



Mineral Deposit Series Report No. 17

Mineral Deposits and Occurrences in the Sherridon Area, NTS 63N/3

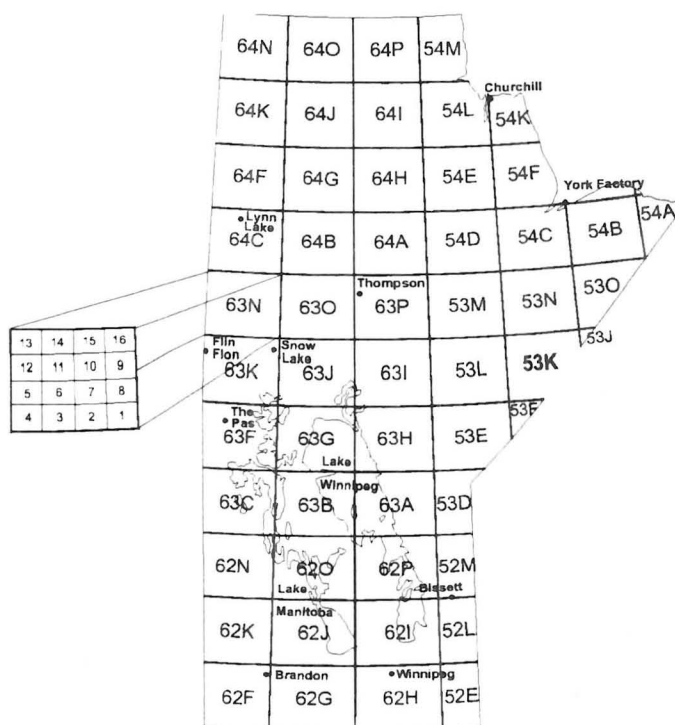
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Winnipeg, 1998

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GEOREF

NTS AREA: 63N/3, 63N/2

Keywords:	Bob Lake	Manitoba	amphibolite
	chemical sedimentary deposits	maps	Kisseynew
	Cold Lake	massive sulphide deposits	Burntwood Suite
	Collins Point	mineral deposits	Missi Suite
	economic geology	Park Lake	anthophyllite
	economic geology maps	sedimentation	cordierite
	economic geology, general and mining	Sherridon	Sherritt Gordon Cu-Zn Deposit
	Fidelity Lake	stratabound deposits	Smith-Pride
	Ideal Lake	ultramafic composition	
	Kississing Lake	western Canada	
	Lost Lake	Yakushavich Island	

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MAP

MDS Map 17:	Mineral deposits and occurrences in the Sherridon area (63N/3), Manitoba; 1:50 000	in pocket
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INTRODUCTION

This report and accompanying map (MDS Map No. 17) 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.

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 Although revisions of the publication are anticipated, any additional unpublished information may be obtained by contacting the author or Director, Geological Services Branch.

METHODOLOGY

The documentation program was initiated in the main mining districts of the province under the 1984-1989 Mineral Development Agreement. Under this project mineral deposit geologists of the Geological Service 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 documents that represent 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 files and/or company files.

Information has been collated and maps prepared with the assistance of junior staff geologists and summer assistants. Senior mineral deposit geologists have provided the deposit classifications and text for the report. The locations of all mineral deposits and occurrences are presented in Figure 1.

Deposit vs 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 vs 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 sulphide deposits, or the only portion remaining, 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 conducted in the 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 the 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 DEPOSITS

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, if present, 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. Where an occurrence is known solely from diamond drilling the name of the occurrence will state 'Mineralization intersected by diamond drilling'.

Exploration Summary:

This section provides an idea of the extent of exploration. The information 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 mineralogy, host rocks and alteration provides the reader with the opportunity to make their 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 collected from trenches and outcrops in the vicinity of the occurrences. Selected assay and geochemical data may be included in this section. Multi-element analyses are presented in Appendix I for 174 rock samples. Silicate whole rock analyses are presented in Appendix II for 109 rock samples.

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 endeavor to supply copies of unpublished material on a deposit by deposit basis. References listed at the end of each occurrence description may also include sources of additional information not directly cited in the text.

ABBREVIATIONS:

The following abbreviations are used throughout the occurrence descriptions:

A.F.	assessment file
apy	arsenopyrite
ay	anthophyllite
bt	biotite
cc	calcite
cd	cordierite
CEM	Crone electromagnetic
cf.	compare (Latin)
ch	chlorite
Co.	company
cp	chalcopyrite
DDH	diamond-drill hole(s)
e.g.	for example
EM	electromagnetic
fd	feldspar
gf	graphite
gt	garnet
g/t	grams per tonne
hb	hornblende
HBED	Hudson Bay Exploration and Development Company Limited
HBM&S	Hudson Bay Mining and Smelting Company Limited
HLEM	horizontal loop electromagnetic
i.e.	that is to say
Ltd.	limited
ms	muscovite
mt	magnetite
Mt	million tonnes
oz/ton	ounces per ton
po	pyrrhotite
ppb	parts per billion
ppm	parts per million\
py	pyrite
qz	quartz
s	sulphide
sl	sillimanite
VLF-EM	very low frequency electromagnetic

Conventional symbology is used for elements.

ACKNOWLEDGEMENTS

Throughout the five year term of the project junior staff geologists and senior geological assistants participated in: 1) collection of field data; 2) extracting data from cancelled assessment files; 3) data compilations; 4) directing of field camps; and 5) preparation of summary reports published in the annual Report of Field Activities.

The figures that appear in this report of the Mineral Deposit Series have been reproduced from previously published documents with exception of those figures that contain data provided by Ted Baumgartner of HBED. The figures were prepared by Marli Himelstein (Generic Cadd) and Bonnie Lenton (AutoCAD). Len Chackowsky and Bonnie Lenton, Manitoba Energy and Mines, drafted the accompanying map. Technical review of the manuscript was provided by G.H. Gale and M.A.F. Fedikow. Editing was provided by K. Ferreira and D.A. Baldwin.

GENERAL GEOLOGY OF NTS 63N/3

The geological base for MDS Map No. 17 is taken from the 1: 50 000 geology map of Schledewitz (1988). Important sources of geological information include the 1:7 920 geology map of Goetz (1980) in the vicinity of Sherridon, Manitoba, the 1:20 000 geology map of Froese and Goetz (1981), and detailed mapping in selected areas by Gale (1980, 1981).

The map area is situated near the south margin of the Churchill structural province of the Precambrian Shield in Manitoba and underlain by supracrustal and intrusive rocks of the east-trending Paleoproterozoic Kiseynew Domain (formerly Kiseynew Gneiss Belt). Bruce (1918) defined the Kiseynew metasedimentary gneisses after their type exposures at Kiseynew Lake, Manitoba (NTS 63K). In the vicinity of Sherridon, Manitoba, Bateman and Harrison (1946) divided the gneisses into quartzofeldspathic gneisses of the Sherridon Group and greywacke- and shale-derived gneisses and migmatites of the Cold Lake Group. Robertson (1953) refined this stratigraphy in the Batty Lake map sheet (NTS 63N/2) and divided the supracrustal rocks into three major units: 1) the predominantly greywacke-derived gneiss and migmatite of the Nokomis Group; 2) the 'granitized' Nokomis Group gneiss; and 3) after Bateman and Harrison (1946), the predominantly arkose- and subgreywacke-derived gneisses and migmatites of the Sherridon Group. Zwanzig and Lenton (1987) and Schledewitz (1987) proposed a new stratigraphic nomenclature for these supracrustal components. The revisions included: 1) Amisk Group for fine grained amphibolite and associated rocks that occur in proximity to the Kiseynew gneiss belt/Flin Flon greenstone belt margin; 2) Burntwood Metamorphic Suite (after Gilbert *et al.*, 1980; Lenton, 1981) for greywacke-derived gneiss and migmatite; and 3) Missi Metamorphic Suite for fine grained sedimentary (and volcanic) derived quartzofeldspathic gneiss and migmatite previously mapped as granitized Nokomis by Robertson (1953).

At the Flin Flon/Kiseynew belt margin the granitized Nokomis Group rocks have locally been interpreted to be equivalent to the Missi Group of the Flin Flon belt (Bailes, 1980). Ostry (1986) reinterpreted Robertson's granitized Nokomis Group gneiss as a sequence of fine grained quartzofeldspathic paragneiss and amphibolite (similar to rocks of the Missi Group (formerly Missi Metamorphic Suite or Missi Suite) and lithologically distinguished these rocks from those of Robertson's Sherridon Group (Sherridon Metamorphic Suite)) Zwanzig and Lenton (1987) and Schledewitz (1987) have designated the Sherridon Metamorphic Suite as the dominantly quartz-rich, quartzofeldspathic gneisses that include rocks of the former Sherridon Group within the type area at Sherridon, Manitoba. Robertson (1953) interpreted his Sherridon Group rocks to have been derived from a sequence of clastic sedimentary rocks, including abundant orthoquartzite, with interbedded hornblende gneisses of both sedimentary and volcanic origin. Goetz (1980) proposed that some of the Sherridon Group amphibolite layers, and one felsic breccia unit in the vicinity of Singsing Lake, may represent volcanic rocks and suggested that these rocks may be high metamorphic grade equivalents of Amisk Group volcanic rocks. Although Gale *et al.* (1980) considered the majority of Sherridon rocks to be clastic sedimentary derived, they did not dismiss a possible volcano-sedimentary genesis. Ashton

and Froese (1988) have interpreted that some of the Kiseynew belt quartz-rich rocks in Saskatchewan, those previously mapped as arkose, as equivalent to the Amisk Group and largely volcanic or volcanoclastic in origin. They further suggest that Sherridon Group quartz-rich gneisses near Sherridon, Manitoba are similar in appearance and may be volcanic in origin. These quartz-rich rocks are restricted to the domal Sherridon structure that straddles NTS areas 63N/2 and 63N/3 (Zwanzig *et al.*, 1988) and contain the Sherridon Cu-Zn massive sulphide type deposit plus a number of smaller base metal massive sulphide type deposits (Gale *et al.*, 1980).

The Burntwood River Metamorphic Suite comprises biotite-feldspar-quartz \pm garnet \pm graphite \pm sillimanite \pm cordierite paragneiss and quartz-feldspar-garnet-biotite migmatite \pm cordierite \pm sillimanite (Zwanzig *et al.*, 1988). The Missi Metamorphic Suite comprises intermediate feldspar-quartz \pm biotite \pm hornblende \pm magnetite \pm epidote \pm muscovite paragneiss, pink felsic gneiss, metaconglomerate and minor amphibolite. The Sherridon Metamorphic Suite is predominantly quartzofeldspathic gneiss, commonly quartz-rich, \pm garnet \pm hornblende with interlayered amphibolite and calc-silicate gneiss, marble and garnet \pm anthophyllite \pm cordierite porphyroblastic gneiss. The apparently stratiform garnet-anthophyllite gneiss forms a regionally continuous stratiform layer(s) or a series of lenses within quartz-rich gneiss of the Sherridon structure (NTS 63N/3 and 63N/2, and within orthogneiss in the Batty Lake area (NTS 63N/2). Possible precursors include sedimentary material that underwent *in situ* chloritization prior to high grade metamorphism (Froese, 1985), metamorphosed fault gouge material (Zwanzig and Lenton, 1987), a transposed Fe-Mg alteration zone similar to those commonly associated with massive sulphide type deposits, and pelitic and/or chemical sedimentary rocks.

Mafic and intermediate intrusive rocks include meta-diorite and massive, intermediate to ultramafic amphibolites. Felsic intrusive rocks include granite, granodiorite, tonalite and pink granitic pegmatite.

Kiseynew rocks have been metamorphosed to middle and upper amphibolite facies. The highest grades of metamorphism and most extensive migmatite development occur towards the central portion of the belt (Bailes and McRitchie, 1978).

The structural history of the belt is not certain due to local variations in the style of deformation, particularly within the rocks that outcrop along the south margin of the Kiseynew gneiss belt (Zwanzig, 1990a). Most investigators agree the earliest deformation, which is common to all areas of the belt, produced large-scale recumbent isoclinal folds or nappe-like structures (Pollock, 1965; Pearson, 1972; Elphick, 1972; Schledewitz, 1972; Bailes, 1975, 1980; Baldwin *et al.*, 1979; Lenton, 1981; Tuckwell, 1979; Zwanzig, 1983, 1984, 1990a, 1990b). This style of deformation is inferred from regional inversions and repetitions of stratigraphy. Transposition of beds and development of the main regional schistosity/gneissosity (defined by biotite and/or hornblende alignment parallel to compositional layers) also occurred during this event. Refolding of the early recumbent structures has produced dome and basin interference patterns that are prevalent throughout the Kiseynew gneiss belt. These structures commonly exhibit shallow to

moderate plunges and dips. However, south of Puffy Lake near the south margin of the Kisseynew belt, Zwanzig (1990a) has observed relatively young folds that exhibit steep dips and plunges that have been tentatively interpreted as the latest structures. These structures include open and flexural type folds, kinks and crenulations with north and south plunging axes; late strain zones, that are also prominent along the south margin of the belt may also be linked to these structures. A description of the tectonic evolution of the gneiss belt is presented in Zwanzig (1990b).

