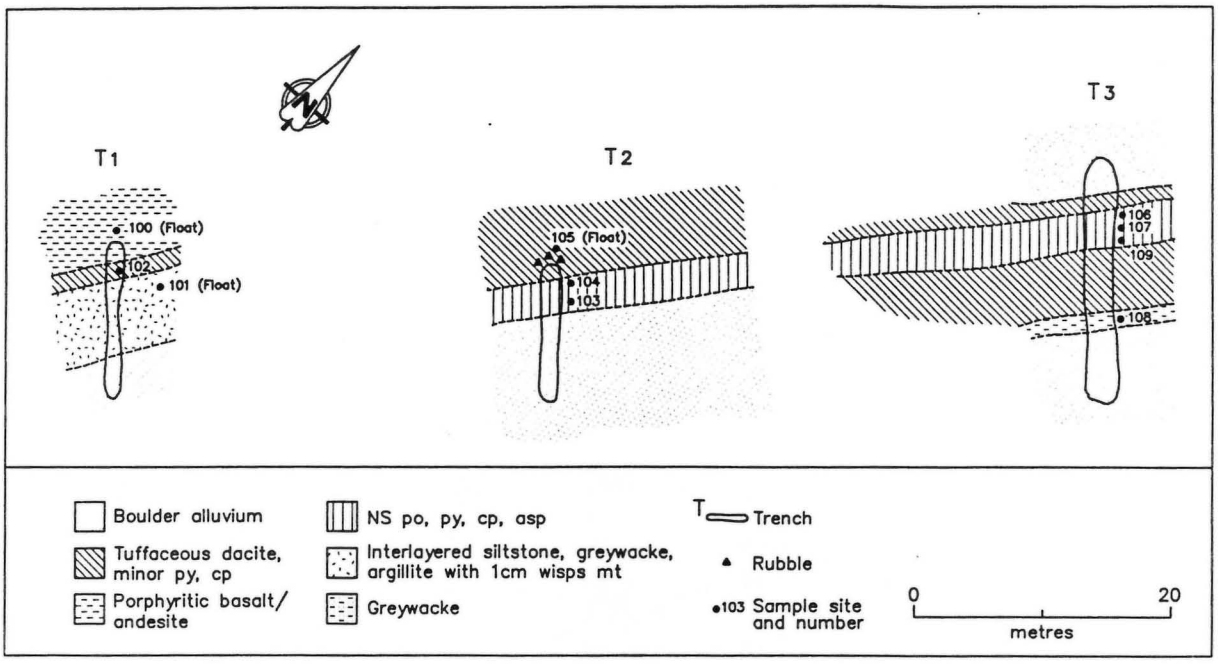

Figure 13-4: Geology and sample locations at sites of trenches at occurrence 13 (after Fedikow, 1983). Sample results are presented in Table 13-2. See Figures 13-2 and 13-3 for location of trenches.

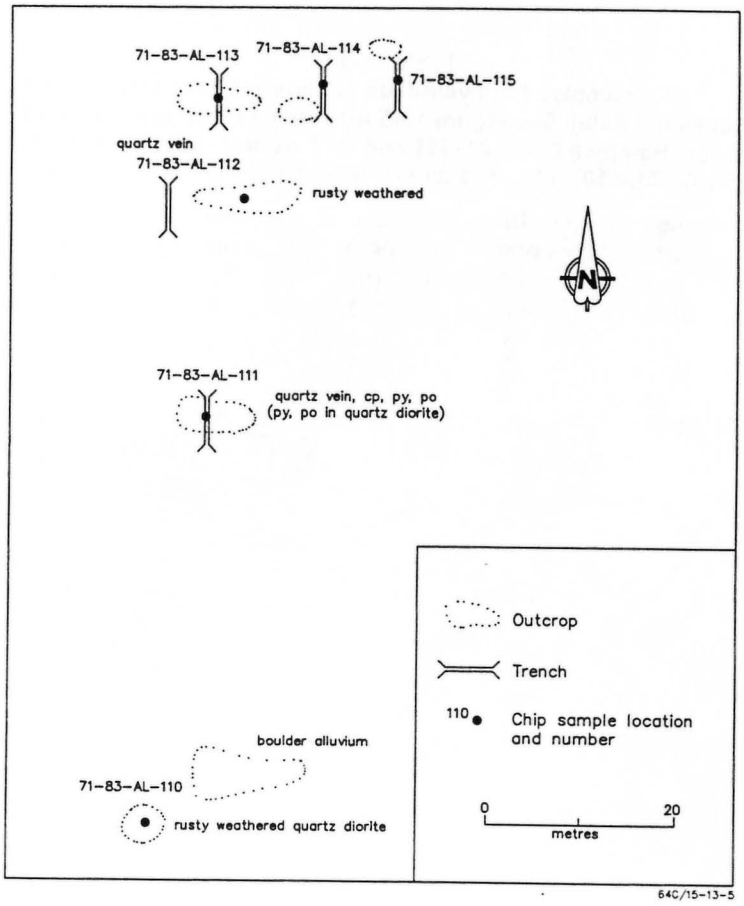

Figure 13-5: Sample locations of vein-type mineralization in quartz diorite, occurrence 13 (M.A.F. Fedikow, unpublished data). Sample results are presented in Table 13-3. Location of trenched area is shown in Figure 13-2.

LOCATION: **14**

NAME: (A.F.- Mineralization Intersected by Diamond Drilling)
UTM: 6311258N/393850E
ACCESS: Float plane to the east side of Arbour Lake

AREA: Northeast shore of Arbour Lake (Fig. 13-1)
AIRPHOTO: A24299-123

EXPLORATION SUMMARY:

The area was staked in 1948 as part of the J.G. claim block (Milligan, 1960).

Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5, which covers part of this area, in 1954 (A.F. 91615). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). SGM conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Selco Exploration Company Limited conducted an airborne EM survey over Airborne Permit 31 in 1960 (A.F. 91626). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

Rock Ore Exploration & Development Ltd., in joint venture with the Province of Manitoba, completed DDH RO 75-8 (269.1 m) in 1976 (A.F. 93082). Also under this joint venture, the Exploration Operations Branch of Manitoba Mineral Resources Division carried out an HLEM and magnetometer survey in 1976 (A.F. 93082). Rock Ore Exploration & Development Limited carried out vertical loop EM surveys in 1976 to check if any of the previously identified EM anomalies represented multiple parallel conductors; results of this check survey did not indicate multiple conductors (A.F. 93082).

GEOLOGICAL SETTING:

The area is underlain by rhyolite tuff, greywacke, siltstone and mudstone, and massive mafic rocks and mafic tuff. These rocks are intruded to the north and south by tonalite (Fig. 13-1).

MINERALIZATION:

Mineralization intersected by DDH RO 75-8 includes narrow solid pyrrhotite and chalcopyrite bands and pyrite veins (Table 14-1).

Mineralization is reported in outcrop at two sites. Site 1 occurs approximately 300 m south-southwest of the lake (Fig. 13-1). A trench exposes near solid pyrrhotite and pyrite in several 0.3 to 2 m thick zones that crosscut layering. The host rock is rusty weathered, grey-white, laminated felsic tuff and siltstone (Fig. 14-1; Parbery, 1988).

Mineralization at site 2, a few metres from the lakeshore, consists of a 3 to 4 m wide, south-trending, rusty weathered zone in felsic siltstone(?) (Fig. 13-1, 14-2). The zone contains up to 10% disseminated and stringer pyrite + pyrrhotite ± chalcopyrite. Within the rusty weathered zone the host rock is siliceous felsic siltstone (Fig. 14-2; Parbery, 1988). Based on the similarity of the host rocks and surrounding rocks, Sites 1 and 2 are considered to be part of the same mineralized unit.

GEOCHEMICAL DATA:

Drill core assays from DDH RO 75-8 are summarized in Table 14-1.

Three samples collected at Site 1 (81-88-038, 81-88-039, 81-88-040A) contained 100 to 500 ppm Cu, 100 to 1100 ppm Zn, 0.3 to 7.2 g/t Au, and nil Ag (D. Parbery, unpublished data).

Two samples collected at Site 2 in 1983 contained 402 ppm Cu, 129 ppm Ni, 1590 ppm Zn, <1 ppb Pb, 45 ppm Co, <10 ppm W, tr. Au, and nil Ag (sample 71-83-AL-116) and 332 ppm Cu, 126 ppm Ni, 1620 ppm Zn, <1 ppm Pb, 45 ppm Co, 10-50 ppm W, nil Au, and nil Ag (sample 71-83-AL-117) (M.A.F. Fedikow, unpublished data).

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. Crosscutting sulphide bands and veins may represent mobilizate.

REFERENCES:

Assessment Files 91615, 91616, 91622, 91626, 91679, 91689, 91699, 91989, 91992, 93082
Manitoba Energy and Mines, Mines Branch.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

Parbery, D.
1988: Investigation of volcanic stratigraphy and iron formation occurrences, Lynn Lake area; **in** Manitoba Energy and Mines, Minerals Division, Report of Field Activities 1988, p. 12-15.

Table 14-1
Summary of significant mineralization and assay results from DDH RO 75-8

DDH	Intersection Length (m)	Mineralization	Host Rock	Zn (%)	Ni (%)	Cu (%)	Au g/t	Ag g/t	Sample Length (m)	Comments	DDH Length (m)	Assessment File Number
RO 75-8	13.3	Py veins, cp-po bands, diss.	Biotite-hornblende-feldspar mafic volcanic rocks	0.10	0.01	0.04	tr.	nil	1.5	Continuous sample	269.1	93082
				0.10	0.01	0.03	nil	nil	1.5			
				0.25	0.02	0.04	nil	nil	1.5			
				0.16	0.01	0.03	tr.	nil	1.5			
				0.17	0.02	0.04	tr.	nil	1.5			
				0.30	0.01	0.01	nil	nil	1.5			
				0.08	tr.	tr.	tr.	nil	1.5			
				0.02	tr.	0.01	nil	nil	1.5			
	21.0	Minor to mod.(?) po, cp blebs, veins, local narrow SS sections	Biotite-chlorite-hornblende-feldspar mafic volcanic rocks[1], biotitic bands, quartz veinlets, siliceous, local "healed shear zones"	0.02-0.23	tr.-0.01	0.01-0.03	nil-tr.	nil-tr.		Twelve samples assayed through section, each 1.5 m; range given		
	11.6	Po-cp blebs, diss., veins, narrow SS sections	Biotite-rich mafic volcanic rocks, siliceous, dk. brown, quartz veins	0.03-0.15	nil-0.01	0.01-0.03	nil-tr.	nil-nil		Six samples assayed through section, each 1.5 m; range given		

[1]- probably picritic basalt

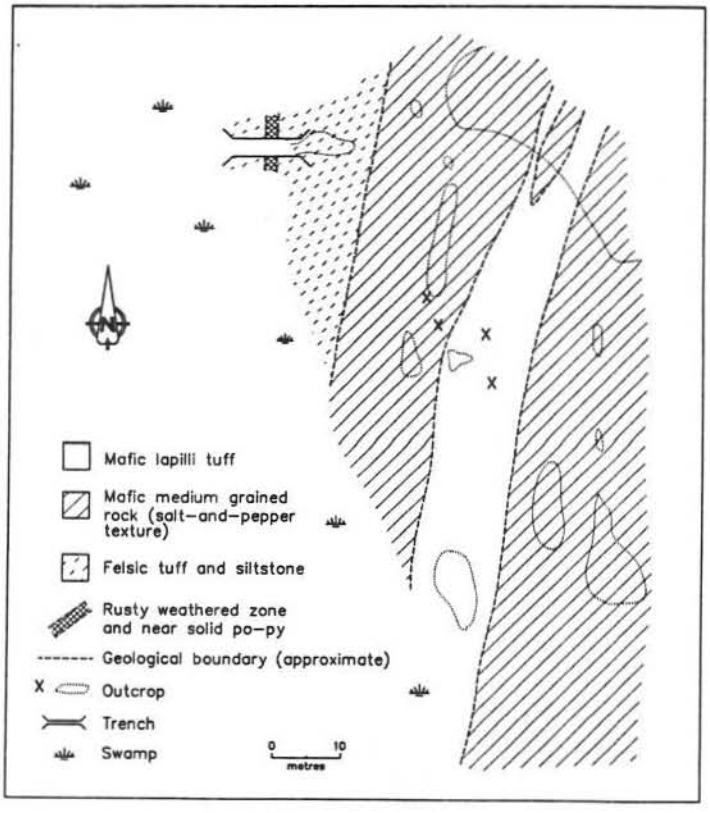

Figure 14-1: Detailed geology of site 1, occurrence 14 (D. Parbery, unpublished data, 1988).

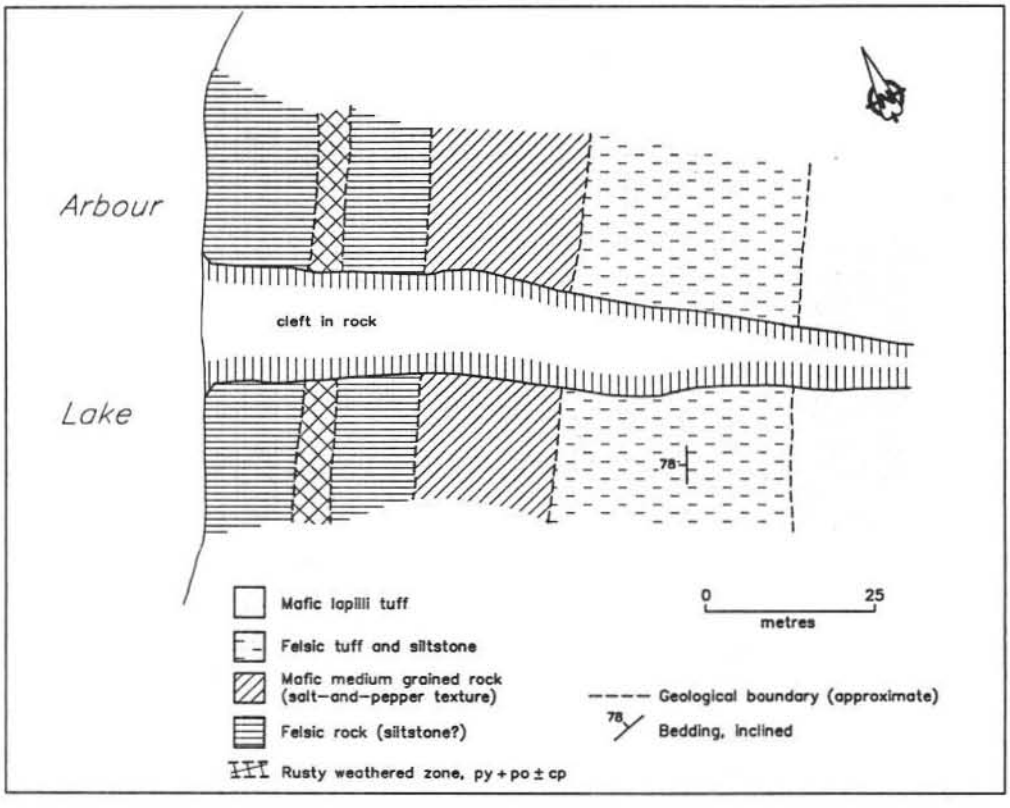

Figure 14-2: Detailed geology of site 2, occurrence 14 (D. Parbery, unpublished data, 1988).

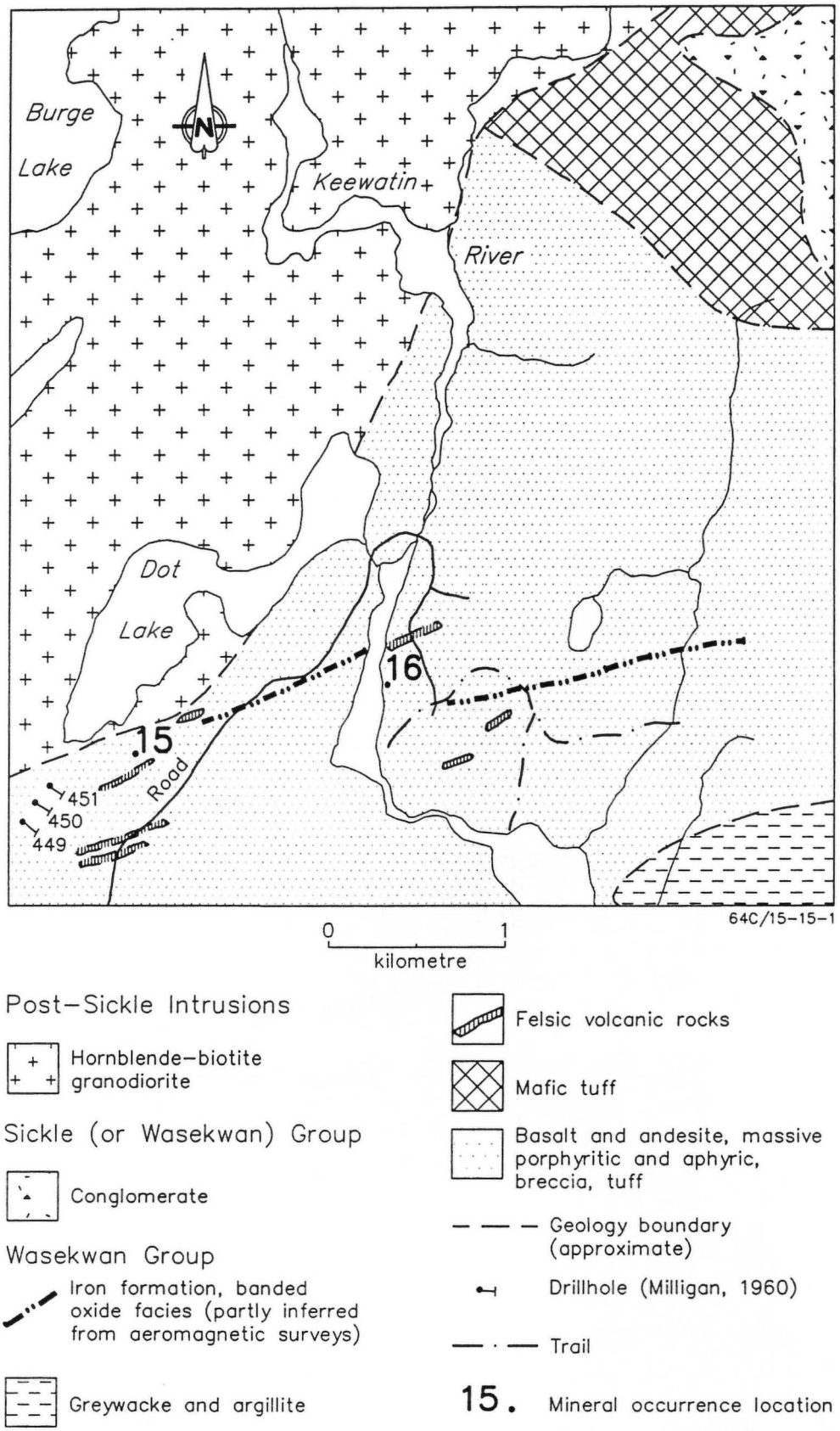

Figure 15-1: Geological setting of occurrences 15 and 16 (after Gilbert et al., 1980).

LOCATION: **15**

NAME: Rushed
UTM: 6306282N/378727E
ACCESS: The MacLellan mine road and 750 m traverse northwest towards Dot Lake

AREA: South of Dot Lake (Fig. 15-1)
AIRPHOTO: A23828-74

EXPLORATION SUMMARY:

Noranda carried out a magnetometer and geological (1:2400) survey on the J.J., Dot and Pot claim groups in 1948 (A.F. 91471).

Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5, which covers part of this area, in 1954 (A.F. 91615). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). SGM conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

Geological mapping (1:2400), geophysical and lithogeochemical surveys, and drilling (total number of holes and metres drilled are not known) have been undertaken in the area by SGM (Fedikow, 1986a), and later, its subsidiary SherrGold Inc. and LynnGold Resources Inc.

GEOLOGICAL SETTING:

The MacLellan deposit occurs within a unique stratigraphic sequence known as the Agassiz Metallotect within Wasekwan Group rocks of the northern belt of the Lynn Lake greenstone belt. Rocks of the Agassiz Metallotect include interlayered biotitic and siliceous siltstone, picritic basalt, oxide-, silicate- and sulphide-facies iron formation, and minor felsic volcanic rocks. These rocks are underlain and overlain by thicker sequences of fragmental aluminous basalt and mafic polymictic debris flows (Fig. 2, 15-2; Fedikow, 1986b; Fedikow *et al.*, 1986; Fedikow *et al.*, 1990). Host rocks at the Rushed occurrence are steeply dipping greywacke and andesite tuff, bounded on the northwest and southeast by aluminous basalts. A thin (<3 m) oxide facies (magnetite-chert) iron formation is interbedded with the southeastern aluminous basalts. Rocks in the area of the Rushed occurrence are typically rusty weathered, fractured and sheared (Fedikow, 1986a).

MINERALIZATION:

The Rushed Au occurrence consists of several zones of near solid to solid pyrite, pyrrhotite and arsenopyrite with minor amounts of magnetite, sphalerite and chalcopyrite. Mineralized zones extend along strike for 1200 m and range from 0.2 to 1.0 m thick. The zones are hosted by rusty weathered, fractured, sheared, interlayered intermediate siltstone and oxide facies iron formation. The structural and stratigraphic footwall is characterized by basalt with thin interlayers of oxide facies iron formation. Massive basalt forms the hanging wall rocks (Fedikow, 1986a). The Au content is proportional to the amount of arsenopyrite (Audet, 1983).

GEOCHEMICAL DATA:

Drill core samples assayed 0.68 to 3.4 g/t Au (Fedikow, 1986a); tonnages have not been calculated.

Fedikow (1986a) presents results of a vegetation geochemical survey over the Rushed occurrence using 74 black spruce (*Picea mariana*) bark samples. The survey is useful in delineating the picritic basalts, but had limited application in outlining trace element associations with the Rushed mineralization because of the small size of the anomalous halo. Nevertheless, Zn and As contents in black spruce needles and twigs, respectively, deliniated the mineralized zone. Fedikow (1986a) also presents trace element analyses of two rock samples from outcrop at the Rushed occurrence (Table 15-1).

Fedikow *et al.* (1996) present results of a vegetation geochemical survey over the Rushed occurrence and Dot Lake deposit using black spruce *(Picea mariana)* twigs and needles. Geochemical data reflect the positions of mineralized zones, IP anomalies, lithologies and lithologic contacts in the Dot Lake area. Gold, As, Sb, Zn and Fe are enriched in black spruce twigs growing in proximity to mineralized zones.

Fedikow (1986c) and Fedikow and Amor (1990) demonstrate mercury-gas anomalies that have a "rabbit's ear" configuration, *i.e.*, low Hg values over the mineralized rocks, with high values on either side of the Rushed occurrence. Two rock samples of near solid to solid pyrrhotite, pyrite and arsenopyrite from the Rushed occurrence contained 20 and 15 ppb Hg, likely too low to produce 'real' measurable Hg-gas anomalies (Fedikow, 1986; Fedikow and Amor, 1990).

Eight till samples were collected from the area of the Rushed occurrence in 1984 as part of a larger till geochemical survey of the MacLellan Mine - Dot Lake area. The heavy mineral fraction of one of the samples contained 1045 ppb Au (Nielsen and Fedikow, 1987).

CLASSIFICATION:

Stratabound massive sulphide type deposit; volcanic rock associated.

REFERENCES:

Assessment Files 91471, 91615, 91616, 91622, 91679, 91699, 91989, 91992
Manitoba Energy and Mines, Mines Branch.

Audet, M.
1983: Geology and mineralization of the Dot Lake property, Lynn Lake area, Manitoba; Queens University, B.Sc.(Honours) Thesis (unpublished), 62p.

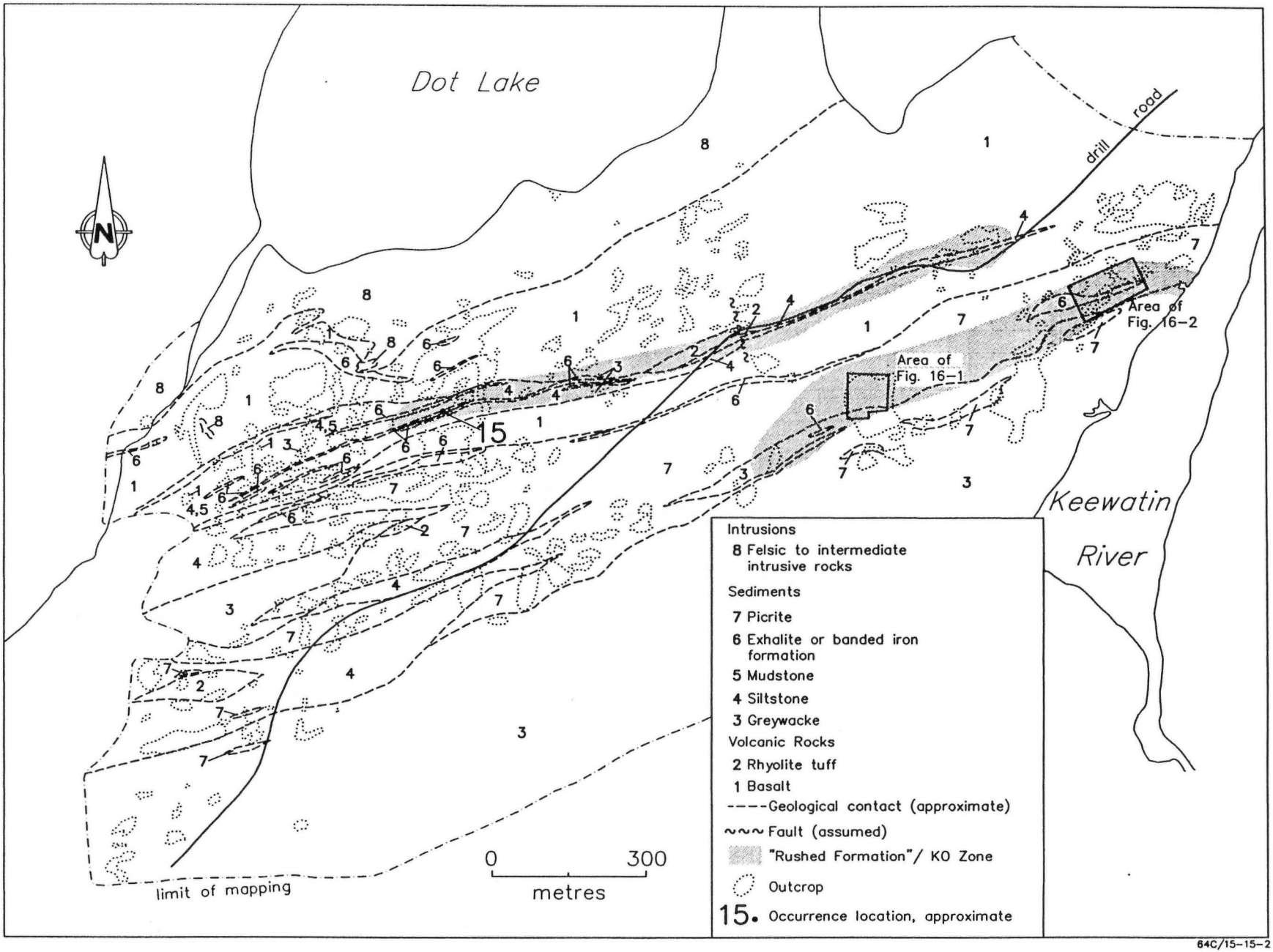

Figure 15-2: Detailed geology of the Dot Lake area (Rushed occurrence and K zones; locations 15 and 16; after Audet, 1983).

Fedikow, M.A.F.
1986a: Detection of gold mineralization and lithologic mapping within the Agassiz Metallotect (Lynn Lake area) utilizing black spruce (*Picea mariana*) bark; Manitoba Energy and Mines, Open File Report OF86-6, 61p.
1986b: Geology of the Agassiz stratabound Au-Ag deposit, Lynn Lake, Manitoba; Manitoba Energy and Mines, Open File Report, OF85-5, 80p.
1986c: Mercury gas surveys over base and precious metal mineral deposits in the Lynn Lake and Snow Lake areas, Manitoba; Manitoba Energy and Mines, Open File Report, OF85-11, 45p.

Fedikow, M.A.F. and Amor, S.
1990: Evaluation of a mercury-vapour detection system in base- and precious-metal exploration, northern Manitoba; Journal of Geochemical Exploration, 38(3),p. 351-374.

Fedikow, M.A.F., Baldwin, D.A. and Taylor, C.
1986: Gold mineralization associated with the Agassiz Metallotect and the Johnson Shear Zone, Lynn Lake greenstone belt, Manitoba: in Gold in the Western Shield (L.A. Clarke, ed.); Canadian Institute of Mining and Metallurgy, special volume 38, p. 361-377.

Fedikow, M.A.F., Ferreira, K.J. and Chackowsky, L.
1996: Geochemistry of black spruce *(Picea mariana)* needles and twigs growing over zones of gold mineralization and associated induced polarization responses, Dot Lake area, Agassiz Metallotect; Manitoba Energy and Mines, Economic Geology Report ER96-1, 231p.

Fedikow, M.A.F., Parbery, D. and Ferreira, K.J.
1990: Agassiz Metallotect - a regional metallogenic concept, Lynn Lake area; Manitoba Energy and Mines, Mineral Deposit Thematic Map Series; Map 89-1, 1:50 000.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

Nielsen, E. and Fedikow, M.A.F.
1987: Glacial dispersal of trace elements in Wisconsinan till in the Dot Lake - MacLellan Mine area, Manitoba; Manitoba Energy and Mines, Open File Report OF87-2, 73p.

Table 15-1
Geochemical analyses of rock chip samples from the area of the Rushed occurrence (Fedikow, 1986a)

Sample	Na %	Cr ppm	Fe %	Co ppm	Ni ppm	Zn ppm	As ppm	Se ppm	Mo ppm	Ag ppm	Cd ppm	Sb ppm	Ba ppm	La ppm	Hf ppm
00602	1.00	40	21.9	45	420	3000	82.5	8	19	<2	9	0.7	330	8	1
00603	1.60	21	8.3	110	100	2000	<3000.0	<6	<3	<2	<13	18.2	830	5	<1

Sample	Ta ppm	W ppm	Ir ppb	Au ppb	Th ppm	U ppm	Cu ppm	Pb ppm	Zn ppm	Cd ppm	Ag ppm	Ni ppm	Co ppm	Mo ppm
00602	<0.5	<1	<50	180	1.5	4.8	468	16	2900	10.1	2.2	315	28	19
00603	<0.5	<12	<50	595	1.3	2.2	104	120	1750	15.9	1.2	90	79	7

Analyses done by Bondar-Clegg Co. Ltd., Ottawa. Na, Cr, Fe, Co, Ni, Zn, As, Se, Mo, Ag, Cd, Sb, Ba, La, Hf, Ta, W, Ir, Au, Th and U analyzed by neutron activation (INAA). Cu, Pb, Zn, Cd, Ag, Ni, Co and Mo analyzed by atomic absorption spectrophotometry (AAS).

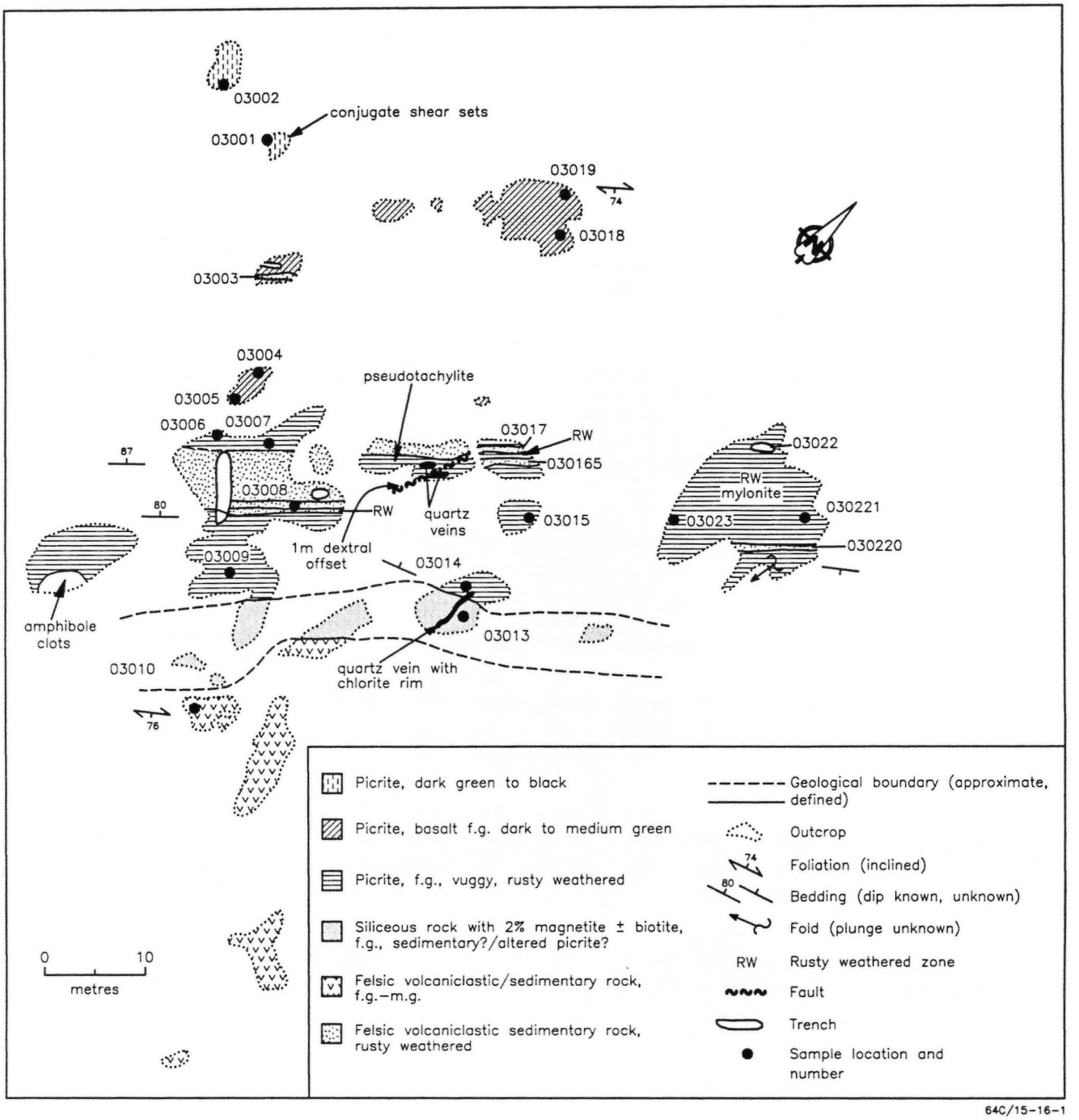

Figure 16-1: Detailed geology of the K2 zone (D. Parbery, unpublished data, 1987). See Figure 15-2 for location of mapped area.

LOCATION: **16**

NAME: Dot Lake; K zones
UTM: 6306693N/380223E
ACCESS: MacLellan Mine road

AREA: South of Dot Lake (Fig. 15-1)
AIRPHOTO: A23828-74

EXPLORATION SUMMARY:

Noranda carried out a magnetometer and geological (1:2400) survey on the J.J., Dot and Pot claim groups in 1948 (A.F. 91471). SGM drilled DDH 449, 450 and 451 totalling 292 m on claims Dot 11 and Dot 12 in 1956 (Milligan, 1960, p. 237-238).

Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5, which covers part of this area, in 1954 (A.F. 91615). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). SGM conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

Geological mapping (1:2400), geophysical and lithogeochemical surveys, and drilling (total number of holes and metres drilled) have been undertaken in the area by SGM (Fedikow, 1986a), and later, its subsidiary SherrGold Inc. and LynnGold Resources Inc.

GEOLOGICAL SETTING:

The Dot Lake deposit occurs within a unique stratigraphic sequence known as the Agassiz Metallotect within Wasekwan Group rocks of the northern belt of the Lynn Lake greenstone belt, approximately 1 km along strike to the west of the MacLellan deposit (Location 1). Rocks of the Agassiz Metallotect include interlayered biotitic and siliceous siltstone, picritic basalt, oxide-, silicate- and sulphide-facies iron formation, and minor felsic volcanic rocks. These rocks are underlain and overlain by thicker sequences of fragmental aluminous basalt and mafic polymictic debris flows (Fig. 2, 15-2; Fedikow, 1986b; Fedikow *et al.*, 1986; Fedikow *et al.*, 1990). Rocks in the area include interlayered picritic basalt flows, tuff and breccia, greywacke and andesite tuff, thin layers (<3 m) of oxide facies (magnetite-chert) iron formation, and aluminous basalt (Fig. 15-2). Rocks are typically rusty weathered; some are silicified. Pseudotachylite and mylonite have been identified in outcrop (Figs. 16-1, 16-2; M.A.F. Fedikow and D. Parbery, unpublished data, 1987).

MINERALIZATION:

The Dot Lake deposit consists of several auriferous zones in a four km long and 61 to 244 m wide zone that represents the westerly continuation of the host rocks to the MacLellan Au-Ag deposit (Fig. 15-2; Table 16-1). These are the K1, K2, K4, K5 and K6 zones, and the incompletely tested KO zone, represented by an intersection of 5.6 g/t over 1.98 m (Wright, 1989).

Table 16-1
Geological characteristics, drill-indicated grades and tonnages for the K zones, Dot Lake deposit

Deposit	Geological Characteristics	Grade and Tonnage
K0 zone		5.6 g/t Au over 1.98 m
K1 zone	Stratabound, 1-15% pyrrhotite, pyrite with lesser galena, sphalerite and arsenopyrite in fine- and medium-grained picrite	218 050 t at 2.85 g/t Au
K2 zone	Stratabound, 10% pyrite and pyrrhotite with lesser base metals in medium- to coarse-grained picrite	222 983 t at 3.57 g/t Au
K4 zone	Quartz vein-hosted, 5-20% pyrite with 4-10% galena and sphalerite in a strongly silicified intermediate siltstone	63 404 t at 6.62 g/t Au
K5 zone	Stratabound zone of six lenses representing the western extension of the Rainbow deposit; picrite and siltstone host rocks	383 567 t at 5.49 g/t Au
K6 zone	Predominantly stratabound 1-7% pyrite and pyrrhotite with accessory base metals and visible gold in picrite	169 980 t at 3.94 g/t Au

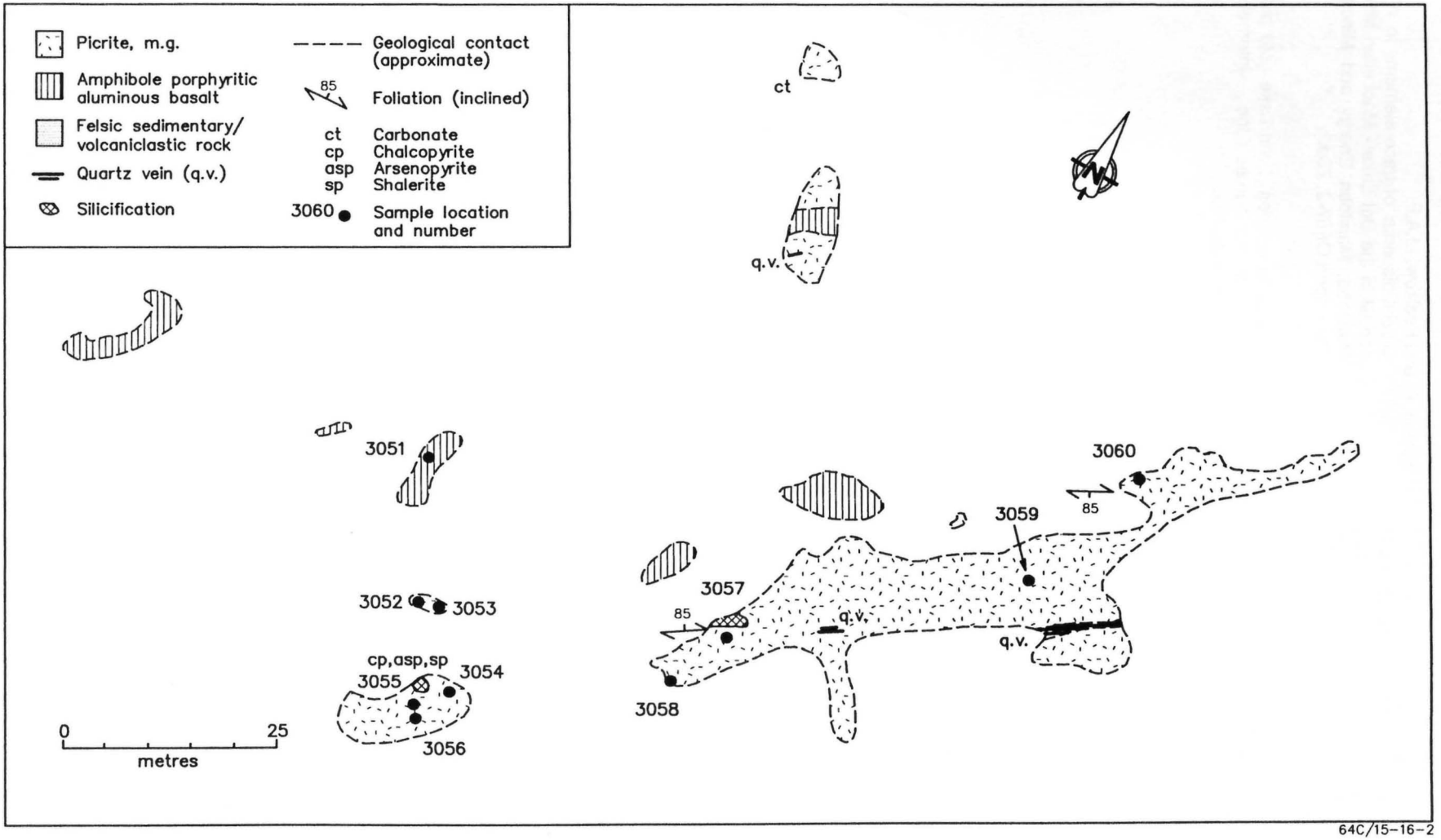

Figure 16-2: Detailed geology of the K6 zone (D. Parbery, unpublished data, 1987). See figure 15-2 for location of mapped area.

