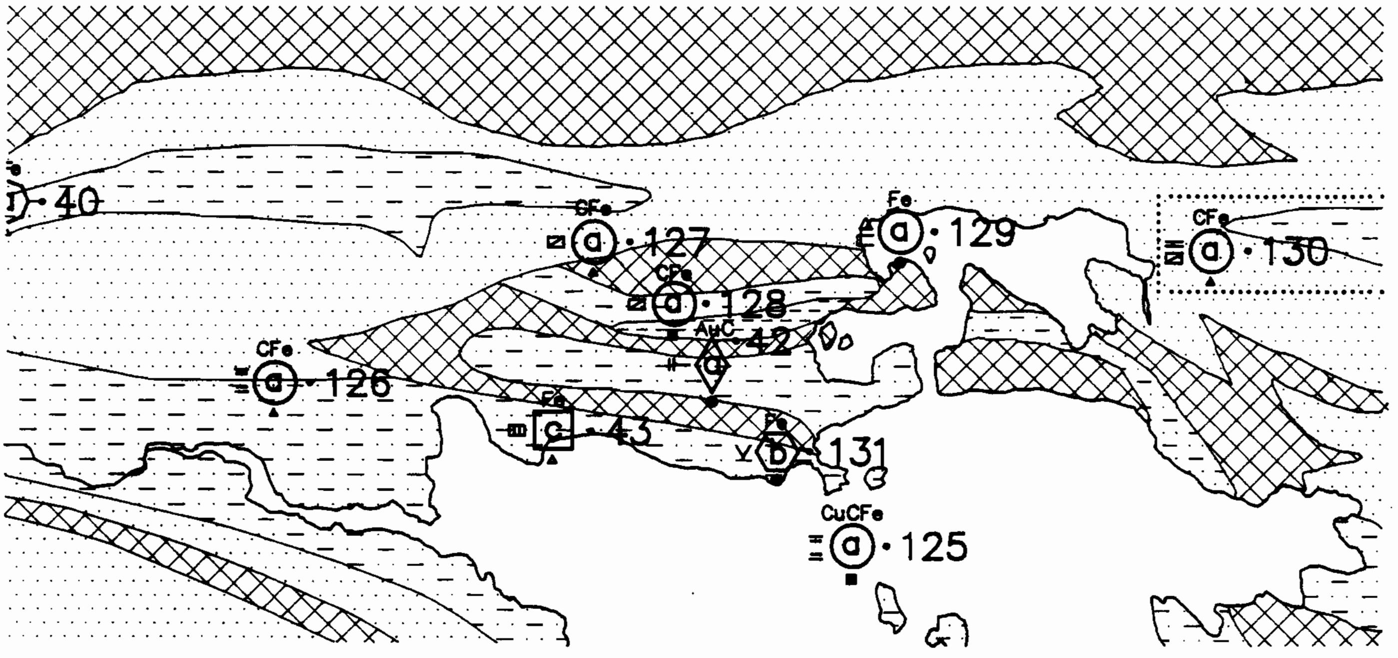
Mineral Deposit Series Report No. 14



Mineral Deposits and Occurrences in the Wekusko Lake Area, NTS 63J/13

By M.A.F. Fedikow, P. Athayde, and A.G. Galley

Manitoba
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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. 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 In addition, for each occurrence the geologists have attempted to synthesize available data from published and unpublished sources.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 responsibility for the acquisition of mineral deposit information was apportioned to the authors in 1984. Accordingly, specific deposit descriptions are attributed as follows:

1. Mark Fedikow (and senior assistants): locations 1 to 65, and 82 to 126, field examinations and compilations; locations 66 to 74 and 81, compilations;
2. Priscilla Athayde: exploration histories for 63J/13;
3. Al Galley: locations 66 to 74 and 81, field examinations.

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% to 100% and 'near solid sulphide' for 50% to 75% sulphide minerals is adopted in place of the commonly used term 'massive' to describe the textural aspects of a sulphide mineralization.

FORMAT OF MINERAL DEPOSIT MAPS

Location:

One of the incentives spurring 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.

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.

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

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 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. Multi-element analyses are presented for 319 rock samples collected from mineral occurrences 1 to 126. Details of the sampling and analytical procedures are presented in Appendix I along with multi-element geochemical data.

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:

M.I.	Mineral Inventory
A.F.	Assessment file
g/t	Grams per tonne
oz/ton	Ounces per ton
HBED	Hudson Bay Exploration and Development Company Limited
HBMS	Hudson Bay Mining and Smelting Company Limited
DDH	Diamond drill hole(s)
EM	Electromagnetic
HLEM	Horizontal loop electromagnetic
VLEM	Vertical loop electromagnetic
VLF-EM	Very low frequency electromagnetic
IP	Induced polarization
SP	Self-potential
t	Tonne
MT	Million tonnes
m	Metre
cm	Centimetre
dm	Decametre
km	Kilometre
MDS	Mineral Deposit Series
CB	Claim block
tr.	Trace
diss.	Disseminated
NSS	Near solid sulphide
SS	Solid sulphide
py	Pyrite
po	Pyrrhotite
cp	Chalcopyrite
sp	Sphalerite
apy	Arsenopyrite
v.f.g.	Very fine grained
f.g.	Fine grained
m.g.	Medium grained
c.g.	Coarse grained

ACKNOWLEDGMENTS

During the course of mineral occurrence documentation in the Wekusko Lake area, seasonal students provided assistance with sampling, grid construction, outcrop preparation, outcrop map production and portions of the geological mapping. We would like to acknowledge the following for their contributions in the field and the office:

1985:Senior Geological Assistant - D.R. Eccles
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Computing:	G. Conley
Typing:	L. Chudy, S. Weselak
Review:	K.J. Ferreira, I. Hosain, W.D. McRitchie
Editing:	D.A. Baldwin.

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 authors or the Director, Geological Services Branch.

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GENERAL GEOLOGY OF WEKUSKO LAKE AREA, NTS 63J/13

The geology base for mineral deposit map map, No. 44, NTS 63J/13 has been compiled from a variety of map sources. The eastern portion of the area was compiled using the one inch:one mile map of Frarey (1950), the one centimetre:two kilometre map of Gordon and Gall (1882) and the one inch:one thousand foot map of Stockwell (1935). The western portion of the map area was derived from the 1:50 000 maps of Froese and Moore (1980), Bailes (1975), the two inch:one mile map of Russell (1954), the 1:1000 map of Stockwell (1935) and the 1:5000 map of Bailes and Galley (1991).

The area of mineral deposit map NTS 63J/13 forms part of the Flin Flon-Snow Lake greenstone belt. The belt is situated in the southeastern Churchill Structural Province of the Canadian Shield. An Aphebian age of 1700-1800 Ma has been assigned to the belt based upon Rb-Sr isochron studies (Mukherjee *et al.*, 1971; Josse, 1974; Bell *et al.*, 1975) and Pb isotope determinations (Sangster, 1972, 1978). Recently, Gordon *et al.* (1990) determined an age of 1886 Ma for Amisk volcanism at Flin Flon. The greenstone belt is in fault and/or gradational contact with the Kisseynew metasedimentary gneiss terrane to the north and is unconformably overlain by Ordovician limestone and dolomite to the south. Supracrustal rocks in the belt include the Amisk Group that is unconformably overlain by subaerially deposited volcanic and sedimentary rocks of the Missi Group.

The Amisk Group comprises mafic and felsic volcanic rocks with intercalated volcanogenic sedimentary rocks that predominate near the top of the succession (Harrison, 1949; Froese and Moore, 1980; Bailes, 1980; Walford and Franklin, 1982). The felsic volcanic rocks are fragmental, thickly to thinly bedded and contain 3 to 5 mm quartz phenocrysts. A pyroclastic and/or volcaniclastic origin has been proposed for these rocks (Froese and Moore, 1980). Mafic volcanic rocks consist mainly of flows and pyroclastic rocks. Pillows, quartz-filled amygdales and mafic breccia are present in the mafic rocks. Typically, these units are dark green to black, fine- to medium-grained amphibolite and hornblende schist that are granoblastic, lineated or schistose. These units may be thickly layered (0.2-1 m) and contain coarse hornblende. Fine grained, pyritic, calcareous and/or siliceous chemical sedimentary rocks form thin discontinuous interlayers in the volcanic rocks. Thinly interbedded greywacke and shale, commonly with graded bedding and flame structures, are present. Locally, calc-silicate layers and impure marble are interlayered with the greywacke and shale.

Missi Group sedimentary rocks consist of bedded and crossbedded arenite and minor paraconglomerate and interbedded arkose and polymictic pebble conglomerate. These units are typically bedded on a scale of 0.2 to 2 m, are fine grained and granoblastic. Locally, the sedimentary rocks are intercalated with, and overlain by, mafic and felsic volcanic rocks. The felsic volcanic rocks include porphyritic volcaniclastic flows; mafic volcanic rocks are characterized by thick sequences of primarily subaerially deposited andesite and basalt flows (Stockwell, 1937; Gordon and Gall, 1982).

Intrusions in the map area have been divided into pre-, syn-, and late-tectonic varieties by Cerny *et al.*, (1981). The pretectonic group includes intrusions that are coeval with Amisk volcanic rocks, as well as those that crosscut Amisk and Missi supracrustal rocks. Numerous mafic to ultramafic dykes (diorite, gabbro, pyroxenite) intrude the Amisk volcanic rocks. A quartz-eye tonalite that occurs in the Anderson Lake area is interpreted to represent a shallow synvolcanic intrusion of Amisk age on the basis of its massive character, absence of fragmental textures and discordant relationship to country rocks. Missi sedimentary and volcanic rocks have been intruded by quartz- and feldspar-phyric intrusions that also exhibit extrusive character, and lamprophyre-shoshonite dykes and sills. A series of gneiss domes that occur east and north of Herblet Lake and Squall Lake have been cited as examples of syntectonic intrusions, however, their origin is enigmatic (Fedikow and Trembath, 1991). Portions of the Herblet and Pulver gneiss domes (Bailes, 1975) are present in the map area; both extend northward into NTS area 63O/4. The 3 to 4 km thick outer layer of these domes is composed of fine- to medium-grained, pink, quartz-oligoclase-microcline granitoid gneiss; the cores of the domes are characterized by white to grey quartz-oligoclase granitoid gneisses. The Rex Lake Complex, which forms a peninsula in northeast Wekusko Lake, includes mafic to felsic intrusions, and along with granitic intrusions that occur along the southwest shore of Wekusko Lake and the Wekusko Lake pegmatite field (Cerny *et al.*, 1981), represent late-tectonic intrusions.

Froese and Moore (1980) documented two periods of folding that have affected the rocks in the area. The initial episode of deformation (F_1) produced east-trending isoclinal folds. The F_1 structures were refolded by later north-northeast-trending folds during F_2. The Threehouse and Herb Lake synclines are representative of the F_2 deformational event. Diapiric emplacement of the gneiss domes occurred subsequent to F_2. Three ages of faults have been recognized in the area. The earliest represents syn- to post-F_1 and pre-F_2 thrust faults (e.g., McLeod Road Thrust Fault) that juxtapose Amisk volcanic rocks over Amisk sedimentary rocks (Froese and Moore, 1980; Gordon and Gall, 1982). The Berry Creek Fault is representative of syn- to post-F_2 sub-vertical oblique slip faults. Post-F_2 faults are east-trending brittle faults that offset earlier structures.

Metamorphism in the map area ranges from greenschist facies in the south to almandine-amphibolite facies along the border between the Kisseynew terrane and the Flin Flon-Snow Lake greenstone belt. Gordon *et al.* (1987) indicate that metamorphism in the Snow Lake area probably commenced during the later stages of

Missi magmatism (1832 ± 2 Ma) and continued to approximately 1800 Ma. Metamorphic grades are generally higher in the Snow Lake area than elsewhere in the Flin Flon-Snow Lake belt. Froese and Moore (1980) documented four metamorphic zones in the area. These are the (i) chlorite-biotite, (ii) chlorite-biotite-staurolite, (iii) biotite-staurolite-sillimanite, and (iv) biotite-sillimanite-almandine zones. Metamorphism of sulphide mineral deposits and their associated alteration zones has produced coarse grained alteration mineral assemblages characterized by the presence of one or more of garnet, staurolite, sillimanite, cordierite, chlorite and anthophyllite.

Gold mineralization in the area occurs as lode gold or vein type deposits on the east shore of Wekusko Lake within a group of gold deposits collectively referred to as the Herb Lake gold camp. Gold also occurs in association with volcanogenic base metal massive sulphide type deposits in the Snow Lake (63K/16) and Wekusko Lake (63J/13) areas. Franklin *et al.* (1981) calculated that massive sulphide deposits in the Snow Lake camp contain approximately 23 million grams of gold. These calculations included the Chisel deposit (*cf.* location 33, Fedikow *et al.*, 1989), and the Anderson (location 75), and the Stall (location 76) deposits. Gold intersections of 13 g/t over 10 m occur in the Chisel deposit, but the distribution of gold is inconsistent due to faulting and folding. South of Threehouse Lake, gold-bearing synvolcanic felsic intrusions occur in extensive hydrothermal alteration zones developed in the footwall rocks to massive sulphide deposits. These alteration zones are postulated to have developed as part of the base metal mineralizing processes (Galley *et al.*, 1986). The gold content of the massive sulphide deposits in this area has been estimated at 0.6 g/t (Franklin *et al.*, 1981). Galley *et al.* (1986) postulate that the high gold zones in the deformed portions of the Chisel deposit may have been deposited coeval with the base metals and was mobilized and concentrated in the massive sulphide deposits during middle amphibolite metamorphism. An alternate explanation would be to add the gold to the massive sulphides during deformation. Similar arguments could be used to explain the presence of gold in the base metal massive sulphide deposits in map area 63J/13 (locations 75 to 80).

Lode gold deposits in the area occur in two groups in the Herb Lake gold camp on the east shore of Wekusko Lake. Gold deposits on the east shore of Wekusko Lake occur within brittle-ductile shear zones formed as part of the post-F_2 Crowduck Bay fault. The host rocks were sheared during the initial ductile deformation that was responsible for the strong schistosity in the fault zones. Rupture planes and breccia zones formed subsequent to further displacement and the gold-bearing fluids were then emplaced into these zones. Subsidiary faults to the main structures appear to represent a significant metallogenetic control to gold deposits in NTS 63J/13 map area (Galley *et al.*, 1986). Galley *et al.* (1986) described the gold occurrences as being spatially and genetically related to (i) the northwest limb of the Herb Lake Syncline near the contact between Missi Group sedimentary and volcanic rocks (Elizabeth-Dauphin, location 66; Rex-Laguna, location 67; Moosehorn-Ballast, location 69; Kiski, location 73; and Bingo, location 81), and (ii) the axial trace of the Herb Lake Syncline, where the occurrences form a discontinuous linear array subparallel to the axial trace (Ferro-Rainbow Group-Pocahontas-Gold Dust-Lieury-Orcadian-Wizard, location 68).

The "northwest limb occurrences" are situated within a zone 10 km long by 800 m wide. Half of the occurrences are hosted entirely or partly by quartz- and feldspar-phyric rocks; the remainder of the occurrences are within 400 m of this rock type. Occurrences within the felsic porphyritic rocks are characterized by one or two quartz veins up to 1 m wide and 700 m long. The veins may be boudinaged and kinked. Occurrences hosted by sedimentary rocks and mafic dykes are represented by irregular lenses and stringers of quartz up to 30 cm wide in 1 m wide schistose zones. Sericite-albite-carbonate-chlorite alteration is developed in the felsic host rocks; biotite-chlorite-carbonate is the typical alteration assemblage that accompanies quartz veins hosted by sedimentary, mafic volcanic and dyke rocks. This alteration overprints regional metamorphic mineral assemblages and, as such, indicates a late-tectonic age for quartz vein development. The major veins strike north-northeast, parallel to the strike of the sedimentary and volcanic rocks, as well as the major faults. The regional foliation strikes northeast at an acute angle to the vein systems. The veins and the regional foliation dip southeasterly. Typically, the veins are crack-and-seal type with elongate fragments of wall rock contained within the outer two thirds of the quartz vein. The long axes of the fragments are oriented parallel to the wallrock. Vein mineralogy is quartz-albite with minor sericite, chlorite and tourmaline. Locally, subsidiary veins are composed entirely of albite. Euhedral and acicular crystals of arsenopyrite, the predominant sulphide, occur in wallrocks, as well as in xenoliths in the veins. Other sulphides include pyrite, sphalerite, chalcopyrite, pyrrhotite and galena. High gold grades correlate to the presence of acicular arsenopyrite crystals, which plunge 45° southwest, opposite to the northeast plunge of the Herb Lake Syncline. This indicates that the orientation of the constituent minerals in the foliated wallrocks is controlled by the shearing that accompanied vein formation, not regional structure. The parallel alignment of the major vein systems and gold occurrences with the trend of the Crowduck Bay Fault suggests the gold may have been emplaced into subsidiary structures related to this fault.

The "axial trace occurrences" are developed within a sequence of subaerial andesite-basalt flows that is subdivided into three parts by thin layers of rhyolitic pyroclastic tuff and tuffaceous sedimentary rock. Gold appears to be associated with the uppermost of these three mafic units. The occurrences have a northeasterly strike and a steep southeasterly dip, and consist of multiple veins and lenses of quartz within 1 to 6 m of biotite schist, which represents an alteration product of the mafic flows. The veins are boudinaged and tightly folded where they crosscut the foliation. Veins commonly contain pyrite with minor chalcopyrite, pyrrhotite, native gold, carbonate, sericite and tourmaline. Gold also occurs at quartz boudin necks and at vein/wallrock interfaces. Unlike the "northwest limb occurrences", these gold occurrences are conspicuous by their lack of arsenopyrite.

Base metal massive sulphide type deposits in NTS 63J/13 map area (locations 75 to 80) have many characteristics that lend themselves to the formulation of a metallogenetic framework for exploration. The Anderson, Stall, Ram, Linda and Osborne deposits exhibit spatial and genetic relationships to a lower semi-conformable alteration zone that has been likened to a regional aquifer, the pathway for the metals that formed these deposits (Walford and Franklin, 1982; Zaleski, 1988; Bristol and Froese, 1990). Insufficient data are available to ascertain whether this relationship also exists for the Rod deposit. This lower alteration zone/acquifer/reservoir has been documented by Walford and Franklin (1982) at the Anderson, Stall and Ram deposits where footwall alteration pipes descend from each of these deposits to intersect or tap the reservoir. Similar scenarios have been described by Zaleski (1988) for the Linda deposit and by Bristol and Froese (1990) for the Osborne deposit. The reservoir hypothesis, if correct, is critical to the understanding of the controls on the distribution of massive sulphide deposits in the Snow Lake area. The recognition of the surficial geological, geophysical and/or geochemical expressions of synvolcanic or growth faults that intersect the lower reservoir becomes critical. These features will then dictate the location of pathways for metal-charged brines and their subsequent debouching on the seafloor. Walford and Franklin (1982) contend that the tonalitic synvolcanic intrusion in the footwall sequence at the Anderson deposit acted as a heat engine that drove the mineralizing event: this represents a second criteria for the localization of massive sulphide mineralization in the map area.

Recently, Bailes and Galley (1991) have reinterpreted the geology in the vicinity of the Anderson Lake, Stall Lake and Rod Cu-Zn deposits , including the areal extent and geological characteristics of the Sneath Lake pluton. Detailed, 1:5000 mapping indicates the Rod No. 1 and 2 deposits occur within the Sneath Lake pluton. Elsewhere, Bailes and Galley (1991) indicate similarities between the stratigraphic sequence that hosts the Linda massive sulphide type deposit and the host rocks to the Anderson Lake, Stall Lake and Rod deposits. The hypothesis that the Linda deposit occurs on the south limb of a major F_1 antiform was originally proposed by Coats et al. (1970), Gale and Koo (1977) and Jeffrey (1982, unpubl.). Bleeker (pers. comm., 1991 in Bailes and Galley, 1991) argues that the presence of an S_1 cleavage in Snow Lake volcanic strata necessitates the presence of a major F_1 structure in the vicinity of the Linda deposit. The presence or absence of this antiform is critical for volcanic rock hosted base metal deposit exploration in the Snow Lake area. Bailes and Galley (1991) indicate that in the presence of this antiform, structural repetition of the host rocks to the Anderson Lake, Stall Lake and Rod deposits could occur south of the Sneath Lake pluton.

The Bur Zone Zn-Cu (location 126) and Ruby Zn-Pb-Ag (location 13) massive sulphide type deposits are hosted by Amisk Group greywacke (Fedikow, 1991) and represent a different geological setting from the volcanic/volcaniclastic rock associated base metal deposits in the Snow Lake mining camp. The host rocks to the Bur Zone and Ruby deposits extend along strike to the northeast and southwest where massive sulphide and chemical sediment type deposits have been documented (this report; locations 97 and 15, respectively). Disseminated mineralization in these rocks has also been documented at location 19. Location 64 (sphalerite-pyrite in argillite) and locations 83 and 84 (graphite-pyrite in greywacke-quartzite-argillite) also occur in these Amisk Group sedimentary rocks. These sedimentary rocks, extending northeast from the Bur Zone towards the eastern portions of the Herblet Lake Gneiss Dome Complex and southwest to the northwest shore of Wekusko Lake, therefore represent highly prospective terrane for repetitions of Bur Zone massive sulphide type deposits

The Wekusko Lake pegmatite field (Cerny, 1989) occurs within an area of granitoid intrusions that straddles the Grass River northeast of Wekusko Lake. These intrusions comprise: (i) a gabbro-diorite-granodiorite-granite sequence known as the Rex Lake Complex; (ii) a syntectonic gneiss dome characterized by granitoid gneisses; and (iii) fertile leucogranites and pegmatites intruding Amisk and Missi Group volcanic and sedimentary sequences. The pegmatites are spatially associated with two northeast-trending fault zones that transect three distinct metamorphic isograds in the area (Froese and Moore, 1980). Generally, the Wekusko Lake pegmatites (locations 108, 109, and 110) tend to be depleted in Li, considerably lower in Rb, Cs, Be, P, and F, and poor in Sn, Ta and Nb compared to their Archean analogs. This unique low level of geochemical evolution is attributed to the nature and evolution of the crust in the Wekusko Lake area (Cerny, 1989).

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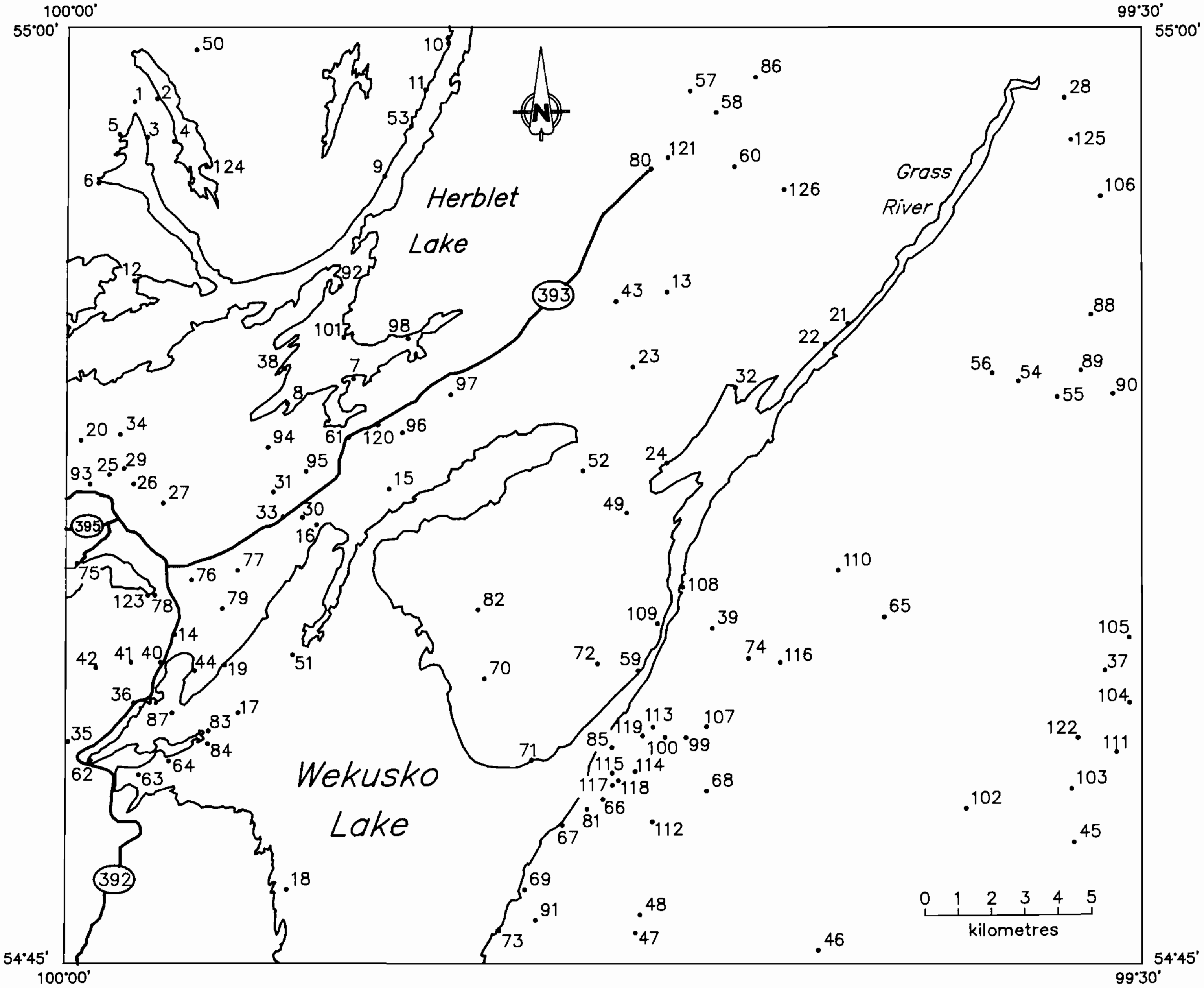


Figure 1: Location of mineral deposits and occurrences (63J/13).

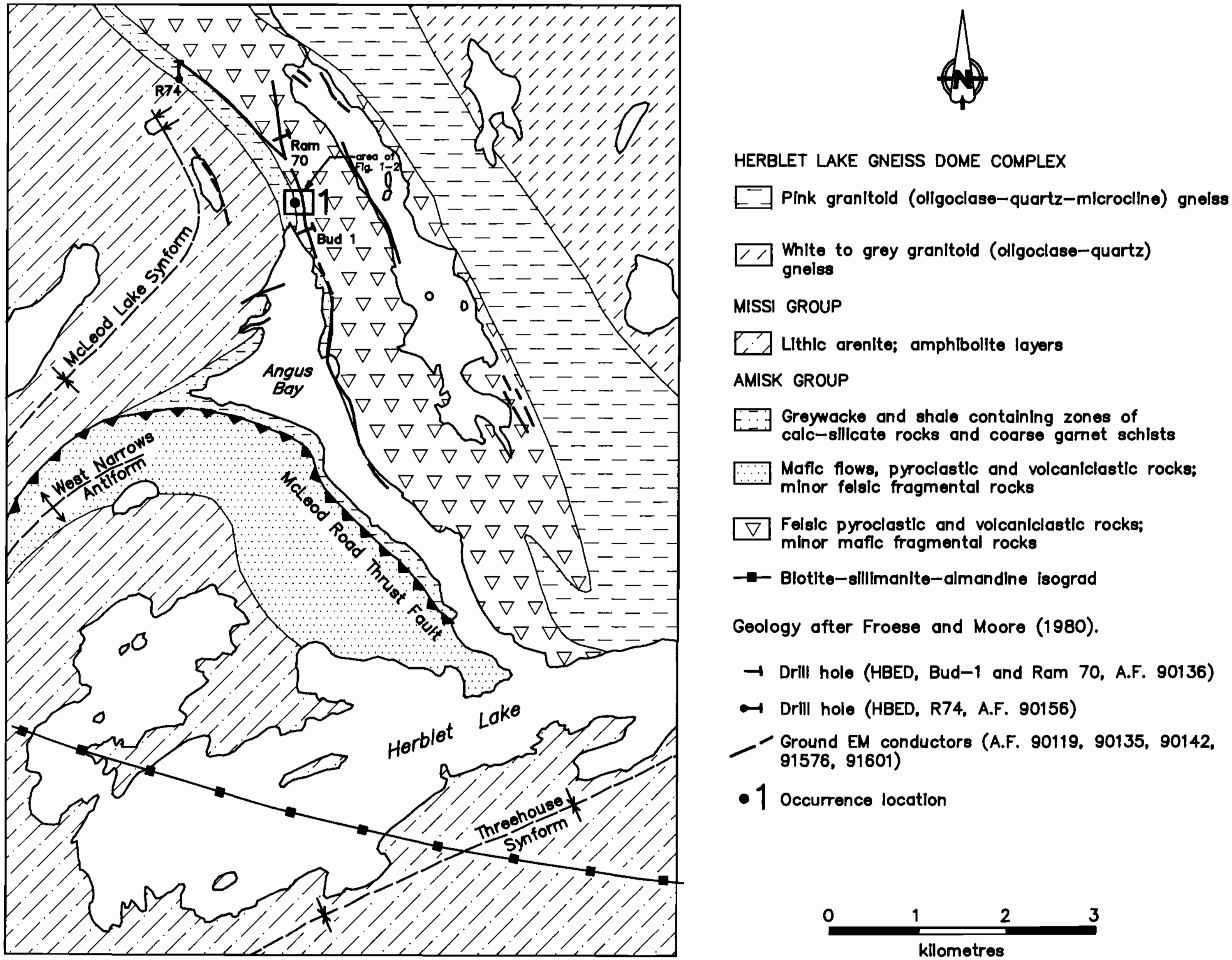


Figure 1-1: Geological setting of occurrence 1.

MINERAL DEPOSITS AND OCCURRENCES: WEKUSKO LAKE AREA (63J/13)

LOCATION: 1

NAME:

UTM: 6092769N/437951E

ACCESS: Via Provincial Road 393 from Provincial Road 392 to Herblet Lake landing; boat across Herblet Lake to Angus Bay and traverse.

AREA: North end of Angus Bay, Herblet Lake.

AIRPHOTO: A20170-25

EXPLORATION SUMMARY:

The area was first staked as the Iron Six group of claims prior to 1930. Angus Wood sunk a shaft on the property in 1928 (Herblet Lake Shaft Closures, Mining Engineering File). Hack, Hack 1, Reid 3 and the Schultz and R.R. groups of claims were staked in the 1940's. Wolverton Lake Gold Mines Limited examined the Hack group of claims in 1945 (Mineral Inventory Card 63J/13 Au 22). HBED did an HLEM survey in the area between 1956 and 1957 (A.F. 90017, 90119, 90135, 90156, 91576) and drilled three holes totalling 458 m on Bud 4, Ram 593 and Ram 600 in 1957 (A.F. 90136, 90156). Canadian Nickel Company Limited staked CB 4192 in 1971 and did diamond drilling under a claim grouping from 1974 to 1975 (Mineral Inventory Card 63J/13 Cu 8). HBED restaked the area under CB 7024 in 1978 and carried out linecutting, EM and magnetic surveys. The area is also partly covered by Domex 3 staked by Peter Dunlop in March, 1991 over ground held by Snow Lake Mines Limited from 1987 to 1991.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by felsic pyroclastic and volcaniclastic rocks to the east and northeast and greywacke and shale to the southwest. Both sequences have been assigned to the Amisk Group (Fig. 1-1; Froese and Moore, 1980). In the immediate vicinity of the occurrence, mineralization is localized at or near the contact of these two sequences (Fig. 1-2). Missi Group lithic arenite occurs west and southwest of the occurrence.

The felsic volcanic rocks are ferruginous, contain 1 to 5 mm red garnets, and locally, quartz-sillimanite "knots" that weather in relief. Boudined nonmineralized quartz veins are common. Diamond drill holes, collared to test ground EM conductors, intersected altered rhyolite, quartz-hornblende gneiss, graphite and sulphide mineralization (A.F. 90136), and coarse grained garnetiferous quartz-hornblende-biotite gneiss with "quartz-eyes" (A.F. 90156).

MINERALIZATION:

Mafic rocks in the area are silicified, rusty weathered and contain disseminated pyrite. Chert float contains 1 to 2% coarse grained pyrrhotite. The highest concentration of mineralization is associated with a poorly exposed graphite-chert-pyrite layer within the felsic sequence. Coarse- to fine-grained disseminated pyrite occurs with the chert and graphite.

Diamond drilling intersected multiple layers of near solid to solid sulphide mineralization. These mineralized zones vary in core length from 0.8 to 2.0 m in DDH Bud 1, and 0.2 to 0.9 m in DDH Ram 70. The predominant sulphide minerals are pyrite and pyrrhotite with minor sphalerite and chalcopyrite. Parts of the mineralization are graphitic. The mineralized zones are laminated with graphitic and garnetiferous hornblende-muscovite-biotite gneiss, quartz-hornblende gneiss and rhyolite. Locally, 0.5 cm pyrite stringers and lenses of pyrrhotite and pyrite are present. A 1 m intersection of vuggy "quartz" in core from DDH Bud 1, interpreted from the examination of surface exposure as chert or a cherty sinter, contains lenses and zones of near solid pyrrhotite and pyrite with disseminated chalcopyrite. Disseminated arsenopyrite is noted in the drill logs (A.F. 90136). DDH R74 intersected disseminated pyrite in coarse grained garnetiferous quartz-hornblende-biotite gneiss and "well mineralized sulphides" in hornblende-biotite-quartz gneiss (A.F. 90156).

GEOCHEMICAL DATA:

Two representative rock chip samples were collected from a graphitic-chert-pyrite zone exposed at surface (Fig. 1-2). Assay results are summarized and tabled on Fig. 1-2 and the geochemical results in Appendix I. The samples contain low base and precious metal values.

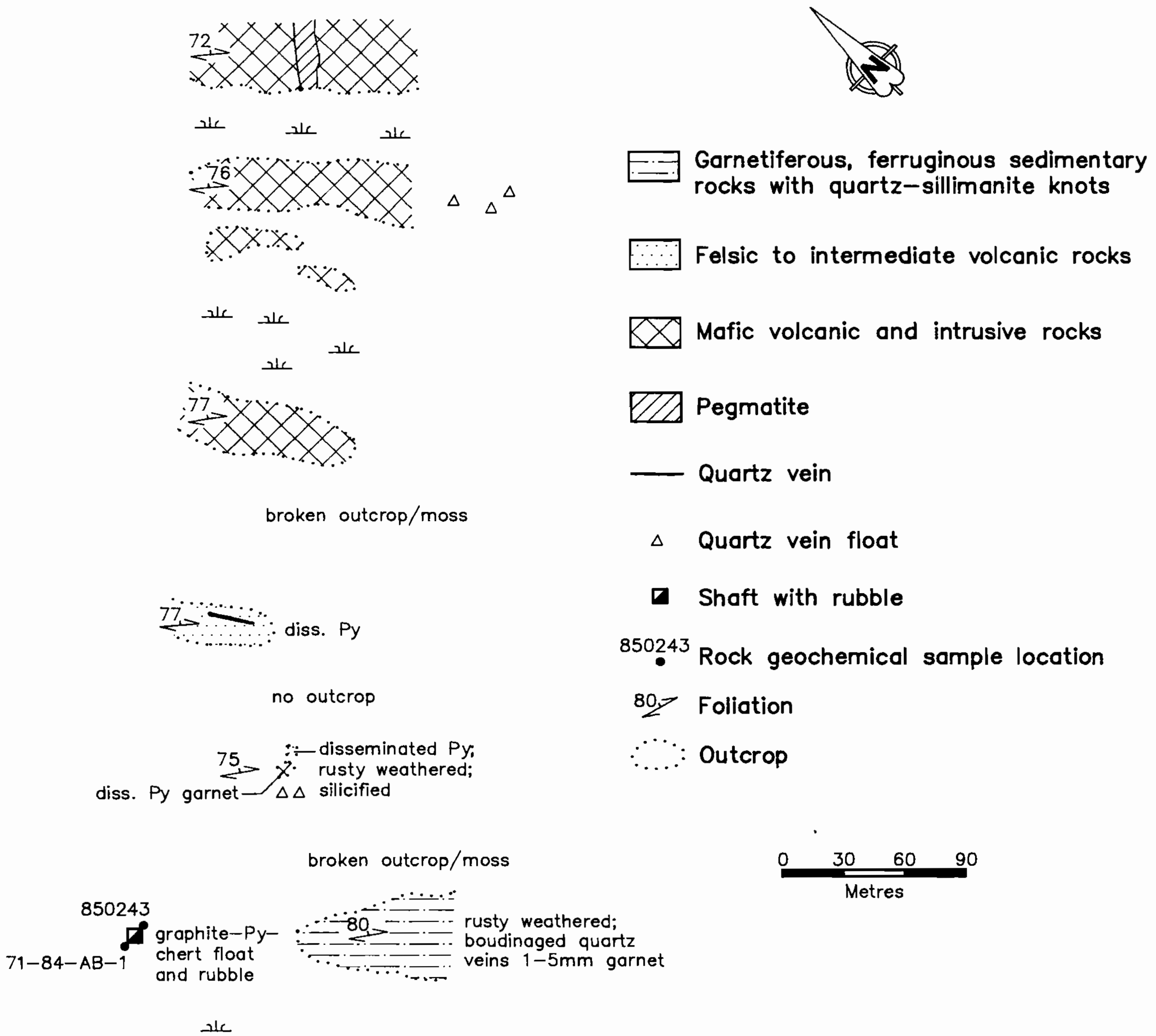
CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

Assessment Files 90017, 90119, 90135, 90136, 90142, 90156, 91576, 91601
Manitoba Energy and Mines, Minerals Division.

Davies, J.F., Bannatyne, B.B., Barry, G.S. and McCabe, H.R.
1962: Geology and mineral resources of Manitoba; Manitoba Department of Mines and Natural Resources, Mines Branch, 190p.



Sample	Au (g/t)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)
71–84–AB–1	–	1	161	94	158

Figure 1-2: Outcrop, geology, shaft and sample location map and assay results, occurrence 1.

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1984: Mineral deposit studies - Snow Lake area; in Manitoba Energy and Mines, Mineral Resources, Report of Field Activities, 1984, p. 46-52.

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Manitoba Energy and Mines, Minerals Division, Mining Engineering Files.

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Manitoba Energy and Mines, Minerals Division.

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Russell, G.A.
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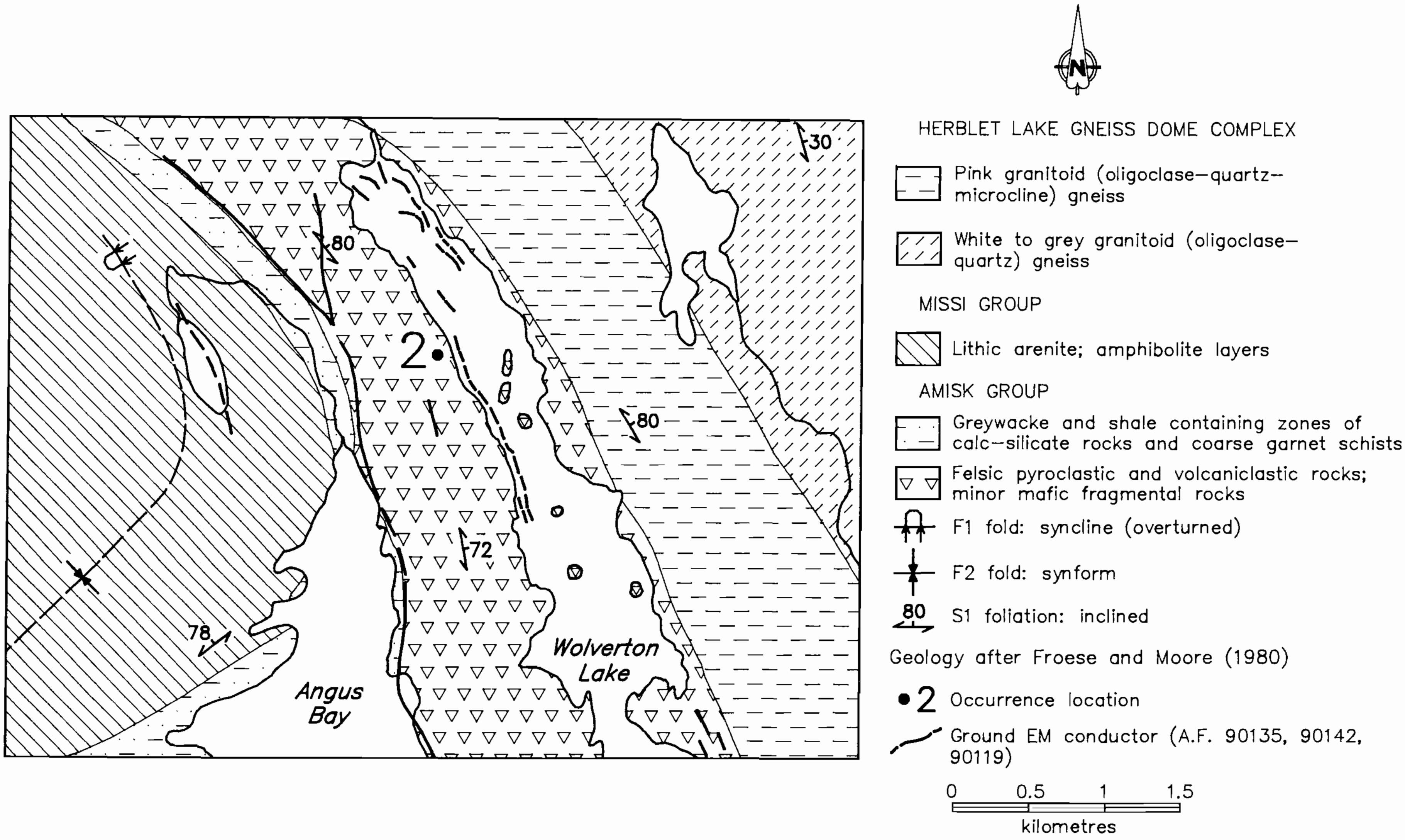

Figure 2-1: Geological setting of occurrence 2.

LOCATION: **2**

NAME:

UTM: 6092845N/438621E

ACCESS: Via Provincial Road 393 from Provincial Road 392 to Herblet Lake landing; boat across Herblet Lake to Angus Bay, then traverse.

AREA: Northwest shore of Wolverton Lake.

AIRPHOTO: A20170-25

EXPLORATION SUMMARY:

The area was first staked as Dominion No. 4 and Wolf prior to 1930, and as Jay B4 in the 1940's. Wolverton Lake Gold Mines Limited examined the Jay B group of claims in 1945 (Mineral Inventory Card 63J/13 Au 22). Bud 3 and Jan 6 were staked by J.H. Kerr in 1955, and assigned to W. Johnson in 1956. HBED optioned the property and did HLEM surveys between 1956 and 1957 (A.F. 90117, 90119, 90135, 90142, 91576). The claims were cancelled in 1960. HBED restaked the ground under Zyl 3 in 1966 and partly under Zyl 59 Fr. in 1971 and CB 7204 in 1978. Zyl 59 Fr. was cancelled in 1974 (Mineral Inventory Card 63J/13 Au 22). The ground is covered by Zyl 3 and CB 7204 (1991).

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group felsic pyroclastic and volcaniclastic rocks. These rocks are flanked to the west by Amisk Group greywacke and Missi Group lithic arenite, and to the east by pink and grey granitoid gneiss of the Herblet Lake Gneiss Dome Complex (Fig. 2-1; Froese and Moore, 1980; Bailes, 1975). The host rocks to the occurrence are rusty weathered, garnetiferous and magnetite-bearing rhyolite.

MINERALIZATION:

Mineralization is characterized by disseminated 1 to 10% pyrite, chalcopyrite, sphalerite and scheelite in a boudined white to rusty weathered quartz vein that persists for approximately 300 m at surface at 330° Azimuth. The quartz vein strikes parallel to a ground EM geophysical conductor that, in turn, parallels the western shoreline of Wolverton Lake (Fig. 2-1). The quartz vein varies from 10 cm to 2 m thick and contains biotite books and malachite stain in addition to the sulphide mineralization. Minor disseminated pyrite occurs in the wall rocks adjacent to the vein.

GEOCHEMICAL DATA:

Eight representative rock chip samples were collected from the vein for assay. The results are presented in Appendix I. The samples contain low base and precious metal values.

CLASSIFICATION:

Vein type deposit; single vein.

REFERENCES:

Armstrong, J.E.

1939: Wekusko, Manitoba; Map 665A; Geological Survey of Canada, 1:63 360.

Assessment Files 90017, 90019, 90135, 90142 and 91576

Manitoba Energy and Mines, Minerals Division.

Bailes, A.H.

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1984: Mineral deposit studies - Snow Lake area; in Manitoba Energy and Mines, Mineral Resources, Report of Field Activities, 1984, p. 46-52.

Mineral Inventory Card 63J/13 Au 22

Manitoba Energy and Mines, Minerals Division.

Russell, G.A.

1957: Structural studies of the Snow Lake - Herb Lake area; Manitoba Mines and Natural Resources, Publication 55-3, 33p.

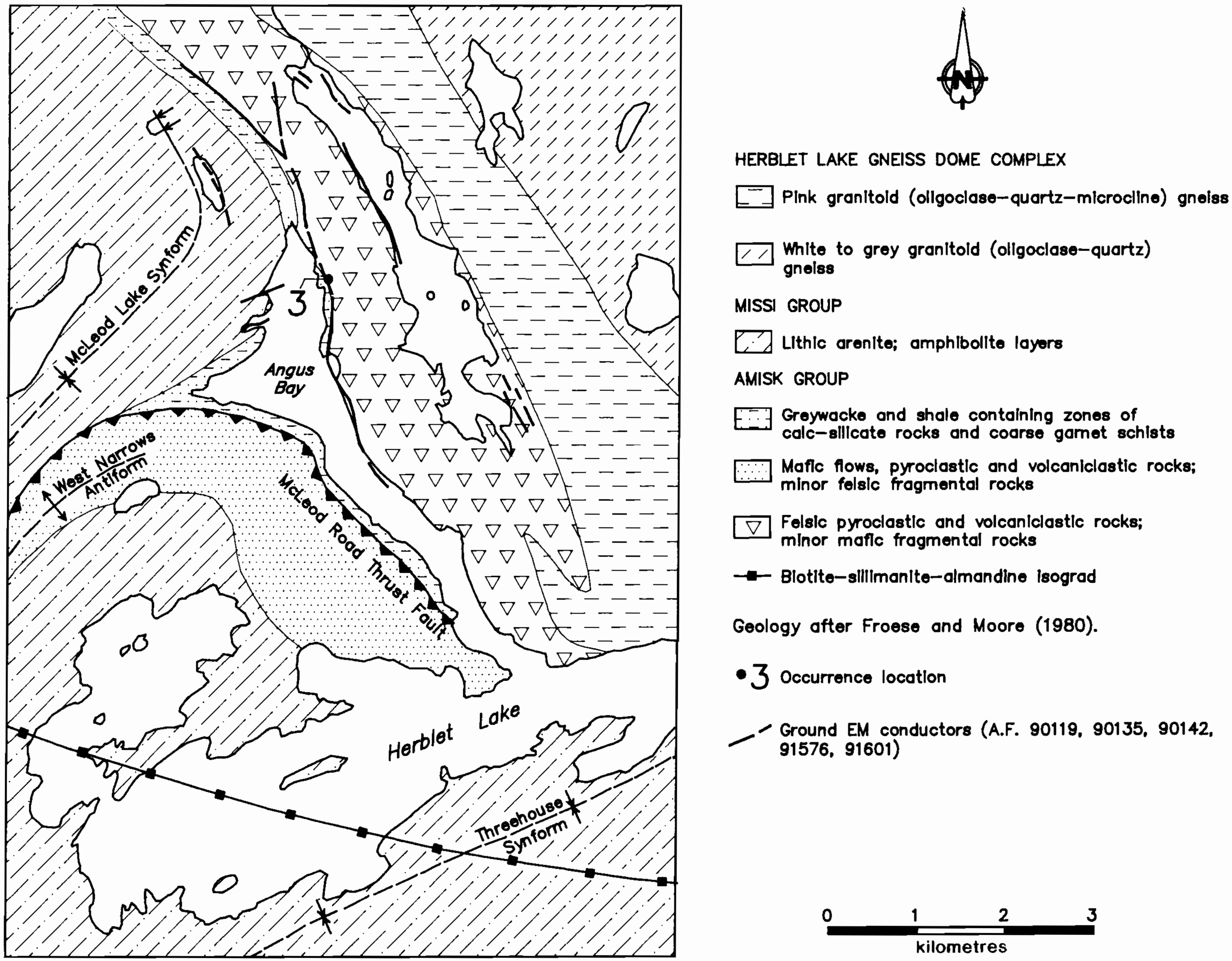


Figure 3-1: Geological setting of occurrence 3.

LOCATION: **3**

NAME: Woods Showing

UTM: 6091692N/438324E

ACCESS: Via Provincial Road 393 from Provincial Road 392 to Herblet Lake landing; boat across Herblet Lake to Angus Bay.

AREA: East shore of Angus Bay, approximately 2 km south of the northern end of Angus Bay.

AIRPHOTO: A20170-25

EXPLORATION SUMMARY:

The area was first staked as Jay, Iron Six Fr. and Iron Six 4 prior to 1930. Jay was staked by Angus Woods in 1925. Trenches and pits were dug on Jay in 1925 and by 1926 one pit was 4.9 to 6.7 m deep. Puella Bay Mining & Development Company Limited optioned the property in 1929 and did some trenching and a 2 hole 152 m drill program (Mineral Inventory Card 63J/13 Cu 8). Jay was cancelled in 1936. Hack 3 and 4, and Schultz 8 were staked in the 1940's. Hacker Tungsten Prospecting Syndicate and Herblet Tungsten Prospecting Syndicate did surface work in 1943. The companies merged in 1945 to form Wolverton Lake Gold Mines Limited. Hack 4 was assigned to Herblet Hudson Mines Limited in 1945. Diamond drilling totalling 65 m was reported on Hack 4 in 1945 (Mineral Inventory Card 63J/13 Cu 8). Hack 3 was also drilled that year by E. Swanson (Manitoba Mines and Natural Resources, 1946). On Hack 4 a total of 366 m of diamond drilling was done in 1947 and a 10 m deep hole was drilled in 1949 (Mining Recording File Nos. 27866, 20293). The claims were leased for 21 years in 1950. HBED did an HLEM survey in 1956-1957 and outlined a conductor (A.F. 90017, 90119, 90135, 91576). An airborne EM survey was done by Canadian Nickel Company Limited in 1957 (A.F. 91624). Fosco Mining Limited carried out airborne EM and magnetic surveys in 1971 (A.F. 92130). Canadian Nickel Company Limited did a magnetic survey and a 2 hole 249 m diamond drill program on CB 4192 in 1973 (Mineral Inventory Card 63J/13 Cu 8). Diamond drilling was also reported between 1974 and 1975 under a claim grouping (Mining Claim Card CB 4192). Granges Exploration Aktiebolag staked CB 9201 over the property in 1978 and did work from 1980 to 1981 under a claim grouping (Mining Claim Card CB 9201).

The area is covered by CB 9241 and CB 13434, staked by HBED in 1978 and 1983, respectively.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group felsic pyroclastic and volcaniclastic rocks flanked to the west by Missi Group lithic arenite, to the southwest by Amisk Group greywacke and shale, and to the east by pink and white granitoid gneiss of the Herblet Lake Gneiss Dome Complex (Fig. 3-1; Froese and Moore, 1980; Bailes, 1975). Outcrop is sparse in the immediate vicinity of the occurrence; geological observations have been made from trenches (Fig. 3-2). Rusty weathered, foliated, tuffaceous mafic volcanic rocks are associated with the mineralized zone in the trenches. The mineralogy of these rocks is characterized by an assemblage of amphibole-feldspar-quartz-magnetite-iron sulphide. White, nonmineralized quartz veins and pink pegmatite dykes occur in the host rocks. Coarse grained biotite occurs at the pegmatite/basalt contacts. A small outcrop of basalt occurs west of the occurrence, at the edge of Angus Bay, that differs from the basalt in the trenches by the presence of abundant 0.25 to 1.0 cm red garnets and the absence of magnetite.

MINERALIZATION:

Near solid to solid and disseminated iron sulphides were observed in muck piled at trench 3. In addition to pyrrhotite and pyrite, some chalcopyrite and arsenopyrite also occur in the near solid sulphide. Generally, the quartz veins contain minor disseminated iron sulphide that probably represents sulphide mobilizate. Wall rock/vein interfaces are rusty weathered with visible iron sulphide minerals. Trench 3 is slumped and overgrown.

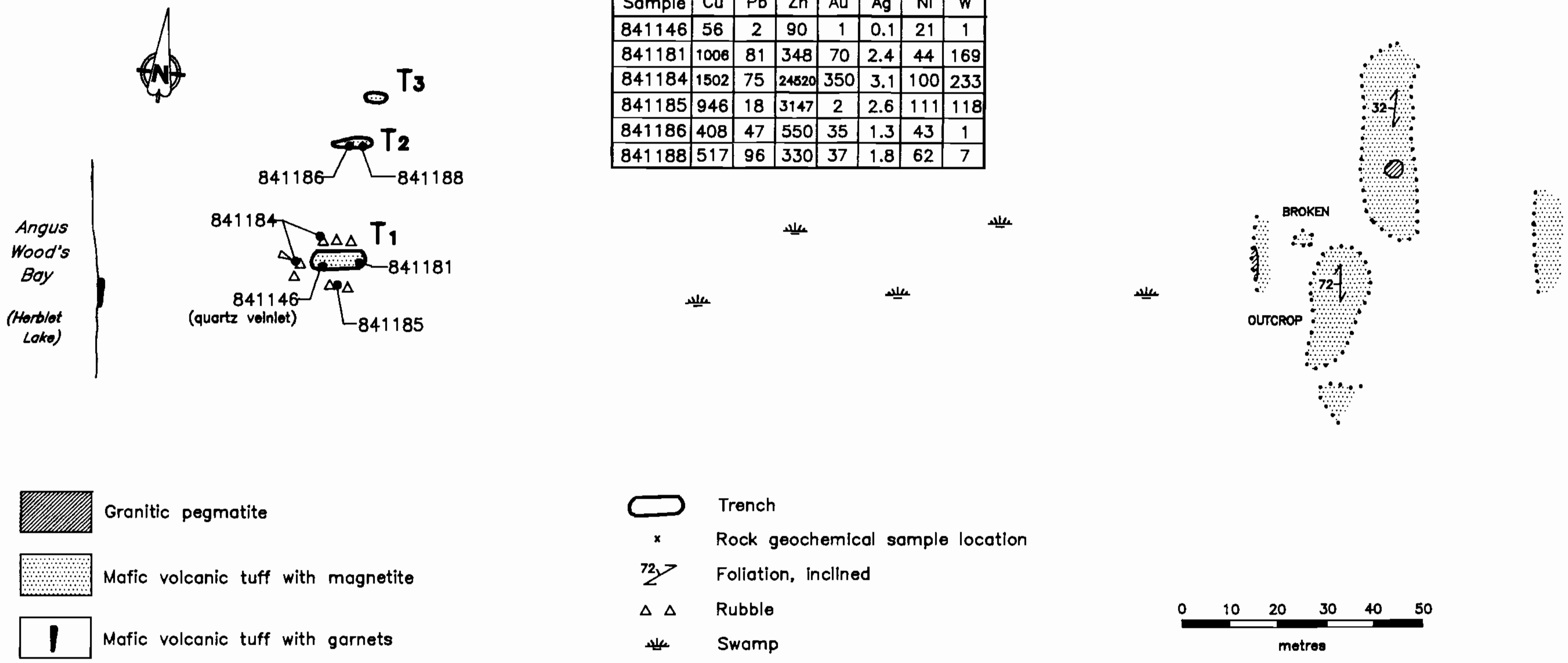
GEOCHEMICAL DATA:

Nickel and copper were reported in assays from surface samples collected by Puella Bay Mining and Development Company Limited (Mineral Inventory Card 63J/13 Cu 8).

Four representative samples were collected from trench 1 for assay: samples 841181 and 841184 are wall rock, 841146 is quartz vein with 1 to 5% disseminated iron sulphide, and 841185 is near solid to solid sulphide collected from the muck pile. Two samples of wall rock (841186 and 841188) that contain 1 to 5% disseminated iron sulphides were collected from trench 2. Analyses are summarized in Appendix I and on Figure 3-2. Sample 841184 contains 2.45% Zn, 0.15% Cu, and 350 ppb Au.

CLASSIFICATION:

Stratabound massive sulphide type deposit; volcanic rock associated. This deposit is associated with mafic volcanic rocks; it is uncertain whether there is an associated footwall alteration zone accompanying the mineralized zone.



Sample	Cu	Pb	Zn	Au	Ag	Ni	W
841146	56	2	90	1	0.1	21	1
841181	1006	81	348	70	2.4	44	169
841184	1502	75	24520	350	3.1	100	233
841185	946	18	3147	2	2.6	111	118
841186	408	47	550	35	1.3	43	1
841188	517	96	330	37	1.8	62	7

Figure 3-2: Outcrop, geology and trench and sample location map, occurrence 3.

REFERENCES:

Assessment Files 90017, 90119, 90135, 91576, 91601, 91624 and 92130

Manitoba Energy and Mines, Minerals Division.

Bailes, A.H.

1975: Geology of the Guay-Wimapedi Lakes area; Manitoba Mines, Resources and Environmental Management, Mineral Resources Division Publication 75-2, 104p.

Froese, E. and Moore, J.M.

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Gonzales, A. and Fedikow, M.A.F.

1984: Mineral deposit studies - Snow Lake area; in Manitoba Energy and Mines, Mineral Resources, Report of Field Activities, 1984, p. 46-52.

Manitoba Mines and Natural Resources,

1946: 18th Annual Report on Mines and Minerals, 85p.

Mineral Inventory Card 63J/13 Cu 8

Manitoba Energy and Mines, Minerals Division.

Mining Claim Cards CB 4192 and CB 9201

Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Mining Recording File Nos. 27866 and 20293

Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Puella Bay Mining & Development Company, Limited

Manitoba Energy and Mines, Minerals Divison, Corporation Files.

Russell, G.A.

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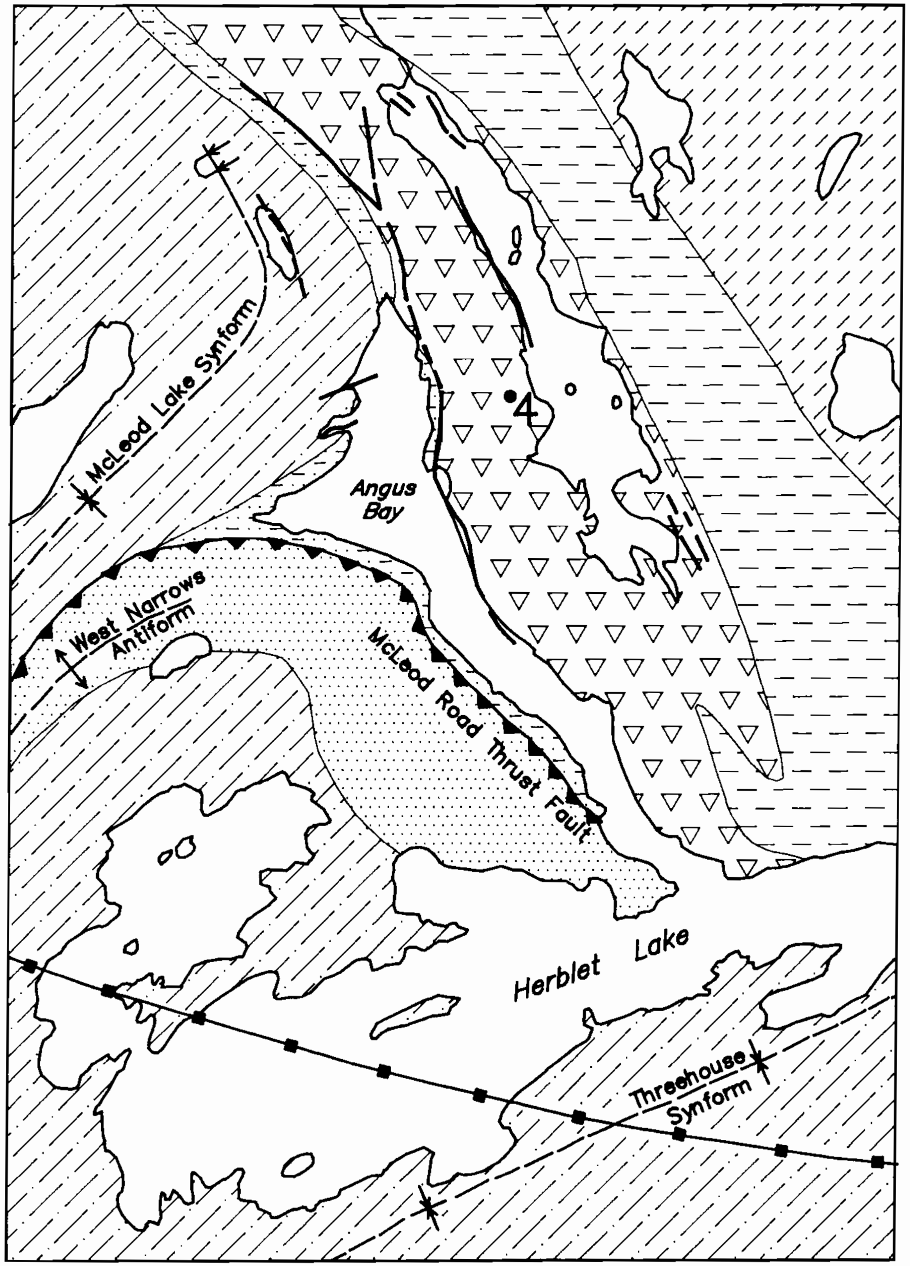
Wright, J.F.

1938: Geology and mineral deposits of a part of northwest Manitoba; Geological Survey of Canada, Summary Report, 1930, Part C, 124p.



HERBLET LAKE GNEISS DOME COMPLEX

Pink granitoid (oligoclase–quartz–microcline) gneiss

White to grey granitoid (oligoclase–quartz) gneiss

MISSI GROUP

Lithic arenite; amphibolite layers

AMISK GROUP

Greywacke and shale containing zones of calc–silicate rocks and coarse garnet schists

Mafic flows, pyroclastic and volcaniclastic rocks; minor felsic fragmental rocks

Felsic pyroclastic and volcaniclastic rocks; minor mafic fragmental rocks

Biotite–sillimanite–almandine isograd

Geology after Froese and Moore (1980).

•4 Occurrence location

Ground EM conductors (A.F. 90119, 90135, 90142, 91576, 91601)

0 1 2 3
kilometres

Figure 4-1: *Geological setting of occurrence 4.*

LOCATION: 4

NAME: Wolverton Lake Gold

UTM: 6091552N/439122E

ACCESS: Via Provincial Road 393 from Provincial Road 392 and then by boat to Angus Bay, Herblet Lake; traverse.

AREA: Near the west shore of Wolverton Lake.

AIRPHOTO: A20170-25

EXPLORATION SUMMARY:

The first known stakings were made prior to 1930 when Effie, Iron Six Nos. 9 and 10, and Cormorant 9 and 10 were staked. Hack 6, Jay B1 to Jay B3, and Reid 4 to 5 were staked between 1942 and 1943 by various individuals. Trenching was done between 1943 and 1944. In 1943 Hacker Prospecting Syndicate described a quartz vein on this property as being "heavily mineralized with chalcopyrite" (Northern Miner, September 23, 1943). A.J. McLaren, visited the property in 1944 and recommended diamond drilling. Hacker Tungsten Prospecting Syndicate merged with Herblet Tungsten Prospecting Syndicate in 1945 to form Wolverton Lake Gold Mines Limited. Wolverton did a 27 hole 1541 m drill program in 1945. Twelve holes were drilled on the Hack 6 claim. Eleven holes were drilled on vein 2 (Jay B1 and Jay B2 claims). Reid 4 and 5 were assigned to Herblet Hudson Mines Limited in 1945. Four holes totalling 131 m were drilled on Reid 4 and one 46 m deep hole was drilled on Reid 5 (Mining Recording Files 20293, 20294). Trenching was done on Reid 4 in 1946. Hack 6, and Jay B1 to Jay B3 were cancelled in 1950. HBED did an HLEM survey on the Bud and Jan claims from 1956 to 1957 and delineated a weak conductor on Jan 2 and 3 (A.F. 90017, 90119, 90135, 90136, 90142, 90156, 91576). Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624). Reid 4 and 5 were cancelled in 1971. Airborne EM and magnetic surveys were carried out by Fosco Mining Limited in 1971 (A.F. 92130). HBED staked Zyl 59 Fr., 60 Fr., 61 and 62 in 1971 and did some diamond drilling in 1973 under a claim grouping (Mining Claim Card Zyl 62). Canadian Nickel Company Limited staked CB 4192 over the former Hack 6 area in 1971 and did diamond drilling under a claim grouping from 1974 to 1975 (Mineral Inventory Card 63J/13 Cu 8). The area is presently held by HBED as Zyl 2 staked in 1966, and as CB 9241 and CB 7024, staked in 1978. Since 1978 HBED has carried out linecutting, and EM and magnetic surveys (Mineral Inventory Card 63J/13 Au 22).

GEOLOGICAL SETTING:

The occurrence is situated within felsic pyroclastic and volcaniclastic rocks of the Amisk Group. These rocks are flanked to the west by Missi Group lithic arenite, to the southwest by Amisk Group greywacke and shale, and to the east by pink and grey granitoid gneiss of the Herblet Lake Gneiss Dome Complex (Fig. 4-1; Froese and Moore, 1980; Bailes, 1975). In the immediate vicinity of the occurrence the host rocks are rusty weathered, garnetiferous quartz-feldspar-biotite gneiss that locally contain magnetite. Boudinaged layering is common.

MINERALIZATION:

This occurrence comprises five quartz veins with an aggregate thickness of 183 m for the zone. The Main vein on claim Hack 6 is approximately 305 m long, 3.5 m wide with a maximum width of 10.5 m. The galena vein, about 107 m east of the main vein, is 914 m long and averages 1.2 m in width. Vein 2 is south and east of the main vein and has a 1372 m strike length and averages 0.6 m in width. The quartz veins contain pyrite and minor chalcopyrite, sphalerite and galena. Diamond drill logs for the occurrence are not available.

GEOCHEMICAL DATA:

Samples collected from trenches on the property between 1943 and 1944 contained up to 42.85 g/t gold across 1.22 m (Mineral Inventory Card 63J/13 Au 22). Samples collected from core from twelve holes drilled on the Hack 6 claim contained from 1.37 g/t gold over 0.61 m to 15.77 g/t over 0.7 m. Samples collected from core from 11 drill holes on vein 2 (Jay B1 and Jay B2 claims) contained a maximum of 24.69 g/t gold over 1.04 m. The best surface assay, taken in the southwest corner of Jay B1, was 43.20 g/t over 0.31 m (Northern Miner, November 8, 1945). Thirty-five channel samples were collected from the No. 2 vein by Wolverton Gold Mines Limited. The highest values obtained from the sampling program were 7.5 g/t Au across intervals of 0.6 m and 0.5 m. Seven of thirty-five samples contained greater than 3.4 g/t Au. Wolverton Gold Mines Limited report 17.1 g/t Au across 0.3 m and 43.9 g/t Au across 0.3 m from other quartz veins near the occurrence.

Two representative chip samples from the Main quartz vein were submitted for assay. These samples contain 10 and 20 ppb Au, nil Ag, 49 and 87 ppm Cu, 13 and 74 ppm Zn and nil and 75 ppm Pb. Sample 841165, submitted for multi-element geochemical analysis, confirms the low base and precious metal contents (Appendix I).

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. The quartz veins contain base and precious metals.

REFERENCES:
Armstrong, J.E.
1941: Wekusko, Geological Survey of Canada, Map 665A, 1:63 360.

Assessment Files 90017, 90119, 90135, 90136, 90142, 90156, 91576, 91624 and 92130
Manitoba Energy and Mines, Minerals Division.

Bailes, A.H.
1975: Geology of the Guay-Wimapedi Lakes area; Manitoba Mines, Resources and Environmental Management, Mineral Resources Division Publication 75-2, 104p.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.

Gonzales, A. and Fedikow, M.A.F.
1984: Mineral deposit studies - Snow Lake area; in Manitoba Energy and Mines, Mineral Resources, Report of Field Activities, 1984, p. 46-52.

Mineral Inventory Cards: 63J/13 Au 22, Cu 8
Manitoba Energy and Mines, Minerals Division.

Mining Claim Card Zyl 62 (P 2912E)
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Mining Recording File Nos. 20293, 20294 (Reid 4, 5)
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Russell, G.A.
1957: Structural studies of the Snow Lake - Herb Lake area; Manitoba Mines and Natural Resources, Publication 55-3, 33p.

Scrap Books, 1943 (Hacker Prospecting Syndicate), 1944 (Herblet Prospecting Syndicate)
Manitoba Energy and Mines, Minerals Divison, Corporation Files.

Wolverton Lake Gold Mines Limited
Manitoba Energy and Mines, Minerals Divison, Corporation Files.

Wright, J.F.
1938: Geology and mineral deposits of a part of northwest Manitoba; Geological Survey of Canada, Summary Report, 1930, Part C, 124p.

LOCATION: **5**

NAME: (A.F. - Mineralization intersected by diamond drilling)

UTM: 6091789N/437494E

ACCESS: Via Provincial Road 393 from Provincial Road 392 to Herblet Lake landing; boat across Herblet Lake to Angus Bay; traverse.

AREA: West of northwest shore of Angus Bay, Herblet Lake.

AIRPHOTO: A20170-25

EXPLORATION SUMMARY:

The area was first staked as the Farl, Au and F group of claims in the late 1940's. The Farl group was drilled by W.J. Farley for E.L. Brown in 1944 and by Wekusko Consolidated Limited in 1945 (Manitoba Mines and Natural Resources, 1945, 1946). Wekusko also did some prospecting, and found some gold on the southern and eastern part of the Farl group (Wekusko Consolidated Limited, 2nd Annual Report, 1945). HBED did an HLEM survey on the Kays group of claims in 1956 (A.F. 90017, 90119, 90135, 90136, 90156, 91576). A 4 hole, 579 m diamond drill program was done on Kays 8 and 10 by Bob Roberts for Wm. McKayseff in 1961 (A.F. 91574). Stall Lake Mines Limited did magnetic and EM (DPM-1) surveys over the property in 1971 (A.F. 91575, 91601). Fourteen conductors were outlined, five of which were more than 610 m long (Stall Lake Mines Limited, 1971 Annual Report). Stall Lake carried out a 4 hole, 244 m drill program on Kays 1, 2, 5 and 15 in 1972 (A.F. 91575). The claims were cancelled in 1976. CB 10914 was staked by W. B. Kobar in 1979. Camflo Mines Limited optioned the property from 1980 to 1985 and did four year's of assessment work (Mining Claim Card CB 10914). Noranda Exploration Company Limited optioned the property from 1986 to 1987 and carried out a geochemical humus sampling program, a VLF-EM survey and a total field magnetometer survey, in joint venture with Manitoba Mineral Resources Limited (A.F. 93032). W. B. Kobar did work on the claim between 1988 and 1989 before cancelling it in 1991 (Mining Claim Card CB 10914). Gold Fields Canadian Mining Limited staked Gold 17 over part of the area in 1983 and optioned it to HBM&S from 1985 to 1986. The ground is presently covered by Domex 2 and 3, staked by Peter Dunlop in 1991 and by Gold 17, held by Snow Lake Mines Limited since 1986.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Missi Group lithic arenite. These rocks are flanked to the west by Amisk Group greywacke and to the east by Amisk Group greywacke, shale and felsic volcanic rocks (Fig. 5-1; Froese and Moore, 1980). Diamond drilling intersected hornblende-plagioclase gneiss, pegmatite, staurolite schist, amphibolite and quartz-feldspar-biotite gneiss (A.F. 91574 and 91575). Russell (1957) marked the location of the occurrence on Map 55-3.

MINERALIZATION:

Disseminated 1 to 5% pyrite and chalcopyrite are present in hornblende-plagioclase ± biotite gneiss and amphibolite in core from DDH 71-K1, -K2, -K3, -K4 and -K5. A 1 cm zone of 1 to 2% disseminated chalcopyrite occurs within hornblende-plagioclase-biotite gneiss in core from DDH 71-K3. A 10 cm interval of 0.5 to 1% chalcopyrite hosted by amphibolite was intersected by DDH 71-K4. Numerous rusty weathered zones with malachite stain and leached quartz pods or lenses are described in the drill logs, along with malachite-stained chloritic fractures that also contain chalcopyrite films (A.F. 91575). Core from DDH 71-K6 is nonmineralized. Pyritic quartz veins in amphibolite are described in core from DDH 1, 2, 3, and 4 (A.F. 91574). Geophysical conductors at the occurrence appear to be related, in part, to graphitic quartz-plagioclase-biotite gneisses.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. Chalcopyrite and pyrite mineralization is associated with leached and rusty weathered quartz veins. Sulphide mobilization accompanied the development of shear zones as evidenced by chalcopyrite films on chloritic fracture surfaces.

REFERENCES:

Assessment Files 90017, 90119, 90135, 90136, 90156, 91574, 91575, 91576, 91601 and 93032

Manitoba Energy and Mines, Minerals Division.

Eccles, D.R. and Fedikow, M.A.F.

1985: Mineral occurrence documentation and alteration zone mapping, Snow Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 82-99.

Froese, E. and Moore, J.M.

1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.

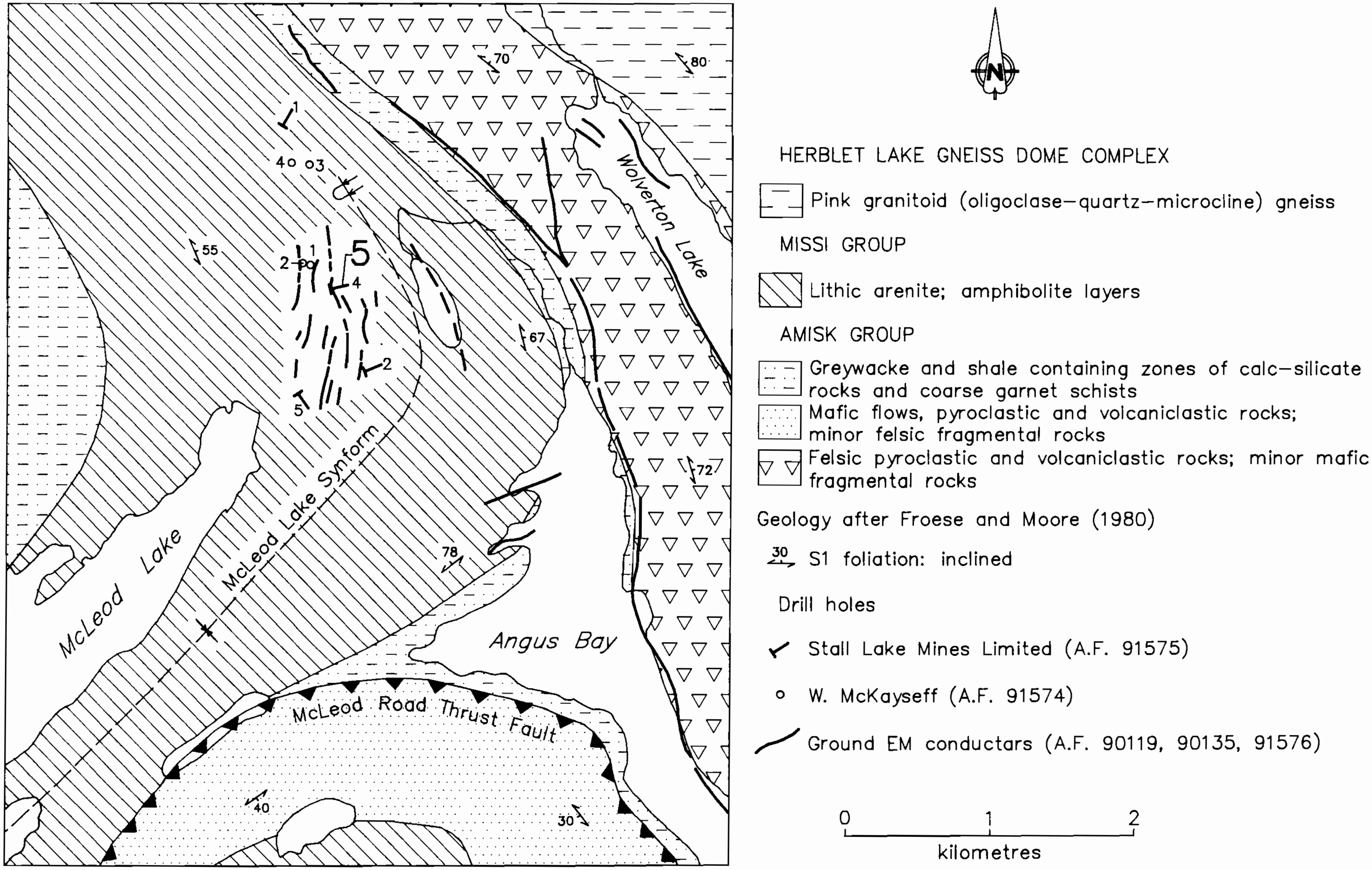


Figure 5-1: ***Geological setting of occurrence 5.***

Gonzales, A. and Fedikow, M.A.F.
1984: Mineral deposit studies - Snow Lake area; in Manitoba Energy and Mines, Mineral Resources, Report of Field Activities, 1984, p. 46-52.

Manitoba Mines and Natural Resources
1945: 17th Annual Report on Mines and Minerals, 92p.
1946: 18th Annual Report on Mines and Minerals, 85p.

Mining Claim Card CB 10914
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Russell, G.A.
1957: Structural studies of the Snow Lake - Herb Lake area; Manitoba Mines and Natural Resources, Publication 55-3, 33p.

Stall Lake Mines Limited, 1971 Annual Report
Manitoba Energy and Mines, Minerals Divison, Corporation Files.

Wekusko Consolidated Limited, 2nd Annual Report, 1945
Manitoba Energy and Mines, Minerals Divison, Corporation Files.

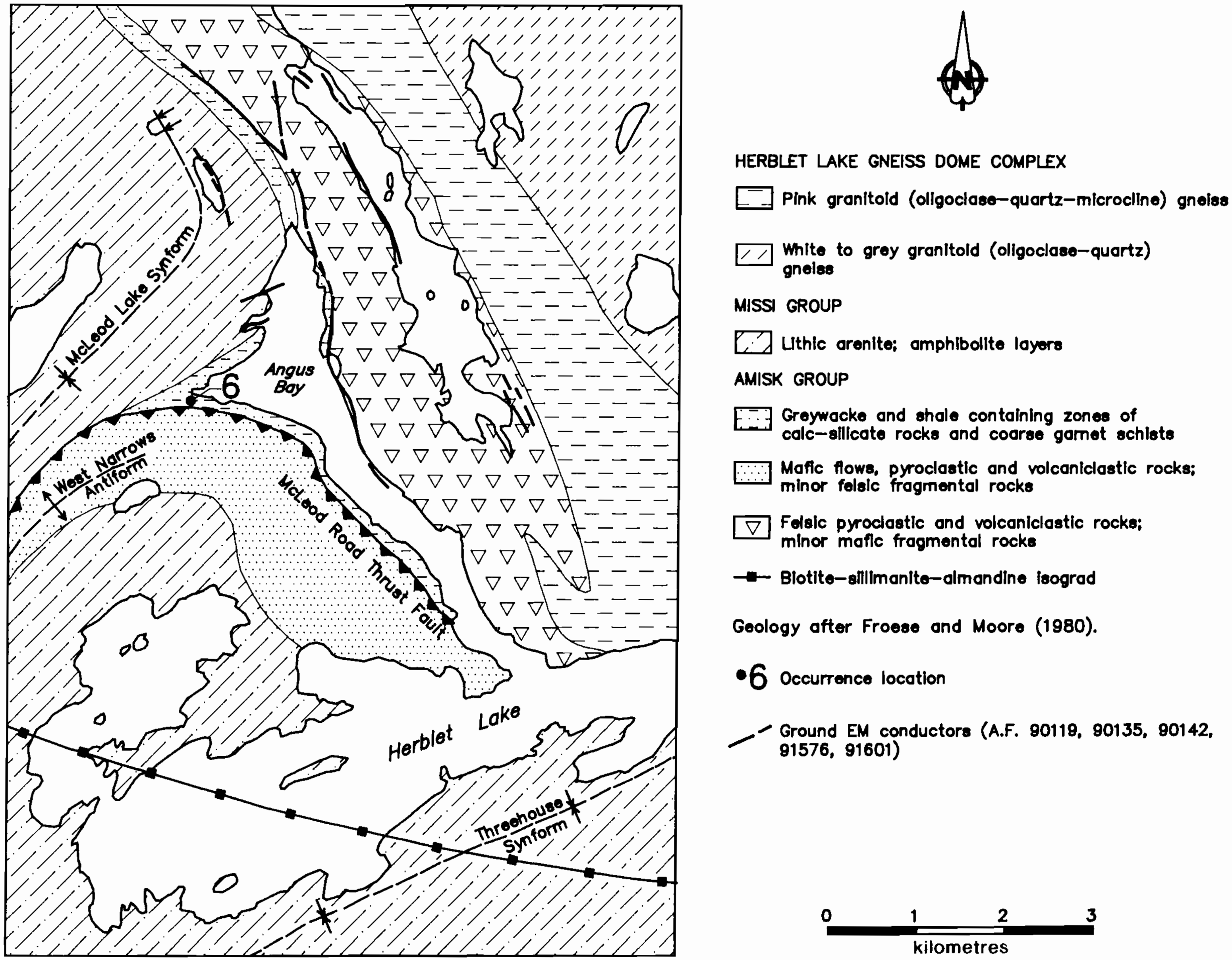


Figure 6-1: Geological setting of occurrence 6.

LOCATION: 6

NAME: (A.F. - Mineralization intersected by diamond drilling)

AREA: Angus Bay, Herblet Lake.

UTM: 6090378N/436856E

AIRPHOTO: A20170-25

ACCESS: Via Provincial Road 393 from Provincial Road 392 to Herblet Lake landing; boat across Herblet Lake to Angus Bay and traverse.

EXPLORATION SUMMARY:

The area was first staked as Peg 32 and 33 in the late 1940's. Wekusko Consolidated Limited did prospecting and 937 m of diamond drilling on the Peg group of claims in 1945 (Wekusko Consolidated Limited, 2nd Annual Report; Manitoba Mines and Natural Resources, 1946). HBED did an HLEM survey between 1956 and 1957 (A.F. 90017, 90119). Fosco Mining Limited carried out airborne EM and magnetic surveys in 1971 (A.F. 92130). Gold Fields Canadian Mining Limited staked Gold 15 in 1983, and optioned it to HBM&S from June 1985 to February 1986. Snow Lake Mines Limited acquired the property in October 1986.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group mafic volcanic flows and pyroclastic rocks, greywacke and shale, and a sugary-textured, sulphidic unit mapped as ferruginous, calcareous and carbonaceous sedimentary rocks by Russell (1954). This unit persists along the western shore of Angus Bay and contains massive carbonate and chert layers, commonly with 1 to 5% disseminated pyrrhotite and pyrite. These rocks are flanked to the north by Missi Group lithic arenite. The occurrence is situated just north of the McLeod Road Thrust Fault (Fig. 6-1). At the occurrence, mafic volcanic rocks contain red garnet, flecks of brown weathering carbonate and minor iron oxide stain.

MINERALIZATION:

Approximately 75 unlabelled boxes of drill core, in collapsed core racks, are present in the general area of the occurrence. Diamond drill hole collars and mineralized exposure were not located. The following observations are based on the drill core. An oxidized 2.4 m section of near solid to solid pyrite and pyrrhotite with minor chalcopyrite is interlayered with cherty rocks that contain 1 to 3% disseminated pyrrhotite and 5 mm pink-red garnets. The cherty rocks resemble those mapped along the western shore of Angus Bay by Russell (1954). A partial log of DDH H-68 that includes the near solid to solid sulphide section is presented below:

68.6-70.4 m: siliceous, cherty sedimentary rock with pink garnet, white mica and 1 to 3% disseminated pyrrhotite

70.4-72.8 m: near solid to solid pyrrhotite, pyrite and chalcopyrite

72.8-73.1 m: coarse grained pink pegmatite

73.1-73.2 m: solid pyrrhotite-pyrite

73.2-75 m: white quartz veins in beige, cherty sedimentary rocks; disseminated pyrrhotite and pyrrhotite films on fracture surfaces.

GEOCHEMICAL DATA:

A representative sample collected from the near solid-solid sulphide intersection in core from DDH H-68 contains 60 ppb Au, 1 ppm Ag, 253 ppm Cu, 660 ppm Zn and 20 ppm Pb. Two outcrop chip samples collected from a pyrrhotite-chalcopyrite-bearing quartzite along the western shore of Angus Bay, just north of the occurrence location, contain the following range of values: 10 to 20 ppb Au, 208 to 268 ppm Cu, and 68 to 221 ppm Zn. Silver and Pb were not detected.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

Assessment Files 90017, 90119, 90135, 90142, 91576 and 92130
Manitoba Energy and Mines, Minerals Division.

Eccles, D.R. and Fedikow, M.A.F.
1985: Mineral occurrence documentation and alteration zone mapping, Snow Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 82-99

Gonzales, A. and Fedikow, M.A.F.
1984: Mineral deposit studies - Snow Lake area; in Manitoba Energy and Mines, Mineral Resources, Report of Field Activities, 1984, p. 46-52.

Manitoba Mines and Natural Resources
1946: 18th Annual Report on Mines and Minerals, 85p.

Russell, G.A.
1957: Structural studies of the Snow Lake - Herb Lake area; Manitoba Mines and Natural Resources, Publication 55-3, 33p.

Wekusko Consolidated Limited, 2nd Annual Report (1945)
Manitoba Energy and Mines, Minerals Divison, Corporation Files.

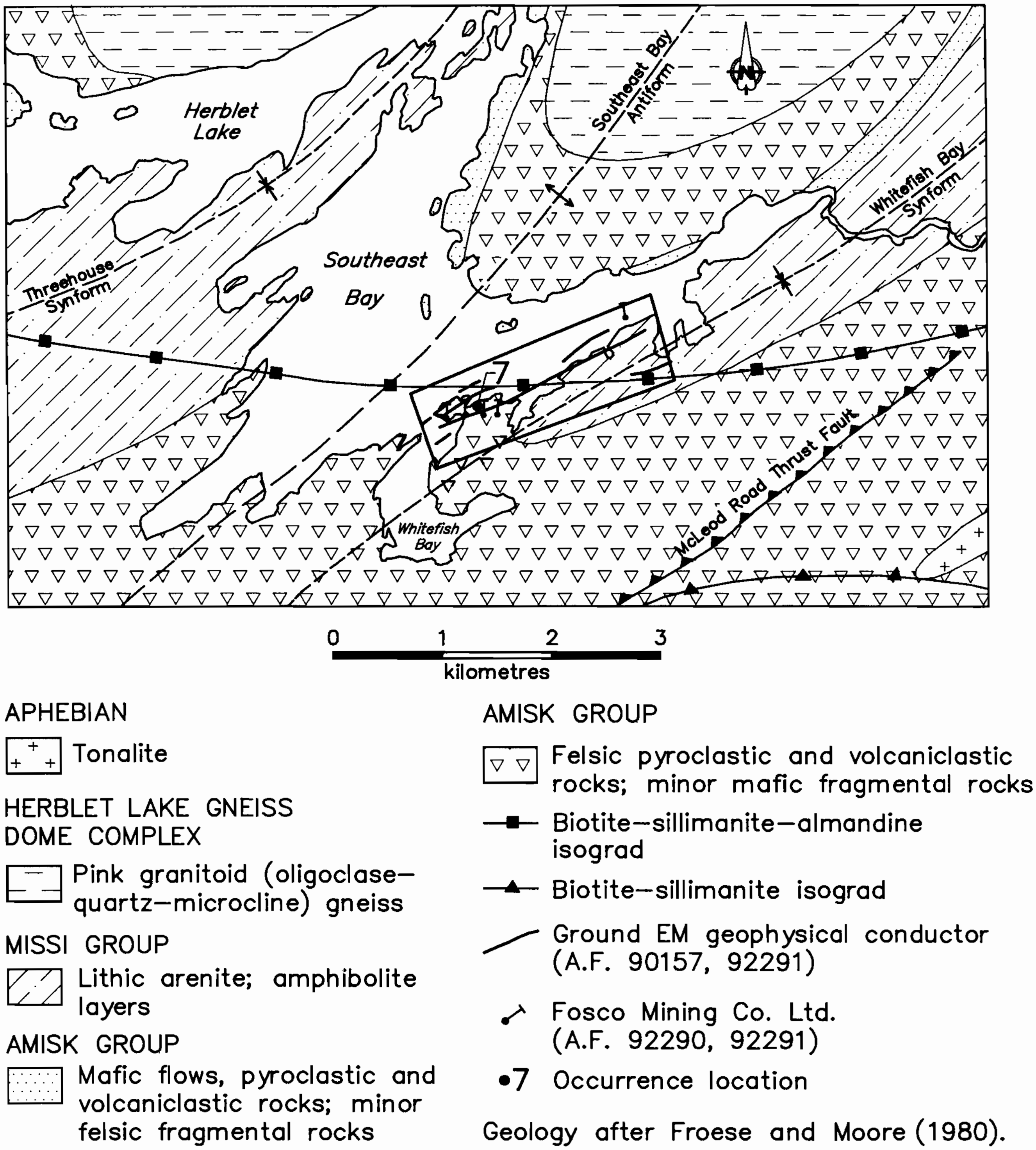


Figure 7-1: Geological setting of occurrence 7.

LOCATION: **7**

NAME: Soo 3

UTM: 6084503N/444419E

ACCESS: Via Provincial Road 393 from Provincial Road 392 to Herblet Lake landing; boat to occurrence.

AREA: Southeast Bay, Herblet Lake.

AIRPHOTO: A20127-130

EXPLORATION SUMMARY:

HBED did an HLEM survey on the Ram group of claims from 1955 to 1956 (A.F. 90119, 90154, 90155) and drilled a 131 m deep hole on Ram 223 Fr in 1956 (A.F. 90155). One hole was drilled to a depth of 77 m on Metals 1 in 1956 (A.F. 90154), but the drilled area is shown on claim maps as Ram 83. Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624, Ground Hog Sheet 13) and held ground in the area from 1960 to 1961. R.G. Zeemel staked Rob 9 to 11 in 1964. A Turam EM survey was done for Gunnex Limited in 1966, and a weakly conductive zone was delineated on the north part of Rob 11 (A.F. 90157). Falconbridge Nickel Mines Limited did magnetic and AFMAG-long wire surveys on Herblet Lake in 1966 (A.F. 90132). The Rob claims lapsed in 1967. A Turam EM survey was done for Sydney Teal on the Ruby claims in 1967 (A.F. 90158). In 1971 Focso Mining Limited acquired the Soo group of claims. Airborne EM and magnetic surveys and ground magnetic, VLEM and I.P. surveys were done in 1971 (A.F. 92130, 92291). Geochemical surveys were also done (Northern Miner, May 25, 1972). Prospecting and geological mapping (1:2400, 1:3600) were done by D. Arscott for Anglo-Bomarc Mines Limited and Fosco Mining Limited in 1971 (A.F. 92291). In 1972, Fosco drilled two holes totalling 300 m on Soo 3 and two holes totalling 205 m on Soo 13 (A.F. 92290, 92291). Anglo-Bormarc Mines Limited and Bernard L. Belec each earned a one-third interest in the property following expenditures on airborne and ground geophysical surveys and 1369 m of diamond drilling (Fosco Mining Limited, Corporation File). Fosco had also explored CB 1077 from 1970 to 1978. The Soo claims were cancelled in 1980. The ground was held by Dawn Mines Limited from 1979 to 1981 and by Snow Lake Exploration from 1981 to 1983. The area is presently covered by CB 12703 and Little Herb 1, staked by W. Bruce Dunlop Limited in 1983 and 1987, respectively. HBED optioned CB 12703 from 1985 to 1987. Falconbridge Limited optioned the claims from 1988 to 1990.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group felsic pyroclastic and volcaniclastic rocks flanked to the east by Missi Group lithic arenite. The arenite contains layers of amphibolite, interpreted to represent metamorphosed mafic sills (Fig. 7-1; Froese and Moore, 1980). Fine- to coarse-grained amphibolite and garnetiferous quartz-feldspar gneiss (rhyolite) was mapped in outcrop (Fig. 7-2). Diamond drilling intersected sulphide-bearing, garnetiferous and graphitic quartzite (A.F. 92290).

MINERALIZATION:

A rusty-weathered chert layer containing blebs, laminae and disseminations of pyrite, pyrrhotite, magnetite and chalcopyrite is exposed in a trench. The cherty layer occurs at or near the contact between rusty weathered garnetiferous felsic volcanic rocks and amphibolite (Fig. 7-3). Drill logs (A.F. 92290) indicate 1 to 5% disseminated pyrite, pyrrhotite, sphalerite and chalcopyrite in quartzite and hornblende-biotite-feldspar gneiss.

GEOCHEMICAL DATA:

D. Arscott, on behalf of Anglo-Bomarc Mines Ltd. and Fosco Mining Ltd. collected one rock sample (So-1) from a heavily rusted outcrop. This sample contained trace Au, 2.74 g/t Ag, 0.04% Cu, 0.01% Pb and 0.12% Zn (A.F. 92291).

Four representative chip samples were collected from the trench for geochemical analysis (Fig. 7-3). Samples 841139 and 841176 were collected from the mineralized garnet-chert layer, and 841177 and 841171 are rusty weathered fine grained chert that contain blebs, laminae and disseminated iron and base metal sulphides. The highest metal contents were obtained from 841171; that contained 1594 ppm Zn, 2.2 ppm Ag and 467 ppm Cu. The analyses are summarized in Figure 7-3. Multi-element geochemical analyses fore four samples are presented in Appendix I.

Assay results from 12 drill core samples collected from DDH S72-4 are representative of the range in metal contents at the occurrence. The ranges are;

trace to 0.08% Cu,
trace to 0.02% Ni,
trace to 0.20% Zn, and
trace to nil Au (A.F. 92290).

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

Armstrong, J.E.

1941: Wekusko; Geological Survey of Canada, Map 665A, 1:63 360.

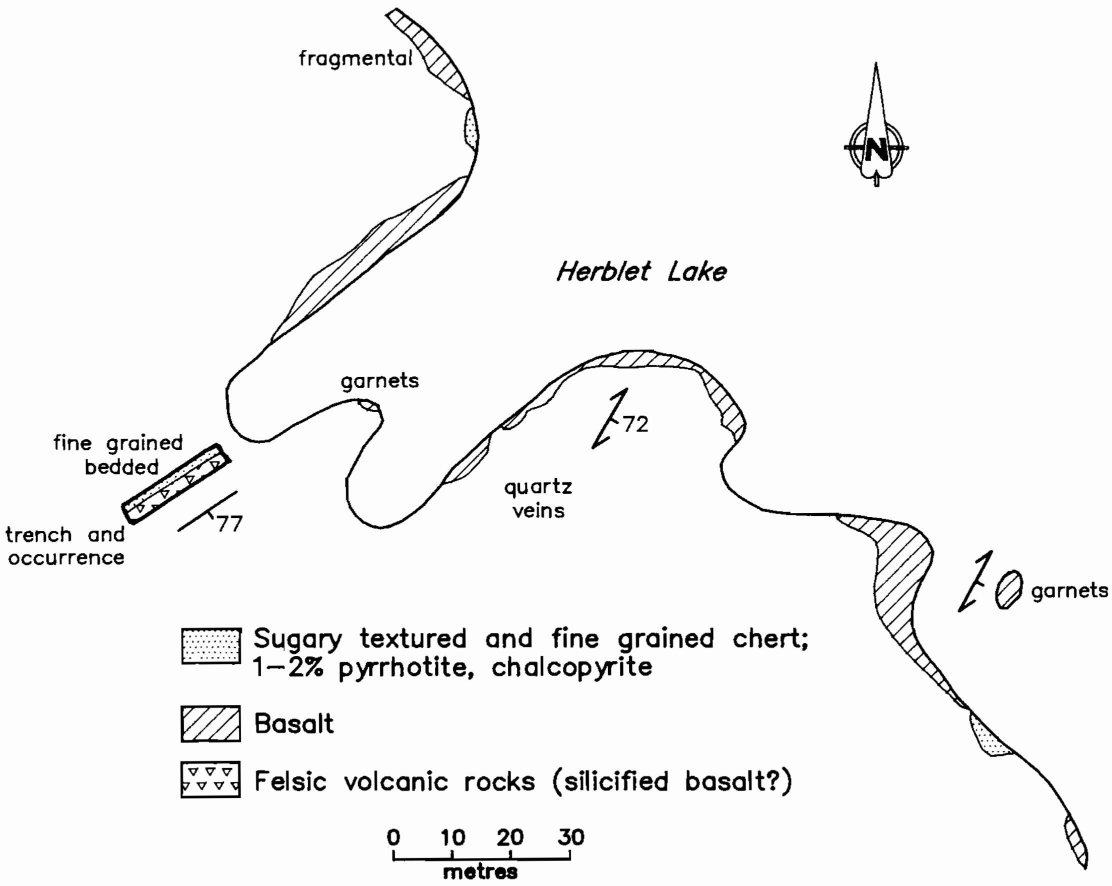


Figure 7-2: ***Shoreline geology and trench location in the vicinity of occurrence 7.***

Assessment Files 90119, 90132, 90154, 90155, 90157, 90158, 92130, 92290, and 92291
Manitoba Energy and Mines, Minerals Division.

Eccles, D.R. and Fedikow, M.A.F.
1985: Mineral occurrence documentation and alteration zone mapping, Snow Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 82-99.

Fosco Mining Limited
Manitoba Energy and Mines, Minerals Division, Corporation Files.

Froese, E. and Gasparrini, E.
1975: Metamorphic zones in the Snow Lake area, Manitoba; Canadian Mineralogist, v. 13, p. 162-167.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.

Gobert, G.
1990: Till geochemistry of the Snow Lake area (NTS 63K/16, 63J/13, 63J/12); in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1990, p. 72-73.

Gonzales, A. and Fedikow, M.A.F.
1984: Mineral deposit studies - Snow Lake area; in Manitoba Energy and Mines, Mineral Resources, Report of Field Activities, 1984, p. 46-52.

Mineral Inventory Card 63J/13 Cu 7
Manitoba Energy and Mines, Minerals Division.

Sample	Cu	Pb	Zn	Au	Ag	W	Mo	As
841139	149	19	364	1	1.1	1	7	19
841171	467	39	1594	5	2.2	1	20	163
841176	271	31	527	6	1.6	431	12	38
841177	83	15	309	6	0.3	1	4	2

concentrations in ppm; Au in ppb

Rusty weathered, thinly bedded, fine grained chert containing blebs, laminae and disseminated sulphides; sulphide mobilizate along fractures

Layered garnets, disseminated Po and silica (chemical sedimentary rock or intensely altered basalt)

Fine to coarse grained amphibolite

841176 ● Rock geochemical sample location

74 Bedding

77 Foliation

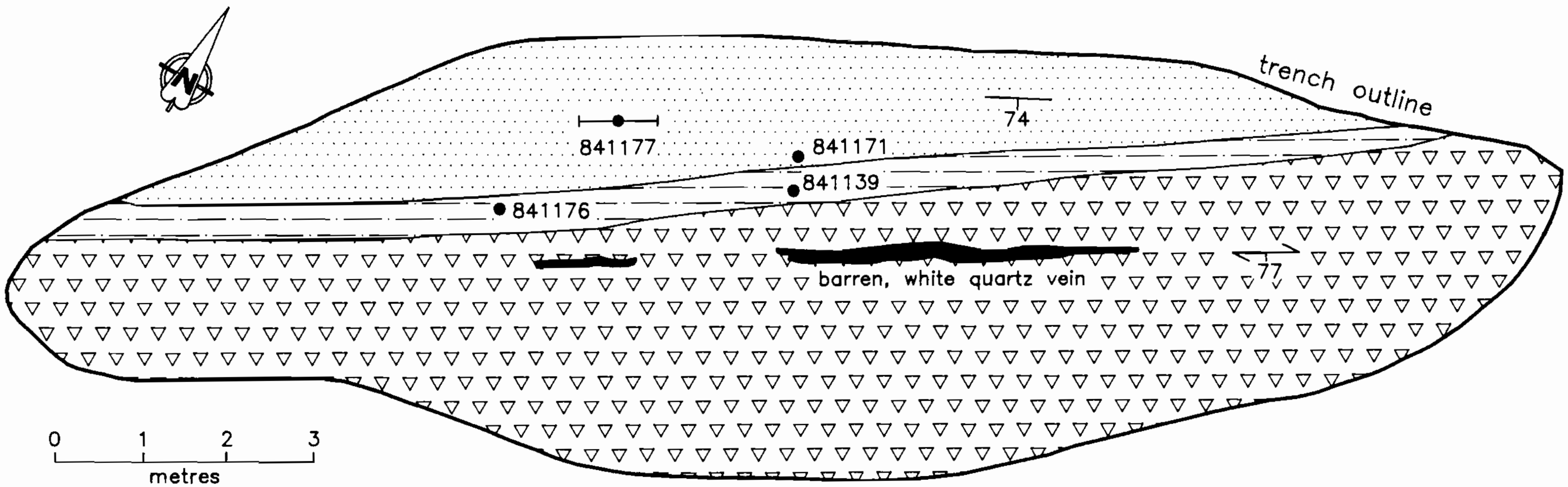


Figure 7-3: ***Detailed trench map illustrating geology and sample locations, occurrence 7.***

LOCATION: 8

NAME:

UTM: 6083798N/442437E

ACCESS: Via Provincial Road 393 from Provincial Road 392 to Herblet Lake landing; boat to occurrence.

AREA: Southeast Bay, Herblet Lake

AIRPHOTO: A20127-130

EXPLORATION SUMMARY:

The area was first staked in the late 1920's. Flo 19 and the Bel group of claims were staked in the late 1940's. Glen Rapson drilled Bel 3 and 6 in 1946 (Manitoba Mines and Natural Resources, 1947). In 1955 HBED did an HLEM survey and an eight hole, 966 m diamond drill program on the Ram group of claims (A.F. 90119, 90155). Two holes were drilled on Ram 114 and an 88 m deep hole was drilled on Ram 134 by HBED in 1957 (A.F.90156). Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624, Ground Hog Sheet 9, 12, 13). In 1966 Huntec Limited did a Turam survey on AO 42 to 45 for Gunnex Limited (A.F. 90157). In 1967, Moreau, Woodard & Co. Limited did a Turam survey on the Ruby claims (A.F. 90158). International Nickel Company of Canada, Limited drilled two holes totalling 200 m on Sko 26 and 40 in 1967 (A.F. 90160). Between 1967 and 1971 diamond drilling was done on the Fox group of claims (Mining Claim Card Fox 11). Fosco Mining Limited carried out ground magnetometer and VLEM surveys on part of CB 1078 in 1970 and did airborne EM and magnetic surveys in 1971 (Fosco Mining Limited, Corporation File; A.F. 92130). Stall Lake Mines Limited did ground magnetometer and EM (DPM-1) surveys on CB 3559 in 1971 (A.F. 91601). Diamond drilling was done in 1974 on a claim grouping that included CB 3559 (Mining Claim Card CB 3559). The ground is presently held by HBED as CB 4736 and Bud 27 to 29 Fr., staked in 1973, and as CB 7066 and CB 7067, staked in 1978. The ground was also partly held by Dawn Mines Limited from 1979 to 1981 as CB 10174, which was restaked as CB 13471 by Snow Lake Exploration in 1981 and then as CB 12702 by W. Bruce Dunlop Limited in 1983. CB 12702 was optioned to HBED from 1985 to 1987 and then to Falconbridge Limited from 1988 to 1990.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group felsic pyroclastic and volcaniclastic rocks flanked to the northwest by Missi Group lithic arenite. The axial trace of the Southeast Bay antiform occurs in the area of the occurrence (Fig. 8-1; Froese and Moore, 1980). Diamond drilling intersected variably altered rhyolite, garnetiferous chlorite-hornblende-mica-talc schist, and quartz-hornblende gneiss (A.F. 90156, 90160).

MINERALIZATION:

The occurrence is characterized by a 100 m wide zone of rusty weathered quartz-feldspar-biotite gneiss interlayered with garnetiferous rhyolite that contains 1 to 5% disseminated pyrrhotite. Multiple drill holes, collared to test geophysical conductors, intersected 0.2 to 1.2 m of near solid pyrrhotite and 0.9 m of an "altered earthy zone" that probably represents a graphite-iron sulphide layer. The host rocks to the mineralization comprise sericitic and carbonate-altered rhyolite. The drill logs also describe 1.2 to 2.3 m intervals of chlorite-mica-talc schists with garnets and trace pyrrhotite and chalcopyrite, as well as graphitic garnet-chlorite-hornblende gneiss with minor pyrrhotite, pyrite and chalcopyrite (A.F. 90156, 90160).

GEOCHEMICAL DATA:

Three representative outcrop chip samples (841152, 84153 and 84154) were collected from the rusty weathered exposure for geochemical analysis. The samples contain low base and precious metal values (Appendix I).

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. The mineralogy of the alteration zones intersected in core from drill holes in proximity to the occurrence is suggestive of alteration associated with massive sulphide type mineralization.

REFERENCES:

Assessment Files 90119, 90155, 90156, 90157, 90158, 90160, 91601, 91624 and 92130
Manitoba Energy and Mines, Minerals Division.

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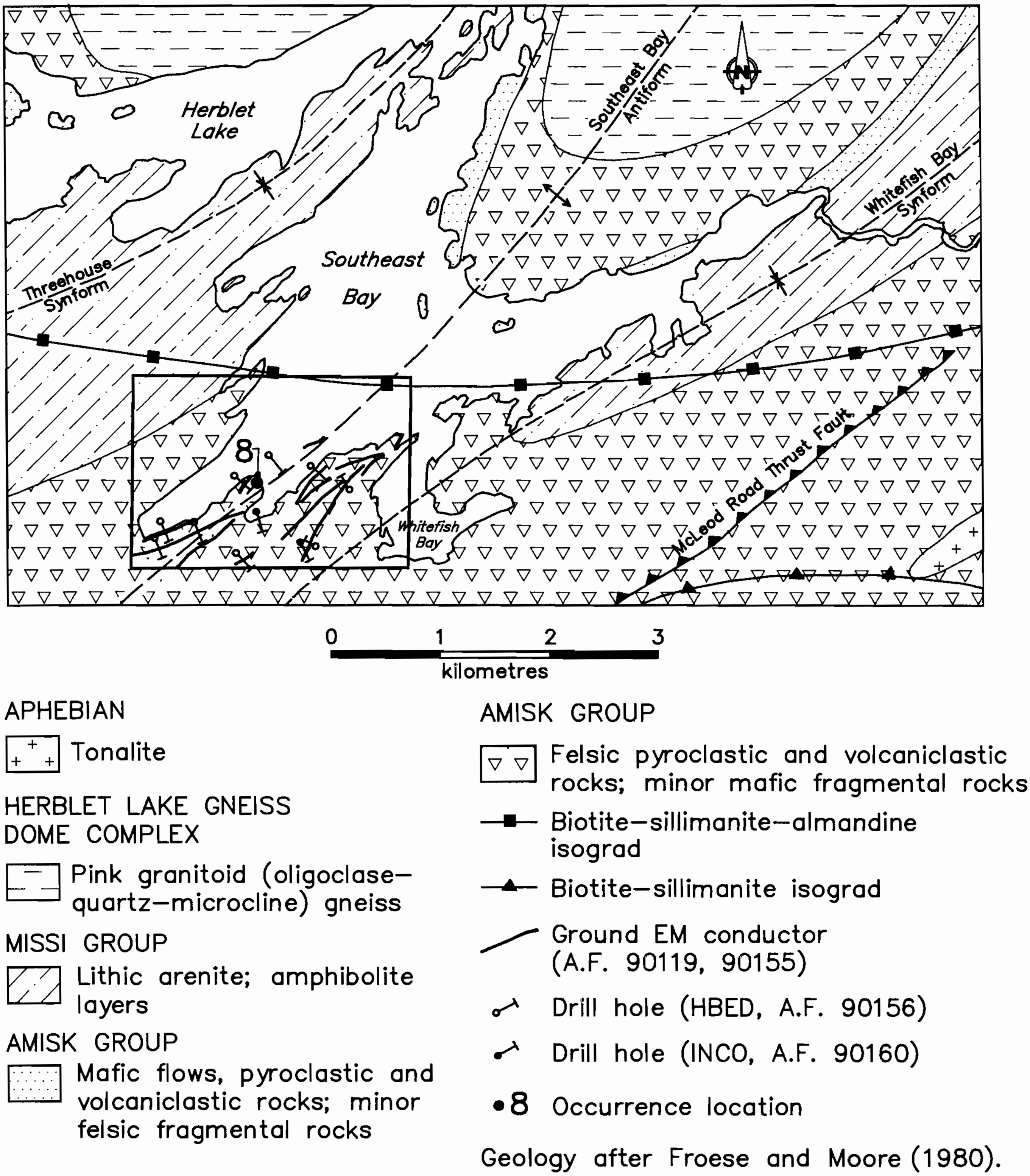

Figure 8-1: Geological setting of occurrence 8.

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Manitoba Energy and Mines, Minerals Division, Corporation Files.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.

Gobert, G.
1990: Till geochemistry of the Snow Lake area (NTS 63K/16, 63J/13, 63J/12); in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1990, p. 72-73.

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1984: Mineral deposit studies - Snow Lake area; in Manitoba Energy and Mines, Mineral Resources, Report of Field Activities, 1984, p. 46-52.Manitoba Mines and Natural Resources
1947: 19th Annual Report on Mines and Minerals, 100p.

Mining Claim Cards CB 3559 and Fox 11 (P7565C)
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Russell, G.A.
1957: Structural studies of the Snow Lake - Herb Lake area; Manitoba Mines and Natural Resources, Publication 55-3, 33p.

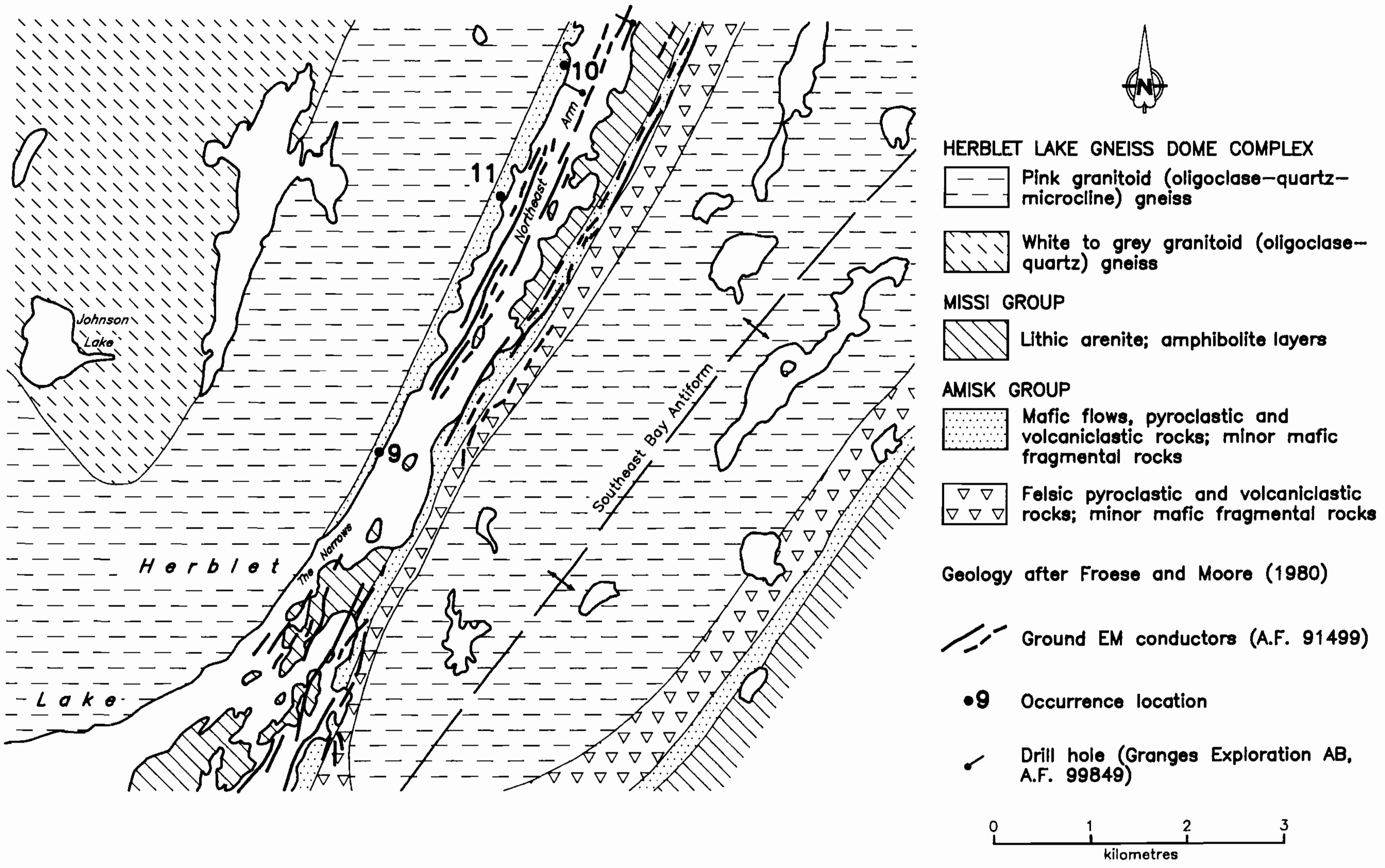

Figure 9-1: *Geological setting for occurrences 9, 10 and 11.*

LOCATION: **9**

NAME: Moss 1 (Ferguson Mine)

UTM: 6090492N/445407E

ACCESS: Provincial Road 393 from Provincial Road 392 to Herblet Lake landing; boat to occurrence.

AREA: West shore of the northeast arm of Herblet Lake.

AIRPHOTO: A21963-55

EXPLORATION SUMMARY:

The area was first staked as Spruce by R. Kerr in 1916 and later as Sulphide by P. Durand in 1928. Pits, trenches and a shaft were dug between 1928 and 1932. The claim lapsed in 1933. A trench was dug on Duck 1 in 1935. Moss 1 and 2 were staked by J. Mosso in 1942. Trenching, stripping and blasting were done in 1943, 1944 and 1946. In 1946 the property was transferred to J.R. Starnes and then to W.H. Stanton. Ferguson Mines Limited was formed in 1950 to develop the property. In 1951, Little Herb Mines Limited took over development and a 13.6 tonne per day mill was installed. The claims were leased as M-3211 and M-3212 in 1952. In 1955, 196 tonnes of material was reported in a surface stockpile (Quinn, 1957). Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624). HBED did a Turam survey on adjacent ground to the east in 1970 (A.F. 91499). The Moss claims lapsed in 1973. The ground was held by W.B. Dunlop between 1976 and 1978. In 1980 Dawn Mines Limited acquired Production Lease PL33 and Granges Exploration Aktiebolag staked CB 11090 around PL33. CB 11090 lapsed in 1982. PL33 was cancelled in 1984. Peter Dunlop staked Moss 1 over the property in 1984. Ground surrounding Moss 1 was held by Nor-Acme Gold Mines Limited from 1987 to 1990, and was restaked as Box 1 by Peter Dunlop in 1990.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by pink granitoid gneiss of the Herblet Lake Gneiss Dome Complex and Amisk Group mafic and felsic pyroclastic and volcaniclastic rocks (Fig. 9-1; Froese and Moore, 1980). Rusty weathered mafic volcanic rocks, greywacke and pink granitoid gneiss are exposed in the general area of the occurrence (Fig. 9-2). Numerous ground EM conductors have been delineated in the immediate area of the occurrence (A.F. 91499).

MINERALIZATION:

Twelve trenches expose discontinuous, en echelon quartz veins that contain 1 to 5% disseminated and veinlet pyrite, chalcopyrite, sphalerite, magnetite and native gold. The quartz veins have an exposed width of 3 to 18 cm and are parallel to the foliation in the host mafic volcanic rocks. Vein wall rock contacts are rusty weathered and contain 1 to 3% disseminated pyrite and magnetite.

GEOCHEMICAL DATA:

In 1942 a series of channel samples were collected by the Metals Controller's Office, Ottawa from selected trenches. Assay results across 7.6 m averaged 0.384% WO_3 with a range of 0.026% to 1.215% WO_3. W. Ringlesben sampled the property in 1942 and reported assays of up to 1.215% WO_3 (Mineral Inventory Card 63J/13 Au 20). By May 1950, Ferguson Mines Limited had stockpiled approximately 8164 tonnes of ore averaging 25.71 g/t Au. A bulk sample gave an 80% recovery of gold. Little Herb Mines Limited (1951) reported 5444 tonnes of ore grading 51.43 g/t was removed from trenches on Moss 1 (Northern Miner, March 29, 1951). Seven representative rock chip samples were collected from trenches examined on the property for assay (Fig. 9-2). Results are summarized below:

Sample	**Au (ppb)**	**Ag (ppb)**	**Cu (ppm)**	**Pb (ppm)**	**Zn (ppm)**
Trench 2	90	1000	71	5	235
Trench 2	2320	1000	64	8	354
Trench 4	470	nd	67	3	33
Trench 7	1200	nd	66	nd	27
Trench 8 - A	500	nd	67	nd	49
Trench 8 - B	1240	3000	64	3	1.80(%)
Trench 12	220	nd	87	nd	11

*nd - not detected

Six representative samples were also submitted for multi-element geochemical analysis (Appendix I). Sample 841179 contains high Bi (17 ppm) and Cd (160 ppm) relative to the other five samples.

Additionally, 5 alder twig samples were collected adjacent to or within the trenches (Fig. 9-2). Each of the ashed alder samples contain less than 10 ppb Au.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. The Zn assay of 1.80% indicates the presence of sphalerite in the vein system that may have been derived as mobilizate from a pre-existing chemical sediment or massive sulphide type deposit situated under the northeast arm of Herblet Lake.

REFERENCES:

Assessment Files 91499 and 91624
Manitoba Energy and Mines, Minerals Division.

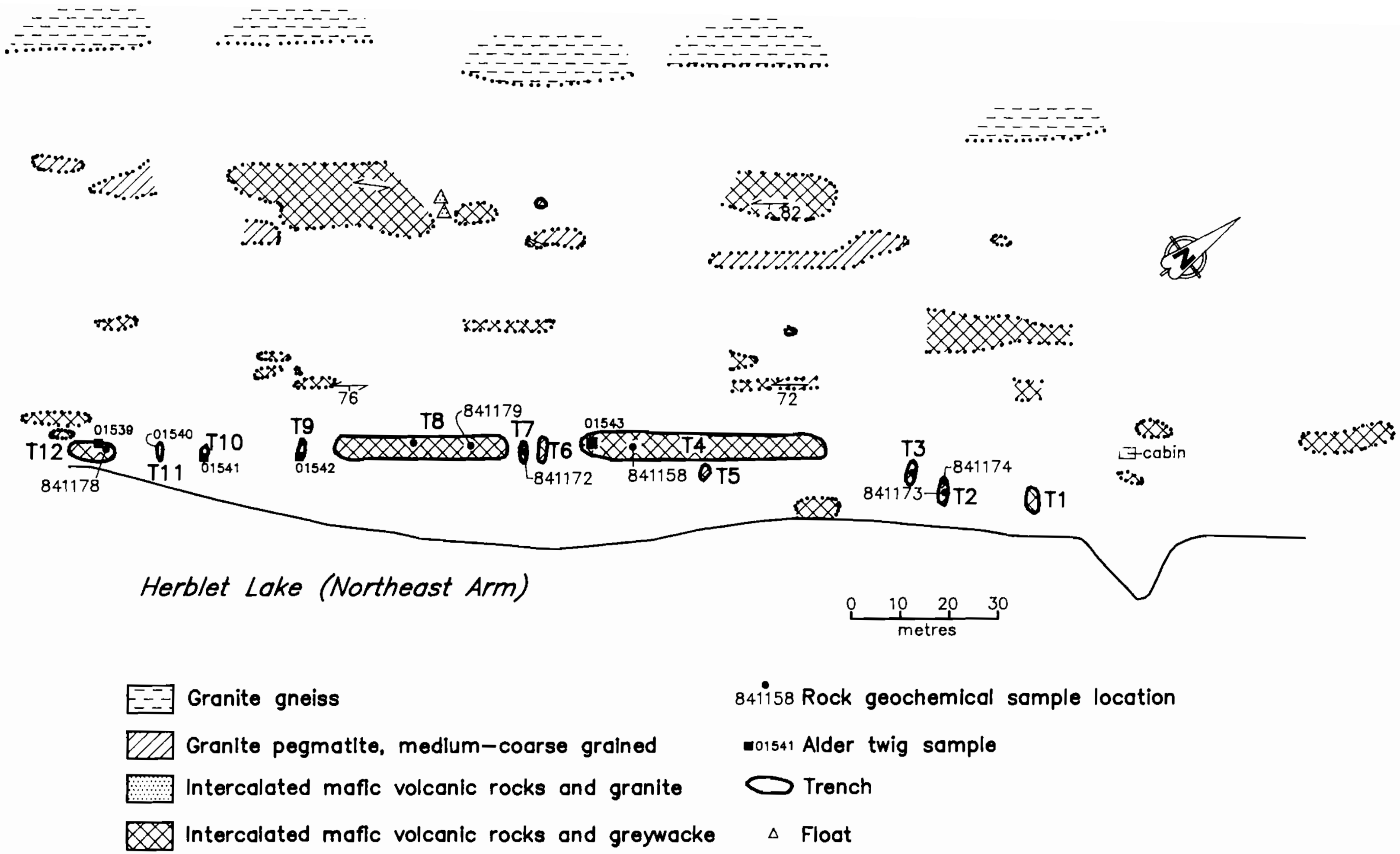

Figure 9-2: Outcrop, geology and trench and sample locations, occurrence 9.

Fedikow, M.A.F., Roney, C.T., Schmidt, G.J. and Robbie, T.
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1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.

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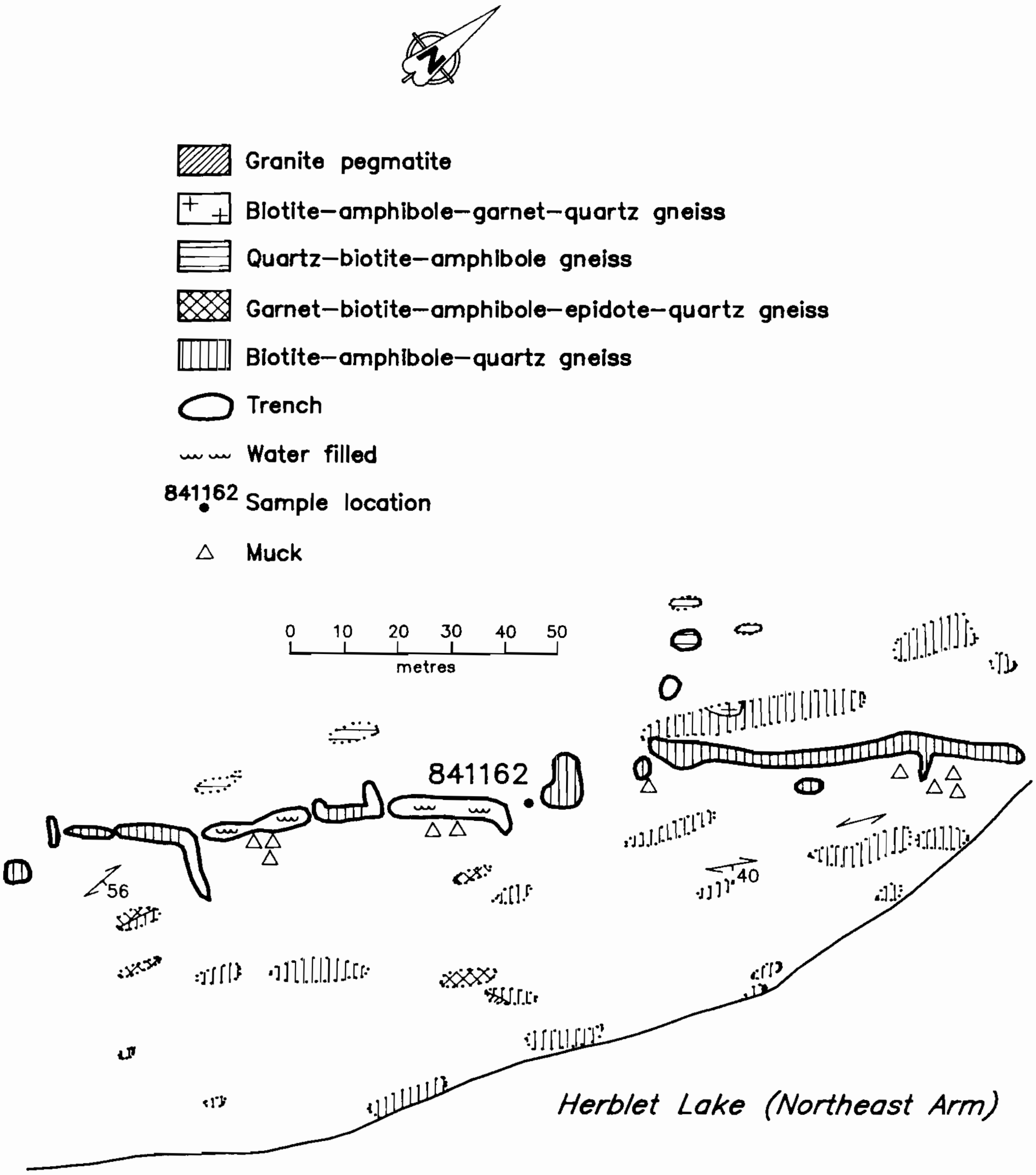
Manitoba Energy and Mines, Minerals sion.

Quinn, H.A.
1957: Mineral occurrences between Chipe and Herb Lakes, Manitoba; The Preca ian, v. 30, No. 1, p. 31.

Richardson, D.J. and Ostry, G.
1987: Gold deposits of Manitoba; Manitoba ergy and Mines, Economic Geology Re ER86-1, 91p.



Sample	Au (ppb)	Ag (oz/ton)	Cu (ppm)	Pb (ppm)	Zn (ppm)
71–84–HL–Au24	20	–	160	–	10

Figure 10-1: Outcrop, geology and trench and sample locations, occurrence 10.

LOCATION: **10**

NAME: Cyclone (Sask-Mani)

UTM: 6094412N/447338E

ACCESS: Provincial Road 393 from Provincial Road 392 to Herblet Lake landing; boat to occurrence.

AREA: West shore of the northeast arm of Herblet Lake.

AIRPHOTO: A20170-33

EXPLORATION SUMMARY:

Cyclone was staked in 1920 by G.C. Taylor and optioned to John Nutt and Russell Hartney in 1925. Pits and trenches were dug in 1921, 1924, 1928 and 1931. An inclined shaft was sunk to a depth of 11 m. Cyclone Development Company funded a 15 m vertical shaft that was sunk in 1926. Reserves were estimated at approximately 450 tonnes on the basis of underground development and bulk sampling (Sask-Mani Precious Metals Mining Company, Corporation File). Sask-Mani Precious Metals Mining Company Limited acquired a partial interest in the claim from Broad Bay Mining Company Limited in 1929. A diamond drill program was planned for 1929 or 1930, but it is not known if this work was done (Mineral Inventory Card 63J/13 Au 24). In 1970 a Turam survey was done by HBED on adjacent ground to the east (A.F. 91499). The claim was cancelled in 1976. Granges Exploration Aktiebolag carried out a 2 hole, 143 m drill program on CB 9080 in 1980 (Mineral Inventory Card 63J/13 Au 24). Cyclone was staked by Peter Dunlop in 1982. A limited program of sampling and stripping was done in 1984 (Mineral Inventory Card 63J/13 Au 24).

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by pink and white to light grey granitoid gneisses of the Herblet Lake Gneiss Dome Complex (Bailes, 1975), Missi Group lithic arenite, Amisk Group mafic flows, and mafic and felsic pyroclastic and volcaniclastic rocks (Fig. 9-1; Froese and Moore, 1980). The occurrence is situated in a unit of mafic volcanic rocks that consists of mineralogically variable gneisses. The gneisses are biotite-amphibole-garnet-quartz gneiss, quartz-biotite-amphibole gneiss, garnet-biotite-amphibole-epidote-quartz gneiss and biotite-amphibole-quartz gneiss (Fig. 10-1). The garnet-biotite-amphibole-epidote-quartz gneiss is strongly magnetic and rusty weathered. Numerous, long and short strike length ground EM conductors have been delineated beneath the northeast arm of Herblet Lake, east of this occurrence. Diamond drilling intersected quartz-hornblende-biotite ± garnet gneiss, and garnetiferous andesite and talc-carbonate schist (A.F. 99849).

MINERALIZATION:

The most prevalent rock type in the vicinity of the trenches is biotite-amphibole-quartz gneiss that contains 0.5 to 1.0 cm thick quartz veins with 1 to 3% disseminated pyrrhotite, magnetite and rare chalcopyrite. Rocks in the trenches are generally rusty weathered. The trenches are flooded, slumped and overgrown; exposure is poor.

Mineral inventory card 63J/13-Au 24 describes the zone as a shear 0.92 to 1.53 m wide and 244 m long. The shear strikes 080° and contains quartz veins and lenses along the southern 131 m section of the zone. Gold is reported to occur in quartz along the footwall in a zone of gouge. Silver and copper minerals are also present. DDH 34 intersected disseminated (3 to 5%) pyrite in quartz-hornblende-biotite gneiss over core intervals of generally less than 1 m. DDH 35 intersected near solid graphite with 2% disseminated pyrite in quartz-hornblende-biotite gneiss over similar core intervals as DDH 34. DDH 35 also intersected a 4.3 m interval of talc-carbonate schist with 10% graphite and 5% pyrite (Fig. 9-1; A.F. 99849).

GEOCHEMICAL DATA:

Cyclone Development Company treated a 27 tonne bulk sample of ore that averaged 19.89 g/t Au (Wright, 1938).

One representative rock chip sample (841162), containing 0.5 cm wide quartz veins with disseminated pyrrhotite, was collected for assay. The results are presented in Figure 10-1; the sample contains low base and precious metal values. A multi-element geochemical analysis of the same sample is presented in Appendix I. This analysis indicates the sample contains 650 ppb Au and 10 ppb Pd.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses.

REFERENCES:

Armstrong, J.E.

1941: Wekusko, Geological Survey of Canada, Map 665A, 1:63 360.

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Manitoba Energy and Mines, Minerals Division.

Bailes, A.H.

1975: Geology of the Guay-Wimapedi Lakes area; Manitoba Mines, Resources and Environmental Management, Mineral Resources Division Publication 75-2, 104p.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.

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Manitoba Energy and Mines, Mineral Resources Division.

Gonzales, A. and Fedikow, M.A.F.
1984: Mineral deposit studies - Snow Lake area; in Manitoba Energy and Mines, Mineral Resources, Report of Field Activities, 1984, p. 46-52.

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Manitoba Energy and Mines, Minerals Division.

Richardson, D.J. and Ostry, G.
1987: Gold deposits of Manitoba; Manitoba Energy and Mines, Economic Geology Report ER86-1, 92p.

Sask-Mani Precious Metals Mining Company
Manitoba Energy and Mines, Minerals Division, Corporation Files.

Wright, J.F.
1938: Geology and mineral deposits of a part of northwest Manitoba; Geological, Survey of Canada, Summary Report 1930, Part C, 124p.

LOCATION: **11**

NAME:

UTM: 6093038N/446646E

ACCESS: Provincial Road 393 from Provincial Road 392 to Herblet Lake landing; boat to occurrence.

AREA: Northeast Arm, Herblet Lake

AIRPHOTO: A21963-53

EXPLORATION SUMMARY:

The area was first staked as Chance, Cabin and Caribou prior to 1930. A 3.6 m deep pit was sunk on the Cabin claim (Wallace, 1920). Pits and trenches were dug on the Cabin claim between 1922 and 1936. From 1917 to 1959, the ground was held by various individuals. Diamond drilling was done on the Caribou claim by Glen Rapson in 1947 (Manitoba Mines and Natural Resources, 1948). Surface work was reported between 1957 and 1958 on the J.S. group of claims held by J. Kerr. An airborne EM survey was done in the area by Canadian Nickel Company Limited in 1957 (A.F. 91624). HBED held ground in the area from 1960 to 1961 and from 1969 to 1976. HBED carried out a Turam survey in 1970, followed by a 6 hole 605 m drill program on CB 281 and an 8 hole, 554 m drill program on CB 282 in 1971 (A.F. 91499; Mineral Inventory Card 63J/13 Cu 6). Results of the drilling are not available. The ground was held by Granges Exploration Aktiebolag from 1980 to 1982, and by Nor-Acme Gold Mines Limited from 1987 to 1990. Box 3 was staked over the area by W. Bruce Dunlop Limited in January 1990 and assigned to Peter Dunlop in October 1990.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by pink and white to grey granitoid gneisses that belong to the Herblet Lake Gneiss Dome Complex (Bailes, 1975), Missi Group lithic arenite, Amisk Group mafic flows and mafic and felsic pyroclastic and volcaniclastic rocks (Fig. 9-1; Froese and Moore, 1980). Biotite-amphibole schist, granitic pegmatite and pink granitoid gneiss were mapped in surface exposure (Fig. 11-1).

MINERALIZATION:

Four quartz veins, varying from 2 to 6 cm in thickness separated from one another by 2 to 3 cm of biotite-amphibole schist, are exposed in trenches 1 and 3 (Fig. 11-1). The quartz veins contain minor disseminated pyrite and chalcopyrite; minor pyrite also occurs at the vein wall rock contact. The veins trend at 018° and dip 62° northwest. Trench 2 exposes a 12 cm wide quartz vein that strikes 024°, dips 58° northwest and contains minor disseminated pyrite and chalcopyrite. Garnets and disseminated pyrite occur at the quartz vein wall rock contact. Wallace (1920) reports that the quartz veins converge to form a single sulphide-bearing quartz vein at depth.

GEOCHEMICAL DATA:

Two representative rock chip samples were collected for assay and multi-element geochemical analysis. The samples represent the pyrite- and chalcopyrite-bearing quartz veins exposed in trenches 1 and 2 (Fig. 11-1). The assay results are tabulated on Figure 11-1. Multi-element geochemical results (Appendix I) indicate sample 841164 contains 143 ppb Au (arithmetic mean of two analyses).

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. Quartz veins with iron and base metal sulphide minerals.

REFERENCES:

Armstrong, J.E.

1941: Wekusko; Geological Survey of Canada, Map 665A, 1:63 360.

Assessment Files 91499 and 91624

Manitoba Energy and Mines, Minerals Division.

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1975: Geology of the Guay-Wimapedi Lakes area; Manitoba Mines, Resources and Environmental Management, Mineral Resources Division Publication 75-2, 104p.

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Manitoba Mines and Natural Resources

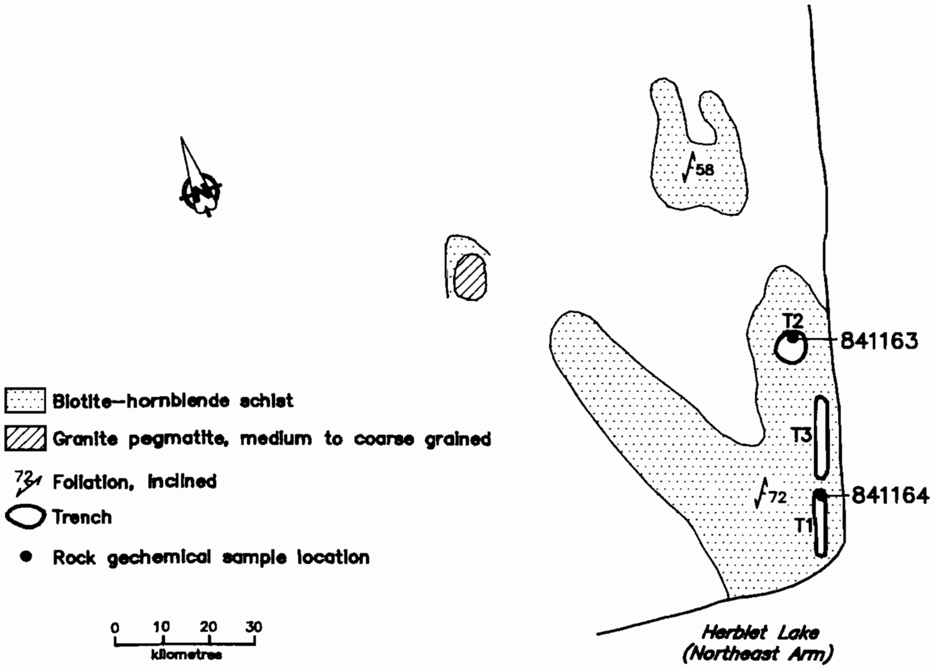
1948: 20th Annual Report on Mines and Minerals, 126p.

Mineral Inventory Card 63J/13 CU 6,

Manitoba Energy and Mines, Minerals Division.

Wallace, R.C.

1920: Mining and mineral prospects in northern Manitoba; Government of Manitoba, Office of Commissioner of Northern Manitoba, Northern Manitoba Bulletins, 37p.



Sample	Au (ppb)	Ag (ppb)	Cu (ppm)	Pb (ppm)	Zn (ppm)
841164 (T1)	50	nil	93	nil	8
841163 (T2)	10	nil	43	nil	5

Figure 11-1: Outcrop, geology, trench and sample locations and assay results, occurrence 11.

LOCATION: **12**

NAME: D Group (Fosco)

UTM: 6087479N/437906E

ACCESS: Provincial Roads 392 and 393 to Herblet Lake landing; boat to occurrence.

AREA: Western end of Herblet Lake.

AIRPHOTO: A20170-23

EXPLORATION SUMMARY:

The D group of claims were staked by O. Dickson in 1943, and assigned to A.D. MacPherson in 1947. Geological mapping (1:2400) was done by R.J. Terroux in 1947 and an 8 hole, 365 m diamond drill program was done by A.D. MacPherson in 1948 on D1 to D3 (A.F.90137). The drilling had been done to test a "quartz shear zone". The claims were leased in 1952 and cancelled in 1966. W.B. Kobar staked CB 1086 in 1969 and assigned it to Fosco Mining Limited in 1971. Fosco Mining Limited did airborne EM and magnetic surveys in 1971 (A.F. 92130; Fosco Mining Limited, Corporation File). W.B. Kobar restaked the area as CB 5753 between 1973 and 1976. CB 12946 and CB 12947 were staked by Gold Fields Resources Canada Limited in 1981, and assigned to Darius Gold Mine Inc. and then to Gold Fields Canadian Mining Limited in 1982. HBM&S took a one year option on the property in 1985. Snow Lake Mines Limited acquired the property in 1986.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Missi Group lithic arenite flanked to the north by Amisk Group mafic flows, pyroclastic and volcaniclastic volcanic rocks. The occurrence is situated north of the biotite-sillimanite-almandine isograd that marks the transition from Kisseynew gneisses in the north to the Missi-Amisk successions of the Flin Flon-Snow Lake greenstone belt to the south (Fig. 12-1; Froese and Moore, 1980). Greywacke, arkose and amphibolite were mapped in the general area of the occurrence (Fig. 12-2). Mineralization is hosted by greywacke that is flanked to the north and south by amphibolite.

MINERALIZATION:

Four trenches at the occurrence expose quartz veins that contain pyrite, chalcopyrite, arsenopyrite, sphalerite and galena within rusty weathered greywacke. Red-pink garnets are developed at the contact between the greywacke and a 1 to 12 cm thick amphibolite dyke (Fig. 12-2). Stubby arsenopyrite crystals occur in the wall rock adjacent to the quartz veins.

GEOCHEMICAL DATA:

Fosco Mining Company (1970) reported the following ranges for 4 grab samples collected from "quartz-filled shears" on claims D1 to D3: 0.01 to 1.34% Cu, 0.07 to 0.22% Zn and 0.34 to 26.74 g/t Au (Mineral Inventory Card 63J/13 Cu 5).

Six representative samples were collected for assay and multi-element geochemical analysis from quartz veins in outcrop (Fig. 12-3). Assay results are summarized on Figure 12-3. The samples contain a range of 0.7 to 5.1 g/t Au and 1 to 16 ppm Ag. Samples 00612 and 00616 contain 0.19% and 0.15% Pb, respectively. Sample 00616 also contains 0.11% Zn. Multi-element geochemical analyses confirm the high Pb, Zn, Au and Ag in the samples. Additionally, the samples contain 1066 to 13663 ppm As, 4 to 27 ppm Sb, 1 to 22 ppm Cd and 2 to 7 ppm Bi. The remainder of the multi-element analyses are presented in Appendix I.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. The base metals in the quartz veins may represent mobilizate from previously deposited sulphide mineralization.

REFERENCES:

Assessment Files 90119, 90137 and 92130
Manitoba Energy and Mines, Minerals Division.

Eccles, D.R. and Fedikow, M.A.F.
1985: Mineral occurrence documentation and alteration zone mapping, Snow Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 82-99.

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1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.

Gonzales, A. and Fedikow, M.A.F.
1984: Mineral deposit studies - Snow Lake area; in Manitoba Energy and Mines, Mineral Resources, Report of Field Activities, 1984, p. 46-52.

Mineral Inventory Card 63J/13 Cu 5
Manitoba Energy and Mines, Minerals Division.

Russell, G.A.
1957: Structural studies of the Snow Lake - Herb Lake area; Manitoba Mines and Natural Resources, Publication 55-3, 33p.

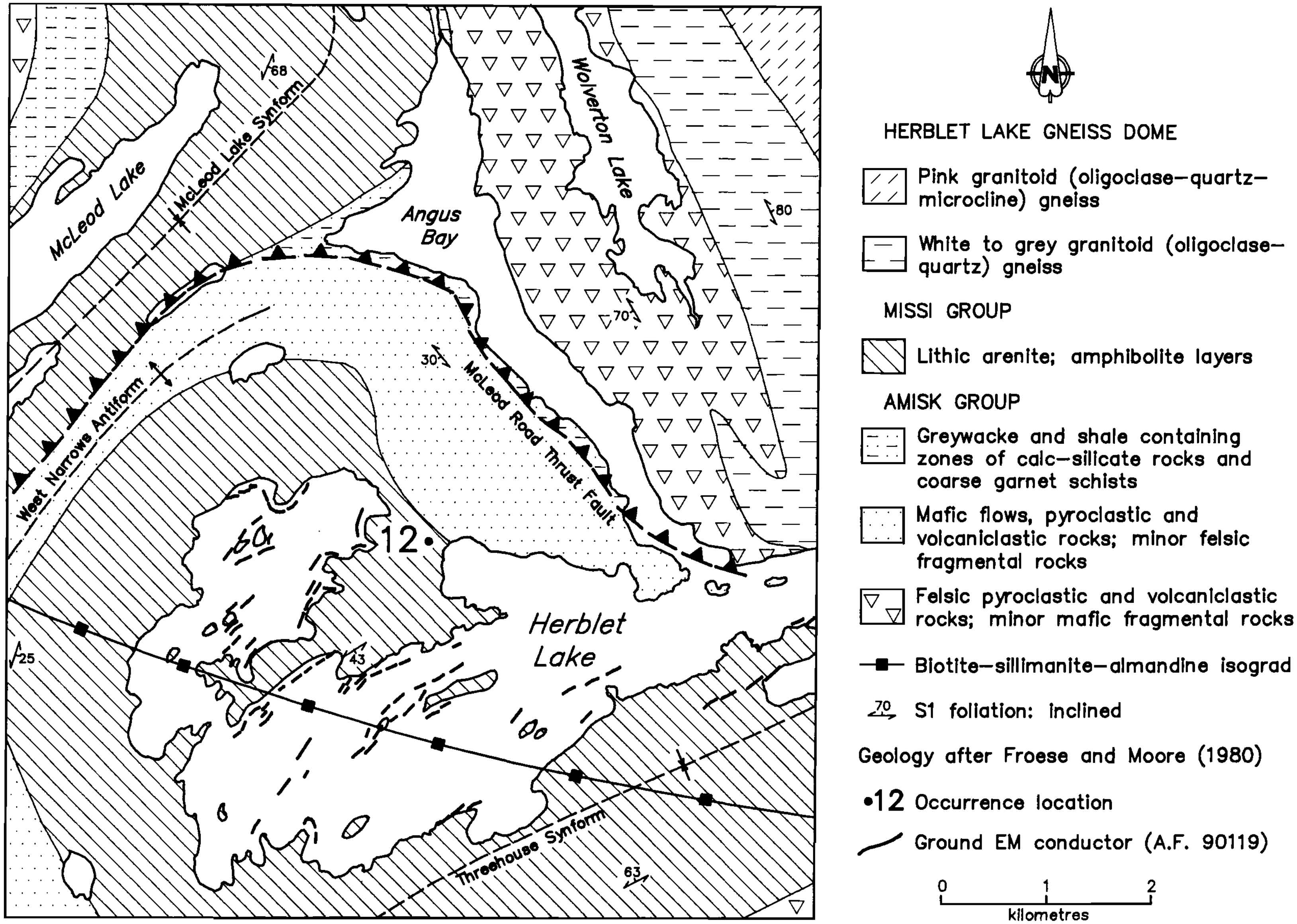


Figure 12-1: Geological setting of occurrence 12.

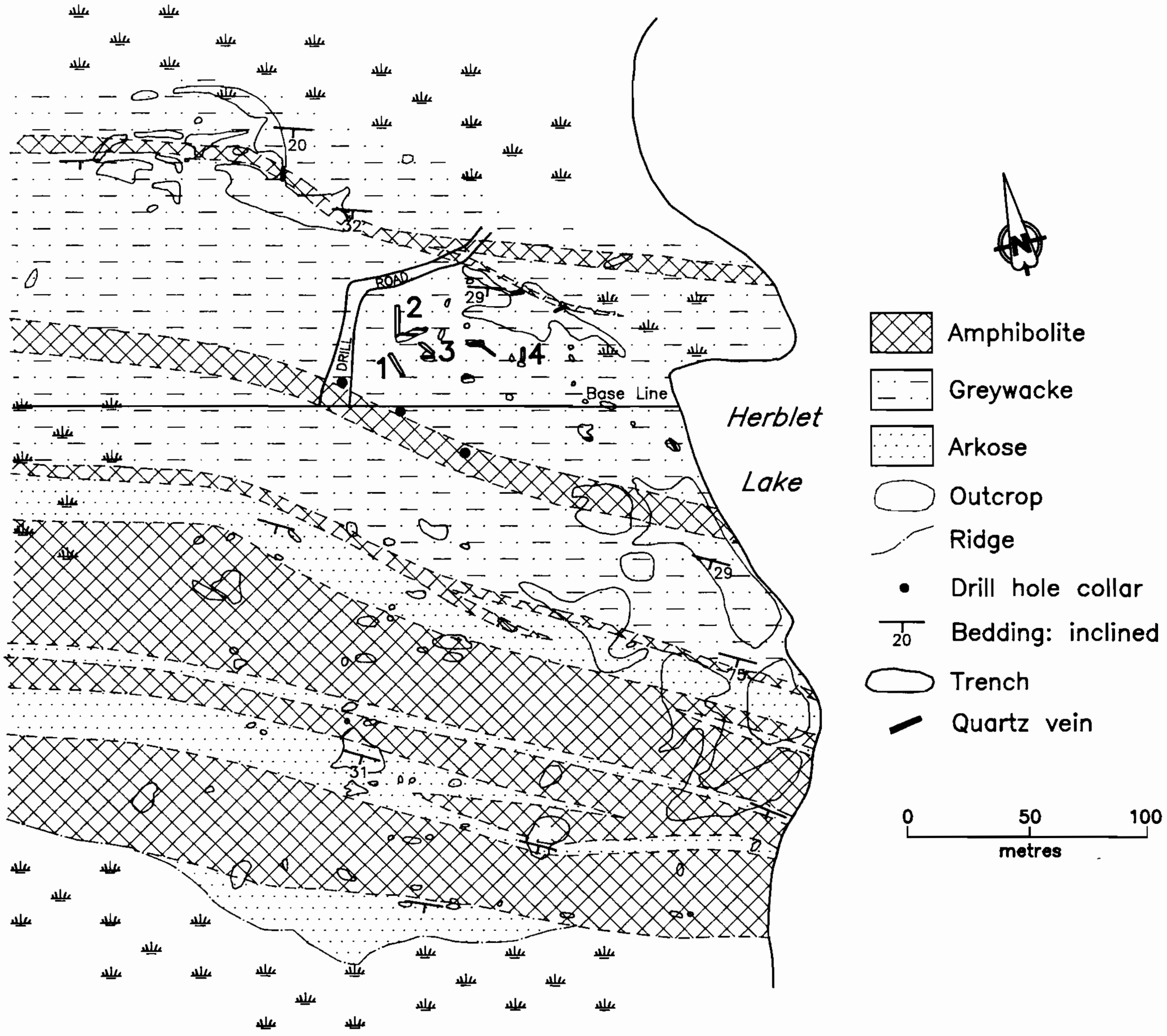
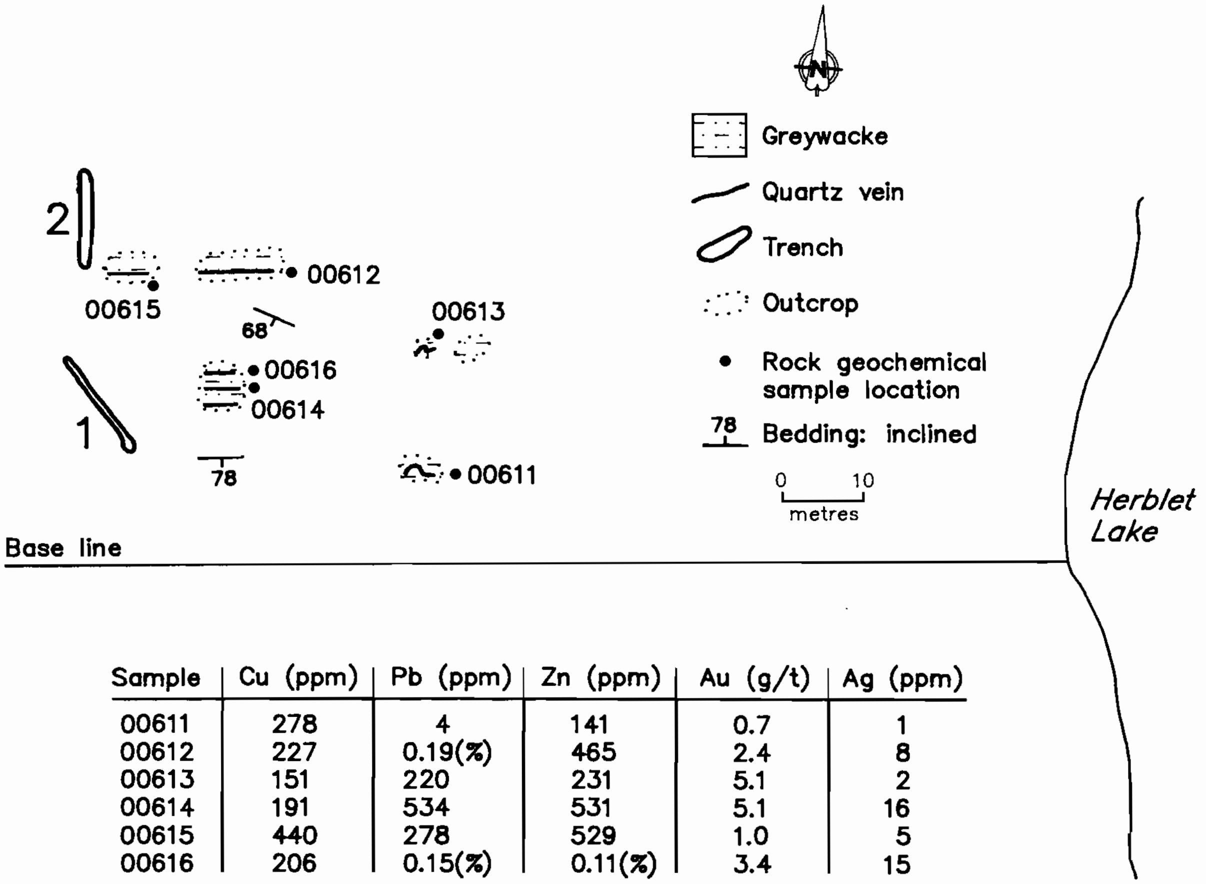


Figure 12-2: Outcrop, local geology and trench location map, occurrence 12.



Sample	Cu (ppm)	Pb (ppm)	Zn (ppm)	Au (g/t)	Ag (ppm)
00611	278	4	141	0.7	1
00612	227	0.19(%)	465	2.4	8
00613	151	220	231	5.1	2
00614	191	534	531	5.1	16
00615	440	278	529	1.0	5
00616	206	0.15(%)	0.11(%)	3.4	15

Figure 12-3: Outcrop, detailed geology and trench and sample location map, occurrence 12.

LOCATION: **13**

NAME: Ruby Silver-Lead-Zinc
UTM: 6086983N/453785E
ACCESS: Boat from Bartlet's Landing to Herb Bay and Wekusko Brook, Wekusko Lake; traverse.

AREA: Northeast of Herb Bay, Wekusko Lake
AIRPHOTO: A20124-81

EXPLORATION SUMMARY:

In 1920, the Surprise, Puzzler, Ruby and Galena claims were staked by R. Kerr, P. Gasse, L. Leullier and B.B. Syndal, respectively. Pits and trenches were dug on Puzzler and Ruby between 1921 and 1923. A 10 to 14 m deep shaft was sunk on Puzzler, and about 12 m of drifting was done on the 7 m level in 1925. By August 1928, a 10 m crosscut had been driven 12 m from the shaft collar. The property was optioned by the American Smelting and Refining Company from 1923 to 1924, by Thomas Creighton from 1927 to 1928, and by Cold Lake Mines Limited from 1928 to 1929. The Ruby Silver-Lead-Zinc Syndicate, formed by R. J. Jowsey, drilled 7 holes totalling 587 m on Puzzler between 1928 and 1929 (Mineral Inventory Card 63J/13 Zn 1). The claims were leased for 21 years in 1930. A magnetic survey was done by the syndicate in 1948. W. Kobar and P. Kobar staked Zinc 1 to 6 and Zinc 10 over the property in 1951. In 1952, HBED optioned the claims and carried out a ground EM survey and geological mapping (1:2400) on Zinc 3 to 5, rock sampling of 6 trenches on Zinc 1 and 2, a 4 hole, 464 m drill program on Zinc 1, and drilled a 151 m deep hole on Zinc 2 (A.F. 90089, 90193). In 1953, a 40 hole, 3850 m diamond drill program was done on Zinc 1, 2, 5 and 6 (A.F. 90089). Three holes were drilled on Peg 21 Fr., Peg 41 Fr.,and Peg 42, but the logs are not available (A.F. 90089). HBED acquired the claims in 1954 and cancelled them in 1959. Canadian Nickel Company did an airborne EM survey in 1957 (A.F. 91624). Surface work was done on Leg 1 (formerly the Ruby claim) by Green Bay Mining and Exploration Limited from 1957 to 1958 and by A. Jacobson in 1959. On Bear 1 (formerly the Surprise claim), a 53 m and a 21 m deep hole were drilled in 1962 and 1965, respectively for W.B. Kobar (A.F. 90068, 90069). Falconbridge Nickel Mines Limited did a magnetic survey on this claim in 1967 (A.F. 90070). D.W. Esson examined the property in 1968. W.B. Kobar staked the Silver-Lead claim in 1970 and optioned it to Hewbet Mines Limited in 1972. Four 100 lb bulk samples were collected from muck around the shaft for analysis. HBED staked the Kik claims in 1963, and did work on the property between 1964 and 1975. Airborne EM and radiometric surveys were done by HBED in 1965 (A.F. 91650). All of the Kik claims, except Kik 52 and 69, were cancelled in 1976. D.N. Glassey staked CB 7694 and W45874 over the area in 1977, and assigned them to West-way Mines Limited in 1978. Work was reported in 1979 and 1981 (Mining Claim Cards CB 7694 and W 45874). HBED restaked the area as CB 13384 and CB 13385 in 1982. The ground is presently covered by CB 13384, CB 13385, Kik 52 and 69, all held by HBED, and by Silver-Lead, held by W.B. Kobar since 1970.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group felsic pyroclastic and volcaniclastic rocks and greywacke. Aphebian pegmatite and tonalite intrusions are also present. The trace of the McLeod Road Thrust Fault occurs just south of the occurrence at the contact between rhyolite and greywacke (Fig. 13-1; Froese and Moore, 1980). In the area of the occurrence rusty weathered quartz phyric, quartz-biotite gneiss (rhyolite) and garnet-biotite gneiss were mapped in trenches and in bulldozed and washed outcrop (Fig. 13-2, 13-3, 13-4). Blocks of bedrock blasted from the trenches contain abundant white mica, staurolite and sulphide. The quartz-biotite and garnet-biotite gneisses are considered to represent altered Amisk greywacke.

Diamond drill holes, collared to test long and short strike length ground EM conductors (Fig. 13-2; A.F. 90089), intersected thinly interlaminated biotite-, sericite-, sericite-chlorite ± graphite, graphite and garnet-biotite gneisses and schists. These units are, in part, silicified, mineralized and interlayered with quartzite, graphitic quartzite and limestone. The schistose and gneissose rocks are described as "limey" in the drill logs. Granite, aplite, syenite, hornblendite and pegmatite intrusions are common (A.F. 90068, 90069, 90089).

MINERALIZATION:

Fifteen trenches (Fig. 13-4) expose near solid to solid sphalerite and galena with minor chalcopyrite, pyrite and pyrrhotite. Blocks of sulphide up to 0.5 m in diameter, blasted from the trenches contain quartz veins with some polymetallic sulphide mobilizate. A 1 cm thick solid sphalerite layer occurs in outcrop, 2 m south of trench 13 (Fig. 13-3). Disseminated pyrite is common in the outcrops surrounding the trenches (Eccles and Fedikow, 1985). Multiple vertical drill hole collars were located in proximity to the trenches.

Mineralization intersected by multiple inclined diamond drill holes is characterized by 1 to 5% disseminated pyrite that occurs in practically every lithology described in the drill logs. In addition, disseminated pyrrhotite occurs within quartzite; pyrite and galena occur in thin white quartz veins hosted by siliceous biotite gneiss (DDH 15; Fig. 13-2). Polymetallic sulphide mineralization occurs in narrow core intervals in many lithologies. DDH 22 intersected 14 m of biotite-garnet gneiss that contains disseminated sphalerite and pyrite; DDH

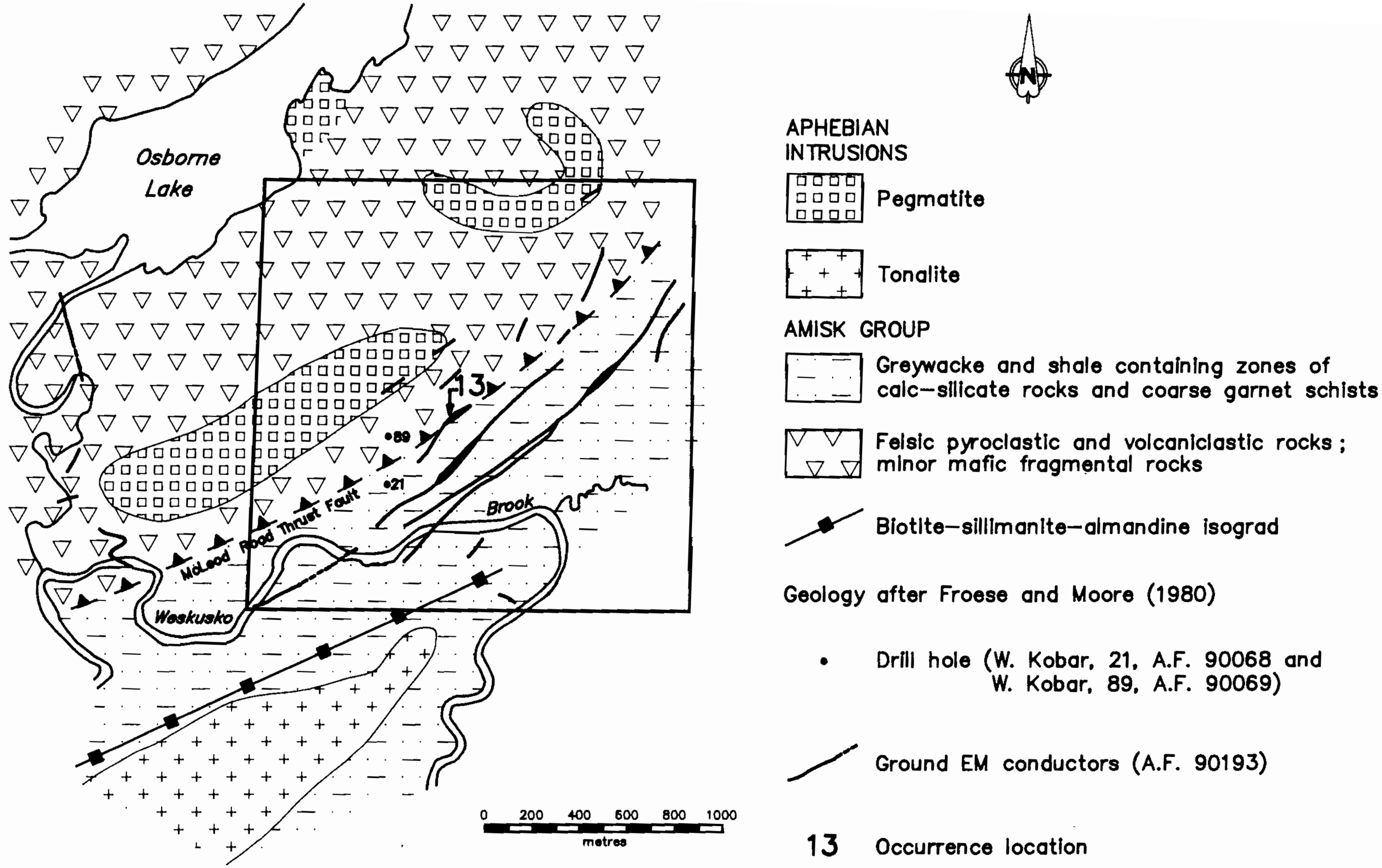


Figure 13-1: Geological setting of occurrence 13.

21 intersected 3.2 m of garnetiferous quartzite with disseminated sphalerite, pyrite, and galena; similar intersections are documented in DDH 37 and 46. In core from DDH 19, a 0.3 m near solid sphalerite layer is overlain by 0.4 m of pyritic quartzite and underlain by biotite gneiss that contains disseminated pyrite and sphalerite. A 5.3 m interval of quartz-biotite gneiss that contains disseminated pyrite, chalcopyrite, sphalerite, arsenopyrite and galena was intersected by DDH 50. Numerous graphitic lithologies, ranging in core length from 0.3 to 11.9 m occur throughout the drill core. Graphite schist, commonly 0.9 to 1.2 m in core length, host disseminated pyrite and sphalerite and galena. Graphite is described in drill logs as disseminated to amorphous and, in combination with quartzite, occurs throughout the sericite-chlorite schist and garnet-biotite gneiss and schist.

GEOCHEMICAL DATA:

Samples collected from pits and trenches averaged 17% Zn, 4% Pb, and 205.7 g/t Ag (Cold Lake Mines Limited, Corporation File). Hosain (1988) reports that a sample assayed by Falconbridge Nickel Mines Limited contained 8.6% Zn, 1.41% Pb and 302 ppm Ag. A muck grab sample collected by D.W. Esson in 1968 was assayed and contained 17.1% Zn, 5.57% Pb, 0.06% Cu, 0.34 g/t Au and 269.8 g/t Ag.

Nine representative rock chip samples were collected from the general area of the trenches for assay and multi-element geochemical analysis. Most of the samples represent near solid to solid sulphide; sample 00623 represents a sulphide-bearing quartz vein. The assay results are tabulated below.

Multi-element data for all samples except 01423 are presented in Appendix I. The multi-element analyses confirm the high Pb, Zn, Cu and Ag contents of the samples. Additionally, the samples contain high Sb, Bi and Cd.

Sample	Cu (ppm)	Ni (ppm)	Pb (%)	Zn (ppm)	Au (g/t)	Ag (g/t)
00621	928	nd	4.81	10.98(%)	tr.	250.3
00622	0.10(%)	62	6.00	14.45(%)	tr.	302.0
00623	315	49	0.48	906	tr.	23.3
00624	0.10(%)	nd	8.00	16.7(%)	tr.	384.7
00625	419	65	2.03	175(%)	tr.	92.9
01414	0.10(%)	46	6.80	14.15(%)	0.7	325.7
01423	60	110	0.11	133	tr.	6.0
01424	327	111	1.25	27	tr.	52.8
01425	71	12	0.97	436	tr.	48.3

nd-not detected

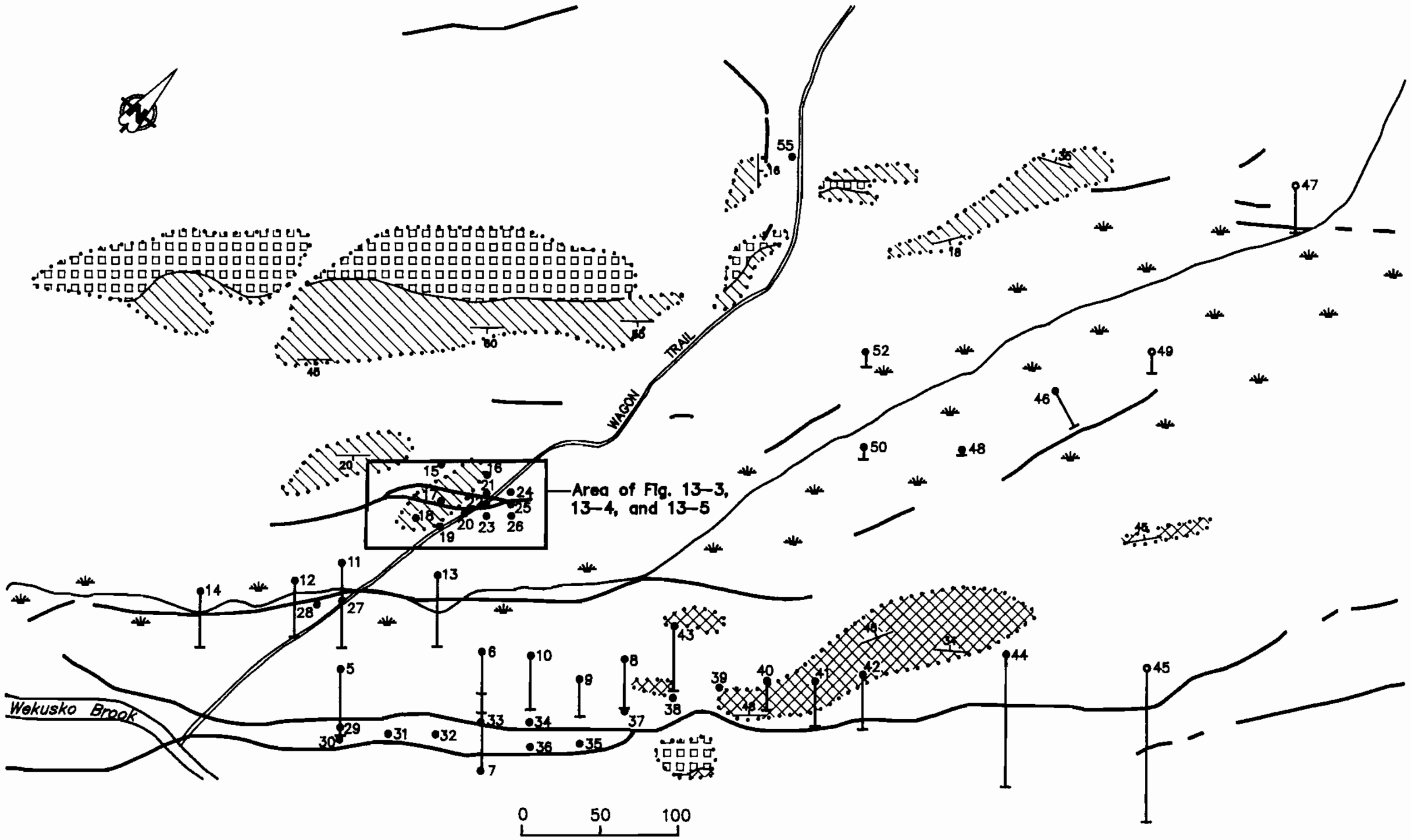
Representative chip samples 00726 and 00727 were collected from the two trenches located southeast from the Ruby occurrence. Sample 00727 contains 4023 ppm Pb, 25882 ppm Zn, 22.6 ppm Ag, 24 ppm Cd, 39 ppm Sb and 59 ppb Au.

A mercury vapour survey was conducted over the occurrence to test the usefulness of Hg-vapour as an exploration sampling medium (Fig. 13-5; Fedikow, 1986; Fedikow and Amor, 1990). This occurrence was selected because of the conspicuous Hg enrichment in the mineralization. Six samples (00621 to 00625 and 01414) of near solid to solid sulphide contain Hg contents of 50, 4800, 5200, 5400, 6000, and 9000 ppb, respectively. Despite thin, but clay-rich overburden in the area of the occurrence, each of the ten Hg detectors measured less than 10 ppb Hg along a transect perpendicular to the trend of the mineralization.

Table 13-1 compares the abundances of certain trace elements in mineralization from base metal massive sulphide deposits in the Snow Lake area with those from the Ruby occurrence. The similarities between the Ruby occurrence and these massive sulphide deposits is apparent for Cd and Bi, but less apparent for Sb. Near solid to solid polymetallic mineralization at the Ruby occurrence contains less W and Co, but significantly more Ag.

Table 13-1: A comparison of trace element abundances in massive sulphide type mineral deposits, Snow Lake area. Analyses based upon ICP-AAS subsequent to aqua regia dissolution. Complete data listing is given in Appendix I.

Deposit	Cd (ppm)	Sb (ppm)	Bi (ppm)	W (ppm)	Co (ppm)	Ag (ppm)
Rod Cu-Zn	22-76	107-543	2-110	58-452	152-1705	11-47.3
Ruby Pb-Zn-Ag	3-195	59-663	2-11	1-3	5-38	54.5-228.3
Anderson Cu-Zn	1-5	2-49	2-82	113-472	186-364	0.4-15.8
Stall Lake Cu-Zn	10-119	30-230	2-205	38-672	175-350	10.4-30.8
Osborne Cu-Zn	1-98	2-62	2-38	4-921	14-1110	0.1-17.8
Chisel Cu-Zn	1-609	2-109	2-198	108-610	22-144	0.1-58.0



APHEBIAN INTRUSIONS

Pegmatite

AMISK GROUP

Quartz–biotite gneiss (rhyolite)

Garnet–biotite gneiss (greywacke)

Geology after HBMS (1953; A.F.90089)

Bedding, inclined

Ground EM conductor (A.F. 90089)

Drill hole, vertical (HBED, 15 to 39, 55, A.F. 90089)

Drill hole, log available (HBED, 5 to 14, 40 to 44, 46, 48, 50, 52, A.F. 90089)

Drill hole, log unavailable (HBED, 45, 47, 49, A.F. 90089)

Figure 13-2: Outcrop, geology, ground EM conductors and diamond drill hole locations, occurrence 13.

CLASSIFICATION:

Stratabound massive sulphide type deposit; volcanic rock associated. The quartz-rich and garnet-biotite-rich gneisses associated with this deposit are altered equivalents of Amisk greywacke. The occurrence of Amisk greywacke was not mapped on the north side of the McLeod Road Thrust Fault prior to this examination (Froese and Moore, 1980). Drill logs and detailed outcrop examination, supplemented with thin sections, indicate the host rocks to the Ruby polymetallic deposit are greywacke. Similar stratigraphic relationships are observed and discussed for the Bur Zone sediment hosted base metal massive sulphide type deposit (Location 126).

REFERENCES:

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Mineral Inventory Card 63J/13 Zn 1

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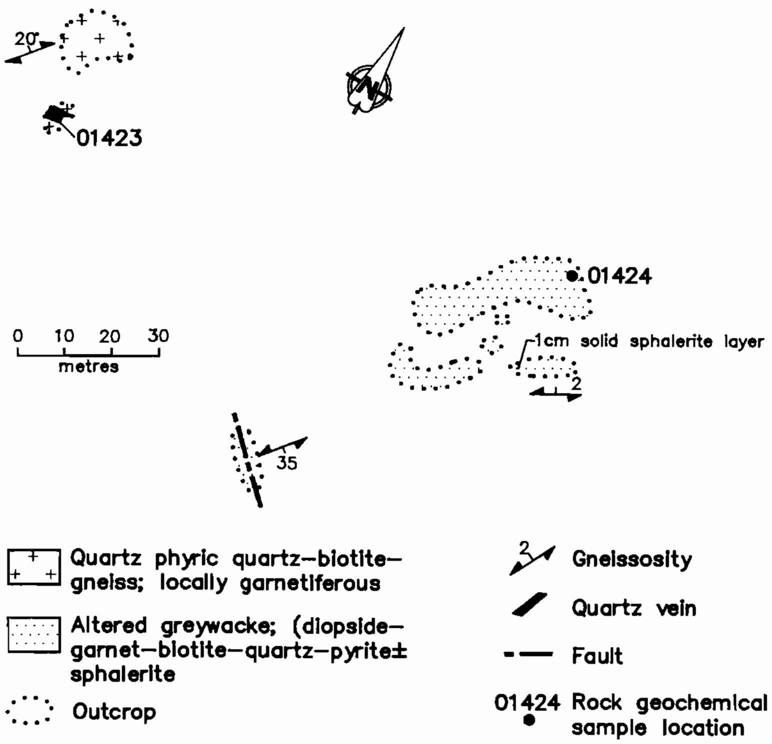

Figure 13-3: Outcrop, geology and sample location map in the vicinity of the trenches in Figure 13-2.

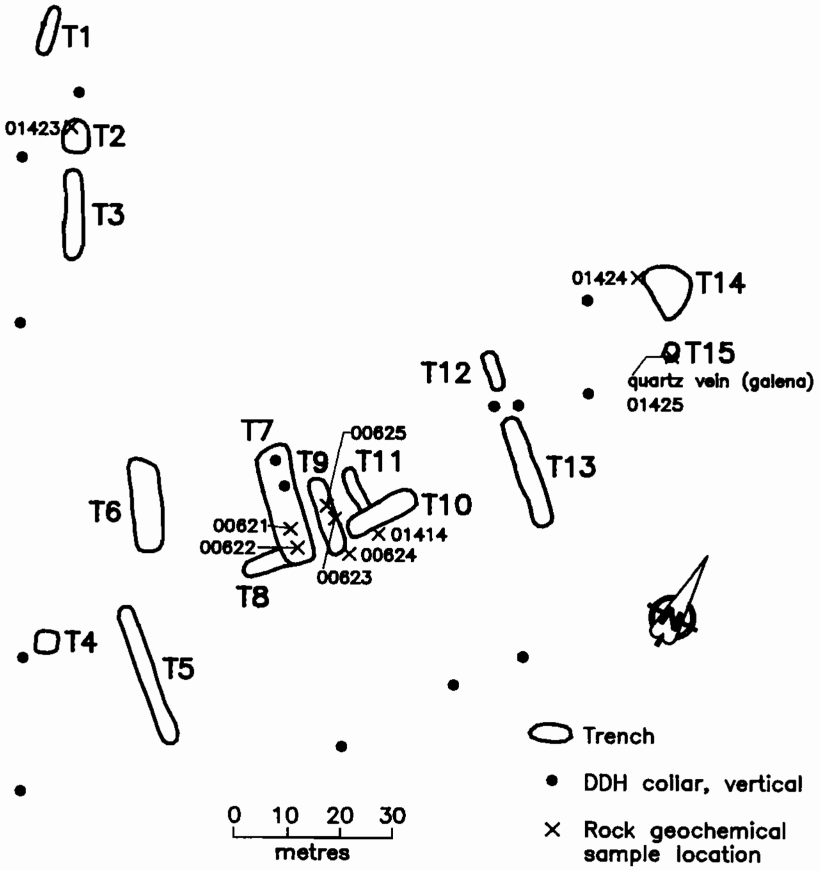

Figure 13-4: Trench, sample and drill hole collar location map, occurrence 13.

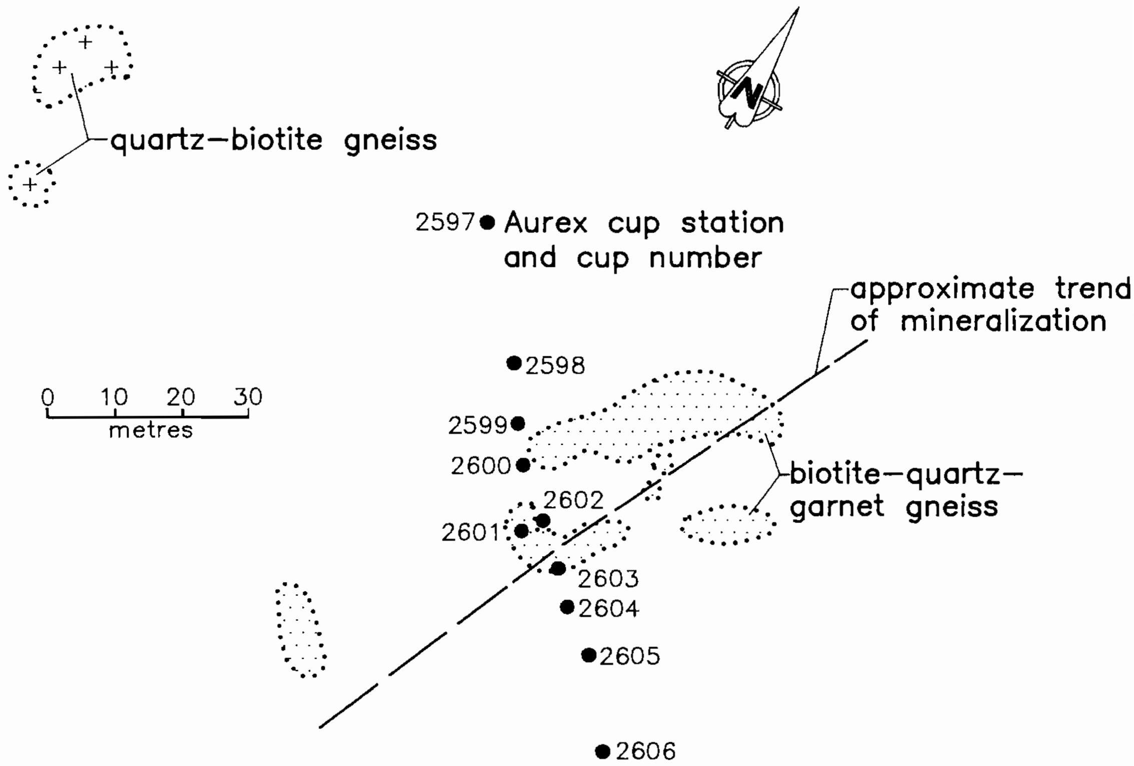

Figure 13-5: Aurex mercury-vapour survey, occurrence 13.

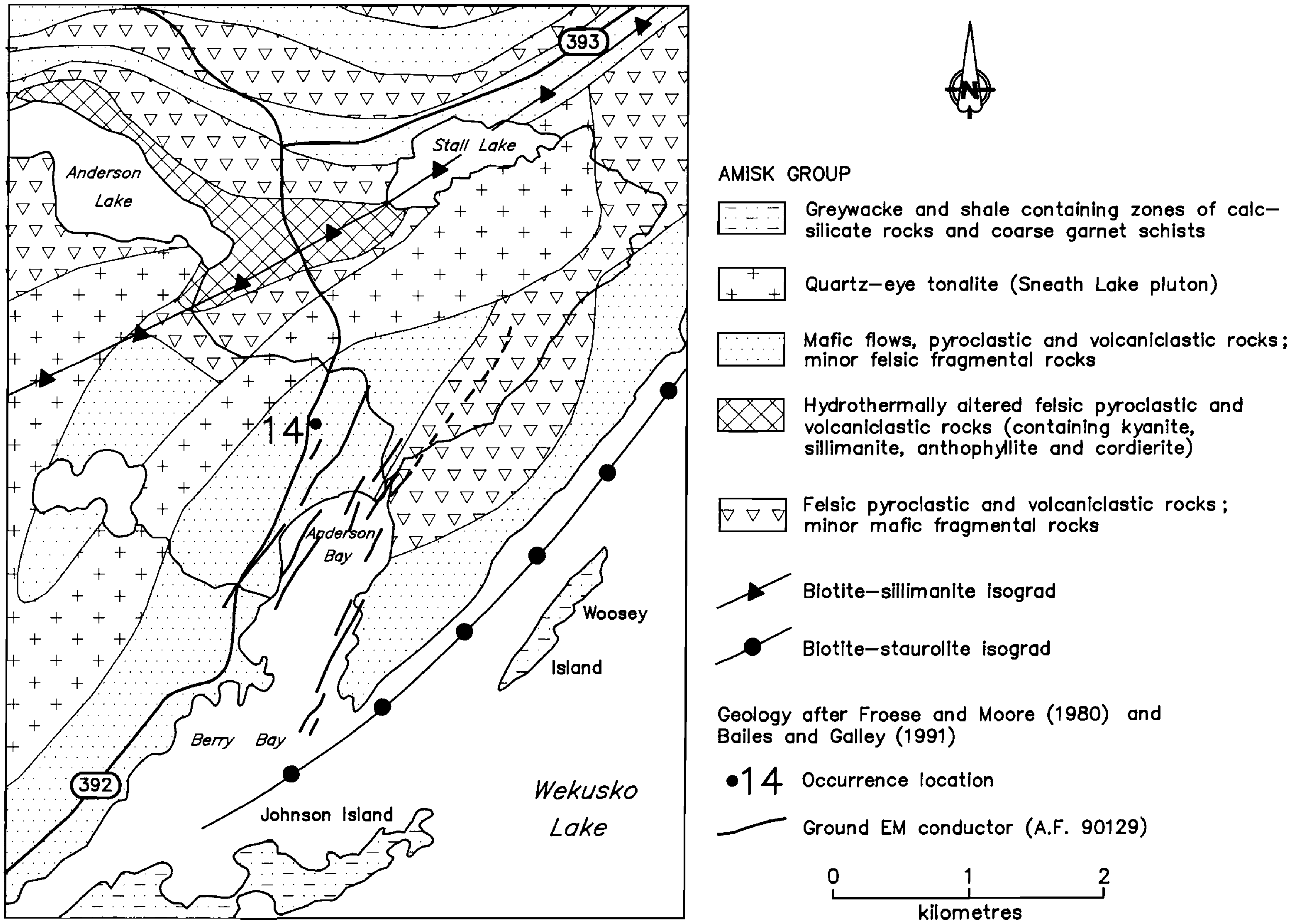

Figure 14-1: Geological setting of occurrence 14.

LOCATION: **14**

NAME:

AREA: North of Anderson Bay, adjacent to Provincial Highway 392.

UTM: 6076973N/439002E

AIRPHOTO: A20170-15

ACCESS: Provincial Highway 392.

EXPLORATION SUMMARY:

The area was first staked as Savage 2 and 3 in the 1920's. Surface exploration was done by Herb Lake Mining and Exploration Limited on the Mallard group in 1947 (Manitoba Energy and Mines, Scrap Book, 1947). HBED did an HLEM survey in 1955 (A.F. 90108). A Turam survey was done by HBED on the Solar group in 1965 (A.F. 90129). Canton 1 to 2 were staked by Wm. McKayseff between 1968 and 1969, and assigned to W.B. Kobar in 1971. Stall Lake Mines Limited optioned the Canton claims from 1971 to 1976, and did geophysical work on the property between 1971 and 1973 (Stall Lake Mines Limited, 1971 and 1973 Annual Reports). The Canton claims were transferred to Wm. McKayseff in 1976 and then to Falconbridge Nickel Mines Limited in 1978. The area was restaked by Falconbridge as W 45881 Fr. in 1978. In 1982 the company changed its name to Falconbridge Limited and transferred a 90% interest in the property to Corporation Falconbridge Copper (known as Minnova Inc. since 1987).

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by mafic flows, pyroclastic and volcaniclastic rocks flanked to the north by felsic pyroclastic and volcaniclastic rocks and to the south by greywacke and shale. The mafic volcanic rocks have been intruded by tonalite to the west of the area of the occurrence. All rock units in the area of the occurrence have been assigned to the Amisk Group (Froese and Moore, 1980). The occurrence is situated between the biotite-sillimanite isograd to the north and the biotite-staurolite isograd to the south (Fig. 14-1; Froese and Moore, 1980). In the immediate vicinity of the occurrence the mafic volcanic rocks are carbonatized, rusty weathered and silicified.

MINERALIZATION:

Disseminated and veinlet fine grained pyrrhotite (1 to 2%) and chalcopyrite occur in massive basalt. The basalt is strongly foliated, rusty weathered and silicified. Brown-weathered carbonate flecks, veinlets and laminae are pervasive in the roadside exposure that hosts this mineralization.

GEOCHEMICAL DATA:

Representative outcrop chip sample 01422 was collected for assay and multi-element geochemical analysis. Assay results, confirmed by multi-element geochemical data (Appendix I), indicate the sample contains low base and precious metal values. The assay results are: nil Au and Ag, 143 ppm Cu, 15 ppm Ni, 75 ppm Zn and 91 ppm Pb.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 90108 and 90129
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1947: Manitoba Energy and Mines, Minerals Divison, Corporation Files.

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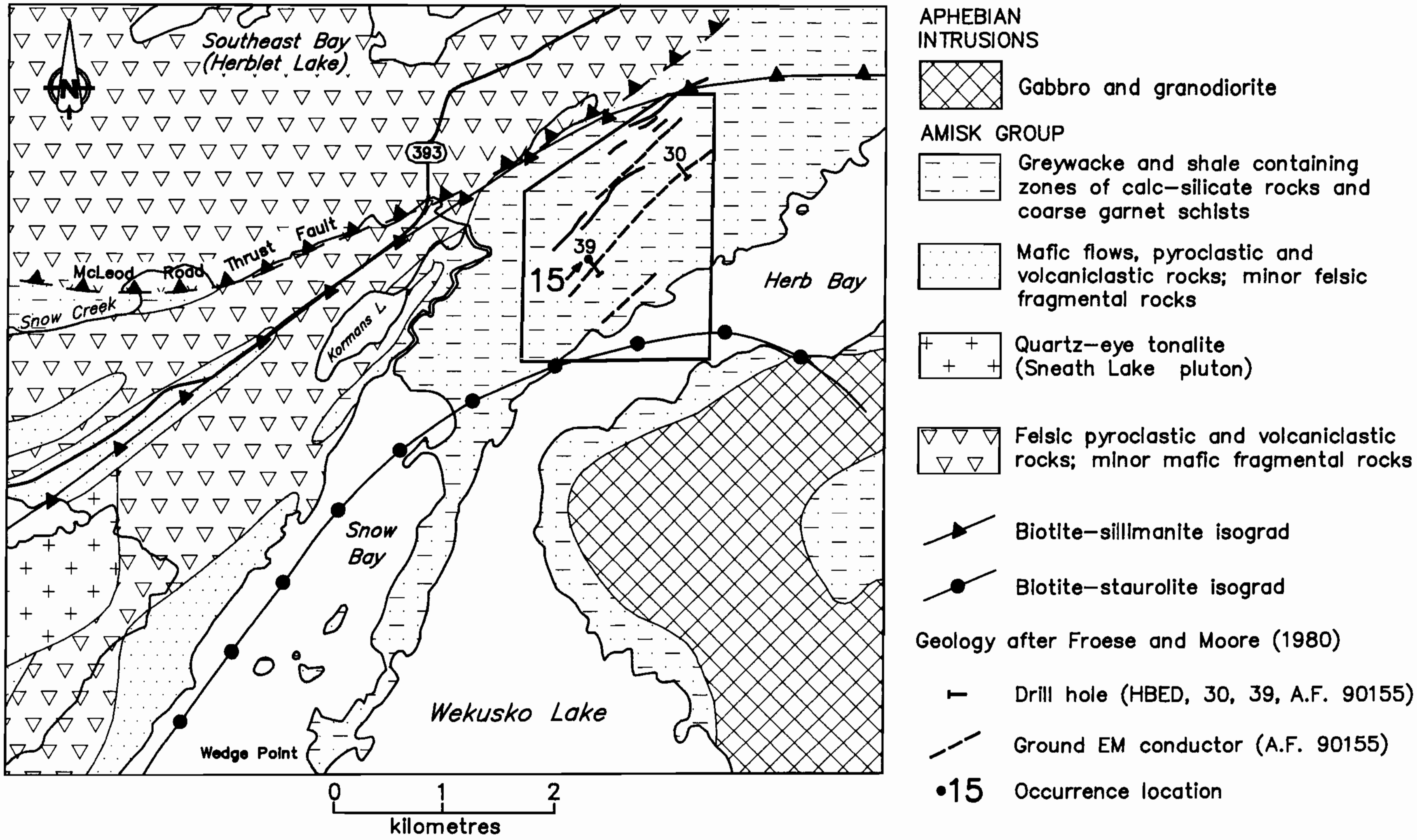

Figure 15-1: Geological setting of occurrence 15.

LOCATION: **15**

NAME: (A.F. - Mineralization intersected by diamond drilling).

UTM: 6081243N/445463E

ACCESS: Boat on Wekusko Lake to Herb Bay and traverse.

AREA: Northwest of Herb Bay, Wekusko Lake and southeast of Bart Lake.

AIRPHOTO: A20170-41

EXPLORATION SUMMARY:

The area was first staked as Opip 10, Pipo 2, 3, A.C. 6 and Polar 1 to 4, 7 to 10 in the late 1940's. HBED did an HLEM on the Ram group of claims between 1955 and 1957 (A.F. 90119, 90155). A 110 m deep hole was drilled on Ram 89 and a 104 m deep hole was drilled on Ram 109 by HBED in 1956 (A.F. 90155). Claim maps indicate that the drilling on Ram 109 may actually have been done on Ram 198. Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624, Ground Hog Sheet 13). HBED carried out airborne EM and radiometric surveys in the area in 1965 (A.F. 91650). Falconbridge Nickel Mines Limited staked Ex 3 and Lex 44 over Ram 89 in 1965. Geophysical work and diamond drilling was done between 1966 and 1973 on several claim groupings in the area (Mining Claim Card Lex 44). Lex 44 was cancelled in 1974. W. Bruce Dunlop Limited staked CB 10075 over part of the former Ram 109 and 198 area in 1979, but cancelled the claim in 1981. Falconbridge Limited presently owns the Stall 2 and 3 claims, staked in 1983, and the Ex 3 claim.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group greywacke and shale and is situated between the biotite-sillimanite isograd to the north and the biotite-staurolite isograd to the south. The greywacke and shale sequence is intruded by gabbro and granodiorite to the south (Fig. 15-1; Froese and Moore, 1980). Diamond drill holes, collared to test long and short strike length ground EM conductors, intersected staurolite-garnet breccia, andesite, garnetiferous andesite interlayered with garnet-mica-staurolite schist bands, and chemical sedimentary rocks (A.F. 90149, 90154, 90155, 90156).