The Kisseynew gneisses are probably best known for the Zn-Cu massive sulphide type deposit at the Sherritt Gordon mine in Sherridon, Manitoba, and a number of other

smaller massive sulphide type deposits in the vicinity. At present, mineral production within NTS 63N/3 has occurred exclusively at the Sherritt Gordon Mine (Location 1) at Sherridon, Manitoba that was operated from 1931 to 1951. The Sherridon Cu-Zn deposit and all other Cu-Zn massive sulphide type deposits within the domal Sherridon structure occur within quartz-rich quartzofeldspathic gneisses of the Sherridon Metamorphic suite. These include the Bob Lake (Location 2), Park Lake (Location 3), Cold Lake (Location 4), and Fidelity (Location 5) massive sulphide type deposits, and in NTS 63N/2, the Jungle Lake massive sulphide type deposit. Furthermore, Froese and Goetz (1981) place the Sherritt Gordon and Park Lake massive sulphide type

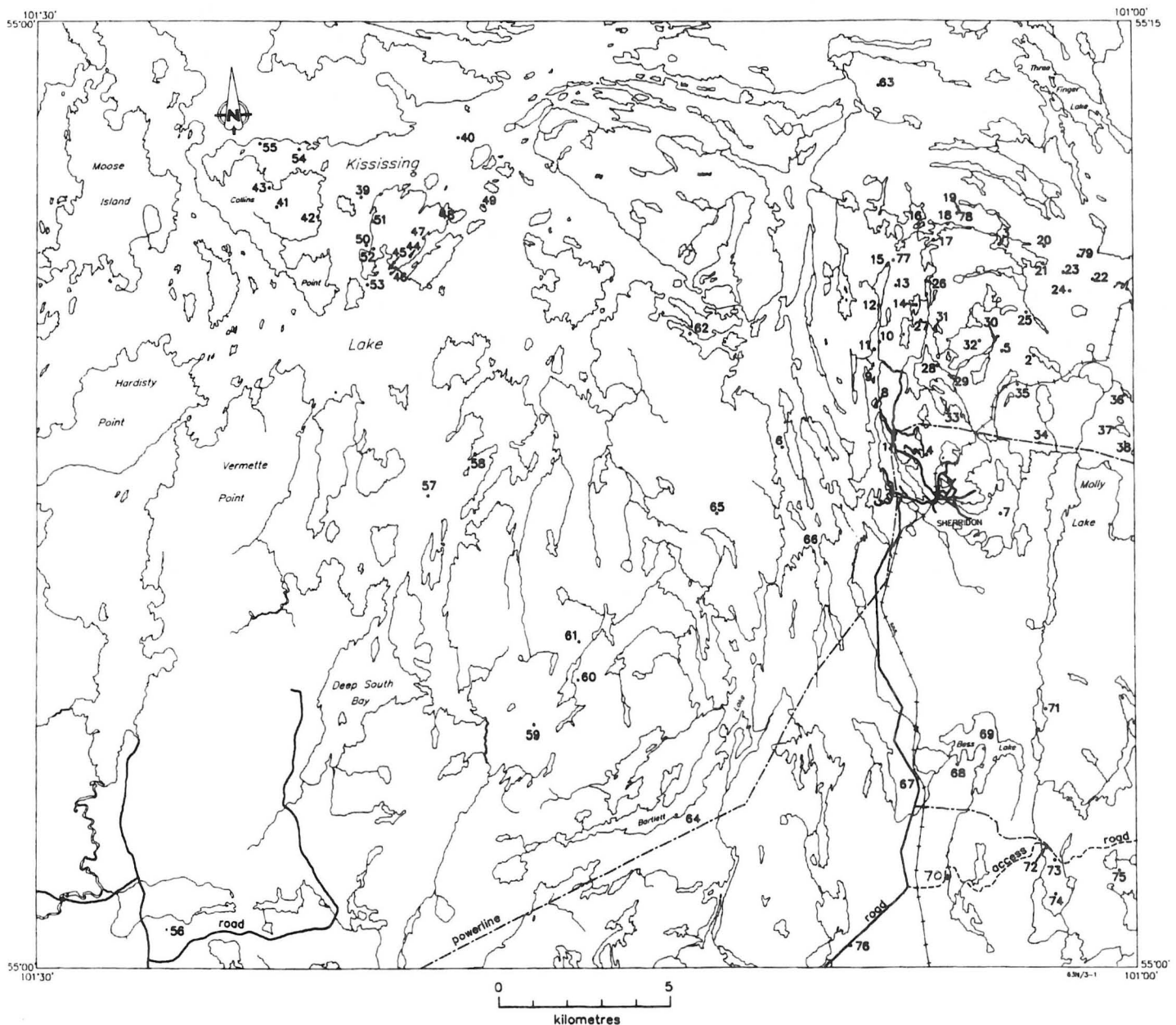


Figure 1: Mineral deposits and occurrences in Kississing Lake area (NTS 63N/3)

deposits at the same stratigraphic position or 'ore bearing horizon' as the Jungle Lake massive sulphide type deposit (63N/2), and place the Bob Lake, Cold Lake and Fidelity massive sulphide type deposits at a different stratigraphic position or 'ore bearing horizon'. The stratiform cordierite-anthophyllite bearing layers/lenses occur at both stratigraphic positions.

Outside the Sherridon Structure, solid sulphide mineralization occurs at the Ideal (Location 6) and in the Yakushavich Island/Collins Point area (Locations 39 and 44). The Ideal massive sulphide deposit occurs in an area of Burntwood Metamorphic Suite gneiss, but is associated with chert/quartzite, calc-silicate rock and dolomitic marble. In the Yakushavich Island/Collins Point area both Locations 39 and 44 also occur in proximity to Burntwood Metamorphic Suite gneiss. However, the mineralization intersected at Locations 39 and 44 are hosted within a sequence of 'siliceous biotite paragneiss' that may represent an interval of felsic rock deposition within the greywacke-derived Burntwood Metamorphic Suite rock sequence or, alternatively, a different lithologic sequence, possibly equivalent to the Sherridon Metamorphic Suite. Hydrothermally altered anthophyllite-bearing rocks are intimately associated with the solid sulphide mineralization at all three localities. Both the Yakushavich Island/Collins Point and Ideal massive sulphide type deposits exhibit elevated levels of Zn \pm Pb with respect to Cu and may represent a more distal depositional environment than that at the Sherritt Gordon deposit at Sherridon, Manitoba. Additionally, all massive sulphide type mineralization contains geochemically anomalous concentrations of gold. The massive sulphide type deposits within the Sherridon structure commonly contain from 0.3 to 0.6 g/t Au. Similarly, at the Ideal massive sulphide type deposit (Location 6) the near solid - solid sulphide mineralization contains up to 0.6 g/t Au, and locally up to 189 g/t Ag. A grab sample of the disseminated and stringer footwall mineralization contained 6.9 g/t Au. Massive sulphide type mineralization at Yakushavich Island and Collins Point locally contains up to 11.66 g/t Au (Location 39).

Although Sherridon Metamorphic Suite quartz-rich rocks are of uncertain age and genesis, Gale *et al.* (1980) drew attention to the potential for large tonnage massive sulphide type deposits within these rocks due to their similarities with the Potosi gneisses of the Australian Willyama Complex that contain the Broken Hill Pb-Zn-Ag massive sulphide type deposit.

At least five localities of gold-arsenopyrite mineralization occur on the south flank of the Kisseynew gneiss belt within Manitoba in proximity to its southern boundary with the Flin Flon metavolcanic and metasedimentary belt. All mineralization occurs within predominantly amphibolitic rock sequences; these include the Puffy Lake, Nokomis Lake, Evans Lake (63N/2), Lobstick Narrows (63K/14) and Martell Lake (63K/15) gold occurrences. At Nokomis and Evans Lakes (Gale and Ostry, 1984), and Lobstick Narrows (Parbery, 1990) stratigraphically controlled gold-arsenopyrite mineralization occurs within a regionally extensive, layered, predominantly mafic amphibolitic sequence that occupies a stratigraphic position between Missi Metamorphic Suite rocks and Burntwood Metamorphic Suite rocks. Within NTS 63N/3, stratabound mineralization comprises disseminated to near solid Fe-sulphide and base metal sulphide mineralization (Locations 59, 62, 63, 65), disseminated

arsenopyrite and/or pyrrhotite/pyrite mineralization (Location 58, 60, 61, 67, 70) and occurs within amphibolite or sequences of amphibolite that locally mark the contact between Burntwood River Metamorphic Suite rocks and Missi Metamorphic Suite gneiss (*cf.* Gale and Ostry, 1984). High concentrations of Au were reported in samples from Locations 58, 60, 67 and 69. Samples from Locations 59, 61, 67 and 69 contain elevated concentrations of arsenic; elevated levels of tungsten were detected in samples from Locations 59 and 69. Furthermore, at Location 75, immediately west of the Puffy Lake gold deposit (NTS 63N/2), disseminated pyrite, pyrrhotite and arsenopyrite mineralization occurs within a fine grained siliceous gneiss layer (s) near or at the contact between greywacke-derived Burntwood River Metamorphic Suite gneiss, and Missi Metamorphic Suite quartzofeldspathic gneiss.

A regional till sampling program by Kaszycki (1989) that included NTS 63N/3 identified a possible As, Au and Cu dispersal train that begins near or at the north boundary of NTS 63N/3 and extends, at least, to the south boundary of the map area. Furthermore, during 1988 Neilsen and Gobert (1988) collected till samples along road traverses in the southwest portion of the map sheet south of Kissing Lake as follow up to the identification of this dispersal train. Approximately 50% of these till samples contained from 1 to 5 visible grains of gold. The majority of gold grains are abraded. Approximately 80% of the samples contained from 5 ppb to 1676 ppb Au in the heavy mineral fraction (Specific Gravity greater than 2.96).

Occurrences of sulphide facies iron formation are common in NTS 63N/3. Two regionally extensive graphitic sulphide facies Fe-formations layers occur within the Sherridon structure. Locations 7, 18, 20 and 34 occur predominantly within calcium-rich hornblende-bearing gneiss, calc-silicate gneiss and quartz-rich gneiss close to the contact between Sherridon Metamorphic Suite calc-silicate rocks and quartz-rich gneisses west and east of Park Lake, south of Shellet Lake and north of Molly Lake. Graphitic sulphide facies iron formations also occur at a similar stratigraphic position near the periphery of the structure in NTS 63N/2 (*cf.* Ostry and Trembath, 1992). Locations 26 to 31 occur at or near the contact between the Sherridon Metamorphic Suite biotite-garnet schist formation and a marble and calc-silicate rock unit near the centre of the structure near Jonah Lake, at Cree Lake and south of Singing Lake. Dark grey, very fine grained graphitic and pyritic layers, possibly 'earthy pyrite' (Laufer *et al.*, 1985), are described at locations 26, 29 and 30.

At Location 73 a red weathered syenite is malachite stained and contains hematite and chalcopyrite on fracture surfaces. A sample of the mineralized syenite contained elevated concentrations of Au, Cu, Bi, Mo and W.

NOTE:

The most recent and detailed geologic mapping of the domal Sherridon structure rocks in 63N/3 was done by Goetz (1980), and Froese and Goetz (1981). Most figures within this volume that contain mineral occurrences located within the Sherridon structure, predominantly Locations 1 to 6 and 7 to 38, will display the stratigraphic subdivisions in use in 1980-1981. Sherridon Group refers to rocks of the Sherridon Suite, and the Nokomis Group rocks are now interpreted to be tonalitic - granodioritic orthogneiss (Schledewitz, 1988).

All other figures will display the stratigraphic nomenclature used on the source geology map.

UPDATE 1996:

Since the completion of this manuscript a considerable amount of structural and stratigraphic data has been collected throughout the Flin Flon metavolcanic belt and the Kiseynew gneiss belt. The new data has resulted in a revised stratigraphic nomenclature and tectonic history for this area. For a detailed interpretation of the regional geology and tectonic setting of the Kiseynew gneiss belt the reader is referred to Zwanzig (1990b), Zwanzig and Schledewitz (1992), Zwanzig (1994a), Zwanzig *et al.*, (1996a, b).

To summarize: The Sherridon Group, now termed the Sherridon Suite, is interpreted to be a tectonic assemblage

of supracrustal and intrusive rocks rather than a stratigraphic sequence of rock units and represents time equivalents of the Amisk Group volcanic rocks (now termed the Amisk collage (Syme *et al.*, 1996, Lucas *et al.*, 1996)) of the Flin Flon greenstone belt.

The Missi Metamorphic Suite and Burntwood Metamorphic Suite rocks are now called Missi Suite and Burntwood Suite respectively because, locally, both rock types can be traced from the low grade Flin Flon belt to the high grade Kiseynew belt.

The new tectonic interpretation proposes at least two phases of nappe emplacements. Nappe emplacement resulted in interleaving of various lithological units on the Kiseynew south flank and formation of a complex transition from Kiseynew belt to the Flin Flon belt.

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MINERAL DEPOSITS AND OCCURRENCES: SHERRIDON AREA (63N/3)

LOCATION: 1

NAME: Sherritt Gordon Cu-Zn Deposit

UTM: 6111778N/365584E

AREA: Sherridon, Manitoba.