K1 and K2 zones

The K1 and K2 zones have a combined strike length of 274 m and a down-dip extension of 183 m. Mineralization is characterized by 1 to 15% fine- to medium-grained blebs, streaks and disseminations of pyrrhotite and pyrite with accessory galena, sphalerite, and arsenopyrite. Local visible gold in associated quartz veins may represent mobilisate. The K1 and K2 zones are hosted by fine- to medium-grained and medium- to coarse-grained picritic basalt, respectively. The picrite is composed of interlocked tremolite-actinolite porphyroblasts in a fine grained chlorite ± biotite, carbonate, quartz and talc matrix. Contacts between fine grained and coarser grained picrite define layering on a centimetre to metre scale. Subrounded to ovoid fragments occur in the fine grained picrite. The trend of the mineralization is 5°-10° discordant to the foliation of the host picrite. Silicification and quartz ± carbonate veins are the alteration types recognized in the two zones; veins, bands and blebs vary from 1 to 30 cm in width. Shears occur north of the K1 zone, as well as between the K1 and K2 zones. Both zones are offset by late stage high angle faults that sinistrally displaces bedding up to 34 m (Wright, 1989).

K4 zone

The K4 zone is characterized by 2 to 10 cm wide mineralized quartz veins with accompanying silicification and is hosted within a strongly altered felsic volcanic and/or siltstone unit. Mineralization occurs as 5 to 20% disseminated pyrite with 4 to 10% galena and sphalerite. The trend of the mineralization is slightly discordant to the foliation in the host rocks (Wright, 1989).

K5 zone

The K5 zone consists of six lenses that represent the westward extension of the Rainbow deposit (see Location 1). The K5 zone contains a greater proportion of picrite than sedimentary rocks and a more erratic distribution of the mineralization compared to the Rainbow deposit. The lenses strike east and dip steeply to the north over a strike length of 213 m to a depth of at least 472 m. The zone strikes subparallel, but discordant at a low angle, to stratigraphy. Shears, 0.3 to 7.6 m wide, are present in the lenses. The zone is cut into three blocks by a north-trending sinistral fault at a high angle to stratigraphy with movement up to 30 m (Wright, 1989).

K6 zone

The K6 zone has a strike length of 244 m, a dip of 76° north and extends to a minimum of 183 m below surface. The zone is discordant to stratigraphy and crosscuts it at an angle of approximately 15°. Gold mineralization occurs at or near the contact of the picritic basalt on the north and the altered felsic unit to the south. The bulk of the mineralization occurs within the picrite. Mineralization is characterized by 1 to 7% pyrite and pyrrhotite with accessory galena, sphalerite, arsenopyrite and local visible gold. Silicification, carbonatization and quartz veins are present in the host rocks. Shears are ubiquitous throughout the mineralized zone; they dip approximately 87° north, steeper than stratigraphy, which dips at 70° north. High angle faults transect the deposit and dextrally offset stratigraphy by 24.4 m. The mineralized zone is truncated by faulting on both the east and west ends of the deposit (Wright, 1989).

DDH 449, 450 and 451 intersected up to 15% pyrite and pyrrhotite; quartz stringers, chlorite and carbonate are common (Milligan, 1960, p. 237-238).

GEOCHEMICAL DATA:

Drill-indicated gold resources in the Dot Lake deposits total 1 023 000 tonnes grading 4.4 g/t Au (Granduc Mining Corporation, 1995 Annual Report). Table 16-1 details grade and tonnage estimates for the individual zones.

Geochemical analyses of rock samples from the K2 and K6 zones are presented in Table 16-2, 16-3 and 16-4.

Fedikow *et al.* (1996) present results of a vegetation geochemical survey over the Rushed occurrence and Dot Lake deposit using black spruce *(Picea mariana)* twigs and needles. Geochemical data reflect the positions of mineralized zones, IP anomalies, lithologies and lithologic contacts in the Dot Lake area. Gold, As, Sb, Zn and Fe are enriched in black spruce twigs growing in proximity to mineralized zones.

Nielsen and Fedikow (1987) present results of a till geochemical survey over the MacLellan Mine - Dot Lake area. A widespread dispersion train up to 1.5 km long contains anomalous Au in the heavy mineral fraction and As in the <2μ fraction in the area of the Dot Lake deposit.

"Low" values of Cu, Ni and Zn were present in core from DDH 449, 450 and 451 (Milligan, 1960, p. 237-238); these cores apparently were not assayed for Au.

CLASSIFICATION:

Vein type deposit; multiple veins and lenses. See also the discussion of the classification of the MacLellan deposit (location 1).

REFERENCES:

Assessment File 91471, 91615, 91616, 91622, 91679, 91699, 91989,91992
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Wright, P.
1989: Property summaries, Lynn Lake gold properties; LynnGold Resources Inc., internal report (unpublished), 10p.

Table 16-2
Geochemical analyses of rock samples from the K2 and K6 zones (Location 16) (M.A.F. Fedikow, unpublished data, 1987). Sample locations shown in Figures 16-1 and 16-2.

K2 zone

Sample	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %
3001	1	22	2	45	0.1	18	19	236	2.19	37	5	nd	1	4	1	6	2	48	1.05
3002	1	46	3	15	0.1	21	36	131	1.92	72	5	nd	1	2	1	5	2	39	0.62
3003	1	115	3	53	0.2	438	29	333	2.93	139	5	nd	1	5	1	2	2	27	0.42
3004	1	11	2	60	0.1	517	61	457	2.20	797	5	nd	1	14	1	2	2	23	1.28
3005	2	78	6	36	0.1	83	15	259	2.62	12	5	nd	1	17	2	2	2	53	1.29
3006	1	12	4	69	0.1	482	69	289	2.24	802	5	nd	1	21	1	2	2	22	0.86
3007	3	148	15	104	0.4	61	17	399	3.84	16	5	nd	1	34	1	4	2	79	1.74
3008	3	151	17	185	1.3	125	32	336	5.63	53	5	2	1	86	1	2	2	122	0.80
3009	1	33	2	44	0.1	241	18	379	2.35	20	5	nd	1	9	1	2	2	39	0.25
3010	3	123	13	134	0.4	18	23	454	7.60	5	5	nd	1	37	1	2	2	231	0.71
3011**	3	60	18	95	0.1	13	19	797	6.51	9	5	nd	1	51	1	2	2	149	2.80
3012***	3	107	4	45	0.4	16	10	399	4.03	6	5	nd	1	24	1	2	2	59	1.66
3013	4	137	25	98	0.1	10	13	561	5.75	588	5	nd	1	10	1	2	2	55	1.07
3014	2	66	5	148	0.2	203	22	502	5.27	61	5	nd	1	10	1	4	2	65	0.33
3015	2	161	10	151	1.2	380	40	354	4.76	43	5	nd	2	62	1	2	2	48	0.49
3016	1	68	5	99	2.8	247	28	215	2.93	159	5	19	1	6	1	2	3	35	0.35
3017	2	230	20	83	1.0	44	16	251	3.54	10	5	nd	1	82	1	2	2	65	1.10
3018	1	8	4	62	0.1	228	29	433	3.24	199	5	nd	1	18	1	2	2	38	1.55
3019	2	57	14	20	0.1	62	11	148	2.08	8	5	nd	1	108	1	3	2	23	2.12
3020	3	139	28	70	1.0	327	38	269	5.68	14	5	nd	3	402	1	2	2	159	1.87
3021	1	95	7	86	0.2	388	25	277	2.51	28	5	nd	1	5	1	2	3	24	0.11
3022	1	26	10	122	0.3	400	23	3576	1.24	26	5	nd	1	94	1	4	2	8	5.47
3023	1	88	5	76	0.3	336	27	387	2.74	23	5	nd	2	106	1	2	2	33	0.57

Sample	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Au ppb	Rock Type
3001	0.041	4	18	0.45	4	0.05	3	0.60	0.10	0.03	1	1	Picrite, rusty weathered, foliated
3002	0.050	7	18	0.40	15	0.04	3	0.45	0.07	0.07	1	1	Al-basalt, f.g., chloritic, rusty patches, diss po.
3003	0.008	2	454	1.92	6	0.02	2	1.47	0.01	0.02	1	1	Picrite, foliated, rusty weathered
3004	0.032	4	351	2.07	9	0.01	2	1.30	0.01	0.01	1	3	Picrite, foliated, rusty weathered
3005	0.046	5	62	0.96	79	0.11	2	0.93	0.07	0.27	1	6	Feldspathic layer, f.g., rusty weathered, in picrite
3006	0.039	5	346	2.01	22	0.02	2	1.41	0.01	0.02	1	1	Picrite, m.g., sheared rusty weathered
3007	0.052	7	45	1.22	49	0.16	2	1.33	0.14	0.28	1	1	Altered picrite or amphibole-feldspar layer, rusty weathered
3008	0.038	6	168	2.69	96	0.14	2	3.13	0.12	0.69	9	1080	Feldspar-amphibole layer, po-bearing, sheared, rusty weathered
3009	0.020	2	266	1.73	9	0.02	2	1.30	0.01	0.01	1	30	Picrite, c.g., sheared, rusty weathered
3010	0.026	4	37	2.40	300	0.32	2	4.48	0.24	2.25	15.	5	Amphibole-feldspar (volcaniclastic sed.?), sheared, rusty weathered
3011	0.016	3	30	1.63	283	0.28	2	5.39	0.43	2.00	1	6	Volcaniclastic sedimentary rock, rusty weathered
3012	0.045	6	25	0.82	22	0.10	2	1.86	0.25	0.12	1	3	Volcaniclastic sedimentary rock, foliated, rusty weathered
3013	0.085	7	17	1.43	85	0.28	4	2.49	0.06	0.60	19	55	Felsic volcaniclastic sedimentary rock, rusty weathered
3014	0.033	2	466	3.55	46	0.04	4	3.26	0.01	0.03	2	27	Picrite, sheared foliated, rusty weathered
3015	0.061	8	459	2.00	16	0.04	3	2.03	0.01	0.04	7	1450	Picrite, foliated, rusty weathered
3016	0.047	4	296	1.64	7	0.03	2	1.42	0.03	0.02	1	550	Picrite, m.g.-c.g., sheared, pock-marked, rusty weathered
3017	0.051	5	39	0.89	102	0.10	2	1.72	0.17	0.17	1	1030	Feldspar-amphibole volcaniclastic sedimentary rock, sheared, rusty
3018	0.052	2	381	2.58	9	0.02	2	1.82	0.01	0.03	1	1	Picrite, m.g.-c.g., foliated, rusty weathered
3019	0.005	2	35	0.88	50	0.02	2	3.87	0.49	0.17	2	1	Silicified feldspar-amphibole layer
3020	0.064	13	567	2.71	153	0.28	2	4.74	0.08	1.70	1	13	Sedimentary layer, sheared, rusty weathered
3021	0.026	2	294	1.09	2	0.03	2	0.86	0.01	0.01	3	480	Picrite, sheared, rusty weathered
3022	0.024	6	60	0.53	4	0.03	2	0.46	0.01	0.01	10	78	Picrite, m.g.-c.g., sheared, rusty weathered
3023	0.042	5	246	1.59	3	0.04	2	1.94	0.01	0.01	6	15	Picrite, c.g., sheared, rusty weathered

K6 zone

Sample	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %
3025	1	35	9	50	0.1	61	15	212	1.58	31	5	nd	1	84	1	2	2	17	2.89
3051	1	44	2	55	0.2	30	7	160	1.68	3	5	nd	1	5	1	2	3	30	0.61
3052	1	44	2	28	0.1	178	10	210	2.93	7	5	nd	2	3	1	2	2	38	0.40
3053	2	108	8	46	0.1	45	17	413	6.32	16	5	nd	3	10	1	2	2	47	0.86
3054	2	1575	551	11451	37.8	190	99	269	8.85	17580	5	20	2	11	83	4	52	24	0.10
3055	1	107	2	79	0.3	408	38	213	2.80	21	5	nd	1	19	1	2	2	25	0.54
3056	2	71	2	35	0.1	82	10	196	2.10	12	5	nd	1	24	1	2	2	23	0.54
3057	2	279	13	169	1.5	140	19	527	5.07	8	5	nd	1	28	1	2	2	63	0.22
3058	1	126	5	151	0.6	642	51	338	3.40	67	5	nd	1	21	1	2	2	30	0.93
3059	1	39	2	154	0.1	565	46	473	3.31	153	5	nd	1	19	1	2	2	40	0.83
3060	1	28	2	48	0.1	357	50	206	2.87	509	5	nd	1	2	1	2	2	35	0.29

Sample	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Au* ppb	Rock Type
3025	0.002	2	46	0.72	5	0.04	4	2.81	0.23	0.02	1	1	Chloritic basalt, porphyritic, rusty weathered patches
3051	0.043	5	34	0.59	5	0.05	2	0.52	0.05	0.02	1	1	Basalt, porphyritic, rusty weathered patches
3052	0.039	4	280	1.17	20	0.04	3	0.92	0.03	0.01	1	2	Picrite, f.g., foliated, rusty weathered
3053	0.083	9	56	0.83	9	0.04	3	1.02	0.09	0.03	1	1	Picrite, f.g., foliated, siliceous infolded layers
3054	0.019	2	205	0.67	14	0.01	2	0.65	0.01	0.02	10	34800	NS py-po-sp layer, thin, hosted by picrite
3055	0.047	6	262	1.53	21	0.04	2	1.30	0.01	0.02	5	51	Picrite, m.g., foliated, cleaved, rusty weathered patches
3056	0.011	2	76	0.54	2	0.02	2	0.71	0.01	0.01	2	220	Quartz vein in recrystallized picrite; local sp in vein and wall rock
3057	0.038	3	244	2.23	27	0.04	4	2.06	0.02	0.04	2	113	Picrite, m.g., foliated, rusty weathered
3058	0.037	3	403	1.97	35	0.03	2	1.47	0.01	0.01	1	45	Picrite, m.g., foliated, possible silicification; diss. po
3059	0.034	3	544	2.74	9	0.04	2	2.03	0.01	0.01	138	24	Picrite, m.g., folded, foliated, rusty weathered
3060	0.035	2	380	1.86	17	0.04	6	1.42	0.02	0.01	3	1	Picrite, f.g., foliated, rusty weathered patches

(All sample numbers prefixed by '71-87-'; prefixes are not shown in Figures 16-1, 16-2.) ICP analysis. 0.500 g samples digested with 3 ml 3:1:2 HCl - HNO_3 - H_2O at 95°C for one hour and diluted to 10 ml with water. This leach is partial for Mn, Fe, Ca, P, La, Cr, Mg, Ba, Ti, B, W, and limited for Na, K and Al. Au detection limit by ICP is 3 ppm. Au* analysis by AA from 10 g sample.

** - Collected 15 m south of sample 3010.

*** - Collected 20 m south of sample 3010.

Table 16-3

Geochemical analyses (Ni, Cr, MgO) of rock samples from K6 zone (Dot Lake deposit; Location 16) (M.A.F. Fedikow, unpublished data). See Figure 16-2 for sample locations. Total concentrations based on a lithium metaborate fusion. Analyses performed by Manitoba Energy and Mines, Analytical Laboratory (Winnipeg).

Sample	Ni (ppm)	Cr (ppm)	MgO (%)
71-87-3025	245	400	10.45
71-87-3051	126	254	6.94
71-87-3052	653	1232	14.43
71-87-3053	109	160	6.13
71-87-3054	286	511	6.33
71-87-3055	690	1162	15.16
71-87-3056	171	319	4.94
71-87-3057	267	950	12.15
71-87-3058	877	1506	16.15
71-87-3059	870	1456	17.48
71-87-3060	976	1468	15.85

Table 16-4

Whole rock and trace element analyses from the K2 zone (Dot Lake deposit, Location 16) (M.A.F. Fedikow, unpublished data, 1987). Sample locations are shown in Figure 16-1.

	Picrite dykes		Amphibole-feldspar clastic sedimentary rock and basalt				Feldspar-rich			Altered picrite	
Sample No.	Range		3008	3010	3017	3019	3002	3005	3007	3020	3083
(wt. %)											
SiO_2	41.2	48.5	55.4	44.5	51.2	48.5	48.7	50.4	49.4	49.5	41.2
Al_2O_3	6.6	12.1	10.5	19.7	13.7	26.0	12.9	14.0	13.8	13.2	7.7
FeO	7.12	12.09	9.75	10.16	9.03	4.97	12.75	9.23	9.87	10.08	9.35
Fe_2O_3	1.43	3.53	2.32	3.23	3.16	0.84	2.93	1.84	2.22	1.94	0.93
CaO	7.48	16.58	4.55	4.80	8.14	9.82	8.11	8.88	9.10	6.48	16.75
MgO	14.39	17.34	8.97	5.16	6.80	4.09	5.90	6.89	6.69	9.09	8.39
Na_2O	0.21	0.68	0.65	3.05	1.86	3.86	3.37	2.83	2.39	0.34	0.31
K_2O	0.04	0.22	1.03	3.52	0.56	0.47	0.29	0.56	0.45	2.75	0.66
TiO_2	0.72	1.86	1.52	1.54	1.85	0.23	1.76	1.68	1.91	2.19	1.19
P_2O_5	0.03	0.19	0.13	0.11	0.16	0.02	0.16	0.15	0.17	0.23	0.13
MnO	0.21	1.50	0.20	0.13	0.22	0.07	0.17	0.18	0.21	0.18	0.25
H_2O	1.99	5.58	3.41	2.50	2.07	1.88	1.15	1.28	1.28	2.41	1.84
S	0.01	1.00	0.93	0.21	0.38	0.04	0.03	0.19	0.30	1.20	1.06
CO_2	0.19	6.31	0.42	0.32	0.47	0.31	0.25	0.93	1.06	0.44	9.85
Total	99.32	100.32	99.49	98.87	99.48	101.11	98.46	98.96	98.73	99.55	99.19
Ni (ppm)	396	900	228	98	87	133	74	170	116	447	847
Cr (ppm)	938	1652	326	50	119	61	73	178	111	1116	1291

LOCATION: **17**

NAME: (A.F.Mineralization intersected by diamond drilling)
UTM: 6314264N/399477E
ACCESS: Float plane to Tulune Lake, and traverse

AREA: West of Tulune Lake (Fig. 17-1)
AIRPHOTO: A24299-94, -95

EXPLORATION SUMMARY:

International Nickel Company of Canada, Limited carried out geological mapping (1:4800), a magnetometer survey, and drilled ten holes (total 959.5 m; drill logs are not included) to explore for copper-nickel mineralization on the MW claims in 1947 (A.F. 91036). Three of these holes, DDH 5493, 5494 and 5495, were drilled within the area of location 17; the remainder of this work is described for Location 20. T. Lisitza drilled seven holes totalling 214.9 m and dug one pit (4.9 x 1.8 x 3.7 m) on claim D.L. 20 in 1948 (A.F. 91033).

Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). SGM conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622).

Lavant Iron Mines Limited drilled DDH EX-2 and XR-1 (total 155.8 m) on claim Lim 2 in 1958. Lavant Iron Mines Limited conducted a magnetometer survey in 1959 and an EM survey in 1960 on the Mel claims and drilled two holes (DDH 1, 2; total 246 m) on claim Mel 10 (A.F. 91043). Initially, Lavant Iron Mines Limited was exploring for iron ore, but shifted their emphasis to copper-nickel exploration as drilling proceeded.

Selco Exploration Company Limited conducted an airborne EM survey over Airborne Permit 31 in 1960 (A.F. 91626).

Canadian Nickel Company Limited drilled DDH R-1, R-2, R-3 and R-4 (total 847.6 m) on claims Sulphide 15 and Sulphide 30 (A.F. 91037), and DDH R-6, R-7, R-8, R-9 and R-10 totalling 470 m on CB 2084 (A.F. 91031) in 1969.

Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

The exploration history of the area is detailed in Mineral Inventory Card 64C/15 Cu4.

GEOLOGICAL SETTING:

The area is underlain by pre-Sickle Group gabbro, diorite, and tonalite that intrude Wasekwan Group mafic and intermediate volcanic rocks. A major north-trending fault transects the area west of Tulune Lake (Fig. 17-1; Gilbert *et al.*, 1980). The gabbro is highly fractured and uralitized; aplite and amphibolite(?)[1] dykes, quartz stringers and epidote fill the fractures. The western part of the mafic intrusion is more uralizitized and contains a greater variety of dykes. North of the west end of Tulune Lake, the gabbro contains patches of magnetite and ilmenite, which are surrounded by narrow light-coloured feldspathic zones (Milligan, 1960, p. 214; A.F. 91036). Inco's report of detailed mapping describes a band "several thousand feet" wide with disseminated magnetite and ilmenite in gabbro near the contact with diorite (A.F. 91036).

The "R-" drillholes intersected mottled green-black coarse grained metapyroxenite, anorthosite, and a very fine grained, black, amphibolitic rock[1] (hornblendite?). In places throughout the core, the metapyroxenite is variously serpentinized, epidotized, and contains olivine crystals (A.F. 91037). DDH EX-2 intersected gabbro and lesser amphibolite, with pyroxenite and granite. DDH XR-1 intersected gabbro (A.F. 91035). DDH 1 intersected gabbroic to peridotitic to pyroxenitic intrusive rocks; a mottled mafic to ultramafic intrusive rock (olivine + clinopyroxene) with extensive calcite, serpentine, brucite, magnetite, and epidote (green mottled propylite; extensive serpentinization and propylitization; and minor metaquartzite (xenolith?). DDH 2 intersected uralized magnetite-bearing gabbro, migmatite, minor late granite dykes (A.F. 91043). Drillholes R-6 through R-10 intersected metapyroxenite, some uralitized, and hornblendite. In addition, DDH R-8 intersected minor anorthosite and serpentinized metapyroxenite (A.F. 91031).

Further to the north, DDH 4, 5 and 7 intersected feldspar porphyry, granite with andesitic xenoliths, fine grained mafic volcanic rocks and quartz-hornblende diorite (recrystallized volcanic rock?). DDH 1, 2, 3, 6 were abandoned in overburden (A.F. 91033).

MINERALIZATION:

Inco's report of detailed mapping describes a band "several thousand feet" wide with disseminated magnetite and ilmenite in gabbro near the contact with diorite (A.F. 91036).

Core from DDH R-1 contains scattered minor disseminated pyrrhotite and chalcopyrite, local traces of native copper, and in one place, <1 cm solid sphalerite. A 4.9 m zone of metapyroxenite from DDH R-2 at 57.9 m contains "substantial" pyrrhotite with lesser chalcopyrite and pyrite, including 15 cm of near solid sulphide. Core from DDH R-3 also includes a 0.6 m mineralized intersection, of which the first 0.3 m contained 25% magnetite, and the last 0.3 m contained ≈30% magnetite with intermixed chalcopyrite, pyrite and pyrrhotite. The zone coincides with a magnetic anomaly. A 19.8 m mineralized zone of metapyroxenite from DDH R-4 at 49.4 m is probably the source of the magnetic anomaly

[1] The drill log names the very fine grained, black, amphibolitic rock as a lamprophyre, but "lamprophyre" may be a misnomer: there is no indication of porphyritic character. Milligan (1960, p. 214) also mentions lamprophyre dykes, but is summarizing Inco's mapping; again, it is suspected that these are actually amphibolitic dykes.

Table 17-1
Assay results from DDH R-1 to R-4 (A.F. 91037) and R-6 to R-10 (A.F. 91031). See text for additional assays.

DDH	Sample Length (m)	Cu (%)	Ni (%)	Au (g/t)	Ag (g/t)	Rock Type	Mineralization
R-1	1.0	0.05				Transition:	Tr. native copper
	0.3	0.05				metapyroxenite/	Tr. native copper
	0.8	0.05				anorthosite	Tr. native copper
	0.5	0.05				Tr. native copper	
	0.5	0.08	nil			Metapyroxenite	Minor cp
	1.5	tr.	nil			Metapyroxenite	Minor cp
R-2	1.1	0.18	nil	0.8		Metapyroxenite mt; includes 15 cm~30% sulphide	Minor diss. cp, po,
	15 cm	0.15	0.01			Metapyroxenite	NS po, cp, py
	1.0	0.16	nil	0.3		Metapyroxenite	Minor diss. po, cp, py
	0.8	0.14	nil	1.0		Metapyroxenite	Minor diss. po, cp, py
	0.5	0.09	nil	0.3		Metapyroxenite	Tr.-minor po, cp, py
R-4	11 cm	0.92	nil	0.7	24.7	Metapyroxenite	~30% py, minor cp, mt
R-6	6 cm	0.07	0.02			Hornblendite	2-70% po, minor py, cp
	0.4	tr.	nil			Hornblendite	2-70% po, minor py, cp
	6 cm	0.08	0.04			Metapyroxenite	Native copper along fractures
	?(narrow?)	0.05	0.03			Metapyroxenite	1-2% po, tr. cp
	18 cm	0.14	0.03			Metapyroxenite	5% po, minor cp
R-7	no assays						
R-8	23 cm	0.059	0.012			Metapyroxenite (boulder? probably not *in situ*)	3% po, tr. cp
	1.3 cm	0.23	0.02			Metapyroxenite near bottom of hole	Minor diss. po
R-9	0.3	0.110	0.014			Metapyroxenite	5% po, py, cp
	15 cm	0.11	0.02			Metapyroxenite	Up to 75% po, py, cp
	10 cm	0.35	0.02			Metapyroxenite	≈30% po, py, cp
R-10	0.15	0.02	0.039			Metapyroxenite	Up to 20% po, py, cp
	Narrow(?)	0.18	0.07			Metapyroxenite	≈30% to SS po, cp, py

tested by this drillhole. Mineralization in this zone includes several sections, 0.3 to 1.4 m, with 25 to 50% pyrite, magnetite and minor chalcopyrite, alternating with sections that contain minor disseminated pyrite, chalcopyrite and magnetite. Minor disseminated pyrrhotite, chalcopyrite, pyrite and/or magnetite were intersected in places in all four drillholes (A.F. 91037).

DDH EX-2 intersected two zones, each 0.6 m, with moderate(?) amounts of pyrite and lesser chalcopyrite. In the first zone, the sulphides occur in a very fine grained sooty matrix (*author's note:* pyrite?), and in the second zone, sulphides occur in a "fine grained altered groundmass". DDH XR-1, abandoned at 31.4 m, intersected black fine grained disseminated pyrite in gabbro at the end of the hole (A.F. 91035).

Trace to minor amounts of chalcopyrite ± pyrite ± pyrrhotite are disseminated throughout core from DDH 1. Locally, a molybdenite-bearing quartz veinlet was intersected by DDH 1, and native copper and cuprite(?) were observed in core from a fault zone. Trace to minor amounts of chalcopyrite ± pyrite ± pyrrhotite are disseminated throughout core from DDH 2 (A.F. 91043).

DDH R-6 was drilled to test a magnetic anomaly. Over a 6.2 m intersection, core from DDH R-6 contains numerous centimetre-thick zones with 2 to 70% pyrrhotite with lesser pyrite and chalcopyrite. Minor pyrrhotite, traces of pyrite and chalcopyrite, and locally, native copper are disseminated throughout two other sections, 2.4 m and 3.3 m. DDH R-7 and R-8, drilled for "geological information", intersected only local traces of pyrrhotite and chalcopyrite. DDH R-9, drilled to test a magnetic anomaly, intersected sulphidic metapyroxenite with moderate to near solid pyrrhotite and lesser chalcopyrite: 30% sulphide over 0.8, 0.9, 0.08 and 0.3 m; 1 to 50% sulphide over 1.1 m; and 0.5 to 75% sulphide over 3.0 m. In addition, minor pyrrhotite, pyrite and chalcopyrite are disseminated in numerous sections, ≤3.0 m in core length. DDH R-10, drilled to test a magnetic anomaly, intersected a 13.4 m zone of metapyroxenite at 59.7 m with 30% to solid pyrrhotite, lesser chalcopyrite and pyrite. Other significant intersections include core lengths of 3.0 m with 0.5 to 20% sulphide, 1.2 m with 50% sulphide, and 0.6 m with 10% sulphide. Minor pyrrhotite, pyrite and chalcopyrite were also disseminated locally throughout the core (A.F. 91031).

Core from DDH 1 to 7, north of Tulune Lake, was not mineralized (A.F. 91033).

GEOCHEMICAL DATA:

A drill core sample from DDH R-1 from a transition zone from metapyroxenite to anorthosite with traces of native copper assayed 0.06% Cu, nil Zn, nil Pb, 0.001% Ni, 0.003% Co, 0.06% V_2O_5, 0.7% Ti, nil Au, nil Ag, and 0.001% Mo over 0.6 m. Another sample of metapyroxenite from DDH R-2 with 30% sulphide overall assayed 0.27% Cu, trace Ni, 0.3 g/t Au, 0.01% Co, trace V_2O_5, nil Pb, tr. Zn, tr. Sn, and 0.4% Ti over 1.2 m; included in this section was 15 cm near solid sulphide that assayed 0.42% Cu and 0.01% Ni (A.F. 91037). Drill core assays from DDH R-10 included 0.1% Ni, 0.135% Cu, 0.06 g/t [0.04 dwts] Pd and 0.09 g/t [0.06 dwts] Pt over 1.2 m; and a contiguous 0.01% Ni, 0.222% Cu, 0.3 g/t [0.20 dwts] Pd and nil Pt over 0.9 m. A spectrographic analysis of the latter 2.1 m is reported: 0.1 to 1% Mn, 0.01% Zn, nil Au, trace Ag, and ≤0.01% V (A.F. 91031). Other assays from A.F. 91037 are tabulated in Table 17-1.

A drill core sample from the first mineralized zone from DDH EX-2 assayed trace Au, trace Cu and trace Ni. A drill core sample from the second zone assayed trace Au, 0.19% Cu and trace Ni. No samples from DDH XR-1 were reported (A.F. 91035).

Five core samples from DDH 1 yielded assay ranges of 0.03-0.40% Cu, 0.04-0.05% Ni over 0.3 m sample lengths. No samples were assayed from DDH 2 (A.F. 91043).

No assays were recorded from DDH 1 to 7 (A.F. 91033).

CLASSIFICATION:

Magmatogenic-type deposit associated with mafic rocks; disseminated.

REFERENCES:

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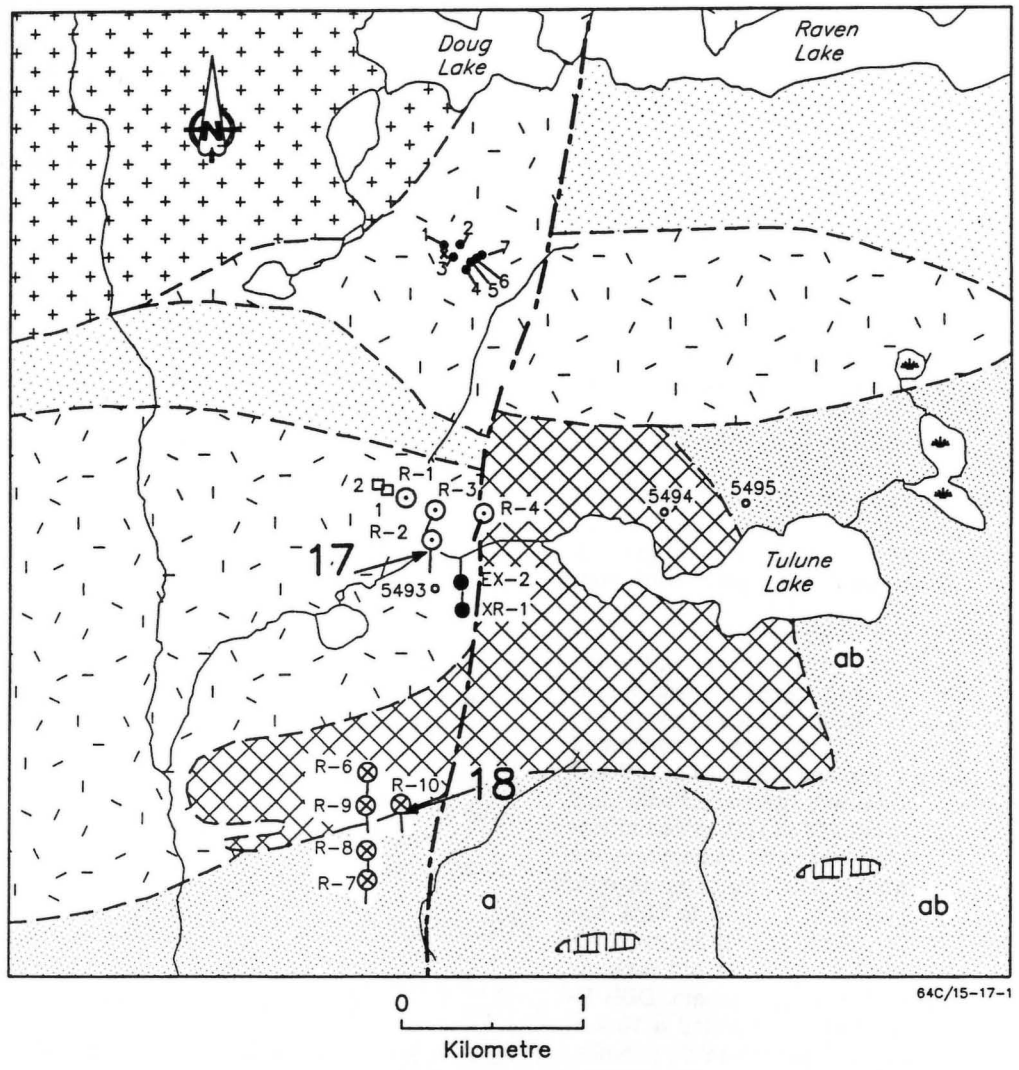
Mineral Inventory Card 64C/15 Cu4
Manitoba Energy and Mines, Geological Services Branch.



Pre-Sickle Intrusions

- Granite, granodiorite
- Diorite, quartz diorite, tonalite
- Gabbro

Wasekwan Group

- Dacite
- Mafic and intermediate volcanic rocks
  - a) massive porphyritic and aphyric basalt and andesite
  - b) autoclastic breccia
- Undivided

- Geological boundary (approximate)
- Fault, approximate

Drillhole:

- A.F. 91037
- A.F. 91035
- A.F. 91033
- A.F. 91036
- A.F. 91043
- Pit (A.F. 91033)
- 17 Mineral occurrence location

Figure 17-1: Geological setting of occurrence 17 (after Gilbert et al., 1980).

LOCATION: **18**

NAME:
UTM: 6312022N/397695E
ACCESS: Float plane to Muskeg Lake and traverse approximately 5 km northwest along trail to north of Bob Lake

AREA: 2.2 km northwest of Muskeg Lake (Fig. 18-1)
AIRPHOTO: A24299-94

EXPLORATION SUMMARY:

Towagmac Exploration Co. Ltd. carried out a magnetometer survey and a geological reconnaissance over the B.O. claim group in 1947; locations of three trenches south of Bob Lake are also shown on maps (A.F. 91030). SGM mapped the W.J.F. claim group, which covers the east part of the area, at 1:6000 in 1948 (A.F. 91423).

SGM conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Selco Exploration Company Limited conducted an airborne EM survey over Airborne Permit 31 in 1960 (A.F. 91626). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

Different parties staked the area several times, most recently SGM in 1986. A grid has been cut over the area, and at least one hole drilled and a trench (1 x 2 m) was excavated north of Bob Lake (D. Parbery, 1988, unpublished data; location not plotted). A grid has been cut and three holes have been drilled south of Bob Lake by 1973 (Fig. 18-1; SGM, unpublished data). Details are not available for any of these four drillholes.

GEOLOGICAL SETTING:

The area north of Bob Lake is underlain by Wasekwan Group mafic volcanic rocks, greywacke, banded oxide-facies iron formation, and tonalite (Fig. 18-1; Gilbert *et al.*, 1980). The mafic rocks are massive to weakly foliated and contain up to 3%, 2 to 3 mm anhedral amphibole phenocrysts. Contacts between the various rock types are distinct (D. Parbery, unpublished data, 1988). Parbery (1988) considers that the mafic volcanic rocks may be high-Mg basaltic tuff.

Quartz-magnetite banded iron formation occurs within intermediate to mafic, fine grained, foliated, rusty weathered volcanic rocks and siliceous, laminated sedimentary rocks (greywacke-siltstone) (Fig. 18-2). The iron formation is 0.1 to 1.2 m thick, and although outcrop is sporadic, it can be traced for approximately 1100 m along strike. The iron formation consists of interlayered magnetite-rich, quartz- and chlorite-rich, and siliceous 0.1 to 1 cm thick laminae. Hematite laminae, up to 1 mm thick, are rare. Discontinuous, cherty folded layers, 1 to 4 cm thick, occur within siliceous sedimentary rocks (Parbery, 1988).

MINERALIZATION:

Thin sections reveal minor hematite-filled hairline fractures in the rock, as well as what appear to be small arsenopyrite crystals within magnetite-rich laminae. In some places where mafic rock is interlayered with banded iron formation, the mafic rocks are rusty weathered (D. Parbery, unpublished data, 1988).

"Sheared volcanic rock" with 10% arsenopyrite was noted northeast of Muskeg Lake (A.F. 91030).

Felsic and mafic volcanic rocks from the area south of Bob Lake contain up to 5% disseminated pyrite (D. Parbery, unpublished data, 1988).

GEOCHEMICAL DATA:

A sample of "sheared volcanic rock" with 10% arsenopyrite collected by Towagmac Exploration Co. Ltd. northeast of Muskeg Lake (Fig. 18-1) contained 4.4 g/t Au (A.F. 91030; Milligan, 1960, p. 215).

Geochemical analyses of two rock samples collected from an outcrop of banded oxide facies iron formation returned values of 15 ppb Au and 430 ppm As, and 16 ppb Au and 160 ppm As, respectively (D. Parbery, unpublished data, 1988).

"Sheared rhyolite" samples with minor fine grained pyrrhotite collected from trenches south of Bob Lake contained 0.34 g/t Au (A.F. 91030).

CLASSIFICATION:

Chemical sediment type deposit; oxide facies iron formation. Gold and arsenopyrite mineralization northeast of Muskeg Lake occur along strike from the iron formations north of Bob Lake.

REFERENCES:

Assessment Files 91030, 91423, 91622, 91626, 91679, 91699, 91989, 91992
Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

Parbery, D.
1988: Investigation of volcanic stratigraphy and iron formation occurrences, Lynn Lake area; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities 1988, p. 12-15.