MINERALIZATION:

A 26.7 m interval of graphitic schist that contained disseminated to near solid pyrite stringers and trace chalcopyrite was intersected by DDH 39. DDH 30 intersected graphitic and pyritic staurolite-garnet breccia and a 1.2 m interval of graphite with disseminated pyrite (A.F. 90155).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. The staurolite-garnet breccia suggest wall rock alteration similar to that accompanying base metal massive sulphide type mineralization in the Snow Lake camp.

REFERENCES:

Assessment Files 90119, 90149, 90154, 90155, 90156, 91624 and 91650
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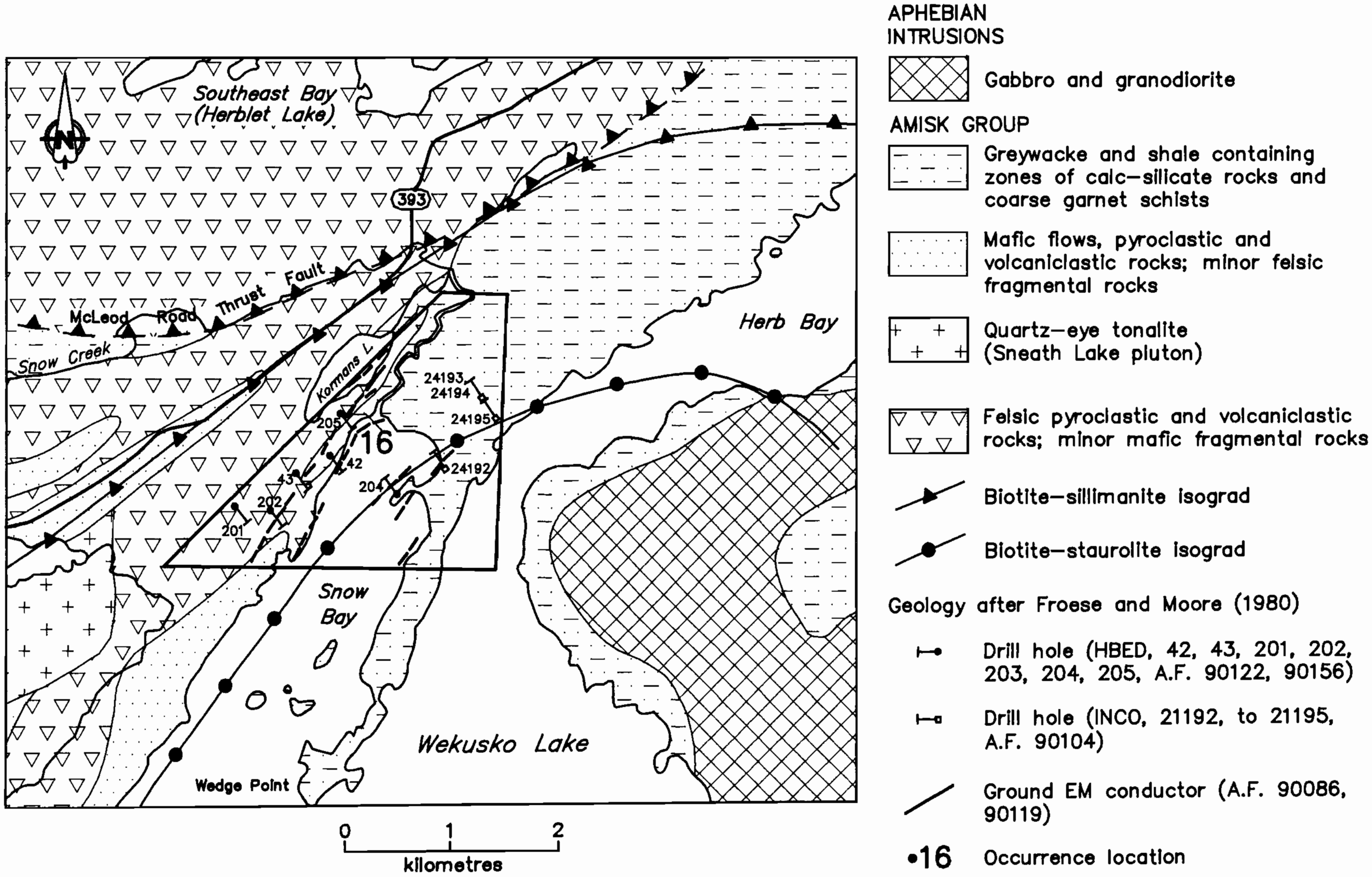

Figure 16-1: Geological setting of occurrence 16.

LOCATION: 16

NAME: (A.F. - Mineralization intersected by diamond drilling).

UTM: 6080208N/443278E

ACCESS: Provincial Road 393 and traverse; alternatively by boat on Wekusko Lake and traverse.

AREA: North Snow Bay, Wekusko Lake and Kormans Lake.

AIRPHOTO: A25352-53

EXPLORATION SUMMARY:

The area was first staked as the Bull group of claims in the late 1920's. Glen Rapson drilled Manasan 8 and Opip 7 and 8 in 1945 (Manitoba Mines and Natural Resources, 1946). HBED did an HLEM survey on the Ram claims between 1955 and 1956 (A.F. 90119). Three holes totalling 407 m were drilled on Ram 145, Ram 146 and Snow 2 in 1957 (A.F. 90122, 90156). A further five holes were drilled on the Ram, Rod and Snow claims, but the drill logs are not available (A.F. 90122). Canadian Nickel Company Limited carried out an airborne EM survey in 1957 (A.F. 91624, Ground Hog Sheet 10). Surface work was done on the May group of claims in 1962 (Mining Claim Card May 7 Fr.). The International Nickel Company of Canada Limited drilled three holes totalling 258 m on Ice 27 and a 192 m deep hole on Ice 22 in 1963 (A.F. 90104). A geophysical survey was done on the Ice claims in 1964 (Mining Claim Card Ice 20). Kerr Addison Mines Limited did a VLEM (Crone JEM) survey on the Bob claims in 1964 (A.F. 90086). HBED did airborne EM and radiometric surveys in the area in 1965 (A.F. 91650). HBED staked Pin 1 Fr. and 2 Fr. in 1966. Work was reported on Pin 1 Fr. between 1967 and 1971 (Mining Claim Card Pin 1 Fr.). Pin 1 Fr. was cancelled in 1976. CB 10074 and CB 10075 were staked by W. Bruce Dunlop Limited in 1979, and cancelled in 1981. Granges Exploration Aktiebolag staked CB 9035 in 1978 and did work on the property in 1980, 1985-1986 and 1988-1989, before cancelling the claim in April, 1991 (Mining Claim Card CB 9035). The area is presently covered by Pin 2 Fr., held by HBED, Earl 1 and 2 held by W. Bruce Dunlop Limited, and part of Explored Area Lease No. 31 held by Stall Lake Mines Limited and Falconbridge Limited.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group felsic pyroclastic and volcaniclastic rocks, mafic volcanic rocks and locally staurolitic greywacke and shale. Long and short strike length ground EM conductors occur within the greywacke and shale and at or near the contacts between (1) felsic and mafic volcanic rocks and (2) mafic volcanic rocks and sedimentary rocks (Fig. 16-1; Froese and Moore, 1980). Diamond drill holes testing these conductors intersected mineralized slate and argillite, tuff of unspecified composition, locally garnetiferous and staurolitic quartz-hornblende ± biotite gneiss, fragmental andesite and chemical sedimentary rocks (A.F. 90104, 90122).

MINERALIZATION:

Veinlet and disseminated pyrite occur in slate and argillite over very short core intervals (DDH 24192; A.F. 90104). DDH 205 (A.F. 90122) intersected a 2.3 m and a 1.4 m interval of chlorite-graphite schist containing disseminated pyrite. Disseminated pyrite also occurs with graphite in fragmental andesite. DDH 24193 and 24194 were abandoned in overburden. DDH 203 and 204 intersected minor disseminated pyrite in garnetiferous and siliceous mica gneiss and in garnet-staurolite-biotite-quartz schist, respectively. The location of DDH 203 is uncertain (A.F. 90156). Drill logs for DDH 201, 202, 41 and 42 are not available.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

Assessment Files 90086, 90104, 90119, 90122, 90156, 91624 and 91650

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1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.

Gobert, G.

1990: Till geochemistry of the Snow Lake area (NTS 63K/16, 63J/13, 63J/12); in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1990, p. 72-73.

Gordon, T.M.
1981: Metamorphism in the Crowduck Bay area, Manitoba; in Geological Survey of Canada, Current Research, Part A, Paper 81-1A, p. 315-316.

Hosain, I.T.
1988: An update summary and evaluation of geophysical data from open assessment files of the Flin Flon - Snow Lake greenstone belt (NTS sheets 63K (N1/2) and 63J/12, 13); Manitoba Energy and Mines, Mines Branch, Open File Report OF87-11, 99p.

Manitoba Mines and Natural Resources
1946: 18th Annual Report on Mines and Minerals, p. 80-81.

Mining Claim Cards May 7 Fr. (P90819), Ice 20 (P2573A), Pin 1 Fr. (P1888C) and CB 9035.
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Russell, G.A.
1957: Structural studies of the Snow Lake - Herb Lake area; Manitoba Mines and Natural Resources, Publication 55-3, 33p.

LOCATION: 17

NAME: Rice Island
UTM: 6074632N/440877E
ACCESS: Boat from Bartlet's Landing, Wekusko Lake.

AREA: West Wekusko Lake.
AIRPHOTO: A20127-106

EXPLORATION SUMMARY:

Richard Woosey staked Basic in 1917, and cancelled it in 1920. Kathleen Rice staked the Cu claim in 1922. H.L. Rice staked the Ni claim in 1924, and assigned it to Kathleen Rice in 1928. Trenching was done between 1924 and 1928 and in 1930. Wright (1938) mentions a prospect shaft on the property. C.E. Herman claimed to have done at least 61 m of diamond drilling in 1928. Ventures Limited optioned the property in 1928 and drilled 7 holes. By 1929 Ventures Limited had done 457 m of drilling on Ni and "$9000" worth of drilling on Cu (Mineral Inventory Card 63J/13 Ni 3). Rice Island Nickel Mining Company Limited was formed in 1930 and the Ni and Cu claims were transferred to this company by court order. Leases M-229 and M-230 were issued for 21 years in 1932. Canadian Nickel Company Limited optioned the property in 1948 and did ground EM and magnetic surveys and 7567 m of drilling in 1949. Canadian Nickel Company Limited renewed the leases in 1953 and assigned them to the International Nickel Company of Canada Limited in 1958. An EM survey was done in 1962. HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650). A total of 1497 m of drilling was done in 1967. Approximately 1829 m of drilling was done in 1974 (Mineral Inventory Card 63J/13 Ni 3). The leases were converted to Explored Area Lease No. 28 in 1975. Inco Limited has held the lease since 1976.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group greywacke and shale flanked to the northwest by mafic flows and pyroclastic and volcaniclastic rocks. The greywacke has been intruded by gabbro (Fig. 17-1; Froese and Moore, 1980). On Rice Island, fine grained, foliated, aphyric and rusty weathered gabbro is associated with the occurrence; coarse grained, porphyritic gabbro occurs away from the mineralization.

MINERALIZATION:

Rusty weathered gabbro, that contains a maximum of 10% disseminated and stringer pyrrhotite, chalcopyrite and possibly pentlandite, occurs along the northwest shoreline of Rice Island. Some of the sulphide mineralization appears to be localized in 090°- and 235°-trending joints. Wright (1938) described the mineralized zones from drill core examination. The bulk of the sulphide mineralization occurs as disseminated narrow veinlets and massive sulphide veins within a quartz gabbro near the contact with greywacke. The mineralized zones are crosscut by quartz and calcite veinlets. Interestingly, one diamond drill hole (DDH 6) intersected 0.3 m of "black greywacke" containing disseminated and veinlet pyrrhotite and chalcopyrite. This suggests either; (1) mobilization of sulphide minerals into the greywacke during or subsequent to gabbro emplacement, or (2) derivation and incorporation of sulphide mineralization by the gabbro during emplacement. The "black greywacke" may be a graphitic chemical sediment representing the protore to the occurrence. Two trenches and a prospect shaft described by Wright (1938) were not located.

GEOCHEMICAL DATA:

Representative outcrop chip sample 850728 was collected for assay and multi-element geochemical analysis. The sample contains 0.36% Cu, 0.32% Ni, 50 ppm Zn and no detectable Au or Ag; the sample also contains 30 ppb Pt and 20 ppb Pd. Wright (1938), using assay results supplied by the claim holders, indicates that broad zones of disseminated mineralization contain "a small percentage of Ni and Cu" and "narrow sections held up to 5% combined Ni and Cu".

A 9 m section of mineralized gabbro intersected by DDH 6 contained an "average content of 0.93% Cu and 3.2% Ni". A 0.3 m assay of "black greywacke" contains 0.60% Cu and 2.55% Ni. A "veinlet" of massive sulphides contains 0.54% Cu and 4.98% Ni. One assay of 1.62% Cu, 4.46% Ni and 2.7% Zn was obtained from approximately 30 m "down the drill hole" (Manitoba Basin Mining Co. Limited, Mining Engineering File).

CLASSIFICATION:

Magmatogenic type deposit; disseminated. Zones of disseminated and near solid to solid sulphide occur in gabbro and a probable graphitic sedimentary rock ("black greywacke"). The altered and mineralized gabbro should be evaluated for platinum group element content.

REFERENCES:

Assessment Files 90107 and 91650
Manitoba Energy and Mines, Minerals Division

Eccles, D.R. and Fedikow, M.A.F.
1985: Mineral occurrence documentation and alteration zone mapping, Snow Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 82-99.

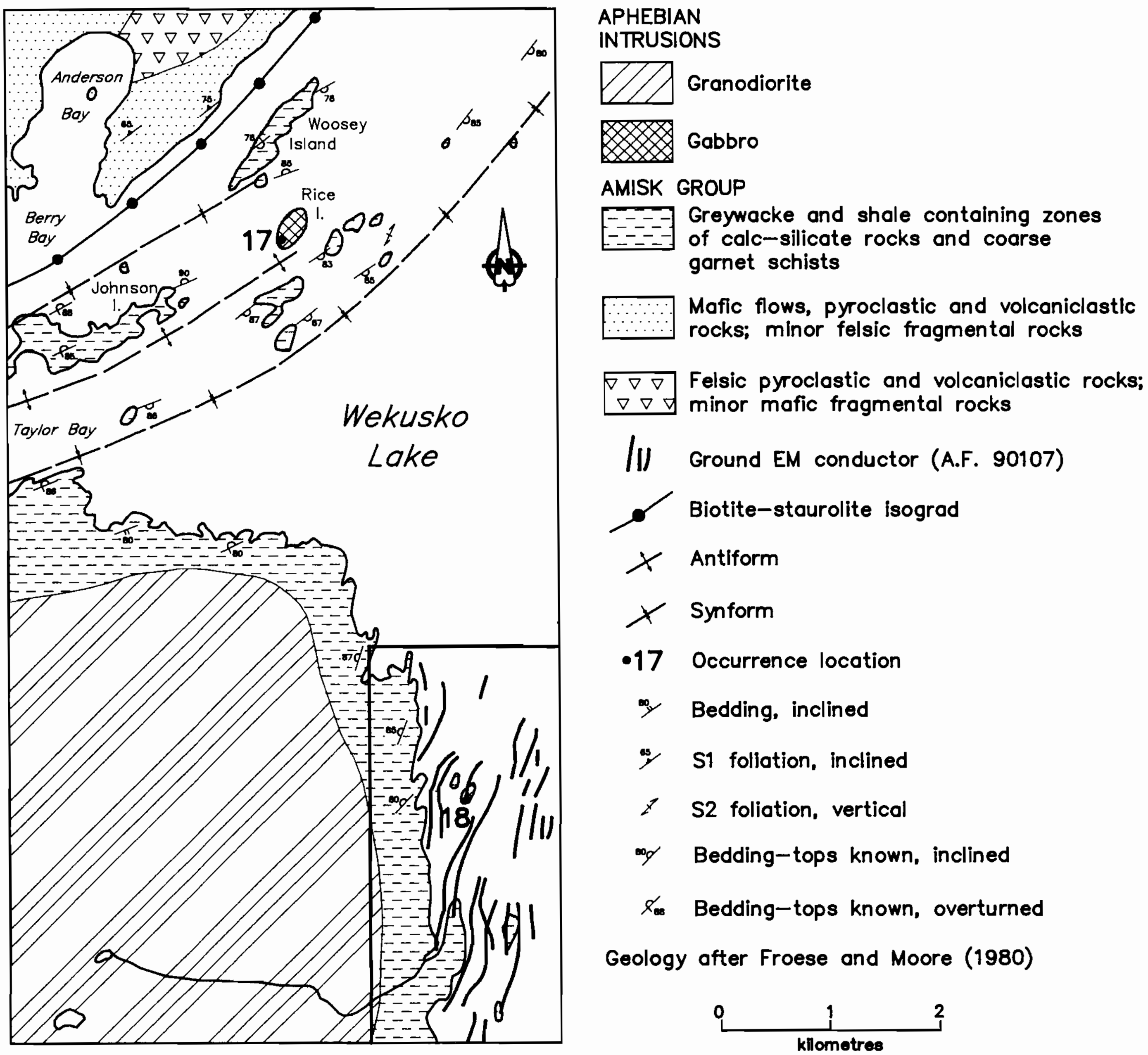

Figure 17-1: Geological setting of occurrences 17 and 18.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.

Manitoba Basin Mining Co. Limited
Manitoba Energy and Mines, Minerals Division, Mining Engineering File.

Mineral Inventory Card 63J/13 Ni 3
Manitoba Energy and Mines, Minerals Division.

Russell, G.A.
1957: Structural studies of the Snow Lake - Herb Lake area; Manitoba Mines and Natural Resources, Publication 55-3, 33p.

Wright, J.F.
1938: Geology and mineral deposits of a part of northwest Manitoba; Geological Survey of Canada, Summary Report, 1930, Part C, p. 1-124.

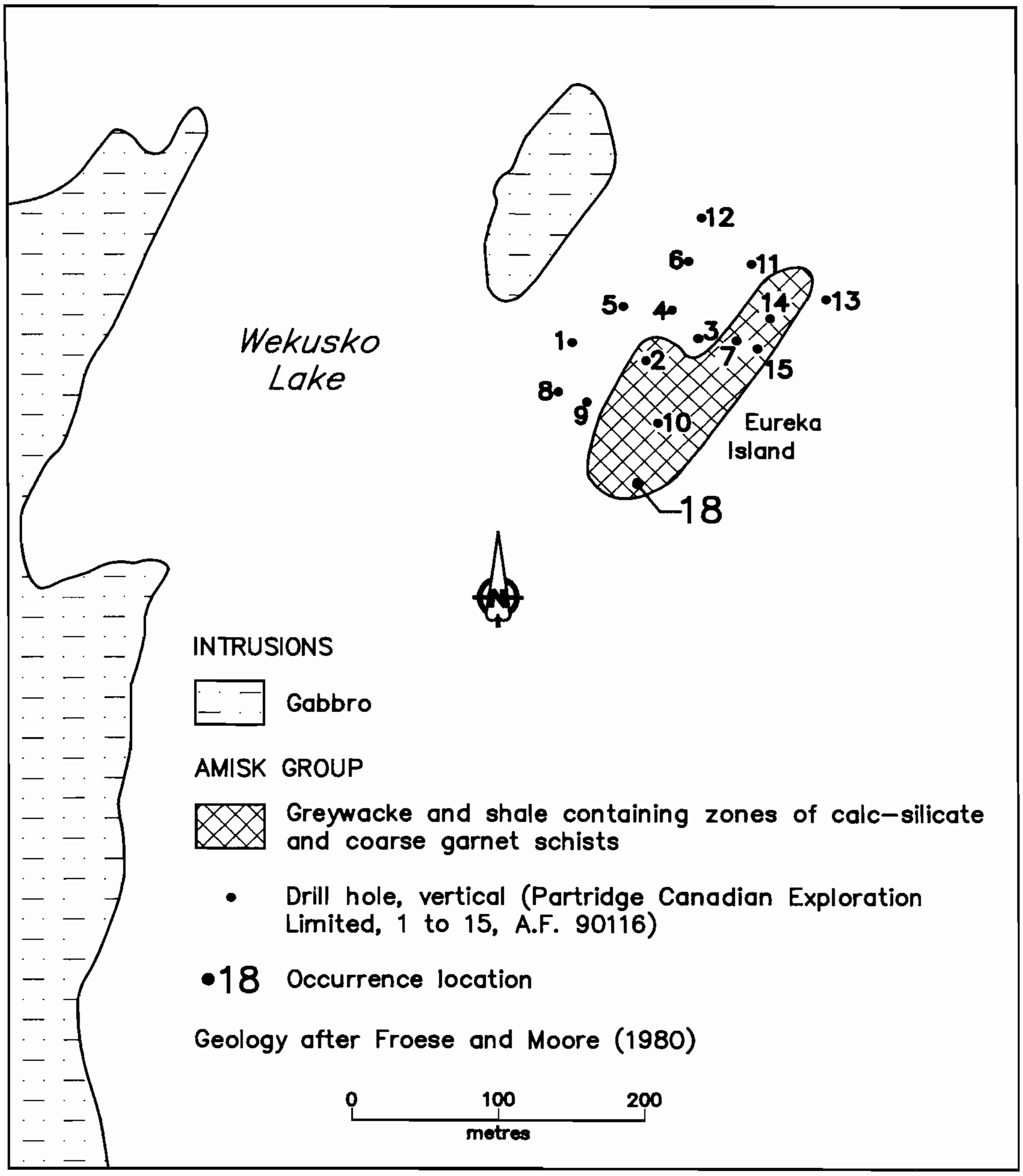

Figure 18-1: Diamond drill hole locations, occurrence 18.

LOCATION: **18**

NAME: Eureka Island

UTM: 6069351N/442281E

ACCESS: Boat from Bartlet's Landing on Wekusko Lake.

AREA: West Wekusko Lake.

AIRPHOTO: A20127-103

EXPLORATION SUMMARY:

Eureka 4 was staked over the area in the 1920's. By 1929 a large prospect pit had been dug and 2 holes drilled (Mineral Inventory Card 63J/13 Ni 4). From 1948 to 1962 the ground was held by various individuals and companies. P. Kobar did a 5 hole, 305 m, drill program on the Nickel claim in 1954 (A.F. 90115). In 1957 Partridge Canadian Explorations Limited drilled 15 holes totalling 1389 m to test geophysical conductors that had been delineated on the property (A.F. 90116). The Nickel claim was cancelled in 1962. W.B. Kobar drillled two holes totalling 171 m on Ivan in 1962 (A.F. 91531). HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650) and took a one year option on the Ivan group in 1966. An HLEM survey was done between 1965 and 1966, followed by a three hole, 361 m, diamond drill program on Ivan, Ivan 1 and Ivan 2 in 1967 (A.F. 90107, 91474). Diamond drilling had been reported on the Ivan group between 1963 and 1974 (Mining Claim Card Ivan). The Ivan claims were held by G.N. Milner in 1968, by T.P. O'Connor between 1969 and 1971, and by W.B. Kobar from 1971 until 1976 when they were cancelled. CB 4777 was staked over the property by J.B. Kobar in 1978, and assigned to W.B. Kobar in 1983.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group greywacke and shale intruded by Aphebian(?) granodiorite and gabbro (Fig. 17-1; Froese and Moore, 1980). Porphyritic and fine grained gabbro is exposed on Eureka Island. Diamond drilling intersected layered, fine- to coarse-grained mineralized gabbro, slate and greywacke. Diamond drill logs describe bluish quartz veins, minor shear zones, and flecks and stringers of carbonate in the gabbro A.F. 90116).

MINERALIZATION:

Disseminated and stringer chalcopyrite, pyrrhotite and pentlandite occur in rusty weathered, porphyritic gabbro on the northwest shore of Eureka Island. Diamond drilling intersected layered fine- to coarse-grained gabbro that contain predominantly disseminated and minor stringer pyrrhotite and chalcopyrite over drill core intervals of 7 m (DDH 13) to 56.8 m (DDH 14, A.F. 90116). Diamond drill holes 2a and 2b (A.F. 91531) and 1 to 5 (A.F. 90115) did not intersect mineralized zones. Three diamond drill holes, which tested short and long strike length ground EM conductors in the area of the occurrence, intersected greywacke and slate. No indication of the cause of the anomalies is given in the logs although "thin bands of slate interlayered with the greywacke" may be graphitic (A.F. 91474). Locations of diamond drill holes and ground EM conductors are presented in Figures 18-1 to 18-3.

GEOCHEMICAL DATA:

One drill core assay was reported to contain approximately 4% Ni. This same drill hole contained a 30.5 m interval that averaged 0.25% copper and nickel (Mineral Inventory Card 63J/13 Ni 4).

Two representative rock chip samples were collected from outcrop for assay and multi-element geochemical analysis. The samples contain visible chalcopyrite, pyrrhotite and pentlandite. Assay results are tabulated below.

Sample	**Cu (%)**	**Pb (ppm)**	**Zn (ppm)**	**Ni (ppm)**	**Au (g/t)**	**Ag (g/t)**	**Pt (ppb)**	**Pd (ppb)**
850729	0.13	nd	56	940	tr.	<1	na	na
850730	0.35	3	102	0.26(%)	nd	1	30	36

na - not analyzed

nd - not detected

A summary of assay results for samples collected from mineralized intervals in drill core is presented in Table 18-1.

Table 18-1: **Summary of mineralized intervals and range in assay results for Cu and Ni, occurrence 18 (A.F. 90116)**

DDH	**Mineralized Interval (m)**	**Cu (%)**	**Ni (%)**
2	6.7-16.1	0.06-0.50	0.12-0.37
7	75.3-117.4	0.06-0.63	0.04-0.54
14	97.5-156.1	0.06-0.25	0.03-0.27

CLASSIFICATION:

Magmatogenic type deposit; disseminated. The layered gabbro that hosts the copper-nickel mineralization may have incorporated some of the contained metals, including graphite, from the graphitic sedimentary rocks during intrusion. A more thorough evaluation of the gabbro for platinum group element content is warranted.

REFERENCES:

Assessment Files 90107, 90115, 90116, 91474, 91531 and 91650

Manitoba Energy and Mines, Minerals Division.

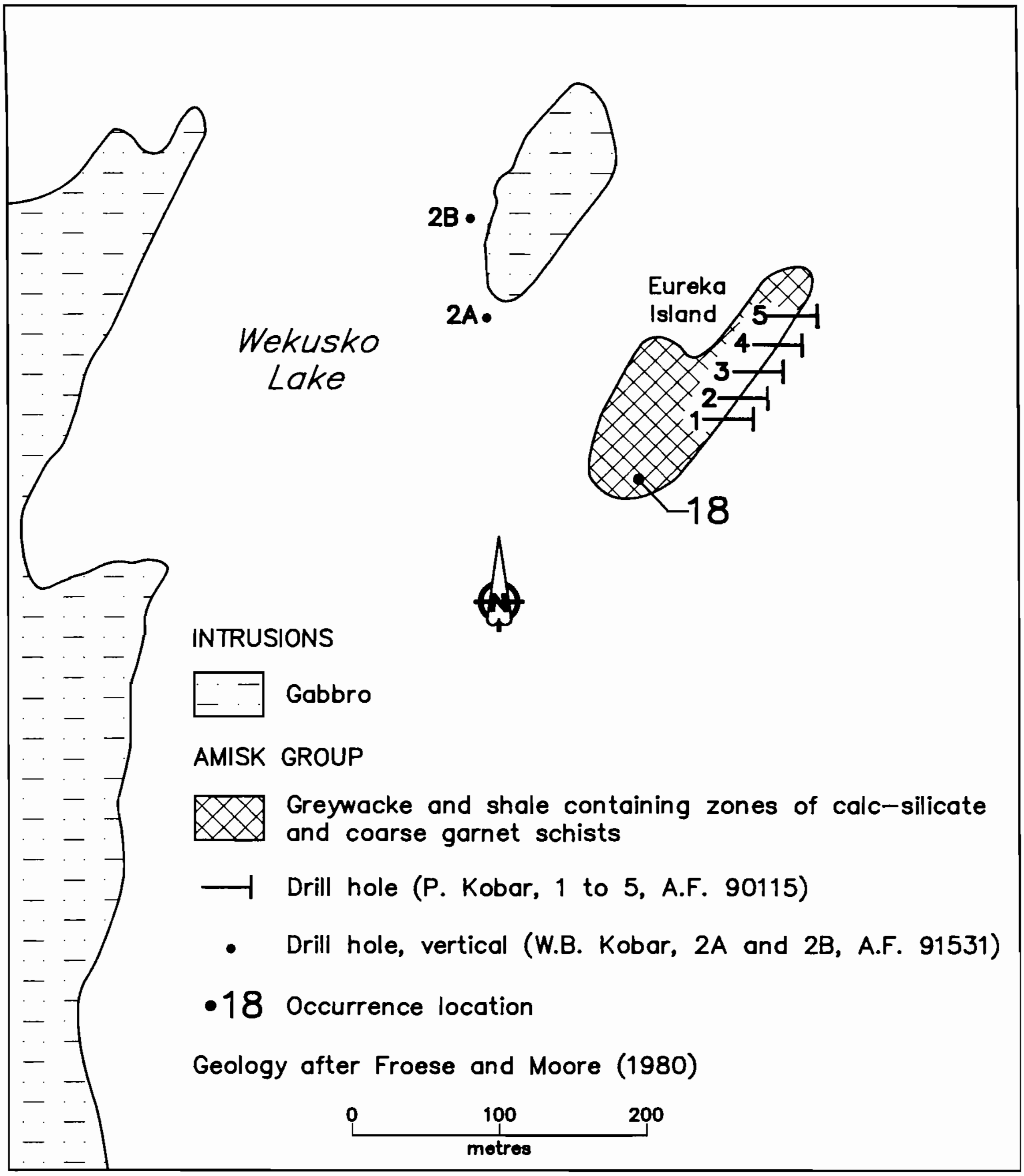

Figure 18-2: Diamond drill hole locations, occurrence 18.

Eccles, D.R. and Fedikow, M.A.F.
1985: Mineral occurrence documentation and alteration zone mapping, Snow Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 82-99.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.

Mining Claim Card Ivan (P96018)
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Mineral Inventory Card 63J/13 Ni 4
Manitoba Energy and Mines, Minerals Division.

Russell, G.A.
1957: Structural studies of the Snow Lake - Herb Lake area; Manitoba Mines and Natural Resources, Publication 55-3, 33p.

Wright, J.F.
1938: Geology and mineral deposits of a part of northwest Manitoba; Geological Survey of Canada, Summary Report, 1930, Part C, 124p.

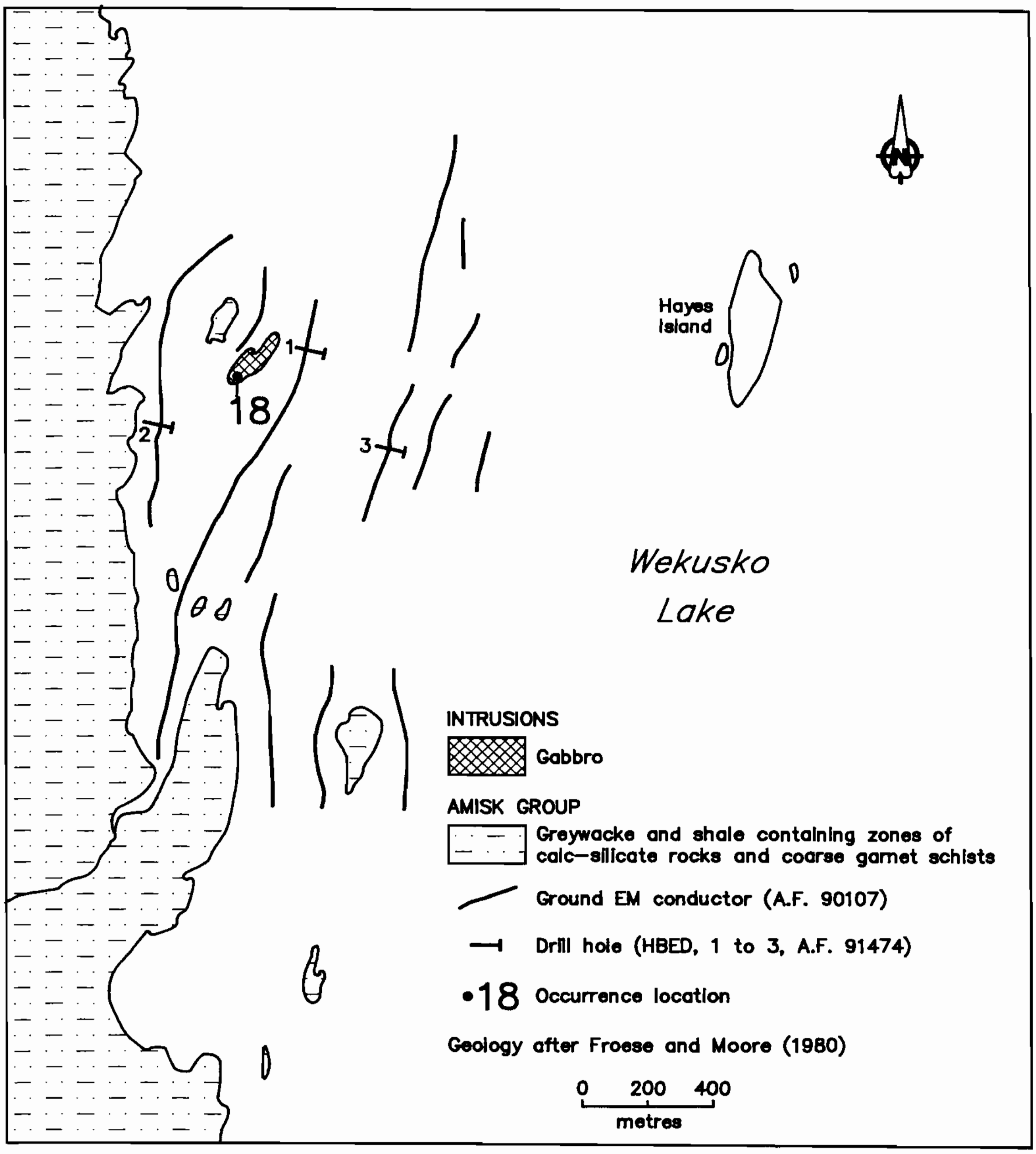

Figure 18-3: Diamond drill hole locations, occurrence 18.

LOCATION: **19**

NAME: (A.F. - Mineralization intersected by diamond drilling).

AREA: Northwest of Woosey Island, Wekusko Lake.

UTM: 6076059N/440491E

AIRPHOTO: A20127-108

ACCESS: Boat on Wekusko Lake.

EXPLORATION SUMMARY:

One hole was drilled to a depth of 91.7 m on Wren 8 by Walter Johnson on behalf of Jay-Kay Exploration Syndicate in 1954 (A.F. 90109). HBED did an HLEM over the property in 1955 (A.F. 90108) and carried out airborne EM and radiometric surveys in 1965 (A.F. 91650). Fly 23 Fr., staked by Canadian Nickel Company Limited in 1963, covered most of this area until 1981 when the claim was shifted to the east. The area was partly staked as CB 6203 by Falconbridge Nickel Mines Limited in 1978. In 1982 the company's name changed to Falconbridge Limited and a 90% interest in the property was given to Corporation Falconbridge Copper (now known as Minnova Inc.).

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group mafic flows, pyroclastic and volcaniclastic rocks flanked to the south and east by greywacke and shale and to the north by felsic pyroclastic and volcaniclastic rocks. The greywacke and shale are intruded by nickel- and copper-bearing gabbroic intrusions of probable Aphebian age (Fig. 19-1; Froese and Moore, 1980). The occurrence is situated just north of the biotite-staurolite isograd. Diamond drilling intersected peridotite, slate, mineralized chlorite schist and greywacke (Fig. 19-2, A.F. 90109).

MINERALIZATION:

A 40.2 m interval of "soft" chlorite schist containing "very much" pyrite was intersected by DDH 6 (A.F. 90109). The chlorite schist probably represents altered peridotite.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 90108, 90109 and 91650
Manitoba Energy and Mines, Minerals Division.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.Gale, G.H., Baldwin, D.A. and Koo, J.
1980: A geological evaluation of Precambrian massive sulphide deposit potential in Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER79-1, 137p.

Gobert, G.
1990: Till geochemistry of the Snow Lake area (NTS 63K/16, 63J/13, 63J/12); in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1990, p. 72-73.

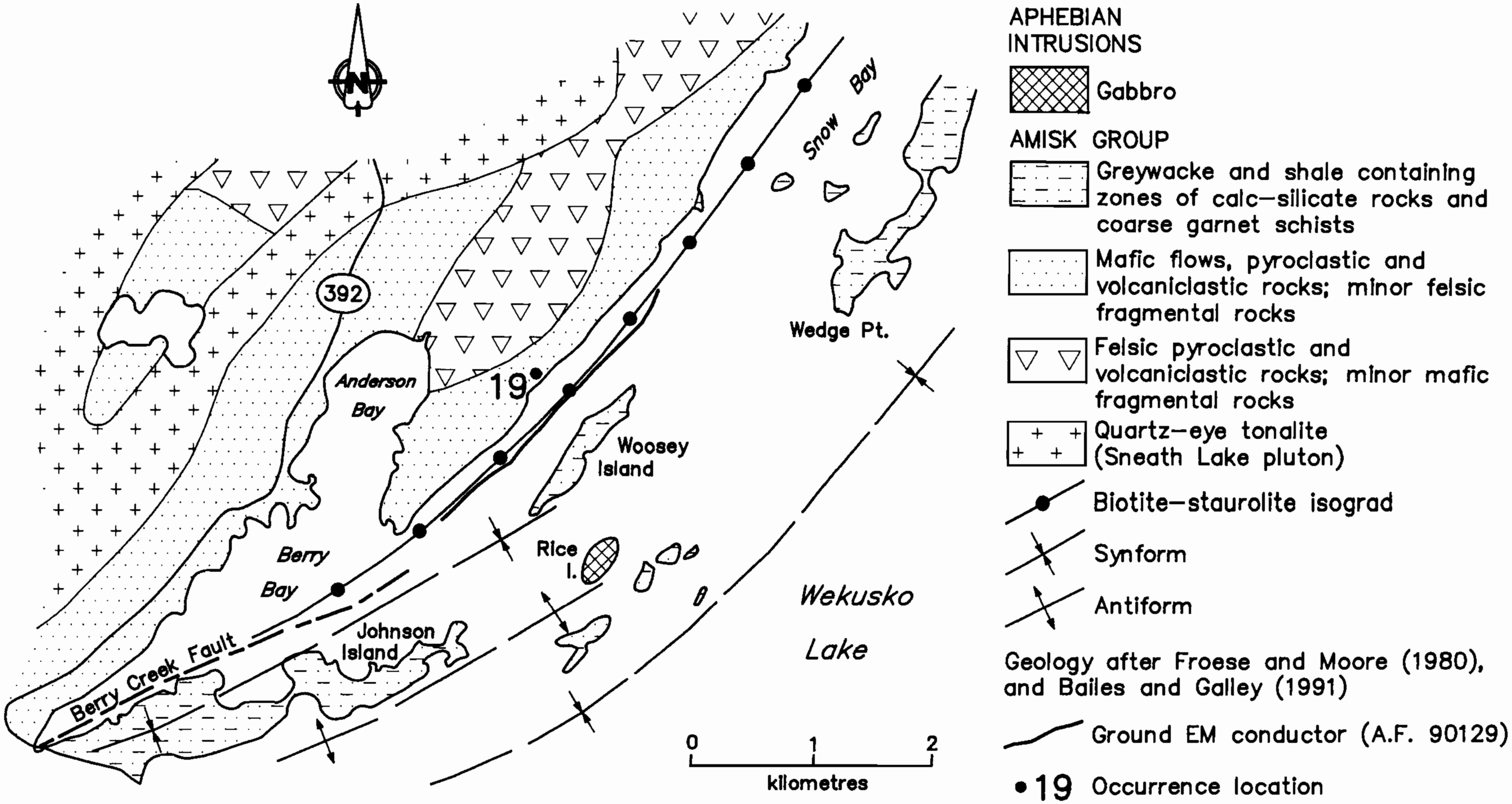

Figure 19-1: Geological setting of occurrence 19.

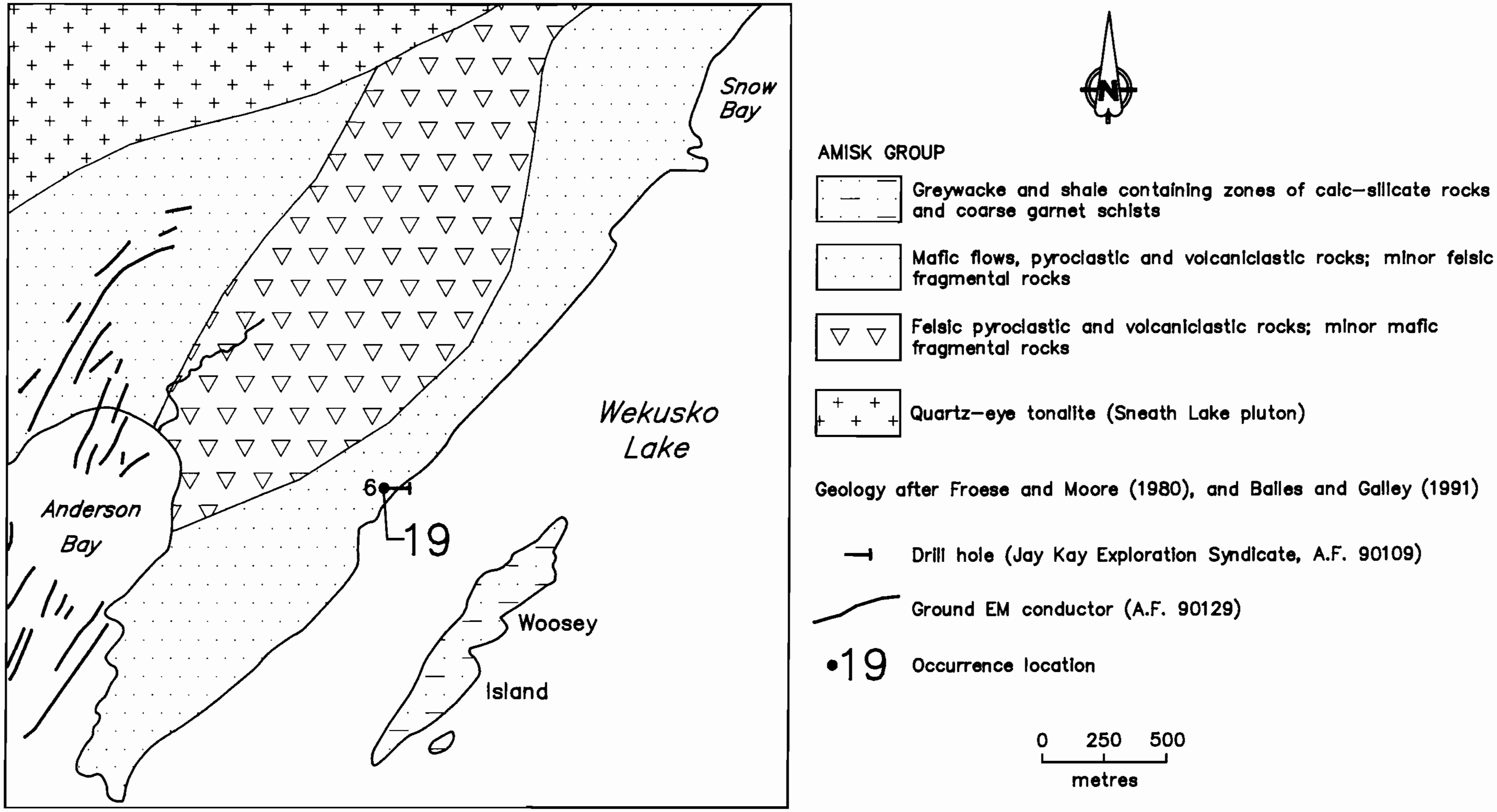

Figure 19-2: Geology, ground EM conductors and diamond drill hole location for occurrence 19.

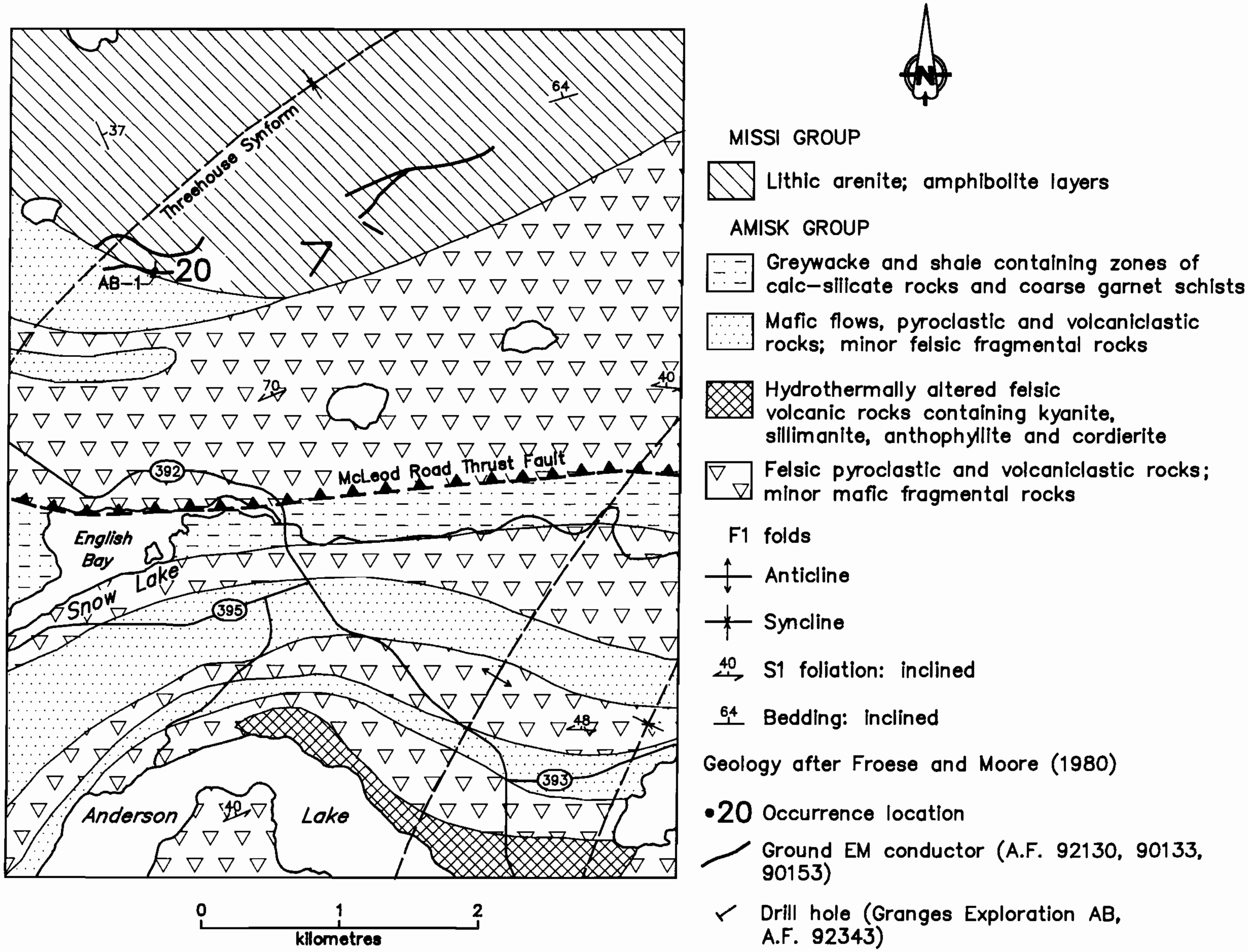

Figure 20-1: Geological setting and drill hole location, occurrence 20.

LOCATION: **20**

NAME: (A.F. - Mineralization intersected by diamond drilling)

UTM: 6082788N/436259E

ACCESS: Provincial Highway 392 and traverse.

AREA: South of central Herblet Lake.

AIRPHOTO: A20170-21

EXPLORATION SUMMARY:

The area was first staked as the Martel claim in the late 1920's. HBED optioned the Eva 4 claim and did an HLEM survey over the property in 1956 (A.F. 90119, 90140, 90153). Fosco Mining Limited carried out airborne EM and magnetic surveys in 1971 (A.F. 92130). In 1978, the ground was staked as CB 9195 by Granges Exploration Aktiebolag and as CB 9415 by HBED. Granges carried out an HLEM (Apex MaxMin II) survey on the property and drilled one hole to a depth of 54.5 m in 1979 (A.F. 92343). CB 9195 was restaked as CB 12455 by HBED in 1981.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Missi Group lithic arenite flanked to the south by Amisk Group mafic and felsic pyroclastic and volcaniclastic rocks (Fig. 20-1; Froese and Moore, 1980). Diamond drill hole AB-1, which tested a ground EM conductor, intersected massive dacite, amphibolite, diorite and mineralized graphitic schist (Fig. 20-1; A.F. 92343).

MINERALIZATION:

DDH AB-1 intersected 7.5 m of graphite schist with narrow quartz stringers and 10% pyrite (A.F. 92343). This zone is overlain and underlain by a garnetiferous, graphitic dark green amphibolite.

GEOCHEMICAL DATA:

Four core samples, ranging in length from 1.8 to 2.0 m, were collected from DDH AB-1 for assay. The samples contain 0.05 g/t Au, 0.5 g/t Ag, 0.02% Cu and 0.01 to 0.08% Zn (A.F. 92343).

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

Assessment Files 90119, 90133, 90140, 90153, 92130 and 92343

Manitoba Energy and Mines, Minerals Division.

Gobert, G.

1990: Till geochemistry of the Snow Lake area (NTS 63K/16, 63J/13, 63J/12); in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1990, p. 72-73.

Froese, E. and Moore, J.M.

1980: Metamorphism in the Snow Lake area; Geological Survey of Canada Paper 78-27, 16p.

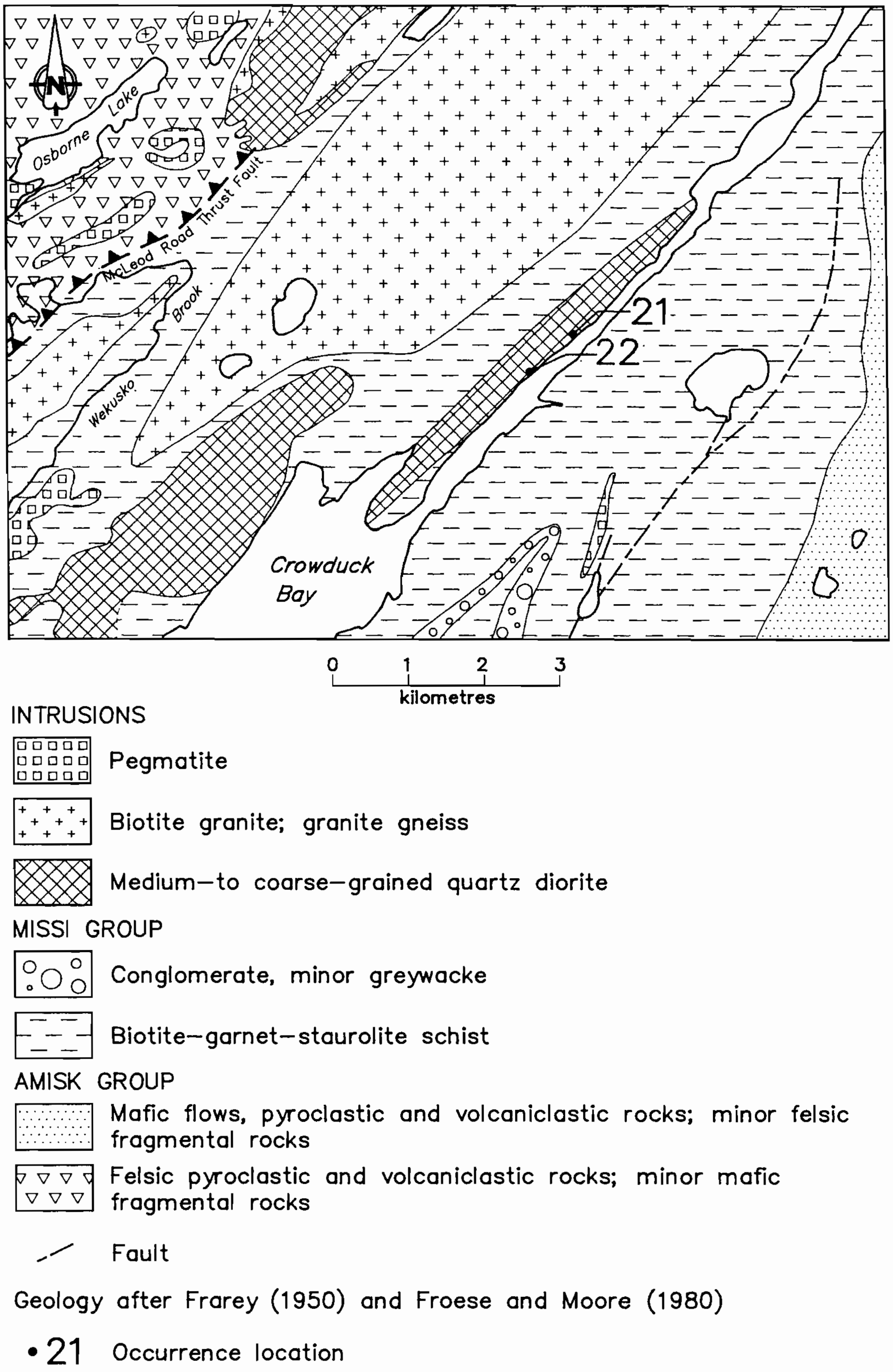

Figure 21-1: Geological setting of occurrences 21 and 22.

LOCATION: **21**

NAME:

UTM: 6086004N/459184E

ACCESS: Boat from Bartlett's Landing on Wekusko Lake.

AREA: Grass River, northeast of Crowduck Bay

AIRPHOTO: A20137-108

EXPLORATION SUMMARY:

The area was first staked as Bendgar 5 to 7 in 1929. Two trenches were dug on Bendgar 7 in 1930 (Mineral Inventory Card 63J/13 Mo 2). The claims were cancelled in 1931. From 1955 to 1962, the ground was held by various individuals. Canadian Nickel Company Limited did an airborne EM survey in the area in 1957 (A.F. 91624). HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650). HBED staked CB 13448 in 1984 and did work on the property in 1985 (Mining Claim Card CB 13448). The claim was cancelled in 1988.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by medium- to coarse-grained quartz diorite flanked to the northwest by biotite granite, granite gneiss, and to the northwest and southeast by biotite-garnet-staurolite schist (Fig. 21-1; Gordon and Gall, 1982; Frarey, 1950). Rusty weathered quartz diorite occurs in the vicinity of the occurrence.

MINERALIZATION:

A 5.3 m wide, vuggy, white and rusty weathered quartz vein contains disseminated pyrite and minor chalcopyrite. The vein strikes 310° and dips vertically. Vugs (1 cm) are commonly lined with subhedral to euhedral pyrite.

GEOCHEMICAL DATA:

Representative chip sample 00733 was collected from the quartz vein; assay results are summarized below.

Sample	**Cu (ppm)**	**Pb (ppm)**	**Zn (ppm)**	**Ni (ppm)**	**Au (g/t)**	**Ag (ppm)**
00733	669	33	88	130	tr.	nd

nd - not detected

Samples 03188 and 03189 were collected from the quartz vein for multi-element geochemical analysis (Appendix I). These results confirm the low base and precious metal contents obtained from the assay results for 00733.

CLASSIFICATION:

Vein type deposit; single vein.

REFERENCES:

Alcock, F.J.
1918: Wekukso Lake area, northern Manitoba; Geological Survey of Canada, Summary Report, 1917, Part D, p. 15.

Alcock, F.J.
1920: The Reed-Wekusko map area, northern Manitoba; Geological Survey of Canada, Memoir 119, 47p.

Assessment Files 91624 and 91650
Manitoba Energy and Mines, Minerals Division.

Davies, J.F., Bannatyne, B.B., Barry, G.S. and McCabe, H.R.
1962: Geology and mineral resources of Manitoba; Manitoba Department of Mines and Natural Resources, Mines Branch, 190p.

Eccles, D.R. and Fedikow, M.A.F.
1985: Mineral occurrence documentation and alteration zone mapping, Snow Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 82-99.

Frarey, M.J.
1950: Crowduck Bay; Geological Survey of Canada, Map 987A, 1:63 360.

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Mining Claim Card CB 13448
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Mineral Inventory Card 63J/13 Mo 2
Manitoba Energy and Mines, Minerals Division.

Vokes, F.M.
1963: Molybdenum deposits in Canada; Geological Survey of Canada, Economic Geology Report No. 20, p. 69-70.

Wright, J.F.
1938: Geology and mineral deposits of a part of northwest Manitoba; Geological Survey of Canada, Summary Report, 1930, Part C, 124p.

LOCATION: **22**

NAME:

UTM: 6085403N/458498E

ACCESS: Boat from Bartlet's Landing on Wekusko Lake.

AREA: Grass River, northeast of Crowduck Bay

AIRPHOTO: A20137-108

EXPLORATION SUMMARY:

The area was first staked as Bendgar 2 in 1929. The claim was cancelled in 1931. From 1956 to 1962, the ground was held by various individuals. Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624). HBED did airborne EM and radiometric surveys in the area in 1965 (A.F. 91650). HBED staked CB 13448 and CB 13449 in 1984 and did work on the property in 1985 (Mining Claim Card CB 13448). The claims were cancelled in 1988.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by medium- to coarse-grained quartz diorite flanked to the northwest by biotite granite, granite gneiss and to the northwest and southeast by biotite-garnet-staurolite gneiss (Fig. 21-1; Gordon and Gall, 1982; Frarey, 1950). Rusty weathered quartz diorite was observed at the occurrence.

MINERALIZATION:

A 19 m wide, vuggy, white and rusty weathered quartz vein that strikes 020° contains 4% disseminated pyrite. Pyrite also occurs as subhedral to euhedral crystals that line 0.5 cm vugs in the quartz vein. The wall rocks are rusty weathered up to 1 m away from the contact with the quartz vein.

GEOCHEMICAL DATA:

Representative chip sample 00734 was collected from the quartz vein for assay; the sample contains low base and precious metal values. This is confirmed by the results of the multi-element geochemical analysis of samples 03190 and 03191 collected from the vein (Appendix I).

CLASSIFICATION:

Vein type deposit; single vein.

REFERENCES:

Assessment Files 91624 and 91650
Manitoba Energy and Mines, Minerals Division.

Eccles, D.R. and Fedikow, M.A.F.
1985: Mineral occurrence documentation and alteration zone mapping, Snow Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 82-99.

Frarey, M.J.
1950: Crowduck Bay; Geological Survey of Canada, Map 987A, 1:63 360.

Gordon, T.M.
1981: Metamorphism in the Crowduck Bay area, Manitoba; in Geological Survey of Canada, Current Research, Part A, Paper 81-1A, p. 315-316.

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Mining Claim Card CB 13448
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

LOCATION: **23**

NAME
UTM: 6084774N/452751E
ACCESS: Boat on Wekusko Lake

AREA: Herb Bay, Wekusko Lake.
AIRPHOTO: A20124-63

EXPLORATION SUMMARY:

The area was first staked in the 1920's. Canadian Nickel Company Limited did surface work on Blue 9 in 1949 (Mining Claim Card Blue 9). HBED did a ground EM survey on the Peg group in 1952 (A.F. 90193). P. Kobar did a 3 hole, 183 m, drill program on P.B.M. 3 in 1956 (A.F. 90151). An airborne EM survey was done by Canadian Nickel in 1957 (A.F. 91624). In 1964 Kennco Explorations Canada Limited did a magnetometer survey on the Nip, Tuc and Far claims under option from J.B. Barton (A.F. 91812). HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650). Noranda Exploration Company Limited did an HLEM survey and an 8 hole, 519 m, drill program on the Tuc 7, Nip 39 and 41, and Far 2 and 7 claims between 1965 and 1966 (A.F. 91813, 90090). Another hole was drilled on Far 7, but the drill log is not available (A.F. 90090). A magnetometer survey and an AFMAG longwire EM survey was done on the Nip and Tuc claims by Central Geophysics Limited for J.B. Barton in 1969 (A.F. 91795). HBED did a Turam EM survey and a 3 hole, 204 m, drill program on CB 147 and Bur 211 in 1971 (A.F. 92029). HBED staked CB 6446, CB 6472 and CB 6473 in 1978, and filed assessment work for the property under claim groupings from 1980 to 1989 (Mining Claim Cards CB 6446, CB 6473 and CB 6446). CB 6446 and CB 6473 were cancelled in June 1991.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group greywacke and shale intruded by Aphebian tonalite and pegmatite (Fig. 23-1; Froese and Moore, 1980). The occurrence is situated between the biotite-sillimanite isograd to the south and the biotite-sillimanite-almandine isograd to the north. The general area of the occurrence is characterized by east- and northeast-trending ground EM conductors (Fig. 23-2) that coincide with low ground between a ridge of quartz-biotite-garnet-feldspar gneiss to the south and a pegmatite ridge to the north. Both ridges have a general east-west trend. Scattered outcrops of rusty weathered, foliated garnet-quartz-biotite gneiss contain clusters of radiating amphibole intercalated with silicic, leached layers. Diamond drill holes, collared to test ground EM conductors (Fig. 23-2), intersected mineralized biotite gneiss and sericite schist (A.F. 90151), mineralized chemical sedimentary rocks (A.F. 90090) and mineralized garnetiferous quartz-biotite gneiss (Fig. 23-2; A.F. 92029).

MINERALIZATION:

Minor disseminated pyrite and rare chalcopyrite occur in leached and silicic layers intercalated with garnet-quartz-biotite gneiss. Diamond drilling intersected sericite schist and gneiss with "some pyrite and chalcopyrite" over 4.6 to 43.3 m core intervals, and massive to disseminated graphite with veinlets, blebs and grains of pyrite over 1.5 to 28.9 m core intervals (A.F. 90151). Fractures and shears in the graphite are coated with pyrite (A.F. 90090). Trace to 5% pyrite and trace chalcopyrite occur over 0.2 to 4.6 m core intervals in garnetiferous biotite-quartz gneiss (A.F. 92029).

GEOCHEMICAL DATA:

One representative outcrop chip sample (00735) was collected for assay and multi-element geochemical analysis. The sample contains low base and precious metals (Appendix I). Assay results are 32 ppm Cu, 11 ppm Zn, 11 ppm Ni, and nil Au, Ag and Pb. Assays reported in drill logs are given as 0.3 g\t Au, nil to 6.9 g\t Ag and nil Cu and Zn (A.F. 90090).

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. Abundant zones of disseminated pyrite with minor chalcopyrite are hosted by altered garnet-quartz-biotite gneiss.

REFERENCES:

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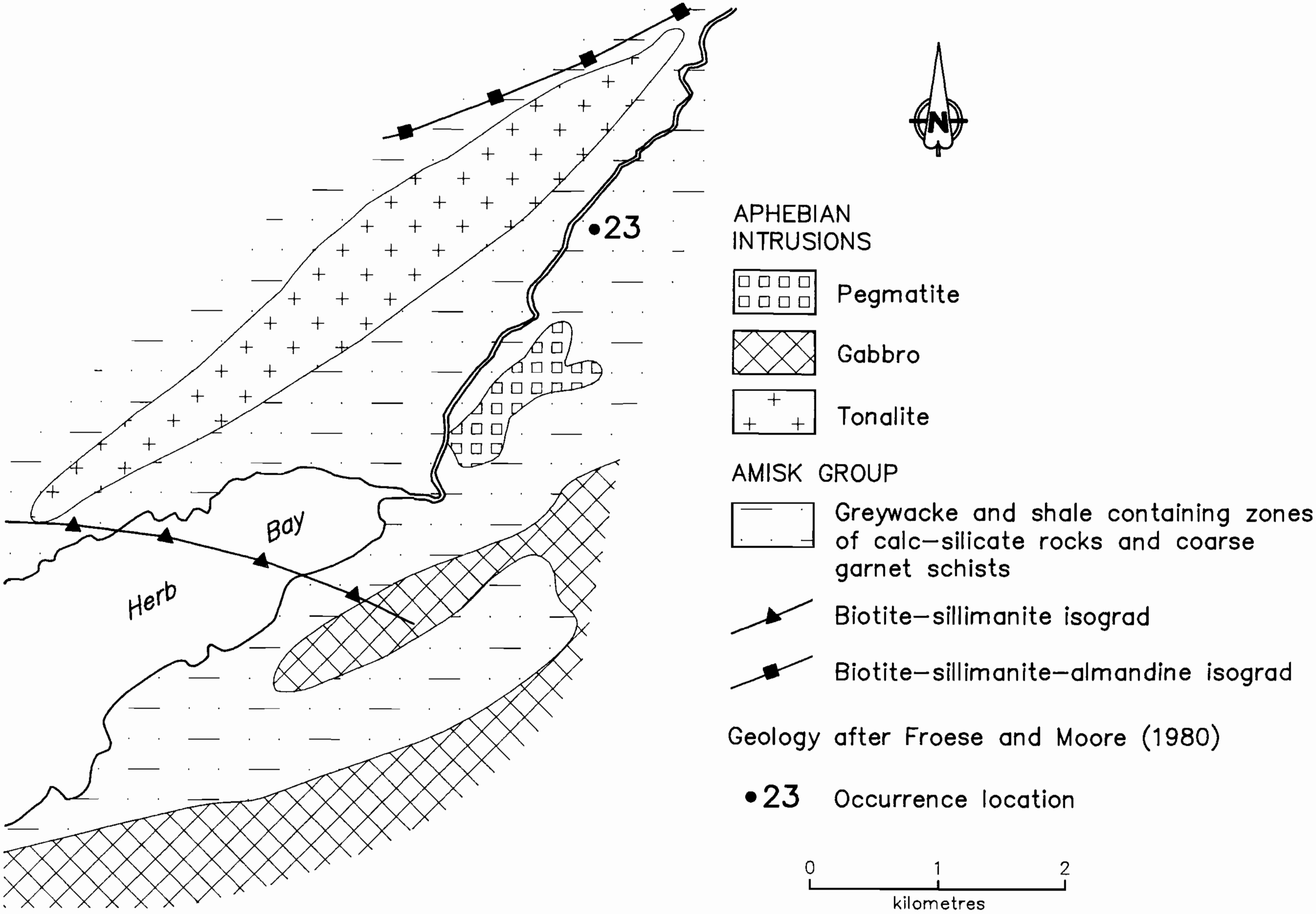

Figure 23-1: Geological setting of occurrence 23.

Froese, E. and Moore, J.M.

1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.

Gordon, T.M.

1981: Metamorphism in the Crowduck Bay area, Manitoba; in Geological Survey of Canada, Current Research, Part A, Paper 81-1A, p. 315-316.

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Mining Claim Cards Blue 9 (P 19605), CB 6446, CB 6473 and CB 6446

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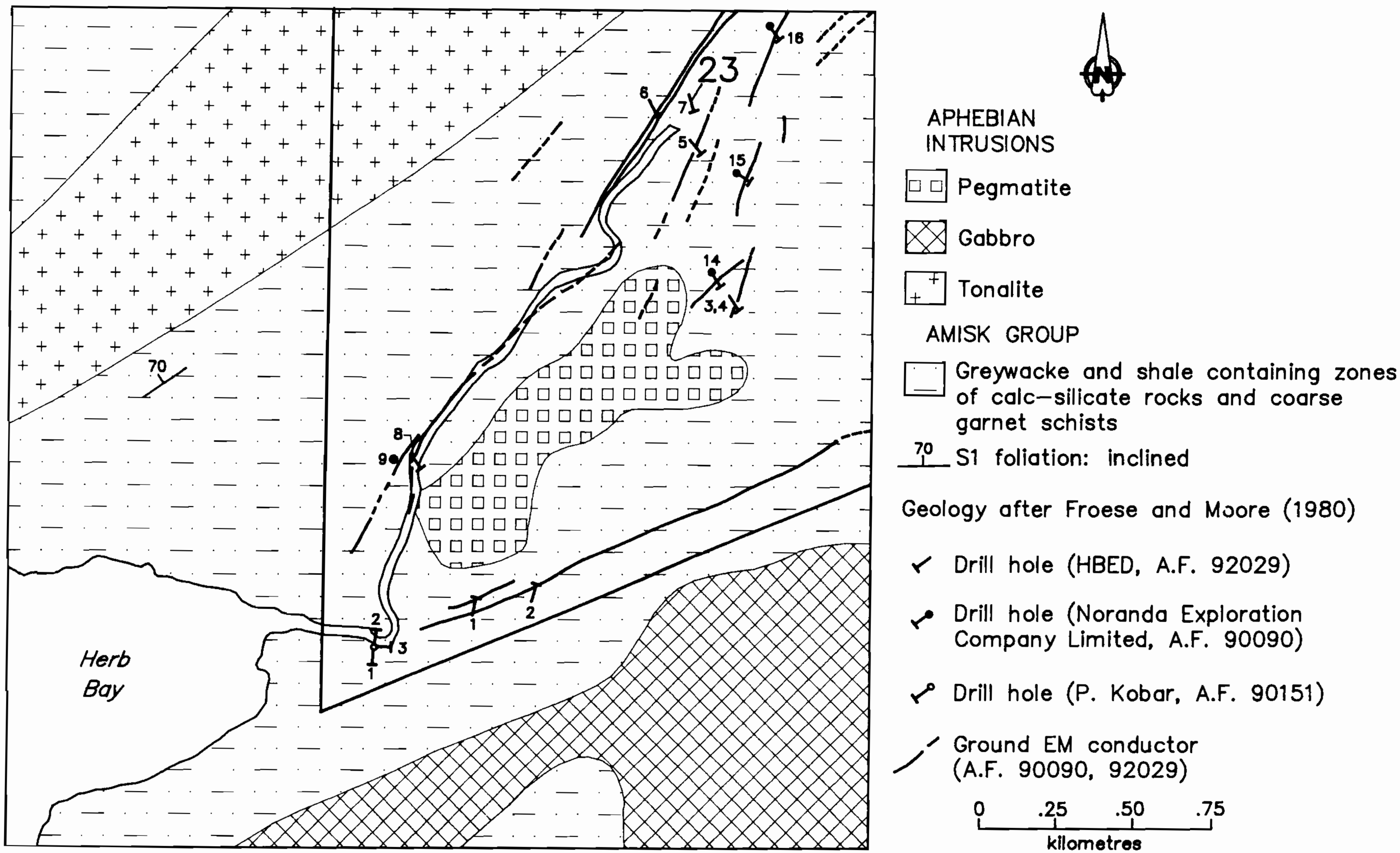

Figure 23-2: Detailed geology, ground EM conductors and drill hole locations, occurrence 23.

LOCATION: **24**

NAME: Copper Dome
UTM: 6081935N/453746E
ACCESS: Boat on Wekusko Lake.

AREA: Crowduck Bay, Wekusko Lake.
AIRPHOTO: A20124-84

EXPLORATION SUMMARY:

The Copper Dome group of claims was staked in the area by Felix Bordeau and Michael Huot in 1929. Pits and trenches were dug between 1929 and 1930 (Mineral Inventory Card 63J/13 Ni 6). Wright (1938) describes two trenches on the property. The claims lapsed in 1932. From 1942 to 1963 the ground was held by various individuals. Wekusko Consolidated Limited did a magnetometer survey on the C.D.B. and Last Hope groups and sampled trenches on C.D.B. 2, and Last Hope 2 and 5 in 1944 (Manitoba Energy and Mines, Unpublished Information File, 63J/13). Canadian Nickel Company Limited drilled three holes totalling 309 m on Last Hope 5 and 6 in 1949 (A.F.90159). Surface work was reported on C.N. 3 and 4 between 1948 and 1956 (Mineral Inventory Card 63J/13 Ni 6). Magnetawan Iron Mines Limited optioned the property in 1956. Ground magnetic and EM surveys, geological mapping (1:2400), and an 11 hole, 1381 m, diamond drill program was done on C.N. 3 and 4 by Sulmac Exploration Services Limited in 1956 (A.F. 90071). Two holes totalling 175 m were drilled northeast of C.N. 3 on Duck 1 and 8 in 1956 (A.F. 90071). An airborne EM survey was done by Canadian Nickel Company Limited in 1957 (A.F. 91624). The option was abandoned in 1963. HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650). From 1963 to 1989 the ground was held by various individuals. The area is presently covered by Bur 7817, staked by HBED in 1989, and by Ark 1, staked by Strider Resources Limited in 1991.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Aphebian gabbro that intrudes Amisk Group greywacke and shale (Fig. 24-1; Gordon and Gall, 1982; Froese and Moore, 1980). Magnetawan Iron Mines Limited reports gabbro, quartz gabbro, norite, anorthositic gabbro, pegmatoid gabbro and pyroxenite that intrude metasedimentary schists and gneisses. Some sedimentary rocks occur as rafts within the gabbro intrusion (Fig. 24-2, 24-3; A.F. 90071).

MINERALIZATION:

Disseminated (1 to 5%) pyrrhotite, pyrite and lesser chalcopyrite is present in surface exposure. Many of the trenches on the property are caved and filled with overburden; two large trenches were examined (Fig. 24-4). Mineralization is most abundant where the intrusion has been highly fractured and sheared. Diamond drill holes intersected; (1) finely disseminated chalcopyrite and pyrrhotite in medium grained gabbro over 12.3 m (DDH H-3), and (2) up to 28.5 m of 1 to 2 % pyrrhotite and chalcopyrite in the proportion of 10:1 in DDH H-4 and H-7, including a 0.5 m massive chalcopyrite vein in H-7. DDH H-5 intersected 5% pyrrhotite and trace chalcopyrite over 21.9 m; trace pyrite over short core intervals was observed in core from DDH H-6. Gabbro intersected by DDH H-8 and 9 was nonmineralized. DDH H-10 intersected 50% pyrrhotite over 2 cm in medium grained gabbro. DDH H-11 intersected "sulphide specks" in gabbro schist. DDH H-12 intersected 35 m of 0.5% chalcopyrite and pyrrhotite in medium grained gabbro (A.F. 90071). Multiple sulphide occurrences are present in outcrop and trenches in the area of location 24; however, the species of sulphide minerals is not given.

GEOCHEMICAL DATA:

Assay results are reported for copper and nickel in core from DDH H-1. Based upon 13 samples, the concentration of Cu and Ni ranged from 0.03 to 0.16% and 0.01 to 0.11%, respectively. Two representative rock chip samples collected for assay from trench 1 (00736) and trench 2 (00737) (Fig. 24-4) contain 0.16% and 0.12% Cu, and 0.11% and 838 ppm Ni, respectively. Both samples contain low Au, Pb, Ag and Zn. A multi-element analysis of sample 00737 indicates the sample contains 1199 ppm Cu, 18 ppb Pd and 32 ppb Au (Au result based on an arithmetric mean of 25, 34 and 37 ppb Au - 3 separate analyses). Sample 00736 contains 44 ppb Au and 12 ppb Pd. The remainder of the multi-element geochemical analyses are presented in Appendix I.

CLASSIFICATION:

Magmatogenic type deposit; disseminated. A layered mafic-ultramafic intrusion contains nickel, copper and palladium. An examination of the platinum group element potential of this intrusion is warranted.

REFERENCES:

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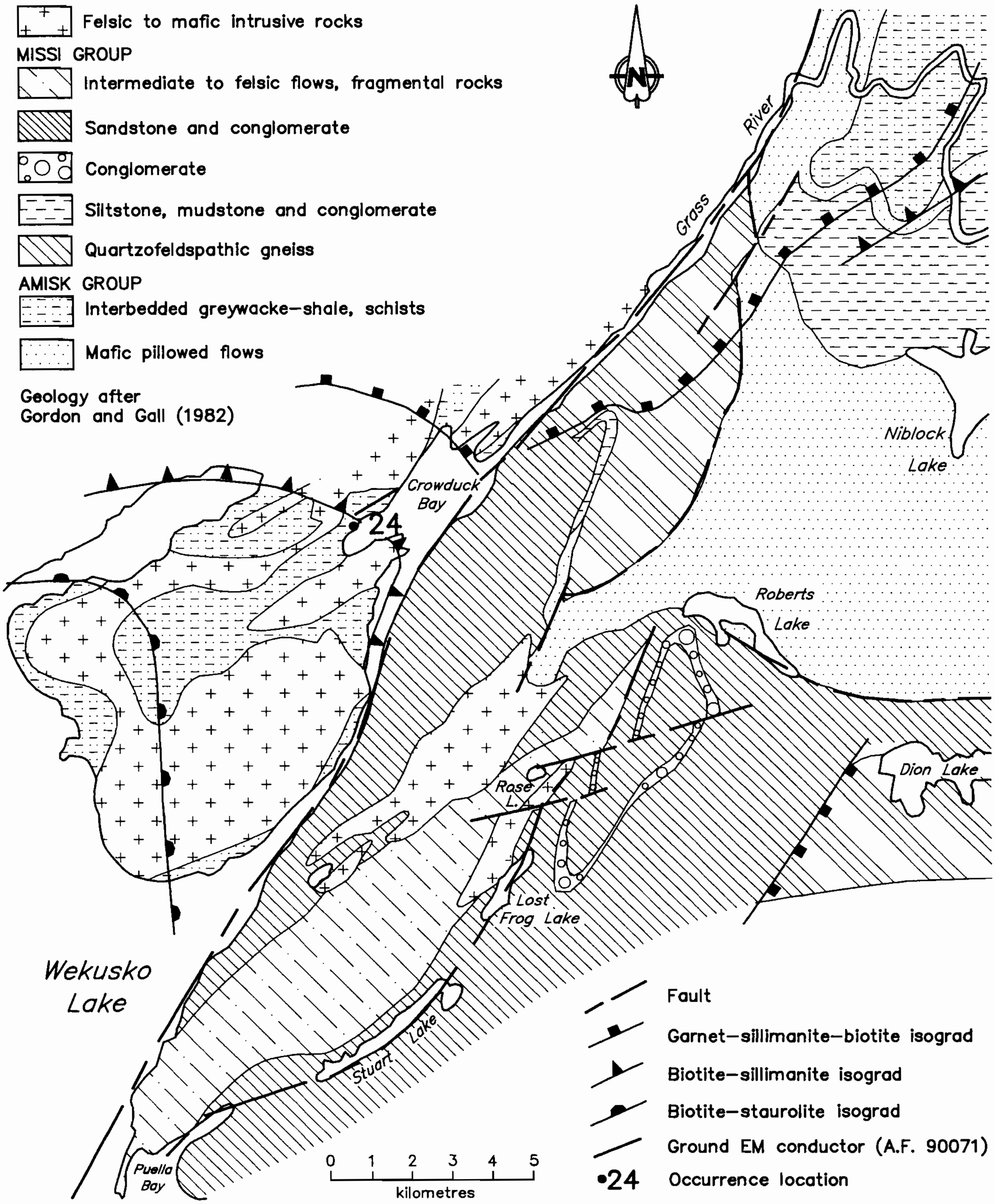

Figure 24-1: Geological setting of occurrence 24.

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1985: Evaluation of industrial mineral occurrences in the Snow Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 100-104.

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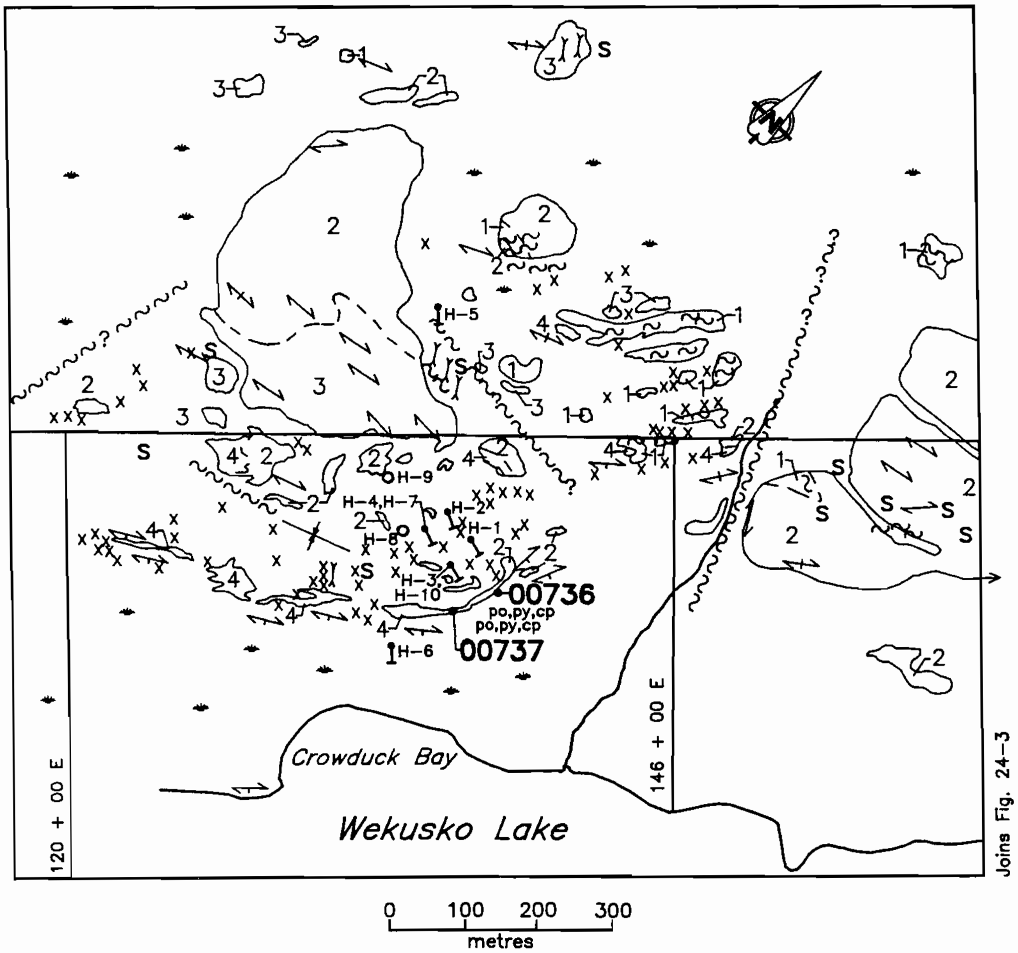

1 Pegmatite; minor fine grained granite or aplite

2 Gabbroic rocks undivided–gabbro, quartz gabbro, norite, anorthositic gabbro pegmatoid gabbro, pyroxenite

3 Coarse to fine grained gabbro intermixed with sedimentary rocks

4 Metasedimentary rocks–
garnet–mica–feldspar–quartz schist and gneiss
staurolite–sericite–feldspar–quartz schist
biotite–feldspar–quartz schist and gneiss
biotite–hornblende–feldspar gneiss
amphibolite

Shear zone

Syncline

Foliation; inclined, vertical, dip unknown

Trench

S Sulphide occurrence, sulphides not specified

Drill hole, inclined, vertical (Sulmac Exploration Services Ltd. for Magnetawan Iron Mines Ltd., A.F. 90071)

Swamp

Geological contact

x Outcrop

00737 Rock geochemical sample

Figure 24-2: Outcrop, geology and sample location map, occurrence 24.

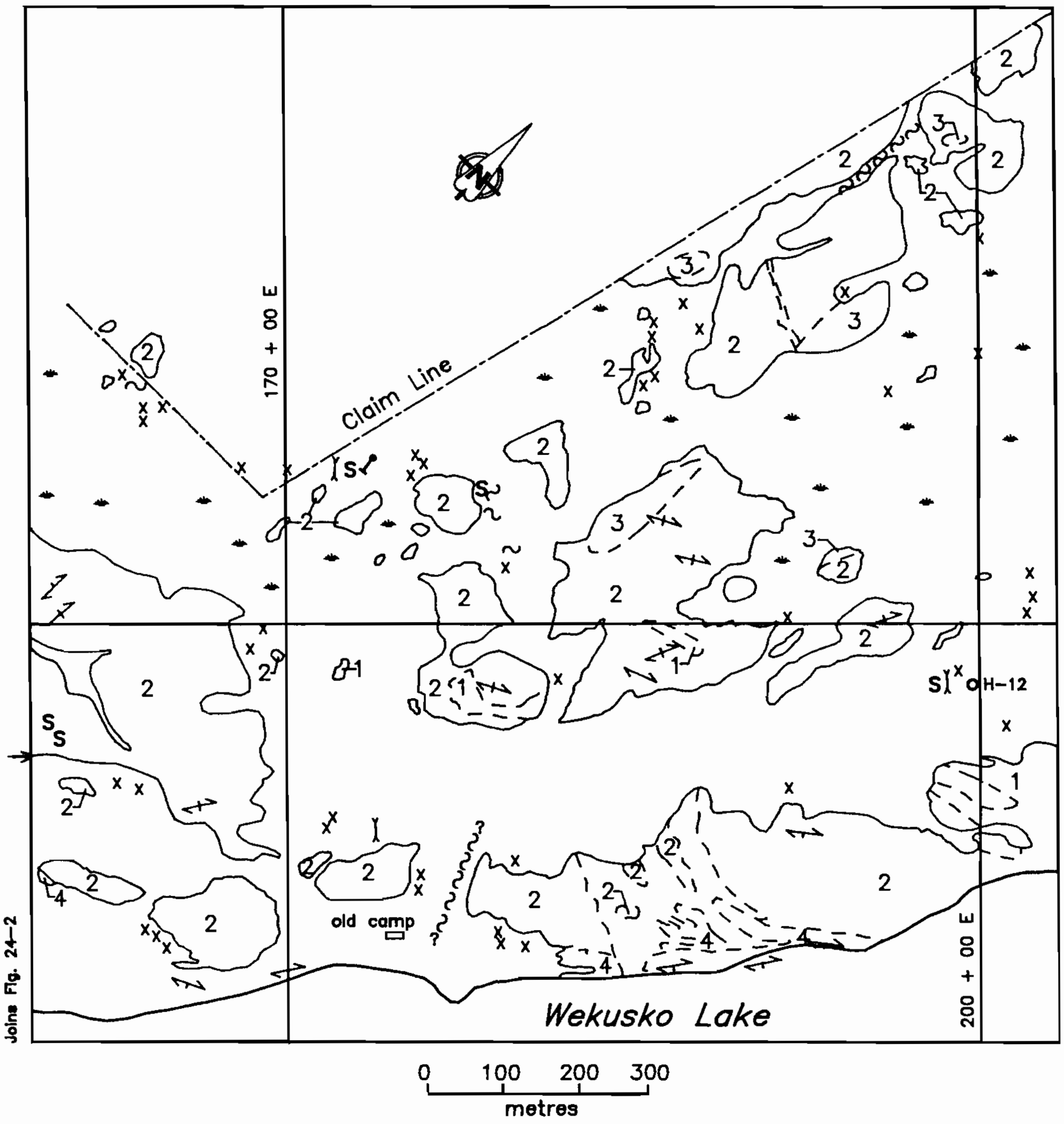

Figure 24-3: Outcrop, geology, trench and geochemical sample location map, occurrence 24. See legend in Figure 24-2.

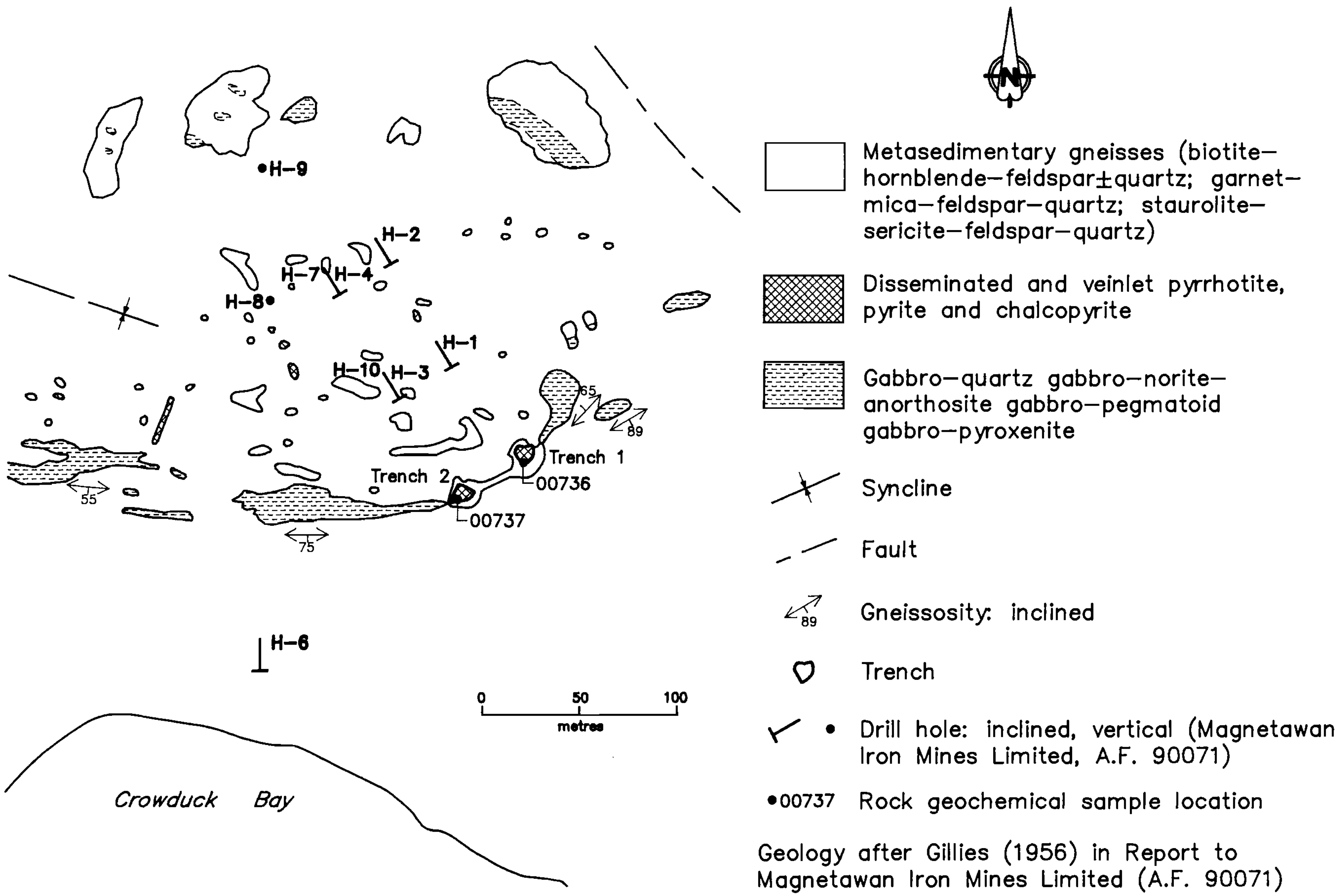

Figure 24-4: Outcrop, geology and trench and sample locations, occurrence 24.

LOCATION: **25**

NAME: Caper Zone

AREA: North of the mouth of Snow Creek at English Bay, Snow Lake.

UTM: 6081755N/437099E

AIRPHOTO: A20170-18

ACCESS: Provincial Highway 392 and traverse.

EXPLORATION SUMMARY:

The area was first staked as the Rita, Leo, and De Montagny claims in the late 1920's. Louis Revord acquired the D.D. and D.D. 1 claims in 1942. In 1943 five holes totalling 209.8 m were drilled on D.D. 1 and ten holes totalling 519.4 m were drilled on D.D., but the results of this work are not available (Mining Recording File 20118). In 1947 J. Nutt drilled fifteen holes totalling 346 m on D.D. 1 and six holes totalling 118.5 m on D.D. (A.F. 92150). Snow Lake Gold Mines Limited did some drilling on D.D. in 1952, but the results are not available (Manitoba Mines and Natural Resources, 1953). Britannia Mining and Smelting Company Limited acquired the property in 1956. An HLEM (Ronka Mark III) survey was done by Noranda Exploration Company Limited over part of the area in 1965 (A.F. 91593). An airborne EM and magnetic survey was done by Fosco Mining Limited in 1971 (A.F. 92130). The area was restaked under CB 6444 and CB 9418 by HBED in 1978. CB 9418 was transferred to Mingold Resources Inc. in 1988.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by interlayered Amisk Group felsic pyroclastic and volcaniclastic rocks and mafic volcanic rocks (Fig. 25-1; Froese and Moore, 1980). The felsic volcanic rocks consist of quartz and feldspar phyric and quartz phyric dacitic fragmental rocks and coarse tuff interlayered with thinner beds of lapilli tuff and tuff breccia. Garnetiferous sedimentary rocks conformably overly the felsic fragmental sequences (Fig. 25-2; Eccles and Fedikow, 1985). The volcanic rocks are crosscut by thin hornblendite dykes. North of the occurrence, the felsic sequence is in contact with mafic heterolithic coarse- to fine-grained debris flow deposits. The west-striking, steeply north-dipping felsic sequence can be traced for approximately 2000 m under the town of Snow Lake, where the same felsic mafic contact described above is marked by the Howe Sound Fault, host to the NorAcme gold deposit.

The felsic rocks contain a west-striking, steeply north-dipping penetrative foliation, with a strong stretch lineation that plunges 40° to 50° east-northeast. Shear zones, developed within this stratigraphy, contain high concentrations of gold mineralization. Diamond drilling intersected silicified "greenstone" with quartz veins, sheared amphibolite, and silicified garnet gneiss (Fig. 25-3; A.F. 92150).

MINERALIZATION:

Four mineralized sites have been recognized in the general area (Fig. 25-3) and have been designated sites 1 to 4. Site 1 (Fig. 25-4) consists of four shear zones developed within felsic tuffaceous volcanic rocks with the mineralogical assemblage quartz-feldspar-biotite-garnet. These felsic volcanic rocks are altered to a fine grained banded rock with 2 to 3 cm quartz-albite-carbonate bands interlayered with 1 to 3 mm chlorite-biotite-amphibole-carbonate-tourmaline layers. These zones also contain small quartz-albite veinlets parallel to the foliation. High gold values within these zones are associated with minor disseminated to near solid concentrations of fine grained arsenopyrite and pyrite, with subordinate pyrrhotite. The sulphides are commonly concentrated in the chlorite-biotite-rich layers. There are abundant hematite-carbonate-altered planar fractures within the footwall and hanging wall to the altered and mineralized shear zones.

Site 2, occurs north of a small unnamed lake, situated within porphyritic and fragmental basalt (Fig. 25-2). Numerous caved and filled trenches are present at this locality. Disseminated 1 to 5% pyrrhotite and pyrite are observed in the same rock types along strike from the trenches. Site 3 (Fig. 25-2) is located northwest of site 2 within interbedded felsic fragmental rocks and lapilli tuff. Blocky arsenopyrite with 1 to 3% disseminated pyrrhotite, pyrite and chalcopyrite occur in sulphide-silica haloes developed adjacent to white, nonmineralized quartz veins. Mineralization is exposed in six partly fillled trenches. Site 4 (Fig. 25-2) occurs west of site 3 and comprises two small trenches (2 x 2 x 1 m and 4 x 2 x 1 m) in silicified, garnetiferous, mafic sedimentary rocks. The trenches expose disseminated, 1 to 5% acicular arsenopyrite, as well as pyrrhotite, pyrite and chalcopyrite in a 2 m thick zone of strongly foliated rocks.

GEOCHEMICAL DATA:

Representative outcrop chip samples 01075 and 01076 were collected for assay from site 3. Samples 01075 and 01076 contain 3 and 2.4 g/tonne Au, nil Ag, 36 and 80 ppm Cu, 33 and 101 ppm Zn; sample 01075 also contains 4 ppm Pb. A multi-element geochemical analysis of 01076 confirms the high gold content in the sample (3390 ppb Au). The sample also contains 14 ppb Pd and 8057 ppm As.

Representative outcrop chip sample 01081, collected from site 4 for multi-element geochemical analysis, contains 2820 ppb Au and 6991 ppm As. The re-

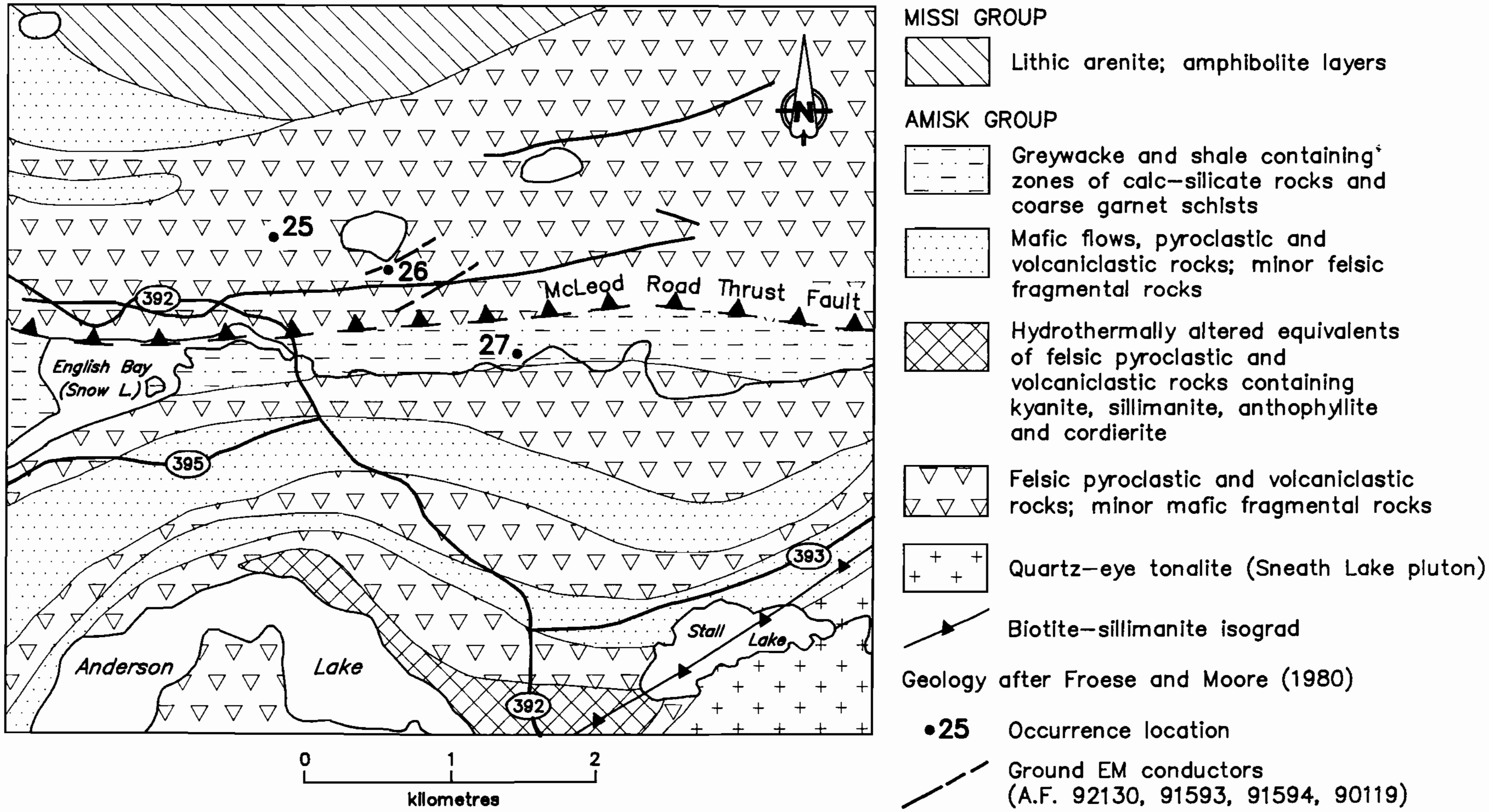

Figure 25-1: Geological setting of occurrences 25, 26 and 27.

mainder of the multi-element geochemical data is presented in Appendix I.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. Sulphide and gold mineralization occur as disseminations and as haloes in strongly to weakly foliated wall rocks adjacent to nonmineralized quartz veins.

REFERENCES:

Assessment Files 90119, 91593, 91594, 92130 and 92150
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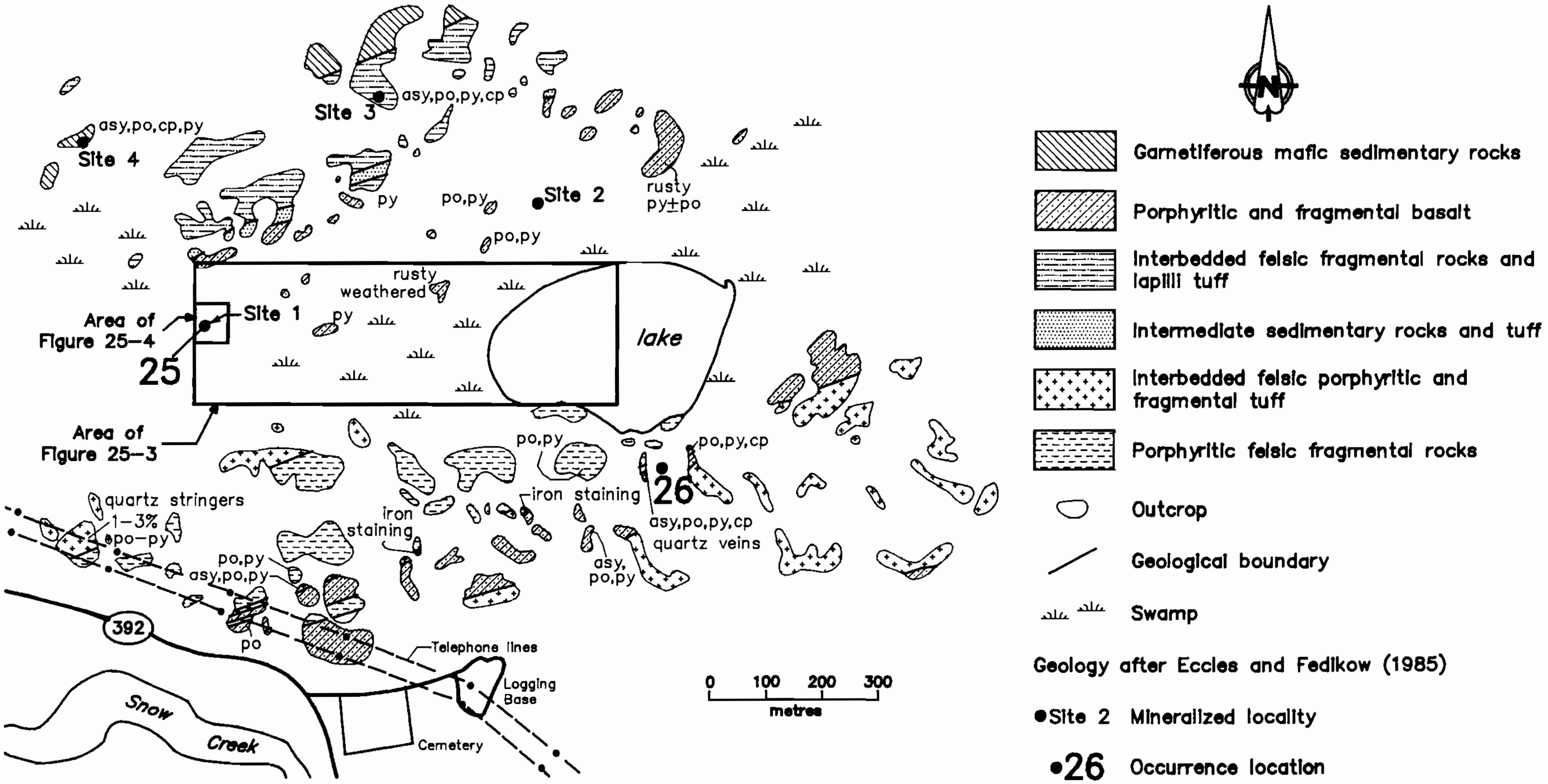


Figure 25-2: Local geology in the vicinity of occurrences 25 (sites 1 through 4) and 26.

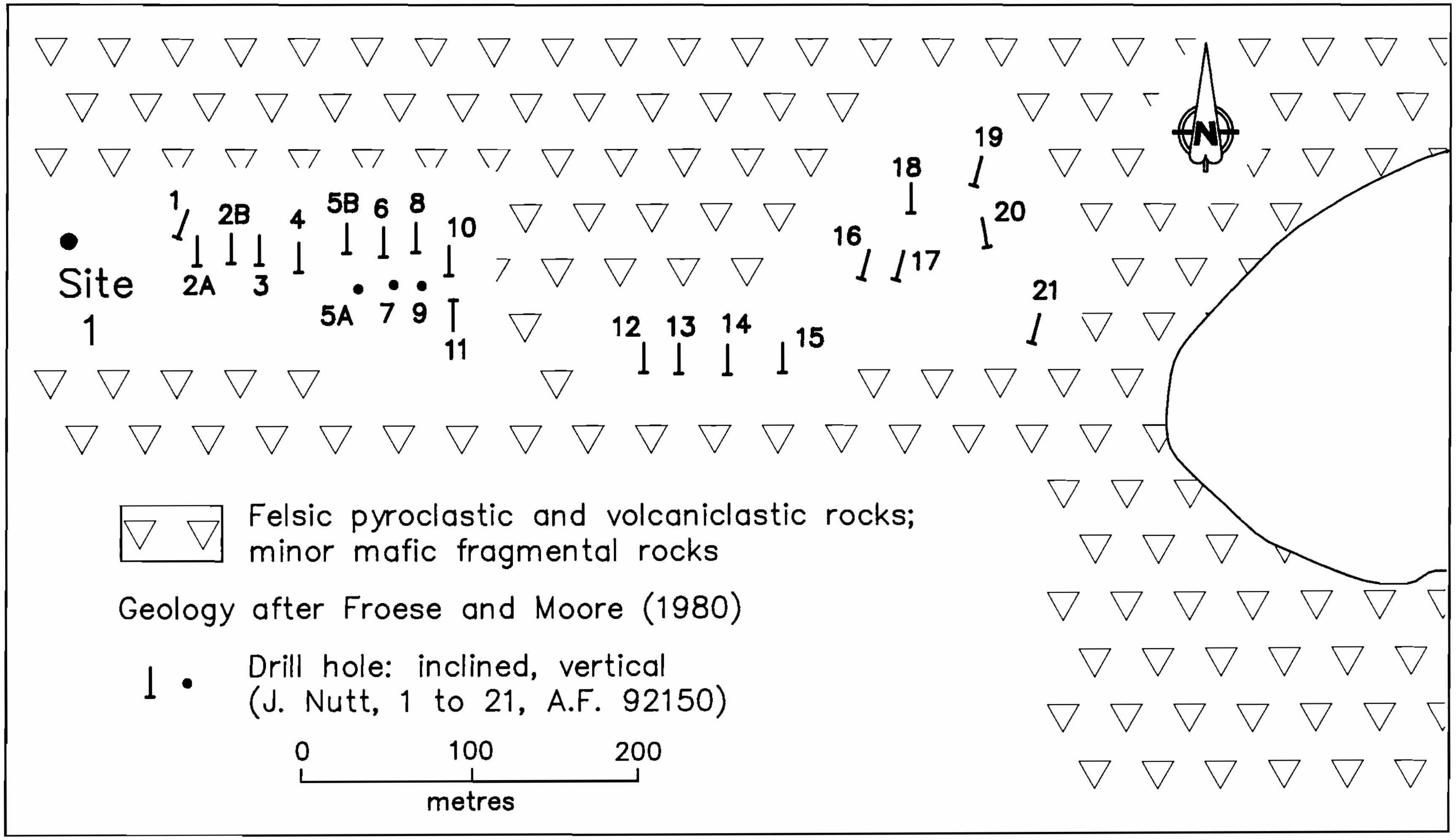


Figure 25-3: Geology and diamond drill hole locations, occurrence 25.

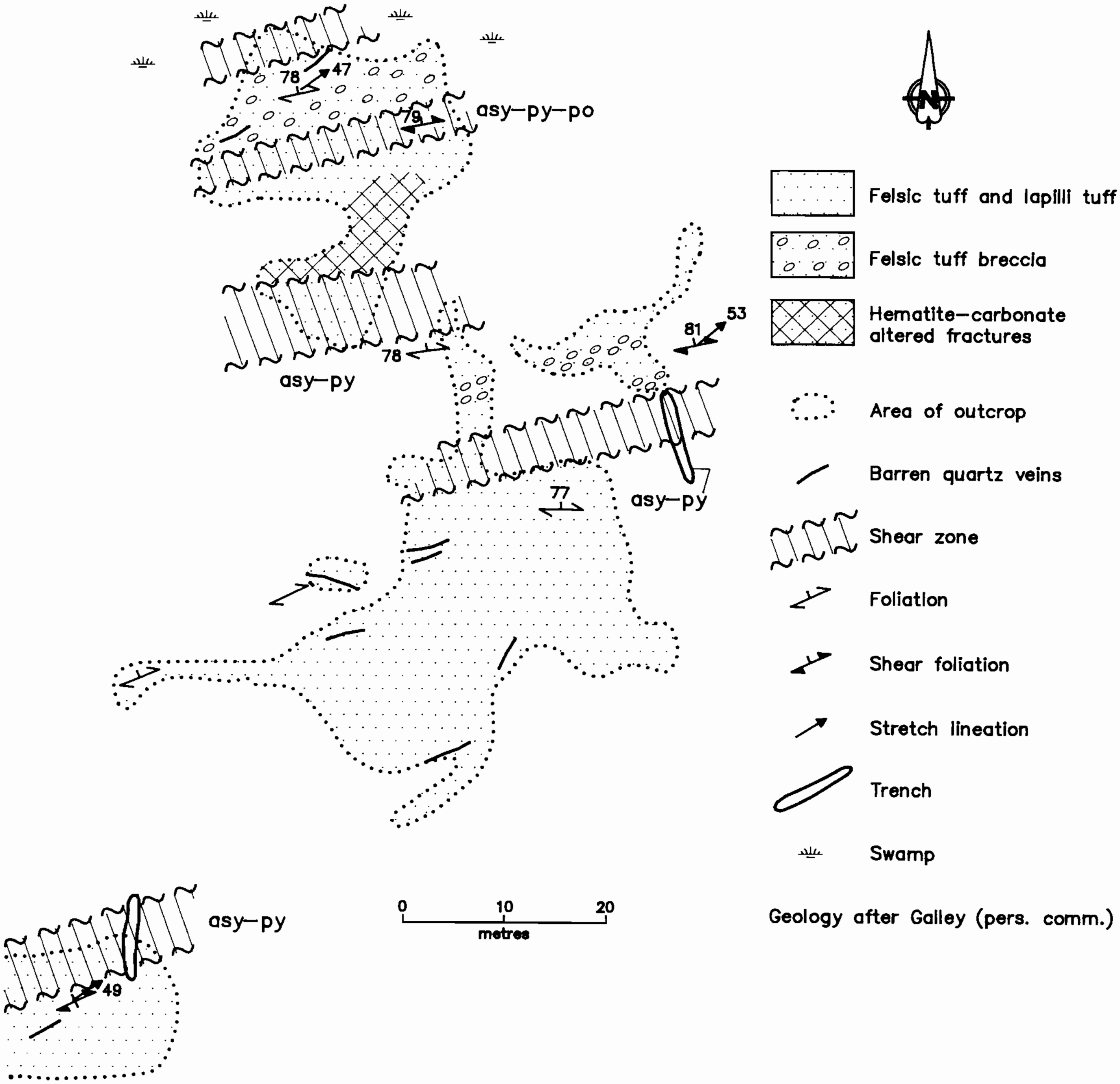


Figure 25-4: Outcrop, geology and trench locations, site 1 (Caper Zone), occurrence 25.

LOCATION: **26**

NAME: English

AREA: North of Snow Creek and east of English Bay, Snow Lake.

UTM: 6081466N/437821E

AIRPHOTO:

ACCESS: Provincial Road 393 and traverse.

EXPLORATION SUMMARY:

The area may have been staked in the late 1920's as the Fly or Spider claims. E 1 was staked in 1942 by W.F. English. In 1947 Parmac Diamond Drilling Exploration Company carried out a 14 hole, 329 m, drill program (A.F. 90207). E 1 lapsed in 1953. Rapid 2, 4 and 6 were also staked over the area by E. Taylor in 1947. Trenching was undertaken between 1948 and 1953. The claims were assigned to Stan P. Millan in 1953. HBED did an HLEM survey on the Bill group in 1956 (A.F. 90133). Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624, Ground Hog Sheet 9). More trenching was done between 1957 and 1963. Noranda Exploration Company Limted optioned the property and did an HLEM (Ronka Mark III) survey in 1965 (A.F. 91593). The survey outlined two conductors. Noranda carried out a 4 hole, 160 m, drill program in 1966 (A.F. 91594). The Rapid claims were leased as M-9111 and M-9112 in 1970 and were cancelled in 1977. S. McLeod staked CB 7762 in 1977, and assigned it to W. Bruce Dunlop in 1979. HBED staked CB 6444 over part of the area in 1978, and optioned CB 7762 from 1980 to 1984. HBED undertook a 3 drill hole program and a magnetometer survey between 1979 and 1982 (Mineral Inventory Card 63J/13 Au 21).

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group felsic pyroclastic and volcaniclastic rocks. These felsic volcanic rocks are flanked to the north by Missi Group lithic arenite and Amisk Group mafic flows, pyroclastic and volcaniclastic rocks and to the south by Amisk Group greywacke and shale and intercalated mafic and felsic volcanic rocks (Fig. 25-1; Froese and Moore, 1980). The McLeod Road Thrust Fault has been mapped to the south of the occurrence (Fig. 25-1). Diamond drill holes, collared to test long and short strike length ground EM conductors (A.F. 91593), intersected variably altered, fine grained and porphyritic andesite, amphibolite, greywacke, peridotite, garnet-staurolite-biotite-chlorite gneiss, quartz-biotite gneiss and chemical sedimentary rocks (A.F. 90207, 91594). A mineralized surface exposure (Fig. 25-2) comprises interlayered rusty weathered felsic tuff and felsic fragmental and lapilli tuff flanked by porphyritic felsic volcanic rocks to the north and by porphyritic and fragmental basalt to the south (Eccles and Fedikow, 1985).

MINERALIZATION:

DDH Rapid 1 (Fig. 26-1) intersected 0.2 m of "massive" graphite with visible pyrite underlain by 10.6 m of garnet-staurolite-biotite-chlorite gneiss. DDH Rapid 2 intersected 3.2 m of "visible" to "well mineralized" pyrrhotite, pyrite, graphite and chalcopyrite hosted by silicified hornblendite, and 1.9 m of disseminated pyrrhotite and pyrite in a garnetiferous hornblende gneiss. DDH Rapid 4 intersected "highly altered" andesite, described as a chlorite schist, and 9.8 m of disseminated to near solid graphite and pyrite in a garnet-staurolite amphibolite. This mineralized zone is underlain by non-mineralized garnet-staurolite-biotite-chlorite schist (A.F. 91594). An east-west series of 14 drill holes tested the same long strike length ground EM geophysical conductor as DDH Rapid 1 and 4 (Fig. 26-2; A.F 90207). Mineralization intersected in these drill holes comprises: 1) disseminated pyrite and blebs of "massive" arsenopyrite in quartz veins over 0.3 to 1.7 m hosted by quartz-biotite schist; 2) disseminated fine grained acicular arsenopyrite with pyrite in silicified rhyolite and quartz-biotite schist; and 3) visible gold in quartz-biotite schist (DDH 3, 12). Tourmaline occurs with the fine grained arsenopyrite needles in quartz veins. Fractures in quartz veins may be covered with pyrite films. Mineral percentages are not reported. A mineralized surface exposure situated approximately 40 m south of the shoreline of a small lake (Fig. 25-2) is characterized by blocky arsenopyrite that occurs in a sulphide-silica halo developed adjacent to a white quartz vein. The vein is mineralized with pyrite, pyrrhotite and chalcopyrite. Two small, partially filled trenches were also observed at this site.

GEOCHEMICAL DATA:

A 0.2 m drill core sample from DDH Rapid 1 contains 6.8 g/t Au. A 0.2 m drill core sample collected from DDH Rapid 2 contains 0.10% Cu and 0.40% Zn. An assay of 13.7 g/t Ag was obtained from a 0.8 m core sample from DDH Rapid 4.

Assay results for Au in core from DDH 1 through 14 range from 0.3 to 77.4 g/t Au; however, most assays are in the 0.3 to 1.7 g/t Au range (A.F. 90207).

Three representative chip samples (01051, 01055, 01057) were collected from the walls of the two trenches for assay. The samples contain nil to trace Au, nil Ag, 20 to 34 ppm Cu, 27 to 40 ppm Zn and 8 to 26 ppm Pb. Multi-element geochemical analysis of sample 01057 confirms the low base and precious metal contents (Appendix I). Multi-element geochemical analysis of two representative outcrop chip samples (01030, 01031) collected west of the trenches indicates these samples

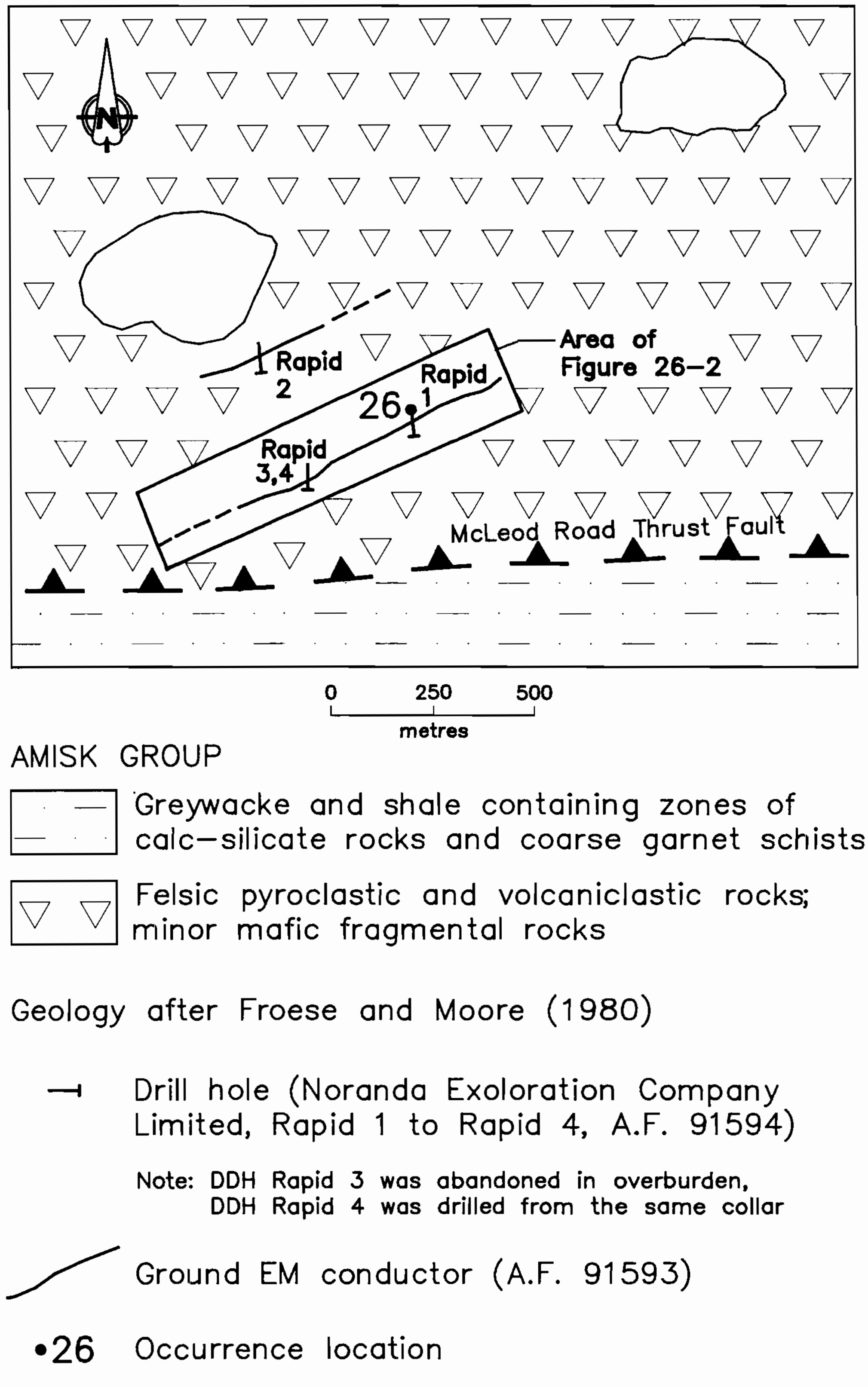


Figure 26-1: Diamond drill hole locations, occurrence 26.

also contain low base and precious metal values (Appendix I).

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. Visible gold associated with fine grained arsenopyrite needles occurs in quartz veins in quartz-biotite schist. A chemical sediment type deposit; sulphide facies iron formation occurs in core from DDH Rapid 1 and 2. Plots of gold assays in Figure 26-2 and lithologic descriptions from drill logs (A.F. 90207) suggest the mineralized zone consists of thin quartz veins with disseminated sulphide and gold that overprint, or is being derived from, a graphitic chemical sedimentary layer containing iron sulphides. The high lead content, 502 ppm (sample 01030) is unusual compared to the remainder of the analytical results from the occurrence. Some of the alteration features described from this area (*cf.*, DDH Rapid 1) are similar to alteration typically associated with massive sulphide type deposits.

REFERENCES:

Assessment Files 90133, 90207, 91593, 91594 and 91624
Manitoba Energy and Mines, Minerals Division.

Eccles, D.R. and Fedikow, M.A.F.
1985: Mineral occurrence documentation and alteration zone mapping, Snow Lake area; in Manitoba Energy and Mines, Report of Field Activities, 1985, p. 82-99.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.

Gale, G.H., Baldwin, D.A. and Koo, J.
1980: A geological evaluation of Precambrian massive sulphide deposit potential in Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER79-1, 137p.

Mineral Inventory Card 63J/13 Au 21
Manitoba Energy and Mines, Minerals Division.

Russell, G.A.
1957: Structural studies of the Snow Lake - Herb Lake area; Manitoba Mines and Natural Resources, Publication 55-3, 33p.

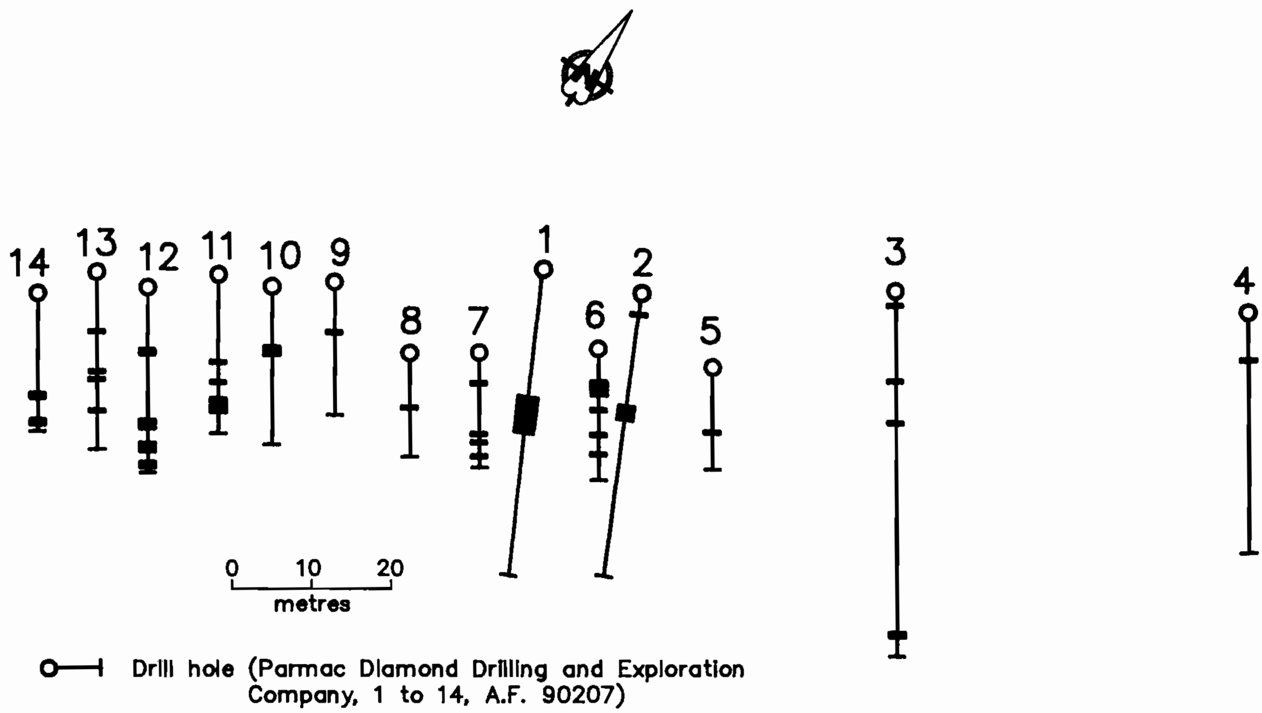


Figure 26-2: Longitudinal section illustrating diamond drill hole locations and gold assay results (greater than 0.3g/tonne Au), occurrence 26.

LOCATION: **27**

NAME: (A.F. - Mineralization intersected by diamond drilling).

UTM: 6080891N/438701E

ACCESS: Provincial Road 393 and traverse.

AREA: Snow Creek, east of the town of Snow Lake.

AIRPHOTO: A20127-111

EXPLORATION SUMMARY:

The area was first staked as Mogul 11 by Walter Johnson in 1945. In 1949 two holes totalling 75 m were drilled on the property by Glen Rapson and one trench was dug (A.F. 90112). Astra 6 and 9 were staked in 1955 and assigned to Walter Johnson. HBED optioned the claims that year and exercised its option in 1956. Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624, Ground Hog Sheet 9). HBM&S staked Astra 45Fr. in 1959 and acquired Astra 6 and 9 in 1960. In 1961 the property was leased under 21-year leases M-7497, M-7498 and M-7509. Fosco Mining Limited carried out airborne EM and magnetic surveys in the area in 1971 (A.F. 92130).

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group greywacke and shale flanked to the north and south by Amisk Group felsic pyroclastic and volcaniclastic rocks. The occurrence is situated at or near the contact between felsic volcanic rocks and staurolitic greywacke and shale, and is south of the McLeod Road Thrust Fault (Fig. 25-1; Froese and Moore, 1980). Diamond drill holes, collared to test long strike ground EM conductors (Fig. 27-1; A.F. 92130), intersected mineralized rhyolite porphyry with "bands" of carbonate, quartz and carbonate stringers, and amphibolite (A.F. 90112).

MINERALIZATION:

Disseminated arsenopyrite and chalcopyrite occur in rhyolite porphyry and amphibolite over core intervals of 0.6 m and 0.9 m in DDH 2 (A.F. 90112). DDH 1 intersected rhyolite porphyry with quartz and carbonate stringers.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified. Percentages of chalcopyrite and arsenopyrite are not given in the drill logs.

REFERENCES:

Assessment Files 90112, 91624 and 92130
Manitoba Energy and Mines, Minerals Division.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.

Hosain, I.T.
1988: An update summary and evaluation of geophysical data from open assessment files of the Flin Flon - Snow Lake greenstone belt (NTS sheets 63K (N1/2) and 63J/12, 13); Manitoba Energy and Mines, Mines Branch, Open File Report OF87-11, 99p.

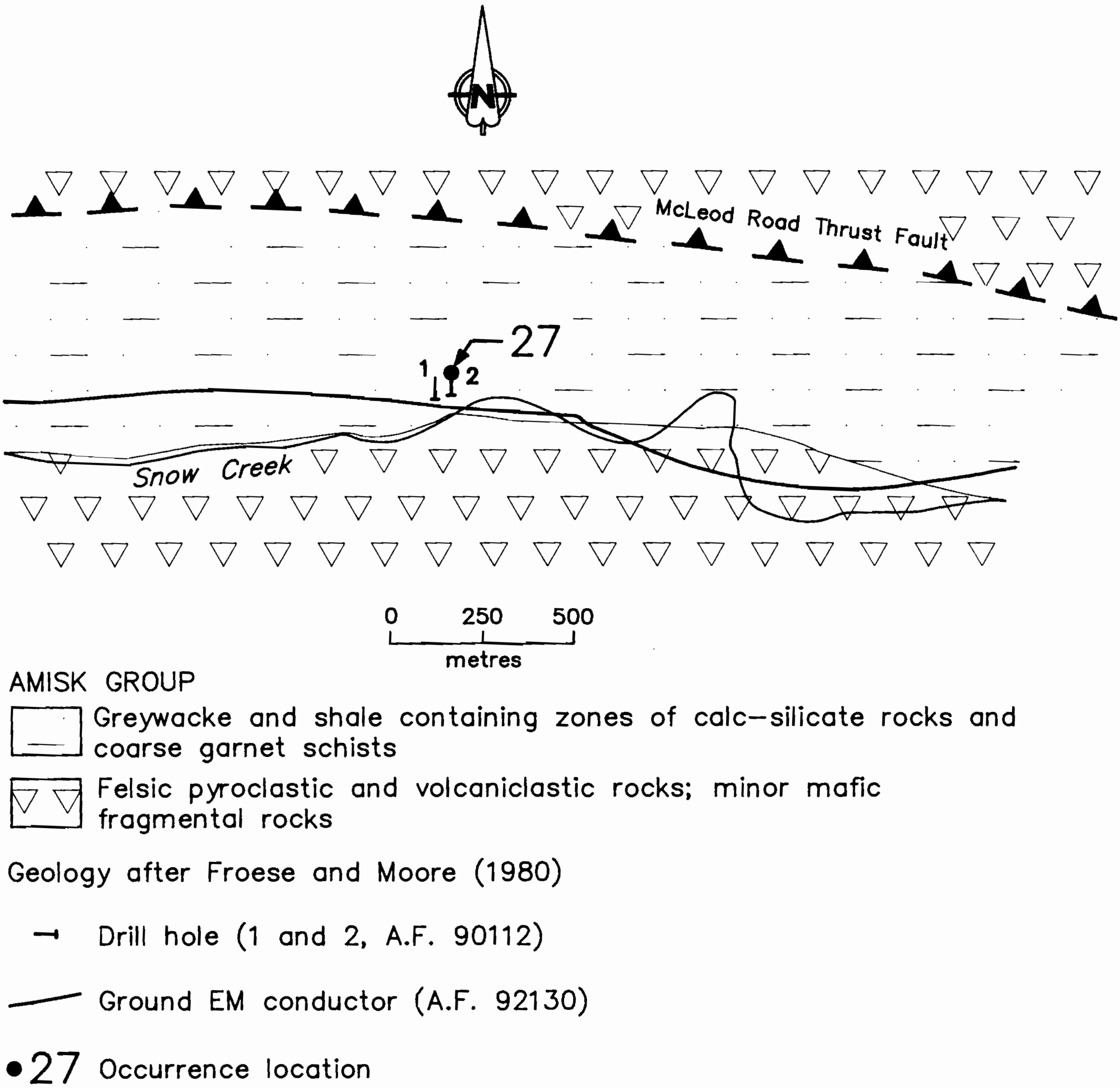


Figure 27-1: Diamond drill holes and ground EM conductors, occurrence 27.

LOCATION: **28**

NAME:

UTM: 6092632N/465675E

ACCESS: Boat along Grass River from Wekusko Lake.

AREA: Grass River

AIRPHOTO: A20808-200

EXPLORATION SUMMARY:

The area was first staked as Old Gold by Charles Messer in 1953. The claim was cancelled in 1954. Between 1956 and 1957, Terry 1, Copper 2, 3, 6, 7 and Meeney 4 were staked by various individuals. Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624). Surface work was done on the property between 1957 and 1959 (Mining Claim Cards Terry 1, Copper 2, 3, 6, 7 and Meeney 4). The Copper claims were restaked in 1959. Jay-Kay Exploration Syndicate drilled two holes totalling 157.5 m on Meeney 4 and 4 holes totalling 330 m on Copper 8 in 1960 (A.F. 90084). All claims were cancelled in 1962 except for Meeney 4, which was cancelled in 1965. HBED did an airborne EM and radiometric survey in 1965 (A.F. 91650).

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by pillowed to massive mafic volcanic flows, sillimanite-bearing, garnetiferous sedimentary gneiss and coarse grained garnet gneiss (Fig. 28-1). The age relationships of these rocks are uncertain (Frarey, 1950). Gordon and Gall (1982) assigned the mafic volcanic rocks to the Amisk Group. Diamond drilling intersected grey gneiss and schist of unspecified composition, peridotite, diorite and aplite (Fig. 28-2; A.F. 90084).

MINERALIZATION:

Disseminated pyrite occurs in grey gneiss and peridotite over core intervals that vary from 2.1 to 3.4 m. The composition of the gneiss is unspecified and mineral percentages are not given in the drill logs (A.F. 90084). In outcrop silicified pillow basalt contains 1 to 3% disseminated pyrrhotite and pyrite (Fig. 28-3). Silicification of pillow basalts has produced a granular siliceous unit that contains disseminated iron sulphides. This silicified rock can be traced into relatively unaltered pillow basalt. The genesis of the silicification is unknown.

GEOCHEMICAL DATA:

Four representative outcrop chip samples were collected for multi-element geochemical analysis. Results are summarized in Appendix I. All samples contain low base and precious metal values.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 90084, 91624 and 91650

Manitoba Energy and Mines, Minerals Division.

Eccles, D.R. and Fedikow, M.A.F.

1985: Mineral occurrence documentation and alteration zone mapping, Snow Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 82-99.

Fedikow, M.A.F. and Malis, C.

1987: Mineral occurrence documentation and geochemical surveys in the Snow Lake area; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1987, p. 91-93.

Frarey, M.J.

1950: Crowduck Bay; Geological Survey of Canada, Map 987A, 1:63 360.

Gordon, T.M.

1981: Metamorphism in the Crowduck Bay area, Manitoba; in Geological Survey of Canada, Current Research, Part A, Paper 81-1A, p. 315-316.

Gordon, T.M. and Gall, Q.

1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Mining Claim Cards Terry 1 (P 44179), Copper 2, 3, 6, 7 (P 56991-94) and Meeney 4 (P 68544)

Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Gordon, T.M. and Gall, Q.

1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

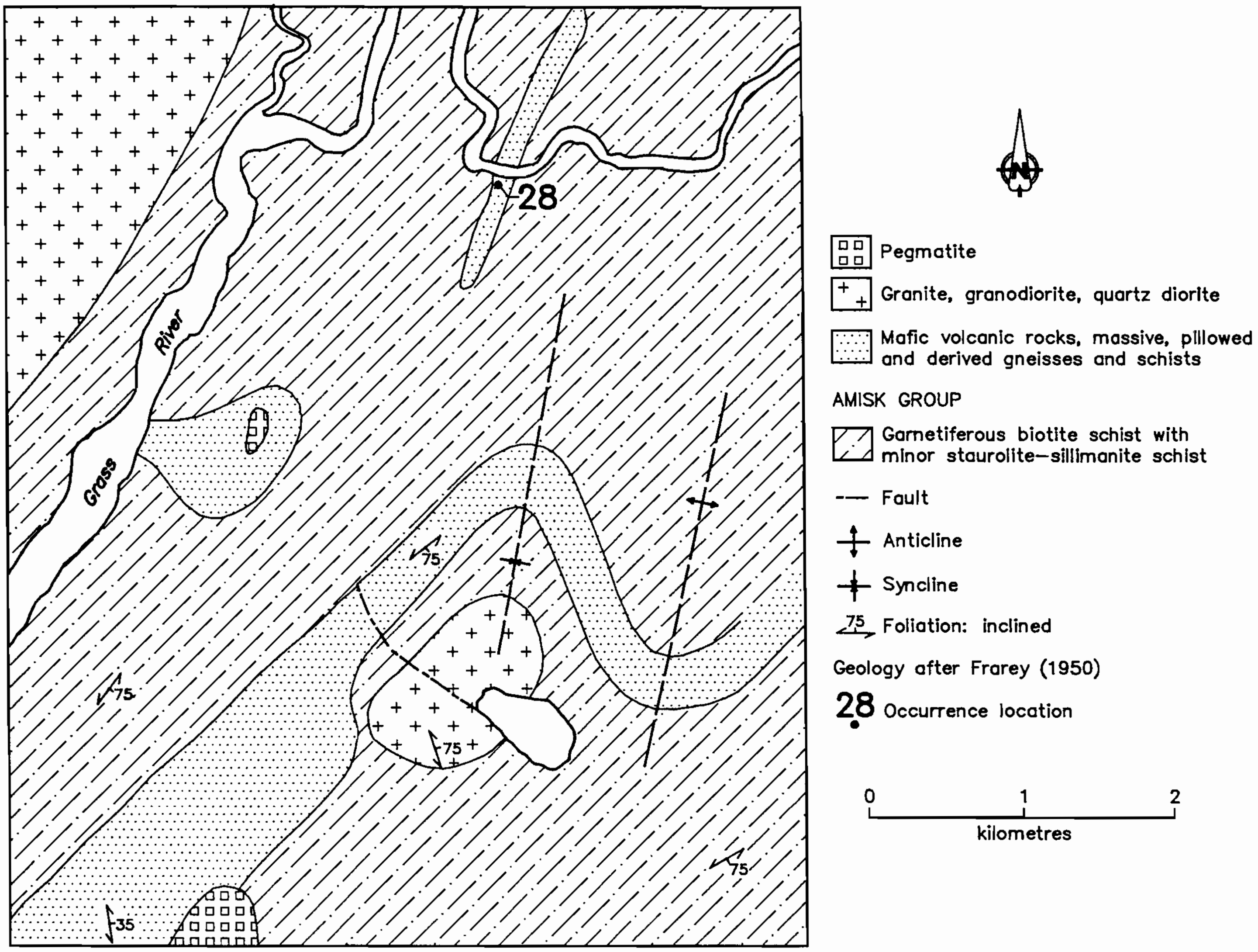


Figure 28-1: Geological setting of occurrence 28.

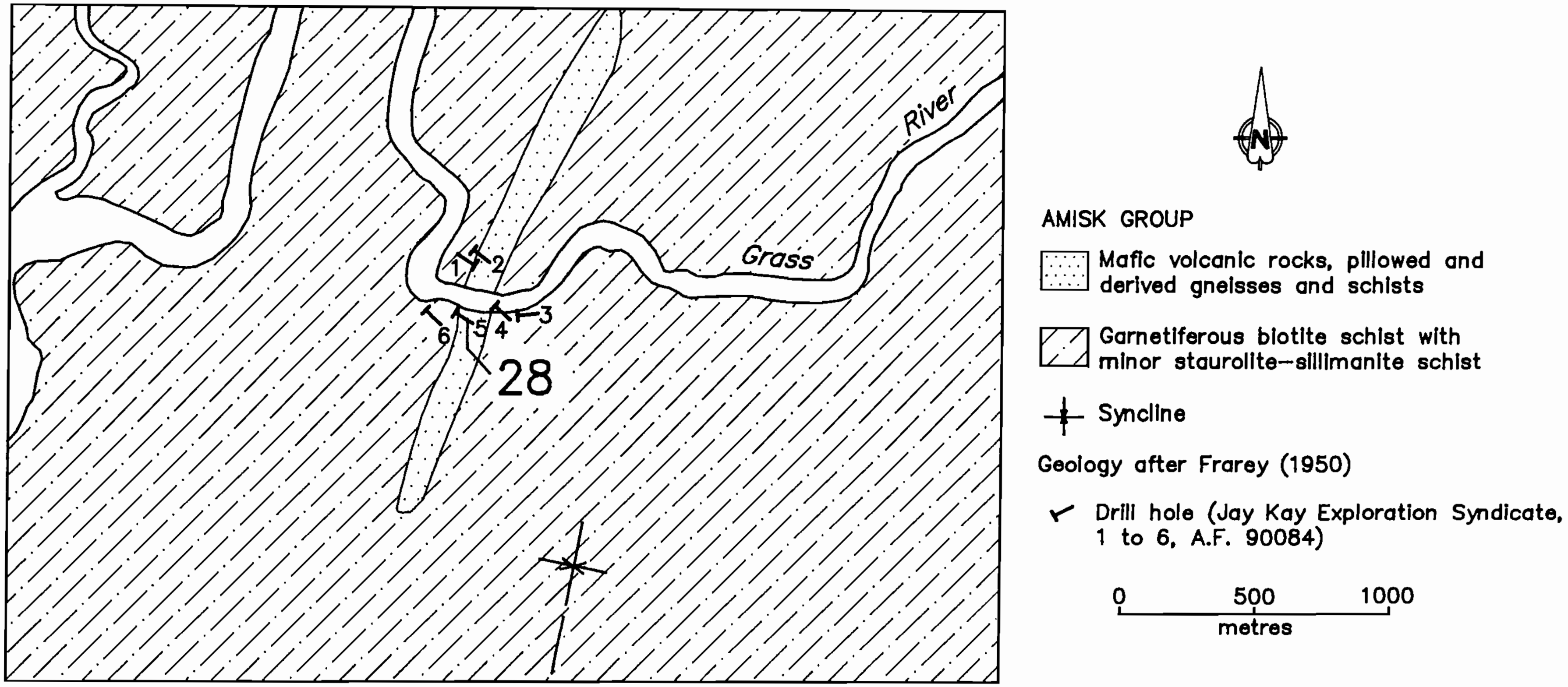


Figure 28-2: Detailed geology and diamond drill hole locations, occurrence 28.

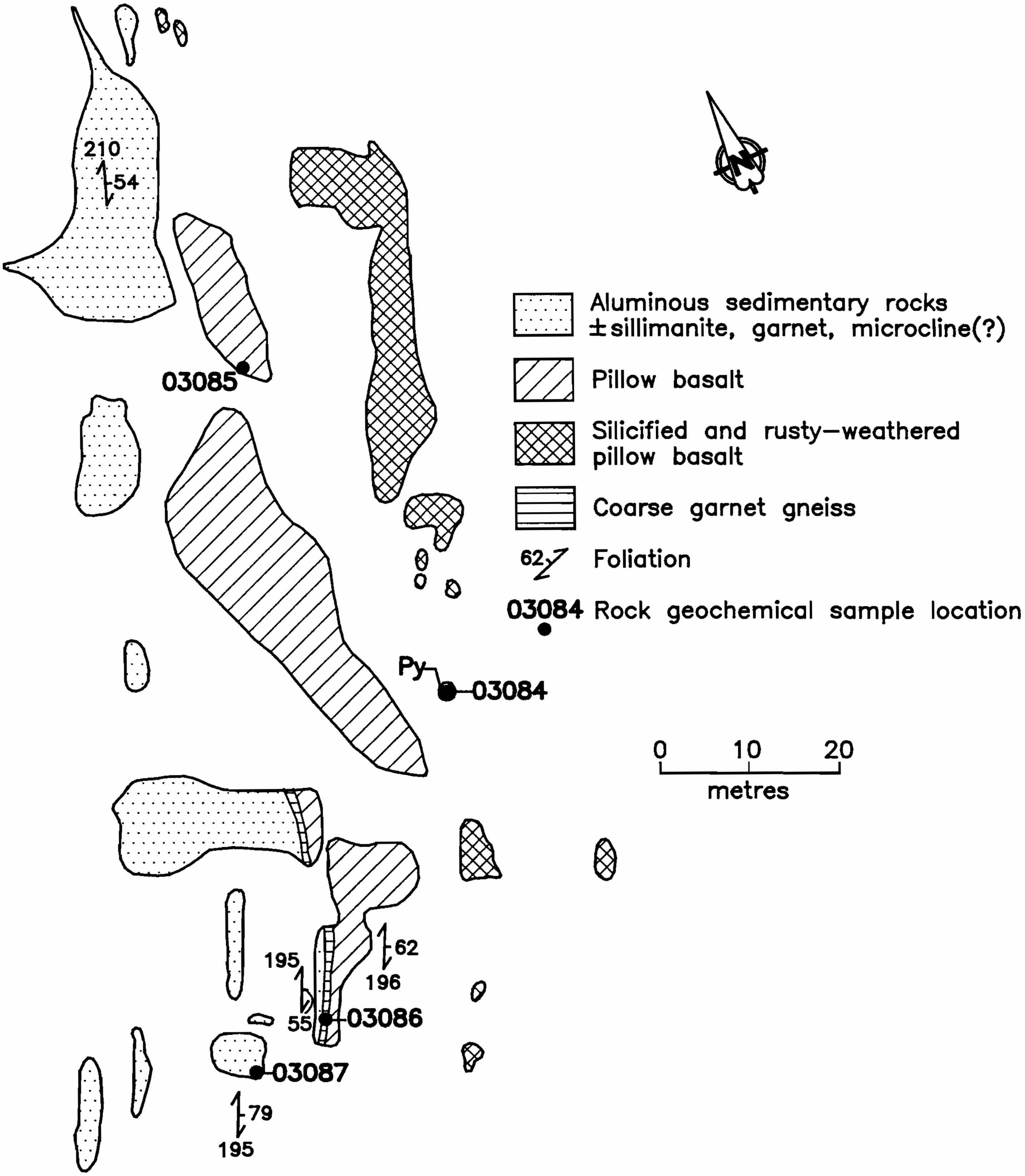


Figure 28-3: Outcrop, geology and sample location map, occurrence 28.

LOCATION: **29**

NAME: (A.F. - Mineralization intersected by diamond drilling).

AREA: North of Snow Creek.

UTM: 6081940N/437539E

AIRPHOTO: A20127-112

ACCESS: Provincial Road 393 and traverse.

EXPLORATION SUMMARY:

The area was first staked as Ex 5, 6 and Flo 24 to 26 in the 1940's. International Mining Corporation Canada Limited carried out 717 m of diamond drilling on the Flo group of claims in 1944, and Wekusko Consolidated Limited carried out diamond drilling on the same group in 1945 (Manitoba Mines and Natural Resources, 1945, 1946). Murray 1 to 4 were staked by Mrs. Cecelia Revord in 1955, and assigned to Walter Johnson in 1956. Radar 2 and 3 were staked in 1956 by W.F. English and A.L. Parres. HBED optioned the claims and carried out an HLEM survey between 1955 and 1956 (A.F. 90145, 90146, 90152, 90153). The survey outlined a 61 m long conductor on Murray 2, a 91 m long conductor on Radar 3, and a conductor on Radar 2 (A.F. 90145, 90153). HBED drilled a 93 m deep hole on Murray 2 and a 107 m deep hole on Radar 3 in 1957 (A.F. 90146, 90152). The option was abandoned in 1958, and Radar 2 and 3 were cancelled soon after. Radar 3 was restaked as Ritz 3 by W.F. English in 1959, and surface work was done on the property between 1960 and 1961 before the claim lapsed in 1962 (Mining Claim Card Ritz 3). Mrs. C. Revord acquired the Murray claims in 1961. Two holes totalling 42 m were drilled on Murray 2 and 4 by Eugene Cote for J. Murray (A.F. 90147). This drilling may have been done in 1966 (Mining Claim Card Murray 1). Surface work was done on the Murray claims between 1959 and 1965 and between 1967 and 1971 (Mining Claim Card Murray 1). Fosco Mining Limited carried out airborne EM and magnetic surveys in 1971 (A.F. 92130). The Murray claims lapsed in 1972. HBED staked CB 4737 over the former Murray claims in 1973 and Bud 42, 43, 47Fr. and 48Fr. over the former Radar 2 and 3 claims in 1974.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group felsic pyroclastic and volcaniclastic rocks. These felsic volcanic rocks are overlain to the north by Missi Group lithic arenite and to the south by interlaminated Amisk Group felsic volcanic rocks, mafic flows, pyroclastic and volcaniclastic rocks, and greywacke and shale. The McLeod Road Thrust Fault has been mapped to the south of the area of occurrence 29 (Fig. 29-1; Froese and Moore, 1980). Diamond drill holes, collared to test ground EM conductors (Fig. 29-2), intersected hornblende-chlorite gneiss and schist, rhyolite, granite, gabbro, quartz porphyry and andesite (A.F. 90146, 90147, 90152).

MINERALIZATION:

DDH 197 intersected 5.1 m of chlorite-sericite schist with hematite and quartz stringers (A.F. 90146). DDH 1 and 2 intersected disseminated pyrite, pyrrhotite and minor chalcopyrite in a biotite granulite that is locally garnetiferous and sericitic (A.F. 90147). Multiple intervals of disseminated to near solid pyrite and pyrrhotite were intersected by DDH 198. A 4.7 m interval of disseminated arsenopyrite and pyrite occurs in hornblende-mica gneiss with numerous quartz veins and blebs. The most abundant mineralization occurs between 22.4 m and 40.8 m in a variety of lithologies:

22.4-24.5 m:	pyrite stringers in hornblende-chlorite gniess
24.5-25.4 m:	disseminated pyrite and pyrrhotite in gabbro
25.4-30.6 m:	pyrite stingers in diorite
32-32.3 m:	disseminated pyrite and quartz veins in quartz-hornblende gneiss
32.3-36.9 m:	disseminated to near solid pyrite and pyrrhotite with minor chalcopyrite and sphalerite in diorite. Rhyolite is also described in this interval but its relationship to the mineralized zone is unknown
36.9-39.2 m:	near solid pyrite and pyrrhotite with minor chalcopyrite and sphalerite in gabbro
39.2-40.8 m:	pyrite "sections" and quartz veins in rhyolite

Additionally, disseminated pyrrhotite and pyrite with chalcopyrite occur over a 1 m interval of granodiorite. Disseminated pyrite and pyrrhotite are also described in quartz gneiss, granodiorite and quartz-hornblende-chlorite gneiss (A.F. 90152).

GEOCHEMICAL DATA:

Sections of drill core from DDH 2 (A.F. 90147) were collected every 1.5 m along the core and assayed for Au, Ag, Cu and Zn. The samples contain trace amounts of these metals.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. The 6.9 m intersection (32.3-39.2 m) of disseminated to near solid pyrrhotite, pyrite and minor chalcopyrite and sphalerite in DDH 198 represents the most significant mineralized zone. Although the host rocks are described as diorite and gabbro, zones of

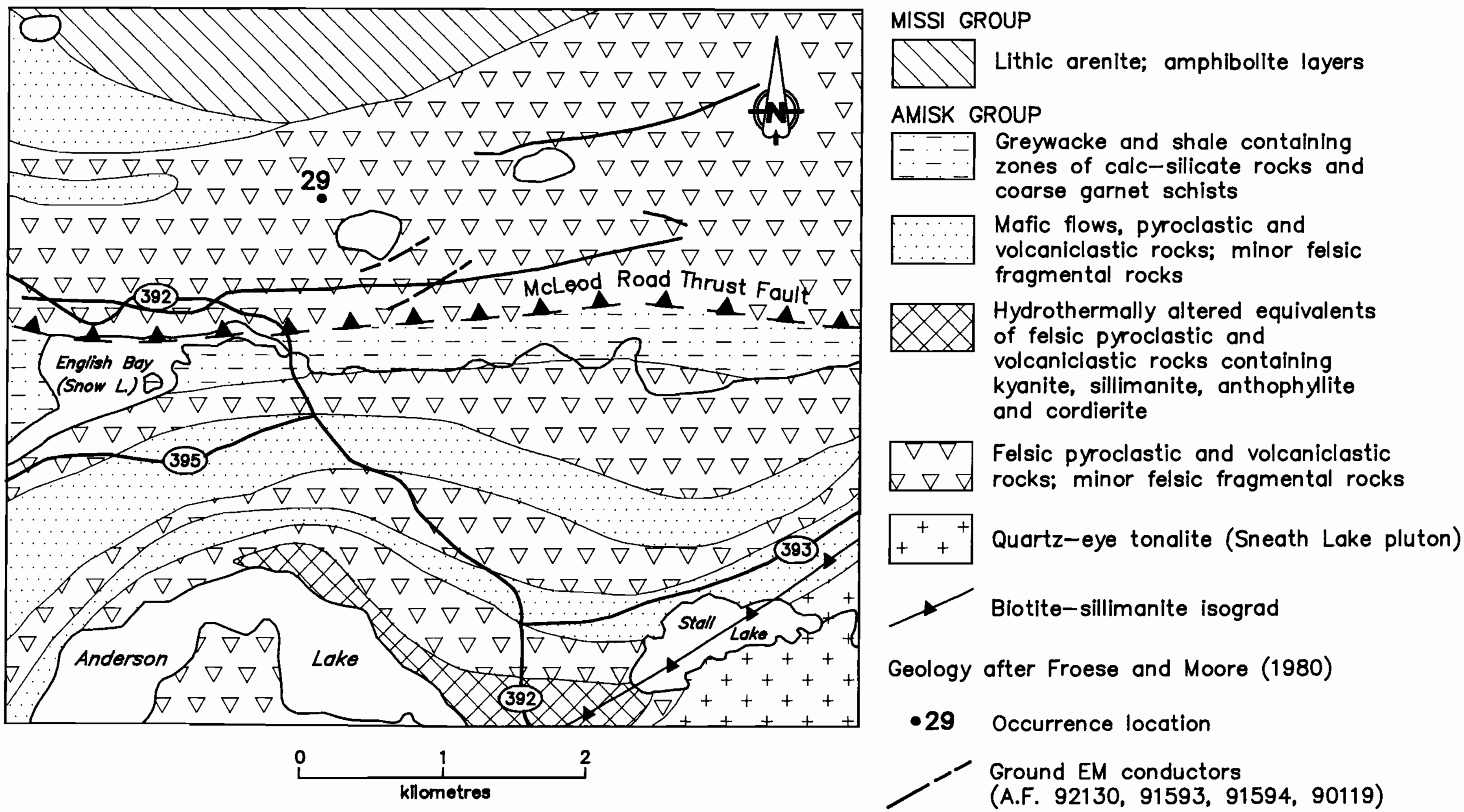


Figure 29-1: Geological setting of occurrence 29.

rhyolite are present in the section, but the relationship between rhyolite and mineralization is not specified.

REFERENCES:

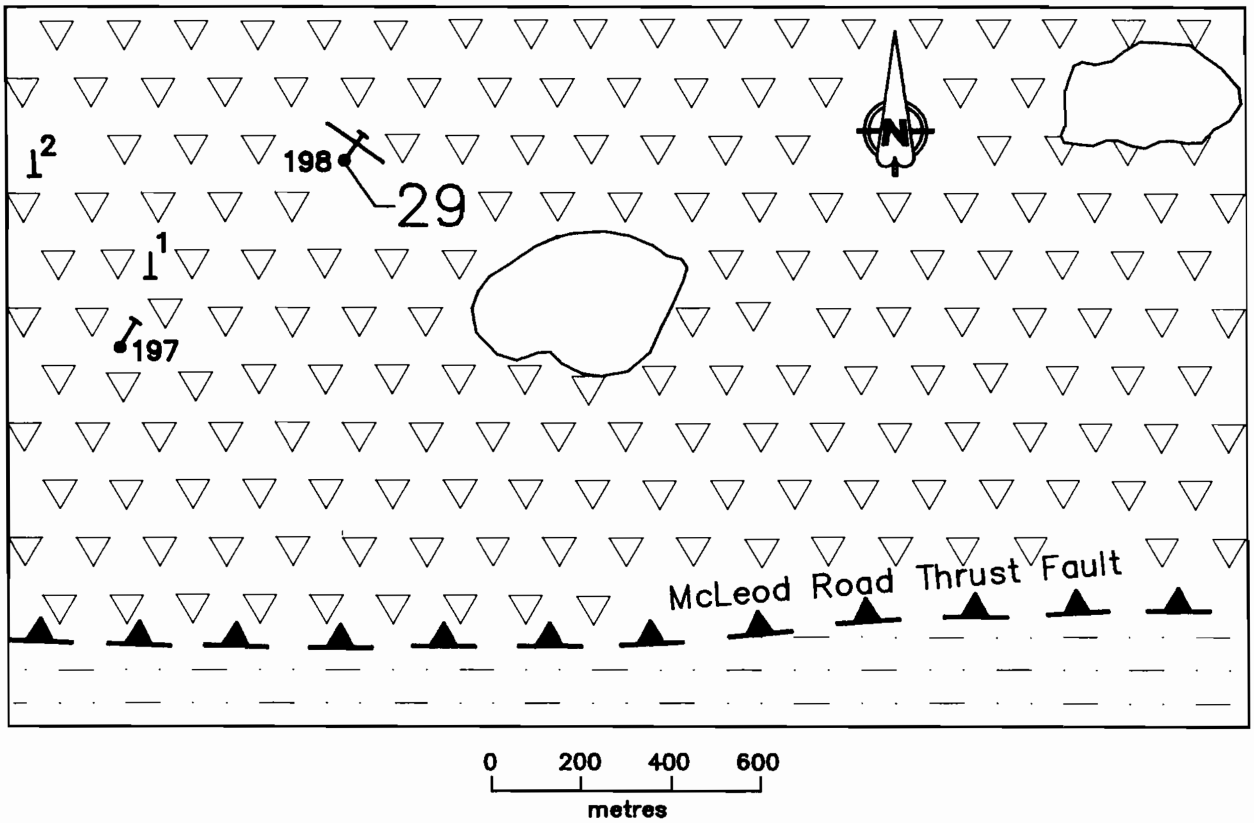
Assessment Files 90145, 90146, 90147, 90152, 90153 and 92130
Manitoba Energy and Mines, Minerals Division.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area; Geological Survey of Canada Paper 78-27, 16 p.

Gale, G.H., Baldwin, D.A. and Koo, J.
1980: A geological evaluation of Precambrian massive sulphide deposit potential in Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER79-1, 137p.

Manitoba Mines and Natural Resources,
1945: 17th Annual Report on Mines and Minerals, 105p.
1946: 18th Annual Report on Mines and Minerals, 85p.

Mining Claim Cards Ritz 3 (P 76011) and Murray 1 (P 34999)
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.



AMISK GROUP

Greywacke and shale containing zones of calc–silicate rocks and coarse garnet schists

Felsic pyroclastic and volcaniclastic rocks; minor mafic fragmental rocks

Geology after Froese and Moore (1980)

Drill hole (HBED, 197 and 198, A.F. 90146, 90152)

Drill hole (1 and 2, A.F. 90147)

Ground EM geophysical conductor (A.F. 90152)

Figure 29-2: Diamond drill hole locations and ground EM conductors, occurrence 29.

LOCATION: **30**

NAME: Pin Occurrence
UTM: 6080427N/442866E
ACCESS: Provincial Road 393 and traverse.

AREA: Kormans Lake
AIRPHOTO: A25352-53

EXPLORATION SUMMARY:

The area was first staked under the P.D. 1 and Dugan claims prior to 1930. HBED did an HLEM survey on the Snow claims between 1955 and 1956 (A.F. 90119, 90122, 90156). Kerr Addison Mines Limited did a VLEM (Crone JEM) survey on the Bob claims in 1964 (A.F. 90086). HBED staked Pin 5 in 1966. The claim was leased under 21-year lease M-9345 in 1971 and was transferred to HBM&S in 1972. HBED acquired the property in 1975.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by felsic pyroclastic and volcaniclastic rocks flanked to the west by mafic fragmental volcanic rocks and to the south by greywacke, shale and mafic volcanic rocks. All of these rock units have been assigned to the Amisk Group (Fig. 30-1; Froese and Moore, 1980). Detailed mapping in the vicinity of the occurrence delineated fine grained, sugary textured siliceous sedimentary rocks (altered felsic volcanic rocks?), pillow basalt, fragmental mafic volcanic rocks and garnetiferous dacitic rocks (Fig. 30-2; D.V. Ziehlke, pers. comm.).

MINERALIZATION:

Disseminated, veinlet and bleb pyrite, chalcopyrite, sphalerite and galena hosted by white quartz veins occur within rubbly outcrops of mafic tuff. Rubble was produced by blasting.

GEOCHEMICAL DATA:

Two representative rock samples (71-84-Pin-50 and 71-84-Pin-52) were collected from the mineralized quartz vein rubble for analysis. The samples contain 3298 and 1772 ppm Cu, 18743 and 11248 ppm Pb, 5891 and 2981 ppm Zn, 15 and 8 ppm Cd, 16 and 10 ppm Bi, 56.2 and 30.3 ppm Ag, and 7400 and 5200 ppb Au, respectively. The remainder of the analyses are presented in Appendix I.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. Multiple quartz veins are mineralized with base and precious metals. These metals, as well as the silica, that form this occurrence may represent a leakage halo that has developed from the mineralized host rocks and the Rod Cu-Zn deposit.

REFERENCES:

Assessment Files 90019, 90086, 90122 and 90156
Manitoba Energy and Mines, Minerals Division.

Eccles, D.R. and Fedikow, M.A.F.
1985: Mineral occurrence documentation and alteration zone mapping, Snow Lake area; In Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 82-99.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area; Geological Survey of Canada Paper 78-27, 16p.

Fedikow, M.A.F., Roney, C.T., Schmidt, G.J. and Robbie, T.J.
1986: Mineral deposit studies in the Snow Lake area; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1986, p. 77-85.

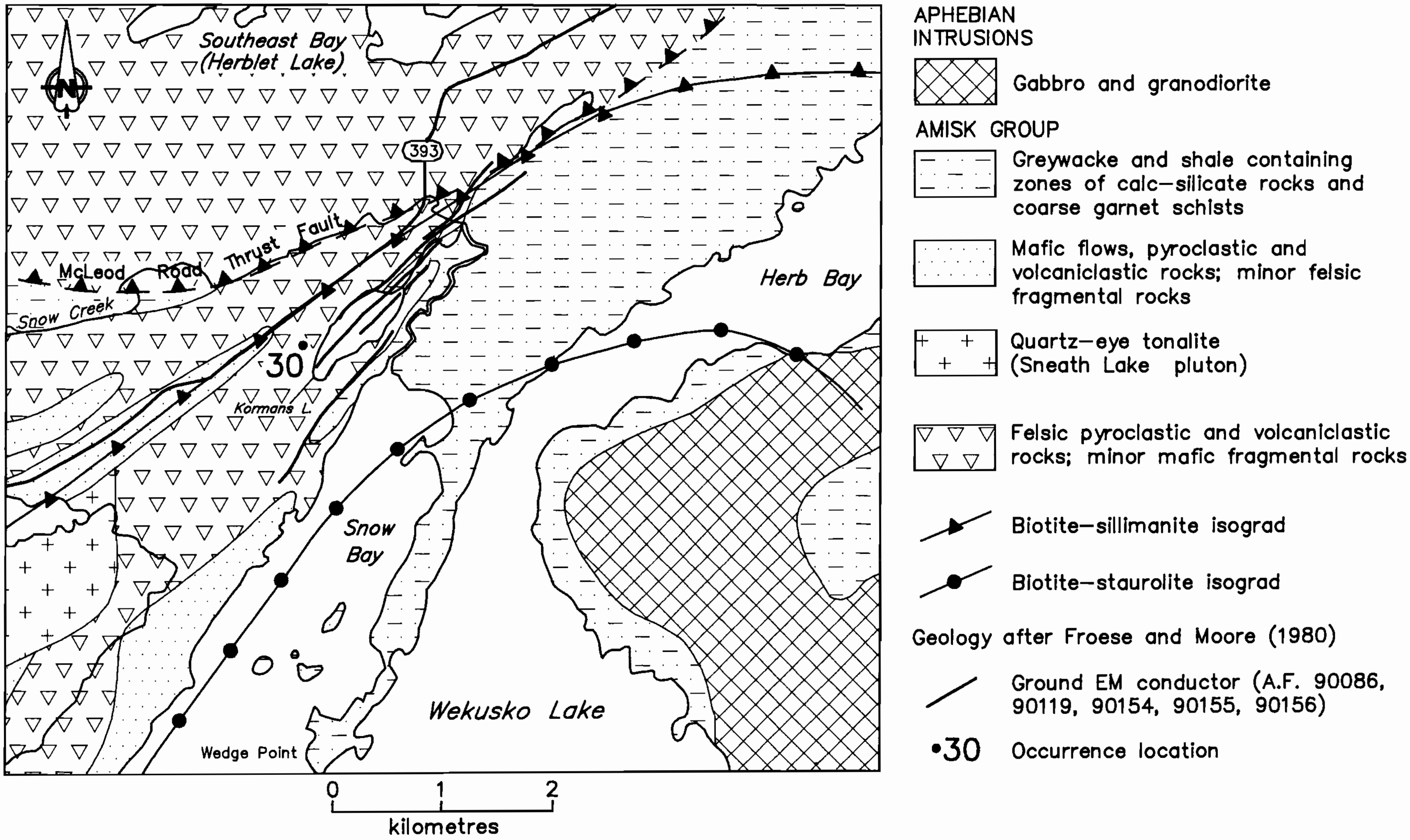


Figure 30-1: Geological setting of occurrence 30.

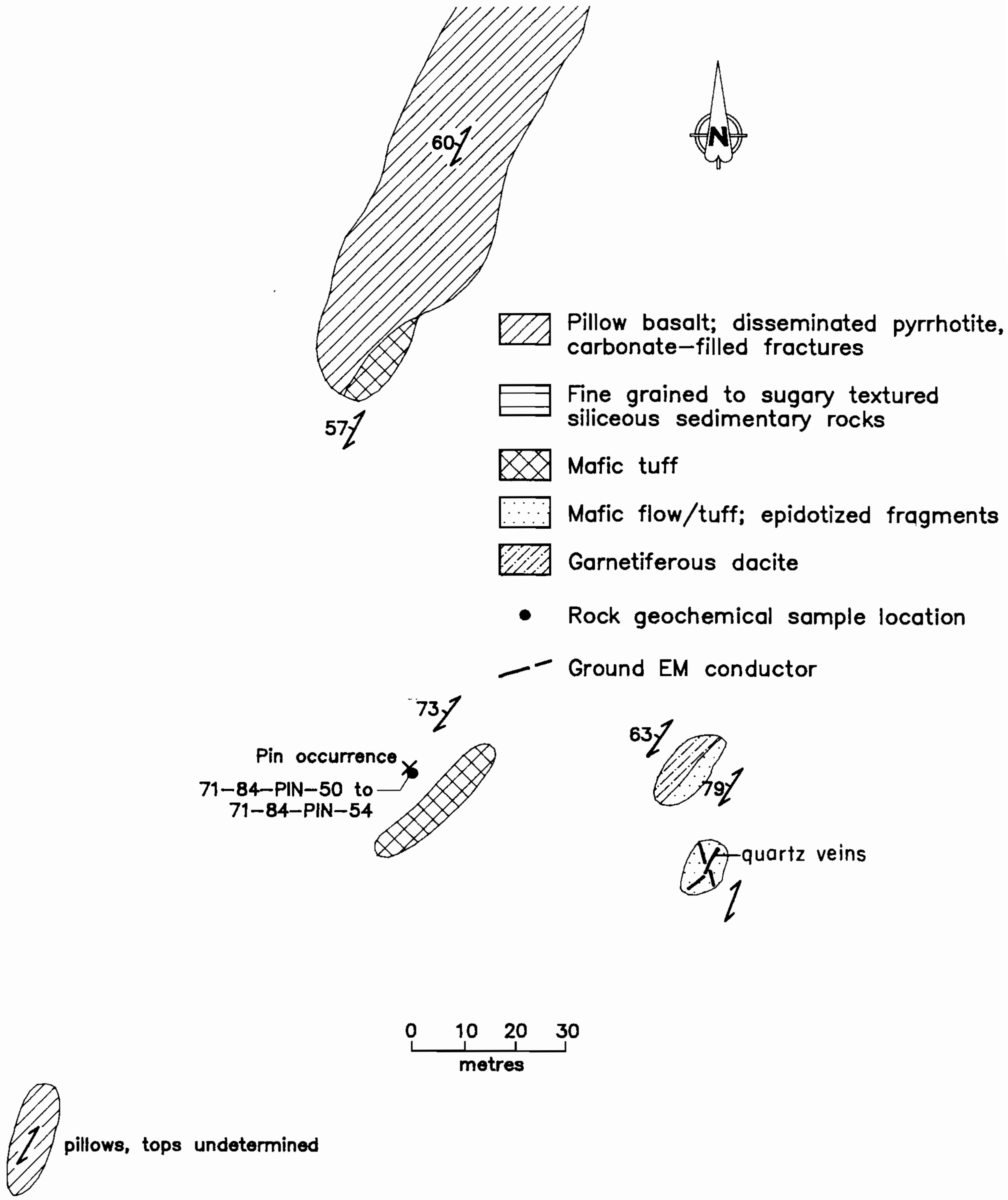


Figure 30-2: Outcrop, geology and sample location map, occurrence 30.

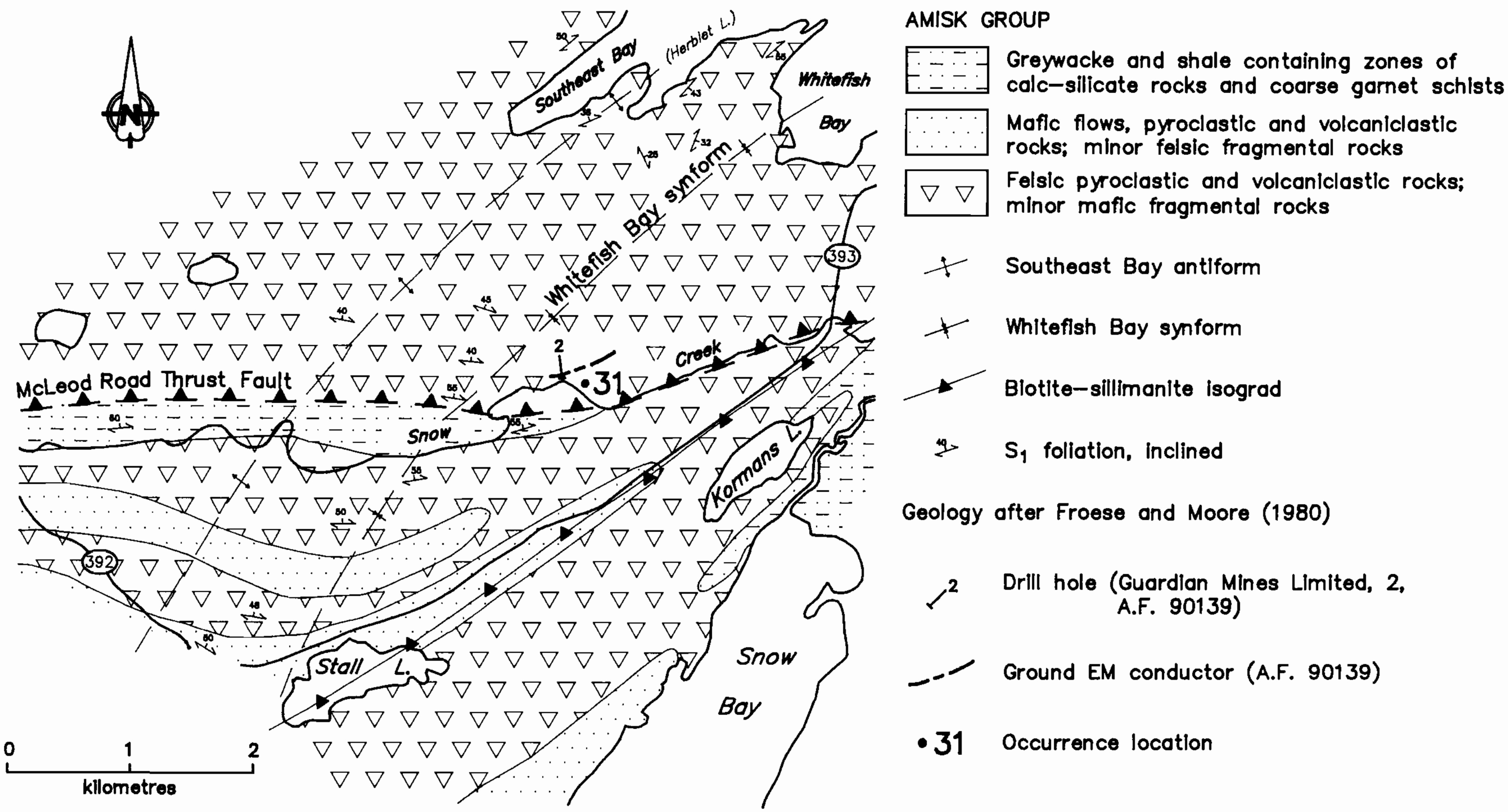


Figure 31-1: Geological setting, diamond drill hole location and ground EM conductors, occurrence 31.

LOCATION: **31**

NAME:
UTM: 6081180N/442004E
ACCESS: Provincial Road 393 and traverse.

AREA: Snow Creek.
AIRPHOTO: A20127-111

EXPLORATION SUMMARY:

The area was first staked as Teepee 3, Teepee 6 and LPH 1 prior to 1930. HBED did an HLEM survey on the Pox claims in 1956 (A.F. 90156). An airborne EM survey was done in the area by Canadian Nickel Company Limited in 1957 (A.F. 91624; Ground Hog Sheet 10). HBED staked Tal 10 in 1962 and Pin 10 Fr., 16 Fr. and 17 Fr. in 1966. Two holes were drilled on Tal 10, but the logs are not available (A.F. 90156). Guardian Mines Limited did a Turam EM survey on the Fox group of 18 claims and drilled a 245 m deep hole on Fox 5 in 1967 (A.F. 90139). Guardian Mines had apparently drilled two holes totalling 236 m on an 18 claim grouping in 1967 (Guardian Mines Limited, Corporation File). HBED acquired 21-year leases M-9345 and M-9347 for the Pin and Tal claims in 1971. HBM&S acquired the property in 1972. HBED staked Pin 19 Fr. in 1973 and acquired Tal 10, and Pin 10 Fr., 16 Fr. and 17 Fr. in 1975.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by felsic pyroclastic and volcaniclastic rocks flanked to the southwest by mafic flows, pyroclastic and volcaniclastic rocks. The mafic and felsic volcanic sequences have been assigned to the Amisk Group. The axial trace of the Whitefish Bay Synform has been mapped in the general area of the occurrence. The McLeod Road Thrust Fault is situated just south of the occurrence (Fig. 31-1; Froese and Moore, 1980). Detailed outcrop mapping has delineated felsic and mafic pyroclastic and massive volcanic rocks, an intermediate porphyritic intrusion and a highly altered zone consisting of rusty-weathered anthophyllite-cordierite-garnet that occurs at the contact between felsic tuffaceous and volcaniclastic rocks and a mafic sequence of massive, porphyritic, fragmental and tuffaceous rocks (Fig. 31-2). Garnets in the altered zone are densely packed and are 0.3 to 2.0 cm in diameter. Anthophyllite crystals are commonly up to 4.0 cm in length; locally, cordierite porphyroblasts are up to 3.0 cm in diameter. The rock types throughout the general area are variably altered; silicified garnetiferous and rusty-weathered zones are common. Diamond drilling intersected garnetiferous mafic volcanic rocks, graphite-coated shears in mafic volcanic rocks, and felsic volcanic rocks (A.F. 90139).

MINERALIZATION:

Disseminated pyrite and pyrrhotite occur with garnet-anthophyllite-cordierite at site 1 and in silicified rusty weathered porphyritic and massive basalt at site 2 (Fig. 31-2). DDH 2 (A.F. 90139) intersected: 1) disseminated pyrrhotite and minor chalcopyrite in garnetiferous mafic volcanic rocks; and 2) 0.6 m of "massive" pyrrhotite in predominantly pyritic mafic volcanic rocks.

GEOCHEMICAL DATA:

Representative outcrop chip sample 01089 was collected from the general area of the occurrence (Fig. 31-2) for multi-element geochemical analysis. The sample contains low base and precious metal values (Appendix I).

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. The 0.6 m intersection of massive pyrrhotite may be hosted by a mafic tuffaceous layer. The coarse grained mineral assemblage of garnet-anthophyllite-cordierite iron sulphides is generally diagnostic, in the Snow Lake base metal mining camp, of an elemental loss and gain regime related to the formation of massive sulphide type deposits.

REFERENCES:

Assessment Files 90139, 90156 and 91624
Manitoba Energy and Mines, Minerals Division.

Eccles, D.R. and Fedikow, M.A.F.
1985: Mineral occurrence documentation and alteration zone mapping, Snow Lake area; in Manitoba Energy and Mines, Report of Field Activities, 1985, p. 82-99.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area; Geological Survey of Canada Paper 78-27, 16p.

Guardian Mines Limited
Manitoba Energy and Mines, Minerals Division, Corporation Files.

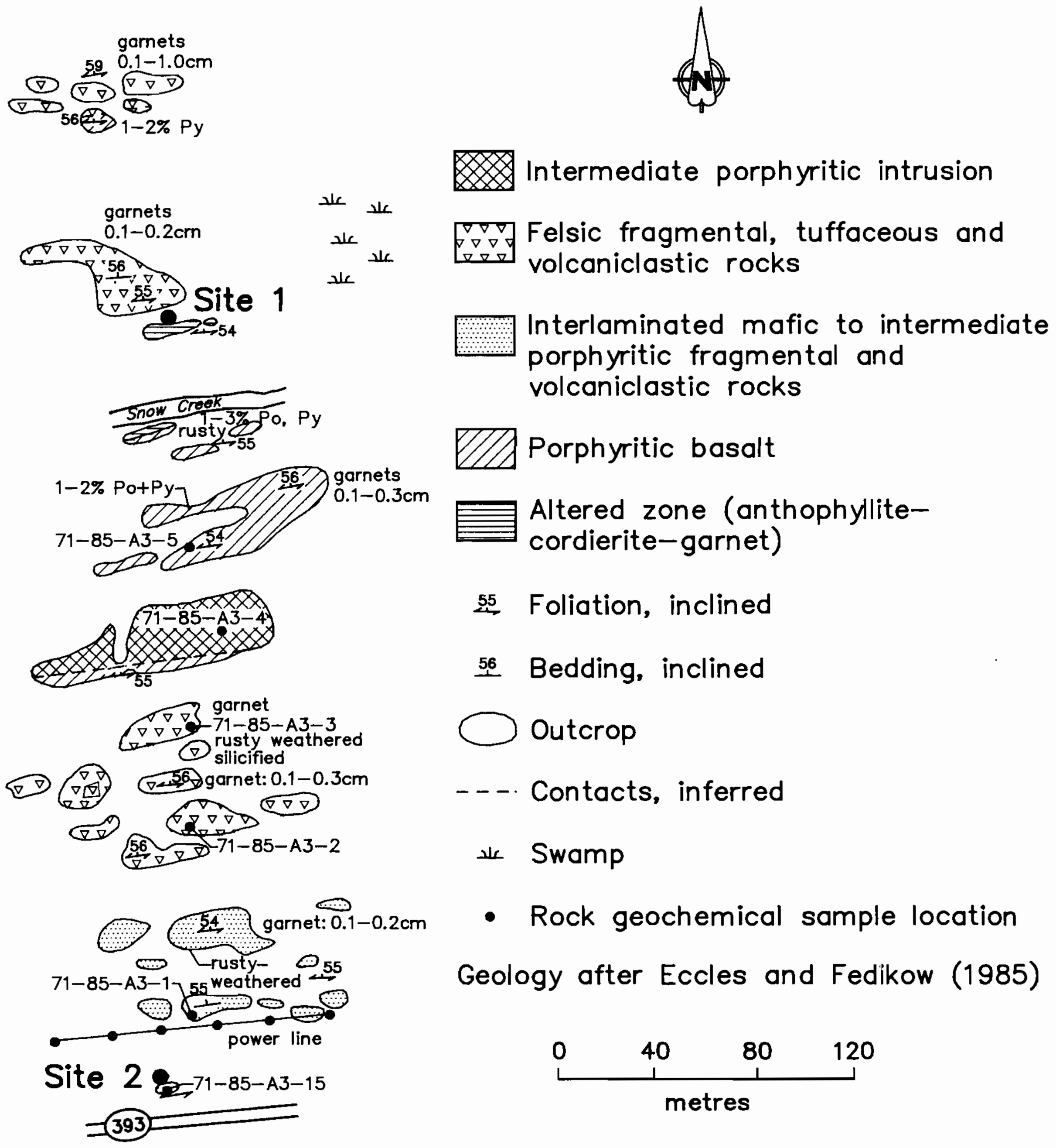


Figure 31-2: Detailed geology at occurrence 31, Snow Creek area, Snow Lake.

LOCATION: **32**

NAME: (A.F. - Mineralization intersected by diamond drilling).

AREA: Crowduck Bay, Wekusko Lake.

UTM: 6090820N/440077E

AIRPHOTO: A20782-50

ACCESS: Boat on Wekukso Lake.

EXPLORATION SUMMARY:

The area may have been partly staked under the Mundic 2, 5 and 6 claims in 1929. Between 1929 and 1930 six trenches were dug on Mundic 2 and four trenches were dug on Mundic 6 (Mineral Inventory Card 63J/13 Ni 2). Wright (1938) describes trenches on Mundic 5. The exact locations of these claims are not known. The Strike and Frost group of claims were staked in 1956 and assigned to General Lithium Mining and Chemical Corporation Limited. In 1956, C.J. Power carried out a three hole 141 m diamond drill program and dug one trench on Strike 16, and drilled a 63 m deep hole on Frost 7 and a 60 m deep hole on Frost 8 (A.F. 90074). Canadian Nickel Company Limited did an airborne EM survey in the area in 1957 (A.F. 91624). HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650). William Clark staked Nick 7 in 1971, and did surface work on the property in 1973 (Mining Claim Card Nick 7). The claim lapsed in 1974. The ground was held by Snow Lake Exploration Limited from 1981 to 1987. Granges Exploration Limited staked Tiz 4 and 5 in 1988 and did work on the property in 1989 (Mining Claim Cards Tiz 4 and Tiz 5). The claims were cancelled in 1991.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group greywacke and shale intruded by diorite and gabbro of uncertain age (Fig. 32-1; Gordon and Gall, 1982; Frarey, 1950). Diamond drilling (Fig. 32-2) intersected pegmatite and variably altered greywacke (A.F. 90074).

MINERALIZATION:

DDH 2 and 4 intersected; (1) "altered" greywacke containing trace pyrite associated with quartz-carbonate veinlets, and (2) pyrite-coated fractures associated with a fault or shear zone (A.F. 90074).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses.

REFERENCES:

Alcock, F.J.

1918: Wekukso Lake area, northern Manitoba; Geological Survey of Canada, Summary Report, 1917, Part D, p. 8-17.Alcock, F.J.

1920: The Reed-Wekusko map area, northern Manitoba; Geological Survey of Canada, Memoir 119, 47p.

Assessment File 90074, 91624 and 91650

Manitoba Energy and Mines, Minerals Division.

Cerny, P., Trueman, D.L., Ziehlke, D.V., Goad, B.E. and Paul, B.J.

1981: The Cat Lake-Winnipeg River and the Wekusko Lake pegmatite fields, Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER80-1, 216p.

Frarey, M.J.

1950: Crowduck Bay; Geological Survey of Canada Map 987A, 1:63 360.

Gordon, T.M.

1981: Metamorphism in the Crowduck Bay area, Manitoba; in Geological Survey of Canada, Current Research, Part A, Paper 81-1A, p. 315-316.

Gordon, T.M. and Gall, Q.

1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Gunter, W.R. and Yamada, P. H.

1985: Evaluation of industrial mineral occurrences in the Snow Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 100-104.

Mining Claim Cards Nick 7 (P3613E), Tiz 4 (P6535E), and Tiz 5 (P6536E)

Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Mineral Inventory Card 63J/13 Ni 2

Manitoba Energy and Mines, Minerals Division.

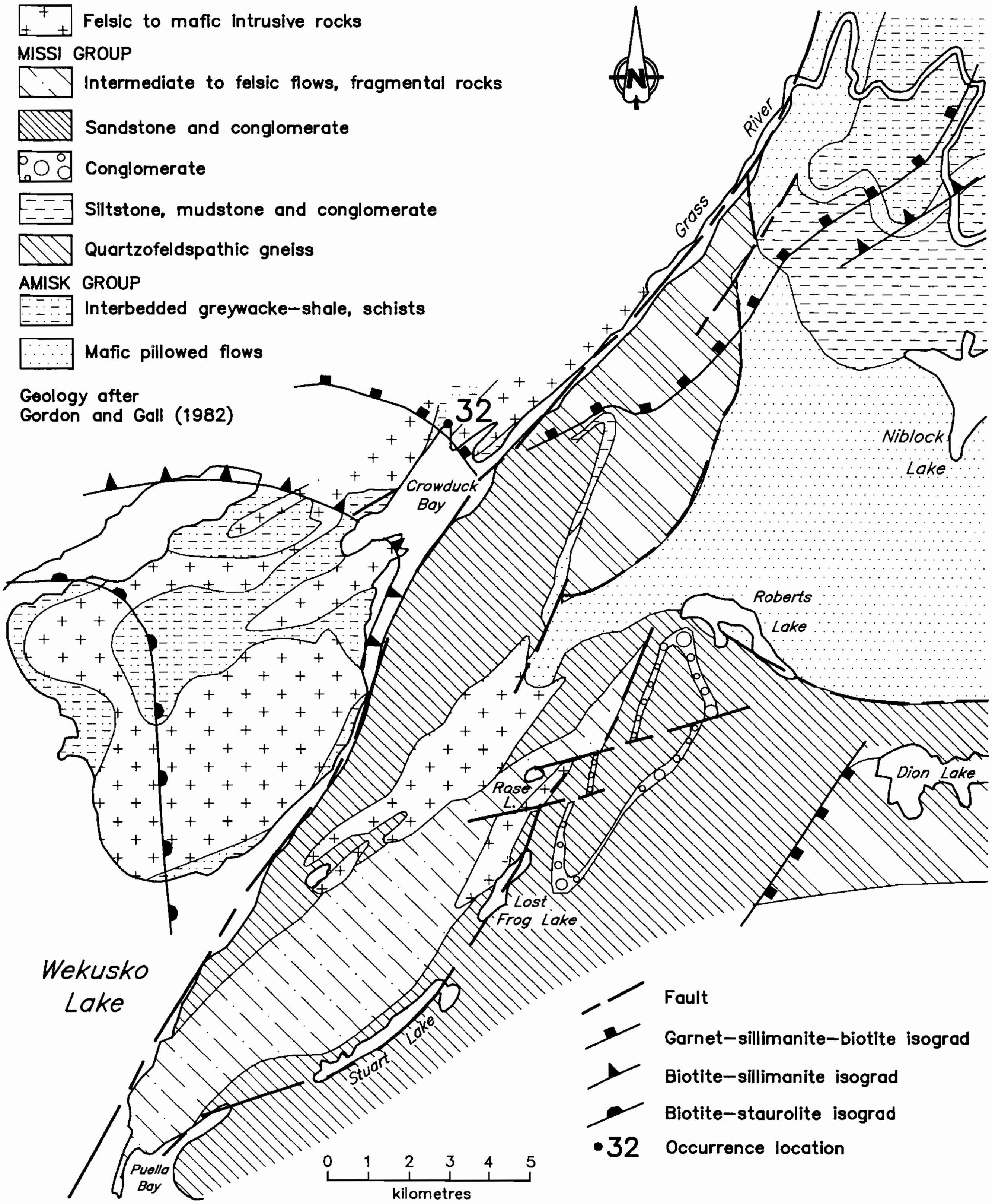


Figure 32-1: Geological setting of occurrence 32.

Sabina, A.P.

1987: Rocks and minerals for the collector, La Ronge-Creighton, Saskatchewan; Flin Flon-Thompson, Manitoba; Geological Survey of Canada, Miscellaneous Report 42, 81p.

Wright, J.F.

1938: Geology and mineral deposits of a par northwest Manitoba; Geological Survey Canada, Summary Report, 1930, Part 124p.

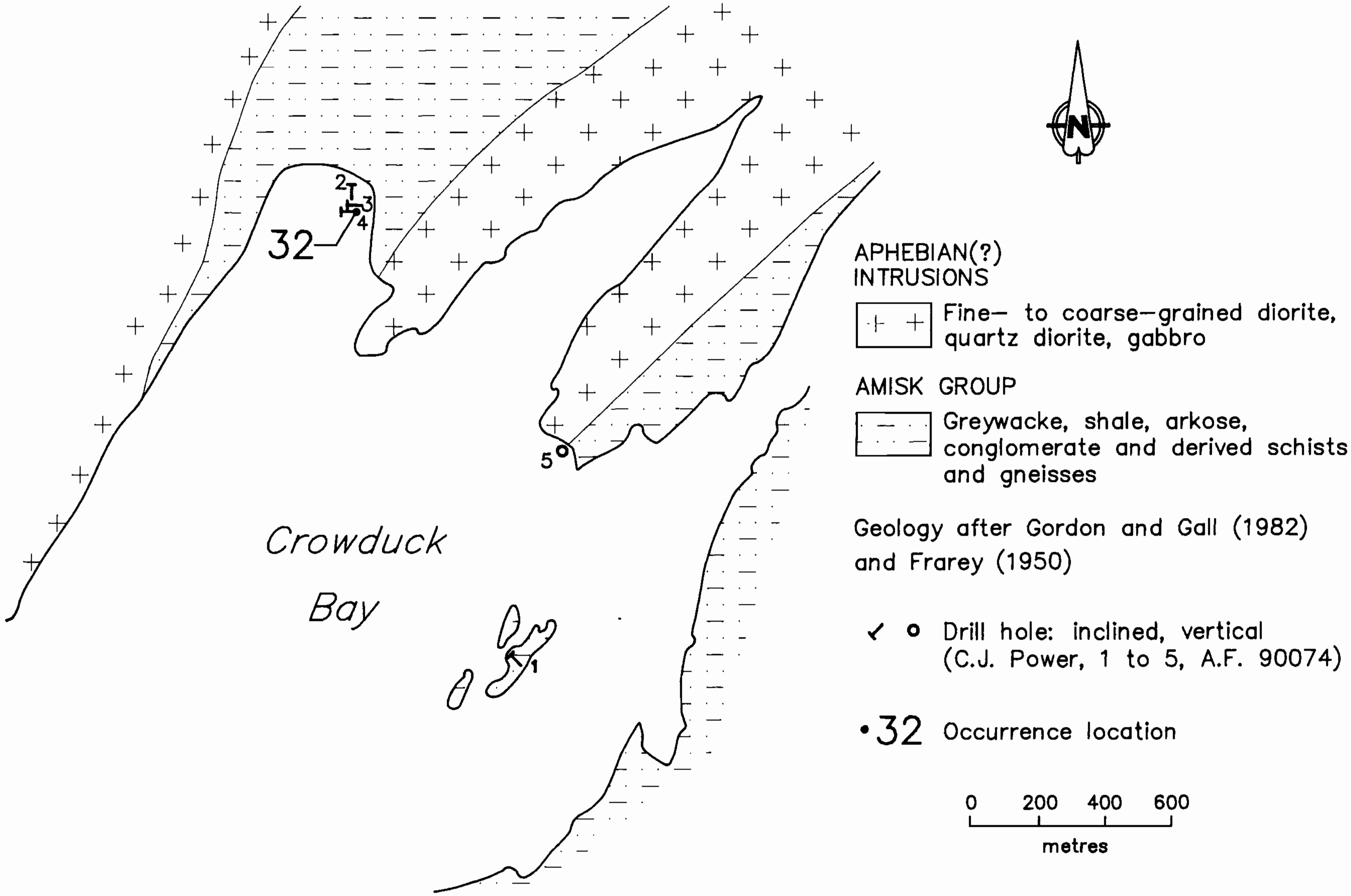


Figure 32-2: Local geology and diamond drill hole locations, occurrence 32.