AIRPHOTO: A26397-010

ACCESS: Kississing Lake road via the Sherridon access road to Cold Lake/Sherridon, Manitoba.

EXPLORATION SUMMARY:

The original discovery was made by Philip Sherlett in 1922 (Brown, 1933). Sherlett's claims (Teddy, Deer, Mink, Gull, Daisy, Bear, and Rose) lapsed in 1924. C.W. Sherritt and R. Madole acquired the property in 1923-1924. In 1925 J.P. Gordon optioned the Sherritt-Madole group of 16 claims and added more claims to form the Sherritt-Gordon group of 25 claims. Nipissing Mines Company, Limited carried out a 28-hole 1514 m diamond drill program in 1925-1926 (Mineral Inventory Card 63N/3 CU 3). This work outlined 408 000 tonnes of ore with an average grade of 2.86% Cu, 3.3% Zn (Wright, 1929a). Options were taken by Victoria Syndicate, Limited (an associate of the Mond Nickel Company, Limited) in 1926, and then by J.L. Agnew and Associates of the International Nickel Company of Canada, Limited in 1927.

Sherritt Gordon Mines Limited was incorporated in July 1927 to develop the property. Ten shallow holes were drilled into the East orebody (East lens) in the fall of 1927, followed by 116 holes by the fall of 1929.

Plans were made for production at 1240 tonnes per day and an agreement was made with HBM&S to treat 181 tonnes of copper concentrate per day at Flin Flon. Shaft sinking began in 1928-1929. Leases 1007-1061 and 1142 were issued in 1929. A railway was extended from Flin Flon to Sherridon in 1929. By 1939 the No. 1 shaft (on Lake M.C.) was sunk to 113 m into the East lens with levels established at 38 m and 76 m; the No. 2 shaft (on Spruce M.C.) was sunk to 146 m into the West orebody (West lens) with levels at 38 m, 76 m, and 114 m; an inclined 4-compartment shaft, the No. 3 shaft (on Crow M.C. and Ook), was sunk to 208 m within the West lens with levels at 61 m, 107 m, 152 m, 198 m, 244 m, 290 m, and 335 m. Prospecting, geophysical surveys and detailed geological mapping was done north and northeast of the mine in 1938-1939 (Corporation Files, Sherritt Gordon Mines, Limited).

The No. 3 shaft (West lens) was in production from April, 1931 to June, 1932 and August, 1937 to September, 1951; the No. 1 shaft (East lens) was in production from May, 1940 to October, 1946. Zinc concentrate was produced using ore from the East lens in June 1942, and continued to be produced after 1946 from the copper tailings. During 1931-1932 and 1937-1951, 7 737 936 tonnes of ore from the Sherritt Gordon Mine were milled, producing 166 093 tonnes of copper, 135 108 tonnes of zinc concentrate (50%), 2867 kg of gold, and 91 320 kg of silver (Mineral Inventory Card 63N/3 CU 3). The leases were renewed in 1950. The entire mine facilities and town site were moved to Lynn Lake during 1946-1953 (Fogwill and Bamburak, 1987).

Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). The leases were cancelled in 1976. HBED restaked the ground as CB 6439 to CB 6443 in January 1977. Shell Canada

Resources Limited did an airborne EM/Mag survey in 1980 (A.F. 92513). The area was included in a regional till sampling program conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km². CB 6440 was cancelled in 1990, and was restaked as Erik 6 by L. Racic in 1991.

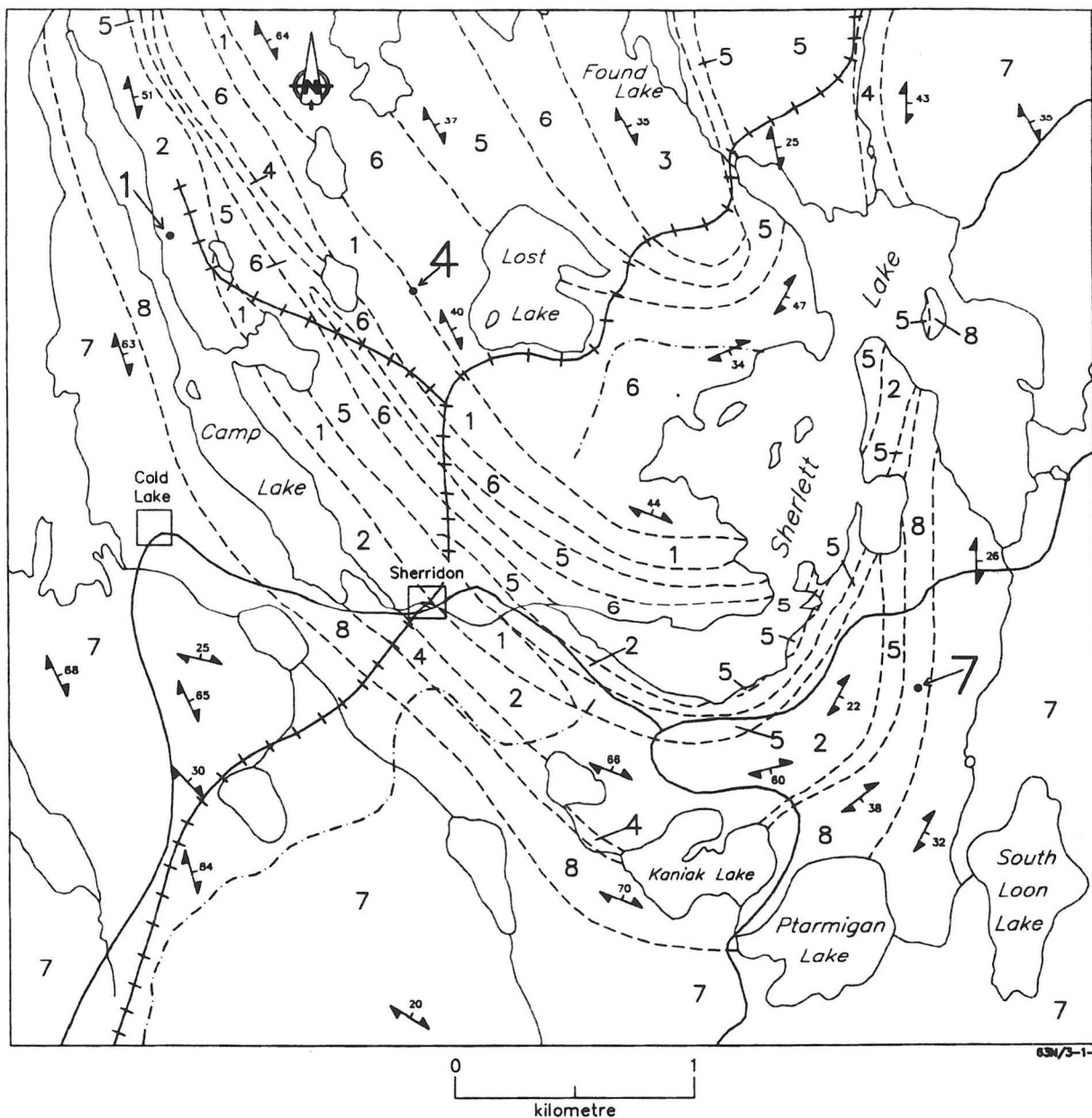
GEOLOGICAL SETTING:

The area is underlain by biotite- or hornblende-bearing quartz-rich quartzofeldspathic gneiss, amphibolite, calc-silicate gneiss and cordierite-anthophyllite rock of the Sherridon Suite (former Sherridon Group) (Fig. 1-1; Zwanzig and Schledewitz (1992). The mineralization is hosted by Sherridon Suite quartzofeldspathic quartz-rich gneiss. Early reports indicated that quartz-rich gneiss formed the footwall (structural) and quartz-bearing garnetiferous amphibolite formed the hanging wall to the deposit (Wright, 1929a, 1929b; Bruce, 1929; Farley, 1949). Sherritt Gordon Mines Ltd. (1930) indicate that up to 1 m of quartz-rich gneiss separated the deposit from the hanging wall amphibolite. Goetz (1980) states that the sulphide lenses occur exclusively within the quartz-rich gneiss. A pelitic biotite-garnet-sillimanite bearing gneiss occurs in close proximity to, and along a portion of, the East lens hanging wall contact (Fig. 1-2; Goetz, 1980). Both Goetz (1980) and Gale (1980) describe felsic calc-silicate interlayers within the host quartz-rich gneiss unit. A crosscutting Mg-Fe metasomatic alteration zone associated with the mineralization has not been identified at Sherridon, but Bruce (1929) and Farley (1949) identified chlorite that occurs locally along the margins of the solid sulphide mineralization. Cordierite-anthophyllite rocks occur immediately east of the East lens but at the same stratigraphic position as the mineralization (Fig. 1-2; Goetz, 1980).

MINERALIZATION:

Various aspects of the deposit have been described by Wright (1929a, 1929b), Bruce (1929), Sherritt Gordon Mines Ltd. (1930), Brown (1933), Brownell (1938), Derry (1942), Bateman (1944), Bateman and Harrison (1946), Farley (1949), Sangster (1978), Tuckwell (1979), Goetz (1980), Gale *et al.* (1980), Gale (1980), Froese and Goetz (1981) and Goetz and Froese (1982). The following description is taken mainly from Goetz (1980) and Froese and Goetz (1981). The Sherritt Gordon deposit consists of two stratabound solid sulphide lenses, the West orebody and East orebody (Fig. 1-2). Both occur at the same stratigraphic position, but are separated by approximately 1100 m along strike. The East lens is approximately 2400 m long, 5 m wide and extends to a maximum depth of approximately 75 m. The West lens is approximately 2400 m long, 5 m wide and reaches a maximum vertical depth of 460 m. The solid sulphide is composed predominantly of pyrrhotite with lesser amounts of pyrite, chalcopyrite and sphalerite. Locally, exsolution blades of cubanite occur in the chalcopyrite. Wright (1929b) observed disseminated galena and pyrrhotite in the hanging wall amphibolite and locally, magnetite within the solid sulphide. Farley (1949) mentions minor amounts of arsenopyrite within the ore, and noted the association of gold and arsenopyrite with late galena-filled veins in the hanging wall amphibolite.

Most investigators described a sharp structural hanging wall contact on or near the amphibolite, and a



Intrusive Rocks

8 Coarse grained amphibolite, metagabbro

7 Tonalitic to granodioritic gneiss

Sherridon Suite

6 Quartz-rich gneiss \pm amphibolite

5 Amphibolite and intermediate gneiss

4 Calc-silicate rock

3 Calcareous gneiss, marble

2 Cordierite-anthophyllite rock

1 Massive amphibolite

----- Geological boundary (approximate)

Gneissosity (inclined)

Geology after Zwanzig and Schledewitz (1992).

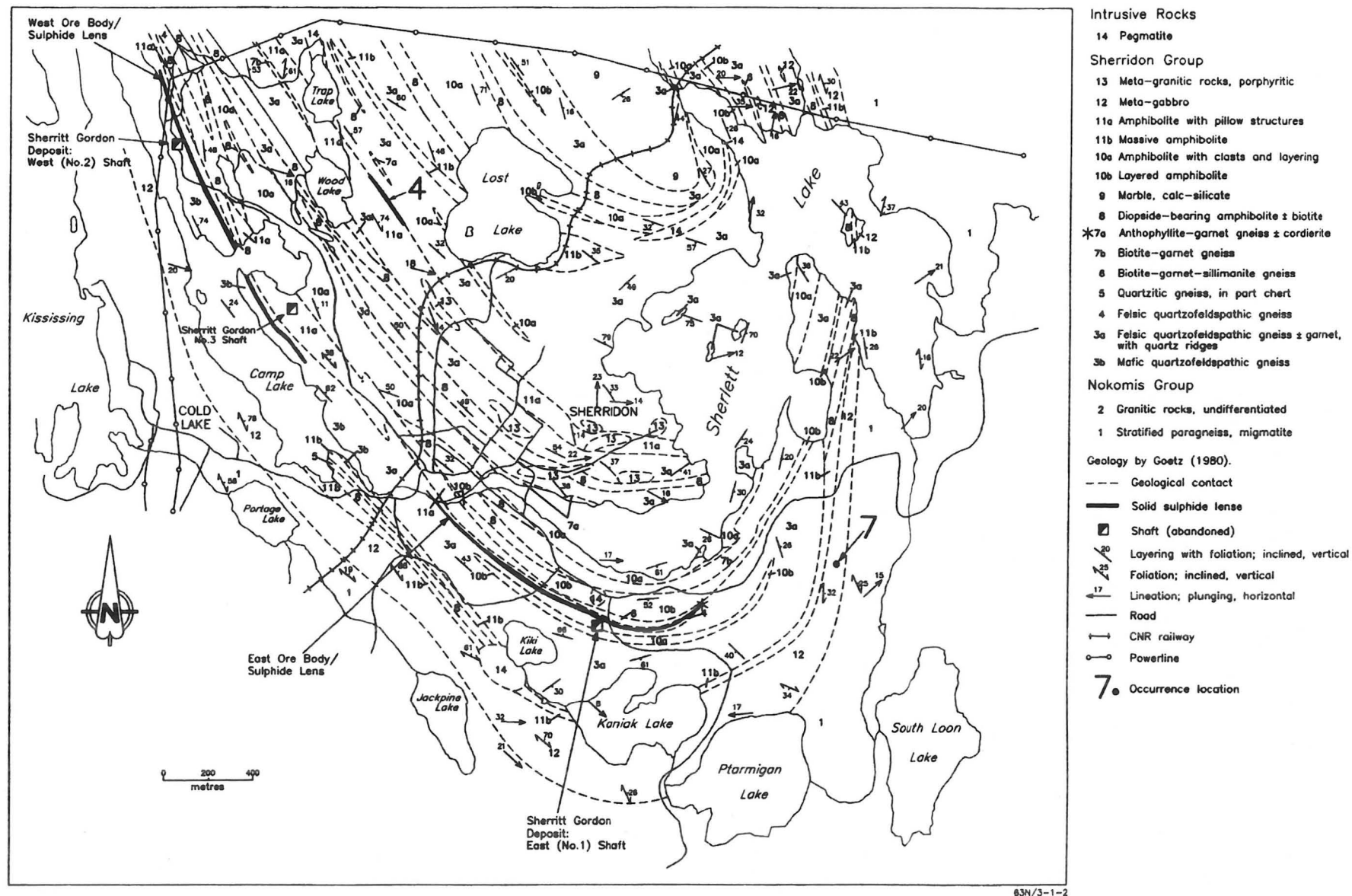
----- Trail

———— Road

+ + + CNR railway

7. Occurrence location

Figure 1-1: General geology in the vicinity of Sherridon, Manitoba and locations of the Sherritt Gordon (Location 1) and Lost Lake (Location 4) massive sulphide type deposits and occurrence 7