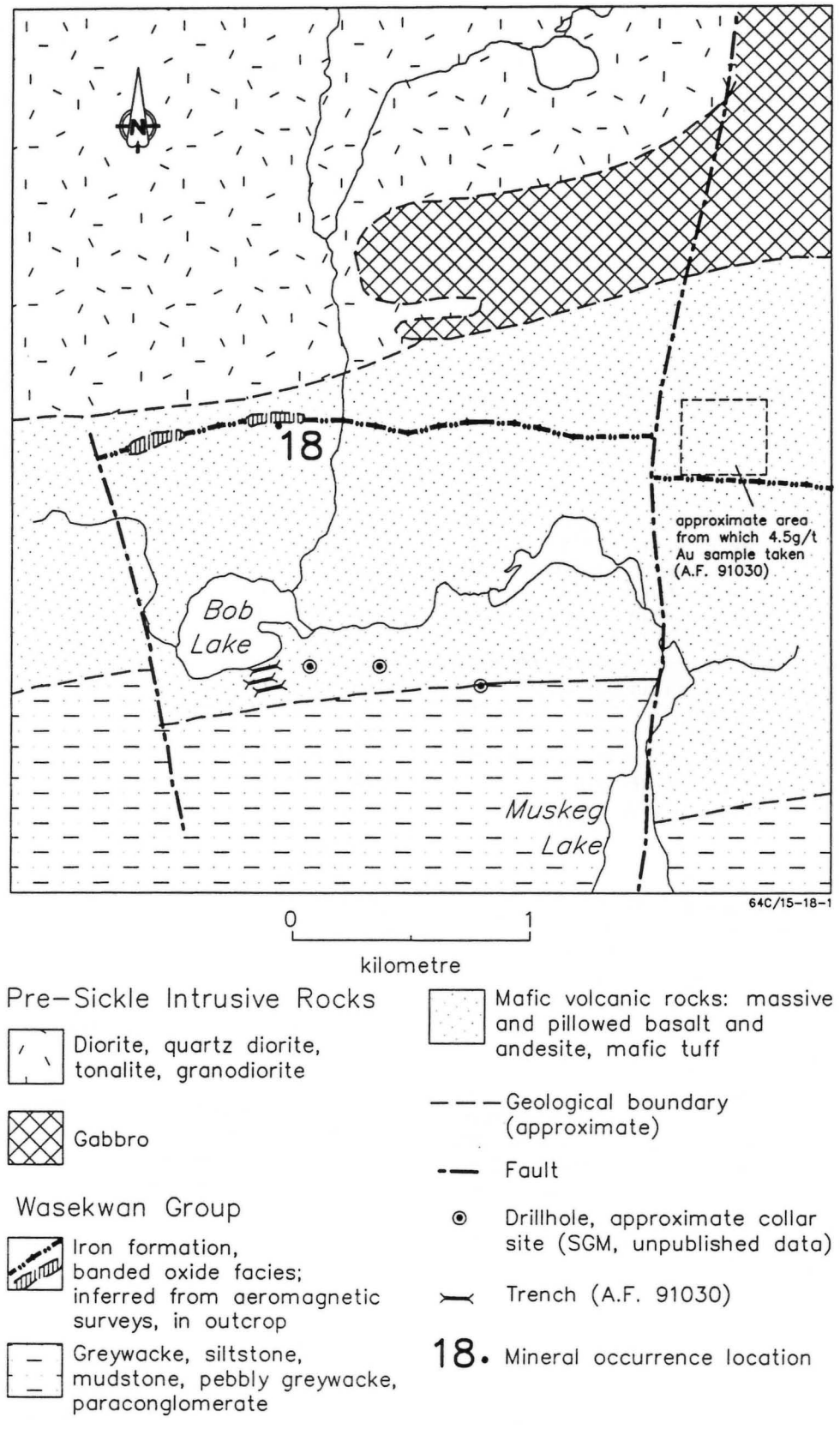
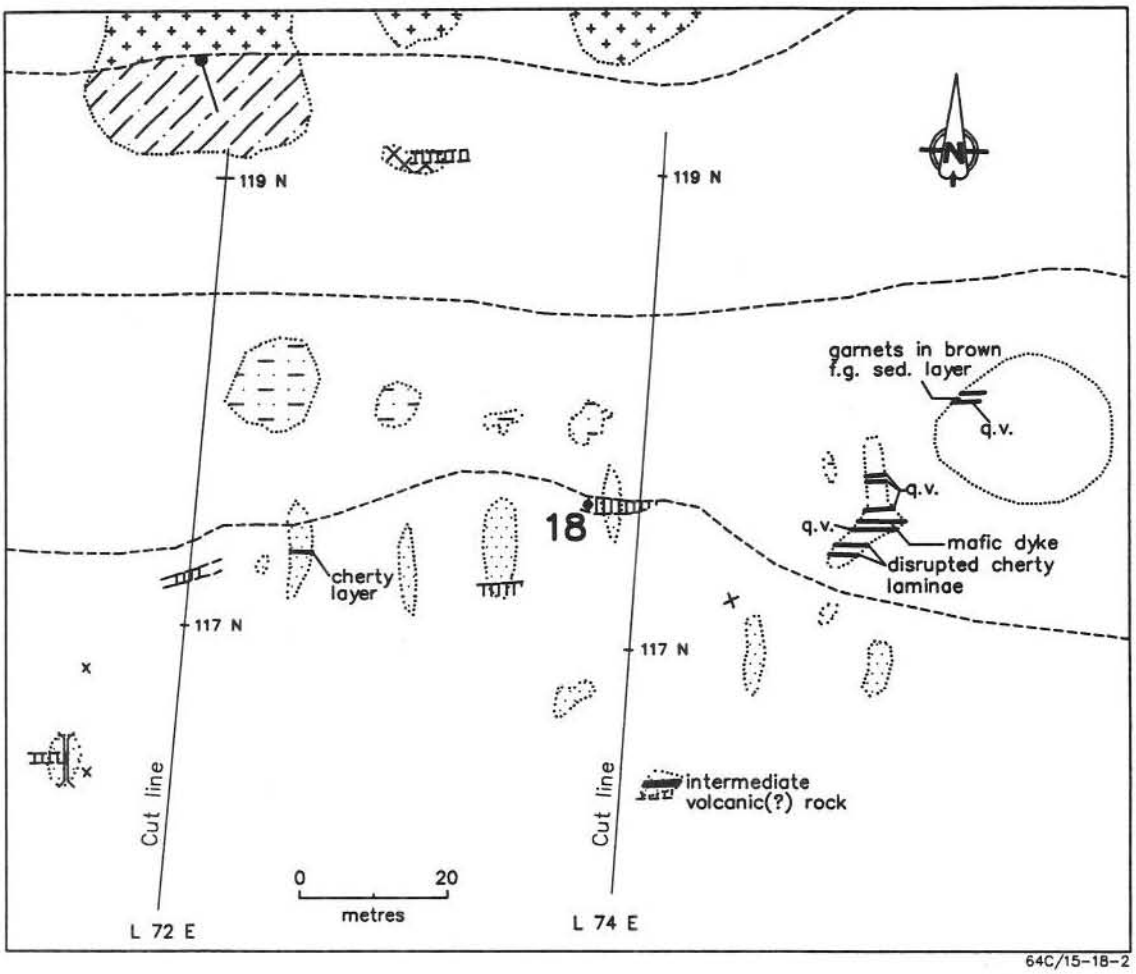


Figure 18-1: Geological setting of occurrence 18 (after Gilbert et al., 1980).



Pre-Sickle Intrusions

Tonalite

Wasekwan Group

Intermediate volcanic(?) rock

Fine grained mafic volcanic(?) rock

Siliceous laminated sedimentary rocks

Mafic crystal tuff

Quartz-magnetite iron formation, banded

Quartz vein

Geological contact (approximate)

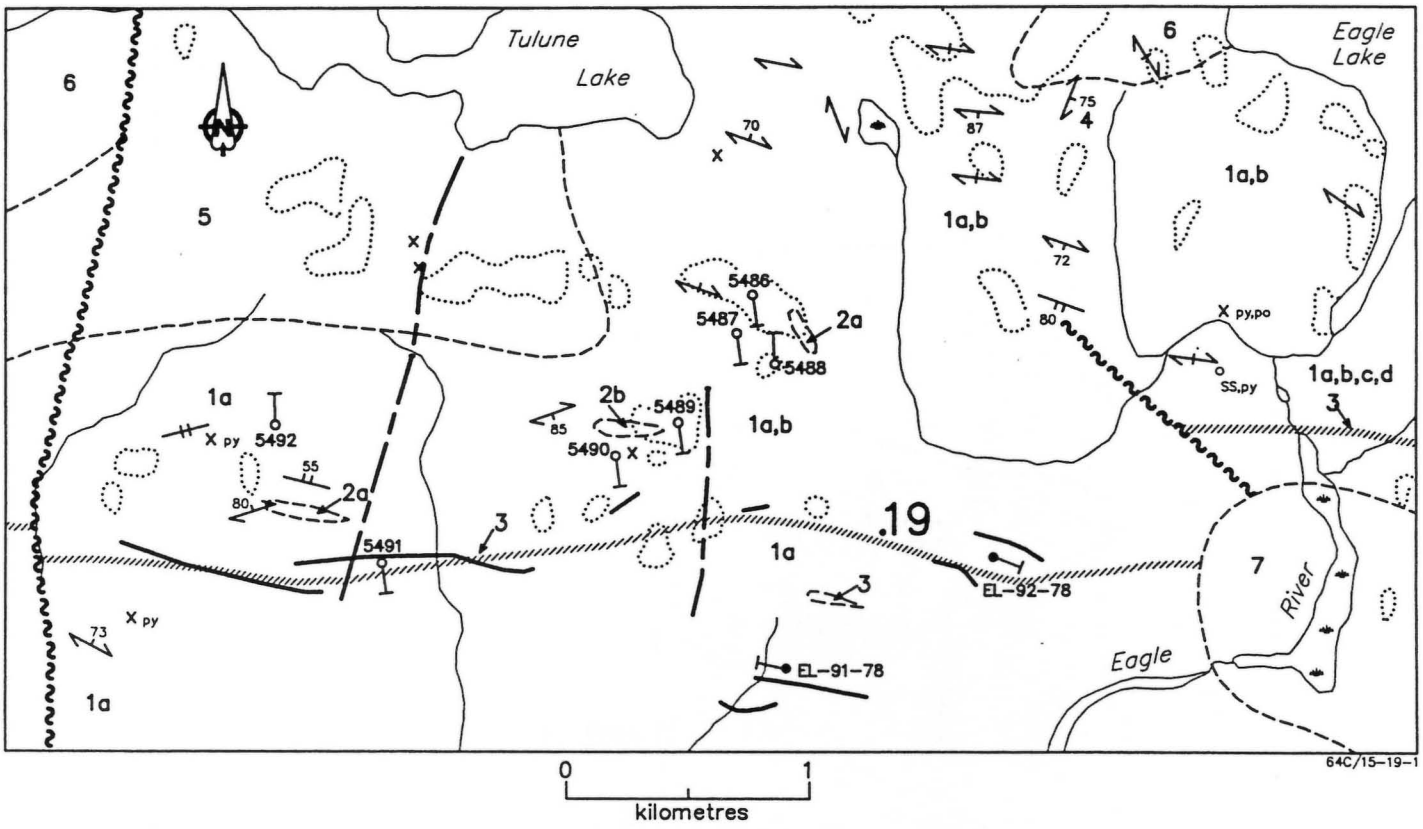
Trench

Outcrop

Drillhole

18. Mineral occurrence location

Figure 18-2: Detailed geology at occurrence 18 (D. Parbery, unpublished data, 1988).



Intrusive Rocks

7 Syenite

6 Diorite, quartz diorite, hornblende–biotite tonalite, quartz diorite, granodiorite, tonalite

5 Gabbro, diabase

Wasekwan Group

4 Hornblende greywacke, siltstone

3 Iron formation

2 Dacite
- a) massive porphyritic
- b) breccia

1 Basalt and andesite
- a) massive porphyritic and aphyric
- b) autoclastic breccia
- c) polymictic breccia
- d) mafic tuff

Geological boundary (approximate)

Fault (Gilbert *et.al.*, (1980))

Fault (A.F. 91036)

Foliation (inclined, vertical, dip unknown)

Bedding (inclined, vertical)

EM conductors (A.F. 91038, A.F. 92700)

Outcrop

Drillholes:
- (A.F. 91036)
- (A.F. 92700)

Mineralization
- (A.F. 91423)
- (Milligan,1960; D. Parbery, unpublished data, 1985)

Swamp

.19 Occurrence location

Figure 19-1: Geological setting of occurrence 19 (after Gilbert et al., 1980).

LOCATION: **19**

NAME:
UTM: 6311872N/402764E
ACCESS: Float plane to Eagle Lake, and traverse along grid lines from Eagle Lake

AREA: 2.5 km southwest of Eagle Lake (Fig. 19-1)
AIRPHOTO: A24297-62

EXPLORATION SUMMARY:

International Nickel Company of Canada, Limited carried out geological mapping (1:4800), a magnetometer survey, and drilled ten holes (total 959.5 m; drill logs are not included) on the MW claims in 1947 (A.F. 91036). K.L. Rose and W.L.C. Greer carried out a magnetometer survey and 1:1200 geological mapping on the Auni claim group in 1947 (A.F. 91029) for International Mining Corporation (Canada) Limited (Milligan, 1960, p. 212). SGM mapped the W.J.F. claim group at 1:6000 in 1948 (A.F. 91423). R.G. Crosby carried out an EM survey on the Lin claim group in 1957 and 1958 (A.F. 91038).

Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). SGM conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Selco Exploration Company Limited conducted an airborne EM survey over Airborne Permit 31 in 1960 (A.F. 91626). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out an airborne INPUT survey (Phase II) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976 (A.F. 91992).

Granges Exploration Aktiebolag drilled DDH EL-91-78 (47.9 m) and EL-92-78 (53.9 m) to test EM conductors on CB 8658 in 1978 (A.F. 92700).

GEOLOGICAL SETTING:

The area is underlain mainly by Wasekwan Group mafic and intermediate volcanic rocks. Banded oxide facies iron formation outcrops and is inferred from aeromagnetic surveys (Fig. 19-1; Gilbert *et al.*, 1980). The syenite plug south of Eagle Lake is ovoid in plan, with dioritized relict roof pendants of greenstone wall rock (A.F. 91029). Fragmental picritic volcanic rocks identified near Eagle Lake (Fig. 19-2) are part of a 500 m wide zone that is discontinuous over a 12 km strike length from here eastward to Gordon Lake (NTS 64C/16) (Parbery, 1992). These rocks are probably equivalent to those north of the Auni Lakes (A.F. 91029): tuff interbedded with small discontinuous lenses of iron formation; dark green to black, fine- to medium-grained, equigranular chlorite-amphibole-plagioclase rocks, some of which are amphibole schists (*author's note:* picritic basalt?). Dacite occurs in the northern part of the area (Parbery, 1992; see also Location 25). Mapping by SGM detailed an east-striking, near vertically dipping sequence of mafic to felsic volcanic rocks, including intermediate to mafic, porphyritic massive and aphyric pillowed flows; a volcanic breccia consisting of very dark green aligned fragments in a fine grained rhyolitic matrix; tuff; very fine grained thin bedded greywacke; and a thin bedded magnetite-silica iron formation approximately 7.5 m thick (A.F. 91423). This area is part of the Agassiz Metallotect (Fedikow, 1984; Fedikow, 1986; Fedikow *et al.*, 1990).

A report of detailed mapping by Inco for the area south of Tulune Lake describes east-striking volcanic rocks that include rhyolite, trachyte, and andesite flows, tuff and breccia with some interbedded sediments. Minor greywacke, parts with disseminated magnetite, was mapped in the southern part of the area. Two small faults, south and southeast of Tulune Lake, trend 30°-50° and north, respectively. The presence of these faults is interpreted by Inco from an offset in the magnetic signature (A.F. 91036).DDH EL-91-78 and EL-92-78 intersected amphibolite and dacite (A.F. 92700).

MINERALIZATION:

Rusty weathered, banded, quartz-magnetite iron formation is exposed in a small (3.6 x 1 m) outcrop. Siliceous layers are 1 to 10 mm thick, chlorite-rich layers are 1 to 3 cm thick, and magnetite ± chlorite layers are 1 to 70 mm thick. Adjacent to, and north of, the banded iron formation there is a 0.5 m wide aphanitic to fine grained, laminated chlorite-magnetite rich rock. The magnetite layers are up to 2 cm thick (D. Parbery, unpublished data, 1988; Parbery, 1992).

Inco's report of detailed mapping describes two subparallel silicified bands of pyrrhotite with lesser chalcopyrite, pyrite and magnetite in the volcanic and interbedded sedimentary unit south of Tulune Lake. These bands are interpreted by Inco as sulphidized silicified replacements of oxide facies iron formation. Sulphide concentrations and the degree of silicification are reportedly greatest at the juncture between the two faults interpreted southeast of Tulune Lake and these iron formations. Host rocks are reported to be chiefly andesitic flows and tuff (A.F. 91036). Although drill logs were not included, the report for A.F. 91036 mentions drill intersections of solid sulphide (mostly pyrrhotite) and brecciated quartz-calcite zones with chalcopyrite and pyrite; details are not specified. Precious metals were not reported (A.F. 91036).

A vein of solid pyrrhotite fills a 7.5 m thick northwest-striking sheared zone in mafic volcanic rocks (Fig. 19-1; A.F. 91423).

DDH EL-91-78 intersected a 2.7 m section with 10 to 20% pyrrhotite, 5 to 20% pyrite and 0 to 4% sphalerite in a dark silicified zone. DDH EL-92-78 intersected two mineralized zones, 5.5 m with minor to 40% pyrrhotite, minor pyrite and traces of chalcopyrite and 1.5 m with up to 50% pyrrhotite with minor pyrite and traces of chalcopyrite in amphibolite. Minor local sections, <1 m, contain 30% pyrrhotite and minor chalcopyrite ± pyrite (A.F. 92700).

Along the creek southwest of Eagle Lake, layered quartzite contains 3% disseminated pyrite and pyrrhotite (D. Parbery, unpublished data, 1985). This site corresponds to Milligan's (1960) site 130: "Highly rusted sheared zone, less than 1 inch (2.5 cm) wide, in sediments and tuffs. Interbanded with porphyritic andesite, and breccia".

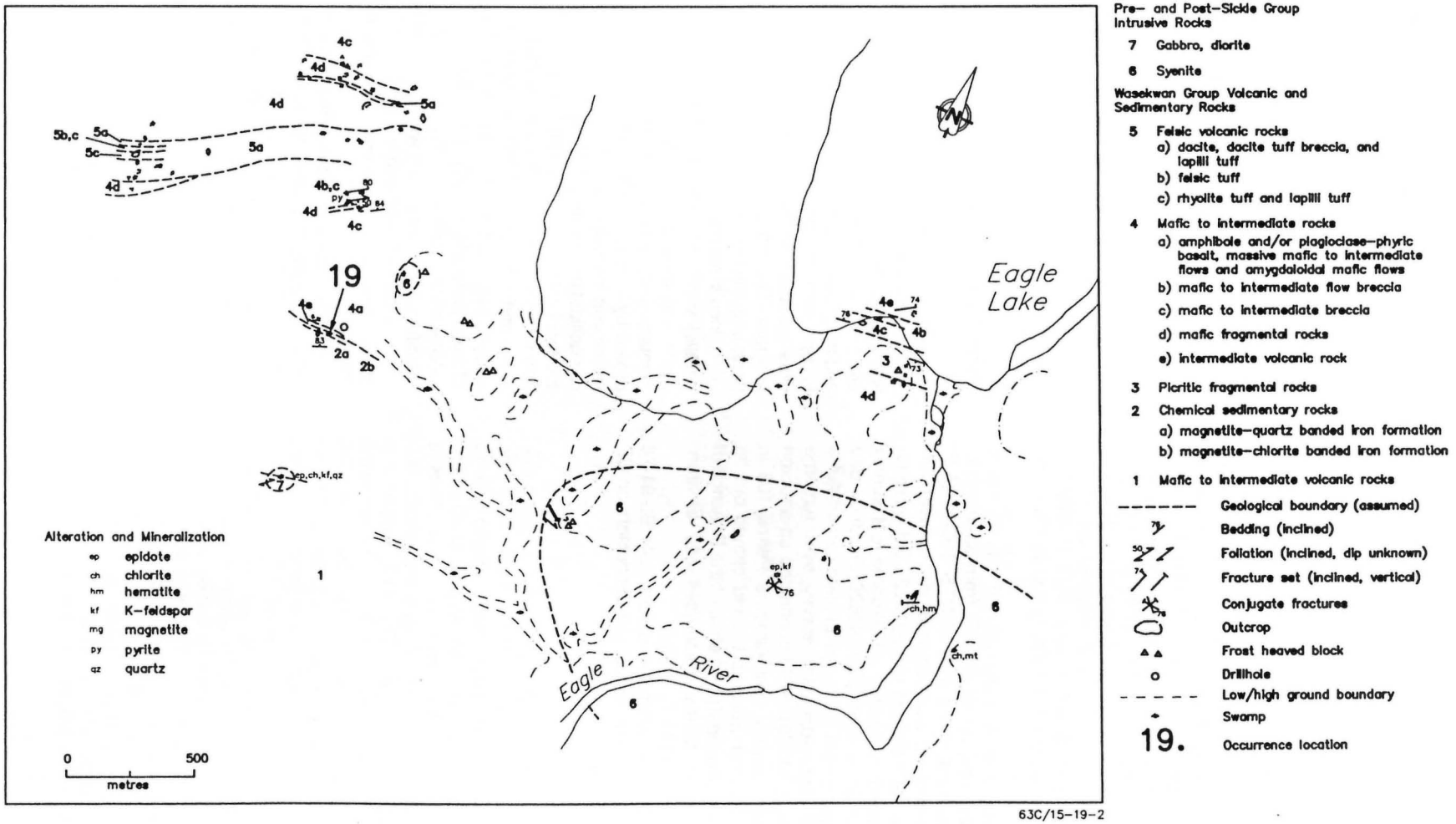


Figure 19-2: Detailed geology southwest of Eagle Lake (location 19) (after Parbery, 1992).

GEOCHEMICAL DATA:

A sample of sulphidic amphibolite contained trace gold, nil nickel and 0.18% copper. Three samples of diorite contained traces of gold, nil nickel, and "negligible" copper. "Sheared greenstone" (schistose intermediate to mafic volcanic rocks) with 20% pyrite contained traces of gold (A.F. 91029).

The report from A.F. 91423 state that the vein of solid pyrrhotite "carried no nickel or copper". Nine metres further along strike, frost-heaved quartz contains moderate sulphides (unspecified) "but carries no gold or silver values" (A.F. 91423).

Seven core samples from DDH EL-91-78 have ranges of 0.05 g/t Au, 0.5-1.0 g/t Ag, 0.01-0.09% Cu, and 0.01-0.03% Zn. The best intersection from thirteen core samples from DDH EL-92-78 was 0.05 g/t Au, 2.0 g/t Ag, 0.07% Cu, 0.84% Zn over 0.5 m; the range of remainder of samples 0.05 g/t Au, 0.5-1.5 g/t Ag, 0.01-0.07% Cu, 0.01-0.30% Zn (A.F. 92700).

CLASSIFICATION:

Replacement type deposit. This occurrence is characterized by silicified, sulphidized oxide-facies iron formation with attendant quartz-carbonate breccia (at least in places). This occurrence appears similar to the style of mineralization exhibited at the Farley Lake Au deposit (see Location 1, Mineral Deposit Series Report NTS 64C/16).

REFERENCES:

Assessment Files 91029, 91036, 91038, 91423, 91616, 91622, 91626, 91679, 91699, 91992, 92700
Manitoba Energy and Mines, Mines Branch.

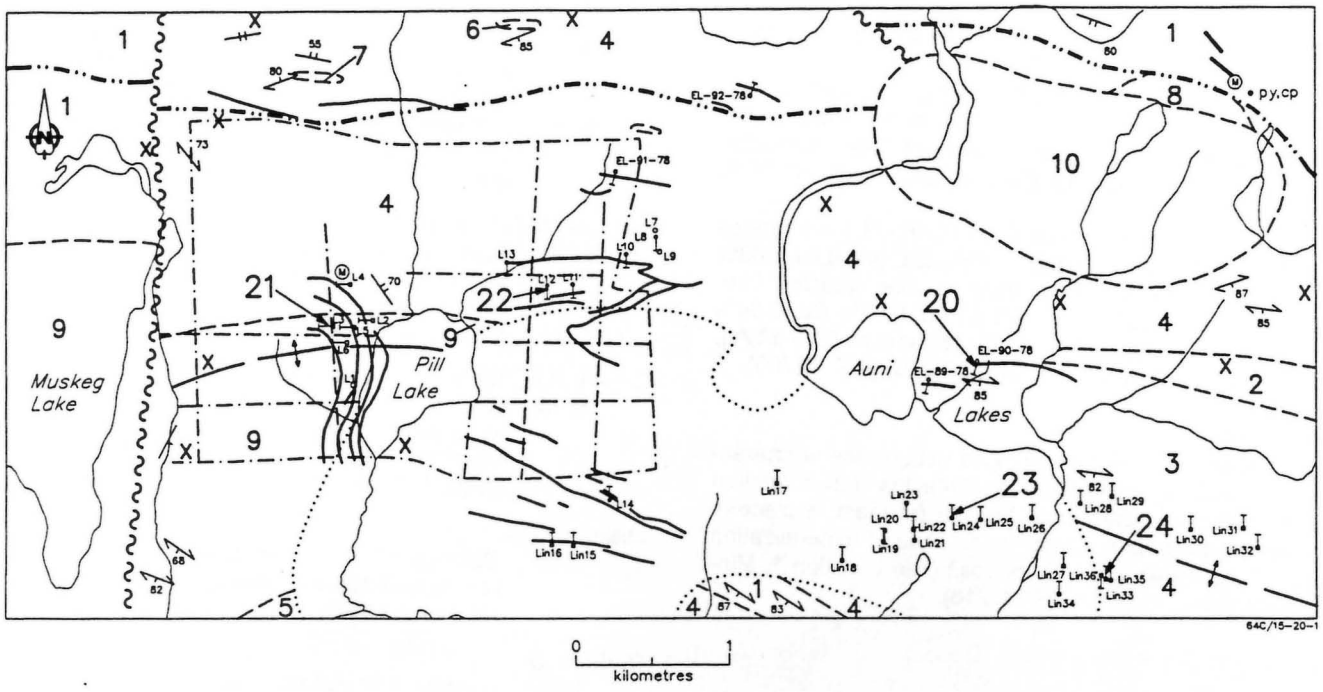
Fedikow, M.A.F.
1984: Preliminary results of biogeochemical studies in the Lynn Lake area; Manitoba Energy and Mines, Open File Report OF84-1, 104p.
1986: Geology of the Agassiz stratabound Au-Ag deposit, Lynn Lake, Manitoba; Manitoba Energy and Mines, Open File Report, OF85-5, 80p.

Fedikow, M.A.F., Parbery, D. and Ferreira, K.J.
1990: Agassiz Metallotect - a regional metallogenic concept, Lynn Lake area; Manitoba Energy and Mines, Mineral Deposit Thematic Map Series; Map 89-1, 1:50 000.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

Parbery, D.
1992: Agassiz Metallotect Project; Manitoba Energy and Mines, Economic Geology Report ER91-2, eight 1:50 000 maps with marginal notes.



Intrusive Rocks

10 Syenite

Wasekwan Group

9 Biotite, greywacke

8 Massive porphyritic rhyolite

7 Massive porphyritic dacite

6 Breccia

5 Mafic and intermediate volcanic rocks, amphibolite

4 Massive porphyritic and aphyric basalt and andesite

3 Pillowed basalt and andesite

2 Polymictic breccia

1 Mafic tuff

Geological boundary (approximate)

Iron formation

Foliation (inclined)

Anticline

Shear zone

..... Limit of mapping

Geology after Gilbert *et al.*, (1980).

Bedding tops known (inclined, vertical)

EM conductors (A.F. 91038, 92700)

Drillholes:

(A.F. 91039)

(A.F. 91040)

(A.F. 91042)

(A.F. 92700)

Cut line

Magnetic anomaly

X Mineralization, location approximate (Milligan, 1980)

• py,cp Mineral occurrence

20 Occurrence location

Figure 20-1: Geological setting of occurrences 20, 21, 22, 23 and 24 (Gilbert et al., 1980).

LOCATION: **20**

NAME:
UTM: 6309995N/404703E
ACCESS: Float plane to Auni Lakes

AREA: Auni Lakes
AIRPHOTO: A24297-63

EXPLORATION SUMMARY:

K.L. Rose and W.L.C. Greer carried out a magnetometer survey and 1:1200 geological mapping on the Auni claim group in 1947 (A.F. 91029) for International Mining Corporation (Canada) Limited (Milligan, 1960, p. 212).

SGM conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Selco Exploration Company Limited conducted an airborne EM survey over Airborne Permit 31 in 1960 (A.F. 91626). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). Mattagami Lake Mines Limited conducted an airborne INPUT and magnetometer survey in 1973 (A.F. 91826). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out an airborne INPUT survey (Phase II) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976 (A.F. 91992).

Granges Exploration Aktiebolag drilled DDH EL-89-78 (43.0 m) and EL-90-78 (41.8 m) to test EM conductors on CB 8659 in 1978 (A.F. 92700).

GEOLOGICAL SETTING:

The area is underlain by Wasekwan Group mafic and intermediate volcanic rocks. Banded oxide facies iron formation outcrops and is also inferred from aeromagnetic surveys (Fig. 20-1; Gilbert *et al.*, 1980). The area north of Auni Lakes includes a syenodiorite plug, ovoid in plan, with dioritized relict roof pendants greenstone wall rock; tuff interbedded with small discontinuous lenses of iron formation; dark green to black, fine- to medium-grained, equigranular chlorite-amphibole-plagioclase rocks, some of which are amphibole schists, probably intermediate to mafic volcanic rocks (*author's note:* picritic basalt?); in one outcrop, calcareous quartzite with interstitial carbonate; and minor feldspar porphyry dykes, probably related to the syenodiorite pluton (A.F. 91029). Drillholes intersected amphibolite (A.F. 92700).

MINERALIZATION:

"Sheared greenstone" at the northeasternmost shore of Auni Lakes contains 20% pyrite. The iron formation lenses are rusty weathered. Amphibolite northeast of Auni Lakes contains 2 to 3% disseminated pyrite and chalcopyrite. Minor disseminated pyrite is common throughout the volcanic and sedimentary rocks (Fig. 20-1; A.F. 91029).

DDH EL-89-78 intersected a 13.2 m silicified zone in amphibolite with 10 to 60% pyrrhotite, minor pyrite and magnetite. DDH EL-90-78 intersected a 12.3 m silicified zone in amphibolite with 35 to 40% pyrrhotite, minor pyrite and trace chalcopyrite. Minor pyrite and pyrrhotite with traces of chalcopyrite are disseminated throughout sections of the remainder of core (A.F. 92700).

GEOCHEMICAL DATA:

A sample of sulphidic amphibolite contained trace gold, nil nickel and 0.18% copper. Three samples of diorite contained traces of gold, nil nickel, and "negligible" copper. "Sheared greenstone" (schistose intermediate to mafic volcanic rocks) with 20% pyrite contained traces of gold (A.F. 91029).

Assays of nine core samples from DDH EL-89-78 had ranges of 0.01-0.07% Cu, 0.02-0.33% Zn, 0.05% Ni, 0.05 g/t Au, and 0.5-2.5 g/t Ag. Assays of eleven core samples from DDH EL-90-78 had ranges of 0.01-0.16% Cu, 0.01-0.23% Zn, 0.04-0.05% Ni,0.05-0.30 g/t Au, and 1.00-3.0 g/t Ag (A.F. 92700).

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

Assessment Files 91029, 91622, 91626, 91679, 91699, 91826, 91992, 92700
Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

LOCATION: **21**

NAME: (A.F. Mineralization intersected by diamond drilling)
UTM: 6310253N/400456E
ACCESS: Float plane to Pill Lake or Muskeg Lake, and traverse to drill site

AREA: West of Pill Lake (Fig. 20-1)
AIRPHOTO: A24299-93

EXPLORATION SUMMARY:

SGM mapped the W.J.F. claim group at 1:6000 in 1948 (A.F. 91423) and drilled DDH L1 through L6 (also named Lin 1 through Lin 6; total 261 m) on claims Lin 26, -27, and -31 in 1958 (A.F. 91039). Drill logs presented in A.F. 91039 list only major rock types, and do not specify mineralization, alteration and/or veins, core axis angles, or assays. More detailed logs were provided by SGM as unpublished data.

R.G. Crosby carried out an EM survey on the Lin claim group in 1957 and 1958 (A.F. 91038). SGM conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Selco Exploration Company Limited conducted an airborne EM survey over Airborne Permit 31 in 1960 (A.F. 91626). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). Mattagami Lake Mines Limited conducted an airborne INPUT and magnetometer survey in 1973 (A.F. 91826). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out an airborne INPUT survey (Phase II) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976 (A.F. 91992).

GEOLOGICAL SETTING:

The area is underlain by anticlinally folded Wasekwan Group biotite greywacke, siltstone and mudstone, in contact to the north and south with mafic and intermediate volcanic rocks and amphibolite (Fig. 20-1; Gilbert *et al.*, 1980).

DDH L1 intersected fine grained grey gneiss, biotite gneiss and fine grained biotite gneiss with siliceous bands in places, and fine grained grey tuff. DDH L2 intersected fine grained impure biotitic quartzite and micaceous paragneiss, hornblendic in places. DDH L3 intersected a dense siliceous rock that is brecciated in one section, and partly garnetiferous mafic volcanic rocks. DDH L4 intersected impure quartzite with biotitic, carbonitic, and mafic volcanic sections. DDH L5 intersected mafic volcanic rocks with carbonate veinlets and siliceous bands. DDH L6 intersected mafic volcanic rocks, including tuff, with siliceous bands and a 7.2 m cherty unit with local garnets (A.F. 91039). The rocks from all of the drillholes are locally siliceous, biotitic, contain carbonate stringers, some local garnetiferous zones, and thin local quartz veins (SGM, unpublished data).

MINERALIZATION:

DDH L1 through L6 contained minor pyrrhotite, chalcopyrite ± sphalerite and local arsenopyrite as disseminations, blebs, streaks and veinlets throughout the core. In addition, DDH L3 intersected 0.5 m fine grained siliceous rock with 20% fine grained disseminated pyrrhotite. The sulphide-rich section is overlain in core by fine grained andesitic rock, which locally contains garnet, interlayered with siliceous rock that is cut by carbonate stringers and contains "occasional blue opalescent quartz" — probably quartz "eye" phenocrysts — and up to 8% pyrrhotite and traces of sphalerite and chalcopyrite. The sulphide-rich section is underlain in core by "tuffaceous" rock that is locally siliceous, biotitic, brecciated, and/or garnetiferous. DDH L6 intersected 0.8 m fine grained grey gneiss with 15% pyrrhotite and pyrite, and trace chalcopyrite and sphalerite, including 1 cm streaks of solid sulphides (SGM, unpublished data).

GEOCHEMICAL DATA:

Two continuous core samples of fine grained "impure quartzite" with siliceous streaks or inclusions and 4 to 6% pyrrhotite, chalcopyrite, pyrite and sphalerite from DDH L2 assayed 0.21% and 0.24% Cu, 0.02 and 0.05% Zn, tr. Ni, nil Au, 7.5 and 0.7 g/t Ag, respectively. Remaining drill core samples from DDH L1 to L6 had ranges of 0.02 to 0.08% Cu, 0.03 to 0.10% Zn, tr. to 0.07% Ni, nil to 6.8 g/t Au, and nil to 14.7g /ton Ag (SGM, unpublished data).

CLASSIFICATION:

Chemical Sediment type deposit; sulphide facies iron formation. The presence of quartz "eyes" in a siliceous rock suggests that the host rocks are felsic to intermediate volcanic rocks, at least in part..

REFERENCES:

Assessment Files 91038, 91039, 91423, 91622, 91626, 91679, 91699, 91826, 91992
Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

LOCATION: **22**

NAME: (A.F. Mineralization intersected by diamond drilling)
UTM: 6310494N/401893E
ACCESS: Float plane to Auni Lakes or Muskeg Lake, and traverse to drill site

AREA: Between Pill Lake and Auni Lakes (Fig. 20-1)
AIRPHOTO: A24297-62

EXPLORATION SUMMARY:

K.L. Rose and W.L.C. Greer carried out a magnetometer survey and 1:1200 geological mapping over the northeasternmost part of this area in 1947 (A.F. 91029) for International Mining Corporation (Canada) Limited (Milligan, 1960, p. 212). SGM mapped the W.J.F. claim group, which covers part of the area at 1:6000, in 1948 (A.F. 91423). R.G. Crosby carried out an EM survey on the Lin claim group in 1957 and 1958 (A.F. 91038). SGM conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). SGM drilled DDH L7 and L8 (also named Lin 7 and Lin 8; total 116 m) on claim Lin 110 in 1958 (A.F. 91039). SGM drilled DDH L9, L10, L11, L12 and L13 (total 268 m) on claims Lin 22, -23, -24 and -111 in 1958 (A.F. 91040). Drill logs presented in A.F. 91039 list only major rock types, and do not specify mineralization, alteration and/or veins, core axis angles, or assays. Logs presented in A.F. 91040 give only a summary of mineralization and major rock types. More detailed logs were provided by SGM as unpublished data.

Selco Exploration Company Limited conducted an airborne EM survey over Airborne Permit 31 in 1960 (A.F. 91626). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). Mattagami Lake Mines Limited conducted an airborne INPUT and magnetometer survey in 1973 (A.F. 91826). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out an airborne INPUT survey (Phase II) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976 (A.F. 91992).

GEOLOGICAL SETTING:

The area is underlain by Wasekwan Group mafic and intermediate volcanic rocks and amphibolite, with greywacke, siltstone and mudstone to the south; the sequence is anticlinally folded (Fig. 20-1; Gilbert *et al.*, 1980).

DDH L7 intersected mafic volcanic rocks, weakly banded impure quartzite, a fine grained siliceous rock, and argillite with carbonate veins. DDH L8 intersected fine grained biotitic gneissic "diorite" (amphibolite?) with quartz veins, a fine grained biotitic quartzite with carbonate veins and a fine grained rock with a few garnets and local sillimanite (A.F. 91039). DDH L9 intersected fine grained biotitic gneissic diorite and a locally chloritic and biotitic, fine grained siliceous rock. DDH L10 intersected fine grained siliceous rock, fine grained biotite gneiss and ended in fine grained granulite. DDH L11 intersected locally silicified mafic volcanic rocks and a dense fine grained siliceous rock, in places sericitic and with carbonate veinlets. DDH L12 intersected fine grained chloritic quartzitic rock; fine grained quartz-biotite gneiss, chloritic in part; and diorite with quartz and carbonate veins. DDH L13 intersected biotitic mafic volcanic rocks with quartz-carbonate veins (A.F. 91040). The rocks from all of the drillholes are locally siliceous, biotitic, contains carbonate stringers, some local garnetiferous sections, and thin local quartz veins (SGM, unpublished data).

MINERALIZATION:

DDH L7 through L13 contained minor pyrrhotite, pyrite, chalcopyrite, sphalerite, and local magnetite as disseminations, particularly along fractures, and less commonly as blebs, streaks and veinlets throughout the core. In addition, DDH L7 intersected 4.9 m of 40 to 60% pyrite, pyrrhotite, sphalerite and chalcopyrite in dark, fine grained argillitic rock. Grey siliceous "calcified" (carbonatized?) rock and "impure quartzite", both of which contain 1 to 6% fine grained disseminated sulphides, were intersected above the argillitic rock. Grey siliceous "calcified" rock that contains 1 to 4% fine grained disseminated sulphides, was intersected below the argillitic section (SGM, unpublished data).

DDH L10 intersected two solid pyrite, pyrrhotite, sphalerite and chalcopyrite sections, 3.0 m in core length at 21.4 m and 11.5 m at 42.7 m, in fine grained siliceous rock. The mineralized intersections are separated by siliceous rock with sericite- and carbonate-bearing sections that contain up to 12% (average <5%) sulphides. Mineralization from DDH L11 included several sections, generally <1 m in core length, with up to 15% disseminated pyrrhotite, pyrite, sphalerite and chalcopyrite (SGM, unpublished data).

DDH L12 intersected a 21.3 m thick section of intercalated fine grained, siliceous rock, "altered feldspathic volcanic?" rock, quartzite and minor argillite that contains sections of near solid and solid bands of pyrite, pyrrhotite, sphalerite and chalcopyrite separated by rock with minor to moderate amounts of sulphides. DDH L12 intersected near solid and solid sulphide bands: 0.5 m in core length at 22.9 m, 2.3 m at 24.1 m, 1.9 m at 26.7 m, 1.5 m at 29.0 m, 4.2 m at 33.2 m, and 0.3 m at 39.5 m. Core from DDH L13 included a 0.3 m intersection at 32.5 m with 90% pyrrhotite and minor chalcopyrite and fine grained "altered" siliceous carbonate-bearing volcanic rocks (SGM, unpublished data).

GEOCHEMICAL DATA:

The 0.3 m solid sulphide intersection from DDH L13 contained 0.22% Cu, 0.08% Ni, nil Au, and 13.0 g/t Ag. Remaining assays of drill core samples had ranges of 0.01 to 0.12% Cu, 0.03 to 0.09% Zn, tr. to 0.14% Ni, nil to tr. Au, and nil to 18.9 g/t Ag (SGM, unpublished data).

CLASSIFICATION:

Stratabound massive sulphide type deposit; volcanic rock associated. Rocks are commonly referred to in logs as siliceous or biotitic, and carbonate veins are common. Although sericite and garnet are mentioned, they appear to be localized and not notably abundant in core.

REFERENCES:

Assessment Files 91029, 91038, 91039, 91040, 91423, 91622, 91626, 91679, 91699, 91826, 91992
Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

LOCATION: **23**

NAME: (A.F. Mineralization intersected by diamond drilling)
UTM: 6309180N/402286E
ACCESS: Float plane to Muskeg Lake and traverse 2.3 km to drill site

AREA: 0.8 km southeast of Pill Lake (Fig. 20-1)
AIRPHOTO: A24297-63

EXPLORATION SUMMARY:

R.G. Crosby carried out an EM survey on the Lin claim group in 1957 and 1958 (A.F. 91038). SGM conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). SGM drilled DDH L14 (also given as DDH Lin 14; 60.4 m) on claim Lin 49 in 1958 (A.F. 91040). Logs presented in A.F. 91040 give only a summary of mineralization and major rock types. More detailed logs were provided by SGM as unpublished data. SGM drilled DDH Lin 15 and Lin 16 (total 112.2 m) in 1958 on claims Lin 48 and Lin 51, respectively (A.F. 91042).