LOCATION: **33**

NAME: (A.F. - Mineralization intersected by diamond drilling).

AREA: Kormans Lake.

UTM: 6080451N/442289E

AIRPHOTO: A25352-53

ACCESS: Provincial Road 393 and traverse.

EXPLORATION SUMMARY:

The area was first staked prior to 1930. HBED carried out an HLEM survey on the property between 1955 and 1956 and drilled two holes totalling 273 m on Snow 10 in 1957 (A.F. 90119, 90122). HBED also drilled one hole on claim M.P. 5, but the drill log is unavailable (A.F. 90122). Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624, Ground Hog Sheet 10 and 13). Kerr Addison Mines Limited did a VLEM survey on the Bob claims in 1964 (A.F. 90086). Canadian Nickel Company Limited undertook diamond drilling on the Sko group between 1967 and 1969 (Mining Claim Card Sko 30). Stall Lake Mines Limited did magnetometer and EM (DPM-1) surveys on CB 3558 in 1971 (A.F. 91601). Diamond drilling was done in 1974 on a claim grouping t'!t included CB 3558 (Mining Claim Card CB 3558). The area is covered by Pin 7 held by HBED since 1966 and leased under a 21 year lease M-9345 in 1971, M.P. 5 held by Threehouse Mines Limited since 1971, and CB 9036 staked in 1978 by Granges Exploration Aktiebolag.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group felsic pyroclastic and volcaniclastic rocks, and staurolitic greywacke and shale. The mineralized area is south of the McLeod Road Thrust Fault and situated between the biotite-sillimanite isograd to the north and the biotite-staurolite isograd to the south (Fig. 33-1; Froese and Moore, 1980). Diamond drill holes, collared to test long and short strike length ground EM conductors in the area, intersected altered fragmental andesite, locally garnetiferous, staurolitic and mineralized, quartz-hornblende-biotite gneiss, chlorite-mica schist, fragmental and massive siliceous gneiss, and chemical sedimentary rocks (A.F. 90122).

MINERALIZATION:

DDH 55 intersected 10.7 m of graphite schist with talc, chlorite and disseminated pyrite and 6.7 m and 17.3 m intervals of near solid graphite with disseminated pyrite. DDH 205 intersected 4.8 m of graphite-mica schist with pyrite stringers and minor chlorite and 3.7 m of graphite schist with disseminated pyrite and talc layers. Logs for DDH 34 are not available.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

Assessment Files 90086, 90119, 90122, 90154, 90155, 90156, 91601 and 91624
Manitoba Energy and Mines, Minerals Division.

Fedikow, M.A.F., Roney, C.T., Schmidt, G.J. and Robbie, T.
1986: Mineral deposit studies in the Snow Lake area; in Manitoba Energy and Mines, Geological Services Branch, Report of Field Activities, 1986, p. 77-85.

Froese, E. and Gasparrini, E.
1975: Metamorphic zones in the Snow Lake area, Manitoba; Canadian Mineralogist, v. 13, p. 162-167.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area; Geological Survey of Canada Paper 78-27, 16p.

Gobert, G.
1990: Till geochemistry of the Snow Lake area (NTS 63K/16, 63J/13, 63J/12); in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1990, p. 72-73.

Mining Claim Card Sko 30 (P4647C) and CB 3558
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

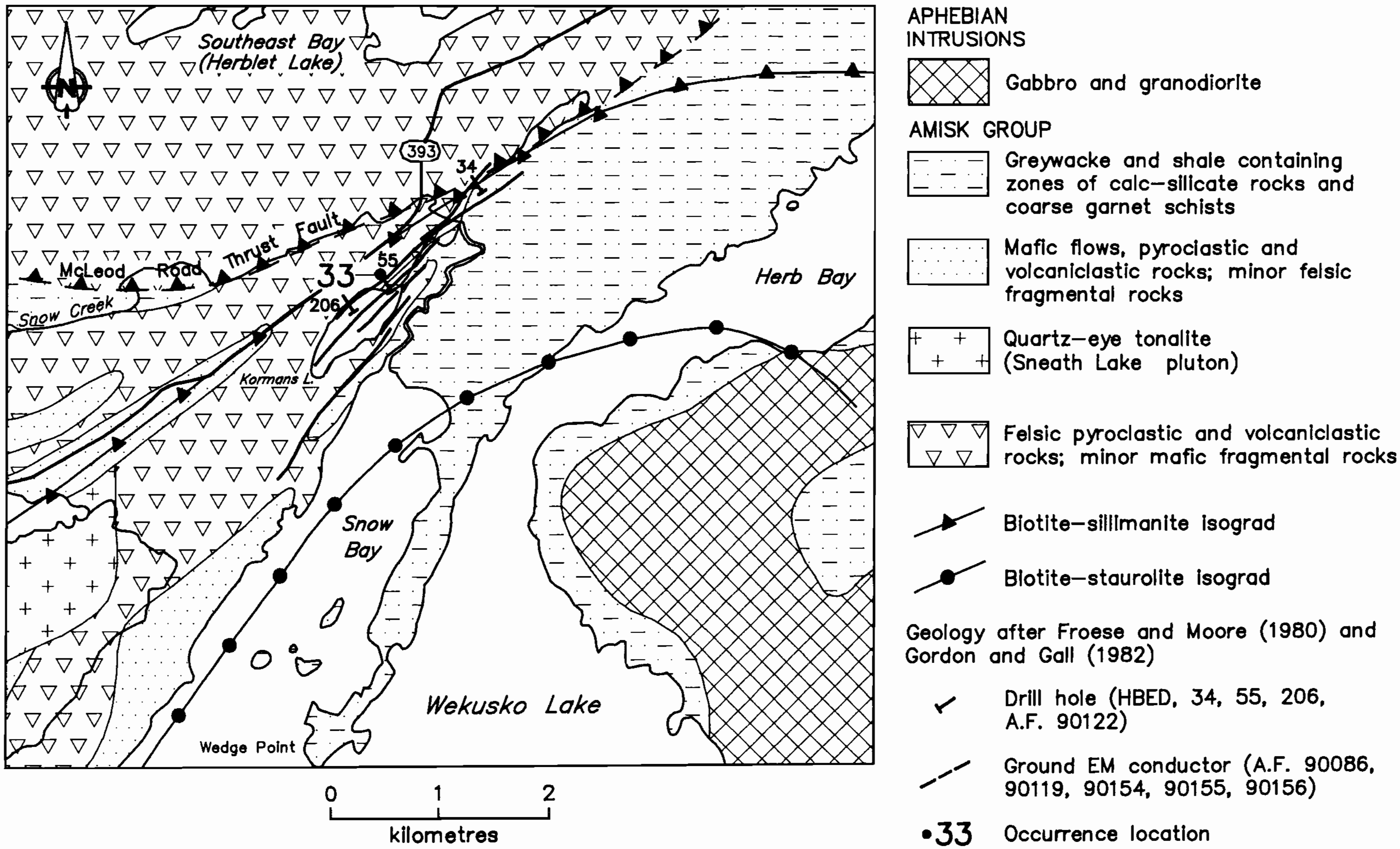


Figure 33-1: Geological setting, ground EM conductors and diamond drill hole locations, occurrence 33.

LOCATION: **34**

NAME:

UTM: 6082950N/437438E

ACCESS: Provincial Highway 392 and traverse.

AREA: Northeast of English Bay, Snow Lake.

AIRPHOTO: A20170-19

EXPLORATION SUMMARY:

The area was first staked as the Fold claims in the late 1940's. In 1956 HBED did an HLEM survey and outlined a 200 m long conductor on Bill 3 and a 61 m long conductor on Ike 1 (A.F. 90119, 90138, 90140, 90153). A 103 m deep hole was drilled on Ike 1 and a 95 m hole was drilled on Bill 3 by HBED in 1957 (A.F. 90133). W.F. English did surface work on Lew 3 between 1960 and 1961 (Mining Claim Card Lew 3). Fosco Mining Limited carried out airborne EM and magnetic surveys in the area in 1971 (A.F. 92130). The ground is presently covered by CB 6422, CB 7031 and CB 10620 staked by HBED in 1974, 1978 and 1979, respectively. CB 7031 was transferred to Mingold Resources Inc. in 1988.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Missi Group lithic arenite flanked to the south by Amisk Group mafic and felsic pyroclastic and volcaniclastic rocks and mafic flows (Fig. 34-1; Froese and Moore, 1980). Diamond drill holes that tested ground EM conductors intersected altered andesite and garnet-quartz-biotite gneiss (Fig. 34-1 ; A.F. 90133, 90153).

MINERALIZATION:

DDH BIL-1 intersected multiple intervals of near solid pyrite that vary in core thickness from 0.1 to 0.9 m. These near solid sulphides have two distinct modes of occurrence. The thicker near solid pyrite (0.9 m) intervals occur in a graphite matrix, whereas the thinner (0.2 m) pyrite layers are associated with sericitic, garnetiferous and staurolitic andesite. DDH IKE-1 intersected 1.8 m of graphite with disseminated pyrite in an interlayered sequence of garnet-staurolite-quartz-biotite gneiss and gneissic, garnetiferous andesite (A.F. 90133).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. Some of the alteration characteristics reported in the drill log for core from DDH BIL-1 are similar to those associated with massive sulphide type deposits.

REFERENCES:

Assessment Files 90119, 90133, 90138, 90140, 90152, 90153 and 92130

Manitoba Energy and Mines, Minerals Division.

Eccles, D.R. and Fedikow, M.A.F.

1985: Mineral occurrence documentation and alteration zone mapping, Snow Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 82-99.

Froese, E. and Moore, J.M.

1980: Metamorphism in the Snow Lake area; Geological Survey of Canada Paper 78-27, 16p.

Gobert, G.

1990: Till geochemistry of the Snow Lake area (NTS 63K/16, 63J/13, 63J/12); in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1990, p. 72-73.

Mining Claim Card Lew 3 (P76000)

Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Russell, G.A.

1957: Structural studies of the Snow Lake - Herb Lake area; Manitoba Mines and Natural Resources, Publication 55-3, 33p.

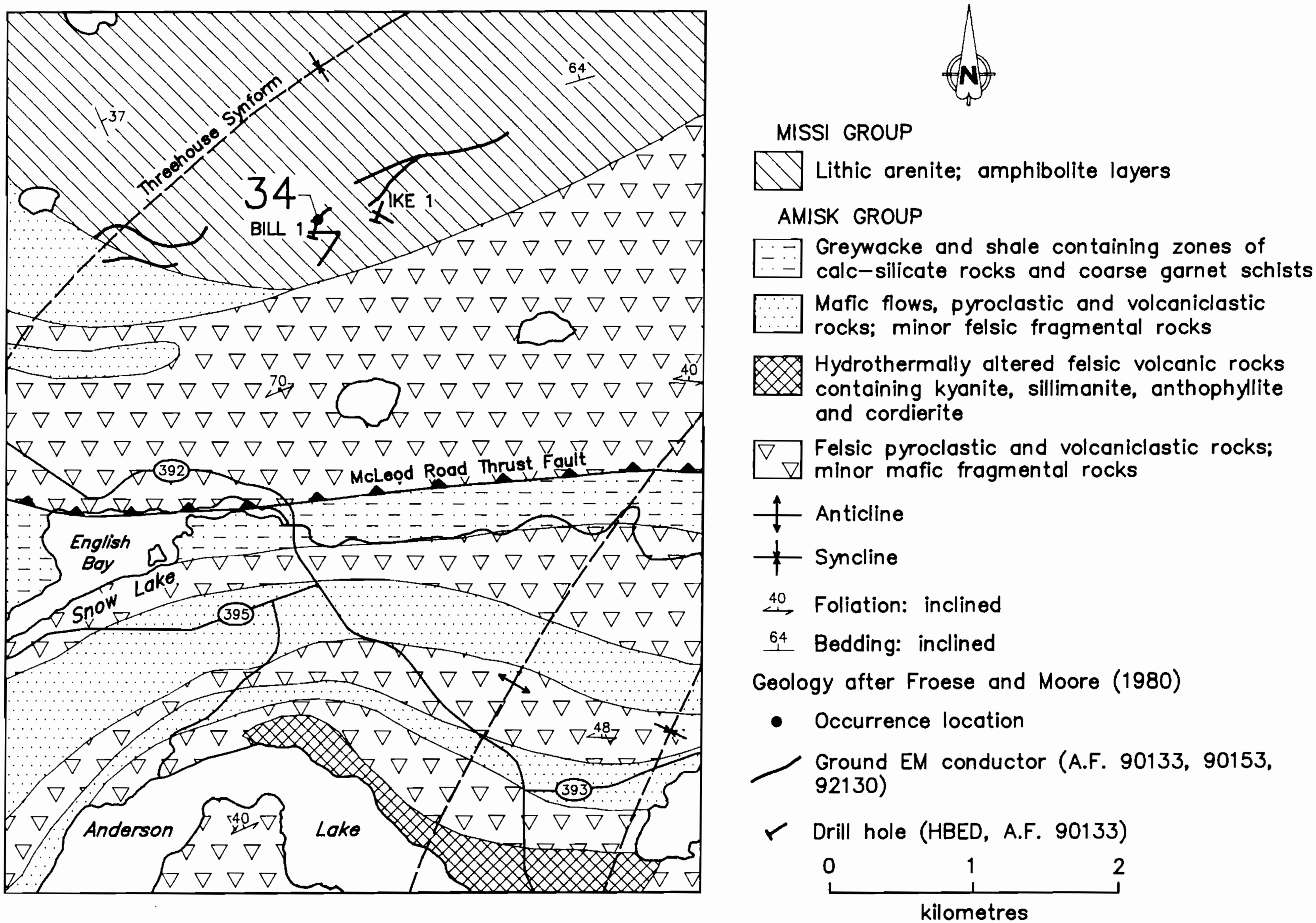


Figure 34-1: Geological setting of occurrence 34.

LOCATION: **35**

NAME: (A.F. - Mineralization intersected by diamond drilling)

UTM: 6073822N/435792E

ACCESS: Provincial Highway 392 and traverse.

AREA: North of Berry Creek.

AIRPHOTO: A20170-120

EXPLORATION SUMMARY:

The P.A. claim was staked in the area in the late 1940's. In 1949, Walter Johnson drilled a 46 m deep hole on P.A. on behalf of Andrew Paterson (A.F. 90117). HBED did an HLEM survey on the Ram claims in 1956 (A.F. 90119, 90058). Alpha Mines Limited did a Turam survey in 1968 and delineated a conductor on Dianne 41 and 42 (A.F. 91514). The Dianne claims were cancelled in 1972. The ground was held by A.L. Parres from 1973 to 1976, by W. Bruce Dunlop Limited from 1980 to 1985, under option to Noranda Exploration Company Limited from 1981 to 1982, and by Snow Lake Exploration from 1984 to 1988. W. Bruce Dunlop Limited staked Berry 4 over the former CB 11466 area in 1986 and optioned it to Granges Exploration Limited from 1987 to 1988. One year of assessment work had been reported on CB 11466 in 1983 (Mining Claim Card CB 11466). W. Bruce Dunlop Limited also staked Berbay 7 in the area in 1990.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group quartz-eye tonalite that intrudes mafic flows, pyroclastic and volcaniclastic rocks (Fig. 35-1; Froese and Moore, 1980). Basalt and porphyry were intersected by diamond drilling (A.F. 90117).

MINERALIZATION:

DDH 1 intersected 1.8 m of porphyry with disseminated pyrite. Nonmineralized quartz veins occur in porphyry over 2.7 m in the same drill hole. Mineral percentages are not reported (A.F. 90117).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 90058, 90117, 90119 and 91514
Manitoba Energy and Mines, Minerals Division.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.

Mining Claim Card CB 11466
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

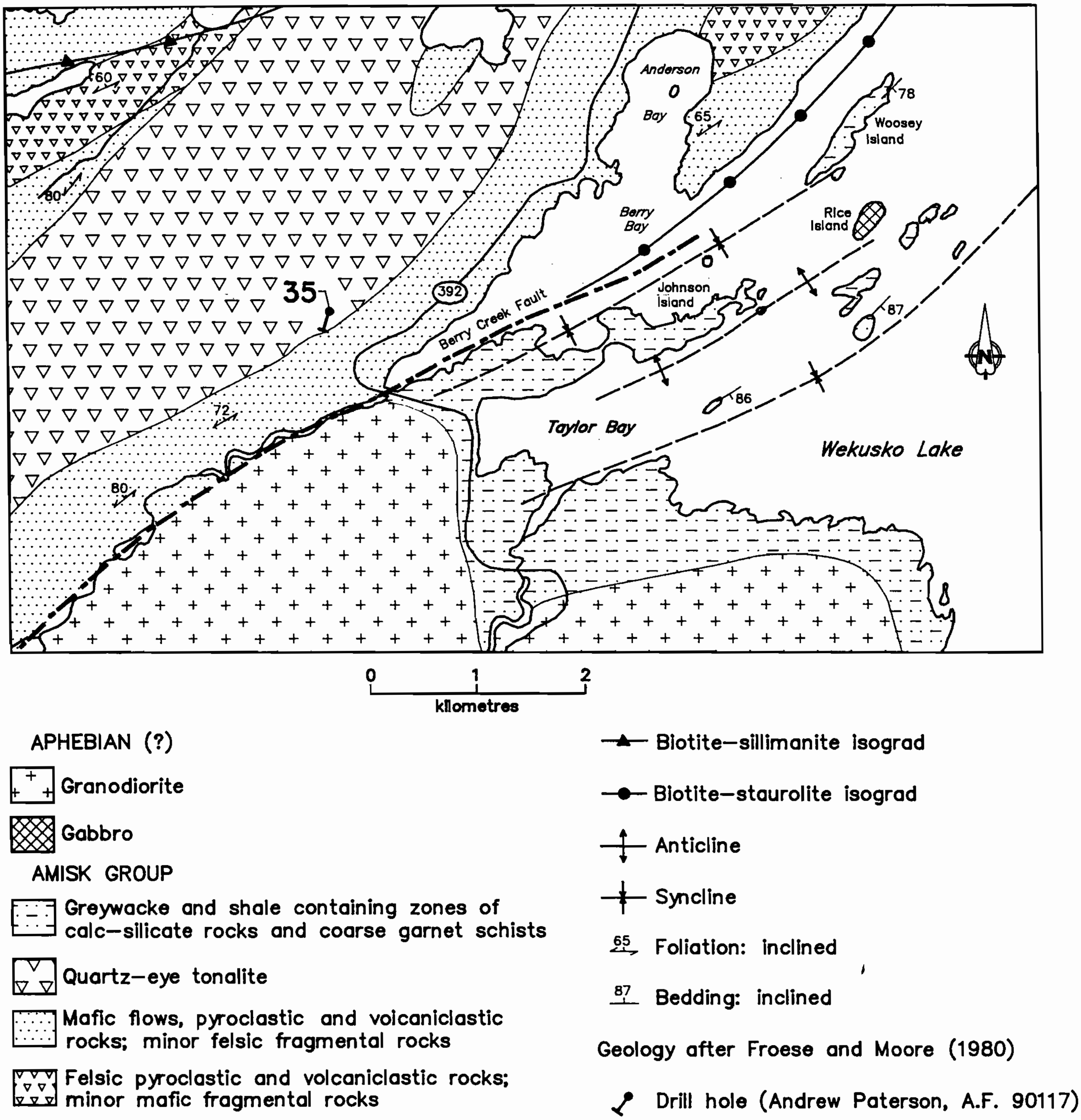


Figure 35-1: Geological setting and diamond drill hole location, occurrence 35.

LOCATION: **36**

NAME: (A.F. - Mineralization intersected by diamond drilling).

AREA: Berry Bay, Wekusko Lake.

UTM: 6074953N/437766E

AIRPHOTO: A20170-120

ACCESS: Provincial Highway 392 and traverse.

EXPLORATION SUMMARY:

The area was first staked as Nip 5 in the 1920's. Violet 5 and 7, Bob 2, 4 and 5, Ken 5, 8 and 9, and Strike 1 and 2 were staked in the 1940's. Surface exploration was done on the Violet and Bob groups by Herb Lake Mining and Exploration Limited in 1947 (Manitoba Energy and Mines Scrap Book, 1947). HBED did an HLEM survey in the area between 1955 and 1956 and drilled a 143 m deep hole on Fault 2 and a 233 m deep hole on Moose 2 in 1956 (A.F. 90119, 90124, 90103). HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650). Alpha Mines Limited did a Turam EM survey in 1968 and a 3 hole, 267 m, diamond drill program on Dianne 27, 29 and 36 in 1969 (A.F. 91514, 91815). The claims lapsed in 1972. The ground was held by J.H. Kerr from 1973 to 1976. Granges Exploration Aktiebolag carried out an HLEM survey on CB 9189 in 1979 (A.F. 92993). Assessment work was reported on the property under a claim grouping between 1980 and 1989 (Mining Claim Card CB 9189). W. Bruce Dunlop Limited restaked the area as Berbay 5 in August 1990.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by mafic flows, pyroclastic and volcaniclastic rocks flanked to the southeast by greywacke and shale and to the west by quartz-eye tonalite. These rock units have been assigned to the Amisk Group (Froese and Moore, 1980). Granodiorite (Aphebian) occurs to the south of the occurrence (Fig. 36-1). Diamond drill holes that tested the ground EM conductors intersected chloritic-sericitic-graphitic schists with minor carbonate and talc, siliceous chlorite schist, hornblende schist (A.F. 90103) and sheared talcose and chloritic andesite (A.F. 91815; Fig. 36-2).

MINERALIZATION:

DDH F1 and F2 intersected multiple near solid to solid sulphide layers that contain pyrite, pyrrhotite and rare chalcopyrite (A.F. 90103). These layers ranged from 0.1 to 2.8 m in core length and are separated by variably altered andesite. The andesite is described in the drill logs as chloritic, sericitic, siliceous and/or graphitic. Carbonate and quartz veinlets are also present in the host rocks. Notably, in DDH F1, a 2.8 m intersection of near solid pyrite and pyrrhotite with minor chalcopyrite is underlain in drill core by 2 m of chloritic hornblende schist containing disseminated pyrite and pyrrhotite. Similar alteration characteristics are described in the drill logs for core from DDH A-2-1, A-3-1 and A-4-1 (A.F. 91815). Sheared, talcose and chloritic andesite contains numerous 1.5 to 3.0 m long zones of disseminated pyrite and pyrrhotite. A 0.2 m "massive sulphide" layer is present in core from DDH A-4-1.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Stratabound massive sulphide type deposit; volcanic rock associated. This deposit type was intersected by DDH F2. It is underlain by an altered andesite with some characteristics of footwall alteration usually associated with massive sulphide type deposits. The predominant style of mineralization is a chemical sediment type deposit, sulphide facies iron formation. This deposit type is represented by multiple near solid to solid pyrrhotite and pyrite layers in core from DDH F2 (A.F. 90103).

REFERENCES:

Assessment Files 90103, 90119, 90124, 91514, 91650, 91815 and 92993

Manitoba Energy and Mines, Minerals Division.

Eccles, D.R. and Fedikow, M.A.F.

1985: Mineral occurrence documentation and alteration zone mapping, Snow Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 82-99.

Froese, E. and Moore, J.M.

1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.

Gale, G.H., Baldwin, D.A. and Koo, J.

1980: A geological evaluation of Precambrian massive sulphide deposit potential in Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER79-1, 137p.

Hosain, I.T.

1988: An update summary and evaluation of geophysical data from open assessment files of the Flin Flon - Snow Lake greenstone belt (NTS sheets 63K (N1/2) and 63J/12, 13); Manitoba Energy and Mines, Mines Branch, Open File Report OF87-11, 99p.

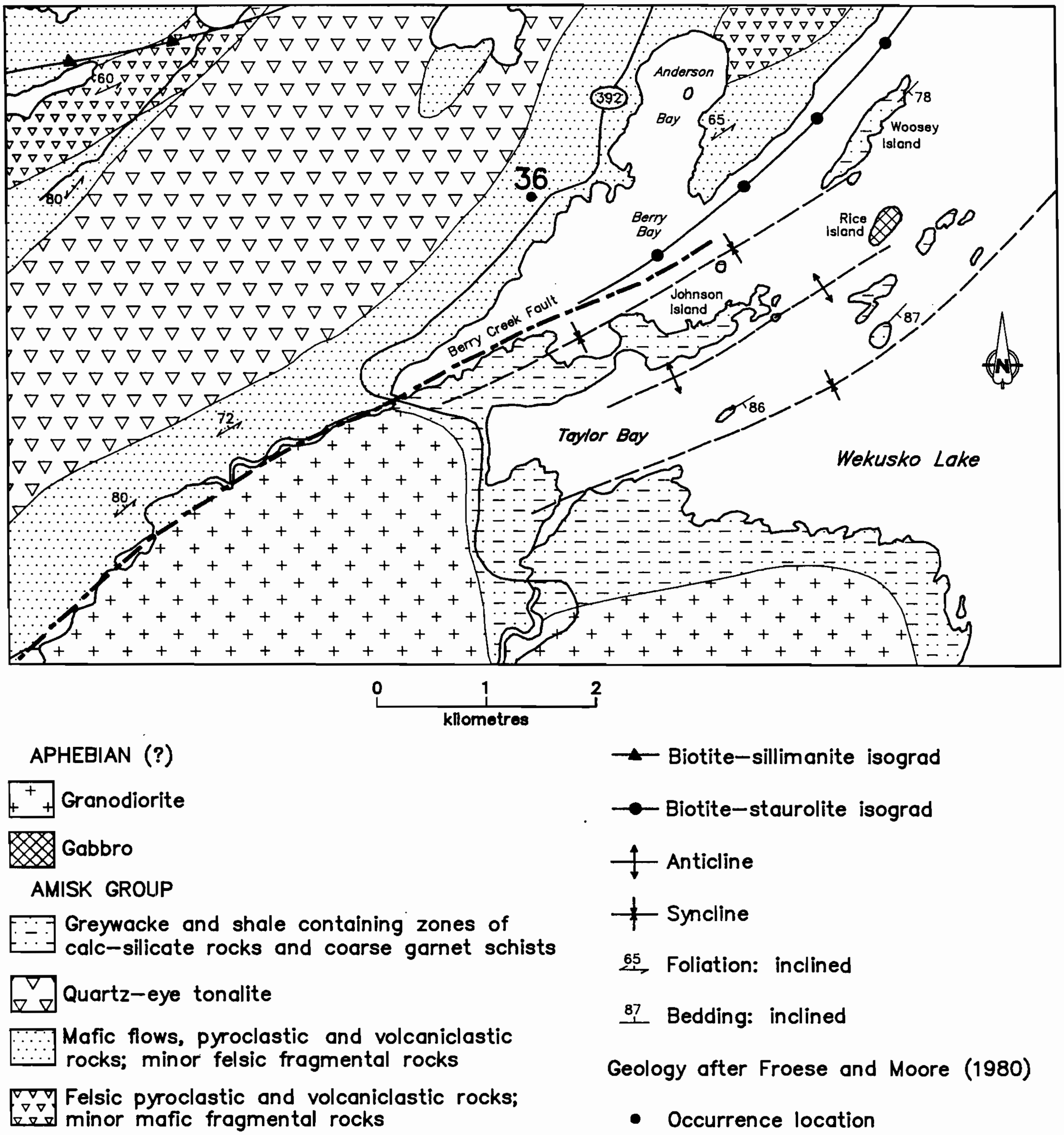


Figure 36-1: Geological setting of occurrence 36.

Macek, J.J.
1976: Wekusko Lake area (63J-12, 13, 14); in Manitoba Mines, Resources and Environmental Management, Mineral Resources Division, Geological Survey, Report of Field Activities, 1976, p. 59.

Mining Claim Card CB 9189
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Russell, G.A.
1957: Structural studies of the Snow Lake - Herb Lake area; Manitoba Mines and Natural Resources, Publication 55-3, 33p.Scrap Book
1947: Manitoba Energy and Mines, Minerals Divison, Corporation Files.

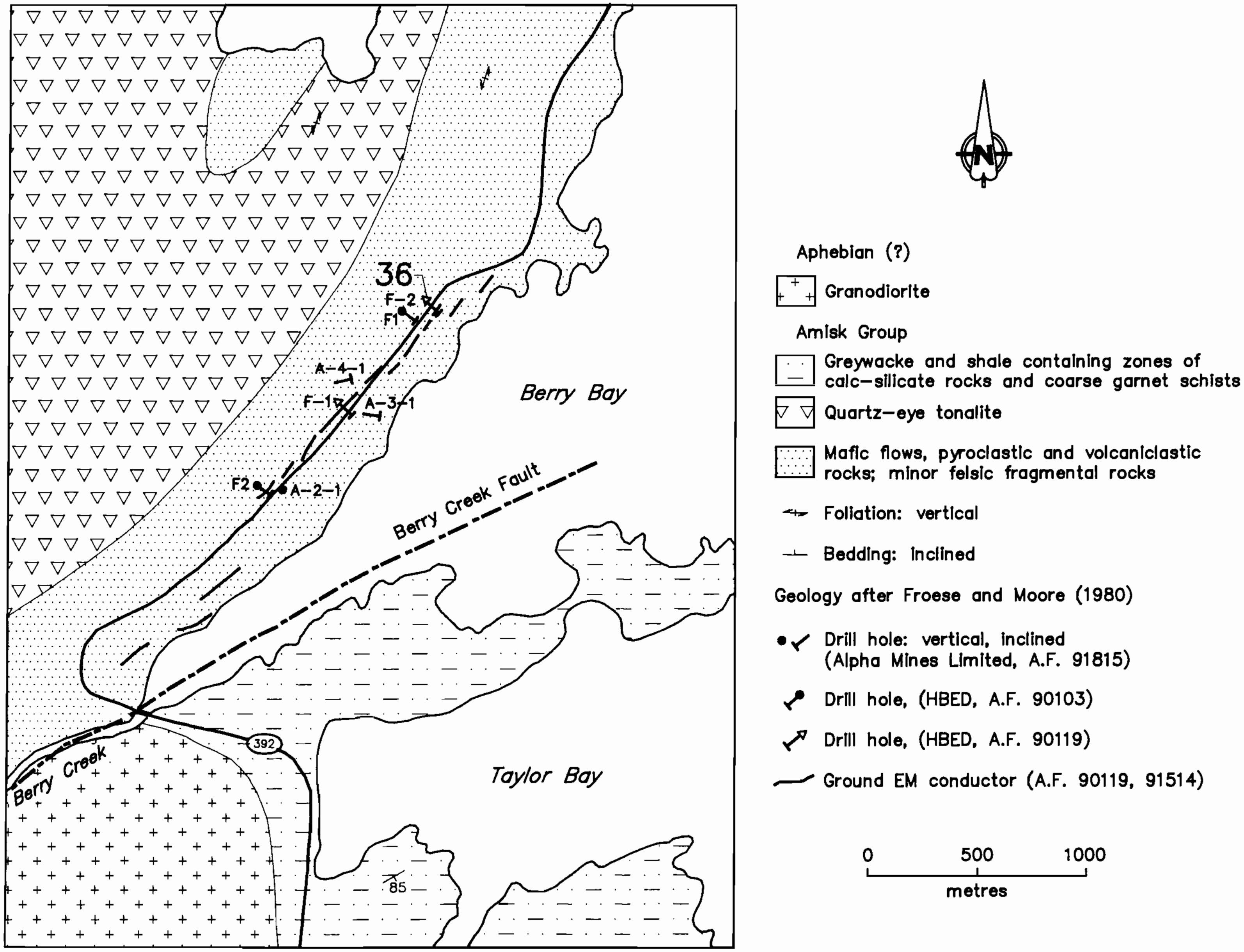


Figure 36-2: Detailed geology, ground EM conductors and diamond drill hole locations, occurrence 36.

LOCATION: **37**

NAME:

UTM: 6075650N/466756E

ACCESS: Bush plane to Dion Lake and traverse

AREA: West shore of Dion Lake.

AIRPHOTO: A20808-188

EXPLORATION SUMMARY:

Gamma 2 and 3 were staked by W. Achtemichuk in 1952. A.L. Parres acquired the claims soon after and carried out trenching, rock sampling and a radioactivity (EA-130 Ratemeter) survey (A.F. 90093). Cyprus Exploration Corporation Limited optioned the property from 1952 to 1957. A twelve hole, 789 m, drill program was done in 1953 (A.F. 90093). Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624, Ground Hog Sheet 13). The claims were assigned to Kix Minerals Limited in 1957 and cancelled in 1958. The ground was held by various individuals between 1958 and 1973. HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650). An HLEM (Ronka Mark III) survey was done by Noranda Exploration Company Limited on the Dat group in 1965 (A.F. 90091). Trenches were dug on the Gam claims between 1966 and 1967 (Mineral Inventory Card 63J/13 U 1). In 1968 a magnetometer survey and a Ronka EM survey was done on the Gam claims for G. Grindle (A.F. 90092). Norma 1 to 4 were staked by J.R.B. Parres in 1973 and assigned to A.L. Parres Limited in 1980. E & B Explorations Limited optioned the claims from 1980 to 1985. Assessment work was done on the property in 1980 and 1985 (Mining Claim Card Norma 1). The claim was cancelled in 1986. The ground was held by Nor-Acme Gold Mines Limited from 1987 to 1988 and by High River Gold Mines Limited from 1988 to 1989. A.L. Parres Limited staked Lee 4 over the property in 1990.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Missi Group greywacke, arkose, conglomerate and derived schists flanked to the south by Amisk Group mafic volcanic rocks (Fig. 37-1; Gordon and Gall, 1982; Frarey, 1950). The Missi Group sedimentary rocks are intruded by pegmatites that are the host rocks to the occurrence. Diamond drilling intersected quartz-biotite schist, hornblende schist and greywacke with chemical sedimentary rocks (Fig. 37-2, -3; A.F. 90093).

MINERALIZATION:

White pegmatite host rocks are locally rusty weathered and covered with a yellow uranium-oxide stain. Rusty weathered amphibolite with disseminated to near solid lenses of pyrrhotite occur in trenches on the property (Fig. 37-2, -3). DDH P1 and P2 intersected pink pegmatite containing yellow mica and uranium oxide over intervals up to 0.4 m. Disseminated to 60% fine grained pyrite, pyrrhotite and graphite were intersected by diamond drilling. The mineralized intervals vary from 0.9 to 22.2 m in greywacke, 0.3 to 29.1 m in hornblende schist, and 10 to 34.8 m in quartz-biotite schist. A 4.1 m thick zone of disseminatd pyrite and pyrrhotite occurs within "highly altered" andesite in DDH P11 (A.F. 90093). Figure 37-3 presents the locations of the drill holes and 16 trenches blasted along a north-south baseline.

GEOCHEMICAL DATA:

Seven representative outcrop chip samples (861632 to 861638) were collected for multi-element geochemical analysis from trenches and outcrops (Fig. 37-2). The samples contain 1 to 917 ppm Mo, 7 to 2026 ppm Pb, and 5 to 2255 ppm U. The remainder of the analyses are presented in Appendix I.

Tables 37-1 and 37-2 summarize mineralized intervals from the diamond drilling and assay results from drill core samples. DDH P1, P2, P8 and P11 intersected U_3O_8 over sample intervals of 1.2 to 1.4 m. The core samples contain trace to 0.19% U_3O_8. Two representative rock chip samples collected from trenches (Fig. 37-3) contain 2.64% and 5.75% U_3O_8. Three channel samples from the southern portion of the baseline contain 0.86% U_3O_8 over 1.2 m, 1.70% U_3O_8 over 3.4 m, and 0.86% U_3O_8 over 1.8 m. The graphite-pyrite-pyrrhotite mineralization contains trace U_3O_8. Three samples of hornblende schist with pyrite, pyrrhotite and graphite contain nil Au, MoS_2 and Ni (Fig. 37-3; A.F. 90093).

CLASSIFICATION:

Pegmatite type deposit.

REFERENCES

Assessment Files 90091, 90092, 90093, 91624 and 91650
Manitoba Energy and Mines, Minerals Division.

Bell, C.K.
1963: Wekusko map area, Manitoba; Geological Survey of Canada, Summary of Activities, Paper 63-1, p. 39.

Cerny, P., Trueman, D.L., Ziehlke, D.V., Goad, B.E. and Paul, B.J.
1981: The Cat Lake-Winnipeg River and the Wekusko Lake pegmatite fields, Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER80-1, 216p.

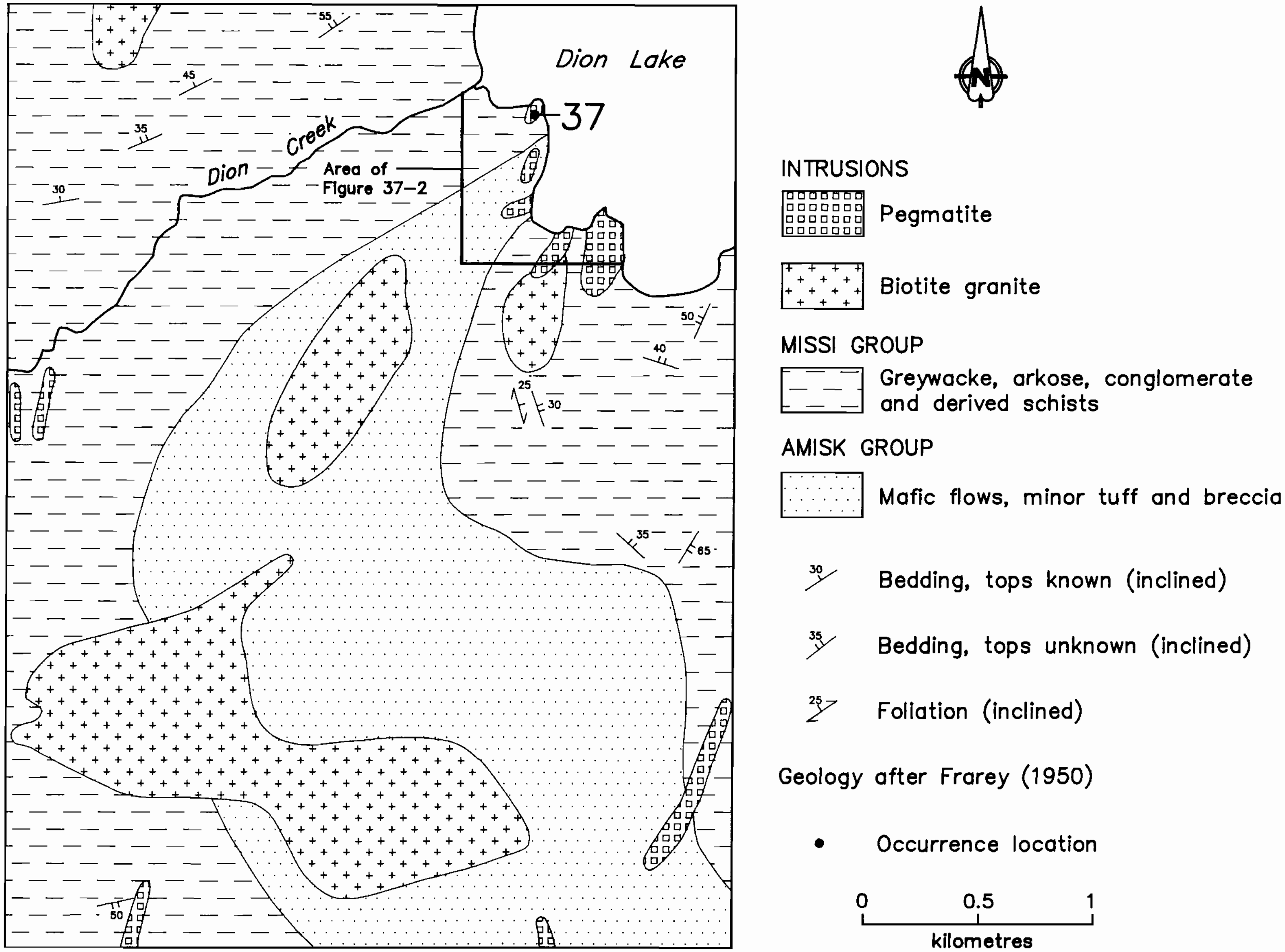


Figure 37-1: Geological setting of occurrence 37.

Cypress Exploration Corporation Limited
Manitoba Energy and Mines, Minerals Division, Corporation Files.

Fedikow, M.A.F., Roney, C.T., Schmidt, G.J. and Robbie, T.
1986: Mineral deposit studies in the Snow Lake area; in Manitoba Energy and Mines, Geological Services Branch, Report of Field Activities, 1986, p. 77-85.

Frarey, M.J.
1950: Crowduck Bay; Geological Survey of Canada Map 987A, 1:63 360.Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Mining Claim Card Norma 1 (P4505E)
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Mineral Inventory Card 63J/13 U1
Manitoba Energy and Mines, Minerals Division.

Table 37-1: Summary of mineralized intervals in drill core, occurrence 37 (A.F. 90093)

Drill Hole	Interval (m)	Mineralization
P1	1.8 - 12.2	pink pegmatite containing 3 cm biotite plates; uranium oxide from 11.5-11.9 m
P2	36.5 - 39.9	pink pegmatite with yellow mica at 38.1 m
	54.6 - 58	greywacke with 35% disseminated and stringer pyrite and pyrrhotite
	54.6 - 76.8	silicified and visibly unaltered greywacke with disseminated pyrite, pyrrhotiteand graphite
P3	21.8 - 22.7	greywacke with 60% graphite and pyrite
P4	6.7 - 19.4	greywacke with fine grained disseminated pyrite, pyrrhotite and graphite
	35.1 - 39.6	greywacke with up to 60% pyrite, pyrrhotite and graphite
	46.9 - 57.6	greywacke with fine grained disseminated pyrite, pyrrhotite and graphite
P5	8.7 - 34	hornblende schist with up to 60% pyrrhotite, pyrite and graphite
	42.1 - 42.4	hornblende schist with 25% pyrrhotite and pyrite
	42.4 - 71.5	hornblende schist with fine grained disseminated pyrite,pyrrhotite and graphite
P6	36.9 - 45.7	greywacke with 50% disseminated and stringer pyrite
P7	19.3 - 35.2	greywacke with pyrite stringers and disseminated graphite
	37.8 - 38.7	biotite schist with disseminated pyrite and pyrrhotite
P8	31.5 - 33.2	greywacke with up to 60% graphite and disseminated and stringer pyrite
P10	1.5 - 12.6	chloritic greywacke with disseminated pyrrhotite
	40.5 - 42.2	hornblende- and biotite-rich greywacke containing stringer and disseminated pyrite, pyrrhotite and graphite
	49.3 - 55.2	quartz-chlorite schist with disseminated pyrite and pyrrhotite; talc from 51.8-52.1 m
	55.2 - 60.9	greywacke with disseminated pyrrhotite
P11	13 - 17.1	"highly altered" andesite with disseminated pyrite and pyrrhotite
P12	26.2 - 61	quartz-biotite schist with disseminated pyrite and pyrrhotite
	65.8 - 75.8	quartz-biotite schist with up to 40% pyrite, pyrrhotite and graphite

Table 37-2: Summary of assay results from drill core, occurrence 104 (A.F. 90093)

DDH	Assay Results U_3O_8 (%)	Interval (m)
P1	0.11	11.5-12.7
	0.19	20.5-21.8
	tr.	59.7-61.0
P2	0.09	36.1-37.3
P8	0.04	19.1-20.3
P11	0.03	45.1-46.3

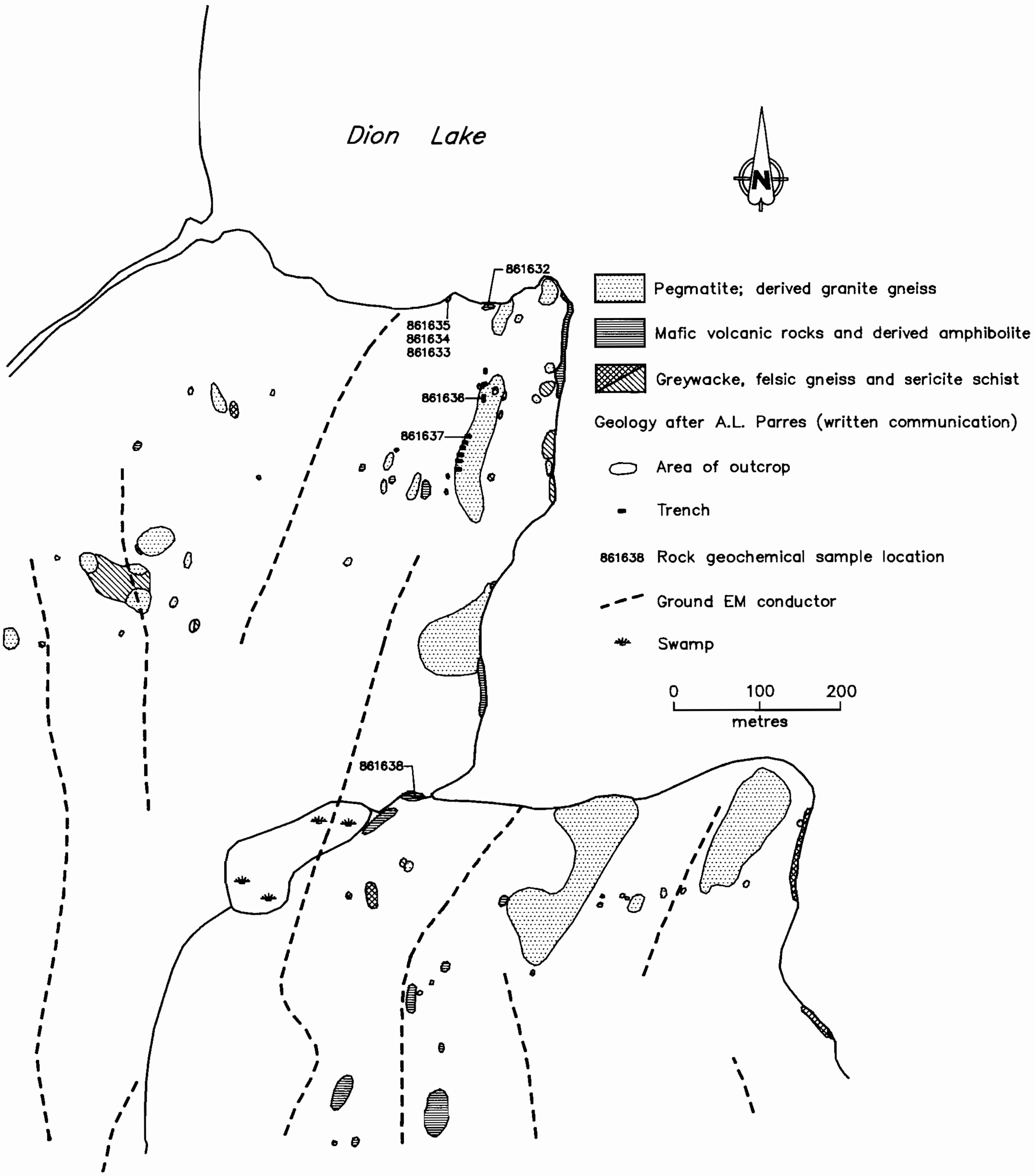


Figure 37-2: Outcrop, geology and trench and sample location map, occurrence 37.

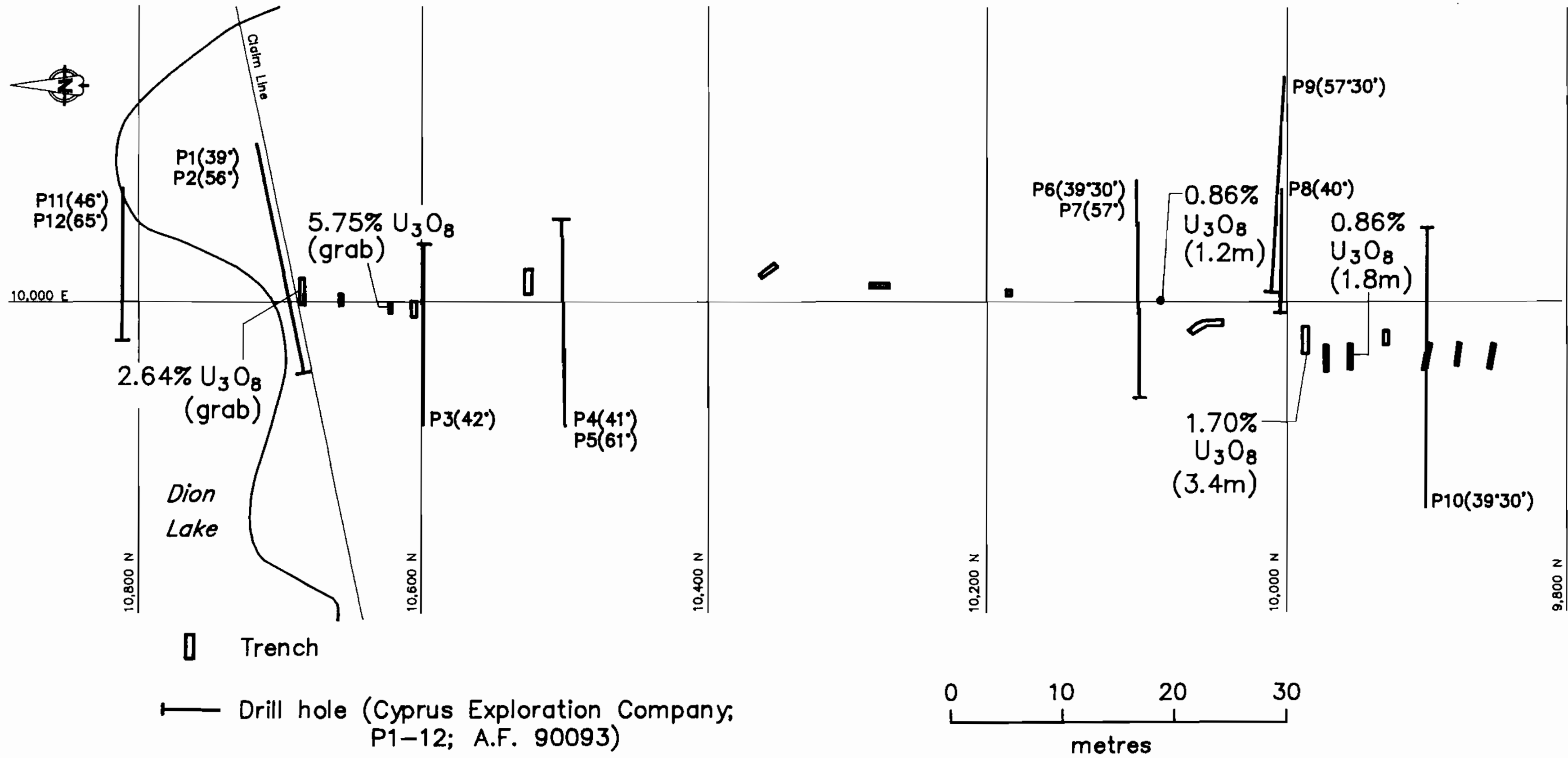


Figure 37-3: Trench and diamond drill hole locations and assay results, occurrence 37.

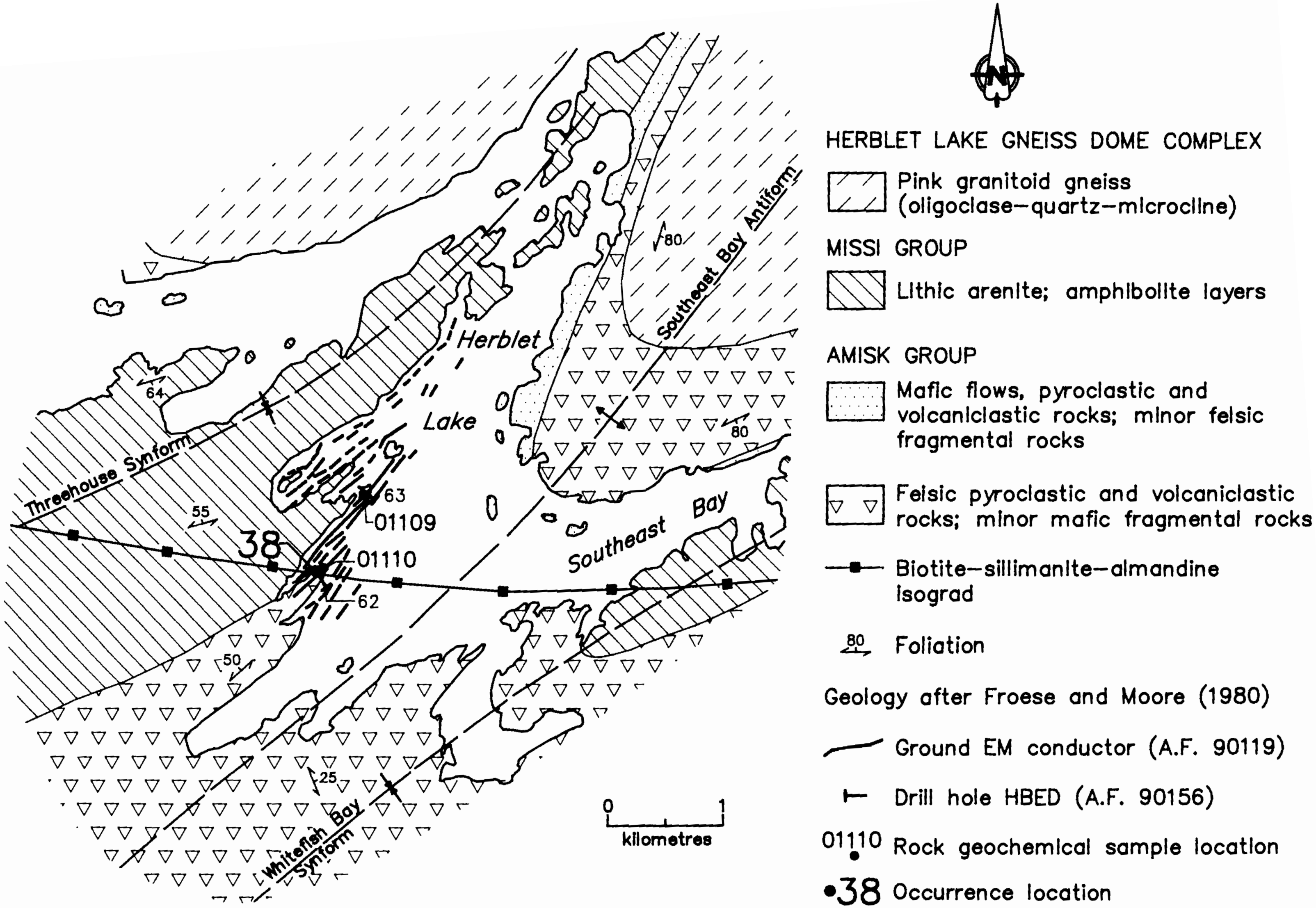


Figure 38-1: Geological setting of occurrence 38.

LOCATION: **38**

NAME:

UTM: 6084825N/442374E

ACCESS: Provincial Highway 393 to Herblet Lake Landing, boat to occurrence.

AREA: West shore of Southeast Bay, Herblet Lake.

AIRPHOTO: A20127-130

EXPLORATION SUMMARY:

The area was first staked as the Ram group of claims by HBED in 1956. HBED did an HLEM survey between 1956 and 1957 and drilled a 139 m deep hole on Ram 227 and a 114 m deep hole on Ram 242 in 1957 (A.F. 90119, 90156). The claims were cancelled in 1959. CB 1078 was staked by W.B. Kobar in 1969. Fosco Mining Limited carried out a ground magnetometer survey and a VLEM on the property in 1970 (Fosco Mining Limited, Corporation File) and did airborne EM and magnetic surveys in 1971 (A.F. 92130). The claim was cancelled in 1974. In 1978 the area was partially staked as CB 7066 by HBED and as CB 9198 by Granges Exploration Aktiebolag (now known as Granges Inc.). Granges Inc. also holds the Zit 6 claim, staked over the former Ram 242 area in 1987.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group felsic pyroclastic and volcaniclastic rocks and Missi Group lithic arenite. Regional foliation in the area generally trends northeast. The general area of the occurrence is transected by the biotite-sillimanite-almandine isograd (Fig. 38-1; Froese and Moore, 1980). Diamond drill holes, collared to test long and short strike length ground EM conductors, intersected gabbro, variably altered basalt, quartz-hornblende-biotite gneiss, fragmental quartz-biotite-hornblende gneiss, chlorite-hornblende-mica-talc schist, chlorite schist and chemical sedimentary rocks (A.F. 90156).

MINERALIZATION:

DDH 62 and DDH 63 intersected a variety of altered lithologies that contain minor disseminated pyrite, pyrrhotite, chalcopyrite and arsenopyrite (A.F. 90156). DDH 62, collared in rhyolite, intersected garnetiferous, chloritic and carbonatized gabbro and hornblende-biotite-quartz gneiss with minor pyrite and pyrrhotite. DDH 63, collared in lithic arenite, intersected carbonatized and nonmineralized quartz-hornblende-biotite gneiss and garnetiferous mica-chlorite schist. Near the bottom of the drill hole, a 0.3 m section of chlorite-hornblende gneiss contains disseminated arsenopyrite underlain by garnetiferous chlorite-mica-talc schist with disseminated pyrrhotite and chalcopyrite. These zones are, in turn, underlain by; (1) a 2 m interval of garnetiferous chlorite-hornblende gneiss containing graphite-pyrrhotite-pyrite and chalcopyrite, and (2) fragmental hornblende-quartz gneiss containing abundant carbonate and minor chlorite with disseminated pyrrhotite. Sulphide mineral percentages are reported.

GEOCHEMICAL DATA:

Two representative outcrop chip samples (01109 and 01110) were collected from quartz veins in the general area of the occurrence for assay. The samples contain nil and 0.01% Cu.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

Assessment Files 90119, 90156 and 92130

Manitoba Energy and Mines, Minerals Division.

Eccles, D.R. and Fedikow, M.A.F.

1985: Mineral occurrence documentation and alteration zone mapping, Snow Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 82-99.

Fedikow, M.A.F., Roney, C.T., Schmidt, G.J. and Robbie, T.J.

1986: Mineral deposit studies in the Snow Lake area; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1986, p. 77-85.

Fosco Mining Limited

Manitoba Energy and Mines, Minerals Division, Corporation Files.

Froese, E. and Gasparrini, E.

1975: Metamorphic zones in the Snow Lake area, Manitoba; Canadian Mineralogist, v. 13, p. 162-167.

Froese, E. and Moore, J.M.

1980: Metamorphism in the Snow Lake area; Geological Survey of Canada Paper 78-27, 16p.

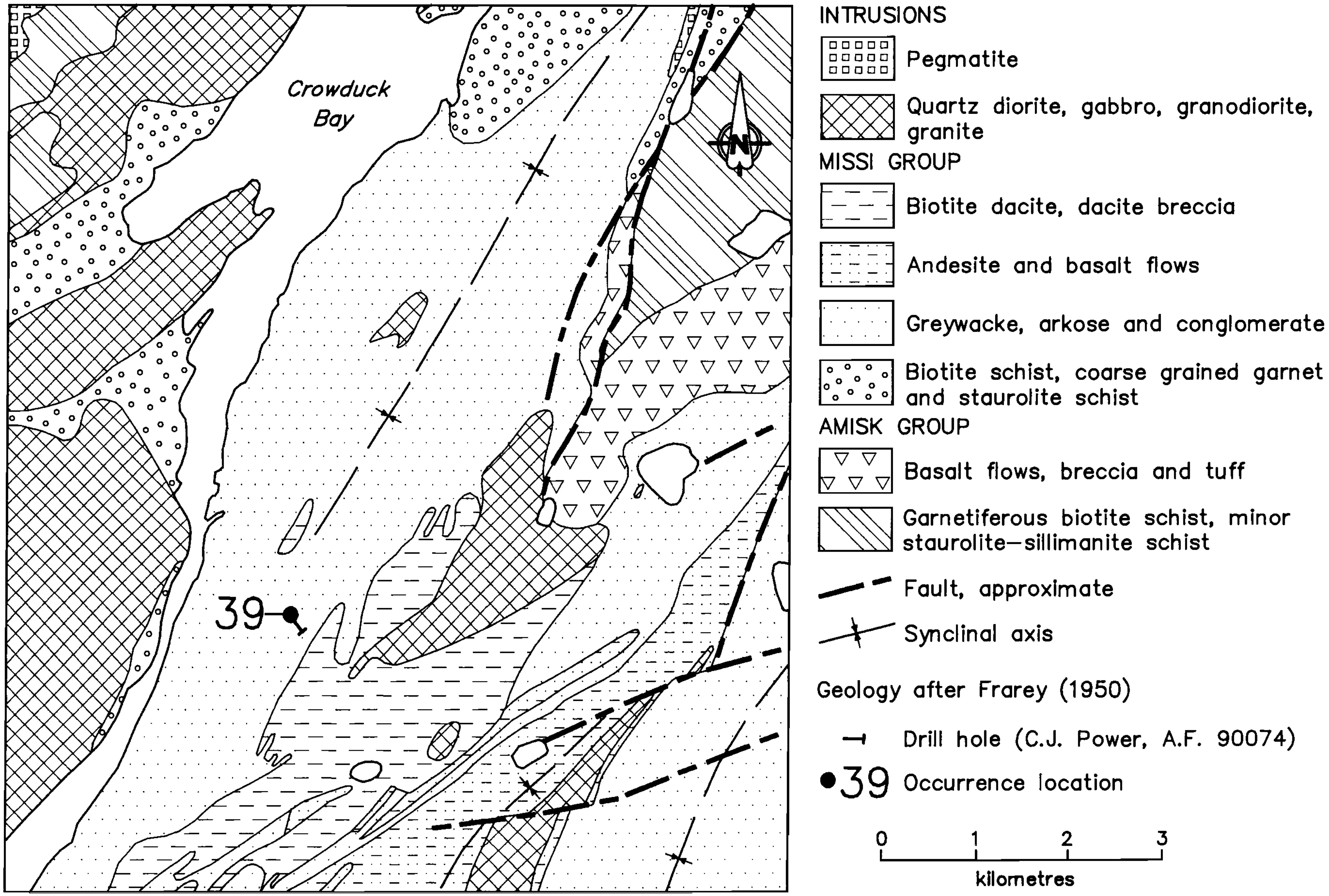


Figure 39-1: Geological setting and diamond drill hole locations, occurrence 39.

LOCATION: **39**

NAME: (A.F. - Mineralization intersected by diamond drilling).

AREA: Grass River northeast of Wekusko Lake.

UTM: 6077001N/455058E

AIRPHOTO: A20124-88

ACCESS: Boat on Wekusko Lake to Grass River.

EXPLORATION SUMMARY:

The area was first staked as Buffalo Boy prior to 1930. In 1956 C.J. Power drilled a 71 m deep hole on Dot 8 and dug five trenches on the property (A.F. 90074). HBED did airborne EM and radiometric surveys in the area in 1965 (A.F. 91650). Falconbridge Nickel Mines Limited did airborne EM and magnetic surveys in 1973 (A.F. 91564). Cangold Limited held the ground as Can 8 between 1981 and 1983. Noranda Exploration Company Limited restaked the area as Nor 18 in 1983. The claim was cancelled in 1988.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by greywacke, arkose and conglomerate flanked to the east by intermediate to felsic flows and fragmental rocks. These rocks have been assigned to the Missi Group (Fig. 39-1; Gordon and Gall, 1982; Frarey, 1950). DDH D-1 intersected greywacke (A.F. 90074).

MINERALIZATION:

Trace pyrite occurs over 0.9 m core intervals in association with chloritic and garnetiferous greywacke (DDH D-1; A.F. 90074).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 90074, 91564 and 91650
Manitoba Energy and Mines, Minerals Division.

Cerny, P., Trueman, D.L., Ziehlke, D.V., Goad, B.E. and Paul, B.J.
1981: The Cat Lake-Winnipeg River and the Wekusko Lake pegmatite fields, Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER80-1, 216p.

Frarey, M.J.
1950: Crowduck Bay; Geological Survey of Canada, Map 987A, 1:63 360.

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Stockwell, C.H.
1937: Gold deposits of Herb Lake area, northern Manitoba; Geological Survey of Canada, Memoir No. 208, p. 24-25.

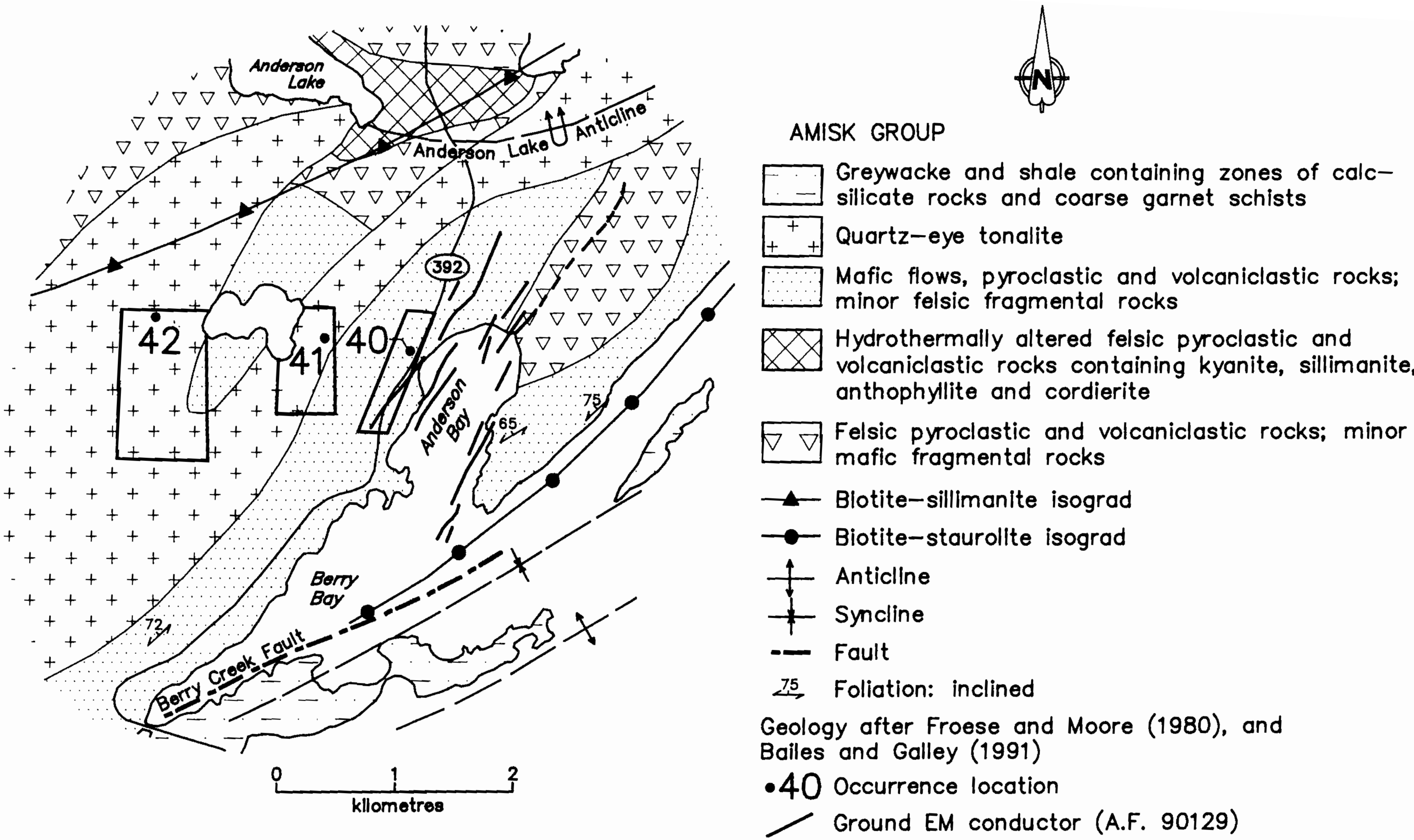


Figure 40-1: Geological setting of occurrences 40, 41 and 42.

LOCATION: **40**

NAME:

UTM: 6076164N/438572E

ACCESS: Provincial Highway 392 and traverse.

AREA: West of Anderson Bay.

AIRPHOTO: A20170-14

EXPLORATION SUMMARY:

The area was first staked as Savage 5 and 6 in the 1920's. Surface exploration was done on the Mallard group by Herb Lake Mining and Exploration Limited in 1947 (Manitoba Energy and Mines Scrap Book, 1947). HBED did an HLEM survey in the area in 1955 (A.F. 90108, 90124). In 1965 HBED drilled a 73 m deep hole to test a Turam EM anomaly on Day 3 (A.F. 90100, 90129). G.A. Russell carried out geological mapping (1:31 680) on the Dianne group of claims and submitted a report to Alpha Mines Limited in 1967, but the report and map are not available (A.F. 91514). Alpha Mines Limited did a Turam EM survey on the property in 1968 (A.F. 91514). W.B. Kobar staked Peter 4 in 1972, and did work on the property between 1974 and 1975 (Mining Claim Card Peter 4). The area was restaked as CB 6202 by Falconbridge Nickel Mines Limited in 1968. In 1982 the company changed its name to Falconbridge Limited and transferred a 90% interest in the claim to Corporation Falconbridge Copper (known as Minnova Inc. since 1987).

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group mafic flows, pyroclastic and volcaniclastic rocks flanked to the north by felsic pyroclastic and volcaniclastic rocks and to the south by greywacke and shale. The mafic volcanic sequence is intruded by Amisk Group quartz-eye tonalite (Fig. 40-1; Froese and Moore, 1980). Drill holes testing a ground EM conductor intersected pyritic schistose basalt and peridotite (A.F. 90131) and fine grained, sheared andesite and diorite (A.F. 90100; Fig. 40-2). Silicified basalt is present in the vicinity of the occurrence (Fig. 40-3).

MINERALIZATION:

"Small amounts" of pyrite were noted in basalt and peridotite in core from DDH 1 and 5 (A.F. 90131).

"Very slight" pyrrhotite and chalcopyrite were intersected in core from DDH 1 over 0.3 m (A.F. 90100). Disseminated (1 to 2%) pyrite, pyrrhotite and chalcopyrite were mapped in outcrop (Fig. 40-3).

GEOCHEMICAL DATA:

Four representative outcrop chip samples (01111, 01112, 01113, 01114) were collected for multi-element geochemical analysis (Fig. 40-3). The samples contain low base and precious metal values (Appendix I).

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 90100, 90108, 90124, 90129, 90131, 91514, 91815 and 91816
Manitoba Energy and Mines, Minerals Division.

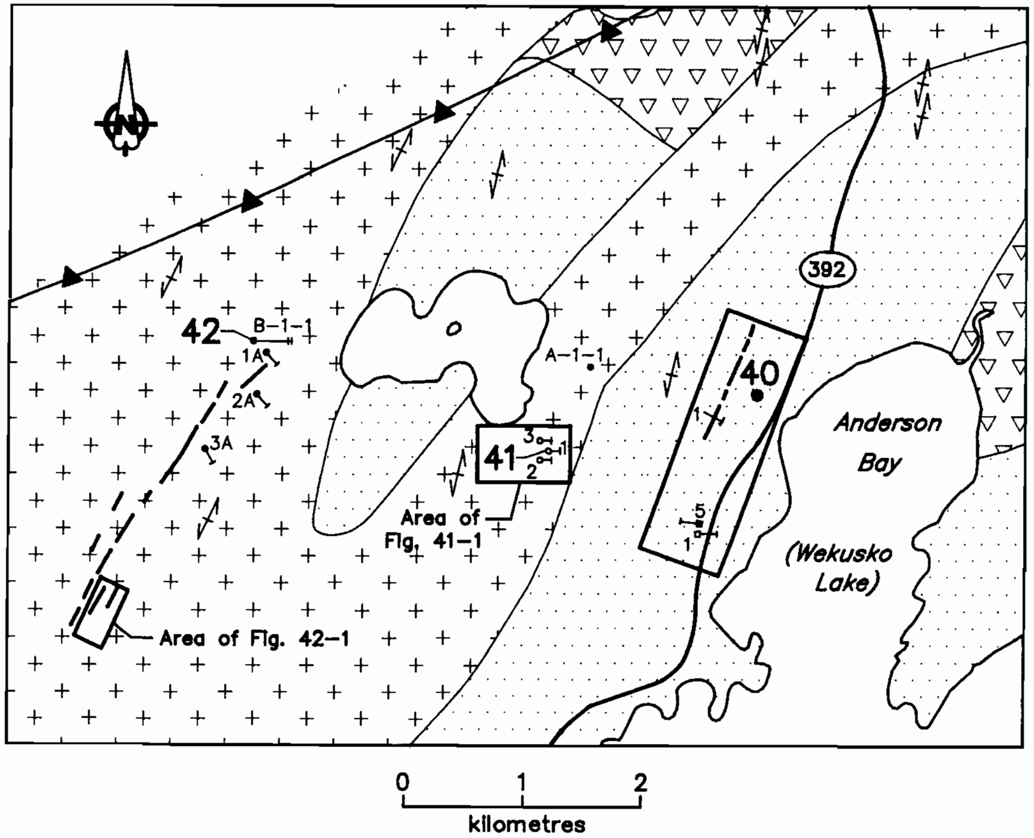
Fedikow, M.A.F., Roney, C.T., Schmidt, G.J. and Robbie, T.J.
1986: Mineral deposit studies in the Snow Lake area; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1986, p. 77-85.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.

Hosain, I.T.
1988: An update summary and evaluation of geophysical data from open assessment files of the Flin Flon - Snow Lake greenstone belt (NTS sheets 63K (N1/2) and 63J/12, 13); Manitoba Energy and Mines, Mines Branch, Open File Report OF87-11, 99p.

Mining Claim Card Peter 4 (P 3975E)
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Scrap Book
1947: Manitoba Energy and Mines, Minerals Divison, Corporation Files.



AMISK GROUP

Quartz-eye tonalite

Mafic flows, pyroclastic and volcaniclastic rocks; minor felsic fragmental rocks

Felsic pyroclastic and volcaniclastic rocks; minor mafic fragmental rocks

Biotite-sillimanite isograd

S_2 foliation, vertical

Geology after Froese and Moore (1980), and Bailes and Galley (1991)

Drill hole (HBED, 1, A.F. 90100)

Drill hole, vertical drill hole (Alpha Mines Ltd., A-1-1 and B-1-1, A.F. 91815)

Drill hole (Alpha Mines Ltd., 1A to 3A, A.F. 91816)

Drill hole (Walter Johnson, 1 to 3, A.F. 90131)

Drill hole (Jay Kay Exploration, 5, A.F. 90131)

Drill hole (Naomi Vance, 1, A.F. 90131)

Ground EM conductor (A.F. 91514)

•40 Occurrence location

Figure 40-2: Diamond drill hole locations and ground EM conductors, occurrences 40, 41 and 42.

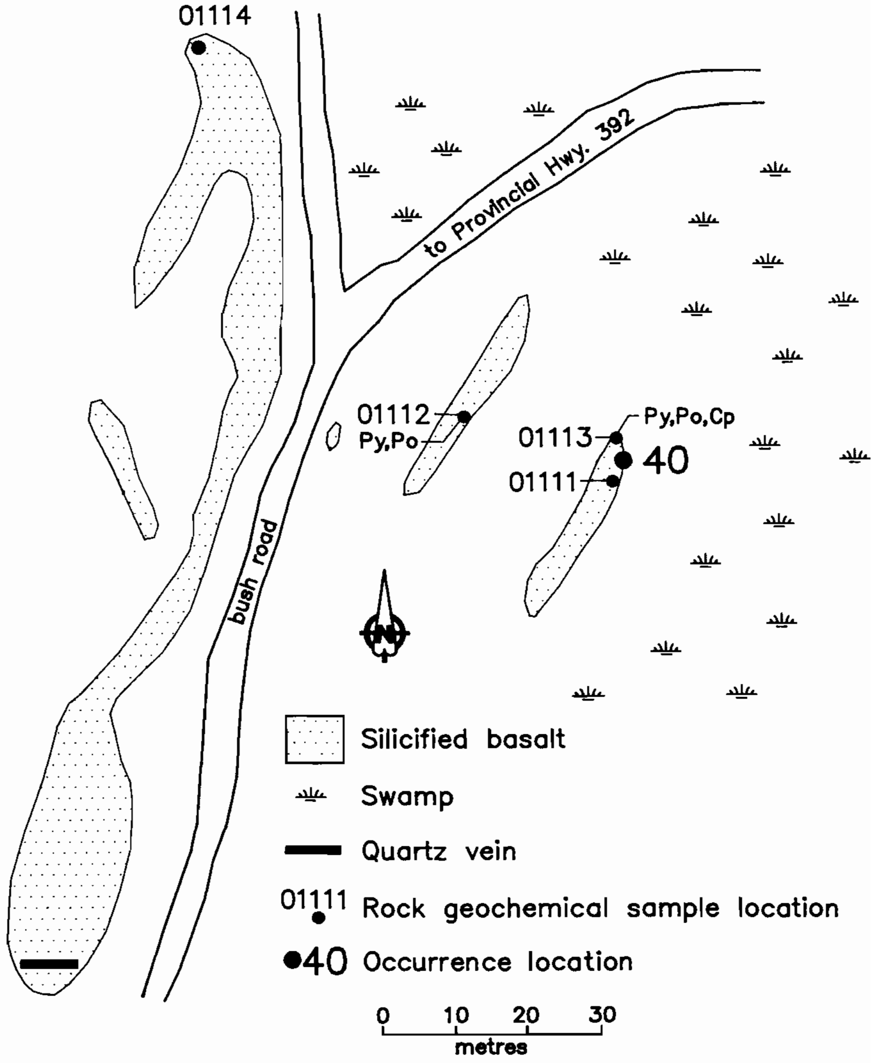


Figure 40-3: Outcrop, geology and sample location map, occurrence 40.

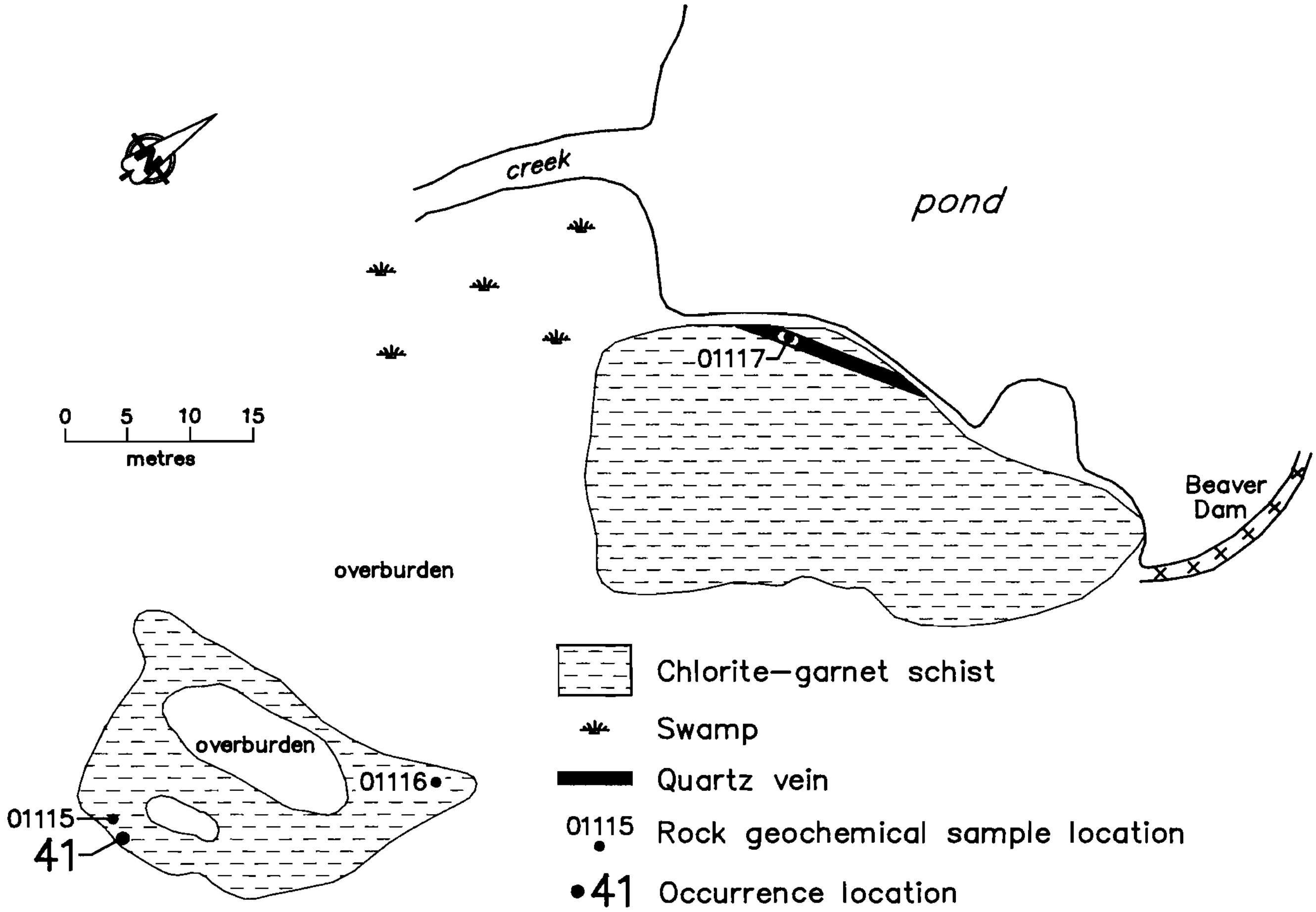


Figure 41-1: Outcrop, geology and sample location map, occurrence 41.

LOCATION: **41**

NAME:

UTM: 6076173N/437693E

ACCESS: Provincial Highway 392 and traverse.

AREA: West of Anderson Bay.

AIRPHOTO: A20170-14

EXPLORATION SUMMARY:

The area was staked as Aster 3 and 4 in the 1950's. Walter Johnson drilled 3 holes totalling 110 m on Aster 4 in 1952 (A.F. 90131). In 1955, HBM&S did an HLEM survey on the Ram claims (A.F. 90124, 90108). G.A. Russell carried out geological mapping (1:31 680) on the Dianne group of claims and submitted a report to Alpha Mines Limited in 1967, but the report and map are not available (A.F. 91514). Alpha Mines Limited did a Turam EM survey in 1968, and drilled a 151 m deep hole on Dianne 16 in 1969 (A.F. 91514, 91815). Surface work was done between 1974 and 1975 on the Peter 3 claim, held by W.B. Kobar (Mining Claim Card Peter 3). The area was partly staked as CB 6202 by Falconbridge Nickel Mines Limited in 1978. In 1982 Falconbridge changed its name to Falconbridge Limited and transferred a 90% interest in the claim to Corporation Falconbridge Copper (known as Minnova Inc. since 1987). W.Bruce Dunlop Limited also staked CB 9360 over part of the area in 1978, and optioned it to Noranda Exploration Company Limited from 1981 to 1982. Assessment work was filed for CB 9360 betweem 1982 and 1984 (Mining Claim Card CB 9360). CB 9360 was restaked in 1986 as Berry 1 by W.Bruce Dunlop Limited. Granges Exploration Limited optioned the property from 1987 to 1988.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by quartz-eye tonalite that intrudes Amisk Group mafic flows, pyroclastic and volcaniclastic rocks (Fig. 40-1; Froese and Moore, 1980). Diamond drilling intersected basalt, and "sediments" and "tuff" of unspecified composition (Fig. 40-2; A.F. 90131, 91815). Chlorite-garnet schist was mapped in the vicinity of the occurrence (Fig. 41-1).

MINERALIZATION:

DDH A-1-1 intersected disseminated pyrite over 0.3 m in sheared fine grained tuff of unspecified composition (A.F. 91815). Chalcopyrite occurs in quartz veins over 0.9 m. Disseminated pyrite chalcopyrite occurs in massive and garnetiferous basalt (DDH 2; A.F 90131).

GEOCHEMICAL DATA:

Three representative outcrop chip samples were collected for geochemical analysis from chlorite-garnet schist (01115 and 01116) and a nonmineralized, white quartz vein (01117) (Fig. 41-1). Sample 01115 contains 889 ppm Cu; sample 01116 contains 117 ppm Ni and 343 ppm Cr; sample 01117 contains 18 ppm Mo and 223 ppm W. The remainder of the analyses are given in Appendix I.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 90108, 90124, 90131, 91514 and 91815
Manitoba Energy and Mines, Minerals Division.

Fedikow, M.A.F., Roney, C.T., Schmidt, G.J. and Robbie, T.J.,
1986: Mineral deposit studies in the Snow Lake area; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1986, p. 77-85.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.

Mining Claim Cards Peter 3 (P 3974E), and CB 9360
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Hosain, I.T.
1988: An update summary and evaluation of geophysical data from open assessment files of the Flin Flon - Snow Lake greenstone belt (NTS sheets 63K (N1/2) and 63J/12, 13); Manitoba Energy and Mines, Mines Branch, Open File Report OF87-11, 99p.

Russell, G.A.
1957: Structural studies of the Snow Lake - Herb Lake area; Manitoba Mines and Natural Resources, Publication 55-3, 33p.

LOCATION: **42**

NAME:

UTM: 6076019N/436644E

ACCESS: Provincial Highway 392 and traverse.

AREA: West of Anderson Bay.

AIRPHOTO: A20170-14

EXPLORATION SUMMARY:

The area was first staked as North Star in the 1920's. Wright (1938) examined a gold occurrence on the Taylor and Joe claims, located south of North Star. Val 1 to 6, Rex and Rex 1, Star 1, 2, 5 and 6, and Bird 9 were staked in the late 1940's. In 1945, Mike Remniak did diamond drilling on the Rex claim and P. Kobar and B. Kobar did diamond drilling on Star 2 to 6 (Manitoba Mines and Natural Resources, 1946). P. Kobar drilled Star 1 in 1946 (Manitoba Mines and Natural Resources, 1947). Creole Snow Lake Mines Limited explored the Bird claims in 1946 (Manitoba Energy and Mines Scrap Book, 1946). Herb Lake Mining and Exploration Limited dug trenches and pits on the Val group in 1947 and did surface exploration on the Bird claims from 1947 to 1949 (Manitoba Energy and Mines Scrap Books, 1947, 1949; Manitoba Mines and Natural Resources, 1948, 1950). HBED did an HLEM survey on the Ram claims in 1956 (A.F. 90119, Grid B). Alpha Mines Limited did a Turam EM survey in 1968, and drilled a 181 m deep hole on Dianne 13 in 1969 (A.F. 91514, 91815). A 3 hole, 366 m, diamond drill program was done on Dianne 9 and 13 in 1972 (A.F. 91816). The Dianne claims were cancelled in 1976. W. Bruce Dunlop Limited staked CB 9360 in 1978 and CB 11468 in 1980 and optioned the properties to Noranda Exploration Company Limited from 1981 to 1982. Assessment work was reported under claim groupings for CB 11468 in 1983 and for CB 9360 from 1982 to 1984 (Mining Claim Cards CB 11468 and CB 9360). The claims were cancelled in 1985. W. Bruce Dunlop Limited staked Berry 1 and 2 in 1986, and optioned the claims to Granges Exploration Limited from 1987 to 1988.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group mafic flows, pyroclastic and volcaniclastic rocks intruded by an Amisk Group quartz-eye tonalite (Fig. 40-1; Froese and Moore, 1980). Diamond drilling intersected granite, rhyolite, amygdaloidal basalt and andesite. These rocks are mylonitic and contain mineralized quartz veins and carbonate veinlets (A.F. 91815, 91816). Outcrops consist of rafts of mafic volcanic rock (chlorite schist) in a quartz-eye tonalite (Fig. 42-1).

MINERALIZATION:

DDH B-1-1 intersected 10 to 15% pyrite blebs and "slight" chalcopyrite in quartz veins over 0.1 m in rhyolite. Zones of silicification and disseminated pyrite with chalcopyrite occur in both rhyolite and granite. Sericite occurs in rhyolite and granite and is spatially associated with shear zones. Disseminated chalcopyrite also occurs in fine grained, garnetiferous andesite (A.F. 91815).

DDH 1A, 2A and 3A (A.F. 91816) intersected sheared greenstone with 3% pyrite stringers and specks of chalcopyrite over core intervals of 0.3 to 0.6 m. Thin quartz and carbonate stringers and mylonitic zones are also present in these drill holes; however, the percentage of sulphide minerals is generally very low (A.F. 91816).

GEOCHEMICAL DATA:

Representative outcrop chip samples 01502 and 01503 (Fig. 42-1) were collected for geochemical analysis from silicified chlorite schist; 01504 was collected from a nonmineralized white quartz vein. Sample 01505 consists of quartz-eye tonalite. The samples contain low base and precious metal values (Appendix I).

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. Multiple quartz, carbonate and pyrite veinlets in sheared and altered volcanic rocks and tonalite.

REFERENCES:

Assessment Files 90119, 91514, 91815 and 91816.
Manitoba Energy and Mines, Minerals Division.

Fedikow, M.A.F., Roney, C.T., Schmidt, G.J. and Robbie, T.J.
1986: Mineral deposit studies in the Snow Lake area; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1986, p. 77-85.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.

Hosain, I.T.
1988: An update summary and evaluation of geophysical data from open assessment files of the Flin Flon - Snow Lake greenstone belt (NTS sheets 63K (N1/2) and 63J/12, 13); Manitoba Energy and Mines, Mines Branch, Open File Report OF87-11, 99p.

Manitoba Mines and Natural Resources,
1946: 18th Annual Report on Mines and Minerals, 85p.
1947: 19th Annual Report on Mines and Minerals, 100p.
1948: 20th Annual Report on Mines and Minerals, 102p.
1950: 2nd Annual Report on Mines and Minerals, 105p.

Mining Claim Cards CB 11468 and CB 9360
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Russell, G.A.
1957: Structural studies of the Snow Lake - Herb Lake area; Manitoba Mines and Natural Resources, Publication 55-3, 33p.

Scrap Books
1946: Manitoba Energy and Mines, Minerals Divison, Corporation Files.
1947: Manitoba Energy and Mines, Minerals Divison, Corporation Files.
1949: Manitoba Energy and Mines, Minerals Divison, Corporation Files.

Wright, J.F.
1938: Geology and mineral deposits of a part of northwest Manitoba; Geological ,Survey of Canada, Summary Report, 1930, Part C, 124p.

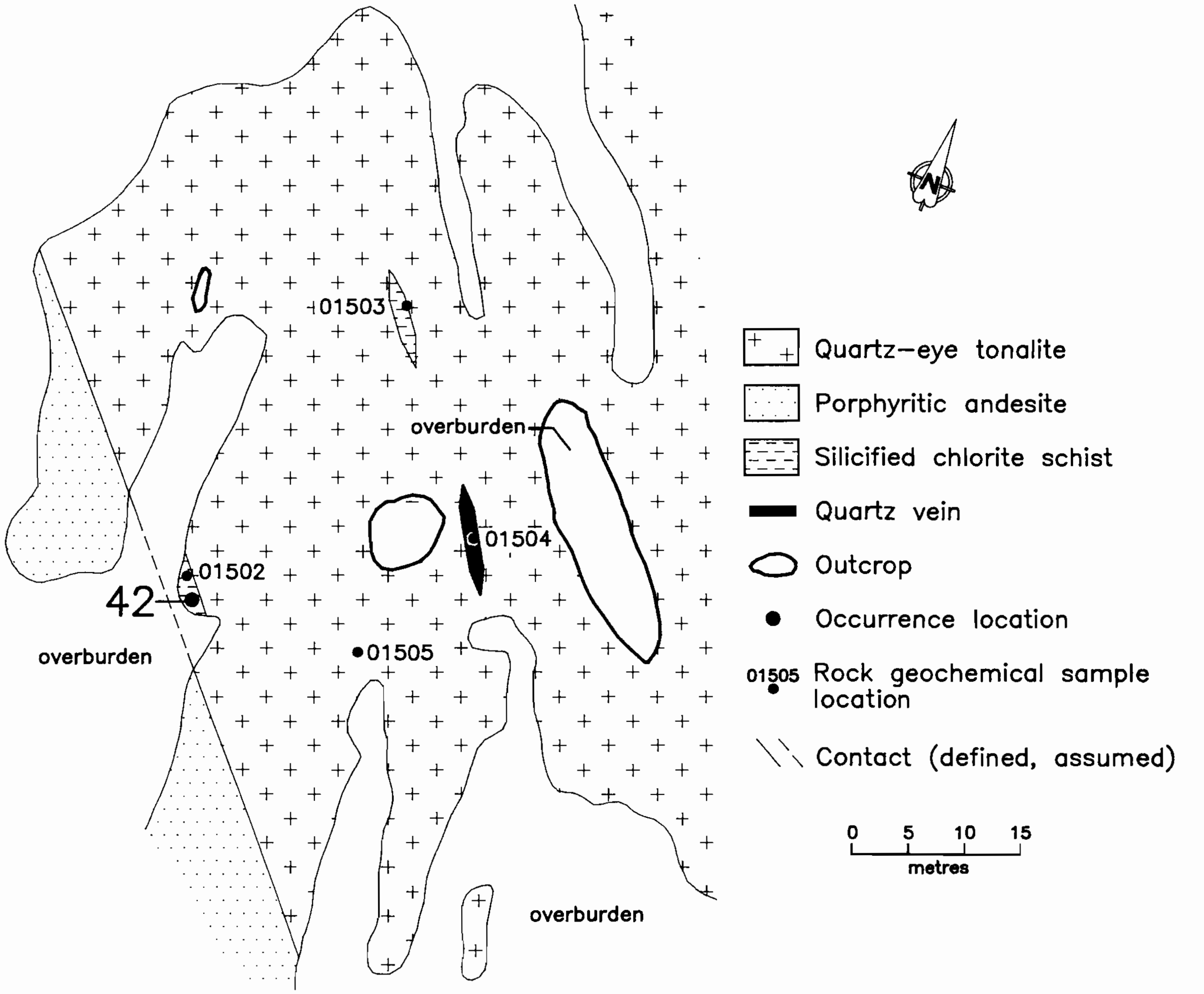


Figure 42-1: Outcrop, geology and sample location map, occurrence 42.

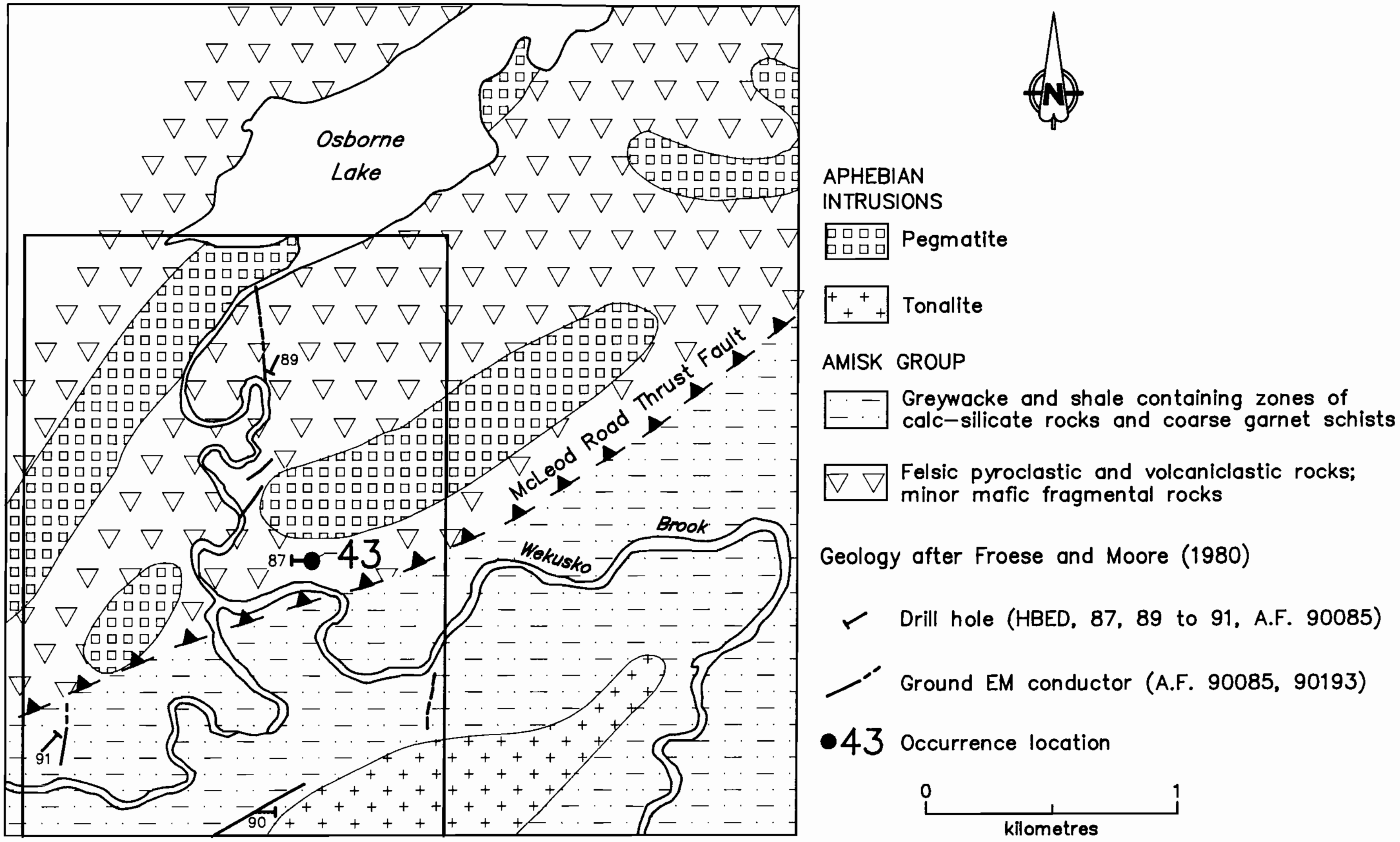


Figure 43-1: Geological setting, ground EM conductors and diamond drill hole locations, occurrence 43.

LOCATION: **43**

NAME: (A.F. - Mineralization intersected by diamond drilling).

AREA: Osborne Lake.

UTM: 6086730N/452247E

AIRPHOTO: A20124-81

ACCESS: Provincial Road 393 and traverse.

EXPLORAITON SUMMARY:

The area was first staked as the Peg group of claims by HBED in 1951. A ground EM survey was done on the property by HBM&S in 1952 (A.F. 90193). HBED did a 4 hole 345 m drill program on Peg 88, 77, 146 and 150 in 1955 (A.F. 90085). Two of the drill holes may actually have been drilled on Peg 100 and 109 according to claim maps. Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624). The claims were cancelled between 1958 and 1959. Airborne EM and radiometric surveys were done by HBED in 1965 (A.F. 91650). HBED staked Kik 58, 128, 130 and 134 Fr. between 1963 and 1964, and did surface work on the property until the claims lapsed in 1973 (Mining Claim Card Kik 128). CB 8946 to CB 8949 were staked by D.N. Glassey in 1977, and assigned to Westway Mines Limited in 1978. Work was done on the property in 1979 under a claim grouping (Mining Claim Card CB 8946). In 1981 the area was restaked as CB 13359 and CB 13361 by HBED.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by felsic pyroclastic and volaniclastic rocks flanked to the south by greywacke and shale. These rocks have been assigned to the Amisk Group (Froese and Moore, 1980). The felsic volcanic rocks are intruded by Aphebian pegmatites; the McLeod Road Thrust Fault transects the area of the occurrence (Fig. 43-1). Diamond drill holes, collared to test ground EM conductors, intersected carbonatized and mineralized quartz-biotite-garnet gneiss, quartz-muscovite gneiss, siliceous sericite schist, green quartzite, pink and white pegmatite and graphitic schist (A.F. 90085).

MINERALIZATION:

Disseminated pyrite occurs in graphitic biotite-sericite schist, sericitic quartz-biotite ± garnet gneiss, graphitic biotite-carbonate schist and in grey "hornfels" over intervals between 0.2 and 8 m in core from DDH 87, and 6.7 and 45.3 m in core from DDH 89. Locally, "pyrite flecks and graphite threads" occur in bleached and sheared quartz-biotite-garnet gneiss in core from DDH 90 and 91 (Fig. 43-1; A.F. 90085). "Slight zinc mineralization" is reported from outcrops in this area (A.F. 90144).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

Assessment Files 90085, 90144, 90193, 91624 and 91650
Manitoba Energy and Mines, Minerals Division.

Cerny, P., Trueman, D.L., Ziehlke, D.V., Goad, B.E. and Paul, B.J.
1981: The Cat Lake-Winnipeg River and the Wekusko Lake pegmatite fields, Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER80-1, 216 p.

Frarey, M.J.
1950: Crowduck Bay; Geological Survey of Canada, Map 987A, 1:63 360.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.

Mining Claim Cards Kik 128 (P 9537A) and CB 8946
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

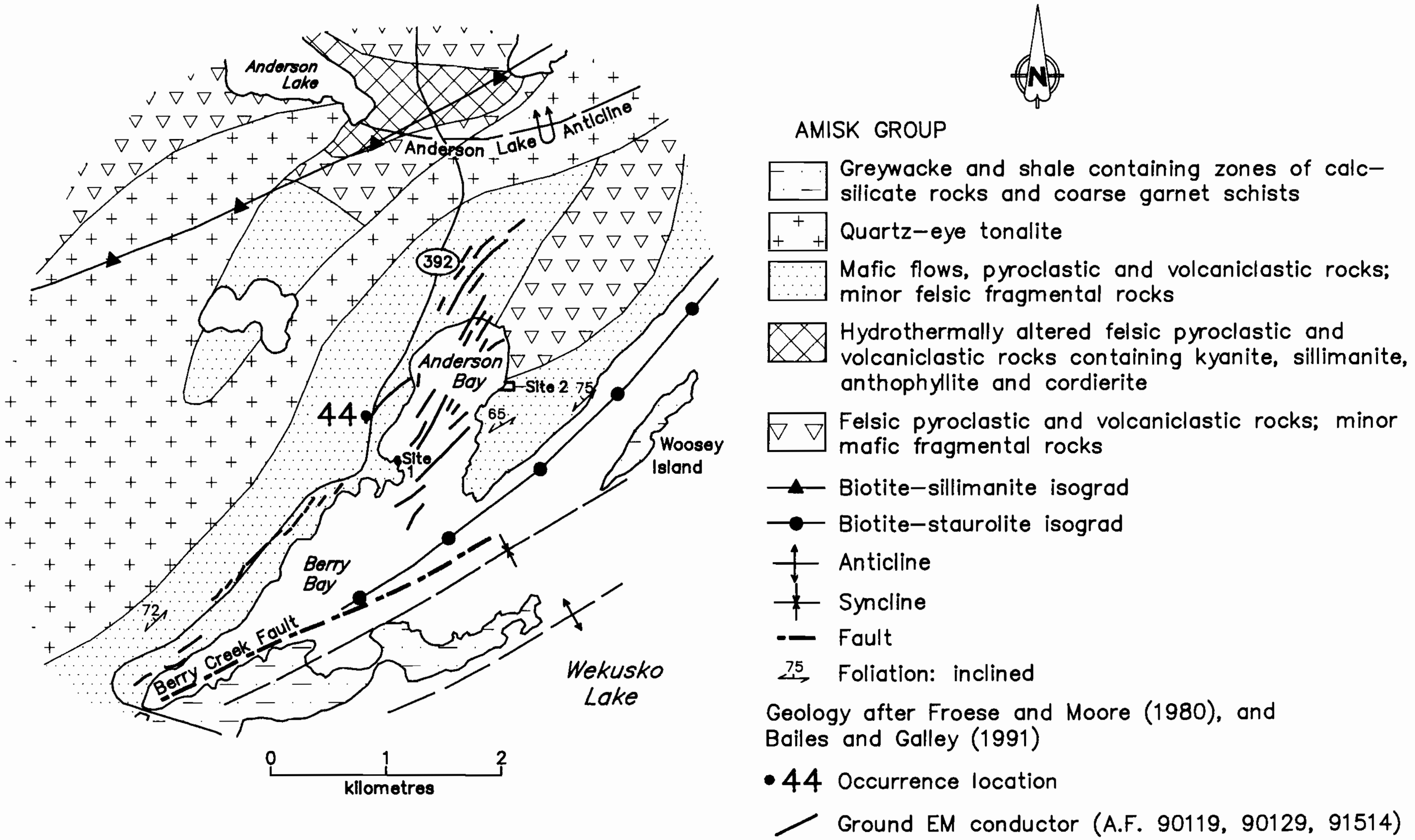


Figure 44-1: Geological setting of occurrence 44.

LOCATION: **44**

NAME:
UTM: 6075896N/439591E
ACCESS: Provincial Highway 392 and traverse.

AREA: Anderson Bay, Wekusko Lake.
AIRPHOTO: A25325-53

EXPLORATION SUMMARY:

The area was first staked as Savage 1, Lincoln, Tuck, and Nip 1, 3, 4, 6 and 7 in the 1920's. Surface exploration was done on the Mallard, Violet and Val groups by Herb Lake Mining and Exploration Limited in 1947 (Manitoba Energy and Mines Scrap Book, 1947). A 7 hole, 287 m, diamond drill program was done on Violet 2, 3 and 6 for J.C.L. Ferguson between 1948 and 1949 (A.F. 90130). A 10 hole, 457 m, drill program was done on Sol 3 and 6 in 1949, and a 3 hole, 138 m, program was done on Sol 2 in 1950 for Charles Vance (A.F. 90127). On Mallard 5, Walter Johnson drilled two holes totalling 74 m for Naomi Vance in 1952 and a 63 m deep hole for Jay-Kay Exploration Syndicate in 1954 (A.F. 90109, 90131). A 6 hole, 414 m, drill program was done on Sol 5 in 1953, and a 4 hole, 274 m, program was done on Moose 3 in 1954 for Jay-Kay Exploration Syndicate (A.F. 90125, 90127). HBED did an HLEM survey in the area in 1955 (A.F. 90108, 90124). In 1959, a 2 hole, 147 m, drill program was done on Solar 7, a 4 hole, 203 m, program was done on Moose 4, and a 6 hole, 447 m, program was done on Moose 3, for Jay-Kay Exploration Syndicate (A.F. 90113, 90126). J.H. Kerr acquired Moose 3, 4 and Solar 7 in 1964. Airborne EM and radiometric surveys were done by HBED in 1965 (A.F. 91650). HBED drilled two holes totalling 230 m to test a Turam EM anomaly on Solar 7 in 1965 (A.F. 90129). Solar 7 was cancelled in 1968. Moose 3 and 4 were assigned to Falconbridge Nickel Mines Limited in 1969, and then to Linda Mines Limited in 1972. W. Bruce Dunlop held the ground from 1975 to 1977. Granges Exploration Aktiebolag staked CB 9188 over the area in 1978, and did an HLEM survey in 1979 and a 2 hole, 156 m, drill program in 1980 (A.F. 92993). Work was filed for CB 9188 under claim groupings from 1980 to 1989, before it was cancelled in July 1990 (Mining Claim Card CB 9188). Canton 5 to 7 were staked over part of the former Sol claims by Wm. McKayseff between 1968 and 1969, and assigned to W.B. Kobar in 1971. Stall Lake Mines Limited optioned the Canton claims from 1971 to 1976. Geophysical work was done on the Canton group between 1971 and 1973 and eight conductors were identified on the Canton group of 7 claims (Stall Lake Mines Limited, 1971 and 1973 Annual Reports). The Canton claims were transferred to Wm. McKayseff in 1976 and then to Falconbridge Nickel Mines Limited in 1978. In 1982 the company's name changed to Falconbridge Limited and a 90% interest in the property was assigned to Corporation Falconbridge Copper (known as Minnova Inc. since 1987). Part of the former Sol claims are also covered by Fly 21 Fr. and Fly 27 held by Canadian Nickel Company Limited since 1963.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by mafic flows, pyroclastic and volcaniclastic rocks flanked to the north by felsic pyroclastic and volcaniclastic rocks, to the west by quartz-eye tonalite and to the south by greywacke and shale. These rock units have been assigned to the Amisk Group. The occurrence is situated between the biotite-sillimanite isograd to the north and the biotite-staurolite isograd to the south (Fig. 44-1; Froese and Moore, 1980). Rusty weathered and malachite-stained mafic volcaniclastic rocks are present in the vicinity of the occurrence (Fig. 44-2). The area of the occurrence is characterized by multiple long and short strike-length ground EM conductors (Fig. 44-3) that are parallel to the regional foliation. Diamond drill holes, collared to test the geophysical conductors, intersected a variety of schistose, massive and altered lithologies. These include peridotite, "greenstone" and "grey sedimentary rocks" (A.F. 90109, 90113), mineralized sericite schist with quartz veins (A.F. 90125), mineralized chlorite schist with quartz veins and nonmineralized gabbro and quartz-eye porphyry (A.F. 90126), peridotite with bands of red hematite, mineralized chlorite-, mica-, talc- and carbonate schists, diorite and altered "quartzite" (A.F. 90127, 90130, 90131), and mineralized quartz-eye granite, chlorite-garnet schists, and andesite with quartz veins (A.F. 90129).

MINERALIZATION:

Most lithologies contain trace to 20% pyrite in rocks that invariably are described as "schistose" in the drill logs. Disseminated pyrite is the most common sulphide mineral although disseminated chalcopyrite is described with pyrite and pyrrhotite in "norite" (Fig. 44-3; DDH 9; A.F. 90127), in talc schist that contains quartz veins (Fig. 44-3; DDH 3; A.F. 90127), in sheared, siliceous tuff and garnetiferous andesite with quartz-and quartz-carbonate veins (Fig. 44-3; DDH 1, 3; A.F. 90127), and in quartz-phyric sericite schist (Fig. 44-3; 44-4; DDH 9; A.F. 90130, 90131).

Mineralized intervals vary from 6 cm to tens of metres in schistose lithologies. Mineralized and nonmineralized, diorite, gabbro, quartz-eye granite, quartz-eye porphyry, peridotite and norite are common. DDH 1 intersected 0.3 m of near solid pyrite in a white quartz vein and 0.1 m of quartz with visible gold in sheared and silicified andesite (Fig. 44-5; A.F. 90129).

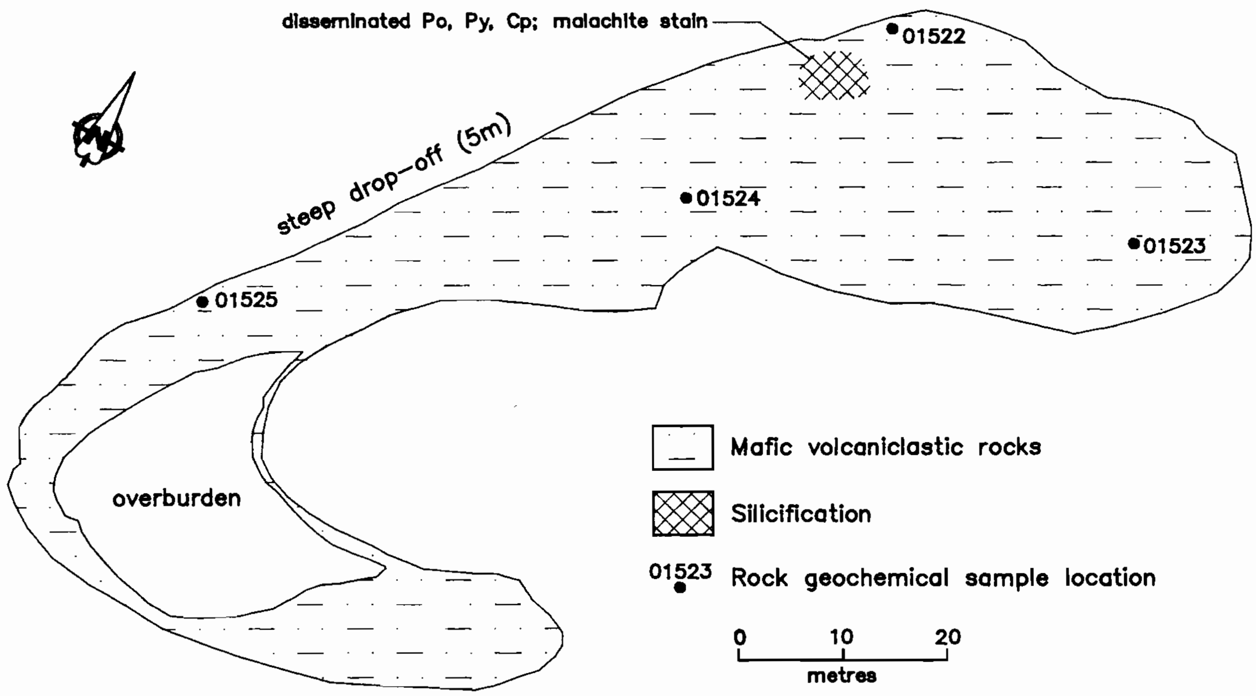


Figure 44-2: Detailed geology, occurrence 44.

GEOCHEMICAL DATA:

Four representative outcrop chip samples (01522 through 01525) were collected for geochemical analysis from silicified mafic volcaniclastic rock on the east shore of Anderson Bay (Site 1, Fig. 44-2, 44-5). A representative outcrop chip sample (860731) of sericite schist with 2 to 3% pyrite was collected from a peninsula in Anderson Bay north of Bartlet's Landing (Site 2, Fig. 44-5). All samples contain low base and precious metal values. Analytical results are presented in Appendix I.

CLASSIFICATION:

Vein type deposit; single vein. A quartz vein in DDH 1, hosted by sheared and silicified andesite, contains visible gold. The predominant style of mineralization is disseminated iron sulphides in sheared and schistose peridotite, basalt and schists of uncertain provenance. Talc-, chlorite- and sericite schists may represent zones of high fluid flow and alteration along structural conduits developed in peridotite, basalt and other lithologies. The alteration that characterizes these rocks may be related to the Linda massive sulphide type deposit (*cf.* Location 79).

REFERENCES:

Assessment Files 90108, 90109, 90124, 90125, 90126, 90127, 90129, 90130, 90131, 90113, 91650 and 92993
Manitoba Energy and Mines, Minerals Division.

Eccles, D.R. and Fedikow, M.A.F.
1985: Mineral occurrence documentation and alteration zone mapping, Snow Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 82-99.

Fedikow, M.A.F., Roney, C.T., Schmidt, G.J. and Robbie, T.J.
1986: Mineral deposit studies in the Snow Lake area; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1986, p. 77-85.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.

Gobert, G.
1990: Till geochemistry of the Snow Lake area (NTS 63K/16, 63J/13, 63J/12); in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1990, p. 72-73.

Mining Claim Card CB 9188
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Russell, G.A.
1957: Structural studies of the Snow Lake - Herb Lake area; Manitoba Mines and Natural Resources, Publication 55-3, 33p.

Scrap Book
1947: Manitoba Energy and Mines, Minerals Divison, Corporation Files.

Stall Lake Mines Limited, 1971 and 1973 Annual Reports
Manitoba Energy and Mines, Minerals Divison, Corporation Files.

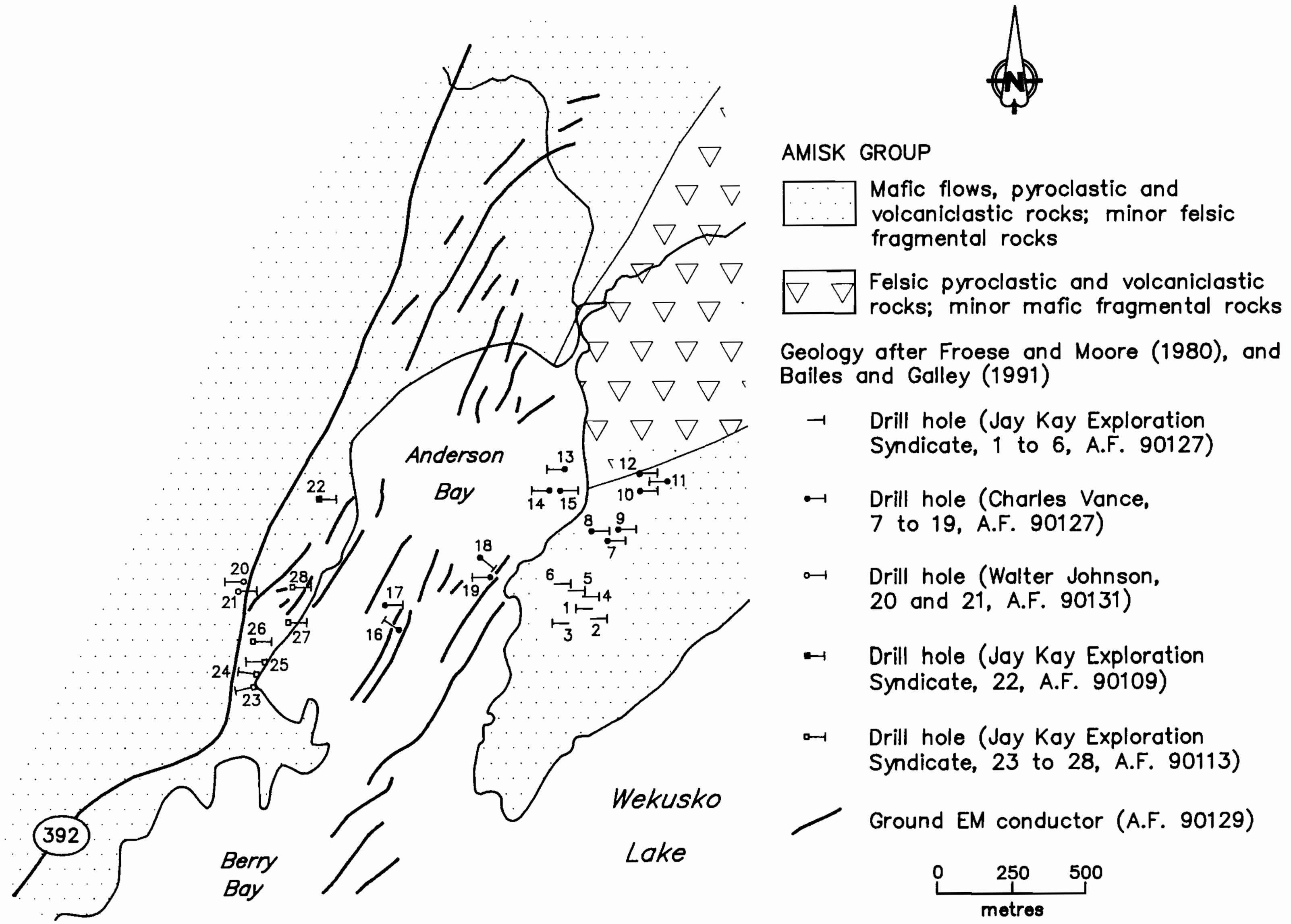


Figure 44-3: Diamond drill holes and ground EM conductors, occurrence 44.

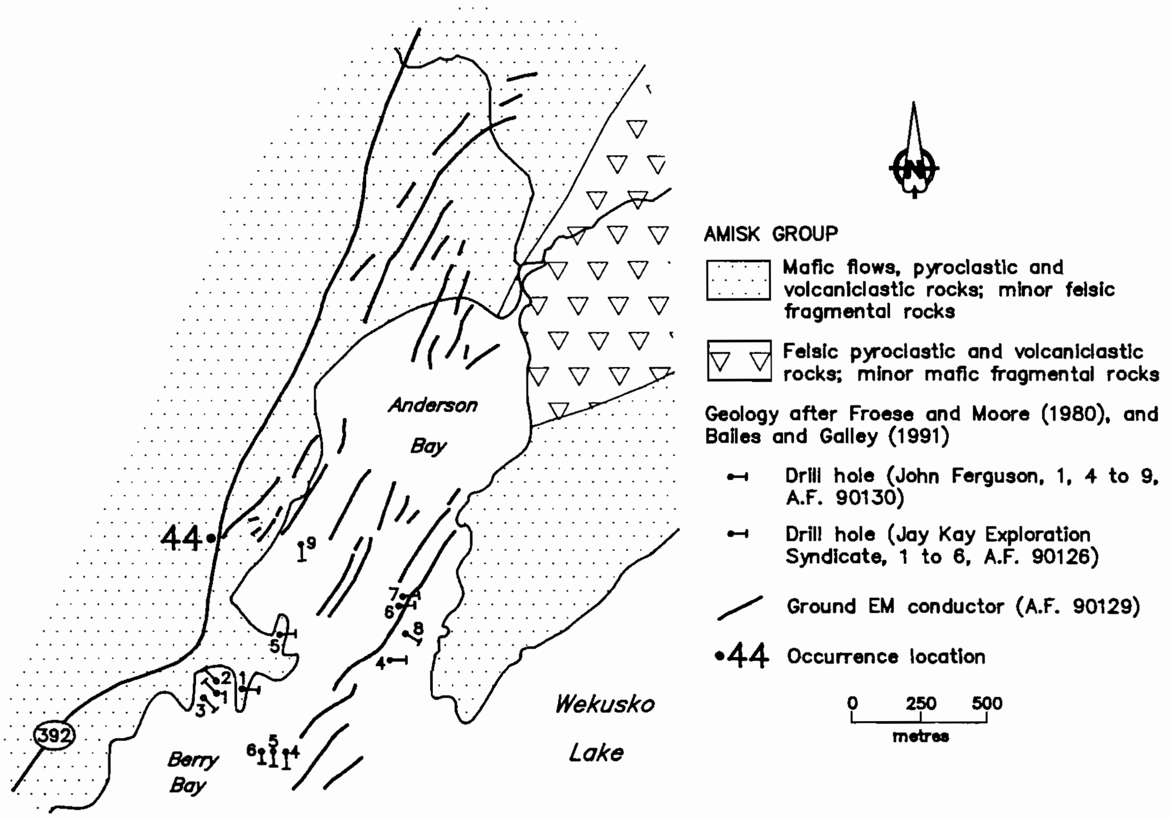


Figure 44-4: Diamond drill holes and ground EM conductors, occurrence 44.

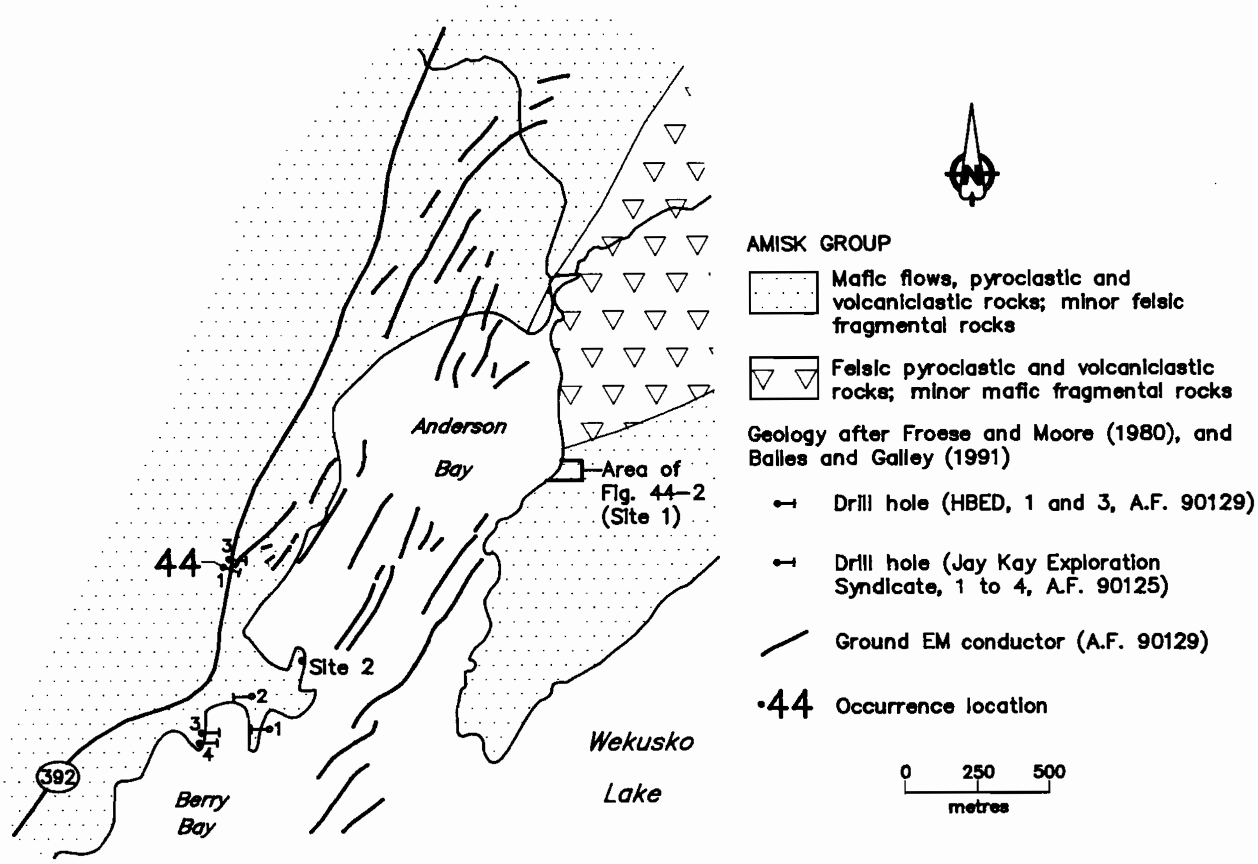


Figure 44-5: Geology, ground EM conductors and diamond drill locations for occurrence 44.

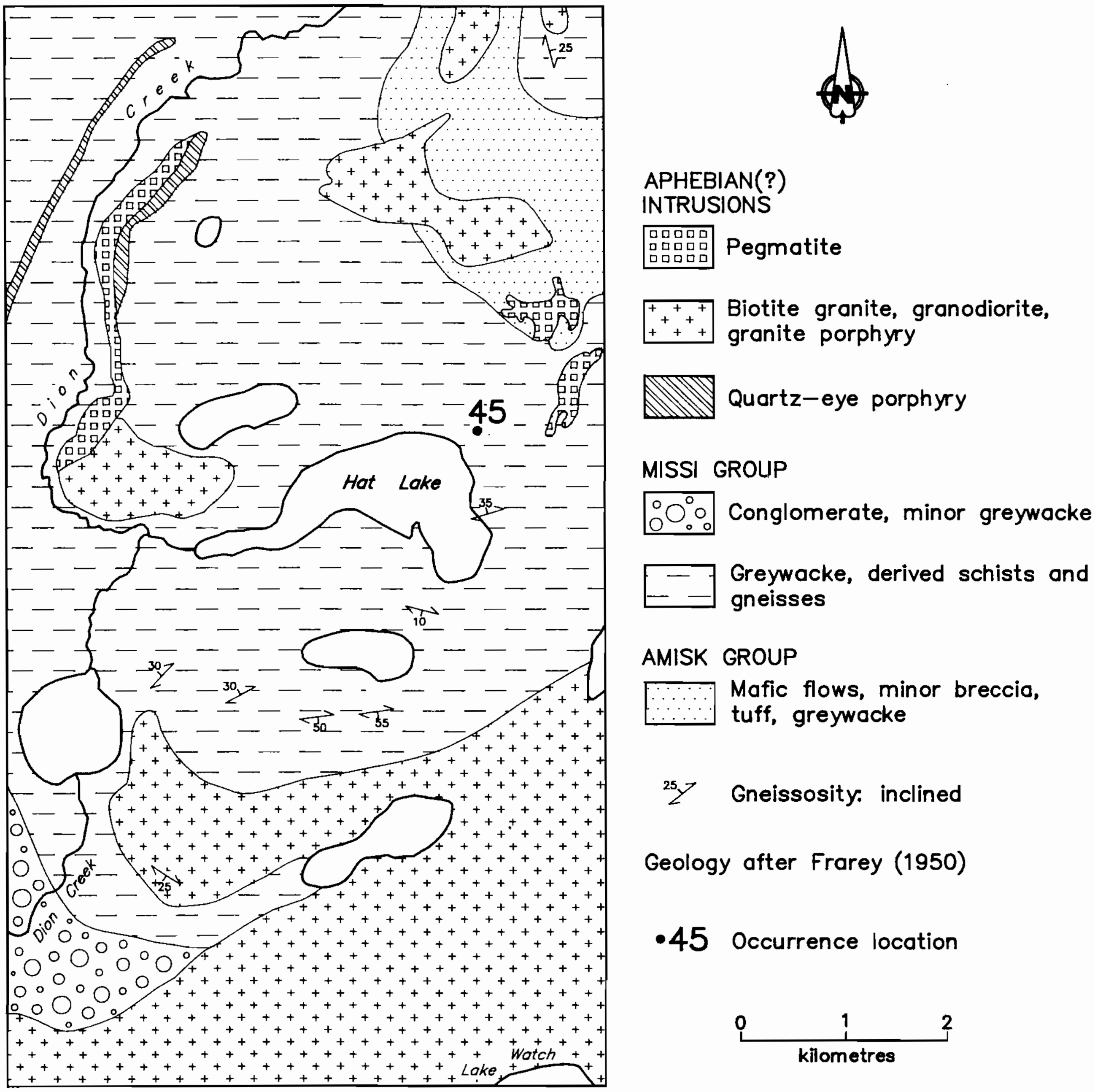


Figure 45-1: Geological setting of occurrence 45.

LOCATION: **45**

NAME:

UTM: 6070548N/465811E

ACCESS: Bush plane to Hat Lake and traverse.

AREA: North shore of Hat Lake.

AIRPHOTO: A20808-185

EXPLORATION SUMMARY:

The area was first staked as Babs 4 by L.P. Lockhart in 1952. W.F. Ulrich acquired the property soon after and did surface work in 1953 (Mining Claim Card Babs 4). The claim lapsed in 1954. Mike Remniak staked Seal 21 in 1955 and did surface work on the Seal group between 1956 and 1957 (Mining Claim Card Seal 21). Fay 26 was staked in the area by R.C. Burkett and assigned to A.L. Parres in 1956. Kix Minerals Limited acquired the claim soon after and did surface work in 1957 (Mining Claim Card Fay 26). Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624, Ground Hog Sheet 13). The Fay and Seal claims lapsed in 1958. In 1960 A. Jacobson staked Tik 34 and assigned it to Conwest Exploration Company Limited. The claim lapsed in 1961. HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650). In 1968, June 37 and 75 were staked and assigned to E.A. Glick. No work was reported and the claims were cancelled in 1969.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Missi Group greywacke, arkose, conglomerate and derived schists and gneisses. These rocks have been intruded by biotite granite and pegmatite (Fig. 45-1; Gordon and Gall, 1982; Frarey, 1950). Rusty weathered greywacke, intruded by pegmatite dykes, was observed at the occurrence.

MINERALIZATION:

Disseminated (1 to 2%) pyrite and pyrrhotite occur in rusty weathered and fractured biotite greywacke. Outcrop is particularly rusty weathered with proximity to pegmatite dykes.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 91624 and 91650
Manitoba Energy and Mines, Minerals Division.

Fedikow, M.A.F., Roney, C.T., Schmidt, G.J. and Robbie, T.
1986: Mineral deposit studies in the Snow Lake area; in Manitoba Energy and Mines, Geological Services Branch, Report of Field Activities, 1986, p. 77-85.

Frarey, M.J.
1950: Crowduck Bay; Geological Survey of Canada, Map 987A, 1:63 360.

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Mining Claim Cards Babs (P25381), Seal 21 (P35723) and Fay 26 (P45066)
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

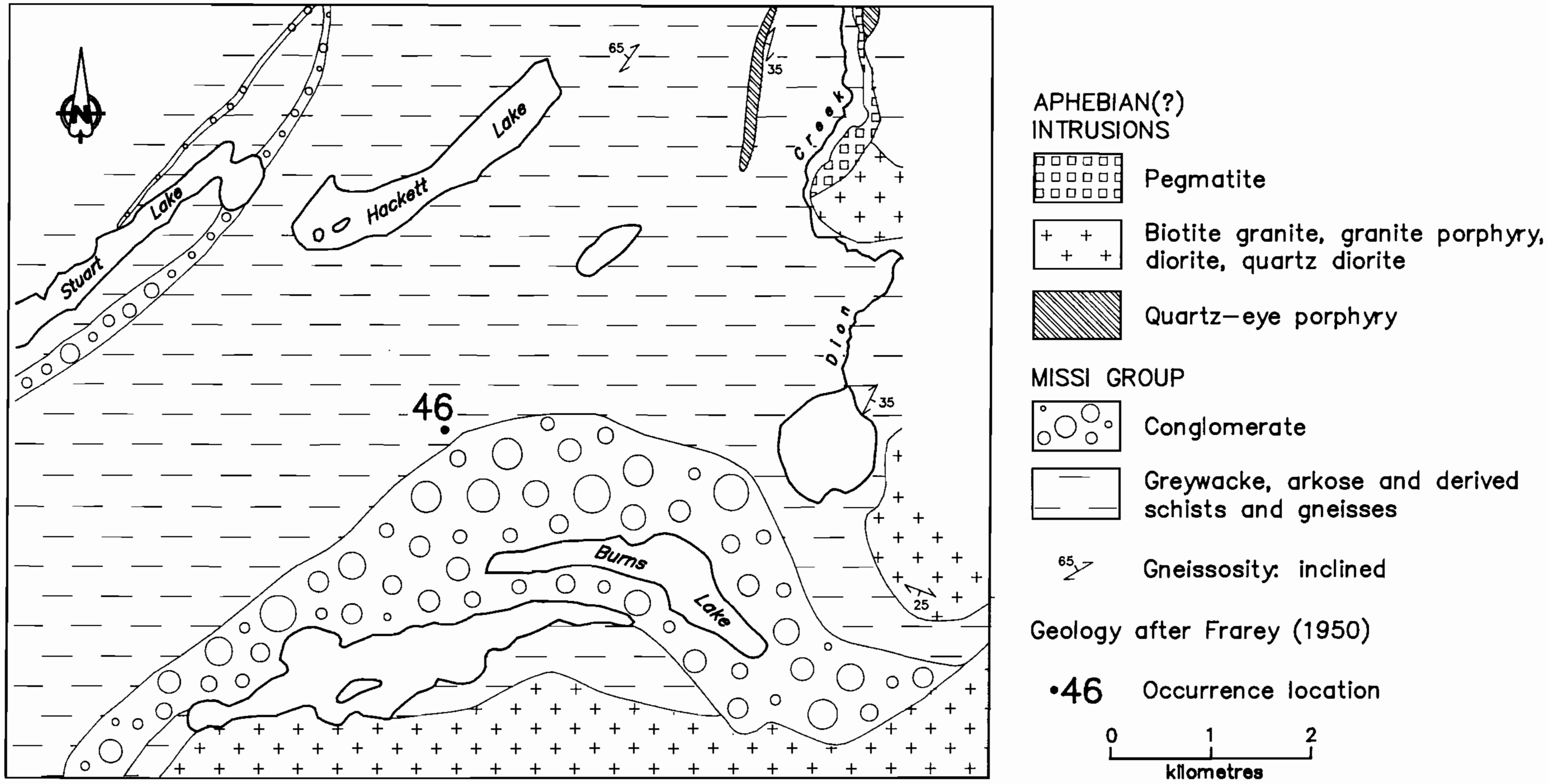


Figure 46-1: Geological setting of occurrence 46.

LOCATION: **46**

NAME:

UTM: 6067386N/458150E

ACCESS: Bush plane to Burns Lake and traverse.

AREA: Northwest of Burns Lake.

AIRPHOTO: A20137-95

EXPLORATION SUMMARY:

The area was first staked as Maxine 9, 10 and 11 prior to 1930. John J. Johnson held ground in the area as Carbon 2 from 1955 to 1956, but did not report any work. HBED did airborne EM and radiometric surveys in the area in 1965 (A.F. 91650). C. Ziehlke staked Kaj 1 in 1987, and assigned it to Strider Resources Limited in 1989. Strider Resources staked additional ground in the area as Dion 5 and Dion 6 in 1989 and 1990, respectively. Strider Resources signed an option agreement with Tenby Resources Limited in 1990.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Missi Group greywacke, arkose, conglomerate and derived schists and gneisses (Fig. 46-1; Gordon and Gall, 1982; Frarey, 1950). Rusty weathered amphibolite and altered greywacke were mapped in the area of the occurrence (Fig. 46-2). South of the occurrence, at the edge of a swamp, a rusty weathered amphibolite contains pyrite, pyrrhotite ± chalcopyrite.

MINERALIZATION:

A polymetallic quartz vein hosted by greywacke is exposed by four trenches (Fig. 46-2). The vein is hosted by arkose and contains disseminated grains, veinlets and blebs of galena, sphalerite, chalcopyrite, arsenopyrite and pyrite. Sulphide mineralization appears to be most abundant in vein material that contains partially assimilated wall rock fragments. In outcrop the arkose is rusty weathered with 3 to 5%, 1 to 3 mm stubby euhedral to subhedral arsenopyrite and is silicified to a cherty, fine grained siliceous rock. Partially digested wall rock fragments within the vein contain 0.5 to 1.0 cm arsenopyrite crystals. Away from the vein/wall rock contact the arkose contains clots of biotite.

GEOCHEMICAL DATA:

Eight representative rock chip samples with variable amounts of vein and wall rock were collected from muck piles (samples 01613 to 01620; Fig. 46-2). The ranges in concentration for Pb, Zn, Ag, Au and As are: 14 to 10189 ppm Pb; 59 to 7212 ppm Zn; 0.1 to 29 ppm Ag; 720 to 8041 ppm As; and 55 to 8090 ppb Au. Additionally, samples 01613, 01615 and 01616 contain 33, 10 and 10 ppm Sb, respectively. These same three samples also contained 15 ppm, 27 ppm and 24 ppm Cd. Sample 01613 contained 6 ppm Bi. The remainder of the analyses are presented in Appendix I.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. The multiple polymetallic quartz veins are hosted by altered arkose. The occurrence of polymetallic quartz veins in hanging wall or host rocks to massive sulphide type deposits in the Snow Lake camp has been attributed to post-depositional mobilization of metals due to a deformational event. Accordingly, these quartz veins have been considered a type of leakage halo related to nearby massive sulphide deposits.

Many of the samples at the Burns Lake occurrence contain high arsenic, gold, antimony, cadmium and bismuth. High concentrations of these elments have also been observed in the massive sulphide type deposits in the Snow Lake area (*cf.*, Locations 75, 76, 77 and 80).

REFERENCES:

Assessment File 91650

Manitoba Energy and Mines, Minerals Division.

Fedikow, M.A.F., Roney, C.T., Schmidt, G.J. and Robbie, T.

1986: Mineral deposit studies in the Snow Lake area; in Manitoba Energy and Mines, Geological Services Branch, Report of Field Activities, 1986, p. 77-85.

Frarey, M.J.

1950: Crowduck Bay; Geological Survey of Canada, Map 987A, 1:63 360.

Gordon, T.M. and Gall, Q.

1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

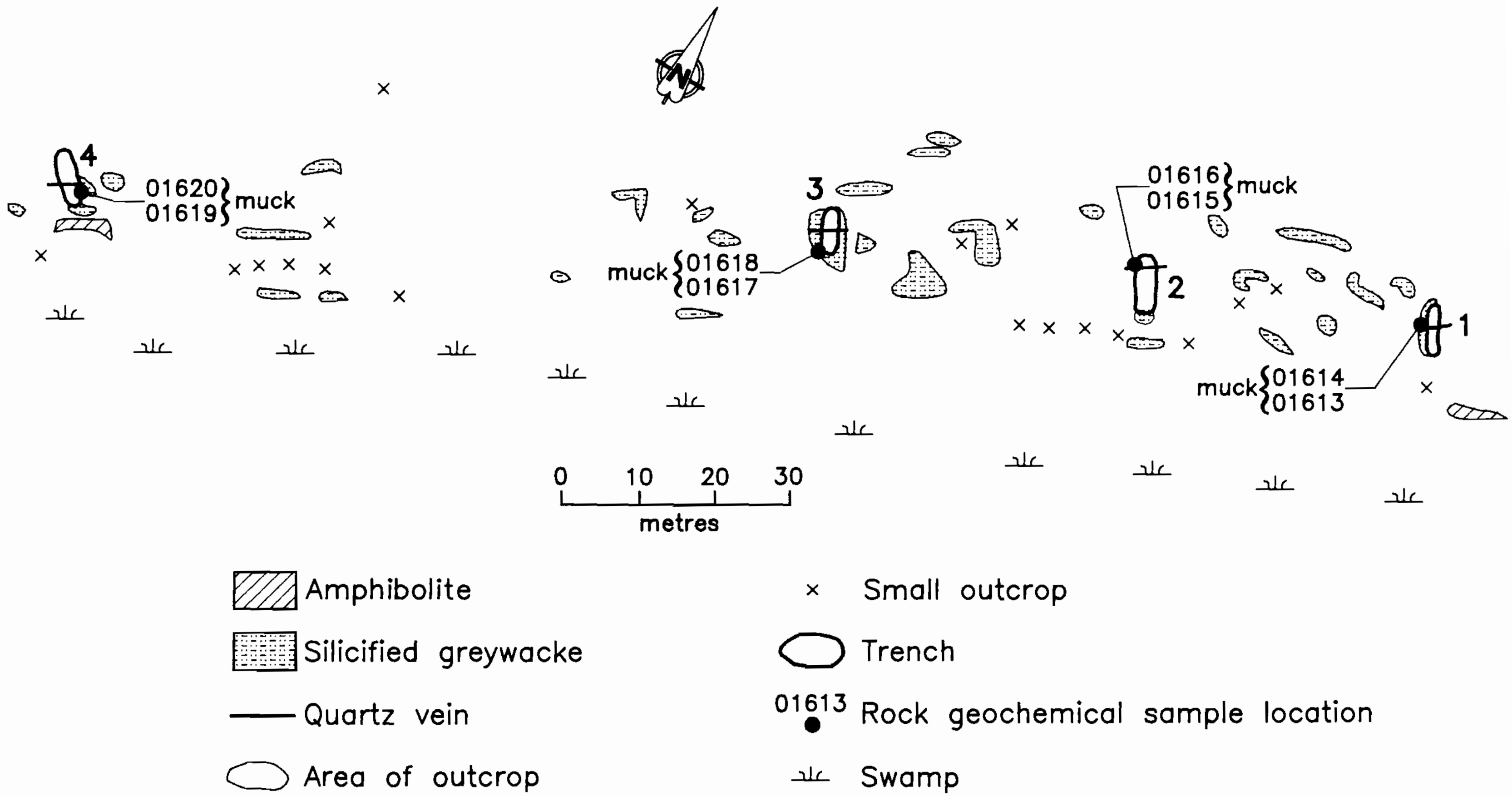


Figure 46-2: Outcrop, geology and trench and sample location, occurrence 46.

LOCATION: **47**

NAME: Glenn Group - Sn 1

UTM: 6067959N/452691E

ACCESS: Bush road from Wekusko Lake; bush plane to Stuart Lake and traverse.

AREA: Stuart Lake

AIRPHOTO: A20124-93

EXPLORATION SUMMARY:

The D.P. Glenn 1 to 6 claims were staked in 1928 and controlled by D'Arcy MacDonald. The claims were assigned to the Stenen Prospecting Syndicate in 1928 and a trench was dug on Glenn 2 (Mineral Inventory Card 63J/13 Sn 1). Extensive trenching was done on the claims before they lapsed in 1930. J.R. Campbell Estate held ground in the area from 1944 to 1949. Airborne geophysical surveys were done by HBED in 1965 and Falconbridge Nickel Mines Limited in 1973 (A.F. 91564, 91650). Noranda Exploration Company Limited held ground in the area as Nor 53 from 1983 to 1987. Strider Resources Limited staked Noc 3 over the area in 1988. Pierce Mountain Resources Limited acquired an 80% interest in the Noc claims in 1989 (Northern Miner, April 10, 1989). Drilling was done on the Noc group in 1990 (Northern Miner, March 12, 1990).

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Missi Group greywacke, arkose and conglomerate flanked to the northwest by andesitic and basaltic flows, rhyolite and laminated feldspathic chert and greywacke. A unit of biotite dacite occurs at the contact between the andesitic and basaltic flows and the greywacke-arkose-conglomerate succession. The occurrence is situated in a concentrically zoned intrusion that contains a biotite granite core and a fine- to medium-grained quartz diorite to diorite rim. These units intrude the greywacke-arkose-conglomerate sequence (Fig. 47-1; Gordon and Gall, 1982; Frarey, 1950), and are rusty weathered and silicified with proximity to the occurrence (Fig. 47-2).

MINERALIZATION:

Disseminated, and veinlets and blebs (1 to 5%) of pyrite and arsenopyrite occur within discontinuous quartz lenses and veins in silicified and rusty weathered biotite granite.

GEOCHEMICAL DATA:

Six representative rock samples were collected for multi-element geochemical analysis. Five samples are from muck piled at trenches 1 and 2 and sample 01552 was collected from mineralized wall rock in trench 2. The samples contain 31 to 1500 ppb Au, and 638 to 50529 ppm As. Sample 01552 also contains 14 ppm Sb and 17 ppm Bi.

This occurrence has been referred to as Sn 1 (Mineral Inventory Card). The mineralization, represented by samples 01552 through 01557, does not contain tin. This contradicts the 1.78% Sn reported from the property in 1929 (Mineral Inventory Card 63J/13 Sn1). Additionally, the following "pathfinder" suite of chemical elements were determined in each of the samples collected from the occurrence. These elements are considered to be useful for the recognition of Sn-W depositional environments.

Sample	F (ppm)	Hg (ppb)	In (ppm)	Li (ppm)	Sn (ppm)	W (ppm)
01552	140	130	1.0	9	<3	1400
01553		48		5	<3	1100
01554	110	8		5	<3	1500
01555	160	32		16	<3	1300
01556	120	22	0.5	11	<3	1500
01557	90	5		7	<3	1300

NOTE: The following analytical methods were used for this 6-element suite:

1. X-ray fluorescence for F, Hg, In, Li and Sn.
2. Neutron activation for W.

Lower limits of detection: F (20 ppm), Hg (5 ppm), In (0.5 ppm), Li (1 ppm), Sn (3 ppm), W (3 ppm).

CLASSIFICATION:

Vein type deposit; multiple veins or lenses.

REFERENCES:

Assessment Files 91564 and 91650

Manitoba Energy and Mines, Minerals Division.

Cerny, P., Trueman, D.L., Ziehlke, D.V., Goad, B.E. and Paul, B.J.

1981: The Cat Lake-Winnipeg River and the Wekusko Lake pegmatite fields, Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER80-1, 216p.

Fedikow, M.A.F., Roney, C.T., Schmidt, G.J. and Robbie, T.

1986: Mineral deposit studies in the Snow Lake area; in Manitoba Energy and Mines, Geological Services Branch, Report of Field Activities, 1986, p. 77-85.

Frarey, M.J.

1950: Crowduck Bay; Geological Survey of Canada, Map 987A, 1:63 360.

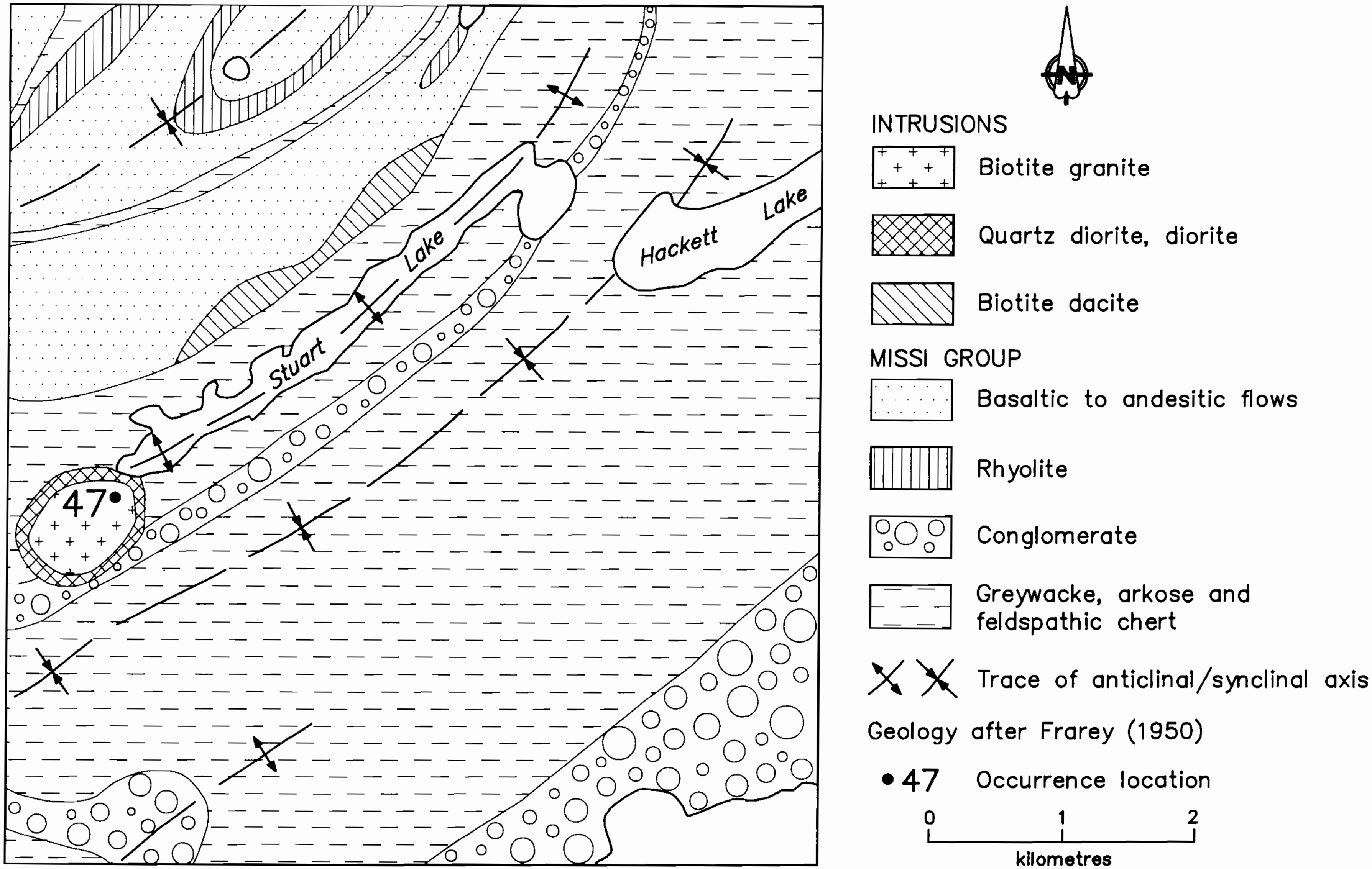


Figure 47-1: ***Geological setting of occurrence 47.***

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p.197-201.

Mineral Inventory Card 63J/13 Sn 1
Manitoba Energy and Mines, Minerals Division.

Stockwell, C.H.
1937: Gold deposits of Herb Lake area, northern Manitoba; Geological Survey of Canada, Memoir No. 208, 46p.

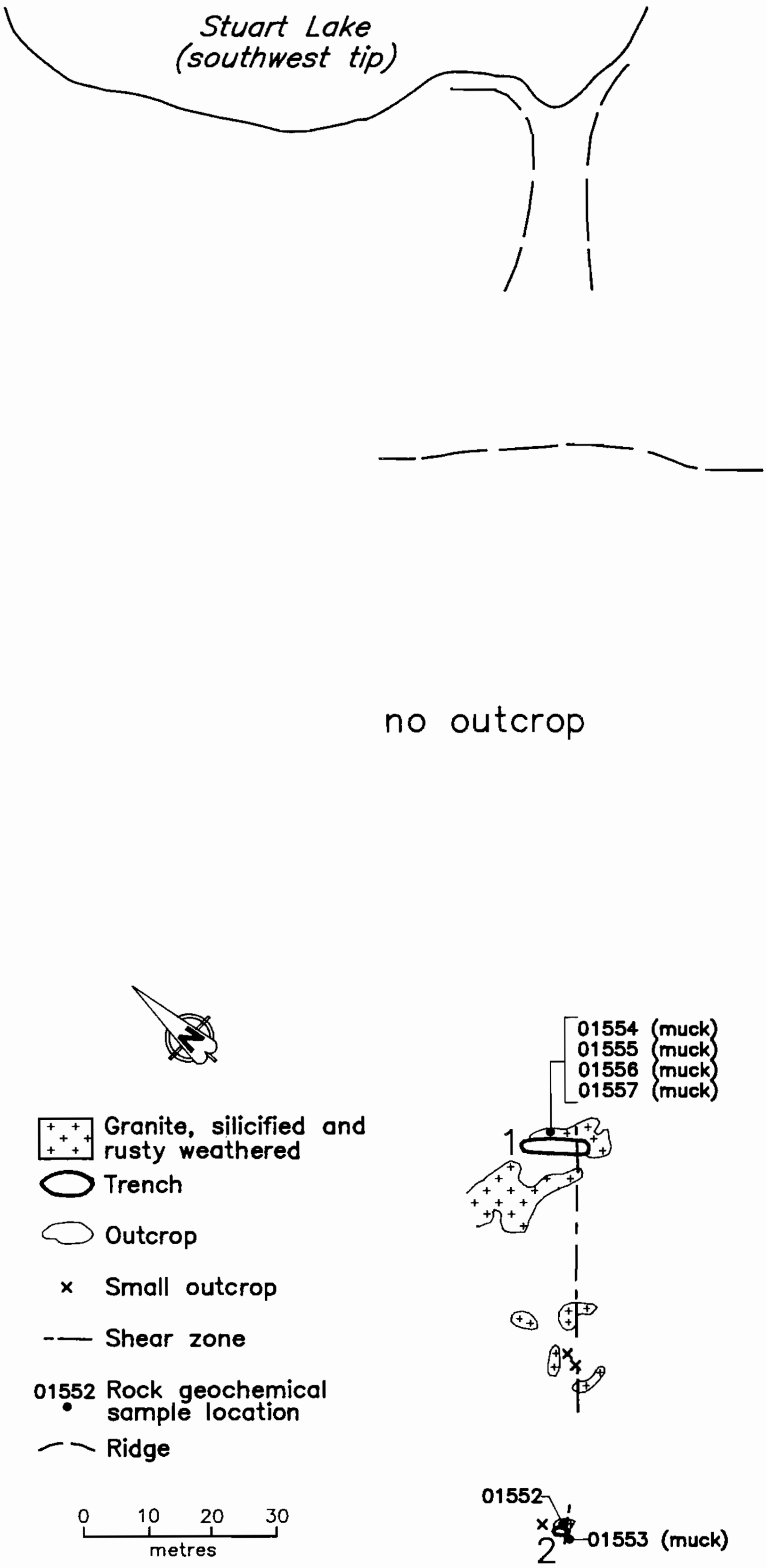


Figure 47-2: Outcrop, geology and trench and sample location map, occurrence 47.

LOCATION: **48**

NAME:

UTM: 6068496N/452828E

ACCESS: Bush road from Wekusko Lake; bush plane to Stuart Lake and traverse.

AREA: Stuart Lake.

AIRPHOTO: A20124-93

EXPLORATION SUMMARY:

The area was first staked as the Wasp and Copper claims prior to 1930. J.R. Campbell Estate held the Rex group from 1944 to 1949. HBED did airborne EM and radiometric surveys in the area in 1965 (A.F. 91650). Falconbridge Nickel Mines Limited did airborne EM and magnetic surveys in 1973 (A.F. 91564). Noranda Exploration Company Limited staked Nor 55 in 1983 and did work on the property in 1985 under a claim grouping (Mining Claim Card Nor 55). The claim was cancelled in 1987. Strider Resources Limited staked Noc 5 in 1988. Pierce Mountain Resources Limited acquired an 80% interest in the Noc claims in 1989 (Northern Miner, April 10, 1989). Drilling was done on the Noc group in January, 1990 (Northern Miner, March 12, 1990).

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Missi Group greywacke, arkose and conglomerate flanked to the north and northwest by andesitic and basaltic flows, rhyolite and feldspathic chert and greywacke. A unit of biotite dacite occurs at the contact between the andesitic and basaltic flows and the greywacke-arkose-conglomerate succession (Fig. 48-1; Gordon and Gall, 1982; Frarey, 1950). The host greywacke is carbonatized at the occurrence.

MINERALIZATION:

Disseminated pyrite (1 to 2%) occurs in rusty weathered zones associated with carbonatized greywacke.

GEOCHEMICAL DATA:

Four representative outcrop chip samples (01548 through 01551) collected from the general area of the occurrence (Fig. 48-2) contain low base and precious metal values (Fig. 48-2; Appendix I).

CLASSIFICATION:

Disseminated mineralization - not classified. It is postulated that the disseminated pyrite at this occurrence is related to carbonatization that accompanied the development of a fault that is parallel to the trace of an anticlinal axis situated beneath Stuart Lake.

REFERENCES:

Assessment Files 91564 and 91650
Manitoba Energy and Mines, Minerals Division.

Fedikow, M.A.F., Roney, C.T., Schmidt, G.J. and Robbie, T.
1986: Mineral deposit studies in the Snow Lake area; in Manitoba Energy and Mines, Geological Services Branch, Report of Field Activities, 1986, p. 77-85.

Frarey, M.J.
1950: Crowduck Bay; Geological Survey of Canada, Map 987A, 1:63 360.

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Mining Claim Card Nor 55 (W47993)
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Stockwell, C.H.
1937: Gold deposits of Herb Lake area, northern Manitoba; Geological Survey of Canada, Memoir No. 208, 46p.

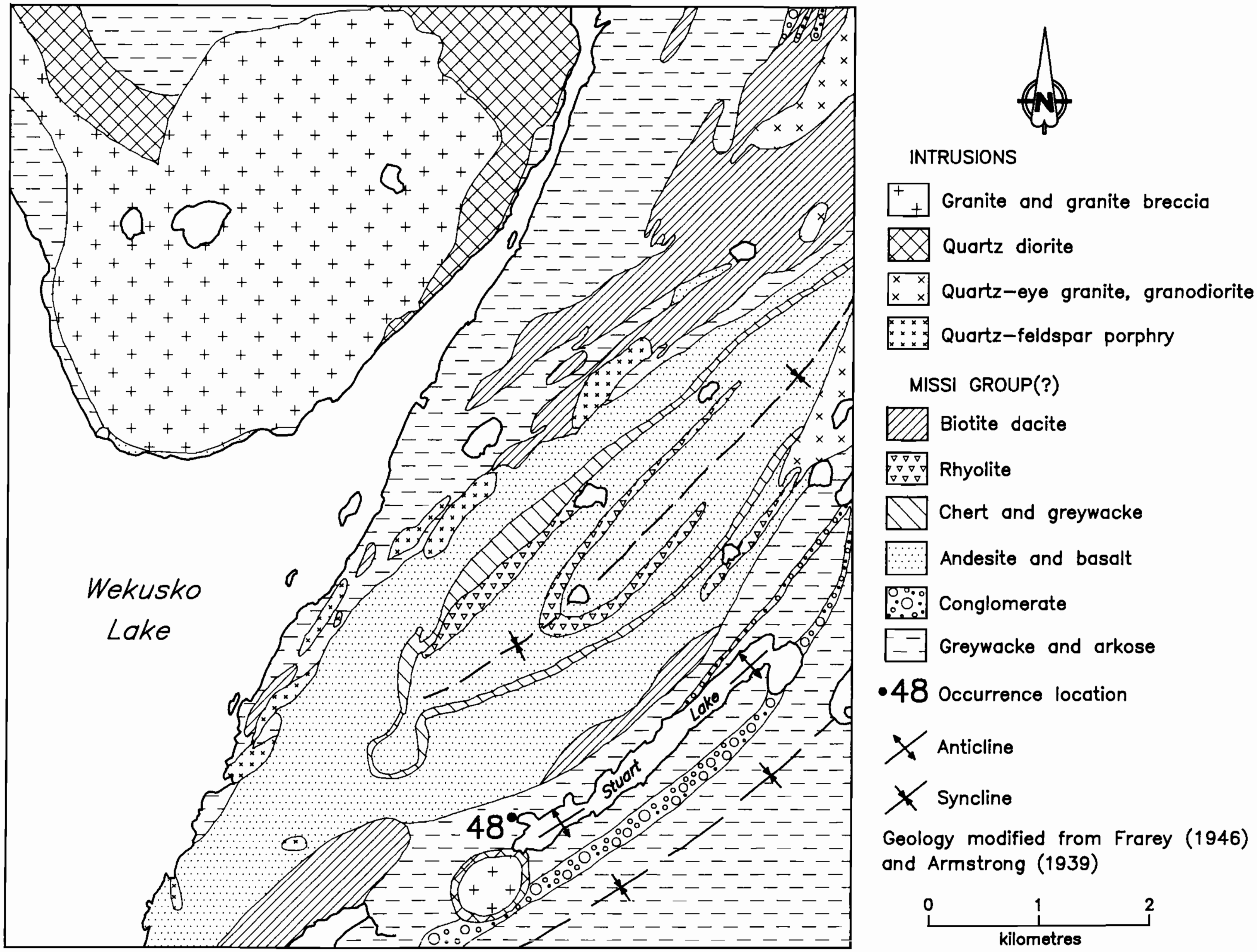


Figure 48-1: Geological setting of occurrence 48.

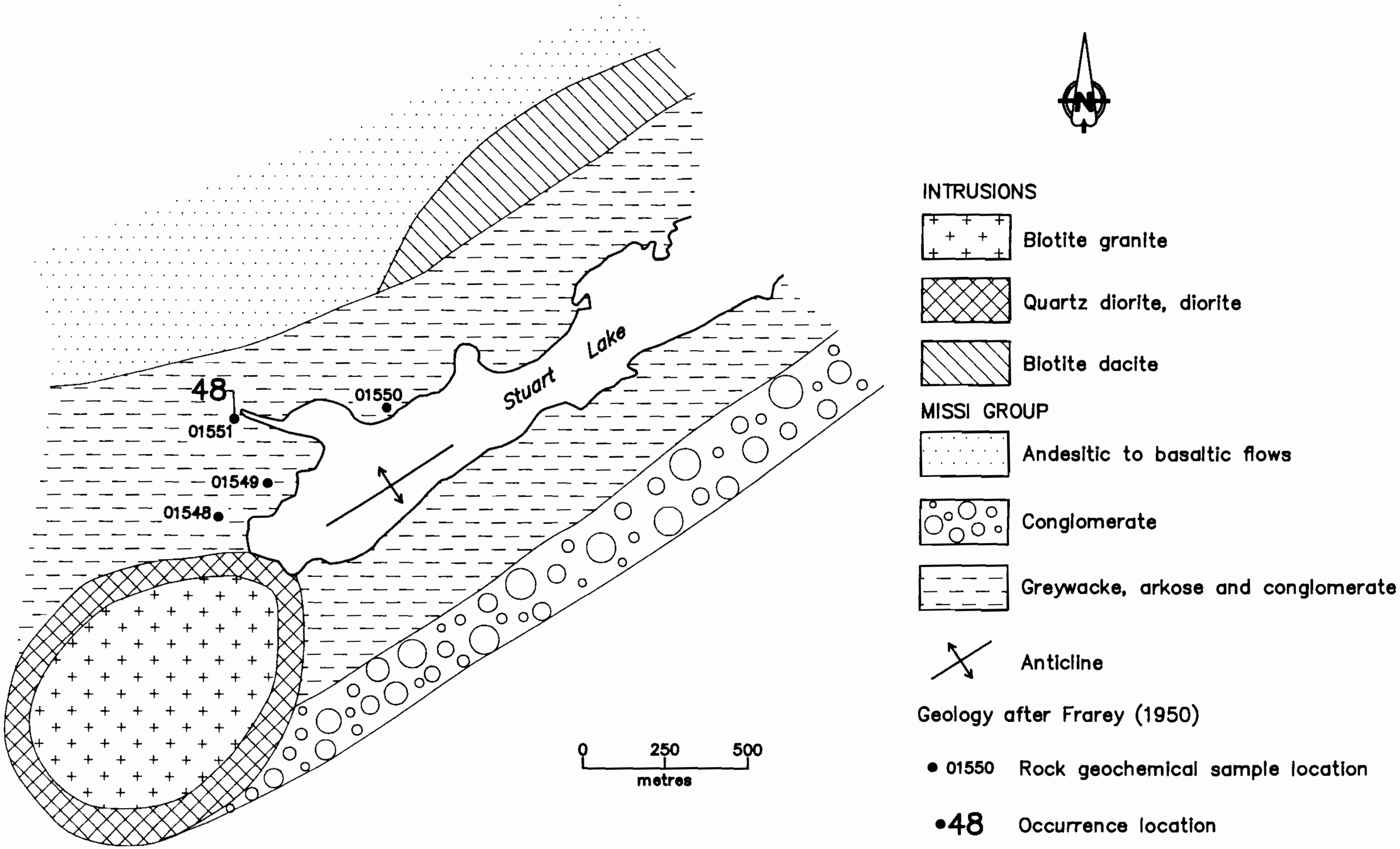


Figure 48-2: Local geological setting and sample location map, occurrence 48.

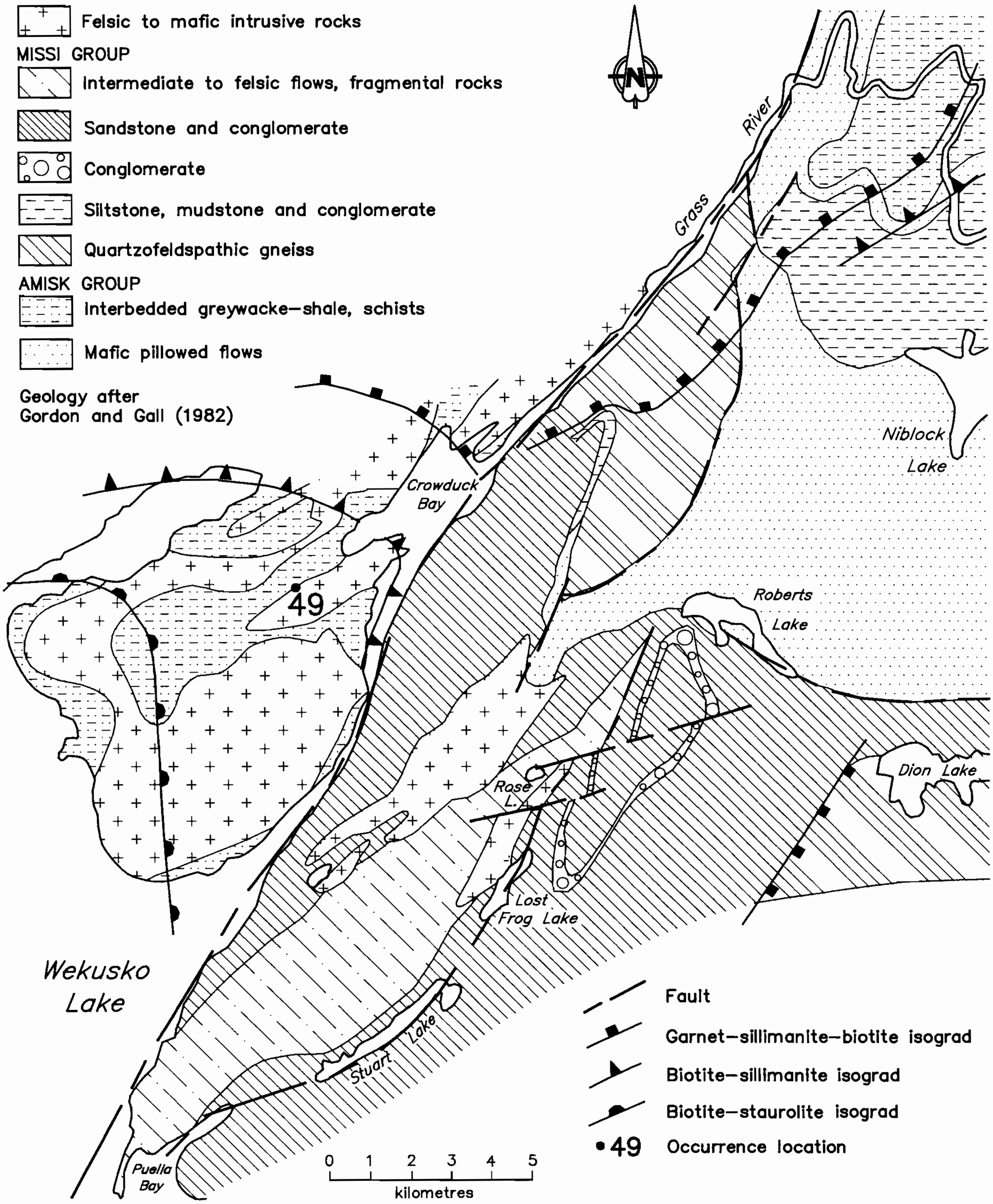


Figure 49-1: Geological setting of occurrence 49.

LOCATION: **49**

NAME:

UTM: 6080464N/452524E

ACCESS: Boat on Wekusko Lake to Crowduck Bay and traverse.

AREA: Crowduck Bay.

AIRPHOTO: A20124-85

EXPLORATION SUMMARY:

In 1956 a geological survey (1:2400) was done on the Mik group of claims by G.E. Midgley for Combined Developments Limited (A.F. 90078). A shear zone was noted on the Mik 5 claim. HBED did an airborne EM and radiometric survey in the area in 1965 (A.F. 91650). Strider Resources Limited staked the area in 1988, and restaked it as Park 1 in 1990.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by medium- to fine-grained quartz diorite (Aphebian) that intrudes Amisk Group interbedded greywacke and shale and derived schists (Fig. 49-1; Gordon and Gall, 1982; Frarey, 1950). The occurrence is situated between the biotite-staurolite isograd to the south and the biotite-sillimanite isograd to the north as defined by Gordon and Gall (1982). The immediate area of the occurrence is characterized by quartz diorite with mineralized quartz veins (Fig. 49-2).

MINERALIZATION:

Disseminated (2 to 5%) coarse grained (3 to 4 mm) euhedral arsenopyrite and 1 mm anhedral arsenopyrite occur within quartz veins hosted by rusty weathered quartz diorite. Approximately 2 to 3% fine grained anhedral pyrite, arsenopyrite and chalcopyrite occur in the wall rock adjacent to the quartz veins. Quartz veins are narrow (0.5 to 1.0 cm), discontinuous and distorted. The veins have a general trend of 140°.

GEOCHEMICAL DATA:

Five representative outcrop chip samples were collected from the area of the occurrence. Sample characteristics and results for Au, As, W, and Cu are summarized below for four of the samples.

Sample	**Au (ppb)**	**As (ppm)**	**W (ppm)**	**Cu (ppm)**
01597	5250	48259	608	64
01598	10	2	17	185
01599	4040	1254	1	129
01600	37	2597	34	106

Sample Descriptions

01597: 5% disseminated arsenopyrite in a white quartz vein, some quartz diorite wall rock in sample.

01598: 3 to 4% disseminated chalcopyrite and pyrite in quartz veins hosted by rusty weathered quartz diorite.

01599: 5% disseminated arsenopyrite in white quartz veins hosted by quartz diorite, wall rocks contain 1% disseminated pyrite and arsenopyrite.

01600: 3% disseminated, stubby arsenopyrite in a 0.5 cm wide quartz vein and quartz diorite wall rock.

The remainder of the analyses are presented in Appendix I.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. Multiple quartz lenses and veins containing gold, arsenic and tungsten in rusty weathered quartz diorite.

REFERENCES:

Assessment Files 90078 and 91650
Manitoba Energy and Mines, Minerals Division

Cerny, P., Trueman, D.L., Ziehlke, D.V., Goad, B.E. and Paul, B.J.
1981: The Cat Lake-Winnipeg River and the Wekusko Lake pegmatite fields, Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER80-1, 216 p.

Fedikow, M.A.F., Roney, C.T., Schmidt, G.J. and Robbie, T.J.
1986: Mineral deposit studies in the Snow Lake area; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1986, p. 77-85.

Frarey, M.J.
1950: Crowduck Bay; Geological Survey of Canada, Map 987A, 1:63 360.

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

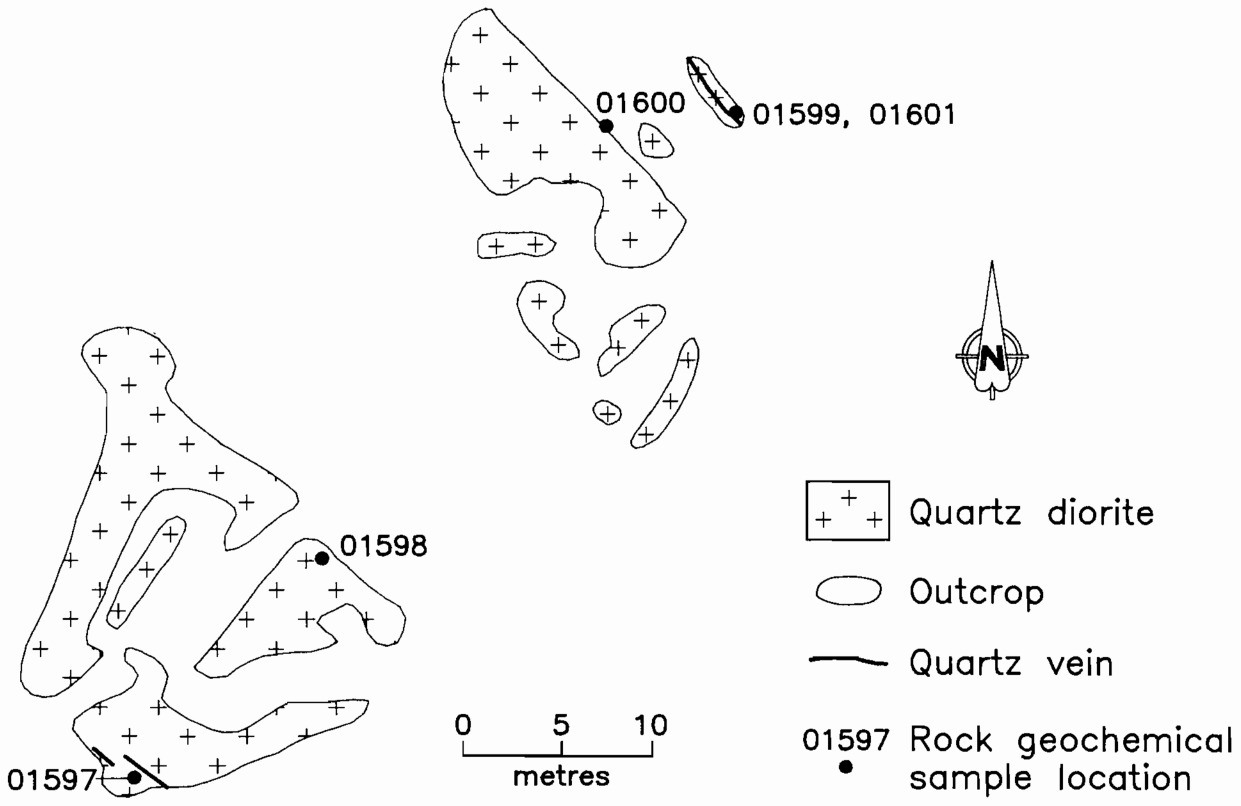


Figure 49-2: Outcrop, geology and sample location map, occurrence 49.

LOCATION: **50**

NAME: Herblet Lake Uranium

UTM: 6094291N/439814E

ACCESS: Via Provincial Road 393 from Provincial Road 392 to Herblet Lake Landing; boat to Angus Bay, Wekusko Lake; traverse.

AREA: East of the north end of Wolverton Lake; along the northwest shoreline of small unnamed lake.

AIRPHOTO: A20127-124

EXPLORATION SUMMARY:

The area was staked as J.N. 1 by Jack Nutt in 1948. Prospectors investigating a rutile showing found the uranium occurrence in 1948 (Mineral Inventory Card 63J/13 U 2). Subsequent to the discovery, geiger counter surveys were undertaken in the area. An 8 hole, 225 m, diamond drill program was done by J. Nutt for Snow Lake Gold Mines Limited in 1948 (A.F. 90105). Massive pitchblende was found throughout one hole (Snow Lake Gold Mines, Corporation File). The claim lapsed in 1951. HBED staked CB 12387 in 1981 and did work on the property in 1982, 1985, 1987 and 1989 under claim groupings. The claim lapsed in 1990.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by pink and light grey to white granitoid gneisses (oligoclase-quartz ± microcline) that form part of the Herblet Lake Gneiss Dome Complex (Fig. 50-1; Froese and Moore, 1980; Bailes, 1975). Diamond drilling intersected mineralized and altered granitoid gneiss (A.F. 90105).

MINERALIZATION:

Early newspaper reports describe "heavy" mineralization with strong radioactive response over long sections of drill core. The surface expression of the deposit is described as being 76.2 m wide by 914.4 m long (Financial Analyst, August 18, 1948).

Diamond drill logs describe 0.3 m of "yellow oxides" in pink granitoid gneiss (DDH 1, A.F. 90105). There are no records of U_3O_8 analyses.

The occurrence is characterized by abundant hornblende, tourmaline and "heavily mineralized", "very heavily mineralized" and "massive" pyrite intervals that vary from 2.1 to 7.6 m in core length. This style of mineralization was intersected in 6 of 7 drill holes; DDH 1-A was abandoned (Fig. 50-2).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. The presence of abundant tourmaline, pyrite and uranium oxides indicates the occurrence should be evaluated for gold and platinum group metals. The massive pyrite layers intersected by the drill holes may be primary chemical sediments.

REFERENCES:

Assessment File 90105
Manitoba Energy and Mines, Minerals Division.

Bailes, A.H.
1975: Geology of the Guay-Wimapedi Lakes area; Manitoba Mines, Resources and Environmental Management, Mineral Resources Division, Publication 75-2, 104p.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.

Gale, G.H., Baldwin, D.A. and Koo, J.
1980: A geological evaluation of Precambrian massive sulphide deposit potential in Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER79-1, 137p.

Mineral Inventory Card 63J/13 U 2
Manitoba Energy and Mines, Minerals Division.

Snow Lake Gold Mines Limited
Manitoba Energy and Mines, Minerals Division, Corporation Files.

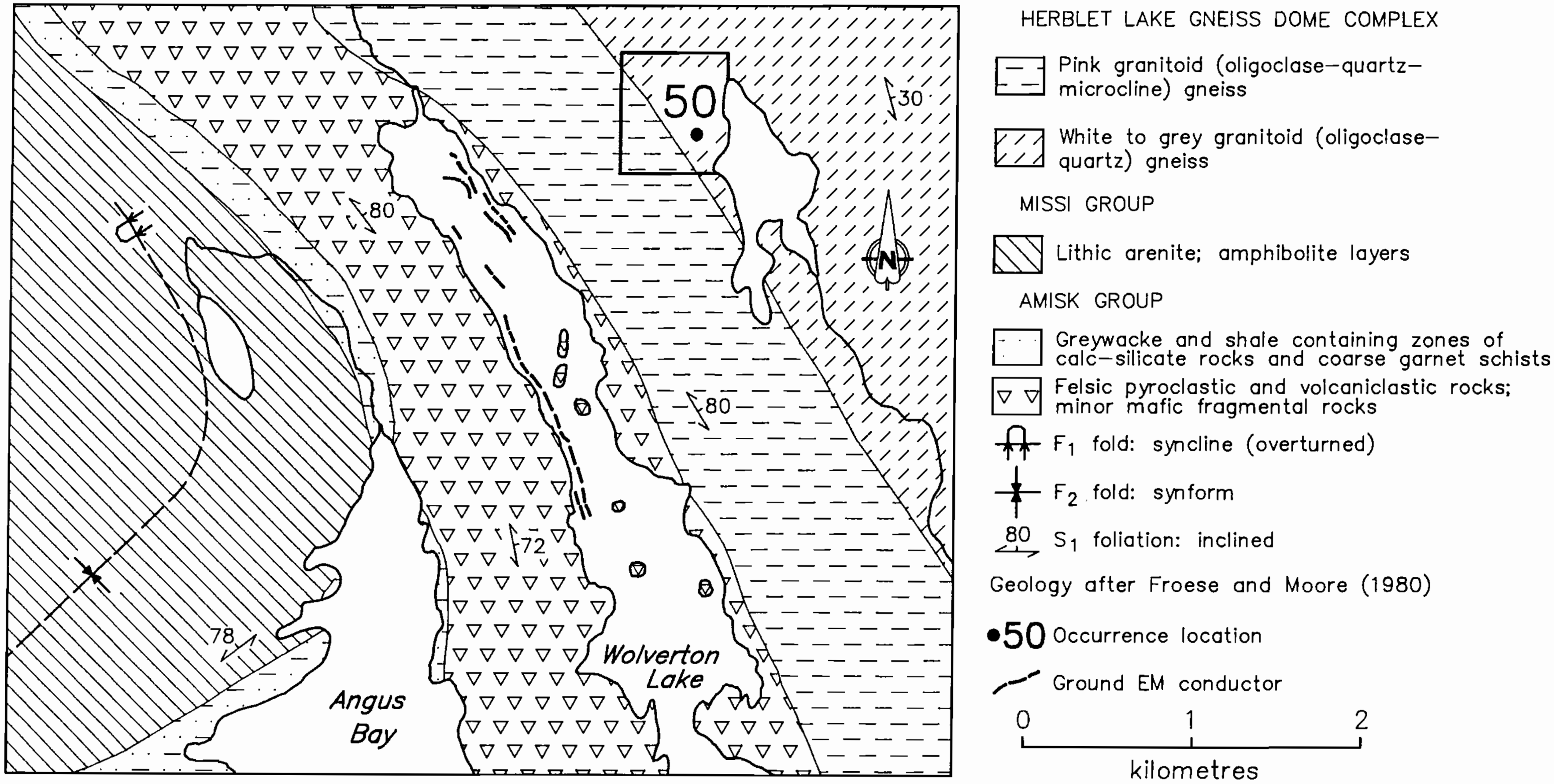


Figure 50-1: ***Geological setting of occurrence 50.***

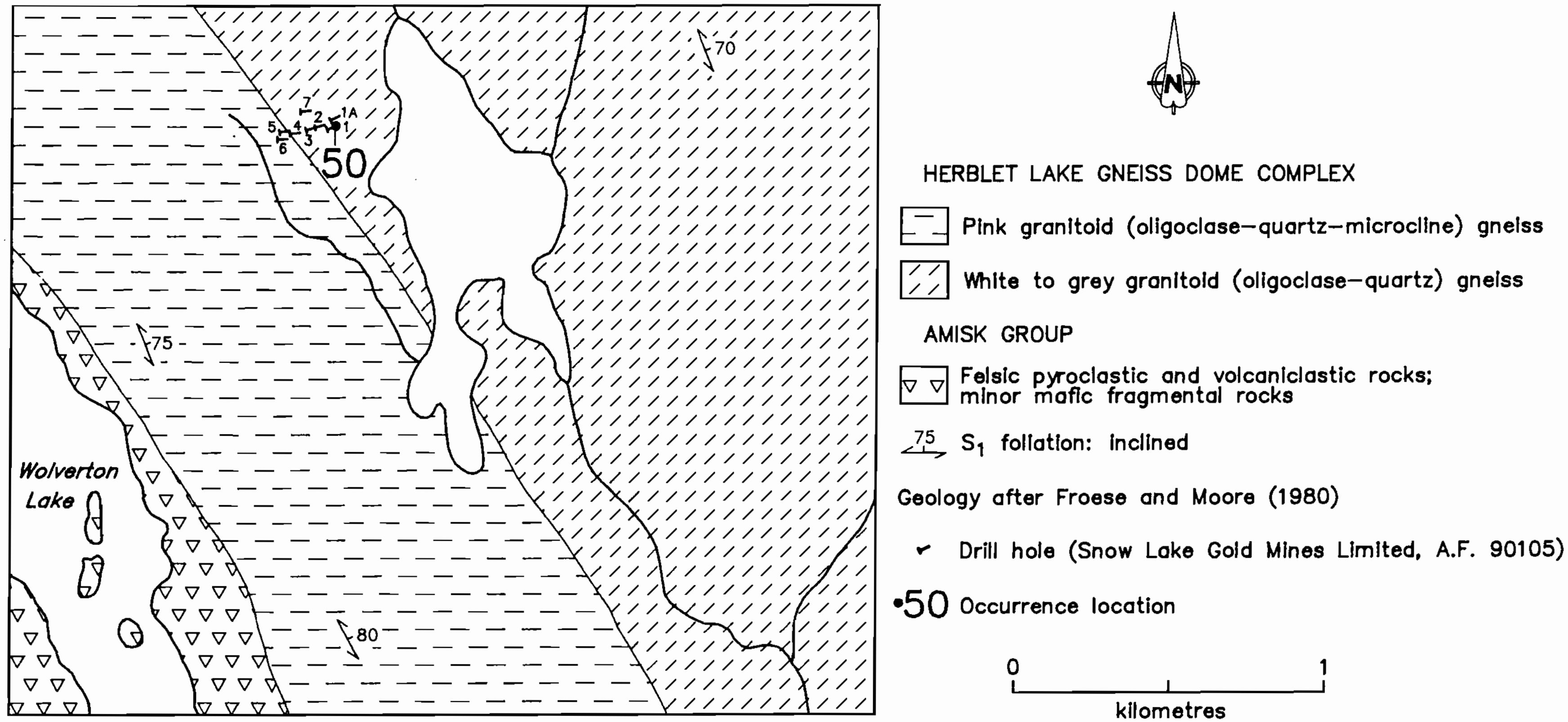


Figure 50-2: Detailed geology and drill hole locations, occurrence 50.

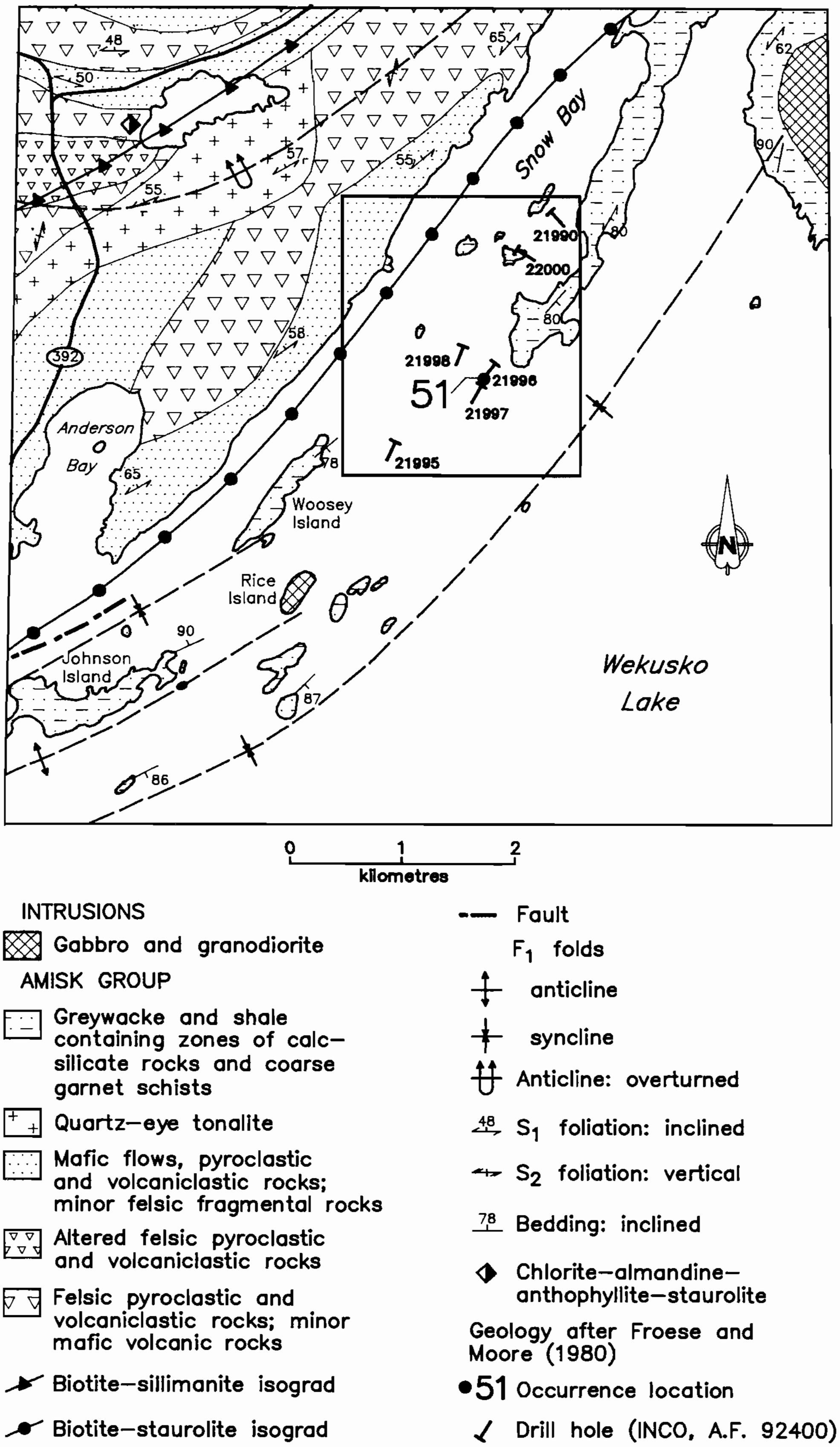


Figure 51-1: Geological setting and diamond drill hole locations, occurrence 51.

LOCATION: **51**

NAME: (A.F. - Mineralization intersected by diamond drilling)

AREA: Wedge Point, Wekusko Lake

UTM: 6076352N/442517E

AIRPHOTO: A20127-36

ACCESS: Boat from Bartlet's Landing, Wekusko Lake.

EXPLORATION SUMMARY:

The area was first staked under the Pike, Damphino, Romeo, Georgina and Sweetie claims prior to 1930. Green Bay Mining and Exploration Company did a magnetometer survey on the Cop and Per claims in 1957 (A.F. 90118). Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624, Ground Hog Sheet 10), followed by geophysical surveys on the Rice and Ice claims in 1962 and 1964, respectively (Mining Claim Cards Rice 15 and Ice 5). In 1963, the International Nickel Company of Canada Limited drilled six holes totalling 1100 m on Rice 1, 7, 15 and Ice 5 and 7 (A.F. 92400). HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650). Diamond drilling was done by Canadian Nickel Company Limited between 1963 and 1980 under various claim groupings (Mining Claim Cards Rice 1 and Rice 15). Ice 5 and 7 were cancelled in 1966; Rice 1 and Rice 7 in 1970, and Rice 15 in 1982. Granges Exploration Aktiebolag held the former Ice 5 and Ice 7 area under CB 9193 from 1978 to 1980. W. Bruce Dunlop Limited held the ground as CB 10071 from 1979 to 1981, as Kathleen from 1983 to 1985, and as Snow Bay 1 and 2 from 1987 to 1990.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group greywacke and shale flanked to the northwest by mafic flows and pyroclastic and volcaniclastic rocks (Fig. 51-1; Froese and Moore, 1980). Diamond drilling intersected shale and tuff of unspecified composition (Fig. 51-1; A.F. 92400).

MINERALIZATION:

Streaks and discontinuous laminae of "sulphide" and pyrite are described in core from the six drill holes (A.F. 92400). A black slaty tuff described in the drill log for DDH 21996 could be interpreted to represent a graphitic chemical sedimentary rock.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. Black slate is interpreted to represent a graphite-pyrite-rich layer in a greywacke sequence.