63N/3-1-2

Figure 1-2: Detailed geology in the vicinity of the Sherritt Gordon massive sulphide type deposit

gradational structural footwall contact within the quartz-rich gneiss that is characterized by solid sulphide grading into disseminated sulphides. However, after viewing level plans of the deposit Goetz (1980) determined that disseminated sulphides were common on both sides of the mineralization (Fig. 1-3). Mobilized solid sulphide lenses or 'offshoot masses' (Fig. 1-4a, b, c), commonly associated with pegmatite, are important locally and typically occur in the hanging wall. These 'offshoots' characteristically lacked pyrrhotite (Goetz, 1980), contained up to 450 000 tonnes of ore (Bateman, 1944), and represented 25 % of total production (Farley, 1949). Silicate gangue minerals commonly formed elliptical or round masses within the sulphide (Wright, 1929a, 1929b; Bruce, 1929). The gangue minerals are predominantly quartz but include feldspar, hornblende, sericite, chlorite, biotite, garnet, calcite, scapolite, clinopyroxene and, locally gahnite. Larger silicate 'fragments' within the sulphide, and probably the majority of gangue minerals, were derived from the quartz-rich gneiss and included calc-silicate rock.

GEOCHEMICAL DATA:

The East sulphide lens was estimated to contain 785 621 tonnes that contained 2.14% Cu, 5.78% Zn, 0.65 g/t Au, 26.06 g/t Ag and the West sulphide lens included 2 967 613 tonnes that contained 2.91% Cu, 2.76% Zn, 0.61 g/t Au, 32.23 g/t Ag. In addition, the West lens contained a central section of 1 012 666 tonnes that contained 1.4% Cu, 0.80% Zn, 0.41 g/t Au and 41.83 g/t Ag. 'Minute' amounts of Cd and Pb also occur within the ore (Sherritt Gordon Mines Ltd., 1930).

Davies *et al.*, (1962) reported "The production of metals from the mine was: copper 366,244,801 lbs., zinc concentrate (50 per cent) 148,961 tons; gold 101,026 oz., silver 3,218,324 oz. The total value of production was \$58,732,366, from 8,531,352 tons milled."

On the basis of unpublished assay plans from the 3 level of the West lens, Goetz (1980) identified a crude metal zonation reflected by a decrease in the Cu/Zn ratio towards the structural hanging wall. The symmetrical distribution of Zn and Cu concentrations about the long axis, in plan, of the orebody on that portion of the level (Fig. 1-5) could, however, indicate that the present metal distributions could have been tectonically produced. In addition, Goetz (1980) using unpublished ore reserve estimates determined that both sulphide lenses exhibited a lateral metal zonation. Cu/Zn ratios increased from west to east in the East lens, and a less pronounced increase in Cu/Zn ratios is exhibited from south to north in the West lens (Fig 1-6).

CLASSIFICATION:

Stratabound massive sulphide type deposit; sedimentary rock associated. The Sherritt Gordon deposit is interpreted to be a distal deposit due to the lack of a documented alteration zone associated with the mineralization. Froese and Goetz (1981) place the Sherritt Gordon deposit at the same stratigraphic position or 'ore-bearing horizon' as the Park Lake (Location 3) massive sulphide type deposit located north-northeast of Sherridon, Manitoba (Fig. 1-7) and the Jungle Lake massive sulphide type deposit (Ostry and Trembath, 1992) immediately to the east in NTS 63N/2. Locally, cordierite-anthophyllite rocks occur along the ore-bearing horizon (Fig. 1-7).

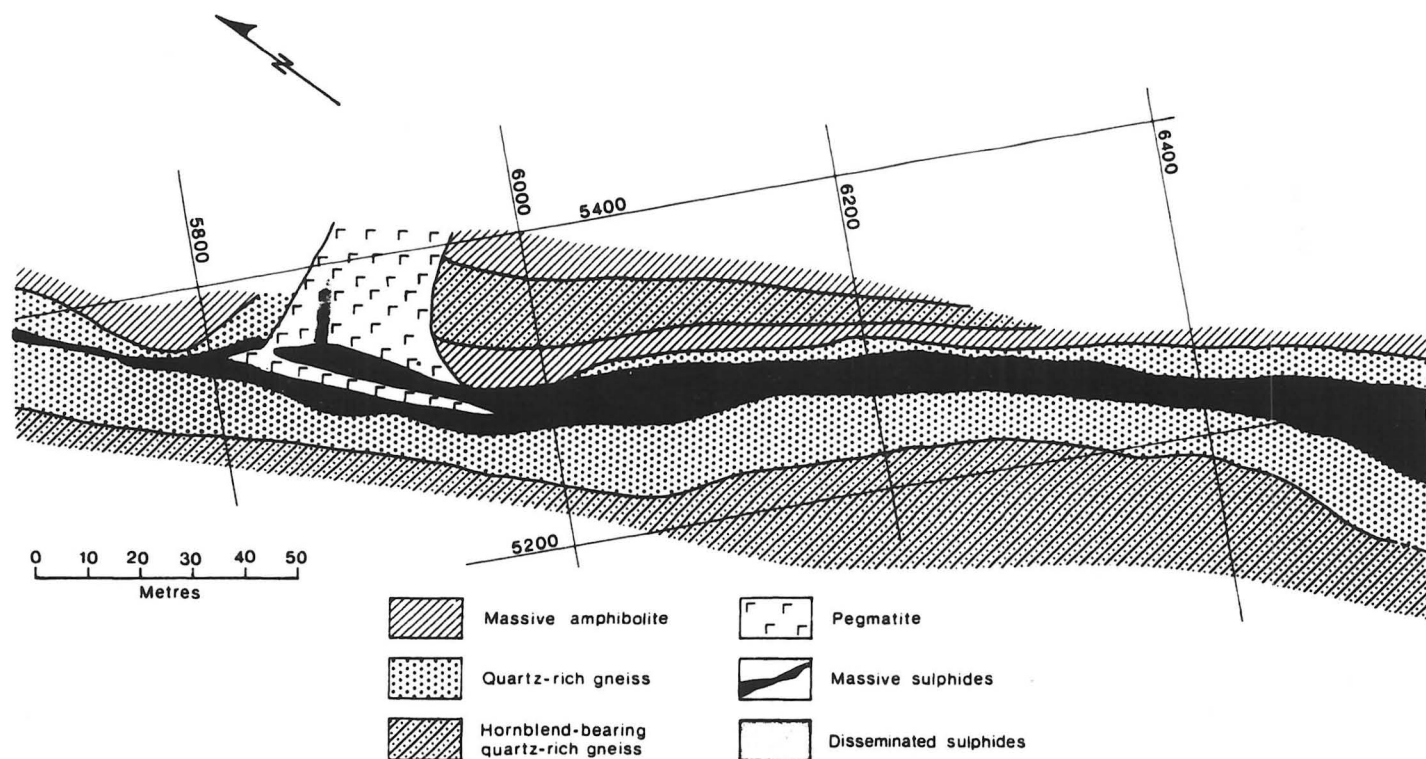


Figure 1-3: Geology and sulphide distribution on a portion of the third level of the west orebody

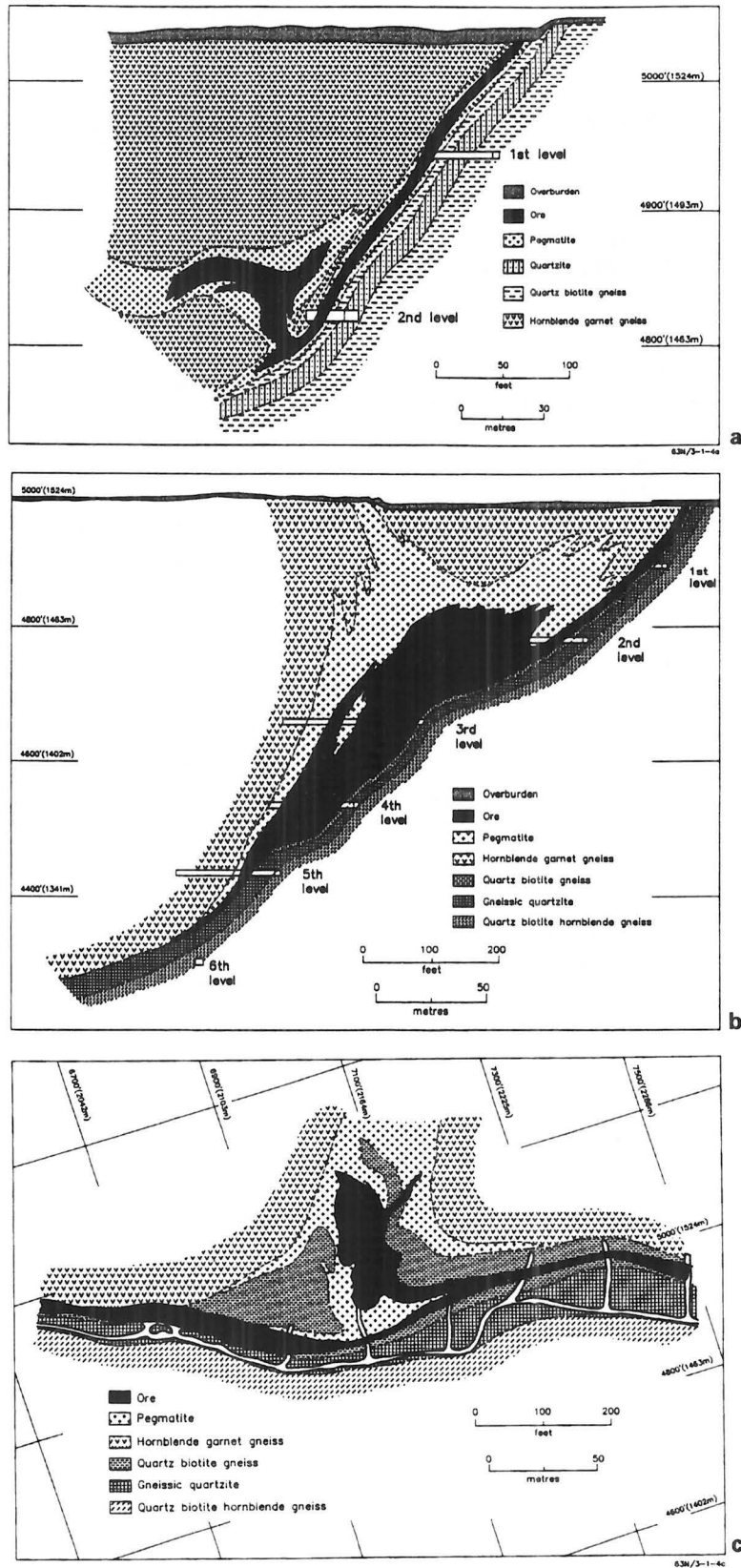


Figure 1-4: Distribution of solid sulphide within the structural hanging wall ('offshoot masses of solid sulphide') to the Sherritt Gordon deposit: (a) geological section looking east through east sulphide lens and "Mackenzie" offshoot, (b) geological section looking south through the west sulphide lens and "72" offshoot, and (c) geological plan of "72" offshoot and portion of the west sulphide lens on the second working level (Farley, 1949)