Selco Exploration Company Limited conducted an airborne EM survey over Airborne Permit 31 in 1960 (A.F. 91626). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). Mattagami Lake Mines Limited conducted an airborne INPUT and magnetometer survey in 1973 (A.F. 91826). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out an airborne INPUT survey (Phase II) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976 (A.F. 91992).

GEOLOGICAL SETTING:

There is no outcrop in the area immediately surrounding the mineral location. The area to the north, east and west is underlain by Wasekwan Group mafic to intermediate volcanic and minor intercalated sedimentary rocks (Fig. 20-1; Milligan, 1960; Gilbert *et al.*, 1980). DDH L14 intersected silicified intermediate to mafic volcanic rocks and a fine grained micaceous siliceous rock with quartz-carbonate veins (A.F. 91040). DDH Lin 15 and Lin 16 intersected fine grained, grey, siliceous, biotitic, intermediate volcanic rocks, partly carbonatized, and minor quartzitic rock (A.F. 91042).

MINERALIZATION:

DDH L14 intersected (1) a 5.6 m section of fine grained, grey, siliceous rock with 10 to 60% pyrrhotite, pyrite, chalcopyrite and sphalerite, (2) a 0.5 m section with 30% pyrrhotite, sphalerite and chalcopyrite, and (3) a 3.8 m section of fine grained, grey, dense, silicified rock with carbonate, contained 20 to 65% pyrrhotite, pyrite, chalcopyrite and sphalerite. Sulphides occur as disseminations, coarse streaks and bands. The remainder of core from DDH L14 contained minor pyrite and pyrrhotite (SGM, unpublished data).

DDH Lin 15 intersected (1) a 1.2 m section of near solid (60%) pyrrhotite, pyrite, sphalerite and chalcopyrite plus (2) a contiguous 0.6 m section of solid (90%) pyrrhotite, pyrite, sphalerite and chalcopyrite, and (3) a 0.8 m section of 70% coarse grained pyrrhotite streaks with "hair like chalcopyrite thread" and sphalerite in fine grained, silicified, carbonatized volcanic rock. The best intersection from DDH Lin 16 was 0.6 m with 15%, finely disseminated pyrrhotite, pyrite, chalcopyrite and sphalerite in an argillaceous section of fine grained silicified volcanic rock (A.F. 91042). The remainder of core from both drillholes contained minor disseminated pyrrhotite, pyrite ± chalcopyrite ± sphalerite and, in places, streaks of solid sulphide (A.F. 91042).

GEOCHEMICAL DATA:

Assays of core samples from DDH L14 had ranges of 0.04 to 0.07% Cu, 0.03 to 0.04% Zn, 0.02 to 0.07% Ni, nil Au, and 3.4 to 15.4 g/t Ag (SGM, unpublished data). Ranges of core assays for DDH Lin 15 and Lin 16 were 0.02 to 0.11% Cu, 0.03 to 0.05% Zn, 0.02 to 0.09% Ni, nil to tr. Au, and nil to 0.37 oz/ton Ag (A.F. 91042).

CLASSIFICATION:

Stratabound massive sulphide type deposit; volcanic rock associated. Near solid sulphide layers occur in silicified mafic to intermediate volcanic rocks.

REFERENCES:

Assessment Files 91038, 91040, 91042, 91622, 91626, 91679, 91699, 91826, 91992
Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

LOCATION: **24**

NAME: (A.F Mineralization intersected by diamond drilling)
UTM: 6308664N/405532E
ACCESS: Float plane to Auni Lakes, and traverse to drill site

AREA: 0.75 km south of Auni Lakes (Fig. 20-1)
AIRPHOTO: A24297-63

EXPLORATION SUMMARY:

R.G. Crosby carried out an EM survey on the Lin claim group in 1957 and 1958 (A.F. 91038). SGM conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). SGM drilled twenty holes totalling 752 m on the Lyn claims in 1958 (A.F. 91042).

Selco Exploration Company Limited conducted an airborne EM survey over Airborne Permit 31 in 1960 (A.F. 91626). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). Mattagami Lake Mines Limited conducted an airborne INPUT and magnetometer survey in 1973 (A.F. 91826). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out an airborne INPUT survey (Phase II) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976 (A.F. 91992). Hosain's (1981) compilation of airborne EM data shows two subparallel conductors, each several kilometres in length, that were ostensibly tested by the drillholes at this location.

The early exploration history of this location is detailed in Mineral Inventory Card 64C/15 Cu5 and Milligan (1960).

GEOLOGICAL SETTING:

The area is underlain by anticlinally folded Wasekwan Group mafic and intermediate volcanic rocks and amphibolite (Fig. 20-1; Gilbert *et al.*, 1980).

DDH Lin 17 through Lin 36 intersected fine grained, grey, silicified, biotitic, intermediate volcanic rocks, partly carbonatized, part (DDH Lin 17, -23, -24) mottled, and minor quartzitic rock. DDH Lin 30 also intersected argillite. DDH Lin 20 and -22 also intersected fine grained, partly siliceous, intermediate volcanic fragmental rocks with "occasional" blue quartz eyes (A.F. 91042). A general stratigraphy can be constructed from the drill logs. Intermediate volcanic rocks that are locally biotitic occur to the north of, and structurally overlying, mineralized argillitic rock. Silicified and carbonatized volcanic rocks occur to the south and structurally underlie the mineralized zones; some of the rocks to the south have been described in the drill logs as "feldspathic". The biotitic and feldspathic sections of rock structurally above and beneath the mineralized rock might represent potassium alteration.

MINERALIZATION:

Drillholes intersected the following mineralized sections:

Lin 17: 0.8 m near solid (60%) pyrrhotite, chalcopyrite, pyrite) with siliceous remnants.

Lin 18: 13.8 m with 15 to 25% pyrrhotite, pyrite, sphalerite, chalcopyrite in fine grained dense grey siliceous rock.

Lin 19: 0.9 m near solid (65%) pyrite, pyrrhotite, chalcopyrite) with dense siliceous remnants.

Lin 20: 12.2 m with 25 to 40% pyrrhotite, pyrite, sphalerite, and chalcopyrite in fine grained, dense, grey, carbonatized, partly sericitic siliceous rock.

Lin 21: 1.6 m near solid (60%) pyrrhotite, pyrite, chalcopyrite, and sphalerite in fine grained carbonatized grey siliceous rock.

Lin 22: Collared in 30% disseminated pyrite, pyrrhotite, chalcopyrite, and sphalerite; 15 to 40% mineralization continued for 13.5 m from the collar.

Lin 23: 0.9 m near solid (65%) pyrite, pyrrhotite, chalcopyrite, and sphalerite in fine grained siliceous rock with local carbonate veins. Structurally underlain by 3.2 m fine grained, siliceous, biotitic, chloritic rock (altered volcanic rock?) with carbonate veinlets with <1% pyrrhotite, pyrite, chalcopyrite, and arsenopyrite.

Lin 24: 1.8 m with 30% disseminated and streaks pyrrhotite, pyrite, chalcopyrite, and sphalerite in fine grained, silicified, carbonatized rock with mineralized dark argillitic bands.

Lin 26: 10.0 m near solid (40-65%) pyrite, pyrrhotite, sphalerite, chalcopyrite, and arsenopyrite with siliceous and calcic remnants and argillite remnants hosted by fine grained, light grey, siliceous, calcic rock.

Lin 29: (a) 5.0 m solid (80-90%) pyrrhotite, pyrite, chalcopyrite and sphalerite; (b) 0.9 m fine grained siliceous carbonatized rock with 20% sulphides overall consisting of bands of solid pyrrhotite, pyrite, chalcopyrite, sphalerite and magnetite; (c) 1.2 m solid (90%) pyrrhotite, chalcopyrite, sphalerite and pyrite with siliceous remnants; (d) 3.3 m near solid (50-60%) pyrrhotite, pyrite, chalcopyrite, sphalerite and arsenopyrite. Fine grained, siliceous carbonatized rock, with trace to 10% sulphide and magnetite, and fine grained, intermediate, silicified volcanic rocks (some sections with "quartz-eyes") occur downhole from the mineralized intersections.

Lin 32: 24.4 m with 15 to 40% disseminated pyrrhotite, pyrite, sphalerite and chalcopyrite in fine grained, dense, grey, siliceous rock.

Lin 33: 0.3 m with 75% arsenopyrite, pyrite, pyrrhotite, chalcopyrite and sphalerite in fine grained, dense, grey, siliceous, carbonate-bearing rock; and other arsenopyrite-bearing sections.

Lin 35: 2.7 m near solid (40-60%) pyrrhotite, pyrite, sphalerite and chalcopyrite with argillitic and siliceous remnants.

The remainder of core from all of the drillholes contains minor disseminated pyrrhotite, pyrite ± chalcopyrite ± sphalerite and, in places, "streaks" of solid sulphide. DDH Lin 19, -21, -23, -36 also intersected local trace to minor arsenopyrite. DDH Lin 25, -27, -28, -30, -31, and -34 intersected only minor (<10% sulphides) mineralization throughout the core (A.F. 91042).

GEOCHEMICAL DATA:

A 0.3 m solid sulphide section from DDH Lin 33 contained tr. Cu, 0.02% Zn, tr. Ni, 9.2 g/t Au, and 28.0 g/t Ag. Other samples from DDH Lin 33 had ranges of nil to 0.08% Cu, nil to 0.04% Ni, nil to 11.3 g/t Au, and 10.6 to 28.0 g/t Ag. One hundred seventy-nine drill core samples, most ≈1.5 m in core length, ranged from nil to 0.24% Cu, nil to 0.14% Ni, nil to 1.7 g/t Au, and nil to 28.5 g/t Ag. Seven samples from various cores had 0.02 to 0.13% Zn (A.F. 91042).

CLASSIFICATION:

Massive Sulphide type deposit; volcanic rock associated. The sedimentary and associated volcanic rocks have undergone some silica, carbonate, and potassium alteration.

REFERENCES:

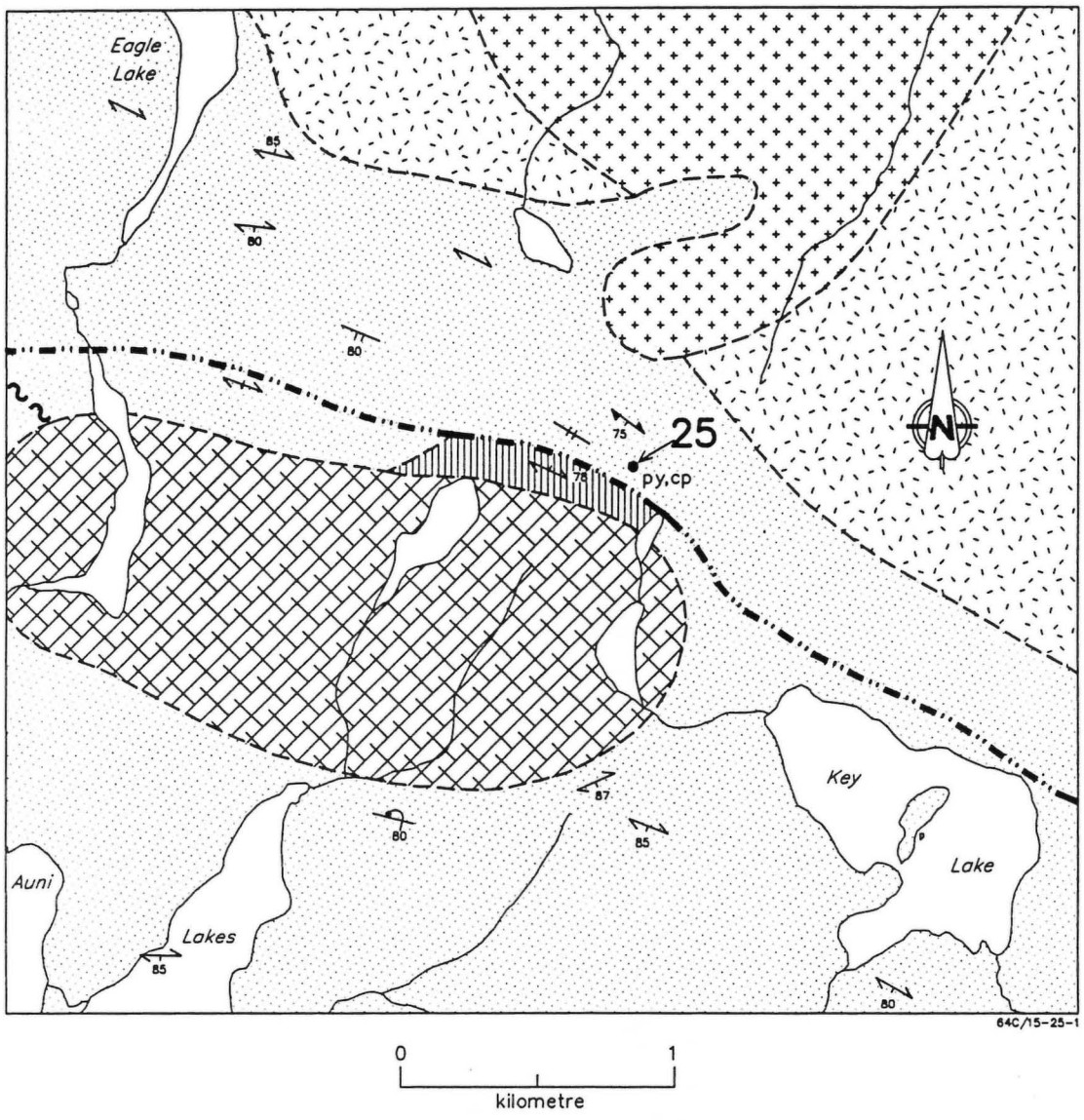
Assessment File 91038, 91042, 91622, 91626, 91679, 91699, 91826, 91992
Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Hosain, I.T.
1981: Summary and evaluation of the geophysical data from the open assessment files of the Lynn Lake greenstone belt (NTS 64C-9 to 16); Manitoba Energy and Mines, Open File Report OF81-5, 40p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

Mineral Inventory Card 64C/15 Cu5
Manitoba Energy and Mines, Geological Services Branch.



Post–Sickle Intrusions

Granite, granodiorite

Pre–Sickle Intrusions

Syenite

Diorite, quartz diorite, tonalite, granodiorite

Wasekwan Group Rocks

Iron formation (inferred from aeromagnetic surveys)

Felsic volcanic rocks

Mafic–intermediate volcanic rocks

Geological boundary (approximate)

Fault

Foliation (inclined, vertical, dip unknown)

Foliation and parallel primary layering (inclined)

Bedding tops unknown (inclined, vertical)

Pillows, tops known (overturned)

py,cp Mineralization

25. Mineral occurrence location

Figure 25-1: Geological setting of occurrence 25 (after Gilbert et al., 1980).

LOCATION: **25**

NAME:
UTM: 6311812N/406648E
ACCESS: Float plane to Eagle Lake and traverse along cut lines to outcrop

AREA: 2.3 km southeast of Eagle Lake (Fig. 25-1)
AIRPHOTO: A23828-158

EXPLORATION SUMMARY:

K.L. Rose and W.L.C. Greer carried out a magnetometer survey and 1:1200 geological mapping on the Auni claim group in 1947 (A.F. 91029) for International Mining Corporation (Canada) Limited (Milligan, 1960, p. 212).

Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). SGM conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Selco Exploration Company Limited conducted an airborne EM survey over Airborne Permit 31 in 1960 (A.F. 91626). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out an airborne INPUT survey (Phase II) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976 (A.F. 91992).

Noranda Exploration Co. Ltd. staked the area in 1979; the claim block was transferred to MMR in 1983. Geological and geophysical (EM) surveys (scale unknown), and a diamond drill program (number of holes not known) were carried out on the property by MMR (MMR staff, pers. comm.).

GEOLOGICAL SETTING:

The area is underlain by mafic and intermediate tuff and fragmental rocks, a syenite body, and a wedge of felsic volcanic rocks; iron formation is interpreted from the aeromagnetic response (Fig. 25-1; Gilbert *et al.*, 1980). The syenite plug north of Auni Lakes is ovoid in plan, with dioritized relict roof pendants of greenstone wall rock (A.F. 91029). Fragmental picritic volcanic rocks identified near Eagle Lake (Fig. 25-2; Parbery and Fedikow, 1987; Parbery, 1992) are part of a 500 m wide zone that is discontinuous over a 12 km strike length from here eastward to Gordon Lake (NTS 64C/16) (Parbery, 1992). These rocks were probably equivalent to those noted by Rose and Greer (A.F. 91029) north of the Auni Lakes: tuff interbedded with small discontinuous lenses of iron formation; dark green to black, fine- to medium-grained, equigranular chlorite-amphibole-plagioclase rocks, some of which are amphibole schists (*author's note:* picritic basalt?). Felsic volcanic rocks have an aphanitic groundmass with 1%, 0.5 to 3 mm quartz phenocrysts and 1%, 1 to 3 mm garnets. Small areas (up to 6 x 15 cm) with up to 10% quartz crystals may be elongated clasts or boudinaged layers. The felsic volcanic units are up to 50 m thick, and are cut by amphibolite dykes (Parbery, 1992).

MINERALIZATION:

A 7 x 60 m rusty weathered zone occurs within siliceous, aphanitic dacitic rock and mafic crystal tuff. Up to 3% pyrite and pyrrhotite are disseminated in dacitic rock (D. Parbery, unpublished data, 1988). A strong magnetic anomaly is coincident with outcrops that are rusty weathered (Gilbert *et al.*, 1980). This location was also shown on a map in A.F. 91029 as 2 to 3% disseminated pyrite and chalcopyrite.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified. Disseminated iron sulphides occur in rusty weathered felsic volcanic rocks.

REFERENCES:

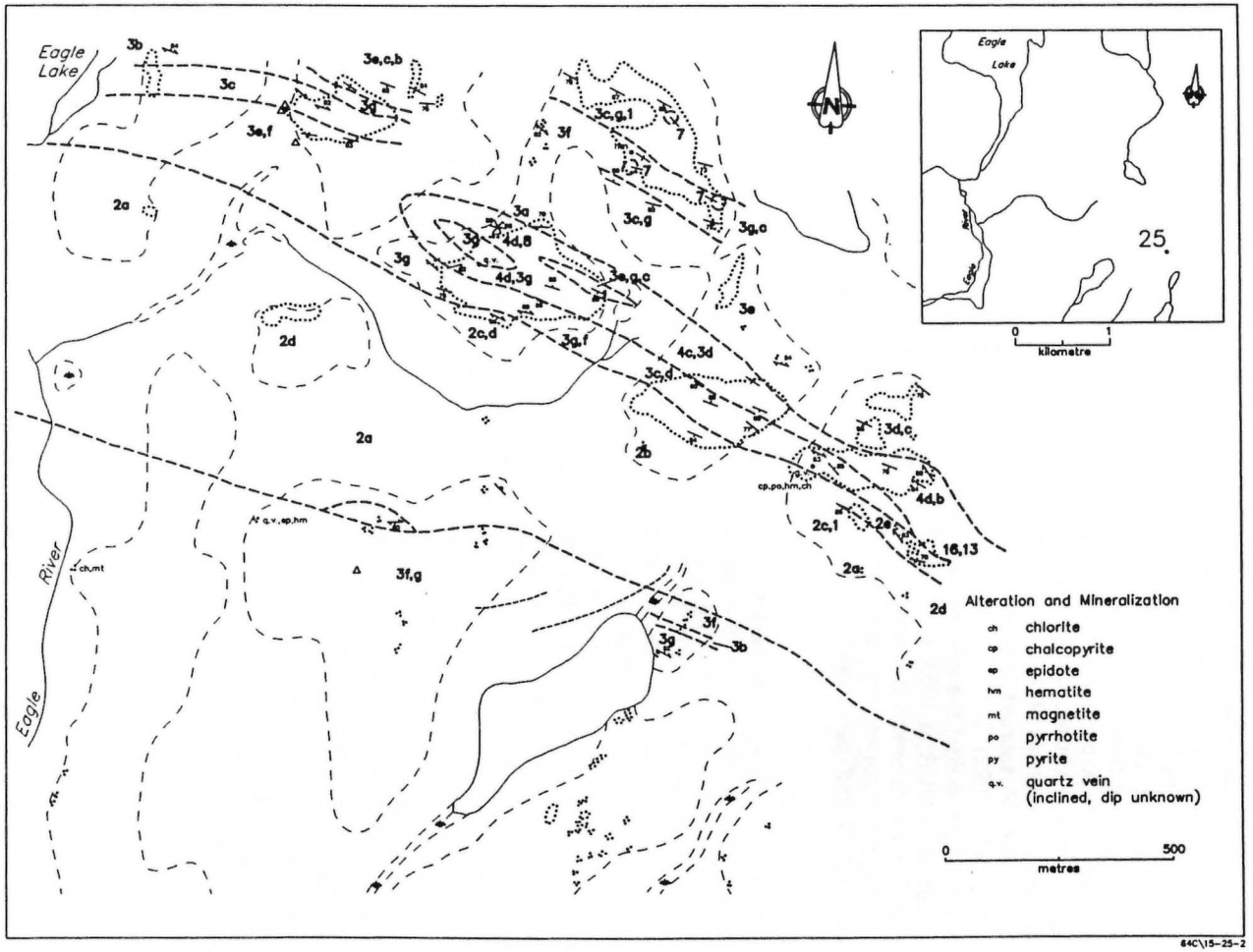
Assessment Files 91029, 91616, 91622, 91626, 91679, 91699, 91992
Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

Parbery, D.
1992: Agassiz Metallotect Project; Manitoba Energy and Mines, Economic Geology Report ER91-2, eight 1:50 000 maps with marginal notes.

Parbery, D. and Fedikow, M.A.F.
1987: Investigation of Agassiz Metallotect stratigraphy; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities 1987, p. 12-16.



Pre– and Post–Sickle Group Intrusive Rocks

9 Fine grained mafic dyke

8 Amphibolite

7 Gabbro, diorite

6 Granodiorite

5 Syenite

Wasekwan Group Volcanic and Sedimentary Rocks

4 Felsic volcanic rocks

- a) dacite, dacite tuff breccia and lapilli tuff
- b) rhyolite breccia
- c) felsic tuff
- d) rhyolite tuff and lapilli tuff

3 Mafic to intermediate flows

- a) amphibole and/or plagioclase phyric basalt, massive mafic to intermediate flows and amygdaloidal mafic flows
- b) mafic to intermediate flow breccia
- c) mafic to intermediate heterolithic breccia and heterolithic tuff breccia
- d) mafic fragmental rocks
- e) mafic heterolithic lapilli tuff and mafic lapilli tuff
- f) mafic plagioclase crystal tuff and mafic to intermediate crystal tuff
- g) mafic to intermediate tuff

2 Picritic volcanic rocks

- a) amphibole phyric pillowed flows, pillowed flows and pillowed breccia
- b) flow breccia
- c) heterolithic lapilli tuff, monolithic lapilli tuff and lapillistone
- d) massive tuff and banded tuff
- e) pyroxene phyric and hornblende phyric crystal tuff

1 Chemical and detrital sedimentary rocks

Geological contact (assumed)

Bedding (inclined, vertical)

Pillowed flow (top known)

Foliation (inclined)

Fracture set (inclined)

Conjugate fractures

Plunge of crenulation fold

Low/high ground boundary

Outcrop

Frost heaved block

Trail

Swamp

Figure 25-2: Detailed geology southeast of Eagle Lake (location 25) (after Parbery, 1992).

LOCATION: **26**

NAME: (A.F Mineralization intersected by diamond drilling)
UTM: 6307658N/407224E
ACCESS: Float plane to Low Lake and traverse

AREA: Approximately 0.8 km north of Low Lake (Fig. 26-1)
AIRPHOTO: A23828-160

E XPLORATION SUMMARY:

Cheskirk Mines Ltd. carried out geological mapping (1:4800) and a magnetometer survey on the Key claim group in 1947 (A.F. 91034).

Sherritt Gordon Mines Limited conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Selco Exploration Company Limited conducted an airborne EM survey over Airborne Permit 31 in 1960 (A.F. 91626) and drilled DDH Dip 1 (109.2 m) on claim Dip 4 in 1962 (A.F. 91032).

Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). Cominco Limited carried out an airborne EM, VLF-EM and magnetometer survey over Airborne Permit 97 in 1971 (A.F. 91551). Hudson Bay Exploration and Development Company Limited drilled DDH Jit 162, -166, -168 and -169 (total 328 m) to test EM conductors on the Jit claims in 1971 (A.F. 91436). Locations are also shown for DDH Jit 154, -157, -159 and an unnumbered drillhole, but further details are not given (A.F. 91436).

SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out an airborne INPUT survey (Phase II) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976 (A.F. 91992).

SGM, in joint venture with Granges Exploration Aktiebolag, carried out an EM and magnetometer survey on CB 7842 in 1978 (A.F. 93106). Lynngold Resources Inc. conducted geological reconnaissance and a lithogeochemical survey on CB 7842 in 1981 (A.F. 93104). SGM drilled DDH Jay 8 (abandoned at 9.8 m), Jay 9 (59.4 m) and Jay 10 (84.1 m) on the Jay claims in 1965 (SGM, unpublished data).

GEOLOGICAL SETTING:

The area is underlain by Wasekwan Group mafic and intermediate volcanic rocks, including massive porphyritic and aphyric basalt and andesite, autoclastic breccia, and porphyritic dacite. The area occurs near the axis of a southeast-trending anticline (Fig. 26-1; Gilbert *et al.*, 1980).

The 'Jit' drillholes intersected massive, bedded and part brecciated rhyolite, interbedded rhyolite and dacite, interbedded rhyolite and andesite, and intermediate to mafic volcanic rocks (A.F. 91436). DDH Dip 1 intersected intermediate to mafic tuff, locally cut by numerous carbonate veinlets, massive dacite and andesite, and a volcanic breccia that consisted predominantly of felsic to intermediate fragments in a fine grained grey-green to dark green matrix (A.F. 91032). DDH Jay 9 and Jay 10 intersected basalt, andesite, porphyritic andesite and banded rhyolite, as well as minor granodiorite and narrow (0.12-0.30 m) quartz veins (SGM, unpublished data).

MINERALIZATION:

The report for A.F. 91034 notes minor(?) pyrite and chalcopyrite in volcanic rocks, but does not delineate specific sites.

DDH Jit 168 intersected 0.2 m with 50% pyrrhotite, trace pyrite and 1% graphite in mafic volcanic rocks with interbedded rhyolite, minor chlorite stringers and carbonate-filled fractures and 1.5 m with 60% pyrrhotite, 2% pyrite and 2% graphite in rhyolite with contorted bedding. DDH Jit 166 and Jit 169 each intersected two <1 m sections with 15 to 20% pyrrhotite and traces of pyrite, graphite and chalcopyrite in rhyolite (from DDH Jit 166) and mafic volcanic rocks (DDH Jit 169). Trace to minor pyrrhotite and/or pyrite, local traces of chalcopyrite and graphite occur throughout much of the core from all four drillholes (A.F. 91436).

A 0.8 m intersection of tuff from DDH Dip 1 contained 15 to 20% pyrrhotite with traces of chalcopyrite and sphalerite. Minor pyrrhotite with lesser pyrite and traces of chalcopyrite and arsenopyrite are common throughout sections of tuff (A.F. 91032).

A 1.5 m thick intersection of basalt at 21.2 m from DDH Jay 10 contained 10% pyrrhotite, pyrite and magnetite. A 4.2 m thick section of brecciated basalt at 29.7 m with distorted banded cherty sections contained 15 to 20% pyrrhotite, pyrite and chalcopyrite. DDH Jay 9 intersected <10% pyrrhotite, magnetite and pyrite throughout the core. Sulphide mineralization from both cores occurs as disseminations, blebs and fracture fillings (SGM, unpublished data).

GEOCHEMICAL DATA:

Seven drill core samples from DDH Dip 1 contained trace Cu, nil Zn, trace Ni, and nil to 0.7 g/t Au (A.F. 91032).

The 1.5 m section with 10% sulphides from DDH Jay 10 contained nil Ni and 0.10% Cu. Three continuous samples through the 4.2 m section with 15 to 20% sulphides contained 0.07, 0.15 and 0.08% Cu and nil Ni. The remainder of drill core samples from DDH Jay 9 and Jay 10 assayed 0.04 to 0.15% Cu, nil Ni, nil to trace Au, and nil to 6.2 g/t Ag (SGM, unpublished data).

Drill core assays from the "Jit" drillholes were not included with logs in A.F. 91436.

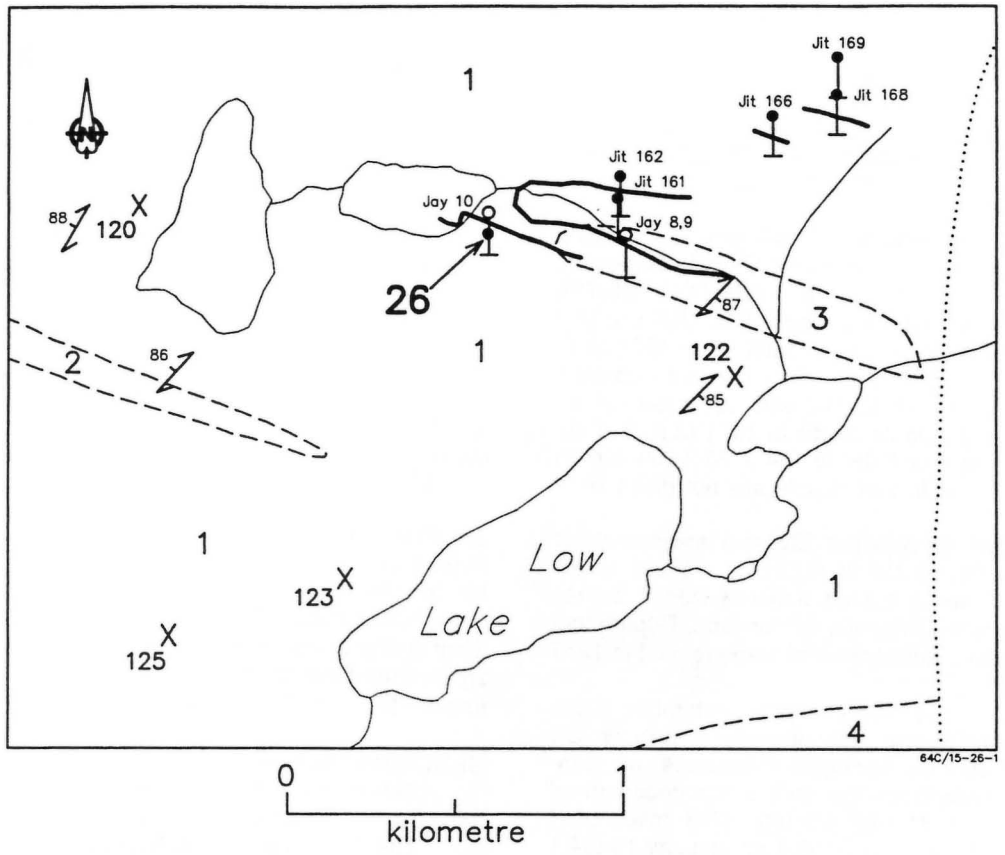
Only one of the lithogeochemical samples collected by LynnGold in 1981 occurred within NTS 64C/15 (the remainder were collected from NTS 64C/16); it contained 42.14% SiO_2, 10.38% Fe_2O_3, 2.74% MgO, 18.08% Al_2O_3, 10.41% CaO, 0.71% K_2O, 2.41% Na_2O, 0.90% TiO_2, 0.23% MnO, 0.26% P_2O_5, 87 ppm Zn, 112 ppm Cu, 8 ppm Ni, 5 ppm Pb, 19 ppm Co, 4 ppm Bi, 10 ppm Mo, <1 ppm Ag, 14 ppm As, and <2 ppb Au (A.F. 93104).

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:
Assessment Files 91032, 91034, 91436, 91551, 91622, 91626, 91679, 91699, 91992, 93104, 93106
Manitoba Energy and Mines, Minerals Division.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.



Intrusions

4 Hornblende–biotite tonalite, quartz diorite

3 Massive porphyritic dacite

Wasekwan Group

2 Mafic tuff

1 Massive porphyritic and aphyric basalt and andesite

--- Geological contact (appropximate)

86 Foliation, tops known (inclined)

..... Limit of mapping

Geology after Gilbert, Syme (1980).

——— EM conductors (A.F. 91616)

Drillholes:

⊢○ (SGM, unpublished)

⊢● (A.F. 91436)

X Mineralization location approximate (Milligan, 1960)

26. Mineral occurrence location

Figure 26-1: Geological setting of occurrence 26 (after Gilbert et al., 1980).

LOCATION: **27**

NAME: (A.F. Mineralization intersected by diamond drilling)
UTM: 6304063N/382968E
ACCESS: Trail from Provincial Road 391

AREA: Northwest of Cockeram Lake (Fig. 27-1)
AIRPHOTO: A23828-118

EXPLORATION SUMMARY:

Conwest Exploration Co. Ltd. conducted a magnetometer survey and a 1:4800 geological mapping program on the F.J. claim group in 1946 (A.F. 91055). Dennison Nickel Mines Limited carried out a magnetometer survey over the M.J. claims in 1947 (A.F. 91051)[1].

Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5 in 1954 (A.F. 91615). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). Sherritt Gordon Mines Limited conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622).

Evelynn Nickel Mines Ltd. conducted an EM and magnetometer survey on the Geo (George) claims in 1957 (A.F. 91354). Lynwatin Nickel Copper Mines Limited drilled DDH 15 and 16 (total 250 m) on the Geo (George) claims in 1957 (A.F. 91056).

Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976. The locations of DDH EL-48-77, EL-49-77, EL-50-77, EL-50a-77, EL-51-77, EL-52-77, EL-53-77, EL-54-77, EL-55-77, EL-106-77, EL-107-77, and EL-108-77 are given on maps by Granges Exploration AB, ostensibly drilled to test EM conductors; logs are not available (A.F. 92698, 92310).

SGM conducted an HLEM and magnetometer survey on the Beluga claim and relogged core from DDH 15, originally drilled by Lynwatin Nickel Copper Mines Limited, in 1984 (A.F. 93357). SGM conducted an HLEM and magnetometer survey on the Blubber, Beluga and Punker claims in 1985 (A.F. 93356). In 1987, SGM ran a VLF-EM survey on the Punker, Blubber and Beluga claims (A.F. 93353). SGM carried out HLEM and magnetometer surveys on the Blubber, Beluga and Punker claims in 1987 to fill in and extend the area of previous coverage (A.F. 93354). A.F. 92867 summarizes, but does not present results of work by SGM on the Beluga claim (in joint venture with Novamin Resources Inc.), and the Punker and Blubber claims from 1984 to 1987: a Max-Min survey in 1984, mapping of the Beluga claim in 1984 (no outcrop located), magnetometer and HLEM surveys in 1987.

GEOLOGICAL SETTING:

The area is underlain by massive porphyritic rhyolite of the Lynn Lake Rhyolitic Complex (Fig. 27-1; Gilbert *et al.*, 1980). Mafic flows with interbedded tongues of rhyolite or dacite were observed during detailed mapping by Conwest (A.F. 91055).

Drill logs from A.F. 91056 describe interbedded dark grey fine grained quartzite and argillite, coarse grained greywacke from DDH 15 and 16; DDH 15 also intersected a 2.1 m (core length) "lamprophyre dike" consisting of biotite with inclusions of white feldspar. SGM relogged the core from DDH 15 as felsic tuff with lesser lapilli tuff (A.F. 93357). Much of the grey to green rock, as well as the impure quartzite, may be altered intermediate to mafic volcanic or rhyolitic rocks of the Lynn Lake Rhyolitic Complex.

MINERALIZATION:

Only trace to minor amounts of pyrite were intersected in DDH 16 (A.F. 91056). SGM noted two narrow intersections from DDH 15 with 2 to 6 mm quartz + pyrite ± chalcopyrite stringers that probably represent mobilizate (A.F. 93357).

Mineralization was not observed in outcrop by Conwest (A.F. 91055).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

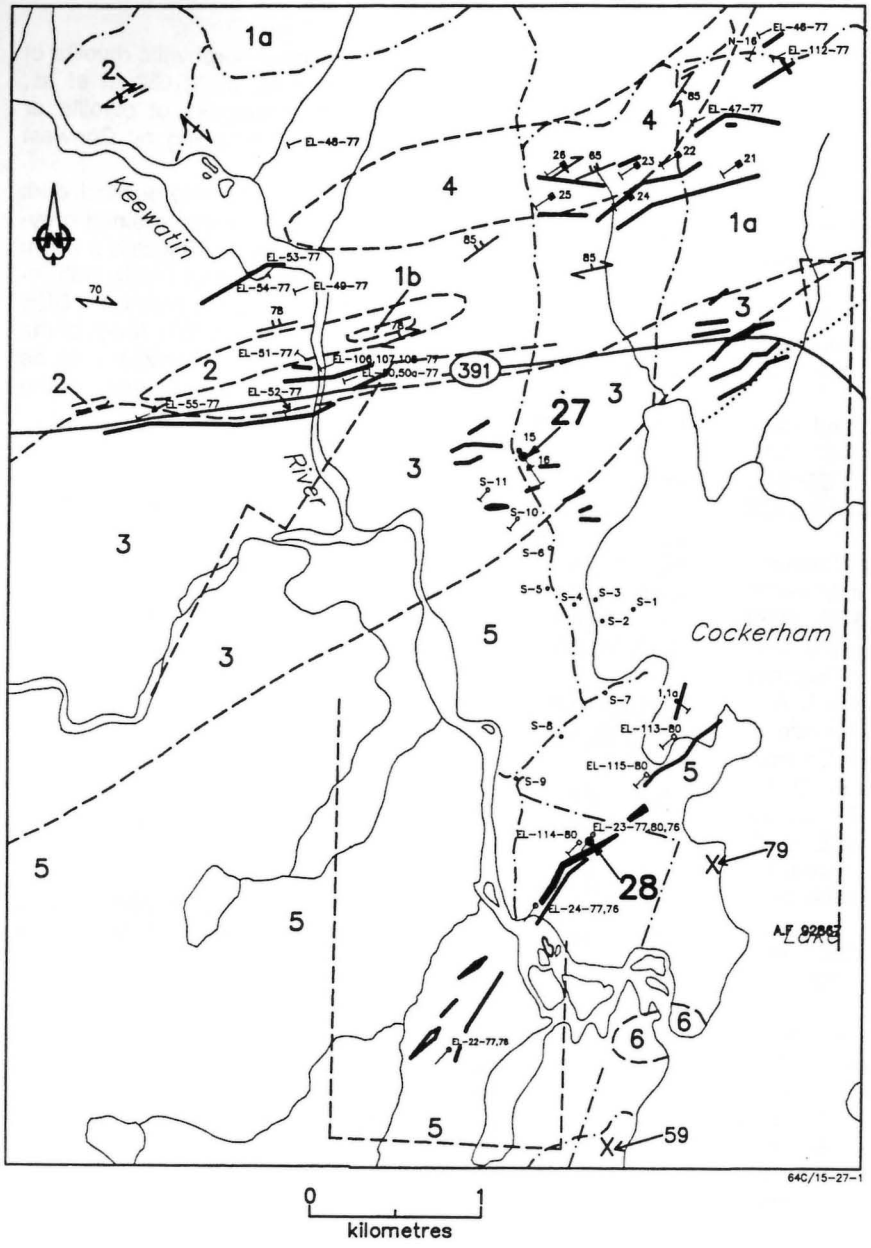
Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 91051, 91055, 91056, 91354, 91615, 91616, 91622, 91679, 91699, 91989, 91992, 92310, 92698, 92867, 93353, 93354, 93356, 93357
Manitoba Energy and Mines, Minerals Division.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

[1] Gilbert et al.'s (1980) map shows DDH locations west of Cockeram Lake; these correspond with DDH 15 and 16 from A.F. 91056.



Intrusions

6 Granite, granodiorite

5 Diorite, quartz diorite, tonalite

Wasekwan Group

4 Greywacke, siltstone, mudstone

3 Massive porphyritic rhyolite

2 Dacite tuff

1 a) mafic and intermediate volcanic flows and autoclastic breccia

b) mafic tuff

Geological boundary (approximate)

Limit of drift

Foliation (inclined, vertical)

Bedding (inclined)

Geology after Gilbert *et.al.* (1980).

EM conductors (A.F. 92866, 92227, 91050, 93353, 93354, 93356, 93357)

Drillholes:

(A.F. 92356)

(A.F. 92699)

(A.F. 91051)

(A.F. 91056)

(A.F. 91059)

(A.F. 92698, 92310)

Trail

X Mineralization, location approximate (Milligan, 1960)

27. Mineral occurrence location

Figure 27-1: Geological setting of occurrences 27 and 28 (after Gilbert et al., 1980).

LOCATION: **28**

NAME: (A.F. Mineralization intersected by diamond drilling)
UTM: 6301858N/383475E
ACCESS: Provincial Road 391 and trail to Cockeram Lake, then by boat on Cockeram Lake and traverse

AREA: Northwest shore of Cockeram Lake (Fig. 27-1)
AIRPHOTO: A23828-117, -118

EXPLORATION SUMMARY:

Dennison Nickel Mines Limited carried out a magnetometer survey over the M.J. claims in 1947, drilled 11 holes (DDH S-1 to S-11) totalling 1654 m in 1948 (A.F. 91051), and carried out a magnetometer survey over part of this location in 1948 (A.F. 91051). God's Lake Gold Mines Limited carried out 1:4800 geological mapping and a magnetometer survey over part of the area in 1947 (A.F. 91050). A magnetometer survey and a 1:2400 geological mapping survey near the west shore of Cockeram Lake were done by consultants Young Young & Gross Ltd. for N.J. Campbell in 1948 (A.F. 91048). A magnetometer survey of claim 16604 was carried out in 1948 by C.E. Michener (A.F. 91049).