REFERENCES:

Assessment Files 90118, 91624, 91650 and 92400
Manitoba Energy and Mines, Minerals Division.

Eccles, D.R. and Fedikow, M.A.F.
1985: Mineral occurrence documentation and alteration zone mapping, Snow Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 82-99.

Froese, E. and Gasparrini, E.
1975: Metamorphic zones in the Snow Lake area, Manitoba; Canadian Mineralogist, v. 13, p. 162-167.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.

Mining Claim Card Ice 5 (P2558A), Rice 15 (P93476) and Rice 1 (P93462)
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

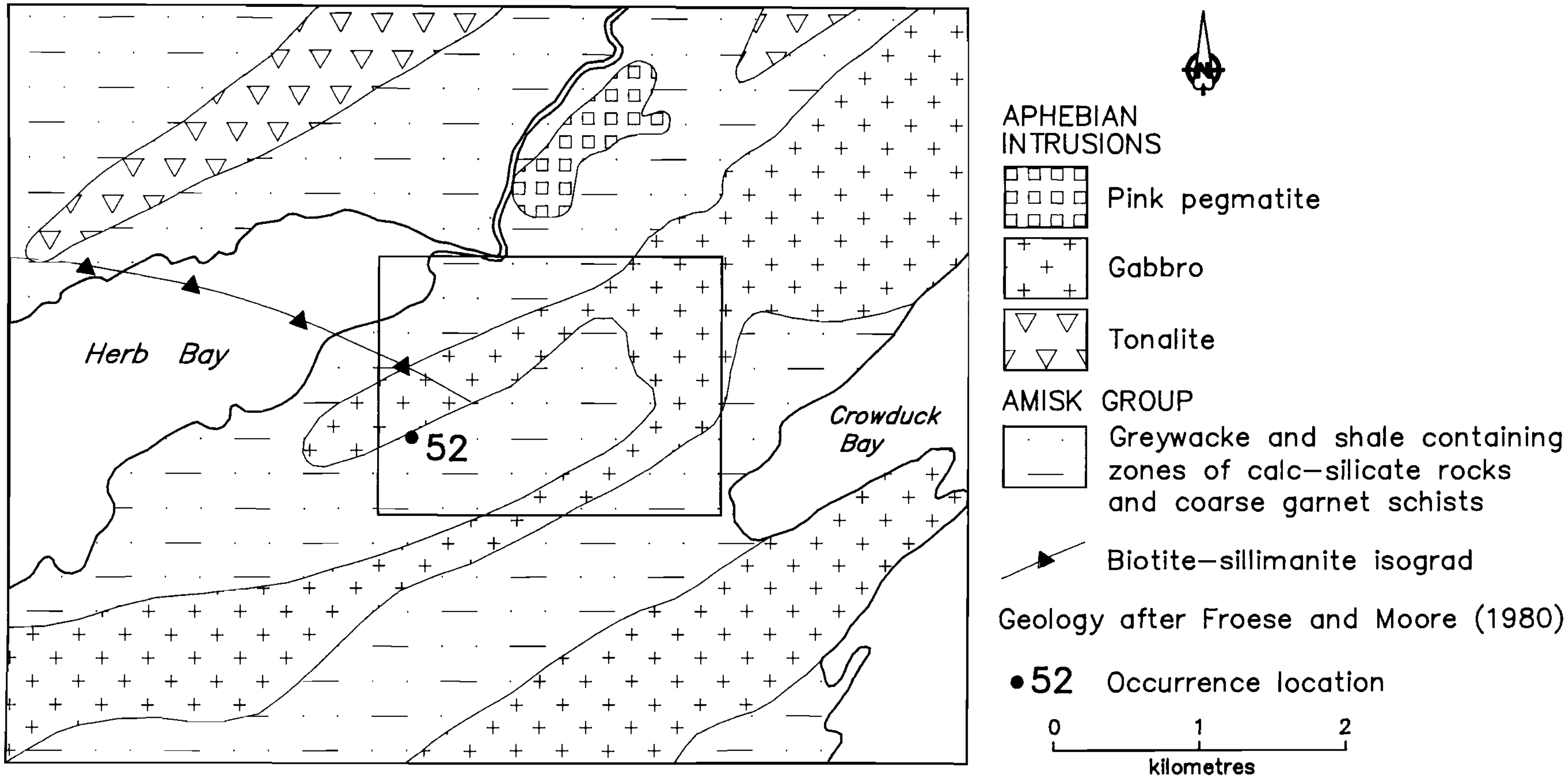


Figure 52-1: Geological setting of occurrence 52.

LOCATION: **52**

NAME: Tag-Arctic-West Group

AREA: Between Herb Bay and Crowduck Bay, Wekusko Lake.

UTM: 6081721N/451225E

AIRPHOTO: A20124-62

ACCESS: Boat on Wekusko Lake and traverse.

EXPLORATION SUMMARY:

The Arctic and West group of claims were staked in 1929. Pits and trenches were dug between 1929 and 1930 (Mineral Inventory Cards 63J/13 Ni 1, Ni 5, Cu 9). J.F. Wright visited the property in 1930. In 1932 the Arctic claims were restaked as the Tag group of claims. Surface work was done on the West group between 1934 and 1948. Trenches were dug on Tag 1, 2 and 4 from 1932 to 1936 (Mineral Inventory Cards 63J/13 Ni 1, Ni 5). Wekusko Consolidated Limited did a magnetometer survey on the Tag group and sampled trenches on Tag 1, 3 to 5 and 12 in 1944 (Manitoba Energy and Mines, Unpublished Information File, 63J/13). Two holes totalling 86 m were drilled on Tag 1 in 1944 (Northern Miner, January 20, 1944). Surface work was done on Tag 4 between 1941 and 1943 and in 1945, and on Tag 1 and 2 from 1945 to 1948 (Mineral Inventory Card 63J/13 Ni 1, Ni 5). Trenching was done on N.C. 2 (former West group area) between 1948 and 1955 and in 1958 (Mineral Inventory Card 63J/13 Cu 9). Canadian Nickel Company Limited optioned the Tag claims in 1948 and drilled one hole to a depth of 106 m on Tag 1, four holes totalling 509 m on Tag 2, and two holes totalling 232 m on Tag 6 and 9 in 1949 (A.F. 90159). Two holes were drilled on Tag 4, but the logs are not available (A.F. 90159). A geological and geophysical program was undertaken on the Tag claims in 1949 and 1951 and some drilling may have been done in 1952 (Mineral Inventory Card 63J/13 Ni 1). The option was dropped in 1952. Montgary Exploration Limited and Mining Endeavour Company Limited optioned the property in 1956, and carried out a six hole, 803 m, drilling program on Tag 2, a two hole, 135 m, drilling program on Tag 6, and a seven hole, 968 m, program on Tag 4 (A.F. 90161, 90162). The Tag claims lapsed in 1957. Trenching was done on Nip 3 and 4 between 1959 and 1963 (Mineral Inventory Card 63J/13 Cu 9). Kenneco Explorations Canada Limited optioned the Nip and Tuc claims in 1963 and did a magnetometer survey in 1964 (A.F. 91812). HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650). Noranda Exploration Company Limited optioned the property and did an HLEM survey in 1965 (A.F. 91813). A conductor was found on Nip 12 and Tuc 1. A magnetic survey and an AFMAG survey was done in 1969 for J.B. Barton (A.F. 91795). Trenching was done on Tuc 1 (former Tag 4 area) in 1972, and on Nip 3, 4 and Tuc 8 between 1972 and 1974 (Mineral Inventory Cards 63J/13 Ni 5, Cu 9). The Tuc claims lapsed in 1976. Several of the Nip claims lapsed in 1967, 1973, 1976 and 1977. Work was reported on Nip 12 in 1976 and 1980 (Mineral Inventory Card 63J/13 Ni 1). Nip 12 was cancelled in 1986. From 1979 to 1991 the ground was held by D. Zagozewski, R. Hertz, R. Pohl and W. Bruce Dunlop Limited. Strider Resources Limited staked Ark 1 to 4 over the area in May, 1991. The area is also covered by Nimo 88 staked by R. Hertz in 1988.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group greywacke and shale intruded by Aphebian gabbro (Fig. 52-1; Froese and Moore, 1980). Outcrops near trenches at mineralized sites consist of rusty weathered and garnetiferous gabbro (Fig. 52-2 to 52-5). Diamond drill holes intersected fine- to coarse-grained gabbro that is locally chloritic, micaceous, garnetiferous, silicified and mineralized. The gabbro contains fine grained mafic volcanic inclusions with nonmineralized quartz- and quartz-carbonate veinlets (Fig. 52-2; A.F. 90159, 90161, 90162).

MINERALIZATION:

In drill core mineralized zones occur over intervals of 2.1 to 59.7 m and are developed primarily in silicified gabbro described as "grey" in the drill logs. Mineralization in these silicified zones is characterized by disseminated pyrrhotite and chalcopyrite and also as "veinlets and blebs". Mineralized intervals in the drill holes have the following lengths:

A.F.	**DDH**	**Length of Mineralized Core (m)**
90162	M-3	2.1
	M-4	39.9
	M-6	11.6
90161	M-8	58.5
	M-9	6.1
	M-10	42.3
	M-12	59.7
	M-13	9.1
	M-15	35.9
90159	6266	42.6

Lithologies intersected by DDH M-1, M-2, M-5, M-7, M-11, M-14, 6264, 6265, 6267 and 6268 were either nonmineralized or contained minor disseminated pyrrhotite. Silicified gabbro was not identified in any of these drill holes. DDH 6288, 6289 and 6290, drilled approximately 2 km east of the drill collar for DDH 6266, intersected medium grained, "slightly to highly altered" norite with nonmineralized quartz veins. DDH 6289 also intersected 18.3 m of finely disseminated pyrrhotite and chalcopyrite. The assessment files do not contain logs for DDH 6270 and 6271.

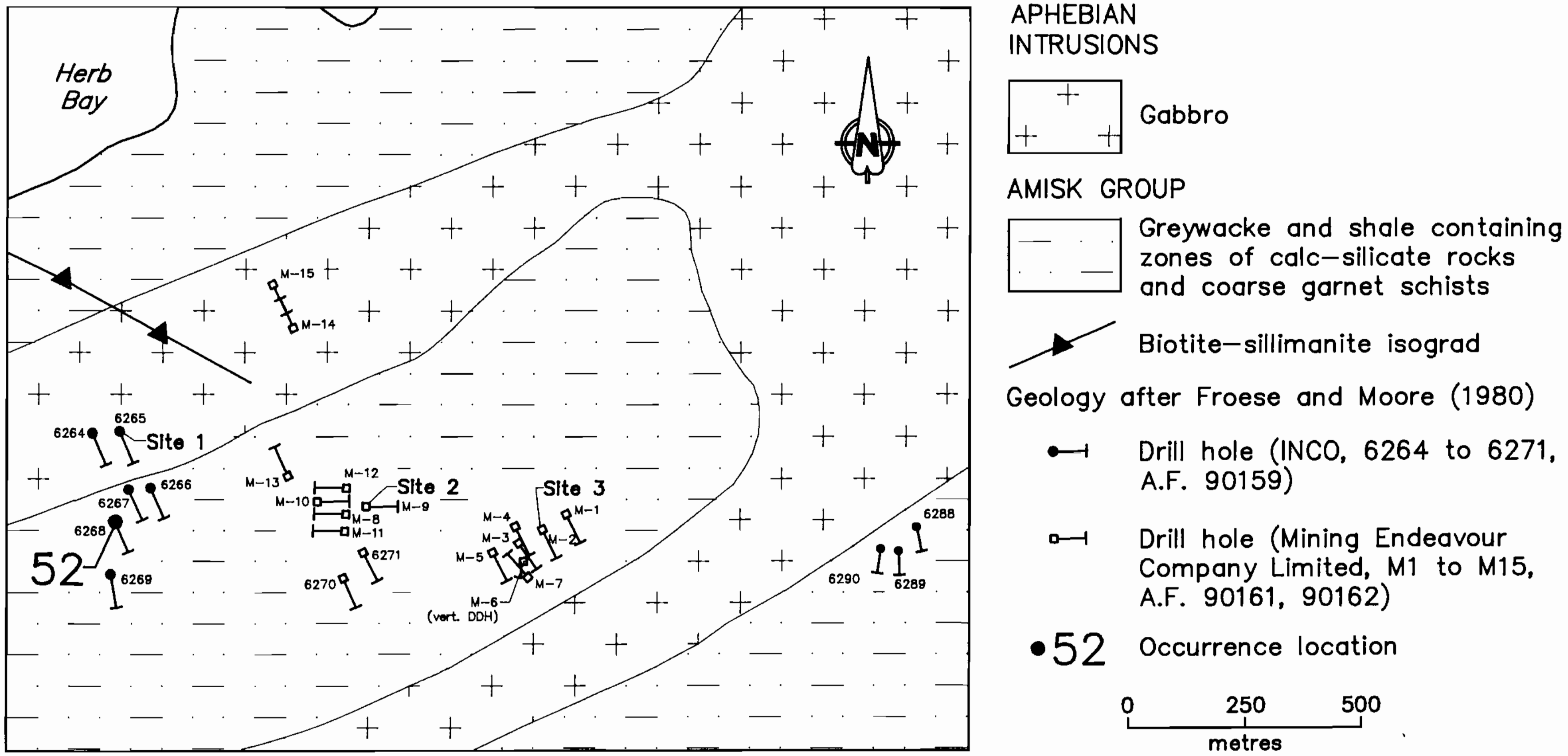


Figure 52-2: Local geology and diamond drill hole locations, occurrence 52.

Disseminated (1 to 5%) pyrrhotite and chalcopyrite were observed in the wall rocks and in muck piled around the trenches at sites 1, 2 and 3 (Fig. 52-3 through 52-5).

GEOCHEMICAL DATA:

Drill core assays from DDH M-3, M-4, M-6, M-8, 6266 and 6268 range in Cu and Ni from trace to 3.25% and trace to 5.65%, respectively. The highest assays (3.25% Cu and 5.65% Ni) were obtained from a 3 m interval (56.4 to 59.4 m) of "fine grained gabbro" in DDH 6268 (A.F. 90159).

Representative rock chip samples were collected from the walls of trenches and from muck piled around the trenches at sites 1, 2, and 3 (Fig. 52-3, 52-4, 52-5; Appendix I). Site 1 samples contain 72 to 1188 ppm Cu, 1 to 112 ppb Au, 8 to 10 ppb Pd and 10 to 20 ppb Pt. Site 2 samples contain 55 to 13328 ppm Cu, 27 to 2495 ppm Ni, and 3 to 84 ppb Au. Site 3 samples contain 1045 to 3746 ppm Cu, 1082 to 5520 ppm Ni, 44 to 248 ppm Co, and 53 to 385 ppb Au.

CLASSIFICATION:

Magmatogenic type deposit; disseminated. Copper, nickel, cobalt, gold, platinum and palladium mineralization occurring within silicified gabbro. A thorough re-evaluation of the occurrence with emphasis on platinum group element mineralization should be considered.

REFERENCES:

Assessment Files 90159, 90161, 90162, 91650, 91795, 91812 and 91813
Manitoba Energy and Mines, Minerals Division.

Cerny, P., Trueman, D.L., Ziehlke, D.V., Goad, B.E. and Paul, B.J.
1981: The Cat Lake-Winnipeg River and the Wekusko Lake pegmatite fields, Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER80-1, 216p.

Eccles, D.R. and Fedikow, M.A.F.
1985: Mineral occurrence documentation and alteration zone mapping, Snow Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 82-99.

Fedikow, M.A.F., Roney, C.T., Schmidt, G.J. and Robbie, T.
1986: Mineral deposit studies in the Snow Lake area; in Manitoba Energy and Mines, Geological Services Branch, Report of Field Activities, 1986, p. 77-85.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area; Geological Survey of Canada Paper 78-27, 16p.

Mineral Inventory Card 63J/13 Ni 1
Manitoba Energy and Mines, Minerals Division.

Mineral Inventory Card 63J/13 Ni 5
Manitoba Energy and Mines, Minerals Division.

Mineral Inventory Card 63J/13 Cu 9
Manitoba Energy and Mines, Minerals Division.

Russell, G.A.
1957: Structural studies of the Snow Lake - Herb Lake area; Manitoba Mines and Natural Resources, Publication 55-3, 33p.

Wekusko Consolidated Limited
Manitoba Energy and Mines, Minerals Division, Corporation Files.

Wright, J.F.
1938: Geology and mineral deposits of a part of northwest Manitoba; Geological Survey of Canada, Summary Report, 1930, Part C, 124p.

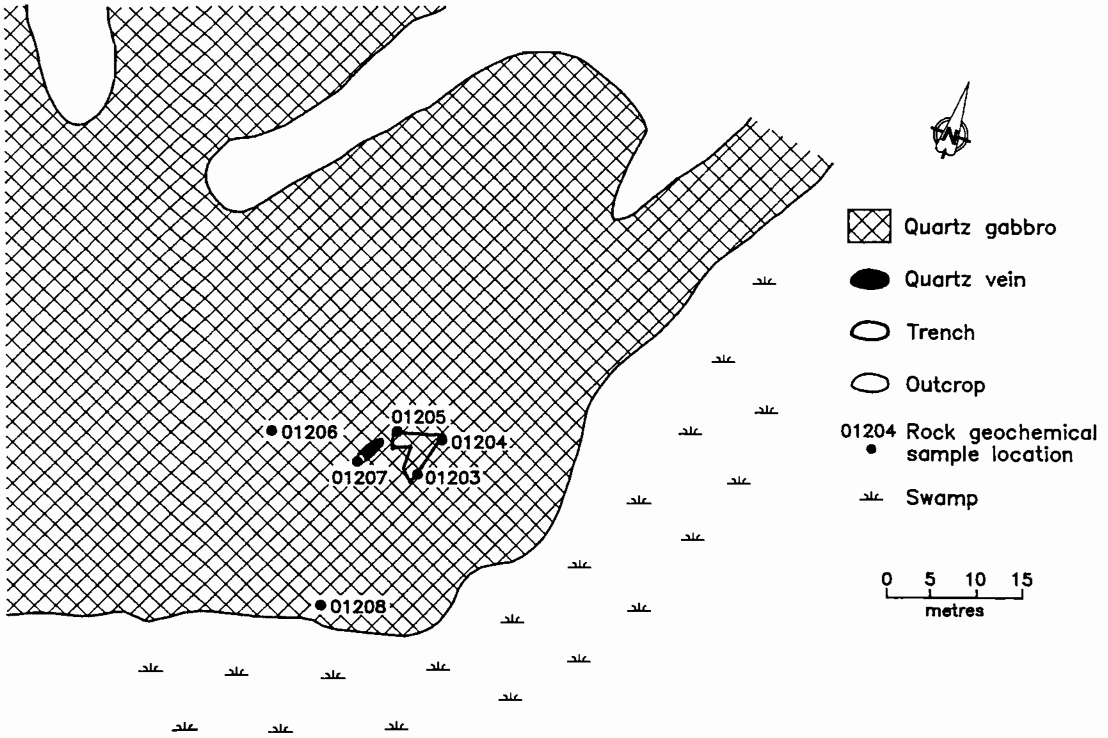


Figure 52-3: Outcrop, geology and trench and sample location map, site 1, occurrence 52.

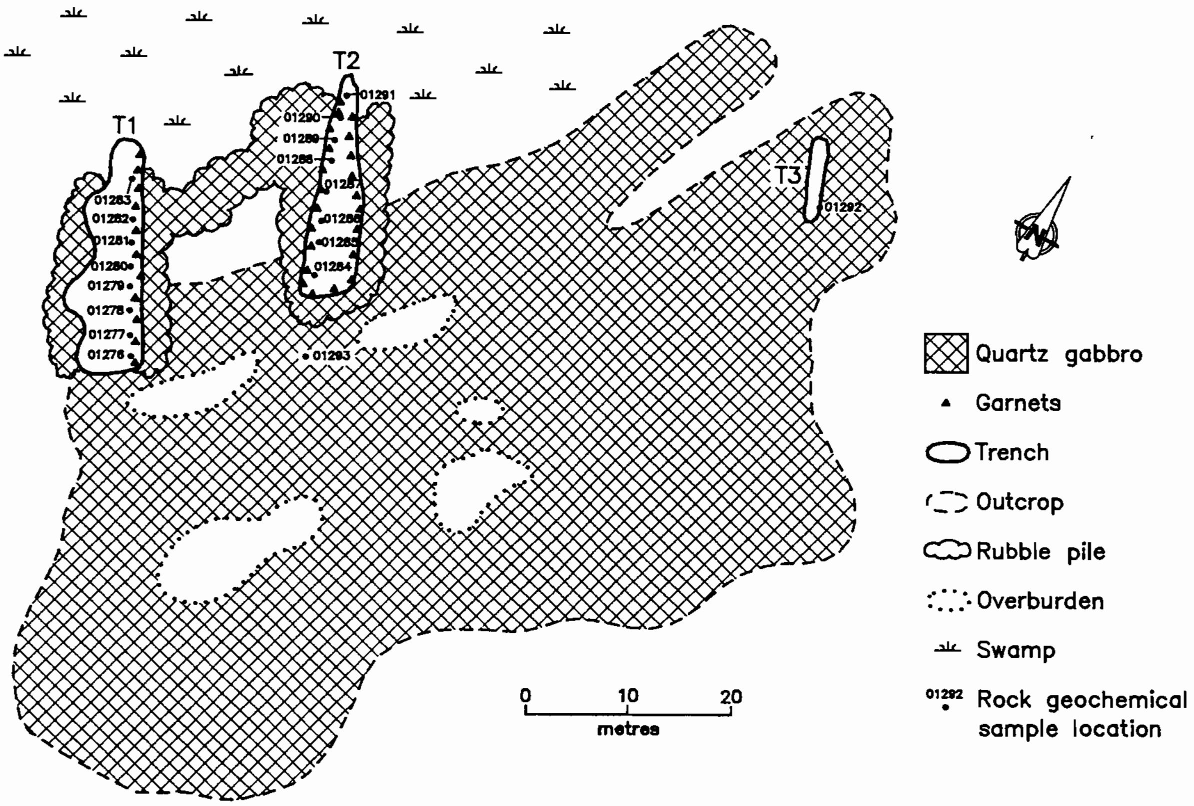


Figure 52-4: Outcrop, geology and trench and sample location map, Site 2, occurrence 52.

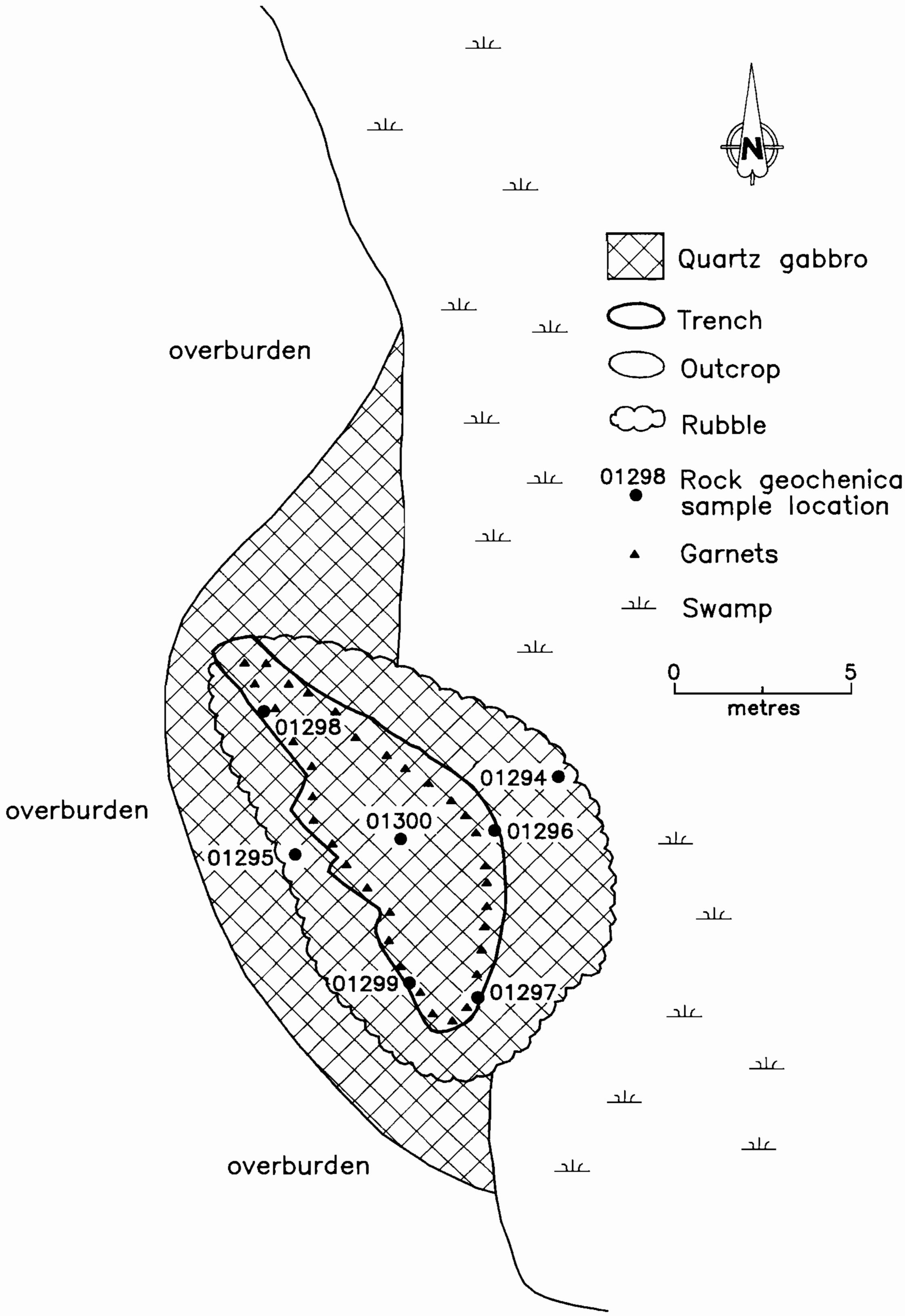


Figure 52-5: Outcrop, geology and trench and sample location map, site 3, occurrence 52.

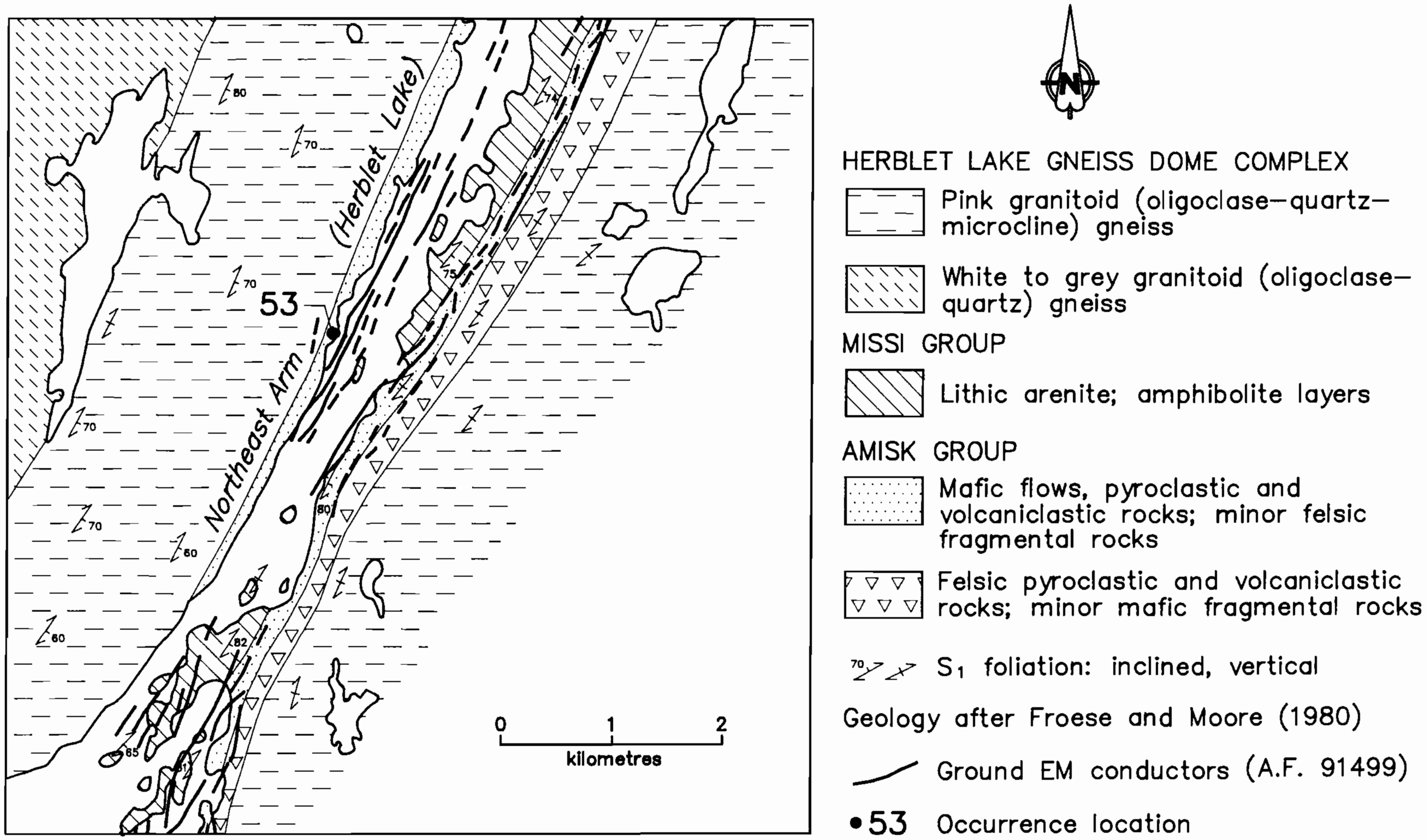


Figure 53-1: Geological setting of occurrence 53.

LOCATION: **53**

NAME: Cabin
UTM: 6091948N/446197E
ACCESS: Boat on Herblet Lake.

AREA: Northeast Arm, Herblet Lake.
AIRPHOTO: A20781-31

EXPLORATION SUMMARY:

The area was first staked prior to 1930. A 7 m deep shaft was sunk on a gold prospect on McLeod M.C. by Rod McLeod in 1920 (Manitoba Energy and Mines, Shaft Closure Files). The Jeep claims were staked and assigned to J.C.L. Ferguson in 1949; surface work was done on the property between 1949 and 1950 (Mining Claim Card Jeep 4). The claim was cancelled in 1954. Surface work was reported from 1957 to 1958 on the J.S. group of claims, held by J. Kerr (Mineral Inventory Card 63J/13 Cu 6). An airborne EM survey was done in the area by Canadian Nickel Company Limited in 1957 (A.F. 91624). A gold deposit owned by Sask-Mani Precious Metals Mining Company Limited is shown in this area (Locality 40; Davies et al., 1962). HBED held ground in the area as Din 78 from 1960 to 1961 and as CB 282 from 1969 to 1976. HBED carried out a Turam survey in 1970, followed by an 8 hole, 554 m, drill program on CB 282 in 1971 (A.F. 91499; Mineral Inventory Card 63J/13 Cu 6). Results of the drilling are not available. Granges Exploration Aktiebolag held ground in the area from 1980 to 1982. In 1986 Peter Dunlop staked Box over the property.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group mafic flows and mafic and felsic pyroclastic and volcaniclastic rocks, Missi Group lithic arenite and salmon pink granitoid gneiss of the Herblet Lake Gneiss Dome Complex (Fig. 53-1; Froese and Moore, 1980; Bailes, 1975). Amphibolite schist, intruded by granitic dykes, is present in outcrops in the area of the occurrence (Fig. 53-2).

MINERALIZATION:

One shaft and 19 trenches expose a series of quartz veins with 1 to 10% disseminated pyrite, chalcopyrite, and pyrrhotite. Additionally, solid pyrite laminae, 2 to 5 cm wide, occur within the quartz veins. The veins are developed close to the contact between a salmon pink granitoid gneiss and amphibolite. The veins dip 70° east, and some have been traced for at least 76 m long with widths of 0.8 m in the shaft. Chalcopyrite and bornite were observed in some veins; gold, copper and iron sulphides are present in the hanging wall amphibolite schist for up to 10 cm from vein/wall rock contact.

GEOCHEMICAL DATA:

Thirty-six representative rock chip samples were collected from the muck around the shaft, and from the mineralized wall rocks and quartz veins (Fig. 53-2; Appendix I). Copper and Au range from 23 to 2410 ppm and from 1 to 5190 ppb, respectively; 18 ppb palladium was detected in sample 01211 (Fig. 53-2).

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. The multiple quartz veins contain copper, iron sulphides and gold. The host rocks are altered mafic schists probably developed from basaltic precursors. This occurrence forms part of a string of occurrences situated along the northwest shore of the Northeast Arm of Herblet Lake. A number of long and short strike length ground EM conductors have been identified under this part of Herblet Lake. Accordingly, the sulphide mineralization may represent mobilisate from these sulphide-graphite conductors.

REFERENCES:

Armstrong, J.E.

1941: Wekusko; Geological Survey of Canada, Map 665A, 1:63 360.

Assessment Files 91499 and 91624

Manitoba Energy and Mines, Minerals Division.

Davies, J.F., Bannatyne, B.B., Barry, G.S. and McCabe, H.R.

1962: Geology and mineral resources of Manitoba; Manitoba Department of Mines and Natural Resources, Mines Branch, 190p.

Fedikow, M.A.F., Roney, C.T., Schmidt, G.J. and Robbie, T.

1986: Mineral deposit studies in the Snow Lake area; in Manitoba Energy and Mines, Geological Services Branch, Report of Field Activities, 1986, p. 77-85.

Froese, E. and Moore, J.M.

1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.

Shaft Closure Files (63J/13NW: Din 78 (P 85980))

Manitoba Energy and Mines, Minerals Division, Mining Engineering Files.

Mineral Inventory Card 63J/13 Cu 6

Manitoba Energy and Mines, Minerals Division.

Mining Claim Card Jeep 4 (P 21009)

Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

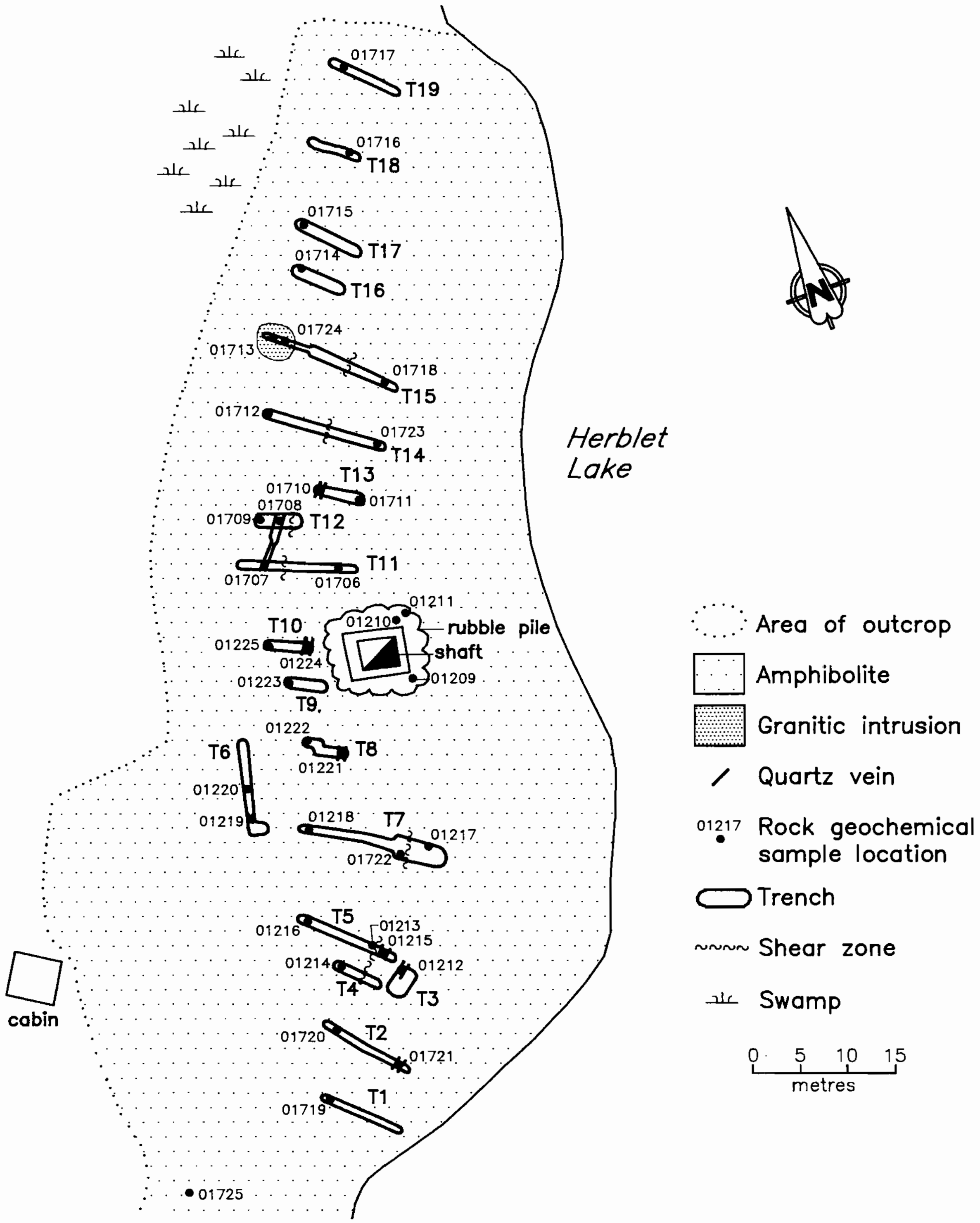


Figure 53-2: Outcrop, geology and trench and sample location map, occurrence 53.

LOCATION: **54**

NAME:

UTM: 6084252N/464245E

ACCESS: Bush plane to Niblock Lake and traverse.

AREA: Southwest of Niblock Lake.

AIRPHOTO: A20808-194

EXPLORATION SUMMARY:

In 1924 Antrim, Wicklow, Donegal and Mt. Mourne were staked by various individuals. Trenching and blasting were done between 1924 and 1929. The trenches were sampled in 1925. Murray Compton Gold Mining and Exploration Company Limited optioned the property from J.C. Secord and The Pas Mining Syndicate in 1928. The claims lapsed in 1931. In 1946 surface work was done on the A.P. claims held by A. Leslie (Mining Claim Card A.P. 3). In 1957 a VLEM survey was done on the Nib group and one hole was drilled to a depth of 43 m on Nib 45 for Selco Exploration Company Limited (A.F. 90079). Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624) and held ground in the area from 1960 to 1961. HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650), and an HLEM survey on the Kus claims between 1966 and 1967 (A.F. 90076). The ground was held by Cangold Limited from 1981 to 1983, and later as Snake 7 and 8 by Esso Minerals Canada from 1986 to 1987, Esso Resources Canada Limited from 1987 to 1989 and Homestake Mining Canada Limited from 1989 to 1990. Work was reported on Snake 7 and 8 in 1988 and 1989 under claim groupings (Mining Claim Card Snake 8). The claims lapsed in 1990.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group mafic pillowed flows with minor breccia and tuffaceous rocks. These mafic volcanic rocks are flanked to the north by Missi Group siltstone, mudstone and conglomerate, to the west by probable Missi Group quartzofeldspathic gneiss, and to the south by Missi Group conglomerate. The contacts to the west and south between the Amisk mafic volcanic rocks and Missi Group sedimentary rocks are marked by faults (Fig. 54-1; Gordon and Gall, 1982; Frarey, 1950). Diamond drilling intersected andesite, diorite and chemical sedimentary rocks (Fig. 54-2). Detailed outcrop mapping documented fine grained basalt (Fig. 54-3).

MINERALIZATION:

DDH 4 intersected 2.1 m of 70% pyrite and minor pyrrhotite and a separate 4 m interval of graphitic sedimentary rocks containing 5% pyrite (A.F. 90079). A series of quartz and quartz-carbonate veins that crosscut the regional foliation are present in trenches (Fig. 54-3). The host basalts have been silicified to form a fine grained grey rock that contains red garnet, 1 to 5% disseminated pyrrhotite and coarse grained 3 to 10 mm subhedral arsenopyrite crystals adjacent to the quartz veins. There are two main orientations of vein sets at this occurrence. The vein set that trends 020°E is non-mineralized, whereas the second set of quartz-carbonate and carbonate veins are mineralized with disseminated to near solid arsenopyrite. The exact nature of the mineralization and trend of the second set of quartz veins is difficult to ascertain due to flooded and slumped trenches and lichen-covered outcrop.

GEOCHEMICAL DATA:

Samples collected from trenches blasted between 1924 and 1929 contained a maximum of 31.19 g/t Au and 25.08% As (Mineral Inventory Card 63J/13 As 1).

Six representative rock chip samples (01267 to 01269; 01698 to 01700) were collected for multi-element geochemical analysis from trenches in the immediate area of the occurrence (Fig. 54-3; Appendix I). Sample 01269 ranges from 690 to 30500 ppb Au in two duplicate samples; the sample also contains 38382 ppm As and 64 ppm Pd. The substantial difference in Au analyses for duplicates from sample 01269 may represent the nugget effect or the analysis of inhomogeneous sample splits. Sample 01698 contains 110 ppm W; sample 01700 contains 21100 ppb Au and 39241 ppm As.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses.

REFERENCES:

Assessment Files 90076, 90079, 91624 and 91650
Manitoba Energy and Mines, Minerals Division.

Fedikow, M.A.F., Roney, C.T., Schmidt, G.J. and Robbie, T.
1986: Mineral deposit studies in the Snow Lake area; in Manitoba Energy and Mines, Geological Services Branch, Report of Field Activities, 1986, p. 77-85.

Frarey, M.J.
1950: Crowduck Bay, Geological Survey of Canada, Map 987A, 1:63 360.

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Mining Claim Cards A.P. 3 (P8875) and Snake 8 (P6380E)
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Mineral Inventory Card 63J/13 As 1
Manitoba Energy and Mines, Minerals Division.

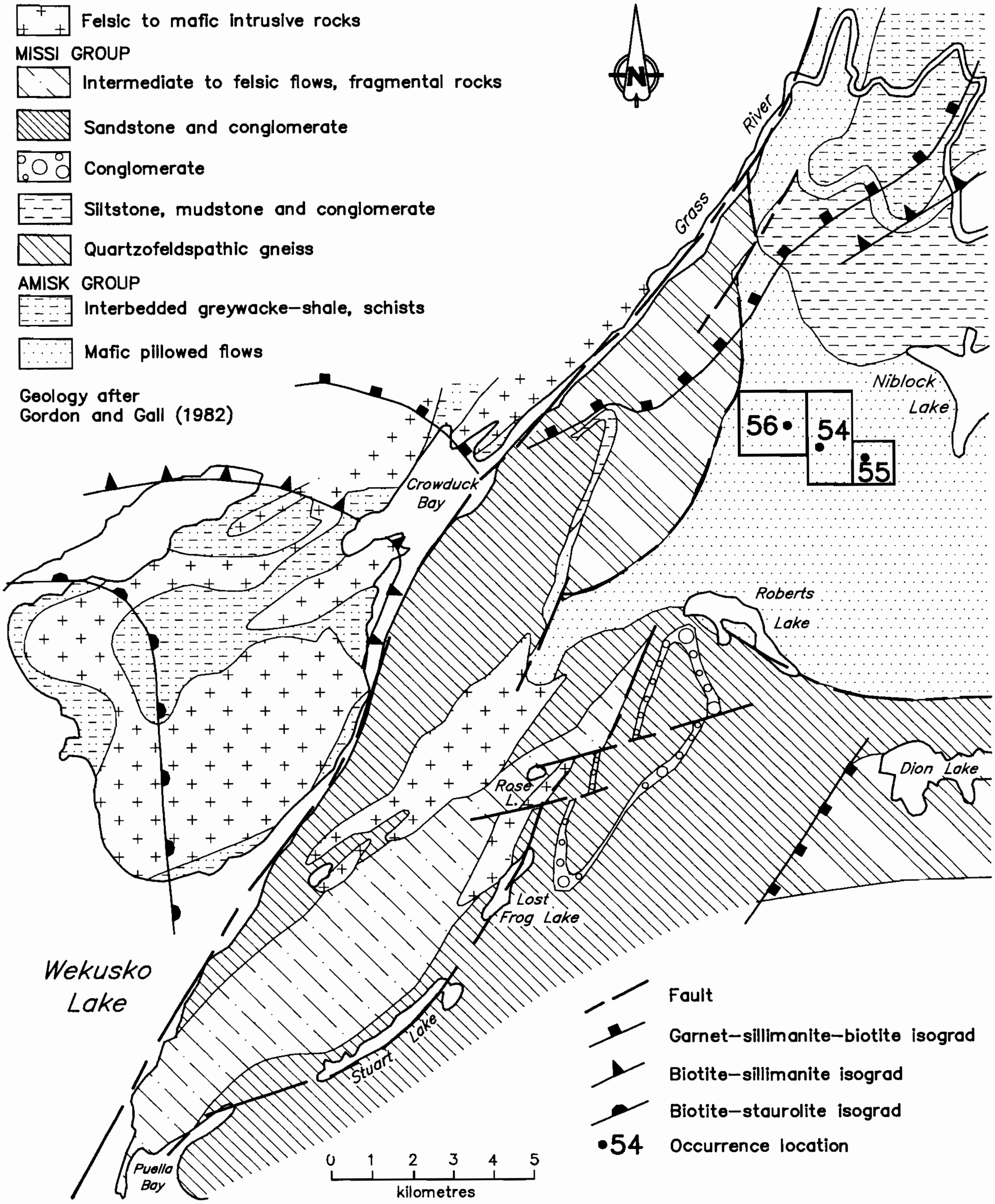
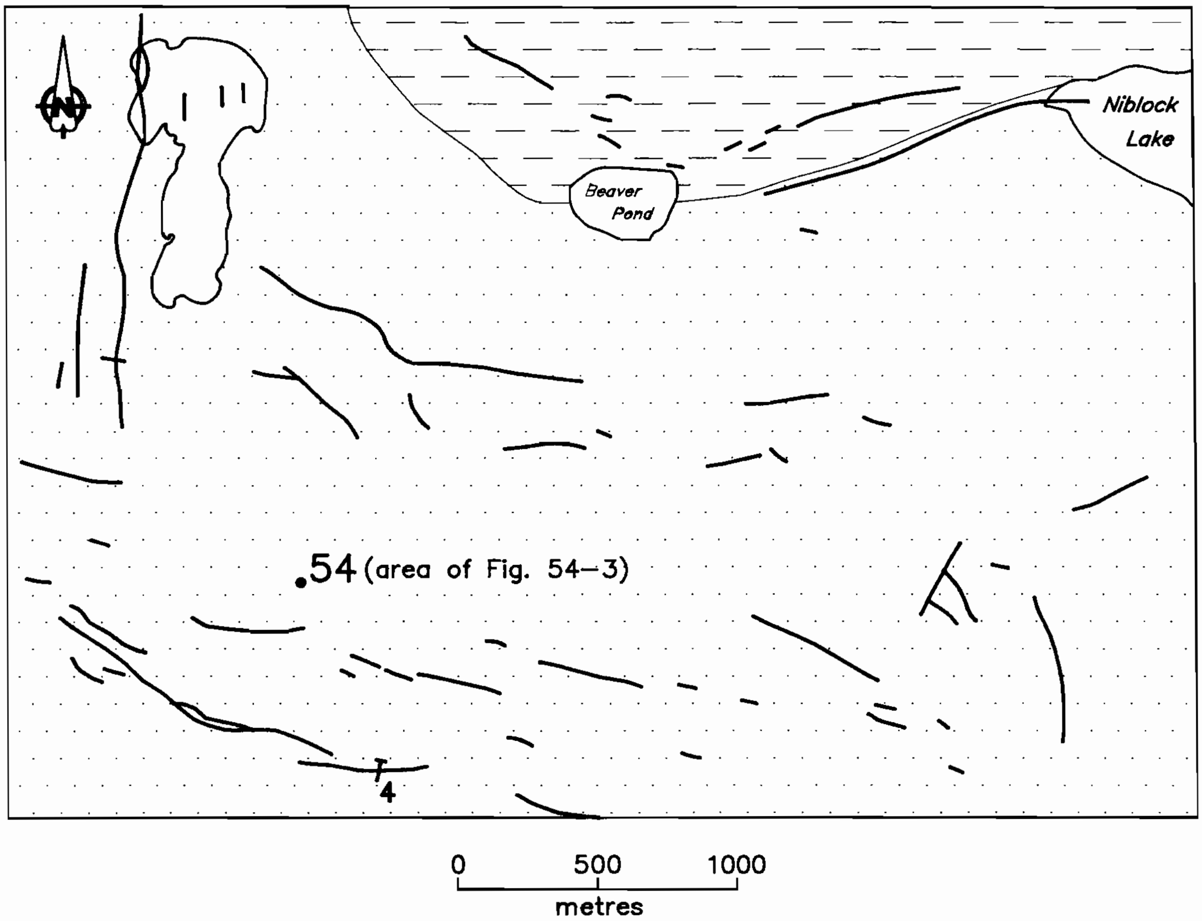


Figure 54-1: Geological setting of occurrences 54, 55 and 56.



MISSI GROUP

Siltstone, mudstone and conglomerate

AMISK GROUP

Mafic flows, minor breccia and tuffaceous rocks

Geology after Gordon and Gall (1982) and Frarey (1950)

Drill hole (Selco Exploration Company Limited, 4, A.F. 90079)

Ground EM conductor (A.F. 90076, 90079)

•54 Occurrence location

Figure 54-2: Local geology, ground EM conductors and diamond drill hole location, occurrence 54.

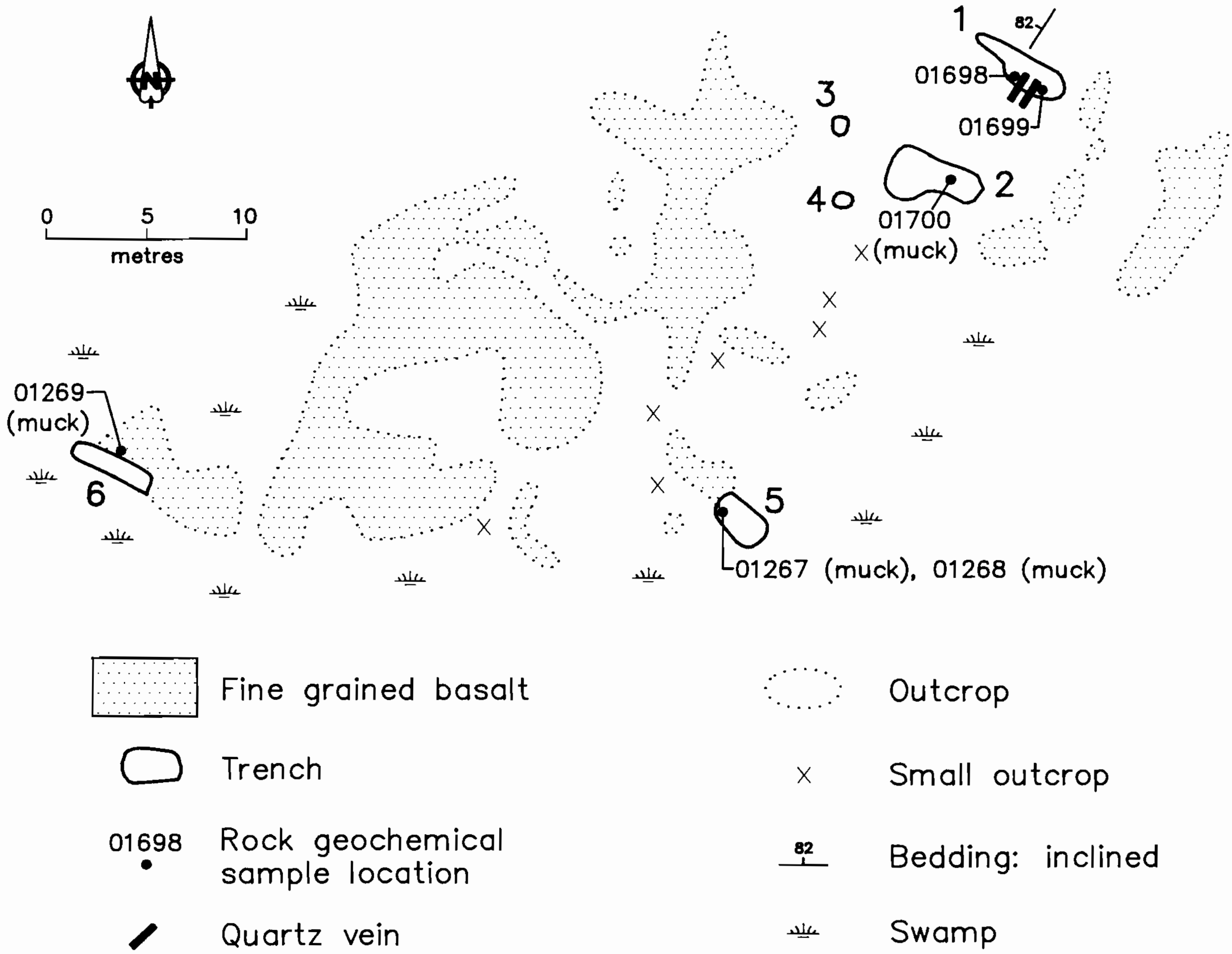


Figure 54-3: Outcrop, geology and trench and sample location map, occurrence 54.

LOCATION: **55**

NAME:

UTM: 6083782N/465413E

ACCESS: Bush plane to Niblock Lake and traverse.

AREA: Southwest of Niblock Lake.

AIRPHOTO: A20169-75

EXPLORATION SUMMARY:

The area was first staked as the Nib group for R.G. Crosby in 1956. In 1957 Selco Exploration Company Limited optioned the prperty and carried out a VLEM survey and a two hole, 58 m, diamond drill program on Nib 73 (A.F. 90079). Canadian Nickel Company Limited held ground in the area from 1960 to 1961. HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650), and an HLEM survey on the Kus claims between 1966 and 1967 (A.F. 90076). The ground was held by Cangold Limited from 1981 to 1983, Esso Minerals Canada from 1986 to 1987, Esso Resources Canada Limited from 1986 to 1989, and Homestake Mining Canada Limited from 1989 to 1990. Assessment work was reported on Snake 3, 4 and 7 in 1988 and 1989 under claim groupings (Mining Claim Card Snake 3). The Snake claims were cancelled in 1990.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group mafic pillowed flows with minor breccia and tuffaceous rocks. These mafic volcanic rocks are flanked to the north by Missi Group siltstone, mudstone and conglomerate, to the west by probable Missi Group quartzofeldspathic gneiss and to the south by Missi Group conglomerate. The contacts to the west and south between the Amisk mafic volcanic rocks and the Missi Group sedimentary rocks are marked by faults. (Fig. 54-1; Gordon and Gall, 1982; Frarey, 1950). Diamond drill holes, collared to test ground EM conductors (Fig. 55-1), intersected gabbro and mineralized and altered greenstone (A.F. 90076, 90079). Detailed mapping in the area of the occurrence documented rusty weathered garnetiferous and mineralized amphibolite with mineralized quartz veins (Fig. 55-2).

MINERALIZATION:

Seven trenches expose white quartz veins that contain blebs and fragments of near solid, coarse grained arsenopyrite. Mineralized wall rock fragments are present in the quartz veins. Near solid to solid arsenopyrite layers/veins are present:

1. in white and rusty weathered quartz veins;
2. at quartz vein-wall rock contacts; and
3. in fine grained basalt adjacent to the quartz veins.

Arsenopyrite is most abundant at vein wall rock contacts or in zones that have been fractured and/or sheared. This suggests that the arsenopyrite may be related to deformation that postdates the quartz veins. The quartz veins trend north to northeast; the northeast veins have been explored with a series of shallow, closely spaced trenches. Amphibolite wall rock adjacent to the quartz veins is commonly garnetiferous; outcrop within 100 m of the trenches is rusty weathered. In addition to arsenopyrite, the amphibolite wall rocks contain 1 to 5% disseminated pyrite and pyrrhotite.

DDH 9 (A.F. 90079) intersected; (1) 1.5 m of disseminated pyrrhotite in greenstone, (2) 1.2 m of sheared greenstone with 40% pyrite, and (3) 0.9 m of banded pyrrhotite underlain by 0.9 m of sericitized greenstone (A.F. 90079). DDH 3 (A.F. 90079) was abandoned in overburden (A.F. 90079). There are no drill logs for DDH 9 (A.F. 90076).

GEOCHEMICAL DATA:

Eight representative rock chip samples (01258 to 01265), collected from trench walls and from muck piled in and around the trenches, were submitted for multi-element geochemical analysis (Fig. 55-2; Appendix I). Gold and As for these samples range from 3 to 5290 ppb Au and 1039 to 35032 ppm As.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. The multiple veins of near solid to solid arsenopyrite have been mobilized by a deformational event that postdates quartz injection. This later structural event produced multi-directional quartz veins with arsenopyrite mobilizate.

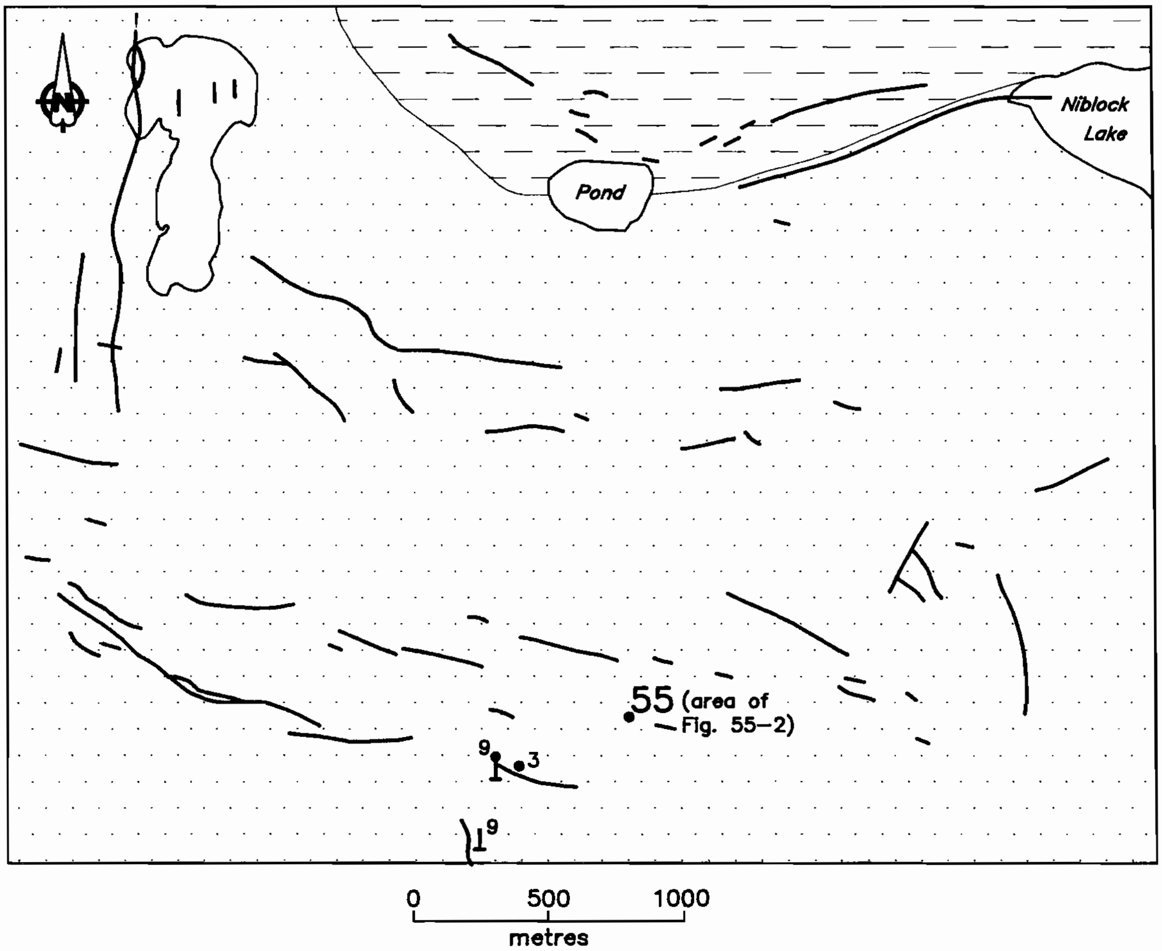
In addition, a chemical sediment type deposit was intersected by diamond drilling. This sulphide facies iron formation consists of disseminated to solid, banded (tectonic?) pyrrhotite underlain, in the drill core, by sericitic greenstone. The sericite may have been produced as an alteration product during formation of the banded sulphide layer, or it may be related to the shearing event described in the drill logs.

REFERENCES:

Assessment Files 90076, 90079 and 91650
Manitoba Energy and Mines, Minerals Division.

Fedikow, M.A.F., Roney, C.T., Schmidt, G.J. and Robbie, T.
1986: Mineral deposit studies in the Snow Lake area; in Manitoba Energy and Mines, Geological Services Branch, Report of Field Activities, 1986, p. 77-85.

Frarey, M.J.
1950: Crowduck Bay, Geological Survey of Canada, Map 987A, 1:63 360.



MISSI GROUP

Siltstone, mudstone and conglomerate

AMISK GROUP

Mafic flows, minor breccia and tuffaceous rocks

Geology after Gordon and Gall (1982) and Frarey (1950)

Drill hole (HBED, 9, A.F. 90076)

Drill hole, vertical drill hole (Selco Exploration Company Limited, 3 and 9, A.F. 90079)

Ground EM conductor (A.F. 90076, 90079)

•55 Occurrence location

Figure 55-1: Local geology, ground EM conductors and diamond drill hole locations, occurrence 55.

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Mining Claim Card Snake 3 (P6265E)
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

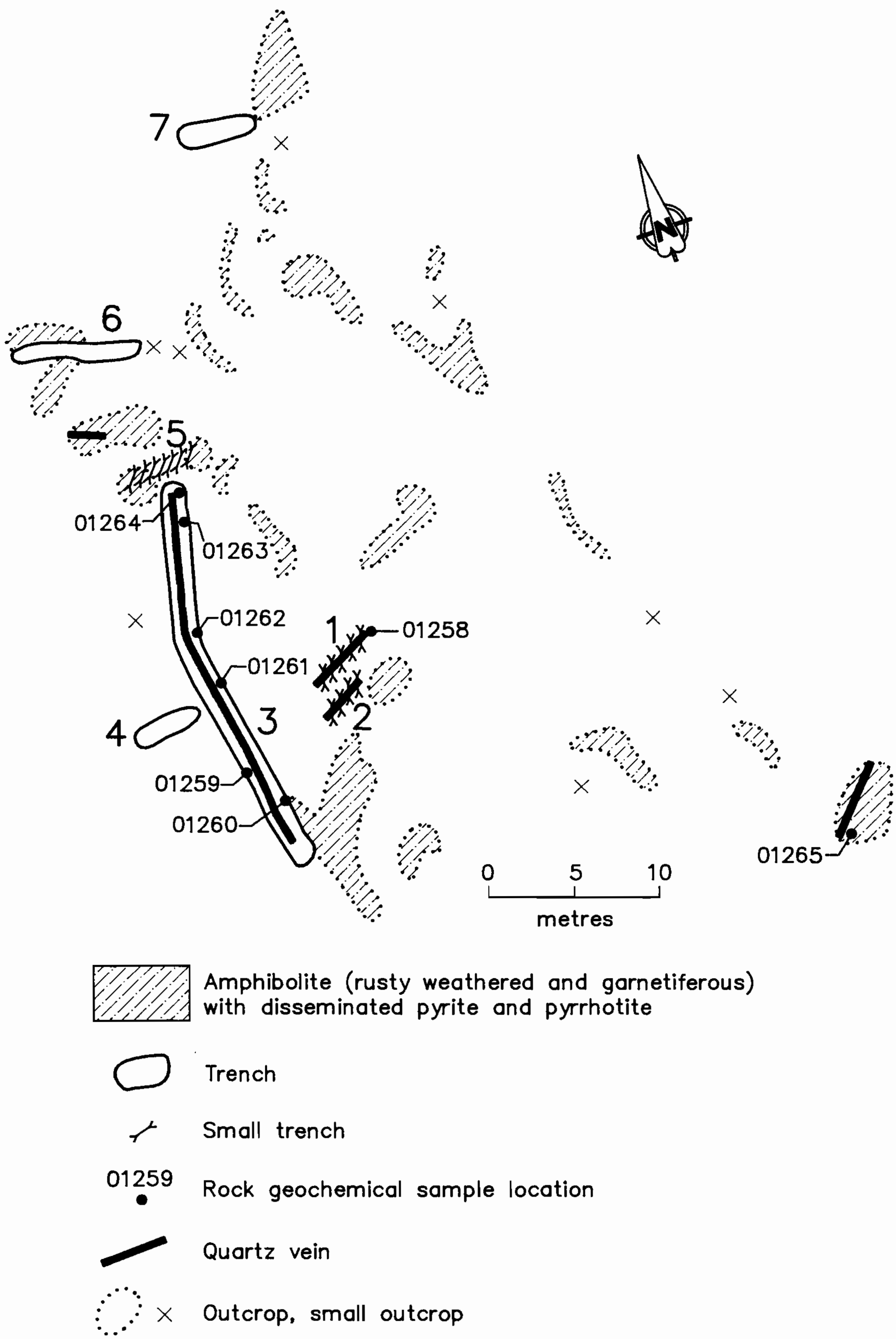


Figure 55-2: Outcrop, geology and trench and sample location map, occurrence 55.

LOCATION: **56**

NAME:

UTM: 6084498N/463471E

ACCESS: Bush plane to Niblock Lake and traverse.

AREA: Southwest of Niblock Lake.

AIRPHOTO: A20808-213

EXPLORATION SUMMARY:

The area was first staked as A.P. 4 and 6 by R. Leslie in 1945. Surface work was done on the A.P. group in 1946 (Mining Claim Card A.P. 4). The Nib group was staked for R.G. Crosby in 1956 and optioned to Selco Exploration Company Limited in 1957. A VLEM survey was done on the property that same year (A.F. 90079). Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624) and held ground in the area from 1960 to 1961. HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650) and an HLEM survey on the Kus claims between 1966 and 1967 (A.F. 90076). Cangold Limited held ground in the area between 1981 and 1983. From 1986 to 1990 the ground was held as Snake 8 by Esso Minerals Canada, Esso Resources Canada Limited and Homestake Mining Canada Limited. Assessment work was done on Snake 8 in 1988 and 1989 under a claim grouping (Mining Claim Card Snake 8). The claim was cancelled in 1990.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group mafic pillowed flows with minor breccia and tuffaceous rocks. These mafic volcanic rocks are flanked to the north by Missi Group siltstone, mudstone and conglomerate, to the west by probable Missi Group quartzofeldspathic gneiss, and to the south by Missi Group conglomerate. The contacts to the west and south between the Amisk mafic volcanic rocks and Missi Group sedimentary rocks are marked by faults (Fig. 54-1; Gordon and Gall, 1982; Frarey, 1950). The general area of the occurrence is characterized by long and short strike length ground EM conductors (Fig. 56-1). Detailed mapping documented mineralized and altered basalt containing mineralized quartz veins (Fig. 56-2).

MINERALIZATION:

Minor disseminated to near solid pyrite, pyrrhotite and minor chalcopyrite layers are exposed in three trenches. The sulphide mineralization is accompanied by sugary textured quartz veins that parallel an en echelon series of shear zones exposed in the trenches. The quartz veins contain disseminated 3 to 10 mm arsenopyrite crystals, as well as iron sulphide mobilizate and wall rock fragments. Blocks of basalt altered to chlorite-garnet and anthophyllite-garnet mineral assemblages, both with disseminated pyrite and pyrrhotite, occur in the trenches.

A second set of fine grained, grey, sheared quartz veins observed in the muck contain disseminated and veinlet pyrite and arsenopyrite.

GEOCHEMICAL DATA:

Seven representative rock chip samples (01251 to 01257) were collected for multi-element geochemical analysis from muck piled in and around the trenches (Fig. 56-2; Appendix I). Some of the analytical results are summarized below.

Sample	**Cu**	**Pb**	**Zn**	**Au**	**As**	**W**
01251	254	11	54	10	8528	146
01252	132	10	21	5	10030	1
01253	312	29	22	1	14	1
01254	191	29	13	1	19	1
01255	789	16	173	29	941	52
01256	41	3	339	21	23375	1
01257	358	16	58	7	7922	1

Sample 01255 also contains 6 ppb Pd. All values in ppm except Au, which is reported in ppb.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. The chlorite-garnet and anthophyllite-garnet mineral assemblages represent alteration of the basalt host rocks. The fluid flow producing this alteration may have accompanied the process that resulted in sulphide deposition or subsequent shearing events and quartz injections. The arsenopyrite-quartz vein mineralization clearly postdates the sulphide facies iron formation.

REFERENCES:

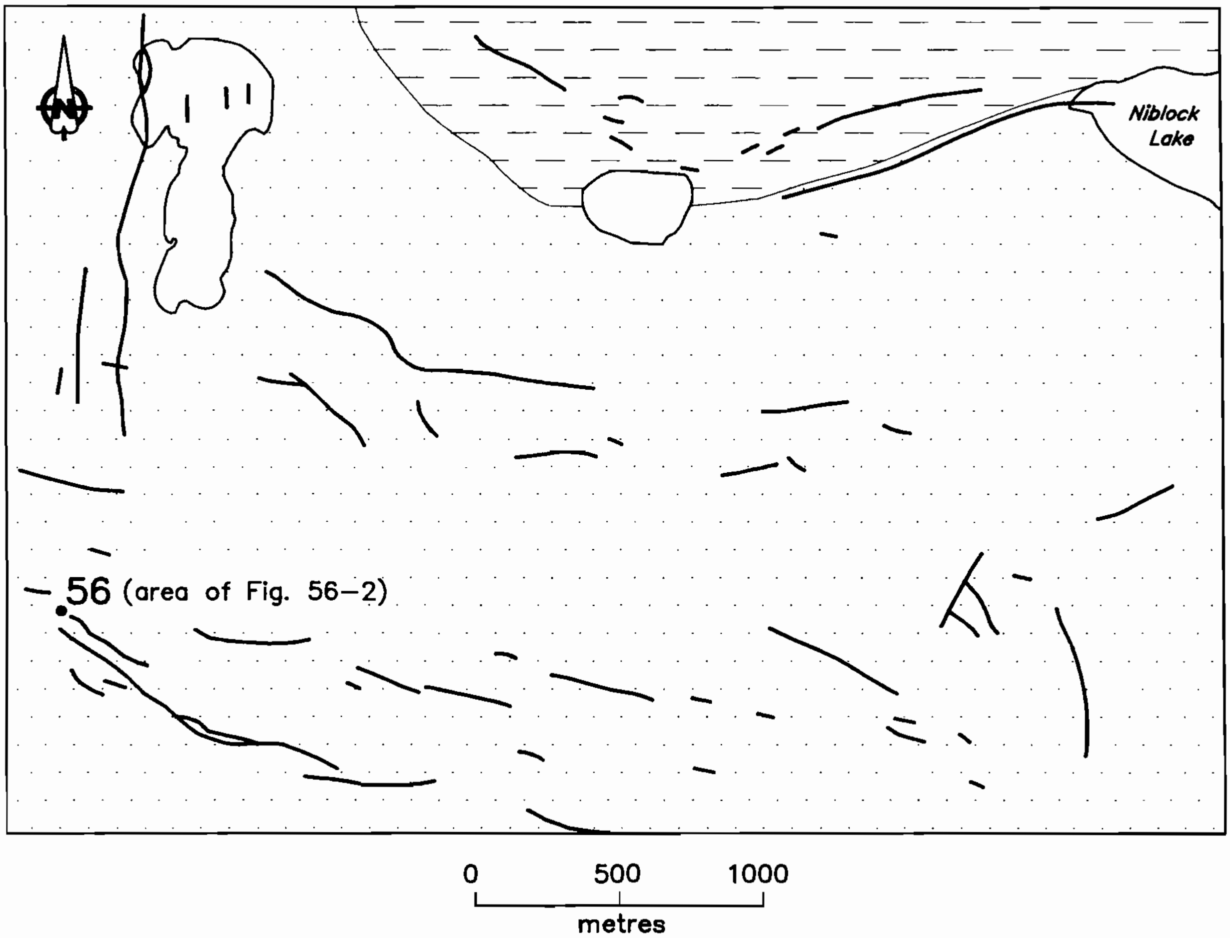
Assessment Files 90076, 90079 91624 and 91650
Manitoba Energy and Mines, Minerals Division.

Fedikow, M.A.F., Roney, C.T., Schmidt, G.J. and Robbie, T.
1986: Mineral deposit studies in the Snow Lake area; in Manitoba Energy and Mines, Geological Services Branch, Report of Field Activities, 1986, p. 77-85.

Frarey, M.J.
1950: Crowduck Bay, Geological Survey of Canada, Map 987A, 1:63 360.

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Mining Claim Cards A.P. 4 (P8876) and Snake 8 (P6380E)
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.



MISSI GROUP

Siltstone, mudstone and conglomerate

AMISK GROUP

Mafic flows, minor breccia and tuffaceous rocks

Geology after Gordon and Gall (1982) and Frarey (1950)

Ground EM conductor (A.F. 90076, 90079)

•56 Occurrence location

Figure 56-1: Local geology and ground EM conductors, occurrence 56.

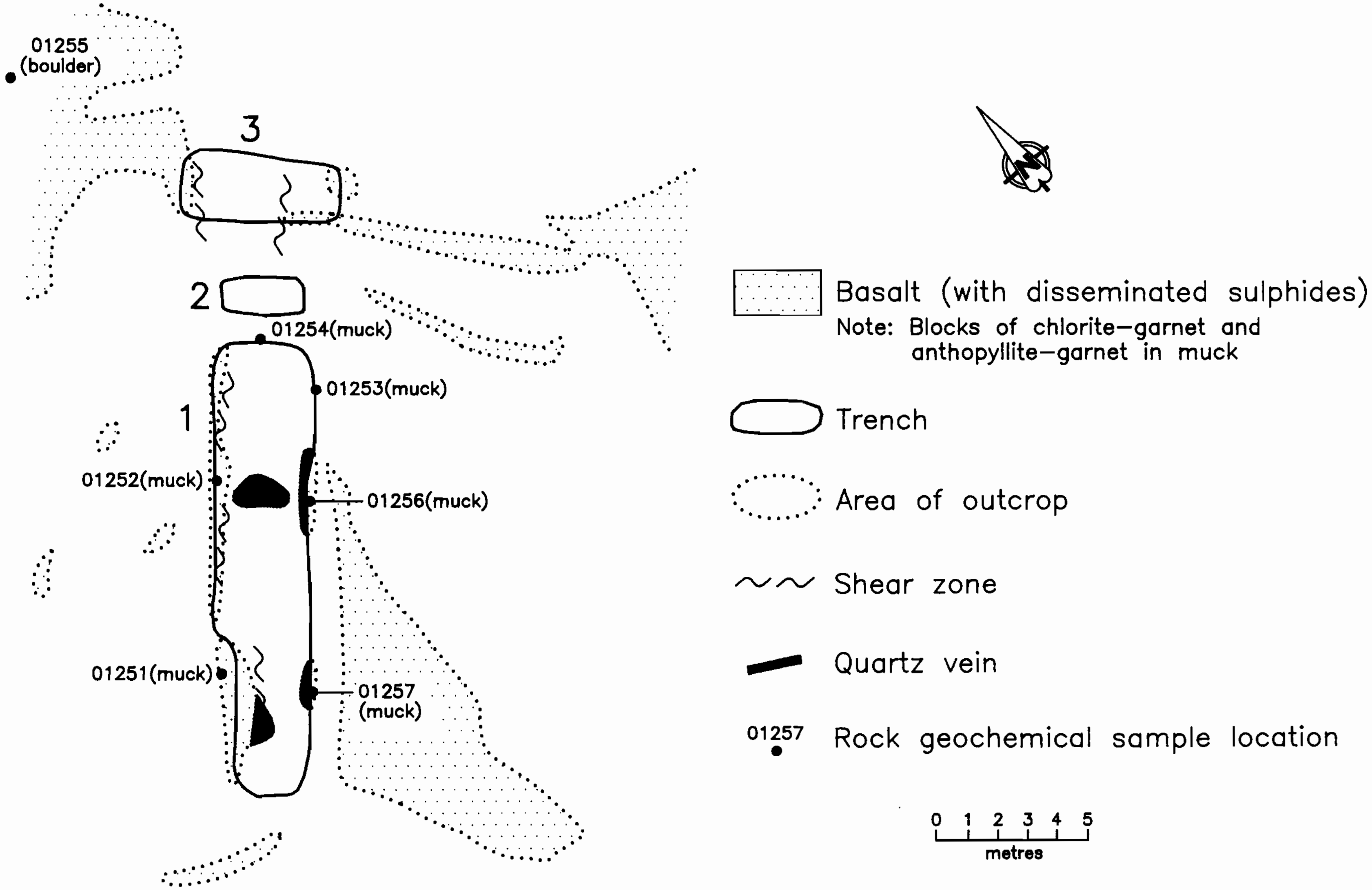


Figure 56-2: Outcrop, geology and trench and sample location map, occurrence 56.

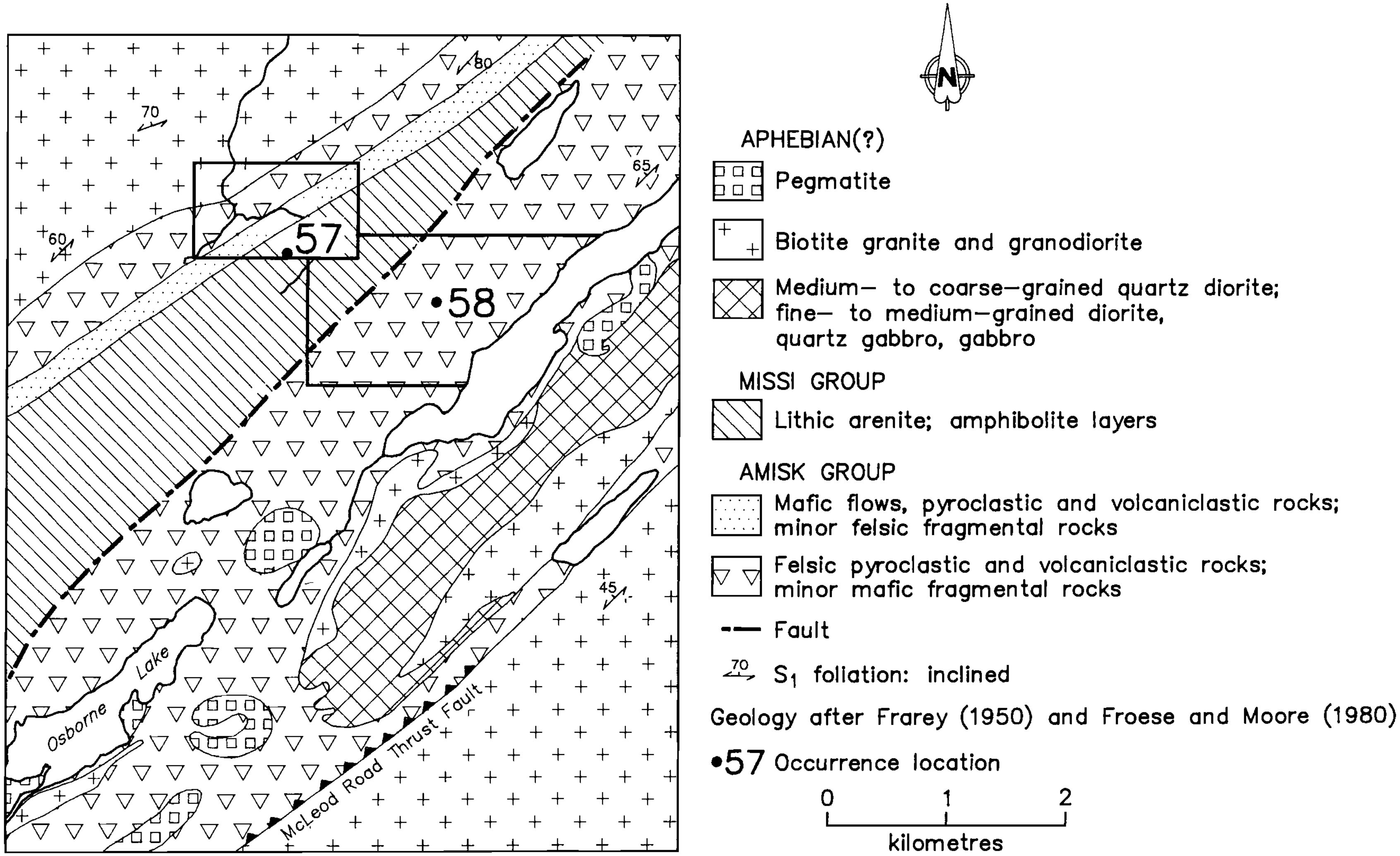


Figure 57-1: Geological setting of occurrences 57 and 58.

LOCATION: **57**

NAME: (A.F. - Mineralization intersected by diamond drilling).

UTM: 6092925N/454510E

ACCESS: Bush plane and traverse.

AREA: Northeast of Osborne Lake.

AIRPHOTO: A20782-56

EXPLORATION SUMMARY:

The area was first staked as the Buddy 1 to 6 claims in the late 1920's. Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624). HBED staked the Tie claims in 1956 and carried out a geophysical survey in 1957 (Mining Claim Card Tie 2). The claims lapsed in 1958. Reed 110 to 112 were staked by Canadian Nickel in 1961. A 78 m deep hole was drilled on Reed 111 in 1961 (A.F. 90087). A 6 hole, 937 m, diamond drill program was done on the Reed claims in 1963, followed by a 3 hole, 91 m, diamond drill program in 1971 (A.F. 91411, 91413). In 1971 a ground magnetometer survey was done and a strong northeast-trending conductor was outlined (A.F. 91412). The Reed claims lapsed in 1973. The area is presently covered by CB 7030 and CB 7069, staked by HBED in 1978.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group felsic pyroclastic and volcaniclastic rocks and mafic flows, pyroclastic and volcaniclastic rocks. These units are flanked to the southeast by Missi Group lithic arenite and to the northwest by biotite granite and granodiorite (Fig. 57-1; Froese and Moore, 1980; Frarey, 1950). Diamond drilling (Fig. 57-2) intersected biotite gneiss, amphibole-biotite gneiss, quartz-biotite gneiss, biotite-garnet gneiss and pegmatite (A.F. 90087, 91411, 91413).

MINERALIZATION:

DDH 35384 intersected 2.8 m of disseminated pyrite in a pink-grey mylonite (A.F. 91413). DDH 35385 intersected amphibolite gneiss with graphite layers over 10.0 m and a highly sheared biotite-quartz-garnet schist with talc and streaks of sphalerite over 2.5 m (A.F. 91413). DDH 24159, 24160, and 24196 to 24199 intersected unspecified core intervals of "minor" and "streaks" of sulphide (A.F. 91411). The percentage and species of sulphide minerals were not specified in the drill logs. DDH BH19576 intersected nonmineralized biotite-, hornblende- and quartz gneiss (A.F. 90087).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

Assessment Files 90087, 91411, 91412, 91413 and 91624
Manitoba Energy and Mines, Minerals Division.

Bailes, A.H.
1971: Preliminary compilation of the geology of the Snow Lake-Flin Flon Sherridon area; Manitoba Department of Mines and Natural Resources, Geological Paper 1/71, 27p.

Frarey, M.J.
1950: Crowduck Bay; Geological Survey of Canada, Map 987A, 1:63 360.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.

Hosain, I.T.
1988: An update summary and evaluation of geophysical data from open assessment files of the Flin Flon - Snow Lake greenstone belt (NTS sheets 63K (N1/2) and 63J/12, 13); Manitoba Energy and Mines, Mines Branch, Open File Report OF87-11, 99p.

Mining Claim Card Tie 2 (P 37632)
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

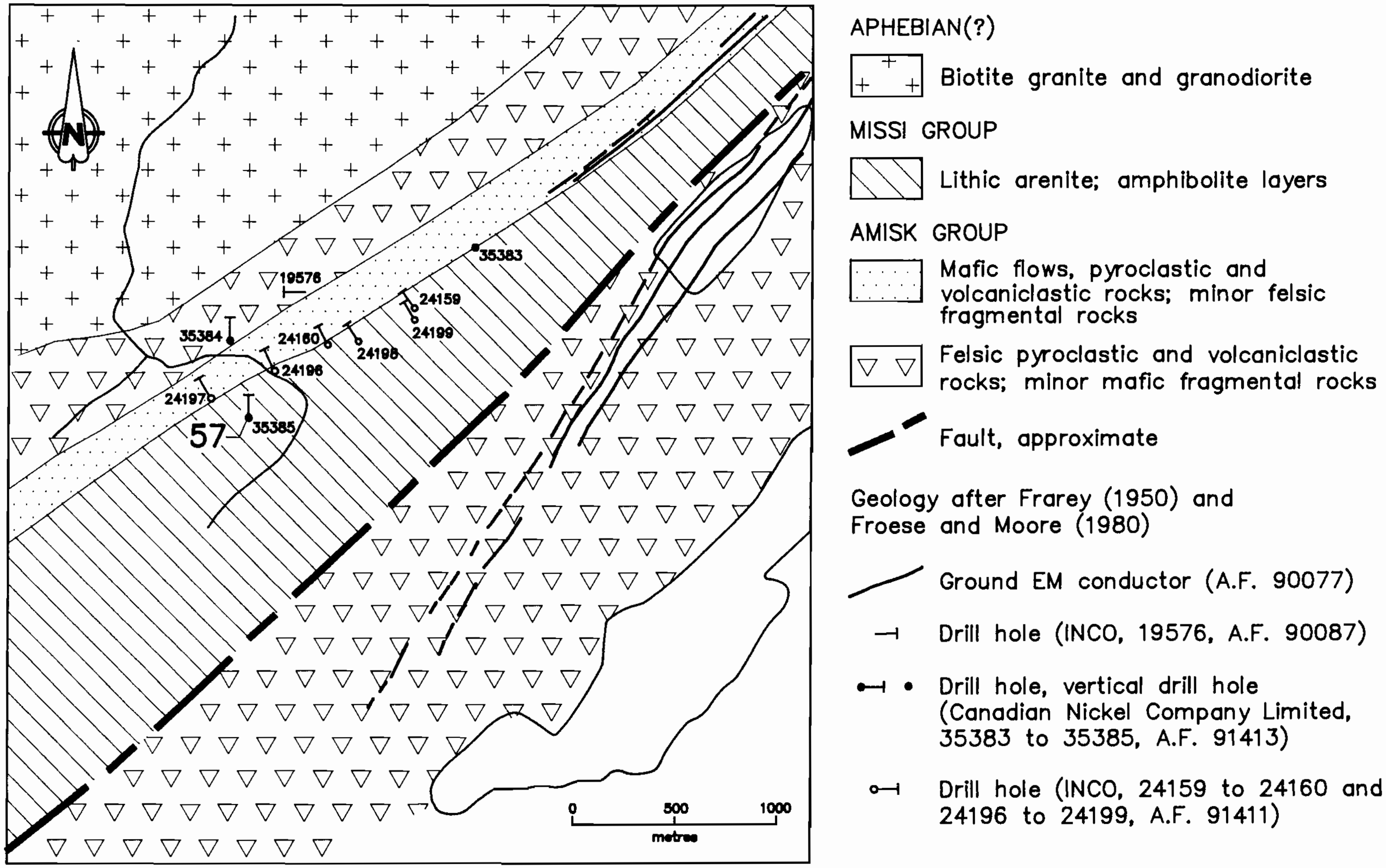


Figure 57-2: Diamond drill hole locations and ground EM conductors, occurrence 57.

LOCATION: **58**

NAME: (A.F. - Mineralization intersected by diamond drilling).

AREA: Northeast of Osborne Lake.

UTM: 6092273N/455268E

AIRPHOTO: A20782-55

ACCESS: Bush plane and traverse.

EXPLORATION SUMMARY:

The area was first staked as the Poplar 1 to 4 claims in the late 1920's. The Oz group of claims was staked by Roy Leslie between 1954 and 1955, and assigned to R.G. Crosby in 1956. Selco Exploration Company Limited carried out an HLEM survey and drilled a 125 m deep hole on Oz 8 and a 112 m deep hole on Oz 2 in 1957 (A.F. 90080). Canadian Nickel Company Limited did an airborne EM survey that year (A.F. 91624). The claims were cancelled in 1958. The Nice 20Fr., Nice 22 and 23 claims were staked by Canadian Nickel Company Limited in 1963. The International Nickel Company of Canada Limited drilled a 125 m deep hole on Nice 22 in 1963 (A.F. 91411). In 1971 Canadian Nickel Company Limited did a ground magnetometer survey and drilled 4 holes totalling 89 m on Nice 22 (A.F. 91412, 91413). The claims lapsed in 1975. The area was restaked under CB 7030 and CB 7069 by HBED in 1978. The Bur 29Fr., Bur 30, and Bur 31Fr. claims, staked by HBED in 1968, also partially cover this area.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group felsic pyroclastic and volaniclastic rocks and Missi Group lithic arenite. The felsic volcanic rocks are intruded by Aphebian biotite granite and granodiorite southeast of the area of the occurrence (Fig. 57-1; Froese and Moore, 1980; Frarey, 1950). Diamond drilling (Fig. 58-1) intersected biotite and muscovite gneiss (A.F. 91413), quartz-biotite schist, biotite schist and quartzite (A.F. 91411).

MINERALIZATION:

DDH 38800 intersected highly sheared muscovite-biotite schist and biotite gneiss that contain 10% magnetite and 10% graphite (A.F. 91413). DDH 24158 intersected "streaks" of graphite and sulphide; the sulphide minerals are not identified in the drill logs (A.F. 91411). DDH 1 and 2 intersected 11.2 and 5.5 m intervals of sedimentary gneiss that contains finely disseminated and coarse blebs of pyrite, and graphitic zones (A.F. 90080). DDH 35383 intersected; (i) 0.2 m of coarse grained carbonate-diopside "skarn" with 2 to 3% disseminated pyrrhotite, (ii) 0.1 m of 2 to 3% pyrrhotite and 4 to 5% chalcopyrite in garnetiferous gneissic amphibolite, and (iii) 1.5 m of biotite gneiss with 2 to 3% streaks and blebs of pyrrhotite and "scattered blebs" of arsenopyrite. DDH 38796, 38798 and 38799 were abandoned in overburden (A.F. 91413).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

Assessment Files 90077, 90080, 91411, 91412, 91413 and 91624
Manitoba Energy and Mines, Minerals Division.

Frarey, M.J.
1950: Crowduck Bay; Geological Survey of Canada, Map 987A, 1:63 360.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area; Geological Survey of Canada Paper 78-27, 16p.

Hosain, I.T.
1988: An update summary and evaluation of geophysical data from open assessment files of the Flin Flon - Snow Lake greenstone belt (NTS sheets 63K (N1/2) and 63J/12, 13); Manitoba Energy and Mines, Mines Branch, Open File Report OF87-11, 99p.

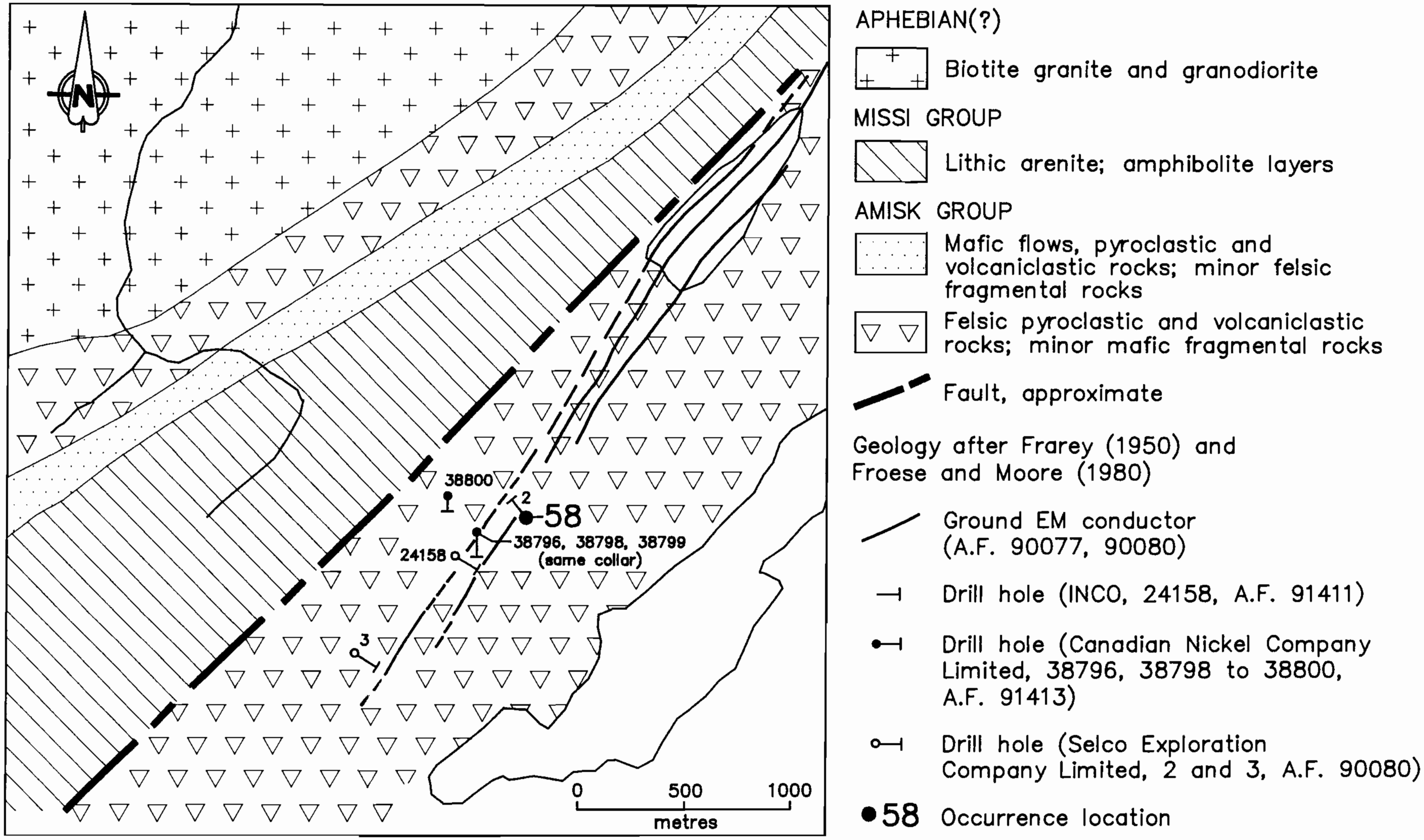


Figure 58-1: Local geology and diamond drill hole locations, occurrence 58.

LOCATION: **59**

NAME: Sparky

UTM: 6075775N/452820E

ACCESS: Boat from Bartlet's Landing, Wekusko Lake and traverse.

AREA: Grass River, northeast of Wekusko Lake.

AIRPHOTO: A20124-88

EXPLORATION SUMMARY:

The area was first staked as Gold Hill in 1918. The Pat and Mike claims were staked by E. R. Masterson in 1939. In 1940, two mineralized samples were sent to Ottawa for testing. The samples weighed 22.7 and 22.2 kg (Herb Lake General, Mining Engineering File). R. Kerr acquired the property in 1942. The Pat claim was drilled by P. Kobar in 1944 (Manitoba Mines and Natural Resources, 1945). The area was restaked as June by P. Kobar in 1947. Four holes totalling 211 m were drilled for P. Kobar and C. Nelson in 1948 (A.F. 90111). K.K. Gold Mines Limited examined the June group between 1948 and 1949 and sampled quartz veins on the property (Mineral Inventory Card 63J/13 Au 19). Two holes totalling 96 m were drilled on June by P. Kobar in 1951 (A.F. 90111, 90095). The ground was restaked in 1955 and 1971, but no work was reported. HBED did airborne EM and radiometric surveys in the area in 1965 (A.F. 91650). Geological and geophysical surveys were done on CB 5736, which was held by J.W. Campbell of Kerr Addison Mines Limited from 1973 to 1976 (Mining Claim Card CB 5736). J.B. Kobar staked Sparky over the area in 1979 and optioned it to Cangold Limited from 1984 to 1986. Cangold sampled trenches and did a VLF-EM survey (Mineral Inventory Card 63J/13 Au 19). Red Earth Energy Limited did a biogeochemical survey, rock sampling and a drilling program in 1984. W.B. Kobar acquired the property in 1986 and optioned it to Mid-North Resources Limited from 1987 to 1990.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by medium- to coarse-grained quartz diorite, biotite granite and Missi Group greywacke, arkose and conglomerate (Fig. 59-1; Gordon and Gall, 1982; Frarey, 1950). Medium- to coarse-grained gabbro and megacrystic gabbro were mapped in the immediate area of the occurrence (Fig. 59-2, 59-3). Diamond drilling intersected sheared, altered and mineralized granodiorite (A.F. 90111).

MINERALIZATION:

Disseminated to near solid arsenopyrite occurs in quartz veins and in sheared gabbro wall rock adjacent to the veins. Arsenopyrite occurs as subhedral to euhedral crystals up to 2 cm long and 0.5 cm wide. Minor pyrite is present in the wall rock. Alteration of the wall rocks adjacent to the quartz veins occurs as 2 to 5 cm wide fine grained, bleached, buff-white to grey zones of silicification. The mineralized zones have been exposed in 14 trenches (Fig. 59-3). Mineralized intersections in drill core vary from 0.9 to 2.4 m and are described as intervals of quartz stringers and shear zones with arsenopyrite. The percentage of arsenopyrite is not given.

GEOCHEMICAL DATA:

In 1940, two bulk samples of mineralization, weighing 22.7 and 22.2 kg, respectively, were sent to the Canada Department of Mines and Resources in Ottawa for testing. The first bulk sample contained 16.46 g/t Au and 2.39 g/t Ag, whereas the second bulk sample contained 241.71 g/t Au, 12.34 g/t Ag and 0.18% As (Herb Lake General, Mining Engineering File; Mineral Inventory Card 63J/13 Au 19).

Ten representative rock chip samples (03071 through 03080) were collected from mineralized outcrop and trenches for multi-element geochemical analysis (Appendix I). High concentrations of Au and As, were obtained. Au ranges from 12 to 13850 ppb and As from 40 ppm to 3.83%. Additionally, sample 873071 contains 48 ppm Sb and 22 ppm Bi; sample 873077 contains 23 ppm Sb and 30 ppm Bi; and sample 873078 contains 77 ppm Mo and 57 ppm Bi.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. The multiple northeast-trending quartz veins with disseminated to near solid zones of coarse grained arsenopyrite occur in gabbro. The trend of the quartz veins parallels a series of lineations defined by Bailes (1971) in this general area. The high Sb, Bi and Mo concentrations are unusual; this suite of trace elements has been documented in high concentrations in the base metal massive sulphide deposits of the Snow Lake camp.

REFERENCES:

Alcock, F.J.

1920: The Reed-Wekusko map area, northern Manitoba; Geological Survey of Canada, Memoir 119, 47p.

Assessment File 90095, 90111 and 91650

Manitoba Energy and Mines, Minerals Division.

Bailes, A.H.

1971: Preliminary compilation of the geology of the Snow Lake-Flin Flon Sherridon area; Manitoba Department of Mines and Natural Resources, Geological Paper 1/71, 27 p.

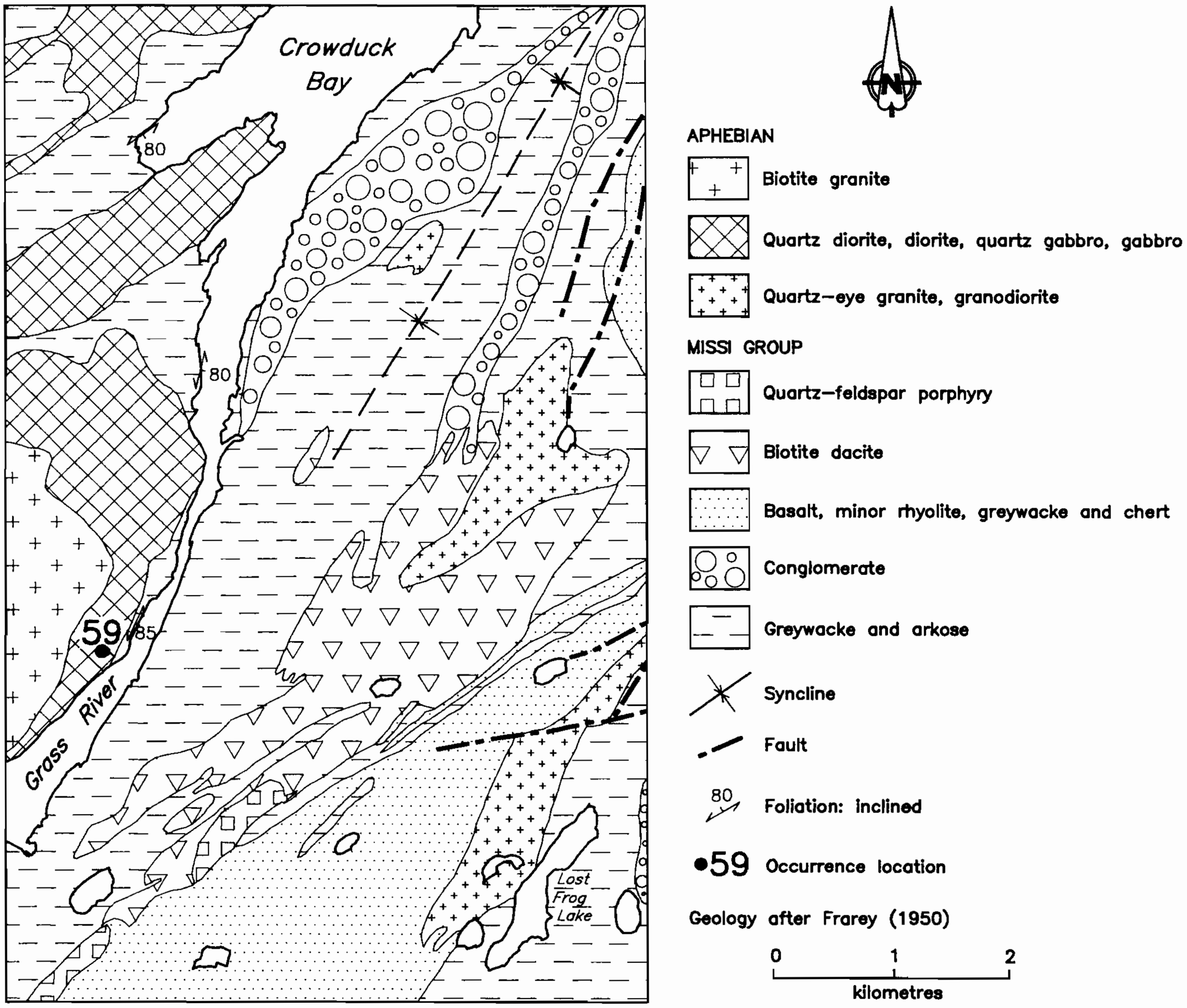


Figure 59-1: Geological setting of occurrence 59.

Cerny, P., Trueman, D.L., Ziehlke, D.V., Goad, B.E. and Paul, B.J.

1981: The Cat Lake-Winnipeg River and the Wekusko Lake pegmatite fields, Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER80-1, 216p.

Cole, G.E.

1942: Unpublished Untitled Memos; in Unpublished Information File, 63J/13, Manitoba Mines Branch.

Fedikow, M.A.F. and Malis, C.

1987: Mineral occurrence documentation and geochemical surveys in the Snow Lake area; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1987, p. 91-93.

Frarey, M.J.

1950: Crowduck Bay, Geological Survey of Canada, Map 987A, 1:63 360.

Gordon, T.M. and Gall, Q.

1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Herb Lake General

Manitoba Energy and Mines, Minerals Division, Mining Engineering Files.

Mining Claim Card CB 5736

Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Manitoba Mines and Natural Resources

1945: 17th Annual Report on Mines and Minerals, 105p.

Mineral Inventory Card 63J/13 Au 19

Manitoba Energy and Mines, Minerals Division.

Sabina, A.P.

1987: Rocks and minerals for the collector, La Ronge-Creighton, Saskatchewan; Flin Flon-Thompson, Manitoba; Geological Survey of Canada, Miscellaneous Report 42, 81p.

Stockwell, C.H.

1937: Gold deposits of Herb Lake area, northern Manitoba; Geological Survey of Canada, Memoir No. 208, 46p.

Wright, J.F.

1938: Geology and mineral deposits of a part of northwest Manitoba; Geological Survey of Canada, Summary Report, 1930, Part C, 124p.

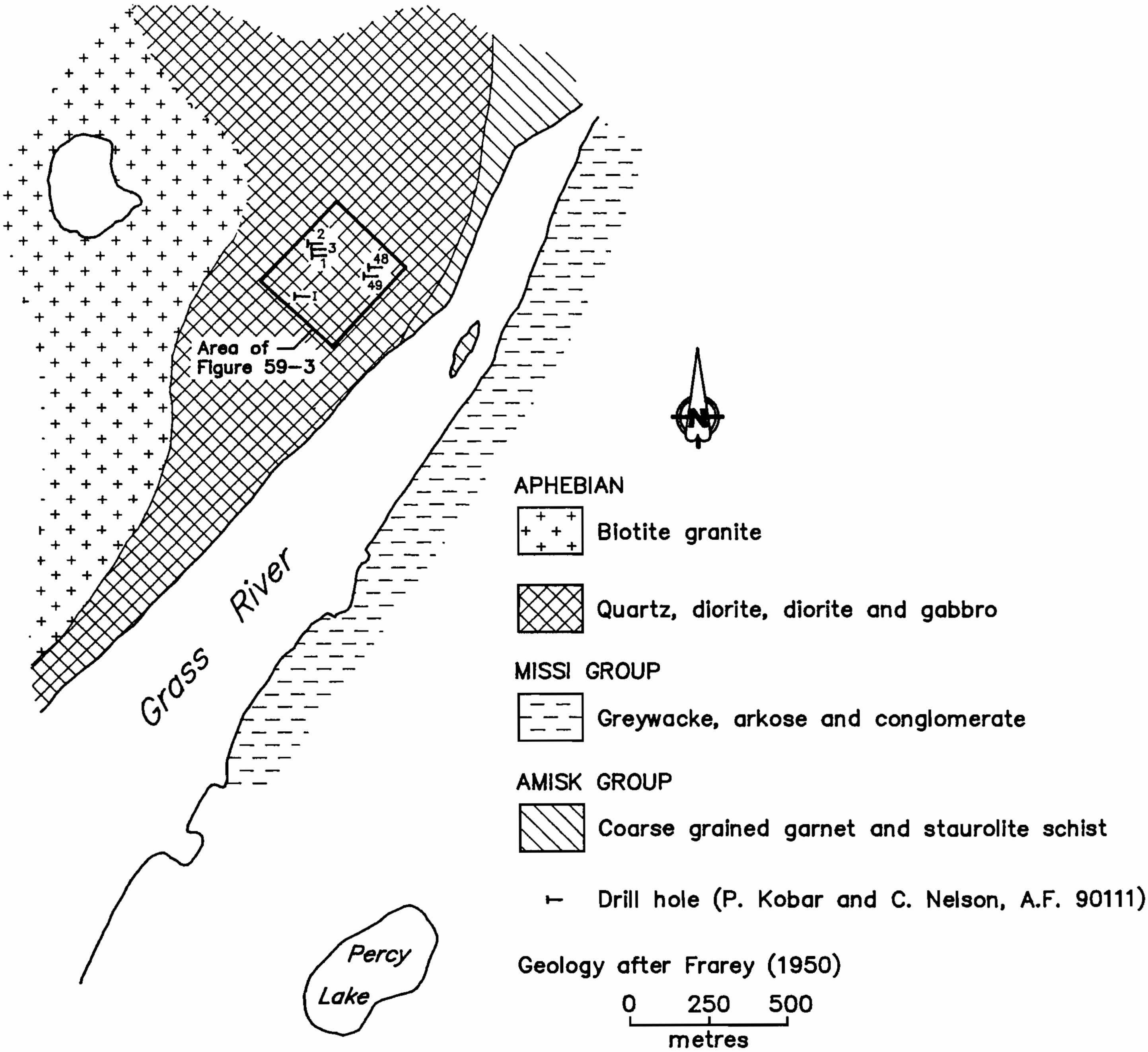


Figure 59-2: Local geology and diamond drill hole locations, occurrence 59.

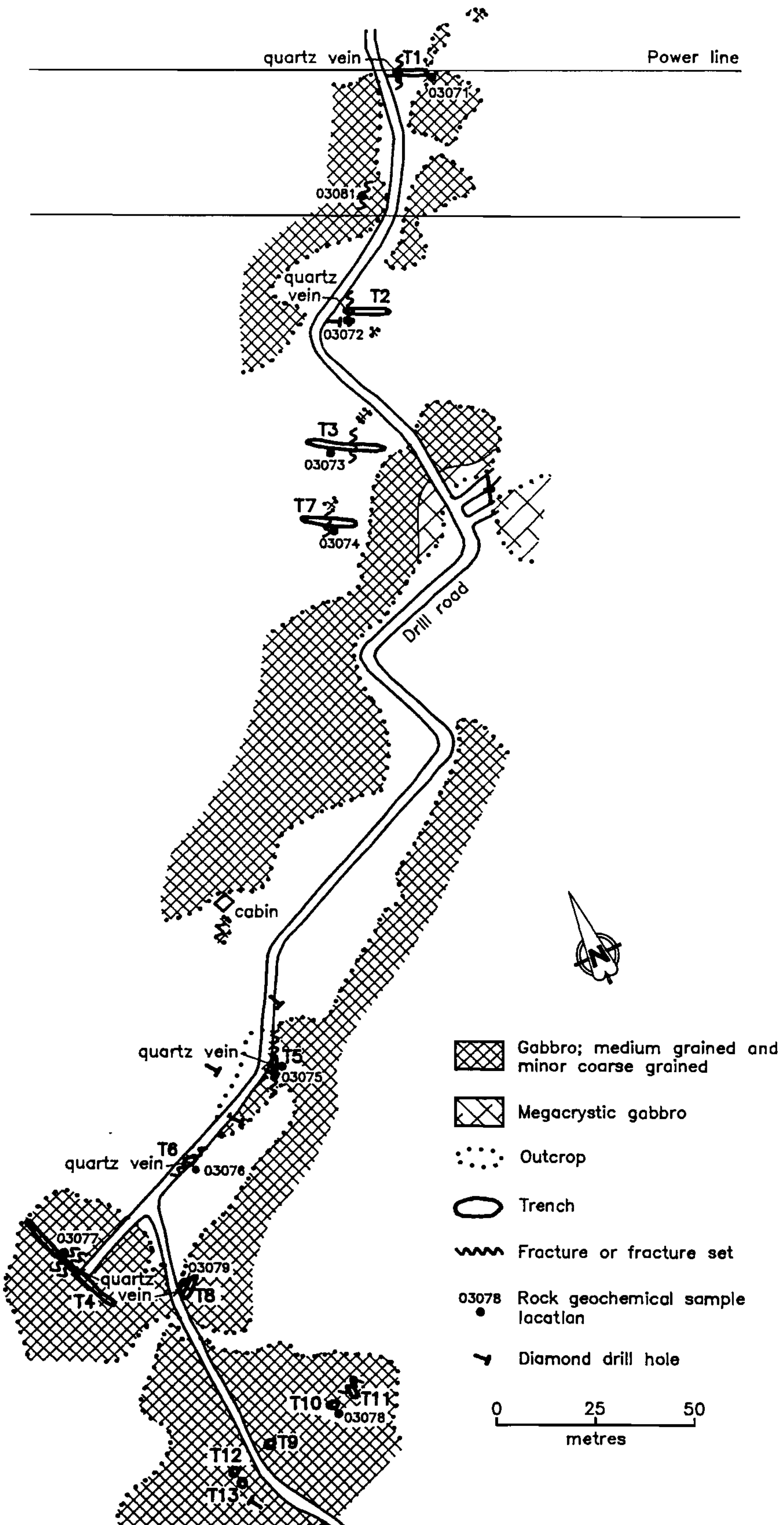


Figure 59-3: Outcrop, detailed geology and trench and sample location map, occurrence 59.

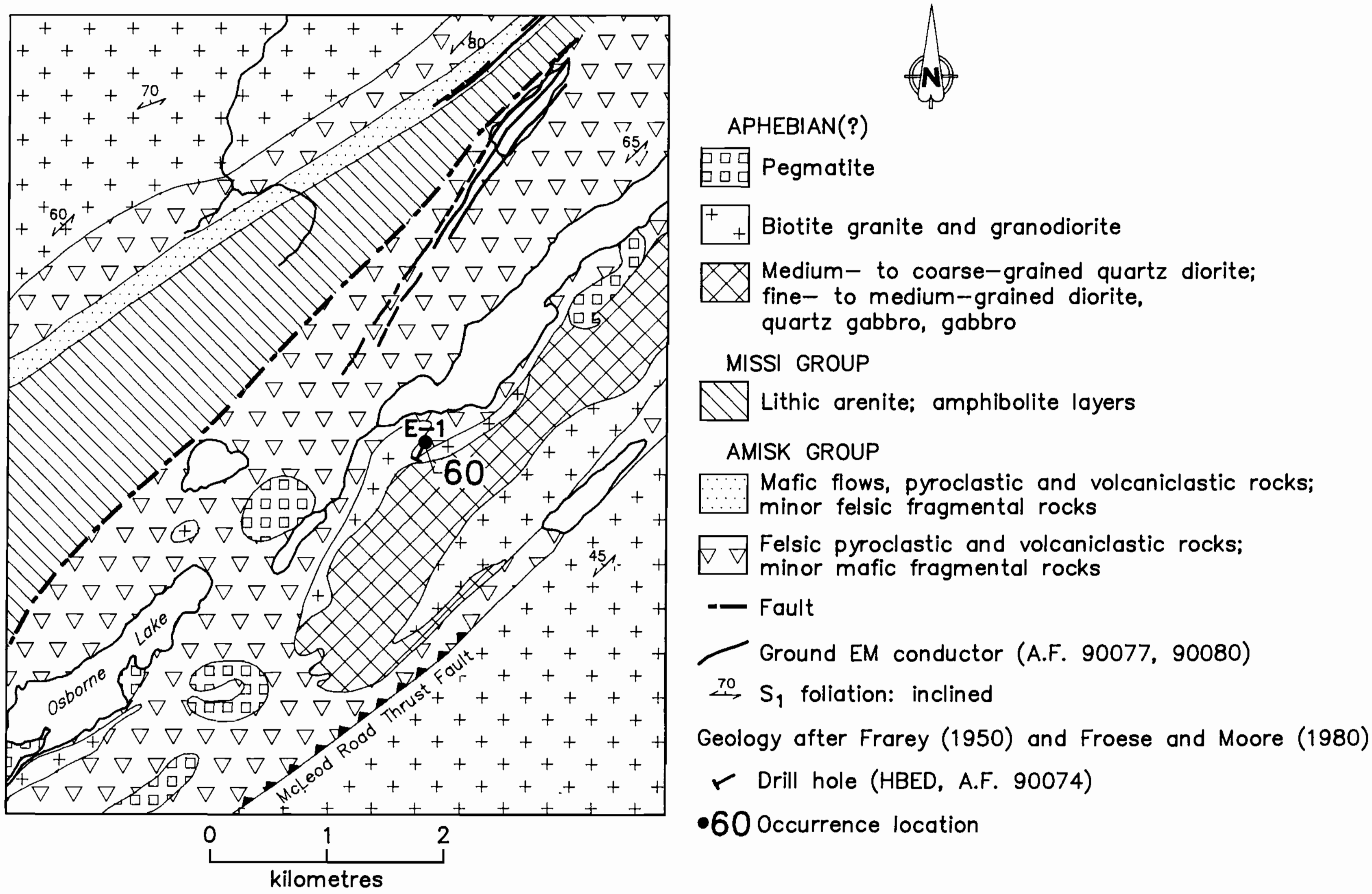


Figure 60-1: Geological setting and drill hole location, occurrence 60.

LOCATION: **60**

NAME: (A.F. - Mineralization intersected by diamond drilling).

AREA: Northeast of Osborne Lake.

UTM: 6090666N/455815E

AIRPHOTO: A20782-55

ACCESS: Bush plane and traverse.

EXPLORATION SUMMARY:

In 1956 the Tie and Easton group of claims were staked by HBED and Eugene Cote, respectively. A 26.8 m deep hole was drilled by C.J. Power on Easton 18 in 1956, and three trenches were dug (A.F. 90074). Cardiff Mining Company Limited did a VLEM survey in 1957 and noted several sulphide occurrences in the area, including one about 1.7 km southeast on Easton 22 (A.F. 90072). HBED carried out a geophysical survey on the Tie group of claims in 1957 (Mining Claim Card Tie 21). Canadian Nickel Company Limited carried out an airborne EM survey in 1957 (A.F. 91624, Ground Hog Sheet 13). The Tie and Easton claims were cancelled in 1958. HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650). HBED staked the Bur 41 Fr., -44, and 52-54 claims in 1968 and CB 9253 (includes former Bur 59, 60 claims) in 1978.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group felsic pyroclastic and volcaniclastic rocks intruded by biotite granite and granodiorite (Fig. 60-1; Froese and Moore, 1980; Frarey, 1950). Diamond drilling intersected medium grained, grey-green mineralized diorite (A.F. 90074).

MINERALIZATION:

DDH E-1 intersected 11.6 m of rusty weathered diorite. The diorite is described as being "heavily iron stained" (A.F. 90074).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 90072, 90074, 91624 and 91650
Manitoba Energy and Mines, Minerals Division.

Frarey, M.J.
1950: Crowduck Bay; Geological Survey of Canada, Map 987A, 1:63 360.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area; Geological Survey of Canada Paper 78-27, 16p.

Mining Claim Card Tie 21 (P 37651)
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

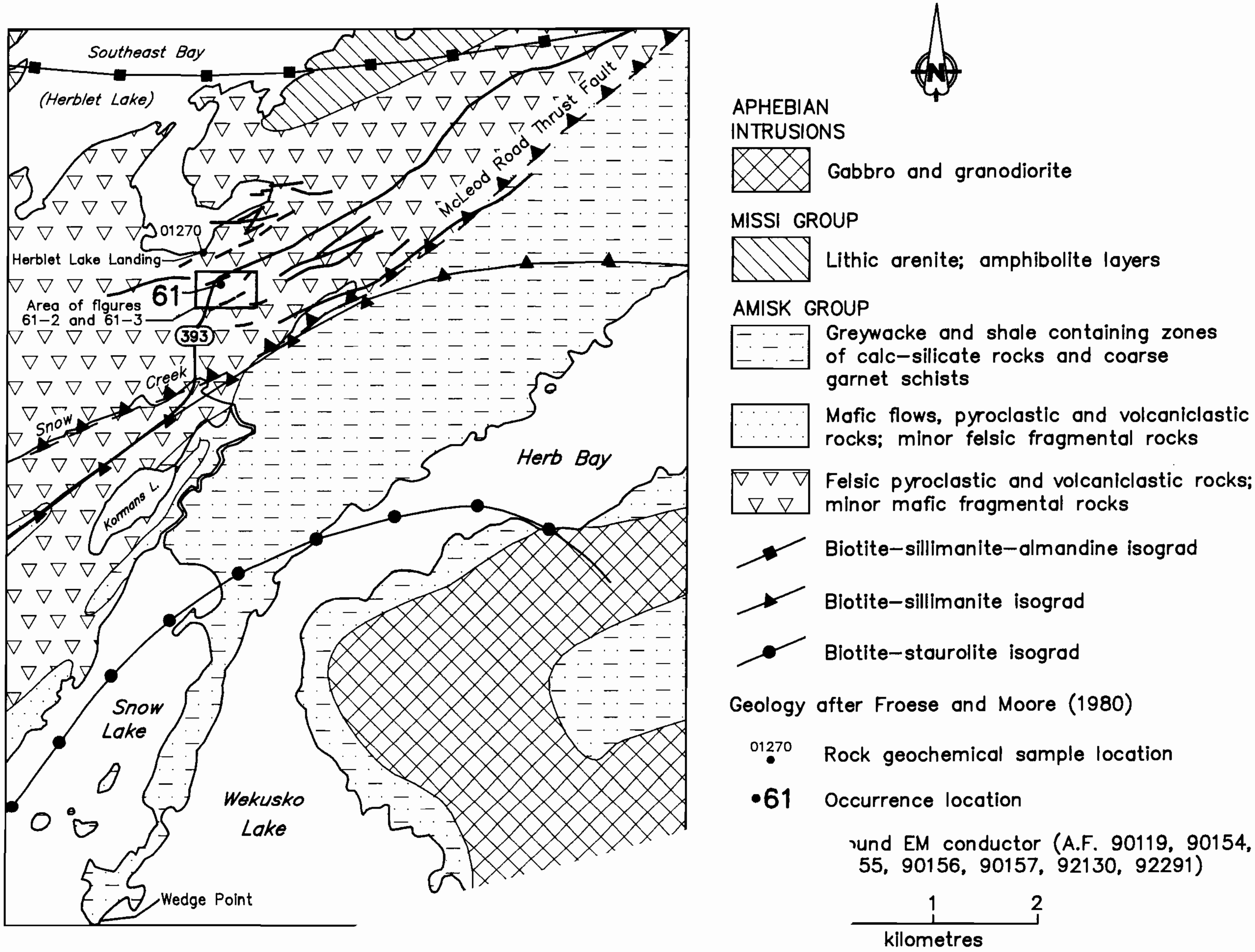


Figure 61-1: Geological setting of occurrence 61.

LOCATION: **61**

NAME:

AREA: Junction of Provincial Road 393 and Herblet Lake access road.

UTM: 6082798N/444253E

AIRPHOTO: A20127-131

ACCESS: Provincial Road 393 and traverse.

EXPLORATION SUMMARY:

The area was first staked as Ruth 7 and T.P. 1 prior to 1930. Diamond drilling was done on A.C. 1 and 2 by A. Dumas in 1949 (Manitoba Mines and Natural Resources, 1950). The M.P. claims were staked by Mrs. Arthur Corman in 1949 and assigned to Arthur Corman in 1955. HBED optioned the property from 1955 to 1958. HBED did an HLEM survey on the property between 1955 and 1956 and drilled one hole on MP 10 (A.F. 90119, 90154, 90155). Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624, Ground Hog Sheet 13). The claims were assigned to James Corman and then to W.B. Kobar in 1965. Turam EM surveys were done over the Whitefish Bay area by Gunnex Limited in 1966 and by Moreau, Woodard and Co. Limited on behalf of Sydney Teal in 1967 (A.F. 90157, 90158). M.P. 1 to 4 were assigned to Falconbridge Nickel Mines Limited in 1968 and then to Threehouse Mines Limited in 1971.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by felsic pyroclastic and volcaniclastic rocks flanked to the south by greywacke and shale. Both of these sequences have been assigned to the Amisk Group. To the north, the felsic volcanic rocks are overlain by Missi Group lithic arenite. The occurrence is situated between the biotite-sillimanite-almandine isograd to the north and the biotite-sillimanite isograd to the south (Fig. 61-1; Froese and Moore, 1980). In the immediate vicinity of the occurrence, mafic volcaniclastic and pyroclastic rocks are interbedded with variably altered felsic volcanic rocks (Fig. 61-2, 61-3).

MINERALIZATION:

Mineralization was observed in two sites at the occurrence. At site 1, 3 to 5% disseminated pyrite occurs in a silicified zone within rusty weathered felsic pyroclastic rocks and mafic pyroclastic and volcaniclastic rocks (Fig. 61-2). The mafic sequence also contains a rusty weathered quartz vein. Site 2 is characterized by 5 to 10% disseminated pyrite in rusty weathered and silicified felsic volcanic rocks. A fine grained rhyolite dyke intrudes the felsic volcanic rocks and also contains 1 to 2% disseminated pyrite (Fig. 61-3).

GEOCHEMICAL DATA:

Representative outcrop chip samples 03186 and 03187 were collected from site 1 (Fig. 61-2); samples 04663 to 04665 were collected from site 2 (Fig. 61-3). All samples contained low base and precious metal values (Appendix I). Representative outcrop chip sample 01270 was collected from rusty weathered and silicified rhyolite that occurs along the Herblet Lake shoreline at Herblet Lake Landing (Fig. 61-1). The sample contains low base and precious metal values (Appendix I).

CLASSIFICATION:

Stratabound massive sulphide type deposit; alteration zone. The silicate alteration mineral assemblage of cordierite-anthophyllite-biotite-garnet was observed in felsic volcanic rocks in the general vicinity of, but not included in, the area of sites 1 and 2. Together with the disseminated and veinlet sulphide this mineral assemblage is similar to alteration that accompanies stratabound base metal massive sulphide type deposits in the Snow Lake base metal mining camp. The alteration that occurs on the lakeshore of Whitefish Bay, Herblet Lake, and represented by sample 01270, is associated with numerous ground EM conductors that occur beneath Whitefish Bay.

REFERENCES:

Assessment Files 90119, 90154, 90155, 90156, 90157, 90158, 92130 and 92291

Manitoba Energy and Mines, Minerals Division.

Eccles, D.R. and Fedikow, M.A.F.

1985: Mineral occurrence documentation and alteration zone mapping, Snow Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 82-99.

Fedikow, M.A.F., Roney, C.T., Schmidt, G.J. and Robbie, T.

1986: Mineral deposit studies in the Snow Lake area; in Manitoba Energy and Mines, Geological Services Branch, Report of Field Activities, 1986, p. 77-85.

Froese, E. and Moore, J.M.

1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.

Manitoba Mines and Natural Resources

1950: 22nd Annual Report on Mines and Minerals, p. 46.

Russell, G.A.

1957: Structural studies of the Snow Lake - Herb Lake area; Manitoba Mines and Natural Resources, Publication 55-3, 33p.

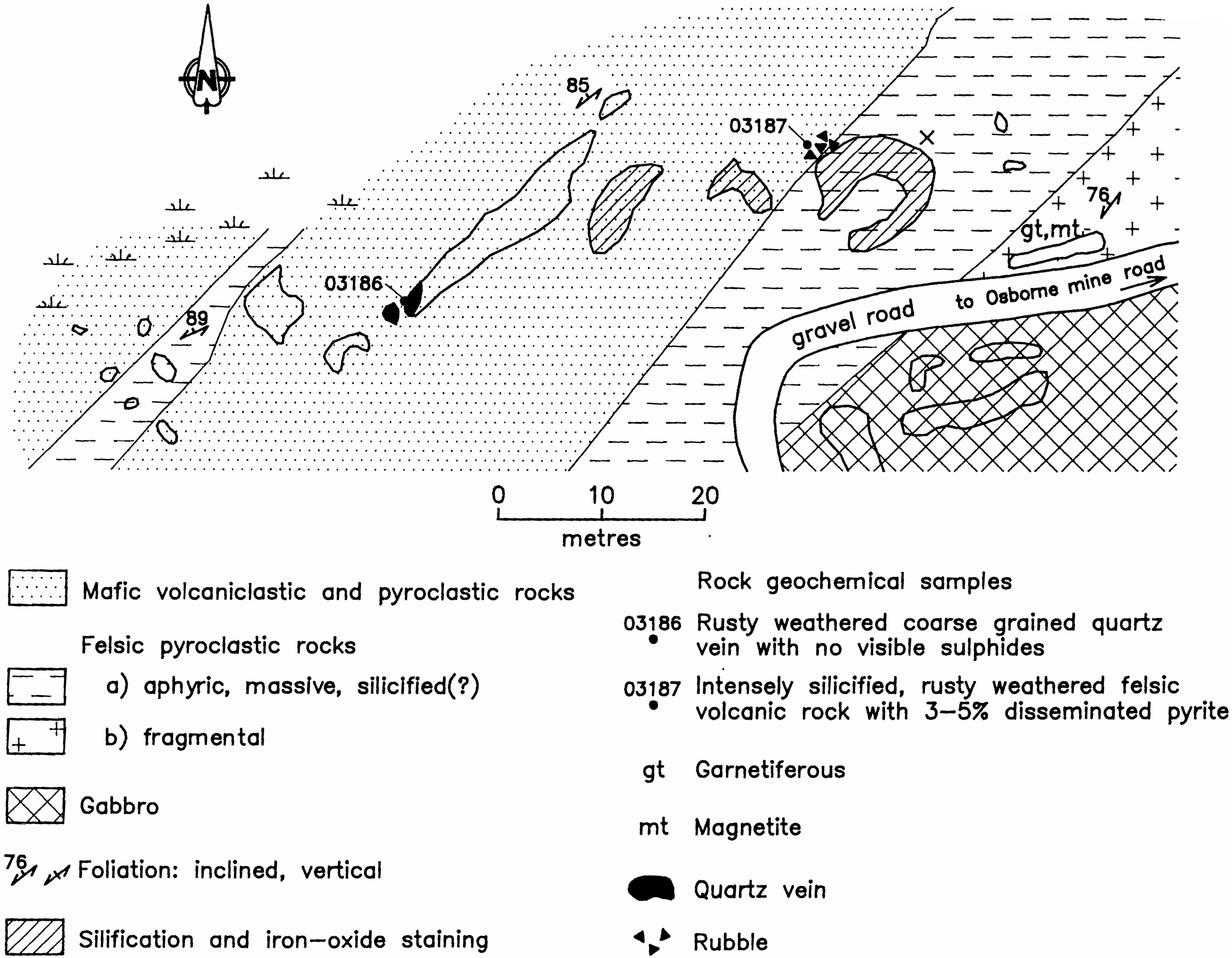


Figure 61-2: Outcrop, geology and sample location map, site 1, occurrence 61.

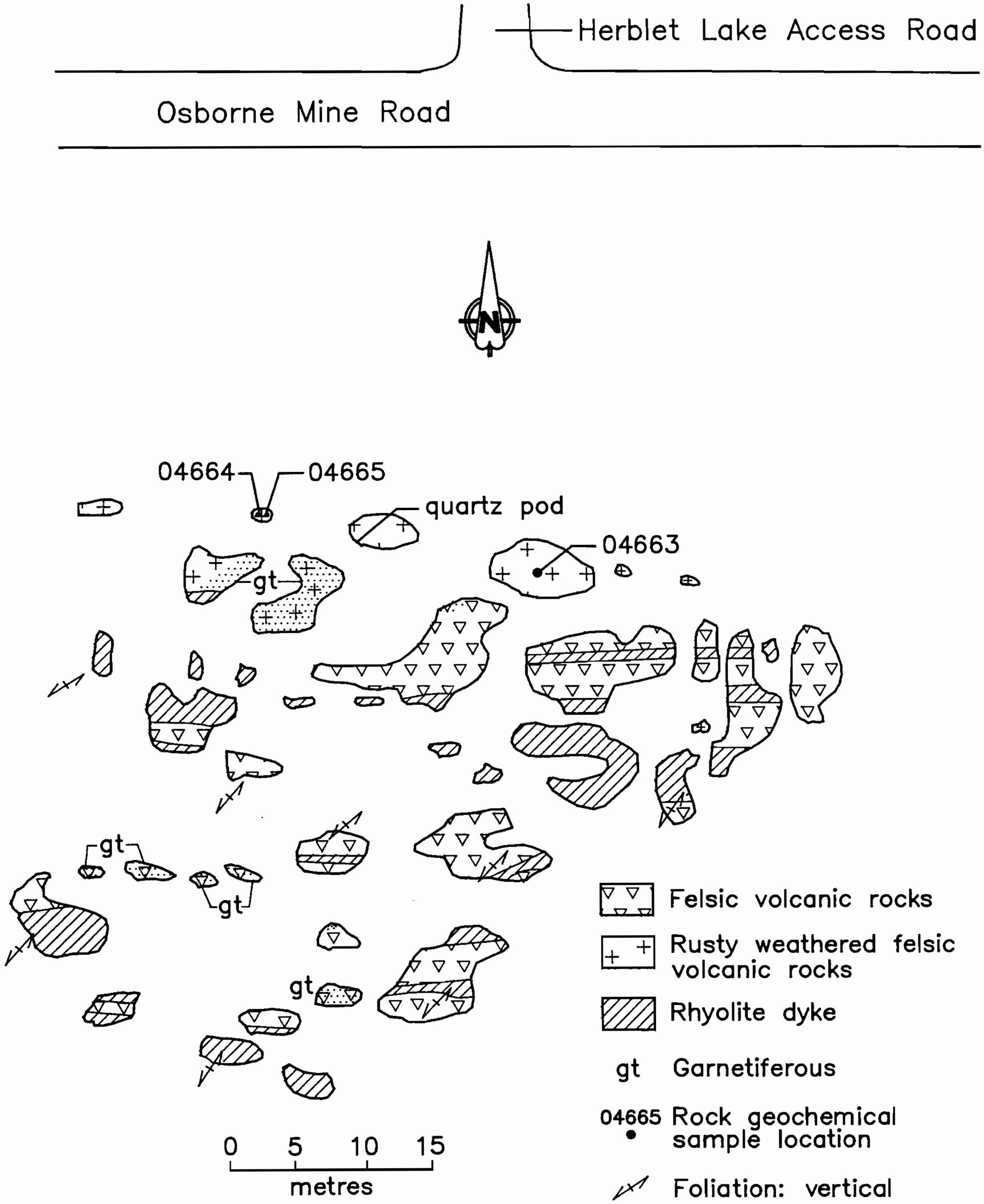


Figure 61-3: Outcrop, geology and sample location map, site 2, occurrence 61.

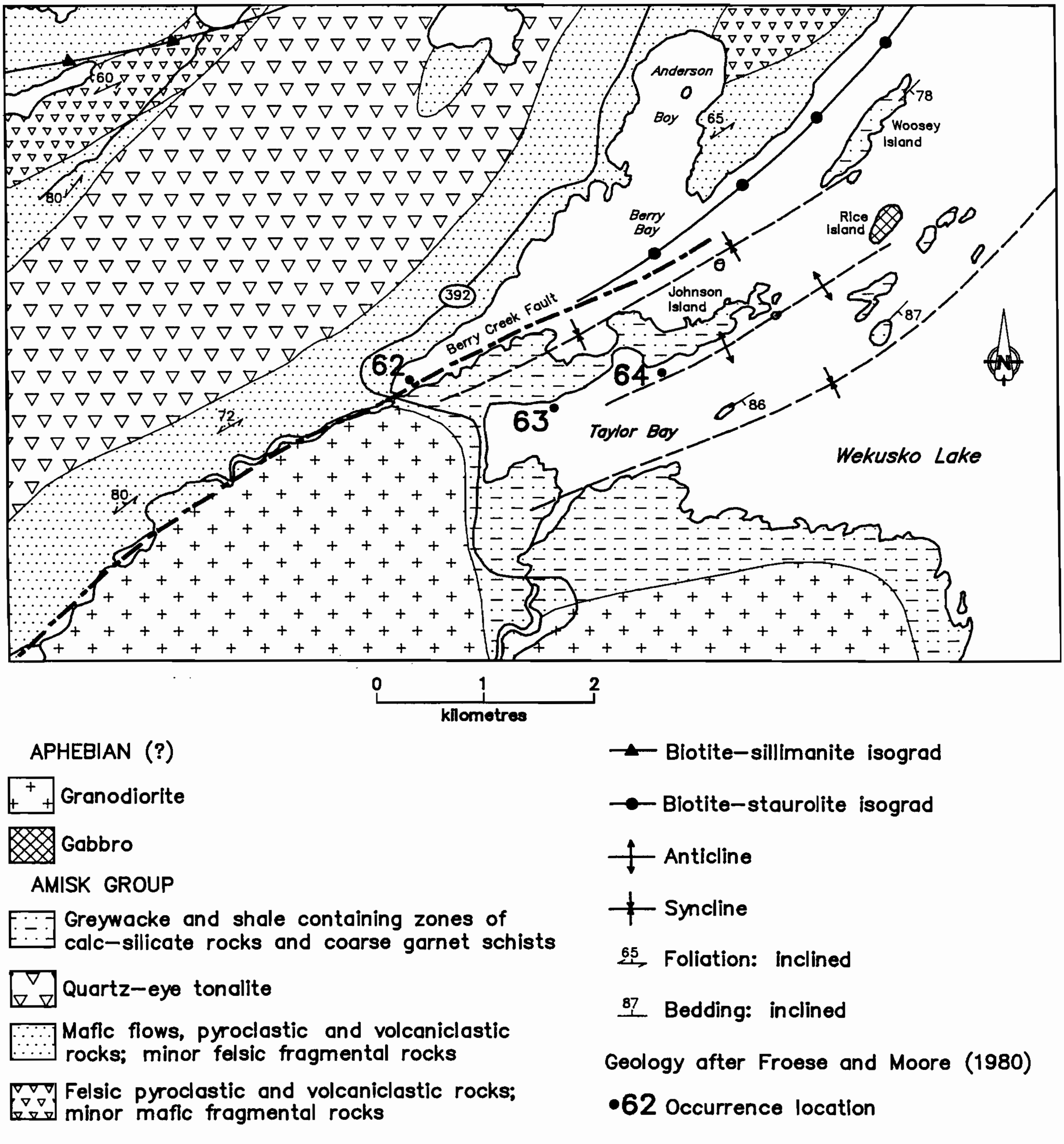


Figure 62-1: Geological setting of occurrences 62, 63 and 64.

LOCATION: **62**

NAME: (A.F. - Mineralization intersected by diamond drilling)

AREA: Berry Bay and Berry Creek, Wekusko Lake.

UTM: 6073263N/436462E

AIRPHOTO: A20170-120

ACCESS: Provincial Highway 392.

EXPLORATION SUMMARY:

The Bob 1, 2, 5 and 6 claims were staked in the area in the late 1940's. Surface exploration was done by Herb Lake Mining and Exploration Limited on the Bob group in 1947 (Manitoba Energy and Mines Scrap Book, 1947). HBED did an HLEM survey in the area between 1955 and 1956 (A.F. 90119), and drilled a 96 m deep hole on Fault 5 in 1957 (A.F. 90103). Four holes totalling 310 m were drilled on Fault 5 by A. Talbot on behalf of Jay-Kay Exploration Syndicate in 1960 (A.F. 90102). HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650). Alpha Mines Limited did a Turam EM survey on Dianne 44 and 45 in 1968 (A.F. 91514). Granges Exploration Aktiebolag did airborne EM and magnetic surveys in 1973 (A.F. 92019). The ground was held by J.H. Kerr from 1973 to 1976, by W. Bruce Dunlop Limited from 1980 to 1983, under option to Noranda Exploration Company Limited from 1981 to 1982, and by Snow Lake Exploration from 1984 to 1988. W. Bruce Dunlop Limited restaked the area as Berbay 7 in October 1990.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group mafic flows, pyroclastic and volcaniclastic rocks, and greywacke and shale. These rocks are flanked to the south and southwest by granodiorite of the Aphebian Tramping Lake Pluton (Fig. 62-1; Froese and Moore, 1980). The trace of the Berry Creek Fault transects the general area of the occurrence. Diamond drill holes (Fig. 62-2) intersected slate, quartzite, pegmatite and mineralized chemical sedimentary rocks (A.F. 90102) and mineralized chloritic schists (A.F. 90103).

MINERALIZATION:

DDH 7 and 8c intersected graphite schist with pyrite over core intervals of 1.8 to 19.8 m; DDH 9c intersected a sequence of graphitic slate (39.9 to 46.3 m), graphitic schist and pyrite (46.3 to 50.9 m), pegmatite (50.9 to 51.5 m) and graphitic schist with pyrite (51.5 to 72.8 m). Nonmineralized quartz stringers up to 2.5 cm wide occur between 53.6 to 53.9 m and 57.6 to 62.1 m. DDH 10c intersected nonmineralized slate, quartzite and pegmatite. Mineral percentages are not reported (A.F. 90102). DDH F3 intersected chlorite-sericite-carbonate schist with talcose sections. A 12 m section of chloritic graphite schist with minor pyrite and pyrrhotite stringers was also intersected (A.F. 90103).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

Assessment Files 90102, 90103, 90119, 91514, 91650 and 92019

Manitoba Energy and Mines, Minerals Division.

Eccles, D.R. and Fedikow, M.A.F.

1985: Mineral occurrence documentation and alteration zone mapping, Snow Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 82-99.

Froese, E. and Moore, J.M.

1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.

Gobert, G.

1990: Till geochemistry of the Snow Lake area (NTS 63K/16, 63J/13, 63J/12); in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1990, p. 72-73.

Scrap Book

1947: Manitoba Energy and Mines, Minerals Divison, Corporation Files.

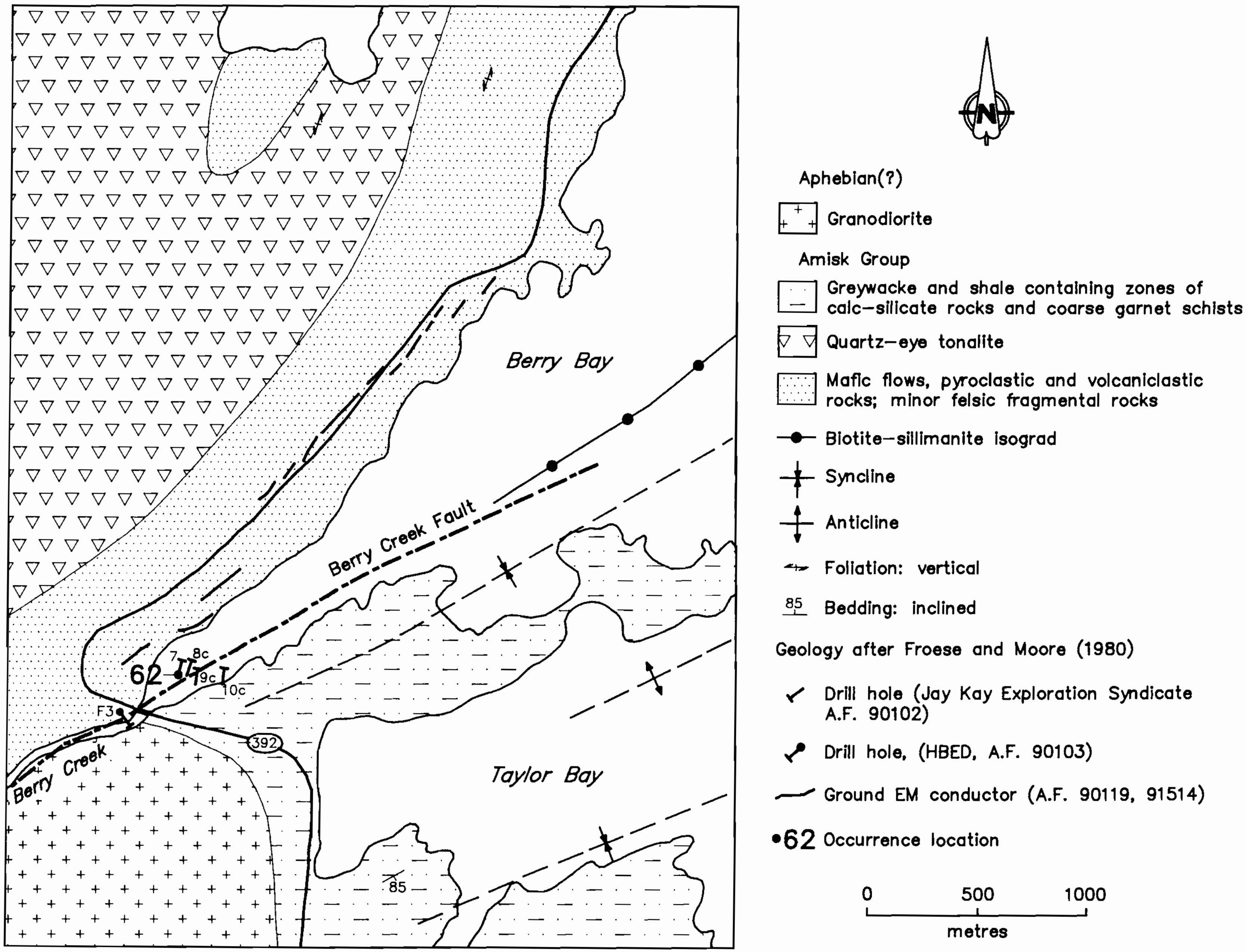


Figure 62-2: Local geology and diamond drill hole locations, occurrence 62.

LOCATION: **63**

NAME: (A.F. - Mineralization intersected by diamond drilling).

AREA: Taylor Bay, Wekusko Lake.

UTM: 6072817N/437889E

AIRPHOTO: A20170-120

ACCESS: Boat on Wekusko Lake.

EXPLORATION SUMMARY:

The area was first staked as the Tom and Jerry claims in the late 1920's. Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624, Ground Hog Sheet 10). In 1963 the International Nickel Company of Canada Limited drilled one hole to a depth of 185 m on Nice 9 (A.F. 90114). HBED did airborne EM and magnetic surveys in 1965 (A.F. 91650). W.B. Kobar did surface work on CB 383 between 1971 and 1972 (Mining Claim Card CB 383). Granges Exploration Aktiebolag did an HLEM survey on CB 9191 and CB 9192 in 1979 and drilled two holes totalling 134 m on CB 9192 and a 65 m deep hole on CB 9191 in 1980 (A.F. 92993). W.Bruce Dunlop Limited held the ground as Berbay 1 from 1986 to 1989 and as Berbay 6 since 1990.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group greywacke and shale and mafic flows, pyroclastic and volcaniclastic rocks. These rocks are flanked to the south and southwest by granodiorite of the Aphebian Tramping Lake pluton (Fig. 62-1; Froese and Moore, 1980). DDH Z1999 (Fig. 63-1) intersected tuff of unspecified composition and "greenstone" (A.F 90114).

MINERALIZATION:

Disseminated sulphide occurs throughout a 76.5 m interval of tuff. Sulphide mineral species are not identified in the log for DDH Z1999 (A.F. 90114).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 90114, 91624, 91650 and 92993
Manitoba Energy and Mines, Minerals Division.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.

Mining Claim Card CB 383
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

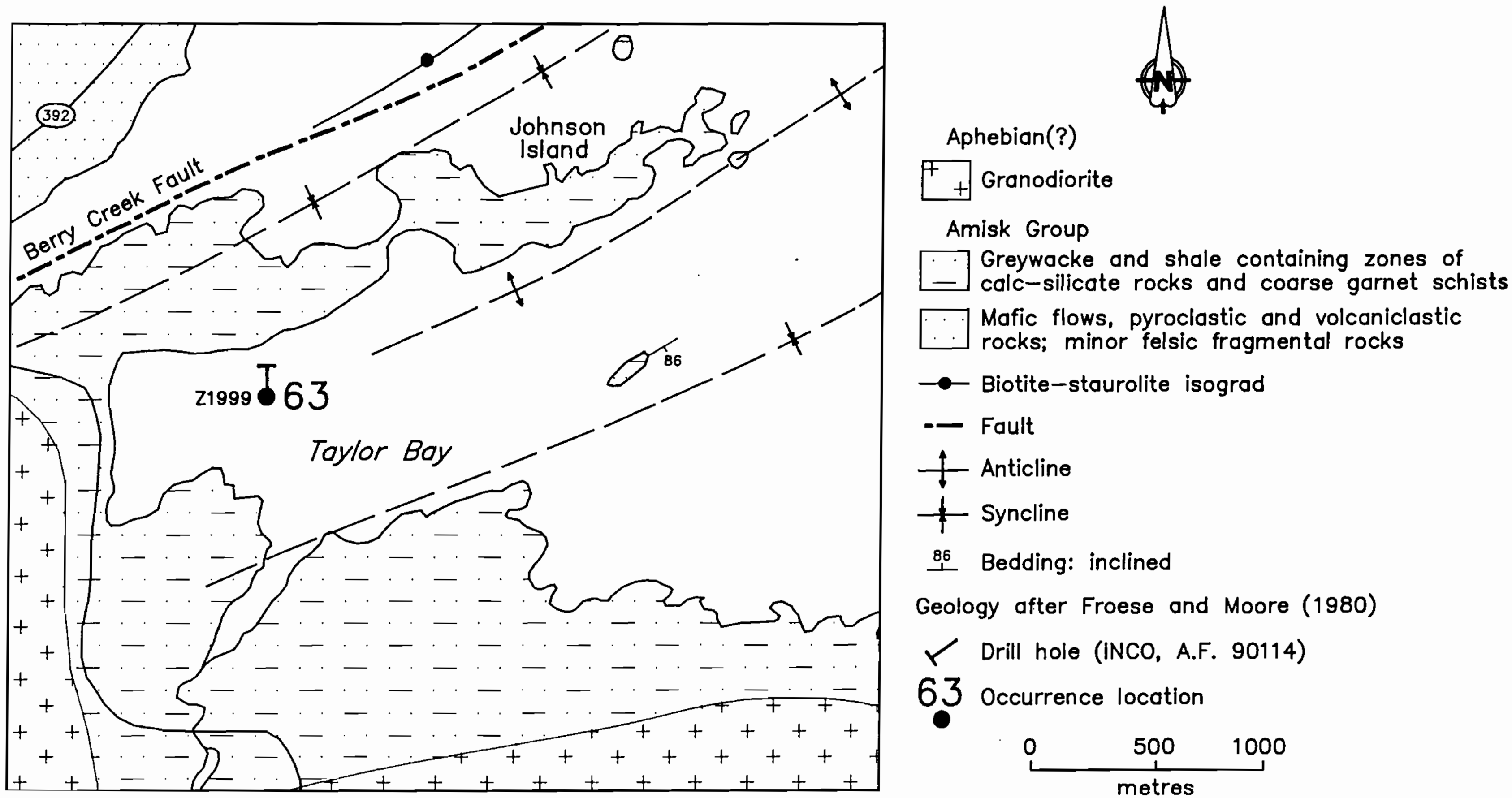


Figure 63-1: Local geology and diamond drill hole location, occurrence 63.

LOCATION: **64**

NAME: (A.F. - Mineralization indicated by diamond drilling).

UTM: 6073215N/438789E

ACCESS: Boat on Wekusko Lake.

AREA: Taylor Bay, Wekusko Lake.

AIRPHOTO: A20170-120

EXPLORATION SUMMARY:

The area was first staked as Orange 2 in the late 1920's. Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624, Ground Hog Sheet 10) and some diamond drilling on the Nice group of 15 claims in 1964 (Mining Claim Card Nice 1). HBED carried out airborne EM and radiometric surveys in 1965 (A.F. 91650). W.B. Kobar did surface work on CB 382 between 1971 and 1972 (Mining Claim Card CB 382). Granges Exploration Aktiebolag did an HLEM survey on CB 9190 in 1979 (A.F. 92993). Granges drilled a 99 m deep hole and a 122 m deep hole on CB 9190 in 1980 and 1983, respectively (A.F. 92993, 92762). W.Bruce Dunlop Limited held the ground as Berbay 2 from 1986 to 1989. HBED restaked the area as Mud 7794 in 1989.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group greywacke and shale flanked to the northwest by mafic flows, pyroclastic and volcaniclastic rocks and to the south by granodiorite of the Aphebian Tramping Lake Pluton (Froese and Moore, 1980). DDH AB71 intersected graphite-, quartz-chlorite-, and talcose schists and argillite (Fig. 64-1; A.F. 92762).

MINERALIZATION:

DDH AB71 intersected graphite schists with 1 to 5% pyrite over 1.5 to 2.7 m core intervals. A 0.1 m thick quartz vein, with 20% pyrite and 2% sphalerite, occurs in a 2.7 m core interval of foliated argillite (A.F. 92762).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Vein type deposit; single vein. The quartz vein with the pyrite-sphalerite mineralization occurs in a geological environment dominated by chemical sediment type deposits. The sulphide mineralization in the quartz vein may represent mobilisate.

REFERENCES:

Assessment Files 91624, 91650, 92762 and 92993
Manitoba Energy and Mines, Minerals Division.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.

Mining Claim Card Nice 1 (P3851A) and CB 382
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

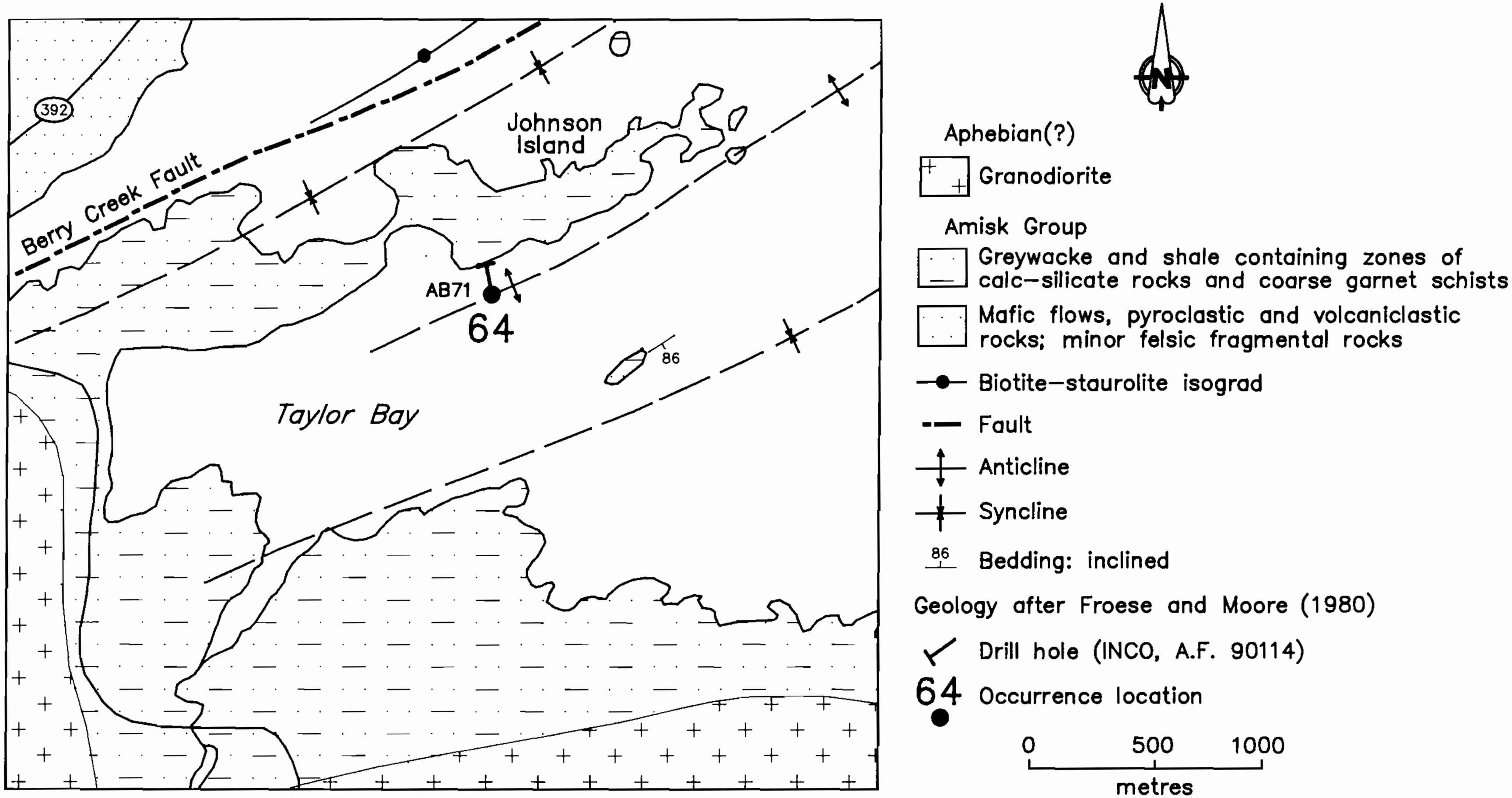


Figure 64-1: Local geology and diamond drill hole location, occurrence 64.

LOCATION: **65**

NAME:

UTM: 6077283N/460197E

ACCESS: Bush aircraft to Roberts Lake and traverse.

AREA: Southwest of Roberts Lake.

AIRPHOTO: A20780-15

EXPLORATION SUMMARY:

The area was first staked as Pas 1 and 2, Beryllium, Bonspiel, Marie and Martha prior to 1930. The Pas group was held by various individuals between 1923 and 1929. The claims were leased as M-255 and M-256 by K.B. Forbes in 1932. R. Hartney acquired the property in 1952. A.L. Parres optioned the property in 1955. The area was also partly covered by the Lit group of claims staked in 1954 and explored by Green Bay Uranium Limited between 1956 and 1957. HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650). The Pas claims were assigned to P.M.P. Hartney and then to Mrs. E. MacPherson in 1973 (Manitoba Energy and Mines, Unpublished Information Files, 63J/13SE). Falconbridge Nickel Mines Limited did airborne EM and magnetic surveys in the area in 1973 (A.F. 91564). From 1981 to 1991 the ground was held by Cangold Limited, by Noranda Exploration Company Limited and by Strider Resources Limited. Assessment work was done by Noranda in 1986 and by Strider Resources in 1990 (Mining Claim Cards Nor 8 and Kelly 2). The area is partly covered by Kelly 6 staked by Strider Resources Limited in 1990.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Missi Group greywacke, arkose, conglomerate and derived schists and gneisses (Fig. 65-1; Gordon and Gall, 1982; Frarey, 1950). These rocks are flanked to the west by andesitic and basaltic flows. The contact between the greywacke and volcanic rocks is marked by a northeast-trending fault. Rusty-weathered greywacke, arkose and medium grained gabbro occur in proximity to the occurrence (Fig. 65-2).

MINERALIZATION:

Three mineralized sites are exposed in outcrop. Site 1 is characterized by 1 to 2% fine grained, white pyrrhotite, pyrite, and minor chalcopyrite in foliated (027°/90°) medium grained, locally silicified gabbro. Calcite veinlets are present in the gabbro; rotten, rusty weathered, intensely foliated and silicified float is present adjacent to the outcrop. Two representative rock chip samples were collected for analysis (04828, 04829).

Site 2 is characterized by 1 to 5% disseminated pyrrhotite in two trenches approximately 25 m north of site 1. (Fig. 65-2). Detailed mapping indicates the mineralization and intensely foliated, rusty weathered and silicified wall rocks occur at or near the contact between interbedded greywacke and arkose and medium grained gabbro. The actual host rocks to the mineralization cannot be ascertained due to intense alteration. A 40 cm thick, white quartz vein with disseminated pyrite and rusty zones, associated with this mineralized zone, can be traced along strike from trench T1 to trench T2 and also to broken and rubbly outcrop north of trench T2. Carbonate blebs and veinlets and needles of tourmaline are also present in the quartz vein and the wall rocks. The zone of alteration has an approximate width of 15 m at surface. A total of six chip samples (04830 through 04835) of the mineralized wall rocks and quartz vein were collected for geochemical analysis.

Site 3 is exposed in a few outcrops in low ground approximately 825 m north of site 2 (Fig. 65-1). A 15 m wide mineralized zone is situated in a gully at or near the contact of medium grained gabbro and bedded greywacke. Wall rocks are strongly foliated and silicified and are mineralized with 1 to 2% disseminated pyrrhotite and trace chalcopyrite. Wall rocks on the western edge of the occurrence are strongly foliated, rusty weathered to rotten chlorite-sericite schists, with veinlets and disseminations of carbonate and tourmaline, and non-mineralized thin white quartz veins. The foliation at this locality trends 021°; the dip is suspected to be near vertical, but is uncertain due to the disrupted nature of the outcrop. Two representative rock chip samples (04836 and 04837) were collected for geochemical analysis.

GEOCHEMICAL DATA:

Rock chip samples collected from the three mineralized sites contained a range of 7 to 350 ppb Au and 0.1 to 0.5 ppm Ag, respectively. The highest Au analysis, 350 ppb Au (sample 04834), was obtained from a quartz vein hosted by medium grained gabbro at site 2 (Fig. 65-2; Appendix I).

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. All three mineralized sites have similarities with respect to mineralization, alteration and geological setting. These sites appear to be restricted to the contact zones between gabbro and greywacke where the contrast in competence between the two lithologies acted as a deformational focus. Accordingly, fluid flow would have been directed along the intensely foliated contacts, resulting in silicification and mineralization. Sites 2 and 3 lie along the eastern side of an extensive fault, mapped by Frarey (1950), that separates massive, fine grained and porphyritic basalt from epiclastic sedimentary rocks. This fault coincides with elongate curvilinear swamps that are prominent on airphotos.

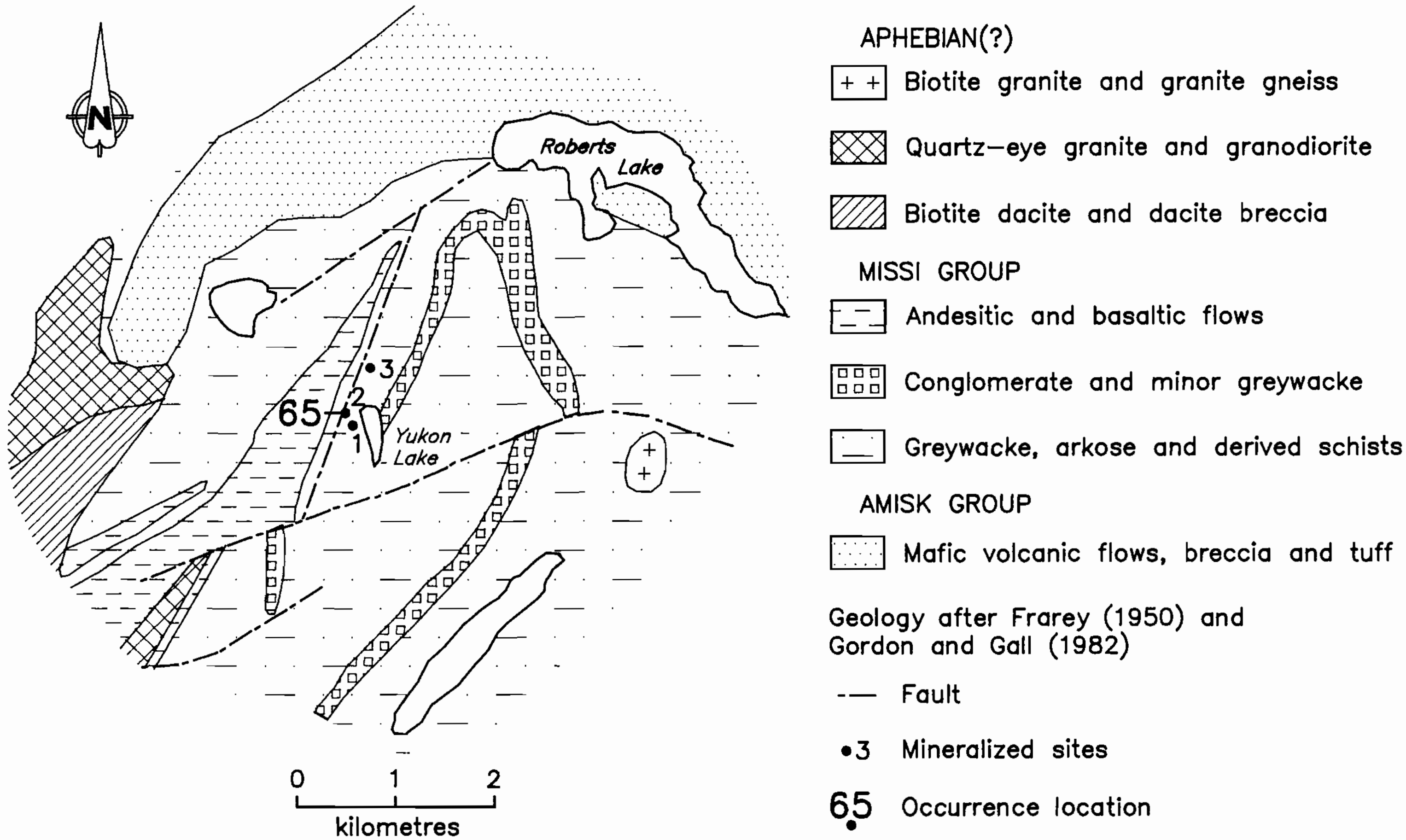


Figure 65-1: Geological setting of occurrence 65.

REFERENCES:

Assessment Files 91564 and 91650
Manitoba Energy and Mines, Minerals Division.

Fedikow, M.A.F. and Malis, C.
1987: Mineral occurrence documentation and geochemical surveys in the Snow Lake area; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1987, p. 91-93.

Frarey, M.J.
1950: Crowduck Bay; Geological Survey of Canada Map 987A, 1:63 360.

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Mining Claim Cards Nor 8 (W49003) and Kelly 2 (P7383E)
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

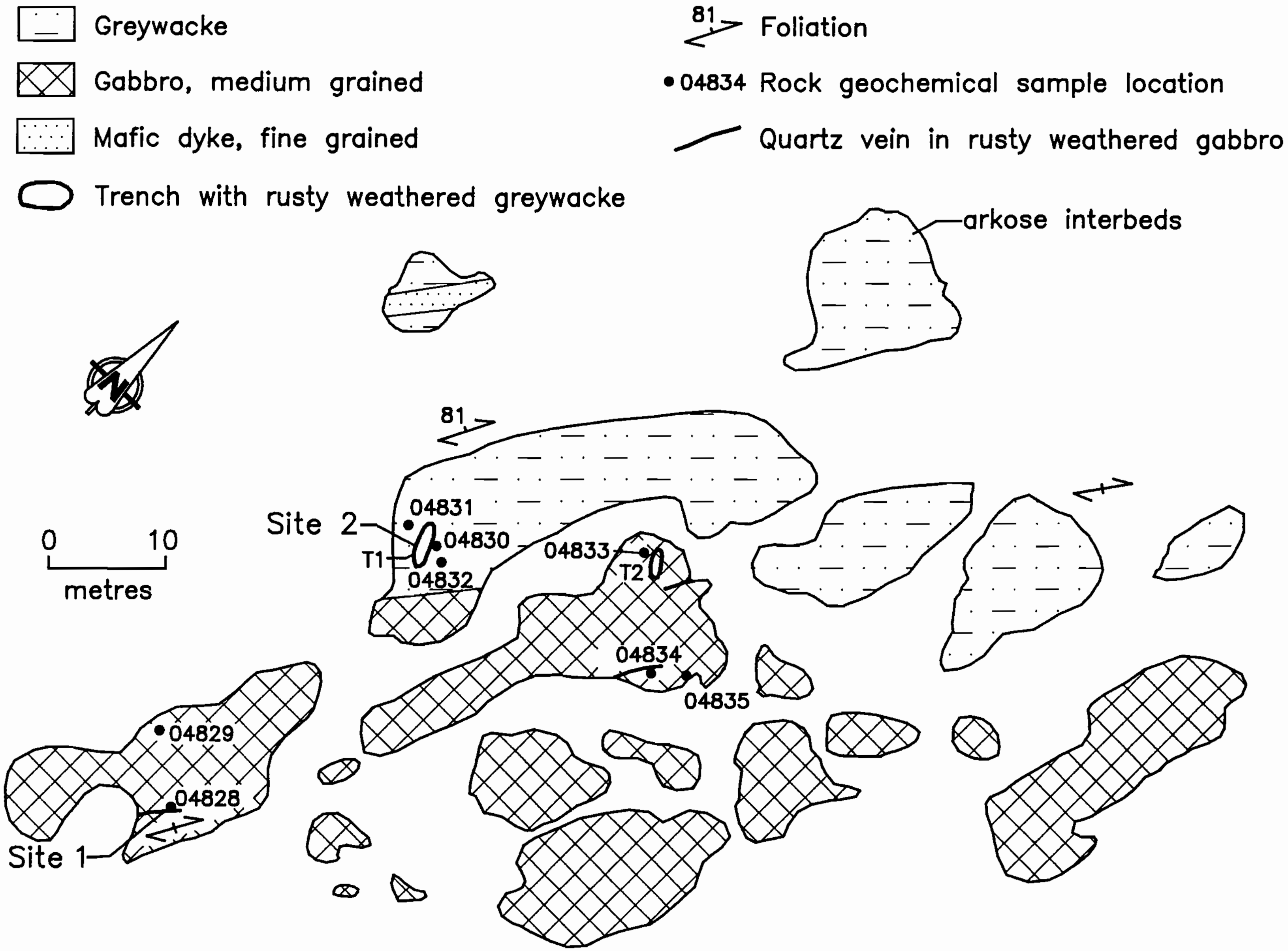


Figure 65-2: Outcrop, geology and trench and sample location map, sites 1 and 2, occurrence 65.

LOCATION: **66**

NAME: Elizabeth-Dauphin

UTM: 6071943N/451756E

ACCESS: Boat from the west shore of Wekusko Lake.

AREA: Traverse from the Rex-Laguna deposit (Location 67).

AIRPHOTO: A20124-91

EXPLORATION SUMMARY:

In 1915 the Dauphin and Elizabeth claims were staked by J.A. Campbell and J.M. Wanless, respectively, and optioned to Mines Exploration Syndicate. The claims were assigned to J.M. Wanless, J.R. Campbell, M.J. Hackett, and E.H. Gurton in 1916. Samples from Elizabeth were tested for platinum in 1916 (Canadian Mining Journal, 1916), but the results are not known. A shaft was sunk to 15 m on Elizabeth in 1917. By 1918 trenching on both claims had traced a vein for at least 253 m. On Dauphin four cross trenches were dug in 1920. Dauphin and Elizabeth were leased as L-190 and L-191 later in 1920. The Pas Consolidated Mines Limited optioned the claims in 1922. From 1947 to 1963, claim owners included J.M. Wanless, C.H. Bethel, and McKenzie Oil and Gas Company Limited. The claims were cancelled in 1963. Airborne EM and radiometric surveys were done in the area by HBED in 1965 (A.F. 91650). In 1968 Mike 12 and 24 were staked by W.B. Kobar and D. Lamb, respectively. Work was reported on the Mike group from 1969 to 1975 (Mining Claim Card Mike 24). Falconbridge Nickel Mines Limited carried out airborne EM and magnetic surveys in 1973 (A.F. 91564). Mike 24 was cancelled in 1977. A. & V. Harris Exploration Services Limited did line cutting and sampling on CB 9305 in 1978, and acquired Mike 12 in 1979. Norman Mines Limited acquired the claims in 1980. Excalibur International Consultants Limited did a detailed examination of quartz veins on the property in 1980 (Mineral Inventory Card 63J/13 Au 7). CB 9305 was cancelled in 1983 and Mike 12 reverted to A.& V. Harris Exploration Services in 1984. Wekusko Gold Resources Limited carried out a biogeochemical survey in 1984. Noranda Exploration Company Limited staked Nor 28 in 1983 and optioned Mike 12. A program of line cutting, geological mapping, lithogeochemical and soil sampling surveys were carried out in 1984. Manitoba Mineral Resources Limited had an option agreement with Noranda on the Nor 28 property. Mike 12 was transferred to W.B. Kobar in August 1987, and was optioned by Mid-North Resources Limited from November 1987 to June 1990.

GEOLOGICAL SETTING:

The occurrence is hosted within the southwestern end of a 1440 by 240 m elongate stock of quartz-feldspar porphyry, that intrudes and incorporates slivers of Missi Group paraconglomerate and rhyolite breccia (Fig. 66-1). The unit mapped as quartz porphyry by Stockwell (1937) appears to have several phases. At the northwest corner of the property the rock is a moderately well foliated feldspar-quartz porphyritic rock with 5% quartz and feldspar phenocrysts, and thin streaks of fine grained biotite that define the foliation. The rock weathers light-pink to white with a light-grey to white fresh surface, and is crosscut by numerous small quartz veins parallel to the foliation. Northeast of the main auriferous quartz vein, the porphyry weathers white with a grey fresh surface. The rock is very fine grained with small black quartz "eyes", similar to the matrix of the rhyolite breccia.

At the northeast end of the property there is a large exposure of rhyolitic rock that contains angular fragments of biotite-rich metasedimentary rocks. The fragments average 4 cm in length, are up to 40 cm long and are aligned parallel to the main north-northeast foliation. The matrix is flinty, light to dark grey with black quartz phenoclasts quartz that average 1 mm, minor feldspar phenoclasts and biotite. This rhyolite layer may be genetically related to the quartz porphyry body, with the massive quartz porphyry representing an isolated brecciated rhyolite lava dome, and the rhyolite breccia, associated ash or debris flows.

The quartz-sericite-biotite-rich heterolithic paraconglomerate is composed of subangular to angular rhyolite fragments up to 15 cm in diameter within a biotite-rich matrix. This rock could represent a more distal, reworked facies of rhyolite.

The porphyry and its inclusions are crosscut by thin, biotite-rich hornblende- and hornblende-feldspar-porphyritic lamprophyre. The contact between the sedimentary felsic volcanic suite and a thick sequence of massive to moderately foliated, cream weathering amygdaloidal basalt occurs approximately 40 m east of the occurrence. This basalt forms the core of the Herb Lake Syncline. The basalt is crosscut by thin, red, fine grained quartz porphyry dykes, possibly related to the large bodies that intrude the metasedimentary sequence.

The regional penetrative foliation strikes 035° to 040° and dips 80° northwest, axial planar to the Herb Lake Syncline. The occurrence is situated on the west limb of this fold structure. The main mineralized shear vein strikes subparallel to the regional foliation, whereas subordinate carbonate-quartz veins strike at an acute angle across the foliation in parallel sets at 114°. This suggests right-lateral movement across the shear hosting the quartz veins. Boudins of deformed vein material within the main mineralized shear vein plunge steeply at 225°. The orientation of dislocated and rotated vein segments within the sheared wall rocks also suggest a component of dextral movement within the zone. The

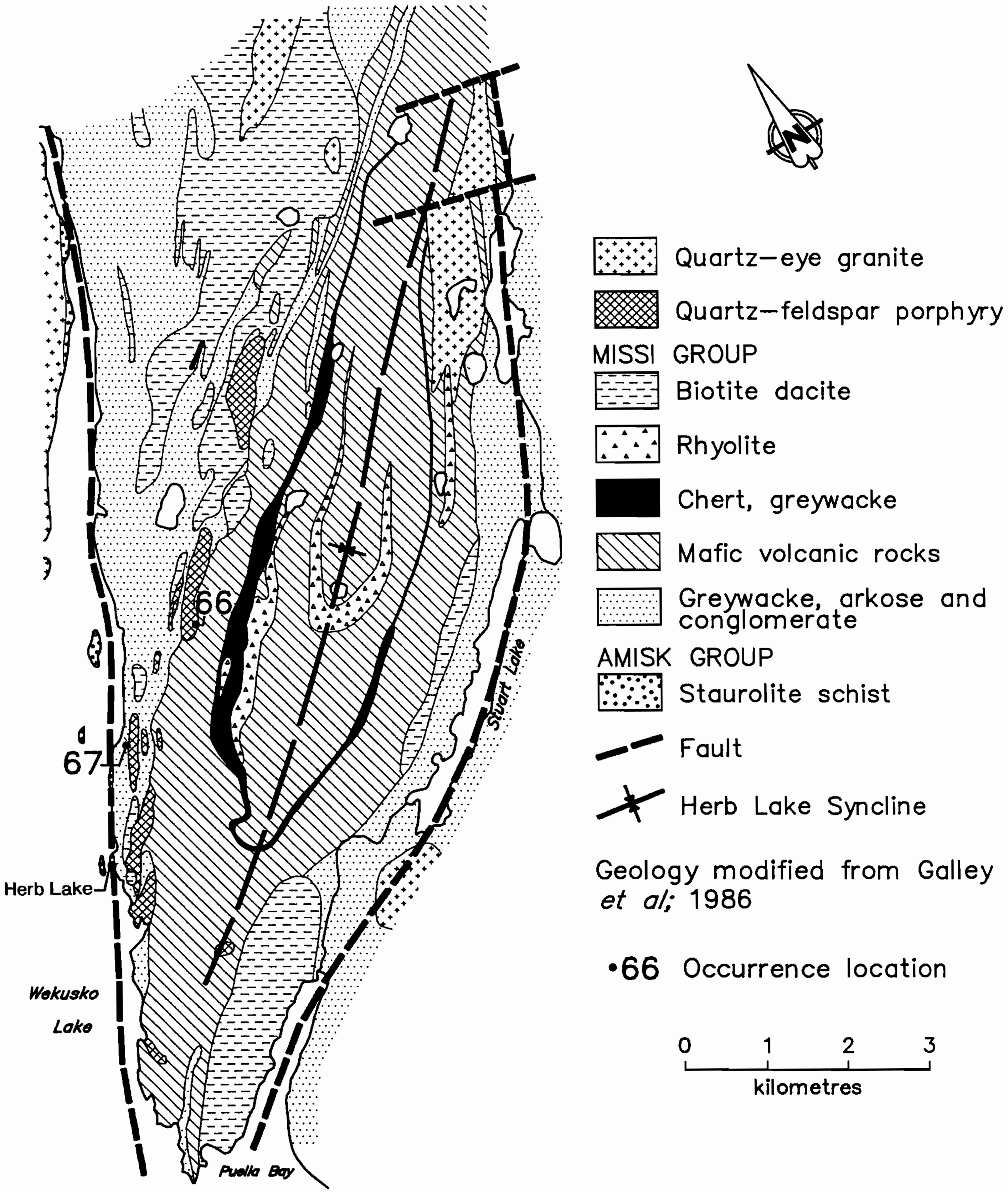


Figure 66-1: Geological setting of occurrences 66 and 67.

contact between basalt flows and the porphyry is strongly sheared parallel to the regional foliation.

MINERALIZATION:

Gold mineralization is restricted to a single, subvertically dipping, sheared quartz vein, the exposed portion of which strikes 040°. The vein is exposed by a number of pits and a small shaft and in these locations varies in width from 30 cm to over 1 m. Stockwell (1937) reports the vein is up to 4 m wide at the top of the shaft, 3 m wide at the bottom. It is composed of massive, sugary white quartz with varying amounts of vein-parallel inclusions of strongly foliated, sericite-rich wall rock that contains concentrations of fine grained crystalline arsenopyrite. The wall rock to the vein is strongly sheared and contains segments of numerous smaller quartz veins that are boudinaged parallel to the shear foliation. These veins may also be strongly buckled where they cross the shear at an oblique angle to the main vein.

The main vein contains pyrite and arsenopyrite, and is reported to contain galena, chalcopyrite and visible gold (Stockwell, 1937). The sheared wall rocks contain disseminated arsenopyrite and pyrite.

GEOCHEMICAL DATA:

A 15 m long cross-section, including the vein, was sampled where the mineralized shear crosscuts a lamprophyre dyke. The quartz vein contains 10 to 20 ppb Au; the mineralized lamprophyre wall rocks contain between 85 and 660 ppb Au.

CLASSIFICATION:

Vein type deposit; single vein. The shear-hosted quartz vein contains gold and minor sulphide mineralization.

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LOCATION: **67**

NAME: Rex-Laguna

UTM: 6071186N/450535E

ACCESS: By boat from the west shore of Wekusko Lake.

AREA: Northeast shore of Wekusko Lake.

AIRPHOTO:

EXPLORATION SUMMARY:

The area was first staked as Rex M.C. by J.R. Campbell in 1914. In 1916 the Makeever brothers took an unregistered interest in the property. Shaft sinking, stripping, trenching and the installation of a 27 tonne steam driven mill was done between 1916 and 1917. The mineralized quartz vein had been traced for 579 m (Wallace, 1916). Samples from the Rex property were tested for platinum in 1916 (Canadian Mining Journal, 1916), but the results are not known. In 1918 Herb Lake Gold Mines Limited was formed to develop the property. The mine operated from May to December, 1918. The property was dormant until 1920 when J.R. Campbell operated the mine for 6 months. The vein was sampled by the Mining Corporation of Canada Limited in 1923. In 1924 Herb Lake Consolidated Mines Limited was formed to develop the property. Based on favourable bulk sampling and testing results the mine and mill were reopened and the Rex main shaft was deepened to 129 m and levels established at 31, 61 and 107 m. Production continued until December 1925. The property was dormant until Laguna Gold Mines Limited, a subsidiary of the Mining Corporation of Canada Limited, acquired the property in 1934. In 1935, a 1360 kg bulk sample was sent to Ottawa for testing and on the basis of favourable results development was again initiated. By the end of 1937, a three compartment vertical shaft that had been started on the 191 m level of the Rex main shaft, was sunk to 343 m and levels were established at 107, 152, 191, 229, 251, and 343 m. A new 45 tonne per day mill was brought in and the first gold brick was poured in September 1936. The shaft was deepened to 381 m in 1938. Underground diamond drilling was done intermittently between 1934 and 1938. An open stope or pit was briefly worked on surface prior to 1938. Marshall Ballard restaked the property in 1944. In 1950 D.A. Hanes acquired the property and undertook a two hole, 34 m, drilling program (A.F. 90120). Homesite Mines Limited acquired the property in 1953. HBED did airborne geophysical surveys in 1965 (A.F. 91650). In 1968 W.B. Kobar restaked the area as Mike 1. Falconbridge Nickel Mines Limited did airborne geophysical work in 1973 (A.F. 91564). The mine was dewatered in 1973. Crowduck Bay Mines Limited optioned the surface stockpile and sampled it between 1973 and 1974. Trenching and sampling were done between 1977 and 1978. In 1979, A.& V. Harris Exploration Services Limited acquired the property and undertook a program of line cutting and sampling of dumps and veins. Assay results were erratic, but encouraging enough for Norman Mines Limited to acquire the property in 1980. Financial difficulties caused ownership to revert to A.& V. Harris Exploration Services in 1984. Wekusko Gold Resources Limited acquired an unofficial option on the property and undertook a biogeochemical survey in 1984. In September 1984 Noranda Exploration Company Limited acquired the property as part of the Laguna-Bingo option. Noranda undertook linecutting, geological mapping, soil sampling, lithogeochemistry and geophysics. W.B. Kobar acquired the property in 1987 and optioned it to Mid-North Resources Limited from 1987 to 1990.

GEOLOGICAL SETTING:

The Rex-Laguna deposit is hosted by an elongate body of feldspar-quartz porphyry that intrudes a sequence of Missi Group greywacke, conglomerate and coarse volcanic epiclastic rocks (Fig. 66-1). Outcrops of interbedded fine grained greywacke and coarser grained quartzose crossbedded greywacke that grade upwards into arkose occur along the shore of Wekusko Lake, to the west of the felsic stock. This sedimentary sequence is conformably overlain to the southeast by interlayered heterolithologicic pebble conglomerate and arkose topped by close-packed rhyolite breccia and tuff breccia and interlayered felsic tuff. The blocks within the breccia are angular, up to 20 cm in diameter, and contain small phenocrysts of feldspar and abundant quartz phenoclasts up to 2 mm in diameter.

The feldspar-quartz stock is 1000 by 120 m, and is semi-conformable with the sedimentary layering. Stockwell (1937) mentions that dykes branch out from the stock, and that it contains inclusions of the sedimentary rock. He also observed that the stock is similar in composition and texture to the fragments within the volcanic breccia, suggesting a genetic relationship between extrusive and intrusive rocks. A smaller stock is present 50 m to the southeast of the larger intrusion, and according to Stockwell (1937), the two bodies are observed to join at depth, in the mine workings. The feldspar-quartz porphyritic stock and supracrustal rocks are crosscut by a series of irregularly-shaped feldspar-hornblende-porphyritic lamprophyre dykes that commonly strike north to northeast, except where transposed by faults.

The sedimentary volcanic sequence strikes 032° and dips vertically to subvertically to the southeast or northwest. A strong bedding parallel penetrative foliation is present within the sedimentary and volcanic rocks. A 20 to 50 m wide zone of high strain, in which the conglomerate and the intrusion are strongly foliated occurs along the northwest margin of the large stock. Pebble elongation and slickensides define a steep northeasterly plunge. The intrusion is transected by several subvertical, 5 to 20 m wide zones of discrete shearing. Feldspar orientation and slickensides define a steep northeasterly plunging lineation within these zones. These zones transect the stock at an acute angle that varies from 035° to 053°.

Along the northwest margin of the stock one lamprophyre dyke has been transposed 30 m to the northeast along the strike of a shear, indicating apparent dextral movement on the structure. Another lamprophyre dyke is parallel to the shear for 200 m, after which it crosscuts the conglomerate along a north-northeast strike. This shear zone contains the Rex-Laguna auriferous quartz vein, that has been traced on surface and underground for up to 700 m. The vein is entirely within, but close to the margin of the stock, and is hosted by a lamprophyre dyke. The vein dips 70° to 75° southeast and has been traced underground for up to 300 m down dip. The vein displays pinch and swell features, changing width from a maximum of 2 m to several cm. The vein also branches into two sections.

The discrete shears that crosscut the stock contain numerous quartz vein swarms. These swarms are a series of planar quartz veins that strike 5° to 15° east of the shear foliation, connected by deformed ladder veins and microquartz breccia zones. Deformation of the ladder veins by rotation indicate apparent dextral movement on these shear zones. The planar quartz veins splay from the 035°-striking main vein, but some are crosscutting.

MINERALIZATION:

Gold mineralization is apparently restricted to several steeply northeast-plunging zones within the large shear-hosted vein in the northwest margin of the stock. The vein varies from white to blue-white, with ribbons of wall rock parallel to the vein margins. Irregular grain size variations within the vein vary from clear and coarse grained to sugary textured and fine grained. Gangue minerals within the vein include tourmaline, carbonate, scheelite, albite and muscovite. The dominant sulphide is arsenopyrite, which occurs in the immediate schistose wall rocks, in included bands of wall rock in the vein, and in the quartz vein as fine grained needles. Small amounts of galena, sphalerite and pyrite are present. Flakes of gold are present along fractures in the quartz, usually in association with arsenopyrite. Pyrrhotite and chalcopyrite were observed in the lower levels of the mine (Stockwell, 1937).

The quartz vein sets that crosscut the porphyry stock are sulphide-poor, with irregular concentrations of pyrite.

Alteration associated with the gold-bearing vein is restricted to a 1 to 2 m wide zone of intense foliation surrounding the main vein. The host rock is sericitized with small amounts of carbonate, and albite where the vein crosscuts the porphyry. Biotite, albite and carbonate form the alteration assemblage where the vein is hosted by the lamprophyre dyke.

GEOCHEMICAL DATA:

Between 1918 and 1940 the deposit produced 1833.9 kg of gold from 109 488.3 tonnes of ore (Richardson and Ostry, 1987). A total of 21 and 254.7 kg of Ag were produced between 1924 and 1925 and between 1936 and 1939, respectively (Mineral Inventory Card 63J/13 Au 1). Cole (1942) reports that the Laguna dump was examined by ultraviolet lamp for scheelite but the results were negative. Bamburak (1990) reports reserves and production of 205 000 tonnes grading 16.04 g/t Au.

CLASSIFICATION:

Vein type deposit; single vein. The shear-hosted quartz vein contains disseminated sulphide and visible gold mineralization.

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LOCATION: **68**

NAME: Ferro-Rainbow Group-Pocahontas-Gold Dust-Lieury-Orcadian-Wizard

UTM: 6072184N/454851E

ACCESS: Boat from west shore of Wekusko Lake.

AREA: Traverse from Herbtown settlement.

AIRPHOTO: A20782-42

EXPLORATION SUMMARY:

Ferro, Rainbow, Pocahontas, Gold Dust, Lieury, Orcadian, Wizard, Beaver and Lingo were staked in 1923. Several individuals and companies held ground in the area from 1923 to 1943. Trenching, surface sampling and stripping was done between 1924 and 1939. A 12.2 m deep shaft was started on a vein 244 m southwest of the Ferro open pit. By early 1935 Hackett Gold Mining Company drilled 43 shallow holes on the Rainbow group. In 1935 J.H.C. Waite drilled 8 holes, approximately 61 m deep, to check two zones where Hackett had encouraging assays. In 1939 a 3 hole, 274 m, drill program was done on Ferro by H. V. Echols, Mining Engineer for Gurney Gold Mines Limited. The Mining Corporation of Canada Limited did some drilling in 1939 and sunk a vertical 3 compartment 52 m shaft at the west end of the open pit in 1940. Underground work was done on the 46 m level. In 1940, an 8 hole, 191 m, drill program was completed on Lieury, a 6-hole, 194 m, drill program was done on Orcadian, and an unspecified amount of drilling was done on the Hughes claim (Mineral Inventory Cards 63J/13 Au 8, Au 9; Manitoba Mines and Natural Resources, 1941). Wekusko Consolidated Limited was formed in 1943 to develop the property. Between 1944 and 1947, Wekusko drilled at least 23 holes on Ferro-Rainbow, 6 holes on Pocahontas, 13 holes on Gold Dust and the adjacent Hughes claim, and did 23 m of diamond drilling on Lieury and an unspecified amount of drilling on the Patsy (former Wizard) claim (Manitoba Mines and Natural Resources, 1945; Mineral Inventory Cards 63J/13 Au 2, Au 5, Au 8, Au 10). A 27 m vertical shaft was reported on Pocohontas. By 1947, the Ferro shaft was deepened to 166 m with levels established at 84 m, 122 m, and 160 m. Over 305 m of drifting was done on each level and 1865 m of underground drilling was done. Between 1946 and 1947, four levels of the Ferro Mine were driven on to the Rainbow claim and sampling was done on these levels. A 7 hole, 519 m, underground drilling program was done on Ferro between 1947 and 1948 (A.F. 92803). Financing and lack of an inexpensive power source for the mill caused work to be discontinued in January, 1948. Between 1957 and 1960, Explorers Alliance Limited (formerly, Wekusko Consolidated Limited) did some surface work and installed a 45 to 68 tonne mill. In 1959 a gold shipment was reported (Northern Miner, January 18, 1973). The shaft was dewatered to a depth of 30 m in 1960. In 1962 the claim was put up for auction and J.C.L. Ferguson acquired the property. Airborne geophysical surveys were done by HBED in 1965 and by Falconbridge Nickel Mines Limited in 1973 (A.F. 91650, 91564). Crowduck Bay Mines Limited acquired the Ferro property in 1973. In 1973 the shaft was dewatered to the 46 m level and a sampling program was undertaken. Mining began in the open pit in 1973. The mill was rehabilitated and operated sporadically until September, 1974 when legal suits and the poor financial position of Crowduck Bay Mines caused its closing. From 1960 to 1979 several individuals and companies held ground in the area. In 1979 Norman Mines Limited gained control of the claims. In 1980 property evaluations were done by Prospection Limited, Excalibur International Consultants, A.& V. Harris Exploration Services Ltd., and Bonn Energy Corp. (Mineral Inventory Card 63J/13 Au 2; A.F. 92483). In 1981 Norman Mines initiated an exploration program consisting of: dewatering and rehabilitation of underground workings, underground mapping, chip sampling and sidewall sludge sampling, and surface exploration, including geological mapping, ground geophysics and diamond drilling. The results of this work are not known. Norman Mines encountered financial difficulties, and in 1983 its holdings reverted to Patrick Harrison Company Limited after a court case. The claims lapsed in 1986, except for Ferro, which lapsed in 1988. In 1988 the Ferro-Pocahontas-Gold Dust-Rainbow area was restaked under Zed 1, Zeke 1 and Zeke 2 by D.V. Ziehlke, who has a trust agreement with Strider Resources Limited. Pierce Mountain Resources Limited had an option to earn an 80% interest in the property (Northern Miner, June 20, 1988). Geological mapping and geophysical surveys were done and an 86 hole, 9000 m, diamond drill program was started by Pierce Mountain and Pro Roc Exploration Incorporated to test the orebody to a depth of 460 m (Northern Miner, October 3, 17, 1988; January 30, 1989). An 18 000 m diamond drilling program was to begin in June 1989, following the discovery of the Gold Dust shear zone about 460 m from the Ferro Main zone (Northern Miner, April 10, 1989). Placer Dome carried out a stripping program in the fall and diamond drilling in January on Ferro (Northern Miner, March 12, 1990). The property surrounding the Ferro-Rainbow group was staked by HBED as CB 10689 in 1979, Kus 4316 and Kus 4890 in 1986, and Kus 7182 in 1988. A reconnaissance VLEM survey was done on CB 10689 in 1981 (Mineral Inventory Card 63J/13 Au 8). Mingold Resources Inc. acquired the Kus claims except for Kus 7182 in 1988. In 1989 Golden Range Resources Inc. acquired the property and optioned it to Pierce Mountain Resources Limited and later to Mingold Resources Inc.