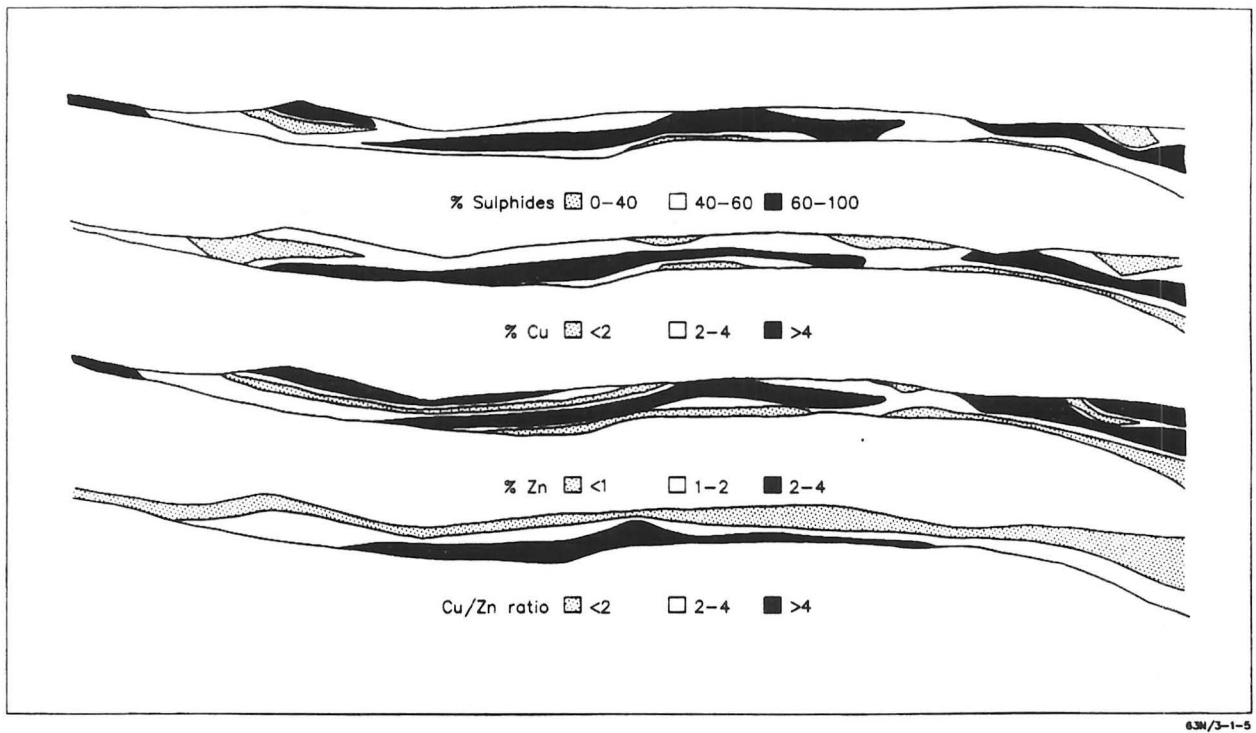


Figure 1-5: Sulphide, Cu and Zn distribution of a portion of the third level of the west sulphide lens

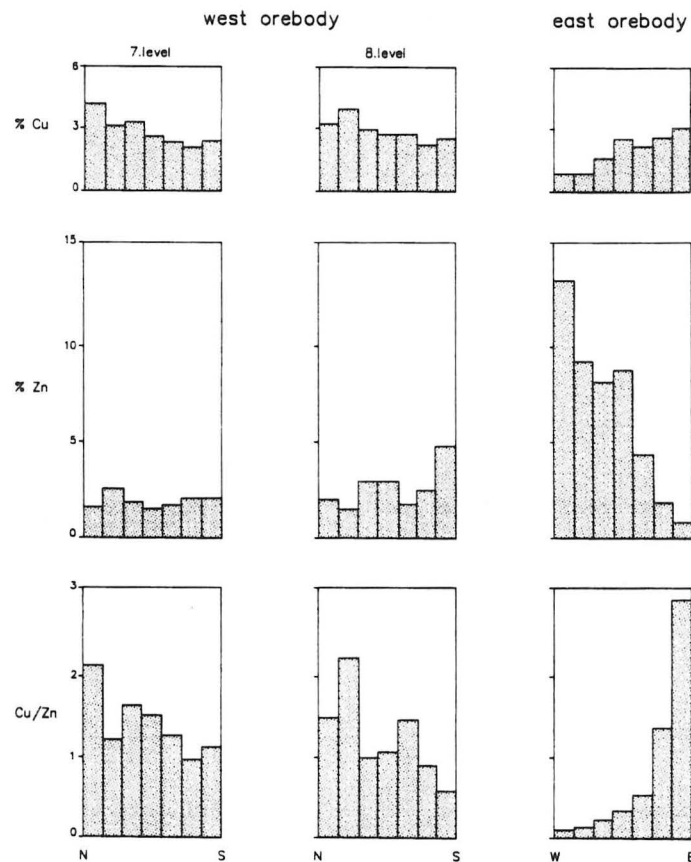


Figure 1-6: Distribution of Cu, Zn and Cu/Zn ratios (on the basis of unpublished ore reserve estimates) from north to south on the seventh and eighth levels of the west sulphide lens, and from west to east within the east sulphide lens (unit measurements for the X axis were not included)

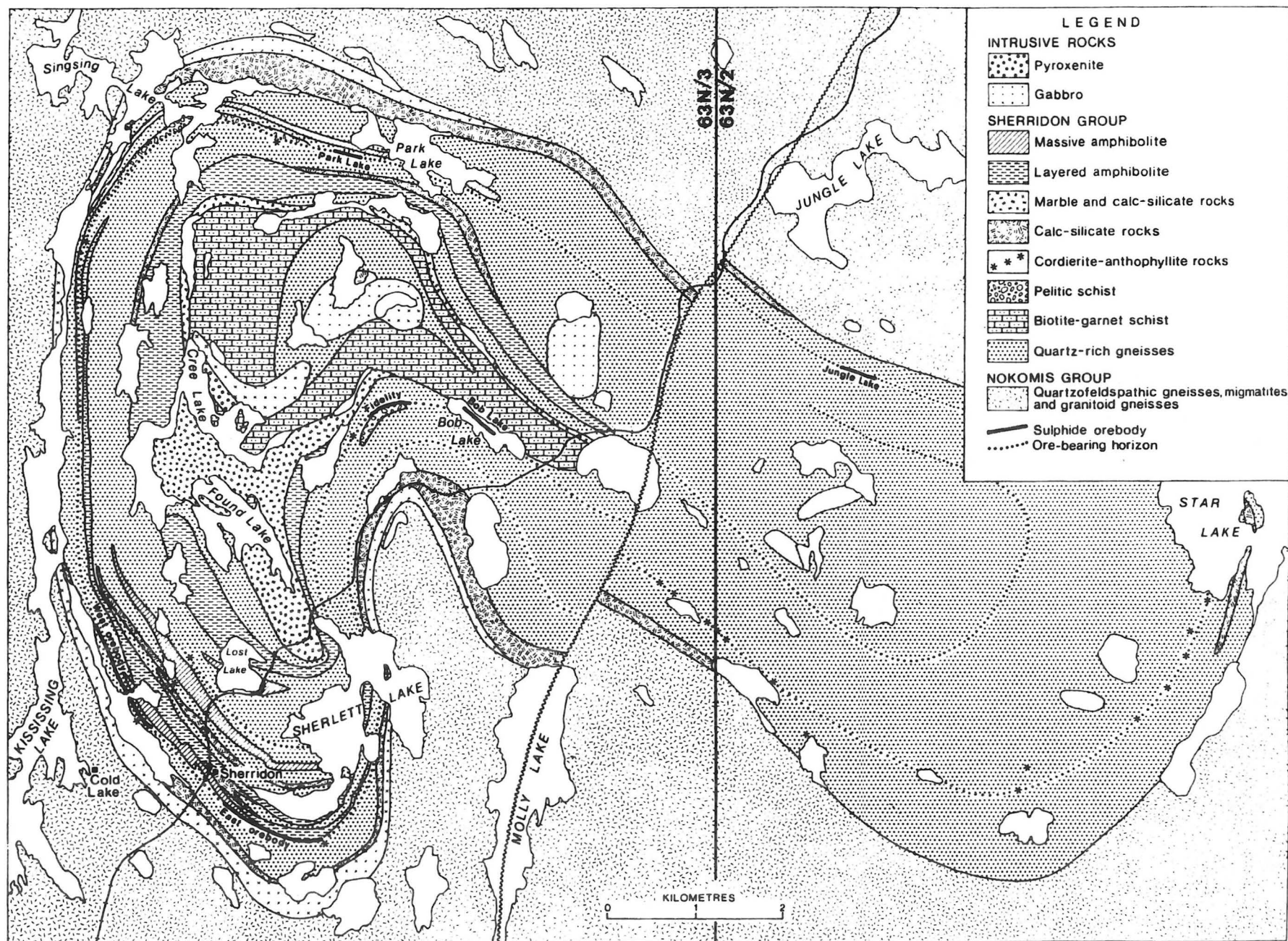


Figure 1-7: Locations of known massive sulphide type deposit "ore-bearing horizons" and occurrences of cordierite-anthophyllite rock within the domal Sherridon structure in NTS 63N/3 and 63N/2

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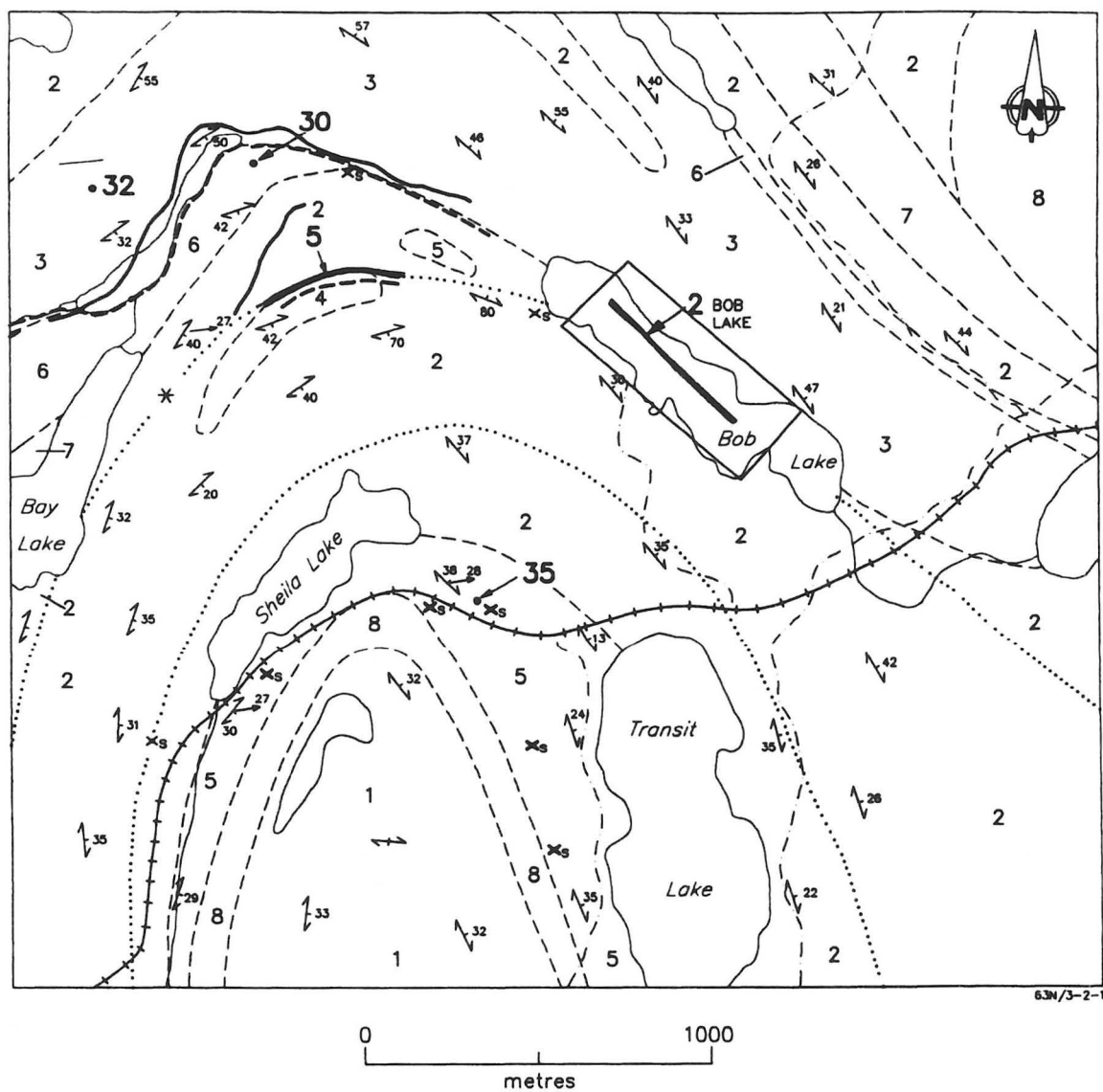
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INTRUSIVE ROCKS

8 Gabbro

SHERRIDON GROUP

7 Layered amphibolite with fragments;
probably metamorphosed volcanoclastic rock

6 Impure marble and calc-silicate rocks

5 Calc-silicate rocks

4 Pelitic schist

3 Biotite-garnet schist

2 Quartz-rich gneisses

NOKOMIS GROUP

1 Migmatite

Geology by Froese and Goetz (1981).