Evelynn Nickel Mines Ltd. conducted an EM and magnetometer survey on the Geo (George) claims in 1957 (A.F. 91354). Lynwatin Nickel Copper Mines Limited drilled DDH 1 (abandoned) and 1A (abandoned); total 59 m on the Geo (George) claims in 1957 (A.F. 91056).

Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5 in 1954 (A.F. 91615). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). Sherritt Gordon Mines Limited conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

Granges Exploration Aktiebolag drilled DDH EL-22-76, EL-23-76, EL-24-76 (total 144 m) in 1976 (A.F. 92699), carried out an HLEM survey, and drilled three holes (DDH EL-113-80, EL-114-80, EL-115-80; total 147.5 m) on CB 9324 in 1979-80 (A.F. 92356). SGM carried out a magnetometer survey on CB 5600 in 1973 (A.F. 92227).

A.F. 92867 summarizes, but does not present results of work by SGM on the Beluga claim (in joint venture with Novamin Resources Inc.), and the Punker and Blubber from 1984 to 1987: a Max-Min survey in 1984, mapping of the Beluga claim in 1984 (no outcrop located), magnetometer and HLEM surveys in 1987. Similarly, A.F. 92867 notes that SGM did magnetometer and VLF-EM surveys on the Ram claims in 1987. Hayes Resources Inc. conducted a magnetometer and HLEM survey in 1987 over the Ram claims, which were transferred from SGM (A.F. 92866).

GEOLOGICAL SETTING:

The area is underlain by intermediate intrusive rocks, including quartz diorite, diorite, and hornblende-biotite tonalite (Fig. 27-1; Gilbert *et al.*, 1980).

The 'S-' drillholes intersected quartz diorite, diorite and syenite with minor xenoliths of mafic volcanic rocks and felsic dykes. DDH 5 also intersected alternating sections of rhyolite and diorite (A.F. 91051). Drillholes EL-22-76 and EL-24-76 intersected amphibolite and quartz diorite. DDH EL-23-76 intersected quartz-biotite schist; mafic volcanic rocks, in part silicified; quartz diorite and diorite (A.F. 92699). DDH EL-113-80 intersected quartz-biotite schist, diorite, amphibolite and quartz-biotite-hornblende schist. DDH EL-114-80 intersected quartz-biotite schist. DDH EL-115-80 intersected sparsely garnetiferous quartz-biotite schist, amphibolite and granite (A.F. 92356).

MINERALIZATION:

DDH EL-22-76 intersected a 1.1 m section of amphibolite with 15% pyrite and a 3.0 m section of diorite (or amphibolite?) with 30% pyrite and pyrrhotite. DDH EL-23-76 intersected two sections, 1.1 and 0.6 m in core length, of solid pyrite, pyrrhotite and traces of chalcopyrite. DDH EL-24-76 intersected a 1.9 m section of cherty rock with 20% pyrrhotite, 10% pyrite, minor graphite and traces of chalcopyrite. Minor pyrite and pyrrhotite are present locally elsewhere in the cores (A.F. 92699).

DDH EL-113 intersected a 1.1 m zone of quartz-biotite-hornblende schist with 15 to 20% pyrrhotite and traces of chalcopyrite. DDH EL-114 intersected a 4.0 m zone in quartz-biotite schist with minor pyrrhotite and traces of chalcopyrite and sphalerite, including 0.9 m with "heavy" pyrite, of which 0.3 m was near solid pyrrhotite and minor chalcopyrite and sphalerite. DDH EL-115 intersected only minor pyrite and pyrrhotite in quartz-biotite schist and amphibolite (A.F. 92356).

Trace to minor amounts of pyrite and local traces of chalcopyrite are present in places throughout all of the 'S-' drill cores (A.F. 91051).

No mineralization was observed in outcrop in God's Lake Gold Mines' mapping program (A.F. 91048).

Milligan (1960) records two sites of mineralization (shown here sites A and B in Figure 27-1): (A) " Some pyrite in ferromagnesians in diorite and quartz diorite north of Keewatin River"; and (B) "Scattered grains and small concentrations of pyrite in diorite".

GEOCHEMICAL DATA:

Drill core samples from the 'S-' drillholes assayed trace Au and nil Ag, except for (1) one sample of 60% quartz in a xenolith of mafic volcanic rocks from DDH S-3 that assayed 2.7 g/t Au and 96.0 g/t Ag over 0.7 m (assay cited in A.F. 92867) and (2) silicified quartz diorite with moderate amounts of pyrite, pyrrhotite and minor chalcopyrite from DDH S-8 assayed 0.7 g/t Au, tr. Ag, and nil Ni and Cu (A.F. 91051).

Seven drill core samples from DDH EL-22-76 assayed 0.01-0.03% Cu, 0.02-0.07% Zn. 0.01% Ni, 0.001 (oz/ton?) Au, and 0.01-0.04 (oz/ton?) Ag. The two solid sulphide sections from DDH EL-23-76 assayed (1) 0.47% Cu, 0.25% Zn, 0.004 (oz/ton?) Au, and 0.08 (oz/ton?) Ag over 1.1 m and (2) 0.29% Cu, 0.78% Zn, 0.001 (oz/ton?) Au, and 0.04 (oz/ton?) Ag over 0.6 m. The remaining three samples from DDH EL-23-76 assayed 0.04-0.14% Cu, 0.01-0.05% Zn, 0.001 (oz/ton?) Au, and 0.01-0.03 (oz/ton?) Ag. The cherty sulphidic rock from DDH EL-24-76 assayed 0.04% Cu, 0.07% Zn, 0.001 (oz/ton?) Au, and 0.04 (oz/ton?) Ag over 1.9 m (A.F. 92699).

One drill core sample of the mineralized zone from DDH EL-113 assayed 0.04% Cu, 0.08% Zn, 0.05 g/t Au, and 2.0 g/t Ag over 1.1 m. Four core samples from DDH EL-114, covering the 4.0 m mineralized zone, had ranges of 0.05-0.38% Cu, 0.01-0.80% Zn, 0.05-0.35 g/t Au, and 1.5-3.5 g/t Ag. No samples were taken from DDH EL-115 (A.F. 92356).

CLASSIFICATION:

Chemical Sediment type deposit; sulphide facies iron formations. Mineralization occurs within a raft of quartz-biotite-hornblende schist.

REFERENCES:

Assessment Files 91048, 91049, 91050, 91051, 91056, 91354, 91615, 91616, 91622, 91679, 91699, 91989, 91992, 92227, 92356, 92699, 92866, 92867
Manitoba Energy and Mines, Minerals Division.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

LOCATION: **29**

NAME:
UTM: 6303355N/385292E
ACCESS: Provincial Road 391

AREA: East of Cockeram Lake and south of Provincial Road 391 (Fig. 29-1)
AIRPHOTO: A23828-118

EXPLORATION SUMMARY:

Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5 in 1954 (A.F. 91615). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). Sherritt Gordon Mines Limited conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Selco Exploration Company Limited conducted an airborne EM survey over Airborne Permit 31 in 1960 (A.F. 91626). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

GEOLOGICAL SETTING:

The area is underlain by hornblende-biotite tonalite and quartz diorite (Fig. 29-1; Gilbert *et al.*, 1980).

MINERALIZATION:

Milligan (1960, p. 281, site 104) notes "pyrite in appreciable amounts". Medium grained hornblende granodiorite contains 1% disseminated pyrite and magnetite (Baldwin *et al.*, 1985; D. Parbery, field notes, 1985).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 91615, 91616, 91622, 91626, 91679, 91699, 91989, 91992
Manitoba Energy and Mines, Minerals Division.

Baldwin, D.A., Parbery, D., Boden, S. and Michielsen, A.
1985: Mineral deposit studies in the Lynn Lake and Barrington Lake areas; in Manitoba Energy and Mines, Report of Field Activities 1985, p. 20-28.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

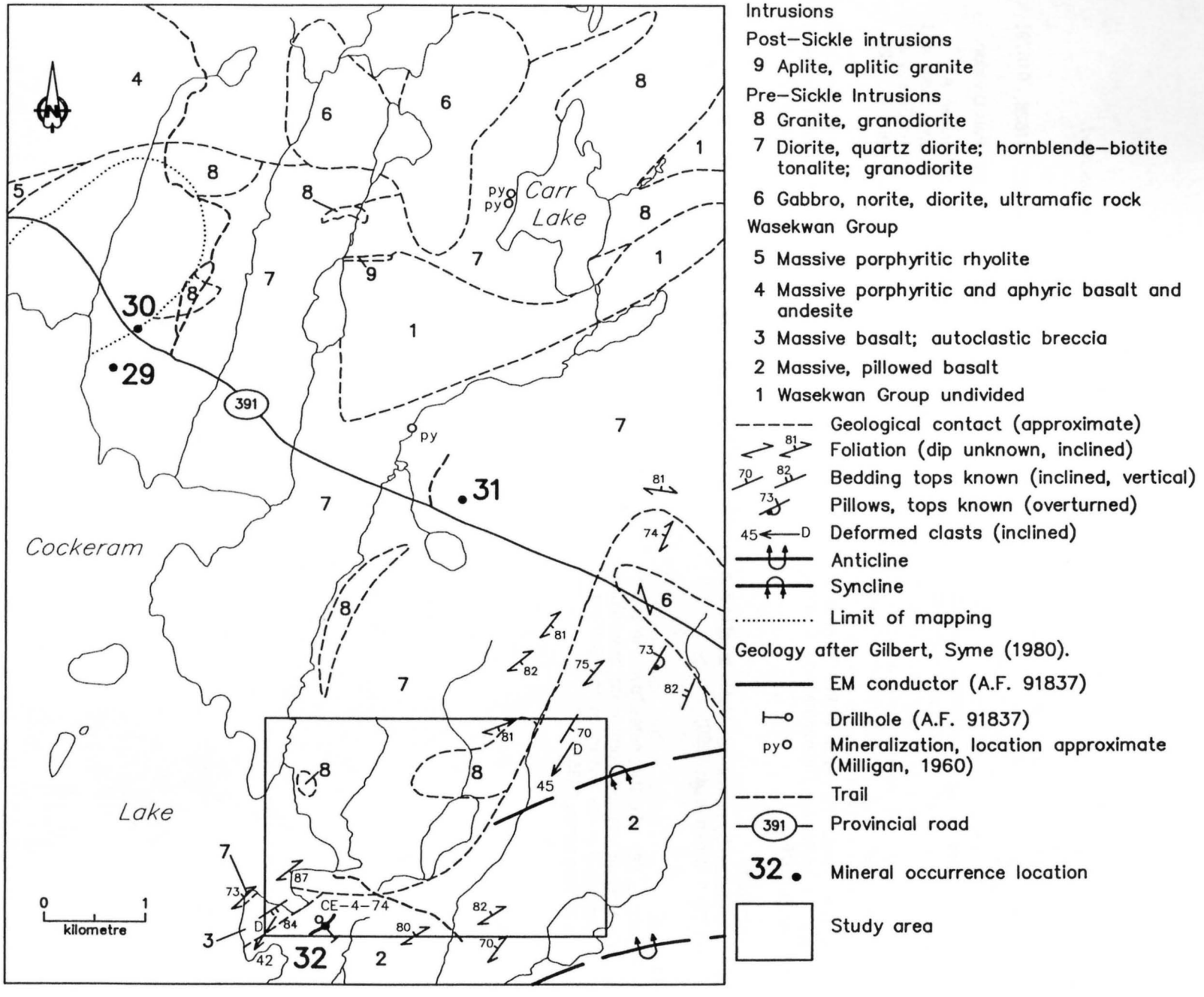


Figure 29-1: Geological setting of occurrences 29, 30, 31 and 32 (after Gilbert et al., 1980).

LOCATION: **30**

NAME:
UTM: 6303708N/385590E
ACCESS: Provincial Road 391

AREA: East of Cockeram Lake and north of Provincial Road 391 (Fig. 29-1)
AIRPHOTO: A23828-118

EXPLORATION SUMMARY:

Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5 in 1954 (A.F. 91615). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). Sherritt Gordon Mines Limited conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Selco Exploration Company Limited conducted an airborne EM survey over Airborne Permit 31 in 1960 (A.F. 91626). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

GEOLOGICAL SETTING:

The area is underlain by hornblende-biotite tonalite and quartz diorite (Fig. 29-1; Gilbert *et al.*, 1980).

MINERALIZATION:

Milligan (1960, p. 103, site 54) reports "Slight fracturing in granite with slight rust and sulphide - pyrite and pyrrhotite". Medium grained biotite-hornblende tonalite contains 1 to 2%, 0.5 cm patches of pyrite (D. Parbery, field notes, 1985; Baldwin *et al.*, 1985).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 91615, 91616, 91622, 91626, 91679, 91699, 91989, 91992
Manitoba Energy and Mines, Minerals Division.

Baldwin, D.A., Parbery, D., Boden, S. and Michielsen, A.
1985: Mineral deposit studies in the Lynn Lake and Barrington Lake areas; in Manitoba Energy and Mines, Report of Field Activities 1985, p. 20-28.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

LOCATION: **31**

NAME:
UTM: 6302058N/388725E
ACCESS: Provincial Road 391.

AREA: East of Cockeram Lake and north of Provincial Road 391 (Fig. 29-1).
AIRPHOTO: A24299-116

EXPLORATION SUMMARY:

Omnitrans Exploration Ltd. conducted a magnetometer survey and 1:4800 geological mapping of the Car and part of the Jenny claim groups in 1948 (A.F. 91058).

International Nickel Co. Ltd. drilled eleven holes (DDH 3775, 3776, 3777, 3778, 5484, 5485, 5496, 5497, 5498, 5499, 5500) totalling 1159 m on the Om claims (year unknown)(A.F. 91053).

Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5 in 1954 (A.F. 91615). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). Sherritt Gordon Mines Limited conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Sherritt Gordon Mines Ltd. carried out an EM survey on the Ram claims in 1957 (A.F. 91054).

Selco Exploration Company Limited conducted an airborne EM survey over Airborne Permit 31 in 1960 (A.F. 91626). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

GEOLOGICAL SETTING:

The area is underlain by intermediate intrusive rocks (Fig. 29-1; Gilbert *et al.*, 1980). Drillholes intersected norite and gabbro, including chloritized sections, diorite, partly granitized sections, minor felsic (aplite, syenite) dykes and quartz stringers. DDH 5484 also intersected minor mica schist. Core from DDH 5496 included siliceous zones (A.F. 91053).

MINERALIZATION:

"Considerable" pyrite and pyrrhotite in granodiorite was observed in outcrop along the northwest shore of Carr Lake (A.F. 91058). This corresponds to Milligan's site 112 (1960, p. 282): "Pyrite in rock described as granodiorite. From map of Carr and Jenny claims by A.J. MacBeth, 1948".

Core from DDH 5484 included a 0.6 m section of gabbro with moderate amounts of chalcopyrite, pyrrhotite and pyrite ("secondary"). Trace to minor amounts of pyrrhotite, chalcopyrite and pyrite were intersected locally throughout core from the remainder of this and other drillholes (A.F. 91053).

Two additional sites of mineralization are shown as sites A and B on Figure 29-1: (A) 1% disseminated pyrite and magnetite in diorite and tonalite (Milligan, 1960, p. 282; Baldwin *et al.*, 1985; D. Parbery, field notes, 1985); (B) "Sparse sulphides in quartz diorite" (Milligan, 1960, p. 281).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 91053, 91054, 91058, 91615, 91616, 91622, 91626, 91679, 91699, 91989, 91992
Manitoba Energy and Mines, Minerals Division.

Baldwin, D.A., Parbery, D., Boden, S. and Michielsen, A.
1985: Mineral deposit studies in the Lynn Lake and Barrington Lake areas; **in** Manitoba Energy and Mines, Report of Field Activities 1985, p. 20-28.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

LOCATION: **32**

NAME:
UTM: 6297802N/387421E
ACCESS: Traverse 1.5 km southwest from Provincial Road 391

AREA: East of Cockeram Lake and south of Provincial Road 391 (Fig. 29-1)
AIRPHOTO: A24299-117

EXPLORATION SUMMARY:

Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5 in 1954 (A.F. 91615). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). Sherritt Gordon Mines Limited conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Selco Exploration Company Limited conducted an airborne EM survey over Airborne Permit 31 in 1960 (A.F. 91626). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Mattagami Lake Mines Limited conducted an airborne INPUT and magnetometer survey in 1973 (A.F. 91826). Mattagami Lake Mines Ltd. carried out magnetometer, VLF-EM and HLEM surveys and drilled DDH CB-4-74-1 (124.4 m) to test an EM anomaly on CB 5526 in 1973 (A.F. 91837).

Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

GEOLOGICAL SETTING:

The area is underlain by Wasekwan Group massive pillowed basalt and basalt tuff and intermediate intrusive rocks (Gilbert *et al.*, 1980; Fig. 29-1). DDH CB-4-74-1 intersected mafic tuff and flows (A.F. 91837).

MINERALIZATION:

A 4.6 m section of mafic flows contained 1% pyrrhotite and traces of chalcopyrite (A.F. 91837).

Milligan (1960, p. 280, site 95) noted "Fine grained massive flows with pyrite". Two additional sites of mineralization are marked as sites A and B on Figure 29-1: (A) Traces of pyrite occur in basalt (Milligan, 1960, p. 282, site 106; Baldwin *et al.*, 1985; D. Parbery, field notes, 1985); (B) "Few small masses of pyrite in gabbro" (Milligan, 1960, p. 281, site 78).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 91615, 91616, 91622, 91626, 91679, 91699, 91826, 91837, 91989, 91992
Manitoba Energy and Mines, Minerals Division.

Baldwin, D.A., Parbery, D., Boden, S. and Michielsen, A.
1985: Mineral deposit studies in the Lynn Lake and Barrington Lake areas; in Manitoba Energy and Mines, Report of Field Activities 1985, p. 20-28.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

LOCATION: **33**

NAME: V.M.C.
UTM: 6295306N/378186E
ACCESS: Traverse from BT mine road, or by boat from Eldon Lake and traverse

AREA: Approximately 1.25 km north of McVeigh Lake (Fig. 33-1)
AIRPHOTO: A23828-78

EXPLORATION SUMMARY:

Baker Lake Explorations Ltd. carried out magnetometer and geological surveys (1:12 000) in 1947. In addition, locations are shown and assessment credit is given for 29 drillholes that total >1800 m located within the area of occurrence 33 (Fig. 33-1), but logs are not included (A.F. 91022).

Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5 in 1954 (A.F. 91615). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). Sherritt Gordon Mines Limited conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Mattagami Lake Mines Limited conducted an airborne INPUT and magnetometer survey over part of the area in 1973 (A.F. 91826). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976. The early staking history of this occurrence is detailed in Mineral Inventory Card 64C/15 Cu2.

Sherrgold Inc. conducted a geological reconnaissance, including trenching of two rusty weathered outcrops, of claims Shear 8 and Shear 9 in 1987 (A.F. 93057).

GEOLOGICAL SETTING:

The area is underlain by Wasekwan Group sedimentary rocks, including biotite greywacke, siltstone, mudstone and quartz-rich greywacke. The rocks are underlain to the south by massive basalt and autoclastic breccia, and bounded to the north by felsic to intermediate intrusive rocks (Fig. 33-1; Gilbert *et al.*, 1980). A 12 m thick unit of fine grained felsic sedimentary rocks consist of laminated to thin bedded siltstone with alternating felsic and garnetiferous mafic beds. The proportion of felsic beds increases up-section to the north; rusty weathering is present in the upper part of the unit. The siltstone is underlain by siliceous argillite and chert, and a coarse grained greywacke (Ferreira and Baldwin, 1984).

Sherrgold's reconnaissance report described interlayered siltstone, mafic flows and tuff, and felsic to intermediate intrusive rocks north and northeast of McVeigh Lake. Barren quartz veins, generally 2.5 to 8 cm wide and 0.9 to 1.8 m long are randomly oriented. A quartz vein with minor pyrite north of McVeigh Lake is approximately 0.3 m wide and 9.1 m long and strikes north. The vein infills a fracture in quartz diorite (A.F. 93057).

MINERALIZATION:

Very fine grained pyrite, 1 to 3%, and traces of pyrrhotite are disseminated in the upper part of the felsic siltstone (Ferreira and Baldwin, 1984).

Two magnetic and calcareous rusty weathered outcrops of interlayered siltstone and tuff contain solid pyrite, chalcopyrite, bornite, magnetite and pyrrhotite (A.F. 93057; location of these outcrops not portrayed in report). A brecciated zone of fine grained bedded sedimentary rocks contained pyrrhotite, up to 90% in some sections, with lesser pyrite, chalcopyrite, sphalerite and galena (A.F. 91022). This zone apparently coincides with Milligan's (1960) site 183. Milligan (1960, p. 281) notes an additional site of mineralization, shown as site A in Figure 33-1: "Very fine grained disseminated pyrite, rather abundant, disseminated in rock composed of feldspar, 60+% brown hornblende."

GEOCHEMICAL DATA:

"Assays were very low...and seemed to bear little relationship to the amount of sulphide" (elements not specified) from the brecciated zone. Up to 0.1% Ni was found in mafic sills with minor disseminated sulphide (A.F. 91022).

SGM located dumped drill core near two old drill collar sites, which they presumed to have been drilled by Mattagami Lake Mines *circa* 1973. Two grab samples of near solid pyrrhotite from this core were assayed; samples Q-7512 and Q-7513 contained 0.07% and 0.03% Cu, 0.17 and 0.16% Zn, 0.06 and 0.04% Ni, and 25.0 and 22.4% Fe, respectively (SGM, unpublished report, 1977).

An assay of 0.3 g/t Au, 2.1 g/t Ag, 0.04% Ni, 0.11% Cu, 22.9% Fe and 0.48% Zn was obtained from a trench sample of one of the rusty weathered outcrops noted by Sherrgold (A.F. 93057).

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

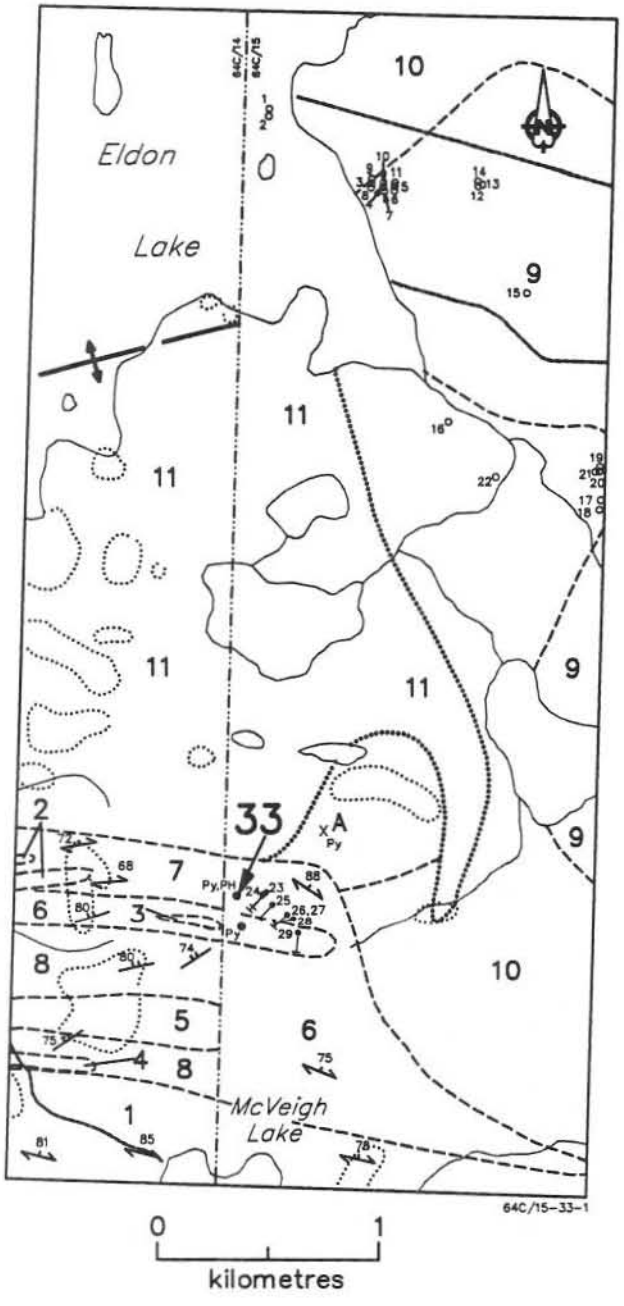
Assessment Files 91022, 91615, 91616, 91622, 91679, 91699, 91826, 91989, 91992, 93057
Manitoba Energy and Mines, Mines Branch.

Ferreira, K.J. and Baldwin, D.A.
1984: Mineral deposit documentation in the Lynn Lake area; **in** Manitoba Energy and Mines, Mineral Resources Division, Report of Field Activities 1984, p. 12-16.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

Mineral Inventory Card 64C/15 Cu2
Manitoba Energy and Mines, Geological Services Branch.



Intrusive Rocks

11 Granite, granodiorite

10 Diorite, quartz diorite

9 Hornblende–biotite tonalite, quartz diorite

Wasekwan Group

8 Hornblende greywacke, siltstone

7 Biotite greywacke, siltstone, mudstone

6 Quartz–rich greywacke

5 Siltstone and mafic mudstone

4 Rhyolite, felsic gneiss

3 Quartz–pebble conglomerate

2 Massive porphyritic and aphyric basalt and andesite

1 Autoclastic breccia

------- Geological boundary (approximate)

..... Limit of mapping

Anticline

Foliation (inclined)

Bedding, tops unknown (inclined)

Geology after Gilbert *et.al.*, (1980).

Outcrop

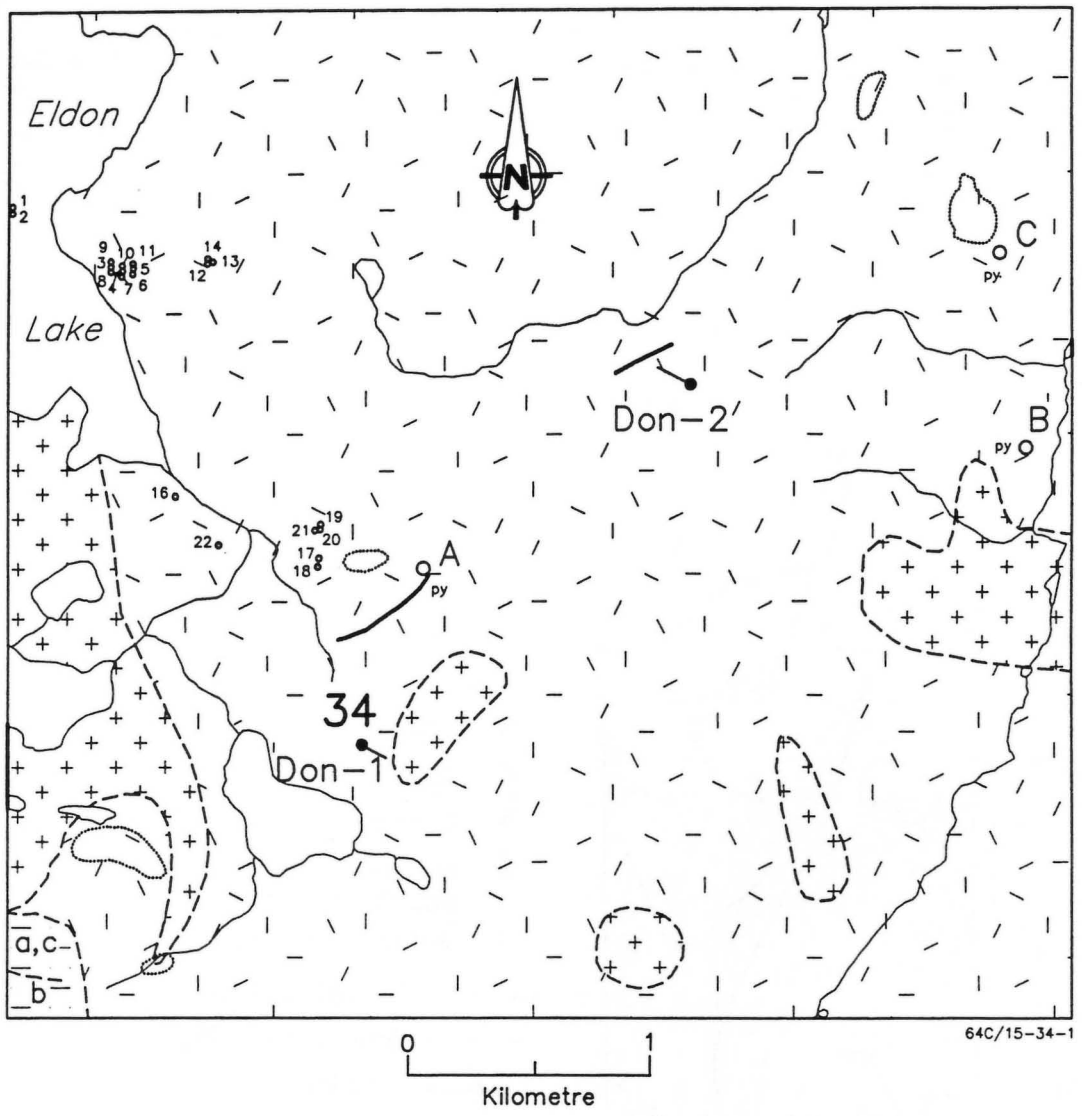
Drillhole. orientation unknown
A.F. 91022, Milligan, 1960

Py,PH Mineralization

Mineralization, location approximate (Milligan, 1960)

33 Occurrence location (approximate)

Figure 33-1: Geological setting of occurrence 33 (after Gilbert et al., 1980).



Pre–Sickle Intrusions

Granite, granodiorite

Hornblende–biotite tonalite, quartz diorite

Wasekwan Group

Sedimentary rocks
- a) biotite greywacke, siltstone, mudstone
- b) quartz–rich greywacke
- c) argillite

Geological boundary (approximate)

EM conductor (SGM, unpublished data)

Outcrop

Drillhole (SGM, unpublished data)

Drillhole (A.F.91022, Milligan, 1960)

Mineralization, location approximate (Milligan, 1960)

34 Mineral occurrence location

Figure 34-1: Geological setting of occurrence 34 (after Gilbert et al., 1980).

LOCATION: **34**

NAME: (A.F. Mineralization intersected by diamond drilling)
UTM: 6296303N/379971E
ACCESS: Traverse from BT mine road, or by boat on Eldon Lake and traverse

AREA: 2 km southeast of Eldon Lake (Fig. 34-1)
AIRPHOTO: A23828-78, -116

EXPLORATION SUMMARY:

Baker Lake Explorations Ltd. carried out magnetometer and geological surveys (1:12 000) in 1947 (A.F. 91022).

Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5 in 1954 (A.F. 91615). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). Sherritt Gordon Mines Limited conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

In 1976, SGM drilled DDH Don 1 (83.5 m) to test a coincident magnetic and EM conductor and DDH Don 2 (55.2 m) to test an EM conductor (SGM, unpublished data).

GEOLOGICAL SETTING:

The area is underlain by hornblende-biotite tonalite, quartz diorite and granodiorite (Gilbert *et al.*, 1980; Fig. 34-1). Drillholes intersected medium- to coarse-grained quartz-biotite-hornblende diorite and medium grained biotite-quartz-feldspar metasedimentary gneiss. Foliation angles within the sections of the gneiss rafts are highly variable; the rafts are more or less granitized (SGM, unpublished data).

MINERALIZATION:

DDH Don 1 intersected three, 0.21 to 0.30 m thick sections that contain 15 to 40% (described as near solid to solid sulphides) pyrrhotite and chalcopyrite between 64.0 m and 68.2 m. Rocks uphole from this section contain minor disseminated and stringer pyrite parallel to foliation planes. Sulphides occur within quartz-biotite-feldspar gneiss. A 7.3 m long section at the end of the drillhole contains carbonate and minor pyrite-filled fractures down the axis of the core (SGM, unpublished data).

Hornblende-biotite-quartz-feldspar gneiss from DDH Don-2 contains three sections, 0.15, 1.3, and 0.15 m thick, of 3 to ≥20% disseminated, stringer and near solid pyrite and pyrrhotite. The last two mineralized intersections are separated by a granodiorite dyke. The gneiss is finer grained and silicified in the sulphide-rich sections. A 7.9 m thick gneiss and schist unit that occurs below the deepest mineralized intersection has epidotized sections and contains a minor carbonate-filled fracture (SGM, unpublished data).

Mineralization described by Milligan (1960, p. 281) is shown as sites A to C on Figure 34-1: (A) "Some pyrite in diorite, cut by pink granite"; (B) "Small amounts of pyrite in fractures in diorite"; and (C) "Small amounts of sulphides in some places, in diorite".

GEOCHEMICAL DATA:

Drill core assays from the mineralized sections described above are presented in Table 34-1.

Table 34-1
Assay results of drill core samples from mineralized sections from DDH Don 1 (SGM, unpublished data).

Mineralization	Sample Length (m)	Au (g/t)	Ag (g/t)	Cu (%)	Zn (%)	Ni (%)
DDH Don 1:						
20% po-cp	0.30	nil	8.9	0.15	0.95	0.02
30-40% po-cp	0.33	nil	11.0	na	na	na
15-20% po	0.21	nil	4.1	0.03	3.21	0.01
DDH Don 2 - 1.3 m mineralized section, continuous samples:						
≥5-7% py-po	0.37	na	na	0.02	0.02	0.01
≥15-20% py-po	0.67	na	na	0.01	0.11	0.01
5-7% po	0.24	na	na	0.01	nil	0.01

na - not analyzed

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. Mineralization occurs within rafts of quartz-biotite-feldspar gneiss within the tonalitic intrusion. Pyritization (DDH Don-1) and silicification (DDH Don-2) are described. Notable quantities of zinc and copper are present in the mineralized zone from DDH Don-1.

REFERENCES:

Assessment Files 91022, 91615, 91616, 91622, 91679, 91699, 91989, 91992
Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

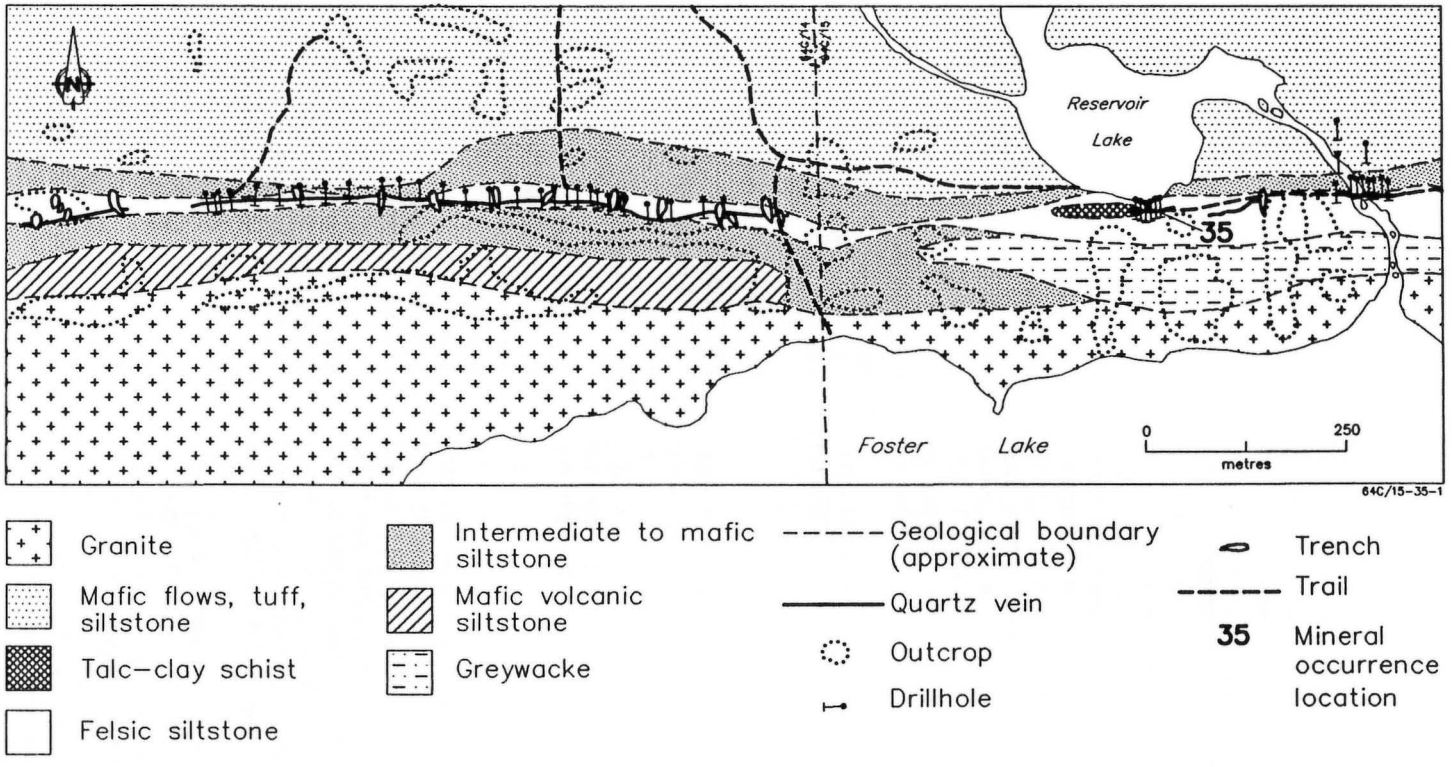


Figure 35-1: Geology of the area north and west of Foster Lake (modified from Bateman, 1945; K. Ferreira, unpublished data, 1986; and SGM, unpublished data, 1986).

LOCATION: **35**

NAME: Johnson Vein; Faust
UTM: 6291752N/378381E
ACCESS: Traverse from road to site of BT mine

AREA: Foster Lake (Fig. 35-1)
AIRPHOTO: A14566-652

EXPLORATION SUMMARY:

A. McVeigh, prospecting for SGM, found gold-bearing quartz float in the creek bed between Foster and Reservoir lakes in 1938 (Bateman, 1945). In 1940, SGM excavated at least 18 trenches and drilled 45 holes (total 2134 m) in the Foster Lake - Reservoir Lake area (Fig. 35-1), including some in NTS 64C/14 (see also Location 19 in MDS Report 6). Of these, the six holes on the south shore of Reservoir Lake totalled 42.7 m, and the eleven holes drilled near the creek between Foster and Reservoir Lakes totalled 70.1 m (Bateman, 1945). Further drilling (unspecified) took place in 1941 (Bateman, 1945). SGM carried out a geological mapping survey (1:6000) on the Faust claims between Foster and Wasekwan lakes in 1945 (A.F. 90992).

Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5 in 1954 (A.F. 91615). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). Sherritt Gordon Mines Limited conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Mattagami Lake Mines Limited conducted an airborne INPUT and magnetometer survey in 1973 (A.F. 91826). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976. Early staking history is detailed in Mineral Inventory Card 64C/15 Au4.

GEOLOGICAL SETTING:

The area is underlain by Wasekwan Group mafic volcanic rocks and mafic to felsic volcaniclastic sedimentary rocks that were intruded by granite, granodiorite and gabbro (Fig. 35-1; Gilbert *et al.*, 1980). The Johnson Shear Zone transects the area (Fedikow *et al.*, 1991); Bateman (1945) describes the type section between Foster and Reservoir lakes. The supracrustal rocks form an east-striking, north-dipping layered sequence, which is summarized in Table 35-1. The gradational nature of the lithologic boundaries, and the similarities in textures and mafic mineral content of the mafic and intermediate rocks suggest that the intermediate rocks may be, in part, altered mafic rocks. Chloritization is common in the mafic sedimentary rocks. Alteration of the sedimentary sequence is most intense south of Reservoir Lake, where the original mineralogy of the felsic sedimentary rocks is replaced by talc, carbonate, clay and sericite(?) schist. Elsewhere, alteration is most intense where fracture cleavage is well developed (Ferreira, 1986). Local occurrences of 1 to 25 cm wide zones of pseudotachylite and breccia in a pseudotachylite matrix are separated by 1 to 20 m wide zones of less deformed rock (Baldwin, 1989).

MINERALIZATION:

Mineralization appears to occur preferentially where fracture cleavage is well developed in felsic sedimentary rocks, and to a lesser degree, in intermediate sedimentary rocks. Pyrrhotite is generally present in amounts of 1 to 5%, but locally concentrated up to 20%. Pyrrhotite is accompanied by trace amounts of pyrite and chalcopyrite, and rare arsenopyrite. Sulphide minerals occur as fine grained aggregates that form streaks on foliation planes. Deformed sulphide-bearing felsic rock occurs as lenses in intermediate rocks.