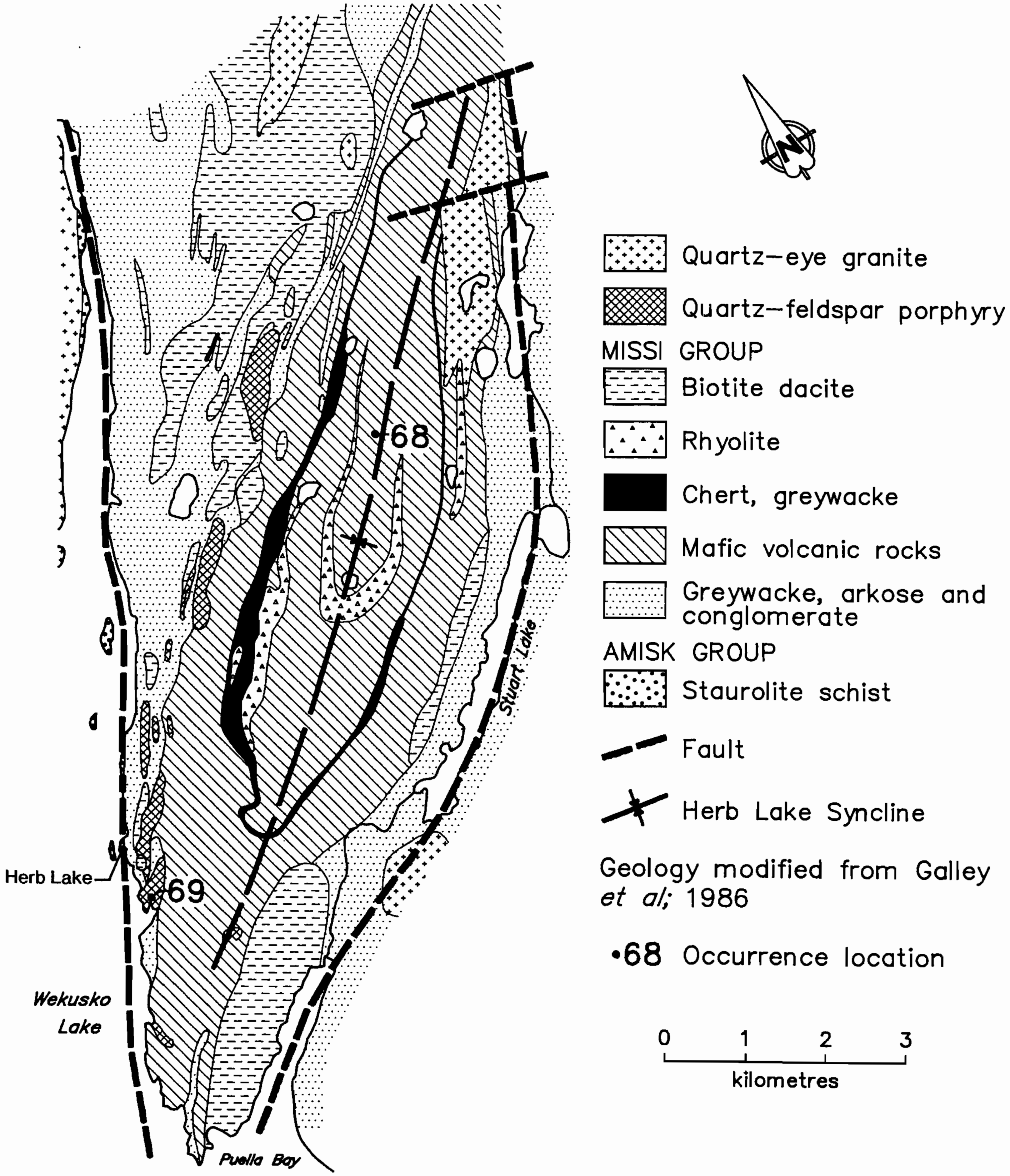

Figure 68-1: Geological setting of occurrences 68 and 69.

GEOLOGICAL SETTING:

The following descriptions of the Ferro, Rainbow, Pocohontas, Gold Dust, Lieury, Orcadian and Wizard occurrences are taken from Stockwell (1937) and their locations and general geological settings presented in Figures 68-1 and 68-2. The geological setting of the Ferro vein system has been provided by A. Galley (Geological Survey of Canada) and by D.V. Ziehlke, Strider Resources. The Ferro deposit is part of a vein system, described here as the Ferro vein system, that includes the occurrences described by Stockwell (1937) as the Rainbow, Ferro, Pocahontas, Gold Dust, Lieury, Orcadian and Wizard claims (Fig. 68-1, 68-2). This system crosscuts a 600 m thick sequence of Missi Group subaerial basalt flow and breccia that form the core to the Herb Lake Syncline (Stockwell, 1937). The basalt is characterized by large, quartz-filled amygdales. Some flows are feldspar porphyritic, with phenocrysts of andesine up to 1 cm long. Some volcaniclastic interlayers contain fragments of epidote-rich basalt. The basalt sequence is separated from a thick underlying sequence of mixed andesite and basalt flows by a 100 to 200 m thick unit of thinly bedded, welded pyroclastic rhyolite tuff.

The underlying basalt flows are massive and featureless except for a northeast-striking, steeply southwest-dipping shear fabric developed where the flows are crosscut by the Ferro shear-vein system. The strike of this system subparallels the fold axis to the Herb Lake Syncline. The shear zone and attendant quartz veins form a series of subparallel to anastamosing lineaments in a zone up to 100 m wide and a strike length of 1700 m. The shear zone is represented by a main shear and a series of subparallel shears; it is unknown whether the subsidiary shears are splays from the main shear or are smaller parallel shears. The subsidiary shears may contain quartz veins and lenses with gold-bearing pyrite.

MINERALIZATION:

The north end of the Ferro vein system occurs as a single 1 m wide biotite schist zone containing numerous boudinaged segments of quartz veins and thin quartz stringers that are parallel to shear fabric. The quartz contains 1 to 2% pyrite. The quartz vein can be traced southwest for 550 m. A second vein system begins 400 m southwest of the north end of the first shear. Both vein systems are auriferous, with the biotite schist and quartz veins containing abundant iron carbonate, and lesser amounts of black tourmaline, pyrite, pyrrhotite, chalcopyrite and visible gold. The second vein system bifurcates, forming No. 1 and 2 vein systems (Stockwell, 1937). The No. 1 vein system can be followed for 200 m. The No. 2 vein system has been traced for 500 m south. On the Ferro Property, the No. 2 vein widens to 3 m. The surface exposure of this vein is buried at the bottom of an open pit, but was observed underground in 1981 by J.M. Franklin of the Geological Survey of Canada. The entire vein system forms a sinuous Z-shaped zone that is spatially associated with the trace of the Herb Lake Syncline fold axis. The shear zones and accompanying veins strike 035 to 050° and dip 75° to 80° southeast. Wall rocks to the veins are composed of biotite-carbonate-quartz schist in zones up to 5 m wide. The hornblende-andesine-quartz assemblage characterizing the fresh basalt is altered to a biotite-iron carbonate-albite-quartz-chlorite-muscovite assemblage close to the vein system. The principal sulphide mineral is pyrchalcopyrite and pyrrhotite. The sulphide minerals are most commonly found in the biotite schist and along the margins of quartz boudins. Coarse blebs of free gold are common along sections of the vein system. Samples from the open pit on the Ferro property contain abundant visible gold with chalcopyrite and pyrite. The gold most commonly appears near the necks of the quartz vein boudins.

Ferro

The Ferro deposit is obscured at surface by muck and ore from underground development. Geological observations are taken primarily from drill core and mapping away from the immediate area.

The Ferro deposit consists of a steeply dipping quartz-injected shear zone that has a known strike length of 396 m. Host rocks to the deposit are subaerially deposited mafic flows comprised predominantly of green massive basalt and feldspar-porphyritic basalt.

The fine- to medium-grained, magnetite-bearing basalt flows contain brecciated flow tops, vuggy to amygdaloidal sections and minor calc-silicate patches. Amygdales range in abundance from trace to 15% and are composed of quartz, calcite and a mixture of chlorite and biotite. Minor mafic to intermediate tuffaceous layers are present within the sequence. Feldspar porphyritic felsic dykes and dacites are also present in the section.

The porphyritic basalts are interlayered with the massive flows and contain 2 to 40% subhedral feldspar phenocrysts that vary from 4 to 25 mm in length. These basalts also contain an average of 3% magnetite.

In the immediate vicinity of the Ferro deposit the two types of basalts are interlayered in what may be a transition zone, from stratigraphically underlying porphyritic basalts, to overlying massive and brecciated basalt.

The Ferro shear zone that hosts the deposit is slightly discordant to stratigraphy and is best developed where there is interlayering between diverse lithologies of ductility contrast. The shear is a curvilinear structure that varies in strike from 044° to 065° Az about a general strike of 053° Az. The dip of the shear zone varies between 62° and 82° south; ore shoots plunge at 65° to 70° to the southwest. In outcrop, the Ferro shear zone is marked by the development of a more strongly foliated rock unit over 1 to 2 m. The mineralized portion of the shear is marked by a well developed schistosity and quartz and carbonate injections. Quartz injections are boudinaged, recrystallized and streaked out along the schistosity of the host rocks. The width of the shear zone varies from 1 to 18 m with an average of approxi-

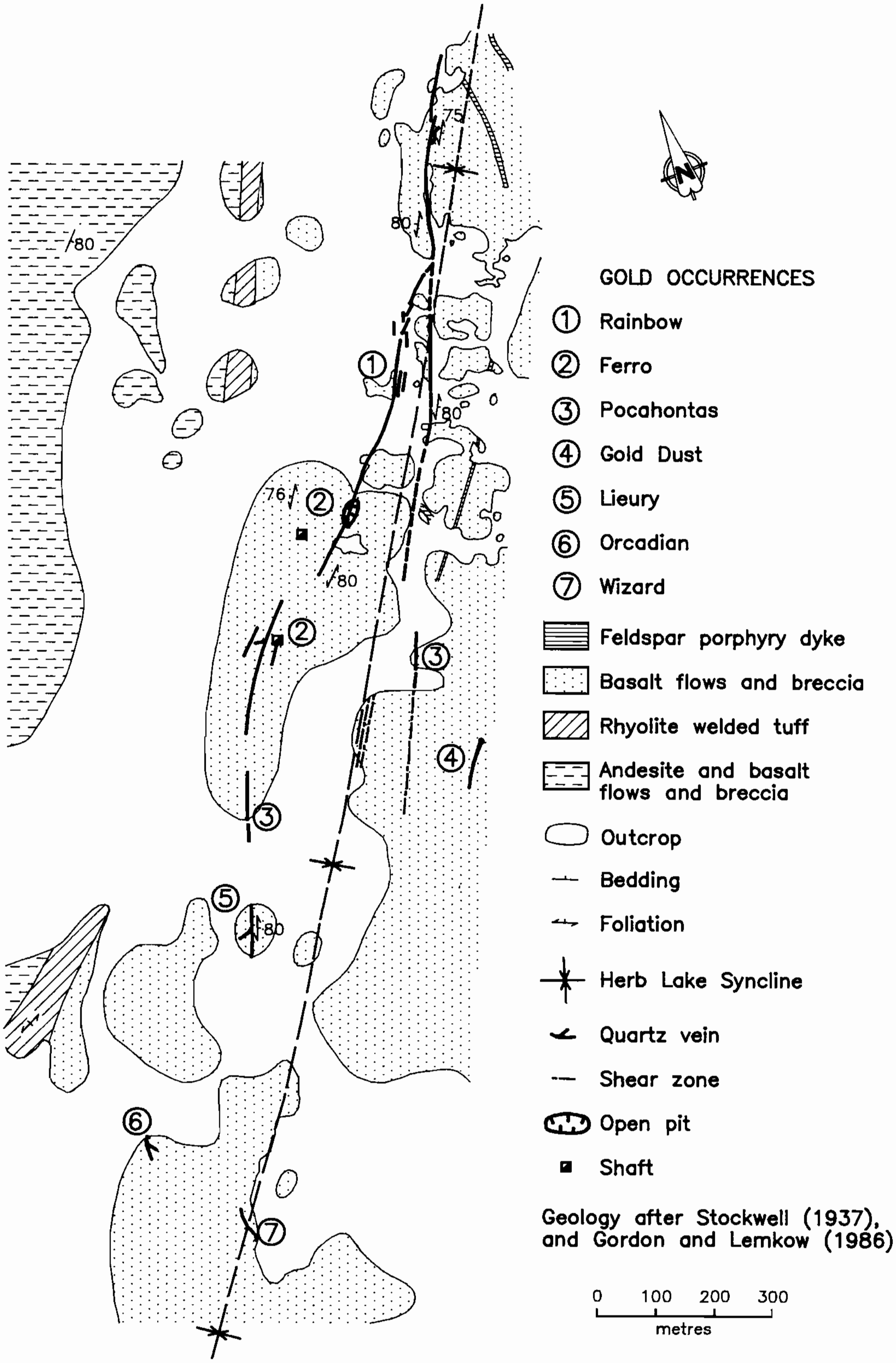

Figure 68-2: Outcrop, local geology and gold occurrences in the Ferro vein system.

mately 6 m. Pyrite, pyrrhotite, chalcopyrite and native gold occur in amounts up to 5% as disseminated sulphide grains in biotite-carbonate schist, quartz veins and whitish silicification patches. Late fractures within the quartz veins may contain fine grained sulphides. There is no correlation between the amount of sulphide and gold contents.

Alteration of the host basalts is characterized by brown to blackish-brown biotite that makes up about 60% of the host rock. The remainder of the alteration mineral assemblage is chlorite and up to 25% carbonate. Accessory minerals are tourmaline (trace to 5%), muscovite (0 to 2%), trace hematite and possibly albite.

Rainbow

The Rainbow occurrence is northeast of the Ferro deposit and consists of a series of gold-bearing quartz veins hosted by andesite intruded by feldspar porphyry dykes. The host rocks vary from a dark green to grey, fine grained, aphyric hornblende-bearing andesite with scattered epidocite domains to a coarse grained porphyritic andesite that contains andesine phenocrysts in a matrix of hornblende and biotite. Quartz-filled amygdales are present in both varieties of andesite. The andesite is schistose and contains a northeast-striking cleavage that dips 80° to the southeast. Quartz lenses and stringers occur along planes of schistosity in shear zones. The andesite is altered to biotite schist along the shear. The schistose wall rock and the quartz contain buff-weathering carbonate, and small amounts of black tourmaline, pyrite, pyrrhotite, chalcopyrite and free gold. Wright (1938) reports arsenopyrite in the quartz veins. The shear zones closely parallel the cleavage of the host rocks, striking 025° to 045° Az. The quartz veins and lenses are aligned over a distance of approximately 640 m.

Pocohontas

The Pocohontas occurrence occurs southwest of the Ferro deposit and consists of a series of quartz veins and lenses in sheared andesite. Mineralization is described from three sites.

Site1: At this site a 2.4 m wide shear zone contains quartz lenses up to 0.4 m wide and 1.8 m long. The quartz is white to grey, coarse grained and contains carbonate and minor sulphide minerals. The host andesite is altered to a biotite schist adjacent to the quartz lenses.

Site 2: A series of six pits expose irregularly distributed quartz lenses within a 3.7 m wide (maximum width) shear zone. The host andesite is altered to a biotite schist adjacent to the lenses. Maximum observed dimensions of the quartz lenses are 1.5 m in width and 15.2 m in length. The quartz is white, coarse grained and contains buff carbonate, muscovite, red feldspar, minor sulphides and gold.

Site 3: A quartz-bearing shear zone occurs within porphyritic andesite. The shear zone attains widths of up to 6.5 m and over this width contains 50 to 75% quartz. Individual quartz lenses may be up to 1.5 m wide and contain buff carbonate, muscovite, black tourmaline, and is "fairly well mineralized" with pyrite and chalcopyrite. The zone strikes 020° Az and has been traced for 30.5 m in pits.

Gold Dust

The Gold Dust mineralization occurs in massive and schistose porphyritic andesite. The andesite hosts two quartz lenses and several quartz veins, and is altered to a biotite schist immediately adjacent to the veins. The quartz is white, coarse grained and contains abundant black tourmaline and minor pyrite. The zone strikes north 45° east and has been exposed in pits and overburden removal for a distance of 61 m.

Lieury

At this occurrence, two quartz veins, containing fine grained black tourmaline and pyrite, occur within quartz amygdular andesite. The quartz veins are confined to a schistose structure that strikes 035° Az, and have been exposed by a series of prospect pits. The pits expose a 1.1 to 1.2 m wide, 12.2 m long quartz vein, as well as a 0.8 m wide, 18.3 m long branch quartz vein that strikes at right angles to the main vein and dips 25° southwest. The main vein dips 70° southeast. Wright (1938) described the main quartz vein as occurring within a 107 m long, 1.2 m wide schistose zone hosted by andesite. Wright (1938) noted that free gold was abundant in the branch vein, described by Stockwell (1937), and near its junction with the main vein. Pyrite in the branch vein occurs as subhedral to euhedral cubes.

Orcadian

The Orcadian occurrence is hosted by quartz amygdular andesite that has been intruded by feldspar porphyry dykes. The andesite is altered to a biotite schist adjacent to the shear zones. Mineralization is characterized by a shear zone-hosted quartz vein that is exposed for 3.9 m in a shear zone that strikes 210° Az. The vein divides into two branches with one branch striking 240° Az and the second branch striking 200° Az. Locally, the sheared host andesite contains multi-directional striking quart stringers. The maximum width of the zone of shearing is 2.4 m. The quartz stringers contain flakes and veinlets of muscovite and carbonate. Coarse grained gold was observed at the contacts between quartz and schistose wall rock in dump samples. Wright (1938) described these quartz veins as the "northern" zone and a second "southern" zone 68.6 m to the south. The south zone consists of a 0.6 to 2.4 m wide, 24.4 m long schistose zone that occurs at the contact between granite porphyry and andesite. The lenses and stringers of quartz, as well as the schistose wall rocks, contained pyrite, chalcopyrite and calcite.

Wizard

A 9.1 m long, 3.1 m wide zone of contorted and irregularly branching quartz stringers hosted by andesite is characteristic of the mineralization at the Wizard. The stringers are less than 0.5 cm wide and contain pyrite and muscovite.

GEOCHEMICAL DATA:

Four levels of the Ferro deposit were driven into the area of the Rainbow mineralization. Samples collected from the drifts were assayed; results are presented in Table 68-1.

Table 68-1: **Summary of assay results from samples collected from 3 levels of the Ferro deposit driven into the Rainbow mineralization. Data from Richardson and Ostry (1987).**

Level	Length (m)	Width (m)	Grade (g/t Au)
1	25.93	1.40	14.40
2	27.36	0.95	11.66
3	15.25	0.95	8.57
3	9.2	0.92	8.91
3	6.41	0.92	10.97

In 1932 a total of 16.28 kg of gold and 0.9 kg of silver was produced from 1006 tonnes of ore mined from an open cut 18 to 20 m deep, 31 m long, and 3 to 6 m wide at the Ferro deposit. Between 1932 and 1933 45 tonnes of ore from a pit on the Rainbow claim were treated at the Ferro mill and produced 602 g of gold. In 1963, 1604.3 g of gold and 92.3 g of silver were produced from 136 tonnes of Ferro ore by J.C.L. Ferguson. Canadian Mines Handbook (1974-75) estimates reserves at 55 040 tonnes averaging 17.42 g/t gold. An additional 4500 tonnes grading 11.99 g/t gold is present in the open pit. Diamond drill indicated reserves were estimated at between 23 000 to 27 000 tonnes of "ore grade" material. Bamburak (1990) states total production and reserves of the Ferro deposit is 77 000 tonnes of ore grading 13.07 g/t gold. Theyer (1988) reports the following data for Pt, Pd and Au in 6 samples collected from the Ferro deposit: ≤10 to 80 ppb Pt, ≤2 to 140 ppb Pd and 11 to 1500 ppb Au.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. The shear-hosted quartz-carbonate vein system contains disseminated sulphide and visible gold mineralization.

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LOCATION: **69**

NAME: Moosehorn-Ballast

AREA: East shore of Wekusko Lake, on the south edge of the Herb Lake settlement.

UTM: 6069269N/449395E

AIRPHOTO: A20124-54

ACCESS: Boat from the west shore of Wekusko Lake.

EXPLORATION SUMMARY:

In 1914 R.A. Hazelwood and H. Vickers staked Ballast and Moosehorn over the deposit. Moosehorn was assigned to Robert Kerr in 1915. Northern Manitoba Mining and Development Company Limited was organized in 1915 to develop the property. The veins were trenched and the sinking of an inclined shaft began on Ballast. Platinum was reported on property of Northern Manitoba Mining (Canadian Mining Journal, 1916). The company held five claims in the area including Moosehorn and Ballast. An 18 m shaft was sunk on Moosehorn. The Makeever brothers optioned the property in 1918. The Ballast shaft reached its final depth of 31 m and about 15 m of drifting was done at that level. Northern Canada Exploration Corporation Limited optioned the claims from 1919 to 1920. A 3 m shaft was completed on Moosehorn in 1919. All options were subsequently dropped. Shaft sinking, stripping, and sampling were reported on Moosehorn in 1921. In 1922 a 6 m shaft was mentioned on that claim (Mineral Inventory Card 63J/13 Au 4). Kiskoba Mining Company Limited acquired the property in 1924. The claims were leased in 1925 as L-566 and L-567. In 1944 Wekusko Consolidated Limited optioned the claims and diamond drilled to a depth of 46 m but did not find an ore shoot. More drilling may have been done before the option was dropped in 1945 (Wekusko Consolidated Limited, Corporation File). The leases were renewed in 1947 and again in 1967. In 1961, McKenzie Oil and Gas Company Limited (renamed Petromines Limited in 1965) acquired the claims. Airborne EM and radiometric surveys were done by HBED in 1965 (A.F. 91650). The claims were cancelled in 1971. In 1973, Falconbridge Nickel Mines Limited carried out airborne EM and magnetic surveys (A.F. 91564). Donald Kish staked W 45289 over the deposit in 1976. The surrounding area was staked as CB 10478 by W. Bruce Dunlop Limited in 1979, and optioned to Cangold Limited from 1981 to 1982. W 45289 lapsed in 1981, but was restaked as CB 13300 by Peter Dunlop in 1984. Noranda Exploration Company Limited optioned CB 10478 in 1985 and CB 13300 in 1986. The options were abandoned in 1987. Mid-North Resources Limited acquired CB 10478 in December 1987.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Missi Group mafic volcanic rocks, greywacke, arkose and conglomerate, and quartz-feldspar porphyry intrusions (Fig. 68-1). The rocks in the immediate area of the deposit are characterized by a strong penetrative foliation that strikes 030° to 045°, dips 85° east, and is axial planar to the Herb Lake Syncline. The occurrence lies on the western limb of this fold structure. Thin shear zones that cross the quartz-feldspar polamprophyre dyke and quartz-feldspar porphyry contain several quartz veins that are parallel to the shear zones. Folded and boudinaged subhorizontal quartz-, quartz-chlorite and quartz-carbonate stringers occur within the lamprophyre. Small veins hosted by the strongly-foliated lamprophyre are buckled and boudinaged. The boudins plunge southwest at approximately 30°. The shears and veins are slightly offset by brittle fractures containing east-southeast- to south-southeast-trending, shallowly-plunging slickensides.

The occurrence is located on the top of hill, where it is exposed by a 4 by 15 m pit with an adit in the north wall. It is hosted within a 4 to 5 m wide, well foliated, biotite-rich, feldspar porphyry lamprophyre dyke that crosscuts the southeast end of an 1800 m long body of quartz-feldspar porphyry, that intrudes Missi Group pebble conglomerate (Fig. 68-1).

MINERALIZATION:

Gold mineralization is associated with shear-hosted quartz-carbonate veins within a strongly foliated portion of the mafic porphyritic lamprophyre dyke. The principal foliation within the shear strikes 030° and dips 75° to 85° southeast. The face of the pit exposes a 1 m wide section of strongly sheared, biotite-arsenopyrite-rich lamprophyre, containing one 20 to 40 cm wide quartz vein, and abundant, smaller segments and boudins of quartz-carbonate vein. The main vein has a distinctive blue cbbon-textured, with thin bands of wall rock parallel to the vein that contain arsenopyrite, tourmaline, pyrite and visible gold. According to Stockwell (1937), coarse gold is associated with tourmaline-rich portions of the vein, which averaged 46 cm wide and was exposed for over 7 m. The vein contained galena, sphalerite, chalcopyrite and gold telluride. In the pit, visible gold is concentrated along small fractures within the quartz vein and contained wall rock inclusions. The wall rock to the main vein is bleached outwards for 7 cm, and contains arsenopyrite, pyrite and visible gold. Carbonate, arsenopyrite and pyrite are concentrated along the necks of the smaller, boudinaged veins within the shear.

A large quartz vein, up to 1 m wide, crosscuts a quartz-feldspar porphyry approximately 160 m northwest of the pit along the edge of a north facing hill. The vein strikes 055° and dips vertically; it can be traced for 17 m to the crest of a hill, where it changes to a series of small quartz veins within a 6 m wide zone. Fractures crossing the quartz contain arsenopyrite, pyrite and tourmaline. According to Stockwell (1937), some of the quartz is heavily mineralized with coarse- and fine-grained arsenopyrite, and subordinate sphalerite, galena, and pyrite.

GEOCHEMICAL DATA:

Bruce (1917) states that platinum was reported from the Moosehorn vein but "tests have failed to show it". Northern Manitoba Mining and Development Co. (1917) treated 26 tonnes of ore and recovered 3.36 kg of Au. Alcock (1918) and the Corporation File of the Kiskoba Mining Company Limited report the ore averaged 139.89 g/t Au. Makeever Brothers (1918) recovered 1.62 kg of Au. In 1931 R. Kerr mined 16 tonnes of ore that produced 1.06 kg of gold and 0.28 kg of silver. Richardson and Ostry (1987) report a total of 41.9 tonnes of ore were mined and milled producing 6.04 kg of gold. Theyer (1988) reports the following data for Pt, Pd and Au in 3 samples collected from the deposit: 10 ppb Pt, 2 to 4 ppb Pd and 130 to 390 ppb Au.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. The shear-hosted mineralized vein contains iron sulphide and visible gold.

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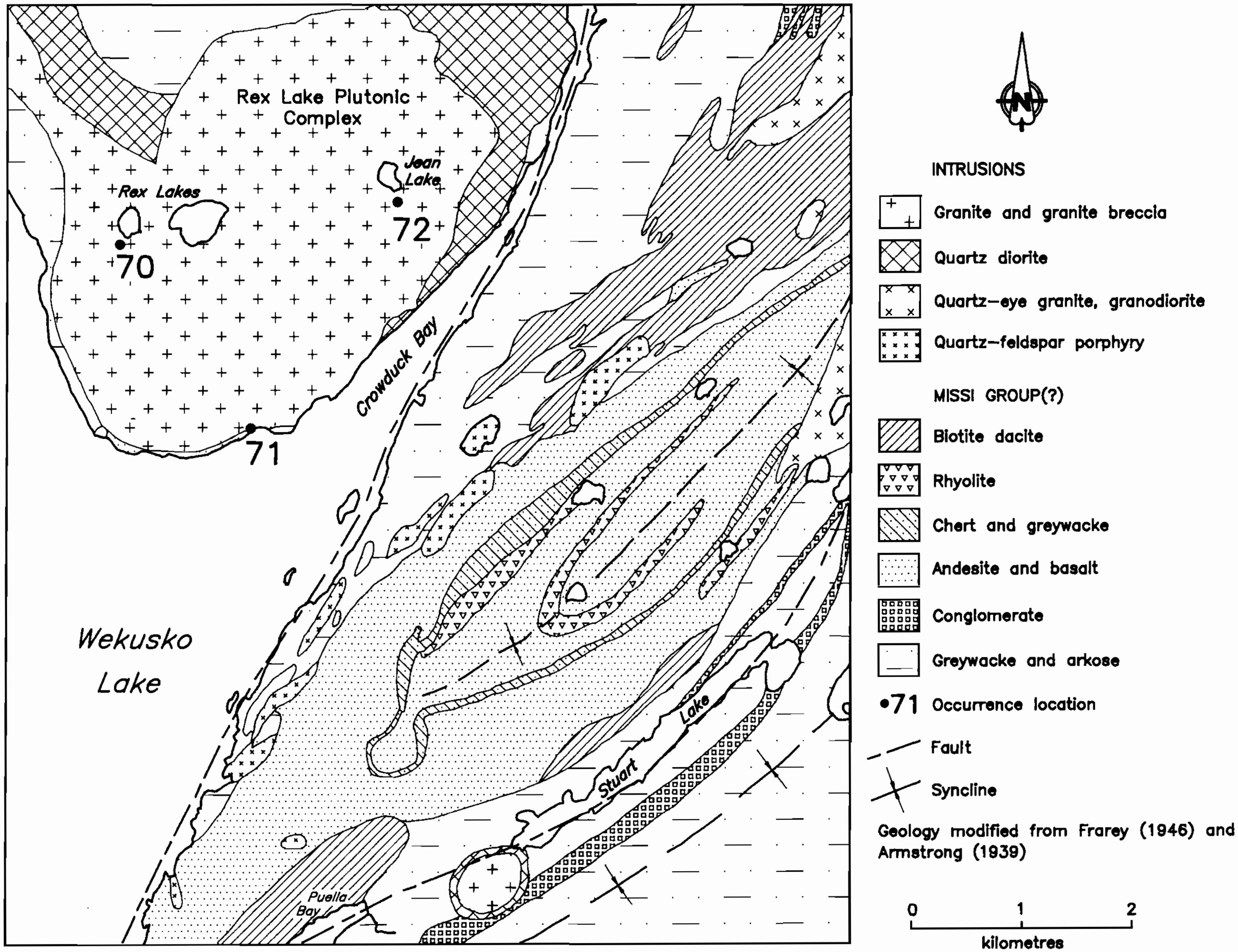

Figure 70-1: Geological setting of occurrences 70, 71 and 72.

LOCATION: **70**

NAME: Apex, Long, Shot, Dawson

AREA: Situated on the peninsula between Herb Bay and Crowduck Bay on the southwest side of Rex Lakes.

UTM: 6075573N/448228E

AIRPHOTO: A20170-46

ACCESS: Boat from the west shore of Wekusko Lake and traverse.

EXPLORATION SUMMARY:

The property was first staked in 1918 as Apex, Dawson, Discovery, Victoria, and Pine Ridge. Pits and trenches were dug between 1918 and 1933. Various people held the claims until the Mammoth Mining Corporation Limited acquired the property in 1920 and 1922 (Mineral Inventory Card 63J/13 Au 11). In 1927, several shallow "shafts" were dug on Dawson and Apex, including 4.6 m shafts on Victoria and Apex. Fifty-Three Syndicate Limited was formed in 1934 to develop the property. In 1934, 1102 m of diamond drilling indicated that the deposit was irregular at depth so the option was dropped. Paul Gasse optioned the claims in 1935 and a further 43 m of drilling was done. The option was assigned to J.A. Reid in 1938. R. Kerr restaked the property as Long and Shot in 1940. Trenching and pitting was done between 1941 and 1943. Tungold Mines Limited found scheelite in the former gold workings in 1942. An area of continuous scheelite formed part of a pit 3.7 m deep and 3.7 m long (Shepherd, 1942). Tungold Mines Limited carried out a 77 hole, 4267 m, diamond drill program between 1943 and 1946 (Manitoba Mines and Natural Resources, 1946). Trench samples were also collected. Ultraviolet examination of the property indicated small, irregular patches of scheelite. Tungold Mines Limited acquired the claims in 1946. Further drilling was done in 1952 (Manitoba Mines and Natural Resources, 1953). The claims were cancelled in 1955. The area was restaked in 1956, 1963 and 1973, but no exploration work was reported. Airborne EM and radiometric surveys were done by HBED in 1965 (A.F. 91650). In 1973 W.B. Kobar staked W 45271 over the property. The surrounding area was staked as CB 9277 and CB 9278 by W. Bruce Dunlop Limited in 1978. A.& V. Harris Exploration Services Limited acquired W 45271 in 1979. Placer Development Limited optioned W 45271, CB 9277 and CB 9278 in 1980, and carried out 16 km of line cutting, detailed mapping, sampling, and 517 m of drilling before abandoning the option. Nord Resources apparently optioned the property and in 1981 contracted San Francisco Mining Associates to carry out an 11 hole, 915 m drill program. Results of the program are not known. In 1982 the options were abandoned. W.B. Kobar acquired W 45271 in 1986. Mid-North Resources Limited optioned W 45271, CB 9277 and CB 9278 in 1987. W 45271 was transferred back to W.B. Kobar in 1987.

GEOLOGICAL SETTING:

The occurrence is situated within the Aphebian Rex Lake Plutonic Complex, a circular body 8 km in diameter with irregular, concentric zonation composed of a diorite margin intruded in turn by quartz diorite and granodiorite (Fig. 70-1). The complex is cored by two small granite stocks. There is evidence of digestion of Amisk Group sedimentary and volcanic rocks at its contact (Cerny et al., 1981). The intrusive complex is dated at 1836 +13/-10 Ma (Gordon *et al.*, 1987), and is comparable in age to the Missi Group volcanic rocks that are part of the stratigraphic sequence east of Crowduck Bay.

The Apex occurrence is hosted within an orange-brown weathering, medium grained biotite-hornblende granodiorite. In a north to south transect across the mineralized zone, the host rocks gradually change from a melanocratic granodiorite to a creamy-white weathering granodiorite that is light grey on fresh surface. This colour change appears to be due to pervasive alteration. Further to the south, the rock changes to a coarser grained granodiorite and then an orange-grey weathering granite. The intrusive rocks contain a northeast-striking, steeply southeast-dipping penetrative foliation.

MINERALIZATION:

The occurrence is exposed by trenches over an area 100 by 130 m, which includes the former Apex and Dawson claims. Within this area, there are two zones of stockwork veins. The west zone is L-shaped, extending south for 22 m, and then east-northeast for 79 m. It has an average width of 9 m. The east zone (the Dawson) extends from the end of the west zone for 63 m, turns south for 35 m and then strikes southwest for 20 m. The stockwork zones contain abundant, randomly oriented, shallowly-dipping quartz veins with associated arsenopyrite-pyrite-scheelite-chalcopyrite mineralization. The quartz veins range from 2 cm to 1.5 m wide, but average 10 cm, and the larger veins pinching out along strike. The stockwork zone appears to have been formed solely by brittle deformation controlled by north- and northeast- fracturing. The zone does not contain any penetrative fabric other than the regional foliation.

Arsenopyrite, pyrite and chalcopyrite grains are present within the veins and as disseminations within the wall rocks, whereas the scheelite ccurs along the margins of the larger veins. A lens of massive scheelite 1.6 m long and 15 cm wide hosted within a quartz vein has been reported from the property. Gold is apparently associated with the arsenopyrite (Wright, 1938).

The wall rocks within the stockwork zones are bleached and appear more siliceous than the surrounding granodiorite. The stockworks are enveloped by a zone of strongly hematized rock. Wall rocks and veins are crosscut by a later joint set striking 050° and 150°.

Alcock (1920) observed that apart from the stockwork zones, the property also contained zones of bleaching and sulphide mineralization up to 13 m wide that locally carry high gold values.

Wright (1938) reports four small occurrences 460 to 1375 m southeast of the main zone. These occurrences are shear-type quartz veins that include fragments of the granite, altered to quartz-sericite schist. The discontinuous lenticular veins strike 185° to 200° and dip 45° or 75° west. Shear zones without quartz strike north and dip 40° west. Arsenopyrite, chalcopyrite and free gold are reported from these zones.

GEOCHEMICAL DATA:

In 1942 a 1115 kg bulk sample was forwarded to Ottawa for testing. It assayed 7.54 g/t Au and 46.64% WO_3. A second shipment weighing 436 kg assayed 8.22 g/t Au and 8.04% WO_3 (Mineral Inventory Card 63J/13 Au 11).

Tungold Mines Limited reports assays of 2.29% WO_3 from an 18.6 m interval of disseminated scheelite intersected during a diamond drill program (Winnipeg Free Press April 11, 1943). Other assay results indicated 5.85 g/t Au over an average intersection width of 6.12 m in 33 of 52 holes. Drilling in 1944 intersected consecutive sections of 2.74 m that assayed 108 g/t and 193.03 g/t Au followed by a 1.22 m zone that assayed 0.17 g/t Au. Assays from samples collected in trenches blasted on the property ranged from 13.11 g/t Au over 6.71 m and 20.05 g/t Au over 5.8 m (Quebec Miner, April 12, 1946). Mammoth Mining Corporation Limited (1922) established a 36.6 m long by 2.75 m wide zone that averaged 16.46 g/t Au based on diamond drilling and trenching. Consolidated Mining and Smelting Company of Canada Limited collected 540 channel samples across 1.53 m widths and based on 816 kg of assayed samples established that the deposit contained 758 000 tonnes grading 3.63 g/t Au. Bamburak (1990) reports the deposit has drill-indicated reserves of 360 000 tonnes grading 2.40 g/t Au.

CLASSIFICATION:

Vein type deposit; stockwork. The intrusive-hosted quartz stockwork hosts sulphide and tungsten-gold mineralization.

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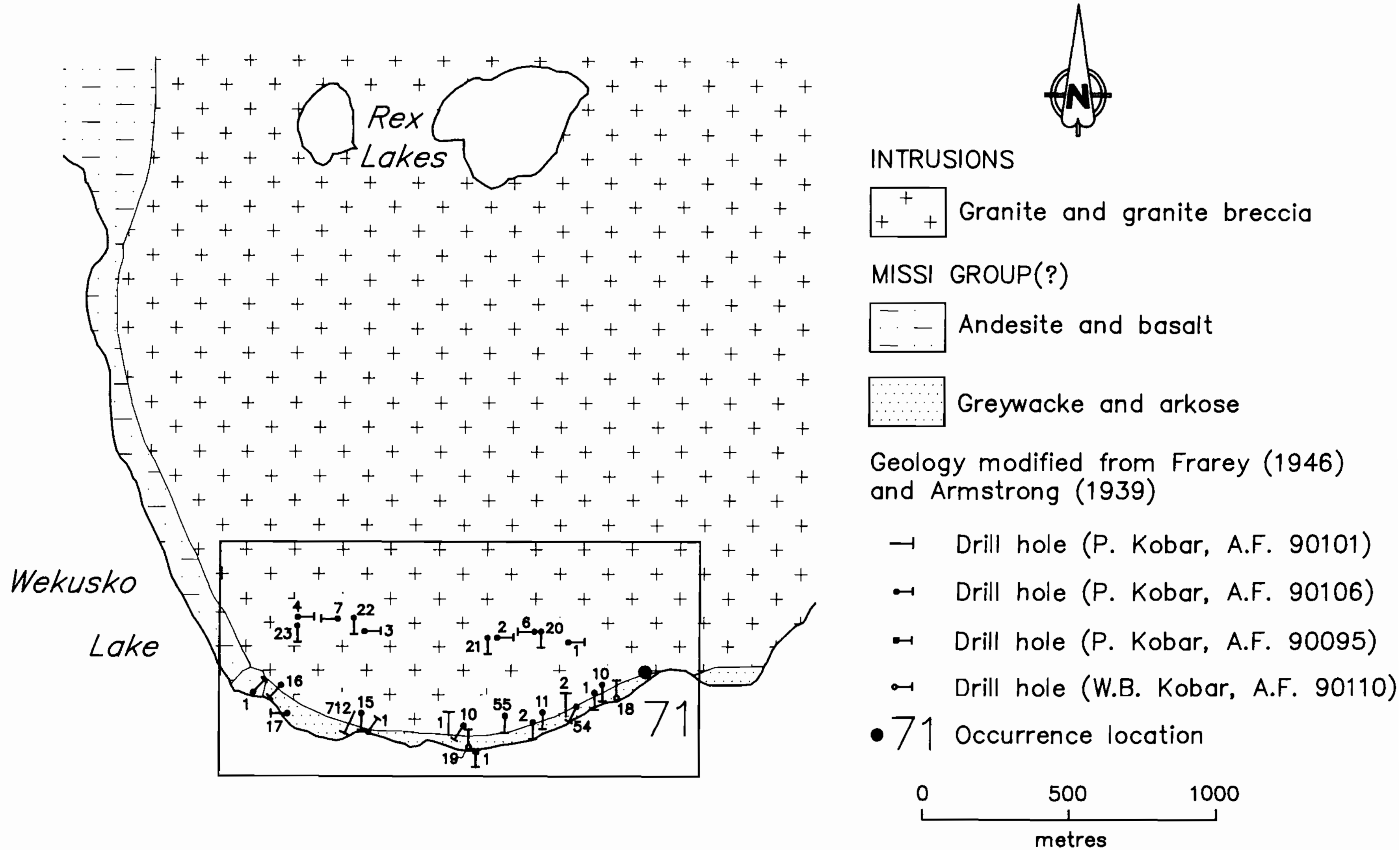

Figure 71-1: Geology and diamond drill hole locations, occurrence 71.

LOCATION: **71**

NAME: Syndicate K.K.

AREA: Along the south shore of the peninsula between Herb and Crowduck Bay at a bearing of 350° from the southern tip of Campbell Island.

UTM: 6073136N/449633E

AIRPHOTO: A20170-47, A20124-57

ACCESS: Boat from the west shore of Wekusko Lake.

EXPLORATION SUMMARY:

The area was first staked prior to 1920. A 7.6 m shaft was sunk on Syndicate in 1917. A 15.2 m shaft was sunk in 1922. McLaren (1930) reported that despite high gold assays from surface and shaft samples the vein was too small to realize commercial exploitation. Pits and trenches were dug between 1920 and 1936 on Syndicate Fr. P. Kobar staked K.K. over the Syndicate claim in 1933. In 1939, 24 kg of rock from K.K. were sent to Ottawa for testing. Several quartz veins on the K.K. group were sampled, probably between 1945 and 1946 (Mineral Inventory Card 63J/13 Au 12). Diamond drilling was reported on Windy, K.K. and K.K. 1 in 1945 and on Star 1, Vancouver 4 and the K.K. group in 1946 (Manitoba Mines and Natural Resources, 1946, 1947). A geophysical survey was done on the K.K. group in 1949 (Manitoba Mineral Inventory Card 63J/13 Au 12). This was followed by a 23 hole, 235 m, drilling program by P. Kobar between 1949 and 1951 (A.F. 90106). The K.K. claims lapsed in 1953. In 1953 P. Kobar undertook a 3 hole, 226 m, drill program on Echo, Echo 1 and 2 (A.F. 90101). In 1961 a two hole, 107 m, drill program was done on Mogar 1 and 2 for W.B. Kobar (A.F. 90110). In 1964 W.B. Kobar drilled a single hole to a depth of 43 m on Mogar 2 (A.F. 90095). HBED did airborne EM and magnetic surveys in 1965 (A.F. 91650). Geological and geophysical surveys were done between 1972 and 1974 on CB 3546, which was held by W.B. Kobar (Mining Claim Card CB 3546). W.B. Kobar staked P896E over the area in 1976. W.B. Dunlop Limited staked CB 10488 and CB 9279 in 1978. In 1979 P896E was transferred to A.& V. Harris Exploration Services Limited. Placer Development Limited optioned CB 9279 from 1980 to 1982. Cangold Limited optioned CB 10488, CB 9312 and P896E and carried out sampling and an EM-16 survey in 1981 (Mineral Inventory Card 63J/13 Au 13). Cangold Limited did an HLEM survey in 1982 to test a strong EM conductor on CB 9312 (A.F. 92692). In 1986 W.B. Kobar acquired P896E and staked Sparky 3 over CB 9312 and CB 10488. Mid-North Resources Limited optioned these claims from 1987 to 1990 and acquired CB 9279 in 1987.

GEOLOGICAL SETTING:

The occurrence is situated at the contact between Missi Group quartz diorite, which forms part of a zoned intrusive complex to the north (Rex Lake Plutonic Complex) (Cerny *et al.*, 1981), and Amisk Group biotite-garnet-rich greywacke (Fig. 70-1).

The wacke-greywacke sequence is well bedded, with cm-scale layers that strike 335° and dip moderately northeast. Bedding is truncated at an oblique angle by the contact with the intrusive complex. The sedimentary rocks and intrusion are crosscut by a penetrative biotite foliation that strikes 220° and dips steeply northwest. Several trenched shear-hosted quartz veins crosscut the greywacke-quartz diorite contact at a high angle. These veins appear to be part of the Syndicate K.K. occurrence, although some confusion exists due to the fact that the veins strike almost perpendicular to the contact and not parallel, as described by Alcock (1920).

MINERALIZATION:

Three trenches occur 125 m due north of the shoreline and another three trenches occur 275 m west of the first trenches. The west zone is composed of a 75 m long by 1.5 m wide quartz vein that strikes 345° and dips 55° southwest and crosscuts the intrusive rock. The wall rocks are strongly sheared and altered, and contain disseminated arsenopyrite and pyrite. The vein margins contain altered and mineralized fragments of the wall rock.

The east zone consists of a shear zone greater than 50 m long that parallels the biotite foliation in the greywacke and quartz diorite. The shear zone is usually less than 1 m wide and contains thin, shear-parallel, barren quartz veins. The sheared quartz diorite is extensively brecciated, and contains abundant disseminated arsenopyrite.

Wallace (1920) describes a vein 30 to 100 cm wide and 235 m long, that contains visible gold. This vein is described as being extensively trenched, and then traced underground by a 16 m deep shaft. Investigations in 1984 failed to locate the vein or workings. Multiple diamond drill holes were collared in the area (Fig. 71-1). DDH 18 intersected graphitic greywacke and quartz stringers with arsenopyrite and tourmaline (A.F. 90110). DDH 22 intersected quartz stringers and pyrite (A.F. 90095); rock types intersected by this drill hole are not specified. DDH 712 intersected arsenopyrite-bearing quartz veins (A.F. 90101). DDH 1 and 2 intersected nonmineralized greywacke and staurolite schist (A.F. 90101). Sixteen of twenty-one drill holes reported in A.F. 90106 intersected nonmineralized granodiorite and greywacke. The remaining drill holes intersected up to 21 m of disseminated arsenopyrite and arsenopyrite-bearing quartz veins in greywacke and granodiorite. DDH 10 intersected a 1 m long core interval of quartz with "massive" tourmaline.

GEOCHEMICAL DATA:

In 1939, a 24 kg bulk sample was sent to Ottawa or testing. The sample contained 59.31 g/t Au, 6.17 g/t Ag, 0.04% Cu, 0.4% As, 0.2% S and 1.74% Fe (Mineral Inventory Card 63J/13 Au 12).

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. The shear-hosted quartz veins contain disseminated sulphide mineralization.

REFERENCES:

Alcock, F.J.

1918: Wekukso Lake area, northern Manitoba; Geological Survey of Canada, Summary Report, 1917, Part D, p. 8-17.

Alcock, F.J.

1920: The Reed-Wekusko map area, northern Manitoba; Geological Survey of Canada, Memoir 119, 47p.

Armstrong, J.E.

1941: Wekusko; Geological Survey of Canada, Map 665A, 1:63 360.

Assessment Files 90095, 90101, 90106, 90110, 91650 and 92692

Manitoba Energy and Mines, Minerals Division.

Cerny, P., Trueman, D.L., Ziehlke, D.V., Goad, B.E., and Paul, B.J.

1981: The Cat Lake-Winnipeg River and the Wekusko Lake pegmatite fields, Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER80-1, 216p.

Manitoba Mines and Natural Resources

1946: 18th Annual Report on Mines and Minerals, 85p.

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1947: 19th Annual Report on Mines and Minerals, 100p.

McLaren, A.H.

1930: Unpublished Untitled Report, in Unpublished Information File, 63J/13, Manitoba Mines Branch.

Mineral Inventory Card 63J/13 Au 12

Manitoba Energy and Mines, Minerals Division.

Mining Claim Card CB 3546

Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Wallace, R.C.

1920: Mining and mineral prospects in northern Manitoba; Northern Manitoba Bulletin.

LOCATION: **72**

NAME: Dion

UTM: 6075990N/451628E

ACCESS: Boat from the west shore of Wekusko Lake and traverse.

AREA: On the peninsula west of Crowduck Bay at the southeast corner of Jean Lake.

AIRPHOTO: A20124-58

EXPLORATION SUMMARY:

The area was first staked as Combined and Annex prior to 1930. Pits and trenches were dug in 1921, 1928 and between 1930 and 1934. Saskatoon Gold Reef Mining Company Limited and Ni-Cu Gold Mining Syndicate briefly owned the property. Wright (1938) mentioned a shallow shaft on the property. C. Nelson staked June 5 and 8 in 1948. K.K. Gold Mines Limited examined the June group of nine claims between 1948 and 1949 and sampled several veins on the property. P. Kobar owned the property from 1949 to 1952. J.W. Campbell of Kerr Addison Mines Limited undertook geological and geophysical surveys on CB 5732 between 1973 and 1976 (Mining Claim Card CB 5732). W.Bruce Dunlop Limited held ground in the area from 1979 to 1982. Cangold Limited staked Gaz 4 in 1984 and collected thirty samples from trenches on the property. Red Earth Energy Limited did a biogeochemical survey, rock sampling and a 16 hole drill program in 1984, thereby earning a 30% interest in the claim (Mineral Inventory Card 63J/13 Au 19). The claim lapsed in 1987. W.B. Kobar staked Sparky 4 in 1987 and optioned it to Mid-North Resources Limited from 1987 to 1990.

GEOLOGICAL SETTING:

The occurrence is situated within the Rex Lake Plutonic Complex, a circular intrusion 8 km in diameter. The complex contains an irregular zonation, with an outer margin of diorite intruded in turn by quartz diorite, granodiorite and granite. The complex intrudes Amisk Group pelite and greywacke, and incorporates and partially digests xenoliths of these metasedimentary rocks (Cerny *et al.*, 1981). The Missi group volcanic rocks east of Crowduck Bay are coeval with the Rex Lake Pluton (Fig. 70-1).

The outer margin of the intrusive complex, which hosts the Dion occurrence, is composed of large, stoped blocks of hornblende-quartz diorite within a hornblende-biotite granodiorite. This internal border phase of the complex is crosscut by several biotite granite dykes.

The intrusive rocks surrounding the occurrence contain a 025° striking penetrative biotite foliation that dips 75° east (Wright, 1938). A series of 1 m wide shear zones are parallel to this foliation. Both features parallel the strike of a regional-scale structure called the Crowduck Bay Fault (Gordon and Gall, 1982).

MINERALIZATION:

Gold mineralization is reported to be contained within an 80 cm wide shear-hosted quartz vein that strikes 025° and dips 75° east (Wright, 1938). The vein crosscuts the intrusive rocks for 122 m and contains arsenopyrite, molybdenite and gold.

One pit exposes diorite that contains randomly oriented quartz stringers with 1 cm long grains of arsenopyrite. Glomeroporphyritic, coarse grained patches of arsenopyrite, hosted by a coarse grained hornblende diorite, are associated with the veins.

GEOCHEMICAL DATA:

Wright (1938) reported assays of over "$11.24 gold/ton)".

Grab samples collected by K.K. Gold Mines Limited from three quartz veins contained 145.4, 28.1 and 34.6 g/t Au (Northern Miner, December 8, 1949). Cangold Limited collected thirty samples from trenches on Gaz 4. The best results were obtained from "vein 1". A sample from this vein assayed 60.7 g/t Au over 1.4 m (Mineral Inventory Card 63J/13 Au 19).

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. The shear-hosted quartz veins contain disseminated sulphide mineralization.

REFERENCES:

Alcock, F.J.

1920: The Reed-Wekusko map area, northern Manitoba; Geological Survey of Canada, Memoir 119, 47p.

Cerny, P., Trueman, D.L., Ziehlke, D.V., Goad, B.E., and Paul, B.J.

1981: The Cat Lake-Winnipeg River and the Wekusko Lake pegmatite fields, Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER80-1, 216p.

Cole, G.E.

1942: Unpublished Untitled Memos; in Unpublished Information File, 63J/13, Manitoba Mines Branch.

Fedikow, M.A.F. and Malis, C.
1987: Mineral occurrence documentation and geochemical surveys in the Snow Lake area; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1987, p. 91-93.

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

K.K. Gold Mines Limited
Manitoba Energy and Mines, Minerals Division, Mining Engineering Files.

Mineral Inventory Card 63J/13 Au 19
Manitoba Energy and Mines, Minerals Division.

Mining Claim Card CB 5732
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Stockwell, C.H.
1937: Gold deposits of Herb Lake area, northern Manitoba; Geological Survey of Canada, Memoir No. 208, 46p.

Wallace, R.C.
1920: Mining and mineral prospects in northern Manitoba; Northern Manitoba Bulletin.

Wright, J.F.
1938: Geology and mineral deposits of a part of northwest Manitoba; Geological Survey of Canada, Summary Report, 1930, Part C, 124p.

LOCATION: **73**

NAME: Kiski

AREA: The No. 1 vein is exposed near the east shore of a small bay on the east side of Wekusko Lake approximately 1 km south of Herb Lake settlement.

UTM: 6068066N/448621E

AIRPHOTO: A20170-52

ACCESS: By boat from the west shore of Wekusko Lake.

EXPLORATION SUMMARY:

Richard Woosey and M.J. Hackett discovered the first gold deposit in this area by tracing float found on the shore of Wekusko Lake. In 1914 they staked Wekusko and Kiski. Stripping, pitting and trenching were done in 1914 and 1916. In 1916 Hackett assigned his interest to J.P. Gordon. The Kiski Mining Company Limited was formed in 1917 to develop the property. D. McLaren acquired the property in 1918. On Kiski a 16 m shaft was sunk on the No. 2 vein (Alcock, 1920). This vein had been stripped for over 152 m. On Wekusko a 4 m shaft was sunk and extensive trenching was done. Leases L-79 and L-80 were issued in 1920, and were assigned to Kiskoba Mining Company Limited in 1924. Consolidated Mining and Smelting Company of Canada Limited optioned the property in 1930 and did extensive sampling. The No. 1 vein was stripped for 214 m. Some high grade ore was removed from the shaft at an unknown date (Mineral Inventory Card 63J/13 Au 6). The leases were renewed in 1941. In 1944 Wekusko Consolidated Limited optioned the property and drilled at least 6 short holes. Further drilling may have been done before the option was dropped in 1945 (Wekusko Consolidated Limited, Corporation File). The claims were assigned to McKenzie Oil and Gas Company Limited in 1961 and cancelled in 1962. Airborne EM and radiometric surveys were done by HBED in 1965 (A.F. 91650). Falconbridge Nickel Mines Limited did airborne EM and magnetic surveys in 1973 (A.F. 91564). Surface work was done on Ruby Ann 1 and 2, held by G. Black from 1963 to 1966, and on Mike 14 and 15, held by W.B. Kobar from 1968 to 1977 (Mineral Inventory Card 63J/13 Au 6). In 1979 W.B. Dunlop Limited staked CB 10479 over the property. Cangold Limited optioned the property in 1981 and carried out sampling of quartz veins and VLF-EM surveys. CB 10479 reverted back to W. Bruce Dunlop Limited in 1985. Noranda Exploration Company Limited optioned the property from 1985 to 1987. Mid-North Resources Limited acquired CB 10479 in December 1987.

GEOLOGICAL SETTING:

The property is underlain by a portion of a 1500 m thick sequence of north-striking, subaerial basalt and basaltic andesite flows and associated dykes (Fig. 73-1). The mafic rocks are crosscut by an elongate quartz-feldspar porphyry intrusion and associated dykes. Both the basalt and felsic intrusion are cut by several small biotite-rich mafic dykes. The basalt is composed of feldspar phenocrysts in a well foliated matrix of hornblende, biotite and quartz. The feldspar phenocrysts are lath shaped, euhedral, up to 1 cm in length, and constitute up to 60% of the volume of the rock. The laths are commonly aligned, forming a trachytic texture. Variations in phenocryst abundance most likely indicate the presence of several flows. Further to the northeast, Gordon and Lemkow (1986) have defined up to ten individual flows within this mafic volcanic sequence.

At the contact with the eastern margin of a quartz-feldspar porphyritic sill, the mafic rocks are coarse grained, and contain pods and dykes of hornblendite.

The quartz-feldspar porphyritic sill that intrudes the mafic volcanic rocks is up to 120 m wide; its margins have a high angle with the dominant foliation. The sill is composed of a fine grained, strongly foliated quartz-feldspar-sericite matrix with scattered phenocrysts of 1 mm dark grey quartz, and less commonly, 2 mm long feldspar. The margins of the sill contain blocks up to 2 m long of feldspar porphyritic basalt. Smaller felsic dykes crosscut the mafic rocks close to the sill margins, while 150 m east of the sill, Stockwell (1937) traced a 3 m wide porphyry dyke of similar composition for greater than 200 m.

The mafic volcanic and felsic intrusive rocks are strongly foliated, with the fabric striking 040° and dipping steeply southwest. A shear foliation parallel to the regional foliation is observed along the margins of several dm-long quartz veins that crosscut the basalt flows.

MINERALIZATION:

The westernmost vein (No. 1), the longest vein on the property, is exposed near the eastern shore of a small bay approximately 1 km south of the Herb Lake settlement. A series of trenches expose the vein for greater than 220 m. Locally, the vein attains widths of up to 2 m. The vein is strongly deformed, pinching out at several locations. The margins of the veins are biotite-chlorite-carbonate schists that contain sulphide minerals that display a strong, steeply northeast-plunging lineation. This lineation is mimicked by the orientation of amphiboles in the less altered mafic wall rocks for up to 15 m away from the veins.

Veins No. 2, 3 and 4 are similar, with pinch and swell characteristics along their lengths; wall rocks are strongly sheared. These veins are shorter in length than

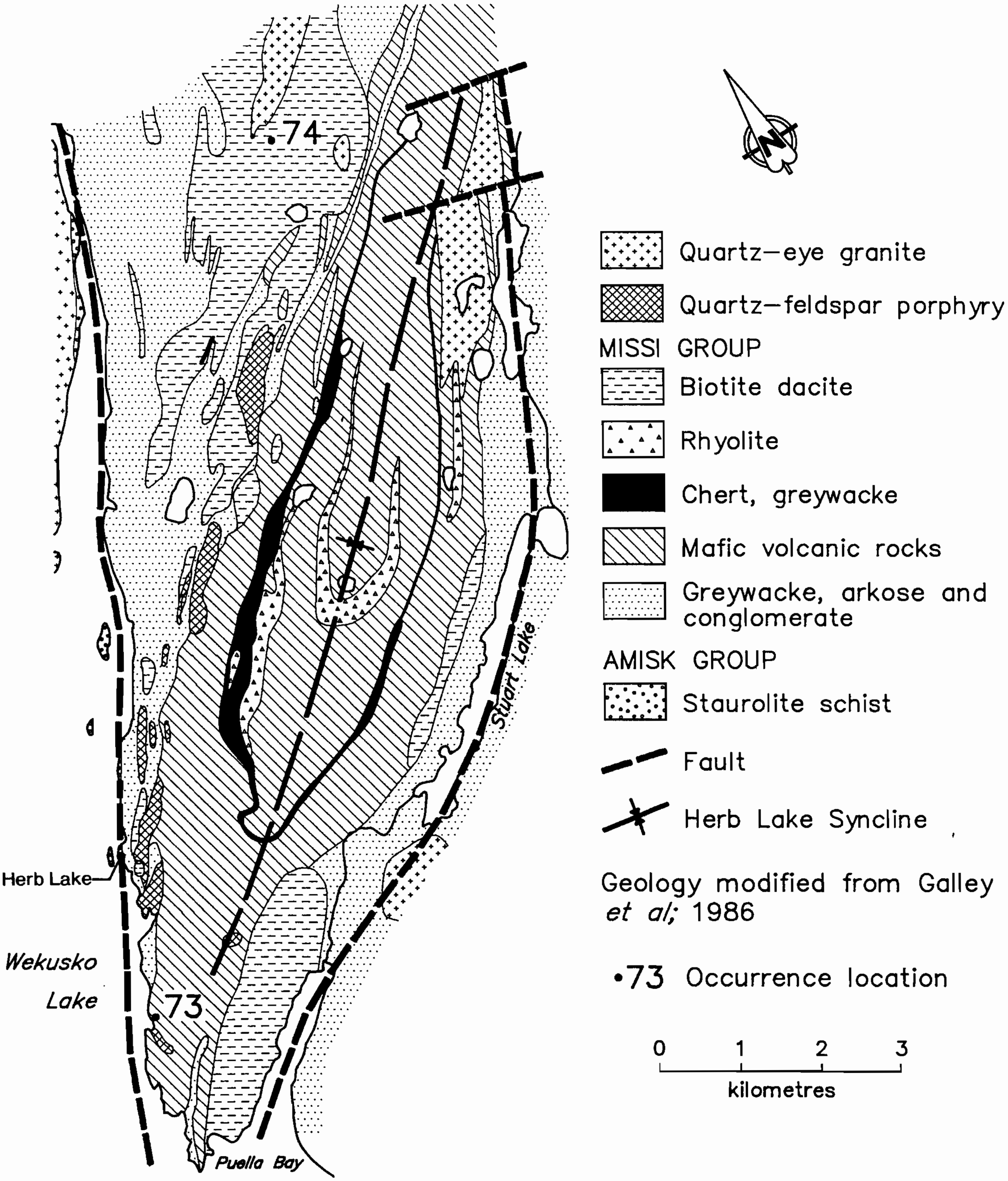

Figure 73-1: Geological setting of occurrences 73 and 74.

the No. 1 vein: the No. 2 vein has been traced for 120 m, No. 3 for 100 m and No. 4 for 60 m. The No. 1 and 2 veins crosscut mafic flows, while the No. 3 and 4 veins crosscut both felsic sill and mafic flow rocks. Although veins No. 1 and 2 pinch out at the basalt felsic intrusive contact, the accompanying shear zone can be traced into the felsic intrusion.

Sulphide mineralization, principally arsenopyrite, is present within all four vein systems. Oriented needles of arsenopyrite occur within the chlorite-biotite-carbonate rich wall rocks adjacent to the veins. The margins of the No. 1 vein are mineralized over most of its strike length. Arsenopyrite mineralization in the No. 2 vein appears to be restricted to a 30 m portion of the vein where it crosscuts the shear foliation, giving the vein a gentle S-shape. Within this portion of No. 2 vein, the quartz contains small patches of arsenopyrite, chalcopyrite and spalerite. Grab samples from the dump, associated with a 20 m deep exploration shaft on the No. 2 vein, contain blebs of tetrahedrite (Stockwell, 1937).

GEOCHEMICAL DATA:

Wekusko Consolidated Limited reports gold assays of 3.09 g/t over 1 m and 7.89 g/t over 2 m (Wekusko Consolidated Limited, 1st Annual Report, 1944). Cangold Limited reported gold assays up to 51.4 g/t over 0.5 m in samples of quartz veins (Wekusko Gold Resources Limited, Corporation File).

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. The shear-hosted veins contain disseminated sulphide minerals and gold.

REFERENCES:

Alcock, F.J.

1920: The Reed-Wekusko map area, northern Manitoba; Geological Survey of Canada, Memoir No. 119, 47p.

Armstrong, J.E.

1941: Wekusko; Geological Survey of Canada, Map 665A, 1:63 360.

Assessment Files 91564 and 91650

Manitoba Energy and Mines, Minerals Division.

Cerny, P., Trueman, D.L., Ziehlke, D.V., Goad, B.E. and Paul, B.J.

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1986: Gold mineralization in the Snow Lake-Wekusko Lake region, Manitoba; in Gold in the Western Shield;(L.A. Clark ed.); Canadian Institute of Mining and Metallurgy, Special Volume 38; p. 379-398.

Gordon, T.M. and Lemkow, D.R.

1986: Geochemistry of Missi Group volcanic rocks, Wekusko Lake, Manitoba; Geological Survey of Canada, Open File Report 1422.

Mineral Inventory Card 63J/13 Au 6

Manitoba Energy and Mines, Minerals Division.

Stockwell, C.H.

1937: Gold deposits of the Herb Lake area, northern Manitoba; Geological Survey of Canada, Memoir 208; 46p.

Wekusko Gold Resources Ltd

Manitoba Energy and Mines, Minerals Division, Corporation Files.

Wekusko Consolidated Limited

Manitoba Energy and Mines, Minerals Division, Corporation Files.

Wright, J.F.

1938: Geology and mineral deposits of a part of northwest Manitoba; Geological Survey of Canada, Summary Report 1930, Part C, 124p.

LOCATION: **74**

NAME: McCafferty

AREA: 2.8 km east of Crowduck Narrows, Wekusko Lake.

UTM: 6076104N/456136E

AIRPHOTO: A20124-88

ACCESS: Boat from the west shore of Wekusko Lake and traverse.

EXPLORATION SUMMARY:

In 1915 H.A. McCafferty staked King George and Ethel Palmer staked Prince Edward. Robert Kerr acquired the claims in 1916. In 1917 the vein was trenched for over 366 m. A 2-compartment shaft (later known as the S or No. 1 shaft) was sunk to 8 m at which point the vein bifurcates. In 1924 the claims were leased as L-39 and L-395. The N or No. 2 shaft was sunk to 28 m by 1931 and 23 m of drifting was done at the bottom of the shaft. Bingo Gold Mines Limited financed this work. In 1930 Consolidated Mining and Smelting Company of Canada Limited uncovered the vein for a further 61 m and did some channel sampling northeast of the No. 2 shaft. In 1934 Canadian Mining Projects Limited optioned the property and carried out channel sampling and a 13 hole drill program. The option was abandoned late in 1934. The No. 1 shaft was reported to be 14.3 m deep. In 1935 Bailor Gold Mines Limited optioned the claims and drilled 19 holes. Early in 1936 the No. 2 shaft was dewatered. After April 1936 there was no further exploration activity on the claims. The leases were renewed in 1945 and 1966. Airborne EM and radiometric surveys were done by HBED in 1965 (A.F. 91650). Falconbridge Nickel Mines Limited did airborne EM and magnetic surveys in 1973 (A.F. 91564). Between 1917 and 1976, several individuals and companies held the property. H.L. Thompson staked CB 7468 over the deposit in 1976. In 1981 Squall Lake Gold Mines, reorganized into McCafferty Lake Explorations Limited, optioned the property and carried out underground sampling on the 27 m level of the No. 2 shaft and collected surface samples between the two shafts (Northern Miner, March 3, 1981). A program of bulk sampling and diamond drilling was planned. Later in 1981 Cangold Limited optioned the property and carried out orientation surveys and geophysics (Mineral Inventory Card 63J/13 Au 13).

GEOLOGICAL SETTING:

The property is underlain by a fragmental biotite-feldspar porphyritic dacite crosscut by quartz porphyritic granite dykes and stocks (Fig. 73-1). Stockwell (1937) also reports the presence of biotite-rich feldspar porphyritic lamprophyre dykes.

The dacite is one of the main volcanic units in the northern part of the Herb Lake area. The well foliated, fine- to medium-grained rock weathers greyish to clay white with a light to dark grey fresh surface, and is composed of feldspar, biotite, quartz, sericite with minor pyrite and arsenopyrite. Feldspar phenoclasts are pink weathering, and vary from 1 to 2 mm in length. Biotite is present as; 1) fine grained elongate aggregates that define the principal foliation, 2) 1 to 2 cm clots of coarse grained biotite and quartz, and 3) up to 5 mm thick books forming rosettes with sulphide cores.

Fine- to medium-grained quartz porphyritic granite stocks and dykes outcrop in the north-northwestern part of the property. These rocks weather clay white to pink and quartz phenocrysts (3 to 5 mm) compose 25% of the rock. The granite dykes are variable in width from 1 to 2 m. The groundmass consists of quartz, sericite, feldspar, biotite, pyrite and/or arsenopyrite. Coarse grained muscovite- and quartz-pegmatitic mobilizate are also associated with these intrusions.

The structural fabric in the rocks is dominated by a regional penetrative foliation that strikes 042° to 055°, and dips steeply to the southeast. The foliation is axial planar to the Herb Lake Syncline; the occurrence is hosted within the western limb of this structure. A number of shear zones 50 cm to 1.5 m wide are observed near the occurrence parallel to the regional foliation. Fracture surfaces within the main mineralized quartz vein parallel the strike of the vein, and contain slickensides that trend approximately 240° and plunge 40° southwest. This parallels the elongation of biotite clusters within the dacite.

MINERALIZATION:

Gold mineralization is contained within a quartz-filled shear that strikes 045° and dips 75° southeast. The vein is 20 to 100 cm wide, and is exposed for over 350 m by a series of trenches and two shafts. The vein bifurcates into two parallel sections for 75 m north from the south shaft. The shear crosscuts quartz porphyry dykes that strike subparallel to the shear and the dacite. The veins have a consistent internal structure that is divided into three parts; 1) margin, 2) outer core, and 3) inner core. The vein margins consist of quartz and carbonate with sheared, sericite-rich inclusions of wall rock elongated parallel to the vein walls. These inclusions contain abundant prismatic, unoriented crystals of arsenopyrite and black tourmaline, minor sphalerite, chalcopyrite, pyrite, galena and possibly tetrahedrite. Tourmaline also occurs as rosettes in fractures within the quartz veins. The abundant wall rock inclusions give the vein margins a banded appearance. Pyrite and chalcopyrite are plated on fracture surfaces that crosscut the wall rock inclusions. The outer-cores of the veins consist of massive, white to vitreous quartz with very few observed mineral inclusions. The inner cores contain strongly-fractured white quartz with a vein-parallel cleavage. The wall rocks to the main vein are strongly sheared over a width of 5 to 10 cm and contain disseminated arsenopyrite and minor pyrite, chalcopyrite, tourmaline, galena and sphalerite. Arsenopyrite is present in the wall rocks up to 30 cm away from the vein. Visible gold was found within fragments of the sheared wall rocks in the dump at the southern shaft.

A series of smaller veins are parallel to the main shear. These veins are to 5 to 10 cm wide, with thin sheared wall rock contacts, and bleached wall rocks that contain disseminated arsenopyrite and pyrite.

GEOCHEMICAL DATA:

Canadian Mining Journal (1916) reports that a vein sample contained "$49 in gold and $17 in platinum". Bingo Gold Mines trenched the vein in 1917 and state "very rich surface samples were found" (Mineral Inventory Card 63J/13 Au 13). Channel samples taken by Consolidated Mining and Smelting Company of Canada Limited northeast of the No. 2 shaft averaged 16.1 g/t Au over a width of 0.76 m and a length of 87.2 m. Canadian Mining Projects Limited reported that channel samples taken at 1.5 m intervals, southwest of the Consolidated Mining and Smelting Company samples, ranged from 39.81 g/t to 96.21 g/t Au. Assays of 1.33 g/t and 36.49 g/t Au were reported further south. Parts of the northern section of the vein assayed 0.66 g/t to 18.58 g/t Au. Other representative assays from channel samples taken at 1.5 m intervals varied from trace to 85.92 g/t Au (Canadian Mining Projects Limited, Corporation File). Drill core assays included a 1.53 m interval of 36.69 g/t Au and a 0.15 m section of "porphyry gold" that assayed 272.9 g/t Au (Globe and Mail, September 22, 1934). Eight of thirteen diamond drill holes intersected mineralized zones that averaged 6.8 g/t Au over an average width of 1.3 m (Manitoba Mines and Natural Resources, 1936). The drilling indicated 18 000 tonnes grading 6.82 g/t Au across 1.37 m for a length of 137 m, "after free gold had been eliminated" (Bailor Gold Mines Limited Corporation File). At least 9 of 19 holes drilled by Bailor Gold Mines in 1935 intersected the vein and outlined a mineralized quartz vein that averaged 7.44 g/t Au over an average width of 0.76 m and a length of 214 m. Deeper drilling intersected the quartz vein with "free gold". Three of the Bailor drill holes intersected mineralized intervals that assayed between 1.37 to 248.57 g/t Au. Channel samples taken from the No. 2 shaft at the 27 m level averaged 16.52 g/t Au (Winnipeg Free Press, February 15, 1936). Channel samples taken by McCafferty Lake Explorations Limited from this level averaged 10.29 g/t Au over an average width of 1.14 m; the best section contained 40.79 g/t over 1.07 m (Northern Miner, March 3, 1981). Low copper and silver values were also reported. Surface grab samples collected between the two shafts averaged 11.99 g/t Au over a 91.4 m length (Northern Miner, March 3, 1981).

Two cross sections of vein and wall rock were sampled during this study. The samples contained up to 1100 ppb Au across 2 m of vein and wall rock. Grab samples of wall rock varied in Au content. One grab sample 9 m away from the vein contained 32 ppb Au. Stockwell (1937) records that Canadian Mining Projects Limited reported an average Au content of 15.5 g/t Au over a 78 cm width, over a strike length of 90 m. Theyer (1988) reports the following ranges for five rock samples collected from the McCafferty deposit: 10 to 30 ppb Pt, 2 to 6 ppb Pd and 44 to 810 ppb Au.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. The shear-hosted quartz veins contain minor sulphide mineralization and gold.

REFERENCES:

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LOCATION: **75**

NAME: Anderson Lake Cu deposit

UTM: 6079129N/436117E

ACCESS: Anderson Mine road from Provincial Road 395.

AREA: North shore of Anderson Lake.

AIRPHOTO: A20170-16

EXPLORATION SUMMARY:

The area was first staked as the Lynx group of claims in the 1920's. The ground was held by various individuals and companies between 1944 and 1952. HBED did EM surveys and diamond drilling on the Astra group of claims in 1955 and acquired the claims in 1956. In 1959 HBM&S was granted a 21 year lease (M-5721). The discovery of the deposit was announced in 1964. During 1964 and 1969 work included surface development, 2897 m of underground drilling and the sinking of a three compartment shaft. By 1968 the shaft had reached 874 m and 14 levels had been established underground. Mining commenced on November 9, 1970 at a rate of 907 tonnes per day. The mining method was changed from open stope to cut-and-fill in 1972 due to bad ground conditions. The mine was closed in 1978 to deepen the shaft by 132 m and install a crusher below the 914 m level. Production resumed in 1979. The Anderson Mine closed in 1988.

GEOLOGICAL SETTING:

The general area of the deposit is characterized by Amisk Group interlayered felsic and mafic volcanic rocks and altered equivalents. The host rocks to the deposit are situated in the biotite-staurolite-sillimanite metamorphic zone (Froese and Moore, 1980) and south of the McLeod Road Thrust Fault (Fig.75-1).

Walford and Franklin (1982) described many aspects of the deposit. The following discussion is taken from their paper.

The local geology is characterized by a homoclinal upright sequence of felsic and mafic volcanic rocks (Fig. 75-2); Locally, the base of the sequence is marked by a quartz tonalite sill, which is generally equigranular, but locally is porphyritic. It consists of 30% quartz, 55% feldspar and 15% hornblende and biotite. The tonalite is hydrothermally altered to the south and west of Anderson Lake and contains 0.5% microfracture-controlled pyrite and chalcopyrite as well as chlorite, sericite and quartz. Figure 75-3 is a stratigraphic section through the orebody (section 12 + 00 w).

Stratigraphy

Lower Mine Felsic Unit

This 900 m thick unit overlies the tonalite sill and contains the Anderson Lake deposit. The unit is characterized by lower massive and upper fragmental sequences. The lower 600 m is essentially massive; locally, fragments are outlined by amphibole and chlorite. Texturally, the unit is aphanitic and composed of 35% quartz, 55% feldspar and 10% biotite with accessory magnetite and ilmenite. This lower sequence may be a marginal phase of the underlying tonalite sill.

The upper 300 m of this unit is a sequence of variably altered fragmental rocks. Fragments have been tectonically flattened and vary in size from ash to blocks. The unit thins westward and thickens to the east; some thin, massive fine grained units interpreted as flows occur in the thicker eastward sections. The upper 100 m of this sequence is porphyritic with an erratic but gradual upward increase in phenocryst abundance. The upper 300 m of the Lower Mine Felsic unit is interpreted to represent a submarine pyroclastic ash flow. Quartz-feldspar porphyry, andesite and basalt dykes intrude both sequences of the footwall felsic unit.

Hanging Wall Mafic Unit

This 100 m thick unit overlies the Anderson Lake deposit. The Hanging Wall unit is separated from the deposit by a 10 to 15 m thick felsic tuff that has been assigned to the Lower Mine Felsic unit.

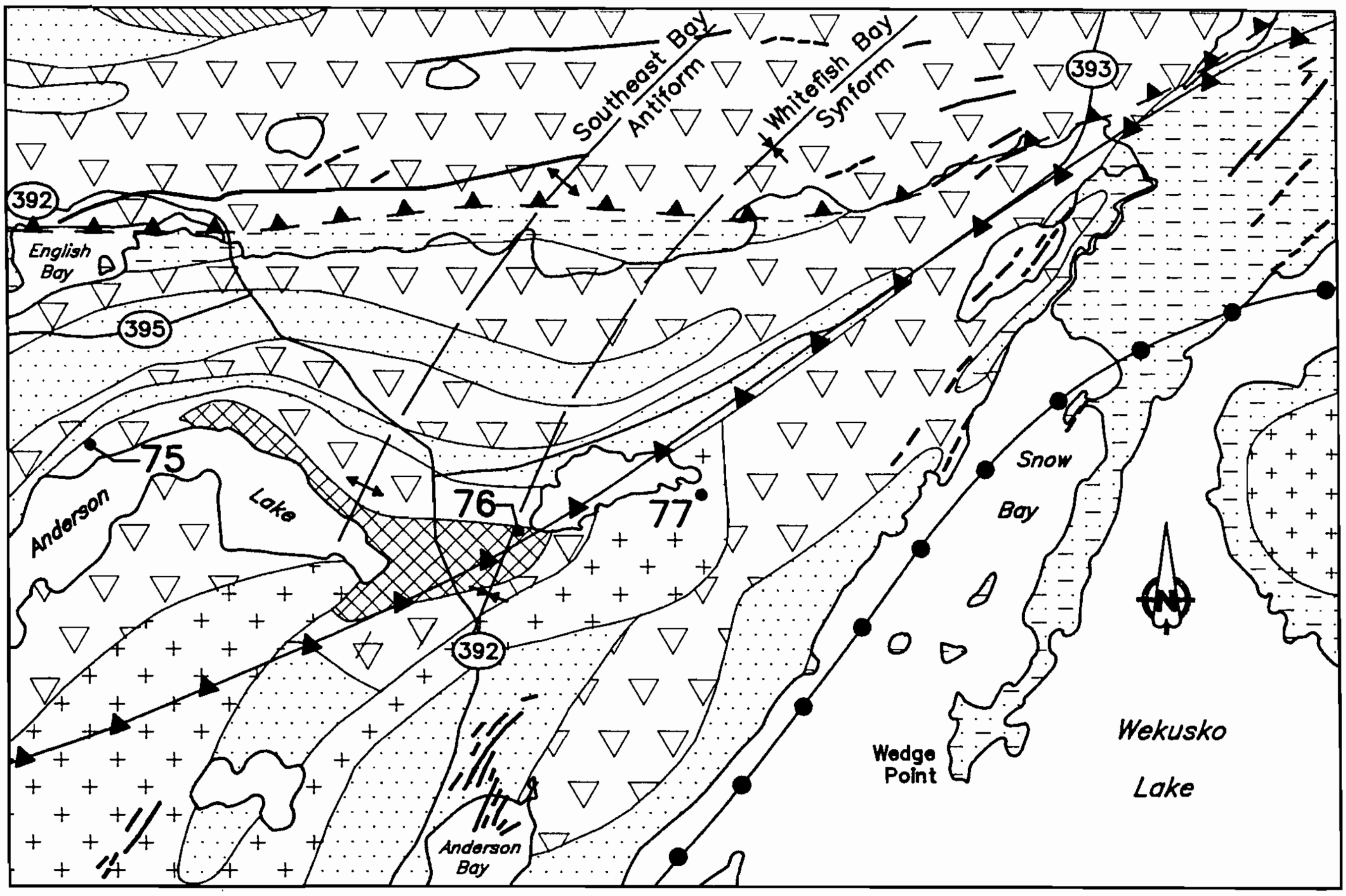
The lower andesitic member of this unit is characterized by pillow breccia, hyaloclastite and tuff. Amygdaloidal flows and well bedded fragmental strata are also present. Mineralogically, the rocks contain 65% hornblende, 20% oligoclase-andesine and 15% quartz with minor biotite. The rocks have a fine- to medium-grained granoblastic texture. The upper basaltic member is characterized by feldspar phyric basaltic flows and epiclastic rocks. The porphyritic basalts contain 20% feldspar phenocrysts and 10 to 15% hornblende phenocrysts.

Hanging Wall Felsic Unit

The remainder of the stratigraphic succession in the general area of the deposit is characterized by the 350 m thick Hanging Wall Felsic unit, which contains porphyritic and pyroclastic flows and massive units. This is overlain by the 600 m thick Threehouse basalt, which consists of porphyritic basalt flows and basaltic epiclastic rocks.

MINERALIZATION:

The Anderson Cu deposit is a single lens of pyrite, chalcopyrite, pyrrhotite and minor sphalerite that strikes 065°E, dips 60° northwest and plunges 55° northeast. The deposit is 150 m long and attains a maximum thickness of 10 m including the stringer ore at the center of the deposit. The near solid to solid sulphide deposit overlies a stringer and disseminated sulphide zone that



APHEBIAN

Granodiorite

MISSI GROUP

Lithic arenite

AMISK GROUP

Greywacke and shale containing zones of calc–silicate rocks and coarse garnet schists

Quartz–eye tonalite (Sneath Lake Pluton)

Mafic flows, pyroclastic and volcaniclastic rocks; minor felsic fragmental rocks

Altered equivalents of felsic pyroclastic and volcaniclastic rocks containing kyanite, sillimanite, anthophyllite and cordierite

AMISK GROUP

Felsic pyroclastic and volcaniclastic rocks; minor mafic fragmental rocks

McLeod Road Thrust Fault

Biotite–sillimanite isograd

Biotite–staurolite isograd

Geology after Froese and Moore (1980)

Ground EM conductor (A.F. 92130)

•75 Occurrence location

0 1 2

kilometres

Figure 75-1: Geological setting of occurrences 75, 76 and 77.

is interpreted to have been part of the area of metal discharge. This alteration pipe has been displaced to the east, relative to the deposit, by regional deformation.

The host rocks to the stringer zone are chlorite-biotite-kyanite schist, an altered equivalent of rhyolitic volcanic rocks. A 12 m thick muscovite-kyanite-chalcopyrite-pyrite zone is developed on the west side of the chlorite-biotite-kyanite zone. The footwall alteration zone contains pyrite, pyrrhotite and chalcopyrite that extends for 30 m below the deposit. This zone of disseminated and stringer mineralization coalesces adjacent to the orebody to form near solid sulphide that contains up to 10% Cu and visible sphalerite. The highest concentration of chalcopyrite and pyrrhotite occurs in the near solid to solid sulphides immediately above the stringer zone. Gangue and minor minerals within the solid and stringer sulphide zones include quartz, cordierite, staurolite, albite, anthophyllite, magnetite and anhydrite. Quartz lenses, 1 to 2 m wide, containing the above mentioned gangue minerals, as well as kyanite, tourmaline and sulphide minerals, occur within the chlorite-biotite alteration zone.

Compositional layering in the near solid to solid sulphides is uncommon, due to recrystallization during metamorphism; accordingly, primary textures are absent. Copper decreases in grade from the footwall to the hanging wall. The sulphide ore is very coarse grained, consisting of porphyroblastic pyrite with pyrrhotite, chalcopyrite and sphalerite infilling the interstices. Chlorite-rich material forms "trails" into the near solid to solid sulphide orebody at its base. The stringer ore is separated from the remainder of the orebody by a 3 m wide carbonate-pyrite unit at the western end of the orebody. Chlorite, quartz, anhydrite and carbonate occur throughout the deposit as ovoid or lensoid bodies. Chalcopyrite mobilizate occurs at the crests of minor folds and as fracture fillings in bands of quartz-muscovite schist that extend from the quartz-muscovite schist that envelopes the orebody, into the near solid to solid sulphides.

The orebody is crosscut by amphibolite dykes partially altered to chlorite-almandine and amphibole-magnetite. Deformation has produced discontinuous pods or lenses of these dykes in the orebody.

Minor amounts of pyrite, chalcopyrite, anhydrite and sphalerite occur within the host muscovite schists away from the deposit. Immediately above the orebody, a muscovite schist up to 4 m thick that contains disseminated pyrite, magnetite and gahnite is, in turn, overlain by partially altered felsic volcaniclastic rock.

Alteration

The distribution of alteration mineral assemblages about the deposit is depicted in a general sense in Figure 75-4 and in greater detail in Figure 75-5. Two intense zones of alteration occur in the footwall sequence. These zones are called the alteration "pipe", which underlies the near solid to solid sulphide orebody and transects stratigraphy at about 30°, and a "lower alteration" zone. Both zones are described briefly.

1. Alteration Pipe

This alteration is exposed 1 km east of the deposit along the north shore of Anderson Lake approximately 300 m stratigraphically below the mineralization. The zone transects massive and fragmental rhyolite and has the following mineralogical characterisitics:

(i) The pipe is characterized by a coarse grained chlorite-biotite-kyanite assemblage that totally replaces the host rhyolite at the eastern end of the deposit. It contains 40 to 70% aluminous and Mg-enriched chlorite (magnesian ripidolite), 10 to 80% Mg-enriched biotite, 5 to 20% quartz and 5 to 50% kyanite. Almandine garnet (0 to 10%), muscovite (0 to 20%) and minor albite are also present. Pyrite, chalcopyrite, pyrrhotite, tourmaline, cordierite and anthophyllite have also been identified. Albite is a common accessory mineral in the chlorite-biotite-kyanite assemblage near the base of the alteration pipe at its eastern end. Within 30 m of the deposit large quartz veins occur in the chlorite zone and contain staurolite, cordierite, kyanite, biotite and sulphide minerals. Apatite is an accessory mineral in these veins.

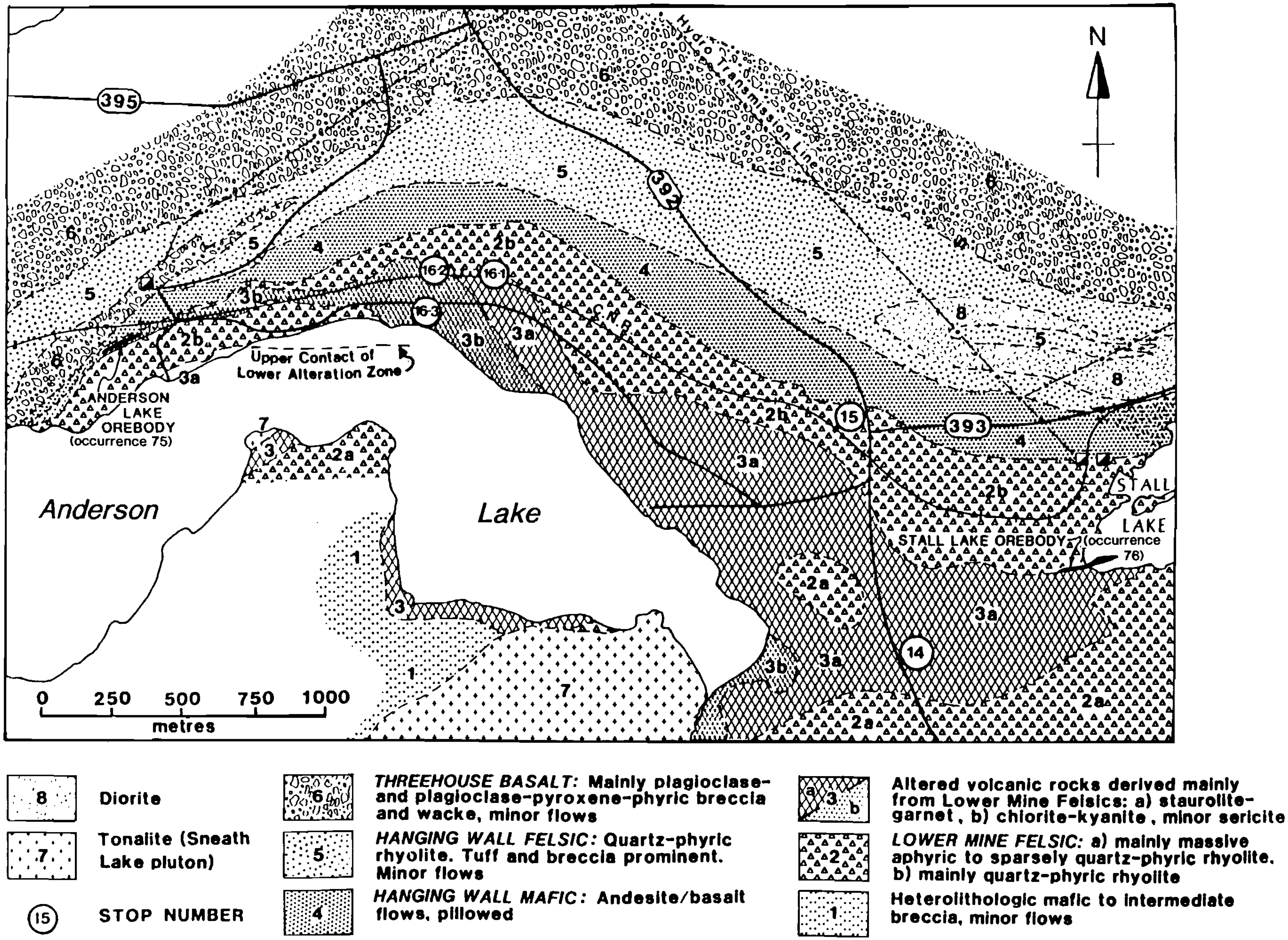
(ii) The muscovite zone occurs adjacent to the orebody where the chlorite-biotite-kyanite assemblage is absent. It is the predominant alteration type with proximity to the deposit. The mineralogy of the zone is characterized by muscovite (50 to 80%), irregularly distributed kyanite (0 to 30%), biotite (5 to 10%), staurolite (5 to 15%), quartz (20 to 50%), andalusite (1 to 5%) and garnet (1 to 5%). Sulphides are disseminated throughout and ilmenite is present as an accessory mineral.

(iii) The staurolite zone represents the zone of least intense alteration, with textural characteristics of the host rhyolite still recognizable. In this zone, rhyolite occurs as a quartz-biotite ± chlorite ± muscovite matrix containing poikiloblastic staurolite crystals. Zinc content in staurolite displays a marked spatial relationship with the Anderson Lake deposit (0.165 to 4.30%) and is also enriched in MnO (*cf.*, Trembath, 1986). Tourmaline and pyrite are accessory minerals throughout the staurolite zone, and feldspar is a minor component.

2. Lower Alteration Zone

The lower alteration zone is exposed 900 m east of the deposit along the northern shore and at the southeastern corner of Anderson Lake. Alteration occurs within a lapilli tuff and breccia zone in the footwall felsic sequence; breccia fragments are replaced in the core of this zone.

The lower alteration zone has a width of 150 m with outer contacts gradational to massive, visibly unaltered



Geology after Bailes *et al* (1987)

Figure 75-2: Local and geological setting of occurrence 75.

rhyolite. With proximity to the deposit, the peripheral zone of alteration is marked by the development of garnetiferous biotite selvages around rhyolite fragments and by irregularly distributed garnetiferous leucocratic patches in visibly unaltered rhyolite.

Chlorite, biotite and minor garnet mark the most intense portion of the lower alteration zone. This 45 m wide mineral assemblage is developed in the matrix of the rhyolite breccia; however, chlorite, biotite, kyanite and minor albite totally replace rhyolite fragments in some areas. Magnetite, ilmenite and muscovite are present throughout the lower alteration zone with pyrite, pyrrhotite and ilmenite present locally.

The lower alteration zone is albite-rich and thickest where it intersects the Anderson Lake deposit alteration pipe. Diamond drilling has traced footwall alteration pipes stratigraphically underlying the Stall (occurrence 76) and Ram (occurrence 78) deposits to a point where the individual pipes intersect the chlorite-rich zone of the lower alteration zone.

GEOCHEMICAL DATA:

From 1970 to the end of 1984, 2 193 546 tonnes of 3.41% Cu and 0.1% Zn were produced (Esposito, 1986). Production figures for the period 1985 to 1988 have not been published. Bamburak (1990) reports 3 190 000 tonnes grading 3.45% Cu and 0.1% Zn. Geochemical data from the alteration zones at the deposit have the following characteristics:

1. Feldspar Elements
   - (i) Al_2O_3:relatively constant throughout the footwall; local enrichment reflected by kyanite
   - (ii) Na_2O:depleted in the footwall, but with an irregular pattern; typically ≤1% except in the lower alteration zone where 3% Na_2O was detected in some samples
   - (iii) K_2O:generally enriched in the footwall; increases towards the deposit; Ba correlates directly with K_2O.
   - (iv) Sr:depleted in footwall sequence
2. Ferromagnesian Elements
   - (i) MgO and FeO: both distinctly high in the footwall
   - (ii) TiO_2: mobile in the most intense alteration; enriched over background in felsic footwall sequence and increases in concentration towards the deposit; V correlates with Ti.

The content of SiO_2 in footwall rocks is highly variable. SiO_2 is generally higher in the footwall sequence away from the deposit.

Zones of silicification or silica precipitation are absent from the deposit. The variation of trace and major elements through hanging wall, ore zone and footwall rocks is depicted in Figures 75-6 and 75-7.

An ICP-AAS multi-element geochemical analysis of 8 samples of near solid to solid sulphide ore from the deposit indicates that, in addition to high Cu and Zn, the following ranges for trace elements are present: 68 to 1242 ppm Pb, 11 to 47.3 ppm Ag, 810 to 5920 ppb Au, 3102 to 8534 ppm As, 107 to 543 ppm Sb, 2 to 110 ppm Bi, 22 to 76 ppm Cd, 152 to 1705 ppm Co, 58 to 452 ppm W. Analyses are presented in Appendix I.

CLASSIFICATION:

Stratabound massive sulphide type deposit; volcanic rock associated. The Anderson Lake Cu deposit has geological characteristics similar to the "typical" massive sulphide type deposit described by Sangster (1972). The deposit is considered to have formed in a submarine depositional environment in proximity to a calc-alkaline felsic volcanic center. The absence of a distinct marker unit in the volcanic stratigraphy along strike from the deposit indicates rapid precipitation of sulphide and associated gangue minerals. The composition of the ore-transporting fluid, as determined from a narrow range of sulphur isotope data, indicates the deposit-forming metals were transported in a relatively homogeneous fluid and that, except for the stringer zone, progressive oxidation of this fluid did not occur during sulphide precipitation. The genesis of the deposit has been described in a three-stage process and illustrated in Figure 75-8. These processes are:

1. The intrusion of the tonalite sill (Sneath Lake Pluton) into the footwall felsic sequence heated intrastratal fluids, which leached metals from the lower alteration zone;
2. Metal-charged fluids moved up synvolcanic or other localized fractures producing penecontemporaneous autobrecciation. Secondary fluid flow produced by the upwelling brine caused seawater to be drawn into the fluid conduit. This caused rapid cooling of the metalliferous brine and precipitated metals to form the stringer zone. Additionally, K derived from the seawater would have been used to form sericite, eventually becoming the muscovite-rich alteration zone.
3. Continued rapid cooling of the metal- and reduced sulphur-rich brine promoted rapid precipitation, with little sulphur fractionation, thereby forming the bulk of the near solid to solid sulphide deposit.

Baites and Galley (1991) indicate a coeval relationship exists between the Sneath Lake pluton and the felsic volcanic sequence in the Anderson deposit area.

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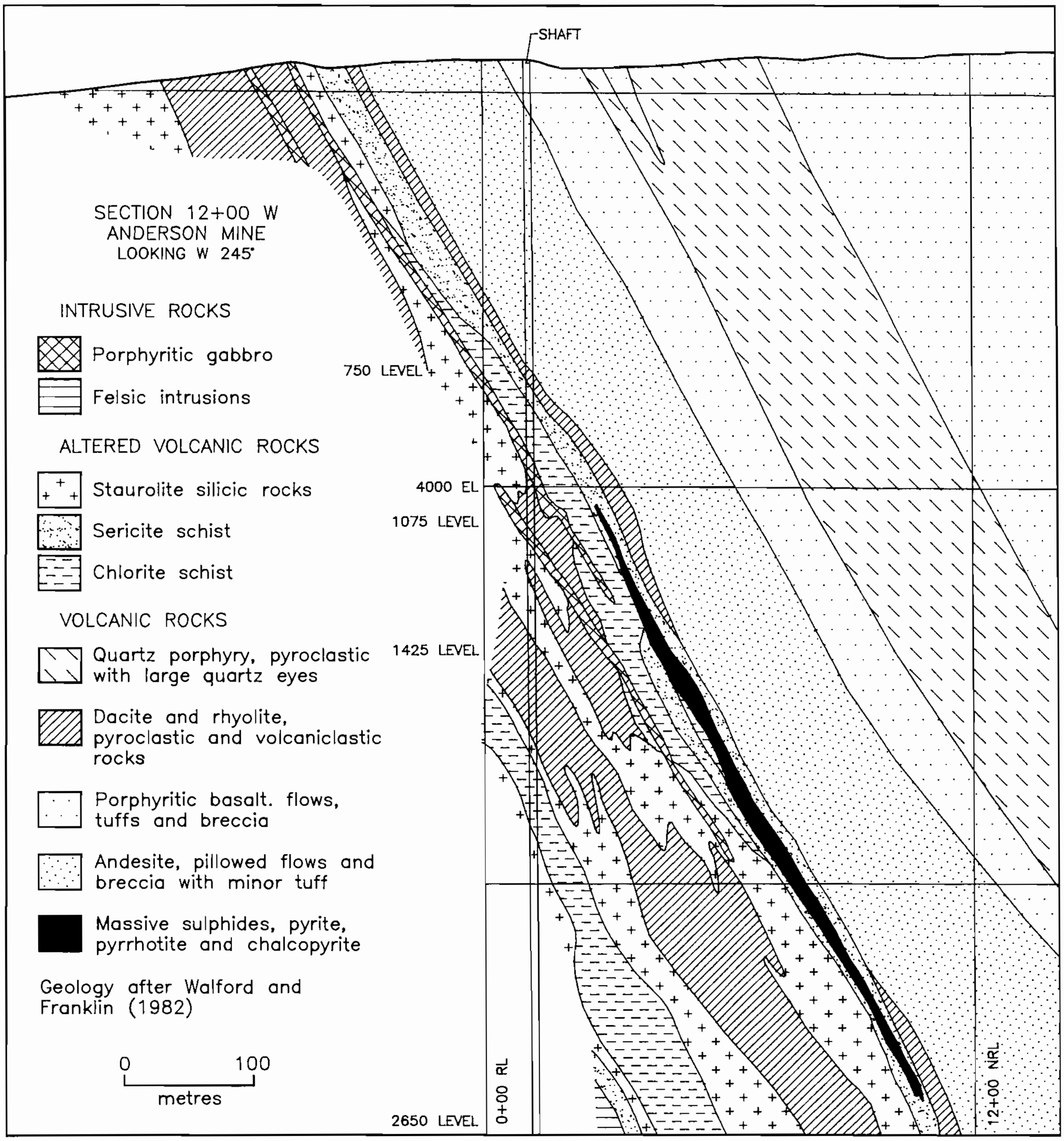

Figure 75-3: ***Stratigraphic section through the Anderson Lake deposit.***

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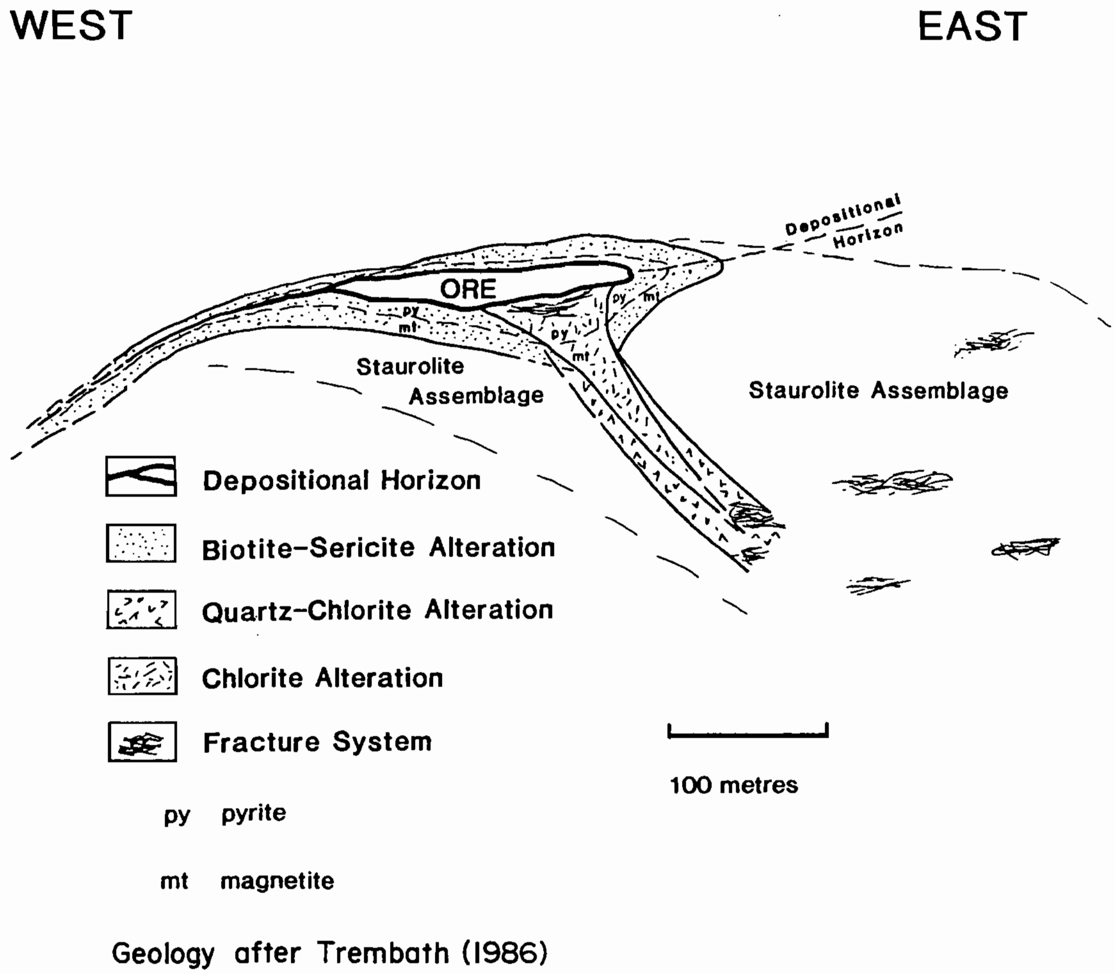

Figure 75-4: Distribution of alteration assemblages associated with the Anderson Lake deposit.

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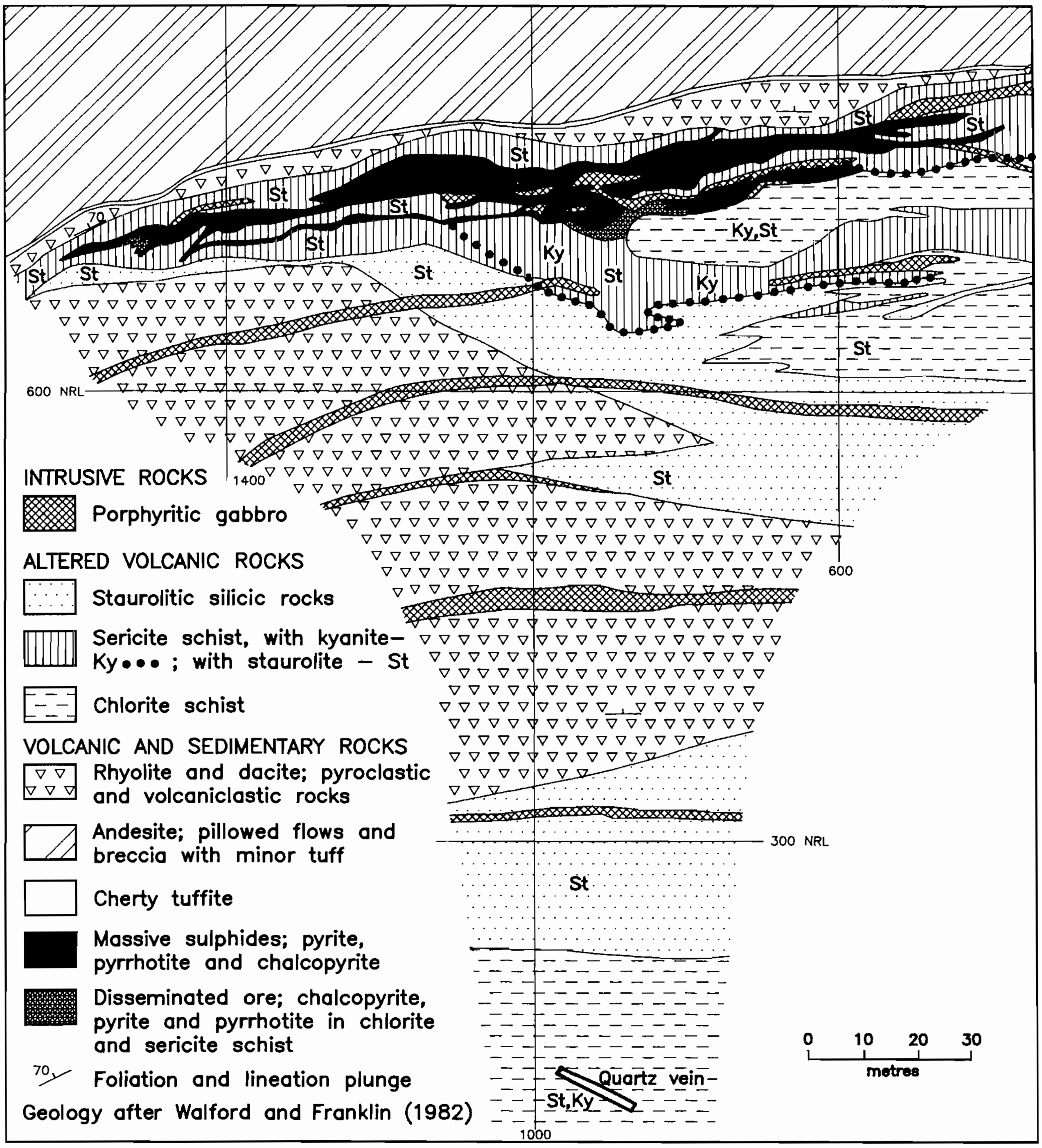


Figure 75-5: Plan of the 1950 level, Anderson Lake deposit.

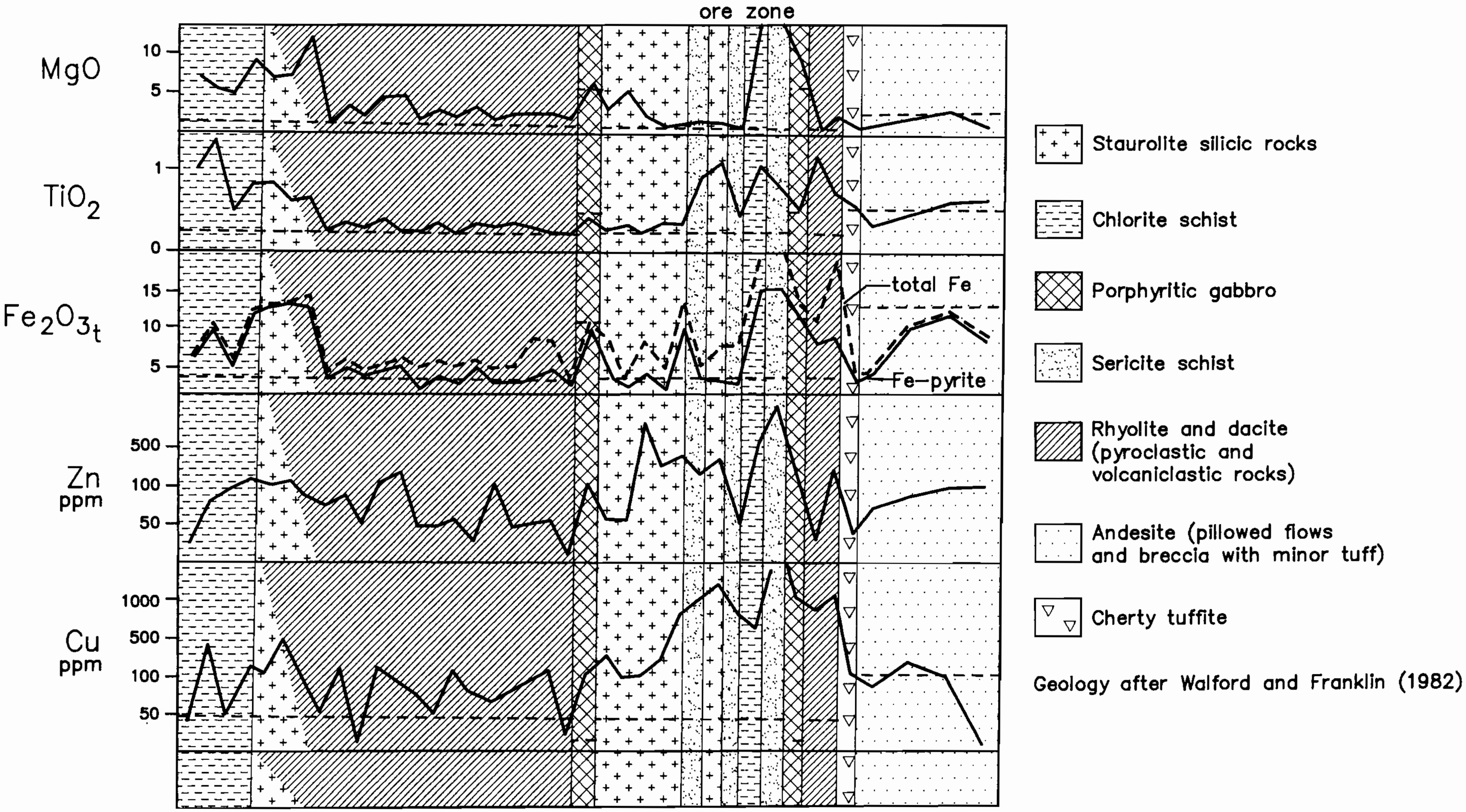


Figure 75-6: Variation of major and trace elements through the hanging wall, ore zone and footwall sequences, 1950 level, Anderson Lake deposit (occurrence 75).

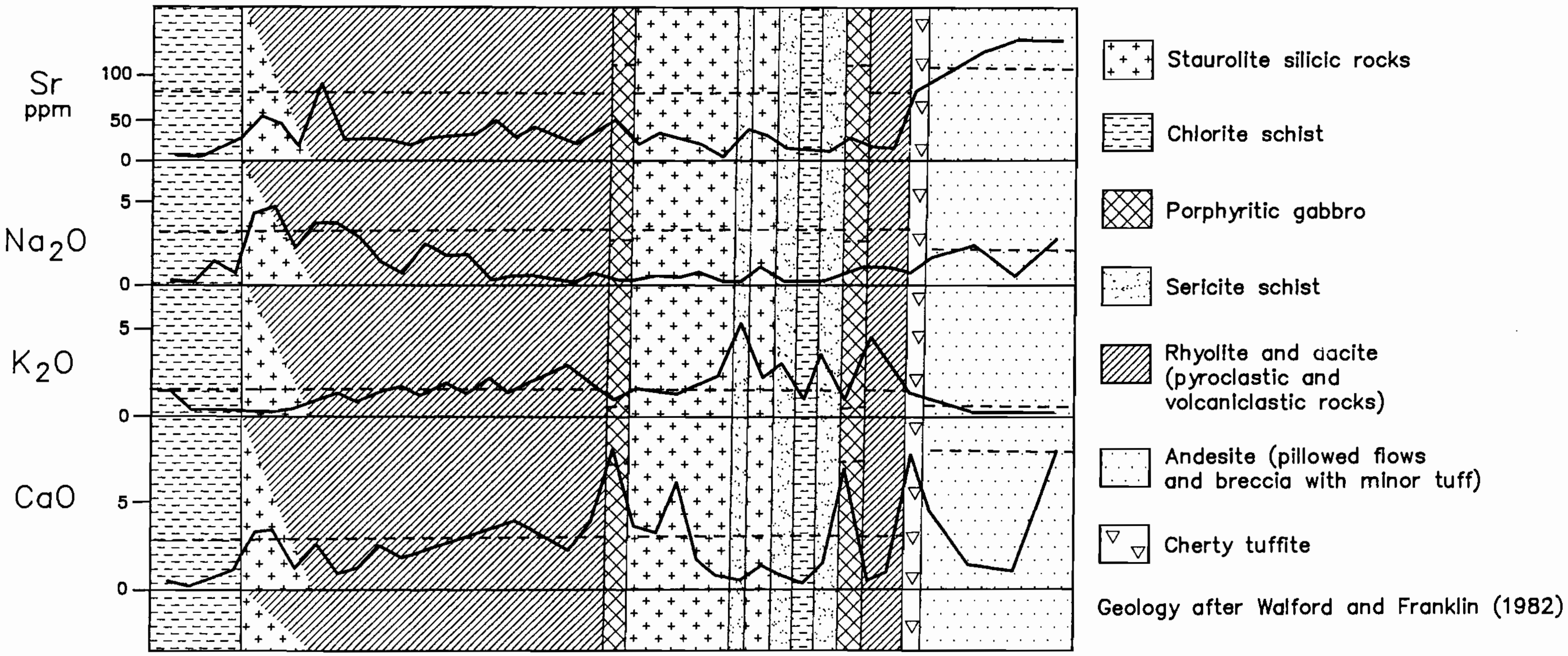


Figure 75-7: Variation of major and trace elements through the hanging wall, ore zone and footwall sequences, 1950 level, Anderson Lake deposit (occurrence 75).

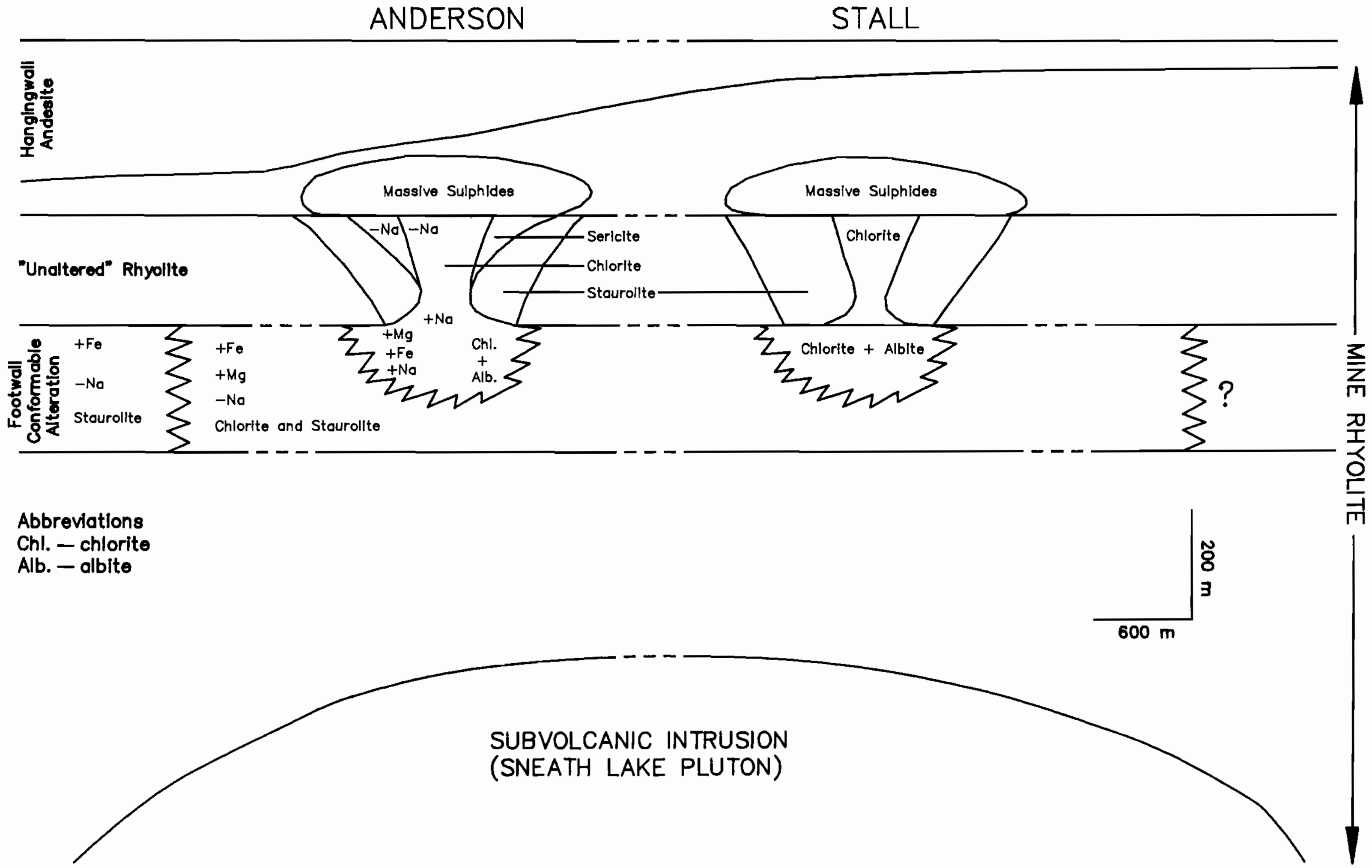
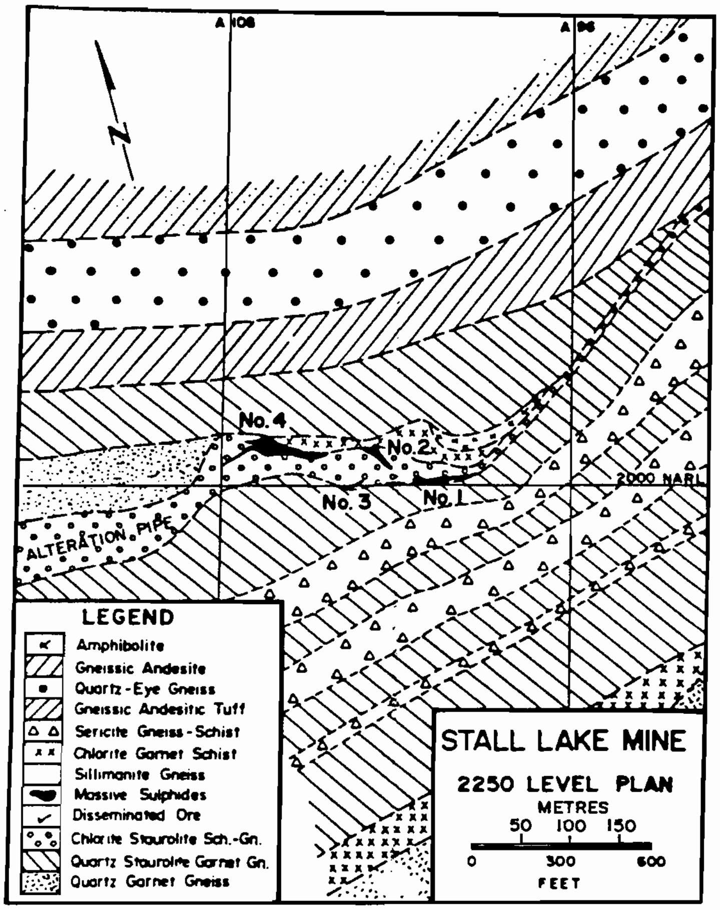


Figure 75-8: Genesis of the Anderson Lake (occurrence 75) and Stall Lake (occurrence 76) deposits (after Walford and Franklin, 1982).



Geology after Studer (1982)

Figure 76-1: Plan view of the geological setting of the Stall Lake deposit.

LOCATION: **76**

NAME: Stall Lake Cu-Zn deposit
UTM: 6078591N/439526E
ACCESS: Stall Lake Mine road from Provincial Road 393.

AREA: West end of Stall Lake.
AIRPHOTO: A20127-110

EXPLORATION SUMMARY:

The area was staked as Col 5 by Colin Baker in 1945. In 1955 Walter Johnson acquired Astra 18 and optioned it to HBED. In 1956 HBED did over 17 374 m of diamond drilling in this area including 4026 m on Astra 18. Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624). Between 1957 and 1959 shaft sinking and 2676 m of diamond drilling was done. In 1959 HBM&S acquired the property and a 21 year lease (M-5716). A further 2735 m of drilling was done in 1961. By 1963 a three compartment service shaft was sunk to 872 m and a production shaft was completed to 896 m with levels established every 46 m between 274 m and 869 m. Another 3048 m of diamond drilling was done before the mine came into production on February 1, 1964. Mining was done by the horizontal cut-and-fill method. Diamond drilling and development work continued through 1967. In 1970 production was halted so that a three compartment winze could be sunk from the 869 m level to access additional ore. The shaft deepening was completed to 1097 m by 1972. Most of the No. 1 orebody was mined out in 1973. The production shaft was deepened to 1466 m by 1979. HBM&S was to drill the area between the Stall and Rod mines at the 590 m level (Northern Miner Magazine, March 1989).

GEOLOGICAL SETTING:

The general area of the deposit is characterized by Amisk Group interlayered felsic and mafic volcanic rocks and their altered equivalents. The host rocks to the deposit are situated in the biotite-staurolite-sillimanite and chlorite-biotite-staurolite metamorphic zones as defined by Froese and Moore (1980; Fig. 75-1). The most comprehensive review of the deposit has been presented by Studer (1982) from which this discussion has been taken.

The geological setting of the Stall Lake copper-zinc deposit is typified by the plan of the 2250 foot mine level (Fig. 76-1). The host rocks, although variably altered, appear to be partly massive, but predominantly fragmental pyroclastic, felsic volcanic and volcaniclastic rocks that strike approximately east and dip 45° north. They have been intruded by an early set of amphibolite dykes that have been affected by all deformational events. Stratigraphic units are described in ascending order:

Chlorite Schist

A 46 m thick unit of coarse grained, sheared chlorite schist forms the stratigraphically lowermost unit observed in the mine. The unit contains very minor iron sulphides and is intercalated with garnet gneiss.

Staurolite-Garnet Gneiss

A 305 m thick unit of quartz-biotite-staurolite-garnet gneiss underlies the Stall Lake massive sulphide deposit. Locally, it has a fragmental texture and is intercalated with sericite gneiss and schist. Disseminated sulphides, quartz and hornblende stringers increase in abundance near the contact with the overlying mineralized host rocks.

Chlorite-Staurolite Schist and Gneiss

These schists and gneisses underlie and partly envelop the various lenses of mineralization that characterize the Stall Lake deposit. This unit is described in more detail in the section "mineralization".

Chlorite-Garnet Schist

A foliated chlorite-garnet-staurolite schist stratigraphically overlies orebodies 2 and 4. It contains lenses of black hornblende and anthophyllite, and contains up to 10% magnetite.

Sillimanite Gneiss

A quartz-biotite-staurolite-sillimanite unit is in contact with the hanging wall of the alteration pipe, and also occurs stratigraphically above the west end of the number 4 orebody. Sillimanite occurs as 10 to 20% light grey porphyroblasts in this unit.

Staurolite-Garnet Gneiss

This massive, coarse grained unit, marked by brown staurolite porphyroblasts, attains a thickness of 107 m. A few sericite-rich layers, and minor tourmaline and apatite are scattered through the unit.

Andesitic Tuff

The staurolite-garnet gneiss is overlain by a 61 m thick unit of andesitic tuff and layered mafic tuffaceous volcaniclastic rocks. Texturally and mineralogically, this unit varies from a massive, fine grained dark-green hornblendite to a well banded rock that contains hornblende, biotite, quartz, plagioclase and garnet.

Quartz-Eye Gneiss

A garnetiferous quartz-eye gneiss overlies the andesite tuff. It has a thickness of 91 m and contains 5 to 20%, homogenously distributed, rounded to subangular, clear to blue, 2 to 5 mm quartz metacrysts. This unit is

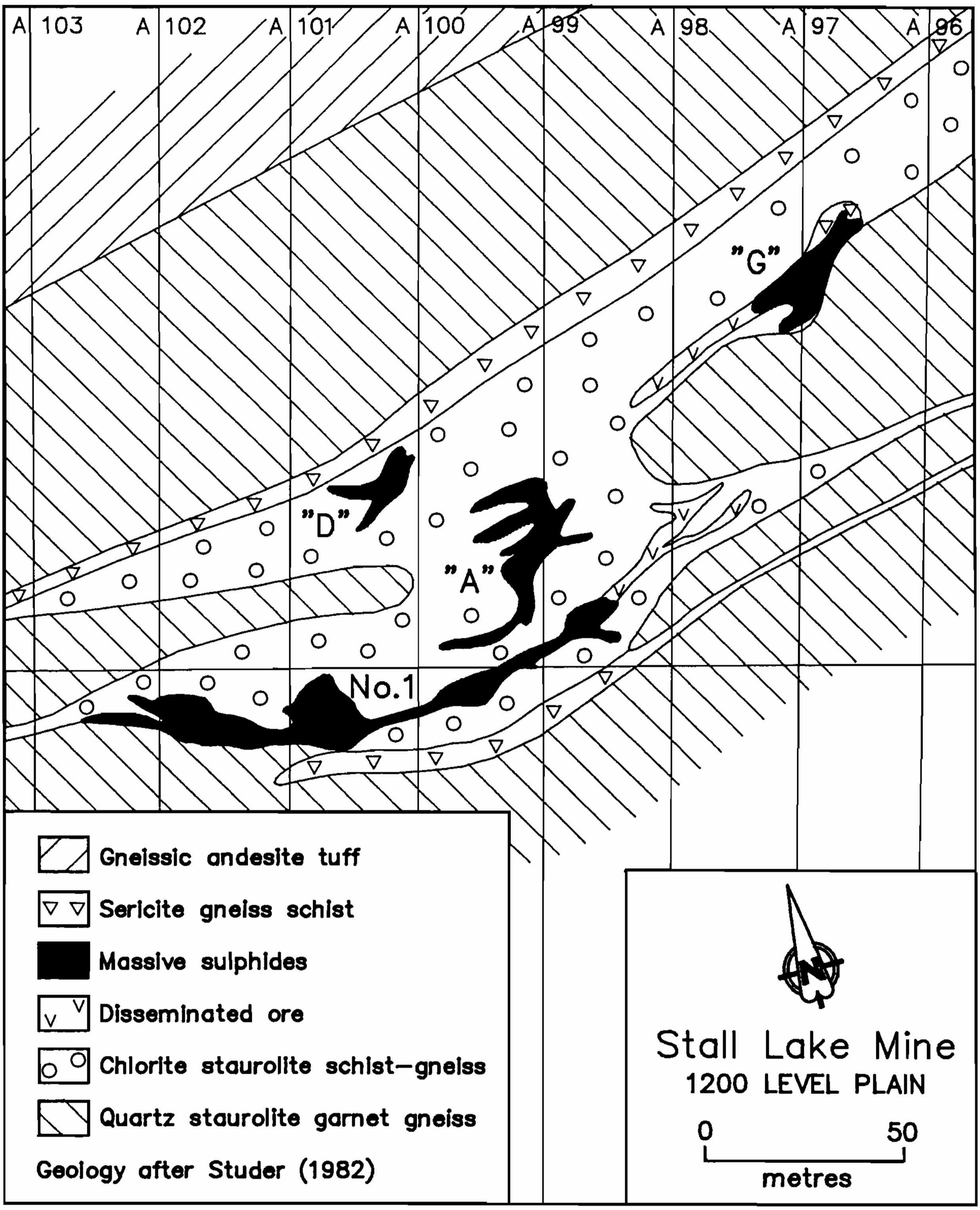


Figure 76-2: Geological setting of the ore lenses in the No. 1 orebody, 1200 level, Stall Lake deposit.

interpreted to have originally been a felsic crystal tuff (Coats *et al.*, 1970).

Gneissic Andesite

This unit is the stratigraphically uppermost unit exposed in the underground workings at the deposit. It is dark green, garnetiferous hornblende-rich andesite that contains zones of volcaniclastic breccia. Pillowed outcrops of this unit, indicating the stratigraphy faces north, are exposed at surface.

MINERALIZATION:

The Stall Lake Cu-Zn deposit contains four main zones of mineralization and a number of smaller zones that occur in hanging wall rocks.

Number 1 Orebody

This zone has a strike length of 76 m and has been traced from surface to the 777 m level in the mine. The deposit dips 45°E. Below the 594 m level the mineralization occurs in a syncline, whereas above the 594 m level the mineralized zone occupies a complex series of anticlines and synclines. The orebody splits into east and west zones above the 221 m level.

In the hanging wall to the Number 1 orebody three sulphide lenses, designated "A", "G" and "D", have been delineated (Fig. 76-2). Each of the sulphide lenses extend from surface to the 594 m level in the mine, and follow the northerly D2 lineation.

The "A" lens appears to have a spatial relationship to the Number 1 orebody in that it is connected to the latter by a sulphide stringer and chlorite-rich zone. The "A" zone consists of near solid to solid coarse grained sulphides. Chalcopyrite is the main sulphide mineral with minor pyrrhotite, pyrite and sphalerite. Assay values for Au and Ag of up to 34 g/tonne have been documented from the Cu-rich portions of this zone. The sulphide zone has been folded in a west-trending D_1 fold direction, and overall is discordant to the wall rocks. The orebody is elongated along the regional north-trending D_2 lineation.

The "G" lens occurs 76 m east of the A lens. It has a strike length of 37 m and a maximum width of 12 m. The near solid to solid sulphides in this zone are fine grained and consist of pyrite, chalcopyrite, pyrrhotite and sphalerite, with sphalerite content increasing towards the hanging wall of the lens and chalcopyrite increasing towards the footwall. The zone contains high Au and Ag contents in association with the chalcopyrite-rich zones in the footwall, as well as with a stringer sulphide and chlorite-rich zone that occurs on the west end of this zone. Near the footwall, massive magnetite and anhydrite have been documented. Sericite schist characterizes the hanging wall rocks and contains disseminated pyrite-sphalerite-pyrrhotite-chalcopyrite-gahnite mineralization.

The "D" near solid to solid sulphide lens occurs approximately 61 m into the hanging wall of the number 1 orebody. The lens contains a sphalerite-rich hanging wall and a chalcopyrite-sphalerite-rich footwall. Both zones contain high gold and silver.

Number 2 and 3 Orebodies

These orebodies occur between the number 1 and 4 orebodies (Fig. 76-3) and are similar in form and mineralogy to the larger mineralized zones. The mineralization characterizing orebodies number 2 and 3 is confined to tight and open synclinal and anticlinal structures. The number 3 orebody is locally discordant to the host rocks and may be a tectonically displaced portion of number 4 orebody.

Number 4 Orebody

The number 4 orebody is the largest of the four near solid to solid sulphide zones with a strike length of 76 m and extending along plunge from the 457 m level to the 1401 m level. The zone has an average strike length of 91 m and a maximum width of 40 m. The dip of the mineralization varies from 20° to 60°E. The orebody is situated in a series of connected anticlines and synclines whose axes are parallel to the D_2 lineation. Metal zonation in this orebody is reflected by a copper-rich west end, that commonly contains in excess of 10% Cu in some sections.

Generally, the four orebodies are characterized by a coarse grained mineral assemblage of pyrrhotite, pyrite and chalcopyrite. Pyrrhotite and chalcopyrite occur as intergrowths, lenses and disseminations in the gangue. Lenses of near solid to solid pyrrhotite may contain pyrite, chalcopyrite, chlorite and quartz. Chalcopyrite, with lesser pyrrhotite and rare magnetite, occupy the hinge zones of local flexures. Pyrite occurs as aggregates and porphyroblasts on the flanks of these folds. Wall rock/mineralization contacts are generally sharp, except in the footwall areas where they are gradational.

Alteration

A chlorite-rich alteration "pipe" has been documented from the west end of the number 4 orebody (Fig. 76-4). The pipe has been tectonically rotated into the plane of mineralization so that it is now subparallel to the strike of the deposit. The pipe can be followed 305 m westward on the 685 m level of the mine; the maximum width of 24 m occurs at the base of the number 4 orebody (Fig. 76-4). At this location the pipe comprises subrounded to rounded felsic fragments up to 0.6 m in diameter with rinds of pyrite and chalcopyrite. Anhydrite and anthophyllite are also present; cordierite crystals up to 0.6 m long and 15 cm in diameter with chlorite reaction rims have been observed.

The mineralogy of the alteration zone is dominated by dark green chlorite, staurolite and garnet with minor kyanite and actinolite. An irregularly shaped stockwork of sulphide stringers and disseminated sulphides occurs in the pipe. Pyrite is the most common sulphide mineral. Magnetite content may be up to 10%.

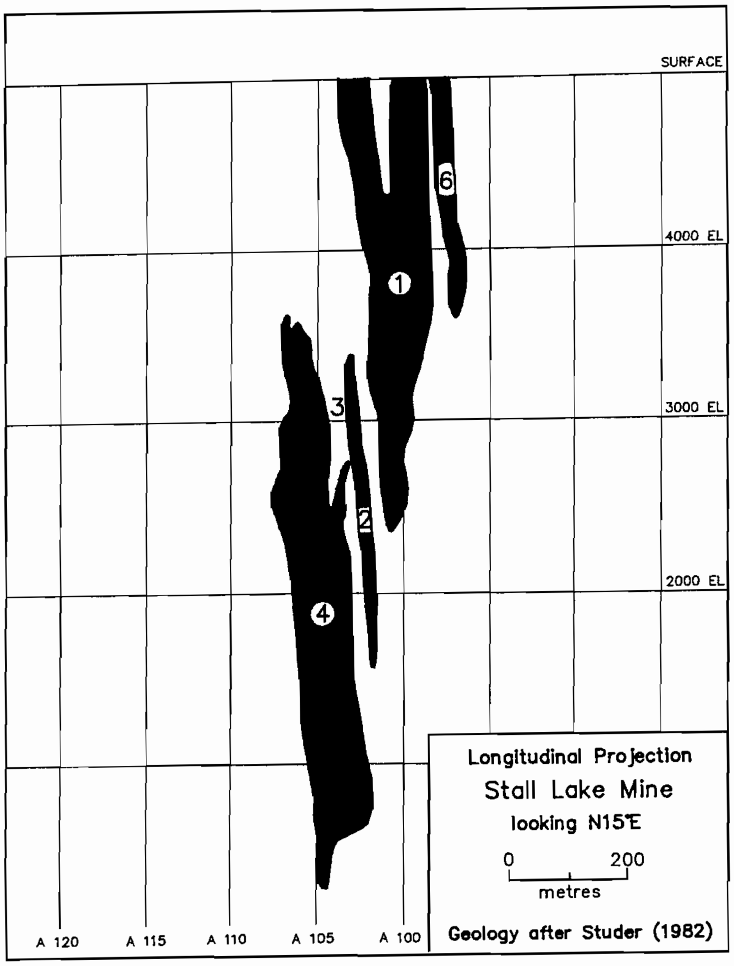


Figure 76-3: Longitudinal projection of No. 1 to No. 4 orebodies Stall Lake deposit.

In addition to the chloritic alteration pipe, a chloritic envelope that contains disseminated and veinlet pyrite, pyrrhotite, chalcopyrite and magnetite encompasses all of the orebodies and extends eastward beyond the number 1 orebody. Sericite-rich zones are developed near the footwall contact between the chloritic unit and the visibly unaltered wall rocks. In the hanging wall, the chlorite schist extends for up to 15 m into surrounding rocks, whereas the mineralized chlorite schist that underlies the orebodies varies from 8 m at the number 4 orebody to 0.9 m thick at the number 1 orebody.

GEOCHEMICAL DATA:

The deposit contains 6 264 000 tonnes grading 4.33% Cu and 0.48% Zn (Bamburak, 1990). From 1964 to the end of 1984 production totalled 4 158 096 tonnes grading 4.29% Cu and 0.57% Zn (Esposito, 1986). Production figures for the period 1985 to 1991 have not been published.

Geochemical data from the wall rocks to the deposit indicate a Na depletion with an unaltered range of 2 to 4% for Na_2O and a lower limit of 0.10% Na_2O in the ore zones. Samples collected from the core of the chloritic alteration pipe reflect MgO enrichment; there is no systematic Mg-enrichment related to the mineralizing event through the section. Some silicification of the hanging wall and footwall rocks has occurred, but this has not been quantified. Total Fe increases from footwall and hanging wall towards the mineralized zones (Fig. 76-5).

ICP-AAS multi-element analysis of four samples of near solid to solid sulphide ore from the deposit indicates that in addition to high Cu and Zn the following ranges for trace elements are present: 63 to 518 ppm Pb, 10.4 to 30.8 ppm Ag, 720 to 1520 ppb Au, 724 to 4674 ppm As, 30 to 230 ppm Sb, 2 to 205 ppm Bi, 10 to 119 ppm Cd, 175 to 350 ppm Co, 113 to 472 ppm W. Analyses are presented in Appendix I.

CLASSIFICATION:

Stratabound massive sulphide type deposit; volcanic rock associated. The Stall Lake deposit is a stratabound series of lenticular near solid to solid sulphide lenses that contain copper, zinc, gold and silver. The shape of the lenses and associated alteration zones have been modified due to multiple phases of deformation, and accordingly, some of the sulphide lenses that compose the Stall Lake deposit are probably tectonically derived from the larger lenses. It has been proposed that orebodies 1, 2 and 3 represent boudins that were derived from a single lens as a result of folding and flattening that occurred during the Hudsonian orogeny. A second deformational event mobilized and elongated the mineralized zones into their present shape. Some compositional (copper-zinc) zonation exists in the deposits and well developed alteration zones are developed around the individual lenses. It is possible that the "A" lens represents stringer sulphide mineralization within the alteration pipe to the "G" lens.

A reconstruction of pre-deformation mineralization at the Stall Lake deposit is presented in Figure 76-6. The stratabound deposit with its chloritic alteration zone is situated on the flanks of a felsic dome. Continued exhalation of metal-rich brines produced a series of metal zoned pyritic sulphide lenses and associated alteration that overlie the main Stall Lake deposit.

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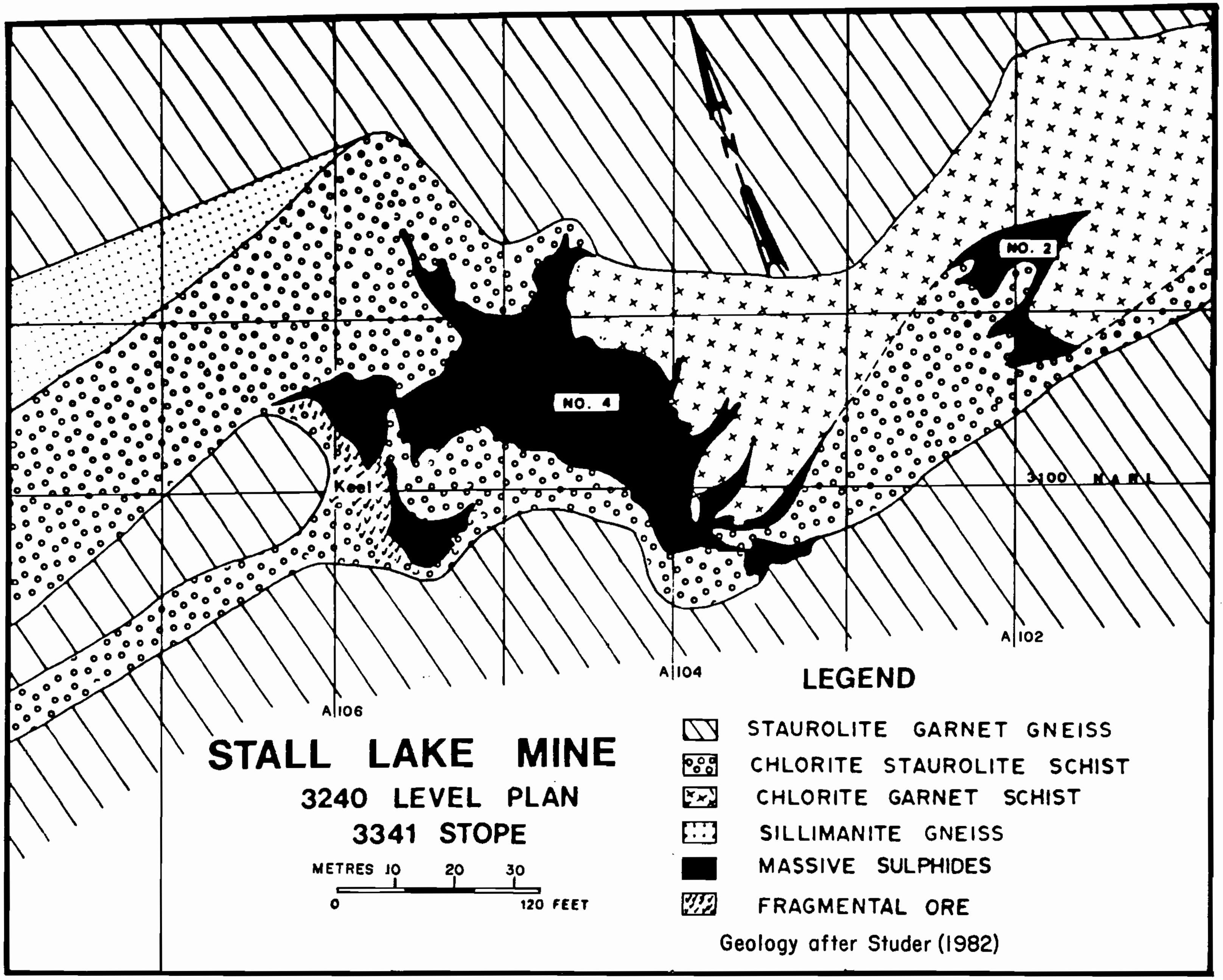

Figure 76-4: Geological plan illustrating the distribution of alteration types associated with the No. 4 orebody, 3240 level, Stall Lake deposit.

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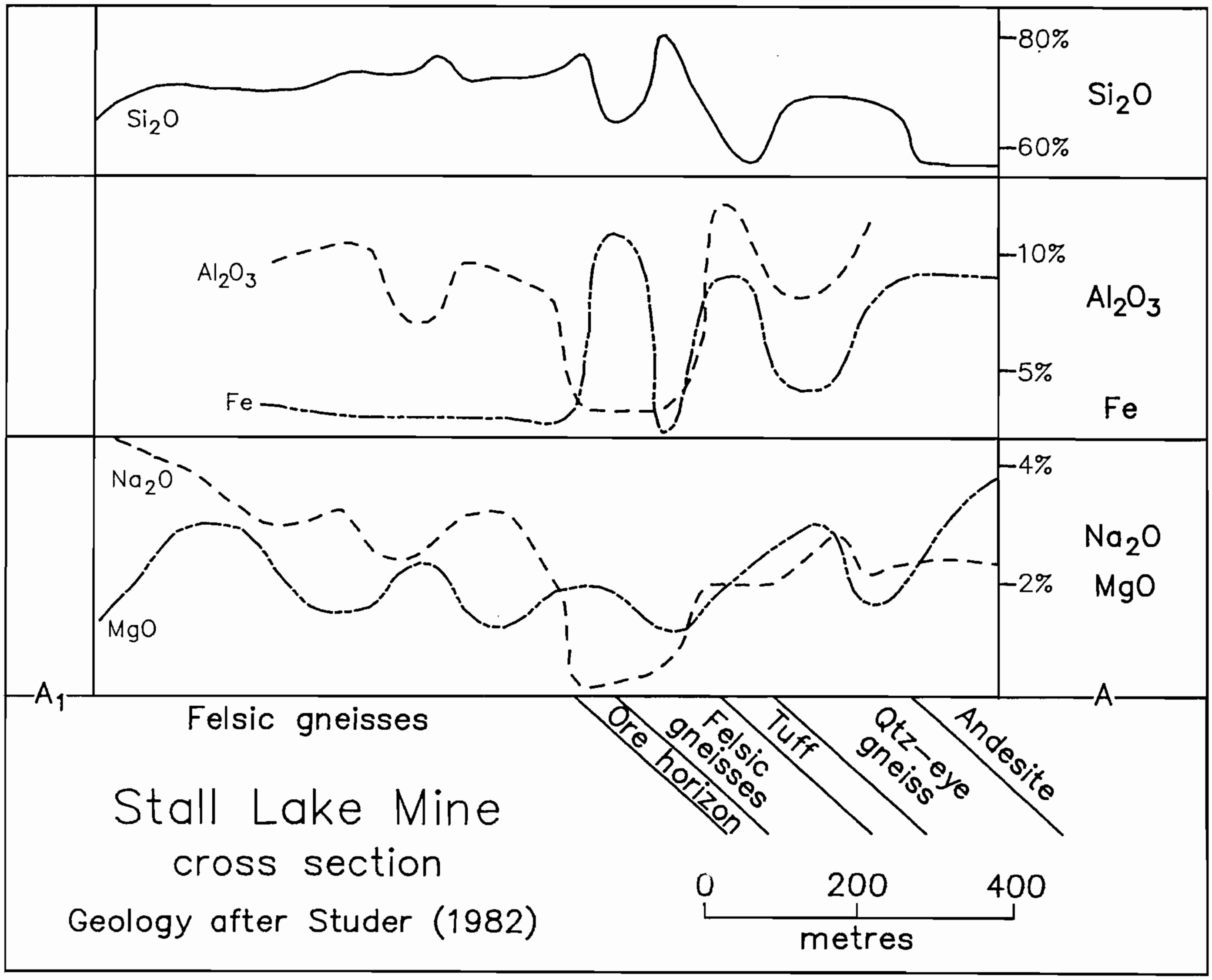

Figure 76-5: Major element geochemical profiles through the Stall Lake deposit, 2840 level.

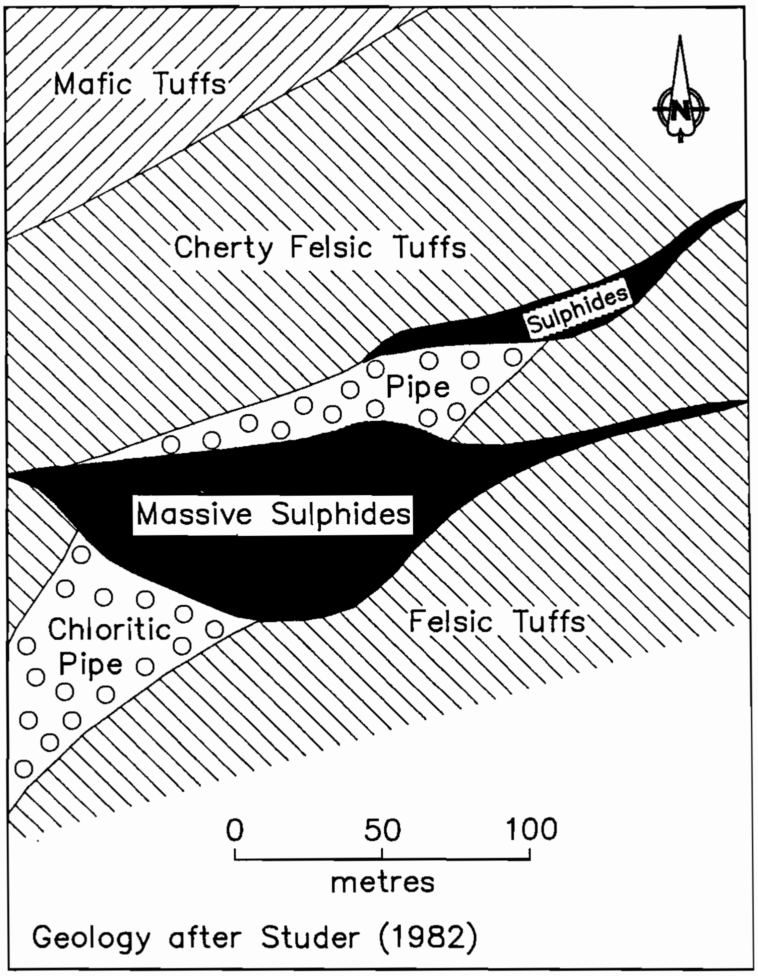

Figure 76-6: A reconstruction of pre-deformation geology at the Stall Lake deposit.

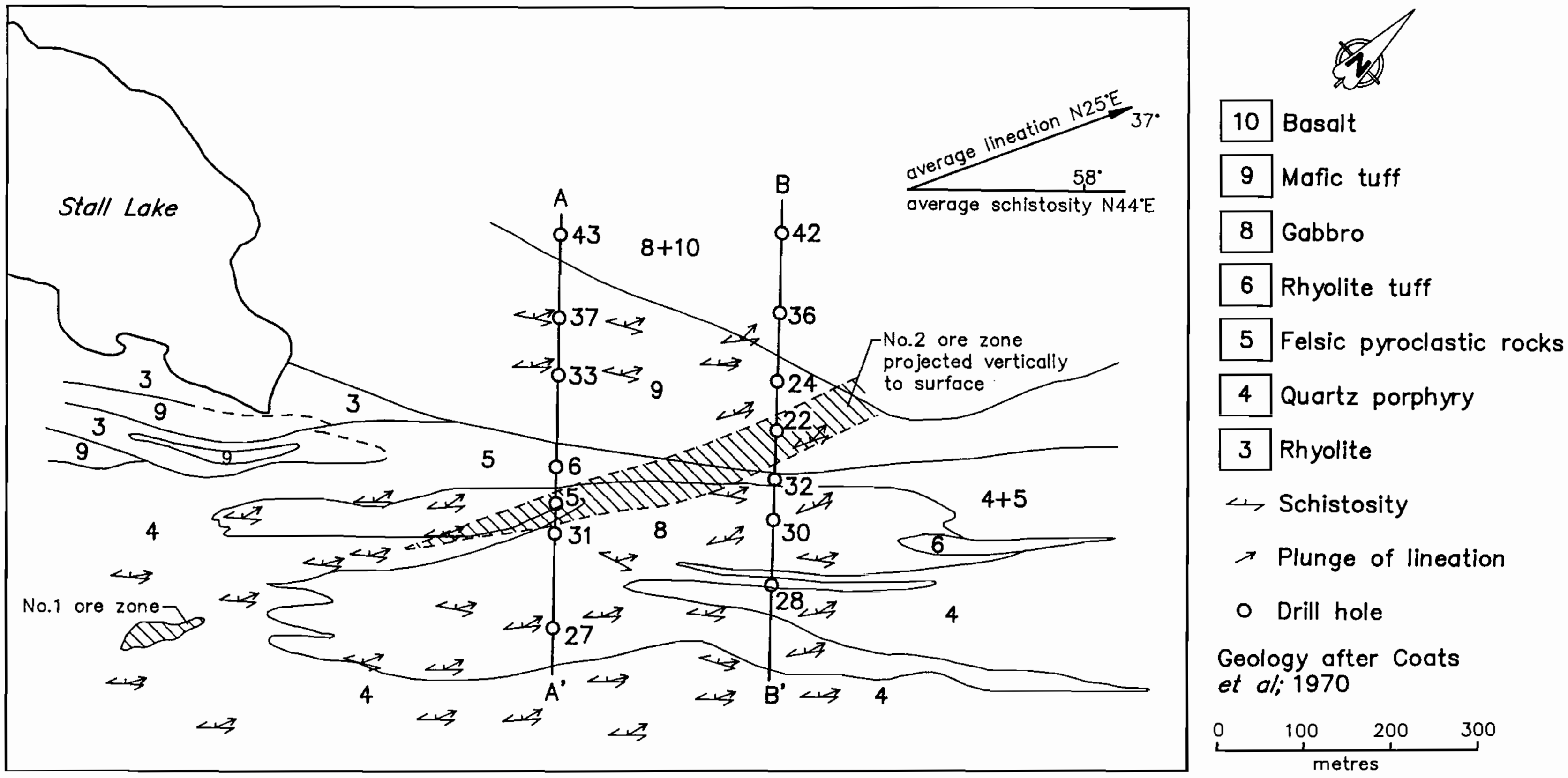

Figure 77-1: Geological setting of occurrence 77, Rod deposit.

LOCATION: **77**

NAME: Rod Cu-Zn deposit

UTM: 6078874N/440911E

ACCESS: Rod Mine access road from Provincial Road 393.

AREA: East end of Stall Lake.

AIRPHOTO: A20127-110

EXPLORATION SUMMARY:

The area was first staked as P.D. 7 in the late 1920's. W.F. English did surface work on the property between 1942 and 1948. In 1951, P. Stewart staked Rod 4 and 5 to cover a copper-gold showing and assigned the claims to Kay Lake Mines Limited. A magnetometer survey was done in 1952 and trenching in 1953. HBED optioned the property in 1955 and did a Boliden hoop EM survey. A short strike length, strong conductor was drilled. HBED did an HLEM survey between 1956 and 1957 (A.F. 90119) and a 36 hole, 7258 m, drill program, but dropped the option in 1958. Stall Lake Mines Limited acquired the property in 1959. A Turam survey and a 55 hole, 5212 m, drill program was done that year. The presence of the No. 1 or A Zone orebody was established. By 1963 a shaft had been sunk to 99 m with levels at 30 m, 61 m, 70 m and 91 m. The No.1 orebody was mined out in April, 1964 and all mining ceased. Falconbridge Nickel Mines Limited acquired a working interest in the property in 1965 and carried out geological, geochemical, magnetic and AFMAG surveys, as well as underground mapping. By the end of 1965 a further 14 holes were drilled to test the No. 1 zone at depth; the No. 2 ore zone was discovered during this exploration. The No.2 zone was delineated by drilling between 1965 and 1968. A joint deep drilling program was done in 1968 by Falconbridge Nickel Mines Limited and HBM&S. Falconbridge resumed drilling in 1969 to test geophysical conductors delineated on the property and acquired a 50% interest in the property. Explored Area Lease 31 was issued in 1975. In 1979 the property was leased to HBM&S for 10 years. The shaft reached a depth of 689 m by 1984. Production from the No. 2 zone began in March, 1984. HBM&S planned to drill the area between the Stall and Rod mines at the 590 m level (Northern Miner Magazine, March 1989). HBM&S has leased the property until 1995 (Canadian Mines Handbook, 1990-91). Production ceased in June, 1992.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group intercalated mafic flows, pyroclastic and volcaniclastic rocks and felsic pyroclastic and volcaniclastic rocks (Fig. 75-1; Froese and Moore, 1980). The host rocks to the Rod deposit are situated on the northeast extension of the east limb of the Threehouse Syncline.

The geology of the immediate area of the deposit (Fig. 77-1) has been described by Coats *et al.*; (1970) and the following discussion has been derived primarily from this publication. Descriptions of the individual units are described in ascending order below and depicted in Figure 77-2. Two geological cross sections through the deposit are presented in Figure 77-3.

Basalt

Basalt characterizes the base and upper limits of the volcanic units exposed near the deposit. The basal unit of basalt tends to be massive and fine- to medium-grained, whereas the uppermost basalt is very fine grained, contains relic flow structures and pillows.

Rhyolite

Rhyolite containing highly contorted lamination and banding, interpreted to represent deformed primary flow structures associated with viscous extrusion, occurs within the quartz porphyry host rocks to the deposit. The majority of rhyolite at the occurrence, however, forms an approximately 100 m thick unit near the base of the felsic volcanic sequence.

Quartz Porphyry

A northeast-trending, moderately well foliated felsic volcanic unit represents the host rocks to the deposit. This unit has an approximate thickness of 762 m and is banded. The unit weathers light buff, is pinkish on fresh surfaces and contains amphibolitic, chloritic and micaceous bands near the deposit. Clear to blue quartz up to 0.5 cm diameter constitutes from 1 to 20% of the rock and microscopically appears as strained single crystals or aggregates of finer grained strain-free quartz. The foliation in the rock wraps around the quartz "eyes" and, in part, is cut by them.

Mineralogically, the quartz porphyry contains 80 to 85% quartz and untwinned feldspar in a 0.01 to 0.12 mm matrix. The quartz and feldspar are accompanied by 8% muscovite, 3 to 4% biotite, 3 to 5% carbonate, 1% plagioclase, 1% pyrite and trace apatite.

The quartz "eyes" in this unit are interpreted to represent products of nucleation of quartz crystal fragments in an ash matrix. A felsic pyroclastic unit is included with the quartz porphyry and is distinguished by the relative absence of quartz "eyes" and the presence of lapilli in an ash matrix. Additionally, a unit of rhyolitic tuff breccia occurs within the quartz porphyry. The breccia contains numerous, well defined, elongate cherty rhyolite fragments up to 30 cm in dimension. Microscopically, the matrix contains 60% quartz, 25% untwinned feldspar, 8% biotite, 5% chlorite, 2% carbonate, 1% muscovite, less than 1% garnet and trace apatite. Rhyolite fragments contain abundant fine grained carbonate.

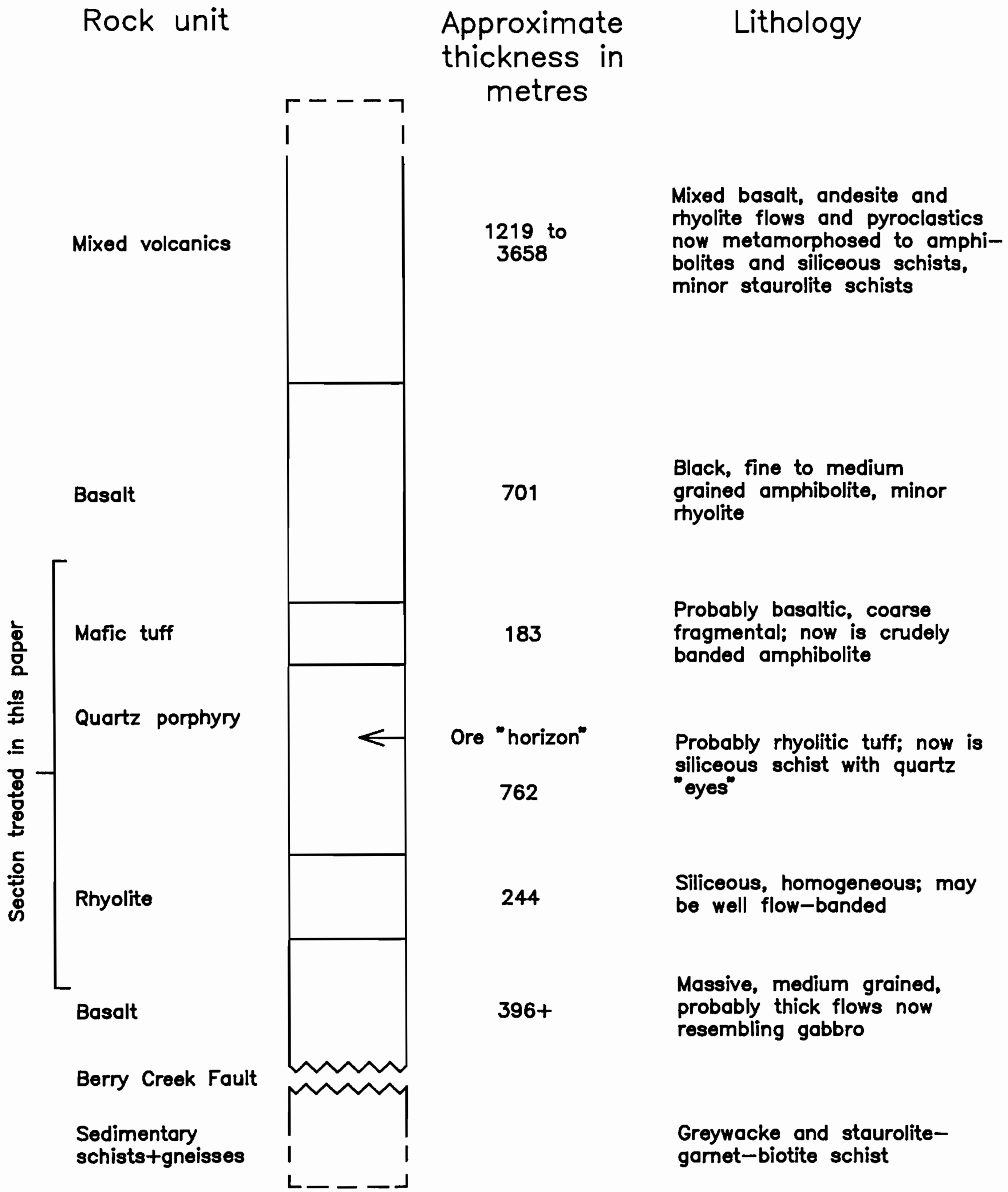

Figure 77-2: Stratigraphic sequence in the area of the Rod deposit (modified after Coates et al., 1970).

Mafic Tuff

A 244 m thick section of mafic tuff overlies the quartz porphyry. It is well layered with some narrow layers containing abundant sheared rhyolite fragments. In addition to this unit, 46 m thick layers of mafic tuff occur within the quartz porphyry. These layers are dark, fine grained, well banded, locally agglomeratic units that consist of 40 to 45% hornblende and approximately 35% quartz. Quartz grain size averages 0.05 mm in darker bands and 0.25 mm in lighter bands. The remainder of the minerals in the tuff include 5 to 10% plagioclase, a maximum of 10% epidote and 5% carbonate, minor chlorite, magnetite and rare garnet. The darker bands in the tuff are interpreted to originally have been a fine glassy-ash.

Intrusions

The volcanic rocks are intruded by two types of gabbro:

Type 1: A massive, fine- to medium-grained gabbro that occurs as 30 m long and 6 m wide sills. A similar gabbro occurs in the hanging wall to the No. 2 ore zone, where it is 762 m long and 152 m wide, possibly represents a feeder for basaltic extrusive rocks north of the deposit. Microscopically, the rock is characterized by 50% untwinned feldspar, 30% hornblende, 15% quartz, 5% biotite, 1% opaques and minor apatite.

Type 2: This coarse grained gabbro occurs as 31 m to 62 m thick sills in the footwall rhyolite. The gabbro is syntectonic and varies from sheared and chloritic varieties to less altered equivalents that contain fresh pyroxene.

MINERALIZATION:

The Rod mineralization can be divided into two mineralized zones.

No. 1 Ore zone

Mineralization in this zone consists of a lens of near solid to solid pyrite, arsenopyrite, chalcopyrite and minor sphalerite that dip 40° to 45° northwest and plunge 32°/028°E. This lens varied in thickness between 0.6 and 8 m and had a maximum plan length of 67 m on the 61 m level of the mine. The nature of the sulphide mineralization was highly variable in this zone, and included:

(i) fine grained near solid pyrite;
(ii) 50 to 75% coarse grained pyrite and pyrrhotite in a fine grained blue-green matrix of chlorite and sericite;
(iii) narrow zones of up to 50% disseminated pyrrhotite with lesser pyrite;
(iv) 25 to 50% vuggy pyrite, pyrrhotite and chalcopyrite hosted by coarse grained quartz veins; and
(v) disseminated sulphides, primarily pyrite, in a coarse grained biotite-rich layer with quartz phenocrysts and light coloured rock fragments.

The host rock to type (v) mineralization was characterized by 60% quartz, 15% staurolite, 8% biotite, 5% chlorite, 8% pyrite and 3% magnetite.

No. 2 Ore Zone

This lens of disseminated and near solid (60 to 90%) to solid sulphide has a length of 533 m and a width that varies from 122 to 244 m. The mineralization includes chalcopyrite, pyrite, sphalerite, pyrrhotite, arsenopyrite and minor galena and marcasite in a uniform lens. The lens dips 50° to 60° northwest and plunges 25° to 30° northeast. This lens is separated from the No. 1 zone by a 228 m gap along plunge that may be due to tectonic deformation or may reflect primary paleotopographical control of sulphide deposition. Copper- and zinc-rich near solid sulphide mineralization changes laterally and vertically to disseminated iron sulphides and disseminated sulphides grade into near solid sulphides over less than 1 m. Sharp contacts are observed between the quartz porphyry host rocks and the mineralized zones.

Metal Distribution

The distribution of copper and zinc in the No. 2 ore zone is marked by a high grade linear zone of both copper and zinc enveloped by disseminated, predominately iron sulphide minerals. In general, copper content in the ore is four times greater than zinc.

The mineralogy of the No. 2 ore zone, based on 67 polished sections and polished thin sections, indicates that the following sulphide minerals and their proportions are representative of this ore zone: 40% chalcopyrite, 30% pyrite, 15% sphalerite, 12% pyrrhotite, 3% arsenopyrite, and minor galena and marcasite.

A wide variety of textures exists for the various ore metals in the sulphide mineralization. Approximately 40% of the chalcopyrite contains particles or blebs of sphalerite or pyrrhotite. Fifty percent of sphalerite contains globules and exsolution blebs of chalcopyrite, and a further 30% includes pyrrhotite blebs. Galena occurs as 0.19 mm patches in high-grade copper zones.

Gold and silver, minor constituents of the ore zones, have a variable distribution in the sulphide mineralization. In zones with greater than 3% Cu, there is an arithmetic average of 0.015 g/t Au and 22.4 g/t Ag, whereas in low grade or subeconomic zones, Au averages 0.003 g/t and Ag averages 2.7 g/t. Gold and silver minerals were not identified in the ore and probably occur as atomic substitutions within sulphide minerals.

In addition to copper, zinc, gold and silver, high grade copper intersections contained 0.06 to 0.12% Co with a maximum value of 0.35% Co. Electron microprobe analyses indicate cobalt occurs in arsenopyrite, and to a lesser extent, in pyrite. Cobalt minerals were not identified in the sulphide mineralization in the ore zones.

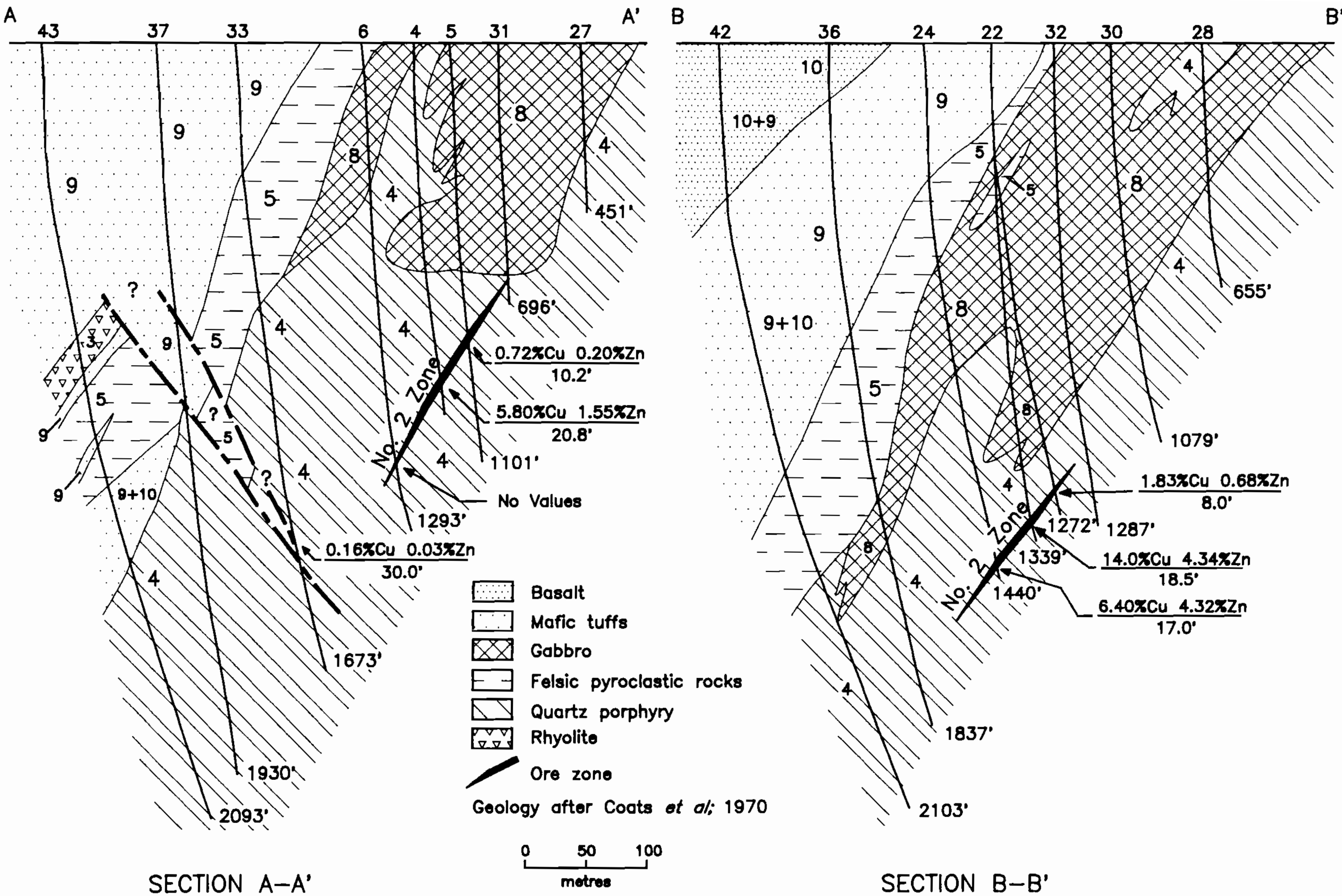

Figure 77-3: Geological cross sections through the Rod Cu-Zn deposit. Locations of sections are marked on Figure 77-1.

Alteration

The predominant type of alteration at the deposit is carbonatization. Carbonate occurs widely as; (i) grayish-white to buff coloured zones of replacement adjacent to fractures, (ii) coarse grained mosaic patches in the sulphide ore, (iii) narrow, ptygmatic veinlets that crosscut the sulphide mineralization, and (iv) veins containing mobilized sphalerite and chalcopyrite. The most intense carbonate alteration produces a grayish-white rock with small rounded zones of unaltered rock within the carbonate alteration. This carbonate alteration occurs in the wall rocks for 3 to 6 m in the hanging wall and, less extensively, in the footwall rocks to the No. 2 Zone.

The carbonate is considered to have been an original constitutent of the volcanic sequence. Subsequent deformation and metamorphism mobilized carbonate in solution with intrastratal pore waters. Eighteen trenches (Fig. 77-4 and 77-5) were mapped southeast of the surface projection of the Rod orebody. The trenches expose white quartz veins and pods hosted by quartz phyric rhyolite (Fig. 77-6) and mineralized with galena, arsenopyrite and minor pyrite and chalcopyrite.

GEOCHEMICAL DATA:

The No. 1 ore zone at the Rod deposit contained 23 000 tonnes grading 5.0% Cu and 4.5% Zn; the No. 2 zone contained 645 000 tonnes grading 6.15% Cu and 2.85% Zn (Bamburak, 1990). In addition to Cu and Zn reserves cobalt assays, averaging 0.09% Co with a maximum of 0.35% Co, were reported by Coats *et al.* (1970). The No. 2 zone produced 42 621 tonnes grading 6.39% Cu and 2.2% Zn in 1984 (Mineral Inventory Card 63J/13 Cu 3).

ICP-AAS analysis of seven samples of near solid to solid sulphide ore from the deposit indicates that, in addition to high copper and zinc, the following ranges for trace elements are present in the samples: 25 to 49 ppm Pb, 0.4 to 15.8 ppm Ag, 83 to 12 220 ppb Au, 106 to 206 ppm As, 2 to 49 ppm Sb, 2 to 82 ppm Bi, 1 to 5 ppm Cd, 186 to 364 ppm Co, and 113 to 472 ppm W. Thirty-six representative chip samples were collected from the quartz veins exposed in the trenches and immediately adjacent to the trenches. The samples contain high gold and silver and low base metal values (Appendix I). A representative major and trace element analysis for the host rhyolite to the Rod deposit is presented in Table 77-1.

Ferreira and Fedikow (1988, 1990) delineated Cu, Zn, Co, Ni, Fe, Mn, H^+ and specific conductance haloes in humus samples collected from a grid centered on the deposit.

Table 77-1: Representative silicate whole rock and trace element analysis of quartz-phyric rhyolite that hosts the Rod deposit.

SiO_2	77.9
Al_2O_3	11.9
FeO	0.49
CaO	0.90
MgO	0.39
Na_2O	4.65
K_2O	1.93
TiO_2	0.24
P_2O_5	0.09
MnO	0.01
H_2O	0.37
S	0.01
CO_2	0.67
Other	0.03
Total	99.58
Ni	23
Cr	nd
Ba	131
Cu	28
Pb	nd
Zn	3
Mn	46

nd - not detected

CLASSIFICATION:

Stratabound massive sulphide type deposit; volcanic rock associated. The deposit is interpreted to have formed contemporaneously with the volcanic host rocks. Pseudobanding and flow textures in the sulphide ore is attributed to recrystallization under conditions of differential movement during metamorphism. Bailes and Galley (1991) mapped an apophysis of the Sneath Lake pluton that crosscuts stratigraphy and envelopes the Rod No. 1 and 2 Cu-Zn orebodies. This represents a significant re-interpretation of the geological setting of the Rod deposit and differs from the observations of Coats *et al.* (1970).

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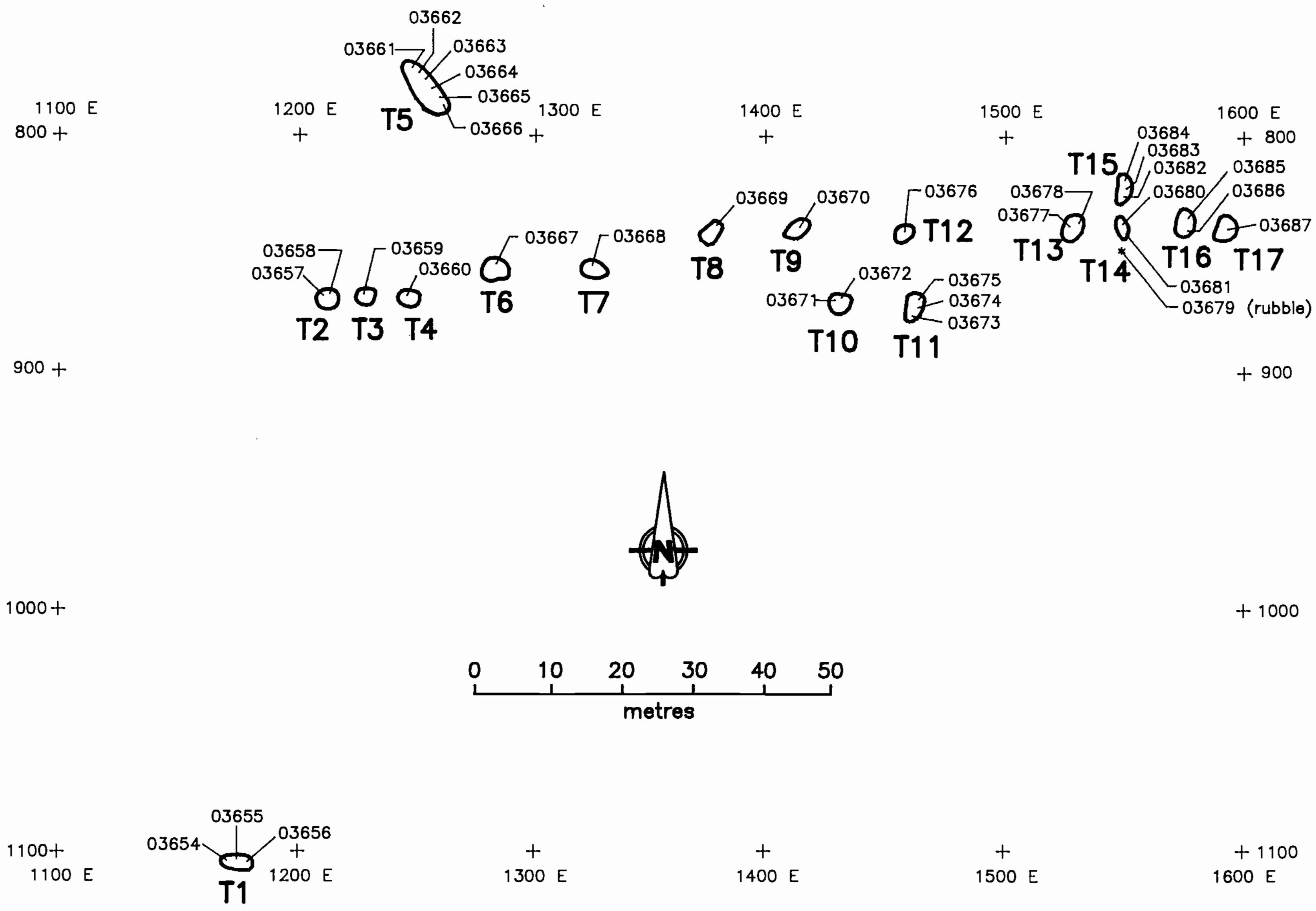

Figure 77-4: Trench and sample location map, vicinity Rod Cu-Zn deposit. Trench locations, relative to the vertical projection of the Rod deposit, are presented in Figure 77-6.

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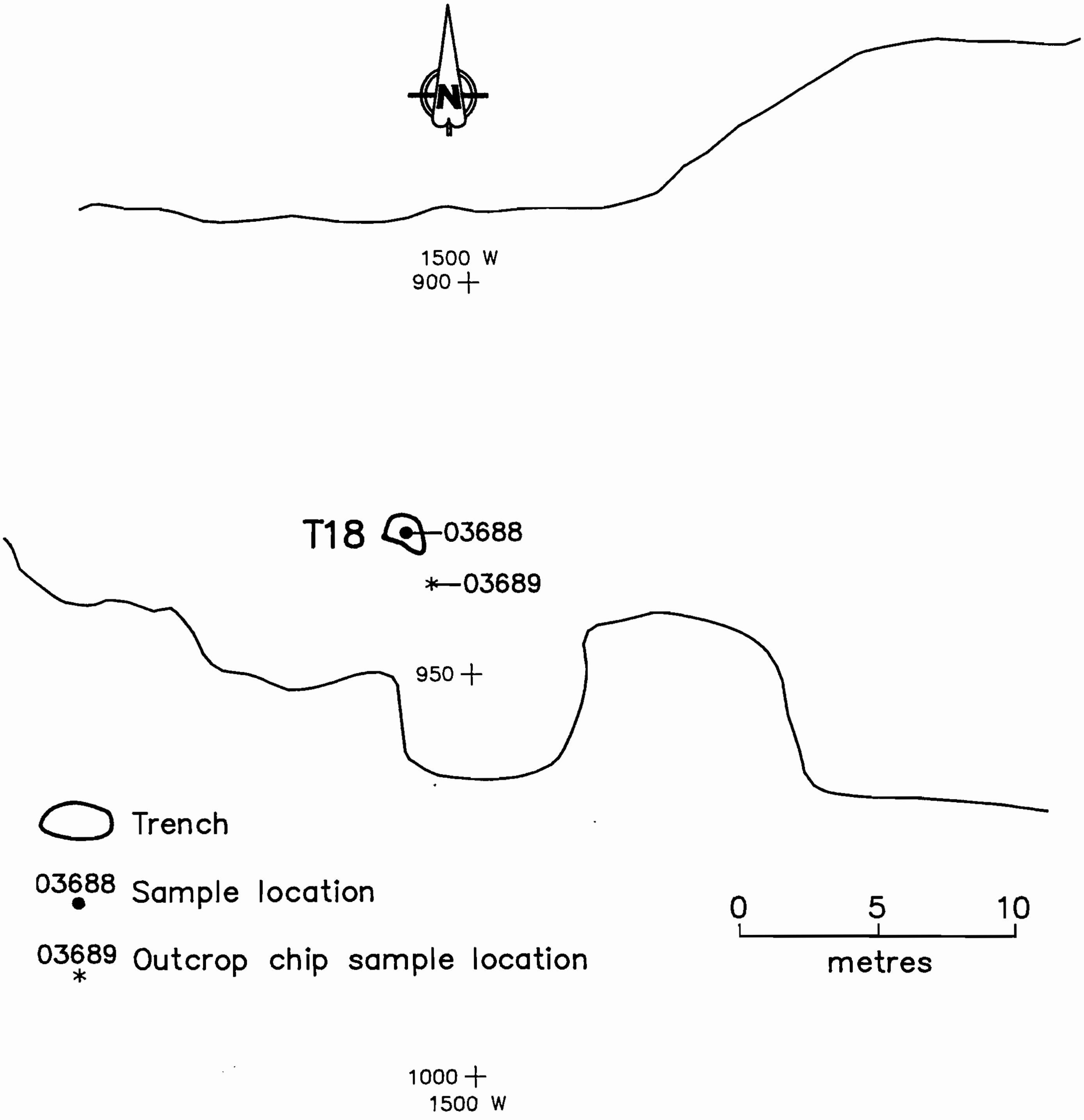


Figure 77-5: Trench and sample location map, vicinity of the Rod Cu-Zn deposit. Trench location, relative to the vertical projection of the Rod deposit, is presented in Figure 77-6.

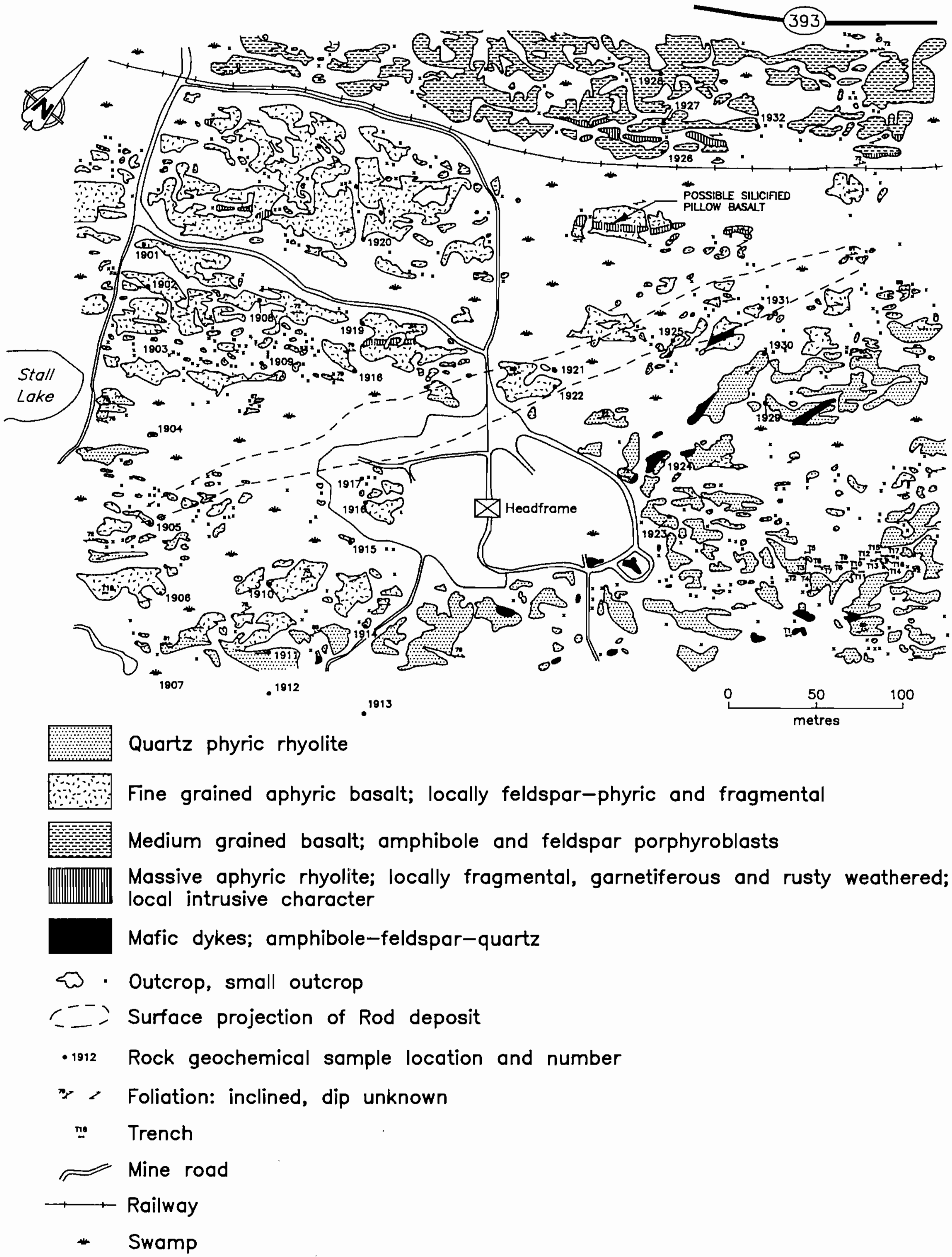
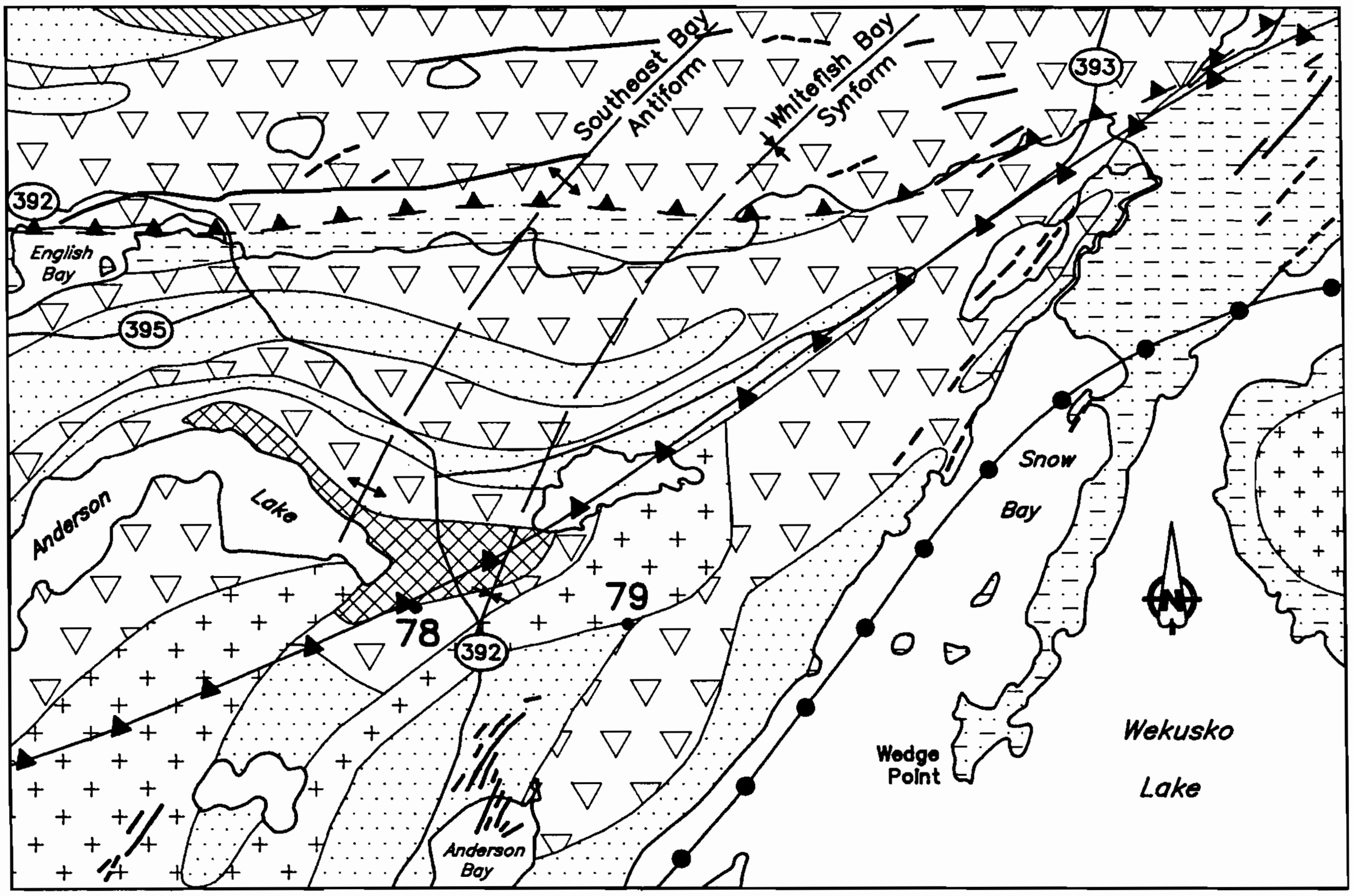


Figure 77-6: Geological map in the area of the vertical projection of the Rod Cu-Zn deposit.



APHEBIAN

Granodiorite

MISSI GROUP

Lithic arenite

AMISK GROUP

Greywacke and shale containing zones of calc–silicate rocks and coarse garnet schists

Quartz–eye tonalite (Sneath Lake Pluton)

Mafic flows, pyroclastic and volcaniclastic rocks; minor felsic fragmental rocks

Altered equivalents of felsic pyroclastic and volcaniclastic rocks containing kyanite, sillimanite, anthophyllite and cordierite

AMISK GROUP

Felsic pyroclastic and volcaniclastic rocks; minor mafic fragmental rocks

McLeod Road Thrust Fault

Biotite–sillimanite isograd

Biotite–staurolite isograd

Geology after Froese and Moore (1980)

Ground EM conductor (A.F. 92130)

•78 Occurrence location

0 1 2

kilometres

Figure 78-1: Geological setting for occurrences 78 and 79.

LOCATION: **78**

NAME: Ram Zone
UTM: 6078148N/438423E
ACCESS: Provincial Highway 392 and traverse.

AREA: East end of Anderson Lake.
AIRPHOTO: A20170-16

EXPLORATION SUMMARY:

The area was first staked as Garnet prior to 1930. A.J. 11 was staked by J. Dickson in 1945 and cancelled in 1946. In 1955 Ram 252 and 257 were staked by R. Ross and S.L. Russell and assigned to HBED. Leases M-5748 and M-5752 were issued for 21 years to HBM&S in 1959. The leases were grouped in 1963 and renewed in 1992.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by felsic pyroclastic and volcaniclastic rocks and their hydrothermally altered equivalents that contain kyanite, sillimanite, anthophyllite and cordierite. These rocks are flanked to the west by quartz- and quartz-feldspar-phyric tonalite and to the south by basaltic flows, pyroclastic and volcaniclastic rocks. These rocks units have been assigned to the Amisk Group (Fig. 78-1; Froese and Moore, 1980). The biotite-sillimanite isograd transects the area of the occurrence. Trembath (1986) mapped altered felsic volcanic rocks that contain the upper greenschist to lower amphibolite facies mineral assemblage of garnet-staurolite-chlorite-kyanite and biotite in the immediate area of the occurrence. Amygdaloidal basalt and basaltic flow breccia were mapped to the south of the occurrence (Fig. 78-2).