--- Geological boundary
(approximate, assumed)

..... Ore-bearing horizon

— Solid sulphide lense

* Cordierite-anthophyllite rocks

x_s Mineral occurrence; sulphide

— EM conductors

(A.F. 92006)

(A.F. 93118)

↗ ↘ Foliation (inclined, vertical)

→ 28 Lamination, mineral

+ + + C.N.R. railway

- - - Trail

• 35 Occurrence location

□ Area encompassed by
Mineral Deposit file

Figure 2-1: Geology in the vicinity of Bob Lake massive sulphide type deposit

LOCATION: 2

NAME: Bob Lake Cu-Zn deposit

UTM: 6114305N/369854E

AREA: Bob Lake, approximately 5 km northeast of Sherridon, Manitoba.

AIRPHOTO: A26369-175

ACCESS: Bush aircraft to Bob Lake.

EXPLORATION SUMMARY:

The Cananac group was staked for P. Hopkins in 1927 and sold to Manitoba Basin Mining Co., Limited in 1928 (Wright, 1929). Prospecting was carried out in 1928 and a 46 m wide showing with 'some copper and zinc' was reported in the centre of the group; sulphide mineralization was reported over a 1.6 km length to the north where it occurred over a 12 m width (Corporation File, Manitoba Basin Mining Co., Limited). Sherritt Gordon Mines Limited did a geological survey in 1938 and a geophysical survey in 1939 (Mineral Inventory Card 63N/3 CU 1).

The Bob group of claims was staked by various individuals including R.W. Johns and W.J. Farley in 1940-1941. E.L. Brown acquired the claims in 1941-1942. A intensive drilling program (70 holes) was begun in November, 1941 and completed during the first half of 1942. The deposit was discovered in December 1941. Sherritt Gordon Mines Limited acquired 21-year leases (M-1780, 1781, 1789, 1790, 1753, 1767, 1768) in 1947. In 1948 geophysical surveys were done, and two holes were drilled east of Bob Lake to test a conductor (The Northern Miner, May 27, 1948). Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). The leases were renewed in 1968. In 1965-1966 Fidelity Mining Investments Limited carried out magnetic and EM surveys on the Bar claims west of Bob Lake (A.F. 93118). Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). In 1975 Sherritt Gordon Mines Limited applied for a production lease and obtained 10-year Explored Area Lease (EAL) 15A. Shell Canada Resources Limited did airborne magnetic and EM surveys in 1980 (A.F. 92513). The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km². EAL 15A was transferred to Hayes Resources Inc. and then to LynnGold Resources Inc. in 1988.

GEOLOGICAL SETTING:

The area is underlain by Sherridon Suite (former Sherridon Group) biotite- or hornblende-bearing quartz-rich quartzofeldspathic gneiss and biotite - garnet schist (Fig. 2-1; Froese and Goetz, 1981). Bateman (1945) indicates that

the sulphide mineralization at Bob Lake is almost completely enclosed in pegmatite. Snow (1982) mentions that the mineralization occurs within quartz-rich gneisses of the Sherridon Metamorphic Suite.

MINERALIZATION:

A description of the mineralogy of the sulphide mineralization at Bob Lake is lacking in the literature, but Bateman (1945) and Bateman and Harrison (1946) indicate that all Cu- and Zn-bearing, near solid to solid sulphide mineralization in the Sherridon area consists, predominantly, of pyrrhotite, with chalcopyrite and sphalerite and minor amounts of pyrite. Other aspects of the Bob Lake sulphide deposit have been described by Snow (1982) and the following information has been derived principally from this source. The Bob Lake deposit consists of four lenses of solid and disseminated sulphides that occur intermittently over a strike length of approximately 490 m. The lenses exhibit a northwest strike and dip, on average, 50° to the northeast, and plunge gently southeast from surface to a maximum vertical depth of approximately 180 m. Locally, the sulphide mineralization has been mobilized into younger granitic rocks. Hydrothermally altered rocks related to the sulphide mineralization have not been identified in the vicinity. However, a chlorite - graphite schist with disseminated sulphides occurs structurally above the deposit in drill core and locally, forms the hanging wall to the mineralization. A geological section through the Bob Lake deposit (Fig. 2-2; Farley, 1949) indicates at least two of the sulphide lenses are arranged *en echelon*.

GEOCHEMICAL DATA:

Metal distribution within the sulphide lenses indicate a decrease in the Cu/Zn ratio towards the footwall and an increase in the Cu/Zn ratio down plunge (Snow, 1982). Published reserve figures for three of the four lenses are 2,159,000 tonnes of 1.33% Cu, 1.18% Zn, 0.31 g/t Au and 8.45 g/t Ag (Sherritt Gordon 1942 Annual Report).

CLASSIFICATION:

Stratabound massive sulphide type deposit; sedimentary rock associated. The distribution of Cu and Zn within the deposit may indicate that the Bob Lake Deposit is overturned (*cf.* Location 5, the Fidelity massive sulphide type deposit). The position of an 'ore-bearing horizon' (Fig. 2-1) suggested by Froese and Goetz (1981), includes the Bob Lake (Location 2), Cold Lake (Location 4) and Fidelity (Location 5) massive sulphide type deposits, and the mineralization at the Cu-sulphide property in 63N/3 (Ostry and Trembath, 1992).

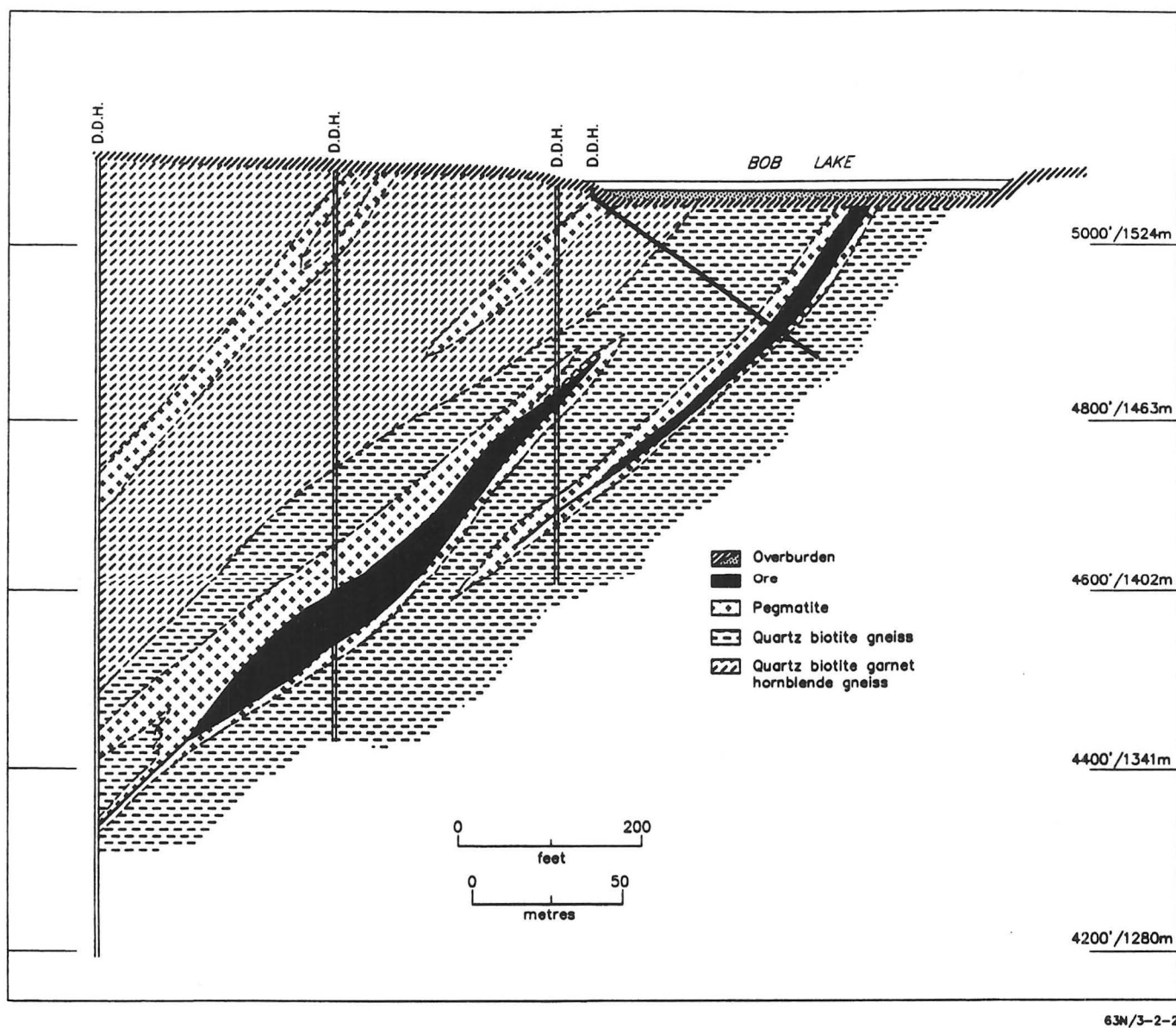


Figure 2-2: Geological section looking southeast through the Bob Lake massive sulphide type deposit

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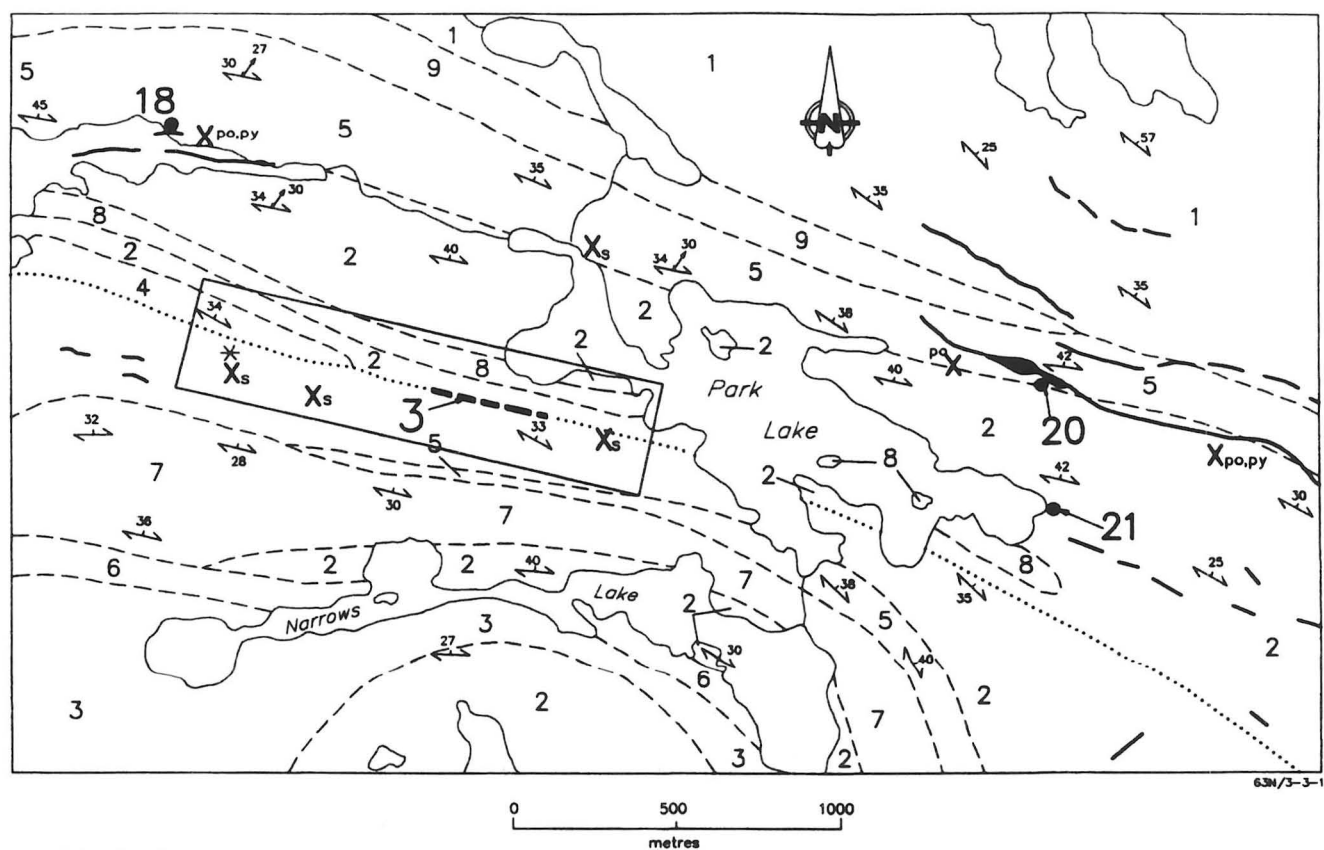
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Intrusive Rocks

9 Gabbro

Sherridon Group

- 8 Massive amphibolite; probably metamorphosed mafic volcanic flows
- 7 Layered amphibolite with fragments; probably metamorphosed volcanoclastic rock
- 6 Impure marble and calc-silicate rocks
- 5 Calc-silicate rocks
- 4 Pelitic schist
- 3 Biotite-garnet schist
- 2 Quartz-rich gneisses

Nokomis Group

- 1 Granitoid gneisses

Geology by Froese and Goetz (1981).