Locally the quartz vein contains up to 10% disseminated sulphide (Ferreira, 1986). Along the south shore of Reservoir Lake, the mineralized zone is approximately 6 m wide, and contains four quartz veins, 10 to 20 cm wide. The veins contain minor galena, pyrite and chalcopyrite; gold is associated with sulphides in quartz (Bateman, 1945).

GEOCHEMICAL DATA:

Rock samples from the Reservoir Lake area contained up to 587 ppb Au (Table 35-2; Fig. 35-2). Samples from the nearby Johnson Vein area (Location 21 in MDS Report 6) contained 53 to 755 ppb Au (Baldwin, 1989). Results of an orientation humus survey directly over the Johnson Vein were negative.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. Although the mineralization is contained in deformed supracrustal rocks and quartz veins, it has yet to be demonstrated what relationships exist between the mineralization, emplacement of the veins and the shear zone. "Structures and fabrics along the zone indicate a relationship between tectonic movement and gold mineralization" (Fedikow *et al.*, 1986).

REFERENCES:

Assessment Files 90992, 91615, 91616, 91622, 91679, 91699, 91826, 91989, 91992
Manitoba Energy and Mines, Mines Branch.

Baldwin, D.A.
1987: Gold mineralization associated with the Johnson shear zone; **in** Manitoba Energy and Mines, Mineral Resources Division, Report of Field Activities 1987, p. 7-11.
1989: Mineral deposits and occurrences in the Lynn Lake area, NTS 64C/14; Manitoba Energy and Mines, Mineral Deposit Series Report 6, 130p.

Bateman, J.D.
1945: McVeigh Lake area, Manitoba; Geological Survey of Canada, Paper 45-14, 34p.

Table 35-1
Stratigraphy at the Johnson Vein, Foster Lake area (Ferreira, 1986)

UNIT	LITHOLOGY
MAFIC VOLCANIC ROCKS	Tuffs and flows, dark green, very fine grained; tuffs are moderately well foliated, flows are massive to poorly foliated and chloritic; flows may contain 1 to 2 mm plagioclase amygdales and/or phenocrysts. Thickness: 213 to 366 m
GABBRO	Coarse grained, dark green. Thickness: 30 m
TALC-CARBONATE-CLAY SCHIST	Pale green-cream, very fine-to medium-grained; schistose with small-scale irregularities in schistosity; white talc (sericite?), carbonate and clay minerals in feathery sheaves and as fine grained replacements of plagioclase and felsic lithic fragments; 15% pale-medium green streaks in mm-widths and irregular lengths; 1% quartz in thin drawn-out veinlets; no sulphide minerals were observed. Thickness: Min. 6 m
FELSIC SEDIMENTARY ROCKS (rusty)	Light grey to dark green, very fine grained; very well foliated, laminated to thin bedded; tough, siliceous, deformed plagioclase-rich, 5 to 10% very fine grained biotite; 5 to 10% very fine grained hornblende usually concentrated in layers; magnetic; up to 20% (average 5 to 10%) pyrrhotite, trace pyrite, (chalcopyrite), rare arsenopyrite in fine grained aggregates forming streaks along foliation planes; rare quartz veinlets5 cm wide, discontinuous, associated with irregular chlorite blebs; small-scale recumbent folding, fold axes225°/45°N, limbs 005°/75°S and230°/55°/75°N, hairline fractures along fold axes that may be marked by mm-wide quartz veinlets, drag folds. Thickness: 0 to 35 m
FELSIC SEDIMENTARY ROCKS	Light grey, creamy to pinkish, very fine grained; poor to moderate foliation; very tough, siliceous; magnetic due to very fine grained disseminated magnetite; rare vugs contain2 mm dark blue- grey magnetite octahedra, quartz crystals, and fine grained chlorite. Thickness: 8 m
INTERMEDIATE (TO MAFIC) SEDIMENTARY ROCKS	Light to medium grey, very fine grained; well bedded and foliated; siliceous, biotitic, plagioclase-bearing; more mafic beds may contain hornblende or chloritized hornblende imparting mottled greenish colouration; minor quartz veinlets commonly subparallel to bedding with chlorite envelopes or included patches. Thickness: 0.91 m
MAFIC SEDIMENTARY ROCKS	Dark green, very fine grained; moderately foliated, biotitic, hornblendic(may be partially to wholly altered to chlorite), may be silicified. Thickness: 20 to 282 m
GREYWACKE	Dark greyish-green, very fine- to fine-grained; moderate foliation; 25% felsic clasts, average1 x 5 mm; 35% mafic clasts in streaks, average 1 to 2 cm long; 5 to 10%, 1 mm plagioclase; 40% dark greenish brown, very fine grained matrix. Thickness: 76 m
GRANITE	Salmon pink, fine- to medium-grained; well defined quartz foliation(265°/60°N); 20 to 25% quartz in clear foliated blebs, up to 1 x 10 mm, average 7 mm long; 70% subhedral feldspars, average 1 mm, K-feldspar and plagioclase. Thickness: 30 to 215 m on north shore of lake

Table 35-2
Au contents of rock samples from the Reservoir Lake area, Foster Lake; samples collected in 1986. Sample locations are shown in Figure 35-1.

Sample No.	Au (ppb)
1218	30
1225	587
1226	2
1229	3
1235	16
1238	13
1239	4
1240	53
1243	1
1244	1

Fedikow, M.A.F., Ferreira, K.J. and Baldwin, D.A.
1991: The Johnson shear zone: a regional metallogenetic feature in the Lynn Lake area; Manitoba Energy and Mines, Mineral Deposit Thematic Map Series, Map 91-1, 1:50 000.

Ferreira, K.J.
1986: Geological investigations in the Foster Lake-Wasekwan Lake area; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities 1986, p. 13-17.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Mineral Inventory Card 64C/15 Au4
Manitoba Energy and Mines, Geological Services Branch.

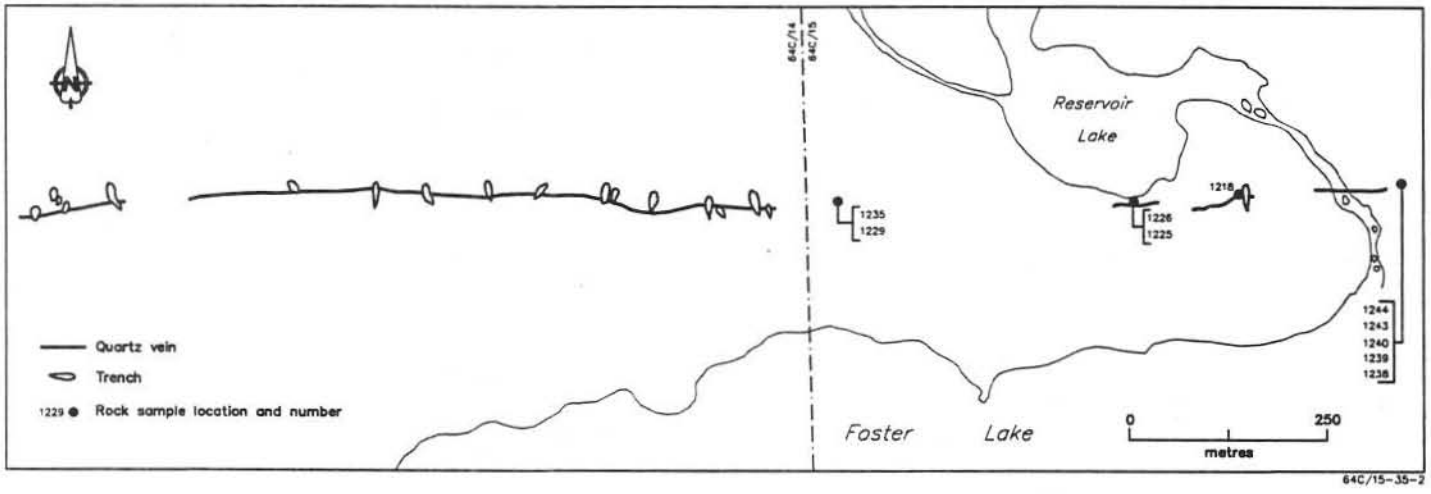
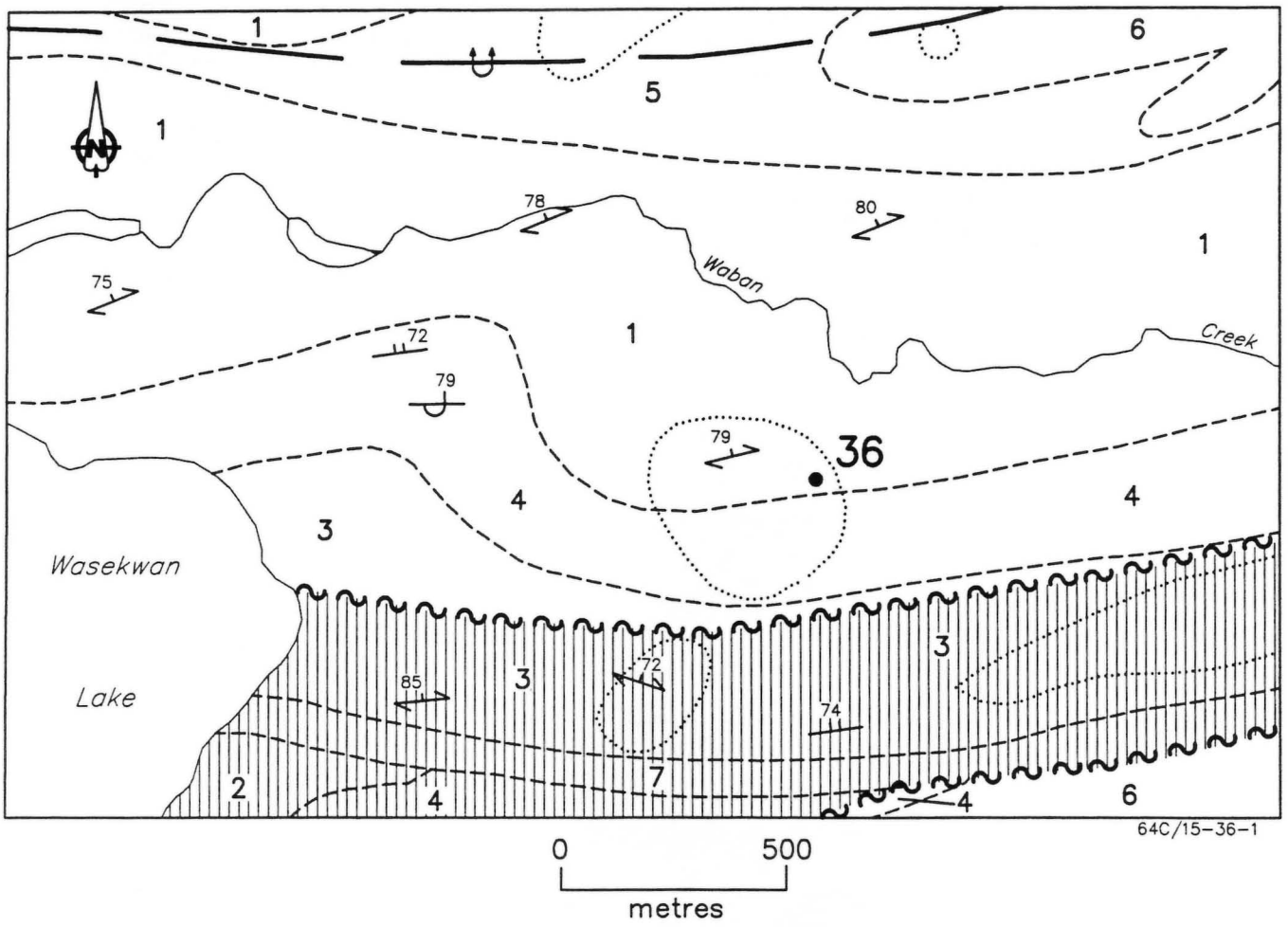


Figure 35-2: Sample locations for data presented in Table 35-2.



Intrusions

7 Granite, granodiorite

6 Diorite, quartz diorite; hornblende–biotite tonalite

5 Gabbro, diabase

Wasekwan Group

4 Pebbly greywacke, paraconglomerate; hornblende greywacke, siltstone; mafic mudstone

3 Massive porphyritic and aphyric basalt and andesite; mafic tuff

2 Porphyritic and aphyric basalt

1 Massive and pillowed basalt

------- Geological boundary (approximate)

79 Foliation, tops known (inclined)

79 72 Bedding, tops known (overturned, inclined)

Anticline

Johnson Shear zone

Geology after Gilbert, Syme (1980).

..... Outcrop

36 • Mineral occurrence (approximate)

Figure 36-1: Geological setting of occurrence 36 (after Gilbert et al., 1980).

LOCATION: **36**

NAME: Central Manitoba; CL
UTM: 6291672N/383477E
ACCESS: Traverse from mine road to site of BT deposit

AREA: 1.1 km east of Wasekwan Lake (Fig. 36-1)
AIRPHOTO: A23828-114

EXPLORATION SUMMARY:

The C.L. claims were staked by Central Manitoba Mines, Limited in 1939. Gold was discovered on claim C.L. 7, and five trenches were blasted to explore the discovery. SGM optioned the property and drilled ten holes (details not reported) to explore this discovery in 1940 (Bateman, 1945; Milligan, 1960). The C.L. claims were grouped with other claims in the area and consolidated under Lasthope Lake Gold Mines Limited, a SGM subsidiary (Milligan, 1960, p. 248).

Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5 in 1954 (A.F. 91615). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). Sherritt Gordon Mines Limited conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Mattagami Lake Mines Limited conducted an airborne INPUT and magnetometer survey in 1973 (A.F. 91826). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976. Early exploration history is detailed in Mineral Inventory Card 64C/15 Au2.

GEOLOGICAL SETTING:

The area is underlain by interlayered Wasekwan Group sedimentary and volcanic rocks (Fig. 36-1; Gilbert *et al.*, 1980). The lithologies from south to north are hornblende greywacke, thin bedded siltstone, mafic volcanic flows, intermediate tuff and hornblende siltstone that are intruded by an albitite dyke (Fig. 36-2). Graded bedding in the sedimentary rocks show the sequence is oriented 270°/58°-80°N and tops north. Isoclinal folds that strike approximately 260° cause repetition in stratigraphy. Further evidence of deformation includes variation in the dip of foliation in the area; minor fold axes and drag folds that indicate recumbent synclines; discontinuous quartz veinlets along foliation near these fold noses; variability in the intensity of foliation within single rock units; small *en echelon* faults at high angles to fold axes that offset bedding on the scale of a couple centimetres; and minor carbonatization in mafic flows, especially in areas with known minor fold axes. It is interpreted that the albitite dyke was emplaced along the axis of an isoclinal fold. The albitite dyke weathers cream with rusty pink mottling or, rarely, a cinnamon colour due to iron carbonate. It is very fine grained, massive, composed of equigranular albite and quartz with a saccharoidal texture. The dyke is highly fractured; orientations of fractures in trenches include 255°/83°, 225°/80°, 155°/85°, 247°/47°, 188°/85°, and 205°/88°. Rare pegmatitic segregations comprise quartz ± albite ± muscovite ± pyrrhotite. The dyke is approximately 6 m wide (K. Ferreira, unpublished data, 1986).

MINERALIZATION:

The albitite dyke contains up to 8%, generally 1 to 5%, very fine to fine grained, disseminated pyrrhotite. Pegmatitic segregations exhibit a local increase in the grain size of pyrrhotite, but not an increase in the amount of mineralization (K. Ferreira, unpublished data, 1986). Quartz fracture fillings contain galena, traces of pyrite and sphalerite, and gold (Bateman, 1945).

GEOCHEMICAL DATA:

Weathered surface samples "indicated commercial quantities of gold" over an average width of 6.1 m and strike length of 131.2 m. Drill core assays were "reported to be disappointingly low in gold" (Bateman, 1945). A grab sample of vein material chosen for high galena content assayed 2.49% Pb, 4.5 g/t Au, and 193.7 g/t Ag (Bateman, 1945, p. 29).

CLASSIFICATION:

Vein type deposit; multiple veins or lenses.

REFERENCES:

Assessment Files 91615, 91616, 91622, 91679, 91699, 91826, 91989, 91992
Manitoba Energy and Mines, Mines Branch.

Bateman, J.D.
1945: McVeigh Lake area, Manitoba; Geological Survey of Canada, Paper 45-14, 34p.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

Mineral Inventory Card 64C/15 Au2
Manitoba Energy and Mines, Geological Services Branch.

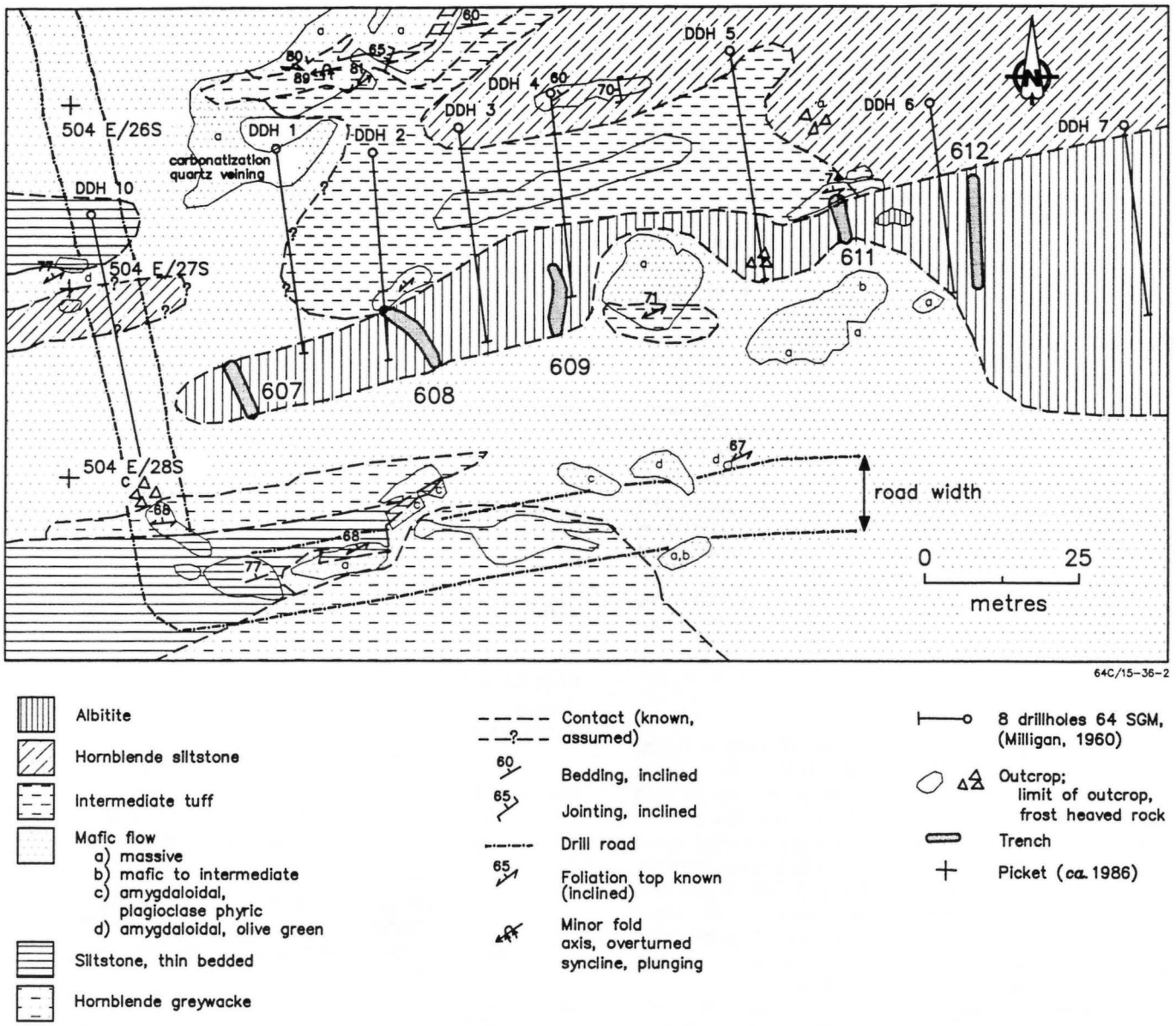


Figure 36-2: Detailed geology, and trench and drillhole locations at occurrence 36 (K. Ferreira, unpublished data, 1986).

LOCATION: **37**

NAME:
UTM: 6298783N/393525E
ACCESS: Provincial Road 391 and traverse.

AREA: Approximately 3 km northwest of Norrie Lake
AIRPHOTO: A24297-50

EXPLORATION SUMMARY:

International Nickel Company of Canada, Limited conducted a geological mapping program (1:4800) over the LC claim group in 1948 (A.F. 91045). Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5 in 1954 (A.F. 91615). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). Selco Exploration Company Limited conducted an airborne EM survey over Airborne Permit 31 in 1960 (A.F. 91626). Sherritt Gordon Mines Limited conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

GEOLOGICAL SETTING:

The area is underlain by a pre-Sickle mafic to ultramafic intrusion that is ovoid in plan view. The intrusion is surrounded by basalt and felsic to intermediate intrusive rocks (Fig. 37-1; Gilbert *et al.*, 1980).

MINERALIZATION:

Up to 1% pyrite and trace chalcopyrite occur in fine- to medium-grained diorite at location 37 and site A (Milligan, 1960, p. 280, 281; Baldwin *et al.*, 1985; D. Parbery, field notes, 1985).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 91045, 91615, 91616, 91622, 91626, 91679, 91699, 91989, 91992
Manitoba Energy and Mines, Mines Branch.

Baldwin, D.A., Parbery, D., Boden, S. and Michielsen, A.
1985: Mineral deposit studies in the Lynn Lake and Barrington Lake areas; **in** Manitoba Energy and Mines, Report of Field Activities 1985, p. 20-28.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

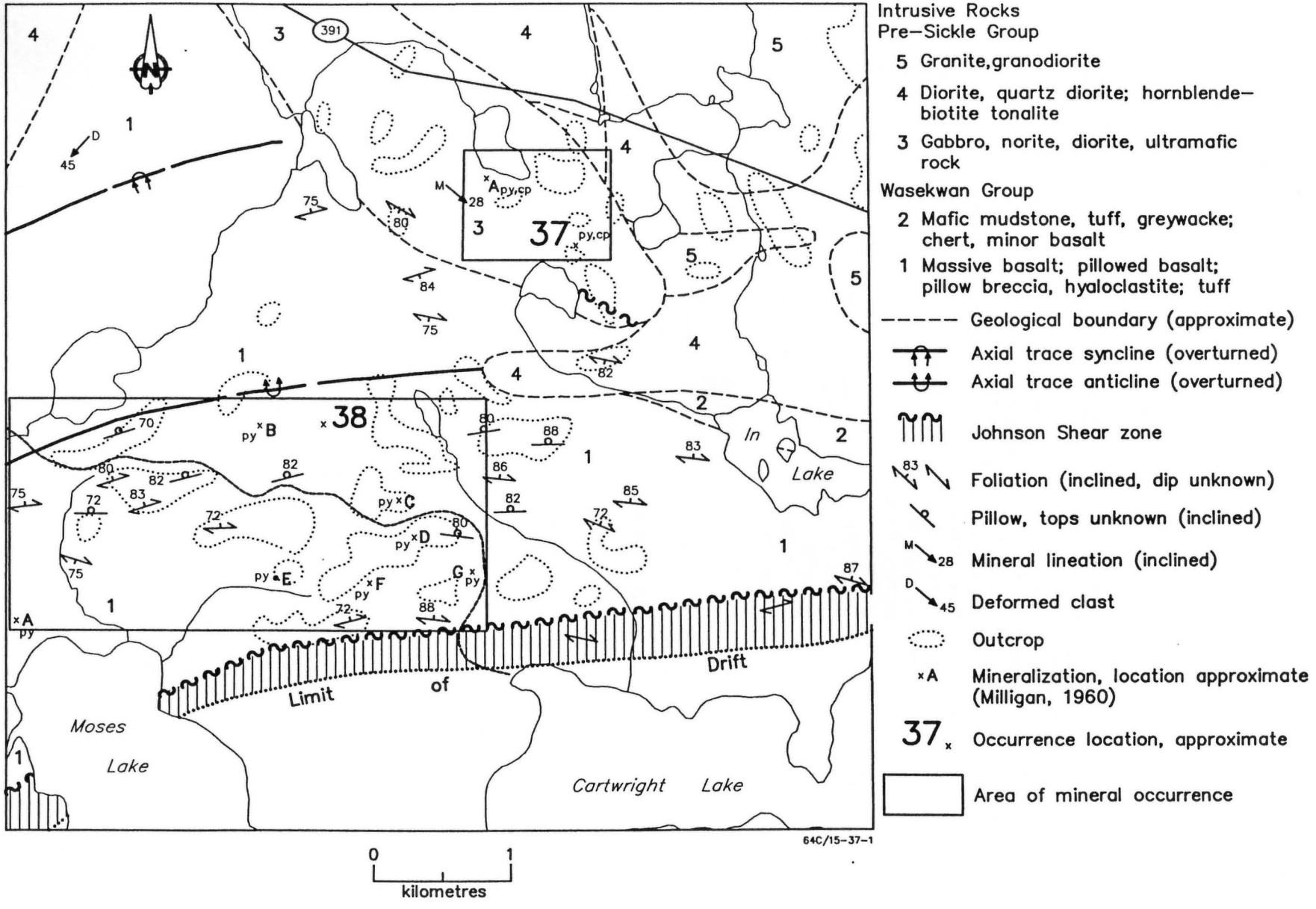


Figure 37-1: Geological setting of occurrences 37 and 38.

LOCATION: **38**

NAME:
UTM: 6297413N/391676E
ACCESS: Traverse from Provincial Road 391, or by boat on Cockeram and Moses lakes from Provincial Road 391 and traverse

AREA: Northeast of Moses Lake, northwest of Cartwright Lake (Fig. 37-1)
AIRPHOTO: A24297-48, -49; A24299-117

EXPLORATION SUMMARY:

Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5 in 1954 (A.F. 91615). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). Selco Exploration Company Limited conducted an airborne EM survey over Airborne Permit 31 in 1960 (A.F. 91626). Sherritt Gordon Mines Limited conducted an aeromagnetic survey over Airborne Permit 17, which covers part of the area of this location, from 1957 to 1961 (A.F. 91622). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Mattagami Lake Mines Limited conducted an airborne INPUT and magnetometer survey in 1973 (A.F. 91826). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

GEOLOGICAL SETTING:

The area in underlain by Wasekwan Group pillowed and massive basalt (Fig. 37-1; Gilbert *et al.*, 1980).

MINERALIZATION:

Milligan (1960, p. 281) notes "Some pyrite in 'dacite porphyry' interbedded with pillowed and amygdaloidal flows".

Seven other mineralized sites, labelled A to G on Figure 37-1, are described by Milligan (1960, p. 280, 281):

A) "With quartz in greenstone";
B) "Some scattered pyrite in fine grained volcanics - pillowed";
C) "Sulphides in 'faults' in pillowed, massive and amygdaloidal lavas";
D) "Some fine grained pyrite";
E) "Sulphides in fine grained (chilled?) diorite or greenstone";
F) "Small grains pyrite in greenstone";
G) "Few scattered grains pyrite and pyrrhotite in greenstone".

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

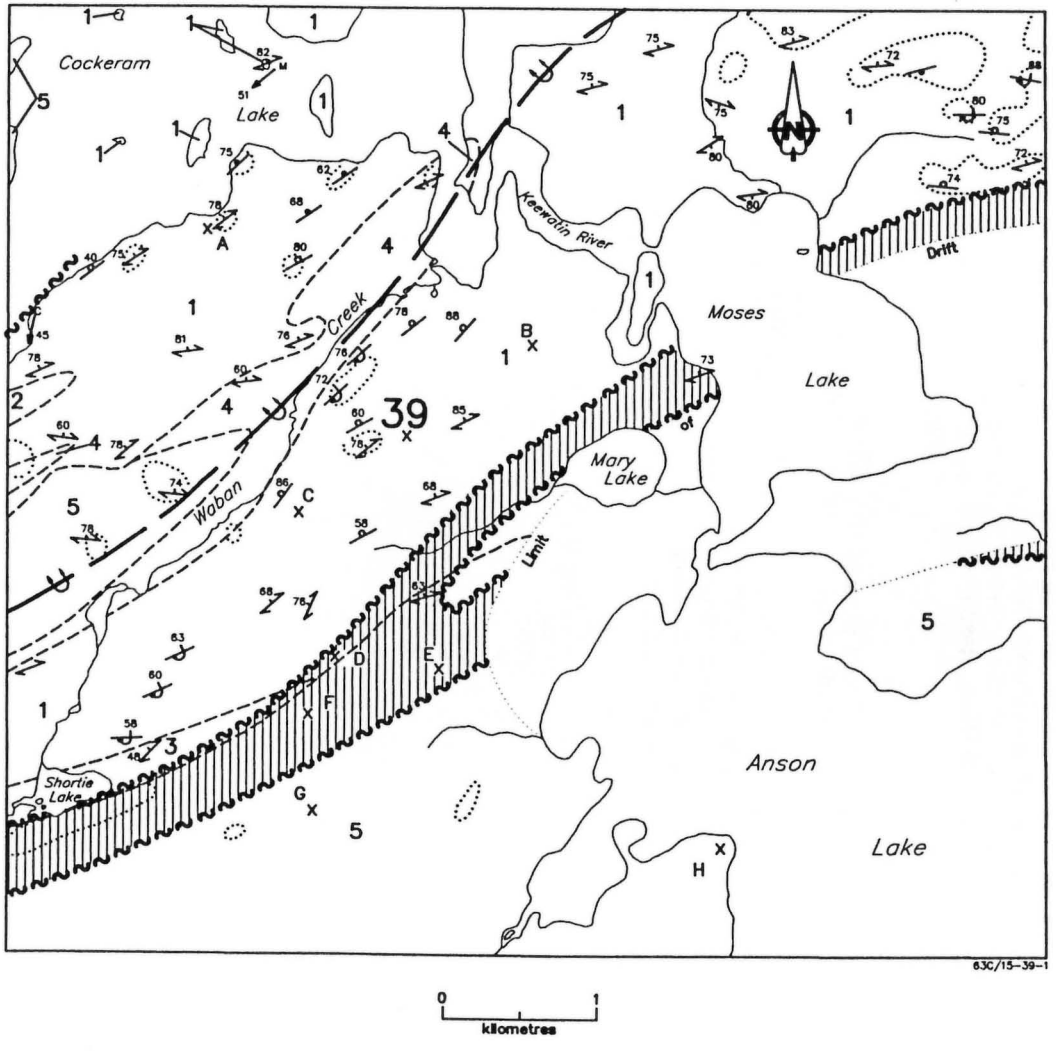
Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 91615, 91616, 91622, 91626, 91679, 91699, 91826, 91989, 91992
Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960:
Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.



Intrusive Rocks

5 Diorite, quartz diorite; hornblende–biotite tonalite

4 Gabbro, diabase

Wasekwan Group

3 Hornblende greywacke, siltstone

2 Porphyritic basalt, massive

1 Aphyric basalt, massive pillowed

Geological boundary (approximate)

Axial trace of anticline (overturned)

Johnson Shear zone

Pillows, tops known (inclined, overturned, dip unknown)

Pillows, tops unknown (inclined, dip unknown)

Foliation (inclined, dip unknown)

Mineral lineation (inclined)

Microcrenulation (inclined)

Outcrop

Mineralization, location approximate (Milligan, 1960)

Occurrence location, approximate

Figure 39-1: Geological setting of occurrence 39.

LOCATION: **39**

NAME:
UTM: 6294301N/387656E
ACCESS: By boat on Cockeram and Anson lakes from Provincial Road 391, and traverse

AREA: Between Cockeram Lake and Anson Lake
AIRPHOTO: A23828-132, -115

EXPLORATION SUMMARY:

Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5 in 1954 (A.F. 91615). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). Sherritt Gordon Mines Limited conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Mattagami Lake Mines Limited conducted an airborne INPUT and magnetometer survey in 1973 (A.F. 91826). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

GEOLOGICAL SETTING:

The area is underlain by Wasekwan Group pillowed and massive basalt, and lesser greywacke, siltstone and mudstone. Gabbro and intermediate intrusive rocks are exposed along the axis of an overturned anticline that strikes northeasterly through the area. The Johnson Shear Zone strikes east-northeasterly through the area (Fig. 39-1; Gilbert *et al.*, 1980).

MINERALIZATION:

Milligan (1960, p. 281) notes "'Much pyrite' in sediments or tuffs and quartz stringers interbedded with greenstone. Quartz is perpendicular to foliation in greenstone. 'Several well sheared zones, and quartz and sulphide throughout this area."

Eight other mineralized sites, labelled A to H on Figure 39-1, are described by Milligan (1960, p. 280, 281):

(A) "Quartz veins up to 2' (0.6 m) with 'fairly extensive rust zone associated - but no sulphides visible', cutting greenstone (and gabbro?);"
(B) "Some sulphides in schistose greenstone (small amounts);"
(C) "'Some pyrrhotite' in fine grained pillowed lavas;"
(D) "Pyrite and some magnetite in tuffs;"
(E) "'Crystals of pyrite scattered through'. Cleavage planes rusted. In siliceous Wasekwan sediments. Considerable magnetite in small crystals;"
(F) "Some grains pyrite in sediments, tuffs, and some flows;"
(G) "Some quartz and sulphides in greenstone cut by granite dykes. There is also rust in several large quartz veins;"
(H) "Scattered cubes of pyrite in granite."

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

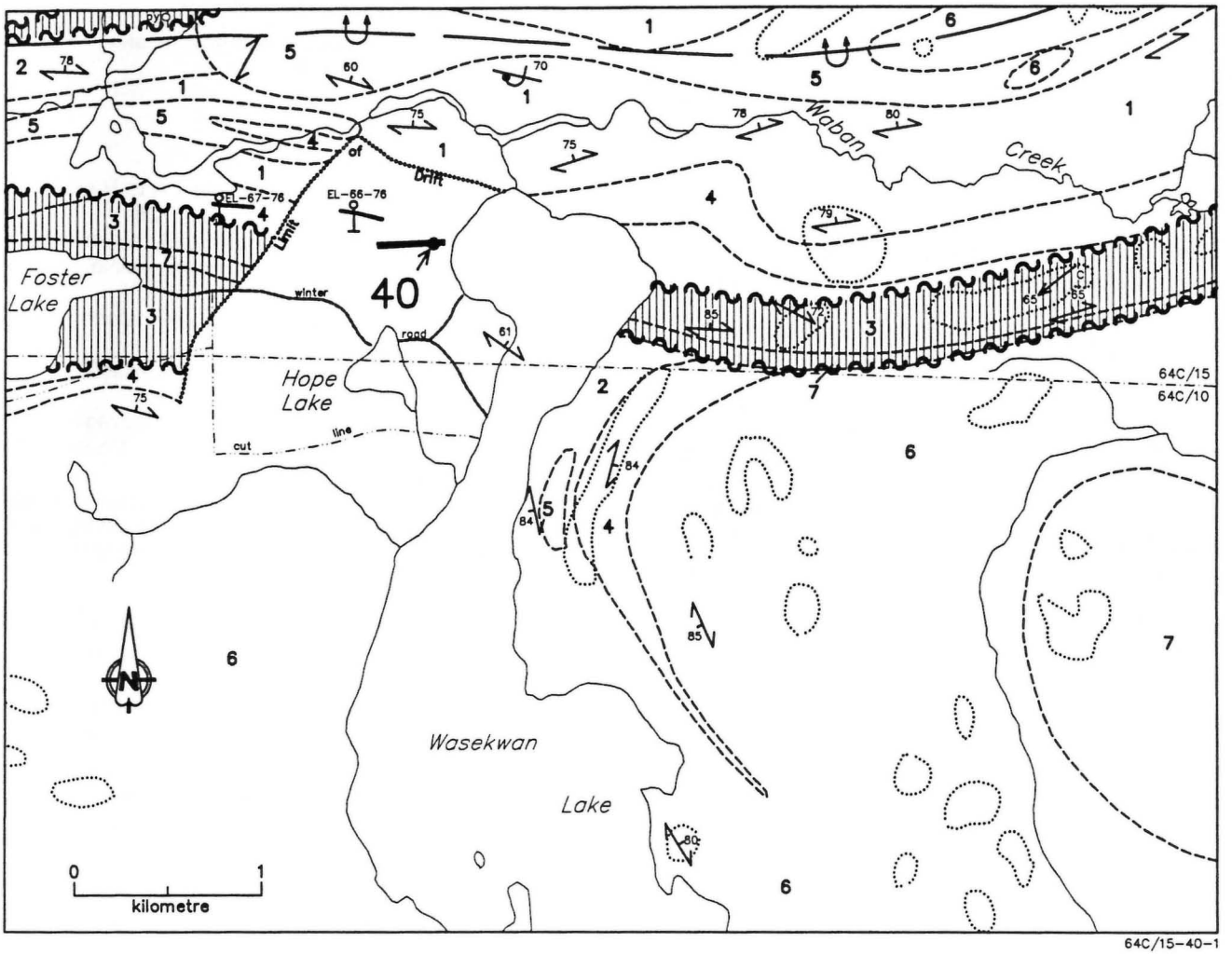
Disseminated mineralization - not classified. Milligan (1960) does not make reference to the Johnson Shear Zone in the brief descriptions of these minor sites of mineralization; it is likely that at least some of these sites may be related to this major structure.

REFERENCES:

Assessment Files 91615, 91616, 91622, 91679, 91699, 91826, 91989, 91992
Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.



Intrusive Rocks

7 Granite, granodiorite

6 Diorite, quartz diorite; hornblende–biotite tonalite

5 Gabbro, diabase

Wasekwan Group

4 Hornblende greywacke, siltstone, mafic mudstone

3 Massive porphyritic and aphyric basalt and andesite, mafic tuff

2 Porphyritic basalt, autoclastic breccia, massive pillowed

1 Aphyric basalt, massive pillowed

Geological boundary (approximate)

Johnson Shear zone

Axial trace of anticline (overturned)

Pillows, tops known (inclined)

Foliation (inclined, dip unknown)

Outcrop

EM conductor (A.F. 90992)

Drillhole (A.F. 90992)

Microcrenulation (inclined)

Mineralization

40 Deposit location

Figure 40-1: Geological setting of the T1A zone (location 40)(Gilbert et al., 1980).

LOCATION: **40**

NAME: T1A Zone
UTM: 6291637N/381206E
ACCESS: Burnt Timber mine road

AREA: Northwest shore of Wasekwan Lake
AIRPHOTO: A23828-79

EXPLORATION SUMMARY:

SGM carried out a geological mapping survey (1:6000) on the Faust claims between Foster and Wasekwan lakes in 1945 (A.F. 90992).

Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5 in 1954 (A.F. 91615). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). Sherritt Gordon Mines Limited conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Mattagami Lake Mines Limited conducted an airborne INPUT and magnetometer survey in 1973 (A.F. 91826). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

Granges Exploration Aktiebolag drilled DDH EL-66-77 and EL-67-77 (total 106 m) on CB 7269 in 1977 (A.F. 92699).

GEOLOGICAL SETTING:

The area of the deposit is covered by overburden. Nearby rocks include Wasekwan Group massive basalt, greywacke, siltstone and mudstone, mafic tuff, and a granite sill (Fig. 40-1). The area is part of the Johnson Shear Zone (Gilbert *et al.*, 1980). A unit of quartz-feldspar porphyry, 23 m thick and 200 m long, with 5 to 30% white feldspar crystals up to 8 mm in length in a grey siliceous matrix was intersected in drill core at the T1A zone (Fedikow *et al.*, 1991). Other lithologies and alteration in drill core are similar to those mapped at Location 35. The talc, carbonate, clay and sericite(?) schist observed south of Reservoir Lake was also intersected by drillholes at the T1A zone.

Drillholes EL-66-77 and EL-67-77 intersected quartz-biotite-chlorite schist and chlorite-biotite-quartz-hornblende schist (A.F. 92699).

MINERALIZATION:

Pyrrhotite is generally present in amounts of 1 to 5%, but locally concentrated up to 20%, in quartz porphyry, the altered schist, and brecciated porphyry and felsic sedimentary rocks (Fig. 40-2). Pyrrhotite is accompanied by trace amounts of pyrite and chalcopyrite, and rare arsenopyrite. Sulphide minerals occur as disseminations and fine grained aggregates that form streaks on foliation planes. Deformed sulphide-bearing felsic rock occurs as lenses in intermediate rocks. Quartz vein(let)s contain up to 10% disseminated sulphide and rare visible gold.

From DDH EL-66-77, chlorite-biotite-quartz-hornblende schist, 2.9 m (core length), contained 10 to 15% pyrrhotite, 1 to 3% pyrite and minor graphite. The first 7.2 m of quartz-biotite-chlorite schist directly down the hole from the mineralized zone contained 10% pyrrhotite, ≤1% pyrite and traces of chalcopyrite. DDH EL-67-77 intersected two mineralized sections in quartz-chlorite-biotite schist: (1) 10% pyrite and 5% pyrrhotite bands over 0.9 m and (2) 15 to 20% pyrite, minor pyrrhotite, and minor graphite over 2.4 m (A.F. 92699).

GEOCHEMICAL DATA:

The T1A zone contains geological resources of 260 000 tonnes grading 1.9 g/t Au (Granduc Mining Corporation, 1995 Annual Report).