MINERALIZATION:

The Ram Zone consists of a disseminated iron and base metal sulphide body with an associated footwall alteration zone characterized by disseminated to solid sulphide stringers. The footwall alteration zone is developed in fine grained, quartz phyric felsic volcanic rocks interpreted to represent tuff (Froese and Moore, 1980). The chloritic alteration zone at the Ram Zone consists of 75 to 90% fine grained quartz with up to 25% fine grained chlorite, some of which is retrograde after biotite. Other mineralogical components of the alteration zone are almandine, staurolite, biotite, kyanite and muscovite. Relic fragments of massive medium grained ultramafic rock occur in the alteration pipe. These fragments are rimmed by biotite and almandine. Late muscovite, biotite and staurolite porphyroblasts replace and crosscut the chlorite matrix. At its furthest extent, the alteration zone is characterized by enrichment in mafic minerals and an anastomozing fracture pattern. Minor amounts of 1 to 2 mm (locally up to 6 mm) magnetite porphyroblasts also occur at the fringes of the chlorite alteration (Trembath, 1986). The Ram Zone is situated stratigraphically beneath the Stall Lake stratabound massive sulphide type copper-zinc deposit (Location 76).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Stratabound massive sulphide type deposit; volcanic rock associated.

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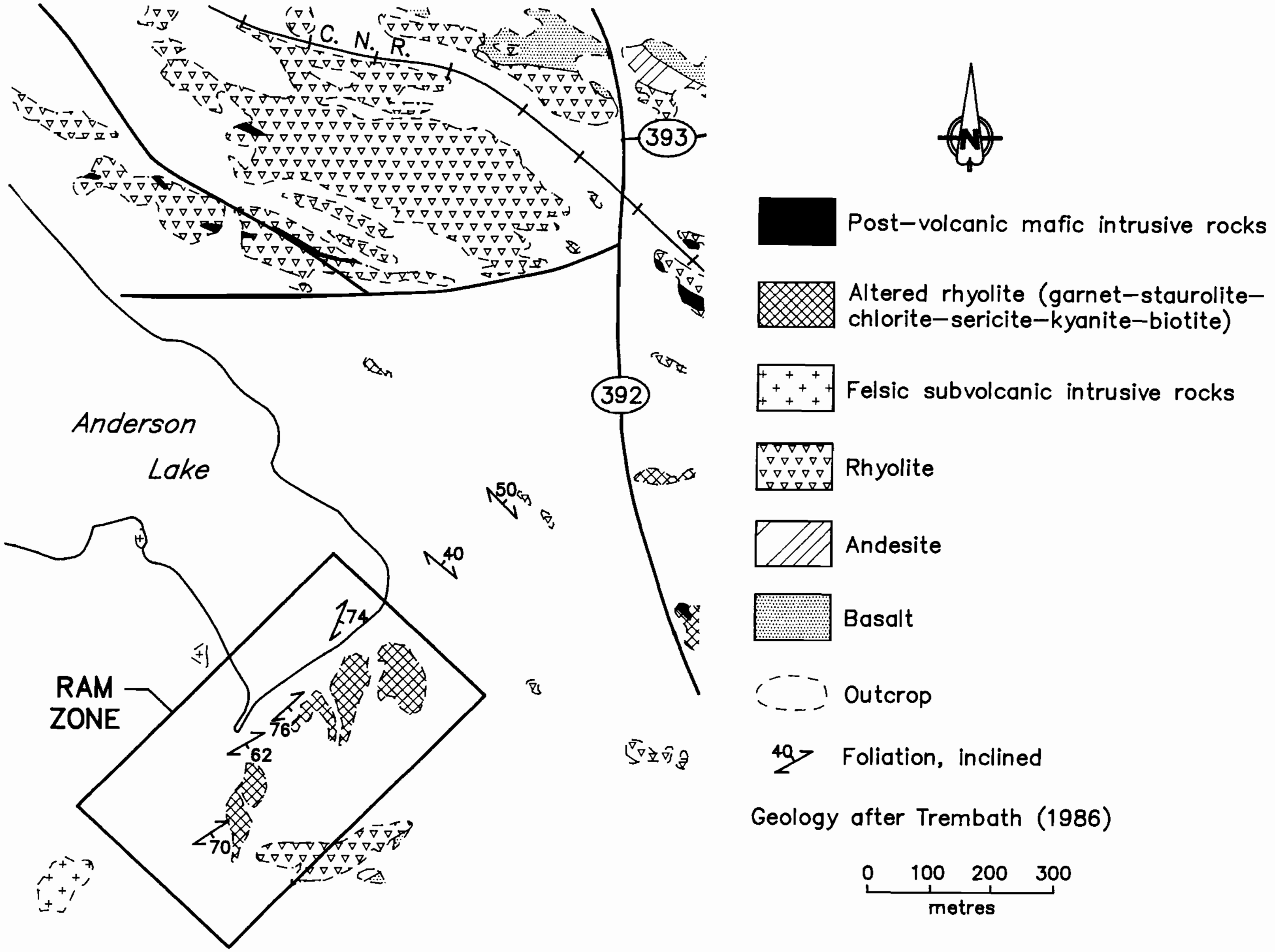

Figure 78-2: Outcrop, geology and alteration mineral assemblages, Ram Zone, occurrence 78.

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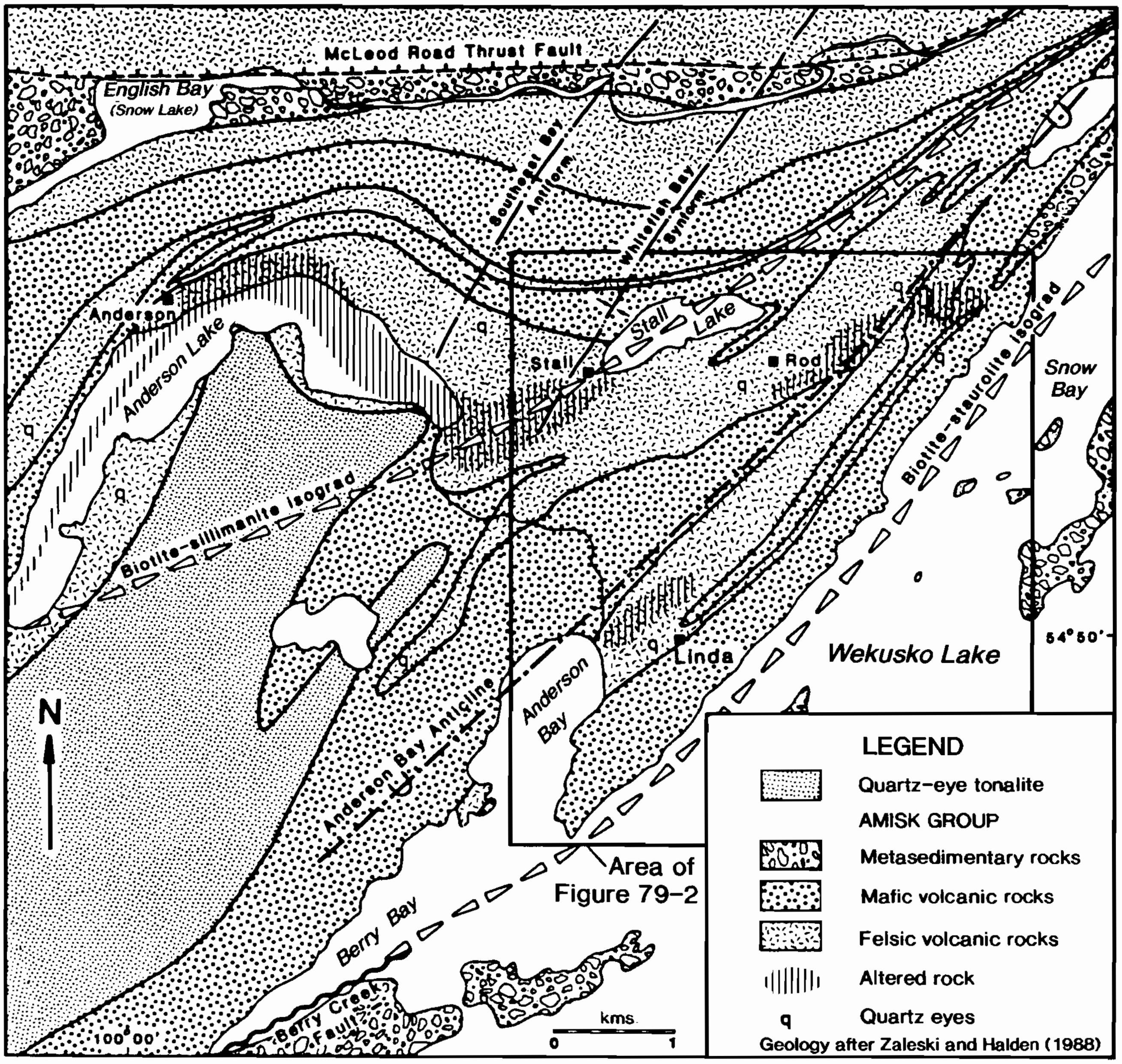

Figure 79-1: Geological setting of occurrence 79, the Linda deposit.

LOCATION: **79**

NAME: Linda Cu-Zn deposit
UTM: 6077710N/440439E
ACCESS: Trail from Provincial Road 392.

AREA: North of Anderson Bay, Wekusko Lake
AIRPHOTO: A20127-109

EXPLORATION SUMMARY:

The area was first staked as Savage 1 to 4 and Bull 2 to 5 prior to 1930. In 1945 Wren 1, 2, 5, 6 and 7 were staked by Naomi Vance and Robin 1 and 2 and Linda 1 to 6 were staked by Joe Taylor. In 1948 Walter Johnson staked Linda 7 and 8. Surface work was done on the Wren claims between 1946 and 1949. Diamond drilling was carried out on the Linda-Robin-Wren group between 1947 and 1950. The Robin claims were cancelled between 1948 and 1949. The Wren claims, except for Wren 7, were cancelled between 1950 and 1951. Surface work was done on the property between 1951 and 1952, followed by diamond drilling from 1952 to 1954. In 1955 Naomi Vance staked Linda 15 to 20. Walter Johnson acquired all claims between 1954 and 1955. HBED optioned the property from 1955 to 1957 and did an HLEM survey (A.F. 90119, 90108). Diamond drilling was reported between 1956 and 1957. Linda 7 and 8 and Wren 7 lapsed in 1957. Diamond drilling was reported on the Linda group of claims from 1957 to 1962. Hung 1 Fr. and 2 Fr. were staked by Joseph H. Kerr in 1961, and work was done on the property between 1962 and 1964. In 1964 J.H. Kerr acquired Linda 1 to 6 and Linda 15 to 20. HBED took a second option on the property from 1964 to 1966 and carried out diamond drilling and geophysical surveys. HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650). Falconbridge Nickel Mines Limited acquired the property in 1969 and carried out geophysical surveys and diamond drilling before assigning the property to Linda Mines Limited in 1972. Diamond drilling was reported on the claim grouping for the period 1972 to 1978. In 1980 Corporation Falconbridge Copper acquired the property. The company had drilled the deposit extensively from 1978 to 1981 (Zaleski, 1986). In 1987 the company's name changed to Minnova Inc. and a joint venture agreement was signed with International Thunderwood Explorations Limited. International Thunderwood could earn a 40% interest in the property by spending $1.75 million by February 1990 (Northern Miner, November 30, 1987). Pierce Mountain Resources Limited was reportedly exploring the property (The Thompson Citizen, January 9, 1988). Diamond drilling was carried out in 1988.

GEOLOGICAL SETTING:

The general area of the Linda copper-zinc deposit is characterized by felsic pyroclastic and volcaniclastic rocks flanked to the southeast and northwest by mafic flows, pyroclastic and volcaniclastic rocks (Fig. 79-1). These units have been assigned to the Amisk Group within the chlorite-biotite-staurolite metamorphic zone (Froese and Moore, 1980). The presence of a zone of alteration, characterized by disseminated and stringer sulphides, northwest of the Linda deposit is used to indicate a south-facing direction for the stratigraphic sequence in this area and to postulate the occurrence of the Anderson Lake anticline (Gale and Koo, 1977). This hypothesis has since been reiterated by Zaleski (1989) and suggested by Bailes and Galley (1991). Coats *et al.* (1970) and Jeffrey (1982, unpubl.) postulated that the Linda deposit occurs on the south limb of a major F_1 antiform and that the host rocks correlate to the Anderson Lake, Stall Lake and Rod deposit host rocks.

The Linda deposit occurs at the contact between felsic pyroclastic and volcaniclastic rocks with interlayered lenses of fine grained graphitic argillite and basalt. Rock units strike northeast and dip northwest; alteration assemblages northwest of the solid to near solid sulphide deposit indicate the deposit is overturned. Zaleski and Halden (1988) described many aspects of the deposit. Eleven lithologic units have been identified by field mapping and diamond drill core logging in the general area of the deposit (Fig. 79-2):

Unit 1: White to light grey to buff rhyolitic to dacitic volcanic and volcaniclastic rocks characterize this unit. Biotite defines S_1, a fine compositional layering of metamorphic origin. The lower portions of this unit are variably altered rhyodacitic volcanic rocks. Volcanic breccia is dominant in the upper sections of this unit and are commonly interlayerd with massive fine grained to aphanitic felsic rocks. These rocks host the alteration zone to the Linda deposit.

Unit 2: Massive to weakly layered and foliated basalt containing patches of alteration rimmed by plagioclase phenocrysts. Pillowed flows are commonly sheared and bleached. Hornblende is the most common mineral and defines a strong lineation.

Unit 3: Fine grained graphitic sedimentary rocks occur in laterally restricted lenses within felsic volcanic breccia and massive fine grained to aphanitic rocks of unit 1. This unit contains disseminated pyrite, pyrrhotite and small near solid sulphide lenses.

Unit 4: Quartz phyric felsic porphyry with 5 to 25%, 3 to 8 mm blue quartz-eyes hosts the near solid to solid sulphide Linda deposit. Northwest of the Anderson Bay anticline, this unit is massive and locally fragmental, whereas southeast of the anticline, the unit is thinner and contains felsic volcanic breccia interlayers. Amphibole- and biotite-rich discontinuous layers are present in the unit.

Unit 5: This unit of near solid to solid pyrite with lesser sphalerite, chalcopyrite and pyrrhotite constitutes the Linda deposit.

Unit 6: Felsic to intermediate volcaniclastic rocks contain lapilli or coarse ash and crystals in a dark-grey

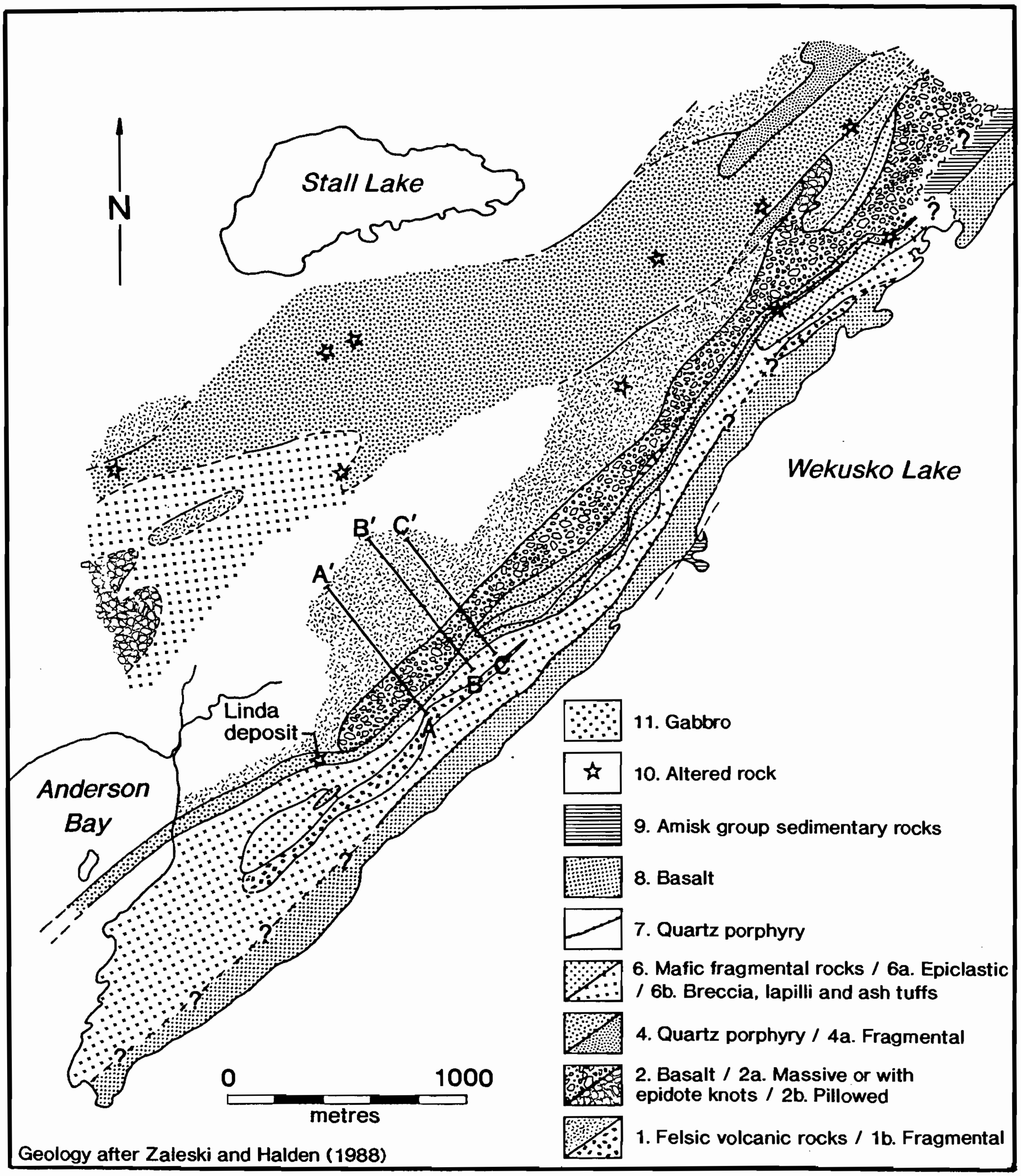

Figure 79-2: Local geological setting of occurrence 79, Linda deposit.

layered mafic matrix. Layering is defined by a 0 to 20% variation in clast concentration. Coarser units contain decimetre-sized clasts, are matrix supported, poorly sorted and heterolithologic.

Unit 7: This unit of quartz porphyry, 0 to 10 m thick, is a marker unit in the higher levels of stratigraphy. Layering is defined on a centimetre scale by interlaminated quartz-eye and feldspar phyric units with solely feldspar phyric units. This unit can be traced for 200 m.

Unit 8: Fine grained massive basalt with a well developed chloritic cleavage and interbeds of coarse ash or crystal tuff and/or bedded tuffaceous sedimentary rocks characterize unit 8.

Unit 9: This unit is characterized by poorly exposed, bedded greywacke.

Unit 10: Altered equivalents of felsic quartz porphyry comprise two distinct schistose alteration zones. A subconcordant zone, distal to mineralization, occurs 200 to 250 m stratigraphically below the Linda deposit. A proximal and discordant alteration zone developed in quartz porphyry of units 1 and 4 immediately underlies the deposit. These altered rocks comprise staurolite ± kyanite ± muscovite ± chlorite ± pyrite ± garnet.

Unit 11: Southeast of Anderson Bay, a non-mineralized, coarse grained, undeformed, hypidiomorphic gabbro intrudes the volcanic rocks.

MINERALIZATION:

The Linda Cu-Zn deposit is a near solid to solid medium- to coarse-grained pyritic deposit hosted by quartz porphyry. Abundant calcite and/or quartz is intergrown with the pyrite. The pyritic zone contains minor amounts of irregularly distributed pyrrhotite, sphalerite and chalcopyrite. A zone of several small sulphide lenses associated with stringer and disseminated sulphides stratigraphically underlies the main body of sulphide mineralization. The mineralogy of these small lenses varies from dominantly pyrite-calcite, to pyrite with minor pyrrhotite-sphalerite-chalcopyrite.

The main pyritic lens of mineralization and the proximal and distal alteration zones extend greater than 1500 m down plunge. This ovoid lens is 150 to 200 m in length with a thin (>3 m) layer extending up to 100 m laterally from it. Both the main lens and the lateral pyritic equivalents are enveloped by the proximal alteration zone that narrows and bifurcates at depth. A three-dimensional reconstruction of this zone indicates that the zone has an overall sheeted appearance.

Alteration

Two different types of mineralization-related alteration have been documented in proximity to the Linda deposit (Fig. 79-3). These synvolcanic hydrothermal alteration zones are marked by mineral assemblages produced during regional metamorphism.

The alteration zone immediately underlying the deposit is termed the proximal alteration zone and contains minor sulphide lenses, stringer and disseminated sulphides and pyritic and pyrrhotite-bearing graphitic sedimentary rock. This zone is developed in felsic massive and fragmental volcanic rocks. Mineralogically, this zone is characterized by muscovite with mineral assemblages of kyanite, staurolite, gahnite, biotite, chlorite, margarite, tourmaline, with lesser magnetite, garnet, orthoamphibole and fuchsite. An intensely altered "core" zone to this proximal alteration contains muscovite, staurolite and gahnite.

The distal alteration zone stratigraphically underlies the proximal alteration zone, separated by visibly unaltered felsic volcanic rocks. Alteration mineralogy is characterized by chlorite with lesser staurolite, kyanite, muscovite, magnetite, biotite and gahnite. Garnet forms a mineralogical halo about the most intensely altered rocks. Calc-silicate minerals occur at the periphery of the distal zone. Drilling has intersected 1 m intervals of tremolite/ actinolite, epidote and calcite. Zaleski et al. (1991) describe the metamorphic petrology of the mineralization-related alteration at the Linda deposit. The Fe-Zn-Mg-Al alteration zones at the deposit are characterized by metamorphic assemblages that indicate crystallization under amphibolite facies conditions during syn-D2 peak metamorphism.

GEOCHEMICAL DATA:

Bamburak (1990) reports the deposit contains 11 800 000 tonnes grading 0.3% Cu, 0.8% Zn, 0.86 g/t Au and 10.29 g/t Ag.

CLASSIFICATION:

Stratabound massive sulphide type deposit; volcanic rock associated.

The proximal and distal alteration zones at the Linda deposit are interpreted to represent a reservoir and a conduit, respectively. The conduit has not been observed to intersect the reservoir. The distal alteration zone is characterized by a chlorite-staurolite-magnetite mineral assemblage indicating enrichment in magnesium, iron and aluminum and depletion in sodium and calcium. The calc-silicate envelope reflects high calcium and iron. Enrichments in potassium, iron, aluminum and depletion in sodium and calcium, reflected by the presence of the minerals muscovite, staurolite and kyanite, are documented in the proximal alteration zone. The presence of quartz veins may indicate that the silica was derived from the wall rocks to the alteration.

The Linda deposit formed as a result of compositionally evolved metal-rich fluids debouching on the sea floor. The fluids were derived from the distal alteration zone (reservoir) and channelled to the depositional site by the conduit represented by the proximal alteration zone. It is suggested that a synvolcanic fault controlled the location of the uprising fluids; however, the fact that this fault may currently be represented by the proximal alteration zone makes this hypothesis difficult to substantiate.

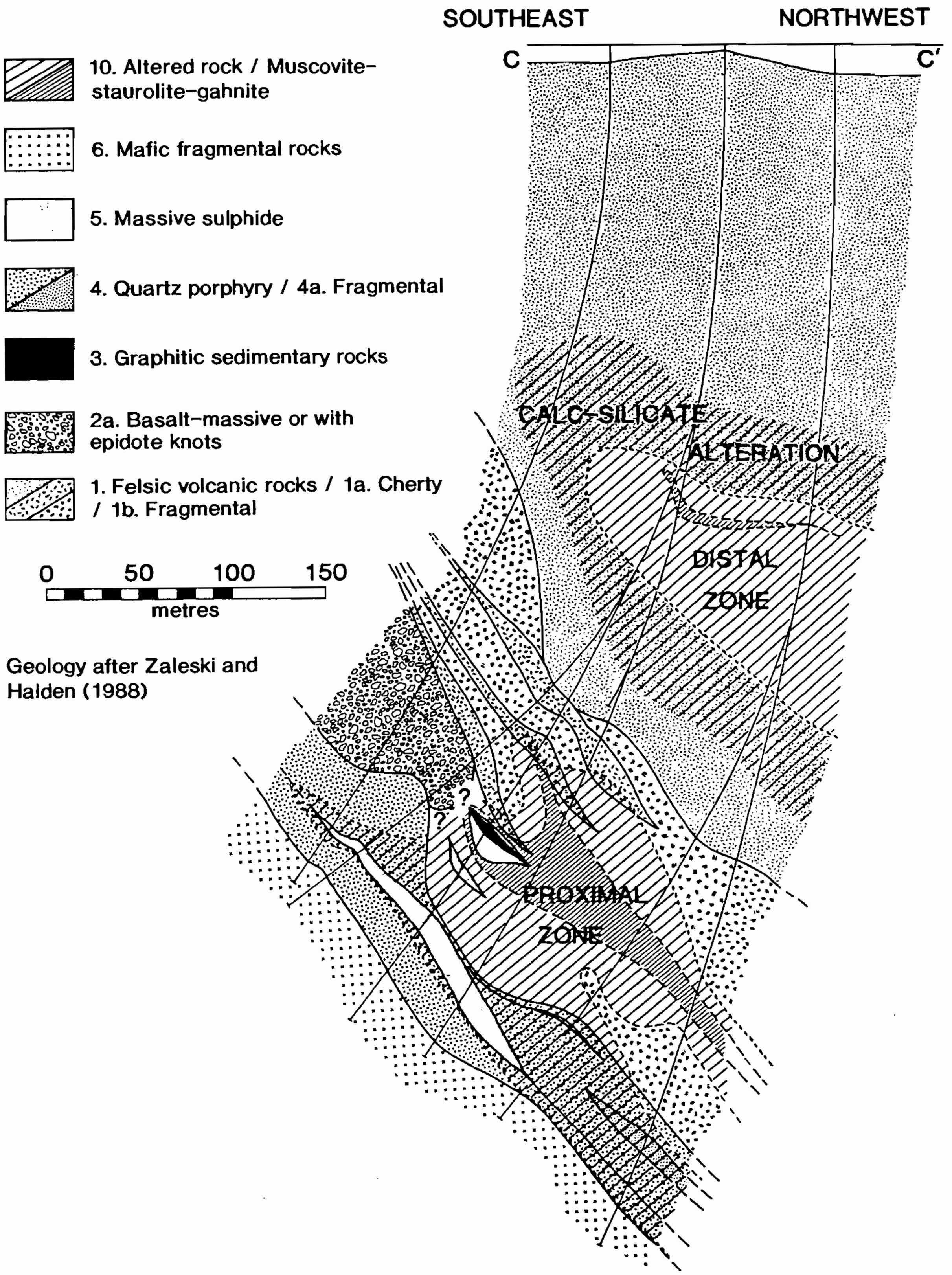

Figure 79-3: Geological cross section through occurrence 79, Linda deposit.

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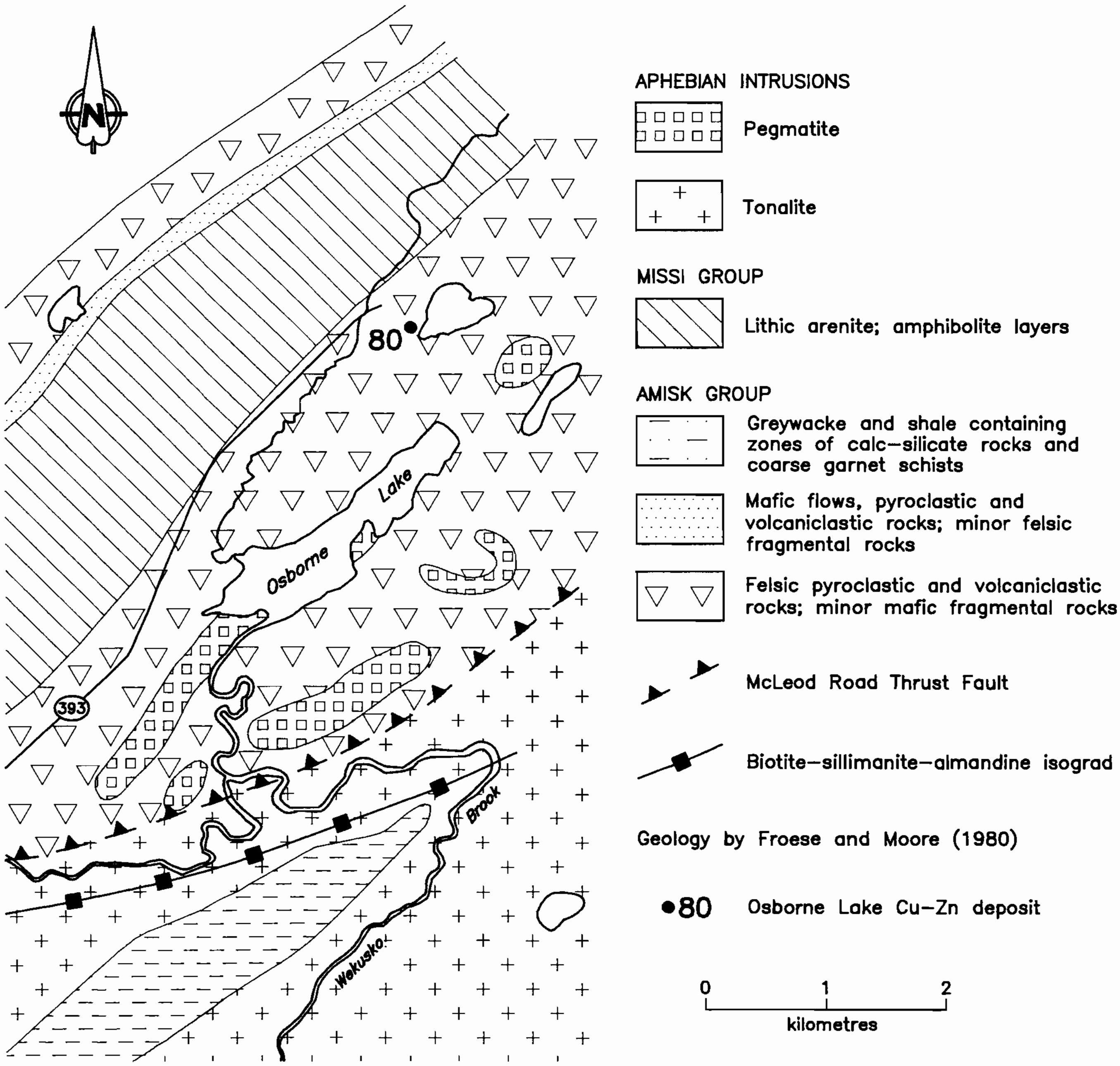

Figure 80-1: Geological setting of occurrence 80, Osborne Lake deposit.

LOCATION: **80**

NAME: Osborne Lake Cu-Zn deposit

UTM: 6090625N/453343E

ACCESS: Provincial Road 393 from Provincial Road 392.

AREA: At the end of Provincial Road 393; northwest of Osborne Lake.

AIRPHOTO: A20124-78

EXPLORATION SUMMARY:

The Lakeside, Lakeview and Great Bear groups were staked in the area prior to 1930. Work on these properties included trenching with assay values for base and precious metals reported in the Manitoba Miner (March 15, 1928). In 1929 Canam Metals Limited acquired the property and undertook diamond drilling. Surface work was done on the Pine Lake claims in 1945. In 1948 G.D. Tribble staked the T.K. group of claims, undertook a magnetometer survey and outlined several conductors. Wekusko Consolidated Limited undertook a 3 hole, 48 m, drill program on T.K. 1, 9 and 15 and collected samples for assay (A.F. 90081). The claims lapsed between 1949 and 1950. In 1950 the O1, O3, O5 and Pine 16 claims were staked by M. Remniak, P. Kobar and W.B. Kobar. One 11 m deep hole was drilled on each of the O1, O3 and O5 claims in 1951. HBED carried out a ground EM survey and diamond drilling (1568 m on O1 and 1594 m on O3) between 1952 and 1953, and acquired the property in 1954. In 1955, 4656 m of drilling was carried out and the claims leased as M-3759 to M-3761 and M-3792. HBM&S acquired the property in 1956. Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624). In 1961 surface leases M-100, M-111 and M-136 were issued. By 1965, a three compartment shaft was sunk to 679 m on O5 with the development of twelve levels. Between 1963 and 1965 drifting was done on four levels and 7972 m of drilling was completed. The shaft was completed to 732 m by 1966. A total of 9057 m was done between 1967 and 1968. As of January 1, 1968 proven reserves were sufficient to commence production at a rate of 726 tonnes per day. By 1970 the mine was producing at 1089 tonnes per day. Production halted in March, 1973 to develop a deeper ore zone below 640 m. The production shaft was deepened another 168 m and levels established at 701 m and 823 m. In 1974, 1227 m of drilling was undertaken and confirmed limited tonnage of ore at greater depths (HBM&S Annual Report, 1978). Development of the lower ore zone was commenced in 1979. The mine ceased production in 1983 and permanently closed in 1984.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group felsic pyroclastic and volcaniclastic rocks (Fig. 80-1; Froese and Moore, 1980). The felsic volcanic rocks are flanked to the northwest by Missi Group lithic arenite and to the southeast by Amisk Group greywacke. The felsic volcanic rocks are intruded by pegmatitic granite and pegmatite. The deposit and the wall rocks have been metamorphosed to the biotite-sillimanite-almandine facies, which represents the highest grade of regional metamorphism in the Snow Lake area (Bristol and Froese, 1990). At the deposit felsic volcanic rocks have been altered to a coarse grained assemblage of cordierite, anthophyllite, staurolite, chlorite and phlogopite. Gahnite is locally present as inclusions within cordierite. Sangameshwar (1968) mapped hornblende-biotite gneiss in outcrops at the deposit.

MINERALIZATION:

The Osborne deposit consists of a near solid to solid sulphide lens that strikes 045°, dips 65° northwest and plunges 30° southwest and is conformable to the host rocks. The deposit is 232 m long, with an average width of 8 m and is composed mainly of pyrrhotite and pyrite with lesser amounts of chalcopyrite and sphalerite. Sangameshwar (1968) describes two types of mineralization that make up the orebody. The first is an early, fine grained pyrite-arsenopyrite assemblage that is observed to occur as inclusions within a later coarse grained pyrite-arsenopyrite-pyrrhotite-chalcopyrite-sphalerite ± cobaltite-galena assemblage. The pyrrhotite in the deposit has a coarse texture without preferred orientation; hexagonal and monoclinic pyrrhotite have been described by Bristol (1974).

Two footwall alteration zones are associated with the deposit (Fig. 80-2, 80-3). The main alteration zone, which varies from 6 to 17 m wide, occurs adjacent to the ore between 305 to 457 m. Below 457 m the alteration bifurcates with the volumetrically greater portion plunging to the northeast away from the deposit and the less extensive alteration accompanying the mineralization to the lowest part of the deposit that have been mined (838 m). A second zone of mineralization, 0.8 m thick and extending from a depth of 150 m to 640 m below surface, occurs in the footwall. This zone contains 1.0% Cu and 1.9% Zn. This mineralization plunges to the northeast; its exact limits are unknown. A second alteration zone, delineated by four diamond drill holes on the 442 m level, is approximately 25 m thick and was intersected between 243 to 275 m from the deposit. Diamond drilling has traced this zone for 243 m away from the deposit.

Table 80-1: Rock compositions and modes of samples from the 838 m level and decline, Osborne Lake Mine (Bristol and Froese, 1990)

	OS-1	OS-2	OS-4	OS-7*	OS-10*	OS-12*	OS-13*	OS-14*	OS-15*	OS-22A*	OS-24*	OS-29	OS-30	OS-32	OS-36
SiO_2	62.80	58.10	65.20	61.90	31.40	67.40	47.00	72.10	71.00	75.20	47.50	63.80	73.90	49.30	77.30
TiO_2	0.46	0.45	0.43	0.30	0.40	0.23	0.27	0.21	0.25	0.15	0.30	0.33	0.25	0.56	0.16
Al_2O_3	13.60	15.90	14.30	11.80	22.80	9.52	18.00	10.90	12.30	7.40	14.60	14.20	11.70	16.30	10.40
Fe_2O_3	1.30	0.88	1.69	--	1.64	0.20	--	1.14	0.74	0.68	0.84	0.75	0.31	--	0.46
FeO	6.98	7.78	7.21	7.03	9.49	10.20	10.01	5.85	6.61	4.09	8.90	5.11	2.58	5.46	1.76
MnO	0.11	0.09	0.16	0.08	0.05	0.10	0.09	0.04	0.05	0.04	0.10	0.24	0.05	0.11	0.08
MgO	1.97	2.08	2.53	6.53	18.30	4.89	10.40	4.72	4.26	3.86	11.10	3.11	1.25	5.37	0.72
CaO	2.44	4.01	4.25	0.35	0.20	0.53	0.87	0.38	0.30	1.94	0.30	2.93	2.19	5.58	1.36
Na_2O	2.28	5.29	1.94	0.36	0.48	0.17	0.37	0.23	0.12	0.15	0.32	3.10	3.14	0.51	3.82
K_2O	4.38	1.60	2.86	2.38	5.84	0.72	1.37	0.90	0.99	1.73	4.35	2.15	1.47	3.50	0.92
P_2O_5	0.20	0.10	0.11	0.01	0.01	0.11	0.18	0.08	0.05	0.03	0.17	0.15	0.14	0.21	0.05
CO_2	0.50	0.92	0.44	0.95	0.46	0.24	1.50	0.36	0.36	6.0	0.86	0.94	0.66	0.94	2.12
H_2O	0.9	1.1	1.2	2.3	4.6	0.3	3.4	1.0	1.3	1.2	3.6	1.0	0.7	2.3	0.5
FeS_2	0.02	0.34	0.02	4.94	4.23	2.04	5.07	0.54	1.25	1.14	6.72	0.34	0.13	9.50	0.13
Total	97.9	98.6	102.3	98.9	99.9	96.7	98.5	98.5	99.6	98.5	99.7	97.9	98.8	100.8	98.6
quartz	20	15	20	10		20	20	25	25	20	10	15	15	40	70
plagioclase	40	50	25		tr		10			15		50	60	15	20
K-feldspar	10														
biotite	25	20	25	30	55	10	35	15	15	20	20	25	25	35	10
garnet	5	tr	20			5		tr				10			
hornblende		15	10												
staurolite				20		15		20	30		20				
anthophyllite						20	10	15	10	25	10				
cordierite				30		30	20	25	20		20	20			
spinel				5	10										
pyrite				2	5	tr	5	tr	tr	tr	5	tr	tr	10	
pyrrhotite				3		tr									
chlorite					30				tr		15				
magnetite				tr		tr									

Composition in weight %; Total S calculated as FeS_2
* Altered rocks

Analysts: Bondar-Clegg and Company, except H_2O by Analytical Chemistry Section, Geological Survey of Canada

GEOCHEMICAL DATA:

Bamburak (1990) reports the deposit contained 3 380 000 tonnes grading 3.03% Cu and 1.48% Zn. As of December 31, 1984 the deposit was reported to contain ore reserves of 528 054 tonnes grading 2.45% Cu and 1.28% Zn (Esposito, 1986). Between 1968 and 1983, 2 852 007 tonnes grading 3.14% Cu and 1.52% Zn had been produced (Mineral Inventory Card 63J/13 Cu 1).

A sample collected from a trench on the northwest shore of Pine Lake contained 0.51% Cu and 2.20% Zn (A.F. 90081).

Table 80-1 (Bristol and Froese, 1990) summarizes geochemical data derived from the altered and unaltered wall rocks to the Osborne deposit. Visual examination of the tabled data indicates depletion of Na_2O, CaO and locally, K_2O, and enrichment of FeO, MgO and H_2O. These trends correlate with the depletion of plagioclase and potassium feldspar, and the formation of staurolite, anthophyllite and cordierite in altered wall rocks relative to unaltered counterparts.

Sangameshwar (1968) determined the trace element content of pyrrhotite and sphalerite from 36 ore samples collected from the deposit. Pyrrhotite contains 51 to 481 ppm Ni, 698 to 1395 ppm Se, nil to 922 ppm Co and nil to 1669 Mn. Sphalerite contains 3.75 to 15.61 mole percent FeS, 2.20 to 9.18 weight percent Fe and nil to 4.90 weight percent Mn.

ICP-AAS multi-element geochemical analysis of 13 near solid to solid sulphide ore samples from the deposit indicates that in addition to high Cu and Zn the following ranges for trace elements are present: 20 to 240 ppm Pb, 0.4 to 17.8 ppm Ag, 31 to 1240 ppm Au, 17 to 1498 ppm As, 2 to 62 ppm Sb, 2 to 13 ppm Bi, 2 to 98 ppm Cd, 131 to 1110 ppm Co, 4 to 921 ppm W. Analyses are presented in Appendix I.

CLASSIFICATION:

Stratabound massive sulphide type deposit; volcanic rock associated. The recrystallized altered wall rocks have been interpreted as products of premetamorphic chloritization related to the mineralizing process (Bristol and Froese, 1990).

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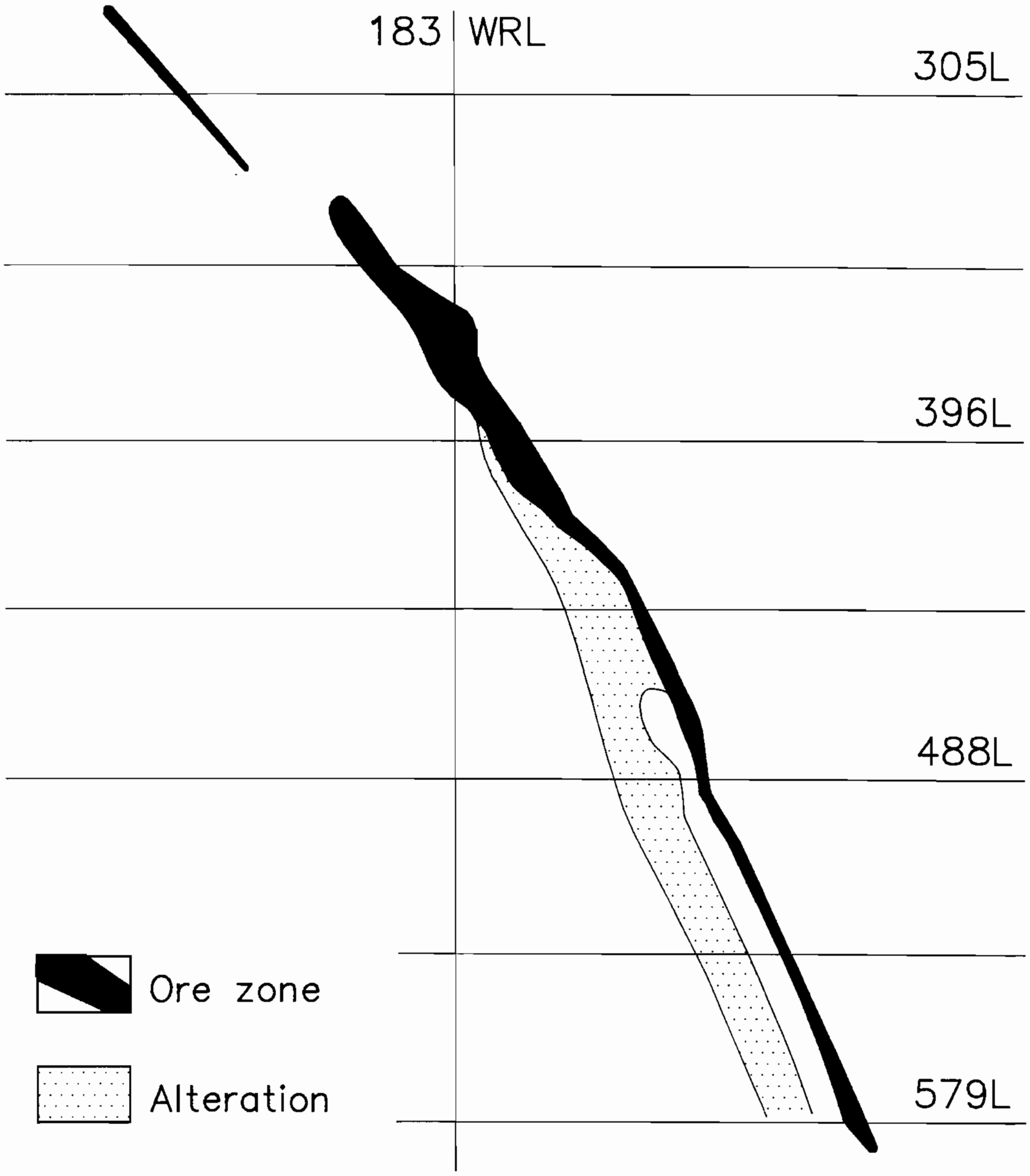

Figure 80-2: Vertical cross section, 2134 m mine level, Osborne Lake deposit.

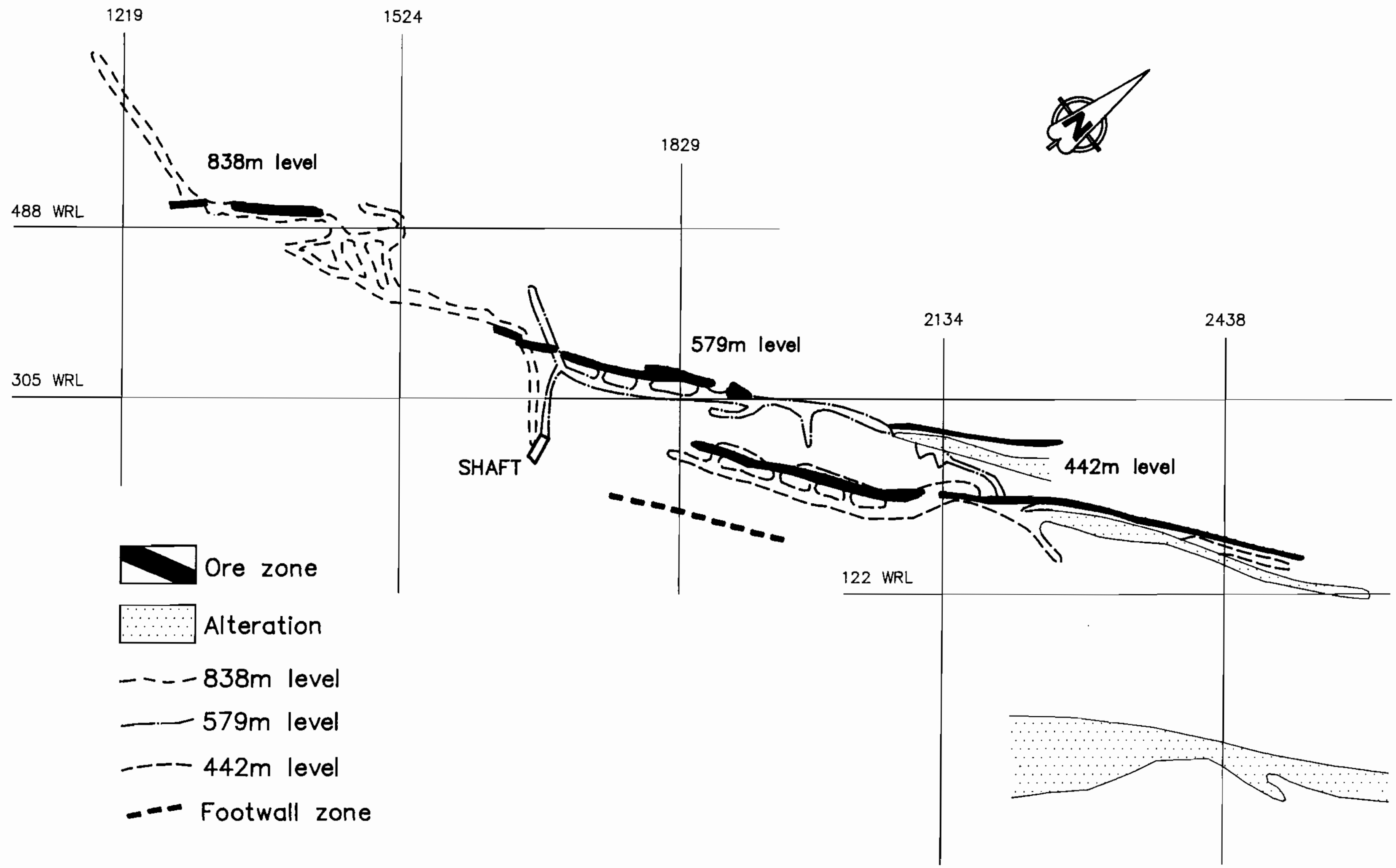

Figure 80-3: Alteration zones and mineralization, Osborne Lake deposit.

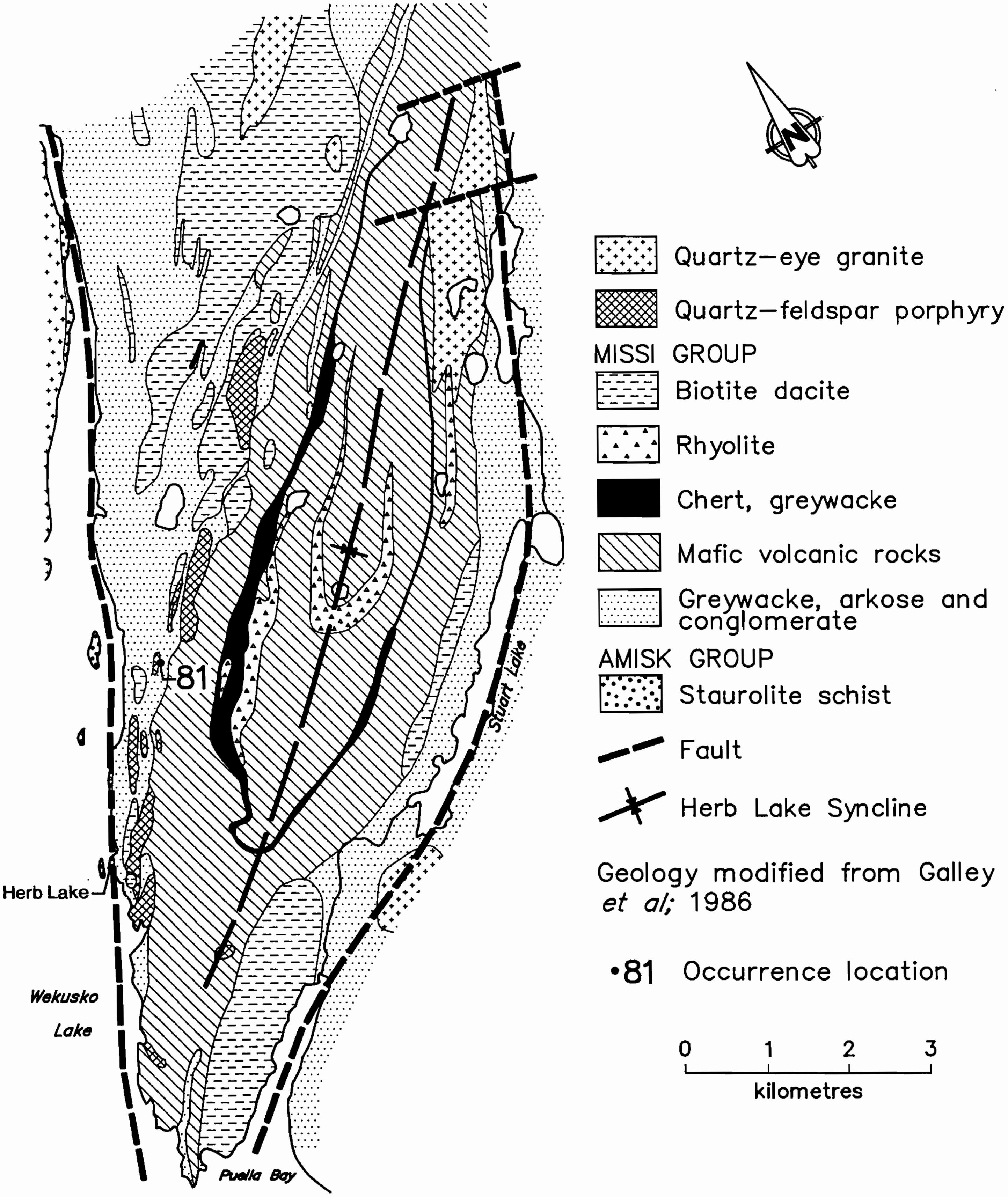

Figure 81-1: Geological setting of occurrence 81.

LOCATION: **81**

NAME: Bingo

UTM: 6071649N/451288E

ACCESS: Boat from the west shore of Wekusko Lake.

AREA: East shore of Wekusko Lake.

AIRPHOTO: A20124-91

EXPLORATION SUMMARY:

Bingo was staked by J. McCormack in 1915, and assigned to J.R. Campbell in 1916. Surface work was done in 1916, 1917 and 1919. Several people held interests in the claim before it was assigned to H.R. Drummond-Hay in 1919. In 1919 W. Fairchild sampled the property. R.C. Wallace found visible gold on the property in 1919 (Mineral Inventory Card 63J/13 Au 3). Bingo Mines Limited was formed to develop the property and between 1920 and 1924 a 127 m shaft was sunk with levels established every 31 m. A total of 742 m of drifting and 60 m of crosscutting was done. Assay samples were collected during this development. In 1927 a drilling program to test the veins at depth was unsuccessful due to poor core recovery and abnormal hole flattening. The mine was flooded and the 9-tonne test mill was sold in 1937. HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650). In 1968 W.B. Kobar staked Mike 7 over the property. Airborne EM and magnetic surveys were done by Falconbridge Nickel Mines Limited in 1973 (A.F. 91564). In 1978 A.& V. Harris Exploration Services Limited acquired the property and sampled the dumps. Norman Mines Limited acquired the property in 1980 and did some prospecting. In 1984 the property reverted to A.& V. Harris who assigned it to Wekusko Gold Resources Limited. A biogeochemical survey was done in May, 1984. In September, 1984 Noranda Exploration Company Limited optioned the property and carried out geological mapping, soil sampling, lithogeochemical and geophysical surveys. W.B. Kobar acquired the property in 1987 and optioned it to Mid-North Resources Limited from 1987 to 1990.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by greywacke, arkose and conglomerate. These rocks are flanked to the east by andesite and basalt. The sedimentary and volcanic rocks have been intruded by quartz-feldspar porphyry and biotite dacite (Fig. 81-1; Stockwell, 1937). Gordon and Gall (1982) have assigned the sedimentary and volcanic rocks to the Missi Group.

The Bingo occurrence is hosted by a 120 by 300 m long quartz-feldspar porphyritic felsic plug that intrudes a sequence of Missi Group interlayered arkose and conglomerate, felsic volcanic breccia and tuff. The porphyry is similar in composition to those that host the Elizabeth-Dauphin (Location 66) and Rex (Location 67) occurrences. The plug and supracrustal rocks are crosscut by biotite-rich feldspar porphyritic lamprophyre dykes, one of which is visible on the east flank of the dump. Approximately 125 m east of the dump is an outcrop of felsic volcanic breccia that is in contact to the east with amygdaloidal basalt flows. The felsic breccia is distinctive with large, blue quartz phenoclasts; it may have been formed by phreatic, in situ brecciation.

There is very little exposure of the Bingo occurrence, except for a series of small pits along the eastern edge of the dump south of the mill foundations (Fig. 81-2). Noranda Exporation Co. Limited excavated a long trench perpendicular to the mineralized structure south of the mine dump in 1986, but very little can now be seen in it due to the sloughing of the trench walls.

The rocks are marked by a regional penetrative foliation that varies from 020° to 040° in strike and dips subvertically southeast and northwest. Several shear and shear-vein sets crosscut the porphyry parallel to regional foliation. Quartz veins that cross the foliation at a high angle have been ptygmatically folded.

MINERALIZATION:

Gold mineralization is localized within a northeast-striking shear-vein system that crosscuts the quartz-feldspar porphyry body. According to Stockwell's (1937) report, at least four parallel mineralized quartz veins across a 20 m width trend 020° and dip 75° northwest. At least one of these veins contained visible gold on surface. Sections of sheared quartz-feldspar porphyry contain disseminated pyrite and arsenoyrite in sericite schist and are crosscut by minor nonmineralized quartz veins.

From an examination of dump samples, mineralization is restricted to schistose quartz-feldspar porphyry containing strongly deformed segments of quartz veins. Minerals present include arsenopyrite, pyrite, galena and tourmaline. Vein segments are mineralized with fine-grained arsenopyrite.

GEOCHEMICAL DATA:

W. Fairchild assayed 6 to 9 kg samples that averaged 188.6 g/t Au in 1919. A 6.3 kg sample out of a bulk sample weighing 454 kg assayed 144.69 g/t Au. Although Bingo Mines Limited reported uniformly high gold grades from samples collected along drifts and crosscuts (Richardson and Ostry, 1987) sampling done by Reid and Dresser (1924) failed to outline any areas of "economic mineralization". Bingo Gold Mines Limited milled 425 tonnes of hand-cobbed ore in 1926 and recovered 4.4 kg of gold (Richardson and Ostry, 1987).

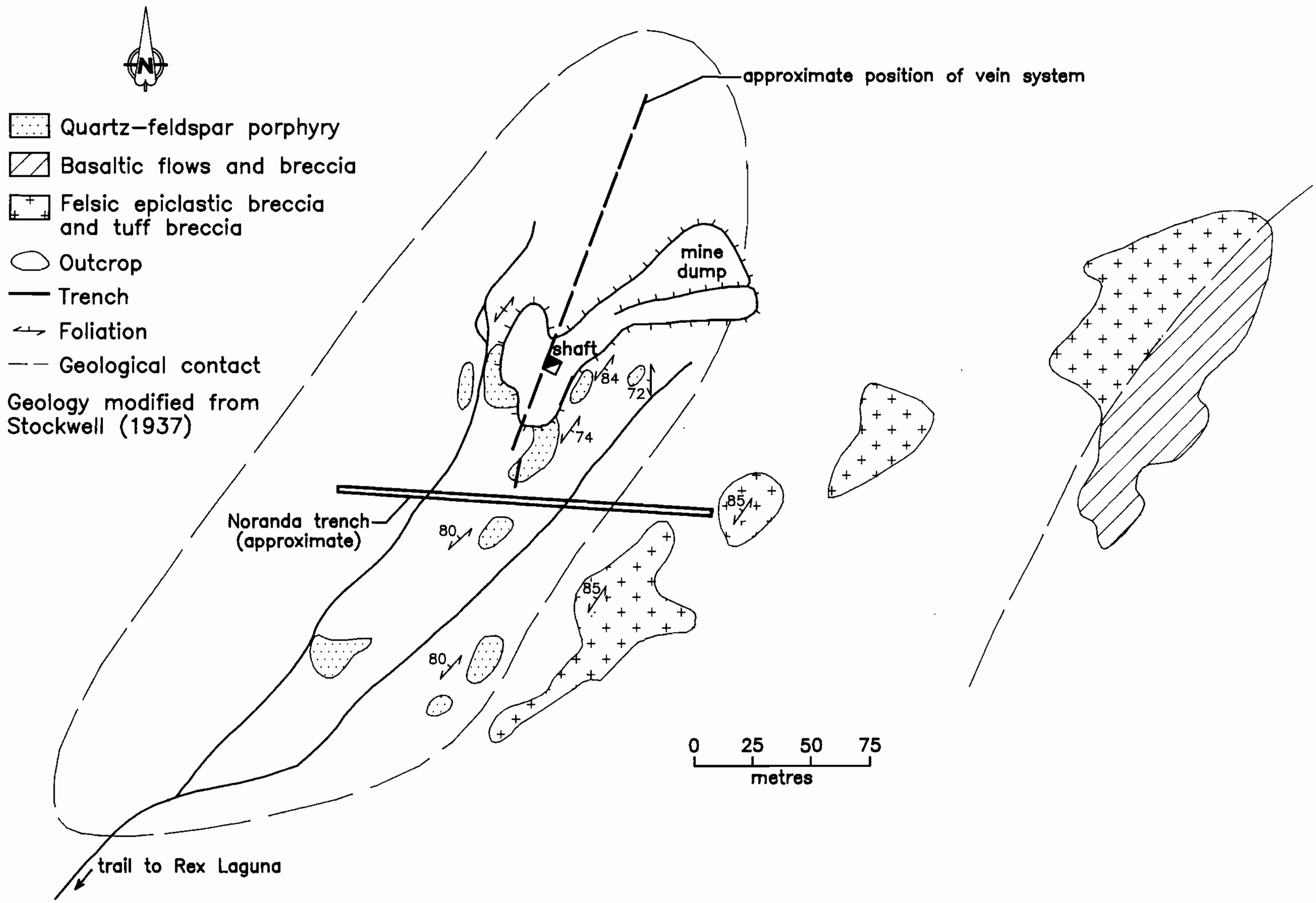

Figure 81-2: Outcrop, geology and trench and vein system distribution, occurrence 81.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. The shear-hosted quartz veins contain sulphide and visible gold mineralization.

REFERENCES:

Assessment Files 91564 and 91650
Manitoba Energy and Mines, Minerals Division.

Bingo Gold Mines Limited
Manitoba Energy and Mines, Minerals Division, Corporation Files.

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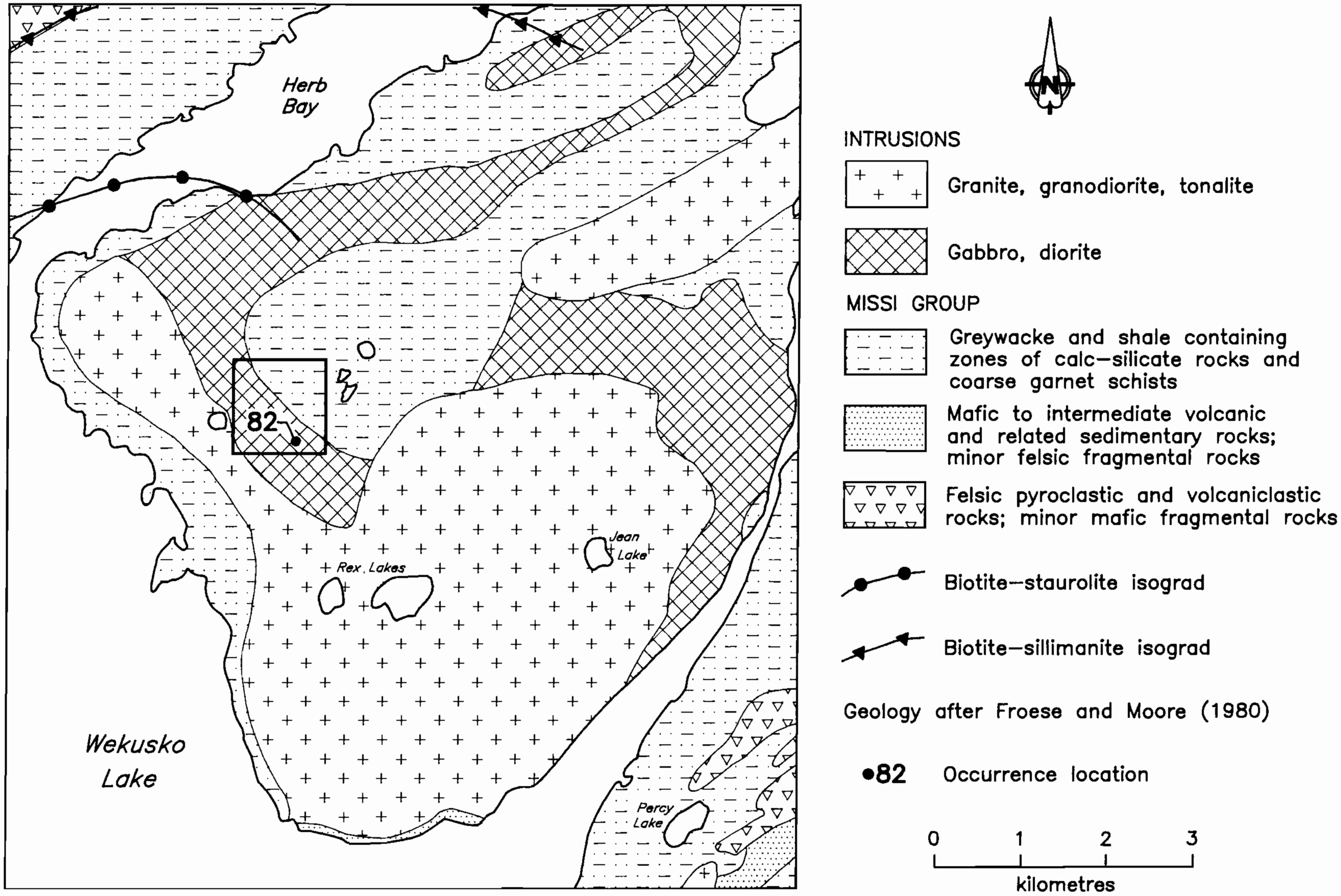

Figure 82-1: Geological setting of occurrence 82.

LOCATION: **82**

NAME: (A.F. - Mineralization intersected by diamond drilling)

UTM: 6077602N/448071E

ACCESS: Boat from Bartlet's Landing, Wekusko Lake.

AREA: Peninsula between Herb Bay and Crowduck Bay, Wekusko Lake.

AIRPHOTO: A20170-44

EXPLORATION SUMMARY:

The area was first staked under the Del Rio, Del Rio 1, 2 and Chalco 4 claims in the late 1920's. The Fly 1 to 4 claims were staked by W. Kobar in 1962. Kennco Explorations Canada Limited did a magnetometer (ABEM torsion MAG) survey in 1964 (A.F. 91512). A map shows three trenches on Fly 2 (A.F. 91512). In 1965 HBED carried out airborne EM and radiometric surveys (A.F. 91650). Canadian Nickel Company Limited optioned the property in 1966 and carried out a magnetometer (MF-1) survey and a 3 hole, 74 m, diamond drill program (A.F. 91508, 91509). W. Kobar drilled 4 holes totalling 114 m on Fly 3 between 1967 and 1968 (A.F. 91510, 91511), and 9 holes totalling 274 m on Fly 2 in 1970 (A.F. 91513). Diamond drilling was reported to have been done on the Fly group between 1973 and 1974 (Mining Claim Card Fly 1). The claims were cancelled in 1976.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group greywacke and shale intruded by granite and gabbro (Fig. 82-1; Froese and Moore, 1980; Frarey, 1950). Diamond drilling intersected variably textured and mineralized gabbro and greenstone (A.F. 91508, 91509, 91510, 91511; Fig. 82-2).

MINERALIZATION:

Drill holes intersected gabbro with disseminated pyrrhotite, chalcopyrite ± pyrite. Percentages of sulphide are generally not given except in the log for DDH 31073, which describes 2% disseminated pyrrhotite in fine- to medium-grained altered gabbro (A.F. 91509). Ten vertical drill holes intersected between 3.7 m and 16.2 m of gabbro with pyrrhotite and chalcopyrite (A.F. 91510, 91513). Core from drill holes 30867 and 30868 was not mineralized (A.F. 91508).

GEOCHEMICAL DATA:

Eleven samples collected for assay from DDH 31073 contained a range of nil to 0.01% Cu and 0.01 to 0.03% Ni (A.F. 91509).

CLASSIFICATION:

Magmatogenic type deposit; disseminated. The mineralized and altered gabbro should be assessed for platinum group elements.

REFERENCES:

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Mining Claim Card, Fly 1 (P 93A)

Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

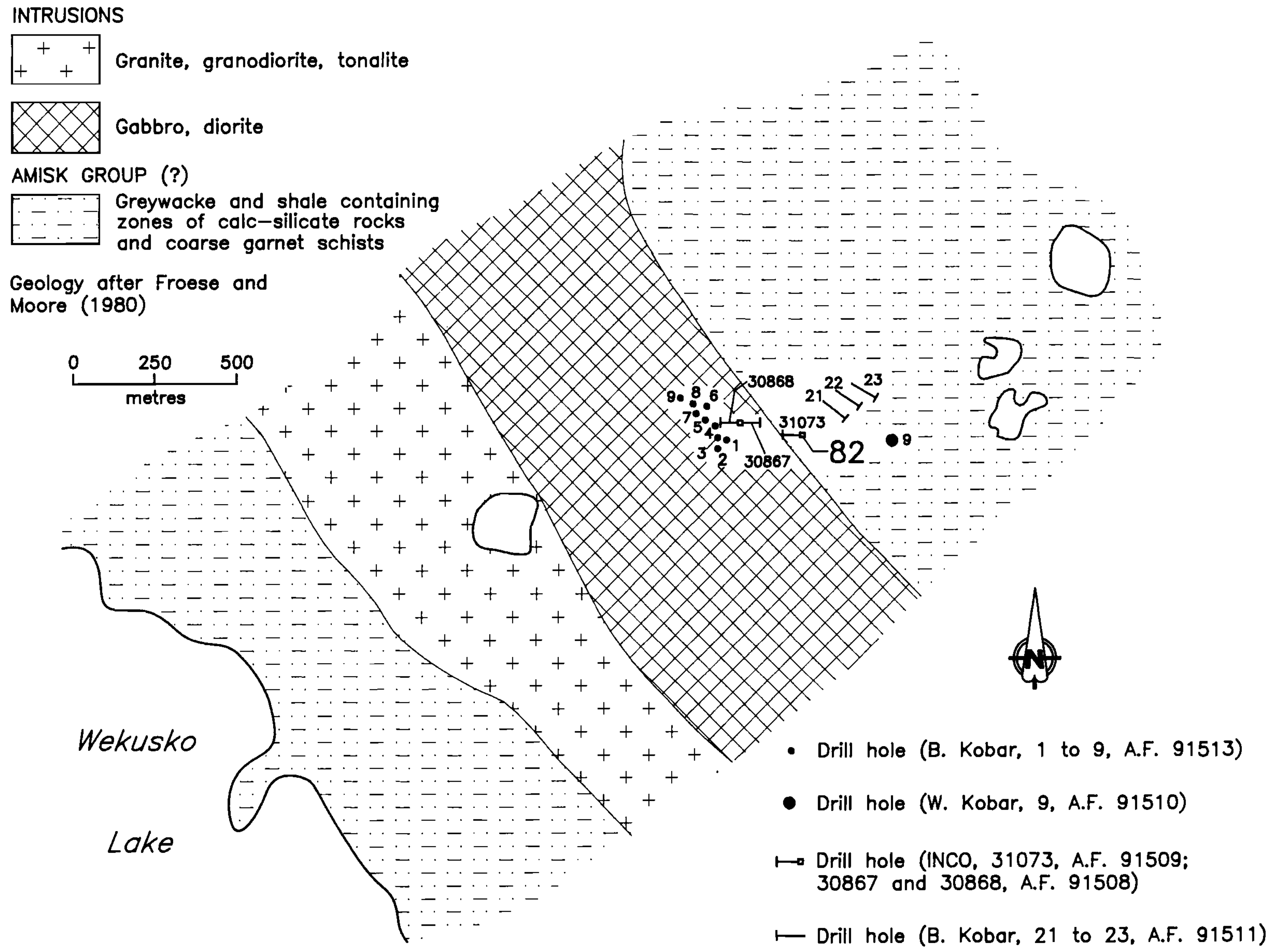

Figure 82-2: Local geology and diamond drill hole locations, occurrence 82.

LOCATION: **83**

NAME: (A.F. - Mineralization intersected by diamond drilling)

UTM: 6074091N/439982E

ACCESS: Boat on Wekusko Lake.

AREA: East end of Johnson Island, Wekusko Lake.

AIRPHOTO: A20127-107

EXPLORATION SUMMARY:

The area was first staked as A.1 and A.6 in the 1920's. Herb Lake Mining and Exploration Limited had an option on the Van group and diamond drilled the property in 1949 (Manitoba Mines and Natural Resources, 1950). Three holes totalling 248 m were drilled on Solar 19 Fr. by A. Talbot on behalf of Jay-Kay Exploration Syndicate in 1960 (A.F. 90128). Airborne EM and radiometric surveys were done by HBED in 1965 (A.F. 91650). Canadian Nickel Company Limited staked Fly 40 in 1963, and did a geophysical survey between 1963 and 1964 and diamond drilling between 1965 and 1980 on its Fly group of claims (Mining Claim Card, Fly 40). Fly 40 was cancelled in 1982. The ground was held by W. Bruce Dunlop Limited as CB 10225 and Berbay 3 from 1983 to 1989. HBED staked Mud 7795 over the property in 1989.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group greywacke and shale flanked to the north by mafic flows, pyroclastic and volcaniclastic rocks and to the south by granodiorite of the Aphebian Tramping Lake Pluton (Fig. 83-1; Froese and Moore, 1980). Diamond drill holes intersected slate, quartzite and pegmatite (Fig. 83-2; A.F. 90128).

MINERALIZATION:

DDH 4c, 5c and 6c intersected graphitic slate that contains unspecified amounts of pyrite and non-mineralized quartz veins. These intersections varied from 0.5 to 10.1 m in drill core (A.F. 90128).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

Assessment Files 90128, 91650 and 92400
Manitoba Energy and Mines, Minerals Division.

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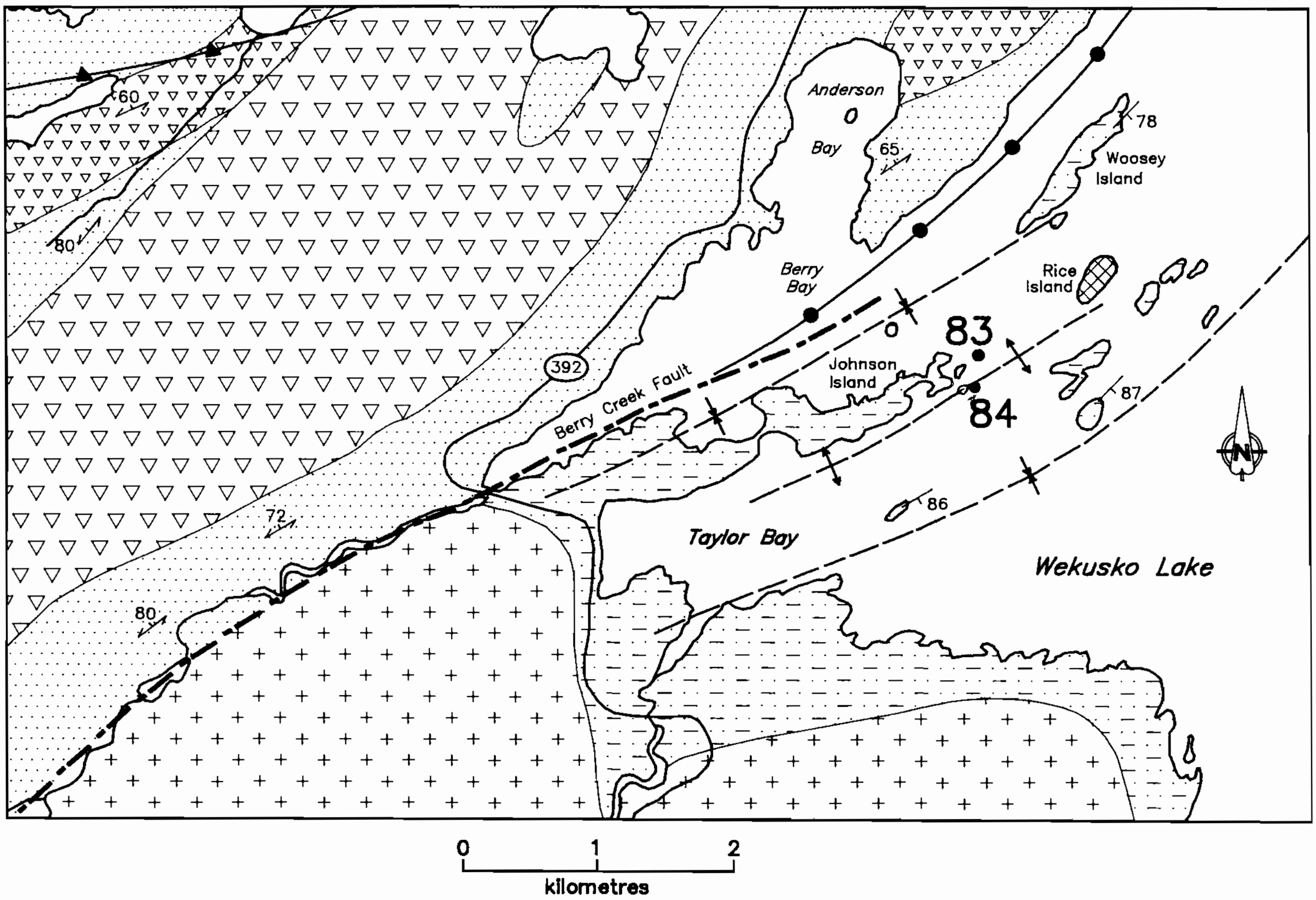


APHEBIAN (?)

Granodiorite

Gabbro

AMISK GROUP

Greywacke and shale containing zones of calc–silicate rocks and coarse garnet schists

Quartz–eye tonalite

Mafic flows, pyroclastic and volcaniclastic rocks; minor felsic fragmental rocks

Felsic pyroclastic and volcaniclastic rocks; minor mafic fragmental rocks

Biotite–sillimanite isograd

Biotite–staurolite isograd

Anticline

Syncline

65 Foliation: inclined

87 Bedding: inclined

Geology after Froese and Moore (1980)

•83 Mineral occurrence

Figure 83-1: Geological setting of occurrences 83 and 84.

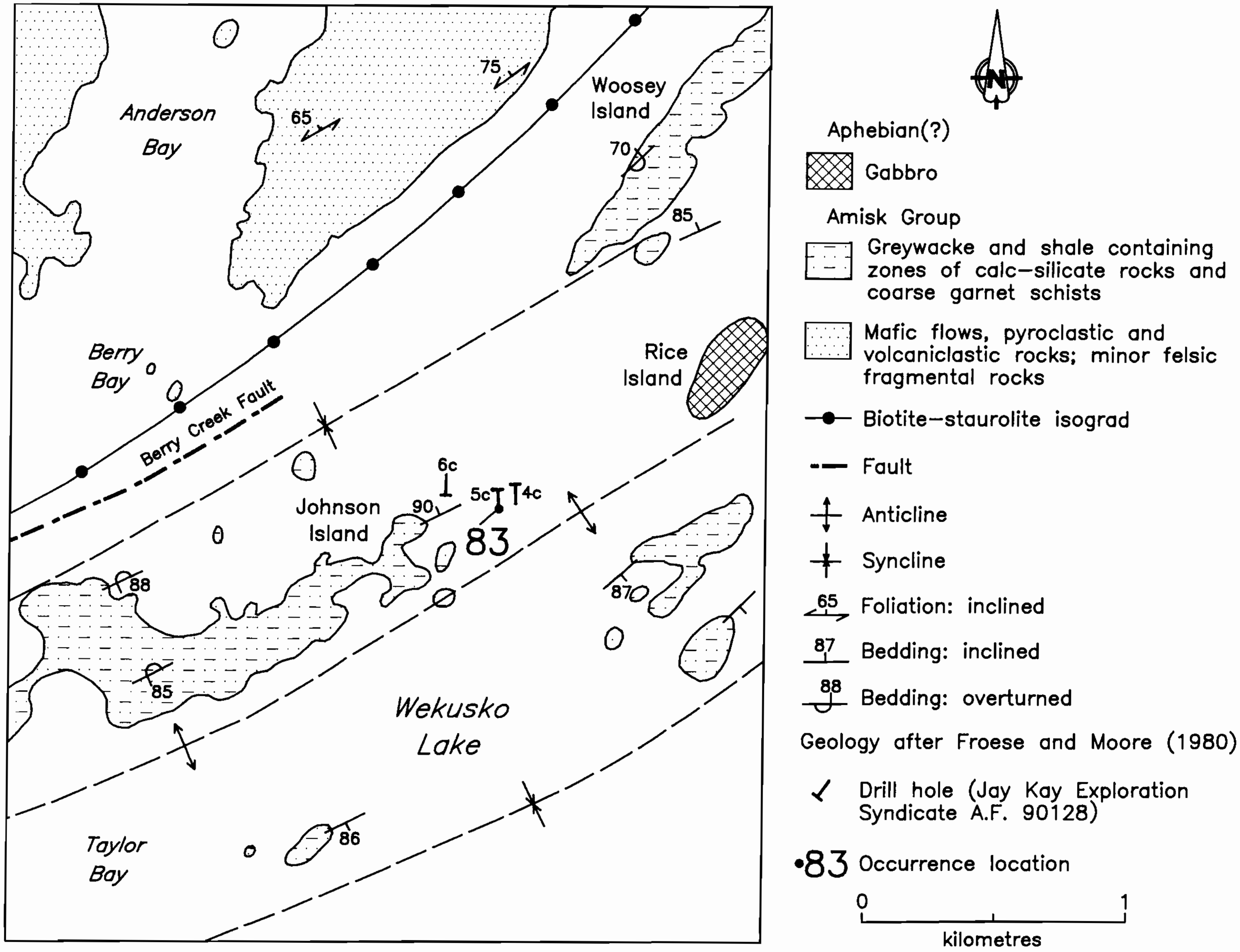


Figure 83-2: Detailed geology and diamond drill hole locations, occurrence 83.

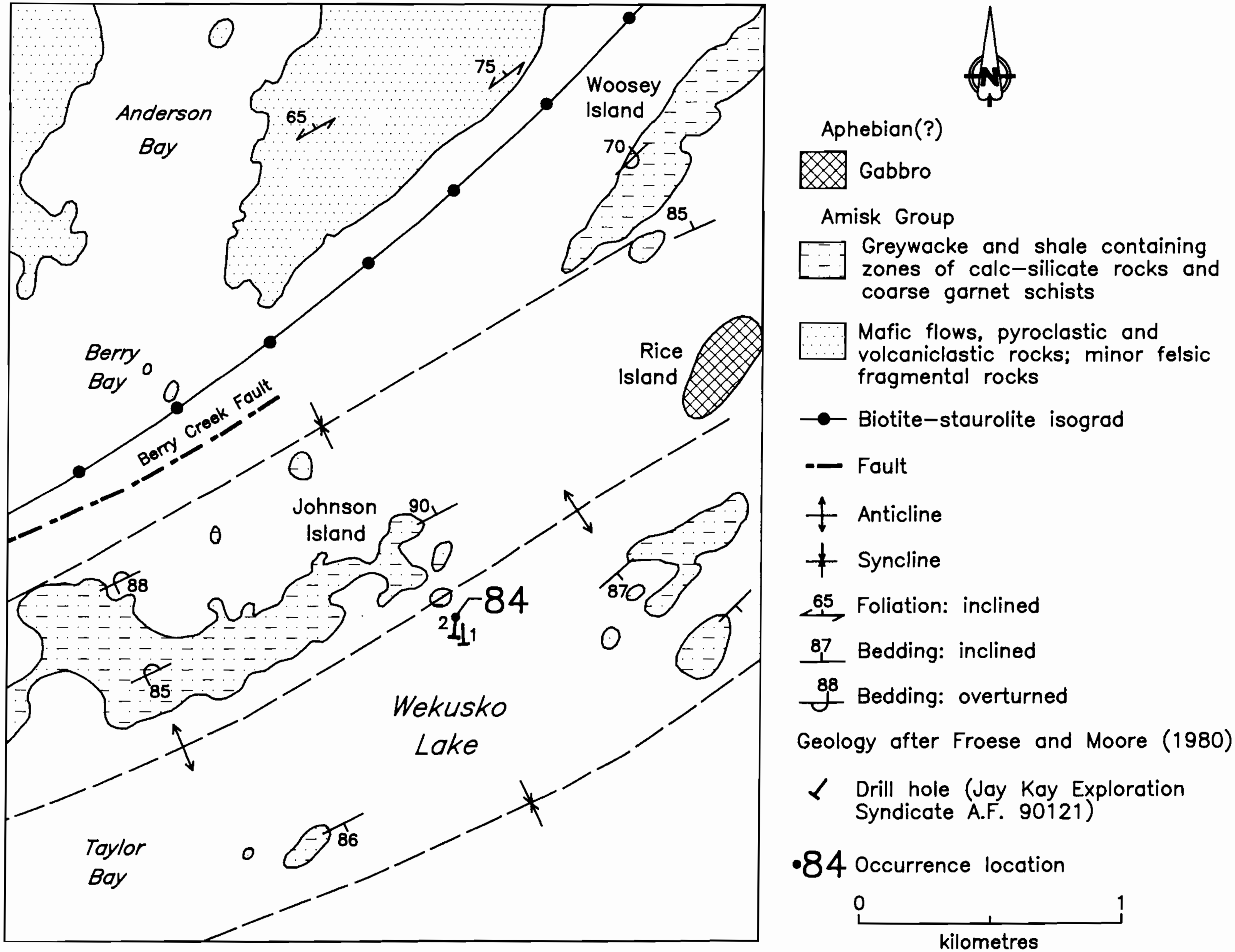


Figure 84-1: Detailed geology and diamond drill hole locaitons, occurrence 84.

LOCATION: **84**

NAME: (A.F. - Mineralization intersected by diamond drilling)

AREA: Johnson Island, Taylor Bay, Wekusko Lake.

UTM: 6073713N/439965E

AIRPHOTO: A20127-106

ACCESS: Boat on Wekusko Lake.

EXPLORATION SUMMARY:

The area was first staked as Star 6 in the 1920's. Van 5 was staked in the late 1940's. Herb Lake Mining and Exploration Limited had an option on the Van group and did diamond drilling on the property in 1949 (Manitoba Mines and Natural Resources, 1950). Two holes totalling 75 m were drilled on Rice 8 by Walter Johnson on behalf of Jay-Kay Exploration Syndicate in 1956 (A.F. 90121). Airborne EM and radiometric surveys were done by HBED in 1965 (A.F. 91650). Canadian Nickel Company Limited staked Fly 42 in 1963, and did a geophysical survey from 1963 to 1964 and diamond drilling between 1965 and 1980 on its Fly group of claims (Mining Claim Card Fly 42). Fly 42 was cancelled in 1982. The ground was held by W. Bruce Dunlop Limited as CB 10225 and Berbay 3 from 1983 to 1989. HBED staked Mud 7795 over the property in 1989.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group greywacke and shale flanked to the north and northwest by mafic flows, pyroclastic and volcaniclastic rocks and to the south by granodiorite of the Aphebian Tramping Lake pluton. The greywacke and shale are intruded by nickel- and copper-bearing gabbros of probable Aphebian age (Fig. 83-1; Froese and Moore, 1980). Diamond drilling intersected schistose graphitic slate (Fig. 84-1; A.F. 90121).

MINERALIZATION:

Sulphide mineralization is not described in the drill logs for DDH 1 and 2; however, the graphitic portions of slate in drill core probably represent an admixture of iron sulphide and carbon.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

Assessment Files 90121 and 91650
Manitoba Energy and Mines, Minerals Division.

Eccles, D.R. and Fedikow, M.A.F.
1985: Mineral occurrence documentation and alteration zone mapping, Snow Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 82-99.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area; Geological Survey of Canada Paper 78-27, 16p.

Mining Claim Card, Fly 42 (P 7615A)
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Manitoba Mines and Natural Resources
1950: 22nd Annual Report on Mines and Minerals, p. 62.

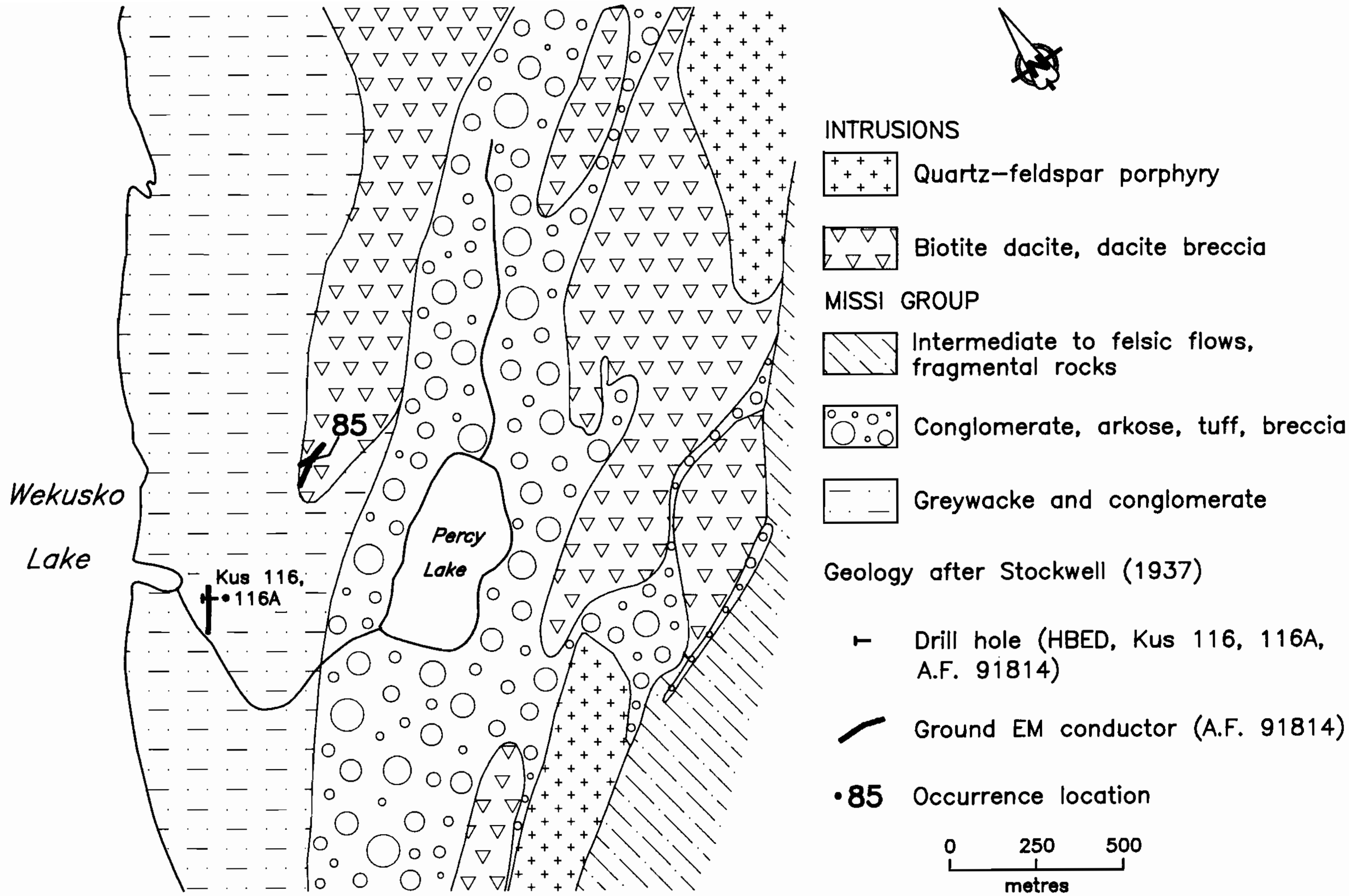


Figure 85-1: Geological setting of occurrence 85.

LOCATION: **85**

NAME: Jack Pot Claim

AREA: East shore of Wekusko Lake; west of Percy Lake.

UTM: 6073487N/452047E

AIRPHOTO: A20124-90

ACCESS: Boat on Wekusko Lake and traverse.

EXPLORATION SUMMARY:

The area was first staked as Jack Pot, Central and Neptune prior to 1930. The Jack Pot claim was staked in 1923 by Marshall Ballard. By 1935 nine prospect pits had been blasted and one shallow hole had been drilled. Five shallow holes were drilled during the winter of 1935-1936 (Stockwell, 1937).The area was restaked as C.C. by L. Revord in 1945. Surface work was done on the claim before it was cancelled in 1948 (Mining Claim Card C.C.). HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650) and an HLEM survey on the Kus claims in 1969 (A.F. 91814). Two holes were drilled on Kus 566 (A.F. 91814). Airborne EM and magnetic surveys were done by Falconbridge Nickel Mines Limited in 1973 (A.F. 91564). The ground was held by various companies between 1973 and 1984. Noranda Exploration Company Limited staked Nor 21 and Nor 56 over the property between 1983 and 1984 and signed a joint venture agreement with Manitoba Mineral Resources Limited in 1984.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Missi Group greywacke, arkose, conglomerate, and tuff and breccia of unspecified composition. This sequence is intruded by biotite dacite that also hosts the mineralization (Fig. 85-1; Gordon and Gall, 1982; Stockwell, 1937).

MINERALIZATION:

Stockwell (1937) described a biotite dacite-hosted quartz vein at this locality. Nine prospect trenches and the exposure of the vein offered by these pits were described. Sheared dacite containing a 0.6 to 1.2 m thick quartz vein with minor disseminated arsenopyrite is exposed by the pits. Approximately 107 m east of this vein, two prospect trenches expose 1.8 m of schistose dacite with pyrrhotite-bearing quartz veins and lenses. Diamond drill holes Kus 116 and 116A were collared to test a ground EM conductor southwest of the occurrence; drill logs are not available (Fig. 85-1; A.F. 91814).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. The quartz veins and stringers contain minor arsenopyrite and pyrrhotite.

REFERENCES:

Assessment Files 91564, 91650 and 91814
Manitoba Energy and Mines, Minerals Division.

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Mining Claim Card C.C. (P9311)
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Stockwell, C.H.
1937: Gold deposits of the Herb Lake area; northern Manitoba; Geological Survey of Canada, Memoir 208, 46p.

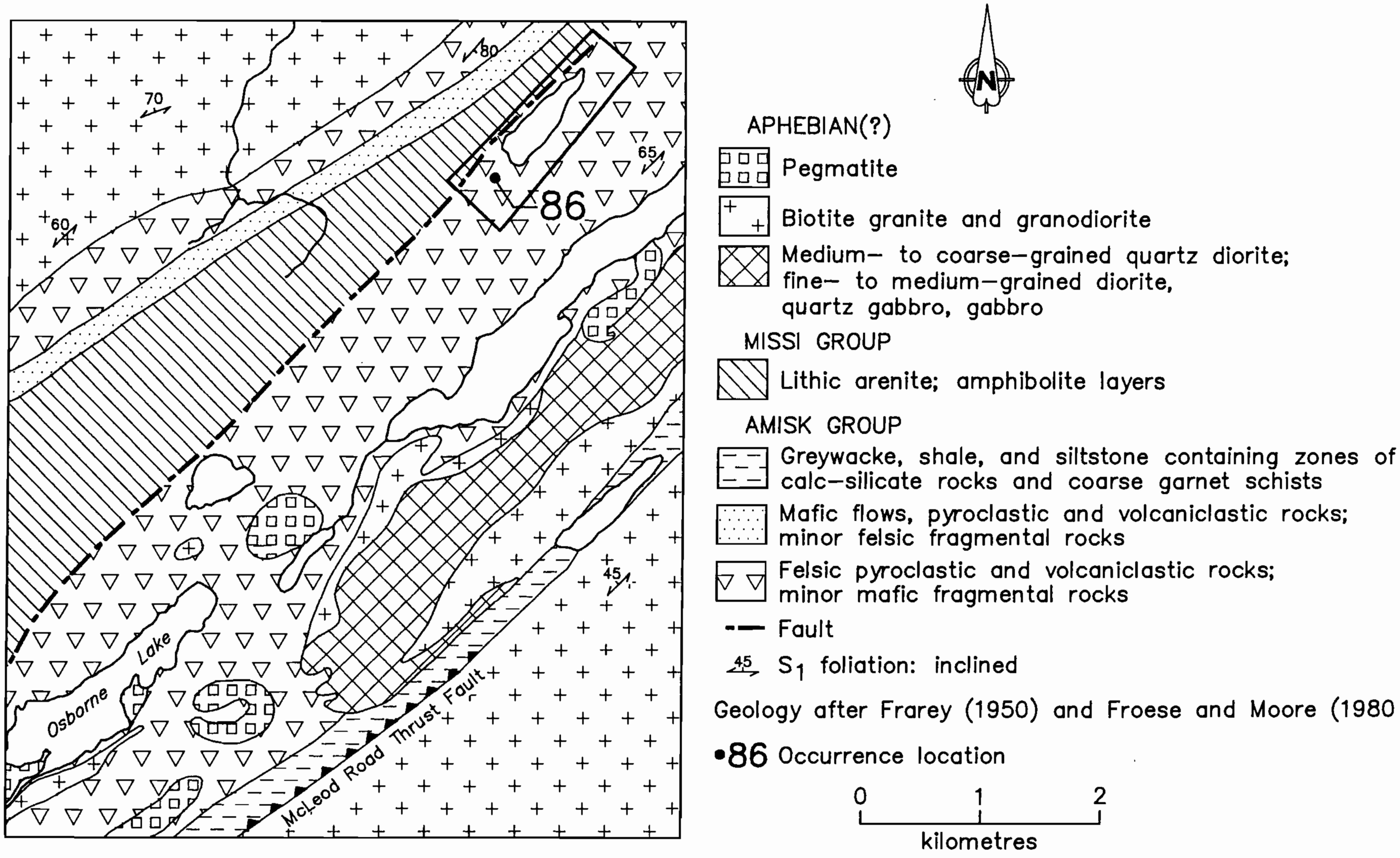


Figure 86-1: Geological setting of occurrence 86.

LOCATION: **86**

NAME: (A.F. - Mineralization intersected by diamond drilling).

AREA: Northeast of Osborne Lake.

UTM: 6093318N/456481E

AIRPHOTO: A20137-114

ACCESS: Bush plane and traverse.

EXPLORATION SUMMARY:

The area was first staked as the Poplar 5 to 10 claims in the late 1920's. The Oz claims were staked by various individuals between 1954 and 1956, and assigned to R.G. Crosby in 1956. Selco Exploration Company Limited carried out an HLEM survey and drilled 4 holes totalling 364 m on Oz 16, 21, 24 in 1957 (A.F. 90080). Canadian Nickel Company Limited did an airborne EM survey that year (A.F. 91624). The claims lapsed in 1958. The Lucky claims were staked by Stanley Major between 1964 and 1967. HBED did an airborne EM and radiometric survey in 1965 (A.F. 91650). Surface work was done on the property between 1965 and 1968 (Mining Claim Card Lucky 1). In 1969 HBED optioned the property and carried out a Turam survey (A.F. 90083). A 4 hole, 583 m, diamond drill program was done on Lucky 1, 4 and 18 between 1969 and 1970 (A.F. 90077). HBED abandoned its option in 1971. The claims were cancelled between 1973 and 1974. The area was partially staked by HBED as CB 7069 in 1978 and as CB 10703 and CB 10704 in 1980.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group felsic pyroclastic and volcaniclastic rocks flanked to the northwest by Missi Group lithic arenite. These rocks are intruded by biotite granite and granodiorite to the northwest and southeast (Fig. 86-1; Froese and Moore, 1980; Frarey, 1950). Diamond drill holes, collared to test long and short strike length ground EM conductors, intersected grey, fine grained quartz-feldspar-hornblende-biotite ± garnet gneiss, chlorite-serpentine schist, pegmatite, and banded quartz-biotite-hornblende gneiss with quartz "eyes" (Fig. 86-2; A.F. 90077), quartz-feldspar-biotite-garnet gneiss, siliceous gneiss and graphitic gneiss (A.F. 90080).

MINERALIZATION:

DDH 1 through 3, 6 and 7 intersected 2 to 15% pyrite with graphite in sericitic feldspathic gneiss. Narrow talc layers and trace disseminated talc are described in the drill logs. Trace sphalerite was observed in graphitic gneiss in core from DDH 6. Mineralized core intervals vary from 0.1 to 25.4 m. DDH 4 and 5 were abandoned in overburden (A.F. 90080).

DDH 1 to 6 (A.F. 90077) intersected pyrite-pyrrhotite-graphite layers that range from 3.2 m of graphite-biotite schist with trace to 1% pyrite and 5 to 80% graphite to 51.9 m of quartz-hornblende-biotite gneiss with numerous 0.1 to 8.4 m intervals of pyrite-pyrrhotite-graphite mineralization. These intervals contain trace to 5% pyrite, trace to 3% pyrrhotite and trace to 50% graphite.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

Assessment Files 90077, 90080, 90083, 91624 and 91650
Manitoba Energy and Mines, Minerals Division.

Frarey, M.J.
1950: Crowduck Bay; Geological Survey of Canada, Map 987A, 1:63 360.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area; Geological Survey of Canada Paper 78-27, 16p.

Gale, G.H., Baldwin, D.A. and Koo, J.
1980: A geological evaluation of Precambrian massive sulphide deposit potential in Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER79-1, 137p.

Hosain, I.T.
1988: An update summary and evaluation of geophysical data from open assessment files of the Flin Flon - Snow Lake greenstone belt (NTS sheets 63K (N1/2) and 63J/12, 13); Manitoba Energy and Mines, Mines Branch, Open File Report OF87-11, 99p.

Mining Claim Card, Lucky 1 (P 5209B)
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

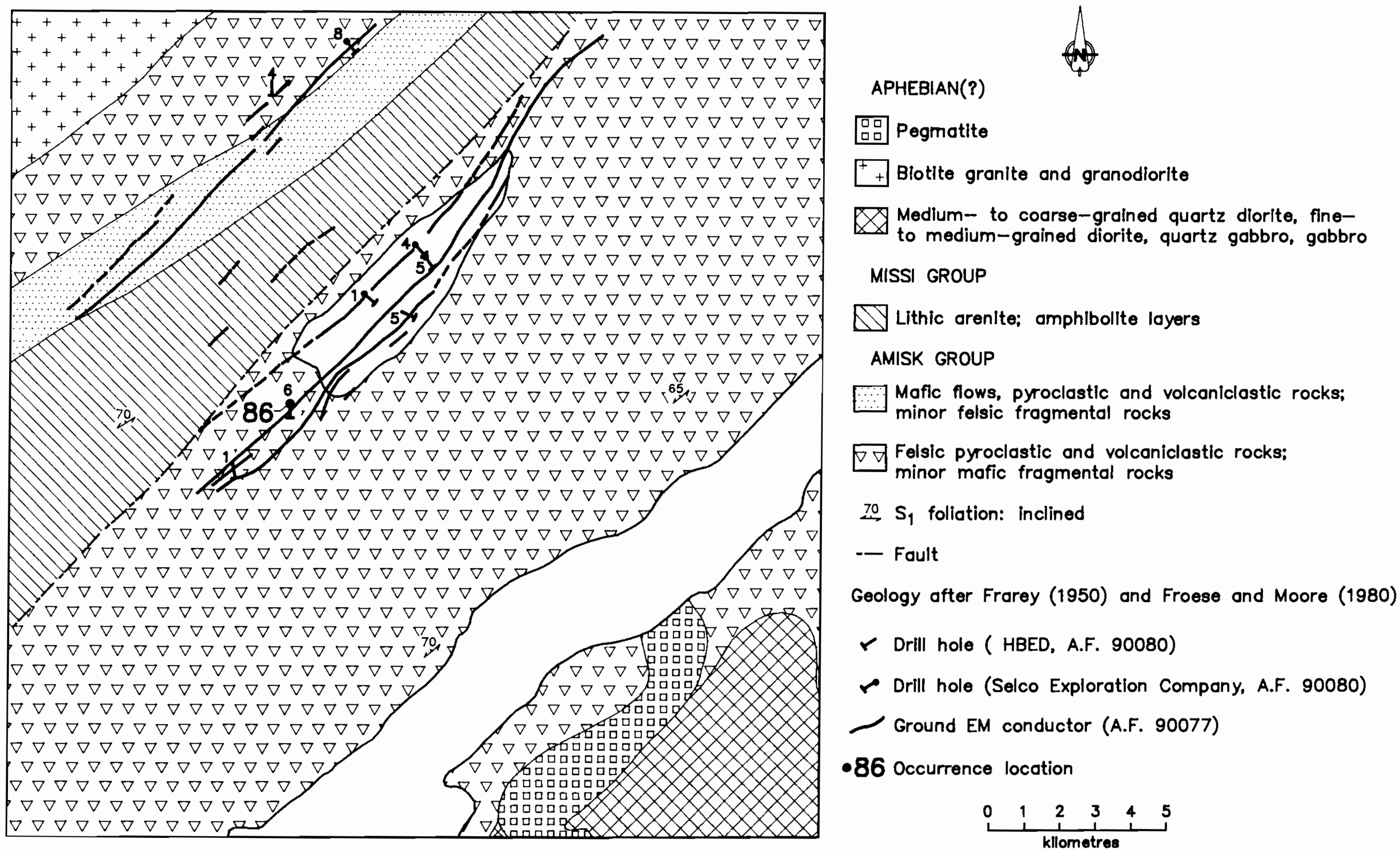


Figure 86-2: Detailed geology and diamond drill hole locations, occurrence 86.

LOCATION: **87**

NAME: (A.F. - Mineralization intersected by diamond drilling)

AREA: Berry Bay, Wekusko Lake.

UTM: 6074635N/438903E

AIRPHOTO: A20127-107

ACCESS: Boat on Wekusko Lake.

EXPLORATION SUMMARY:

The area was staked as Violet 1 and 9, Val 9, and Sol 9 in the 1940's. Surface exploration was done on the Violet and Val groups by Herb Lake Mining and Exploration Limited in 1947 (Manitoba Energy and Mines Scrap Book, 1947). Walter Johnson drilled a 61 m deep hole on Violet 1 for J.C.L. Ferguson between 1948 and 1949 (A.F. 90130). A. Talbot drilled two holes totalling 185 m on Moose 6 and an 80 m deep hole on Solar 22 on behalf of Jay-Kay Exploration Syndicate in 1959 (A.F. 90128). HBED carried out airborne EM and radiometric surveys and a Turam EM survey in 1965 (A.F. 91650, 90129). W. B. Kobar did some work on CB 384 between 1971 and 1972 (Mining Claim Card CB 384). The ground was held by W. Bruce Dunlop Limited from 1975 to 1977. Granges Exploration Aktiebolag carried out an HLEM survey on CB 9188 in 1979 and drilled a 74 m deep hole on the property in 1983 (A.F. 92993, 92983). Assessment work was reported on the property under a claim grouping during 1980 to 1989 (Mining Claim Card CB 9188). CB 9188 was cancelled in July 1990.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group greywacke and shale flanked to the south by Aphebian granodiorite of the Tramping Lake Pluton and to the north by mafic flows, pyroclastic and volcaniclastic rocks. The greywacke and shale have been intruded by nickel- and copper bearing gabbro (Fig. 87-1; Froese and Moore, 1980). Diamond drill holes intersected quartz-eye porphyry, hornblende and chlorite schist, quartzite, and slate (A.F. 90128). Ground EM conductors were delineated to the east of the occurrence (A.F. 92293). DDH AB-71, drilled to test these conductors, intersected quartz-graphite schist with trace to 10% pyrite (Fig. 87-1; A.F. 92983)

MINERALIZATION:

Disseminated pyrite occurs in hornblende schist over 1.2 m in core from DDH 1c and in 8.5 m of core from DDH 2c. DDH 3c intersected disseminated pyrite in slate over 4.0 and 8.5 m core intervals. Nonmineralized quartz veinlets occur within quartz-eye porphyry and slate. Mineral percentages are not reported (A.F. 90128).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 90128, 90129, 90130, 91650, 92983 and 92993

Manitoba Energy and Mines, Minerals Division.

Froese, E. and Gasparrini, E.

1975: Metamorphic zones in the Snow Lake area, Manitoba; Canadian Mineralogist, v. 13, p. 162-167.

Froese, E. and Moore, J.M.

1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.

Mining Claim Cards: CB 384; CB 9188

Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Scrap Book

1947: Manitoba Energy and Mines, Minerals Divison, Corporation Files.

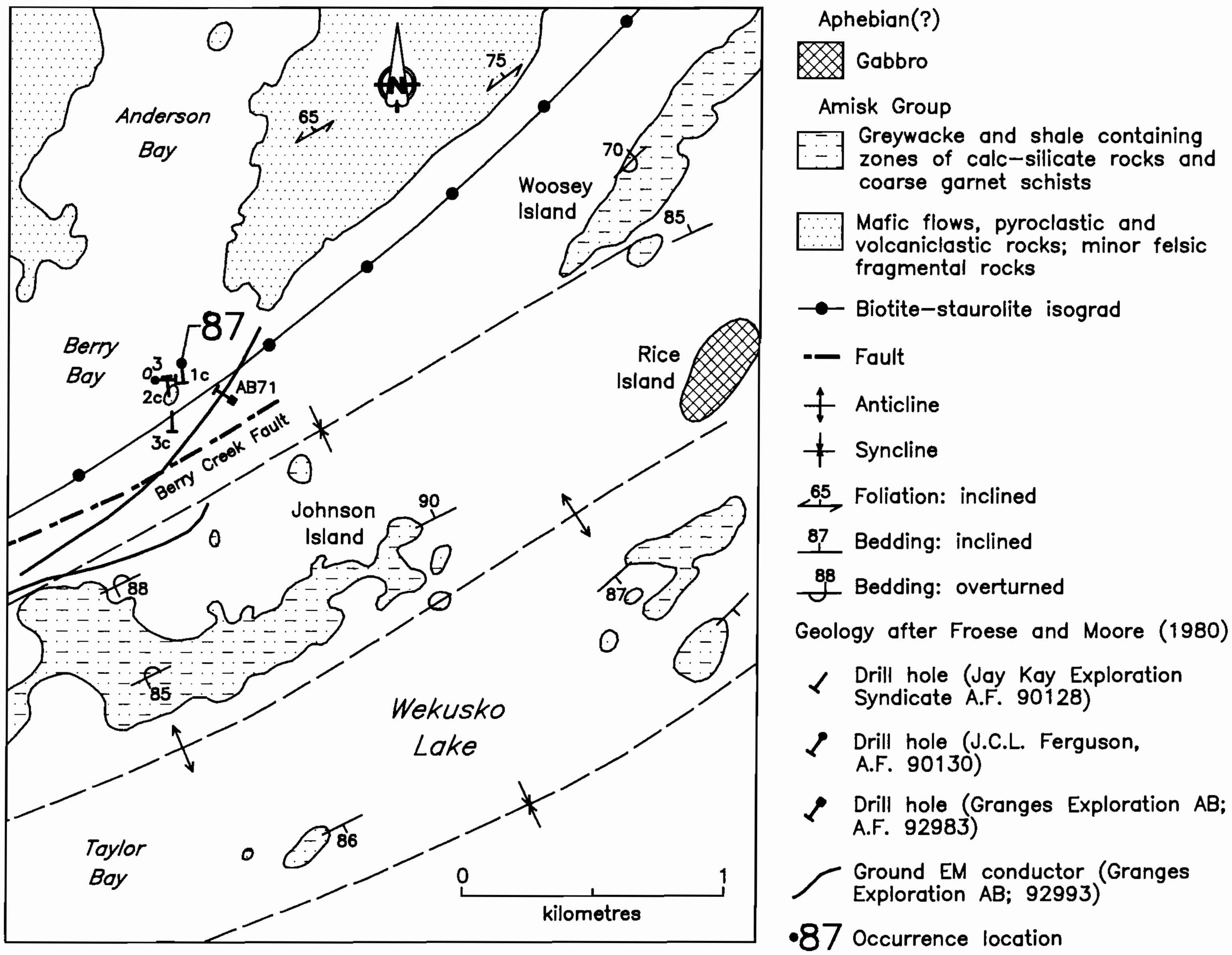


Figure 87-1: Geology, ground EM conductors and drill hole locations, occurrence 87.

LOCATION: **88**

NAME: (A.F. - Mineralization intersected by diamond drilling).

AREA: West of Niblock Lake.

UTM: 6086222N/466426E

AIRPHOTO: A20808-195,-196

ACCESS: Bush plane to Niblock Lake and traverse.

EXPLORATION SUMMARY:

The Nib group was staked in the area for R.G. Crosby in 1956, and was optioned to Selco Exploration Company Limited in 1957. A VLEM survey was done on the Nib claims and a two hole, 138 m, diamond drill program was done on Nib 9 in 1957 (A.F. 90079). Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624) and held ground in the area from 1960 to 1961. HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650) and an HLEM survey on the Kus claims between 1966 and 1967 (A.F. 90076). One hole was drilled on Kus 481 (A.F. 90076). Cangold Limited held ground in the area from 1981 to 1983. Snake 10 and 11 were staked for Esso Resources Canada Limited in 1987 and assigned to Homestake Mining Canada Limited in 1989. Assessment work was reported in 1988 and 1989 under a claim grouping (Mining Claim Cards Snake 10 and 11). The claims lapsed in 1991.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group mafic pillowed flows with minor breccia and tuffaceous rocks. These mafic volcanic rocks are flanked to the north by Missi Group siltstone, mudstone and conglomerate, to the west by probable Missi Group quartzofeldspathic gneiss, and to the south by Missi Group conglomerate. The contacts between the Amisk mafic volcanic rocks and Missi Group sedimentary rocks to the west and south are marked by faults (Fig. 88-1; Gordon and Gall, 1982; Frarey, 1950).

Diamond drill holes, collared to test ground EM conductors (Fig. 88-2), intersected banded and silicified andesite, graphitic greenstone and interlayered mineralized graphite and graphitic andesite (A.F. 90076, 90079).

MINERALIZATION:

DDH 6 intersected a 60.9 m interval of graphite and interlayered graphite and graphitic andesite containing 5 to 40% pyrite (A.F. 90079). DDH 5 was abandoned in overburden. Drill logs are not available for DDH 6 and Kus-75; however, notes plotted beside the collar for DDH 6 mention "graphite-pyrite". (A.F. 90076).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

Alcock, F.J.

1920: The Reed-Wekusko map area, northern Manitoba; Geological Survey of Canada, Memoir 119, 47p.

Assessment Files 90076, 90079, 91624 and 91650

Manitoba Energy and Mines, Minerals Division.

Frarey, M.J.

1950: Crowduck Bay; Geological Survey of Canada, Map 987A, 1:63 360.Gale, G.H., Baldwin, D.A. and Koo, J.

1980: A geological evaluation of Precambrian massive sulphide deposit potential in Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER79-1, 137p.

Gordon, T.M. and Gall, Q.

1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Mining Claim Cards Snake 10 (P6765E) and Snake 11 (P6439E)

Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

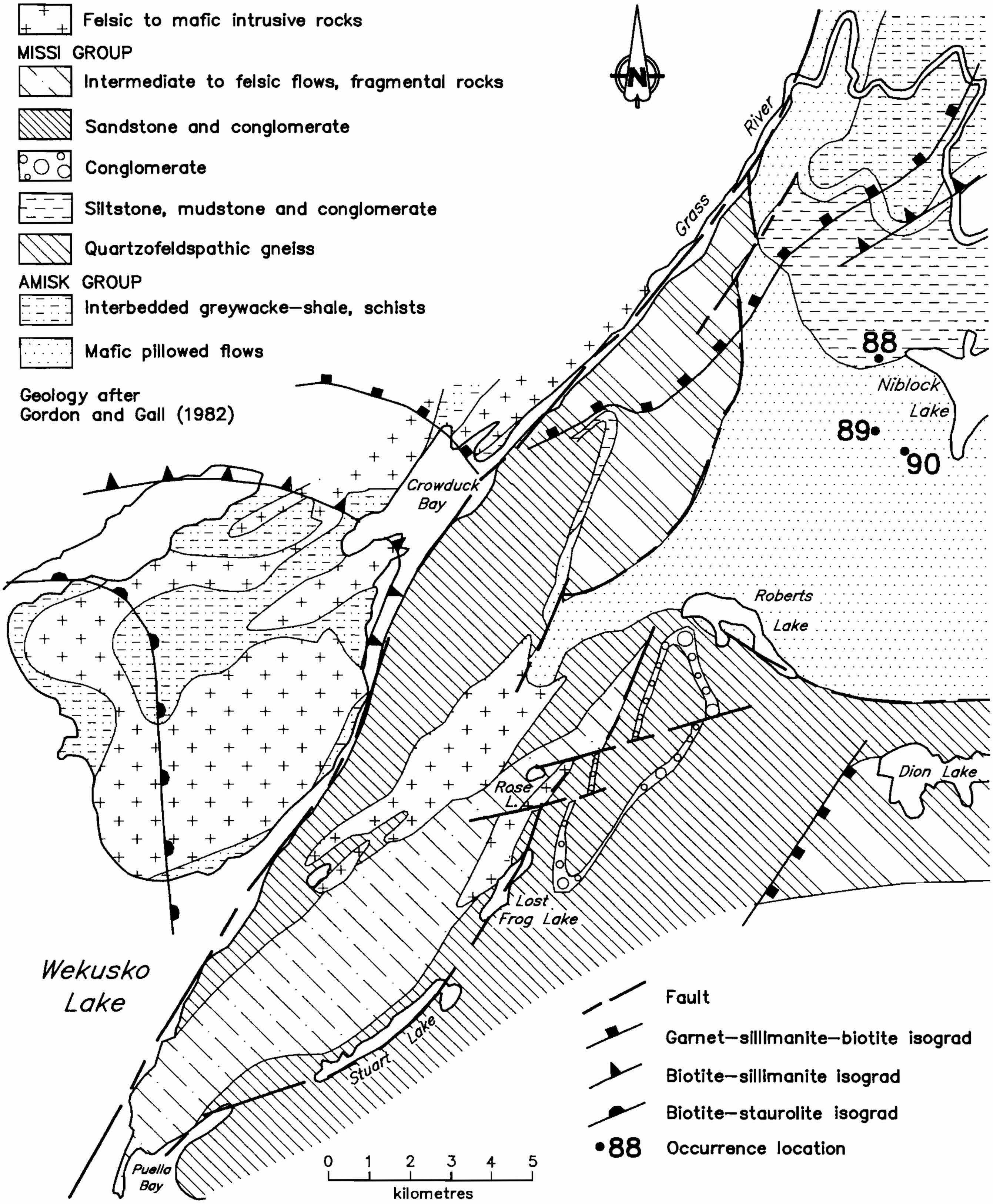
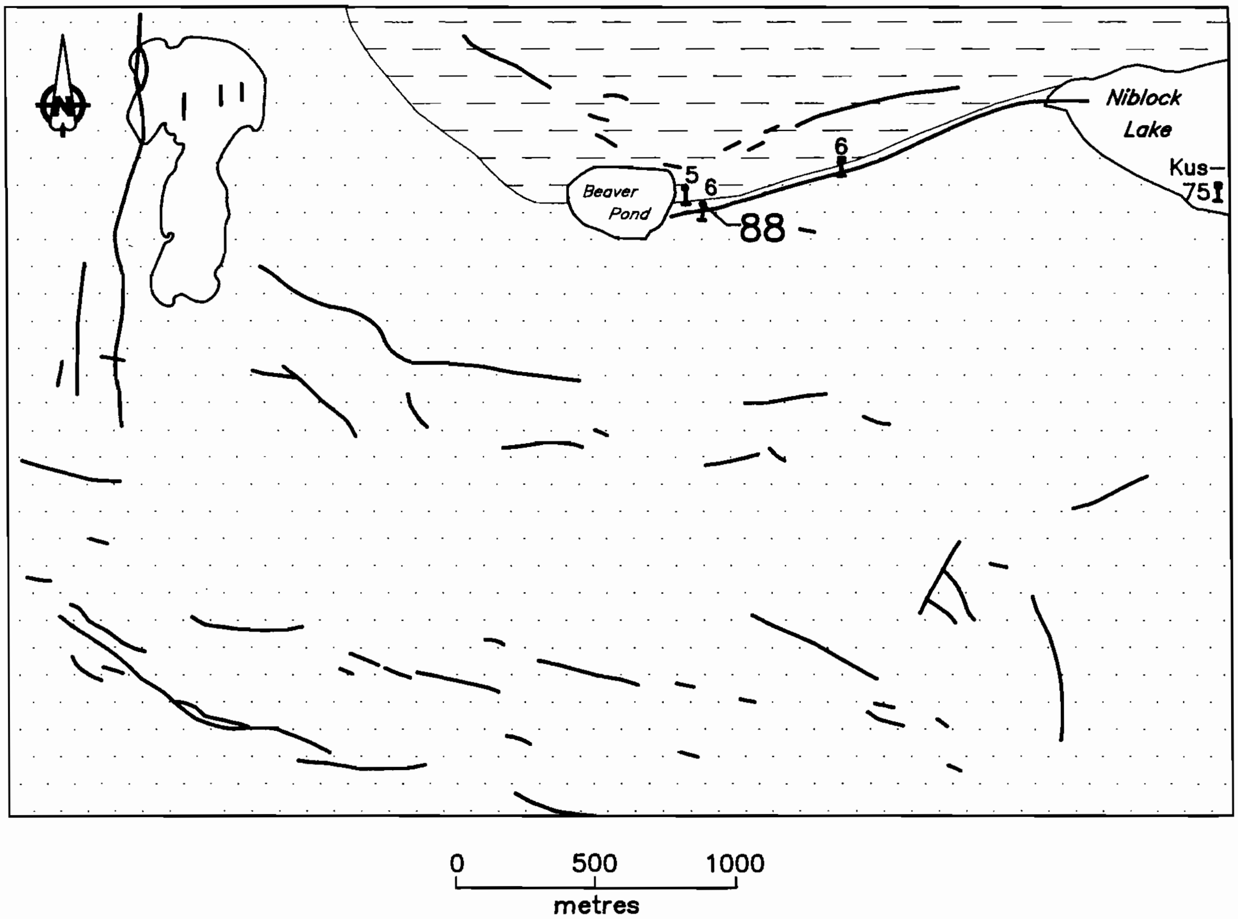


Figure 88-1: Geological setting of occurrences 88, 89 and 90.



MISSI GROUP

Siltstone, mudstone and conglomerate

AMISK GROUP

Mafic flows, minor breccia and tuffaceous rocks

Geology after Gordon and Gall (1982) and Frarey (1950)

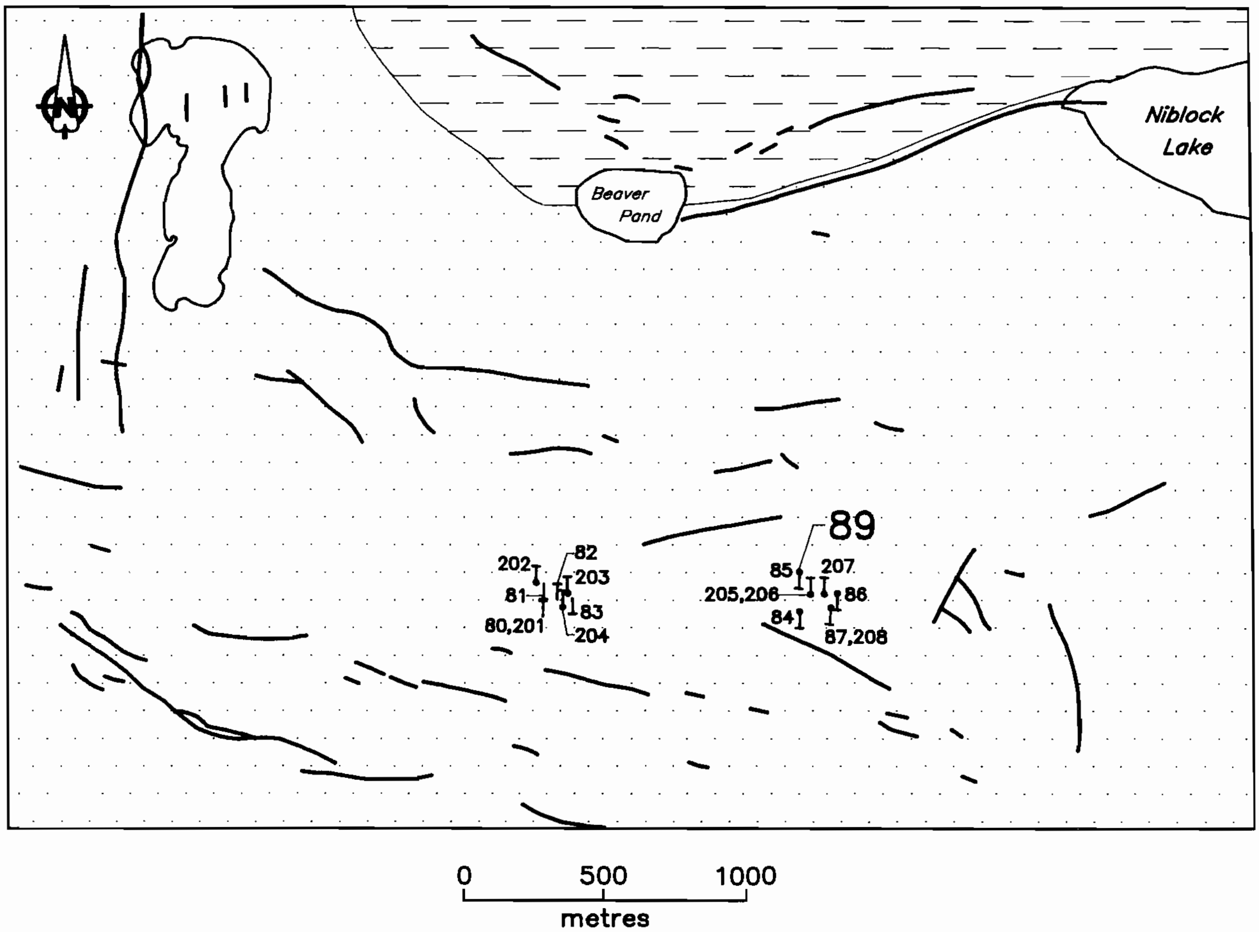
Drill hole (Selco Exploration Company Limited, 5, 6; A.F. 90079)

Drill hole (HBED; Kus–75, 6; A.F. 90076)

Ground EM conductor (A.F. 90076, 90079)

•88 Occurrence location

Figure 88-2: Local geology, ground EM conductors and diamond drill hole locations, occurrence 88.



MISSI GROUP

Siltstone, mudstone and conglomerate

AMISK GROUP

Mafic flows, minor breccia and tuffaceous rocks

Geology after Gordon and Gall (1982) and Frarey (1950)

Drill hole (M. Remnick; 80 to 83; A.F. 90082)

Drill hole (W.B. Kobar; 84 to 87 and 201 to 208; A.F. 90082)

Ground EM conductor (A.F. 90076, 90079)

•89 Occurrence location

Figure 89-1: Local geology, ground EM conductors and diamond drill hole locations, occurrence 89.

LOCATION: **89**

NAME: (A.F. - Mineralization intersected by diamond drilling).

AREA: Southwest of Niblock Lake.

UTM: 6084557N/466117E

AIRPHOTO: A20808-194

ACCESS: Bush plane to Niblock Lake and traverse.

EXPLORATION SUMMARY:

The area was first staked as the Galanda 1 to 6 claims prior to 1930. G.M. Brownell examined the Bear claims in 1933 and Fifty-Three Syndicate Limited optioned these claims in 1935; however, there are no records of the Bear claims on claim maps prior to 1944 (Manitoba Energy and Mines, Unpublished Information File, 63J/13; Manitoba Mines and Natural Resources, 1936). Bear 1 to 4 were staked by R. Leslie and Guess 6 to 9 were staked by S. Leslie in 1944. Wekusko Consolidated Limited examined the property in 1945 (Mining Claim Cards Guess 6, Bear 1). G.B. Tribble drilled Guess 6 in 1945 (Manitoba Mines and Natural Resources, 1946). The claims lapsed in 1947. The Link 1 to 8 claims were staked by W.B. Kobar, P. Kobar and M. Remniak in 1950. P. Kobar did a 16 hole, 171 m, drill program on the property between 1951 and 1952 (A.F. 90082). The claims lapsed in 1953. Selco Exploration Company Limited did a VLEM survey on the Nib group of claims in 1957 (A.F. 90079). Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624) and held ground in the area from 1960 to 1961. HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650) and an HLEM survey on the Kus claims between 1966 and 1967 (A.F. 90076). Cangold Limited held ground in the area from 1981 to 1983. Snake 3 was staked for Esso Resources Canada Limited in 1986 and assigned to Homestake Mining Canada Limited in 1989. Assessment work was done on Snake 3 in 1988 and 1989 (Mining Claim Card Snake 3). Snake 3 lapsed in 1990.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group mafic volcanic flows with minor breccia and tuffaceous rocks. These rocks are flanked to the north by Missi Group siltstone, mudstone and conglomerate, to the west by probable Missi Group quartzofeldspathic gneiss, and to the south by Missi Group conglomerate. The contacts between the Amisk mafic volcanic rocks and Missi Group sedimentary rocks to the west and south are marked by faults (Fig. 88-1; Gordon and Gall, 1982; Frarey, 1950). Diamond drilling intersected hornblende schist and diorite (Fig. 89-1; A.F. 90082). All holes were drilled to a depth of 10.7 m (A.F. 90082).

MINERALIZATION:

DDH 80, 83, 85, 202, 203 and 207 intersected 1.8 to 3.4 m quartz-filled shears with arsenopyrite; percentages are not specified. DDH 81, 82, 84, 86, 87, 201 and 204 through 206 intersected nonmineralized diorite and hornblende schist. DDH 202 and 207 intersected 1.8 and 3.4 m intervals, respectively, of a quartz-filled shear zone arsenopyrite at or near the contact between 3 m of hornblende schist and 4.3 m of altered diorite. Altered diorite was also intersected by DDH 208. The alteration of the diorite may be related to the shearing event.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. The quartz-filled shear zones contain arsenopyrite.

REFERENCES:

Assessment Files 90076, 90079, 90082, 91624 and 91650
Manitoba Energy and Mines, Minerals Division.

Fedikow, M.A.F., Roney, C.T., Schmidt, G.J. and Robbie, T.
1986: Mineral deposit studies in the Snow Lake area; in Manitoba Energy and Mines, Geological Services Branch, Report of Field Activities, 1986, p. 77-85.

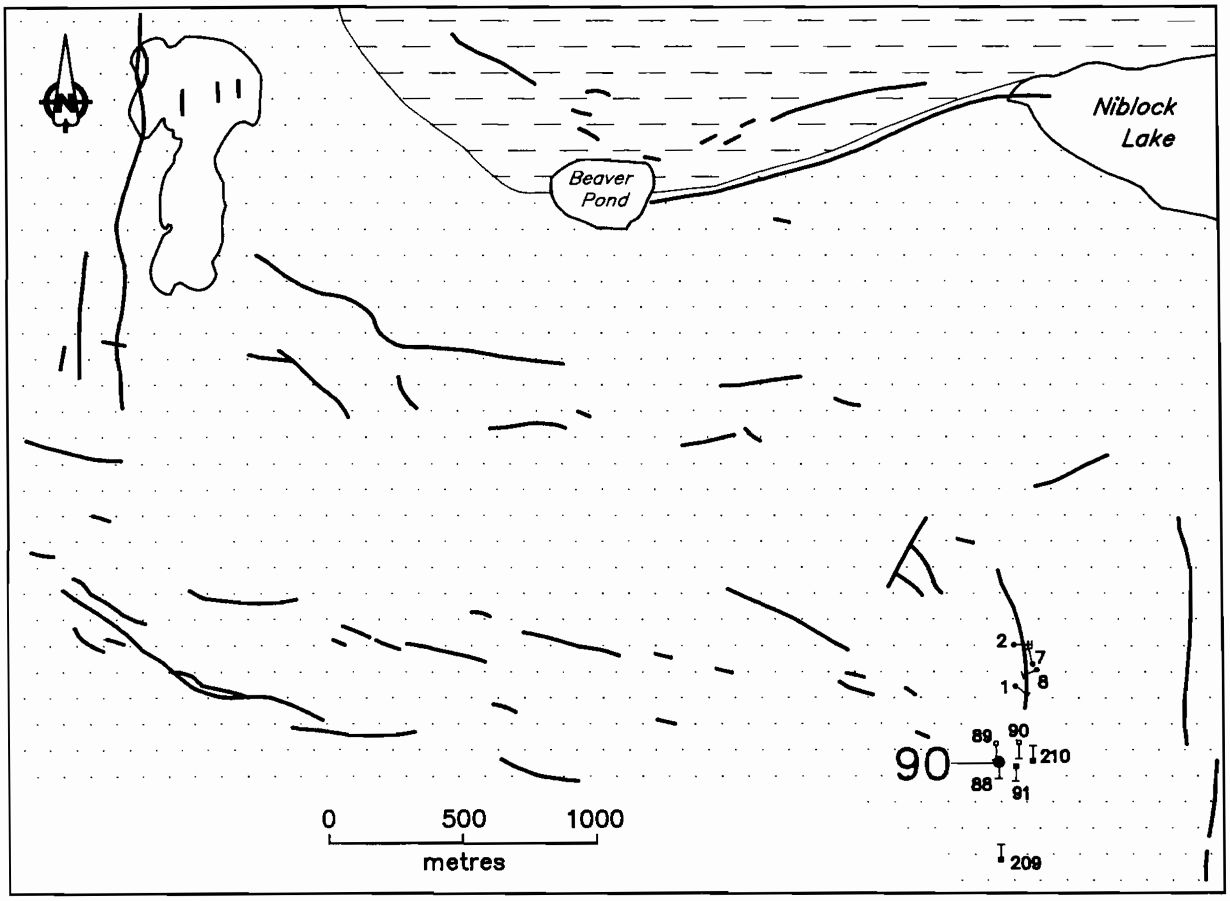
Frarey, M.J.
1950: Crowduck Bay; Geological Survey of Canada, Map 987A, 1:63 360.

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Manitoba Mines and Natural Resources
1936: 8th Annual Report On Mines and Minerals, 118p.

Manitoba Mines and Natural Resources
1946: 18th Annual Report On Mines and Minerals, 85p.

Mining Claim Cards Guess 6 (P7233); Bear 1 (P7289); Snake 3 (P6265E)
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.



MISSI GROUP

Siltstone, mudstone and conglomerate

AMISK GROUP

Mafic flows, minor breccia and tuffaceous rocks

Geology after Gordon and Gall (1982) and Frarey (1950)

Drill hole (Selco Exploration Company Limited; 1, 2, 7, 8; A.F. 90079)

Drill hole (Charles Nelson; 88, 89; A.F. 90082)

Drill hole (M. Remnick; 90; A.F. 90082)

Drill hole (W.B. Kobar; 91, 209, 210; A.F. 90082)

Ground EM conductor (A.F. 90076, 90079)

•90 Occurrence location

Figure 90-1: Local geology, ground EM conductors and diamond drill hole locations, occurrence 90.

LOCATION: **90**

NAME: (A.F. - Mineralization intersected by diamond drilling).

AREA: South of Niblock Lake.

UTM: 6083860N/467065E

AIRPHOTO: A20808-194

ACCESS: Bush plane to Niblock Lake and traverse.

EXPLORATION SUMMARY:

The area was first staked as Goldover 1 and 2, Roxalite 1 and 2 and Royalite 3 to 8 prior to 1930. The Bear group of claims were staked in the area between 1944 and 1945 by various individuals. G.M. Brownell examined the Bear claims in 1933 and Fifty-Three Syndicate Limited optioned these claims in 1935; however, there are no records of the Bear claims on claim maps prior to 1944 (Manitoba Energy and Mines, Unpublished Information File, 63J/13). Wekusko Consolidated Limited did work on the Bear group in 1945 (Mining Claim Card Bear 1). G.B. Tribble drilled Bear 8 in 1945 (Manitoba Mines and Natural Resources, 1946). The claims were cancelled between 1946 and 1947. The Link 9 to 12 claims were staked by Charles Nelson, W.B. Kobar and Mike Remniak in 1950. Six holes totalling 64 m were drilled on the property by P. Kobar between 1951 and 1952 (A.F. 90082). The claims lapsed in 1953. In 1957 Selco Exploration Company Limited did a VLEM survey on the Nib group of claims and drilled 4 holes totalling 95 m on Nib 52, a 15 m deep hole on Nib 56 and a 78 m deep hole on Nib 87 (A.F. 90079). Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624) and held ground in the area from 1960 to 1961. HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650) and did an HLEM survey on the Kus claims between 1966 and 1967 (A.F. 90076). The ground was held by Cangold Limited between 1981 and 1983. The Snake claims were staked by Esso Resources Canada Limited in 1986, and assigned to Homestake Mining Canada Limited in 1989. Work was done on Snake 1, 2, 3 and 4 in 1988 and 1989 (Mining Claim Card Snake 1). The Snake claims lapsed in 1990.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group mafic pillowed flows with minor breccia and tuffaceous rocks. These mafic volcanic rocks are flanked to the north by Missi Group siltstone, mudstone and conglomerate, to the west by probable Missi Group quartzofeldspathic gneiss, and to the south by Missi Group conglomerate. The contacts between the Amisk mafic volcanic rocks and Missi Group sedimentary rocks to the west and south are marked by faults (Fig. 88-1; Gordon and Gall, 1982; Frarey, 1950). Diamond drill holes, collared to test ground EM conductors, intersected hornblende schist and diorite (A.F. 90082) and greenstone and chemical sedimentary rocks (Fig. 90-1; A.F. 90079). All holes described in A.F. 90082 were drilled to a depth of 10.7 m.

MINERALIZATION:

DDH 88 (A.F. 90082) intersected a 6.7 m quartz-filled shear with arsenopyrite; percentages of arsenopyrite are not specified. DDH 91 intersected a non-mineralized 2.1 m quartz filled shear zone at or near the contact between hornblende schist and diorite. DDH 8 intersected a 5.2 m mineralized interval described as;

1. 0.9 m of greenstone with 20% pyrite,
2. 0.9 m of graphite with 30% pyrite,
3. 0.9 m of quartz-graphite-pyrite, and
4. 2.4 m of greenstone with 20% pyrite (A.F. 90079).

DDH 209 intersected "altered" hornblende schist with quartz stringers and DDH 210 intersected "altered" diorite. The nature of the alteration in DDH 209 and 210 was not specified. DDH 89 and 90 intersected non-mineralized hornblende schist. DDH 1 and 7 were abandoned in overburden (A.F. 90079).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. The quartz-filled shear zone contains arsenopyrite. A chemical sediment type deposit; sulphide facies iron formation, is intersected by DDH 8. This hole was collared to test a north trending geophysical conductor.

REFERENCES:

Assessment Files 90076, 90079, 90082, 91624 and 91650
Manitoba Energy and Mines, Minerals Division.

Frarey, M.J.
1950: Crowduck Bay; Geological Survey of Canada, Map 987A, 1:63 360.

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Manitoba Mines and Natural Resources
1946: 18th Annual Report On Mines and Minerals, 85p.

Mining Claim Cards Bear 1 (P7289); Snake 1 (P6264E)
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

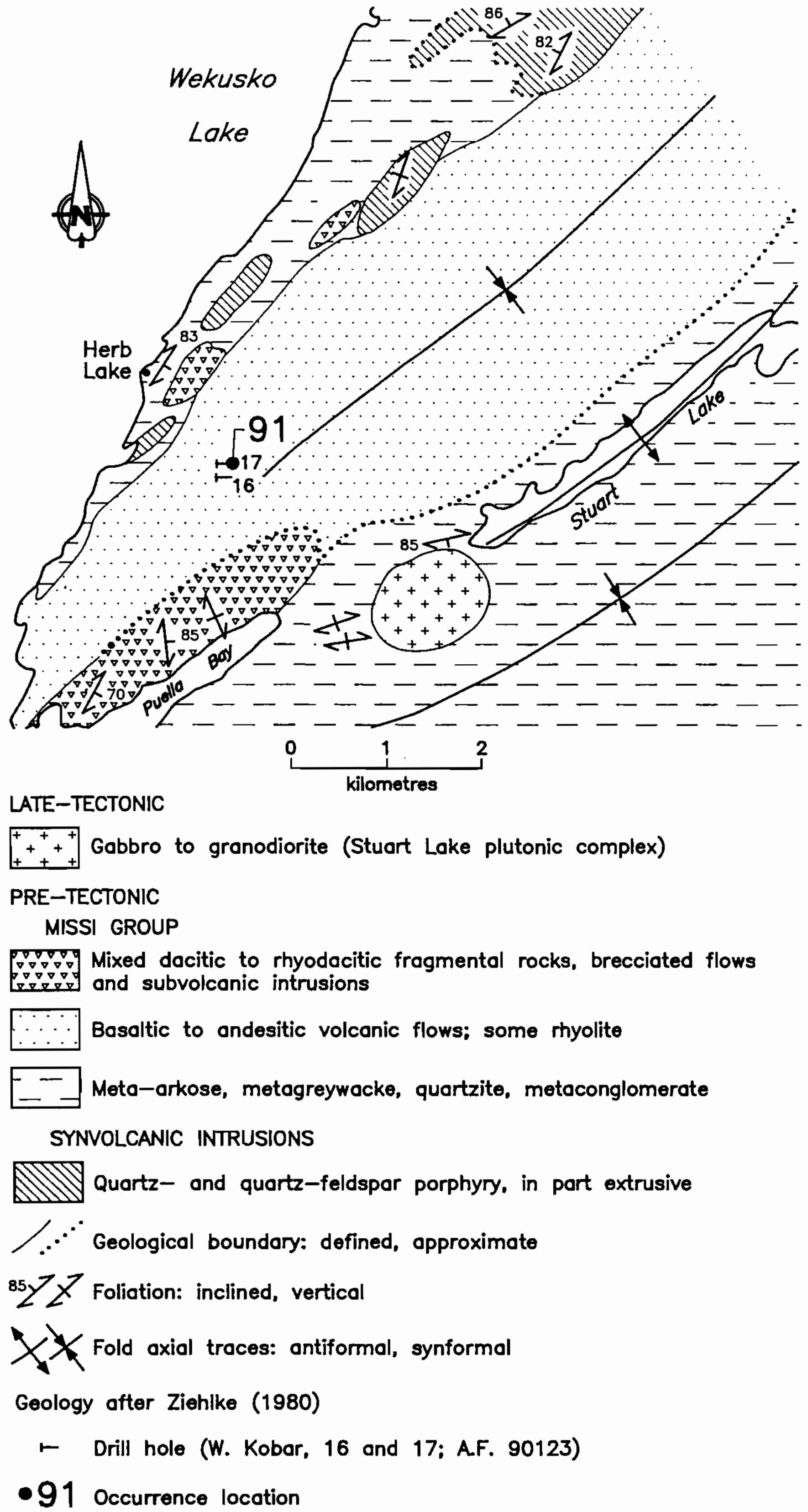


Figure 91-1: Geological setting and diamond drill hole locations, occurrence 91.

LOCATION: **91**

NAME: (A.F. - Mineralization intersected by diamond drilling).

UTM: 6068360N/449704E

ACCESS: Boat on Wekusko Lake.

AREA: Southeast shore of Wekusko Lake.

AIRPHOTO: A20124-53

EXPLORATION SUMMARY:

The area was first staked as the Dolcoath claim prior to 1930. Diamond drilling was done on the Jig group of claims by P. Kobar and B. Kobar between 1945 and 1946 (Manitoba Mines and Natural Resources, 1946, 1947). Surface work was done on the Snow group of claims by W. Kobar between 1959 and 1962 (Mining Claim Card Snow 1). In 1962 W. Kobar drilled two holes totalling 128 m on Snow 1 (A.F. 90123). Snow 1 was cancelled in 1965. Airborne EM and radiometric surveys were done by HBED in 1965 (A.F. 91650). D. Lamb staked Mike 19 in 1968 and did surface work on the Mike group of 27 claims between 1969 and 1975 (Mining Claim Card, Mike 19). Falconbridge Nickel Mines Limited did airborne EM and magnetic surveys in 1973 (A.F. 91564). Mike 19 was cancelled in 1977. W. Bruce Dunlop Limited staked CB 10478 in 1979 and optioned it to Cangold Limited from 1981 to 1982. Noranda Exploration Company Limited optioned the property from 1985 to 1987. Mid-North Resources Limited acquired the property in 1987.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by andesite and basalt flows and related breccia and tuff (Fig. 91-1; Armstrong, 1939). Ziehlke (1978) assigns these rocks to the Missi Group. Diamond drilling intersected rhyolite, chlorite schist and mineralized quartz veins (A.F. 90123).

MINERALIZATION:

DDH 16 and 17 intersected 1.8 m and 3 m zones, respectively, of quartz stringers that contain pyrite and galena. No percentages for the sulphide minerals are given. The log for DDH 17 describes the mineralized quartz veins as being contained within a shear zone in rhyolite and underlain in the drill core by chlorite schist that has a minimum core thickness of 28 m. Both drill holes were stopped in chlorite schist (A.F. 90123).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. The multiple quartz veins with pyrite and galena occur in a shear zone and are hosted by rhyolite. The chlorite schist underlying the rhyolite may have been derived from the rhyolite by shearing and accompanying fluid-rock interaction. Alternatively, the chlorite schist may represent an altered rhyolite that was subsequently sheared.

REFERENCES:

Armstrong, J.E.

1941: Wekusko; Geological Survey of Canada, Map 665A, 1:63 360.

Assessment Files 90123, 91564 and 91650

Manitoba Energy and Mines, Minerals Division.

Frarey, M.J.

1950: Crowduck Bay; Geological Survey of Canada Map 987A, 1:63 360.

Manitoba Mines and Natural Resources

1946: 18th Annual Report on Mines and Minerals, 85p.

1947: 19th Annual Report on Mines and Minerals, 100p.

Mining Claim Cards: Snow 1 (P 71283); Mike 19 (P 8378D)

Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Stockwell, C.H.

1937: Gold deposits of Herb Lake area, northern Manitoba; Geological Survey of Canada, Memoir No. 208, 46p.

Ziehlke, D.V.

1978: Geology of the Wekusko Lake pegmatite field, Map ER80-1-4, 1:100 000; in Manitoba Department of Energy and Mines, Mineral Resources Division, Economic Geology Report ER80-1, 216p.

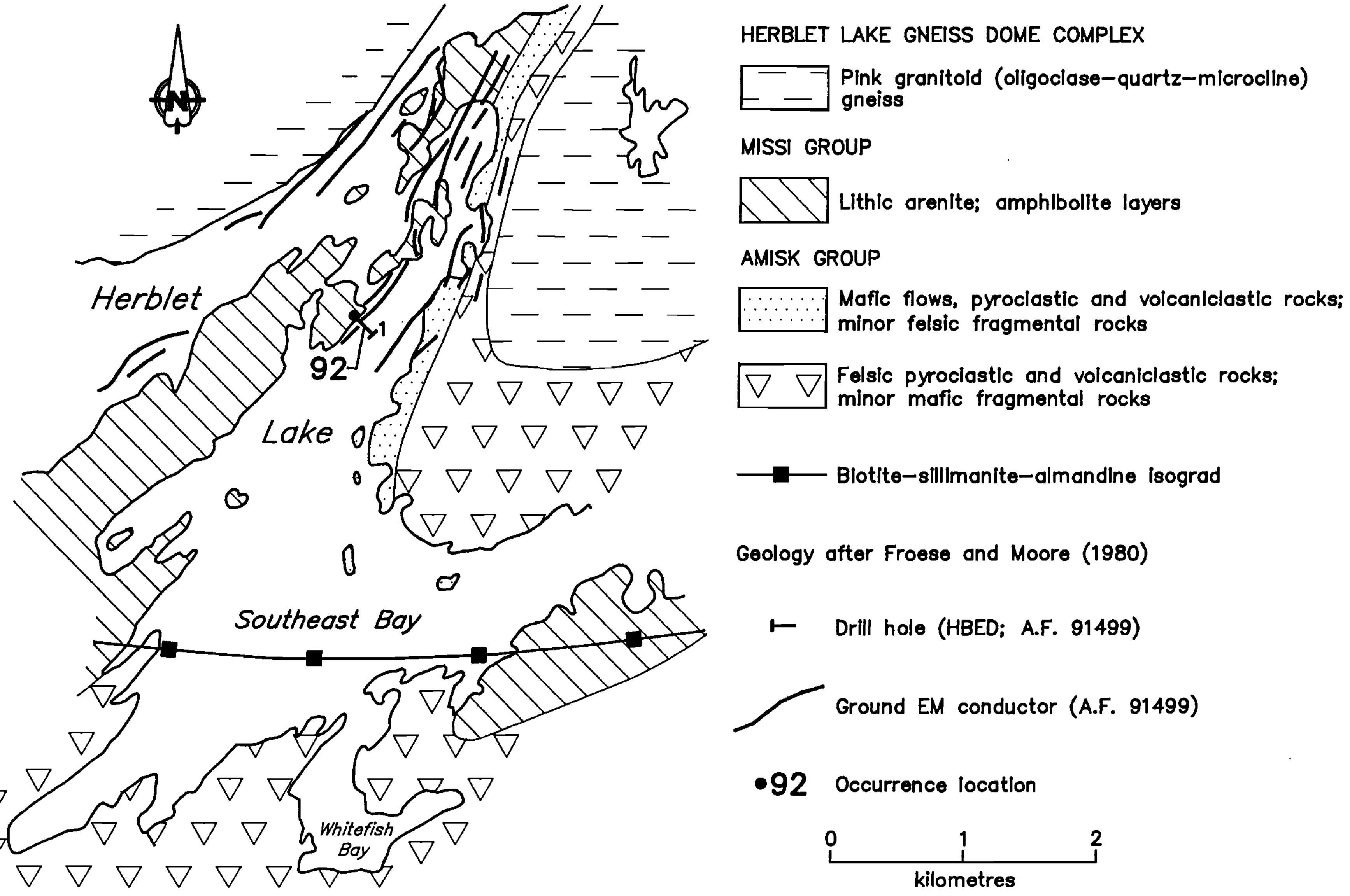


Figure 92-1: Geological setting, ground EM conductors and diamond drill hole location, occurrence 92.

LOCATION: **92**

NAME: (A.F. - Mineralization intersected by diamond drilling).

AREA: Central Herblet Lake.

UTM: 6087247N/444022E

AIRPHOTO: A20127-28

ACCESS: Provincial Highway 393 to Herblet Lake landing and boat on Herblet Lake.

EXPLORATION SUMMARY:

Canadian Nickel Company Limited carried out an airborne EM survey in the area in 1957 (A.F. 91624, Ground Hog Sheet 12). HBED did an HLEM survey on the Ram claims between 1956 and 1957 (A.F. 90119). HBED did a Turam survey on CB 293 in 1970 and drilled one hole on the property, probably between 1972 and 1974 (A.F. 91499; Mining Claim Card CB 293). Fosco Mining Limited carried out airborne EM and magnetic surveys in 1971 (A.F. 92130). CB 293 was cancelled in 1976. The area was restaked as CB 11088 by Granges Exploration Aktiebolag (now known as Granges Inc.) in 1980.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Missi Group lithic arenite flanked to the east by Amisk Group mafic flows, pyroclastic and volcaniclastic rocks. Amisk group felsic pyroclastic and volcaniclastic rocks flank the occurrence to the south; salmon pink granitoid gneiss of the Herblet Lake Gneiss Dome Complex occurs to the north (Fig. 92-1; Bailes, 1975; Froese and Moore, 1980). Multiple long and short strike ground EM conductors characterize the area of the occurrence.

MINERALIZATION:

Disseminated pyrite, (1%), occurs in the lithic arenite. DDH Ram 221 was drilled to test the ground EM conductors, but drill logs are not available (A.F. 91499). It is likely the ground EM conductors represent chemical sediment type deposits.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Armstrong, J.E.

1941: Wekusko; Geological Survey of Canada, Map 665A, 1:63 360.

Assessment Files 90119, 91499, 91624 and 92130

Manitoba Energy and Mines, Minerals Division.

Bailes, A.H.

1975: Geology of the Guay-Wimapedi Lakes area; Manitoba Mines, Resources and Environmental Management, Mineral Resources Division Publication 75-2, 104p.

Eccles, D.R. and Fedikow, M.A.F.

1985: Mineral occurrence documentation and alteration zone mapping, Snow Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 82-99.

Mining Claim Card, CB 293

Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Froese, E. and Moore, J.M.

1980: Metamorphism in the Snow Lake area; Geological Survey of Canada Paper 78-27, 16p.

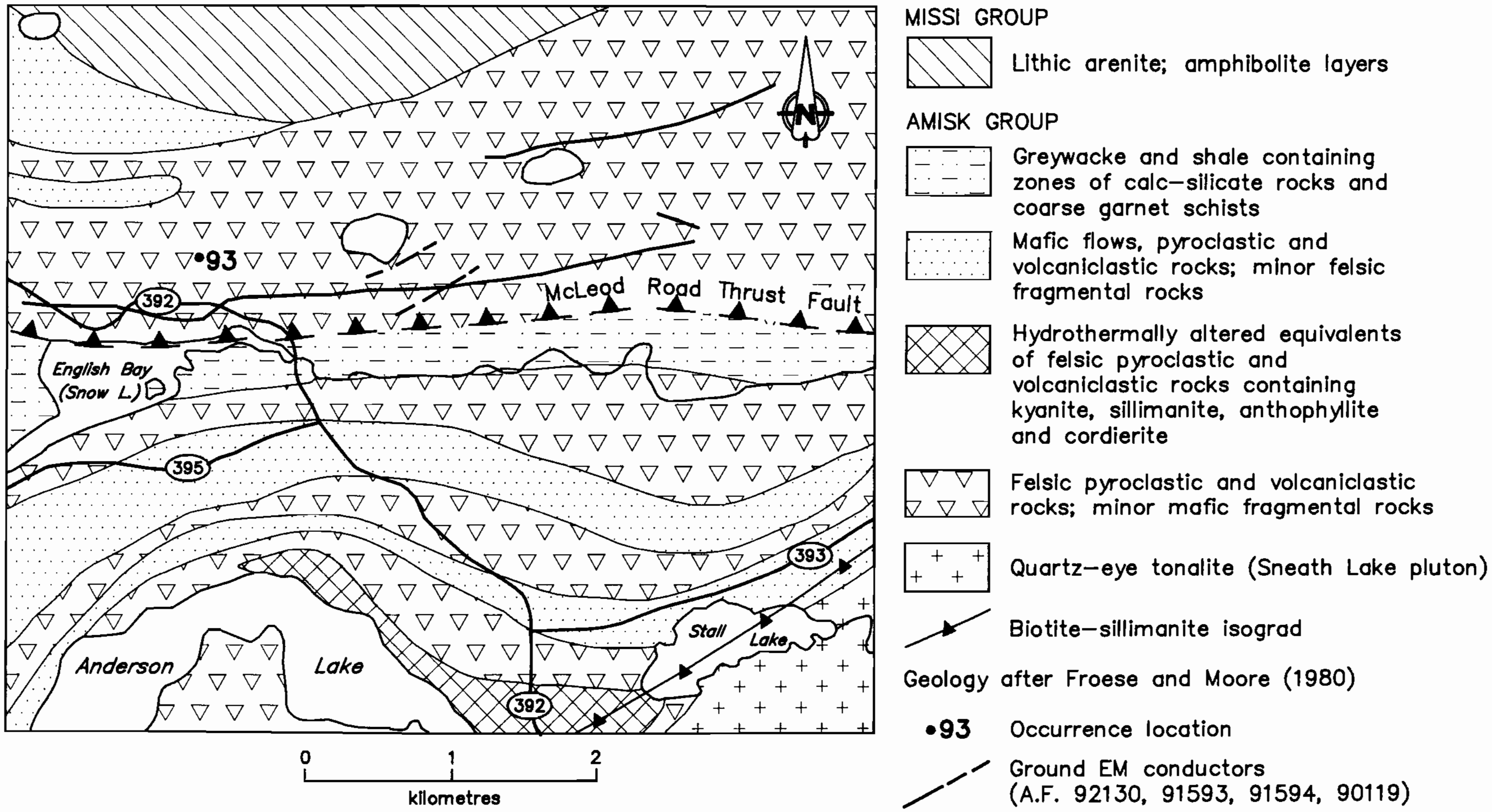


Figure 93-1: Geological setting, ground EM conductors and diamond drill hole locations, occurrence 93.

LOCATION: **93**

NAME: (A.F. - Mineralization intersected by diamond drilling)

UTM: 6081466N/436522E

ACCESS: Provincial Highway 392 and traverse.

AREA: North of English Bay, Snow Lake.

AIRPHOTO: A20170-18

EXPLORATION SUMMARY:

The area was first staked prior to 1930. Diamond drilling was done on Sheba 1 and 2 by J.H. Dawson and R. Gaspard in 1943 (Manitoba Mines and Natural Resources, 1944). In 1945 diamond drilling was done on D.D. 5 and 6 and Sheba 1 by J.E. Rowlandson (Manitoba Mines and Natural Resources, 1946). J. Rowlandson traced a 152 m long, 2 to 4.6 m wide "showing" characterized by two gold bearing quartz veins with "heavy" arsenopyrite mineralization. The location of this occurrence; however, is not known with certainty (Snow Lake Gold Mines Limited, Corporation File). In 1947 J. Nutt drilled 7 holes totalling 126 m on D.D. 6 and 8 holes totalling 183 m on D.D. 2 and 6 (A.F. 92150). In 1955 Howe Sound Exploration Company Limited drilled a 167 m deep hole on Sheba 1 and a 131 m hole on Sheba 2 on behalf of Snow Lake Gold Mines Limited (A.F. 90204). Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624). Fosco Mining Limited did airborne EM and magnetic surveys in 1971 (A.F. 92130). HBED staked CB 9419 over the property in 1978, and transferred it to Mingold Resources Inc. in 1988.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group felsic pyroclastic and volcaniclastic rocks flanked to the north by mafic flows, pyroclastic and volcaniclastic rocks and to the south by intercalated greywacke and shale and mafic and felsic volcanic rocks (Fig. 93-1; Froese and Moore, 1980). The McLeod Road Thrust Fault occurs south of the occurrence. Diamond drilling intersected silicified tuff of unspecified composition, silicified and sheared greenstone, mineralized "altered" garnet gneiss, and "altered" diorite with quartz stringers (Fig. 93-2; A.F. 92150).

MINERALIZATION:

DDH 27 intersected a 17.7 m interval of altered and sheared garnet gneiss that is "well mineralized" with pyrite and minor arsenopyrite. The garnet gneiss contained abundant, nonmineralized quartz veins. The remainder of the drill holes intersected quartz veins in "altered, sheared and silicified" greenstone, diorite and garnet gneiss. The host rocks in DDH 30 are described as being "mineralized", but it is uncertain whether this refers to the "dark altered rocks" or to the quartz veins (A.F. 92150).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified. It is possible the shear zone intersected by the diamond drilling are related to the McLeod Road Thrust Fault.

REFERENCES:

Assessment Files 90204, 91624, 92130 and 92150
Manitoba Energy and Mines, Minerals Division.

Eccles, D.R. and Fedikow, M.A.F.
1985: Mineral occurrence documentation and alteration zone mapping, Snow Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 82-99.

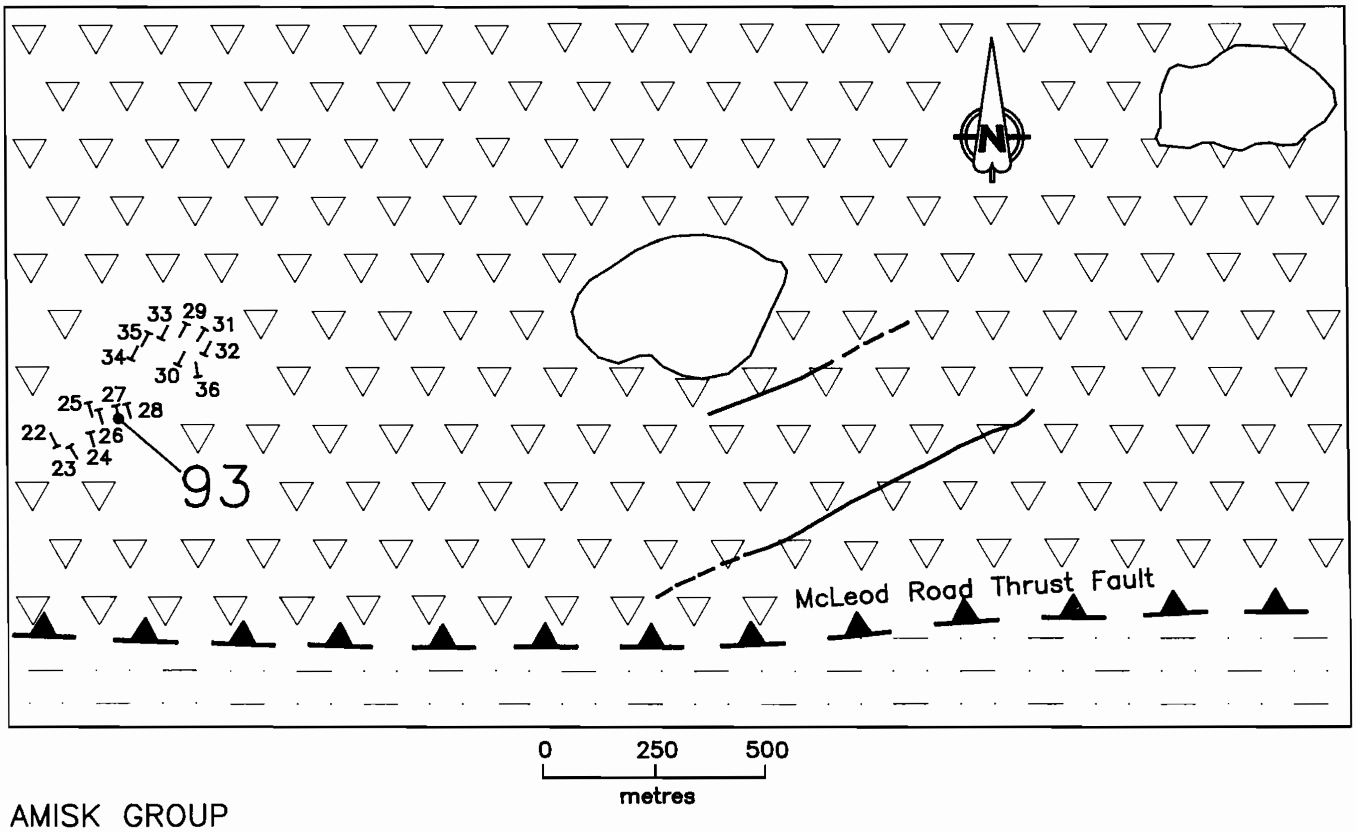
Gale, G.H., Baldwin, D.A. and Koo, J.
1980: A geological evaluation of Precambrian massive sulphide deposit potential in Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER79-1, 137p.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada Paper 78-27, 16p.

Manitoba Mines and Natural Resources
1944: 16th Annual Report On Mines and Minerals, 113p.

Manitoba Mines and Natural Resources
1946: 18th Annual Report On Mines and Minerals, 45p.

Snow Lake Gold Mines Limited
Manitoba Energy and Mines, Minerals Division, Corporation File.



AMISK GROUP

Greywacke and shale containing zones of calc-silicate rocks and coarse garnet schists

Felsic pyroclastic and volcaniclastic rocks; minor mafic fragmental rocks

Geology after Froese and Moore (1980)

Drill hole (J. Nutt, 22 to 36, A.F. 92150)

Ground EM conductor (A.F. 91593)

•93 Occurrence location

Figure 93-2: Geology and diamond drill hole locations, occurrence 93.

LOCATION: **94**

NAME: (A.F. - Mineralization intersected by diamond drilling)

UTM: 6082520N/441840E

ACCESS: Provincial Road 393 and traverse; alternatively, boat on Herblet Lake and traverse.

AREA: North of Snow Creek and south of Southeast Bay, Herblet Lake.

AIRPHOTO: A20127-112

EXPLORATION SUMMARY:

The area was first staked as the Ox 1 to 4 and LPH 1 and 2 claims in the late 1920's. Diamond drilling was done on Sela 1 and on the adjacent Bel group of claims between 1945 and 1946, but the results of this work are not available (Manitoba Mines and Natural Resources, 1946, 1947). HBED drilled an 85.6 m deep hole on Ram 118 (former Bel 8 claim area) in 1955 and carried out an HLEM survey on the Ram group of claims in 1956 (A.F. 90155, 90156). An airborne EM survey was done by Canadian Nickel Company Limited in 1957 (A.F. 91624, Ground Hog Sheet 10). In 1967 Guardian Mines Limited carried out a Turam EM survey and a 4 hole, 708 m, drill program on the Fox 10, 13 and 14 claims (A.F. 90139). Further diamond drilling was apparently done on the Fox claims between 1970 and 1971 (Mining Claim Card Fox 10). In 1971, Stall Lake Mines Limited carried out magnetic and EM (DPM-1) surveys and drilled a 62 m deep hole on CB 3559 (A.F. 91601). Airborne EM and magnetic surveys were done by Fosco Mining Limited that year (A.F. 92130). HBED staked CB 4736 and CB 4737 in 1973 over the former Sela and Fox claims and CB 7085 in 1978 over the former Bel and CB 3559 claim area. Electromagnetic and magnetic surveys were done by HBED in 1986 (Mineral Inventory Card 63J/13 Au 23).

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group felsic pyroclastic and volcaniclastic rocks flanked to the northwest by Missi Group lithic arenite. The axial traces of the Whitefish Bay Synform and the Southeast Bay Antiform have been mapped in the area of the occurrence. The McLeod Road Thrust Fault occurs south of the occurrence (Fig. 94-1; Froese and Moore, 1980). Diamond drill holes, collared to test long and short strike length ground EM conductors, intersected mineralized and variably altered andesite, gabbro, basalt, green garnetiferous biotite-hornblende gneiss, light green, coarse grained hornblendite, talc schist and chemical sedimentary rocks (A.F. 90139, 90156 and 91601).

MINERALIZATION:

Minor disseminated chalcopyrite and pyrite occur in silicified and carbonatized andesite (DDH 71-4; A.F. 91601). DDH 1 intersected 1.5 m and 3 m intervals of "well mineralized" silicified basalt that contains pyrrhotite, pyrite and minor chalcopyrite. Minor disseminated pyrite and a "massive pyrite stringer" were intersected by DDH 3 over a 0.6 m interval within mafic to intermediate volcanic rocks. DDH 4 intersected disseminated pyrrhotite over a 3.7 m interval of basalt. A 2.4 m intersection of pyrite, pyrrhotite and graphite was intersected by DDH 5; a 21.6 m interval of talc schist is also described in the drill log for this hole (A.F. 90139). DDH 19 intersected numerous zones of altered lithologies with disseminated pyrite and pyrrhotite and near solid to solid puyrite and pyrrhotite layers. These include; (1) 0.3 m of graphitic near solid pyrite that is overlain and underlain by granitized hornblende gneiss, (2) 0.3 m of graphite schist, (3) 0.3 m of "quartz" gneiss with near solid pyrite and pyrrhotite, (4) 2 m of near solid pyrite with disseminated pyrrhotite overlain and underlain by "quartz" gneiss, and (5) 0.4 m of near solid pyrite and pyrrhotite overlain by "quartz" gneiss and underlain by biotite-quartz gneiss. Lithologies throughout the drill log are described as garnetiferous and carbonatized (A.F. 90156).

GEOCHEMICAL DATA:

Trenching and diamond drilling in the general vicinity of the occurrence apparently found "material" that assayed 10.90 g/t gold (Russell, 1957).

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

Assessment Files 90139, 90155, 90156, 91624, 91601 and 92130.

Manitoba Energy and Mines, Minerals Division.

Froese, E. and Moore, J.M.

1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, 16p.

Hosain, I.T.

1988: An update summary and evaluation of geophysical data from open assessment files of the Flin Flon - Snow Lake greenstone belt (NTS sheets 63K (N1/2) and 63J/12, 13); Manitoba Energy and Mines, Mines Branch, Open File Report OF87-11, 99p.

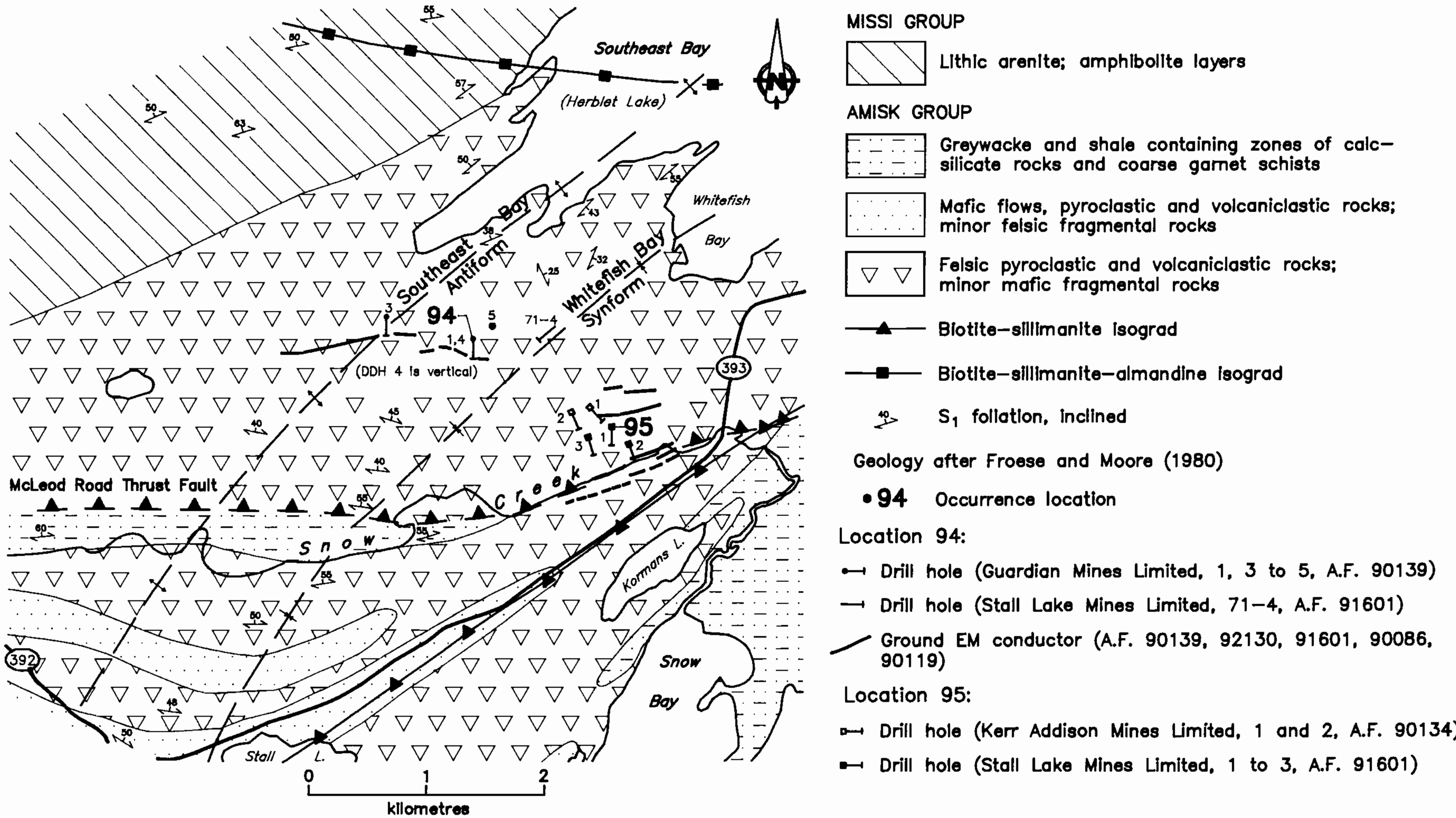


Figure 94-1: Geological setting, ground EM conductors and diamond drill hole locations, occurrences 94 and 95.

Manitoba Mines and Natural Resources,
1946: 18th Annual Report on Mines and Minerals, 85p.
1947: 19th Annual Report on Mines and Minerals, 100p.

Mineral Inventory Card 63J/13 Au 23
Manitoba Energy and Mines, Minerals Division.

Mining Claim Card, Fox 10 (P 7564C)
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Russell, G.A.
1957: Structural studies of the Snow Lake - Herb Lake area; Manitoba Mines and ,Natural Resources, Mines Branch, Publication 55-3, p. 32.

LOCATION: **95**

NAME: (A.F. - Mineralization intersected by diamond drilling)

UTM: 6081791N/442990E

ACCESS: Provincial Road 393 and traverse.

AREA: Snow Creek south of Whitefish Bay, Herblet Lake.

AIRPHOTO: A20127-132

EXPLORATION SUMMARY:

The area was first staked as the Teepee 1, 7, 8 and Ruth 6 claims in the late 1920's. HBED did an HLEM survey between 1955 and 1956 and drilled two holes on Ram 129 and on M.P. 9; however, the only drill log available is for DDH Ram 129 (A.F. 90155, 90156, 90119, 90122). An airborne EM survey was done by Canadian Nickel Company Limited in 1957 (A.F. 91624, Ground Hog Sheet 10). Kerr Addison Mines Limited did an EM (Crone JEM) survey in 1964, followed by a 2 hole, 68 m, diamond drill program on Bob 17 in 1965 (A.F. 90086, 90134). A Turam survey was done by Guardian Mines Limited in 1967 (A.F. 90139). In 1971 Stall Lake Mines Limited carried out magnetic and EM (DPM-1) surveys and a 3 hole, 184 m, diamond drill program on CB 3560 (A.F. 91601). The geophysical survey outlined eight conductors, four of which had strike lengths of greater than 610 m (Stall Lake Mines Limited, Annual Report 1971). Current stakings over the property include CB 6445, held by HBED since 1978, and the M.P. 5, 8, 9, 11 claims acquired by Threehouse Mines Limited in 1971.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by felsic pyroclastic and volcaniclastic rocks flanked to the south by mafic flows, pyroclastic and volcaniclastic rocks. Both mafic and felsic sequences have been assigned to the Amisk Group. The occurrence is situated immediately north of the biotite-sillimanite isograd. The McLeod Road Thrust Fault transects the area of the occurrence (Fig. 94-1; Froese and Moore, 1980). Diamond drill holes, collared to test long and short strike length ground EM conductors, intersected garnetiferous hornblende-biotite gneiss and mineralized garnetiferous quartz-biotite gneiss (A.F. 90134), and siltstone, amphibolite, garnet-biotite ± chlorite schist, graphite schist, argillite, greywacke, basalt, intermediate to mafic tuff, gabbro and chemical sedimentary rocks (A.F. 90155, 91601).

MINERALIZATION:

DDH 1 intersected a thinly interbedded sequence of garnet-biotite schist, actinolite schist, pyritic siltstone and graphite schist. All units contain a maximum of 5% disseminated and stringer pyrite. The most significant mineralized interval in DDH 1 is a 6.1 m intersection of bedded, 1 cm thick pyrite, pyrrhotite and minor chalcopyrite interlayered with 2 cm thick garnet-biotite schist (A.F. 91601). Overall sulphide content is 15%. DDH 2 intersected the same lithologies, but with a maximum of 3% pyrite (A.F. 91601). DDH 3 intersected 2.1 m of 40% pyrrhotite and pyrite with minor chalcopyrite. The mineralized zone is overlain by dark-green biotite-chlorite schist that contains quartz-pyrrhotite-pyrite veins on the uphole side of the sequence and is underlain by partially silicified andesite. The silicified andesite is underlain by a 1.7 m zone of interlayered chlorite-amphibole schist, biotite schist and "massive" pyrrhotite layers up to 12.5 cm thick. The andesite underlying this mineralized zone is garnetiferous, carbonatized and contains traces of pyrrhotite, pyrite and quartz-calcite-biotite veins (A.F. 91601).

Similar mineralization was intersected by DDH 1 and 2: DDH 1 intersected a 2.7 m interval of 20% pyrite and pyrrhotite with "chloritic alteration", including a 0.3 m interval of 70% pyrite and pyrrhotite and a 0.5 m interval of 70% pyrite and pyrrhotite with trace chalcopyrite. The host rocks are garnetiferous quartz-biotite gneiss. DDH 2 intersected garnetiferous quartz-hornblende-biotite gneiss that contains a 0.8 m interval of 50% pyrrhotite and a second 0.8 m interval of 75% pyrrhotite with minor graphite (A.F. 90134).

DDH 34 and 56 were drilled to test ground EM conductors in the area, but drill logs are not available. DDH 27 intersected; (1) 2 m of near solid pyrite and pyrrhotite hosted by a garnetiferous, brecciated quartz-feldspar porphyry, and (2) a 0.8 m of near solid to solid pyrrhotite, pyrite and rare chalcopyrite overlain by garnetiferous brecciated quartz-feldspar porphyry with "narrow" pyrrhotite stringers and underlain by brecciated quartz-feldspar porphyry with "siliceous feldspar fragments".

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Stratabound massive sulphide type deposit; volcanic rock associated. The "brecciated" quartz-feldspar porphyry host rocks may be an altered rhyolite with the brecciated texture representing the effects of an anastomozing network that consists of sulphide- and chlorite-rich veins.

REFERENCES:

Assessment Files 90086, 90119, 90122, 90134, 90139, 90155, 90156, 91601 and 91624
Manitoba Energy and Mines, Minerals Division

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area; Geological Survey of Canada Paper 78-27, 16p.

Gale, G.H., Baldwin, D.A. and Koo, J.
1980: A geological evaluation of Precambrian massive sulphide deposit potential in Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER79-1, 137p.

Hosain, I.T.
1988: An update summary and evaluation of geophysical data from open assessment files of the Flin Flon - Snow Lake greenstone belt (NTS sheets 63K (N1/2) and 63J/12, 13); Manitoba Energy and Mines, Mines Branch, Open File Report OF87-11, 99p.

Russell, G.A.
1957: Structural studies of the Snow Lake - Herb Lake area; Manitoba Mines and ,Natural Resources, Mines Branch, Publication 55-3, 33p.

Stall Lake Mines Limited, Annual Report 1971
Manitoba Energy and Mines, Minerals Division, Corporation Files.

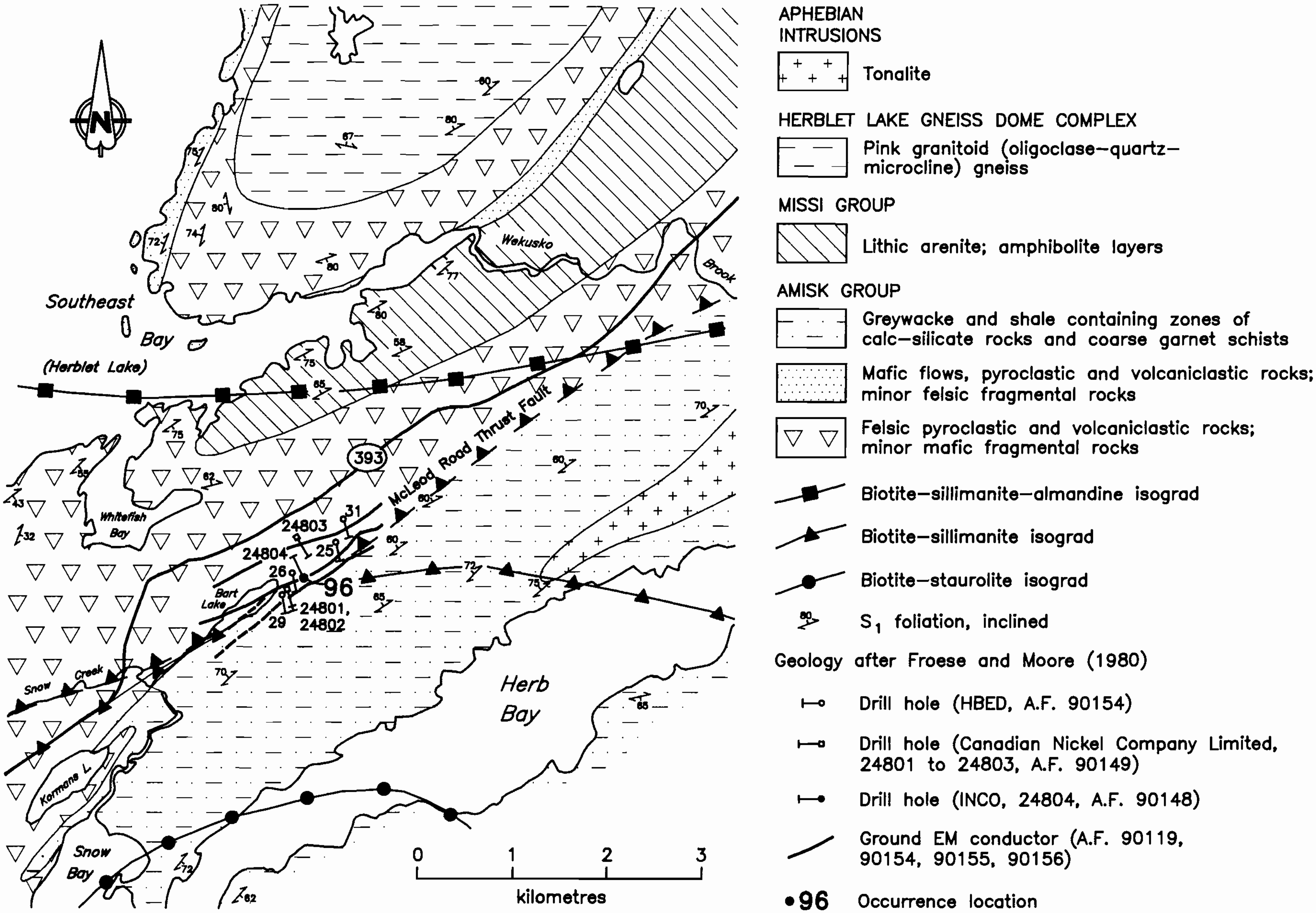


Figure 96-1: Geological setting, ground EM conductors and diamond drill hole locations, occurrence 96

LOCATION: **96**

NAME: (A.F. - Mineralization intersected by diamond drilling)

UTM: 6082921N/445885E

ACCESS: Provincial Road 393 and traverse.

AREA: South of Provincial Road 393 and east of Bart Lake.

AIRPHOTO: A21963-60

EXPLORATION SUMMARY:

The area was first staked as the Bartum, Shan and Buzz group in the 1920's. Wekusko Consolidated Limited did prospecting, trenching, sampling, magnetometer surveys and 310 m of diamond drilling on the B.J. group between 1944 and 1945 (Wekusko Consolidated Limited, 1st and 2nd Annual Reports; Manitoba Mines and Natural Resources, 1945, 1946). Small occurrences with "light copper-nickel mineralization and occasional gold values were located near the fault which the B.J. group follows for 6 km" (Wekusko Consolidated Limited, 1st Annual Report). P. Kobar drilled the B.J. claim in 1947 (Manitoba Mines and Natural Resources, 1948). HBED did an HLEM survey on the Ram group of claims between 1955 and 1956 (A.F. 90154, 90119, 90155, 90156). HBED drilled four holes totalling 420 m on Ram 71, 72 and 88 between 1955 and 1956 (A.F. 90155, 90154). Claim maps indicate that the drilling may actually have been done on Ram 71 and 87. Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624, Ground Hog Sheet 13). A 4 hole, 280 m, drill program was done by Canadian Nickel on Nice 18 and 40 between 1963 and 1964 (A.F. 90149, 90148). Falconbridge Limited staked DA 134, EX 3, Lex 42 and 43 and ED 1 and 2 over the property in 1965, EX 5 in 1968, and Tex 1 in 1969. Fosco Mining Limited carried out airborne EM and magnetic surveys in 1971, and outlined some conductors in the area (A.F. 92130).

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group felsic pyroclastic and volcaniclastic rocks and greywacke and shale. The occurrence is situated between the biotite-sillimanite-almandine isograd to the north and the biotite-sillimanite isograd to the south. The McLeod Road Thrust Fault transects the immediate area of the occurrence; its mapped position correlates to the location of long strike length ground EM conductors (Fig. 96-1; A.F. 90119, 90154, 90155, 90156; Froese and Moore, 1980). Diamond drill holes, collared to test these conductors, intersected biotite-staurolite gneiss, slate, quartzite skarn, "greenstone" and variably altered and mineralized hornblende gneiss (A.F. 90148, 90149).

MINERALIZATION:

DDH 24804 intersected a zone of limestone-graphite-pyrite in hornblende gneiss. This assemblage may represent carbonate alteration superimposed upon a graphite-pyrite layer. The presence of the carbonate may be related to the McLeod Road Thrust Fault. DDH 24801 was abandoned in overburden, and DDH 24802 and 24803 were nonmineralized (A.F. 90148, 90149). DDH intersected approximately 1 m of near solid pyrrhotite with "specs" of chalcopyrite and sphalerite. Logs for DDH 25, 26 and 29 are not available (A.F. 90154).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

Assessment Files 90119, 90148, 90149, 90154, 90155, 90156, 91624 and 92130

Manitoba Energy and Mines, Minerals Division.

Froese, E. and Gasparrini, E.

1975: Metamorphic zones in the Snow Lake area, Manitoba; Canadian Mineralogist, v. 13, p. 162-167.

Froese, E. and Moore, J.M.

1980: Metamorphism in the Snow Lake area; Geological Survey of Canada Paper 78-27, 16p.

Manitoba Mines and Natural Resources,

1945: 17th Annual Report on Mines and Minerals, 105p.

1946: 18th Annual Report on Mines and Minerals, 85p.

1948: 20th Annual Report on Mines and Minerals, 125p.

Russell, G.A.

1957: Structural studies of the Snow Lake - Herb Lake area; Manitoba Mines and Natural Resources, Mines Branch, Publication 55-3, 33p.

Wekusko Consolidated Limited, 1st Annual Report (1944); 2nd Annual Report (1945), Corporation Files

Manitoba Energy and Mines, Minerals Division.

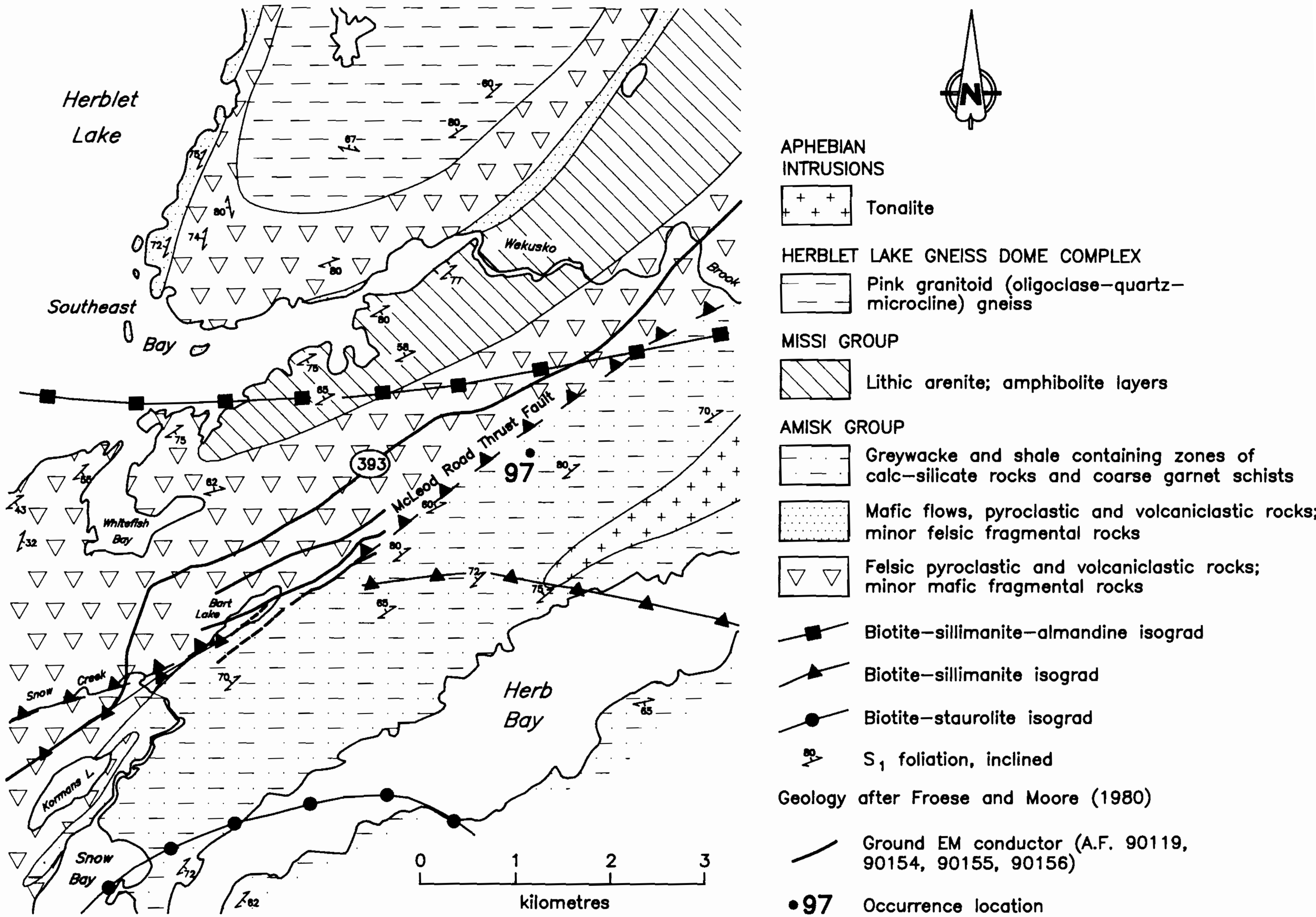


Figure 97-1: Geological setting of occurrence 97.

LOCATION: **97**

NAME: (A.F. - Mineralization intersected by diamond drilling)

AREA: South of Provincial Road 393, east of Bart Lake.

UTM: 6084019N/447320E

AIRPHOTO: A20170-40

ACCESS: Provincial Road 393 and traverse.

EXPLORATION SUMMARY:

The Polo, Shan and Bartum group of claims were first staked in this area in the late 1920's. Surface work was reported in 1930 on the Polo group, which was held by Paul Gasse and associates (Wright, 1938). Wright (1938) examined five trenches on the property. In 1955 HBED carried out an HLEM survey on the Ram and Herb group of claims and drilled 10 holes totalling 1275 m on Ram 55, 56, 59, 62 and 65 (A.F. 90155, 91389). Three holes totalling 257 m were drilled on Herb 1, 9 and 11 in 1955 and another three holes totalling 296 m were drilled on Herb, Herb 4 and 5 in 1957 (A.F. 90141). Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624, Ground Hog Sheet 13). Lex 36, 38, 39 (former Herb 9 and 11 claim areas) were staked in 1965 and assigned to Falconbridge Nickel Mines Limited. Magnetometer and AFMAG-longwire surveys were done in 1966, but the results are not available (Mining Claim Card Lex 38; A.F. 90132). The claims lapsed in 1974. The area is presently partially covered by the following claims: Bill 1 to 3, 4 to 7, and 8 staked between 1960 and 1961; Jamie 6, 7 and Jim 1 staked in 1963; Lex 40, 46 and 47 staked in 1965. These claims were assigned to W. B. Kobar in 1965, to Falconbridge Nickel Mines Limited in 1968, and then to Threehouse Mines Limited in 1971.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by felsic pyroclastic and volcaniclastic rocks, and greywacke and shale. Both sequences have been assigned to the Amisk Group; their northeast trending contact is marked by the McLeod Road Thrust Fault (Fig. 97-1; Froese and Moore, 1980). The area of the occurrence is situated between the biotite-sillimanite-almandine isograd to the north and the biotite-sillimanite isograd to the south. Diamond drill holes, collared to test long and short strike length ground EM conductors, intersected mineralized quartzite, garnetiferous quartz-hornblende ± chlorite gneiss and schist, feldspar porphyry altered to carbonate-chlorite schist, carbonate-quartz tuff, graphitic schists and chemical sedimentary rocks (Fig. 97-2; A.F. 90141, 90155).