--- Geological boundary (approximate, assumed)

25° Foliation (inclined, vertical)

30° Lineation, mineral

— EM conductor

— Solid sulphide lense

..... Ore-bearing horizon

* Cordierite-anthophyllite rocks

Xs Mineral occurrence; sulphide

●18 Occurrence location

□ Area encompassed by Mineral Deposit file

Figure 3-1: General geology in the vicinity of the Park Lake massive sulphide type deposit

LOCATION: 3

NAME: Park Lake Zn-Cu deposit

UTM: 6117417N/368495E

AREA: South of the west portion of Park Lake, approximately 7 km north of Sherridon, Manitoba.

AIRPHOTO: A26387-162

ACCESS: Bush aircraft to Park Lake and traverse.

EXPLORATION SUMMARY:

The area was first staked as Flora, Vera, Canary, Beaver, Martha 1 to Martha 3, James, Bruce 2, and Bruce 3 (Mining claim map, NE 63N/3, *circa* 1930). The Ken group of claims was staked in 1937, and assigned to E.L. Brown in 1938. In 1943 the claims were leased and then assigned to Sherritt Gordon Mines Limited. The leases lapsed in 1951. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). The Chal group was held by G. Rapson and M. Rapson in 1954-1957. In 1958 HBED staked Par 203 to Par 205, Par 214 to Par 216, and Par 241 to Par 243. Diamond drilling was done in 1959-1964, and a low grade copper-zinc deposit was outlined (Mineral Inventory Card 63N/3 CU 2). In 1967 HBMS acquired the property. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). The Par claims were leased under 21-year lease M-9000 from 1967 to 1975. In 1975 the claims were transferred to HBED. The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km².

GEOLOGICAL SETTING:

The area is underlain by an east-trending sequence of Sherridon Suite (former Sherridon Group) quartz-rich paragneiss and amphibolitic gneiss (Fig. 3-1; Froese and Goetz, 1981). The mineralization is hosted by quartz-feldspar-biotite \pm garnet \pm sillimanite gneiss interlayered with quartz-rich gneiss (quartzite?), hornblende-biotite-quartz gneiss and calc-silicate gneiss (E. Brown/A.T. Baumgartner, HBED, written communication, 1992).

MINERALIZATION:

The sulphide deposit comprises medium- to coarse-crystalline pyrite with interstitial blebs of pyrrhotite, sphalerite and chalcopyrite. The deposit dips approximately 45° to the north, has a known strike length of approximately 365 m, a true width of 6 m and extends to a vertical depth of at least 670 m (E. Brown/A.T. Baumgartner, HBED, written communication, 1992).

GEOCHEMICAL DATA:

Inferred undiluted geological resources are 6,142,000 tonnes in 4 lenses grading 2.16% Zn, 0.42% Cu, 2.4 g/t Ag and 0.14 g/t Au to a vertical depth of 670 m (E. Brown/A.T. Baumgartner, HBED, written communication, 1992).

CLASSIFICATION:

Stratabound massive sulphide type deposit; sedimentary rock associated. Froese and Goetz (1981) place the Park Lake deposit at the same stratigraphic position as the Sherritt Gordon Cu-Zn Deposit massive sulphide type deposit and, immediately to the east in NTS 63N/3, the Jungle Lake massive sulphide type deposit (Ostry and Trembath, 1992).

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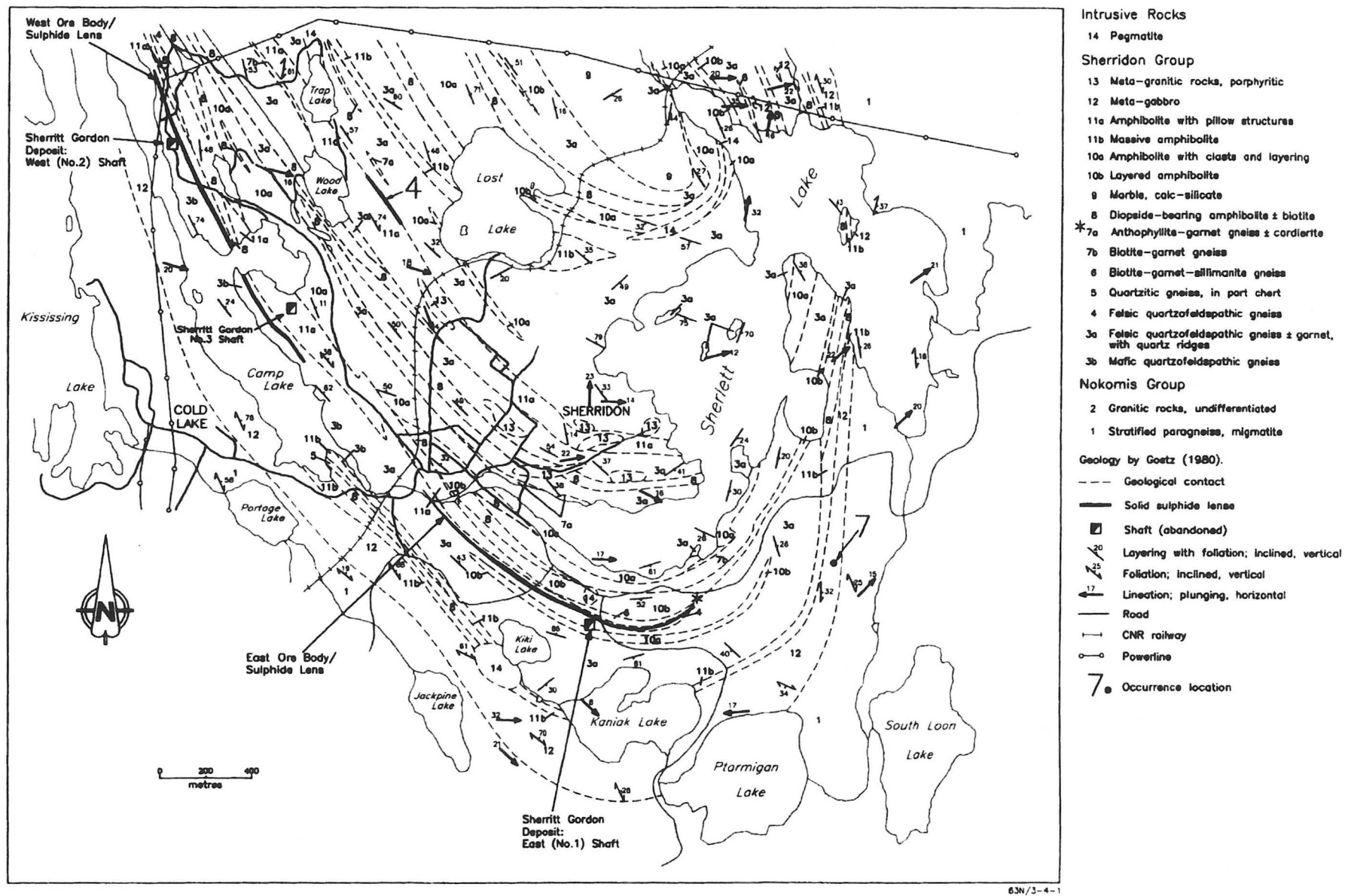
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63N/3-4-1

Figure 4-1: General geology in the vicinity of the Cold Lake massive sulphide type deposit

LOCATION: 4

NAME: Cold Lake Zn-Cu deposit (Lost Lake)
UTM: 6111503N/366591E
AREA: Approximately 0.5 km west of Lost Lake and
1.5 km north of Sherridon, Manitoba.
AIRPHOTO: A26387-156
ACCESS: Traverse from Sherridon, Manitoba to Lost Lake.

EXPLORATION SUMMARY:

The PAT claim was staked over the occurrence and recorded in 1925. The claim is owned by HBMS. Eldorado Mining and Refining Limited did an airborne radiation survey in the area during 1954 (A.F. 91616) and Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). In 1980 a portion of the area was covered by airborne magnetic and EM surveys performed by Shell Canada Resources Limited (A.F. 92513). The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km².

GEOLOGICAL SETTING:

The area is underlain by a north-west trending sequence of Sherridon Suite (former Sherridon Group) quartz-rich paragneiss and amphibolitic gneiss (Fig. 4-1; Goetz, 1980). Gale (1980) mapped a gahnite-bearing quartzite layer (chert) adjacent to an exposure of garnet - biotite - cordierite - anthophyllite rock in the vicinity. Cordierite-anthophyllite rocks were also documented in the area by Froese and Goetz (1981). The mineralization is hosted by quartz-feldspar-biotite gneiss interlayered with quartz-feldspar-hornblende-biotite gneiss and amphibolitic gneiss (E. Brown/A.T. Baumgartner, HBED, written communication, 1992).

MINERALIZATION:

The deposit comprises 'well mineralized to massive sulphides' (pyrrhotite and pyrite with variable amounts of sphalerite and chalcopyrite). The deposit has a variable dip of 50° to 80° northeast, a shallow plunge to the northwest, a strike length of approximately 180 m, a true width of about 3 m and extends to a vertical depth of approximately 180 m (E. Brown/A.T. Baumgartner, HBED, written communication, 1992).

GEOCHEMICAL DATA:

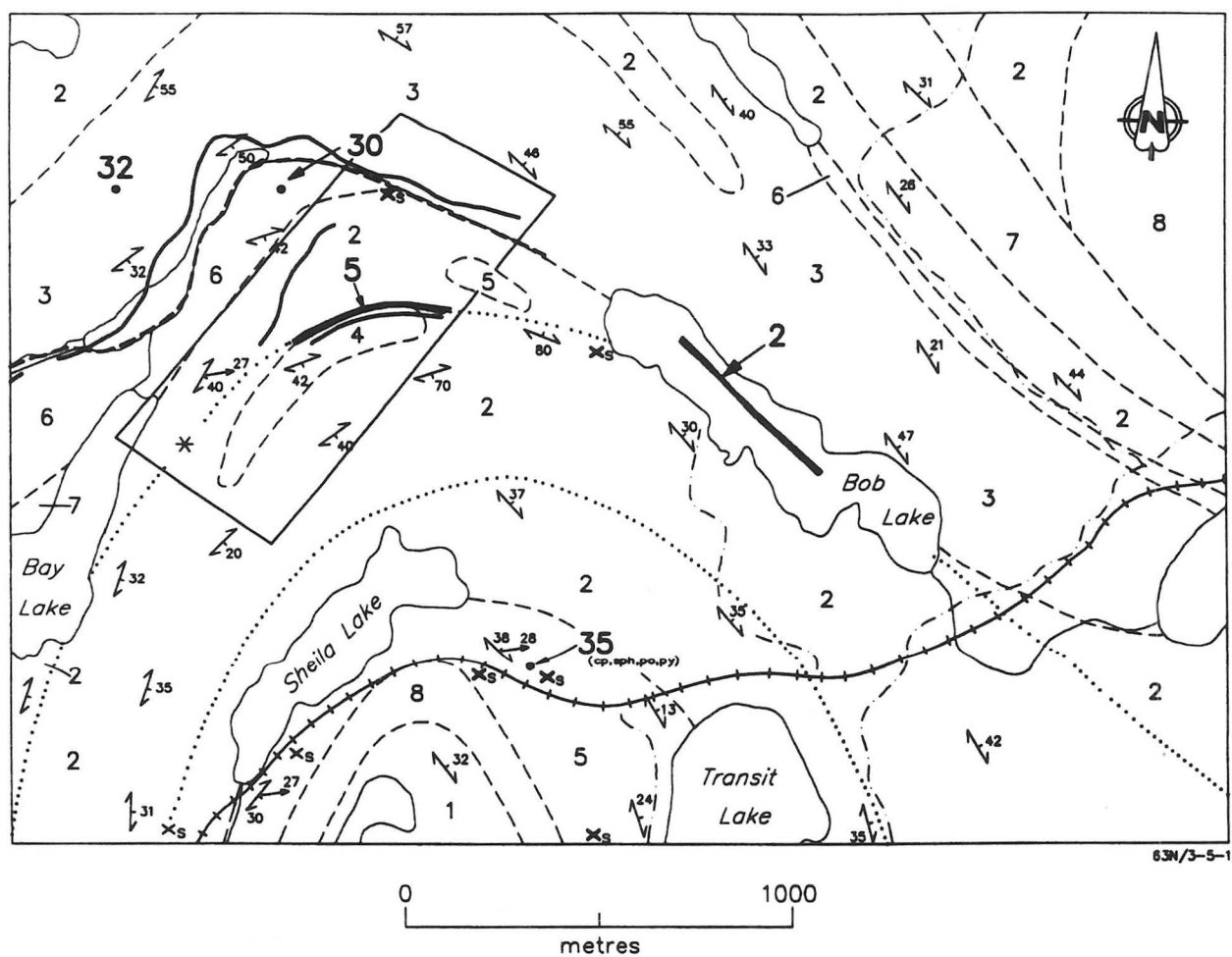
Inferred undiluted geological resources (January, 1966) were 240,000 tonnes grading 1.5% Zn, 1.05% Cu, 11 g/t Ag and 0.34 g/t Au to a vertical depth of 168 m (E. Brown/A.T. Baumgartner, HBED, written communication, 1992).