Four drill core samples from DDH EL-66-77 assayed 0.02-0.03% Cu, 0.01-0.02% Zn, 0.001-0.024 (oz/ton?) Au, and 0.01-0.29 (oz/ton?) Ag. Two drill core samples from DDH EL-67-77 assayed 0.01% Cu, 0.01-0.02% Zn, 0.001-0.021 (oz/ton?) Au, and 0.01-0.08 (oz/ton?) Ag (A.F. 92699).

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. Mineralized breccia zones, quartz veinlets, quartz porphyry, and structural deformation related to the Johnson Shear Zone are common to both the BT (Location 6) and T1A zone deposits.

REFERENCES:

Assessment Files 90992, 91615, 91616, 91622, 91679, 91699, 91826, 91989, 91992, 92699
Manitoba Energy and Mines, Mines Branch.

Bamburak, J.D.
1990: Metallic mines and mineral deposits of Manitoba; Manitoba Energy and Mines, Open File Report OF90-2, 105p.

Fedikow, M.A.F., Ferreira, K.J. and Baldwin, D.A.
1991: The Johnson shear zone: a regional metallogenetic feature in the Lynn Lake area; Manitoba Energy and Mines, Mineral Deposit Thematic Map Series, Map 91-1, 1:50 000.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

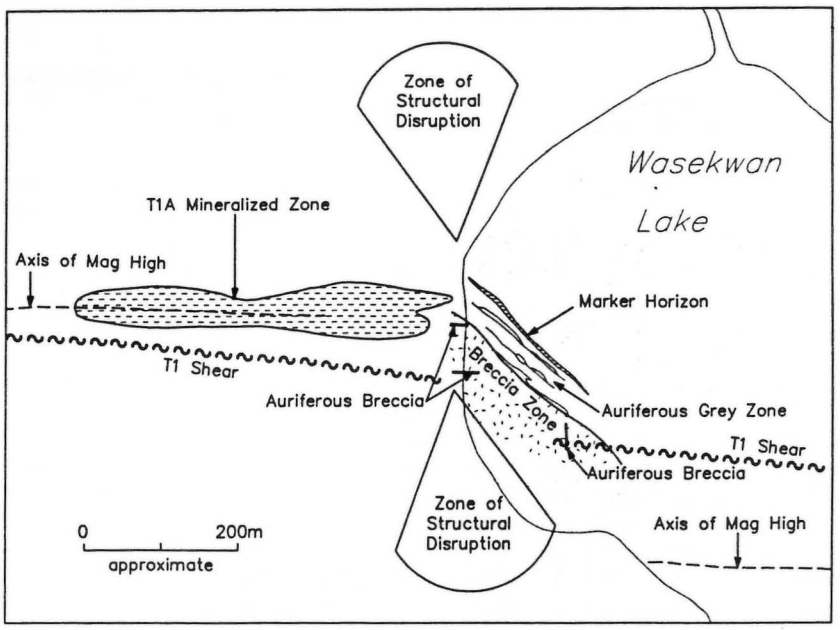


Figure 40-2: Schematic map of area of T1A zone (location 40) projected to 45 m below surface. Wedges representing the zone of structural disruption illustrate the range of possible orientations. Correlation of auriferous breccia is uncertain. Courtesy of SherrGold Inc.

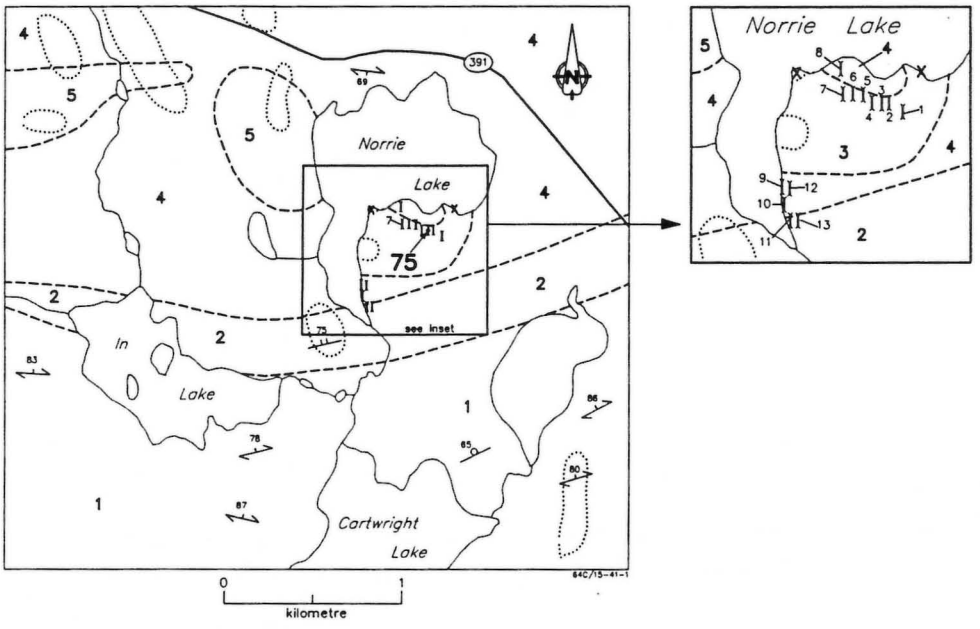


Figure 41-1: Geological setting of occurrence 41.

LOCATION: **41**

NAME:
UTM: 6298013N/396540E
ACCESS: Traverse 1 km southwest from Provincial Road 391

AREA: South shore of Norrie Lake (Fig. 41-1)
AIRPHOTO: A24299-89

EXPLORATION SUMMARY:

Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5 in 1954 (A.F. 91615). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). Sherritt Gordon Mines Limited conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Selco Exploration Company Limited conducted an airborne EM survey over Airborne Permit 31 in 1960 (A.F. 91626). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Mattagami Lake Mines Limited conducted an airborne INPUT and magnetometer survey in 1973 (A.F. 91826). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

George Yourchek excavated thirteen small trenches along the south shore of Norrie Lake in 1976 (A.F. 92014). SGM conducted a magnetometer survey in 1979 and an IP survey in 1980 over CB 9500 (A.F. 92589).

GEOLOGICAL SETTING:

The area is underlain by pre-Sickle gabbro, hornblende-biotite tonalite, and quartz diorite. Granite occurs northwest of Norrie Lake, and the area to the south is underlain by basalt tuff, mafic mudstone and chert (Gilbert *et al.*, 1980; Fig. 41-1).

MINERALIZATION:

Gabbro, hornblendite and minor diorite with local traces of pyrite, pyrrhotite and chalcopyrite along fracture planes underlie the southeastern shore of Norrie Lake (A.F. 92014). Up to 2% disseminated pyrite and magnetite and trace chalcopyrite are exposed in some trenches and in outcrop (Baldwin *et al.*, 1985).

GEOCHEMICAL DATA:

G. Yourchek collected two lake-bottom mud samples from Norrie Lake in 1976; these samples "did not carry anything of value". The best grab samples from the trenches contained 0.03 and 0.05% Cu and 0.05 and 0.09% Ni (A.F. 92014).

CLASSIFICATION:

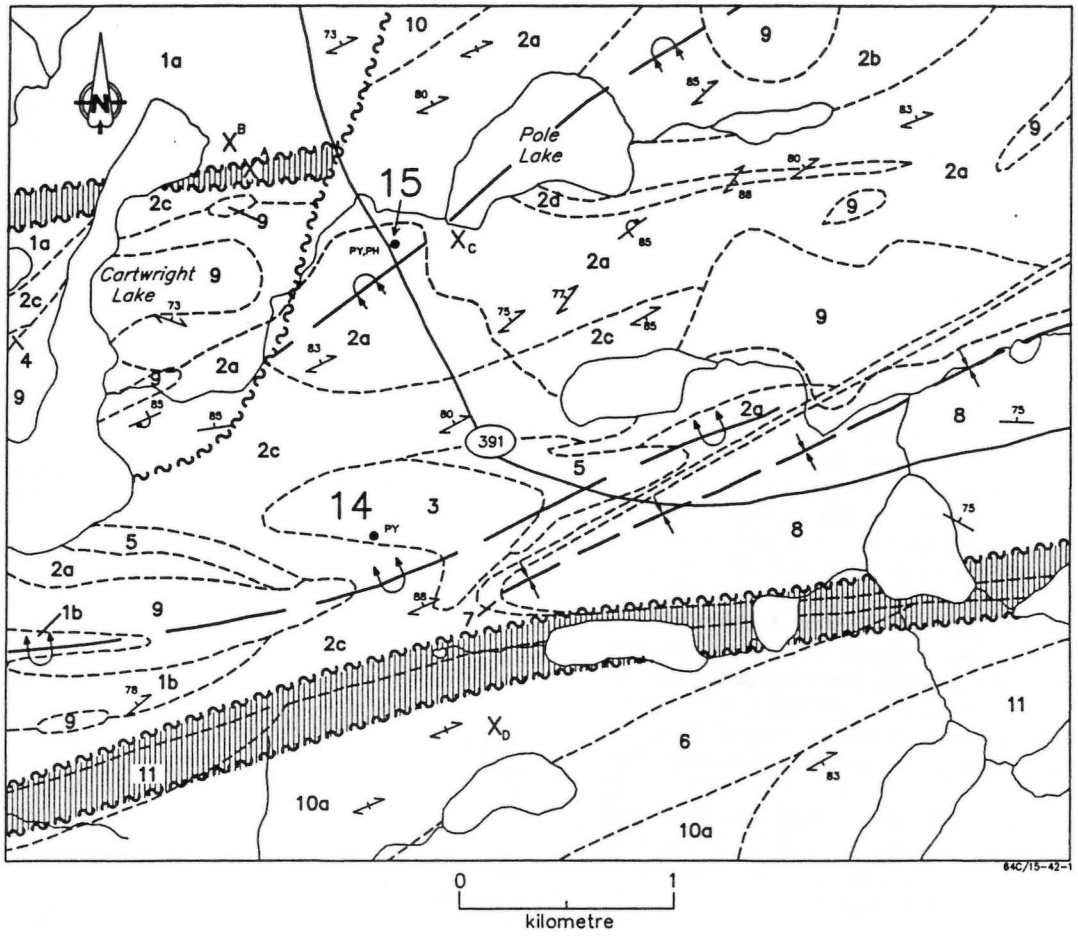
Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 91615, 91616, 91622, 91626, 91679, 91699, 91826, 91989, 91992, 92014, 92589
Manitoba Energy and Mines, Mines Branch.

Baldwin, D.A., Parbery, D., Boden, S. and Michielsen, A.
1985: Mineral deposit studies in the Lynn Lake and Barrington Lake areas; **in** Manitoba Energy and Mines, Report of Field Activities 1985, p. 20-28.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.



Pre–Sickle Intrusions

- 11 Granite, granodiorite
- 10 Diorite, quartz diorite, tonalite
- 9 Hornblende diorite, quartz diorite

Sickle Group

- 8 Arkosic sandstone, pebbly sandstone
- 7 Conglomerate, arkose matrix

Sickle or Wasekwan Group

- 6 Conglomerate, hornblende greywacke matrix

Wasekwan Group

- 5 Biotite, greywacke, siltstone, mudstone
- 4 Polymictic volcanic breccia, conglomerate
- 3 Massive porphyritic rhyolite
- 2 Intermediate and felsic volcanic rocks
  - a) andesite
  - b) porphyritic dacite
  - c) pillow breccia, hyaloclastite
  - d) pyroclastic breccia
- 1 Aphyric basalt

Geological boundary (approximate)

Foliation (inclined, vertical)

Bedding, tops known (inclined)

Pillows, tops known (overturned)

Anticline (overturned)

Syncline (upright, overturned)

Johnson Shear zone

Geology after Gilbert, Syme (1980).

391 Road

X_D Mineralization occurrence (Milligan, 1960)

14 • Occurrence location

Figure 42-1: Geological setting of occurrence 42 and 43.

LOCATION: **42**

NAME:
UTM: 6295936N/398791E
ACCESS: Provincial Road 391

AREA: 400 m southeast of Pole Lake (Fig. 42-1)
AIRPHOTO: A24299-88

EXPLORATION SUMMARY:

Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5 in 1954 (A.F. 91615). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). Sherritt Gordon Mines Limited conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Selco Exploration Company Limited conducted an airborne EM survey over Airborne Permit 31 in 1960 (A.F. 91626). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

GEOLOGICAL SETTING:

The area is underlain by a small unit of pre-Sickle hornblende diorite, in contact with Wasekwan Group intermediate and felsic volcanic rocks near the axis of an overturned syncline (Fig. 42-1; Gilbert *et al.*, 1980). An outcrop of hornblende diorite is exposed along Provincial Road 391 near Pole Lake. Four sets of fractures (094°/60°S, 061°/50°S, 332°/82°W and 358°/68°E) and four narrow shear zones approximately 1 m wide (228°/75°N, 239°/75°-90°, 231°/76°N and 234°/68°N) cut the diorite. The shear zones strike approximately parallel to the axis of the overturned syncline. The diorite is finer grained toward the centre of the shear zones and relict hornblende crystals are visible in all but the most strongly foliated rock. The central portions of the zones are chloritic and have slaty cleavage. Boundaries between sheared and unsheared rocks are sharp. Some of the fractures and sheared zones are filled with quartz and pyrite, <2 cm thick, generally ≈5 mm thick. One fracture is filled with quartz, calcite, chlorite, hornblende, albite, epidote(?) and sulphide minerals.

MINERALIZATION:

Pyrite occurs as very fine grained disseminations and as cubic crystals up to 5 mm. (Milligan, 1960, p. 284, noted crystals up to 1.3 cm.). Pyrrhotite and traces of chalcopyrite form fine grained masses in diorite. The total sulphide content is approximately 3%. The amount and grain size of the sulphides increase adjacent to fractures and shears. Within one of the shear zones, pyrite has an unusual distinctly orthorhombic shape (Ferreira and Baldwin, 1984; K. Ferreira, unpublished data, 1984).

Milligan (1960, p. 284) notes mineralization at sites A and B shown on Figure 42-1: (A) "Scattered pyrite in acid lavas" and (B) "Some shearing and rust".

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified. Disseminated sulphide minerals occur in fractures and shears in hornblende diorite.

REFERENCES:

Assessment Files 91615, 91616, 91622, 91626, 91679, 91699, 91989, 91992
Manitoba Energy and Mines, Mines Branch.

Ferreira, K.J. and Baldwin, D.A.
1984: Mineral deposit documentation in the Lynn Lake area; **in** Manitoba Energy and Mines, Mineral Resources Division, Report of Field Activities 1984, p. 12-16.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

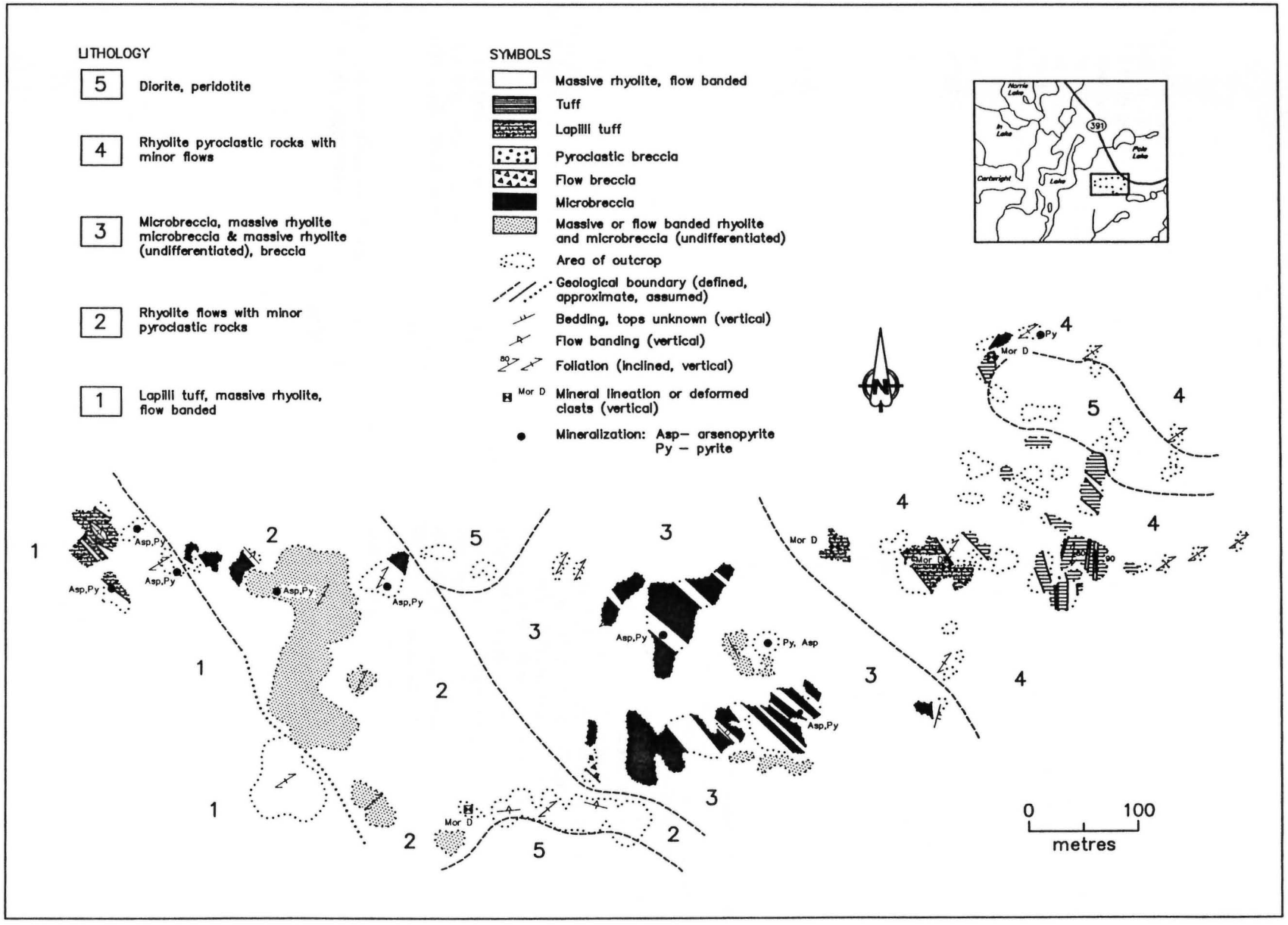


Figure 43-1: Detailed geology of the Cartwright Lake rhyolite (Baldwin, 1983).

LOCATION: **43**

NAME:
UTM: 6294641N/398658E
ACCESS: Traverse 600 m southwest from Provincial Road 391

AREA: East of Cartwright Lake (Fig. 42-1)
AIRPHOTO: A24299-87

EXPLORATION SUMMARY:

East Lynn Mines Limited carried out a magnetometer survey on the Gap claims in 1947 (A.F. 91352).

Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5 in 1954 (A.F. 91615). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). Sherritt Gordon Mines Limited conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Selco Exploration Company Limited conducted an airborne EM survey over Airborne Permit 31 in 1960 (A.F. 91626). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976. SGM carried out "extensive" exploration in the mid-1980's (Peck *et al.*, 1995).

GEOLOGICAL SETTING:

The area is underlain by the Cartwright Lake Rhyolite, folded in the hinge of a northeast-trending overturned anticline with intermediate tuff and lapilli tuff, pebbly greywacke, siltstone, and mudstone (Gilbert *et al.*, 1980; Fig. 42-1). The Cartwright Lake Rhyolite is approximately 500 m by 1300 m in plan. It comprises a lower division of massive and flow banded rhyolite and microbreccia (Baldwin's units 1 and 2, Fig. 43-1; Peck *et al.*'s units 1c and 1d, Fig. 43-2) and an upper division of stratified massive porphyritic rhyolite flows and sills, microbreccia, felsic tuff, lapilli tuff and tuff breccia (Baldwin's units 3 and 4, Fig. 43-1; Peck *et al.*'s units 1b and 1a, Fig. 43-2). Top criteria from graded beds (Baldwin, unpublished notes, 1983; Peck *et al.*, 1995) and ripple marks in fine grained, thinly laminated, felsic tuff in the eastern part of the rhyolite indicate that the rhyolite youngs to the northeast (Baldwin, unpublished notes, 1983). Minor pre-Sickle coarse grained diorite and gabbro intrude the rhyolite. A spaced cleavage (S_2) associated with late open northeast-trending folds is developed locally (Peck *et al.*, 1995); spacing between cleavage planes is generally 1 to 2 cm apart, locally only a few millimetres apart (Baldwin, 1983). This cleavage and rare, west-trending, discontinuous mylonite zones, 2 to 5 m wide, possibly reflect proximity to the Johnson Shear Zone (Peck *et al.*, 1995). Irregular, medium- to coarse-grained, milky white quartz veins up to 1 m wide and rare, irregular pink weathering granitic stringers are barren of sulphides.

MINERALIZATION:

Pyrite and arsenopyrite,<1 to 5%, occur as smears or coatings ("veins", Peck *et al.*, 1995) on shear surfaces in massive sections of the Cartwright Lake Rhyolite (Baldwin, 1983). The shear zones parallel regional foliation, are oblique to layering and do not crosscut lithologic contacts. The mineralized zones are up to a few metres wide, rusty weathered, and consist of mineralized shear planes generally <2 mm thick, a few centimetres long, 1 to 2 cm apart, locally only a few millimetres apart (Baldwin, 1983). The zones lack lateral continuity (Peck *et al.*, 1995). Local fracture fillings within shear zones contain thin, planar to irregular, fine grained quartz-carbonate-feldspar stringers with fine grained pyrite and rare arsenopyrite. Pyrite and arsenopyrite also occur locally as disseminated cubic and tabular crystals, respectively (Baldwin, 1983; Peck *et al.*, 1995).

One additional site, shown as site C on Figure 42-1, is noted by Milligan (1960, p. 284) as "Pyrite in medium grained gneissic hornblende-biotite granite".

GEOCHEMICAL DATA:

Geochemical analyses of arsenopyrite-pyrite-bearing samples are reprinted from Peck *et al.* (1995) in Table 43-1; sample locations are shown in Figure 43-2. Two whole-rock analyses of porphyritic rhyolite from the Cartwright Lake Rhyolite from Gilbert *et al.* (1980) are reprinted in Table 43-2. Gilbert *et al.* (1980) note that the samples are depleted in MgO, CaO, total iron and TiO_2. Most of the Cartwright Lake Rhyolite does not exhibit geochemical alteration patterns indicative of hydrothermal alteration commonly associated with VMS mineralization. Trace and rare element data for the Cartwright Lake Rhyolite given by Syme (1985) show that rhyolite samples display flat REE patterns with pronounced negative Eu anomalies.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. Baldwin (1983) postulates that minor sulphides were mobilized from an unknown source and emplaced into shears and fractures during metamorphism and tectonism. Peck *et al.* (1995) also recognize the mineralization as being shear-related, but describe the mineralization as being in a vein-type setting.

Table 43-1:
Gold and base metal abundances for samples containing arsenopyrite-pyrite mineralization, Cartwright Lake rhyolite (from Peck *et al.*, 1995). All analyses were performed at the Manitoba Energy and Mines Analytical Laboratory. Gold is reported in ppb; base metals are reported in ppm.

Sample Number	Rock Type	Au	Cu	Ni	Zn	Pb
98-95-305-1a	Rhyolite	<6	80	18	140	11
98-95-307-2	Felsic Tuff	<6	52	6	241	<2
98-95-309-2	Felsic Tuff	<6	57	15	8	4
98-95-313-1a	Felsic Tuff	<6	70	17	30	17
98-95-313-1b	Felsic Tuff	10	46	11	55	16
98-95-313-1c	Felsic Tuff	5	64	16	41	<2
98-95-316-1	Felsic Tuff	132	64	14	24	7
98-95-316-2	Rhyolite	15	124	23	7	2
98-95-317-1	Felsic Tuff	51	78	18	25	<2
98-95-317-2	Felsic Tuff	<6	29	4	116	3
98-95-320-1	Rhyolite	253	66	12	33	13
98-95-322-1	Quartz Vein	<6	44	14	3	3
98-95-325-1a	Dacite	<6	57	11	61	23
98-95-327-1	Rhyolite	17	59	15	6	4
98-95-329-1a	Rhyolite	9	60	15	5	<2
98-95-330-1a	Rhyolite	2857	47	12	10	8
98-95-330-1b	Rhyolite	31	84	16	8	3
98-95-333-1	Rhyolite	13	84	13	8	<2
98-95-335-1	Rhyolite	11	67	16	6	<2
98-95-340-1a	Rhyolite	213	59	12	6	<2
98-95-340-1b	Rhyolite	<6	29	19	3	<2
98-95-342-1	Rhyolite	131	77	22	10	<2
98-95-343-1	Rhyolite	<6	58	16	39	3
98-95-347-1a	Rhyolite	10	40	8	13	<2
98-95-347-1b	Rhyolite	12	45	8	216	<2
98-95-347-1c	Rhyolite	421	62	18	12	<2
98-95-348-1a	Rhyolite	185	88	22	<1	<2
98-95-348-1b	Rhyolite	8	49	13	10	3
98-95-351-1	Rhyolite	<6	40	14	109	<2
98-95-351 to 2	Rhyolite	117	91	23	<1	<2
98-95-352-1	Rhyolite	<6	71	20	5	<2
98-95-353-1	Rhyolite	14	74	17	1	4
98-95-355-1	Rhyolite	<6	71	25	1	<2
98-95-356-1	Rhyolite	9	67	18	1	<2

Table 43-2
Whole rock chemical analyses (wt. %) (from Gilbert *et al.*, 1980)

Sample No.	**42**	**43**
SiO_2	77.30	76.50
Al_2O_3	12.86	12.69
Fe_2O_3	0.13	0.44
FeO	0.42	0.64
CaO	0.12	0.70
MgO	0.02	0.14
Na_2O	4.48	3.82
K_2O	3.73	3.73
TiO_2	0.07	0.08
P_2O_5	0	0
MnO	0.01	0.03
H_2O	0.44	0.60
S	0.01	tr.
CO_2	0.25	0.55
Total	99.84	99.92
Ni (ppm)	<4	10
Cr (ppm)	15	<8
FeO*/MgO	26.85	7.4

REFERENCES:

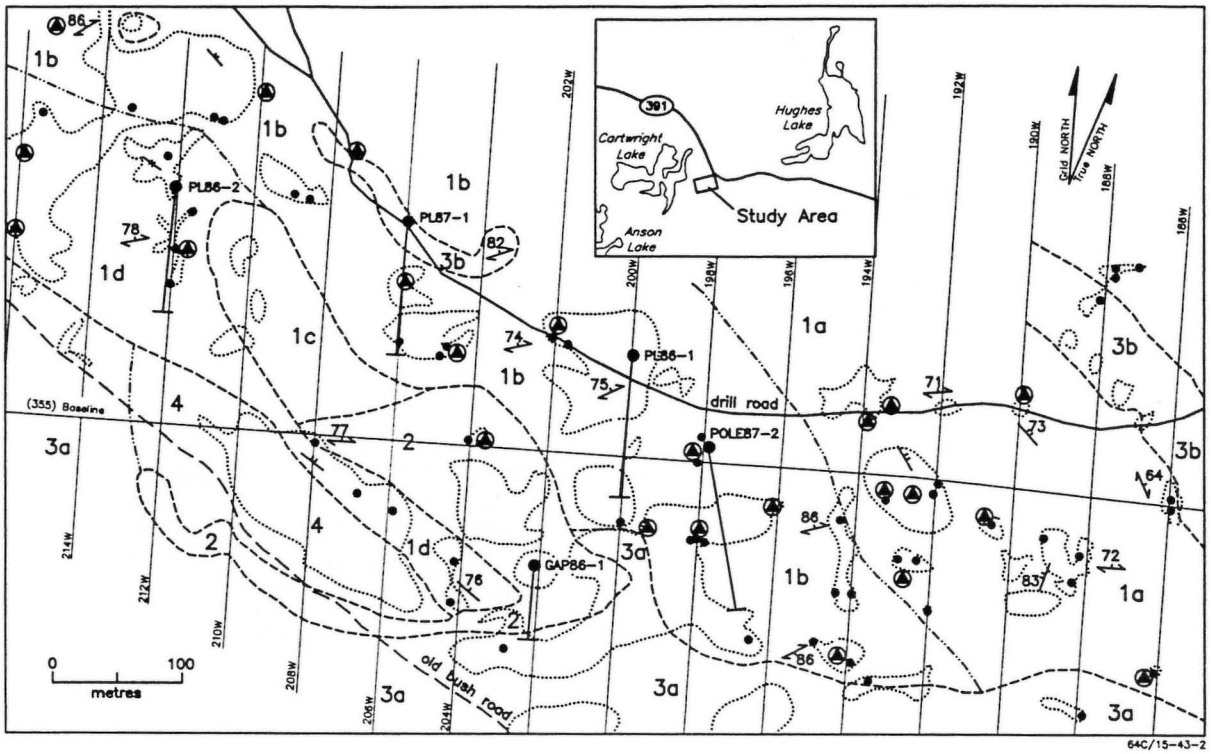
Assessment Files 91352, 91615, 91616, 91622, 91626, 91679, 91699, 91989, 91992
Manitoba Energy and Mines, Mines Branch.

Baldwin, D.A.
1983: Stratigraphic studies of felsic volcanic rocks associated with mineral occurrences in the Lynn Lake area, Manitoba; **in** Manitoba Energy and Mines, Mineral Resources Division, Report of Field Activities p. 88-93.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Peck, D.C., Cameron, H.D.M. and Layton-Matthews, D.
1995: Geological and geochemical studies in the southern part of the Lynn Lake greenstone belt, northwestern Manitoba (Parts of NTS 64C/11. 64C/14, 64C/15); Manitoba Energy and Mines, Geological Services, Report of Activities 1995, p. 4-10.

Syme, E.C.
1985: Geochemistry of metavolcanic rocks in the Lynn Lake belt; Manitoba Energy and Mines, Geological Report GR84-1, 84p.



4 Andesite (locally contains gabbro sills)

3 Intermediate and Mafic Intrusive Rocks
- a) Diorite, quartz diorite, minor gabbro (may include xenoliths derived from unit 2)
- b) Gabbro (may include xenoliths derived from unit 1)

2 Clastic Sedimentary Rocks
Siltstone, subordinate (pebbly) greywacke, mudstone, felsic or mafic tuff and massive rhyolite

1 Cartwright Lake Rhyolite
- a) Felsic pyroclastic and reworked pyroclastic deposits (crystal and lapilli tuff, polymictic breccia) and subordinate massive, porphyritic rhyolite flows
- b) Massive porphyritic rhyolite flows and subordinate felsic crystal tuff, siltstone and greywacke
- c) Felsic crystal and lithic tuff, minor massive porphyritic rhyolite and derived autoclastic breccia
- d) Massive and brecciated porphyritic rhyolite

Geological boundary (approximate, gradational)

Foliation (dip known, dip unknown, vertical)

Bedding, tops unknown (dip known, dip unknown, vertical)

Bedding, tops known (inclined)

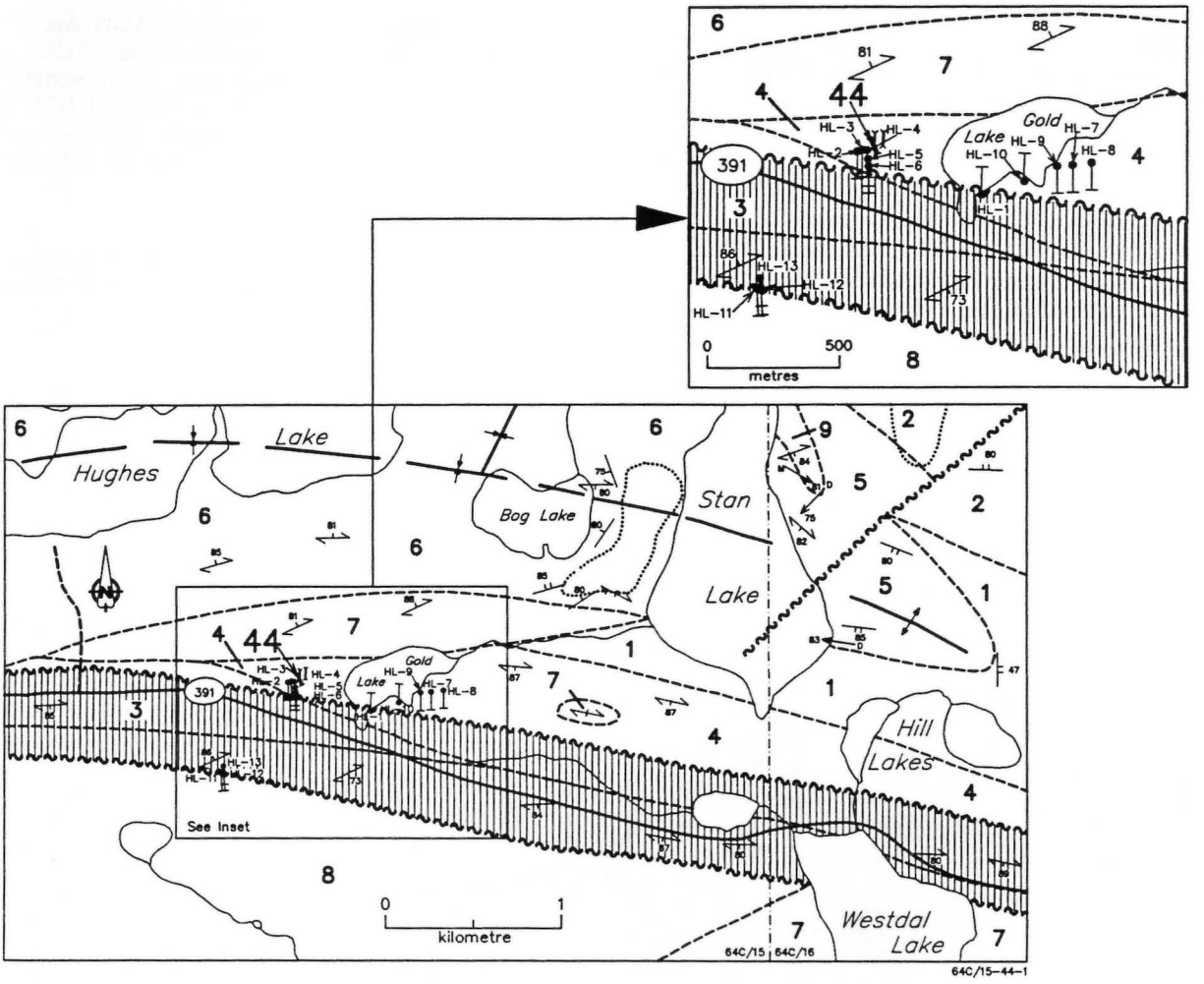
Geochemical sample location

Arsenopyrite + pyrite occurrence

Drillhole location

Outcrop

Figure 43-2: Detailed geology and sample locations, Cartwright Lake Rhyolite (Peck et al., 1995).



Intrusive Rocks

9 Diorite

8 Granite, granodiorite

7 Diorite, quartz diorite; hornblende–biotite tonalite

Sickle Group

6 Arkosic sandstone, pebbly sandstone

5 Conglomerate, arkose matrix

Wasekwan Group

4 Rhyolite tuff, intermediate tuff and lapilli tuff

3 Andesite, minor rhyolite tuff and argillite

2 Massive porphyritic and aphyric basalt and andesite, intermediate tuff, andesite

1 Aphyric basalt, massive

Geological boundary (approximate)

Axial trace of syncline (approximate)

Foliation (inclined, vertical, dip unknown)

Bedding, inclined (tops known, tops unknown)

Fault, approximate

Johnson Shear zone

Mineral lineation (inclined)

Deformed clasts (inclined)

Drillhole (A.F. 91044)

Trench (A.F. 91046)

Outcrop

Provincial road

Trail

44 Mineral occurrence location

Figure 44-1: Geological setting of occurrence 44 (after Gilbert et al., 1980, and A.F. 91046).

LOCATION: **44**

NAME: Lodestone
UTM: 6294555N/405821E
ACCESS: Provincial Road 391

AREA: West of Gold Lake (Fig. 44-1)
AIRPHOTO: A24299-136

EXPLORATION SUMMARY:

SGM drilled thirteen holes totalling 673 m on the H.L. claims in 1947 (A.F. 91044). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). Sherritt Gordon Mines Limited conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Rio Tinto Canadian Exploration Limited optioned the Lodestone claim group, excavated four trenches, chip- and channel sampled the trenches, float and nearby outcrops, and panned twelve overburden samples in 1959 (A.F. 91046).

Selco Exploration Company Limited conducted an airborne EM survey over Airborne Permit 31 in 1960 (A.F. 91626). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out an airborne INPUT survey (Phase II) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976 (A.F. 91992).

Early exploration history is detailed in Mineral Inventory Card 64C/15 Ag1.

GEOLOGICAL SETTING:

The area is underlain by Wasekwan Group felsic to intermediate tuff, andesite, and minor argillite. Pre-Sickle diorite and quartz diorite separate the Wasekwan Group rocks from Sickle Group arkosic and pebbly sandstone to the north (Gilbert *et al.*, 1980; Fig. 44-1). Rocks in the area are intensely sheared at approximately 085°/80°N. The zone is approximately 15 to 30 m wide; the contacts are not exposed (A.F. 91046). This is part of the Johnson Shear Zone (Gilbert *et al.*, 1980).

MINERALIZATION:

Pyrite, arsenopyrite and galena, up to 5%, are disseminated in fine grained felsic sedimentary rocks (sheared sericite schist) in outcrop and trenches (Baldwin *et al.*, 1985; Fig. 44-1, 44-2). Milligan (1960, p. 153) reports the presence of pyrite, chalcopyrite, galena and visible gold.

GEOCHEMICAL DATA:

The report in A.F. 91046 indicates that Stan Simpson, a prospector for SGM, located angular blocks of quartz-sericite schist that assayed "as high as 2½ oz. Au per ton". SGM drilled thirteen holes to determine the source of this gold-bearing float (A.F. 91044); "...it is understood that no values of any consequence were found" and SGM subsequently dropped their claim to the ground (A.F. 91046). Drill logs are not included in A.F. 91044.

Chip and channel samples from trenches assayed nil Au, and nil to 7.5 g/t Ag. One overburden sample showed gold in the pan, the source of which was unknown (A.F. 91046).

Additional assays of sulphide-bearing float blocks are given in Table 44-1.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 91044, 91046, 91616, 91622, 91626, 91679, 91699, 91992
Manitoba Energy and Mines, Mines Branch.

Baldwin, D.A., Parbery, D., Boden, S. and Michielsen, A.
1985: Mineral deposit studies in the Lynn Lake and Barrington Lake areas; **in** Manitoba Energy and Mines, Report of Field Activities 1985, p. 20-28.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

Mineral Inventory Card 64C/15 Ag1
Manitoba Energy and Mines, Geological Services Branch.

Table 44-1
Assays of sulphide-bearing float blocks from occurrence 44 (Gold Lake) (G.H. Gale, unpublished data, 1982)

Sample	Au g/t	Ag g/t	Cu %	Zn %	Pb %	Rock Type
1	tr.	0.04	nil	nil		Quartz-sericite-pyrite schist
2	tr.	0.02	nil	nil		Quartz-chlorite-sericite-pyrite schist
3	tr.	nil	nil	0.01		Quartz-chlorite schist, tr. py, several blocks
4	tr.	tr.	nil	tr.		7 cm quartz vein in chlorite schist
5	0.05	nil	nil	0.01	0.01	Mafic chloritic schist with light coloured silicic lenses and granitic dykes

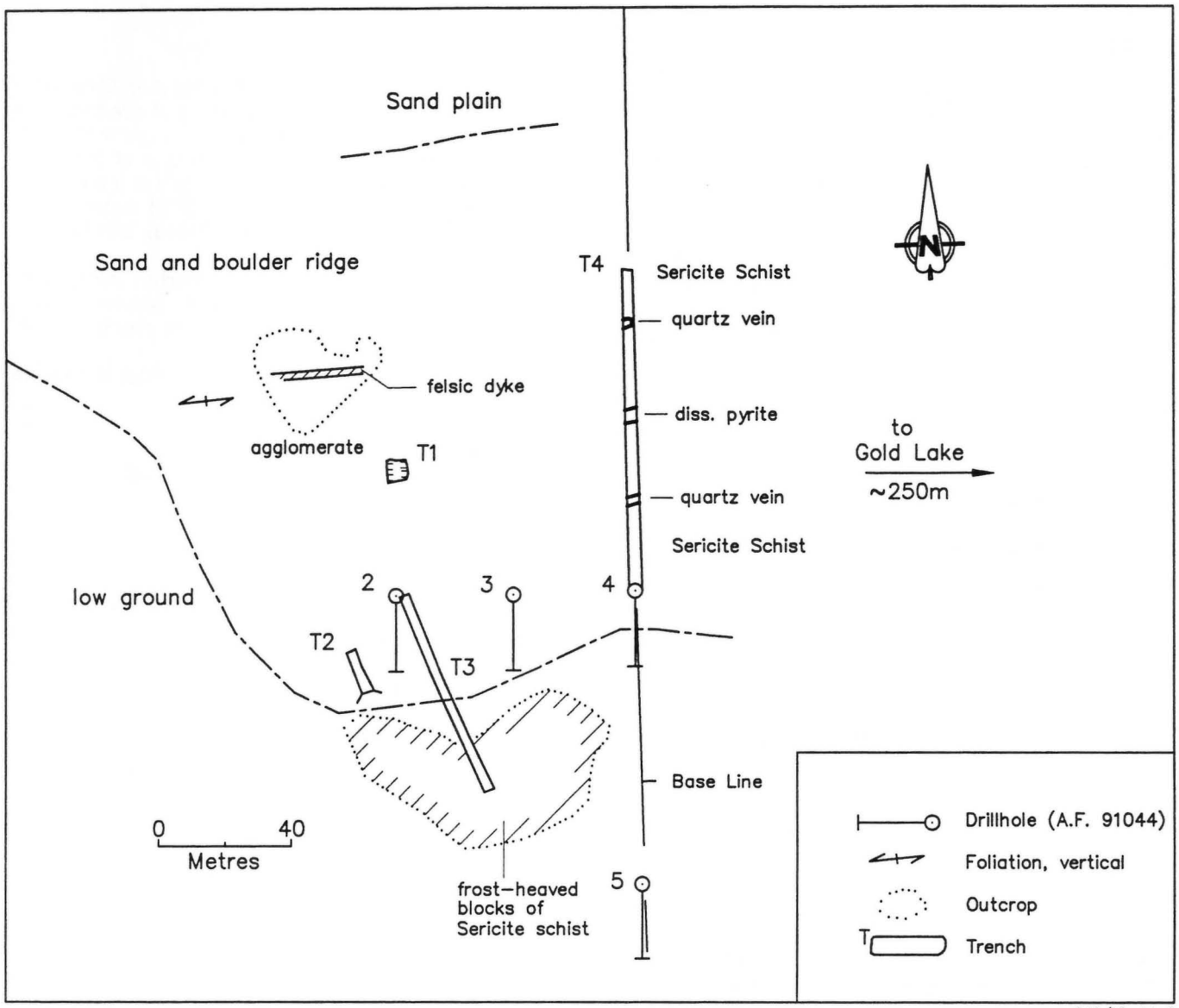


Figure 44-2: Trench locations, occurrence 44.