MINERALIZATION:

Disseminated pyrite, pyrrhotite and trace chalcopyrite occur in intervals varying from 0.2 to 10 m in most lithologies intersected by diamond drilling. Graphite and disseminated pyrite are common in silicified tuff (DDH 14, 20) and in quartzite (DDH 1). Near solid sulphide intervals, intersected by drill holes 1, 5, 8, 14, 23 and 24 and Herb 71, -72, and -73 are characterized by pyrite, pyrrhotite and trace chalcopyrite and sphalerite and range in core thickness from 0.2 to 2.6 m. DDH 1 intersected quartzite that hosts 16 mineralized intervals with graphite and disseminated pyrite and pyrrhotite, and also contains four intervals of near solid pyrite, pyrrhotite and graphite ranging from 0.2 to 1.7 m in core length. The quartzite is interlayered with garnetiferous quartz-hornblende gneiss that also contains disseminated pyrite and pyrrhotite. Traces of sphalerite and chalcopyrite occur in 0.9 m and 1.2 m intervals of near solid to solid pyrite and pyrrhotite hosted by garnetiferous hornblende-quartz ± chlorite gneiss from DDH Herb 72 (A.F. 90141, 90154, 90155, 90156). DDH 2 intersected 0.4, 0.7 and 1.6 m intervals of fine grained quartz-biotite gneiss "mineralized with pyrite and pyrrhotite (A.F. 91389). DDH 3 intersected 0.3 and 1.3 m intervals of near solid pyrite and pyrrhotite in quartz-hornblende gneiss. The host rocks contain numerous stringers of chalcopyrite with minor pyrite and pyrrhotite and associated quartz and garnet. The stringers and alteration occur for up to 45.7 m on the downhole side of the near solid sulphide layers (A.F. 91389).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Stratabound massive sulphide type deposit; volcanic rock associated. This deposit type was intersected by DDH 2. The predominant mineral deposit type is a chemical sediment type deposit, sulphide facies iron formation.

REFERENCES:

Assessment Files 90132, 90141, 90154, 90155, 90156, 91389 and 91624

Manitoba Energy and Mines, Minerals Division.

Eccles, D.R. and Fedikow, M.A.F.

1985: Mineral occurrence documentation and alteration zone mapping, Snow Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 82, 87.

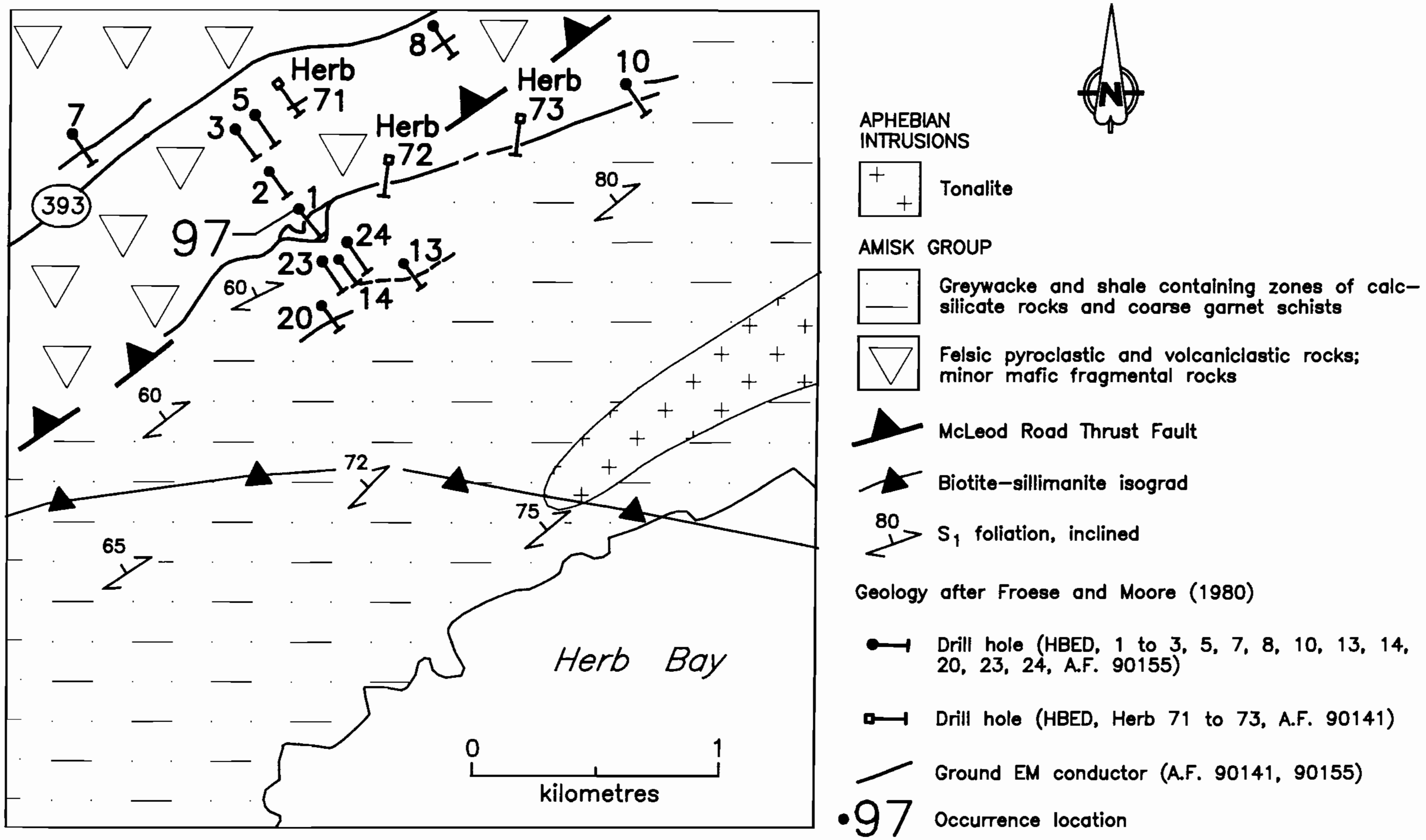


Figure 97-2: Geological setting, ground EM conductors and diamond drill hole locations, occurrence 97.

Froese, E. and Gasparrini, E.
1975: Metamorphic zones in the Snow Lake area, Manitoba; Canadian Mineralogist, v. 13, p. 162-167.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area; Geological Survey of Canada Paper 78-27, 16p.

Gale, G.H., Baldwin, D.A. and Koo, J.
1980: A geological evaluation of Precambrian massive sulphide deposit potential in Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER79-1, 137p.

Gobert, G.
1990: Till geochemistry of the Snow Lake area (NTS 63K/16, 63J/13, 63J/12); in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1990, p. 72-73.

Mining Claim Card, Lex 38 (P 8029B)
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Wright, J.F.
1938: Geology and mineral deposits of a part of northwest Manitoba; Geological ,Survey of Canada, Summary Report 1930, Part C, 124p.

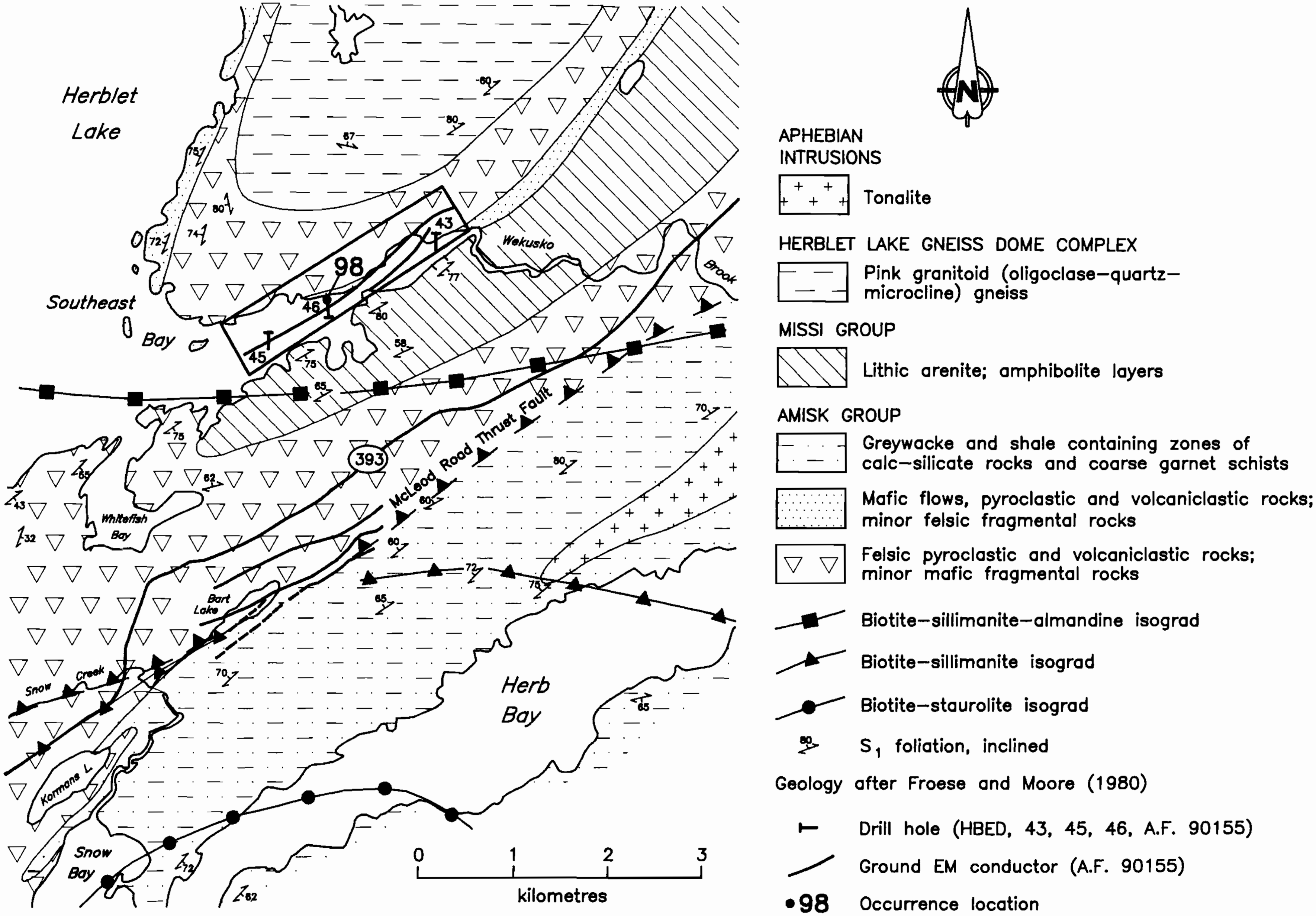


Figure 98-1: Geological setting, ground EM conductors and diamond drill hole locations, occurrence 98.

LOCATION: **98**

NAME: (A.F. - Mineralization intersected by diamond drilling)

AREA: Southeast Bay, Herblet Lake.

UTM: 6085696N/446059E

AIRPHOTO: A21963-59

ACCESS: Provincial Road 393 to Herblet Lake Landing; boat on Herblet Lake and traverse.

EXPLORATION SUMMARY:

The area was partly staked under Dominion 2 and the Moon group of claims prior to 1929. Producer 1 and 2, Cal 1 and Wedson 3 to 5 were staked in the 1940's. HBED did an HLEM survey between 1955 and 1956, and outlined a long strike length conductor on Ram 67, 171, 169, 164 and 163 (A.F. 90155). Three holes totalling 371 m were drilled on Ram 67, 163 and 171 in 1956 (A.F. 90155). Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624, Ground Hog Sheet 13). Falconbridge Nickel Mines Limited did magnetic and AFMAG-longwire surveys on the Lex claims in 1966 (A.F. 90132) Fosco Mining Limited did airborne and ground EM and magnetic surveys in 1971 (A.F. 92130, 92291), and drilled one hole to a depth of 132 m on Soo 9 in 1972 (A.F. 92291). The ground was held by HBED from 1973 to 1976, by Granges Exploration Aktiebolag from 1980 to 1982, and by Granges Exploration Limited from 1984 to 1986. Little Herb 2 was staked by W. Bruce Dunlop Limited in 1987, and optioned by Falconbridge Limited from 1988 to 1990.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by mafic flows, pyroclastic and volaniclastic rocks flanked to the north by felsic pyroclastic and volcaniclastic rocks and to the south by lithic arenite. The felsic and mafic sequences have been assigned to the Amisk Group and the lithic arenite to the Missi Group (Fig. 98-1; Froese and Moore, 1980). Diamond drill holes, collared to test long strike length ground EM conductors, intersected graphitic and mineralized garnetiferous quartz-hornblende-mica gneiss, feldspar-quartz gneiss, coarse grained hornblende schist, garnetiferous biotite andesite and chemical sedimentary rocks (A.F. 90155).

MINERALIZATION:

DDH 43, 45 and 46 intersected disseminated pyrite, pyrrhotite and trace chalcopyrite generally associated with graphitic zones in variably altered rocks of basaltic composition. The basalts are garnetiferous, silicified and rusty weathered. Near solid sulphide intervals, varying from 0.2 to 2.2 m, were intersected by each of the three drill holes. Three near solid sulphide intervals occur in core from DDH 46; they vary from 0.2 to 0.7 m in core thickness, contain near solid pyrrhotite intervals with coarse grained pyrite crystals, and are hosted by garnet-hornblende-quartz-mica gneiss (A.F. 90155). DDH 43 intersected 2.2 m of near solid pyrrhotite with minor pyrite at the contact between garnet-quartz gneiss and garnet-quartz-hornblende-mica gneiss. DDH 45 intersected 0.5 m of "slight" to near solid, vuggy pyrite in garnetiferous quartz-hornblende-mica gneiss.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

Assessment Files 90132, 90155, 91624, 92130 and 92291
Manitoba Energy and Mines, Minerals Division.

Eccles, D.R. and Fedikow, M.A.F.
1985: Mineral occurrence documentation and alteration zone mapping, Snow Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 82-99.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada Paper 78-27, 16p.

Gale, G.H., Baldwin, D.A. and Koo, J.
1980: A geological evaluation of Precambrian massive sulphide deposit potential in Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER79-1, 137p.

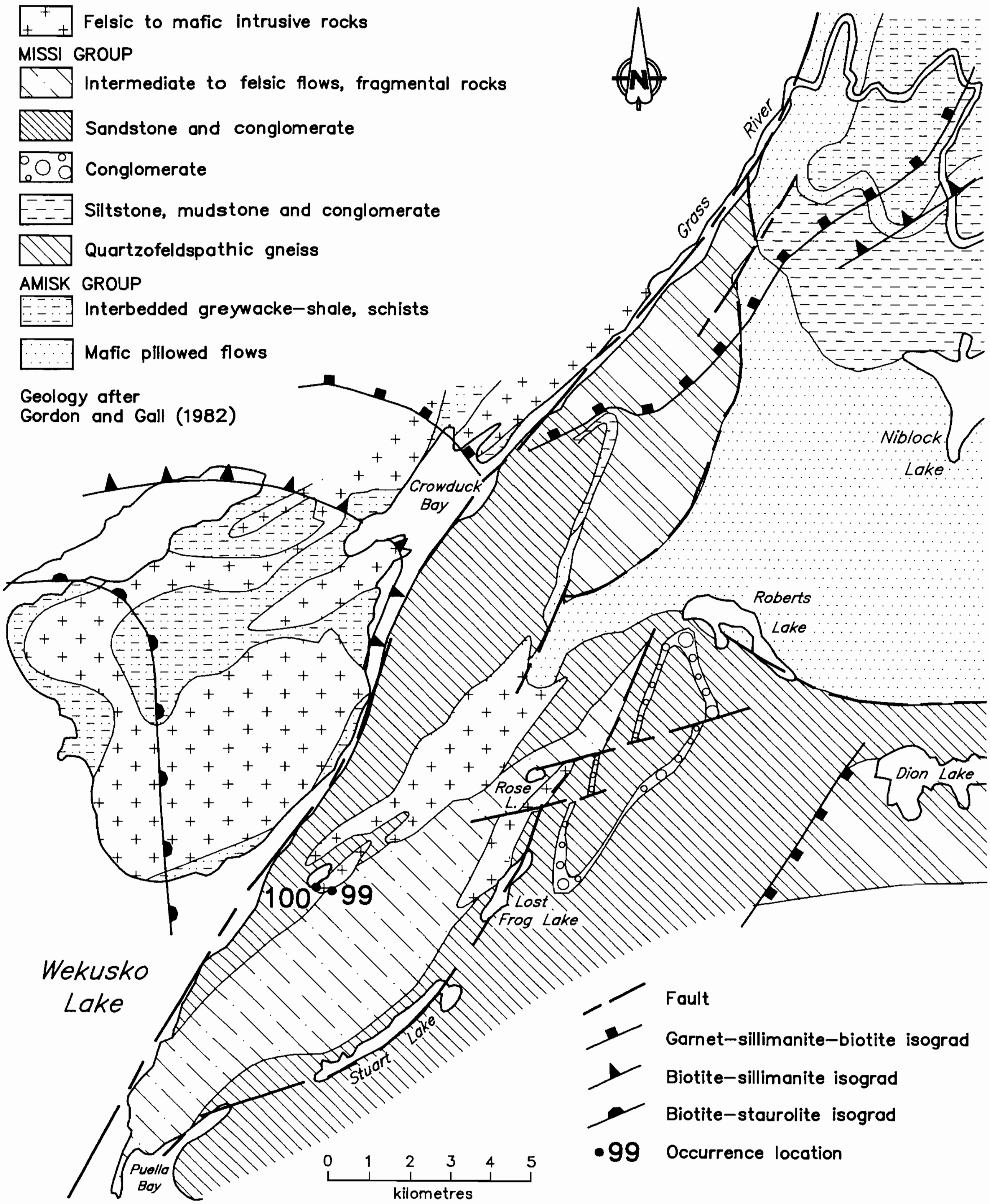


Figure 99-1: Geological setting of occurrences 99 and 100.

LOCATION: **99**

NAME: Bing Claim

AREA: East shore of Wekusko Lake; west of Judge Lake.

UTM: 6073766N/454250E

AIRPHOTO: A20782-43

ACCESS: Boat on Wekusko Lake and traverse along bush trail.

EXPLORATION SUMMARY:

Bing was staked by Gaspard Richard in 1922. It was assigned to C.R. Neeley and then to a group of people one year later. Pits and trenches were dug in 1924, 1926, and 1927. In 1929 Bing was leased as L-1006. Kusko Exploration Syndicate drilled several holes in the area, including one hole on Bing (Mineral Inventory Card 63J/13 Au 14). Bing was cancelled in 1950. Airborne EM and radiometric surveys were done by HBED in 1965 (A.F. 91650). Falconbridge Nickel Mines Limited carried out airborne EM and magnetic surveys in 1973 (A.F. 91564). The ground was held as CB 4610 by E. Duquette from 1972 to 1974, as CB 6469 by J.B. Barton from 1974 to 1976, and as Can 12 by Cangold Limited from 1981 to 1983. Nor 22 was staked over the property by Noranda Exploration Company Limited in 1983. Manitoba Mineral Resources Limited had an option agreement with Noranda on the Nor group of claims in 1984.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Missi Group sandstone and conglomerate flanked to the east by intermediate to felsic flows and to the west and north by felsic intrusive rocks. The sedimentary sequence and the biotite dacite have been intruded by quartz-feldspar porphyry (Fig. 99-1, 99-2; Gordon and Gall, 1982; Stockwell, 1937). Stockwell (1937) mapped massive biotite dacite and dacite breccia, andesite and quartz-feldspar porphyry in the immediate vicinity of the mineralized zones. The mineralization occurs within and east of a quartz-feldspar porphyritic intrusion.

MINERALIZATION:

Stockwell (1937) described four mineralized sites at this locality (Fig. 99-2).

Site 1 is represented by a 5 cm to 0.1 m thick "laminated" quartz vein with disseminated pyrite and arsenopyrite that occurs at the contact between dacite breccia and massive dacite. The vein strikes 045°E, dips 80° southeast and has been traced for 43 m along strike.

Site 2 consists of a few quartz lenses and stringers that occur in a 1.2 to 2.4 m wide schistose zone in andesite that is situated at the contact between dacite breccia and quartz-feldspar porphyry. The vein is rusty weathered and contains disseminated pyrite. Wall rocks are also rusty weathered and have a 040°E/90° cleavage.

Site 3 occurs within a quartz-feldspar porphyry intrusion and is characterized by white to dark-coloured quartz veins and stringers that contain fine grained arsenopyrite in streaks that are parallel to the wall rocks. The vein has been traced for 67 m, trending 310°W and crosscutting the cleavage of the porphyry and some lamprophyre dykes at high angles; however, the vein may dip as shallowly as 20° toward the northeast. The vein attains widths up to 0.3 m; widths of 5 to 10 cm occur near the northwest end of the vein where it turns sharply to the southwest and follows the cleavage of the host quartz-feldspar porphyry for 15 m before pinching out. This narrower portion of the vein dips 40° northwest. Visible gold has been reported from the vein.

Site 4 is a qurtz vein that contains disseminated arsenopyrite and is hosted by a quartz-feldspar porphyry intrusion. The vein strikes 035°E and has been traced for 23 m; it varies from 5 to 50 cm in width, which is increased to 80 cm if small quartz veinlets adjacent to the main vein are included.

GEOCHEMICAL DATA:

An assay of "0.40 oz/ton Au" has been quoted by Stockwell (1937) for a pyrite- and arsenopyrite-bearing quartz vein from site 1.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. The multiple quartz veins and lenses contain auriferous pyrite, arsenopyrite and visible gold.

REFERENCES:

Assessment Files 91564 and 91650

Manitoba Energy and Mines, Minerals Division.

Cerny, P., Trueman, D.L., Ziehlke, D.V., Goad, B.E. and Paul, B.J.

1981: The Cat Lake-Winnipeg River and the Wekusko Lake pegmatite fields, Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER80-1, 216p.

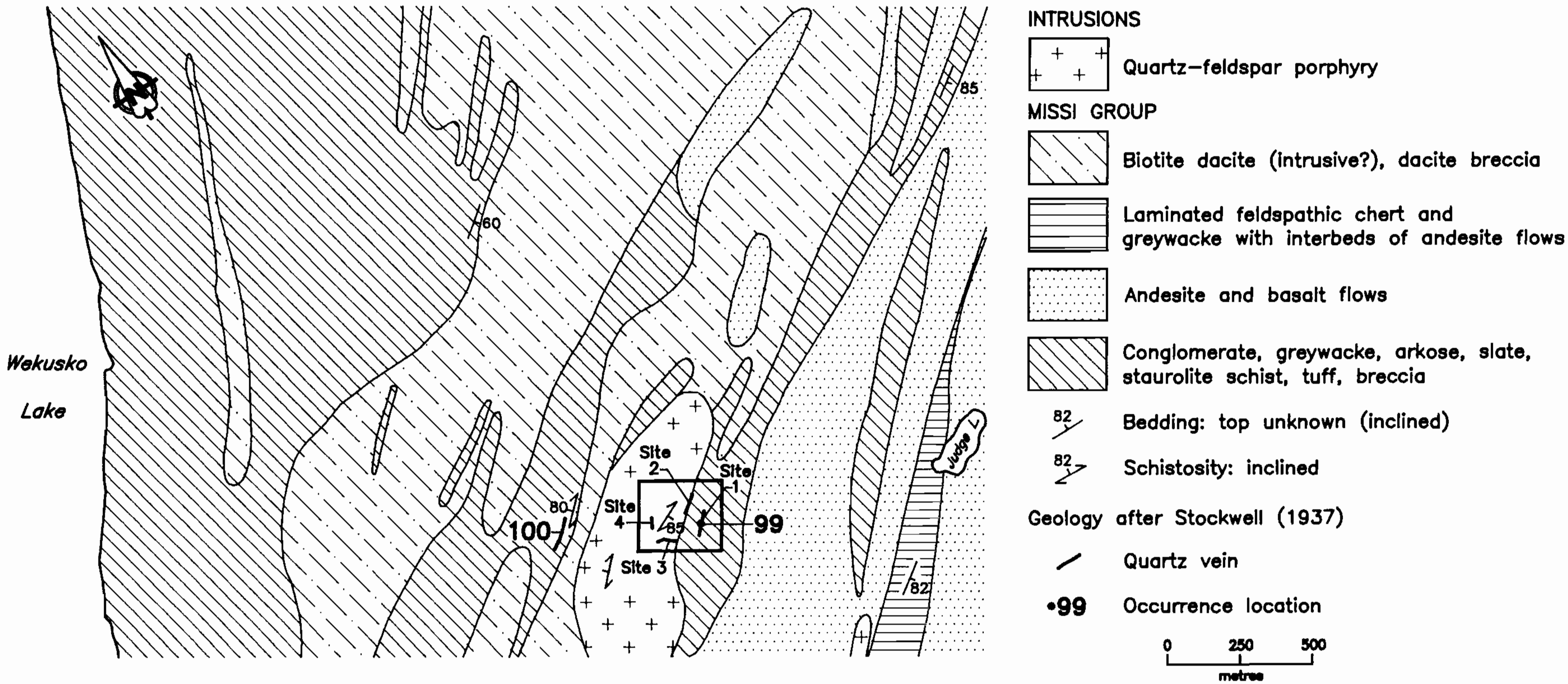


Figure 99-2: Detailed geological setting of occurrence 99 (sites 1 through 4), and occurrence 100.

Frarey, M.J.
1948: Crowduck Bay; Geological Survey of Canada, Paper 48-22, Preliminary Map 48-22, 1:31 680.

Frarey, M.J.
1950: Crowduck Bay; Geological Survey of Canada, Map 987A, 1:63 360.

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Mineral Inventory Card 63J/13 Au 14
Manitoba Energy and Mines, Minerals Division.

Stockwell, C.H.
1937: Gold deposits of Herb Lake area, northern Manitoba; Geological Survey of Canada, Memoir No. 208, 46p.

LOCATION: **100**

NAME: Nemo Claim

AREA: East shore of Wekusko Lake; west of Judge Lake.

UTM: 6073770N/453626E

AIRPHOTO: A20782-43

ACCESS: Boat on Wekusko Lake and traverse along bush trail.

EXPLORATION SUMMARY:

Nemo was staked by Percy McDavitt in 1915. It was assigned to A.E. May shortly thereafter. Blasting and drilling were reported in 1916. Shaft sinking began in 1917. Partial interest was assigned to several people in 1919. The vein was exposed for over 107 m in 1919. The shaft was deepened to 5 m in 1919 and reached its final depth of 8 m in 1920. Pits and trenches were dug in 1922 and 1923 (Mining Recording File No. 772). In 1924 Nemo was leased as L-436. During the summer of 1935 Kusko Exploration Syndicate tested the vein with 6 shallow diamond drill holes (Stockwell, 1937). The lease on Nemo was renewed in 1945. The claim was cancelled in 1963. Airborne EM and radiometric surveys were done by HBED in 1965 (A.F. 91650). Falconbridge Nickel Mines Limited carried out airborne EM and magnetic surveys in 1973 (A.F. 91564). The ground was held as CB 4610 by E. Duquette from 1972 to 1974, as CB 6469 and CB 6470 by J.B. Barton from 1974 to 1976, and as Can 12 by Cangold Limited from 1981 to 1983. The area was restaked as Nor 22 by Noranda Exploration Company Limited in 1983. Manitoba Mineral Resources Limited had an option agreement with Noranda on the Nor group of claims in 1984.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Missi Group sandstone, conglomerate and biotite dacite flanked to the east by andesitic to basaltic flows. A quartz-feldspar porphyry intrudes the sedimentary sequence and the biotite dacite east of the occurrence (Fig. 99-1, 99-2; Gordon and Gall, 1982; Stockwell, 1937). Stockwell (1937) mapped arkose with a cleavage that strikes 045°E and dips 70° to 80° northwest in the immediate area of the occurrence.

MINERALIZATION:

A 0.3 to 0.6 m wide quartz vein with chalcopyrite, sphalerite, galena, pyrite and black tourmaline characterizes this locality. The vein has been traced for 85 m and varies from 0.3 to 1.5 m in width. The quartz vein is curved; it strikes parallel to the cleavage of the arkose at its southern extremity, and discordant to cleavage at its northern end where it strikes 010°E and dips 85° east (Stockwell, 1937).

GEOCHEMICAL DATA:

Stockwell (1937) quotes an assay of "0.38 oz/ton Au" from this vein.

CLASSIFICATION:

Vein type deposit; single vein. The auriferous quartz vein contains base metal sulphide minerals.

REFERENCES:

Assessment Files 91564 and 91650
Manitoba Energy and Mines, Minerals Division.

Cerny, P., Trueman, D.L., Ziehlke, D.V., Goad, B.E. and Paul, B.J.
1981: The Cat Lake-Winnipeg River and the Wekusko Lake pegmatite fields, Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER80-1, 216p.

Frarey, M.J.
1948: Crowduck Bay; Geological Survey of Canada, Paper 48-22, Preliminary Map 48-22, 1:31 680.
1950: Crowduck Bay; Geological Survey of Canada, Map 987A, 1:63 360.

Mineral Inventory Card 63J/13 Au 17
Manitoba Energy and Mines, Minerals Division.

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Mining Recording File No. 772
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Stockwell, C.H.
1937: Gold deposits of Herb Lake area, northern Manitoba; Geological Survey of Canada, Memoir No. 208, 4 6p.

LOCATION: **101**

NAME: (A.F. - Mineralization intersected by diamond drilling)

AREA: Southeast Bay, Herblet Lake.

UTM: 6085754N/444124E

AIRPHOTO: A20127-129

ACCESS: Provincial Highway 392 and 393 to Herblet Lake Landing; boat and traverse.

EXPLORATION SUMMARY:

The area was first staked as Cal 3 in the late 1940's. HBED did an HLEM survey on the Ram claims between 1956 and 1957 (A.F. 90119). Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624). CB 1077 was staked by W.B. Kobar in 1969 and assigned to Fosco Mining Limited in 1970. A ground magnetometer survey and a VLEM survey was done in 1970 (Fosco Mining Limited, Corporation File). In 1971, magnetometer, VLEM surveys and one induced polarization profile along one grid line were done by Kenting Earth Sciences for J. Foster Irwin Engineering and Management Services Limited (A.F. 92115). Fosco Mining Limited did airborne EM and magnetic surveys in 1971 (A.F. 92130) and carried out a five hole, 731 m, diamond drill program on CB 1077 in 1972 (A.F. 92115). CB 1077 was restaked as CB 10136 by Granges Exploration Aktiebolag (now known as Granges Inc.) in 1978.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group mafic flows, pyroclastic and volcaniclastic rocks and felsic pyroclastic and volcaniclastic rocks. The occurrence is characterized by a long strike length ground EM conductor situated in mafic volcanic rocks near the contact with felsic volcanic rocks (Fig. 101-1; A.F. 92115; Froese and Moore, 1980). Diamond drill holes, collared to test the geophysical conductor (Fig. 101-1), intersected hornblende-quartz gneiss, quartz monzonite, biotite-quartz gneiss, garnet-hornblende-quartz gneiss, pegmatite and quartzite (A.F. 92115).

MINERALIZATION:

Less than 1% pyrite occurs in most lithologies intersected by DDH K72-1 through K72-5. A 23.1 m silicified and pyritized zone includes widespread disseminated pyrite and 0.9 m of 20% pyrite and 20% pyrrhotite in DDH K72-3. Fragments of wall rock are mixed with the mineralization. In addition, DDH K72-3 intersected a 0.1 m white quartz vein hosted by quartz-hornblende-feldspar-biotite gneiss with a bleb of molybdenite. DDH K72-1 intersected a 0.6 m zone of 20% pyrite and pyrrhotite and a 1.2 m graphitic zone that contains a maximum of 20% pyrite and pyrrhotite in hornblende-quartz-feldspar gneiss. DDH K72-2 intersected 2.2 m of 0.5 to 15% pyrite ± pyrrhotite in biotite-feldspar-quartz gneiss. DDH K72-4 and K72-5 intersected disseminated pyrite, pyrrhotite and trace chalcopyrite over intervals varying from 0.3 to 1.5 m (A.F. 92115).

GEOCHEMICAL DATA:

Three assay samples from the 23.1 m silicified and pyritized interval in core from DDH K72-3 contain 0.04 to 0.23% Zn, trace Pb, trace to 0.04% Ni, and nil Au and Ag. Two core samples from a 1.2 m graphite-pyrite-pyrrhotite interval in core from DDH K72-1 contain 0.02 to 0.05% Cu, and trace Au and Ni. Two assay samples from a 1.5 m intersection of disseminated pyrite, pyrrhotite and minor chalcopyrite contain a range of 0.03 to 0.06% Cu, trace to 0.02% Ni and nil to trace Au (DDH K72-5; A.F. 92115).

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

Assessment Files 90119, 91624, 92115 and 92130
Manitoba Energy and Mines, Minerals Division.

Eccles, D.R. and Fedikow, M.A.F.
1985: Mineral occurrence documentation and alteration zone mapping, Snow Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 82-99.

Fosco Mining Limited
Manitoba Energy and Mines, Minerals Division, Corporation File.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada Paper 78-27, 16p.

Russell, G.A.
1957: Structural studies of the Snow Lake - Herb Lake area; Manitoba Mines Branch, Publication 55-3, 33p.

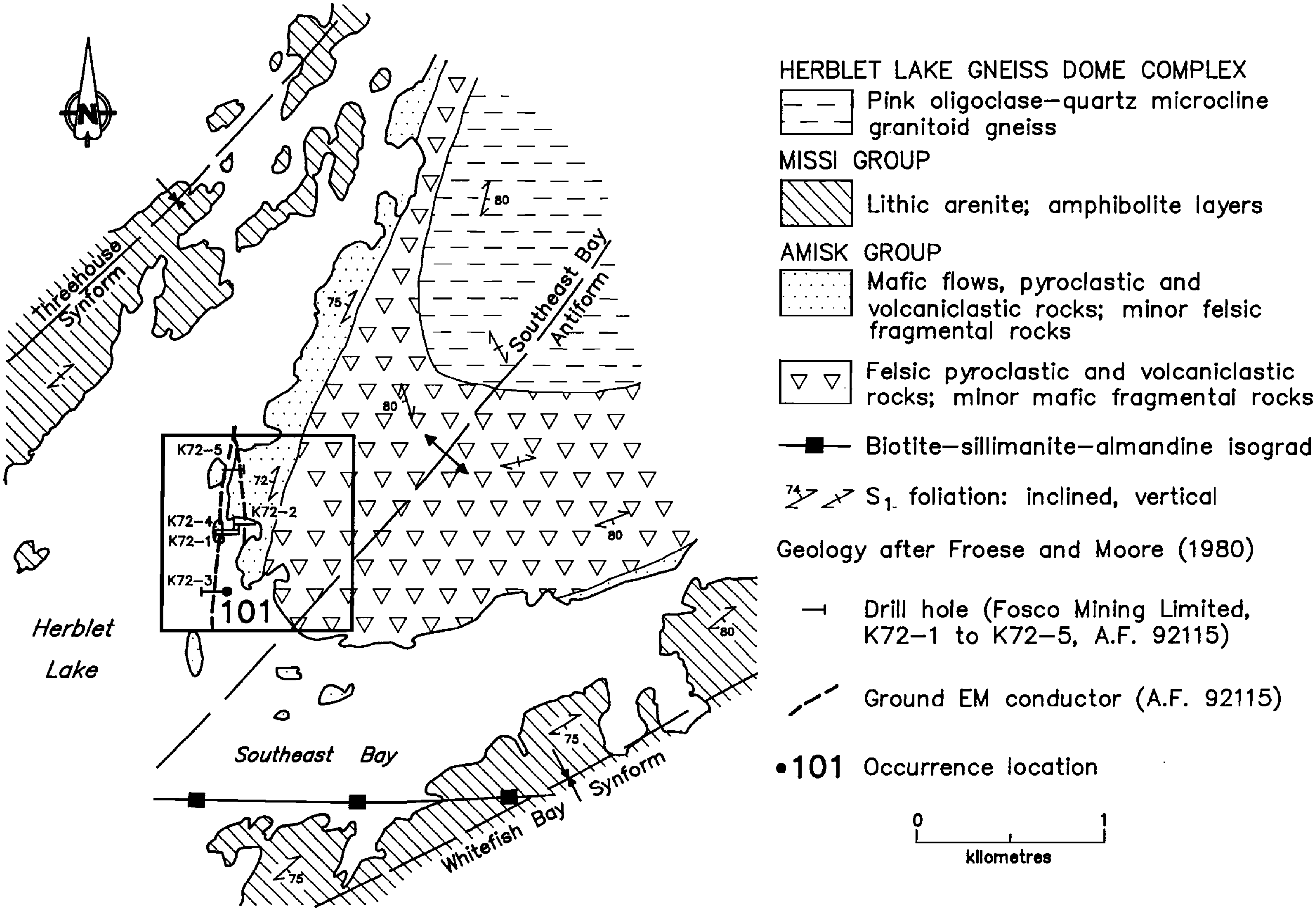


Figure 101-1: Local geology, ground EM conductors and diamond drill hole locations, occurrence 101.

LOCATION: **102**

NAME: (A.F. - Mineralization intersected by diamond drilling)

AREA: Northwest of Hat Lake.

UTM: 6071568N/462584E

AIRPHOTO: A20808, 222-225

ACCESS: Bush plane to Hat Lake or Hackett Lake and traverse.

EXPLORATION SUMMARY:

The area was first staked as the N 1 to N 9 claims prior to 1930. Cypress Exploration Corporation Limited staked the Cyp and Lap claims and optioned the Ray claims of Kay Lake Mines Limited (Northern Miner, December 11, 1952). Details of this work are not available. Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624). HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650). A magnetometer and EM survey was done on the Ron and Hat claims by W. Bruce Dunlop Limited for Green Point Mines Limited in 1969 (A.F. 92101). Thirteen conductors were outlined and five were recommended for diamond drilling (Green Point Mines Limited, Annual Report, 1968). Green Point had planned to explore the area for uranium, gold and lithium (Northern Miner, October 24, 1968), but the claims were cancelled in 1971 with no work reported. W. Bruce Dunlop Limited staked CB 3611 and CB 3613 over the area between 1971 and 1973, and then as CB 6378 to CB 6380 from 1978 to 1983. W. Bruce Dunlop Limited undertook ground EM and magnetic surveys in the area in 1971, but the results of the work are not known (A.F. 92482). Esso Minerals Canada Limited optioned the property in 1978 and carried out an HLEM survey, detailed mapping (1:4800), rock sampling and a radioactivity (SSP-2) survey in 1979 (A.F. 92482). In 1983 HBED did a ground EM survey on the property and drilled one hole to a depth of 77.7 m on CB 6379 (A.F. 92711). The area was staked as Dion 1 to 3 by Strider Resources Limited in 1989. Strider signed an option agreement with Tenby Resources Limited in March, 1990.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Missi Group arkose, greywacke and conglomerate (Gordon and Gall, 1982; Frarey, 1950). These rocks are intruded by pegmatite, quartz porphyry and biotite granite (Frarey, 1950; Fig. 102-1). The occurrence is situated at or near the contact between arkose and a quartz porphyry intrusion (Fig. 102-1). Diamond drilling intersected quartz-muscovite schist, argillite, biotite schist and calc-silicate layers (A.F. 92711). Esso Minerals Canada mapped pegmatite, granite gneiss, greywacke, sulphide facies iron formation and mafic volcanic rocks in the occurrence area (A.F. 92482).

MINERALIZATION:

A 2 m interval of graphitic argillite occurs within an arkosic sequence that contains intercalated mudstone layers. Thin pyrite and sphalerite stringers and trace pyrrhotite occur over 2.2 m of quartz-rich muscovite schist. Brown, 5 to 15 mm long tourmaline crystals are present in this interval. The downhole side of this mineralized zone contains a 1.6 m section with medium- to coarse-grained layers or streaks of light-green epidote and amphibole, carbonate, 2 to 4% pyrite and trace tourmaline (A.F. 92711). This rock occurs within the quartz-muscovite rock and is interpreted to represent a tectonized calc-silicate layer. Disseminated and wispy, discontinuous pyrrhotite and pyrite layers occur in greywacke and sulphide facies iron formation. Pyrrhotite also occurs in granitic gneiss (A.F. 92482).

GEOCHEMICAL DATA:

Thirty-two core samples were collected and assayed for Cu, Zn, Au and Ag. The following ranges in concentration were obtained: nil to 0.03% Cu; nil to 0.22% Zn; nil to 0.006 g/t Au; nil to 0.029 g/t Ag (A.F. 92711). Esso Minerals Canada reports the following geochemical results for rock types in the Hat Lake area: (1) greywacke, 48 to 96 ppm Cu, 8 to 44 ppm Zn, 1 ppm Ag in all greywacke samples and nil Au; (2) chert, 40 ppm Cu, 9 ppm Zn, 1 ppm Ag and trace Au; (3) granitic gneiss, 78 ppm Cu, 75 ppm Zn, 1 ppm Ag and nil Au; and, (4) pegmatite, 33 to 150 ppm U_3O_8 and 52 to 190 ppm Ni. A scintillometer survey (model SSP-2) of the pegmatites documented a range of 150 to 2500 counts per second in outcrop.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

Assessment Files 91624, 91650, 92101, 92482 and 92711
Manitoba Energy and Mines, Minerals Division.

Cerny, P., Trueman, D.L., Ziehlke, D.V., Goad, B.E. and Paul, B.J.
1981: The Cat Lake-Winnipeg River and the Wekusko Lake pegmatite fields, Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER80-1, 216p.

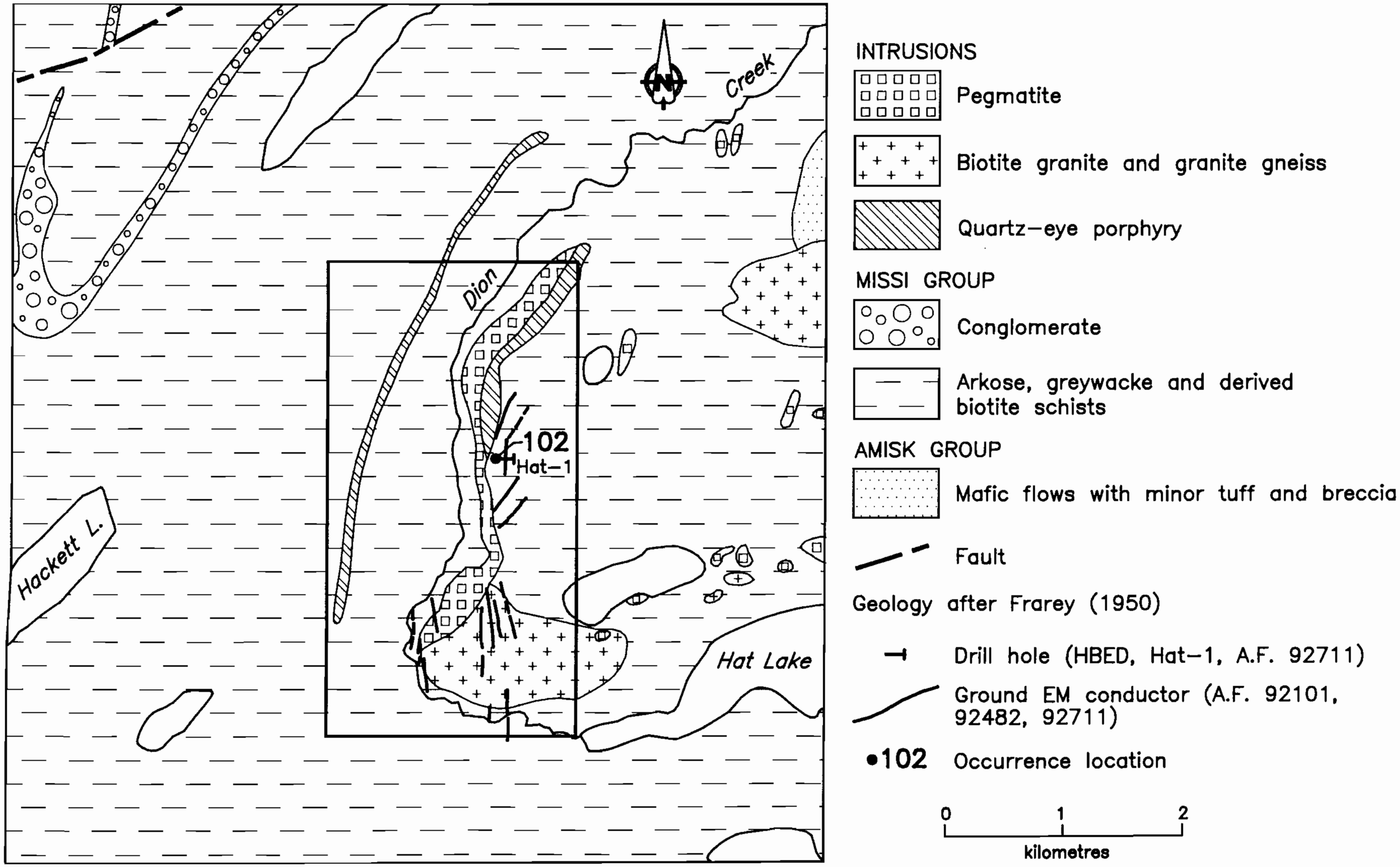


Figure 102-1: Geological setting, ground EM conductors and diamond drill hole location, occurrence 102.

Cypress Exploration Corporation Limited
Manitoba Energy and Mines, Minerals Division, Corporation File.

Green Point Mines Limited
Manitoba Energy and Mines, Minerals Division, Corporation File.

Frarey, M.J.
1950: Crowduck Bay; Geological Survey of Canada, Map 987A, 1:63 360.

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Hosain, I.T.
1988: An update summary and evaluation of geophysical data from open assessment files of the Flin Flon - Snow Lake greenstone belt (NTS sheets 63K (N1/2) and 63J/12, 13); Manitoba Energy and Mines, Mines Branch, Open File Report OF87-11, 99p.

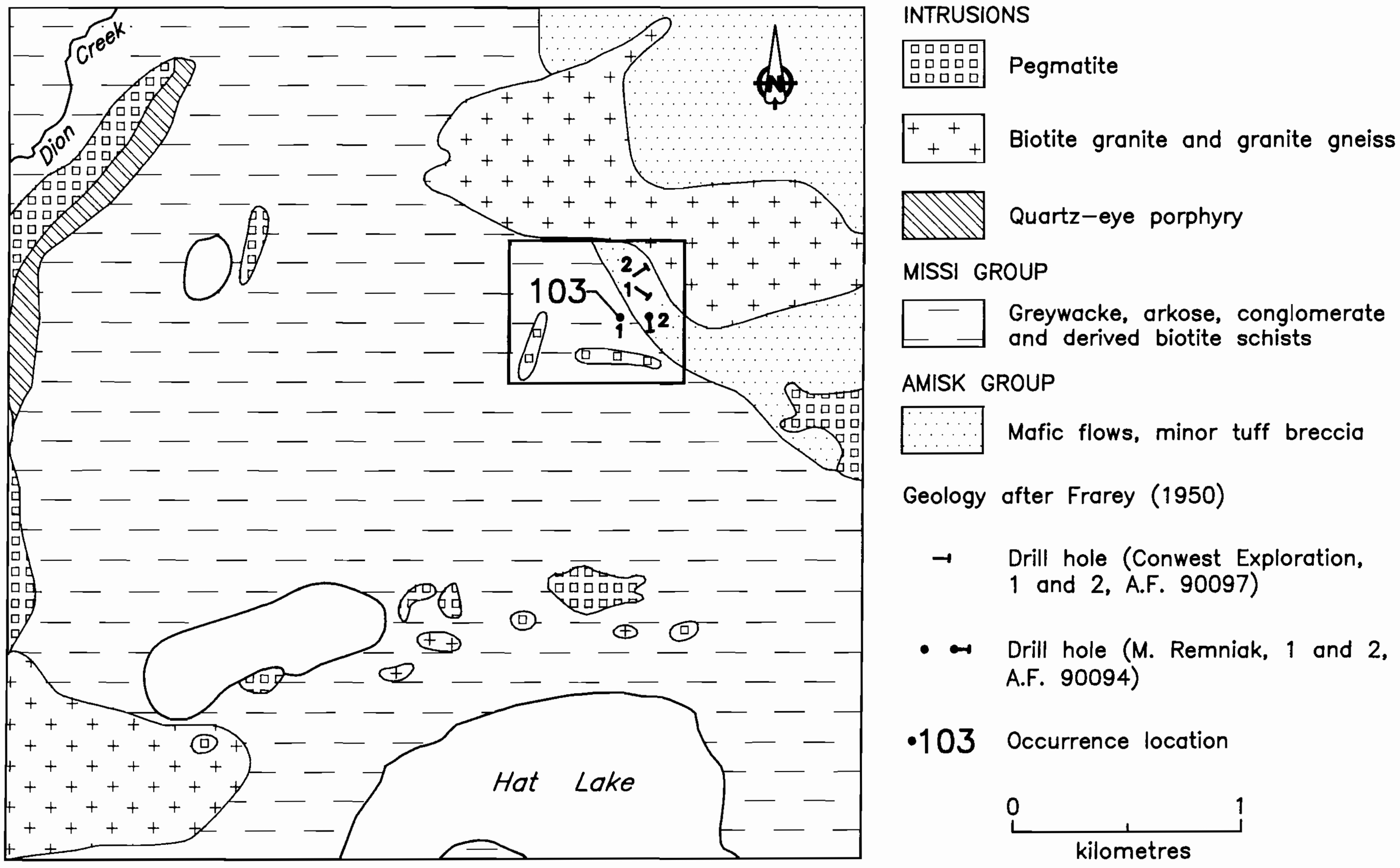


Figure 103-1: Geological setting and diamond drill hole locations, occurrence 103.

LOCATION: **103**

NAME: (A.F. - Mineralization intersected by diamond drilling)

AREA: North of Hat Lake.

UTM: 6072146N/465747E

AIRPHOTO: A20808-186

ACCESS: Bush plane to Hat Lake and traverse.

EXPLORATION SUMMARY:

The area was first staked as Hat 2 and 5 by M. Remniak in 1945. M. Remniak undertook a two hole, 43 m, drilling program on the property in 1950 (A.F. 90094). The area was restaked as Mota 4 and 5 by R.M. Davidson in 1952 and then as Seal 19 and 20 by Mrs. G.J. Kobar in 1954. Surface work was done on the Seal Group between 1955 and 1957 (Mining Claim Card Seal 19). J.J. Johnson restaked the area as Pren 6 and 11 in 1959. Conwest Exploration Company Limited drilled a 130 m deep hole on Pren 6 and a 180 m hole on Pren 11 in 1961 (A.F. 90097). J.A. Syme acquired the claims in 1961 and cancelled them in 1962. Noranda Exploration Company Limited did an HLEM survey on the Dat claims in 1965 (A.F. 90091). HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650). The ground was held as June 44 and 45 by K.A. Wheeler and E.A. Glick from 1968 to 1969, and later as Eel 3 by High River Gold Mines Limited from 1988 to 1989. A.L. Parres Limited staked Lee 3 over the property in 1990.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Missi Group greywacke, arkose, conglomerate and biotite schist. These rocks are flanked to the north and northeast by Amisk Group mafic flows, tuff breccia and garnetiferous biotite schist. Biotite granite intrudes both the mafic flows and the greywacke-biotite gneiss unit (Fig. 103-1; Gordon and Gall, 1982; Frarey, 1950). Diamond drilling intersected hornblende-rich schists, quartz-biotite gneiss and pegmatite (A.F. 90094 and 90097).

MINERALIZATION:

Disseminated chalcopyrite occurs within a "hornblendite" or "hornblende schist" over 0.3 to 3 m core intervals. It contains "0.75% Cu", and "fair amounts" and "minor" chalcopyrite (DDH 1,2; A.F. 90094). Percentages of chalcopyrite are not given. The log for DDH 1 indicates mineralization was not intersected in this hole (A.F. 90097).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 90091, 90094, 90097 and 91650
Manitoba Energy and Mines, Minerals Division.

Cerny, P., Trueman, D.L., Ziehlke, D.V., Goad, B.E. and Paul, B.J.
1981: The Cat Lake-Winnipeg River and the Wekusko Lake pegmatite fields, Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER80-1, 216p.

Frarey, M.J.
1950: Crowduck Bay; Geological Survey of Canada, Map 987A, 1:63 360.

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Mining Claim Card Seal 19 (P31804)
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

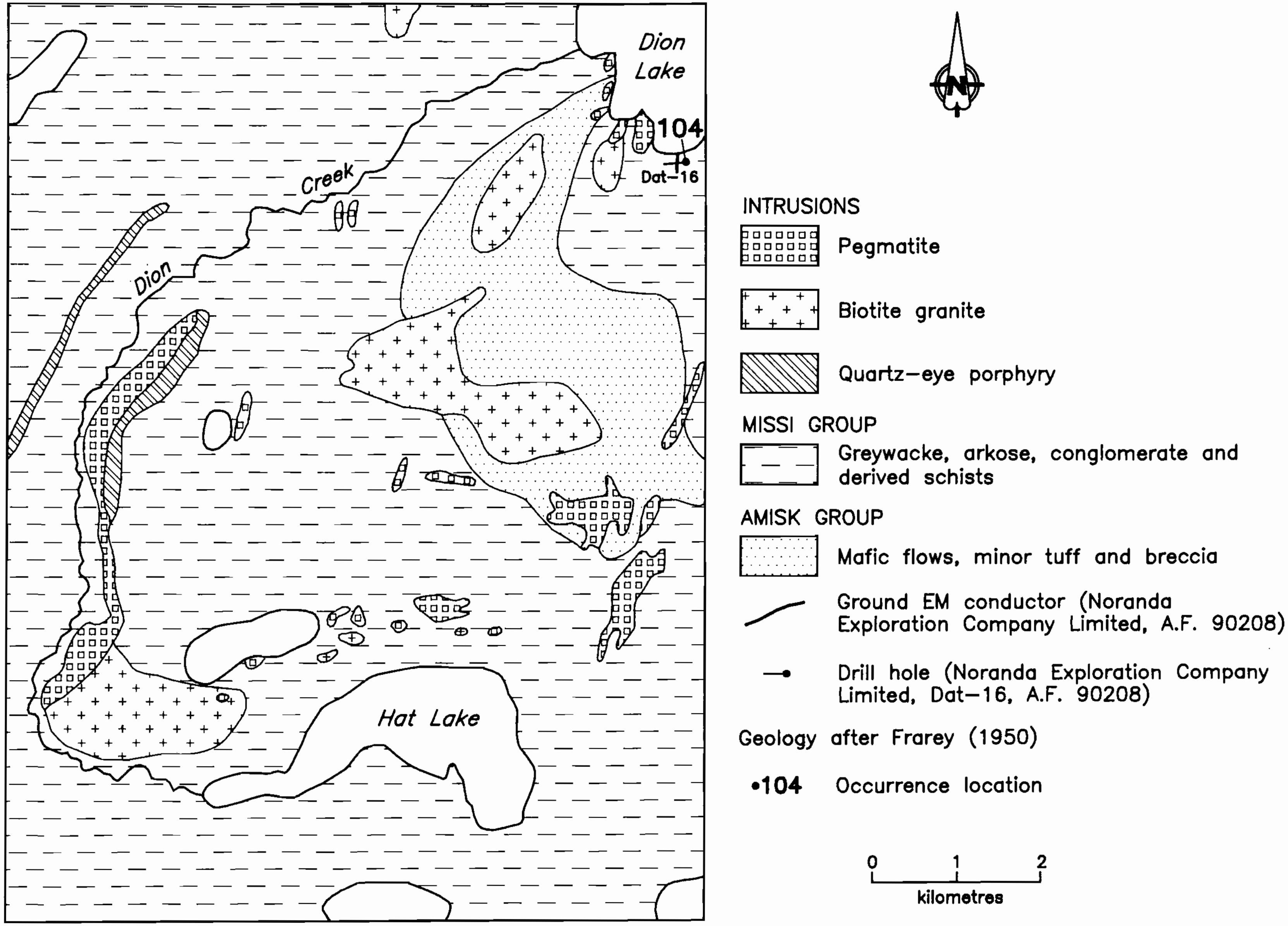


Figure 104-1: Geological setting of occurrence 104.

LOCATION: **104**

NAME: Gamma-Star Group

UTM: 6074664N/467497E

ACCESS: Bush plane to Dion Lake and traverse.

AREA: South of Dion Lake.

AIRPHOTO: A20169-68

EXPLORATION SUMMARY:

Star 2 was staked by A.L. Parres and optioned to Cypress Exploration Corporation Limited in 1952. Canadian Nickel Company Limited did an airborne EM survey in the area in 1957 (A.F. 91624). The ground was held by W. Achtemichuk from 1958 to 1961. In 1965 Noranda Exploration Company Limited did an HLEM survey on the Dat group and drilled a 55 m deep hole on Dat 6 (A.F. 90091, 90208). HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650). A.L. Parres Limited staked CB 11315 in 1980 and optioned it to E&B Explorations Limited from 1980 to 1985. Assessment work was filed in 1980 (Mining Claim Card CB 11315). The claim was cancelled in 1986.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Missi Group greywacke, arkose, conglomerate and derived schists. These sedimentary rocks are flanked to the west and southwest by Amisk Group mafic flows, tuff and breccia. Both units have been intruded by biotite granite, pegmatite and quartz-eye porphyry (Fig. 104-1; Frarey, 1950).

MINERALIZATION:

Disseminated pyrrhotite occurs in outcrops in the general area of drill hole Dat 16. The drill hole intersected two mineralized zones separated by an 8.8 m thick interval of "very siliceous quartz-hornblende gneiss" The first mineralized zone occurs on the uphole side of the silicified quartz-hornblende gneiss and is characterized by 13 separate layers of "slight to solid" graphite with "visible" to "well mineralized" pyrite. These layers vary in thickness from 1 to 2 cm to 0.6 m. The second mineralized zone occurs on the downhole side of the altered quartz-hornblende gneiss and is represented by 3 layers of graphite that is "slight to well mineralized" with pyrite. These layers vary in thickness from 0.4 to 0.7 m.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

Assessment Files 90091, 90208, 91624 and 91650
Manitoba Energy and Mines, Minerals Division.

Cerny, P., Trueman, D.L., Ziehlke, D.V., Goad, B.E. and Paul, B.J.
1981: The Cat Lake-Winnipeg River and the Wekusko Lake pegmatite fields, Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER80-1, 216p.

Frarey, M.J.
1950: Crowduck Bay; Geological Survey of Canada, Map 987A, 1:63 360.

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Mining Claim Card CB 11315
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

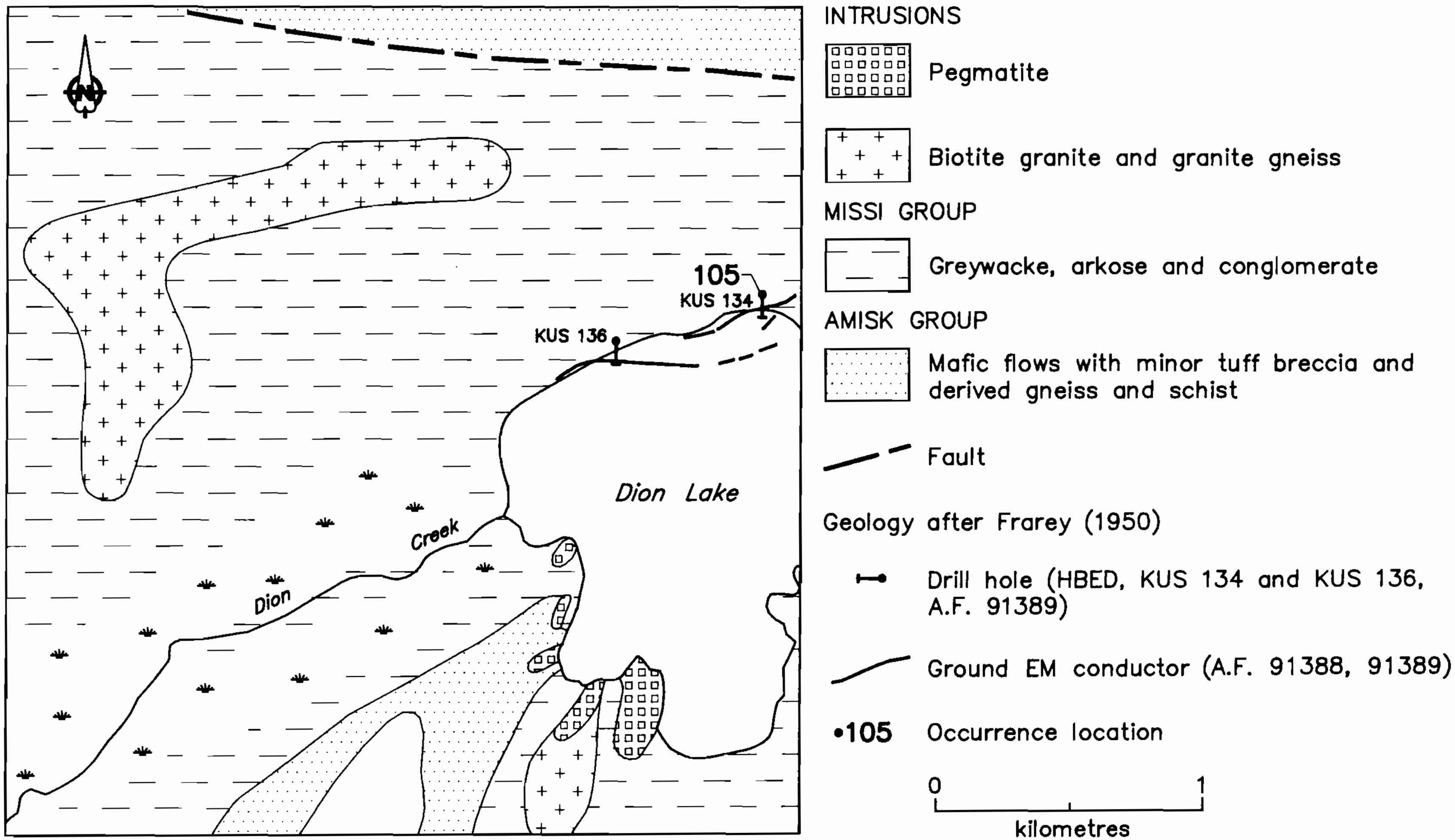


Figure 105-1: Geological setting, ground EM conductors and diamond drill hole locations, occurrence 105.

LOCATION: **105**

NAME: (A.F. - Mineralization intersected by diamond drilling)

AREA: North shore of Dion Lake.

UTM: 6076610N/467493E

AIRPHOTO: A20169-69

ACCESS: Bush plane.

EXPLORATION SUMMARY:

The area was first staked as the Gamma 6 to 9 claims in 1952. The Gamma group was explored for uranium by A.L. Parres in 1952 and by Cypress Exploration Corporation Limited from 1952 to 1957. The claims were assigned to Kix Minerals Limited in 1957. Canadian Nickel Company Limited did an airborne EM survey in 1957 and delineated a strongly conductive zone in the area (A.F. 91624). The area was restaked as Sulphur 6 to 8 between 1958 and 1959. HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650). HBED did an HLEM survey on the Kus claims in 1969 (A.F. 91388) and drilled a 160 m deep hole on Kus 671 and a 72 m deep hole on on Kus 670 in 1970 (A.F. 91389). The claims lapsed in 1970. In 1980 CB 10762 was staked by HBED and CB 11314 was staked by A.L. Parres Limited. Assessment work was done on CB 10762 under a claim grouping in 1982 before the claim lapsed in 1983 (Mining Claim Card CB 10762). CB 11314 was optioned to E&B Explorations Limited from 1980 to 1985 and four years of assessment work was filed before the claim was cancelled in 1986 (Mining Claim Card CB 11314).

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Missi Group greywacke, arkose and conglomerate, and derived schist and gneiss (Gordon and Gall, 1982). These rocks are intruded by biotite granite (Fig. 105-1; Frarey, 1950). Diamond drilling intersected gneissic to schistose greywacke, pegmatite, chlorite-amphibole-biotite schist and chemical sedimentary rocks (A.F. 91389).

MINERALIZATION:

Graphite with pyrite and pyrrhotite was intersected by DDH Kus-134 and -136. DDH Kus-134 intersected 21.5 m of 15 to 60% graphite and 2 to 15% pyrite overlain in the drill hole by light grey, fine grained quartz-biotite-chlorite-feldspar gneiss and underlain by massive pegmatite. DDH Kus-136 intersected trace to 60% graphite and trace to 10% pyrite over a 12.8 m interval within a greenish-grey to greenish-white, fine grained quartz-biotite-chlorite-talc schist. A 0.6 m interval within the 12.8 m intersection contains 60% graphite and 10% pyrite (A.F. 91389).

GEOCHEMICAL DATA:

None

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

Assessment Files 91388, 91389, 91624 and 91650
Manitoba Energy and Mines, Minerals Division.

Frarey, M.J.
1950: Crowduck Bay; Geological Survey of Canada, Map 987A, 1:63 360.

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Mining Claim Cards CB 11314; CB 10762
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

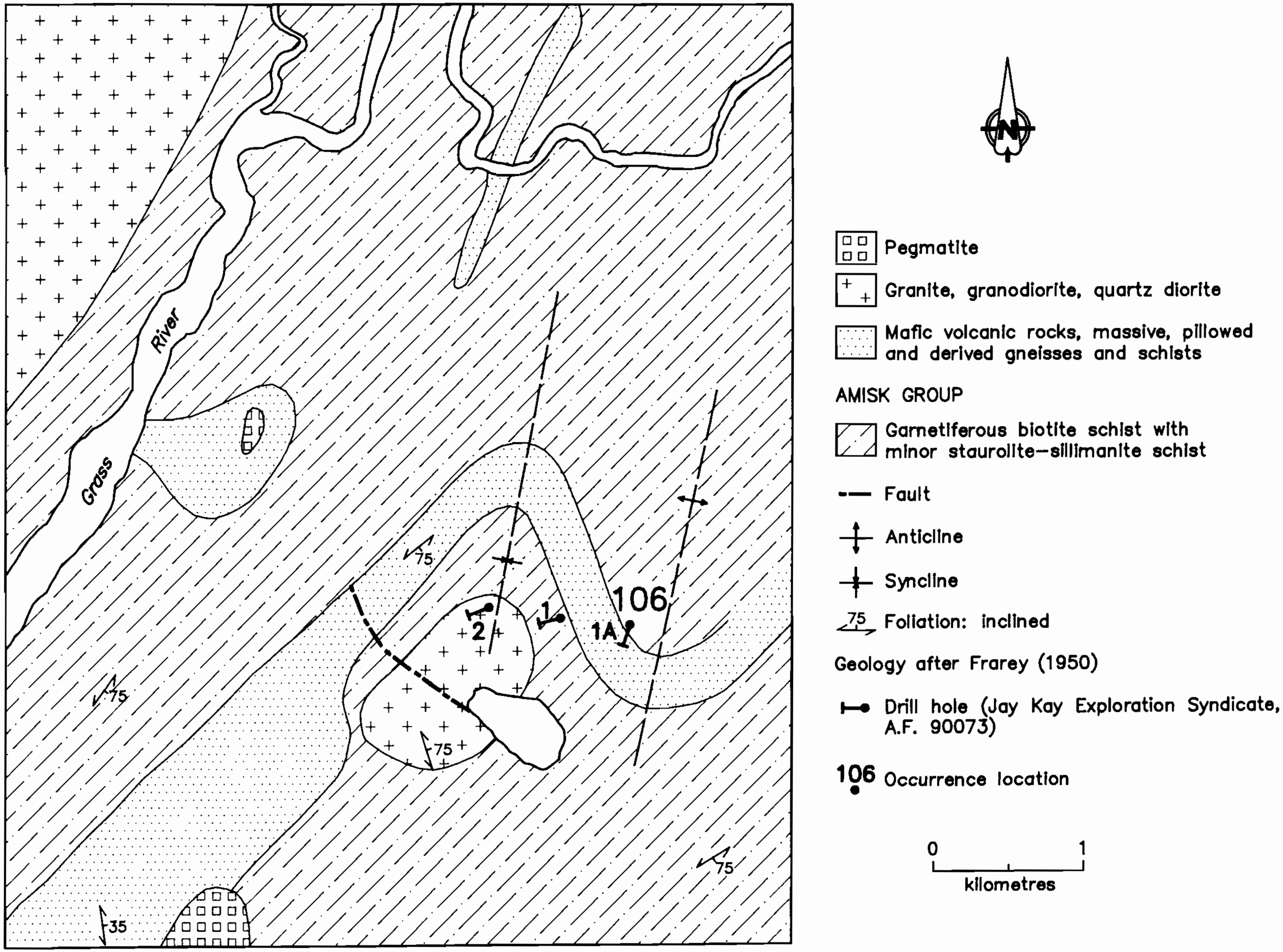


Figure 106-1: Geological setting and diamond drill hole locations, occurrence 106.

LOCATION: **106**

NAME: (A.F. - Mineralization intersected by diamond drilling)

UTM: 6089718N/466729E

ACCESS: Bush plane to Niblock Lake and traverse.

AREA: Northwest of Niblock Lake

AIRPHOTO: A20808-98

EXPLORATION SUMMARY:

Far 1 to 4 were staked by P. Kupnistky in 1956. Surface work was done on the Far group of claims, before they were cancelled in 1958 (Mining Claim Card Far 1). W.F. Uhrich staked Fair 1 to 4 in 1958. Jay-Kay Exploration Syndicate drilled three holes totalling 263 m on Fair 1 to 3 in 1960 (A.F. 90073). The claims were cancelled in 1962. HBED did an airborne EM and radiometric survey in 1965 (A.F. 91650) and acquired the Kus 331, 332, 340 and 341 claims in 1966. The claims were cancelled in 1968.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Missi Group interbedded conglomerate and staurolite schist, garnetiferous biotite schist, and mafic flows with minor tuff and breccia (Gordon and Gall, 1982). These rocks have been intruded by diorite and quartz diorite (Fig. 106-1; Frarey, 1950). Diamond drilling (Fig. 106-1) intersected diorite, basalt, gabbro, peridotite, pegmatite and gneisses and schists of unspecified composition (A.F. 90073). The occurrence is situated close to the contact between the mafic flows and tuffs and the greywacke.

MINERALIZATION:

Unspecified percentages of pyrite were intersected in basalt, gabbro, diorite, chlorite schist and altered peridotite (A.F. 90073).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 90073 and 91650
Manitoba Energy and Mines, Minerals Division.

Frarey, M.J.
1950: Crowduck Bay; Geological Survey of Canada, Map 987A, 1:63 360.

Gordon, T.M.
1981: Metamorphism in the Crowduck Bay area, Manitoba; in Geological Survey of Canada, Current Research, Part A, Paper 81-1A, p. 315-316.

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Hosain, I.T.
1988: An update summary and evaluation of geophysical data from open assessment files of the Flin Flon - Snow Lake greenstone belt (NTS sheets 63K (N1/2) and 63J/12, 13); Manitoba Energy and Mines, Mines Branch, Open File Report OF87-11, 99p.

Mining Claim Card, Far 1 (P 45381)
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

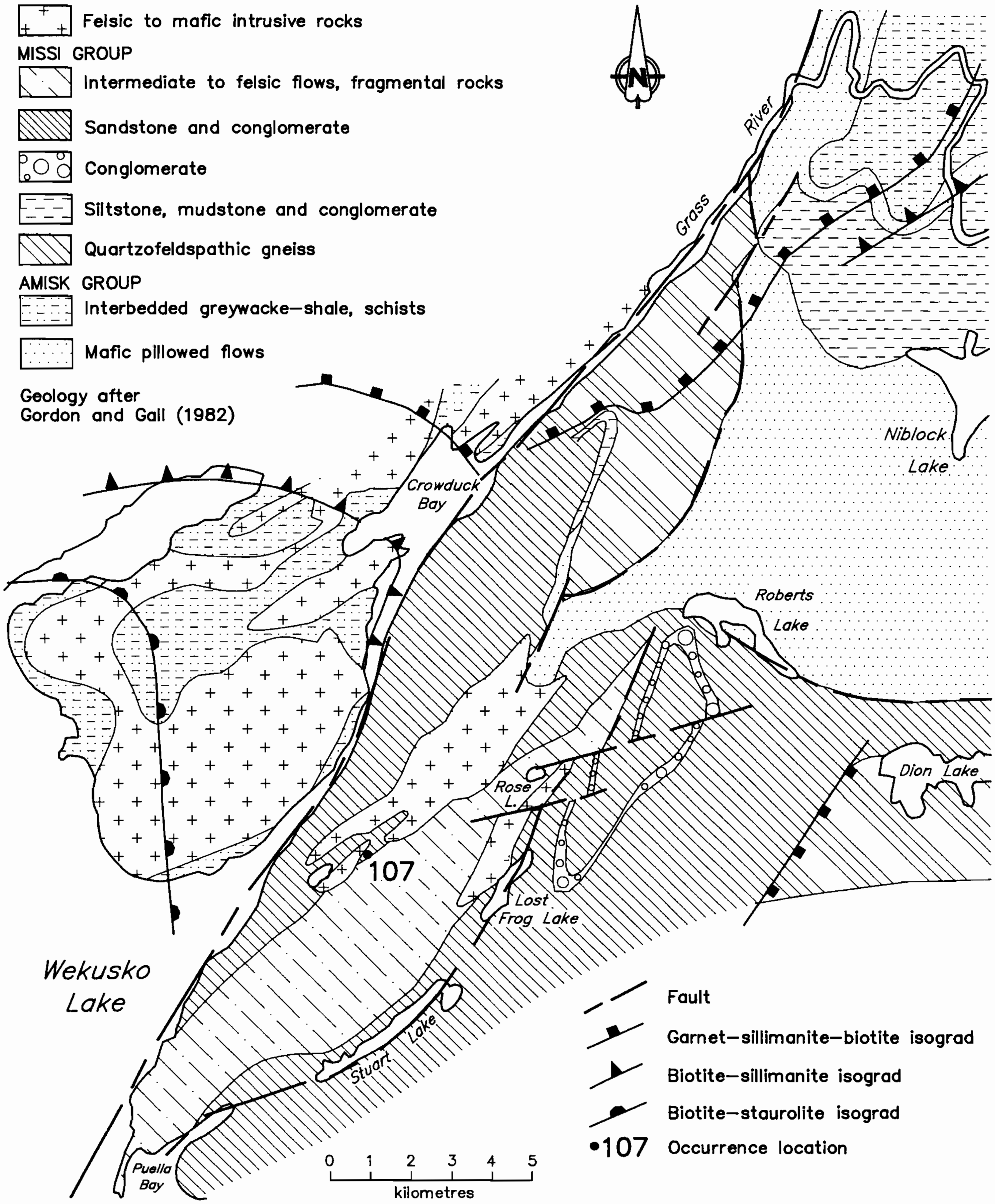


Figure 107-1: Geological setting of occurrence 107.

LOCATION: **107**

NAME: Molley Claim

AREA: East shore of Wekusko Lake; northwest of Judge Lake.

UTM: 6074078N/454852E

AIRPHOTO: A20782-43

ACCESS: Boat on Wekusko Lake and traverse via bush trail.

EXPLORATION SUMMARY:

Savoy was staked by C.H. Downie in 1921 and was cancelled in 1922. In 1923 John Blain staked Molley. The vein was stripped and trenched between 1924 and 1932 (Mineral Inventory Card 63J 13 Au 18). A property examination and geological mapping (1:3960) of the northeast part of the claim was done by Brownell (1932). Molley was cancelled in 1932 and restaked as Beatrice by J. McCallum. Beatrice was cancelled in 1933. John Blain restaked Molley in 1933. Pitting, trenching, and other surface work commenced in 1934. Shaft sinking was reported in 1934, 1936, and between 1938 and 1941 and trenching between 1934 and 1937, and between 1939 and 1941; however, the only evidence of activity on the property is a few shallow pits. Airborne EM and radiometric surveys were done by HBED in 1965 (A.F. 91650). Falconbridge Nickel Mines Limited did airborne EM and magnetic surveys in 1973 (A.F. 91564). The ground was held as Nat 1 by J.B. Barton from 1972 to 1975 and as Can 12 by Cangold Limited from 1981 to 1983. The area was restaked as Nor 22 and Nor 57 by Noranda Exploration Company Limited in 1983 and 1986, respectively. Manitoba Mineral Resources Limited had an option agreement with Noranda on the Nor group of claims in 1984.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Missi Group conglomerate, arkose and tuff and breccia of unspecified composition. These rocks are flanked to the east by intermediate to felsic flows (Fig. 107-1; Gordon and Gall, 1982), and interbedded conglomerate, arkose, greywacke, chert and mafic to intermediate flows (Stockwell, 1937). West of the occurrence biotite dacite, quartz-feldspar porphyry, greywacke and conglomerate have been mapped (Fig. 107-1, 107-2; Gordon and Gall, 1982; Stockwell, 1937). Stockwell (1937) mapped quartz-feldspar porphyry, cherty sedimentary rocks, rhyolite breccia, lamprophyre dykes and pale green sericite schist in the immediate area of the occurrence.

MINERALIZATION:

A quartz vein that contains disseminated pyrite, pyrrhotite, chalcopyrite and visible gold occurs on the property. The vein is exposed for 152 m, strikes 048°E, dips 80° southeast and varies from 2.5 cm to 30 cm in width. Locally, small quartz veinlets branch out from the main vein and extend for less than a metre into the wall rocks. The vein is hosted by dacite breccia and cherty sedimentary rocks. The dacite breccia is poorly bedded, 1 to 8 m thick and overlain to the east by arkose. The cherty sedimentary rocks are 3 to 6 m thick and consist of 2.5 to 15 cm thick layers of "dense red rocks" separated by pale-green sericite schist.

GEOCHEMICAL DATA:

Stockwell (1937) quotes "high values in gold" from the occurrence.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. The auriferous quartz veins contain iron and base metal sulphide minerals.

REFERENCES:

Assessment Files 91564 and 91650
Manitoba Energy and Mines, Minerals Division.

Baldwin, D.A.
1980: Porphyritic intrusions and related mineralization in the Flin Flon volcanic belt; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER79-4, 23p.

Brownell, G.M.
1932: Property of John Blain, Sr.; in Manitoba Energy and Mines, Minerals Division, Unpublished Information File, 63J/13SE.

Cerny, P., Trueman, D.L., Ziehlke, D.V., Goad, B.E. and Paul, B.J.
1981: The Cat Lake-Winnipeg River and the Wekusko Lake pegmatite fields, Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER80-1, 216p.

Davies, J.F., Bannatyne, B.B., Barry, G.S., and McCabe, H.R.
1962: Geology and mineral resources of Manitoba; Manitoba Mines and Natural Resources, Mines Branch, 190p.

Frarey, M.J.
1948: Crowduck Bay; Geological Survey of Canada, Paper 48-22, Preliminary Map 48-22, 1:31 680.

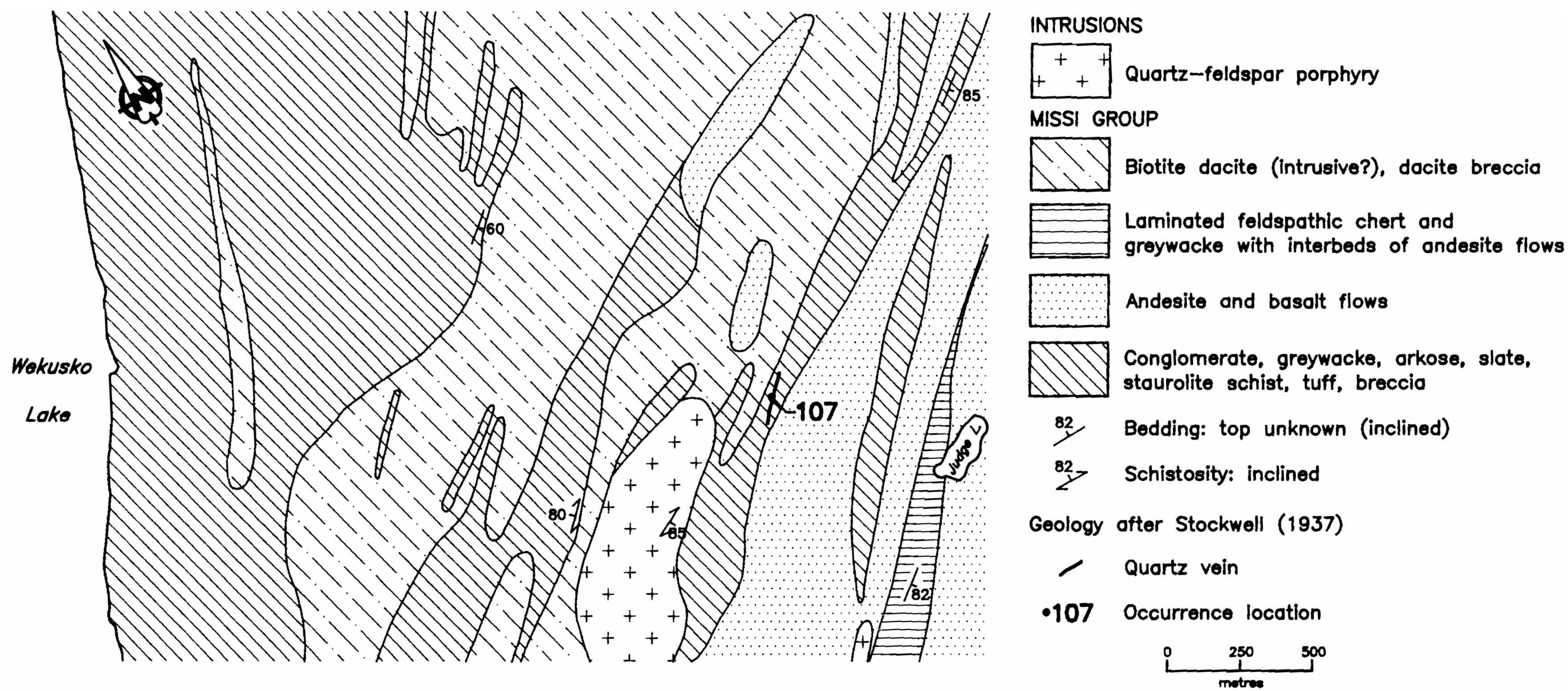


Figure 107-2: Detailed geology, occurrence 107.

Frarey, M.J.
1950: Crowduck Bay; Geological Survey of Canada, Map 987A, 1:63 360.

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Mineral Inventory Card 63J/13 Au 18
Manitoba Energy and Mines, Minerals Division.

Stockwell, C.H.
1937: Gold deposits of Herb Lake area, northern Manitoba; Geological Survey of Canada, Memoir No. 208, 46p.

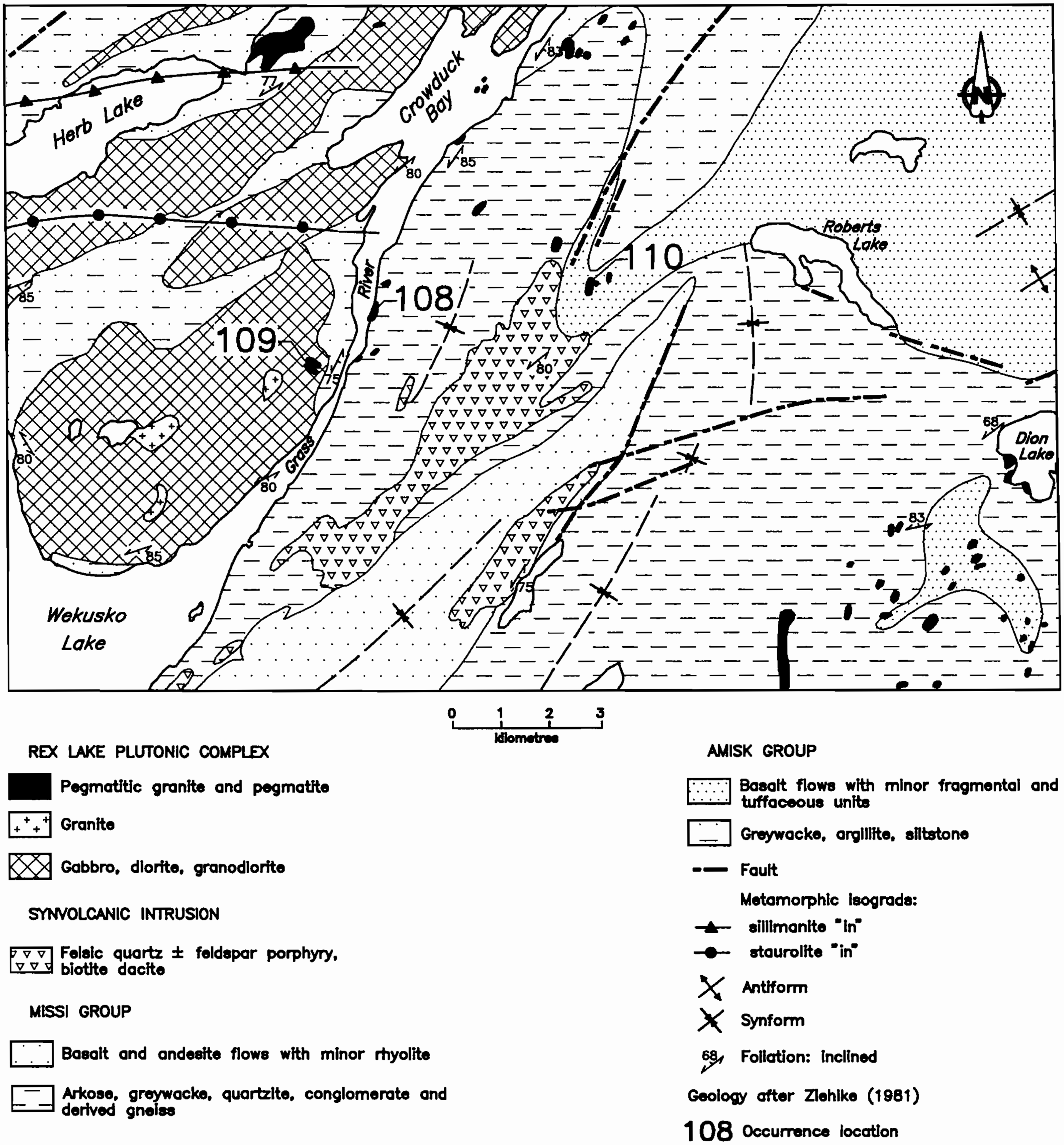


Figure 108-1: Geological setting of occurrences 108,109 and 110.

LOCATION: **108**

NAME: Violet-Thompson
UTM: 6078240N/454176E
ACCESS: Boat from Bartlet's Landing, Wekusko Lake.

AREA: Grass River south of Crowduck Bay.
AIRPHOTO: A20782-46

EXPLORATION SUMMARY:

The area was first staked under O.P. 1 to 4 prior to 1930. Violet 10, 11, 18 and 22 were staked by E. Sander in 1955 and assigned to S.P. Moore. Combined Developments Limited acquired the property in 1955 and diamond drilled 2549 m in 26 holes (A.F. 90099; Mineral Inventory Card 63J/13 Li 3). The diamond drilling outlined a mineralized zone that could be beneficiated by flotation. Canadian Scotia Limited acquired the property in 1956. Another drill program was completed on the property in late 1956 (Bannatyne, 1985). The Violet claims were assigned to General Lithium Mining and Chemical Corporation Limited in 1957. HBED did airborne EM and radiometric surveys in 1965 (AF 91650). The area was restaked by H.L. Thompson and G.F. Thompson as the Thompson 1 to 4 claims in 1964 and Thompson 5 to 6 in 1968. Thompson 5 and 6 were restaked as CB 7473 in 1977 and again as Thompson 5 and 6 by G.F. Thompson in 1982. Starrex Mining Corporation has considered commercial exploitation of the deposit (Northern Miner, May 23, 1988).

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Missi Group greywacke, arkose, conglomerate and derived schists (Fig. 108-1; Frarey, 1950). The occurrence is situated in the Wekusko Lake pegmatite field as delineated by Cerny et al. (1981) (Fig. 108-2). The sedimentary rocks are intruded by a spodumene-bearing pink to red pegmatite dyke (Fig. 108-2, 108-3, 108-4) that strikes 030° to 038° and dips vertically. The dyke is up to 20 m wide and was traced by diamond drilling for more than 500 m north. The dyke is texturally and compositionally homogeneous and contains an oblique ladder-like orientation of 1 to 35 cm long columnar spodumene and potassium feldspar that plunge 10° to 25° at 320° to 340°. Local fracture fillings parallel to, and within, the dyke are marked by mineral assemblages identical to those of the pegmatite dyke. The fracture fillings, however, have fabrics that are not parallel to the felsic dyke. The pegmatite is considered to have been the internal structure of the body. The spodumene and potassium feldspar are bent, cracked and healed by albite and quartz suggesting the host fracture was active during and after crystallization.

MINERALIZATION:

Spodumene varies from 10 to 20% in the dyke and individual columnar crystals are separated by a groundmass of medium- to coarse-grained albite, quartz and muscovite. Garnet, apatite and beryl are subordinate minerals; Nb and Ta-oxide minerals are absent (Cerny *et al.*, 1981). Fluorite (DDH 103; 46.6 to 52.1 m; A.F. 90099) and tourmaline (DDH 104; 42 to 45.4 m; A.F. 90099) are also mentioned as constituent minerals in the pegmatite. Cerny *et al.* (1981) describe 10 to 20% spodumene and up to 25% spodumene in drill logs (A.F. 90099). Veinlets and disseminated chalcopyrite and pyrrhotite within garnetiferous greywacke are also described in drill logs.

GEOCHEMICAL DATA:

According to Combined Developments Limited (Mulligan, 1957) the deposit has indicated reserves of 3.0 million tonnes grading 1.2% Li_2O) according to Combined Developments Limited (Mulligan, 1957). Bannatyne (1985) reported drill-indicated reserves of 5 260 000 tonnes grading 1.2% Li_2O to a depth of 180 m. Table 108-1 summarizes assay results for Li_2O in each of the drill holes on the property. Overall, Li_2O has a range of nil to 1.63%; no analyses are reported for DDH 115 to 117 and 122 to 125. Table 108-2 and Figure 108-5 summarize some of the geochemical characteristics for potassium feldspar, muscovite, beryl, spodumene and garnet. The compositional characteristics with respect to Cs, K, Rb, Li, Fe and Na for selected minerals from the pegmatite dykes are compared for occurrences 108, 109 and 110 in Figure 108-5. The diagram illustrates the close relationship between the pegmatites at occurrences 108 and 109; pegmatites from occurrence 110 have a more advanced fractionation pattern as demonstrated by; (i) the K/Rb vs. Cs plot for potassium feldspar and muscovite samples, and (ii) the Na/Li vs. Cs plot for beryl.

CLASSIFICATION:

Pegmatite-type deposit.

REFERENCES:

Assessment Files 90099 and 91650
Manitoba Energy and Mines, Minerals Division.

Bannatyne, B.B.
1985: Industrial minerals in rare-element pegmatites of Manitoba; Manitoba Energy and Mines, Geological Services, Economic Geology Report ER84-1, 96p.

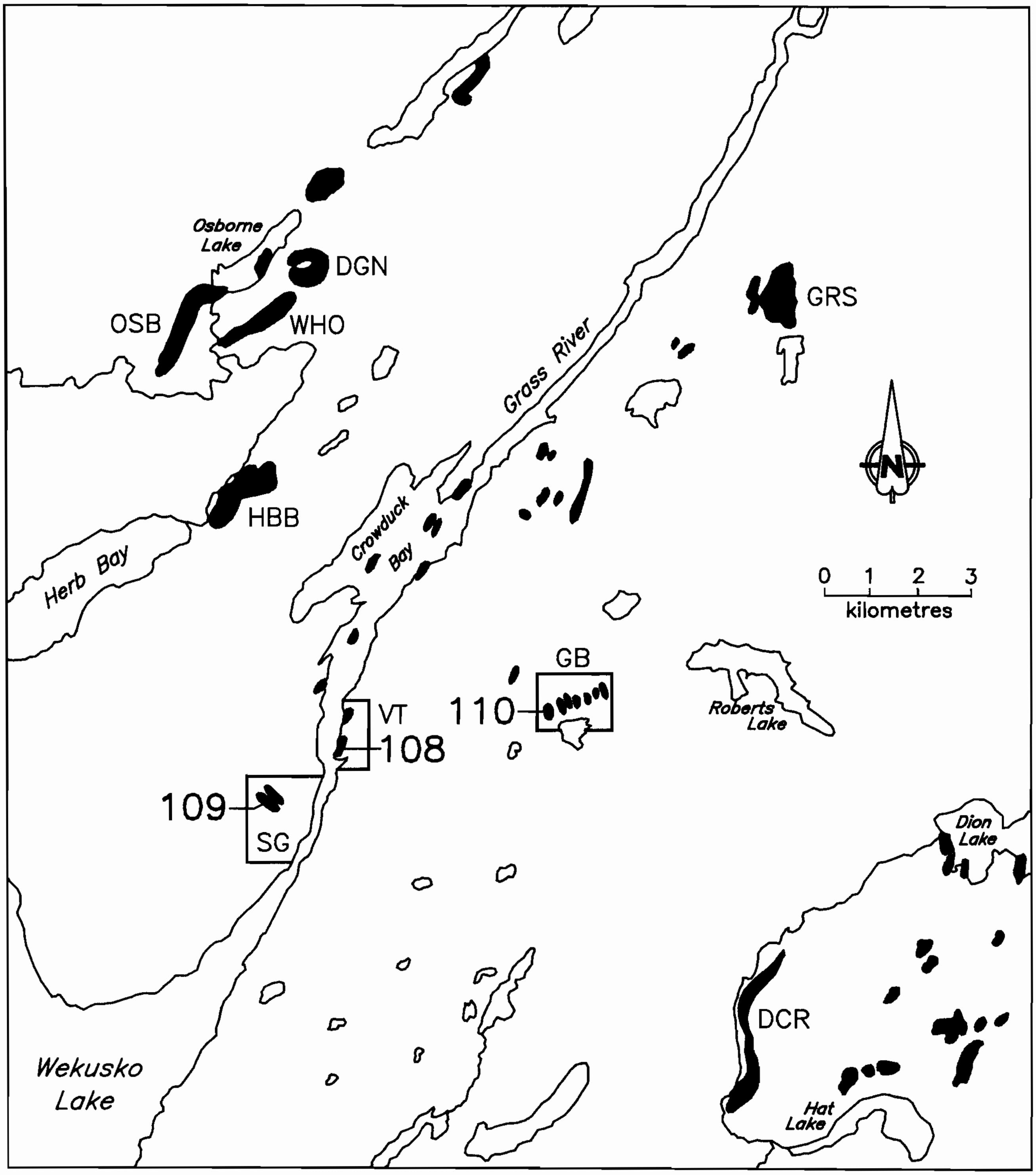


Figure 108-2: Location of pegmatitic granites and lithium pegmatite deposits in the Wekusko Lake pegmatite field.

Table 108-1: Summary of spodumene-bearing drill core intervals and assay results for Li_2O, occurrence 108 (A.F. 90099)

DDH	Interval (m)	No. of Assay Intervals	Li_2O Range(%)	Li_2O (%) Arithmetic Mean
101	58.2-69.2	6	nil-1.35	0.96
102	52.4-59.4	3	0.27-0.96	0.72
103	46.6-52.1	3	1.08-1.40	1.21
104	42.1-56	5	0.22-1.48	1.03
105	31.6-48.5	6	0.22-1.40	0.56
106	43.6-74.8	5	0.32-1.56	0.81
107	48-58.3	4	nil-1.14	0.66
108	66.9-82.8	5	1.05-1.52	1.20
109	28.1-49	7	0.85-1.52	1.24
110	7.1-10.7	1	0.97	
	23.2-25.1	1	0.93	1.10 (combined)
	64.6-65.8	1	1.40	
111	20.9-24.5	1	1.08	
	55.5-57.3	1	0.63	0.86 (combined)
112	101.3-129.1	10	0.60-1.63	1.17
113	82.4-101.0	4	1.22-1.29	1.26
114	83.8-91.6	3	0.75-1.59	1.30
11				
5	no analyses			
116	no analyses			
117	no analyses			
118	57.3-73.4	5	0.57-1.29	0.99
119	44.5-50.9	2	0.54-1.03	0.79
120	26.1-28.8	1	0.75	0.75
121	103.6-111.7	2	0.94-1.29	1.12
122	no analyses			
123	no analyses			
124	no analyses			
125	no analyses			

Cerny, P., Trueman, D.L., Ziehlke, D.V., Goad, B.E. and Paul, B.J.

1981: The Cat Lake-Winnipeg River and the Wekusko Lake pegmatite fields, Manitoba; Manitoba Energy and Mines, Economic Geology Report ER80-1, 216 p.

Frarey, M.J.

1950: Crowduck Bay; Geological Survey of Canada Map 987A, 1:63 360.

Mineral Inventory Card 63J/13 Li 3

Manitoba Energy and Mines, Minerals Division.

Mulligan, R.

1957a: Lithium in Canada-recent developments and geological features; Canadian Mining Journal, v. 78, No. 4, p. 125.

1957b: Lithium deposits of Manitoba, Ontario and Quebec 1956; Geological Survey of Canada, Paper 57-3, 26p.

Table 108-2: Compositional characteristics of selected minerals from the Violet-Thompson Pegmatite (Cerny *et al.*, 1981).

		Rb	K/Rb	Cs	
Blocky K-feldspar	arith. mean, wt. %	0.10	115.9	0.0040	
(31 samples)	st. deviation	± 0.04	± 29.3	± 0.0022	
	range	0.061-0.240	43.6-161	0.0019-0.0131	
	Li	Rb	K/Rb	Cs	Be
Core muscovite	0.067	0.214	42.4	0.0030	0.0019
(4)	± 0.008	± 0.060	± 8.9	± 0.0020	± 0.0009
	0.056-0.073	0.178-0.303	29.3-47.9	0.0017-0.0060	0.0013-0.0032
	Li	Na	Na/Li	Cs	
Late beryl	0.407	1.35	3.33	0.10	
(2)	± 0.009	± 0.18	± 0.53	± 0.015	
	0.400-0.413	1.22-1.48	2.95-3.70	0.89-1.10	
	Na_2O	Fe (as Fe_2O_3)			
Spodumene	0.198	1.237			
(3)	± 0.038	± 0.012			
	0.166-0.240	1.23-1.25			
	FeO	MnO	(MnO x100)/ (MnO + FeO)	CaO	MgO
Garnet	24.85	17.50	41.28	0.94	0.31
(5)	± 6.11	± 6.24	± 14.38	± 0.34	± 0.09
	14.60-30.19	13.04-28.40	30.16-66.05	0.46-1.40	0.19-0.41

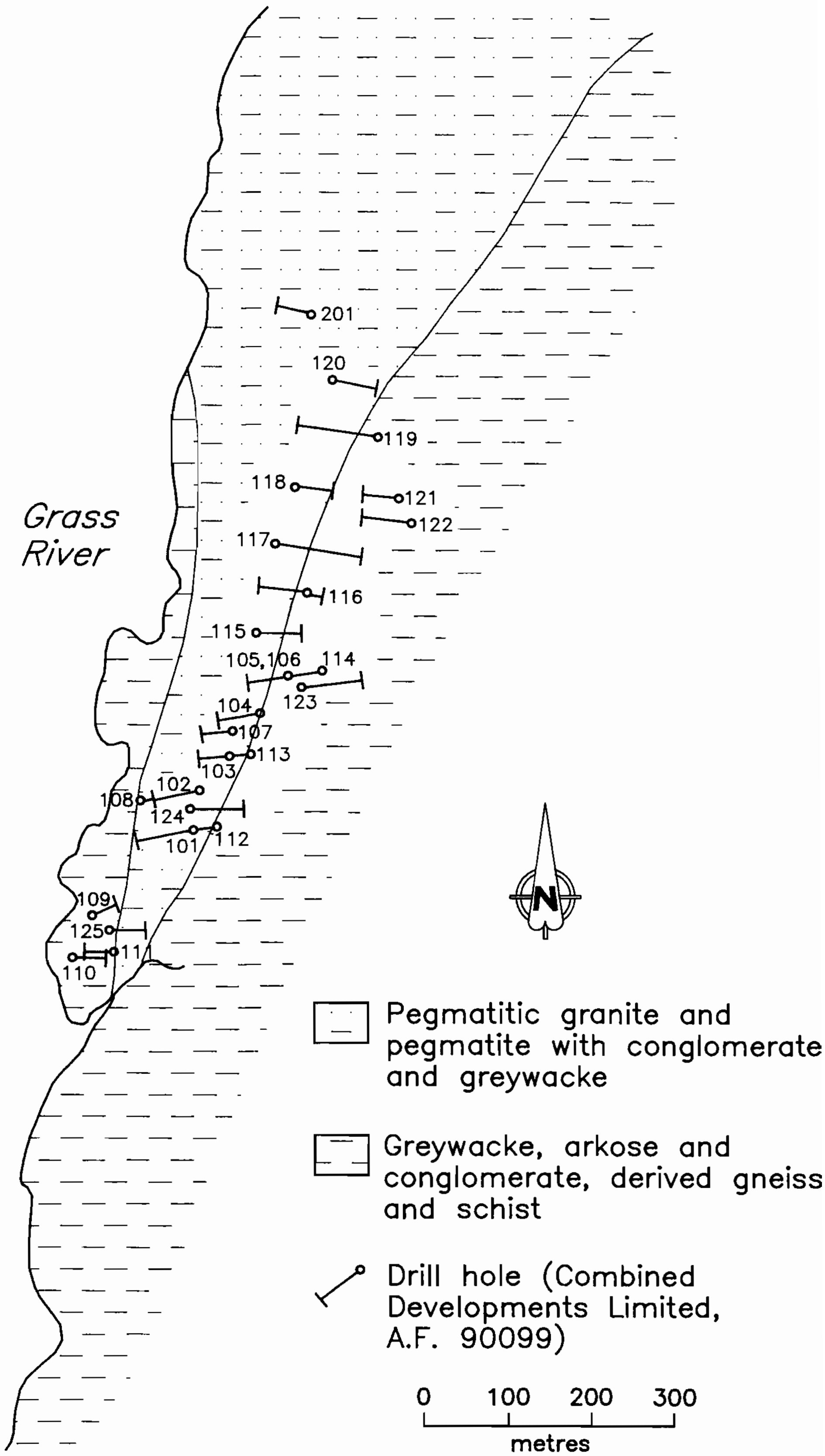


Figure 108-3: Detailed geology and diamond drill hole locations, occurrence 108.

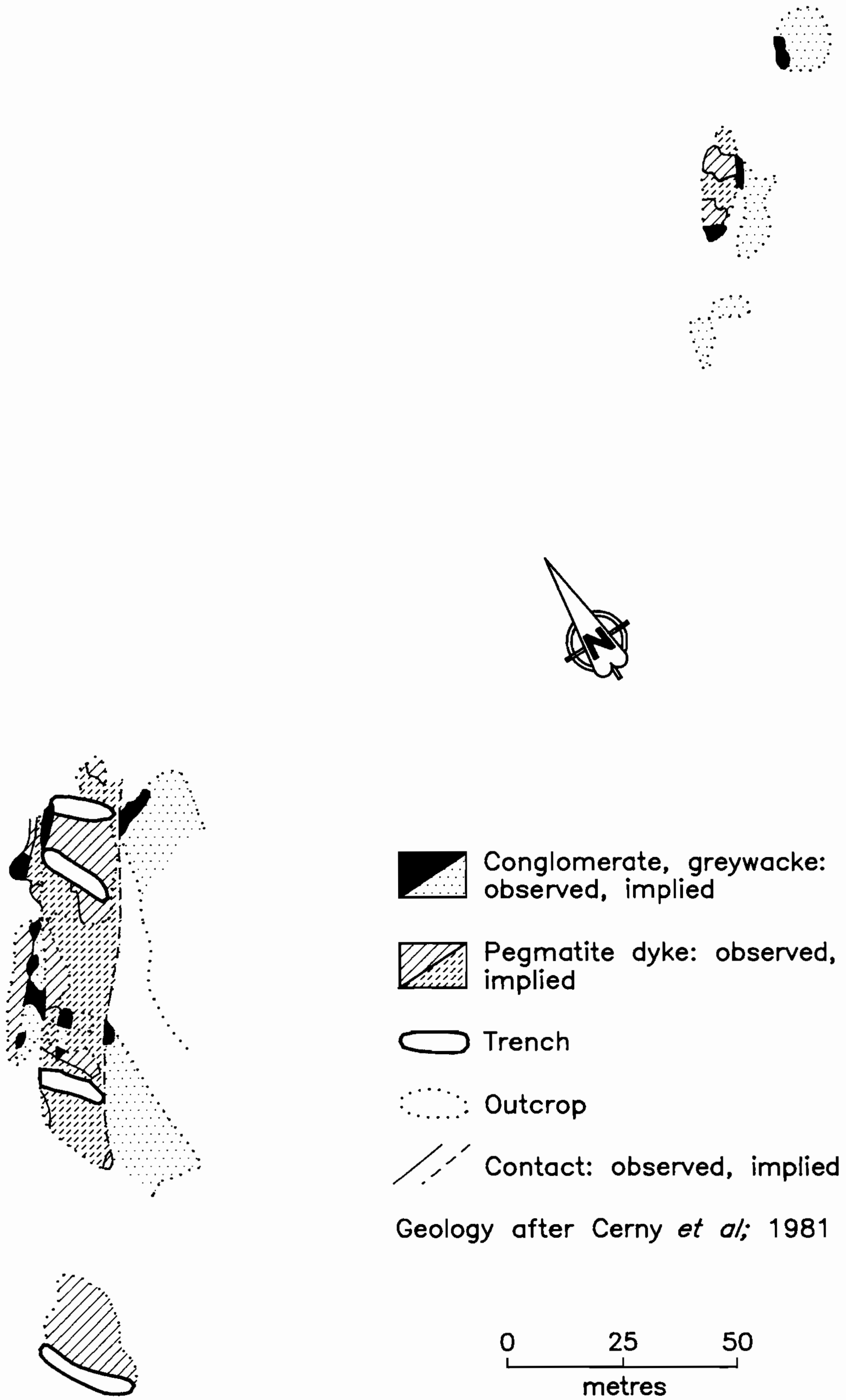


Figure 108-4: The Violet-Thompson pegmatite.

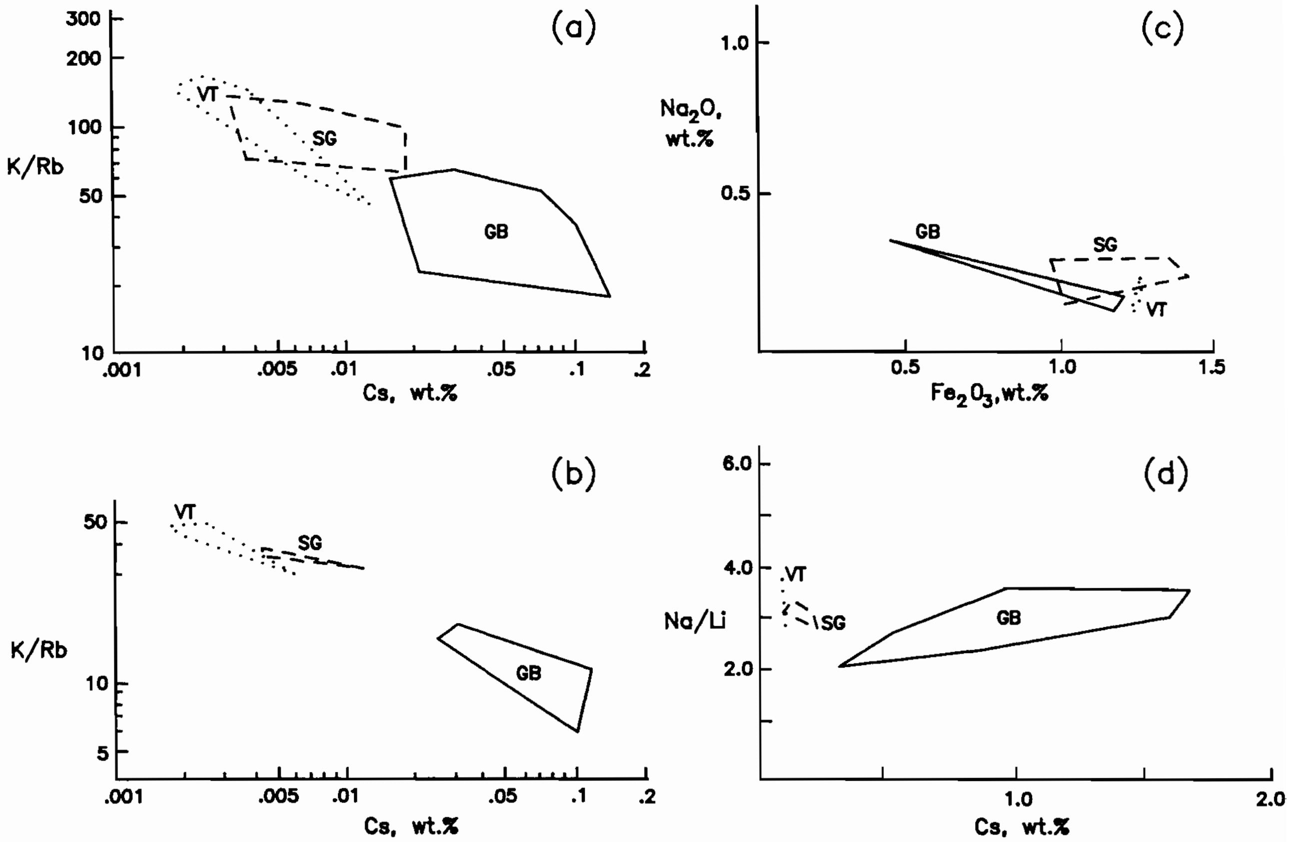


Figure 108-5: Compositional characteristics of pegmatite minerals from occurrences 108, 109 and 110.

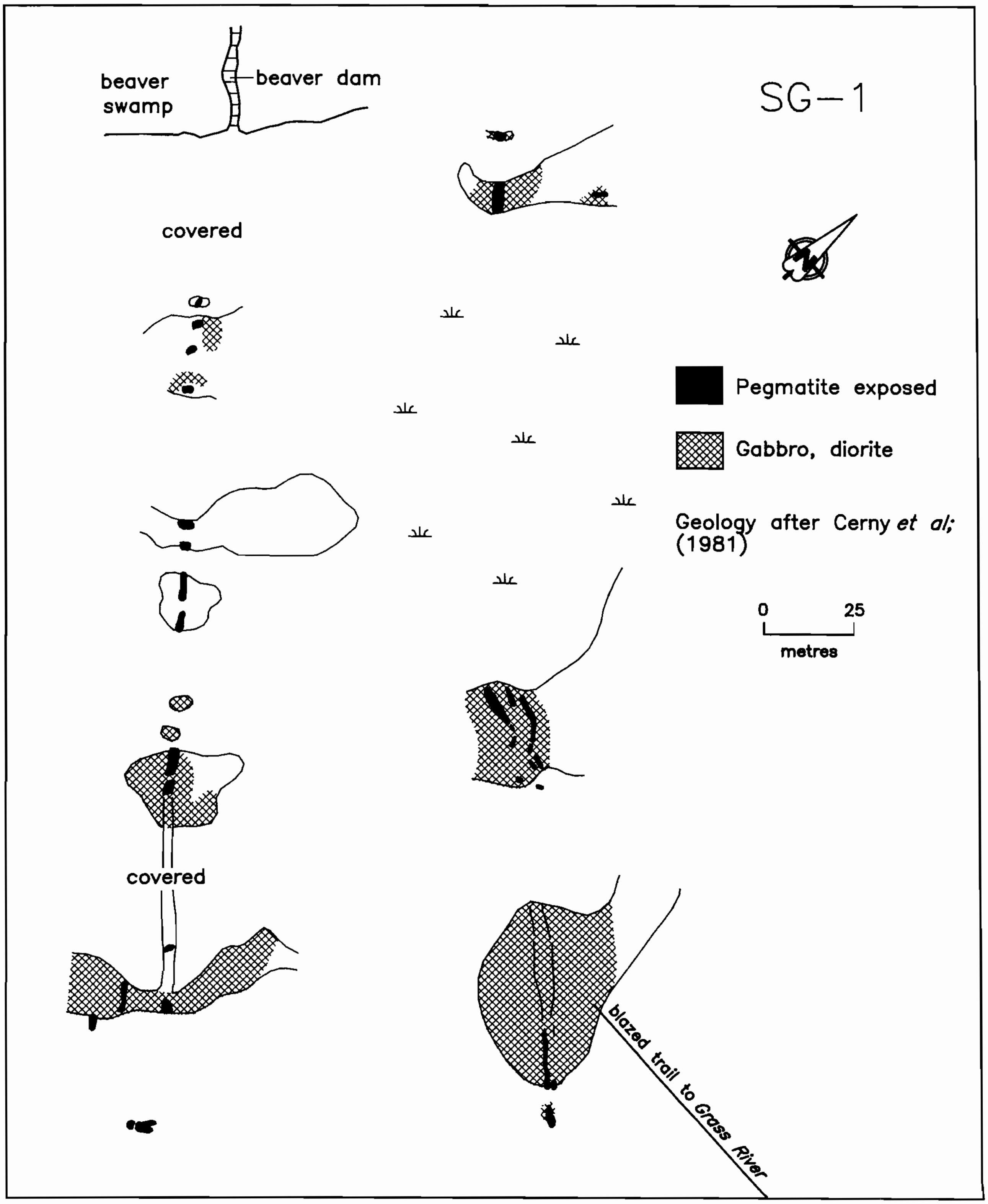


Figure 109-1: Geology of the eastern dyke, occurrence 109.

LOCATION: **109**

NAME: Sherritt Gordon
UTM: 6077392N/452921E
ACCESS: Boat from Bartlet's Landing, Wekusko Lake.

AREA: Grass River south of Crowduck Bay.
AIRPHOTO: A20124-87

EXPLORATION SUMMARY:

The Gold Reef group of claims was staked and assigned to P. Kobar in 1931. Property visits were done by J.S. DeLury in 1931, G.M. Brownell in 1932 and by J. M. Morgan in 1940 (Manitoba Energy and Mines, Unpublished Information File, 63J/13SE). The pegmatite dykes were stripped, blasted and sampled before the claims lapsed in 1938. Spodumene, Lithium and Beryl 9 were staked over the area in 1938. In 1942, W. Ringsleben and Dr. T.L. Tanton found minor scheelite in three places using an ultraviolet lamp (Mineral Inventory Card 63J/13 Li 2). Sherritt Gordon Mines Limited optioned the property, and did a 21 hole, 632 m, drill program on Spodumene and an 8 hole 275 m drill program on Lithium and Beryl 9 in 1942 (A.F. 92182). Sherritt reported that commercial production of spodumene by sink and float concentration was possible (Mineral Inventory Card 63J/13 Li 2). Leases M-1927, M-1928 and M-1922 were issued to Sherritt for 21 years in 1942 and were renewed in 1968. HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650). In 1979, the Spodumene, Lithium, and Beryl 9 claims were restaked as CB 10493, Sparky 1 and CB 10243, by Jim Corman, J.B. Kobar and W. Bruce Dunlop Limited, respectively.

Cangold Limited restaked CB 10243 as Gaz 4 in 1982 and optioned Sparky 1 in 1984. W.B. Kobar Limited acquired Sparky 1 in 1986 and restaked Gaz 4 as Sparky 4 in 1987. Mid-North Resources Limited optioned the Sparky claims in 1987. Prospecting and trenching was done on CB 10493 by Jim Corman and Don Hiebert (A.F. 93027). Work was reported on CB 10493 in 1981, 1982 and 1987, before the claim lapsed in 1990 (Mining Claim Card CB 10492). Strider Resources Limited staked Add 4 over the property in 1991.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Aphebian biotite granite, gabbro, diorite and Amisk Group greywacke, argillite, and siltstone (Fig. 108-1; Frarey, 1950; Gordon and Gall, 1982). Three pegmatite dykes are exposed on the west shore of the Grass River, where they intrude gabbro of the Rex Lake plutonic complex. The eastern dyke, which has been traced for 500 m in surface outcrop, strikes 300° to 315° and dips steeply southwest. This dyke varies between 10 cm and 5 m in width and splits into three subparallel veinlets at the southeast end (Fig. 109-1). The western dyke has been traced for 400 m in outcrop and strikes roughly parallel to the eastern dyke (Fig. 109-2). This dyke has a 50° to 70° southwest dip and varies between 1.5 to 10 m in width. Pinch and swell structures were observed along strike in both the east and west dykes. The pegmatite dykes intruded parallel structures that were subsequently deformed and locally displaced.

The eastern dyke is homogenous in mineral distribution with minor coarsening of grain size towards the interior of the dyke. Grain size in the western dyke is asymmetric, with an increase towards the hanging wall and some accumulation of spodumene, quartz and potassium feldspar along this contact. Cleavelandite, saccharoidal albite, garnet, apatite and beryl are irregularly distributed in the dyke, whereas muscovite is regularly distributed throughout. Ta- and Nb-oxide minerals were not observed in hand specimens from these two dykes. Numerous diamond drill holes were collared to test the extent of these two dykes (A.F. 92182). The eastern and western dykes, as referred to by Cerny *et al.* (1981), make up dyke No. 1 in A.F. 92182. A third pegmatite dyke, approximately 0.8 km south of dyke No. 1 (Fig. 109-3) is described by Brownell (1932). This "southern" dyke is 7.9 m wide at its west end and has been trenched to a depth of 0.3 m over a 10.4 m length. The texture of this dyke is coarser grained than those to the north; with 15 to 20 cm feldspar cleavage planes and 1.2 m long spodumene crystals are common. The average spodumene content appears to be lower, averaging 20% with only the westernmost 18.3 m of the trench containing spodumene. Diamond drill holes collared to delineate these dykes are depicted in Figure 109-3.

MINERALIZATION:

Spodumene in the eastern and western pegmatite dykes compose approximately 25% of the mineralogical constituents. Pink and white feldspar (50%), quartz (20%) and muscovite (5%) represent the remainder of the minerals. Apple-green spodumene crystals up to 15 cm in length are common. Spodumene crystals up to 1.2 m long are reported from the southermost pegmatite dyke. The percentage of spodumene in DDH 21 to 28 is not given in the drill logs.

GEOCHEMICAL DATA:

Drill indicated reserves were reported as 204 000 tonnes of spodumene grading 1.2% Li_2O (Bannatyne, 1973). A bulk sample of "crude" spodumene weighing 605.2 g was screened on a 65 mesh screen giving the split: +65 mesh, 589.0 g; -65 mesh, 16.2 g. The +65 mesh was heated in a muffle furnace at 2150° F for one hour and then cooled; the material was then powdered and assayed. The results are summarized below.

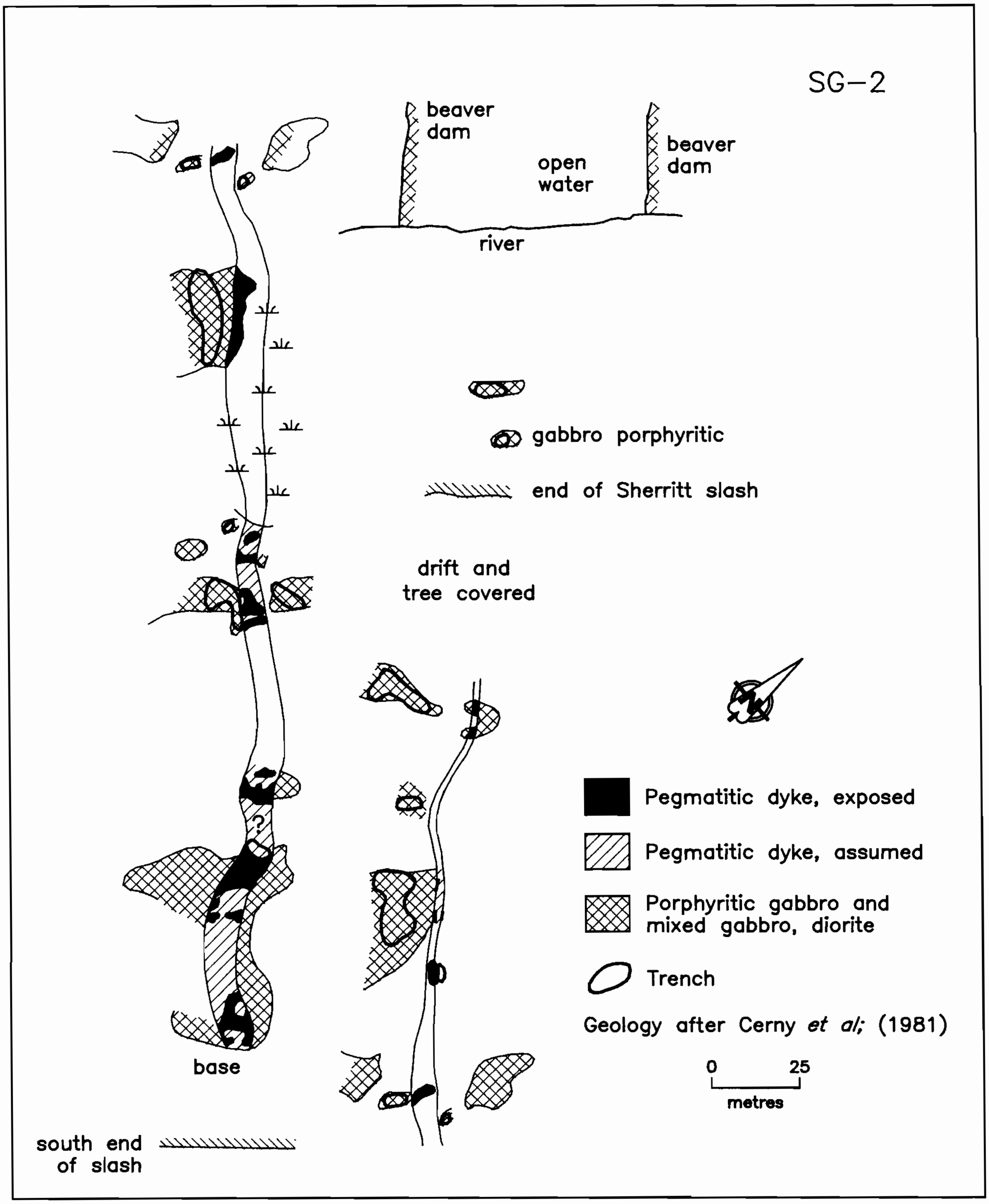


Figure 109-2: Geology of the western dyke, occurrence 109.

Product	Grams	Li_2O,%	Li_2O,g	Total Li_2O,%
-65 Roasted	257.8	6.13	15.80	90.44
+65 Roasted	321.5	0.42	1.35	
-65 Unroasted	16.2	1.95	0.32	
Total	595.5	2.93	17.47	

The assay was performed by the Department of Mines and Resources Canada, Bureau of Mines, Industrial Minerals Milling Laboratory in 1937.

A separate analysis of spodumene indicates the mineral specimens that formed the basis for the assay described above contained 63.80% SiO_2, 27.00% Al_2O_3, 6.97% Li_2O and 2.00% H_2O (A.F. 92182).

The compositional characteristics of the Sherritt Gordon pegmatites with respect to potassium feldspar, muscovite, spodumene, berly and garnet are presented in Table 109-1. These results are compared to those of occurrence 108 and 110 and described under location 108 ("Geochemical Data"). A summary of the gravimetric determination of percent spodumene in drill core samples is presented in Table 109-2.

CLASSIFICATION:

Pegmatite type deposit.

REFERENCES:

Assessment Files 91650, 92182 and 93027
Manitoba Energy and Mines, Minerals Division.

Bannatyne, B.B.
Pegmatite Project; in Manitoba Department of Mines, Resources and Environmental Management, Mines Branch, Summary of Geological Field Work 1973, Geological Paper 2/73, p. 29-33.Bannatyne, B.B.
1985: Industrial minerals in rare-element pegmatites of Manitoba; Manitoba Energy and Mines, Geological Services, Economic Geology Report ER84-1, 96p.

Brownell, G.M.
1932: Report to Sherritt Gordon Mines Limited., 3p.

Cerny, P., Trueman, D.L., Ziehlke, D.V., Goad, B.E. and Paul, B.J.
1981: The Cat Lake-Winnipeg River and the Wekusko Lake pegmatite fields, Manitoba; Manitoba Energy and Mines, Economic Geology Report ER80-1, 216 p.

Frarey, M.J.
1950: Crowduck Bay; Geological Survey of Canada Map 987A, 1:63 360

Mining Claim Card CB 10493
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Mineral Inventory Card 63J/13 Li 2
Manitoba Energy and Mines, Minerals Division.

Table 109-1: Compositional characteristics of selected minerals from the Sherritt Gordon pegmatites, occurrence 109 (Cerny *et al.*, 1981).

		Rb	K/Rb	Cs	
Blocky K-feldspar	arith. mean, wt.%	0.126	95.1	0.084	
(16 samples)	st. deviation	± 0.03	± 22.1	± 0.0050	
	range	0.088-0.187	61.5-132	0.0037-0.0185	
	Li	Rb	Rb	Cs	Be
Core muscovite	0.11	0.255	34.7	0.0067	0.0022
(3)	± 0.035	± 0.024	± 3.3	± 0.0042	± 0.0002
	0.074-0.144	0.236-0.282	31.1-37.5	0.0043-0.0115	0.0020-0.0024
	Li	Na	Na/Li	Cs	
Late beryl	0.346	1.070	3.09	0.175	
(4)	± 0.044	± 0.184	± 0.18	± 0.056	
	0.292-0.390	0.831-1.22	2.85-3.28	0.108-0.228	
	Na_2O	Fe (as Fe_2O_3)			
Spodumene	0.257	1.178			
(4)	± 0.069	± 0.225			
	0.158-0.306	0.96-1.40			
	FeO	MnO	(MnO x 100)/ (MnO + FeO)	CaO	MgO
Garnet	26.08	16.25	38.27	0.73	0.34
(7)	± 4.50	± 4.67	± 10.91	± 0.18	± 0.05
	20.99-31.74	10.99-21.52	25.72-50.43	0.43-0.92	0.25-0.42

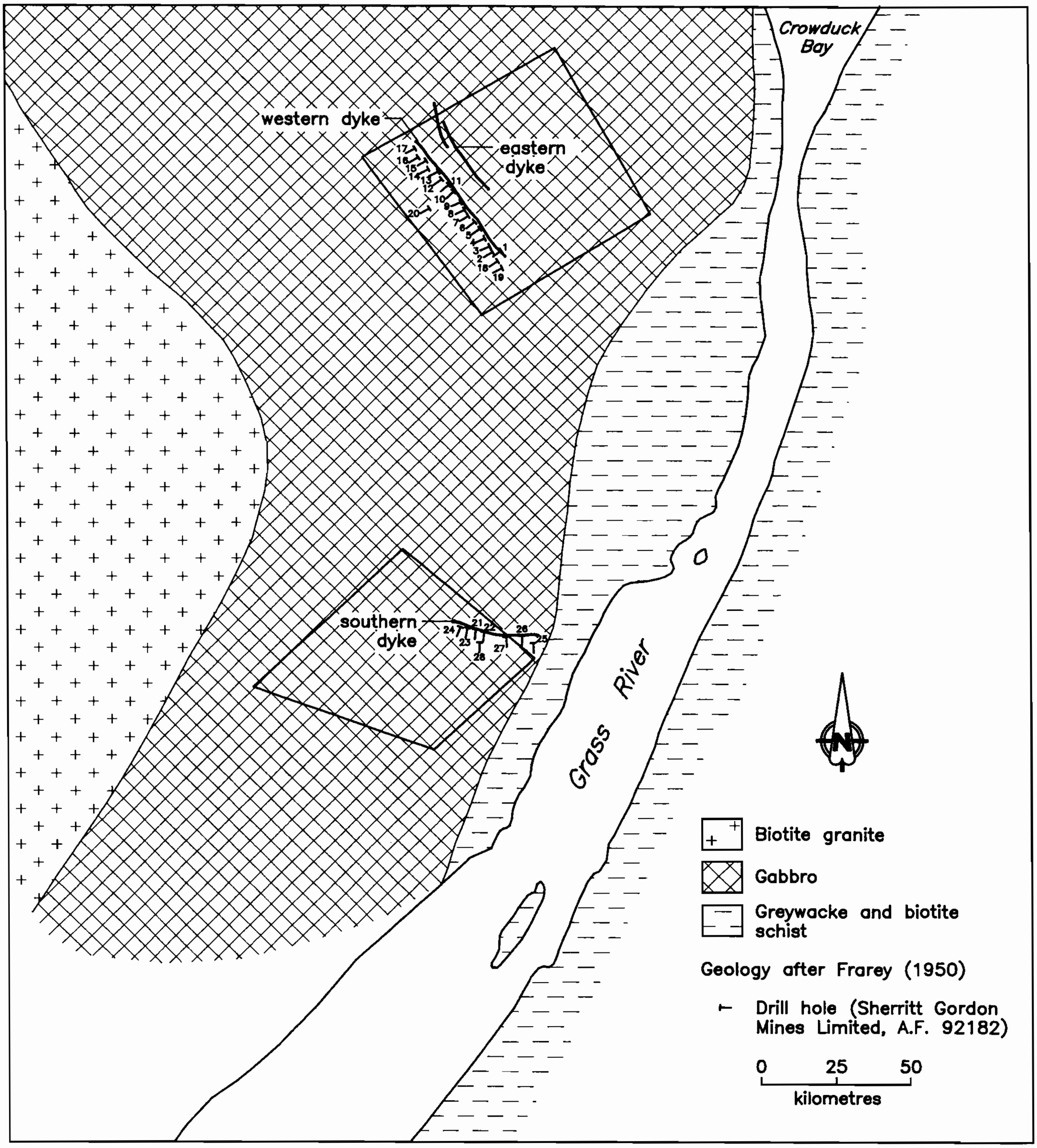


Figure 109-3: Detailed geology and drill hole locations, occurrence 109.

Table 109-2 Summary of the gravimetric determination of per cent spodumene in DDH 1-20, eastern and western pegmatite dykes, occurrence 109

DDH	Interval (m)	% Spodumene
1	13.2-15.2	17.3
	16.6-17.2	12.8
2	13.3-14.0	1.8
	14.0-14.8	12.7
	17.2-19.0	22.6
3	16.9-18.6	18.2
	19.0-19.7	57.2
5	15.2-16.9	7.1
	16.9-18.0	32.0
	18.4-18.8	60.5
	19.3-19.8	47.5
6	18.9-20.4	7.4
	20.4-21.3	7.3
	21.3-22.2	12.0
7	19.3-20.9	21.2
	20.9-21.5	29.9
	21.5-23.6	6.0
	23.6-25.1	16.7
9	18.7-19.8	20.2
	19.8-21.3	40.5
	21.3-22.8	16.9
	22.8-23.8	12.2
10	17.5-19.2	6.2
	19.2-20.4	58.2
	21.3-22.8	9.7
11	19.0-20.4	5.9
	20.4-21.3	54.5
	22.5-23.3	28.4
12	18.3-19.8	23.6
	19.8-21.3	34.6
	21.3-22.8	29.8
	22.8-23.9	13.6
13	24.4-25.9	7.4
15	19.3-22.8	7.2
16	17.6-18.3	16.3
	18.3-19.8	39.0
	19.8-20.3	22.9
17	20.3-21.3	12.4
	21.3-22.8	21.3
18	33.6-37.0	9.6
	37.0-38.3	53.4
	38.3-40.5	7.4
19	33.8-35.0	22.0
	35.0-36.6	19.6
	36.6-38.1	10.1
20	70.1-71.6	25.0
	71.6-73.1	28.3
	73.1-74.1	11.4

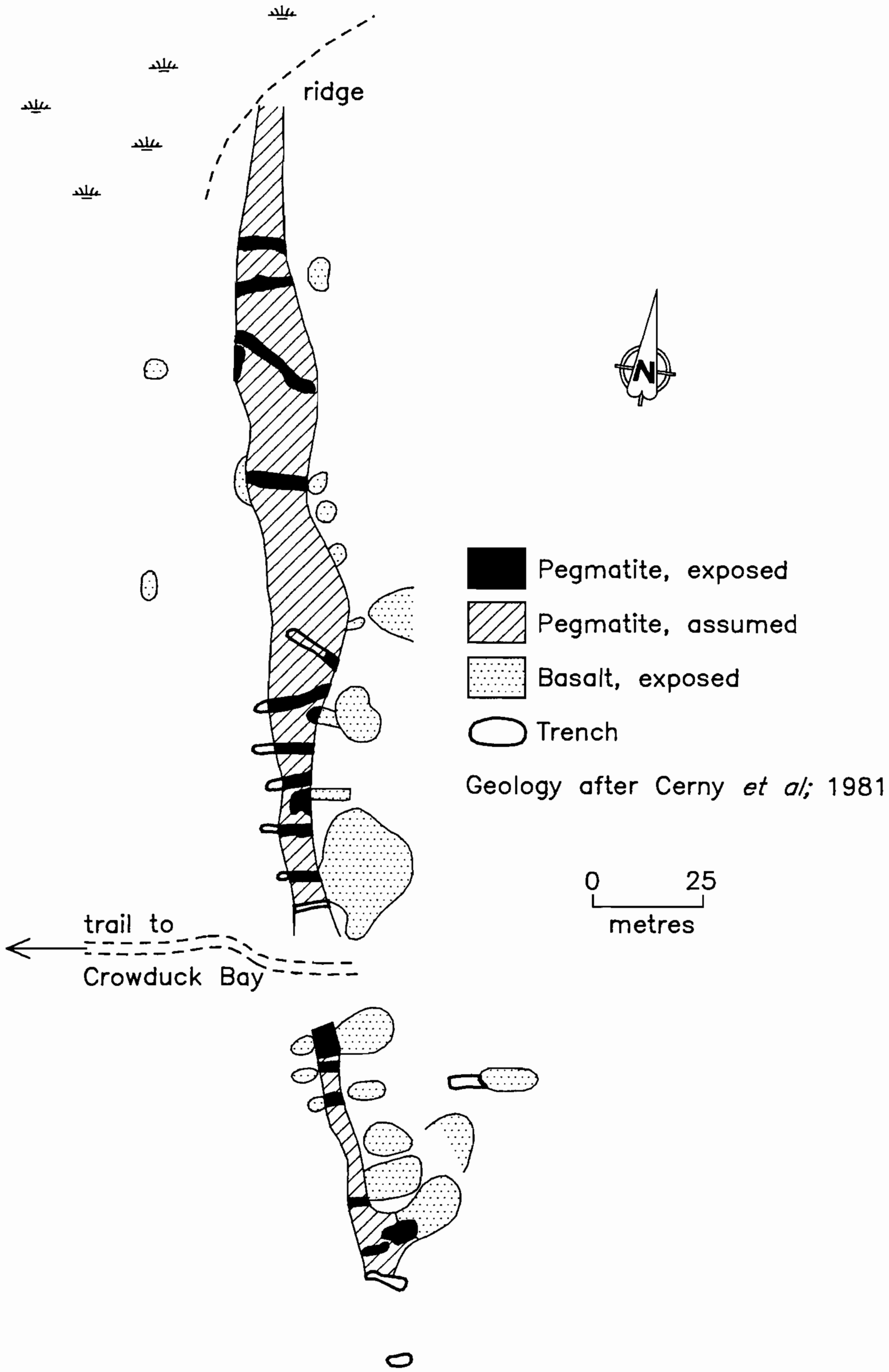


Figure 110-1: The westernmost Green Bay pegmatite dyke, occurrence 110.

LOCATION: 110

NAME: Green Bay Group
UTM: 6078706N/458831E
ACCESS: Boat from Bartlet's Landing, Wekusko Lake and traverse.

AREA: Grass River south of Crowduck Bay
AIRPHOTO: A20782-52

EXPLORATION SUMMARY:

Linda 1 and the Cs, S.R. and Key groups of claims were staked in 1953 and cancelled in 1954. Lit 1 to 18 were staked by J.J. Johnson and J. A. Syme between 1954 and 1955, and assigned to Green Bay Uranium Limited (later known as Green Bay Mining & Exploration Limited) in 1956. Over 6096 m of diamond drilling was done on Lit 1 to 4. Diamond drilling on Lit 10, 16, and 17 amounted to 1950 m. J.A. Syme acquired the claims in 1963. HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650). Falconbridge Nickel Mines Limited did airborne EM and magnetic surveys in 1973 (A.F. 91564). Lit 6 to 18 were cancelled in 1980, and restaked by Noranda Exploration Company Limited as Nor 5 and 6 in 1983. The claims were cancelled between 1987 and 1988, and restaked under Kelly 3 by Strider Resources Limited in 1989. The area is also partly covered by Explored Area Lease 40, acquired by J.A. Syme for the Lit 1 to 4 claims in 1980.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group basalt flows, fragmental and reworked tuffaceous units. The basalts are flanked to the east and west by Missi Group arkose, greywacke, quartzite and conglomerate. A biotite dacite synvolcanic intrusion occurs southwest of this locality (Fig. 108-1; Ziehlke, 1978). A total of seven pegmatite dykes intrude Amisk basalts in a 2 km zone that trends 055°. Individually, the dykes strike northwest to north-northwest with subvertical dips. The strike of the dykes is discordant to the northeasterly regional foliation of the basalts. All of the dykes are flanked by two divergent faults that strike east-northeast and north-northeast. The westernmost and largest of the pegmatite dykes has been studied in detail by Cerny *et al.* (1981) (Fig. 110-1). The dyke is exposed in trenches and outcrop for 250 m. It strikes 350° and dips vertically, varies in width from 3 to 20 m. Generally, the internal structure is concentric with coarsening of grain size of potassium feldspar, quartz, spodumene and black tourmaline towards the core of the dyke. Patches of saccharoidal albite, muscovite aggregates and albite stringers containing garnet and beryl occur locally.

MINERALIZATION:

Spodumene is present in the core of the concentrically zoned pegmatites. Associated minerals are potassium feldspar, quartz and black tourmaline. Minor muscovite, albite, beryl and garnet are also present.

GEOCHEMICAL DATA:

A 136 kg sample of spodumene was sent to Ottawa for testing in 1956 by Green Bay Mining and Exploration Limited. The bulk sample contained 1.19% Li_2O with minor Nb_2O_5 (Green Bay Corporation File). Gold was also found on the property; a 3.3 kg sample contained 4.50 g/t across 3.4 m (Green Bay Corporation File). The main dyke had estimated reserves of 1.8 million tonnes grading 1.4% Li_2O to a depth of 305 m (Mineral Inventory Card 63J13 Li 1).

The compositional characteristics of blocky potassium feldspar, muscovite, beryl, garnet and spodumene are presented in Table 110-1. The compositional variation for minerals in these pegmatites is compared to those of occurrence 108 and 109 in Figure 108-5 and described under location 108 ("Geochemical Data").

CLASSIFICATION:

Pegmatite type deposit.

REFERENCES:

Assessment Files 91564 and 91650
Manitoba Energy and Mines, Minerals Division.

Cerny, P., Trueman, D.L., Ziehlke, D.V., Goad, B.E., and Paul, B.J.
1981: The Cat Lake-Winnipeg River and Wekusko Lake pegmatite fields, Manitoba; Manitoba Energy and Mines, Economic Geology Report ER80-1, 216p.

Energy, Mines and Resources Canada
1987: Canadian mineral deposits not being mined in 1986; Mineral Bulletin MR213, p. 211.

Fedikow, M.A.F., Roney, C.T., Schmidt, G.J. and Robbie, T.
1986: Mineral deposit studies in the Snow Lake area; in Manitoba Energy and Mines, Geological Services Branch, Report of Field Activities, 1986, p. 77-85.

Frarey, M.J.
1950: Crowduck Bay; Geological Survey of Canada, Map 987A, 1:63 360.

Green Bay Mining and Exploration Limited
Manitoba Energy and Mines, Minerals Division, Corporation File.

Mineral Inventory Card 63J/13 Li 1
Manitoba Energy and Mines, Minerals Division.

Mulligan, R.
1957a: Lithium in Canada-recent developments and geological features; Canadian Mining Journal, v. 78, No. 4, p. 125.

Mulligan, R.
1957b: Lithium deposits of Manitoba, Ontario and Quebec 1956; Geological Survey of Canada, Paper 57-3, 26p.

Ziehlke, D.V.
1978: Geology of the Wekusko Lake pegmatite field, Map ER80-1-4; in the Cat Lake-Winnipeg River and the Wekukso Lake pegmatite fields, Manitoba; Manitoba Energy and Mines, Economic Geology Report ER80-1, 216 p.

Table 110-1: Compositional characteristics of selected minerals from the Green Bay pegmatite group, occurrence 10 (Cerny *et al.*, 1981).

		Rb	K/Rb	Cs	
Blocky K-feldspar	arith. mean, wt.%	0.392	33.7	0.0603	
(19 samples)	st. deviation	± 1.44	± 15.1	± 0.0383	
	range	0.183-0.668	171.1-62.8	0.0158-0.1404	
Core muscovite	0.171	0.792	12.5	0.0702	0.0021
(4)	± 0.122	± 0.432	± 5.1	± 0.0497	± 0.0003
	0.025-0.314	0.473-1.42	5.9-17.7	0.025-0.123	0.0017-0.0023
Late Beryl	0.331	0.903	2.83	0.939	
(9)	± 0.080	± 0.101	± 0.50	± 0.452	
	0.202-0.460	0.720-1.01	2.00-3.56	0.334-1.67	
	Na_2O	Fe (as Fe_2O_3)			
Spodumene	0.230	0.943			
(3)	± 0.104	± 0.446			
	0.16-0.35	0.428-1.21			
Garnet	FeO	MnO	(MnO x 100)/ (MnO + FeO)	CaO	MgO
(1)	24.80	17.10	40.81	0.46	0.49

LOCATION: 111

NAME:
UTM: 6073211N/467091E
ACCESS: Bush plane to Dion Lake and traverse.

AREA: South of Dion Lake.
AIRPHOTO: A20169-67

EXPLORATION SUMMARY:

The area was first staked as Babs 15 and 16, and Ray 27 and 28 in the 1950's. The Ray claims, held by A.L. Parres and Kay Lake Mines Limited, were optioned to Cypress Exploration Corporation Limited in 1952. S. Rapson staked Babs 15 and 16 in the area in 1952. Surface work was done on the claims before they lapsed in 1954 (Mining Claim Card Babs 15). J.J. Johnson held Jas 5 from 1956 to 1957. The Loaf 33 claim was examined by Kix Uranium Limited between 1956 and 1957. Conwest Exploration Company Limited did work on Bee 1 and 3 between 1960 and 1961 (Mining Claim Card Bee 1). Noranda Exploration Company Limited optioned the Dat group from A.L. Parres and did an HLEM (Ronka Mark III) survey in 1965 (A.F. 90091, 90208). HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650). The Dat claims lapsed in 1968. The ground was held by George Lawson and Sid Thompson from 1968 to 1969, by Nor-Acme Gold Mines Limited from 1987 to 1988, and by High River Gold Mines Limited from 1988 to 1989. A.L. Parres Limited staked Lee 2 over the property in 1990.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group mafic flows, tuff and breccia. These rocks are flanked to the west and southwest by Missi Group garnetiferous biotite schist and minor staurolite-sillimanite schist probably derived from greywacke and arkose. These units have been intruded by biotite granite, pegmatite and quartz-eye porphyry (Fig. 111-1; Frarey, 1950). Garnetiferous amphibolite containing zones of anthophyllite-quartz-garnet was mapped in the vicinity of the occurrence (Fig. 111-2).

MINERALIZATION:

Disseminated grains, blebs and fracture coatings of pyrite and chalcopyrite occur in a quartz vein hosted by an altered garnetiferous amphibolite.

GEOCHEMICAL DATA:

Three representative muck samples were collected from the rubble piled around the trenches for multi-element geochemical analysis (Fig. 111-2). The samples contain low base and precious metals. Analyses are summarized in Appendix I.

CLASSIFICATION:

Vein type deposit; single vein.

REFERENCES:

Assessment Files 90091, 90208 and 91650
Manitoba Energy and Mines, Minerals Division.

Cerny, P., Trueman, D.L., Ziehlke, D.V., Goad, B.E. and Paul, B.J.
1981: The Cat Lake-Winnipeg River and the Wekusko Lake pegmatite fields, Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER80-1, 216p.

Fedikow, M.A.F., Roney, C.T., Schmidt, G.J. and Robbie, T.
1986: Mineral deposit studies in the Snow Lake area; in Manitoba Energy and Mines, Geological Services Branch, Report of Field Activities, 1986, p. 77-85.

Frarey, M.J.
1950: Crowduck Bay, Geological Survey of Canada Map 987A, 1:63 360.

Mining Claim Cards Bee 1 (P80790) and Babs 15 (P25392)
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

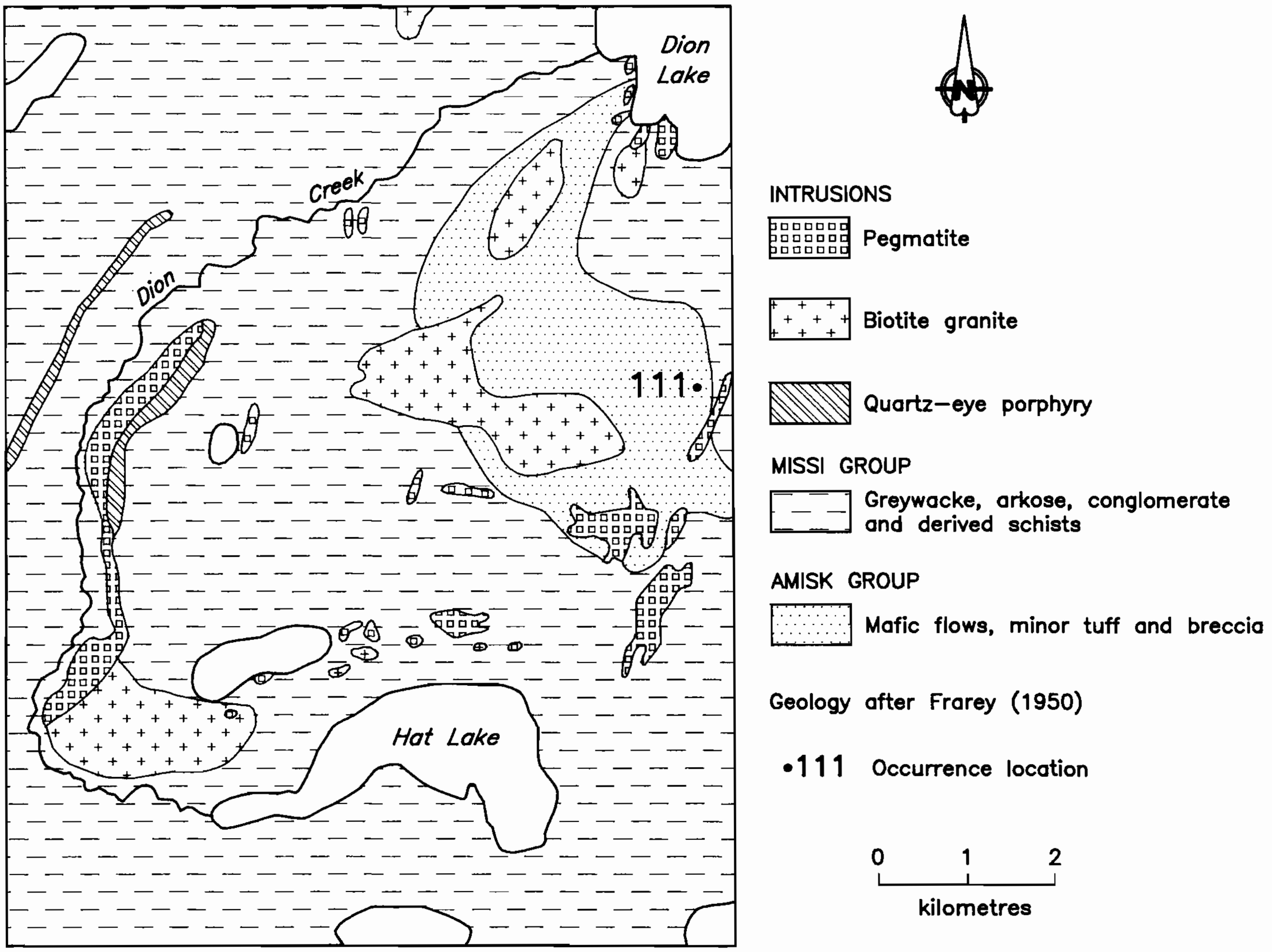


Figure 111-1: Geological setting of occurrence 111.

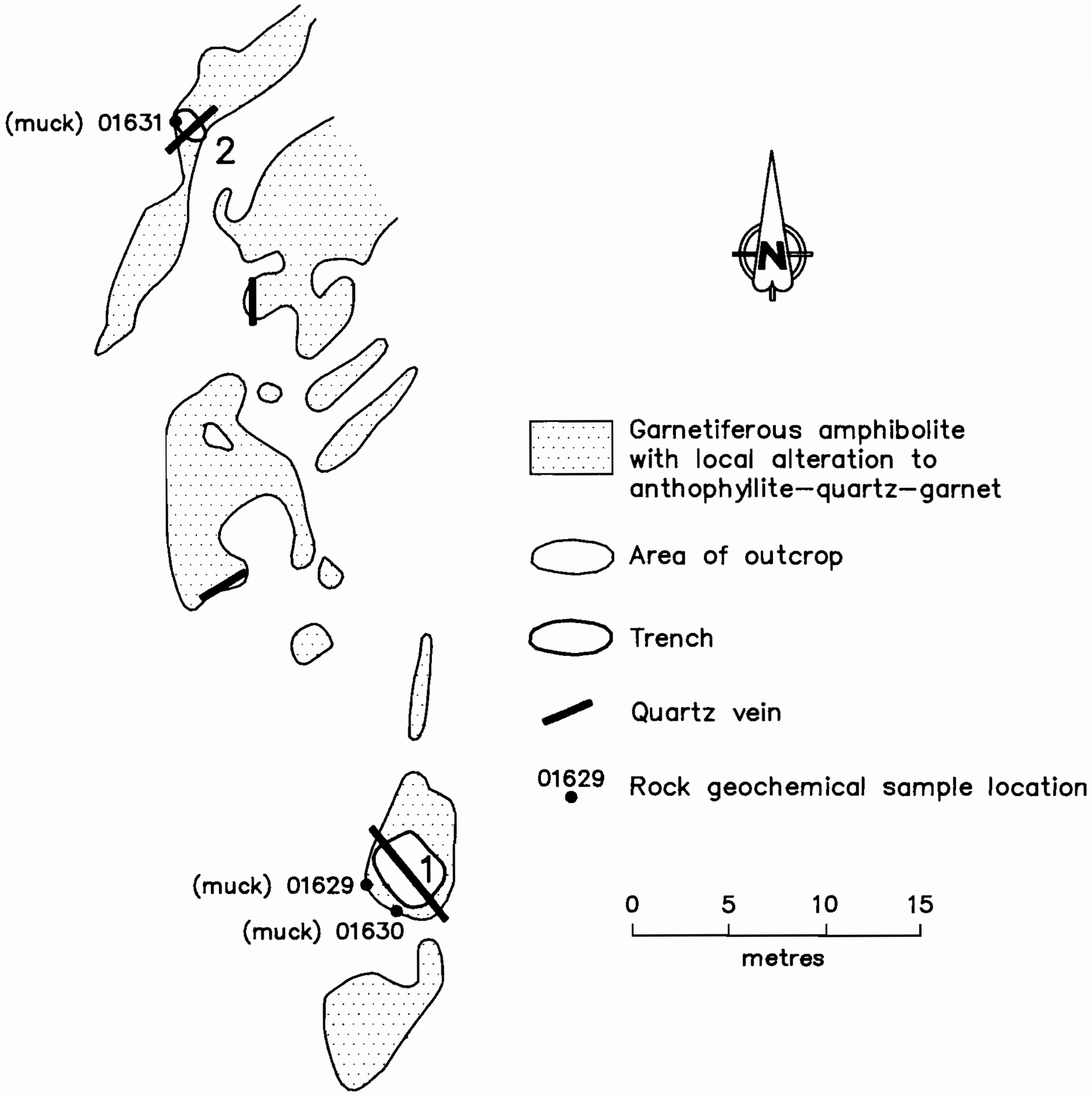


Figure 111-2: Outcrop, geology and trench and sample location map, occurrence 111.

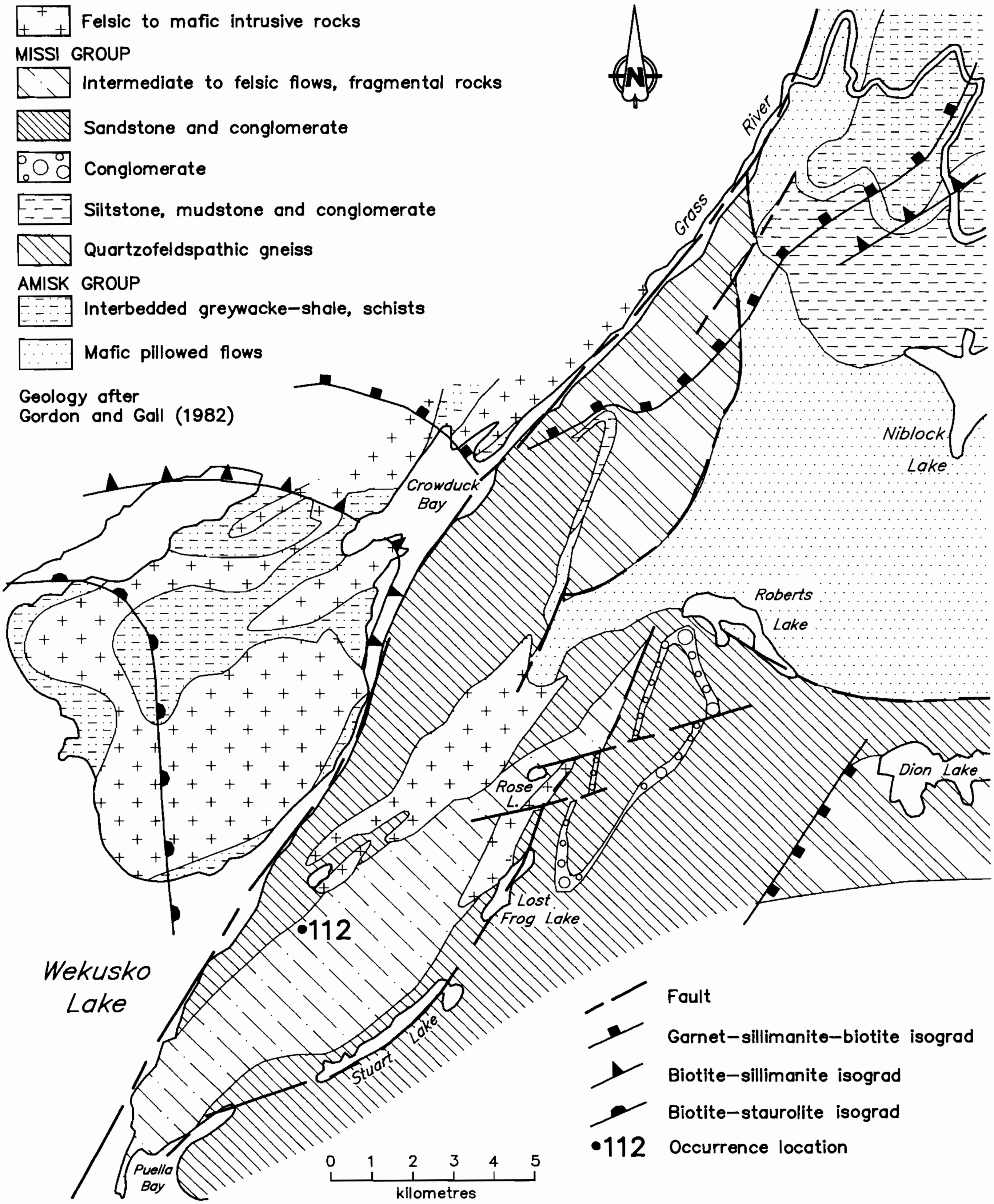


Figure 112-1: Geological setting of occurrence 112.

LOCATION: **112**

NAME: Le Blanc Claim

UTM: 6071258N/453202E

ACCESS: Boat on Wekusko Lake and traverse via bush trail.

AREA: East shore of Wekusko Lake.

AIRPHOTO: A20124-91

EXPLORATION SUMMARY:

The area was first staked as the Gladstone claim prior to 1930. The LeBlanc claim was staked by Henry Makouse in 1932 (Stockwell, 1937). Stockwell (1937) examined several prospect pits that had been dug around 1924. Archie 12 was staked in the 1940's and leased under M-2832 by Wekusko Consolidated Limited in 1949. The ground was held by HBED between 1967 and 1968, E. Duquette from 1972 to 1974, J.B. Barton from 1974 to 1976, and by Cangold Limited from 1981 to 1983. The area is presently covered by Nor 27, staked by Noranda Exploration Company Limited in 1983. A joint venture agreement was signed with Manitoba Mineral Resources Limited in 1984.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Missi Group rhyolite flanked to the east by andesitic and basaltic flows and to the west by laminated feldspathic chert, greywacke and andesitic flows (Fig. 112-1, 112-2; Gordon and Gall, 1982; Stockwell, 1937). Stockwell (1937) mapped rhyolite intruded by hornblende lamprophyre dykes.

MINERALIZATION:

Black tourmaline and minor disseminated pyrite occur in irregular coarse grained quartz veinlets in a hornblende lamprophyre dyke that intrudes rhyolite.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. The multiple quartz veinlets hosted by a lamprophyre dyke contain minor iron sulphide minerals.

REFERENCES:

Gordon, T.M. and Gall, Q.

1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Stockwell, C.H.

1937: Gold deposits of Herb Lake area, northern Manitoba; Geological Survey of Canada, Memoir No. 208, 46p.

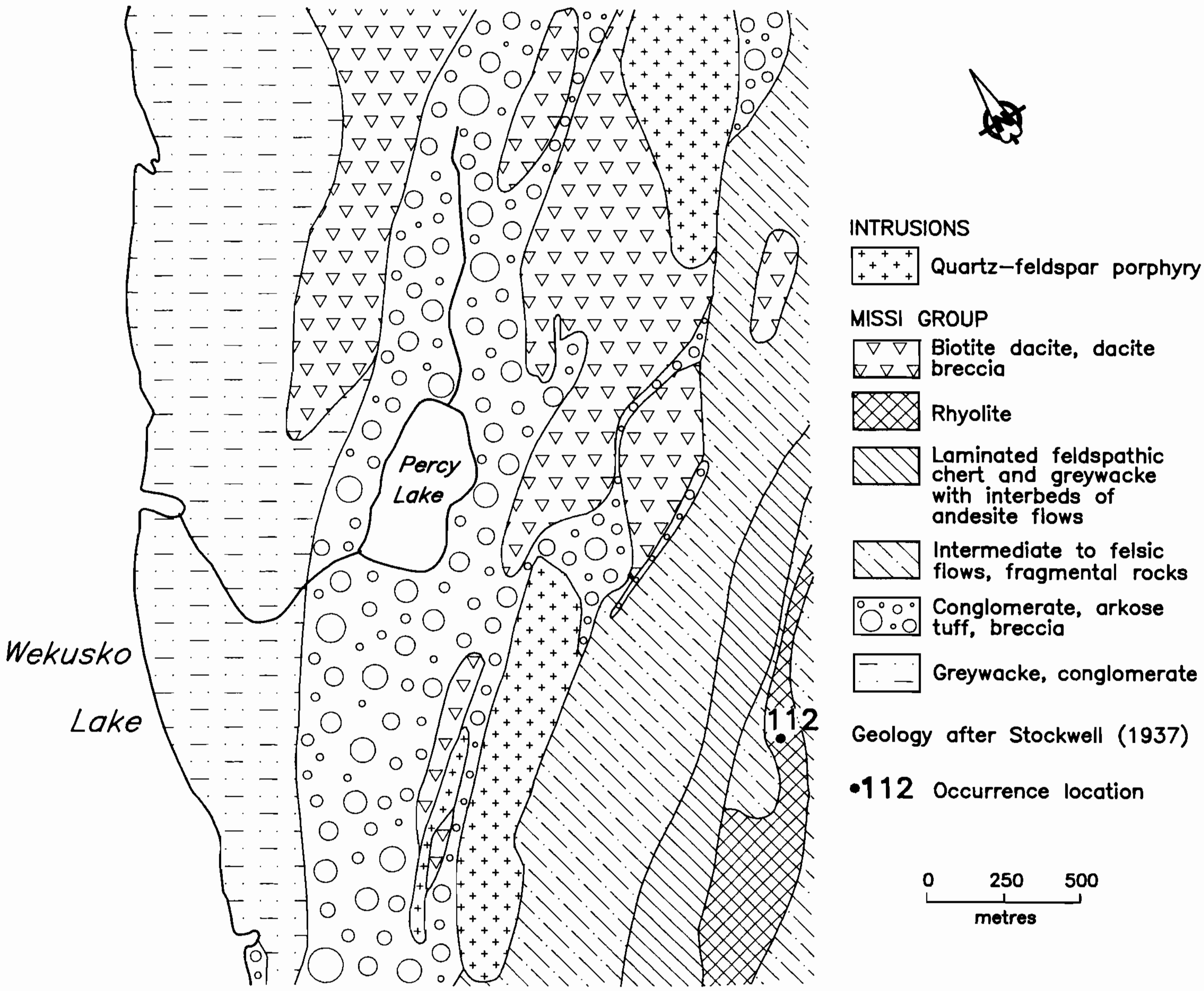


Figure 112-2: Detailed geological setting of occurrence 112.

LOCATION: **113**

NAME: Peter Claim

AREA: East shore of Wekusko Lake; east of Percy Lake.

UTM: 6074086N/453238E

AIRPHOTO: A20124-90

ACCESS: Boat on Wekusko Lake and traverse.

EXPLORATION SUMMARY:

Buster was staked by M.J. Hackett in 1921. Rock trenching was done in 1922, 1924, and 1926 (Mineral Inventory Card 63J/13 Au 15). The claim was cancelled in 1928. In 1928 the Peter claim was staked over the property by M. Chartrand and assigned to C. Olson. Rock trenching was carried out in 1928, 1929, between 1931 and 1935, and 1938. During the summer of 1935, two 31 m holes and two 38 m holes were diamond drilled by Kusko Exploration Syndicate. The drilling intersected two quartz veins (Kusko Exploration Syndicate, Corporation File). The Peter claim was cancelled in 1940. The ground was held as June 4 by W. Cote from 1947 to 1948. Airborne EM and radiometric surveys were done by HBED in 1965 (A.F. 91650). Falconbridge Nickel Mines Limited did airborne EM and magnetic surveys in 1973 (A.F. 91564). The ground was held as CB 4609 by E. Duquette from 1972 to 1974. A.& V. Harris Exploration Services Limited staked CB 9308 in 1978. Norman Mines Limited acquired control of the property in 1980. CB 9308 lapsed in 1983. Noranda Exploration Company Limited staked Nor 23 over the property in 1983. Manitoba Mineral Resources Limited had an option agreement with Noranda on the Nor group of claims in 1984.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by felsic to mafic intrusive rocks, Missi Group intermediate to felsic flows and sandstone and conglomerate (Gordon and Gall, 1982). Stockwell (1937) mapped biotite dacite, dacite breccia, andesite and basalt flows and a quartz-feldspar porphyry intrusion in the immediate area of the deposit. The quartz-feldspar porphyry hosts the three mineralized sites that characterize this locality (Fig. 113-1, 113-2). Stockwell (1937) mapped a schistose structure, striking 045°E, within the host quartz-feldspar porphyry, as well as numerous lamprophyre dykes that crosscut the schistose zone. The schistose structure probably represents a shear zone.

MINERALIZATION:

This occurrence comprises three mineralized sites (Fig. 113-2).

Site 1 consists of quartz veins and stringers that strike 025°E, discordant to the cleavage of the host quartz-feldspar porphyry. Locally, individual quartz stringers parallel this cleavage. Individual quartz lenses are characteristically less than 3 m in length and a few centimetres wide. The entire zone of schistose quartz-feldspar porphyry and quartz lenses varies from 0.9 to 1.5 m. The quartz lenses and the adjacent schistose wall rocks contain minor disseminated arsenopyrite; the quartz also contains "streaks" of fine- to coarse-grained arsenopyrite.

Site 2 is characterized by a 15 m wide zone of quartz lenses and veinlets, and intercalated quartz-feldspar porphyry. The quartz lenses vary from 1 to 20 cm thick and strike parallel to the cleavage of the wall rocks. The quartz contains red feldspar and black tourmaline, whereas schistose wall rocks contain disseminated pyrite and arsenopyrite.

Site 3 is characterized by a 045°E trending, 0.3 to 0.9 m wide zone of schistose quartz-feldspar porphyry and quartz veins that is exposed for 24 m. The quartz veins contain red feldspar and muscovite, whereas the schistose wall rocks adjacent to the veins contain pyrite and arsenopyrite.

GEOCHEMICAL DATA:

Stockwell (1937) quotes "low gold values" from an assay sample representing mineralization at site 2.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. The multiple quartz veins and wall rock contain auriferous pyrite and arsenopyrite. The sulphide mineralization may be unrelated to the quartz veins.

REFERENCES:

Assessment Files 91564 and 91650

Manitoba Energy and Mines, Minerals Division.

Cerny, P., Trueman, D.L., Ziehlke, D.V., Goad, B.E. and Paul, B.J.

1981: The Cat Lake-Winnipeg River and the Wekusko Lake pegmatite fields, Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER80-1, 216p.

Frarey, M.J.

1948: Crowduck Bay; Geological Survey of Canada, Paper 48-22, Preliminary Map 48-22, 1:31 680.

1950: Crowduck Bay; Geological Survey of Canada, Map 987A, 1:63 360.

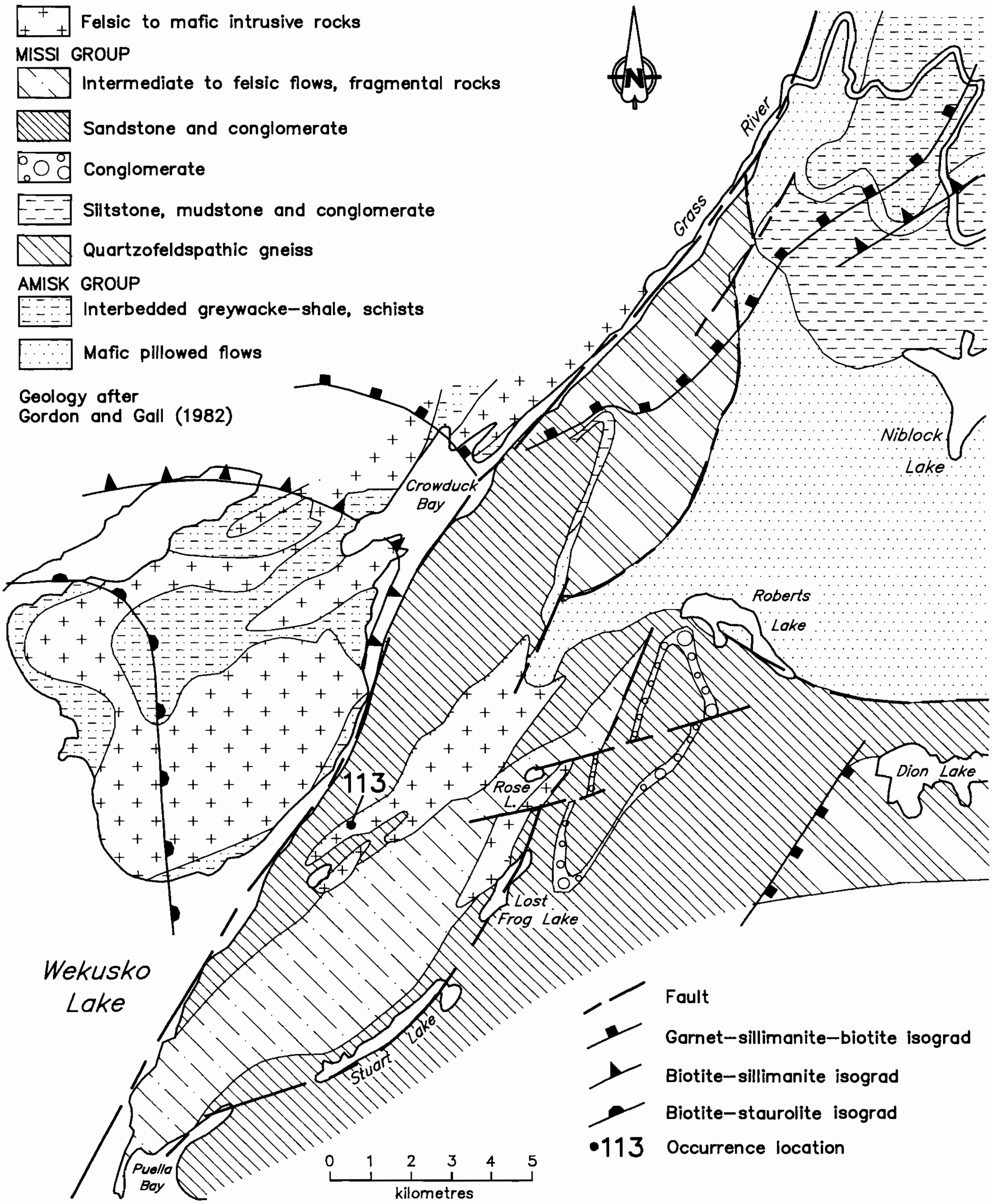


Figure 113-1: Geological setting of occurrence 113.

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Kusko Exploration Syndicate Corporation Files:
Manitoba Energy and Mines, Minerals Division

Mineral Inventory Card 63J/13 Au 15
Manitoba Energy and Mines, Minerals Division.

Stockwell, C.H.
1937: Gold deposits of Herb Lake area, northern Manitoba; Geological Survey of Canada, Memoir No. 208, 46p.

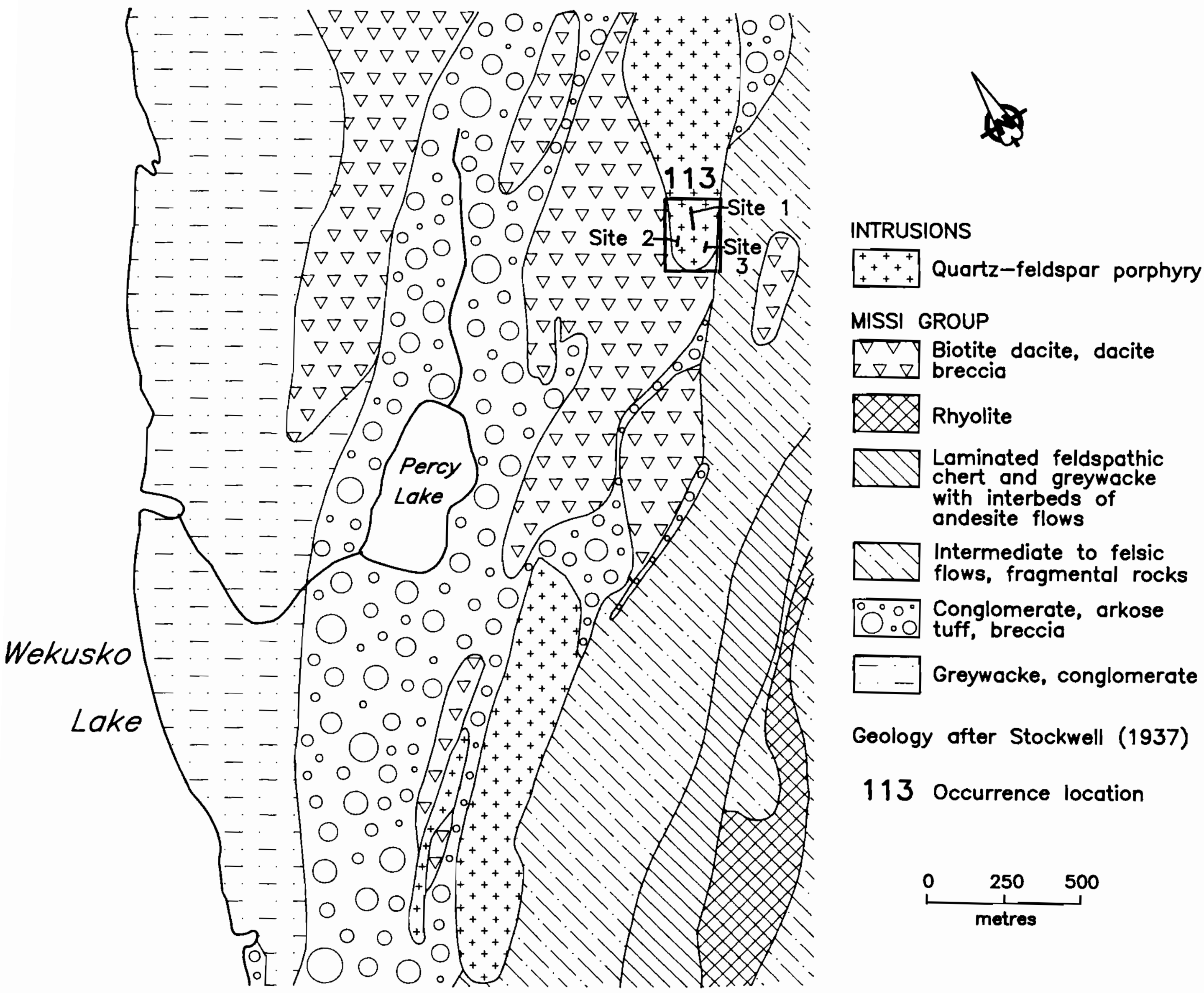


Figure 113-2: Detailed geological setting of occurrence 113.

LOCATION: **114**

NAME: Harry Bill Claim

AREA: East shore of Wekusko Lake; south of Percy Lake.

UTM: 6072771N/452699E

AIRPHOTO: A20124-90,-91

ACCESS: Boat on Wekusko Lake and traverse.

EXPLORATION SUMMARY:

The Harry Bill claim was staked by Mabel Billings in 1922, and assigned to Marshall Ballard (Stockwell, 1937). Stockwell (1937) examined prospect pits in the area in 1935. B. Maxwell staked the Rudy claim in 1944. Surface work was done in 1945. The claim was cancelled in 1948. HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650). Falconbridge Nickel Mines Limited did airborne EM and magnetic surveys in 1973 (A.F. 91564). The ground was held by E. Duquette from 1972 to 1974, J.B. Barton from 1974 to 1976, A.& V. Harris Exploration Services Limited from 1978 to 1980, Norman Mines Limited in 1980 and Norman International from 1981 to 1983. The area is presently covered by Nor 28, staked by Noranda Exploration Company Limited in 1983. Noranda signed a joint venture agreement with Manitoba Mineral Resources Limited in 1984.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by a quartz-feldspar porphyry intrusion that intrudes Missi Group conglomerate and arkose on the west and andesitic and basaltic flows on the east (Fig. 114-1; 114-2; Gordon and Gall, 1982; Stockwell, 1937).

MINERALIZATION:

Quartz rubble that contains disseminated pyrite, galena and black tourmaline occurs in and around a 4.6 m long pit that trends 050°E. The host quartz-feldspar porphyry also contains disseminated pyrite (Stockwell, 1937). The quartz rubble probably represents a blasted quartz vein.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Vein type deposit; single vein. The quartz vein contains pyrite and galena.

REFERENCES:

Assessment Files 91564 and 91650
Manitoba Energy and Mines, Minerals Division.

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Mining Claim Card Rudy (P8063)
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Stockwell, C.H.
1937: Gold deposits of Herb Lake area, northern Manitoba; Geological Survey of Canada, Memoir No. 208, 46p.

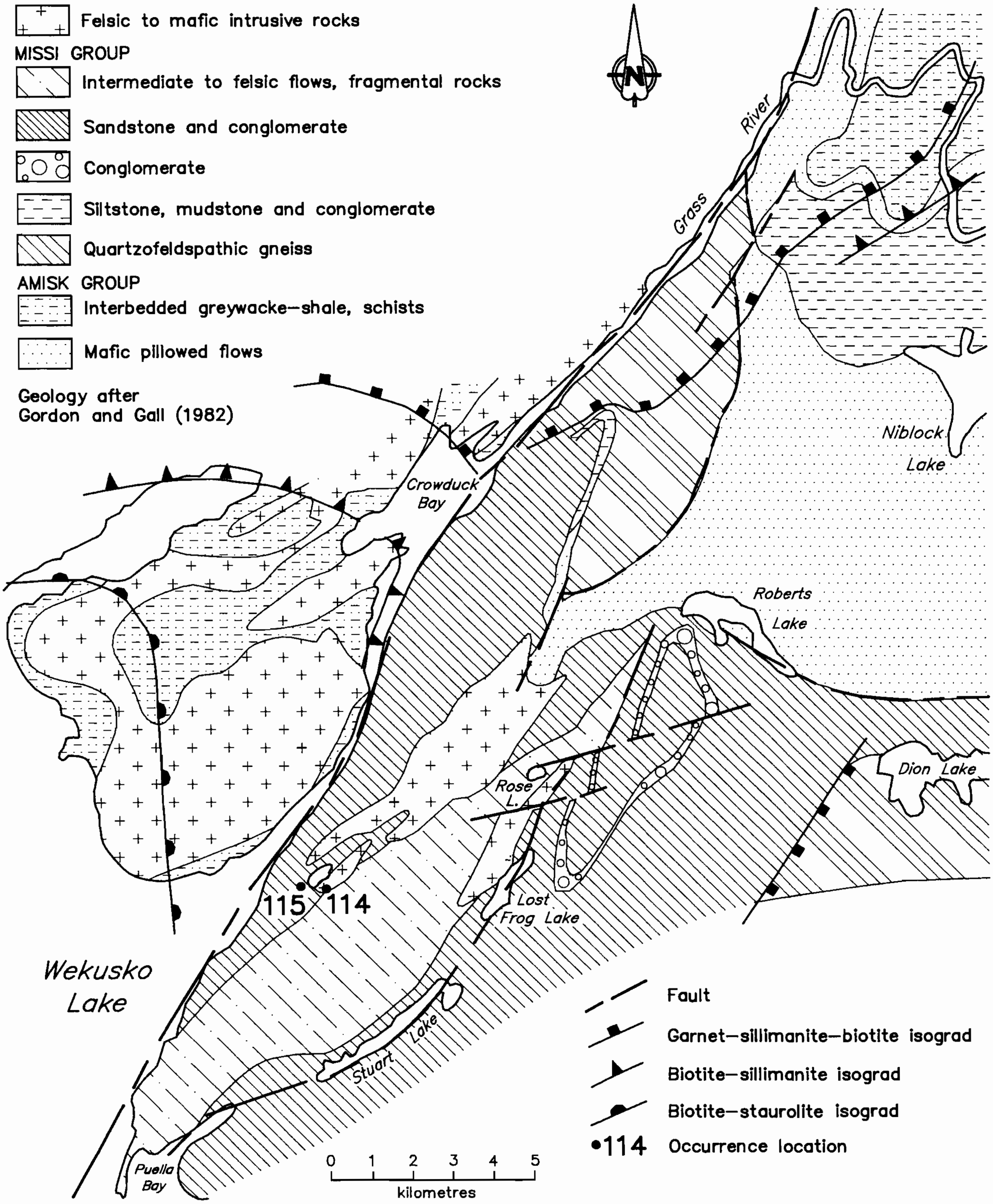


Figure 114-1: Geological setting of occurrences 114 and 115.

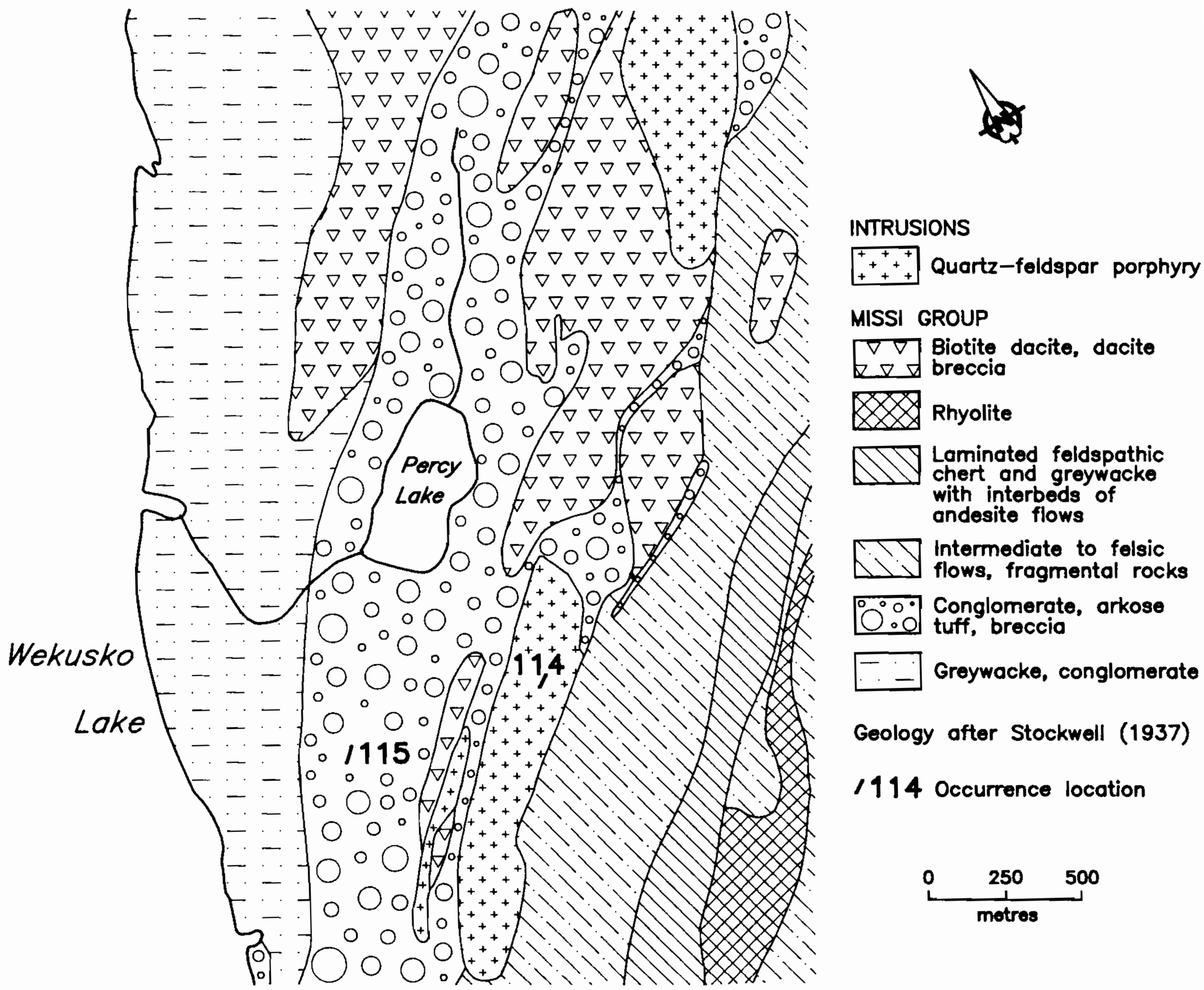


Figure 114-2: Detailed geological setting of occurrences 114 and 115.

LOCATION: **115**

NAME: Pine Claim

AREA: East shore of Wekusko Lake; south of Percy Lake.

UTM: 6072727N/452023E

AIRPHOTO: A20124-90

ACCESS: Boat on Wekusko Lake and traverse.

EXPLORATION SUMMARY:

The Pine claim was staked by Kathleen C. Rice in 1919, and assigned to S.E. Shaw and J.G. Munroe at an unknown date (Stockwell, 1937). Prospect pits were dug on the claim. The property was examined by Wright (1938) and Stockwell (1937). HBED carried out airborne EM and radiometric surveys in 1965 (A.F. 91650). D. Lamb staked Mike 24 in 1968. Falconbridge Nickel Mines Limited did airborne EM and magnetic surveys in 1973 (A.F. 91564). Work was reported on the Mike group from 1969 to 1975 (Mining Claim Card Mike 24). Mike 24 was cancelled in 1977. CB 9305 was staked by A.& V. Harris Exploration Services Limited in 1978. During June and July 1978 A.& V. Harris Exploration Services Limited completed a program of line cutting and sampling on the property as part of the "Laguna Mine Project". In 1980 Norman Mines Limited acquired the property. Excalibur International Consultants Limited, on behalf of Norman Mines, carried out detailed grid investigations of gold bearing quartz vein systems in 1980 (Mineral Inventory Card 63J/13 Au 7). CB 9305 was assigned to Norman International in 1981, but was cancelled in 1983. Noranda Exploration Company Limited staked Nor 28 over part of the area in 1983. A program of line cutting, geological mapping lithogeochemical and soil sampling surveys was carried out in 1984 (Mineral Inventory Card 63J/13 Au 7). Manitoba Mineral Resources Limited had an option agreement with Noranda on the Nor 28 property in 1984.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Missi Group conglomerate, arkose and tuff and breccia of unspecified composition flanked to the west by greywacke and conglomerate and to the east by mafic to felsic flows, chert and greywacke. The sedimentary and volcanic sequences are intruded by biotite dacite and later quartz-feldspar porphyry (Fig. 114-1, 114-2; Gordon and Gall, 1982; Stockwell, 1937). Wright (1938) describes the host rocks to the occurrence as quartz-sericite schist.

MINERALIZATION:

A 2.4 to 3.7 m wide zone of quartz-sericite schist and pyritic quartz veins is exposed for 55 m. The zone trends 070°E and occurs along the northwest edge of an outcrop of garnetiferous quartz pebble conglomerate. The total width of the quartz veins is 0.9 m (Stockwell, 1937; Wright, 1931).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. The pyritic quartz veins are hosted by a quartz-pebble conglomerate that has been altered to a quartz-sericite schist.

REFERENCES:

Assessment Files 91564 and 91650
Manitoba Energy and Mines, Minerals Division.

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Mineral Inventory Card 63J/13 AU 7
Manitoba Energy and Mines, Minerals Division.

Mining Claim Card, Mike 24 (P 8383D)
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Stockwell, C.H.
1937: Gold deposits of Herb Lake area, northern Manitoba; Geological Survey of Canada, Memoir No. 208, 46p.

Wright, J.F.
1938: Geology and mineral deposits of a part of northwest Manitoba; Geological Survey of Canada, Summary Report, 1930, Part C, 124p.

LOCATION: **116**

NAME: Bachelor Claim

AREA: East shore of Wekusko Lake; northeast of McCafferty Lake.

UTM: 6075987N/457075E

AIRPHOTO: A20782-45

ACCESS: Bush trail from Wekusko Lake.

EXPLORATION SUMMARY:

The area was first staked as the Concord claim and then as McCafferty Annex prior to 1930. Gold was found on an extension of the McCafferty vein, on the Concord claim (Mineral Inventory Card 63J/13 Au 18). The Bachelor claim was staked in 1932 by Richard Ellis on behalf of Edna K. Whitaker (Stockwell, 1937). Fourteen small trenches were dug on the property. Two holes, drilled to intersect the vein at 12 m, yielded disappointing results (Stockwell, 1937). Airborne geophysical surveys were done by HBED in 1965 and by Falconbridge Nickel Mines Limited in 1973 (A.F. 91650, 91564). The ground was held by J.B. Barton from 1972 to 1975, and by L.K. Smith from 1980 to 1982. The area is presently covered by Nor 13 and 16, staked by Noranda Exploration Company Limited in 1983. Noranda signed a joint venture agreement with Manitoba Mineral Resources Limited in 1984.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by felsic to mafic intrusive rocks and Missi Group sandstone and conglomerate (Fig. 116-1; Gordon and Gall, 1982). Stockwell (1937) mapped biotite dacite and dacite breccia in the immediate area of the occurrence (Fig. 116-2).

MINERALIZATION:

Lenses and stringers of quartz that contain rusty weathered carbonate and minor disseminated pyrrhotite, pyrite, muscovite, red feldspar, black tourmaline and trace molybdenite occupy cleavage planes in schistose, altered dacite. The schistose zone that contains the mineralized quartz varies from 0.3 to 1.2 m in width and has been traced along strike at 045° for 106.6 m. The maximum width of the individual quartz lenses is 0.8 m. The dacite host rocks are altered to biotite schist with a well developed cleavage that dips 80° to the northwest (Stockwell, 1937).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. The multiple quartz veins contain disseminated pyrite, pyrrhotite and molybdenite and are hosted by schistose altered dacite.

REFERENCES:

Assessment Files 915647 and 91650
Manitoba Energy and Mines, Minerals Division.

Cerny, P., Trueman, D.L., Ziehlke, D.V., Goad, B.E. and Paul, B.J.
1981: The Cat Lake-Winnipeg River and the Wekusko Lake pegmatite fields, Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER80-1, 216p.Frarey, M.J.
1950: Crowduck Bay; Geological Survey of Canada Map 987A, 1:63 360.

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Mineral Inventory Card 63J/13 Au 18
Manitoba Energy and Mines, Minerals Division.

Stockwell, C.H.
1937: Gold deposits of the Herb Lake area; northern Manitoba; Geological Survey of Canada, Memoir 208, 46p.

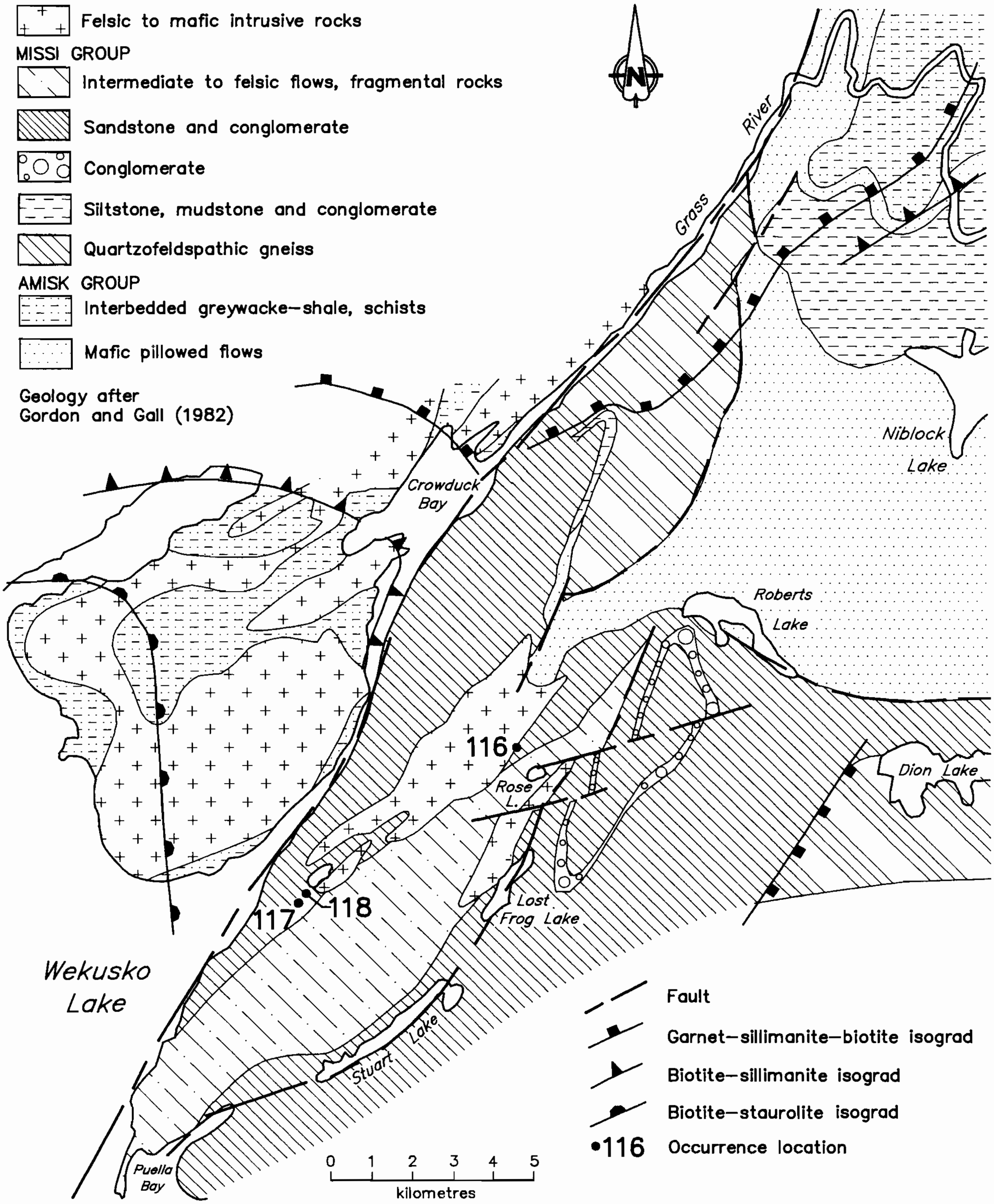


Figure 116-1: Geological setting of occurrences 116, 117 and 118.

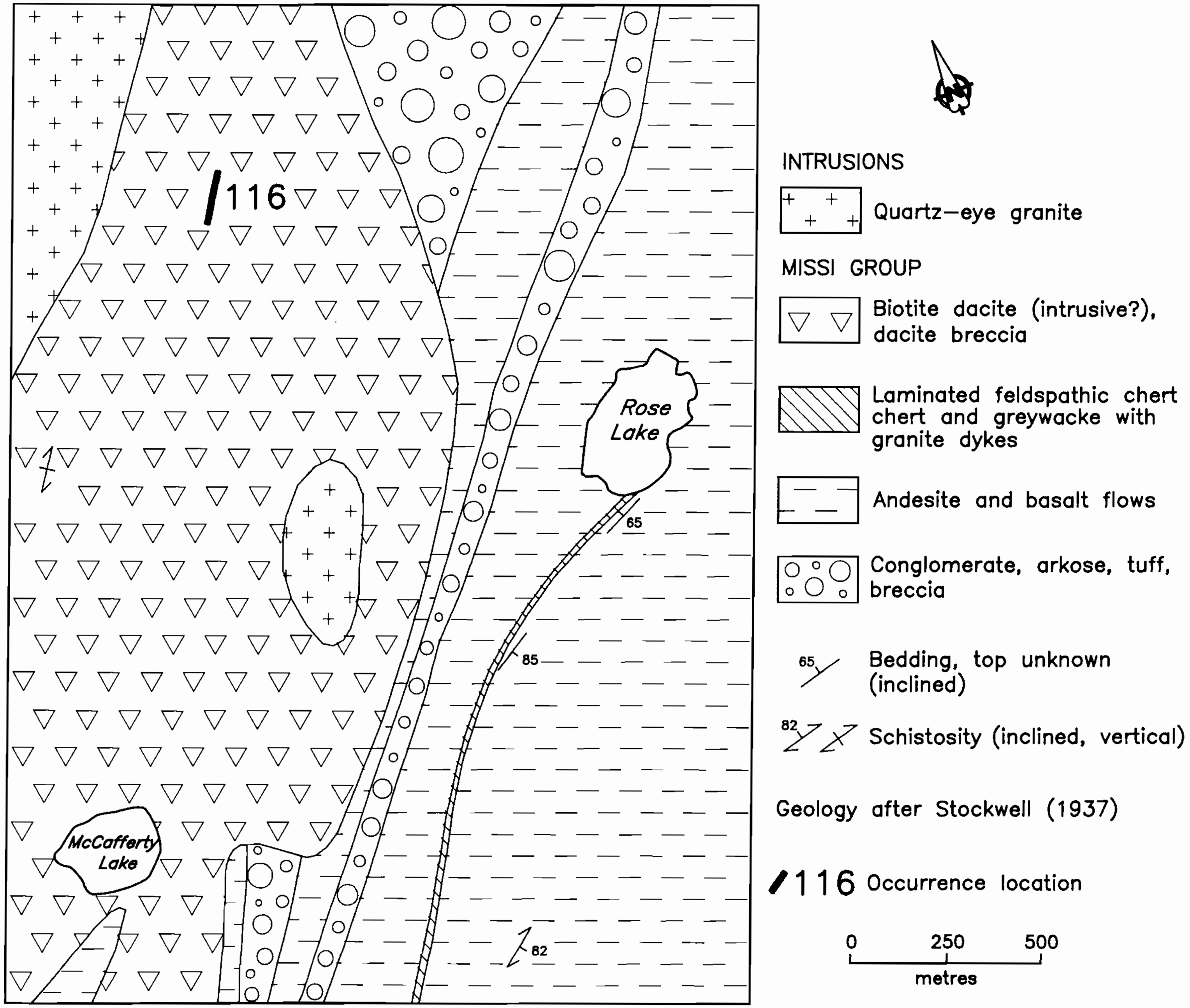


Figure 116-2: Detailed geological setting of occurrence 116.

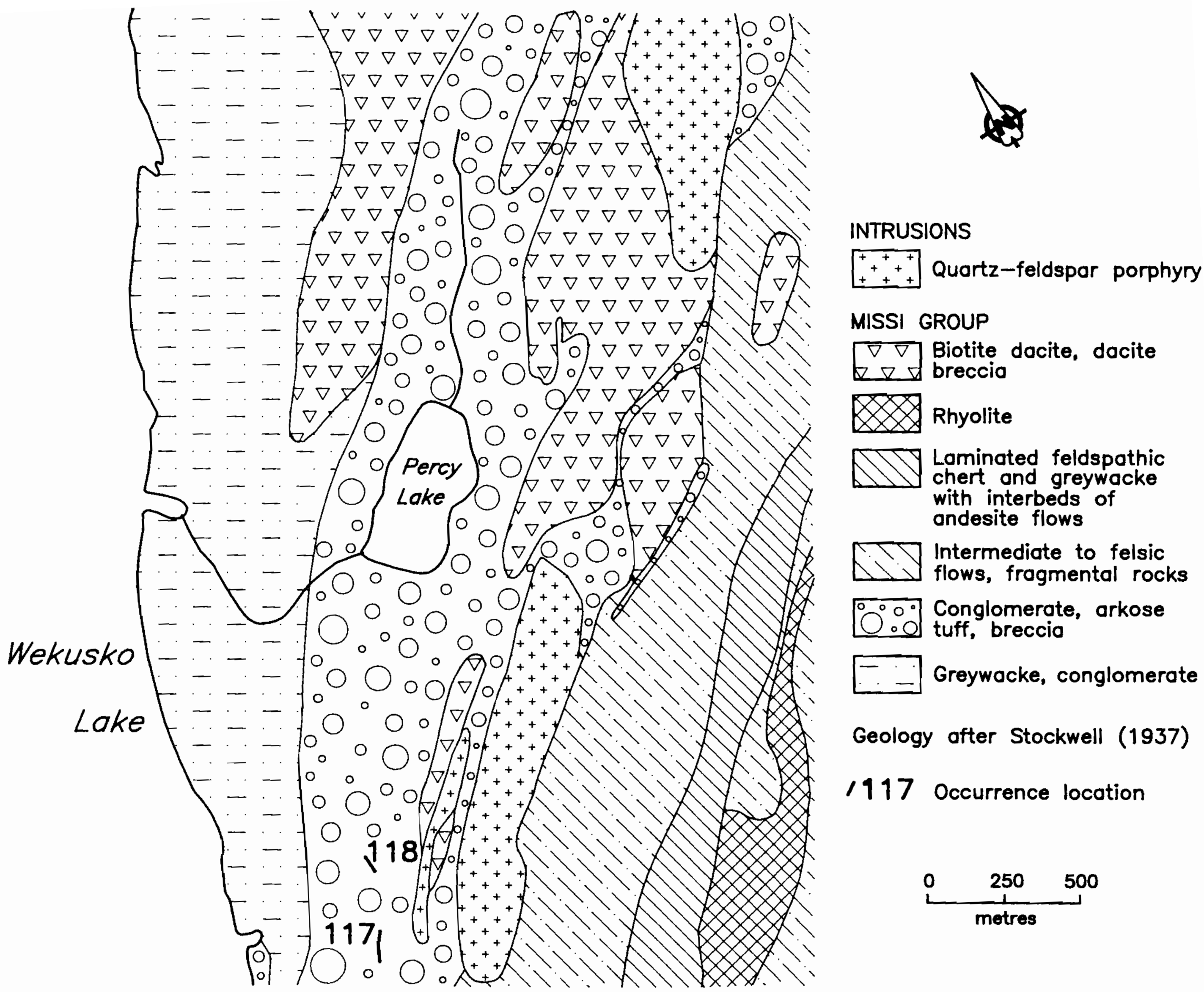


Figure 117-1: Detailed geological setting of occurrences 117 and 118.

LOCATION: **117**

NAME: Le Roy Claim
UTM: 6072372N/452025E
ACCESS: Boat on Wekusko Lake and traverse.

AREA: East shore of Wekusko Lake.
AIRPHOTO: A20124-91

EXPLORATION SUMMARY:

The Le Roy claim was staked by Frank Moore in 1915, and assigned to Bingo Gold Mines Limited at an unknown date (Stockwell, 1937). Trenching and stripping was done on the claim. Alcock (1918) reported that "promising assays" had been obtained from this claim. Stockwell (1937) examined three gold occurrences on the property in 1935. Free gold had been reported by Marshall Ballard in the southeast part of the claim (Stockwell, 1937). The ground was held by J.B. Barton from 1963 to 1964. HBED carried out airborne EM and radiometric surveys in 1965 (A.F. 91650). W.B. Kobar staked Mike 11 in 1968. Falconbridge Nickel Mines Limited did airborne EM and magnetic surveys in 1973 (A.F. 91564). Mike 11 was assigned to A.& V. Harris Exploration Services Limited in 1979. Norman Mines Limited acquired the property in 1980, but transferred it back to A.& V. Harris in 1984. Noranda Exploration Company Limited optioned the claim in 1984, and transferred it to W.B. Kobar in 1987. Mid-North Resources Limited optioned the property from 1987 to 1990.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Missi Group conglomerate and arkose flanked to the east by andesite and basalt flows and to the west by greywacke and conglomerate. The sedimentary sequences have been intruded by quartz-feldspar porphyry and biotite dacite (Fig. 116-1, 117-1; Gordon and Gall, 1982; Stockwell, 1937). Stockwell (1937) mapped alternating layers of arkose and pebble conglomerate intruded by biotite dacite and garnetiferous lamprophyre dykes in the immediate vicinity of the occurrence. The dacite dyke is 3 m wide and strikes 040°E.

MINERALIZATION:

Three mineralized zones are described by Stockwell (1937) at this locality. The main zone consists of lenses and stringers of quartz that contain muscovite and red feldspar with an associated halo of scattered crystals and streaks of fine grained arsenopyrite and visible gold. The quartz veins occur within a 0.9 to 2.4 m wide schistose zone that strikes 035°E and dips 85° northwest. The zone is developed partly in arkose and greywacke and partly in a biotite dacite dyke. The second mineralized zone occurs north of the main zone and consists of quartz lenses and stringers hosted by a 0.3 to 0.9 m wide, 51.8 m long rhyolite (biotite dacite?) dyke. The dyke and the quartz contain "shreds" of fine grained arsenopyrite. The third mineralized zone occurs south of the main zone and comprises a series of three quartz veins that are 10, 20, and 40 cm wide over 1.4 m, each of which contain fine grained arsenopyrite and visible gold. Host rocks are not described.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. A schistose zone occurs in sedimentary rocks and felsic intrusive rocks. Arsenopyrite-gold mineralization occurs in multiple quartz veins and lenses, as well as in schistose wall rocks.

REFERENCES:

Assessment Files 91564 and 91650
Manitoba Energy and Mines, Minerals Division.

Alcock, F.J.
1918: Wekusko Lake area, northern Manitoba; Geological Survey of Canada, Summary Report, 1917, Part D, p. 8-17.

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Stockwell, C.H.
1937: Gold deposits of Herb Lake area, northern Manitoba; Geological Survey of Canada, Memoir No. 208, 46p.

LOCATION: **118**

NAME: Gold Eagle Claim
UTM: 6072509N/452204E
ACCESS: Boat on Wekusko Lake and traverse.

AREA: East shore of Wekusko Lake.
AIRPHOTO: A20124-91

EXPLORATION SUMMARY:

The Gold Eagle claim was staked by Robert Hassett in 1915 and assigned to Bingo Gold Mines Limited at an unknown date (Stockwell, 1937). Stockwell (1937) examined six pits on the property in 1935. HBED carried out airborne EM and radiometric surveys in 1965 (A.F. 91650). Falconbridge Nickel Mines Limited did airborne EM and magnetic surveys in 1973 (A.F. 91564). The area was partly staked under the following claims: Mike 12 and 24 in 1968; CB 9305 in 1978; and Nor 28 in 1983. For a synopsis of exploration activity on these properties see location 66 "Exploration Summary". The ground is presently held by W.B. Kobar as Mike 12 and by Noranda Exploration Company Limited as Nor 28.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Missi Group conglomerate and arkose flanked to the east by andesite and basalt flows and to the west by greywacke and conglomerate. The sedimentary sequences have been intruded by quartz-feldspar porphyry and biotite dacite (Fig. 116-1, 117-1; Gordon and Gall, 1982; Stockwell, 1937). Stockwell (1937) mapped arkose and pebble conglomerate in the immediate vicinity of the occurrence.

MINERALIZATION:

Stockwell (1937) describes a 0.6 to 0.9 m wide, fine grained quartz vein that contains disseminated fine grained arsenopyrite. The schistose sedimentary host rocks also contain disseminated arsenopyrite.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. The multiple quartz veins and veinlets are mineralized with arsenopyrite and hosted by schistose sedimentary rocks.

REFERENCES:

Assessment Files 91564 and 91650
Manitoba Energy and Mines, Minerals Division.

Frarey, M.J.
1948: Crowduck Bay; Geological Survey of Canada, Preliminary Map 48-22, 1:31 680.

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Stockwell, C.H.
1937: Gold deposits of the Herb Lake area, northern Manitoba; Geological Survey of Canada, Memoir 208, 46p.

LOCATION: **119**

NAME: Roy Claim
UTM: 6073825N/452936E
ACCESS: Boat on Wekusko Lake and traverse.

AREA: East shore of Wekusko Lake.
AIRPHOTO: A20124-90

EXPLORATION SUMMARY:

Roy was staked in 1919 by Roy Leslie. It was assigned to a group composed of Leslie, M.J. Hackett, and W. Caldwell later that year. Trenches and pits were dug between 1920 and 1927 (Mineral Inventory Card 63J/13 Au 16). Roy was leased as L-984 in 1928. Stockwell (1937) reports that five diamond drill holes, 15 to 18 m deep, tested the mineralized zone in 1935. The drilling was probably done by Kusko Exploration Syndicate. Roy was cancelled in 1949. Airborne EM and radiometric surveys were done by HBED in 1965 (A.F. 91650). Falconbridge Nickel Mines Limited carried out airborne EM and magnetic surveys in 1973 (A.F. 91564). The ground was held as CB 4609 by E. Duquette from 1972 to 1974. A.& V. Harris Exploration Services Limited staked CB 9308 in 1978. Norman Mines Limited acquired control of the property in 1980. CB 9308 lapsed in 1983. Noranda Exploration Company Limited staked Nor 23 over the property in 1983. Manitoba Mineral Resources Limited had an option agreement with Noranda on the Nor group of claims in 1984.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by felsic to mafic intrusive rocks and Missi Group sandstone and conglomerate and intermediate to felsic flows (Fig. 119-1; Gordon and Gall, 1982). Stockwell (1937) mapped Missi Group altered biotite dacite and dacite breccia in the immediate area of the occurrence (Fig. 119-2).

MINERALIZATION:

A 0.6 m wide zone of schistose, altered dacite that contains a white quartz vein up to 25 cm wide characterizes this locality. This zone has been traced for 30.5 m and strikes 020°E and dips 85° southeast. The quartz is white and varies texturally from sucrosic to coarse and glassy. The vein contains muscovite, pyrite and black tourmaline. The host dacite is altered to sericite schist adjacent to the vein.

GEOCHEMICAL DATA:

The vein assayed a maximum of 17.14 g/t gold (Stockwell, 1937).

CLASSIFICATION:

Vein type deposit; single vein. The quartz vein contains pyrite and gold and is hosted by sericite schist.

REFERENCES:

Assessment Files 91564 and 91650
Manitoba Energy and Mines, Minerals Division.

Cerny, P., Trueman, D.L., Ziehlke, D.V., Goad, B.E. and Paul, B.J.
1981: The Cat Lake-Winnipeg River and the Wekusko Lake pegmatite fields, Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER80-1, 216p.

Frarey, M.J.
1948: Crowduck Bay; Geological Survey of Canada, Paper 48-22, Preliminary Map 48-22, 1:31 680.

Frarey, M.J.
1950: Crowduck Bay; Geological Survey of Canada Map 987A, 1:63 360.

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Mineral Inventory Card 63J/13 Au 16
Manitoba Energy and Mines, Minerals Division.

Stockwell, C.H.
1937: Gold deposits of the Herb Lake area, northern Manitoba; Geological Survey of Canada, Memoir 208, 46p.

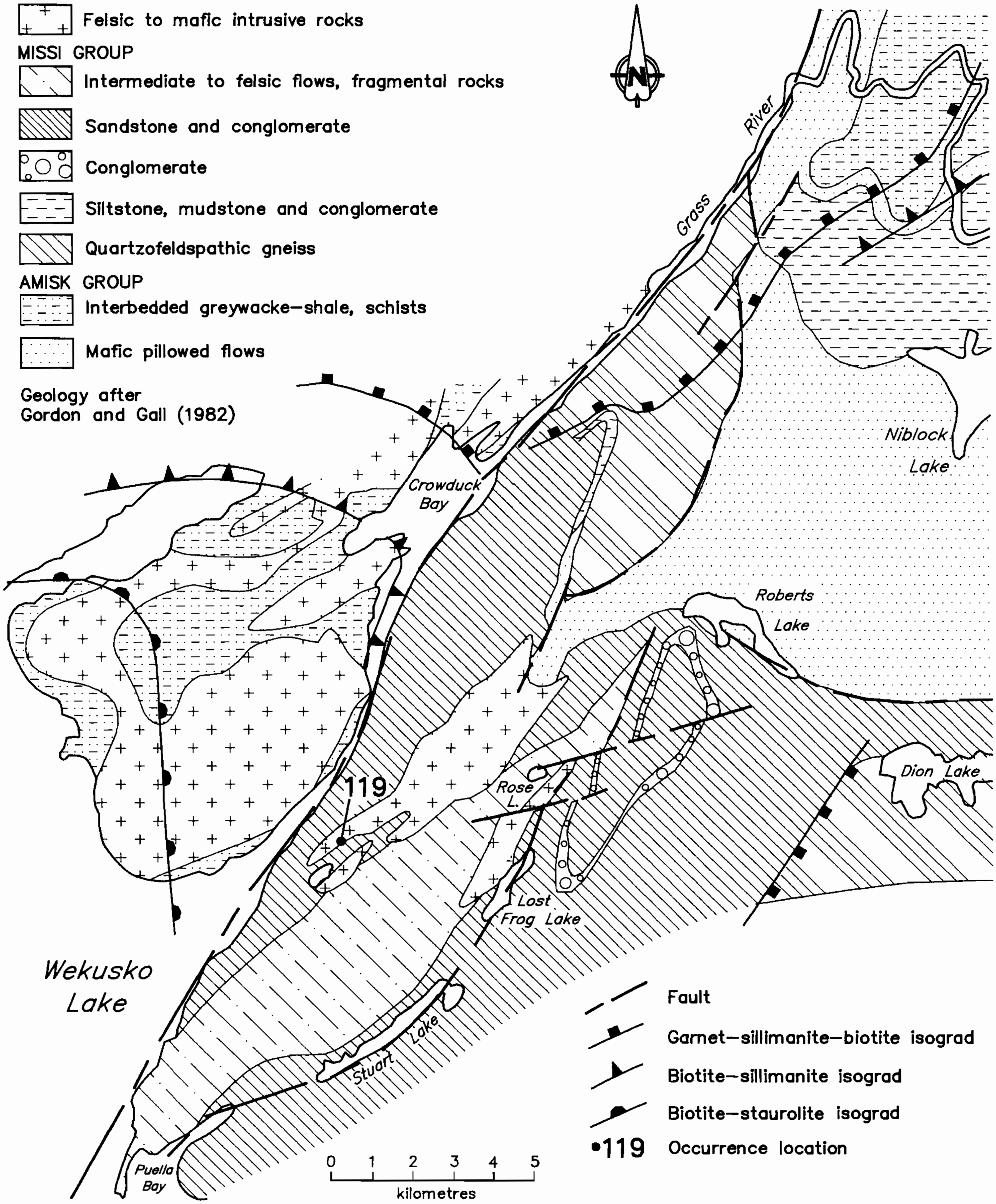


Figure 119-1: Geological setting of occurrence 119.

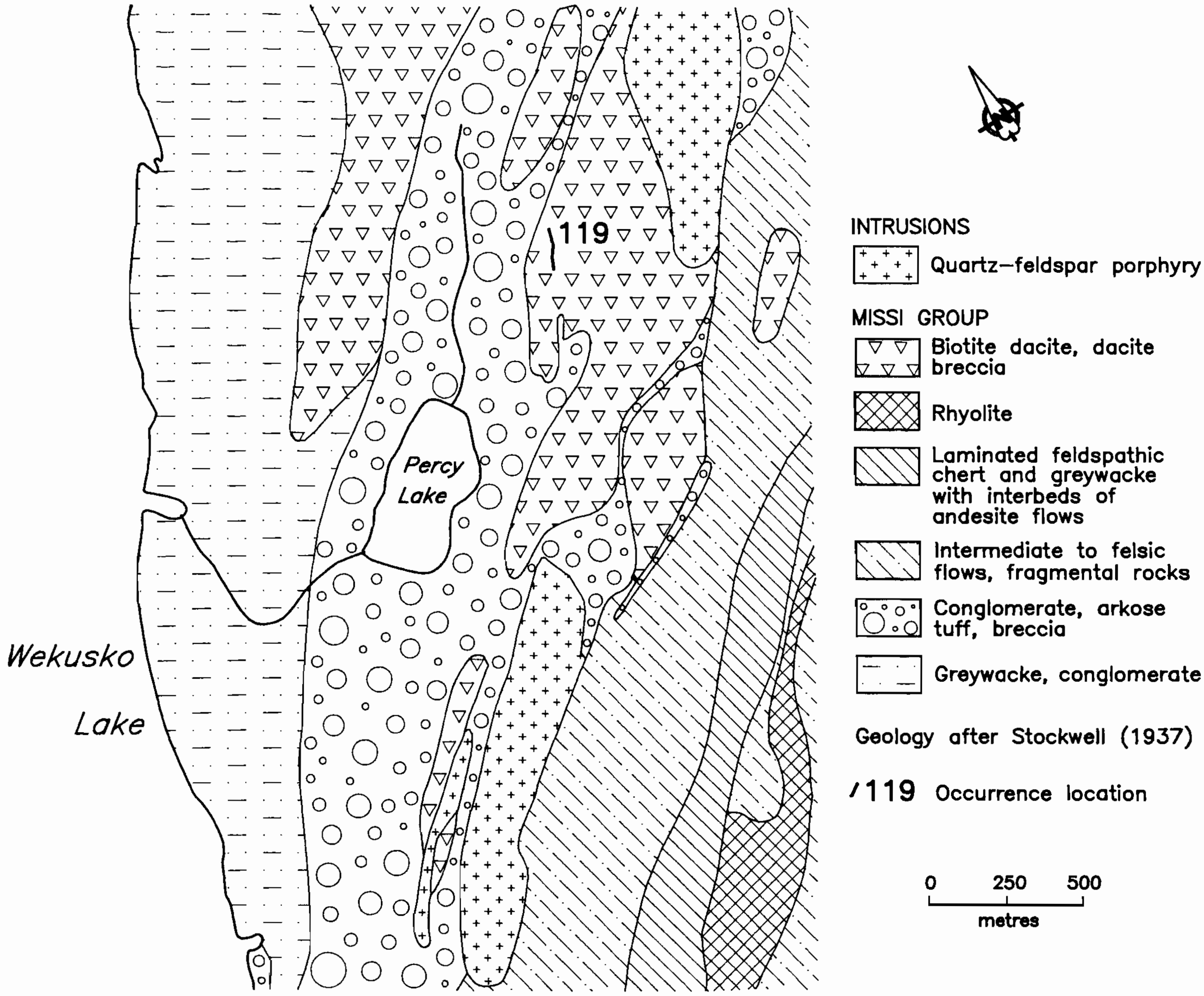


Figure 119-2: Detailed geological setting of occurrence 119.

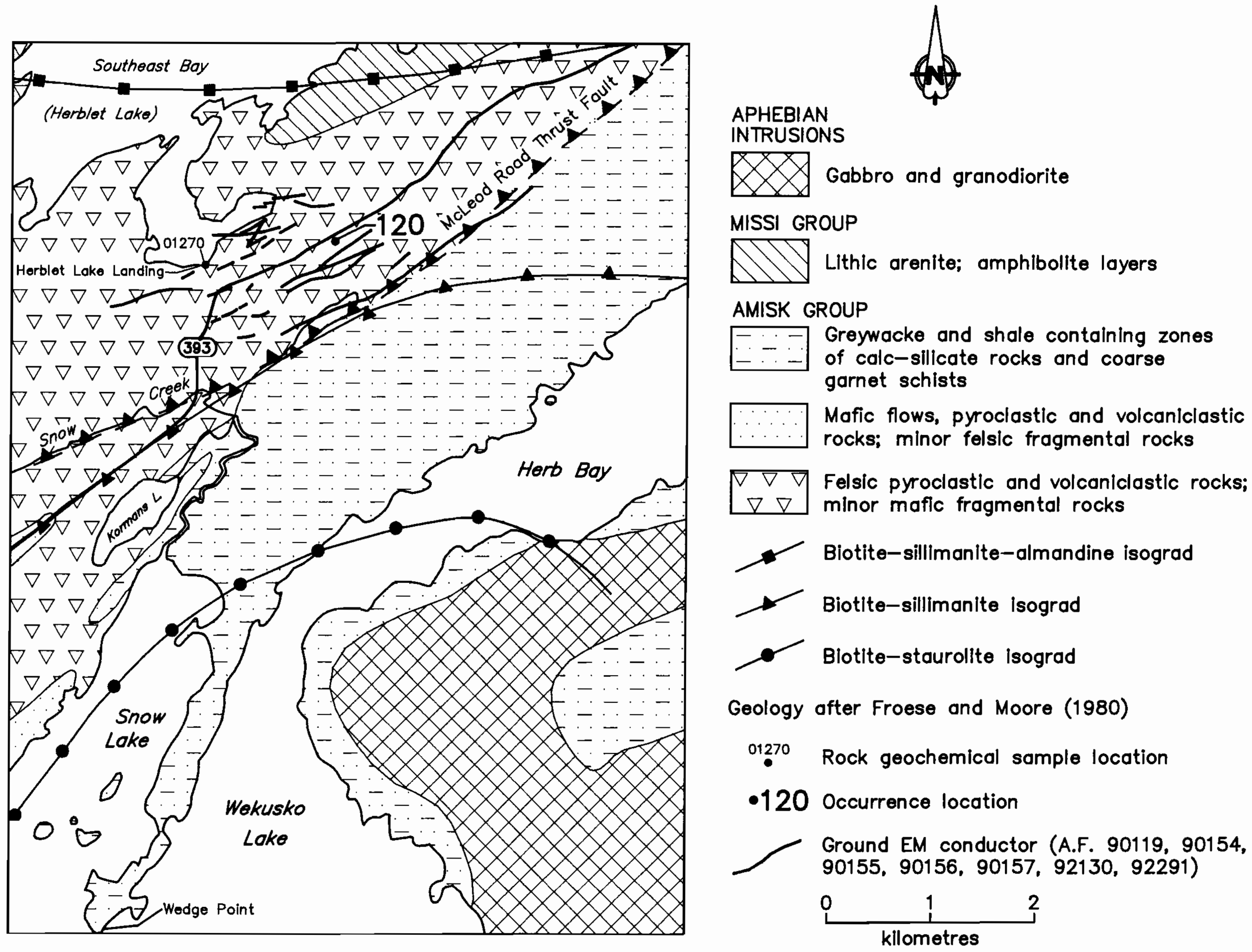


Figure 120-1: Geological setting of occurrence 120.

LOCATION: **120**

NAME:

UTM: 6083163N/445136E

ACCESS: Provincial Road 393 and traverse.

AREA: Whitefish Bay, Herblet Lake

AIRPHOTO: A20127-131

EXPLORATION SUMMARY:

The area was first staked as the Dominion and Buzz group of claims prior to 1930. B.T. 1 to 4 and B.J. 24 and 45 were staked in the 1940's. Wekusko Consolidated Limited did prospecting, trenching, sampling, magnetometer surveys and diamond drilling on the B.J. group from 1944 to 1945 (see location 96 "Exploration Summary" for details). HBED did an HLEM survey on the Ram group of claims between 1955 and 1956 and drilled three holes totalling 343 m on Ram 87, Ram 81 and Metals 1 in 1956 (A.F. 90155, 90154). Claim maps indicate that the drilling may actually have been done on Ram 86, Ram 81 and Metals. DDH 47 was drilled on Metals, but the log is not available (A.F. 90156). Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624, Ground Hog Sheet 13). A Turam EM survey was done on the Ao group by Gunnex Limited in 1966 (A.F. 90157). A Turam EM survey was done on the Ruby claims for Sydney Teal in 1967 (A.F. 90158). In 1971 Fosco Mining Limited did airborne EM and magnetic surveys and ground magnetic and VLEM surveys (A.F. 92130, 92291). From 1969 to 1987 the ground was partly held by D. Teal, Scope Resources Limited and Snow Lake Exploration. In 1981, work was reported on CB 10172, held by Dawn Mines Limited, and on CB 10912 and CB 10913, held by Jim Corman (Mining Claim Cards CB 10172, CB 10912, CB 10913). The area is presently covered by Jamie 8 to 10, staked by James Corman in 1963 and assigned to W.B. Kobar in 1965, to Falconbridge Nickel Mines Limited in 1968 and to Threehouse Mines Limited in 1971. The area is also covered by Herblet 2 and Herblet 3, staked by W. Bruce Dunlop Limited in 1983 and 1987, respectively. HBED optioned Herblet 2 from 1985 to 1987. Falconbridge Nickel Mines Limited optioned Herblet 2 and 3 from 1988 to 1990.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group quartz phyric felsic pyroclastic and volcaniclastic rocks flanked to the south by greywacke and shale and to the north by Missi Group lithic arenite (Fig. 120-1; Froese and Moore, 1980). The McLeod Road Thrust Fault occurs 0.5 km south of the area of the occurrence. Long and short strike length ground EM conductors characterize the general area of the occurrence. Detailed mapping in the immediate area of the occurrence has documented massive and foliated amphibolite, fragmental amphibolite and silicified, rusty weathered and mineralized amphibolite (Fig. 120-2). The amphibolite is interpreted to represent mafic volcanic rocks.

MINERALIZATION:

The silicified, rusty weathered amphibolite hosts 3 to 5% disseminated pyrite and pyrrhotite in a 10 to 15 m wide zone that approximates the foliation in the rocks.

GEOCHEMICAL DATA:

Representative outcrop chip sample 01396 was collected from the rusty weathered and mineralized amphibolite for multi-element geochemical analysis. The sample contains 27 ppb Au (Appendix I).

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. The occurrence coincides with a long strike length ground EM conductor. The disseminated iron sulphides are considered to represent the surface expression of the sulphide facies iron formation.

REFERENCES:

Assessment Files 90154, 90155, 90156, 90157, 90158, 91624, 92130 and 92291
Manitoba Energy and Mines, Minerals Division.

Eccles, D.R. and Fedikow, M.A.F.
1985: Mineral occurrence documentation and alteration zone mapping, Snow Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 82-99.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area; Geological Survey of Canada Paper 78-27, 16p.

Gobert, G.
1990: Till geochemistry of the Snow Lake area (NTS 63K/16, 63J/13, 63J/12); in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1990, p. 72-73.

Mining Claim Cards, CB 10172, CB 10912, CB 10913
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Russell, G.A.
1957: Structural studies of the Snow Lake - Herb Lake area; Manitoba Mines and ,Natural Resources, Mines Branch, Publication 55-3, 33p.

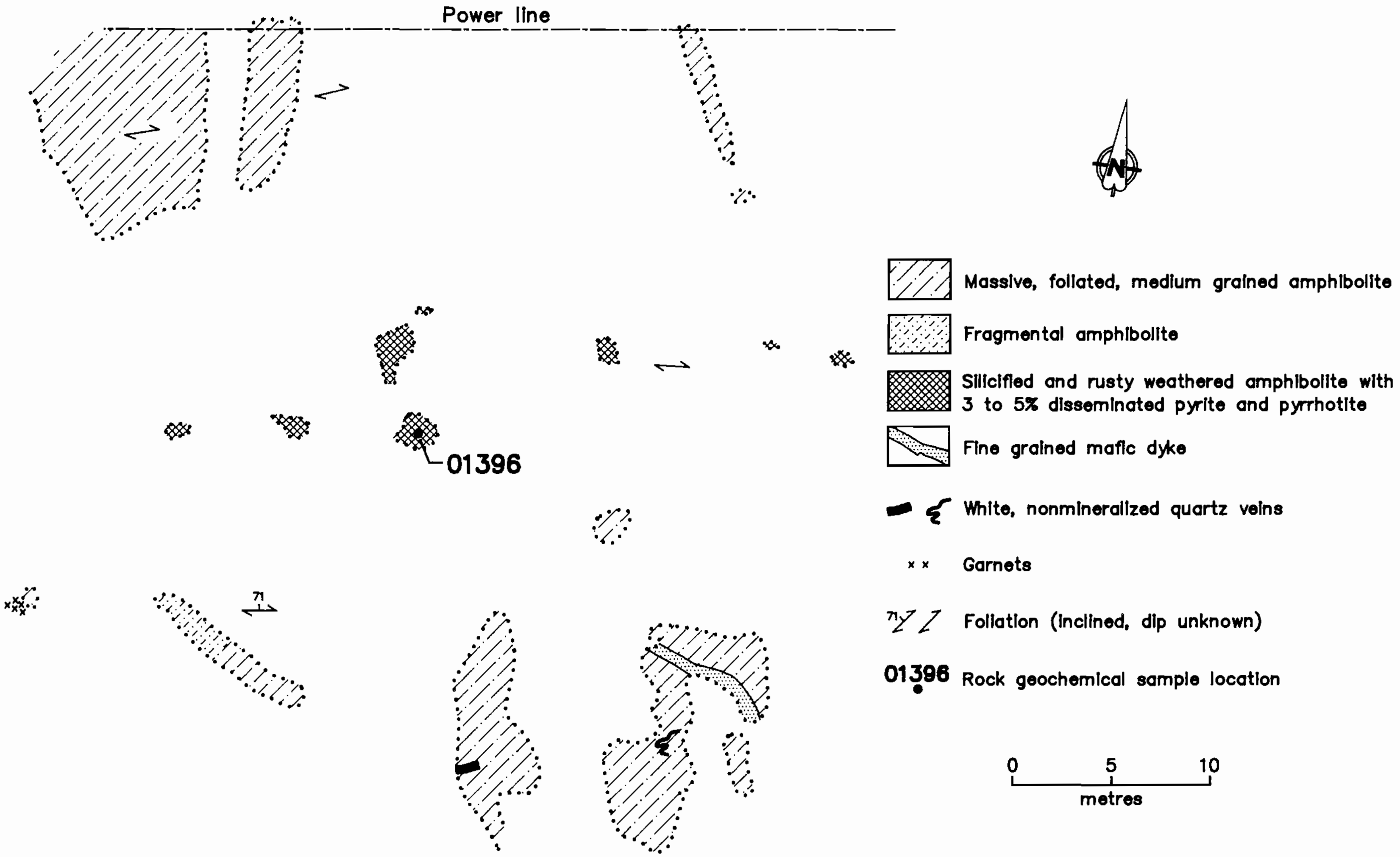


Figure 120-2: Outcrop, geology and sample location map, occurrence 120.

LOCATION: **121**

NAME:

UTM: 6090947N/453856E

ACCESS: Provincial Road 393 to Osborne deposit (location 80) and traverse.

AREA: Northeast of the Osborne Cu-Zn deposit

AIRPHOTO: A20124-77

EXPLORATION SUMMARY:

Refer to Location 80 for the summary of exploration.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group felsic pyroclastic and volcaniclastic rocks flanked to the northwest by Missi Group lithic arenite. The felsic volcanic rocks are intruded by Aphebian pegmatites of the Osborne pegmatite field (Fig. 121-1; Froese and Moore, 1980). Detailed outcrop mapping in the general area of the occurrence documented rusty weathered and garnetiferous fragmental rhyolite. The fragments are poorly sorted, are generally a lighter grey colour than the rhyolite matrix, contain 1 to 6 mm red garnets and are commonly rusty weathered. The fragments are characterized by a quartz-amphibole-garnet mineralogy, which contrasts with the quartz-feldspar-biotite mineralogy of the matrix. Locally, outcrops contain 25 to 50% red garnet.

MINERALIZATION:

Rhyolite in and around the single trench (Fig. 121-2) is silicified and contains 1 to 5% disseminated and veinlet pyrrhotite.

GEOCHEMICAL DATA:

Representative rock chip sample 01399 was collected from muck adjacent to the trench for multi-element geochemical analysis. The sample contains low base and precious metal values (Appendix I).

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

Frarey, M.J.

1950: Crowduck Bay; Geological Survey of Canada Map 987A, 1:63 360.

Froese, E. and Moore, J.M.

1980: Metamorphism in the Snow Lake area; Geological Survey of Canada Paper 78-27, 16p.

Gale, G.H., Baldwin, D.A. and Koo, J.

1980: A geological evaluation of Precambrian massive sulphide deposit potential in Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER79-1, 137p.

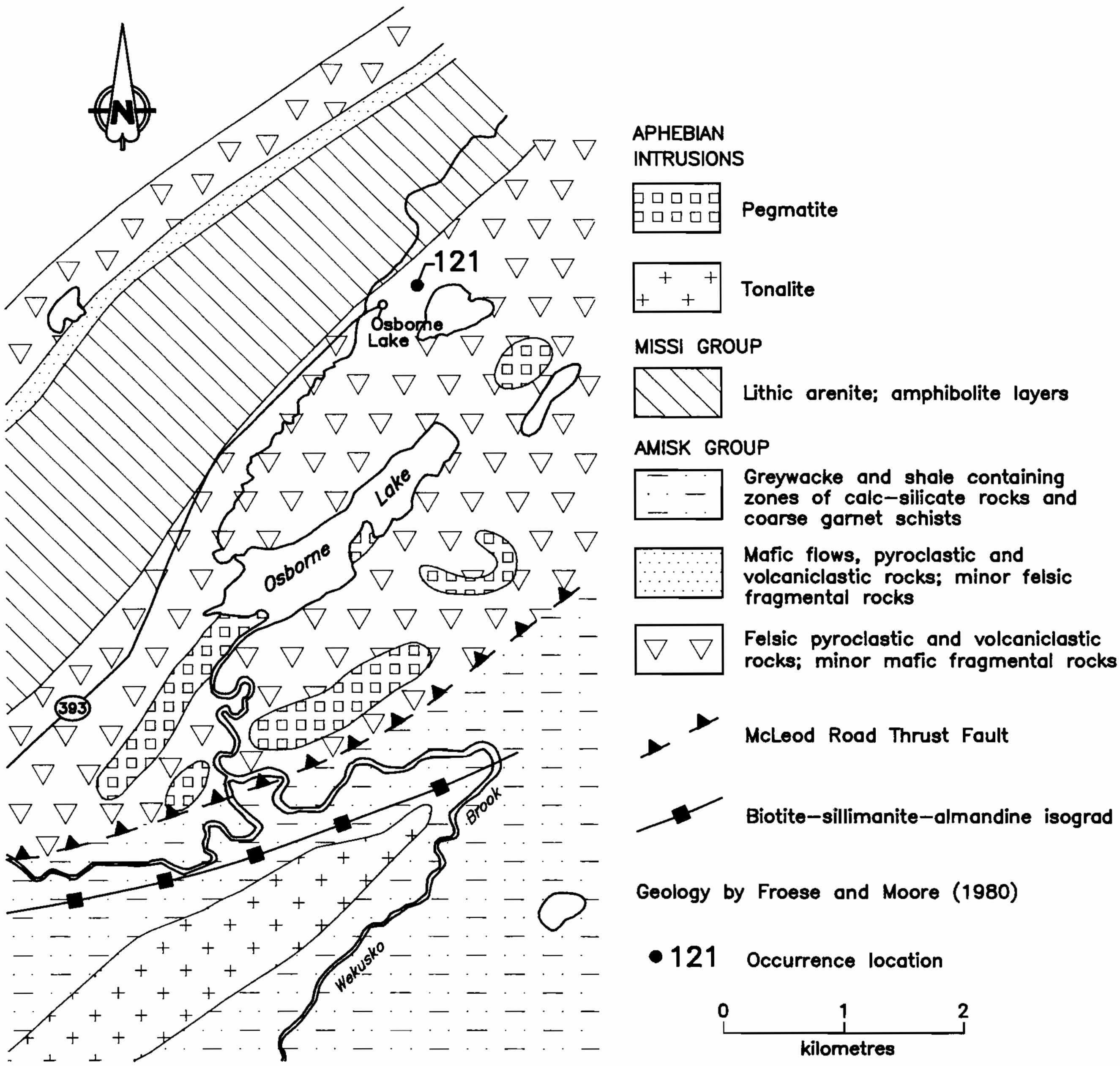


Figure 121-1: Geological setting of occurrence 121.

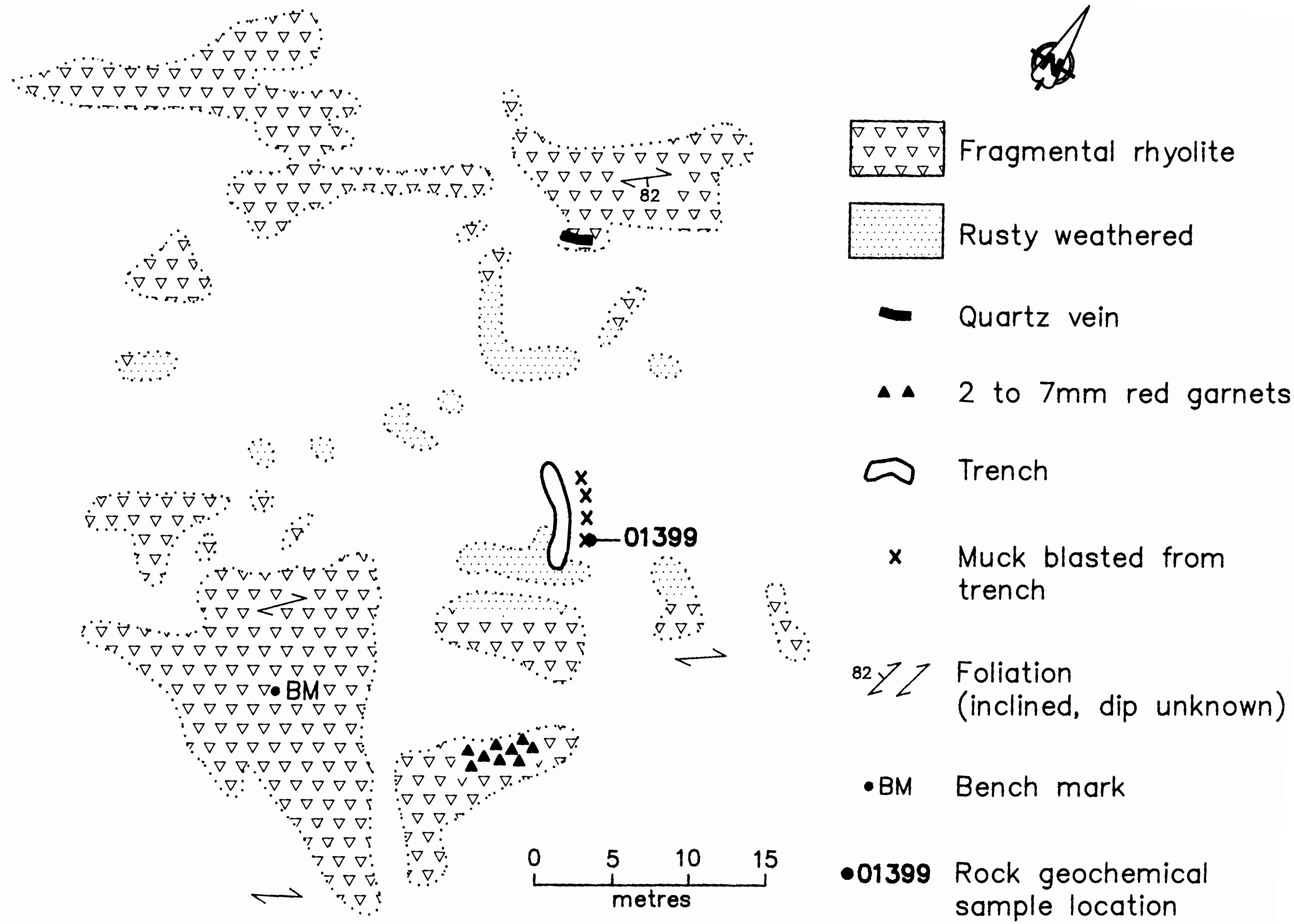


Figure 121-2: Outcrop, geology and trench and sample location map, occurrence 121.

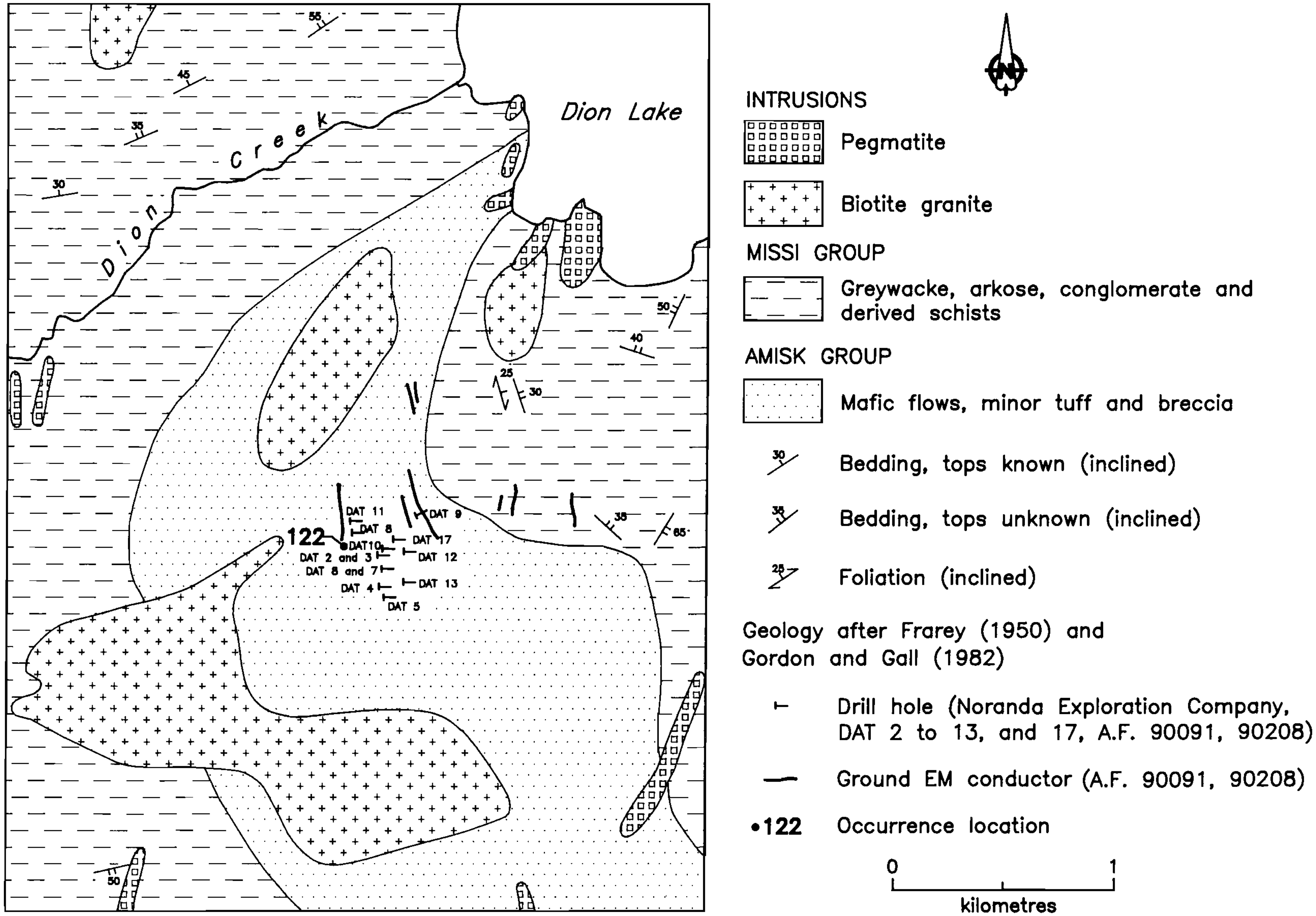


Figure 122-1: Geological setting, ground EM geophysical conductors and diamond drill hole locations, occurrence 122.

LOCATION: **122**

NAME: Lee
UTM: 6073649N/465945E
ACCESS: Bush plane to Dion Lake and traverse

AREA: Southwest of Dion Lake
AIRPHOTO: A20807-187,-188

EXPLORATION SUMMARY:

The Gamma and Ray group of claims were staked in 1952, and were held by A.L. Parres and Kay Lake Mines Limited. Cypress Exploration Corporation Limited optioned the property in 1952. Kix Uranium Limited (renamed Kix Minerals Limited) explored the Loaf group from 1956 to 1957. Conwest Exploration Company Limited did surface work on the Tik group in 1961 (Mining Claim Card Tik 16). Bet 1 and 4 were staked by H.O. Jacobson in 1963, and assigned to A.T. Jacobson in 1965. Dat 53 was staked by G.W. Zbitnoff and assigned to A.L. Parres in 1965. In 1965, Noranda Exploration Company Limited optioned the property, and did an HLEM (Ronka Mark III) survey that outlined eight conductors (A.F. 90091). Noranda drilled 11 holes on Bet 1 and 4, but the logs are only available for three holes totalling 272 m (A.F. 90208). Two holes totalling 105 m were also drilled on Dat 53 in 1965 (A.F. 90208). HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650). The Dat claims were cancelled between 1967 and 1968. Bet 1 to 4 were cancelled in 1974. The area was held by A.L. Parres Limited from 1980 to 1987, by Nor-Acme Gold Mines Limited from 1987 to 1988, and by High River Gold Mines Limited from 1988 to 1989. A.L. Parres Limited staked Lee 1 and 3 over the property in 1990.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group mafic volcanic rocks intruded by biotite granite and pegmatite (Fig. 122-1; Gordon and Gall, 1982; Frarey, 1950). Detailed geologic observations with proximity to the occurrence indicate the mafic volcanic sequence consists of amphibolite, felsic gneiss and late granitic intrusions (D.V. Ziehlke, pers. comm., 1988). Host rocks to the mineralization are variably altered, fine- to coarse-grained amphibolite. Diamond drill holes, collared to test long and short strike length ground EM conductors in the general area of the occurrence, intersected mineralized and variably altered quartz-hornblende-biotite gneiss, quartz-feldspar-biotite-muscovite gneiss, and hornblendite (A.F. 90208).

MINERALIZATION:

Two zones of copper-zinc mineralization, the "Main Zone" and the "North Zone", were observed in the area. The rocks in proximity to the Main Zone consist of a sequence of predominantly mafic, medium- to coarse-grained, recrystallized and altered rocks of dioritic to gabbroic composition. These rocks contain scattered garnetiferous and silica-rich zones. Locally, the black to dark-green mafic units display relict igneous textures that suggest a gabbroic intrusive origin. Elsewhere, these units are fine grained and may either be basalt or the chilled margins of gabbroic intrusions. Approximately 30 m west of the Main Zone, the rocks consist of 20 to 25% fine- to medium-grained feldspar and quartz, 2 to 8% muscovite and trace to 5% biotite. This gneissose unit strikes east and dips 45° north and is interpreted to represent either a metamorphosed sedimentary rock or felsic tuff. The contact between this unit and the mafic rocks is not exposed.

The Main Zone is exposed over an area of 10 by 20 m that contains several blasted pits at the south end of a large outcrop area; the mineralized zone is open to the south beneath muskeg. The immediate host rocks to the copper-zinc mineralization at the Main Zone are a medium-grey, siliceous, medium grained quartz (30 to 50%), hornblende (8 to 12%), feldspar and garnet (trace to 3%) unit that contains 2 to 10% sphalerite and 0.5 to 5% chalcopyrite, as well as 1 to 3% disseminated carbonate. This rock unit is nonfoliated but has a well developed hornblende lineation that plunges 40° to 50° to the east. The sphalerite occurs as 1 to 5 mm grains that are crudely aligned parallel to the lineation. Sphalerite is evenly distributed throughout the host rock. Chalcopyrite occurs as disseminated 1 to 3 mm grains, as well as patches up to several centimetres long.

The "North Zone" occurs 260 m at 347° Az from the Main Zone. The rocks at the North Zone are a heterogeneous assemblage of fine- to coarse-grained, black amphibolite of unknown origin. The grain size varies from up to 2 cm with a mineralogy of amphibole, feldspar, trace to 10% garnet and quartz with minor carbonate, chalcopyrite and malachite. A weak foliation, reflected by discontinuous, subparallel alignment of amphibole, is developed in this unit. The absence of any earlier fabric is attributed to obliteration by recrystallization (D.V. Ziehlke, pers. comm., 1989). This unit has been extensively silicified with the subsequent development of anhedral patches of garnet and up to 30% fibrous to radiating amphibole that is tentatively identified as anthophyllite. Patchy, gradational silicification is spatially associated with trace to 3%, 1 to 2 mm disseminated chalcopyrite and minor malachite stain. Minor quartz stringers, 1 to 4 cm long, containing chalcopyrite are present at one site.

Diamond drill logs describe mineralized lithologies similar to those observed in outcrop. The host rocks are usually quartz-hornblende-biotite-garnet gneiss that are silicified and/or garnetiferous. Mineralized intervals in DDH Dat 5, -8, -10, -11, and -13 range from 0.1 to 0.8 m in core length and consist of disseminated chalcopyrite and/or sphalerite. Drill logs for DDH Dat 2, -3, -4, -6, -7, -9, -12 and -17 are not available (A.F. 90091, 90208).

GEOCHEMICAL DATA:

Eleven grab samples were collected from the Main and North Zones for multi-element analysis. Five representative rock chip samples from the North Zone contain 1864 ppm to 1.33% Cu and 20 to 130 ppb Au. Main Zone samples contain 2557 ppm to 2.12% Cu, 357 ppm to 5.74% Zn, 1 to 209 ppm Cd, 10 to 93 ppm Pb, and 5 to 220 ppb Au. The remainder of the analyses are presented in Appendix I. Assays from drill core samples range from nil to 0.3 g/t Au, nil to 17 g/t Ag, nil to 2.29% Cu and nil to 1.6% Zn (D.V. Ziehlke, pers. comm., 1989).

CLASSIFICATION:

Stratabound massive sulphide type deposit; alteration zone. The numerous long and short strike length ground EM conductors delineated in the area suggest the Main and North Zones are probably part of a continuous mineralized stratum. The high copper and zinc analytical results combined with (1) erratically distributed and crosscutting disseminated and veinlet sulphide mineralization, and (2) the strongly altered nature of the host rocks, are characteristics normally associated with alteration zones that accompany massive sulphide type deposits.

REFERENCES:

Assessment Files 90091, 90208 and 91650
Manitoba Energy and Mines, Minerals Division.

Cerny, P., Trueman, D.L., Ziehlke, D.V., Goad, B.E. and Paul, B.J.
1981: The Cat Lake-Winnipeg River and the Wekusko Lake pegmatite fields, Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER80-1, 216p.

Frarey, M.J.
1950: Crowduck Bay; Geological Survey of Canada Map 987A, 1:63 360.

Gale, G.H., Baldwin, D.A. and Koo, J.
1980: A geological evaluation of Precambrian massive sulphide deposit potential in Manitoba; Manitoba Energy and Mines, Mineral Resources Division, Economic Geology Report ER79-1, 137p.

Mining Claim Card Tik 16 (P82075)
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Mineral Inventory Card 63J/13 Cu 10
Manitoba Energy and Mines, Minerals Division.

Ziehlke, D.V.
1990: Written and verbal communication.

LOCATION: **123**

NAME:
UTM: 6078143N/438210E
ACCESS: Anderson mine access road and traverse.

AREA: Southeast shoreline of Anderson Lake.
AIRPHOTO: A20170-16

EXPLORATION SUMMARY:

A.J. 3 was staked by Andrew Paterson in 1945, and assigned to John Nutt. A.J. 3 was cancelled in 1947. In 1955, Ram 258 was staked by S.L. Russell and assigned to HBED. Lease M-5753 was issued for 21 years to HBM&S in 1959 and renewed in 1980.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group felsic pyroclastic and volcaniclastic rocks and their altered equivalents. The altered equivalents of the felsic volcanic rocks have been mapped as a separate lithology consisting of kyanite-sillimanite-anthophyllite-cordierite and have been designated as "unit 2" by Froese and Moore (1980). The felsic volcanic rocks are flanked to the north and south by mafic pyroclastic and volcaniclastic rocks and massive and pillowed flows. These units have been intruded by a synvolcanic "quartz-eye" tonalite (Fig. 123-1). Detailed mapping in the general area documented variably altered and mineralized mafic volcanic rocks. Alpha Mines Limited reported a copper occurrence along the south shore of Anderson Lake west of location 123 hosted within felsic volcanic rocks (*cf.* Plate 1, A.F. 91514).

MINERALIZATION:

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

GEOCHEMICAL DATA:

Representative outcrop chip samples 01514 to 01516 were collected for multi-element geochemical analysis (Fig. 123-2). The samples contain low base and precious metal values (Appendix I).

CLASSIFICATION:

Disseminated mineralization-not classified.

REFERENCES:

Assessment File 91514
Manitoba Energy and Mines, Minerals Division.

Fedikow, M.A.F., Roney, C.T., Schmidt, G.J. and Robbie, T.
1986: Mineral deposit studies in the Snow Lake area; in Manitoba Energy and Mines, Geological Services Branch, Report of Field Activities, 1986, p. 77-85.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area; Geological Survey of Canada Paper 78-27, 16p.

Mineral Inventory Card 63J/13 KYN 1
Manitoba Energy and Mines, Minerals Division.

Russell, G.A.
1957: Structural studies of the Snow Lake - Herb Lake area; Manitoba Mines Branch, Publication 55-3, 33p.

Yamada, P.H.
1984: Industrial minerals reconnaissance in the Flin Flon-Snow Lake district; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1984, p. 68-69.

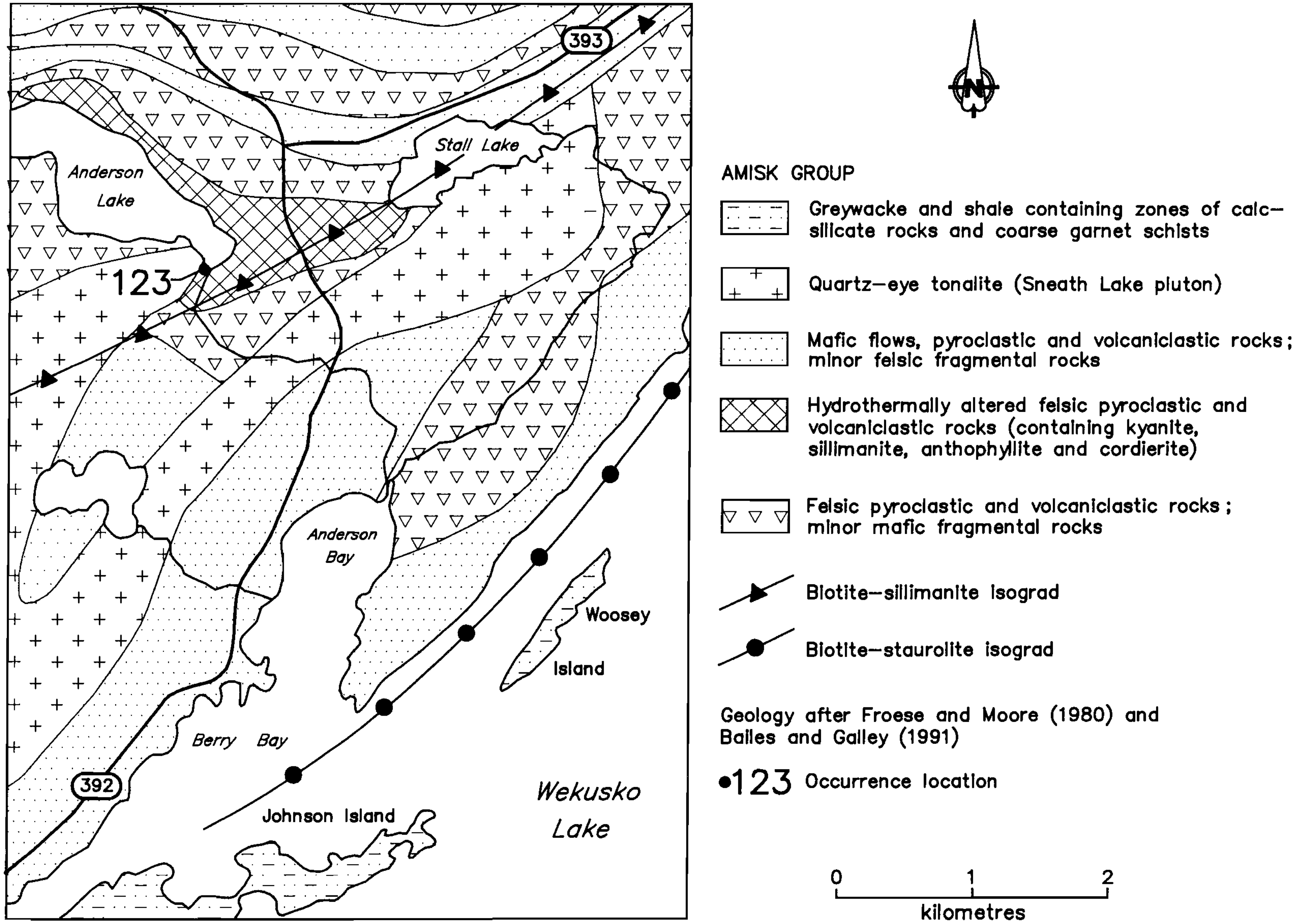


Figure 123-1: Geological setting of occurrence 123.

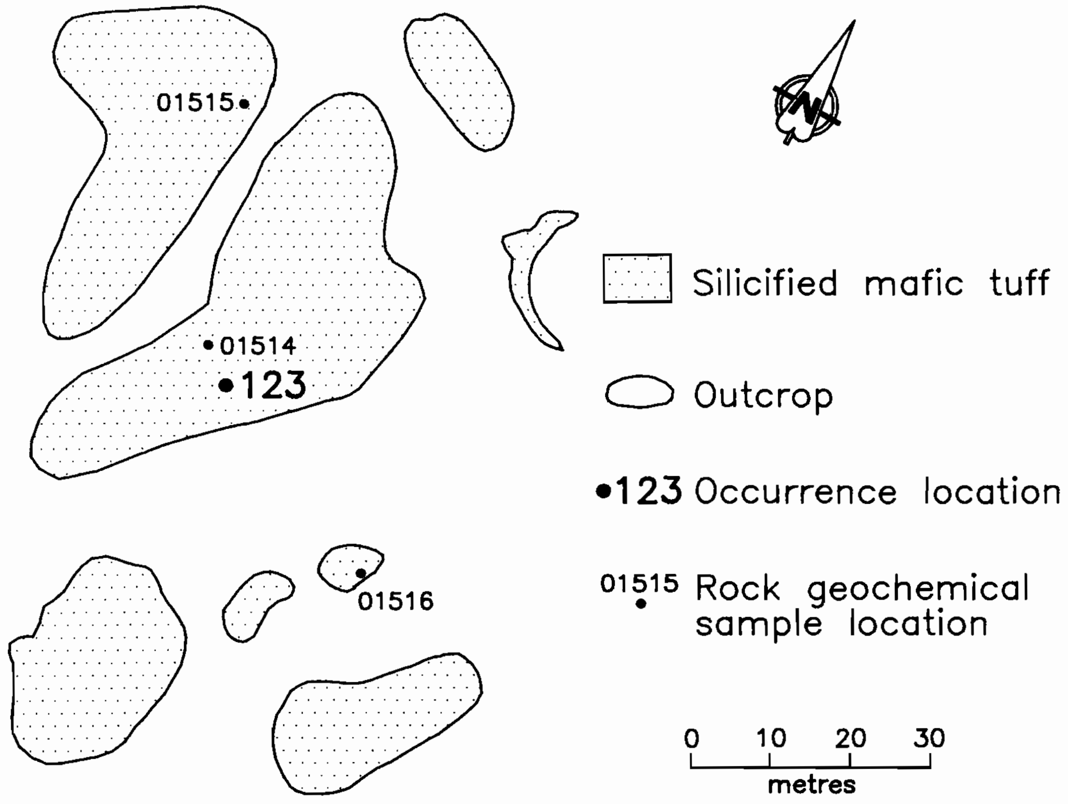


Figure 123-2: Outcrop, geology and sample location map, occurrence 123.

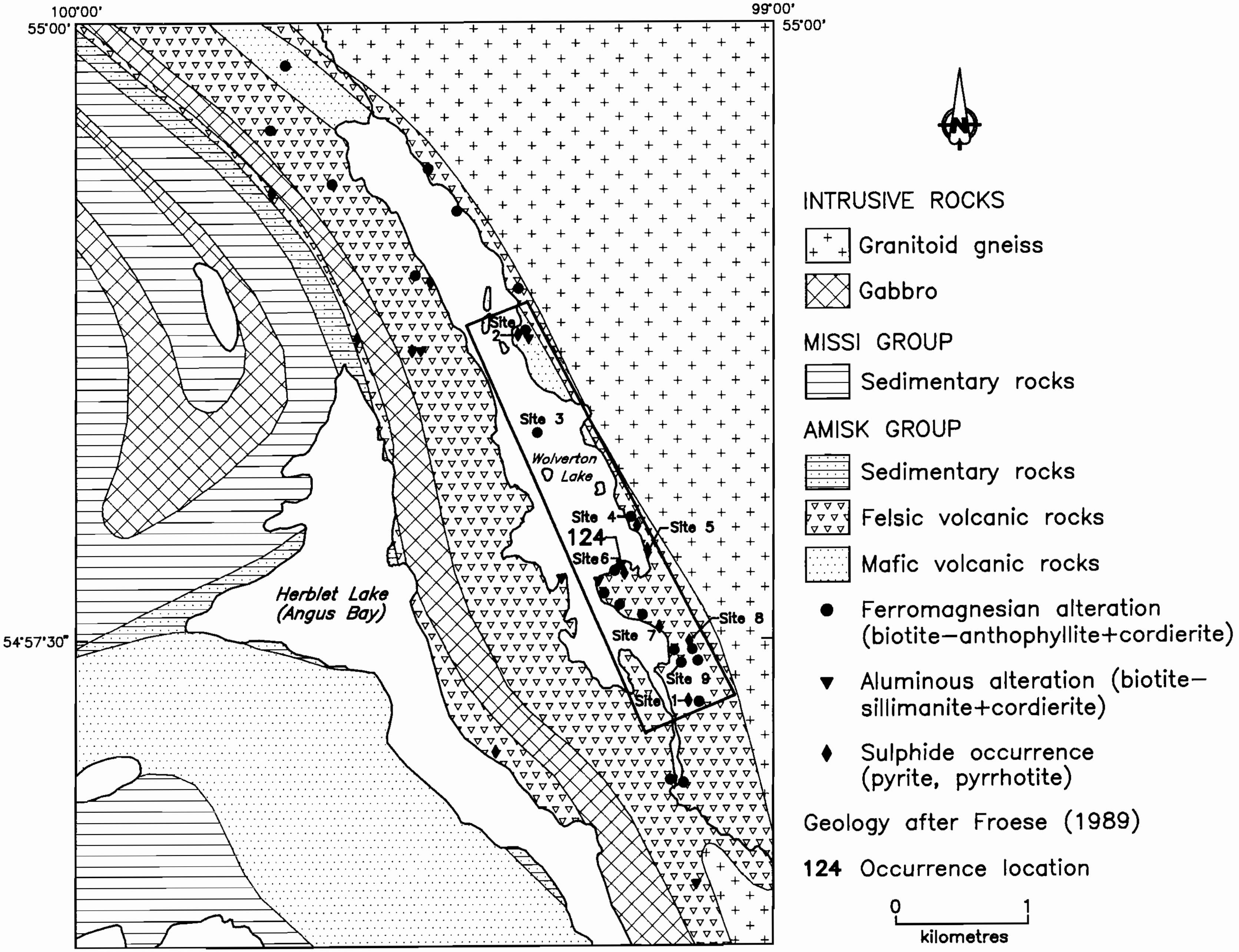


Figure 124-1: Geological setting of occurrence 124.

LOCATION: **124**

NAME:

UTM: 6090966N/440064E

ACCESS: Boat to Angus Bay on Herblet Lake, portage to Wolverton Lake.

AREA: Wolverton Lake

AIRPHOTO: A20170-25, -26

EXPLORATION SUMMARY:

The area was first staked as Cormorant 1 to 8 in the late 1920's. The G.L. group (at the south end of Wolverton Lake) was drilled by R. McIntosh in 1945 (Manitoba Mines and Natural Resources, 1946). HBED did an HLEM survey on the Ram and Jan claims between 1956 and 1957 (A.F. 90142, 90119). A Turam EM survey was done by HBED in 1970 on the Zyl claims at the south end of Wolverton Lake (A.F. 91499). The ground is presently held by HBED as Zyl 1 to 3, 22 to 26, 28 to 31, staked in 1966; Zyl 42Fr., Zyl 44, -47, -49 Fr, -50, -53 to -56, staked in 1967; Zyl 65 Fr to 67 Fr, staked in 1971; and CB 9241 and CB 9244 staked in 1978.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group felsic pyroclastic and volcaniclastic rocks and minor amphibolite flanked to the east by salmon pink granitoid gneiss of the Herblet Lake Gneiss Dome Complex (Bailes, 1975) and to the west by gabbro and Missi and Amisk sedimentary rocks (Fig. 124-1; Froese and Moore, 1980). Felsic volcanic rocks are characterized by linear, northwest-trending rusty weathered zones that can be traced from the south end of Wolverton Lake to the Wim massive sulphide type, a distance of approximately 8 km. The felsic volcanic rocks also contain localized zones of ferromagnesian and aluminous alteration.

MINERALIZATION:

Disseminated and veinlet (5%) pyrite and chalcopyrite occur in rusty weathered and altered felsic volcanic rocks. Ferromagnesian (biotite-anthophyllite ± cordierite) and aluminous (biotite and sillimanite ± cordierite) alteration zones are associated with the pyrite and chalcopyrite mineralization. Nine mineralized and altered sites were examined on Wolverton Lake (Fig. 124-1). The characteristics of each of these sites is presented below.

Site 1: A rusty weathered amphibolite without visible sulphide mineralization occurs at this site. The amphibolite contains subhedral to euhedral 1 to 4 mm magnetite crystals, as well as garnet and anthophyllite.

Site 2: Anastomozing rusty weathered veinlets and diffuse patches occur in heterolithic fragmental basalt at this site. Fifty metres east of the shoreline, the outcrop is altered to a brick-red anthophyllite-bearing rock with subhedral to euhedral magnetite crystals. Sulphide minerals are not visible in outcrop.

Site 3: A small trench on an island in Wolverton Lake exposes 5 to 10% disseminated and veinlet chalcopyrite, pyrite and minor pyrrhotite (Fig. 124-2). The host rocks to this mineralization are basalt that contain 0.5 cm lenses, pods and veinlets of garnet-anthophyllite chalcopyrite and pyrite that are aligned parallel to the foliation. These features are interpreted to represent alteration phenomena associated with the mineralization.

Site 4: A rusty weathered 5 by 0.5 m zone of anthophyllite-garnet-pyrite occurs in a rubbly shoreline exposure of sucrosic-textured, foliated rhyolite.

Site 5: A small exposure of brick-red rhyolite with garnet and subhedral to euhedral magnetite and 1% disseminated pyrite occurs at this site.

Site 6: Rusty weathered rhyolite is exposed on a peninsula in the southeast portion of Wolverton Lake. The rhyolite is characterized by the alteration mineral assemblage of cordierite-anthophyllite-garnet-magnetite-sillimanite-gahnite. Approximately 1 to 3% disseminated to veinlet pyrite and chalcopyrite are present in outcrop.

Site 7: A rusty weathered garnetiferous rhyolite with 2 to 3% disseminated pyrite and pyrrhotite occurs in a small 1 m lakeside exposure at this site.

Site 8 and 9: Rusty weathered, garnetiferous and foliated rhyolite with clusters of 2 to 5 mm subhedral magnetite crystals and 5 mm to 1.5 cm anthophyllite grains characterizes sites 8 and 9. Sulphide minerals were not observed at these sites.

GEOCHEMICAL DATA:

Representative outcrop chip samples 05088 (site 4) and 05089 (site 7) contain low base and precious metal values. Outcrop chip sample 05087 (site 3) contains 44 ppb Au and 1410 ppm Zn. The remainder of the multi-element analyses are presented in Appendix I.

CLASSIFICATION:

Stratabound massive sulphide type deposit; alteration zone.

REFERENCES:

Assessment Files 90119, 90142 and 91499
Manitoba Energy and Mines, Minerals Division.

Eccles, D.R. and Fedikow, M.A.F.
1985: Mineral occurrence documentation and alteration zone mapping, Snow Lake area; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 82-99.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area; Geological Survey of Canada Paper 78-27, 16p.

Froese, E.
1989: Alteration in the vicinity of Wolverton Lake, Snow Lake area; in Investigations in Manitoba and Saskatchewan during the 1984-1989 Mineral Development Agreements, Open File 2133, p. 4.

Manitoba Mines and Natural Resources
1946: 18th Annual Report On Mines and Minerals, 85p.

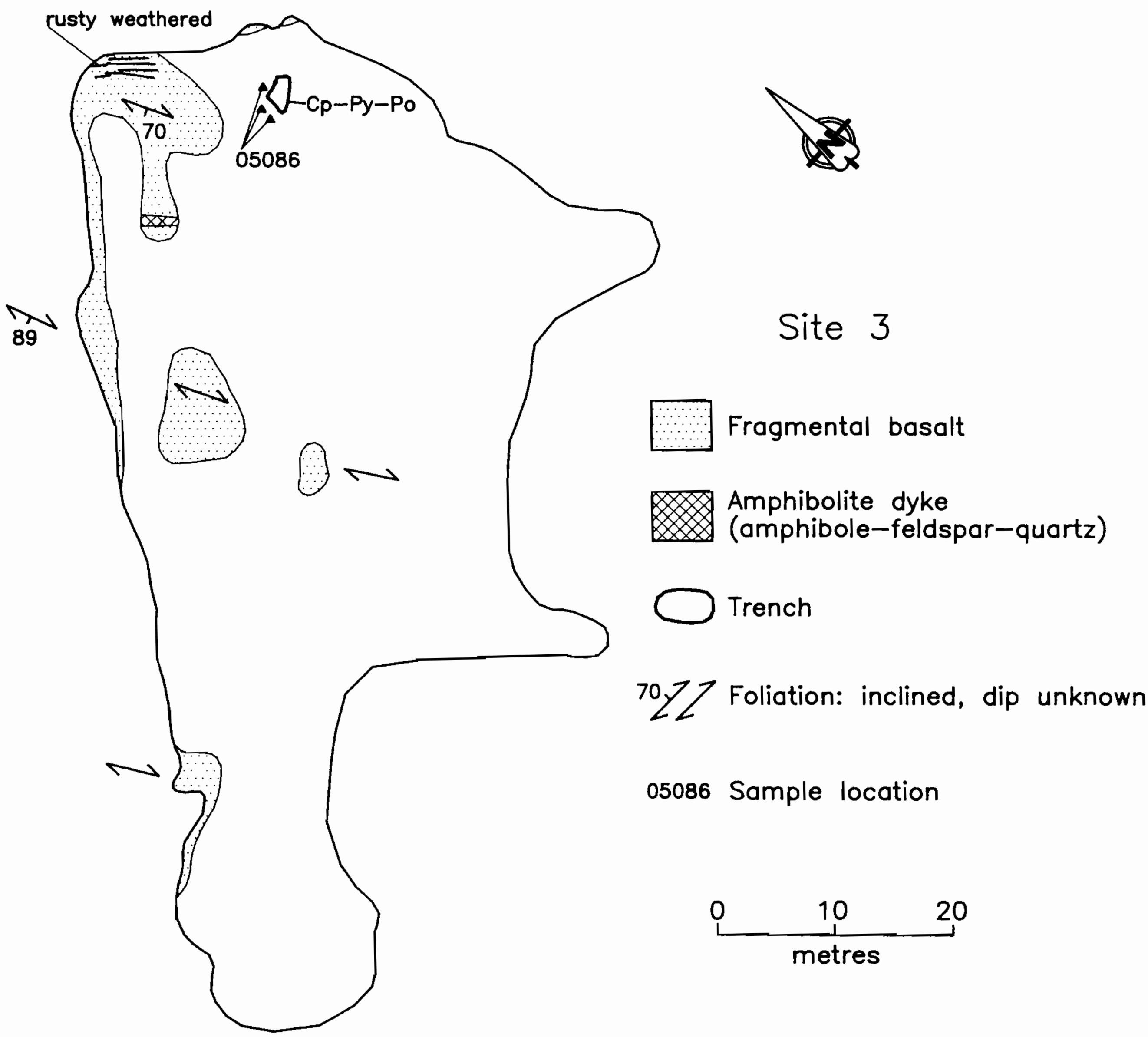


Figure 124-2: Outcrop, geology and trench and sample location, site 3, occurrence 124.

LOCATION: **125**

NAME:

UTM: 6091369N/465871E

ACCESS: Boat along Grass River from Wekusko Lake.

AREA: Grass River

AIRPHOTO: A20808-200

EXPLORATION SUMMARY:

The area was first staked as CNO 2 by Mrs. Arthur Corman in 1952. The claim lapsed in 1953. Canadian Nickel Company Limited did an airborne EM survey in 1957 (A.F. 91624). Archie Talbot staked Far 37 in 1957, and did surface work on the Far group of claims between 1958 and 1959 (Mining Claim Card Far 37). The area was restaked as Fan 13 by Peter Roberts in 1960. Jay-Kay Exploration Syndicate drilled one hole to a depth of 75.3 m in 1960 (A.F. 90084). The claim was cancelled in 1963. HBED did an airborne EM and radiometric survey in the area in 1965 (A.F. 91650).

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by garnetiferous biotite schist with minor staurolite-sillimanite schist (Fig. 125-1). The age relationships of these rocks are uncertain (Frarey, 1950). Gordon and Gall (1982) assigned the mafic volcanic rocks to the Amisk Group. The gneisses are flanked to the south by mafic volcanic rocks and derived schists and gneisses. Diamond drilling intersected pegmatite, peridotite, diorite, "quartz", and gneiss of unspecified composition (A.F. 90084).

MINERALIZATION:

Disseminated pyrite occurs in "schisted diorite" over a core interval of 5.2 m. Mineral percentages are not given in the drill logs (A.F. 90084).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 90084, 91624 and 91650
Manitoba Energy and Mines, Minerals Division

Frarey, M.J.
1950: Crowduck Bay; Geological Survey of Canada, Map 987A, 1:63 360.

Gordon, T.M.
1981: Metamorphism in the Crowduck Bay area, Manitoba; in Geological Survey of Canada, Current Research, Part A, Paper 81-1A, p. 315-316.

Gordon, T.M. and Gall, Q.
1982: Metamorphism in the Crowduck Bay area, Manitoba; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 197-201.

Mining Claim Card, Far 37 (P 53835)
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office

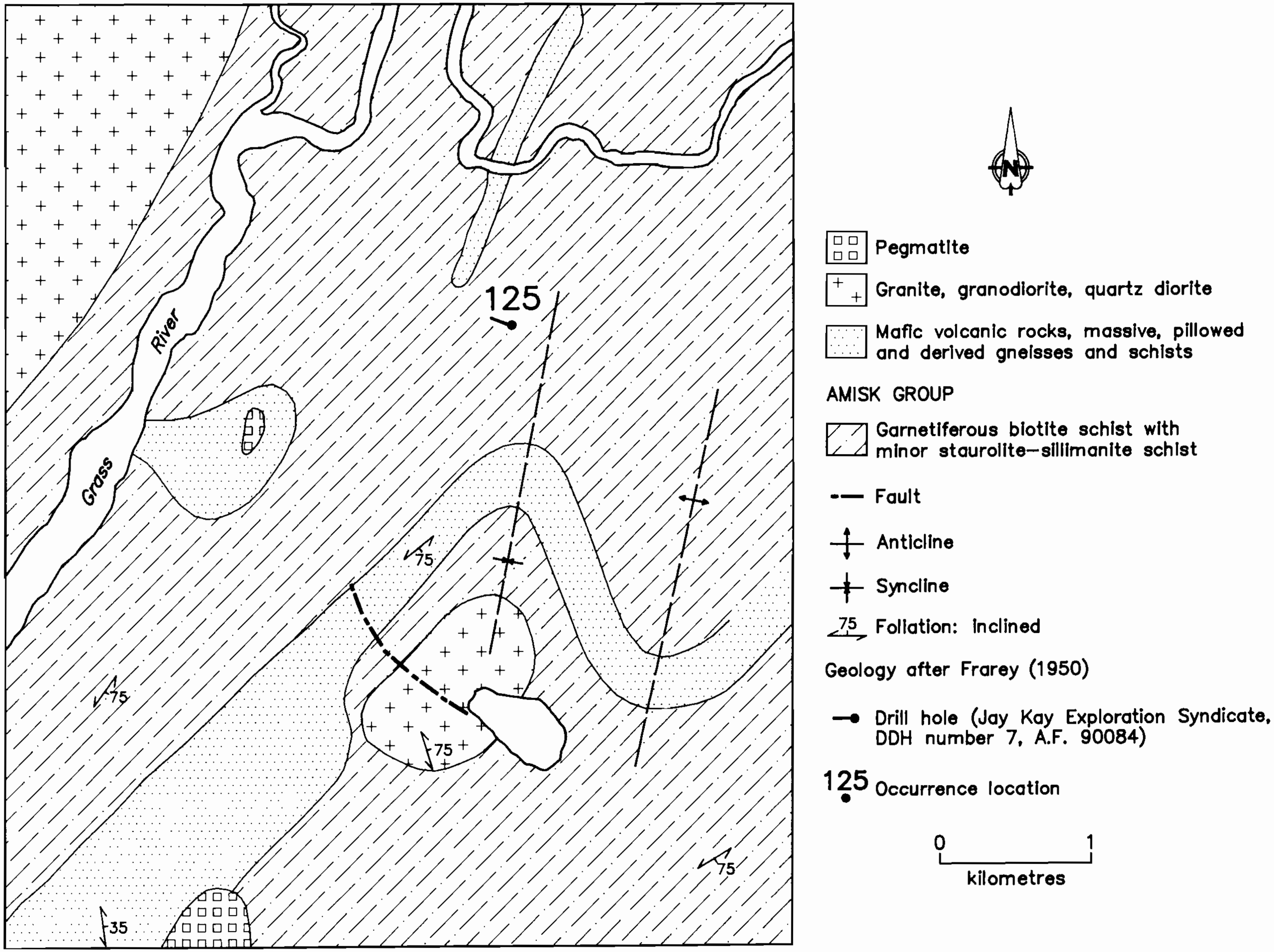


Figure 125-1: Geological setting of occurrence 125.

LOCATION: **126**

NAME:Bur Zone Zn-Cu deposit
UTM: 6089980N/457293E
ACCESS: Traverse and/or trail bike from Osborne minesite.

AREA: Northeast of the Osborne Cu-Zn deposit
AIRPHOTO: A20137-111

EXPLORATION SUMMARY:

H. Roberts staked Easton 32 in 1956. In 1957 Cardiff Mining Company Limited carried out linecutting (A.F. 90072) and Canadian Nickel Company Limited did an airborne EM survey (A.F. 91624). Easton 32 lapsed in 1958. HBED did airborne EM and radiometric surveys in 1965 (A.F. 91650) and staked Bur 81 over the property in 1968.

GEOLOGICAL SETTING:

The general area of the occurrence is characterized by Amisk Group greywacke, shale and siltstone flanked to the east by biotite granite and granite gneiss and to the west by felsic pyroclastic and volcaniclastic rocks (Froese and Moore, 1980; Frarey, 1950). The felsic volcanic rocks have been intruded by a composite intermediate to mafic Aphebian (?) intrusion (Fig. 126-1). The Bur Zone occurs in a thin zone of greywacke-siltstone-argillite sandwiched between the composite intermediate-mafic intrusion to the west and a major granite intrusion to the east. The epiclastic sedimentary rocks continue along strike to the northeast and southwest and are characterized by long and short strike length ground EM conductors (Fig. 126-2). Diamond drill holes, collared to test these conductors, intersected greywacke, siltstone and altered equivalents, as well as graphitic siltstones and calc-silicate rocks (Fedikow, 1991). In detail, the Bur deposit occurs at or near the contact between interlayered garnetiferous and biotite greywacke-siltstone and argillite (Fig. 126-3). Graphite-pyrite layers in the argillite represent a geophysically and lithologically distinctive marker unit. The graphitic beds contain a maximum of 20% pyrite and 3 to 5% sphalerite. Sections of the argillite also contain muscovite-rich layers with disseminated chalcopyrite. A calc-silicate mineral assemblage that includes grossular and diopside is observed in association with the mineralization in drill core. The intrusion that occurs on the west shore of Bur Lake is a foliated, composite intrusion with rafts of incorporated sedimentary rock. The intrusive phases are texturally uniform and unaltered except for rusty weathered joints and fractures. Locally, these fractures are marked by a quartz-epidote-potassium feldspar assemblage.

MINERALIZATION:

The Bur Zone Zn-Cu deposit is characterized by a disseminated to solid zinc-rich sulphide assemblage with 1 to 95% sphalerite, 1 to 10% chalcopyrite, trace to 3 % galena, trace to 2% arsenopyrite, and trace to 5% pyrite. Sphalerite and chalcopyrite are predominantly fine grained, whereas galena and arsenopyrite occur as medium- to coarse- grained blebs, laminae and discrete subhedral to euhedral crystals. Mineralization contains 15 to 20%, 0.5 to 1 cm "chert balls" that consist of silicified wallrock. Some of these wall rock fragments contain quartz veins and some of the fragments are pieces of rounded quartz. This suggests that this texture (durchbegung) is of tectonic origin; subhedral to euhedral arsenopyrite and galena represent products of static recrystallization.

The deposit appears to be distal with areally restricted visible alteration; an alteration pipe, associated with the mineralized layer, has not been recognized to date. Fine grained siliceous beds interlayered with the mineralization are interpreted to represent altered greywacke and siltstone. Within 10 to 15 m of the mineralized zone the structurally overlying and underlying rocks contain very fine grained disseminated iron sulphides and possible sphalerite. Thin laminae and irregularly shaped quartz veins occur in drill core within 20 m of the mineralization and may be accompanied by thin wisps and/or grains of arsenopyrite.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Stratabound massive sulphide type deposit; sedimentary rock associated. The host rocks to the deposit have considerable along strike extensions to the northeast and southwest and are marked by short and long strike length ground EM conductors. In addition, chemical sediment type, massive sulphide and disseminated sulphide type deposits occur along this stratigraphy (*cf.* locations 13, 15, 19, 64, 83, 84 and 97.

REFERENCES:

Assessment Files 90072, 91624 and 91650
Manitoba Energy and Mines, Minerals Division

Fedikow, M.A.F.
1991: Sediment-hosted Zn-Cu (Bur Zone) and Zn-Pb-Ag (Kobar/Ruby) massive sulphide type deposits, Snow Lake area (NTS 63J/13); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1991, p. 43-46.

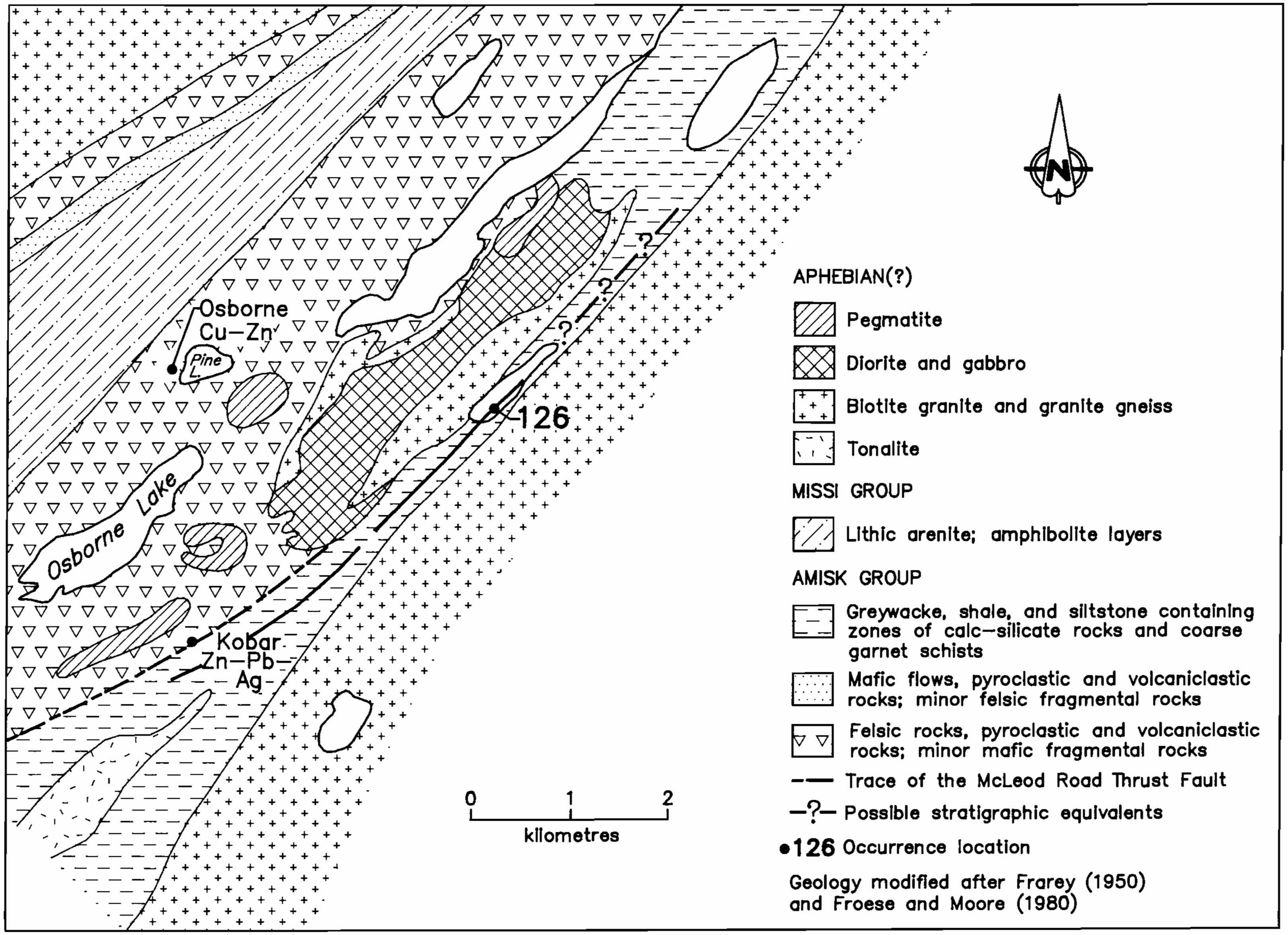


Figure 126-1: Geological setting of the Bur Zone Zn-Cu deposit (location 126), Kobar Zn-Pb-Ag deposit (location 13) and the Osborne Cu-Zn deposit (location 80).

Frarey, M.J.
1950: Crowduck Bay; Geological Survey of Canada, Map 987A, 1:63 360.

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area; Geological Survey of Canada, Paper 78-27, 16p.

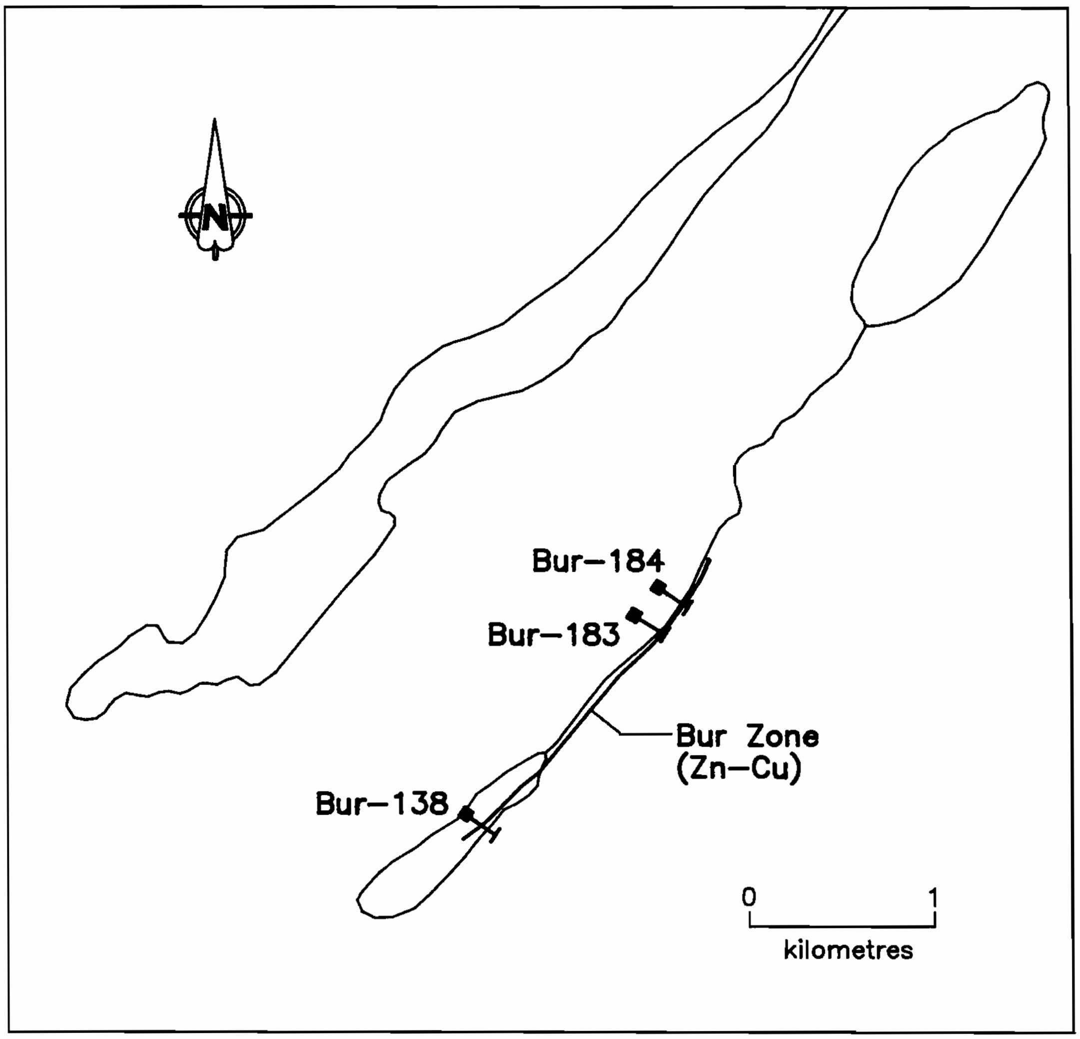


Figure 126-2: Ground EM signature of the Bur Zone Zn-Cu deposit and drill holes logged and sampled.

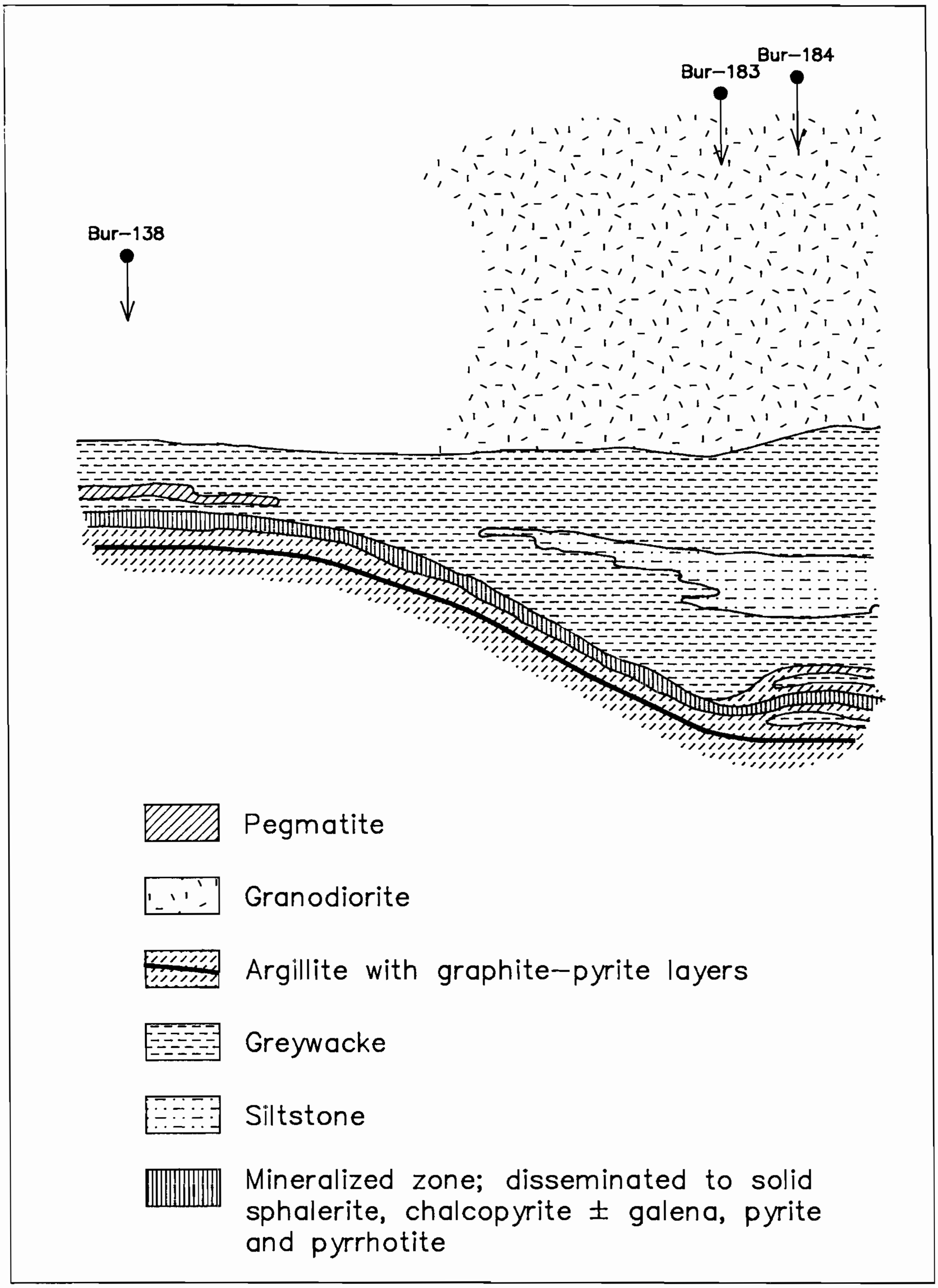


Figure 126-3: Generalized cross section through the Bur Zone deposit; section looks northwest.

APPENDICES

APPENDIX I: MULTI-ELEMENT GEOCHEMICAL ROCK ANALYSES

Rock samples were routinely collected as (1) bulked or composite continuous chip samples over 1 or 2 m intervals from trenches and/or outcrop, (2) single or multiple 1-2 kg samples from representative mineralized zones in trenches and outcrop, or (3) chips or sections or split drill core from specific intervals in a drillhole. These samples were routinely analyzed by Acme Analytical Laboratories Ltd. (Vancouver) by digesting 0.500 g of rock powder with 3 ml of HCl, HNO_3 and H_2O in the proportions 3:1:2 at 95°C for one hour and then diluted to 10 ml with deionised water. This solution is then analysed by inductively coupled argon plasma-atomic absorption spectrophotometry (ICP-AAS) for 30 elements. The lower limit of detection (LLD) for Au using a 0.500 g sample aliquot is 3 ppm, which was considered too high for the purposes of this study. Accordingly, a LLD of 1 ppb was attained for Au with a pre-concentration of a 10 g sample and AAS finish. Assay data for Cu, Pb, Zn, Au and Ag obtained from the analytical laboratories of the Geological Services Branch is presented on figures or in tables accompanying individual mineral occurrence descriptions. All other analytical specifications are given below.

Specifications:

1. Au1: Au by ICP on 10 g sample.
2. Au2: Au, Pt and Pd by INAA on 50 g sample.
3. All other analyses by ICP on 0.500 g sample after a 3:1:2 HCL, HNO_3 and H_2O dissolution. This digestion is partial for Mn, Fe, Ca, P, La, Cr, Mg, Ba, Ti, B, W, Na, K, Al.
4. Hg by flameless AAS.

Note: For samples collected at occurrence 63J/13-122 the P analyses are given in parts per million (ppm).

APPENDIX I

Mineral Occurrence	UTM Coordinates Northing	Easting	Sample Numbers	Mo (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	Au1 (ppb)	Au2 (ppb)	Pt (ppb)	Pd (ppb)	Ag (ppm)	As (ppm)	Sb (ppm)	Bi (ppm)	Cd (ppm)	Ni (%)	Co (ppm)
63J13-01	6092769	437951	850243	26	186	91	116	1				0.6	39	3	2	1	120	27
63J13-02	6092845	438621	841190	3	49	36	33	8				0.1	2	2	2	1	14	2
			841191	2	33	7	9	1				0.1	2	2	2	1	13	1
			841192	3	34	4	6	1				0.1	2	2	3	1	13	2
			841193	3	36	2	5	1				0.1	2	2	2	1	16	2
			852094	1	375	7	285	12				0.2	6	2	2	1	76	22
			852095	1	40	7	25	1				0.1	2	2	2	1	28	7
			852096	1	37	11	102	3				0.1	3	2	2	1	82	21
			852097	4	195	12	51	19				0.2	3	2	2	1	121	19
63J13-03	6091692	438324	841181	1	1006	81	348	70				2.4	8	2	2	1	44	29
			841184	6	1502	75	24520	350				3.1	15	2	2	53	100	64
			841185	4	946	18	3147	2				2.6	2	5	2	6	111	75
			841186	2	408	47	550	35				1.3	5	2	2	1	43	16
			841188	5	517	96	333	37				1.8	6	2	2	1	62	25
63J13-04	6091552	439122	841165	3	38	3	8	1				0.1	10	4	2	1	15	2
63J13-07	6084503	444419	841139	7	149	19	364	1				1.1	29	2	2	1	67	15
			841171	20	467	39	1594	5				2.2	163	5	2	4	270	87
			841176	12	271	31	527	6	<2	<10	<2	1.6	38	2	2	2	151	46
			841177	4	83	15	309	6				0.3	2	3	2	1	30	12
63J13-08	6083798	442437	841152	3	35	2	6	1				0.1	14	3	2	1	16	2
			841153	2	97	11	105	1				0.4	6	2	2	1	27	10
			841154	2	93	10	149	2				0.3	33	2	2	1	30	10
63J13-09	6090492	445407	841158	3	64	2	6	925	2000	<10	<2	0.1	3	2	2	1	17	3
			841172	3	40	2	13	1390				0.1	2	2	2	1	18	2
			841173	3	50	3	1	250				0.1	8	2	2	1	17	3
			841174	2	40	8	296	2620				0.1	2	2	3	2	13	2
			841178	3	52	2	36	68				0.1	3	2	2	1	16	3
			841179	5	47	14	19808	43300				3.4	2	2	17	160	15	3
63J13-10	6094412	447338	841162	4	152	4	3	33	650	<10	10	0.4	14	2	2	1	19	5
63J13-11	6093038	446646	841163	3	42	2	3	1				0.1	8	3	2	1	18	2
			841164	3	72	2	2	185	100	<10	<2	0.1	12	2	2	1	16	3
63J13-12	6087479	437906	00610	2	61	29	135	215				0.3	1907	3	2	1	25	14
			00611	1	69	11	57	410				0.4	2434	4	3	1	28	12
			00612	4	196	1693	451	2220				10.7	13663	27	7	9	23	8
			00613	4	136	247	207	6780				3.0	11913	15	3	2	49	17
			00614	3	179	548	581	4590	3600	<10	<2	25.3	11097	16	6	11	40	19
			00615	4	398	237	505	1010				6.1	3715	11	3	13	16	4
			00616	4	192	1441	1436	5720				14.1	1066	11	5	22	22	6
63J13-13	6086983	453785	00621	46	881	32874	84988	68				224.8	57	513	2	121	7	38
			00622	50	840	26092	99999	245				277.4	63	607	2	153	6	32

Mineral Occurrence	UTM Coordinates Northing	Easting	Sample Numbers	Mo (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	Au1 (ppb)	Au2 (ppb)	Pt (ppb)	Pd (ppb)	Ag (ppm)	As (ppm)	Sb (ppm)	Bi (ppm)	Cd (ppm)	Ni (%)	Co (ppm)
			00623	2	278	4189	876	4				19.0	2	25	11	1	42	7
			00624	4	55	6836	677	3410	3600			54.5	111	59	11	3	14	3
			00625	55	297	18488	99999	25				88.9	33	215	2	195	7	37
			01414	49	844	26049	99999	68				288.3	52	603	2	138	2	35
			01424	5	246	12924	44	62				56.3	15	71	18	1	19	5
			01425	2	72	10970	381	7				54.8	25	443	16	1	12	2
63J13-14	6076973	439002	01422	3	124	74	56	2				0.5	2	2	2	1	13	20
63J13-17	6074632	440877	850728	2	3897	3	52	54	44	30	20	1.3	12	2	2	1	3239	120
63J13-18	6069351	442281	850729	2	1199	10	48	21				0.4	21	2	2	1	759	47
			850730	1	3352	12	94	87	74	30	36	1.6	126	2	2	1	2120	98
63J13-21	6086004	459184	03188	6	55	4	2	1	1			0.1	4	2	3	1	24	2
			03189	5	96	2	4	1	1			0.2	3	2	2	1	22	3
63J13-22	6085403	458498	03190	9	117	10	5	19	1			0.1	7	2	2	1	35	3
			03191	7	75	7	4	3	1			0.1	2	2	2	1	26	2
63J13-23	6084774	452751	00735	3	26	5	8	2				0.1	2	2	2	1	14	4
63J13-24	6081935	453746	00737	1	1199	10	16	25	34	<10	18	0.3	10	2	2	1	724	53
63J13-25	6081755	437099	01076	3	66	6	98	3390	3000	<10	14	0.3	8057	2	2	1	6	5
			01081	2	36	4	53	2820	2700	<10	2	0.1	6991	2	2	1	8	5
63J13-26	6081466	437821	01030	6	44	493	992	6				2.6	17	7	3	1	6	6
			01031	7	56	34	126	2				0.1	4	2	2	1	7	7
			01057	3	36	9	35	4				0.1	16	2	3	1	13	2
63J13-28	6092632	465675	873084	4	247	5	112	9				0.1	10	2	2	1	138	46
			873085	1	164	2	14	7				0.1	9	2	2	1	93	28
			873086	2	63	2	65	6				0.1	7	2	2	1	140	25
			873087	2	38	6	38	11				0.1	5	2	2	1	31	9
63J13-30	6080427	442866	7184PIN50	31	3298	18743	5891	7400	5			56.2	2	2	16	15	6	52
			7184PIN	20	1772	11248	2981	5200	4			30.3	2	2	10	8	7	54
63J13-31	6081180	442004	01089	17	157	7	38	13				0.1	3	2	2	1	71	25
63J13-37	6075650	466756	861632	254	48	298	62	4	<2	<10	<2	0.1	6	2	3	1	13	2
			861633	2	78	7	17	1				0.1	3	2	2	1	25	9
			861634	2	66	7	53	1				0.1	23	2	2	1	161	39
			861635	1	54	7	87	1				0.1	6	2	2	1	107	47
			861636	94	49	262	25	2				0.3	7	2	3	1	11	1
			861637	917	31	2026	29	9	4	<10	<2	0.2	12	2	2	1	11	1
			861638	5	61	7	11	3				0.1	3	2	2	1	80	24
63J13-40	6076164	438572	01111	3	191	2	14	3				0.2	2	2	2	1	52	28
			01112	2	95	3	7	2				0.1	2	2	2	1	19	6
			01113	3	44	2	3	1				0.1	2	2	2	1	16	2
			01114	1	133	3	11	1				0.1	2	2	2	1	25	9
63J13-41	6076173	437693	01115	1	889	2	95	4				0.2	4	2	2	1	8	13
			01116	1	15	5	66	1				0.1	2	2	3	1	117	20

Mineral Occurrence	UTM Coordinates Northing	Easting	Sample Numbers	Mo (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	Au1 (ppb)	Au2 (ppb)	Pt (ppb)	Pd (ppb)	Ag (ppm)	As (ppm)	Sb (ppm)	Bi (ppm)	Cd (ppm)	Ni (%)	Co (ppm)
			01117	18	23	2	11	1				0.1	3	2	2	1	13	18
63J13-42	6076019	436644	01502	2	127	2	24	3				0.1	2	2	2	1	11	10
			01503	2	259	2	24	2				0.1	2	2	2	1	11	13
			01504	4	55	2	4	1				0.1	4	2	2	1	21	2
			01505	1	28	4	9	2				0.1	2	3	2	1	10	10
63J13-44	6075896	439591																
	Site 1		01522	3	78	10	60	1				0.1	2	2	3	1	27	22
			01523	1	55	2	70	1				0.1	8	2	2	1	25	24
			01524	1	675	5	78	2				0.4	6	2	2	1	27	34
			01525	1	147	6	63	2				0.1	2	2	2	1	13	19
	Site 2		860731	24	29	6	24	12				0.1	4	2	2	1	11	2
63J13-46	6067386	458150																
	T1		01613	4	41	10189	3709	8090				29.0	720	33	6	15	19	3
			01614	2	34	1838	122	385				4.0	2713	7	4	1	17	3
	T2		01615	6	43	4509	6781	1390	1600	<10	<2	8.2	4778	13	4	27	18	3
			01616	6	40	2932	7212	55				4.7	3395	10	2	24	15	2
	T3		01617	5	48	18	83	69				0.1	7019	3	2	1	16	3
			01618	3	38	96	59	2920		<10		0.7	8041	3	3	1	15	2
	T4		01619	3	184	32	67	89	36		6	0.1	2150	4	3	1	15	3
			01620	4	42	14	85	119				0.1	2573	2	3	1	15	3
63J13-47	6067959	452691	01552	3	119	68	34	1500				1.9	50529	14	17	1	1	62
			01553	3	39	2	34	169				0.3	8783	3	2	1	1	69
			01554	2	19	3	10	12				0.3	638	2	2	1	1	76
			01555	3	81	2	18	195				0.6	15289	2	2	1	1	80
			01556	2	144	3	26	69				0.9	7737	2	3	1	1	77
			01557	3	78	21	13	31				0.5	4445	2	2	1	2	65
63J13-48	6068496	452828	01548	1	32	5	79	1				0.2	14	2	2	1	44	18
			01549	1	26	3	48	1				0.1	22	3	2	1	43	17
			01550	2	84	2	60	1				0.4	11	2	2	1	43	12
			01551	2	56	6	24	1				0.1	107	2	2	1	50	14
63J13-49	6080464	452524	01597	2	64	2	16	5250	4800	<10	<2	0.1	48259	2	19	1	11	10
			01598	4	185	5	46	10				0.2	2	2	2	1	14	6
			01599	4	129	6	26	4040	3700	<10	<2	0.3	12549	2	29	1	15	8
			01600	5	106	6	45	37				0.1	2597	2	2	1	16	8
			861601	4	275	5	47	195				0.2	3238	2	2	1	14	16
63J13-52	6081721	451225																
	Site 1		01203	3	668	2	13	61				0.3	29	2	2	1	254	24
			01204	2	1188	2	10	72	112	10	10	0.5	21	2	2	1	90	9
			01205	1	716	6	17	61	60	20	8	0.3	33	2	2	1	148	13
			01206	1	105	2	25	3				0.2	2	2	2	1	30	10
			01207	5	72	2	4	1				0.1	5	4	2	1	38	4

Mineral Occurrence	UTM Coordinates Northing	Easting	Sample Numbers	Mo (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	Au1 (ppb)	Au2 (ppb)	Pt (ppb)	Pd (ppb)	Ag (ppm)	As (ppm)	Sb (ppm)	Bi (ppm)	Cd (ppm)	Ni (%)	Co (ppm)
			01208	1	114	5	17	1				0.1	6	2	2	1	79	12
	Site 2		01276	1	1065	3	19	33				0.2	9	2	2	1	606	28
			01277	1	2095	9	26	56	88	14	15	0.9	16	2	2	1	1104	43
			01278	1	1921	7	20	62				0.6	12	3	2	1	1276	68
			01280	1	1042	2	21	22				0.3	9	2	2	1	754	31
			01281	3	13328	6	47	86	126	13	100	0.8	10	2	2	1	1088	50
			01282	1	1617	5	13	52				0.3	9	2	2	1	809	37
			01283	1	1960	9	23	46				1.0	124	2	2	1	1948	91
			01284	2	5053	8	42	42	64	<10	26	1.4	6	2	2	1	1708	82
			01285	1	3464	7	26	32	68	<10	26	1.2	5	3	2	1	1449	65
			01286	2	1771	4	25	18				0.4	9	2	2	1	1716	86
			01287	2	1738	6	24	32				0.9	10	2	2	1	1518	67
			01288	3	4669	6	41	50				1.3	13	2	2	1	3046	136
			01289	2	2138	5	27	27				0.9	28	2	2	1	2227	90
			01290	1	2182	5	31	34				0.5	3	2	2	1	2495	107
			01291	1	1877	7	26	84				0.8	6	2	2	1	1760	70
			01292	1	1558	5	25	5				0.1	2	2	2	1	197	24
			01293	1	55	3	23	3				0.1	5	2	2	1	27	11
	Site 3		01294	1	1045	3	19	78				0.3	125	2	2	1	1082	44
			01295	1	3746	7	38	53	88	19	17	0.7	56	2	2	1	2969	124
			01296	2	2782	10	32	56				0.7	205	3	2	1	2497	110
			01297	2	1776	3	24	205				0.5	82	2	2	1	1890	79
			01298	1	5780	9	57	385	9700	<10	<2	1.2	94	2	2	1	5520	248
			01299	2	1996	12	30	195				0.5	75	2	2	1	2409	97
			01300	1	2889	12	39	335	334	15	19	0.7	78	2	2	1	2544	116
63J13-53	6091948	446197	01209	4	2410	2	10	165				0.3	6	2	2	1	51	51
			01210	3	1440	4	5	129				0.1	6	3	2	1	30	9
			01211	1	636	5	30	660	1300	<10	18	0.6	4	2	2	1	60	33
			01212	3	132	5	11	24				0.1	3	2	2	1	17	3
			01213	1	351	10	47	133				0.6	4	2	2	1	39	31
			01214	1	451	5	23	91				0.6	2	2	2	1	33	25
			01215	4	88	6	5	825				0.1	5	2	3	1	22	4
			01216	1	530	4	26	81				0.3	5	2	2	1	24	18
			01217	1	317	7	28	240				0.4	2	2	2	1	30	24
			01218	1	472	4	27	150				0.5	2	2	2	1	33	20
			01219	2	424	4	9	151				0.4	7	2	2	1	20	19
			01220	1	403	3	23	350				0.3	2	2	2	1	34	17
			01221	3	113	7	5	430				0.1	5	2	3	1	17	3
			01222	1	512	4	29	50				0.5	2	2	2	1	38	18
			01223	1	531	2	24	52				0.3	2	2	2	1	32	18
			01224	3	281	4	6	68				0.1	5	2	2	1	20	5

Mineral Occurrence	UTM Coordinates Northing	Easting	Sample Numbers	Mo (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	Au1 (ppb)	Au2 (ppb)	Pt (ppb)	Pd (ppb)	Ag (ppm)	As (ppm)	Sb (ppm)	Bi (ppm)	Cd (ppm)	Ni (%)	Co (ppm)
			01225	1	341	8	21	29				0.3	2	2	2	1	21	15
			01706	1	317	5	32	205				0.3	3	2	2	1	29	20
			01707	3	53	2	8	1				0.1	4	2	3	1	17	3
			01708	3	61	2	5	11				0.1	3	3	2	1	19	2
			01709	1	269	4	21	295				0.2	2	2	2	1	30	14
			01710	4	73	2	5	15				0.1	3	2	2	1	20	3
			01711	1	633	4	25	185				0.5	4	2	2	1	29	20
			01712	1	583	5	24	68				0.4	4	2	2	1	34	20
			01713	3	35	7	53	7				0.1	5	2	2	1	24	5
			01714	1	475	3	28	315				0.3	2	2	2	1	29	20
			01715	1	478	7	43	250				0.5	6	2	2	1	49	48
			01716	1	401	4	27	235				0.2	3	2	2	1	31	18
			01717	1	418	3	20	16				0.2	2	2	2	1	30	15
			01718	1	444	2	33	325				0.1	2	2	2	1	43	31
			01719	1	315	2	31	24				0.3	3	2	2	1	26	21
			01720	1	438	7	34	165				0.3	3	2	3	1	25	23
			01721	3	82	3	11	5190				0.1	6	3	3	1	21	3
			01722	1	260	8	33	325				0.4	2	2	2	1	34	33
			01723	6	42	6	34	11				0.1	5	5	2	1	17	13
			01724	2	23	5	53	9				0.1	2	2	2	1	11	2
			01725	1	34	5	16	7				0.1	2	2	2	1	21	9
63J13-54	6084252	464245	01267	1	52	3	12	1				0.1	841	2	2	1	9	6
			01268	2	23	6	7	95				0.1	39550	2	3	1	8	9
			01269	6	41	7	5	30500	690	<10	64	1.0	38382	6	2	1	12	13
			01698	3	27	2	6	34				0.1	48	2	2	1	11	10
			01699	1	47	3	16	315				0.1	1563	2	2	1	5	25
			01700	7	18	3	10	21100				0.3	39241	2	5	1	3	20
63J13-55	6083782	465413	01258	7	64	5	20	1560				0.3	34919	2	2	1	13	18
			01259	4	36	3	2	460				0.3	35032	2	2	1	15	5
			01260	4	54	6	23	1920				0.3	34798	2	2	1	8	8
			01261	7	45	13	10	3390				0.5	34135	2	2	1	17	10
			01262	5	52	3	5	5290				0.4	34713	2	4	1	16	4
			01263	5	51	5	8	620				0.1	28401	3	3	1	20	8
			01264	1	27	4	39	18				0.1	1443	2	2	1	5	15
			01265	1	36	7	37	410	670	<10	<2	0.1	19023	2	2	1	9	7
63J13-56	6084498	463471	01251	5	254	11	54	10				0.1	8528	2	2	1	32	21
			01252	6	132	10	21	5				0.1	10030	2	3	1	33	11
			01253	23	312	29	22	1				0.4	14	2	2	1	107	19
			01254	19	191	29	13	1				0.4	19	2	2	1	93	16
			01255	29	789	16	173	29	24	<10	6	0.2	941	2	2	1	113	36
			01256	4	41	3	339	21				0.2	23375	3	2	1	26	14

Mineral Occurrence	UTM Coordinates Northing	Easting	Sample Numbers	Mo (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	Au1 (ppb)	Au2 (ppb)	Pt (ppb)	Pd (ppb)	Ag (ppm)	As (ppm)	Sb (ppm)	Bi (ppm)	Cd (ppm)	Ni (%)	Co (ppm)
			01257	5	358	16	58	7				0.4	7922	2	2	1	39	27
63J13-59	6075775	452820	03071	6	52	11	14	6220				0.1	35394	48	22	1	17	55
			03072	4	77	6	41	1400				0.6	23079	11	2	1	12	11
			03073	4	95	9	81	1620				0.1	24768	17	3	1	10	14
			03074	6	223	12	78	1040				0.1	21882	11	3	1	16	17
			03075	4	40	4	1	8120				0.2	1202	2	38	1	15	3
			03076	5	37	2	4	2920				0.1	6137	3	3	1	18	11
			03077	6	38	10	18	11990				0.6	37389	23	30	1	12	13
			03078	77	29	5	4	13850				1.6	10687	3	57	1	15	4
			03079	3	33	2	1	12				0.1	40	2	2	1	14	1
			03080	2	331	14	85	78				0.6	226	2	2	1	19	14

Mineral Occurrence	UTM Coordinates Northing	Easting	Sample Numbers	Mo (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	Au1 (ppb)	Au2 (ppb)	Pt (ppb)	Pd (ppb)	Ag (ppm)	As (ppm)	Sb (ppm)	Bi (ppm)	Cd (ppm)	Ni (ppm)	Co (ppm)
63J13-61	6082798	444253																
	Site 1		03186	8	76	2	4	1				0.1	3	2	2	1	33	3
			03187	4	86	4	35	10				0.3	16	2	2	1	22	12
	Site 2		04663	2	96	2	82	15				0.1	3	2	2	1	10	12
			04664	5	115	9	369	2				0.1	7	2	2	1	28	13
			04665	4	109	3	322	3				0.2	6	2	2	1	28	12
63J13-61			01270	5	311	14	182	15				0.3	31	2	2	1	100	26
63J13-65	6077283	460197																
	Site 1		04828	3	89	2	12	17				0.1	2	2	2	1	24	9
			04829	3	94	13	9	28				0.3	2	2	2	1	58	18
	Site 2		04830	6	66	2	5	7				0.1	6	2	2	1	28	3
			04831	3	207	2	22	47				0.5	6	2	2	1	148	40
			04832	3	212	2	15	32				0.4	9	2	2	1	88	32
			04833	5	59	4	5	10				0.1	4	2	2	1	22	3
			04834	3	39	6	14	350				0.1	2	2	2	1	17	2
			04835	3	104	2	12	34				0.2	10	2	2	1	62	23
	Site 3		04836	3	79	23	28	25				0.2	4	2	2	1	34	19
			04837	4	54	18	12	23				0.3	14	2	3	1	48	16
63J13-75	6079129	436117	01580	10	47150	114	12089	2760				16.2	4530	154	2	22	33	1705
			01581	23	72627	1242	28114	2540				28.2	4772	543	110	51	176	847
			01582	24	72001	112	30851	4560				30.8	8534	156	53	54	37	1099
			01583	29	78523	121	33635	3300				27.7	7084	123	98	59	29	986
			03004	13	82974	124	39657	5920				47.3	6996	232	89	73	38	152
			03005	11	92091	91	26825	3420				26.2	5947	169	94	53	55	282
			03006	14	51609	68	46649	810				11.0	3102	107	2	76	37	511
			03007	9	78671	306	17549	4620				32.4	7363	249	92	38	64	688
63J13-76	6078591	439526	01576	9	43252	518	5265	1360				10.4	2854	65	11	10	25	182
			01577	18	63078	74	9678	780				21.2	2254	92	49	16	55	175
			01578	39	55884	83	67287	720				18.8	724	30	2	119	45	350
			01579	26	86401	63	26777	1520				30.8	4674	230	205	42	51	261
63J13-77	6078874	440911	01566	6	70665	36	923	445				0.8	138	2	82	5	1	337
			01567	5	56531	27	938	620				11.8	119	4	34	4	4	186
			01568	3	44941	38	472	83				1.1	108	35	81	2	1	364
			01569	4	59523	33	721	1020				8.0	206	2	66	4	3	282
			01570	6	68792	25	1547	1220				15.8	101	2	70	5	8	293
			01571	4	52040	49	955	1120				10.7	106	3	32	3	2	247
			01572	2	37322	38	277	380				0.4	193	49	2	1	3	317
	T1		03654	1	122	2	47	270				0.1	2	2	2	0.2	8	34
			03655	2	13	6	7	17980				0.3	12	2	2	0.2	3	95
			03656	2	4	2	1	220				0.1	10	2	2	0.2	1	104
	T2		03657	1	67	4	149	65				0.2	2	2	2	0.3	4	36

Mineral Occurrence	UTM Coordinates Northing	Easting	Sample Numbers	Mo (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	Au1 (ppb)	Au2 (ppb)	Pt (ppb)	Pd (ppb)	Ag (ppm)	As (ppm)	Sb (ppm)	Bi (ppm)	Cd (ppm)	Ni (ppm)	Co (ppm)
			03658	5	28	662	120	19600				15.0	14	2	3	0.2	3	78
	T3		03659	5	14	20	6	230				0.5	13	2	2	0.2	2	109
	T4		03660	49	177	13	572	860				3.1	9	2	2	1.7	1	65
	T5		03661	3	6	2	14	5				0.1	12	2	2	0.3	2	120
			03662	1	198	4	61	1				0.1	2	2	2	0.2	3	36
			03663	1	144	4	62	25				0.1	2	3	2	0.2	3	32
			03664	1	128	2	97	9				0.2	6	4	2	0.3	7	30
			03665	1	56	5	77	28				0.2	12	4	2	0.2	9	28
			03666	1	62	2	45	2				0.1	2	2	2	0.3	3	36
	T6		03667	2	2	2	5	1				0.1	10	2	2	0.2	2	145
	T7		03668	1	4	2	8	5				0.1	10	2	2	0.2	1	102
	T8		03669	1	171	7	59	34				0.2	2	8	2	0.2	6	28
	T9		03670	6	28	269	10	7260				5.1	9	2	2	0.2	2	83
	T10		03671	2	28	14	36	620				0.3	13	2	2	0.2	2	98
			03672	2	53	17	87	53				0.3	14	2	2	0.2	1	96
	T11		03673	2	119	992	22	1690				3.3	7	2	2	0.2	4	108
			03674	2	12	32	5	40				0.1	10	2	2	0.2	3	126
			03675	3	8	2	16	92				0.3	5	2	2	0.2	2	62
	T12		03676	2	84	17	91	1150				1.8	8	2	2	0.2	5	74
	T13		03677	3	24	2	14	66				0.2	13	2	2	0.2	4	158
			03678	14	26	2	10	3660				0.3	14	2	2	0.2	2	204
	T14		03679	5	53	258	15	1340				2.3	11	2	2	0.2	4	94
			03680	2	40	114	15	1310				1.8	7	2	2	0.2	1	60
			03681	10	60	144	17	760				1.7	11	2	2	0.2	2	93
	T15		03682	1	79	2	26	5				0.1	7	24	2	0.2	4	36
			03683	2	51	2	37	47				0.6	5	4	2	0.2	1	34
			03684	16	64	2	42	1660				0.8	4	2	2	0.2	5	35
	T16		03685	5	13	10	8	45				0.2	13	2	2	0.2	4	103
			03686	15	53	108	17	270				0.6	6	2	2	0.2	3	49
	T17		03687	4	228	13	93	840				1.3	5	2	3	0.3	4	51
	T18		03688	4	64	8	54	100				0.3	11	2	2	0.2	3	99
			03689	2	167	9	40	32				0.6	10	2	2	0.7	6	73
63J13-80	6090625	453343	01584	7	104	9	151	5				0.2	7	2	2	1	1	28
			01585	12	70	9	183	3				0.1	2	2	2	1	1	14
			01586	1	10268	38	833	31				0.5	30	2	2	2	2	211
			01587	1	4464	240	211	76				0.7	17	2	5	2	1	174
			01588	7	19173	47	8897	77				0.6	1498	62	2	15	6	946
			01589	1	4588	376	226	440				2.4	15	2	38	5	1	134
			01590	12	62232	48	13154	1240				8.4	1325	32	13	25	5	395
			01591	37	13169	20	66141	46				0.4	829	3	2	98	6	629
			01592	12	14592	32	18409	97				0.9	840	9	2	24	18	768

Mineral Occurrence	UTM Coordinates Northing	Easting	Sample Numbers	Mo (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	Au1 (ppb)	Au2 (ppb)	Pt (ppb)	Pd (ppb)	Ag (ppm)	As (ppm)	Sb (ppm)	Bi (ppm)	Cd (ppm)	Ni (ppm)	Co (ppm)
			01593	9	54877	99	5834	1320				17.8	1186	22	14	15	1	1110
			01594	14	4953	32	23536	11				1.9	233	2	2	44	38	131
			01595	8	18983	39	12167	110				1.0	169	2	2	21	3	211
			01596	22	30271	54	31354	33				2.4	1429	24	2	51	4	813
			01397	3	6202	40	16070	37				9.8	13	4	15	38.6	42	20
63J13-111	6073211	467091	861629	3	419	4	23	2				0.2	2	2	2	1	22	4
			861630	7	624	3	10	11				0.1	7	2	3	1	21	81
			861631	2	61	2	7	2				0.1	2	2	3	1	18	2
63J13-120	6083163	445136	01396	2	111	10	50	27				0.2	3	2	2	0.2	5	32
63J13-121	6090947	453856	01399	2	29	2	98	1				0.1	25	2	2	0.7	3	47
63J13-122	6073649	465945																
North Zone			13569	4	6363	3	143	75				5.9	<5	<5	<5	1	29	23
			13570	5	1864	<2	243	130				2.7	<5	<5	<5	1	48	28
			13571	8	1.33%	<2	135	85				4.4	<5	<5	<5	1	28	19
			13572	7	3569	2	194	65				1.0	<5	<5	<5	<1	34	27
			13573	3	3281	<2	263	20				0.7	<5	<5	8	1	18	15
Main Zone			13574	21	7351	10	5.74%	10				2.5	<5	<5	<5	209	4	24
			13575	10	2.12%	93	1615	220				6.3	<5	<5	<5	34	6	9
			13576	9	6535	67	4.27%	10				2.5	<5	<5	<5	126	4	17
			13577	8	4184	5	8278	<5				1.7	<5	<5	<5	43	2	8
			13578	1	3835	<2	361	15				1.7	<5	<5	5	1	58	30
			13579	4	2557	<2	357	5				1.5	<5	<5	<5	2	7	5
63J13-123	6078143	438210	861514	2	133	3	20	9				0.1	2	2	2	1	12	11
			861515	3	85	3	21	2				0.1	5	2	2	1	16	12
			861516	18	91	7	29	3				0.1	6	2	2	1	15	16
63J13-125	6091369	465871																
	Site 3		05087				1410	44				<5	1.1	<0.1			<20	52
	Site 4		05088				90					<5	<0.5	<0.1			<20	34
	Site 5		05089				158					<5	1.0	<0.1			<20	56

Mineral Occurrence	UTM Coordinates Northing	Easting	Sample Numbers	K (%)	Ca (%)	Sr (ppm)	Al (%)	Hg (ppb)
63J13-01	6092769	437951	850243	0.01	2.19	12	1.44	
63J13-02	6092845	438621	841190	0.05	0.20	5	0.32	
			841191	0.04	0.09	2	0.18	
			841192	0.01	0.08	1	0.14	
			841193	0.01	0.03	1	0.10	
			852094	0.10	0.07	3	4.05	
			852095	0.02	0.73	6	0.84	
			852096	0.05	0.28	3	2.81	
			852097	0.28	1.13	16	1.63	
63J13-03	6091692	438324	841181	0.27	4.03	65	3.11	
			841184	0.03	2.03	29	1.13	
			841185	0.04	0.33	4	1.85	
			841186	1.66	1.85	47	3.51	
			841188	0.16	4.31	41	1.59	
63J13-04	6091552	439122	841165	0.02	0.17	2	0.09	
63J13-07	6084503	444419	841139	0.07	0.18	2	0.93	
			841171	0.07	0.15	2	1.21	
			841176	0.08	0.20	3	1.32	
			841177	0.13	0.23	4	1.31	
63J13-08	6083798	442437	841152	0.01	0.11	2	0.08	
			841153	0.39	3.78	47	2.65	
			841154	0.71	2.80	67	3.08	
63J13-09	6090492	445407	841158	0.02	0.01	1	0.01	
			841172	0.01	0.16	5	0.01	
			841173	0.01	0.18	2	0.05	
			841174	0.01	0.01	1	0.01	
			841178	0.01	0.05	1	0.05	
			841179	0.01	0.07	1	0.03	
63J13-10	6094412	447338	841162	0.02	0.03	1	0.05	
63J13-11	6093038	446646	841163	0.02	0.08	1	0.04	
			841164	0.01	0.07	1	0.03	
63J13-12	6087479	437906	00610	0.34	0.58	8	1.71	
			00611	0.69	1.15	49	2.30	
			00612	0.10	0.09	5	0.36	
			00613	0.20	0.94	16	0.80	
			00614	0.02	0.23	3	0.16	
			00615	0.19	0.02	1	0.30	
			00616	0.03	0.97	19	0.16	
63J13-13	6086983	453785	00621	0.12	0.22	11	0.77	
			00622	0.09	0.23	11	0.73	
			00623	0.01	0.36	2	0.32	

Mineral Occurrence	UTM Coordinates Northing	Easting	Sample Numbers	K (%)	Ca (%)	Sr (ppm)	Al (%)	Hg (ppb)
			00624	0.01	0.03	1	0.04	
			00625	0.09	0.12	7	0.65	
			01414	0.10	0.28	16	0.80	
			01424	0.01	0.05	1	0.04	
			01425	0.01	0.01	1	0.02	
63J13-14	6076973	439002	01422	0.31	1.31	9	1.51	
63J13-17	6074632	440877	850728	0.05	0.55	14	2.86	
63J13-18	6069351	442281	850729	0.48	2.08	37	3.33	
			850730	0.24	2.23	20	3.45	
63J13-21	6086004	459184	03188	0.01	0.01	1	0.01	
			03189	0.01	0.01	1	0.01	
63J13-22	6085403	458498	03190	0.01	0.01	1	0.02	
			03191	0.01	0.01	1	0.01	
63J13-23	6084774	452751	00735	0.19	0.10	13	1.07	
63J13-24	6081935	453746	00737	0.07	1.37	46	1.99	
63J13-25	6081755	437099	01076	0.48	0.16	3	0.96	
			01081	0.14	0.98	5	0.79	
63J13-26	6081466	437821	01030	0.11	0.10	4	0.21	
			01031	0.55	0.16	6	1.06	
			01057	0.01	0.02	1	0.10	
63J13-28	6092632	465675	873084	0.20	3.45	59	4.79	
			873085	0.01	1.80	45	2.29	
			873086	0.41	0.40	9	1.37	
			873087	0.71	0.34	7	1.36	
63J13-30	6080427	442866	7184PIN50	0.01	0.10	6	0.04	
			7184PIN51	0.01	0.10	3	0.03	
63J13-31	6081180	442004	01089	0.03	2.76	15	1.01	
63J13-37	6075650	466756	861632	0.16	0.10	5	0.40	
			861633	0.14	0.46	6	0.84	
			861634	0.29	3.72	80	4.29	
			861635	0.06	0.84	11	1.26	
			861636	0.11	0.09	14	0.25	
			861637	0.12	0.25	41	0.31	
			861638	0.04	11.34	51	1.07	
63J13-40	6076164	438572	01111	0.02	1.08	7	0.65	
			01112	0.02	1.22	8	1.29	
			01113	0.01	1.16	2	0.06	
			01114	0.03	1.04	9	0.60	
63J13-41	6076173	437693	01115	0.04	0.09	2	1.66	
			01116	0.02	0.46	1	1.56	
			01117	0.03	0.54	2	0.26	

Mineral Occurrence	UTM Coordinates Northing	Easting	Sample Numbers	K (%)	Ca (%)	Sr (ppm)	Al (%)	Hg (ppb)
63J13-42	6076019	436644	01502	0.04	0.97	3	1.12	
			01503	0.03	0.88	3	0.97	
			01504	0.02	0.01	1	0.03	
			01505	0.04	0.28	3	0.33	
63J13-44	6075896	439591						
	Site 1		01522	0.93	4.65	88	4.87	
			01523	0.76	1.33	14	4.08	
			01524	1.48	2.42	33	4.36	
			01525	0.31	0.66	23	3.32	
	Site 2		860731	0.03	0.05	2	1.69	
63J13-46	6067386	458150						
	T1		01613	0.04	0.03	2	0.08	
			01614	0.06	0.10	2	0.11	
	T2		01615	0.07	0.10	2	0.12	
			01616	0.07	0.04	2	0.11	
	T3		01617	0.23	0.43	13	0.47	
			01618	0.08	0.10	3	0.14	
	T4		01619	0.13	0.17	4	0.25	
			01620	0.17	0.15	4	0.29	
63J13-47	6067959	452691	01552	0.05	0.01	2	0.59	130
			01553	0.05	0.17	3	0.20	48
			01554	0.08	0.17	2	0.15	8
			01555	0.09	0.03	3	0.24	32
			01556	0.08	0.31	3	0.19	22
			01557	0.08	0.02	2	0.24	5
63J13-48	6068496	452828	01548	1.51	0.23	19	2.19	
			01549	0.94	0.73	14	1.65	
			01550	0.71	0.99	18	1.21	
			01551	0.76	1.32	35	1.57	
63J13-49	6080464	452524	01597	0.07	0.03	1	0.15	
			01598	0.77	0.25	6	1.05	
			01599	0.48	0.11	3	0.68	
			01600	0.89	0.20	6	1.15	
			861601	0.99	0.23	7	1.31	
63J13-52	6081721	451225						
	Site 1		01203	0.07	0.98	48	1.89	
			01204	0.08	0.85	47	1.80	
			01205	0.07	0.94	45	1.61	
			01206	0.12	1.16	28	1.01	
			01207	0.05	0.03	2	0.15	
			01208	0.06	0.91	28	1.23	

Mineral Occurrence	UTM Coordinates Northing	Easting	Sample Numbers	K (%)	Ca (%)	Sr (ppm)	Al (%)	Hg (ppb)
	Site 2		01276	0.08	1.44	53	2.31	
			01277	0.03	2.35	75	3.30	
			01278	0.05	1.55	56	2.46	
			01280	0.08	2.70	80	3.45	
			01281	0.09	1.73	57	2.59	
			01282	0.03	3.48	98	4.52	
			01283	0.03	2.90	101	3.50	
			01284	0.06	0.89	31	1.54	
			01285	0.05	0.81	33	1.55	
			01286	0.07	1.51	47	2.00	
			01287	0.06	1.98	66	2.49	
			01288	0.03	1.65	53	2.13	
			01289	0.07	2.81	92	3.50	
			01290	0.16	1.09	39	1.67	
			01291	0.05	1.88	58	2.40	
			01292	0.09	1.03	30	1.52	
			01293	0.06	1.10	20	1.06	
	Site 3		01294	0.05	4.09	123	4.26	
			01295	0.14	1.89	83	2.79	
			01296	0.09	3.41	125	4.45	
			01297	0.08	3.27	107	3.90	
			01298	0.12	2.99	105	3.94	
			01299	0.11	3.49	117	4.42	
			01300	0.09	3.86	125	4.78	
63J13-53	6091948	446197	01209	0.01	0.01	1	0.01	
			01210	0.01	0.10	1	0.01	
			01211	0.05	1.32	7	0.73	
			01212	0.01	0.10	1	0.02	
			01213	0.45	3.37	17	1.52	
			01214	0.02	1.42	13	0.99	
			01215	0.01	0.10	1	0.02	
			01216	0.01	1.70	10	1.09	
			01217	0.07	1.82	8	0.97	
			01218	0.02	1.68	15	1.13	
			01219	0.01	0.10	1	0.09	
			01220	0.04	1.52	7	1.01	
			01221	0.01	0.10	1	0.01	
			01222	0.03	1.89	16	1.33	
			01223	0.03	1.74	20	1.29	
			01224	0.02	0.16	2	0.12	
			01225	0.02	2.01	27	1.50	

Mineral Occurrence	UTM Coordinates Northing	Easting	Sample Numbers	K (%)	Ca (%)	Sr (ppm)	Al (%)	Hg (ppb)
			01706	0.05	2.34	8	1.38	
			01707	0.01	0.02	1	0.03	
			01708	0.01	0.10	1	0.01	
			01709	0.04	1.56	5	0.92	
			01710	0.01	0.10	1	0.01	
			01711	0.02	2.15	7	0.95	
			01712	0.04	1.62	16	1.50	
			01713	0.48	0.10	8	0.94	
			01714	0.05	1.79	15	1.37	
			01715	0.14	3.48	15	1.90	
			01716	0.05	2.16	9	1.16	
			01717	0.06	1.61	25	1.77	
			01718	0.03	1.96	9	1.28	
			01719	0.03	2.25	31	1.59	
			01720	0.02	2.20	14	1.42	
			01721	0.01	0.10	1	0.01	
			01722	0.09	1.58	8	1.14	
			01723	0.20	1.33	12	1.26	
			01724	0.37	0.10	3	0.63	
			01725	0.05	1.43	5	0.67	
63J13-54	6084252	464245	01267	0.05	1.02	8	0.67	
			01268	0.02	0.47	8	0.47	
			01269	0.03	0.70	5	0.38	
			01698	0.03	1.54	4	0.23	
			01699	0.08	1.28	6	0.85	
			01700	0.04	6.37	33	0.54	
63J13-55	6083782	465413	01258	0.13	0.42	5	0.60	
			01259	0.01	0.02	1	0.01	
			01260	0.12	0.29	5	0.63	
			01261	0.02	0.09	2	0.16	
			01262	0.04	0.09	2	0.14	
			01263	0.02	0.20	2	0.10	
			01264	0.13	2.01	10	1.25	
			01265	0.18	0.40	8	0.89	
63J13-56	6084498	463471	01251	0.01	0.10	1	0.03	
			01252	0.01	0.10	1	0.04	
			01253	0.31	1.07	9	3.12	
			01254	0.17	1.22	9	2.92	
			01255	1.64	0.19	1	2.42	
			01256	0.01	0.04	1	0.02	
			01257	0.01	0.01	1	0.01	

Mineral Occurrence	UTM Coordinates Northing	Easting	Sample Numbers	K (%)	Ca (%)	Sr (ppm)	Al (%)	Hg (ppb)
63J13-59	6075775	452820	03071	0.09	0.02	1	0.24	
			03072	0.27	0.30	4	0.92	
			03073	0.78	0.51	6	1.45	
			03074	0.91	0.78	7	1.56	
			03075	0.04	0.03	1	0.13	
			03076	0.05	0.03	1	0.35	
			03077	0.19	0.08	2	0.43	
			03078	0.01	0.20	2	0.08	
			03079	0.01	0.01	1	0.01	
			03080	0.08	0.69	16	1.44	
63J13-61	6082798	444253						
	Site 1		03186	0.01	0.01	1	0.01	
			03187	0.06	0.13	3	0.26	
	Site 2		04663	0.26	0.28	10	0.99	
			04664	0.17	0.12	6	0.71	
			04665	0.13	0.08	3	0.40	
63J13-61			01270	0.15	2.14	67	2.97	
63J13-65	6077283	460197						
	Site 1		04828	0.14	3.00	114	4.37	
			04829	0.14	2.33	84	4.28	
	Site 2		04830	0.01	0.14	2	0.10	
			04831	0.30	2.36	83	4.20	
			04832	0.25	1.83	60	3.38	
			04833	0.01	0.03	1	0.01	
			04834	0.01	0.04	1	0.01	
			04835	0.14	1.98	84	3.47	
	Site 3		04836	0.22	5.58	153	7.84	
			04837	0.19	6.00	133	7.98	
63J13-75	6079129	436117	01580	0.02	1.94	20	0.39	
			01581	0.02	0.69	5	0.08	
			01582	0.02	0.40	3	0.08	
			01583	0.01	0.90	5	0.04	
			03004	0.01	0.73	18	0.88	
			03005	0.12	0.62	15	1.06	
			03006	0.01	1.76	4	0.04	
			03007	0.02	0.58	11	0.63	
63J13-76	6078591	439526	01576	0.39	1.99	33	2.41	
			01577	0.29	0.26	8	0.98	
			01578	0.02	0.92	31	0.14	
			01579	0.01	0.08	1	0.10	
63J13-77	6078874	440911	01566	0.01	0.21	4	0.15	

Mineral Occurrence	UTM Coordinates Northing	Easting	Sample Numbers	K (%)	Ca (%)	Sr (ppm)	Al (%)	Hg (ppb)
			01567	0.07	0.35	4	0.44	
			01568	0.02	0.36	5	0.26	
			01569	0.02	1.07	6	0.13	
			01570	0.02	0.10	3	0.23	
			01571	0.02	0.26	5	0.45	
			01572	0.01	0.21	4	0.26	
	T1		03654	0.60	2.08	14	1.99	
			03655	0.02	0.22	2	0.11	
			03656	0.01	0.03	1	0.01	
	T2		03657	1.26	1.52	10	1.70	
			03658	0.02	1.07	4	0.04	
	T3		03659	0.02	0.70	4	0.06	
	T4		03660	0.02	0.91	4	0.21	
	T5		03661	0.01	0.03	1	0.01	
			03662	0.71	1.28	18	2.09	
			03663	0.70	1.85	21	2.04	
			03664	1.07	1.50	13	1.86	
			03665	1.60	0.72	7	2.15	
			03666	0.48	0.88	13	1.28	
	T6		03667	0.01	0.18	1	0.04	
	T7		03668	0.01	0.03	1	0.01	
	T8		03669	0.98	2.55	17	1.80	
	T9		03670	0.03	0.38	4	0.04	
	T10		03671	0.01	0.66	3	0.01	
			03672	0.01	0.82	4	0.02	
	T11		03673	0.04	1.71	60	0.21	
			03674	0.01	0.22	3	0.01	
			03675	0.05	1.25	18	0.27	
	T12		03676	0.22	2.41	22	0.76	
	T13		03677	0.01	0.19	2	0.01	
			03678	0.01	0.08	1	0.01	
	T14		03679	0.01	0.39	5	0.02	
			03680	0.03	0.55	5	0.14	
			03681	0.03	0.81	9	0.18	
	T15		03682	0.06	0.41	10	0.59	
			03683	0.16	0.94	18	0.54	
			03684	0.17	2.58	27	0.65	
	T16		03685	0.01	0.18	2	0.01	
			03686	0.02	0.81	8	0.28	
	T17		03687	0.05	0.77	7	0.62	
	T18		03688	0.01	0.04	1	0.01	

Mineral Occurrence	UTM Coordinates Northing	Easting	Sample Numbers	K (%)	Ca (%)	Sr (ppm)	Al (%)	Hg (ppb)
			03689	0.05	1.69	12	0.41	
63J13-80	6090625	453343	01584	1.23	0.12	2	4.70	
			01585	1.39	0.07	6	2.46	
			01586	2.77	1.20	26	4.15	
			01587	1.32	0.66	19	3.23	
			01588	0.04	0.37	6	0.25	
			01589	0.15	0.09	5	1.51	
			01590	0.47	0.90	20	1.41	
			01591	0.11	0.17	3	0.36	
			01592	0.02	0.18	12	0.15	
			01593	0.23	0.90	12	1.62	
			01594	0.24	0.32	10	0.83	
			01595	0.01	2.87	69	2.94	
			01596	0.02	0.67	17	0.04	
			01397	0.06	0.11	4	0.47	
63J13-111	6073211	467091	861629	0.01	0.10	1	0.02	
			861630	0.01	0.10	1	0.01	
			861631	0.01	0.10	1	0.01	
63J13-120	6083163	445136	01396	0.14	2.59	52	3.29	
63J13-121	6090947	453856	01399	0.07	0.48	9	0.40	
63J13-122	6073649	465945						
	North Zone		13569	0.18	1.95	26	2.55	
			13570	0.18	0.42	<1	1.33	
			13571	0.07	0.05	<1	1.49	
			13572	0.86	0.36	<1	1.75	
			13573	0.09	1.95	9	2.72	
	Main Zone		13574	0.07	2.12	7	1.79	
			13575	0.24	2.67	37	2.95	
			13576	0.47	2.02	19	2.76	
			13577	0.26	2.35	11	2.20	
			13578	1.56	3.00	71	4.50	
			13579	0.42	2.87	32	2.96	
63J13-123	6078143	438210	861514	0.29	0.20	5	0.78	
			861515	0.06	0.87	54	1.75	
			861516	0.04	1.89	88	2.78	
63J13-125	6091369	465871						
	Site 3		05087		<1	<500		45
	Site 4		05088		2	<500		55
	Site 5		05089		2	<500		35

Mineral Occurrence	UTM Coordinates Northing	Easting	Sample Numbers	Fe (%)	Mn (ppm)	Ba (ppm)	B (ppm)	Cr (ppm)	Mg (%)	W (ppm)	U (ppm)	Th (ppm)	P (%)	La (ppm)	V (ppm)	Ti (%)	Na (%)
63J13-01	6092769	437951	850243	15.84	906	2	12	24	2.57	252	5	4	0.185	13	561	0.01	0.11
63J13-02	6092845	438621	841190	1.81	143	13	4	15	0.08	3	5	1	0.009	2	4	0.01	0.02
			841191	1.72	136	5	8	15	0.14	2	5	1	0.009	2	4	0.01	0.01
			841192	1.74	117	3	5	16	0.13	1	5	1	0.010	2	3	0.01	0.01
			841193	1.79	109	4	2	14	0.07	2	5	1	0.009	2	3	0.01	0.01
			852094	5.46	770	29	2	134	5.43	1	6	1	0.017	2	135	0.03	0.05
			852095	1.71	300	9	2	44	0.89	1	5	1	0.017	2	28	0.02	0.08
			852096	4.19	634	18	2	318	3.43	1	5	1	0.018	2	69	0.03	0.04
			852097	3.46	399	116	3	296	1.95	1	6	1	0.050	6	56	0.08	0.08
63J13-03	6091692	438324	841181	8.75	192	23	10	25	0.47	169	5	1	0.024	2	56	0.14	0.38
			841184	25.06	363	6	10	10	0.10	233	5	2	0.010	2	23	0.05	0.22
			841185	20.48	810	6	9	121	1.80	118	5	1	0.012	2	137	0.13	0.05
			841186	7.34	450	61	4	92	2.02	1	5	1	0.027	2	153	0.26	0.21
			841188	8.25	431	15	7	39	0.55	7	5	2	0.044	4	71	0.22	0.18
63J13-04	6091552	439122	841165	1.68	146	3	2	14	0.09	1	5	1	0.010	2	4	0.01	0.01
63J13-07	6084503	444419	841139	10.46	434	16	17	17	0.91	1	5	2	0.043	4	47	0.01	0.03
			841171	27.33	716	9	30	16	0.87	1	5	3	0.039	4	82	0.01	0.02
			841176	14.52	670	10	23	4	1.08	431	5	2	0.051	6	61	0.01	0.05
			841177	7.42	368	28	19	13	0.77	1	5	1	0.042	3	65	0.04	0.05
63J13-08	6083798	442437	841152	1.73	134	3	9	18	0.05	2	5	1	0.015	2	4	0.01	0.02
			841153	5.46	385	103	12	9	0.49	3	5	1	0.040	5	34	0.11	0.25
			841154	6.19	289	42	13	6	0.61	2	5	1	0.030	5	39	0.14	0.30
63J13-09	6090492	445407	841158	1.99	110	1	2	20	0.01	4	5	1	0.004	2	4	0.01	0.01
			841172	1.82	133	1	2	15	0.01	209	5	1	0.016	2	3	0.01	0.01
			841173	2.03	147	1	2	16	0.07	648	5	1	0.030	2	9	0.01	0.01
			841174	1.36	93	1	2	16	0.01	13	5	1	0.002	2	2	0.01	0.01
			841178	1.73	117	1	5	19	0.03	30	5	1	0.006	2	4	0.01	0.01
			841179	2.12	141	1	2	21	0.04	8	5	1	0.007	2	4	0.01	0.01
63J13-10	6094412	447338	841162	3.04	125	1	2	21	0.02	4	9	1	0.006	2	9	0.01	0.01
63J13-11	6093038	446646	841163	1.81	115	1	2	18	0.04	4	6	1	0.004	2	3	0.01	0.01
			841164	2.37	107	1	2	16	0.02	10	5	1	0.007	2	9	0.03	0.02
63J13-12	6087479	437906	00610	4.74	357	68	8	86	1.34	24	5	5	0.048	15	94	0.21	0.08
			00611	3.88	234	208	8	68	0.92	11	5	5	0.033	17	74	0.21	0.17
			00612	4.85	129	30	2	20	0.23	1	5	1	0.015	2	19	0.02	0.04
			00613	4.73	177	71	2	203	0.41	35	5	6	0.186	21	59	0.12	0.06
			00614	3.11	138	12	2	22	0.21	26	5	1	0.013	2	11	0.01	0.03
			00615	3.13	120	29	2	16	0.16	5	5	1	0.009	2	17	0.05	0.02
			00616	2.71	145	13	2	28	0.17	5	5	1	0.234	2	7	0.01	0.05
63J13-13	6086983	453785	00621	11.86	1830	11	15	3	0.39	3	5	17	0.001	2	16	0.01	0.02
			00622	12.84	2226	6	13	1	0.38	2	5	14	0.001	2	12	0.01	0.02
			00623	6.22	3716	1	2	11	0.18	1	5	1	0.022	2	12	0.02	0.01

Mineral Occurrence	UTM Coordinates Northing	Easting	Sample Numbers	Fe (%)	Mn (ppm)	Ba (ppm)	B (ppm)	Cr (ppm)	Mg (%)	W (ppm)	U (ppm)	Th (ppm)	P (%)	La (ppm)	V (ppm)	Ti (%)	Na (%)
			00624	1.85	395	5	2	18	0.04	1	5	3	0.001	2	2	0.01	0.01
			00625	13.48	2711	6	10	1	0.36	2	5	11	0.001	2	23	0.01	0.02
			01414	13.90	2162	9	5	1	0.36	3	5	13	0.001	2	12	0.01	0.03
			01424	3.74	562	1	3	23	0.14	1	5	7	0.004	2	4	0.01	0.01
			01425	1.70	176	1	2	13	0.02	1	5	1	0.002	2	2	0.01	0.01
63J13-14	6076973	439002	01422	5.92	536	202	9	8	1.39	1	5	1	0.035	2	147	0.09	0.12
63J13-17	6074632	440877	850728	7.42	420	11	14	114	2.56	4	5	1	0.014	2	44	0.07	0.11
63J13-18	6069351	442281	850729	5.33	421	126	23	39	2.19	2	5	1	0.018	3	65	0.09	0.25
			850730	8.27	616	52	28	93	3.23	1	5	2	0.018	3	79	0.06	0.09
63J13-21	6086004	459184	03188	1.79	68	3	2	22	0.01	2	5	1	0.003	2	2	0.01	0.01
			03189	1.74	64	1	2	21	0.01	2	5	1	0.003	2	2	0.01	0.01
63J13-22	6085403	458498	03190	2.68	93	1	4	31	0.01	1	5	1	0.006	2	4	0.01	0.01
			03191	2.16	77	3	2	27	0.01	2	5	1	0.004	2	3	0.01	0.01
63J13-23	6084774	452751	00735	1.87	145	188	6	12	0.64	1	5	3	0.019	12	3	0.04	0.06
63J13-24	6081935	453746	00737	3.21	82	31	2	15	0.43	1	5	1	0.020	2	20	0.02	0.28
63J13-25	6081755	437099	01076	4.66	326	107	3	10	0.37	1	5	3	0.031	10	5	0.11	0.06
			01081	3.68	295	28	3	8	0.37	3	5	2	0.025	6	8	0.02	0.05
63J13-26	6081466	437821	01030	2.18	101	15	7	9	0.09	1	5	1	0.018	4	9	0.03	0.02
			01031	4.25	261	179	4	7	0.32	1	5	1	0.041	2	58	0.20	0.07
			01057	2.16	131	2	2	15	0.05	1	5	1	0.003	2	3	0.01	0.01
63J13-28	6092632	465675	873084	2.80	129	22	17	171	0.90	1	5	1	0.027	2	232	0.14	0.31
			873085	4.15	122	3	3	29	0.45	1	5	1	0.032	2	32	0.06	0.14
			873086	3.59	194	157	6	156	0.74	1	5	1	0.055	3	138	0.12	0.04
			873087	3.49	169	240	6	83	0.56	1	5	4	0.027	13	54	0.17	0.03
63J13-30	6080427	442866	74P1N150	1.03	41	50	2	2	0.06	608	5	8	0.010	2	1	0.01	0.01
			7184PIN51	1.02	39	35	2	1	0.07	479	5	4	0.010	2	1	0.01	0.01
63J13-31	6081180	442004	01089	3.18	324	15	5	82	0.94	2	5	1	0.033	2	127	0.09	0.10
63J13-37	6075650	466756	861632	1.98	111	58	17	12	0.16	1	348	296	0.025	155	5	0.01	0.04
			861633	3.92	114	134	10	47	0.96	3	5	2	0.066	4	35	0.04	0.09
			861634	3.34	162	82	43	91	1.23	1	6	2	0.058	3	52	0.09	0.39
			861635	4.14	183	24	26	34	1.06	230	5	1	0.055	3	26	0.02	0.20
			861636	1.55	108	8	10	11	0.09	1	258	138	0.013	81	1	0.01	0.04
			861637	1.15	114	11	18	8	0.10	1	2255	816	0.058	415	22	0.01	0.08
			861638	3.15	397	47	10	83	0.64	1	10	4	0.068	6	79	0.35	0.21
63J13-40	6076164	438572	01111	2.93	224	7	6	24	0.71	1	5	1	0.012	2	27	0.04	0.10
			01112	1.84	135	6	7	20	0.30	1	5	1	0.010	2	13	0.03	0.15
			01113	1.79	233	3	2	16	0.72	1	5	1	0.009	2	4	0.01	0.01
			01114	1.72	214	3	4	65	0.87	1	5	1	0.016	2	34	0.06	0.13
63J13-41	6076173	437693	01115	5.56	240	4	15	9	1.25	2	5	1	0.021	4	60	0.02	0.02
			01116	3.58	365	2	9	343	1.37	2	5	1	0.009	2	33	0.02	0.11
			01117	1.22	154	6	5	14	0.60	223	5	1	0.008	2	7	0.01	0.01

Mineral Occurrence	UTM Coordinates Northing	Easting	Sample Numbers	Fe (%)	Mn (ppm)	Ba (ppm)	B (ppm)	Cr (ppm)	Mg (%)	W (ppm)	U (ppm)	Th (ppm)	P (%)	La (ppm)	V (ppm)	Ti (%)	Na (%)
63J13-42	6076019	436644	01502	3.37	337	6	5	12	0.61	1	5	1	0.034	2	64	0.04	0.15
			01503	3.72	329	7	2	11	0.40	1	5	1	0.045	4	47	0.04	0.12
			01504	2.39	109	6	2	23	0.02	2	5	1	0.004	2	5	0.01	0.01
			01505	2.11	140	10	10	8	0.17	76	5	1	0.022	2	17	0.02	0.06
63J13-44	6075896	439591															
	Site 1		01522	4.26	541	175	24	61	1.69	34	5	2	0.019	3	122	0.11	0.48
			01523	5.51	617	181	72	88	4.08	2	5	1	0.018	2	176	0.06	0.05
			01524	5.87	560	263	63	65	3.66	3	5	1	0.013	2	168	0.13	0.18
			01525	4.88	365	117	48	22	2.27	1	5	1	0.037	2	89	0.04	0.12
	Site 2		860731	2.09	175	6	4	14	2.32	2	5	1	0.018	2	11	0.01	0.02
63J13-46	6067386	458150															
	T1		01613	2.10	94	12	2	21	0.02	1	5	1	0.009	5	3	0.01	0.02
			01614	1.93	103	18	2	12	0.10	1	5	2	0.008	10	3	0.01	0.02
	T2		01615	2.48	111	21	2	21	0.10	1	5	1	0.008	6	3	0.01	0.03
			01616	2.16	99	20	2	16	0.03	1	5	1	0.010	7	3	0.01	0.02
	T3		01617	3.22	257	75	5	17	0.10	1	7	7	0.014	26	5	0.04	0.04
			01618	2.47	110	24	2	15	0.10	1	5	3	0.011	8	3	0.01	0.02
	T4		01619	2.22	136	36	3	13	0.10	1	5	4	0.010	13	3	0.02	0.02
			01620	2.29	127	49	4	16	0.10	1	5	5	0.012	16	3	0.03	0.02
63J13-47	6067959	452691	01552	11.97	113	9	4	1	0.11	1379	5	2	0.008	3	3	0.01	0.02
			01553	1.40	71	12	7	3	0.09	1257	5	2	0.009	14	1	0.01	0.07
			01554	1.23	38	18	5	2	0.09	1048	5	1	0.004	3	1	0.01	0.02
			01555	2.26	23	18	5	3	0.05	1431	5	3	0.009	8	1	0.01	0.06
			01556	6.44	57	14	7	1	0.14	1542	5	2	0.008	9	1	0.01	0.04
			01557	4.65	34	25	5	1	0.05	1573	5	2	0.011	5	4	0.01	0.04
63J13-48	6068496	452828	01548	4.57	352	477	7	142	1.14	45	5	5	0.055	21	82	0.27	0.06
			01549	3.80	392	292	13	93	0.92	74	5	4	0.044	19	53	0.16	0.03
			01550	4.41	351	186	8	119	1.10	1	5	5	0.066	20	70	0.14	0.04
			01551	4.56	375	137	2	62	1.20	1	5	3	0.040	11	39	0.09	0.04
63J13-49	6080464	452524	01597	4.08	78	15	2	12	0.09	608	5	1	0.005	3	3	0.01	0.01
			01598	3.35	332	70	5	18	0.59	17	7	5	0.028	12	34	0.16	0.07
			01599	4.00	226	61	6	19	0.39	1	5	3	0.021	7	25	0.08	0.03
			01600	3.82	360	96	7	20	0.65	34	6	5	0.038	13	42	0.17	0.06
			861601	4.12	348	108	11	18	0.76	7	5	5	0.037	13	48	0.18	0.07
63J13-52	6081721	451225															
	Site 1		01203	3.58	86	56	2	28	0.41	2	5	1	0.025	2	19	0.03	0.35
			01204	5.26	79	51	3	29	0.32	1	5	1	0.019	2	17	0.03	0.28
			01205	4.83	154	39	2	30	0.49	1	5	1	0.019	2	21	0.04	0.31
			01206	2.91	135	57	2	11	0.28	1	5	1	0.159	4	153	0.11	0.25
			01207	3.10	136	11	6	30	0.08	2	5	1	0.009	2	8	0.01	0.02
			01208	2.03	114	42	3	18	0.46	43	5	1	0.023	2	18	0.05	0.15

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	Site 2		01276	2.36	73	58	2	24	0.43	1	5	1	0.013	2	15	0.02	0.41
			01277	2.81	76	40	2	24	0.33	1	5	1	0.012	2	14	0.02	0.65
			01278	4.18	61	39	2	22	0.29	1	5	1	0.023	2	17	0.03	0.50
			01280	2.39	106	52	3	33	0.44	1	5	1	0.017	2	13	0.03	0.65
			01281	4.93	175	48	4	28	0.48	3	5	1	0.035	2	23	0.03	0.49
			01282	2.95	54	37	2	25	0.25	1	5	1	0.007	2	9	0.02	0.84
			01283	5.52	246	27	9	12	1.42	1	5	2	0.007	2	16	0.01	0.49
			01284	6.23	100	32	2	29	0.61	2	5	1	0.025	2	26	0.04	0.26
			01285	5.26	71	43	2	20	0.43	2	5	1	0.026	2	20	0.03	0.26
			01286	4.95	127	40	5	27	0.43	32	5	1	0.039	2	39	0.05	0.33
			01287	4.67	202	30	6	23	1.03	1	5	1	0.022	2	18	0.03	0.40
			01288	6.84	177	31	3	22	0.52	3	5	1	0.014	2	17	0.02	0.40
			01289	5.01	191	51	4	31	0.68	2	5	2	0.015	2	19	0.03	0.60
			01290	5.36	111	55	2	24	0.36	1	5	1	0.032	2	20	0.06	0.34
			01291	3.81	125	43	2	25	0.40	3	5	1	0.019	2	16	0.03	0.47
			01292	4.48	256	55	5	26	0.59	1	5	1	0.118	4	79	0.09	0.30
			01293	2.27	213	40	2	22	0.55	3	5	1	0.079	3	46	0.09	0.22
	Site 3		01294	2.59	102	36	7	38	0.29	1	5	1	0.013	2	10	0.04	0.39
			01295	6.75	90	51	2	63	0.53	1	5	1	0.015	2	25	0.03	0.49
			01296	5.71	80	50	4	39	0.36	1	5	1	0.011	2	17	0.02	0.71
			01297	4.25	90	48	2	46	0.32	2	5	1	0.016	2	14	0.03	0.61
			01298	10.28	91	40	2	48	0.42	2	5	1	0.023	2	16	0.04	0.75
			01299	4.87	80	63	2	50	0.40	1	5	1	0.022	2	21	0.04	0.78
			01300	5.49	98	52	2	56	0.46	1	5	1	0.022	2	19	0.05	0.88
63J13-53	6091948	446197	01209	3.25	88	1	3	18	0.01	353	5	1	0.004	2	3	0.01	0.01
			01210	2.58	90	1	2	19	0.10	4	5	1	0.004	2	3	0.01	0.01
			01211	6.99	370	6	7	5	0.75	27	5	1	0.007	2	379	0.18	0.14
			01212	1.71	78	1	2	16	0.10	5	5	1	0.003	2	6	0.01	0.01
			01213	6.26	682	34	4	5	1.72	13	5	1	0.011	2	373	0.34	0.37
			01214	4.63	297	13	4	4	0.96	1	5	1	0.010	2	381	0.17	0.15
			01215	2.35	99	2	2	21	0.10	2	5	1	0.005	2	9	0.01	0.01
			01216	4.36	340	22	5	4	0.96	1	5	1	0.006	2	351	0.20	0.16
			01217	4.41	395	11	3	4	1.01	4	5	1	0.013	2	290	0.27	0.24
			01218	4.80	327	8	4	1	0.88	1	5	1	0.007	2	415	0.25	0.22
			01219	2.22	85	3	2	14	0.11	117	5	1	0.003	2	19	0.03	0.02
			01220	3.34	344	16	10	10	1.15	1	5	1	0.004	2	227	0.24	0.23
			01221	1.84	77	1	2	17	0.10	1	5	1	0.005	2	5	0.01	0.01
			01222	4.42	354	7	3	21	1.19	1	5	1	0.006	2	350	0.25	0.28
			01223	4.27	328	28	5	9	0.95	1	5	1	0.007	2	335	0.24	0.23
			01224	3.16	125	5	2	18	0.11	11	5	1	0.006	2	38	0.07	0.03
			01225	3.18	318	5	8	3	0.95	1	5	1	0.007	2	204	0.16	0.21

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			01706	4.32	456	14	4	8	1.45	2	5	1	0.005	2	289	0.27	0.26
			01707	1.88	102	1	2	17	0.06	1	5	1	0.004	2	7	0.01	0.01
			01708	2.02	89	1	2	19	0.10	2	5	1	0.003	2	5	0.01	0.01
			01709	2.95	299	10	5	10	0.98	3	5	1	0.008	2	158	0.17	0.19
			01710	2.04	91	1	2	17	0.10	1	5	1	0.003	2	6	0.01	0.01
			01711	4.36	343	8	2	4	0.95	3	5	1	0.006	2	354	0.27	0.24
			01712	4.21	319	22	22	8	1.11	1	5	1	0.004	2	353	0.26	0.17
			01713	2.54	108	58	3	46	0.38	2	5	29	0.021	41	37	0.15	0.08
			01714	4.19	379	11	6	7	1.17	1	5	2	0.006	2	268	0.23	0.25
			01715	6.72	659	22	4	10	1.98	68	5	2	0.005	2	478	0.40	0.50
			01716	3.81	426	9	3	7	1.28	1	5	1	0.009	2	237	0.26	0.28
			01717	2.93	279	10	30	4	1.07	1	5	1	0.004	2	212	0.18	0.24
			01718	5.99	448	19	2	3	1.23	2	5	1	0.008	2	490	0.32	0.30
			01719	4.95	422	10	4	2	1.15	1	5	2	0.011	2	352	0.23	0.23
			01720	5.17	467	17	3	1	1.22	4	5	1	0.011	2	420	0.34	0.28
			01721	2.30	100	1	2	18	0.10	2	5	1	0.003	2	5	0.01	0.01
			01722	6.34	477	6	2	1	1.17	3	5	1	0.016	2	451	0.33	0.41
			01723	4.14	451	76	2	11	0.82	3	5	2	0.069	9	90	0.19	0.17
			01724	1.84	63	25	3	17	0.24	1	5	22	0.008	28	16	0.11	0.04
			01725	2.34	285	6	2	26	0.88	1	5	1	0.020	2	94	0.24	0.09
63J13-54	6084252	464245	01267	4.56	280	31	2	4	0.18	1	5	2	0.071	11	2	0.03	0.07
			01268	6.79	154	9	2	7	0.16	1	5	3	0.074	14	3	0.01	0.08
			01269	14.44	184	5	5	10	0.38	1	7	3	0.101	8	6	0.01	0.07
			01698	2.07	383	8	2	13	0.85	110	5	1	0.024	2	9	0.02	0.02
			01699	4.20	571	40	2	4	0.67	1	5	1	0.034	3	3	0.07	0.11
			01700	17.01	914	14	2	3	0.97	1	6	3	0.175	5	8	0.01	0.09
63J13-55	6083782	465413	01258	11.41	361	26	2	15	0.31	1	5	2	0.184	3	14	0.03	0.04
			01259	5.97	118	1	3	15	0.01	1	5	1	0.008	2	3	0.01	0.01
			01260	9.72	356	23	3	7	0.29	1	5	2	0.084	5	19	0.02	0.03
			01261	14.50	130	11	5	16	0.09	1	5	1	0.038	2	10	0.01	0.02
			01262	9.10	152	6	3	19	0.07	1	5	1	0.049	2	9	0.01	0.02
			01263	5.45	272	3	4	23	0.09	1	5	1	0.044	2	9	0.01	0.02
			01264	5.72	539	66	2	4	0.32	1	5	1	0.337	5	2	0.07	0.14
			01265	7.45	328	40	3	9	0.35	1	5	2	0.088	10	18	0.03	0.09
63J13-56	6084498	463471	01251	4.03	86	1	2	18	0.10	146	5	1	0.013	2	6	0.01	0.01
			01252	4.03	116	5	2	27	0.10	1	5	1	0.010	2	8	0.01	0.01
			01253	15.53	135	11	78	37	0.84	1	5	3	0.074	10	128	0.05	0.09
			01254	15.23	156	13	63	30	0.55	1	5	3	0.098	15	88	0.03	0.07
			01255	18.19	334	21	5	62	2.30	52	7	2	0.083	2	237	0.16	0.13
			01256	3.66	67	1	2	18	0.02	1	5	1	0.020	2	4	0.01	0.01
			01257	5.06	93	2	2	22	0.01	1	5	1	0.006	2	5	0.01	0.01

Mineral Occurrence	UTM Coordinates Northing	Easting	Sample Numbers	Fe (%)	Mn (ppm)	Ba (ppm)	B (ppm)	Cr (ppm)	Mg (%)	W (ppm)	U (ppm)	Th (ppm)	P (%)	La (ppm)	V (ppm)	Ti (%)	Na (%)
63J13-59	6075775	452820	03071	13.00	67	8	2	24	0.11	113	5	3	0.007	2	8	0.02	0.01
			03072	5.54	261	108	4	17	0.35	10	5	4	0.053	7	17	0.07	0.02
			03073	7.24	401	42	2	18	0.58	55	5	3	0.065	9	37	0.19	0.03
			03074	7.75	398	44	2	28	0.69	3	5	4	0.090	12	36	0.21	0.05
			03075	1.97	77	8	3	19	0.06	4	5	1	0.005	2	3	0.01	0.01
			03076	2.80	105	23	8	23	0.28	18	5	1	0.009	2	11	0.01	0.01
			03077	9.47	96	15	2	16	0.15	144	5	2	0.016	2	9	0.04	0.01
			03078	2.18	55	10	2	12	0.02	96	5	3	0.004	3	2	0.01	0.01
			03079	1.85	71	1	2	19	0.01	2	5	1	0.004	2	2	0.01	0.01
			03080	5.15	476	17	21	18	0.66	1	5	4	0.074	12	21	0.11	0.05

Mineral Occurrence	UTM Coordinates Northing	Easting	Sample Numbers	Fe (%)	Mn (ppm)	Ba (ppm)	B (ppm)	Cr (ppm)	Mg (%)	W (ppm)	U (ppm)	Th (ppm)	P (%)	La (ppm)	V (ppm)	Ti (%)	Na (%)
63J13-61	6082798	444253															
	Site 1		03186	2.47	87	1	2	30	0.01	3	5	1	0.003	2	3	0.01	0.01
			03187	2.68	95	13	8	13	0.15	3	5	1	0.028	2	8	0.01	0.03
	Site 2		04663	2.20	51	40	16	10	0.55	1	5	1	0.019	2	37	0.05	0.07
			04664	3.85	83	20	18	15	0.14	1	5	1	0.016	2	3	0.01	0.06
			04665	3.93	83	13	13	11	0.14	1	5	1	0.011	2	2	0.01	0.04
63J13-61			01270	8.34	274	29	31	21	0.69	1	5	2	0.028	4	75	0.07	0.20
63J13-65	6077283	460197															
	Site 1		04828	1.58	99	89	26	15	0.63	1	5	1	0.006	3	14	0.03	0.24
			04829	4.02	70	37	28	34	0.49	1	5	1	0.016	2	12	0.04	0.28
	Site 2		04830	2.05	80	3	2	25	0.09	2	5	1	0.005	2	3	0.01	0.01
			04831	4.94	121	69	56	20	0.83	1	5	1	0.009	2	6	0.02	0.31
			04832	4.79	113	47	33	95	0.71	5	5	1	0.010	2	11	0.02	0.28
			04833	1.81	70	1	4	22	0.03	1	5	1	0.003	2	2	0.01	0.01
			04834	1.14	54	1	5	12	0.03	1	5	1	0.002	2	1	0.01	0.01
			04835	3.99	82	29	26	23	0.52	1	5	1	0.014	2	11	0.02	0.25
	Site 3		04836	2.83	113	51	80	25	0.75	4	5	1	0.004	2	9	0.01	0.53
			04837	2.53	99	31	63	45	0.50	5	5	1	0.002	2	9	0.01	0.51
63J13-75	6079129	436117	01580	29.57	526	1	8	1	0.28	74	5	1	0.333	10	2	0.01	0.02
			01581	32.82	433	1	8	1	0.13	94	6	2	0.015	2	1	0.01	0.01
			01582	33.44	867	2	7	1	0.20	127	5	2	0.024	2	1	0.01	0.01
			01583	30.70	944	1	3	1	0.15	110	5	2	0.022	2	2	0.01	0.01
			03004	30.36	257	3	2	2	0.06	117	5	2	0.001	2	5	0.02	0.13
			03005	30.05	245	5	2	5	0.25	58	5	2	0.001	2	21	0.02	0.15
			03006	26.57	483	1	7	1	0.04	452	11	3	0.001	2	1	0.01	0.11
			03007	32.99	162	1	2	1	0.09	204	5	3	0.001	2	11	0.01	0.12
63J13-76	6078591	439526	01576	8.83	309	36	2	1	0.66	464	5	1	0.012	4	13	0.03	0.17
			01577	22.62	250	11	3	5	0.49	299	5	2	0.017	2	42	0.03	0.04
			01578	27.69	480	5	2	1	0.09	672	5	2	0.023	2	5	0.01	0.01
			01579	30.13	639	1	8	1	0.09	38	5	2	0.005	2	2	0.01	0.01
63J13-77	6078874	440911	01566	27.85	150	1	6	1	0.12	113	5	1	0.082	8	3	0.01	0.01
			01567	28.50	122	5	8	1	0.18	472	5	1	0.016	2	3	0.01	0.02
			01568	27.93	160	1	2	1	0.13	192	5	1	0.018	13	3	0.01	0.01
			01569	29.42	248	5	2	1	0.08	188	5	1	0.023	2	3	0.01	0.01
			01570	30.74	120	4	7	1	0.14	351	5	2	0.042	6	1	0.01	0.01
			01571	26.94	140	3	3	1	0.21	388	5	2	0.014	4	3	0.01	0.02
			01572	31.07	201	2	4	1	0.14	271	5	2	0.011	3	2	0.01	0.01
	T1		03654	4.29	643	120	3	30	1.42	119	5	1	0.023	2	116	0.13	0.15
			03655	0.33	106	7	3	28	0.14	631	5	1	0.005	2	8	0.01	0.01
			03656	0.13	72	3	2	28	0.02	698	5	1	0.003	2	1	0.01	0.01
	T2		03657	4.17	548	170	8	25	1.97	167	5	1	0.022	4	118	0.15	0.06

Mineral Occurrence	UTM Coordinates Northing	Easting	Sample Numbers	Fe (%)	Mn (ppm)	Ba (ppm)	B (ppm)	Cr (ppm)	Mg (%)	W (ppm)	U (ppm)	Th (ppm)	P (%)	La (ppm)	V (ppm)	Ti (%)	Na (%)
			03658	0.41	147	27	4	30	0.62	615	5	1	0.003	2	2	0.01	0.01
	T3		03659	0.42	121	4	5	36	0.38	844	5	1	0.012	2	1	0.01	0.01
	T4		03660	1.04	318	9	6	29	0.53	568	5	1	0.009	2	3	0.01	0.01
	T5		03661	0.07	39	3	2	33	0.03	894	5	1	0.003	2	1	0.01	0.01
			03662	5.16	532	301	4	17	1.01	121	5	1	0.045	2	101	0.17	0.14
			03663	5.45	726	283	4	16	1.01	98	5	1	0.038	5	104	0.17	0.15
			03664	3.88	680	368	6	22	1.32	121	5	1	0.023	5	89	0.17	0.08
			03665	4.19	726	667	4	26	1.54	78	5	1	0.024	5	100	0.20	0.06
			03666	2.30	449	224	2	10	0.82	166	5	1	0.022	4	61	0.13	0.11
	T6		03667	0.17	103	9	3	33	0.11	694	5	1	0.004	2	1	0.01	0.01
	T7		03668	0.06	34	1	3	33	0.01	834	5	2	0.002	2	1	0.01	0.01
	T8		03669	6.96	717	469	3	24	1.37	69	5	1	0.054	7	183	0.21	0.10
	T9		03670	0.40	269	137	3	33	0.20	789	5	1	0.004	2	7	0.01	0.01
	T10		03671	0.41	166	4	3	36	0.33	847	5	1	0.004	2	1	0.01	0.01
			03672	0.56	244	7	8	45	0.38	983	5	1	0.006	2	1	0.01	0.01
	T11		03673	1.15	443	617	6	39	0.39	750	5	1	0.012	2	6	0.01	0.04
			03674	0.13	99	22	4	41	0.09	964	5	1	0.003	2	1	0.01	0.01
			03675	3.41	496	283	5	27	0.45	475	5	1	0.018	7	15	0.01	0.07
	T12		03676	2.47	664	303	5	38	0.58	557	5	1	0.012	2	20	0.05	0.05
	T13		03677	0.27	87	13	6	47	0.07	1071	5	2	0.005	2	2	0.01	0.01
			03678	0.31	46	1	3	46	0.05	1100	5	1	0.004	2	1	0.01	0.01
	T14		03679	0.70	107	2	5	37	0.17	789	5	1	0.004	2	1	0.01	0.01
			03680	0.76	193	25	3	29	0.35	566	5	1	0.011	2	8	0.01	0.01
			03681	1.03	321	38	6	43	0.46	847	5	1	0.008	2	11	0.01	0.03
	T15		03682	1.44	213	19	3	26	0.50	257	5	1	0.026	5	102	0.04	0.10
			03683	4.13	432	200	5	24	0.57	307	5	1	0.020	6	17	0.05	0.09
			03684	3.48	867	173	9	32	1.41	220	5	1	0.023	3	34	0.04	0.08
	T16		03685	0.23	92	7	3	38	0.08	859	5	1	0.004	2	1	0.01	0.01
			03686	1.06	294	31	9	30	0.56	481	5	1	0.017	2	8	0.02	0.04
	T17		03687	2.92	355	59	6	31	0.69	379	5	1	0.022	7	10	0.02	0.04
	T18		03688	0.46	38	7	6	34	0.03	903	5	1	0.004	2	1	0.01	0.01
			03689	1.97	438	45	8	39	1.09	624	5	1	0.029	3	18	0.02	0.05
63J13-80	6090625	453343	01584	6.21	212	151	2	2	5.13	214	5	1	0.004	5	9	0.13	0.04
			01585	2.25	96	238	2	1	1.92	108	5	1	0.010	3	7	0.12	0.09
			01586	17.26	677	56	2	1	4.87	10	5	1	0.038	25	18	0.11	0.12
			01587	12.22	144	41	2	1	2.36	343	5	2	0.015	8	15	0.14	0.12
			01588	30.50	305	2	11	1	0.08	396	5	2	0.026	2	1	0.01	0.02
			01589	7.56	107	7	2	1	0.99	388	5	3	0.011	6	3	0.03	0.04
			01590	29.14	647	16	8	1	0.77	4	5	2	0.014	3	8	0.03	0.05
			01591	20.85	529	4	4	1	0.19	921	5	1	0.019	2	10	0.01	0.02
			01592	42.08	508	3	8	1	0.11	343	5	3	0.016	2	1	0.01	0.01

Mineral Occurrence	UTM Coordinates Northing	Easting	Sample Numbers	Fe (%)	Mn (ppm)	Ba (ppm)	B (ppm)	Cr (ppm)	Mg (%)	W (ppm)	U (ppm)	Th (ppm)	P (%)	La (ppm)	V (ppm)	Ti (%)	Na (%)
			01593	27.37	436	9	4	1	0.34	214	5	2	0.023	2	8	0.03	0.11
			01594	31.92	607	11	12	1	0.41	390	5	2	0.008	3	2	0.02	0.07
			01595	11.77	369	2	2	1	0.24	174	5	2	0.006	4	4	0.03	0.10
			01596	22.72	615	1	2	1	0.13	623	5	2	0.013	2	6	0.01	0.01
			01397	34.48	341	6	12	1	0.16	4	5	1	0.003	2	7	0.01	0.03
63J13-111	6073211	467091	861629	2.25	87	1	2	19	0.10	1	5	1	0.003	2	4	0.01	0.01
			861630	2.66	82	1	2	18	0.10	2	5	1	0.004	2	3	0.01	0.01
			861631	1.74	74	1	2	14	0.10	2	5	1	0.003	2	3	0.01	0.01
63J13-120	6083163	445136	01396	4.82	171	55	33	17	0.40	211	5	1	0.025	3	17	0.07	0.30
63J13-121	6090947	453856	01399	3.23	79	16	10	16	0.22	331	5	1	0.104	6	1	0.01	0.05
63J13-122	6073649	465945															
	North Zone		13569	3.25	552	33	2	106	1.58	<10	<10		282	20	126	0.06	
			13570	3.17	489	49	2	123	1.17	<10	<10		420	16	143	0.08	
			13571	4.28	624	19	2	163	1.30	<10	14		<10	21	117	0.06	
			13572	3.63	405	165	2	146	1.57	<10	32		305	19	183	0.28	
			13573	2.65	666	18	2	93	1.69	<10	15		459	13	72	0.05	
	Main Zone		13574	1.82	663	59	2	106	0.38	<10	25		<10	32	<1	0.02	
			13575	2.67	390	56	2	80	0.46	<10	<10		<10	28	<1	0.03	
			13576	2.57	669	63	2	124	0.70	<10	27		<10	28	<1	0.02	
			13577	1.67	673	47	2	98	0.56	<10	<10		48	29	1	0.03	
			13578	4.37	1122	241	2	103	1.82	<10	31		360	28	72	0.27	
			13579	1.33	575	57	2	62	0.66	<10	<10		176	28	5	0.04	
63J13-123	6078143	438210	861514	4.43	171	76	10	14	0.61	1	5	1	0.020	4	41	0.05	0.06
			861515	5.33	246	11	9	17	0.64	3	5	1	0.029	3	51	0.03	0.27
			861516	5.36	453	6	14	15	0.99	3	5	1	0.017	4	126	0.06	0.50
63J13-125	6091369	465871															
	Site 3		05087	9.72		190		5		270		0.7		5.7			
	Site 4		05088	6.69		79		5		200		1.1		6.5			
	Site 5		05089	3.29		290				590	1.2	1.7		12			

APPENDIX II: NONMINERALIZED DIAMOND DRILL CORE

LOCATION: **Appendix II**

NAME: Nonmineralized drill core

UTM:

ACCESS: Fly to Hackett Lake and traverse

AREA: South of Hackett Lake, east shore of Wekusko Lake.

AIRPHOTO: A20137-96, -97

EXPLORATION SUMMARY:

The area was first staked as the Maxine 1 to 4, Greencorn, Donald, Dorothy and Acouchican claims prior to 1930. In 1950, the K.C. group of claims were staked by P. Kobar and W.B. Kobar and a four hole, 43 m, drill program was done on K.C., and K.C. 1 to 3 (A.F. 90096). The claims lapsed in 1952. HBED did airborne EM and radiometric surveys in the area in 1965 (A.F. 91650). The area is open for staking.

GEOLOGICAL SETTING:

The general area is characterized by Missi Group greywacke, arkose and derived schists and gneisses (Frarey, 1950). Frarey (1950) also mapped an antiform in the immediate area of the drill holes (Fig. II-1). Diamond drill hole intersected nonmineralized rhyolite (A.F. 90096).

MINERALIZATION:

The drill core from DDH 42, 43, 44 and 45 is nonmineralized.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

The rocks encountered by the four drill holes were collared in Missi Group greywacke, arkose and derived schists and gneisses although the rocks intersected during drilling are logged as rhyolite. Frarey (1950) mapped a northeast trending antiform in the immediate area. It is conceivable that the rhyolite logged in the drill core is the product of silicification of sedimentary or other rocks. The silicification could be an alteration product that accompanied the development of a fault(s) parallel to the axial plane of the antiform. This type of geological scenario is present in the Ferro vein system (*cf.* location 68).

REFERENCES:

Assessment Files 90096 and 91650
Manitoba Energy and Mines, Minerals Division

Frarey, M.J.
1950: Crowduck Bay; Geological Survey of Canada Map 987A, 1:63 360.

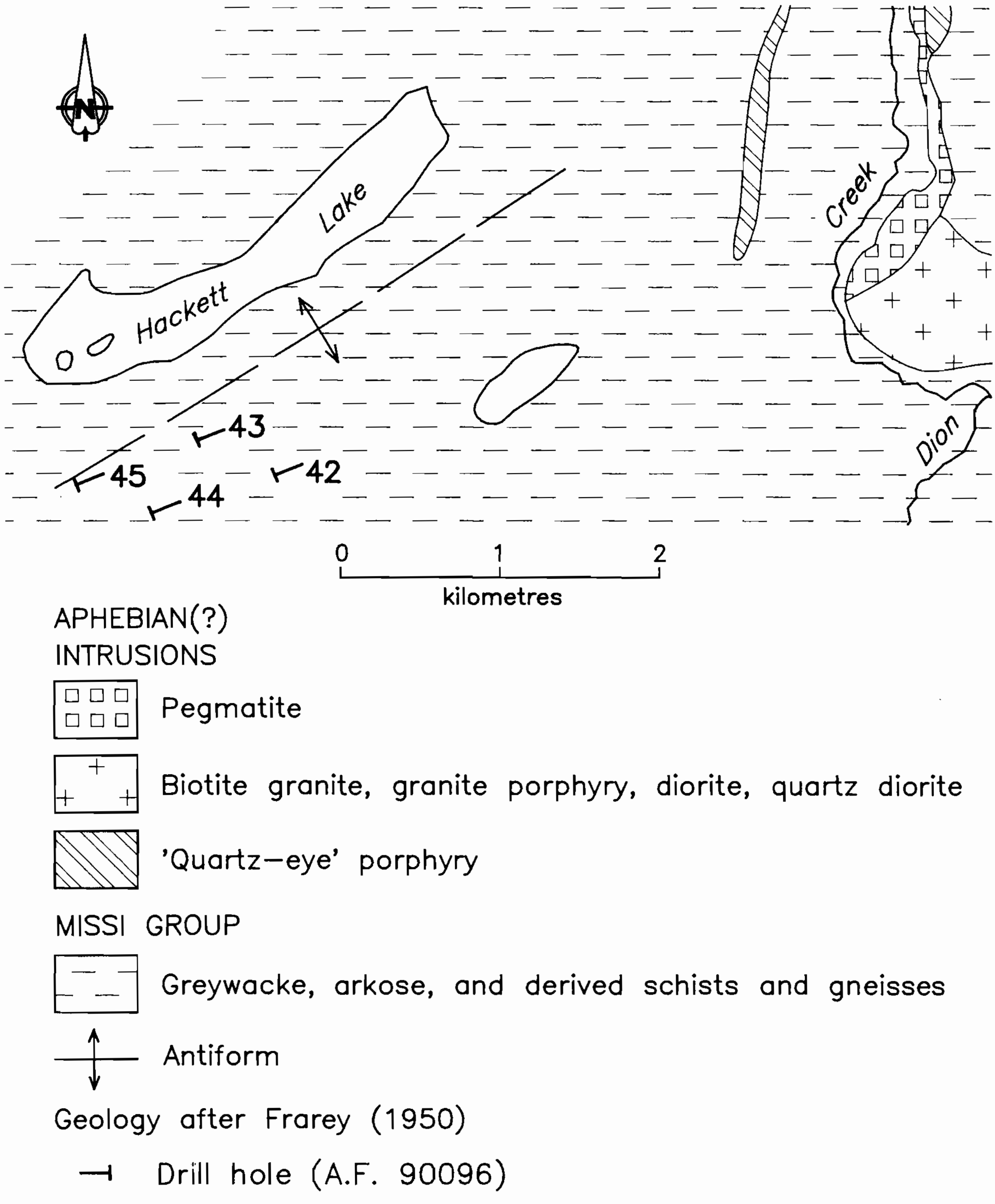

Figure II-1: Nonmineralized diamond drill holes, Hackett Lake area, 63J/13. Each of the four drill holes intersected 21m of rhyolite.