LOCATION: **45**

NAME:
UTM: 6297228N/407537E
ACCESS: Boat on Hughes Lake; boat access by way of Provincial Road 391

AREA: South shore of Hughes Lake (Fig. 45-1)
AIRPHOTO: A23828-164

EXPLORATION SUMMARY:

Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). Sherritt Gordon Mines Limited conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Selco Exploration Company Limited conducted an airborne EM survey over Airborne Permit 31 in 1960 (A.F. 91626). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out an airborne INPUT survey (Phase II) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976 (A.F. 91992).

GEOLOGY SETTING:

The area is underlain by post-Sickle diorite that intrudes Sickle Group arkosic and pebbly sandstone and conglomerate (Gilbert *et al.*, 1980; Fig. 45-1).

MINERALIZATION:

Up to 2% disseminated pyrite occurs in fine- to medium-grained chloritic diorite (Milligan, 1960, p. 284, site 172; Baldwin *et al.*, 1985). An additional site on the southeast shore of Hughes Lake is "locally cut by rusty to white quartz veins, mineralized with pyrite and chalcopyrite" (Milligan, p. 290, site 388).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

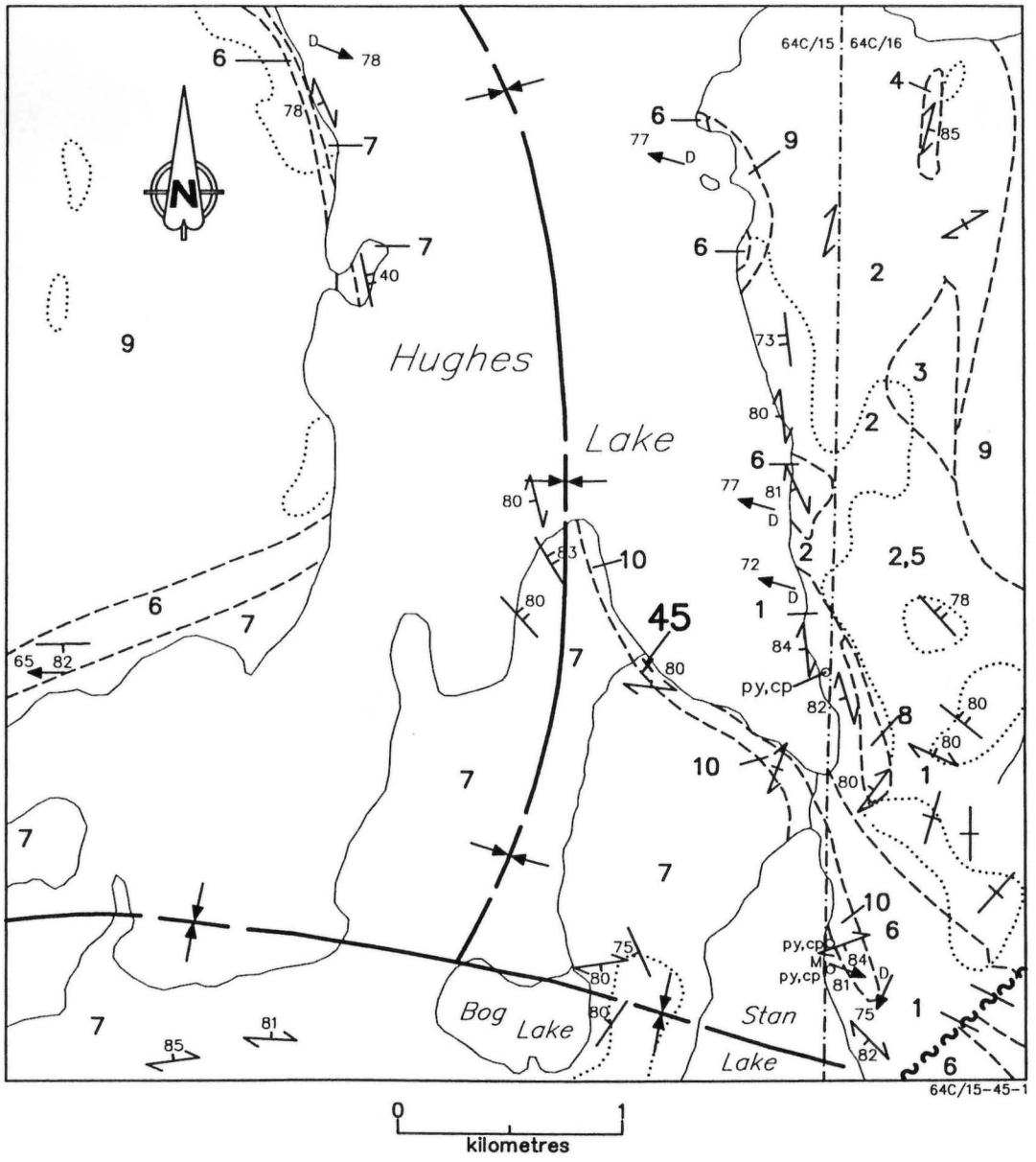
REFERENCES:

Assessment Files 91616, 91622, 91626, 91679, 91699, 91992
Manitoba Energy and Mines, Mines Branch.

Baldwin, D.A., Parbery, D., Boden, S. and Michielsen, A.
1985: Mineral deposit studies in the Lynn Lake and Barrington Lake areas; **in** Manitoba Energy and Mines, Report of Field Activities 1985, p. 20-28.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.



Intrusive Rocks
10 Diorite
9 Hornblende–biotite tonalite, quartz diorite
8 Gabbro, diabase
Sickle Group
7 Arkosic sandstone, pebbly sandstone
6 Conglomerate, arkose matrix
Wasekwan Group
5 Hornblende greywacke, siltstone
4 Polymictic volcanic breccia, conglomerate
3 Massive porphyritic dacite
2 Mafic and intermediate volcanic rocks
1 Massive basalt

Geological boundary (approximate)
Axial trace syncline
Foliation (inclined, vertical, dip unknown)
Bedding (inclined, vertical)
Deformed clasts (inclined)
Mineral lineation (inclined)
Fault, approximate
Outcrop
Mineralization, location approximate (Milligan, 1960)
45 x Occurrence location, approximate

Figure 45-1: Geological setting of occurrence 45 (after Gilbert et al., 1980).

LOCATION: **46**

NAME: (A.F. Mineralization intersected by diamond drilling)
UTM: 6312303N/379175E
ACCESS: By boat on Burge Lake and the Keewatin River

AREA: North of Burge Lake
AIRPHOTO: A23828-73

EXPLORATION SUMMARY:

Hoodoo Lake Mines Limited and International Mining Corporation carried out a magnetometer survey and geological mapping (1:4800) on the Lew, Dan, NT, WJ and Berg claims in the Burge Lake area in 1947 (A.F. 91383). Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5 in 1954 (A.F. 91615). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). Sherritt Gordon Mines Limited conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

Granges Exploration Aktiebolag drilled EL-28-77 (155 m) and EL-29-77 (44.5 m) on CB 7588 in 1977 (A.F. 92698).

GEOLOGICAL SETTING:

The area is underlain by post-Sickle hornblende-biotite granodiorite; biotite ± garnet-bearing metagreywacke and migmatite of the Burntwood River Metamorphic Suite and conglomerate occur to the west (Fig. 46-1; Gilbert *et al.*, 1980). DDH EL-28-77 and EL-29-77 intersected quartz-biotite gneiss (metasedimentary rocks) with hornblende-bearing and quartzite sections (A.F. 92698).

MINERALIZATION:

DDH EL-28-77 intersected fifteen mineralized sections, 0.06 to 3.6 m in core length that contain 30 to 40% graphite, 10 to 40% pyrrhotite and up to 2% pyrite. DDH EL-29-77 intersected 0.5 m and 0.3 m sections with near solid graphite and 2 to 10% pyrite (A.F. 92698).

GEOCHEMICAL DATA:

Drill core assays from DDH EL-28-77 and EL-29-77 have ranges of 0.01-0.05% Cu, 0.01-0.11% Zn, 0.02-0.03% Ni, <0.1 g/t Au, and 0.3-1.7 g/t Ag (A.F. 92698).

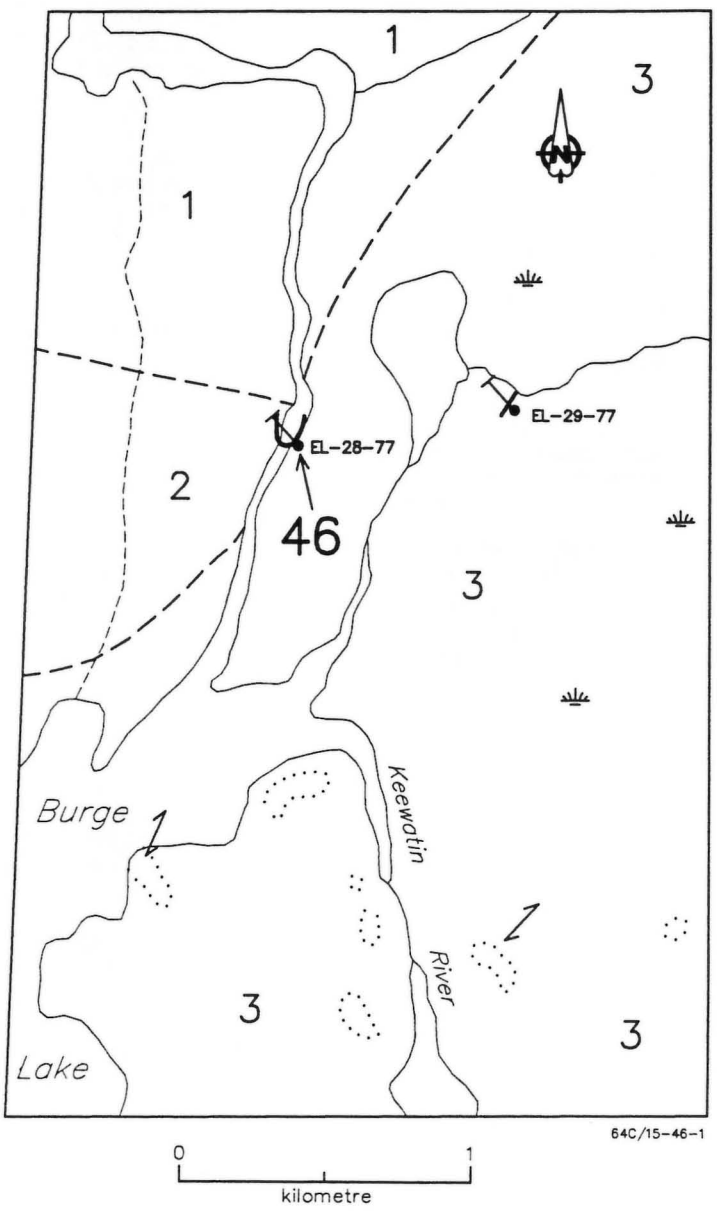
CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

Assessment Files 91383, 91615, 91616, 91622, 91679, 91699, 91989, 91992, 92698
Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.



Post–Sickle Intrusive Rocks

3 Hornblende–biotite granodiorite

Sickle or Wasekwan Group

2 Conglomerate, hornblende greywacke matrix

Burntwood River Metamorphic Suite

1 Biotite±garnet–bearing metagreywacke, migmatite

– – – – Geological boundary (approximate)

Foliation (dip unknown)

——— EM conductors (A.F. 92698)

Drillhole (A.F. 92698)

Outcrop

------- Trail

Swamp

46 Occurrence location

Figure 46-1: Geological setting of occurrence 46 (after Gilbert et al., 1980).

LOCATION: **47**

NAME: (A.F. Mineralization intersected by diamond drilling)
UTM: 6312653N/384076E
ACCESS: Float plane to Lobster Lake and traverse

AREA: Approximately 1.25 km northwest of Lobster Lake (Fig. 47-1)
AIRPHOTO: A23828-121

EXPLORATION SUMMARY:

Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5 in 1954 (A.F. 91615). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). Sherritt Gordon Mines Limited conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

Granges Exploration Aktiebolag drilled EL-31-77 (49.1 m) on CB 7584 in 1977 (A.F. 92698). A.F. 92698 also shows the location of DDH EL-32-77 in the area, but logs are not included.

GEOLOGICAL SETTING:

The area is underlain by post-Sickle hornblende-biotite granodiorite and biotite ± garnet-bearing metagreywacke and migmatite of the Burntwood River Metamorphic Suite (Fig. 47-1; Gilbert *et al.*, 1980). DDH EL-31-77 intersected quartz-feldspar-biotite gneiss (metasedimentary rocks) and biotite granite dykes (A.F. 92698).

MINERALIZATION:

DDH EL-31-77 intersected four sections, 0.2 to 2.4 m in core length, with 30% to near solid graphite, up to 20% pyrrhotite and up to 5% pyrite (A.F. 92698).

GEOCHEMICAL DATA:

Drill core assays from DDH EL-31-77 have ranges of 0.01-0.02% Cu, 0.01-0.03% Zn, <0.1 g/t Au, and 0.3-0.7 g/t Ag (A.F. 92698).

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

Assessment Files 91615, 91616, 91622, 91679, 91699, 91989, 91992, 92698
Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

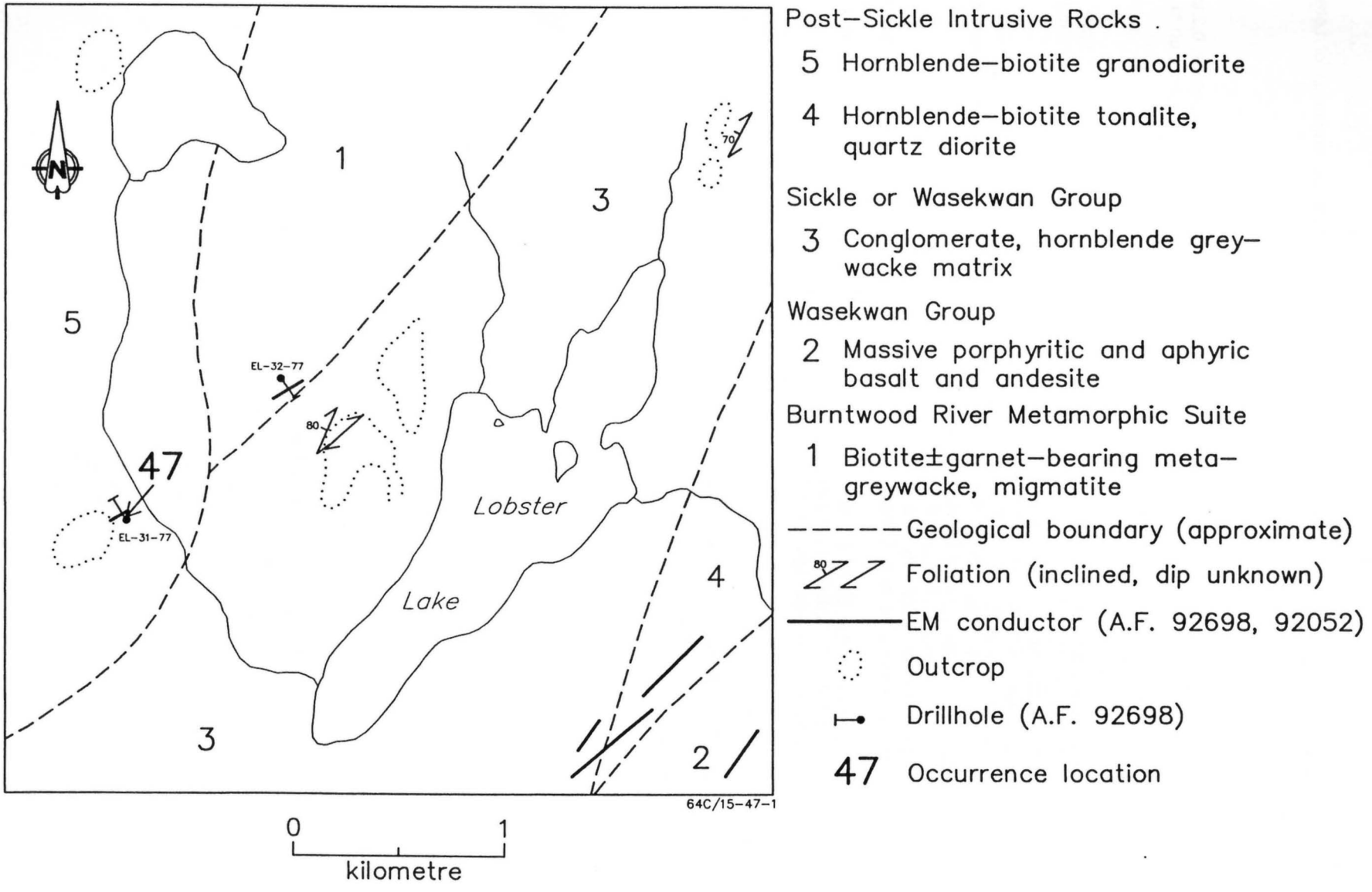


Figure 47-1: Geological setting of occurrence 47 (after Gilbert et al., 1980).

LOCATION: **48**

NAME: (A.F. Mineralization intersected by diamond drilling)
UTM: 6318094N/390039E
ACCESS: Float plane and traverse

AREA: Approximately 4 km west of Gallagher Lake
AIRPHOTO: A24297-109

EXPLORATION SUMMARY:

Canadian Nickel Company Limited carried out an airborne EM survey over Airborne Permit 5 in 1954 (A.F. 91615). Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). Sherritt Gordon Mines Limited conducted an aeromagnetic survey over Airborne Permit 17 from 1957 to 1961 (A.F. 91622). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey over Airborne Permit 86 in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

Granges Exploration Aktiebolag drilled EL-39-77 (43.0 m) on CB 7591 in 1977 (A.F. 92698). A.F. 92698 also shows the location of DDH EL-40-77 in the area, but logs are not included.

GEOLOGICAL SETTING:

The area is underlain by biotite ± garnet-bearing metagreywacke and migmatite of the Burntwood River Metamorphic Suite (Fig. 48-1; Gilbert *et al.*, 1980). DDH EL-39-77 intersected quartz-feldspar-biotite schist and gneiss (metasedimentary rocks) with weakly chloritized sections and biotite granite dykes (A.F. 92698).

MINERALIZATION:

DDH EL-39-77 intersected (1) 0.15 m solid graphite; (2) two sections with near solid graphite and 5% pyrite, 2.2 and 0.4 m in core length; and (3) two quartz-rich graphitic sections ± minor pyrite, 0.5 and 0.9 m in core length (A.F. 92698).

GEOCHEMICAL DATA:

Drill core assays from DDH EL-39-77 have ranges of 0.01-0.03% Cu, 0.01-0.02% Zn, <0.3 g/t Au, and 0.3-0.7 g/t Ag (A.F. 92698).

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

Assessment Files 91615, 91616, 91622, 91679, 91699, 91989, 91992, 92698
Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

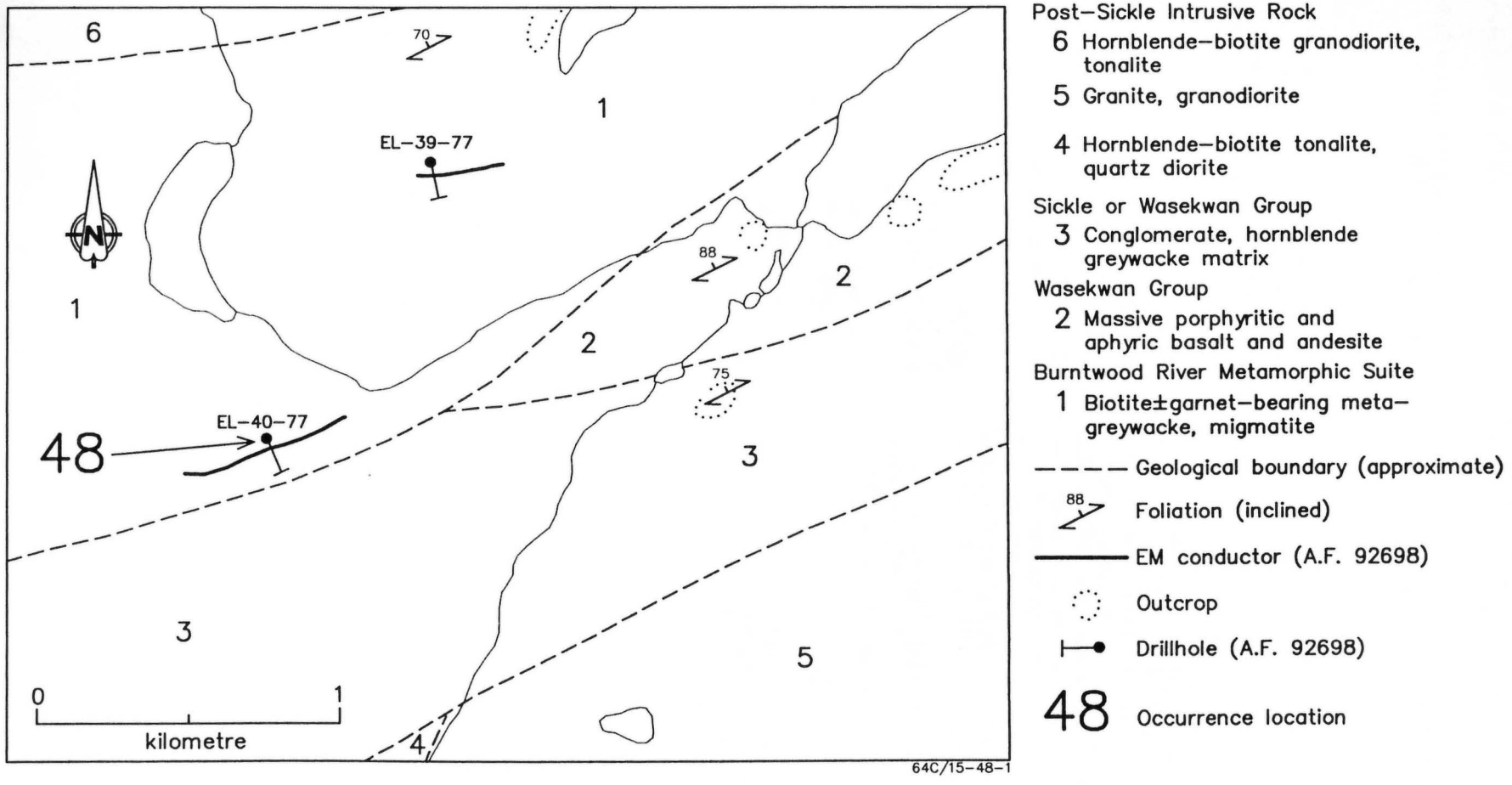


Figure 48-1: Geological setting of occurrence 48 (after Gilbert et al., 1980).

LOCATION: **49**

NAME: FL 9
UTM: 6300244N/378131E
ACCESS: By boat on Eldon Lake and the Lynn River

AREA: East side of Lynn River north of Eldon Lake
AIRPHOTO: A23828-76

EXPLORATION SUMMARY:

God's Lake Gold Mines, Limited drilled DDH 2, 29, 30, 31, 32, 33, 34, 35, 36 and 38 (total 970.2 m) on claim F.L. 9 in 1947 (A.F. 91023). A summary of drillhole and magnetometer survey results from work done on claim F.L. 9 by God's Lake Gold Mines up to 1952 is given in A.F. 91024. This work includes results from drilling of DDH 37 and DDH 39 through 52 (total 1497.2 m; logs not included) and DDH 71, 72, 73 and 74 (total 408.1 m; logs not included) (A.F. 91024).

Eldorado Mining and Refining Limited carried out a helicopter-borne radiometric survey in 1954 from Sherridon to Lynn Lake, including most of the area of NTS 64C/15 (A.F. 91616). An airborne EM survey was conducted over this area by Canadian Nickel Company Limited in 1954 (A.F. 91615). SGM conducted an aeromagnetic survey over the area from 1957 to 1961 (A.F. 91622). Hudson Bay Exploration and Development Company Limited carried out a helicopter-borne EM and radiometric survey in 1970 (A.F. 91679). SGM conducted an airborne EM and magnetometer survey over Airborne Permit 108 in 1973 (A.F. 91699). Questor Surveys Limited carried out airborne INPUT surveys (Phase I, A.F. 91989; Phase II, A.F. 91992) on behalf of the Province of Manitoba, Department of Mines, Resources and Environmental Management in 1976.

GEOLOGICAL SETTING:

The area is underlain by intermediate intrusive rocks (Gilbert *et al.*, 1980; Fig. 49-1); however, drillholes intersected felsic and mafic fragmental rocks, chlorite ± quartz schist, garnetiferous sedimentary rocks including greywacke, mafic flows, hornblendite (possibly recrystallized mafic flows), brecciated rhyolite flows, and minor quartz diorite, pegmatite and porphyry (A.F. 91023).

MINERALIZATION:

Descriptions of the type and amount of mineralization intersected by most of the drillholes are incomplete; however, assays (Table 49-1, 49-2) show that chalcopyrite and sphalerite are locally abundant. DDH 2 intersected minor pyrrhotite, pyrite and chalcopyrite in sections throughout the core. Chlorite alteration is common throughout the core (A.F. 91023). Table 49-2 summarizes mineralization intersected by DDH 71. DDH 72 intersected sedimentary rocks with a few quartz stringers that assayed tr. Au. DDH 73 and 74 intersected unmineralized chlorite schist, "greenstone" and sedimentary rocks (A.F. 91024).

Milligan (1960, site 99) notes surface mineralization in the area: "Sulphides are present and rust is plentiful vicinity of shear between diorite(?) and pyroxenite."GEOCHEMICAL DATA:

Tables 49-1 and 49-2 show assay results from drill core samples. Numerous assays with >2% Cu and/or Zn were obtained from these samples.

CLASSIFICATION:

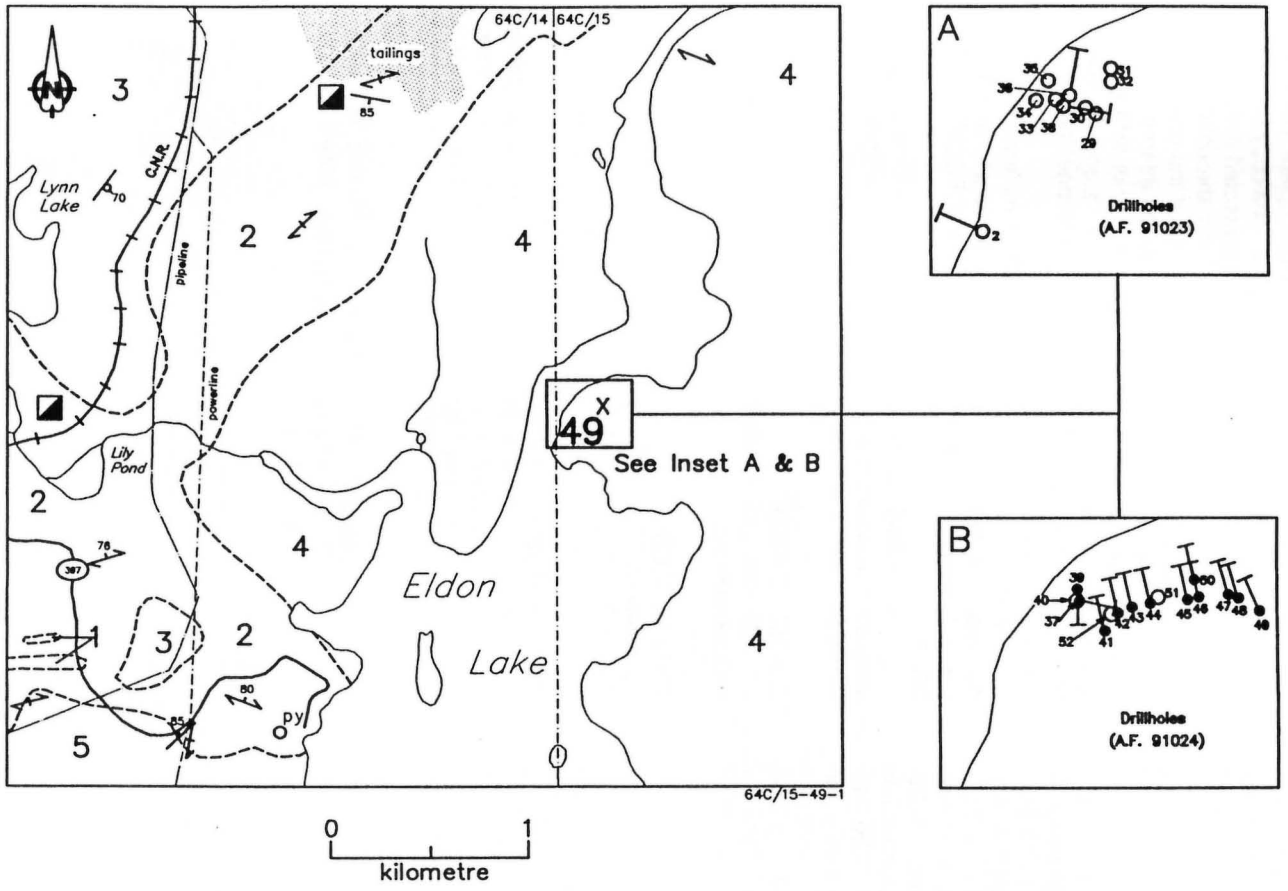
Stratabound massive sulphide type deposit; volcanic rock associated.

REFERENCES:

Assessment Files 91023, 91024, 91615, 91616, 91622, 91679, 91699, 91989, 91992
Manitoba Energy and Mines, Mines Branch.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.



Pre–Sickle Intrusive Rocks

5 Granite, granodiorite

4 Diorite, quartz diorite, tonalite

3 Gabbro, norite, diorite, ultramafic rock

Wasekwan Group

2 Lynn Lake Rhyolitic Complex

1 Mafic tuff

--------- Geological boundary (approximate)

Foliation tops known (inclined, vertical, dip unknown)

Bedding (inclined)

Igneous layering, tops unknown (inclined)

Mineralization

X Mineralization, location approximate (Milligan, 1960)

Shaft

Provincial road

49 Occurrence location

Figure 49-1: Geological setting of occurrence 49 (after Gilbert et al., 1980).

Table 49-1
Assay results from drillholes on former claim F.L. 9

DDH	From (m)	To (m)	Ni %	Cu %	Zn %	Au g/t	Host Rock	Comments	DDH Length (m)	Assessment File
29	3.7	5.5	--	--	nil	0.3	Quartz vein	At contact between altered sediments & brecciated rhyolite flow	127.7	91023
	7.0	7.6	--	--	0.55	tr.	Quartz-chlorite schist			
	8.8	10.4	nil	0.10	0.20	--	Fragmental rock			
	10.4	11.9	nil	0.10	0.20	--	Fragmental rock			
	11.9	13.0	nil	0.13	nil	--	Fragmental rock			
	13.0	14.6	nil	0.44	1.51	--	Fragmental rock			
	16.5	17.2	nil	0.06	nil	--	Serpentinized hornblendite	Recrystallized mafic flow?		
	17.2	18.3	nil	--	0.45	--	Hornblendic fragmental rock			
	19.1	20.6	nil	0.13	3.07	--	Chloritic fragmental rock			
	20.6	21.9	nil	0.51	1.26	--	Chloritic fragmental rock			
	21.9	23.5	nil	0.25	4.13	--	Chlorite schist			
	23.5	25.0	nil	0.51	3.88	--	Chlorite schist			
	25.0	26.5	nil	2.36	1.66	--	Chlorite schist			
	26.5	28.0	nil	0.89	1.71	--	Chlorite schist			
	28.0	29.9	nil	0.83	3.53	1.4	Chlorite schist			
	29.9	31.4	nil	0.32	0.60	--	Chlorite schist, hornblendic			
	31.4	32.9	nil	0.32	2.87	--	Serpentinized hornblendic chlorite schist			
	32.9	34.4	nil	2.23	1.46	0.7	Serpentinized hornblendic chlorite schist			
	36.7	37.3	nil	2.48	2.57	--	Garnetiferous sedimentary rocks + chlorite schist			
	38.6	39.2	nil	0.45	2.47	--	Chlorite schist			
	68.6	69.2	nil	0.13	0.05	--	Hornblendite	Recrystallized mafic flow?		
30	16.9	17.8		0.10			Interbedded sedimentary rocks & felsic flow breccia, serpentinized		81.4	91023
	21.5	21.9		0.06			Felsic flows			
	24.4	25.6		0.16			Interbedded f.g. sedimentary and felsic fragmental rocks			
	31.7	32.6		0.25			Kaolinized fragmental rocks			
	42.8	43.3		0.25			Chlorite schist			
32	49.4	50.0		0.06			Interbedded sedimentary and felsic fragmental rocks		121.0	91023
33	32.5	32.8		--		0.3	Quartz vein	In interbedded flows and sedimentary rocks	92.7	91023
	35.4	36.6		0.35		0.7	Chloritic schistose sedimentary rocks, some breccia			
	36.6	38.1		1.03		0.3				
	71.1	71.9		0.06		--	Hornblendite			
	77.1	77.7		0.16		--	Hornblendite			
	79.2	79.9		0.10		--	Hornblendite			
34	19.5	20.1	--	--		0.3	Quartz vein	In hornblende-mica gneiss	86.3	91023
	29.3	29.7	--	--		2.1	Quartz vein	In felsic flow breccia		
	33.5	34.0	nil	0.06		0.7	Quartzite	Probably rhyolite		
	34.3	35.8	nil	0.82		1.4	Felsic flow breccia			
35	66.9	67.5	nil	tr.		--	"Greenstone"		89.9	91023
	75.4	75.9	nil	tr.		--	"Greenstone"			
36	7.6	8.2	nil	0.06		0.3	Sedimentary rocks		85.3	91023
	8.5	9.1	nil	0.70		tr.	Sedimentary rocks			
37	20.4	21.8		0.57	2.02	0.7	Sedimentary rocks(?)		40.2	91024
39	45.9	46.5					Mafic flows and fragmental rocks	"low values"	57.0	91024
40	9.1	9.9					Mafic flows and sedimentary rocks	mineralized, assay not stated	61.0	91024
	16.0	16.8					Mafic flows and sedimentary rocks	mineralized, assay not stated		
	23.6	24.4					Mafic flows and sedimentary rocks	mineralized, assay not stated		
	32.0	33.2		0.47	1.01		Mafic flows and sedimentary rocks			
	41.6	42.7					Mafic flows and sedimentary rocks	mineralized, assay not stated		
50	27.6	28.7		tr.	0.15	--	Hornblendite		214.0	91024
	81.7	83.2		0.32	0.45	--	Fragmental rocks			
	83.2	84.4		0.13	0.25	--	Fragmental rocks			
	91.1	92.0		0.29	0.40	--	Sedimentary rocks			
	100.6	101.2		0.38	0.35	tr.	Felsic fragmental rocks			
	101.7	103.0		0.25	0.25	0.3	Felsic fragmental rocks			
	103.8	104.7		0.13	0.25	tr.	Felsic fragmental rocks			
	126.5	126.8		0.09	0.20	nil	Mafic fragmental rocks			
	127.7	128.9		0.38	0.20	tr.	Mafic fragmental rocks			
	132.0	133.0		0.37	0.20	0.3	Mafic fragmental rocks			

Table 49-1
Assay results from drillholes on former claim F.L. 9 continued

DDH	From (m)	To (m)	Ni %	Cu %	Zn %	Au g/t	Host Rock	Comments	DDH Length (m)	Assessment File
	140.5	141.0		tr.	0.15	tr.	Pyroxenite			
	157.1	158.3		0.12	0.35	2.1	Sedimentary rocks			
	159.1	160.9		0.13	0.55	0.3	Sedimentary rocks			
	162.2	163.4		0.19	0.14	tr.	Sedimentary rocks			
	171.3	171.9		0.06	0.25	tr.	Chloritic flow			
	178.9	180.4		0.09	0.20	nil	Mafic flow			
	180.4	182.0		0.25	0.05	tr.	Quartz vein			
	182.0	183.5		0.32	0.10	0.3	Quartz vein			
	183.5	185.0		0.25	0.25	nil	Mafic fragmental rocks			
	185.0	186.5		0.89	0.15	tr.	Felsic breccia			
	186.5	188.1		0.06	0.15	tr.	Mafic fragmental rocks			
	193.9	194.3		0.09	0.20	0.3	Sedimentary rocks			
	199.6	200.3		0.25	0.20	tr.	Amphibolite			
51	31.0	32.0		0.20	0.09	tr.	Greywacke		243.2	91024
	35.7	37.2		0.20	0.06	tr.	Hornblendite			
	115.7	116.7		0.25	0.41	0.3	Mafic fragmental rocks			
	123.9	124.4		0.21	tr.	tr.	Pyroxenite			
	124.4	125.4		0.35	0.19	tr.	Pyroxenite			
	125.4	127.3		0.55	0.13	tr.	Pyroxenite			
	127.3	128.8		0.40	0.32	tr.	Pyroxenite			
	130.1	130.5		0.45	0.32	tr.	Pyroxenite			
52	13.1	13.7		0.06	0.15	tr.	Sedimentary rocks		156.4	91024
	26.5	27.0		0.63	1.11	--	Felsic fragmental rocks			
	27.7	28.8		--	--	tr.	Felsic fragmental rocks			
	68.6	70.1		--	--	tr.	Sedimentary rocks			
	70.7	71.0		--	--	tr.	Sedimentary rocks			
	88.4	89.9		0.13	2.47	0.7	Mafic flows			
	93.7	95.3		0.19	1.21	0.3	Mafic fragmental rocks			
	95.3	96.8		0.09	0.81	0.3	Mafic fragmental rocks			
	96.8	98.1		0.18	0.35	0.3	Mafic fragmental rocks			
	105.3	106.4		0.32	0.81	tr.	Mafic fragmental rocks			

No samples were collected from DDH 31 (45.7 m) and 38 (57.0 m). Samples were not described for DDH 2 (A.F. 91023).
Minor sulphides in chlorite schist were intersected by DDH 41 (76.2 m) and in hornblendite from DDH 45 (43.0 m); assays were not reported. Insignificant amounts ("low values", "very low values", "no values", "traces and nils") of copper and zinc were obtained from sections with minor sulphides from DDH 42, 43, 44, 46, 47, 48 and 49 (A.F. 91024).

Table 49-2
Summary of mineralization and assay results from DDH 71 (A.F. 91024)

From (m)	To (m)	Mineralization	Host Rock	Zn (%)	Cu (%)	Au g/t	Comments
3.0	25.3	Nine samples of quartz veins	Sedimentary rocks			tr. & nil	
36.9	38.7	"Heavy" pyrite	Sedimentary rocks			tr.	
68.6	69.2	Sp & py bands, tr. cp	Sedimentary rocks, mainly quartzite	1.76			
69.8	70.4	Sp & py bands, tr. cp	Sedimentary rocks, mainly quartzite	0.40			
71.6	73.2	Sp & py bands, tr. cp	Sedimentary rocks, mainly quartzite	2.82			
73.2	74.7	Sp & py bands, tr. cp	Sedimentary rocks, mainly quartzite	1.06			
74.7	76.2	Sp & py bands, tr. cp	Sedimentary rocks, mainly quartzite	0.86			
80.3	81.7	"Mineralized sediments		2.17			Two samples with some quartz"