CLASSIFICATION:

Stratabound massive sulphide type deposit; sedimentary rock associated. The position of an 'ore-bearing horizon' (Fig. 1-6) suggested by Froese and Goetz (1981), includes the Cold Lake (Location 4), Bob Lake (Location 2) and Fidelity (Location 5) massive sulphide type deposits, and the mineralization at the Cu-sulphide property in 63N/3 (Ostry and Trembath, 1992).

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INTRUSIVE ROCKS

8 Gabbro

SHERRIDON GROUP

7 Layered amphibolite with fragments;
probably metamorphosed volcanoclastic rock

6 Impure marble and calc-silicate rocks

5 Calc-silicate rocks

4 Pelitic schist

3 Biotite-garnet-schist

2 Quartz-rich gneisses

NOKOMIS GROUP

1 Migmatite

Geology by Froese and Goetz (1981).

--- Geological boundary
(approximate, assumed)

..... Ore-bearing horizon

— Solid sulphide lense

* Cordierite-anthophyllite rocks

x_s Mineral occurrence; sulphide

↗ ↘ Foliation (inclined, vertical)

→ 28 Lincation, mineral

— EM conductors
(A.F. 92006)

--- (A.F. 93118)

+ + + C.N.R. railway

- - - Trail

. 35 Occurrence location

□ Area encompassed by
Mineral Deposit File

Figure 5-1: General geology in the vicinity of the Fidelity/Jonah Lake massive sulphide type deposit

LOCATION: 5

NAME: Fidelity/Jonah Lake Cu-Zn deposit
UTM: 6114520N/368956E
AREA: Jonah Lake, approximately 4 km northeast of Sherridon, Manitoba.
AIRPHOTO: A26369-175
ACCESS: Bush aircraft to Jonah Lake.

EXPLORATION SUMMARY:

The area was first staked as Copper and Gold (Mining claim map, 63N/3NE, *circa* 1930). D.C. Barr staked Crescent 7, Crescent 9, Crescent 10, Crescent 11 Fr. and Crescent 12 Fr. in 1939-1940. Rock trenching was reported in 1938-1946. In 1948 Sherritt Gordon Mines Limited took a 3-year option on the property. A 6-hole 675 m diamond drill program was done on Crescent 7 to Crescent 10, but the logs are not available (DDH 1, 5, 7 to 9, 11, A.F. 90669). Leases M-2614 and M-2616 to M-2619 were issued in 1949. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). The leases lapsed in 1960.

W. Shmon held Bar 1, Bar 8, Bar 9 and Bar 11 from 1961 to 1965. In 1965 W. Shmon staked Bar 6 and acquired Bar 7 and Bar 17 from E. Shmon. In 1965-1966 Fidelity Mining Investments Limited carried out magnetic and EM surveys on the Bar claims, a 5 hole, 596 m diamond drill program on Bar 6 and a 31 hole 4223 m diamond drill program on Bar 7 (A.F. 93118; DDH 4 to 21, 24, 25, 27-29, 31-34, 37, 38, 40-44, 46, A.F. 92007). DDH 47 (152 m) was also drilled on Bar 6 in 1966, but claim maps indicate that the drilling was actually done on Bar 17 (A.F. 92007). Over 7620 m of drilling had been done in the area by September 1966 (The Northern Miner, September 1, 1966). In 1972-1974 Sherritt Gordon Mines Limited carried out an airborne EM survey, ground magnetic (Scintrex MF2) and HLEM (Geonics EM-17) surveys, a 5-hole 166 m diamond drill program on Bar 6, and the drilling of DDH 4 (38.4 m) on Bar 7 (A.F. 91695; A.F. 92009; DDH 1 to DDH 3, DDH 3A, DDH 4, DDH 5, A.F. 92006). The Bar claims lapsed in 1977. HBED held CB 10522 in 1979-1986. The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km². Esso Minerals Canada staked Asong in 1988, and transferred it to Esso Resources Canada Limited and then to Homestake Mining (Canada) Limited in 1989. Asong lapsed in 1990. L. Racic restaked the area as Erik 4 in 1991.

GEOLOGICAL SETTING:

The area is underlain by Sherridon Suite (former Sherridon Group) biotite- or hornblende-bearing quartz-rich quartzofeldspathic gneiss and pelitic schist (Fig. 5-1; Froese and Goetz, 1981). The DDH (Fig. 5-2) intersected a sequence of quartzofeldspathic gneiss, predominantly felsic in composition, but mafic layers occur locally in the drill core. Sulphide-rich layers are either structurally overlain or underlain by what are interpreted to be altered rocks that may exhibit variable concentrations of garnet, sillimanite, chlorite, sericite, biotite, hornblende, long blades of hornblende (anthophyllite?) and disseminated sulphides. The area is structurally complex. Froese and Goetz (1981) indicate a reversal in dip of stratigraphy in the vicinity of the mineralization, *i.e.*, stratigraphy dips to the southeast in the west portion of the occurrence area and to the northeast in the east portion of the occurrence area (Fig. 5-1). Reversals in

stratigraphy may also occur in drill core, *e.g.*, both upright and overturned massive sulphide type mineralization and associated alteration may be interpreted from the same drill log.

MINERALIZATION:

The drillholes are clustered in two distinct areas due to the reversal in orientation (dip) of stratigraphy in this area (Fig. 5-2), *i.e.*, the cluster of drillholes in the west portion of the occurrence area test the southeasterly dipping strata, and those in the east portion test the northeasterly dipping strata. The west cluster of holes intersected what is interpreted to be overturned massive sulphide type mineralization. Several DDH in this group intersected disseminated pyrite and pyrrhotite mineralization, with or without chalcopyrite and sphalerite, that ended abruptly, down hole, at a thin, 1 m or less in core length, hornblende-rich (described as long bladed crystals in DDH 42 - anthophyllite?) mafic unit. The disseminated mineralization occurs in quartzofeldspathic rocks that contain variable amounts of silica, garnet, sillimanite and chlorite with little or no feldspar. Graphite was not recorded in the drill logs. DDH 47, the westernmost drillhole, intersected minor amounts of disseminated Fe-sulphide \pm chalcopyrite within the first 60 m of core. DDH 34 (A.F. 92007) and DDH 5 (A.F. 92006) are the only drillholes in this group that intersected near solid sulphide mineralization. Two sulphide-rich layers, 5 m and 4 m in core length, were intersected in DDH 34 and contain up to 80% pyrite and pyrrhotite with lesser amounts of chalcopyrite and sphalerite. The first sulphide layer is overlain by approximately 19 m of disseminated Fe-sulphide \pm chalcopyrite mineralization in rock that contains variable amounts of 'white fibrous lamellar flakes' (sillimanite?), biotite, garnet and hornblende (overturned massive sulphide type mineralization?). The second sulphide layer occurs about 50 m down hole separated by quartz - feldspar gneiss that contains minor amounts of disseminated sulphide. A quartz - feldspar - hornblende gneiss that contains variable garnet concentrations and minor amounts of disseminated sulphide occurs immediately down hole from this layer. If this rock is altered and the second sulphide layer is interpreted to be a massive sulphide type deposit (instead of a sulphide facies iron formation) orientated in an upright attitude, the sequence may, in fact, be folded, *i.e.* a fold hinge exists between the two sulphide-rich layers. Alternatively, if the sulphide intersections are interpreted to be sulphide (remobilized) vein material, the rocks intersected in DDH 34 may simply represent an alteration zone of VMS type. DDH 5 intersected the sulphide layer within 5 m of the collar. Up to 50% pyrrhotite with minor amounts of pyrite and chalcopyrite were intersected over core lengths of 1 and 1.5 m within the 7 m long sulphide layer intersection. On surface, Froese and Goetz (1981) identified anthophyllite-bearing rock in outcrop near the collar of DDH 47.

The majority of the DDH in the east group intersected solid - near solid sulphide mineralization comprises pyrite, pyrrhotite, chalcopyrite and sphalerite. Most drillholes intersected two sulphide bearing layers that ranged from approximately 1 m (*e.g.* DDH 20) to just over 10 m (*e.g.* DDH 14 and 24) in core length. Disseminated pyrite, pyrrhotite and chalcopyrite mineralization is ubiquitous throughout the drill core and is customarily associated with altered rocks that occur structurally below the solid - near solid sulphide layers. These altered rocks commonly contain variable concen-

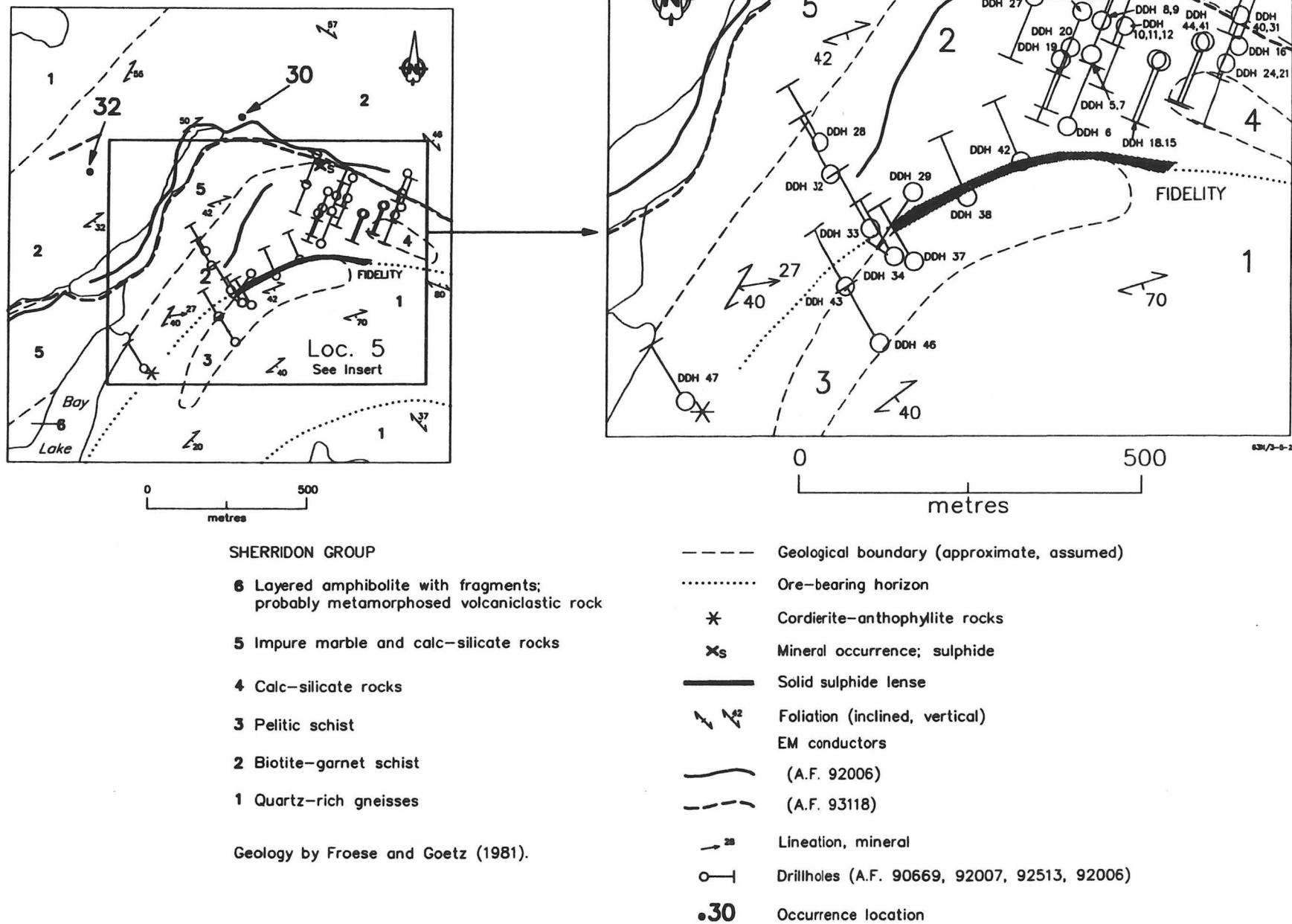


Figure 5-2: Geophysical conductors and drillhole locations at occurrence 5

trations of garnet, biotite, chlorite, hornblende (described as long bladed crystals in DDH 7, 20 and 24 - anthophyllite?), silica, a mineral described as 'white fibrous lamellar flakes' (sillimanite?) and little to no plagioclase feldspar. The only graphite documented in the drill core is in the initial 30 m of DDH 17. Rocks interpreted to be hydrothermally altered, like that associated with massive sulphide type deposits, consistently occurred down hole from the solid - near solid sulphide layers indicating that stratigraphy is most likely not overturned in this (east) area.

GEOCHEMICAL DATA:

Near solid sulphide mineralization was routinely sampled and submitted for assay. Zn concentrations included 1.44% Zn over 1.7 m (DDH 24), 1.94% Zn over 1.5 m (DDH 15) and 1.36% Zn over 1.5 (DDH 14). Cu concentrations included 2.14% Cu over 3 m (DDH 8, possibly drilled down dip) and 2.59% Cu over 70 cm and 1.56% Cu over 1 m (DDH 13).

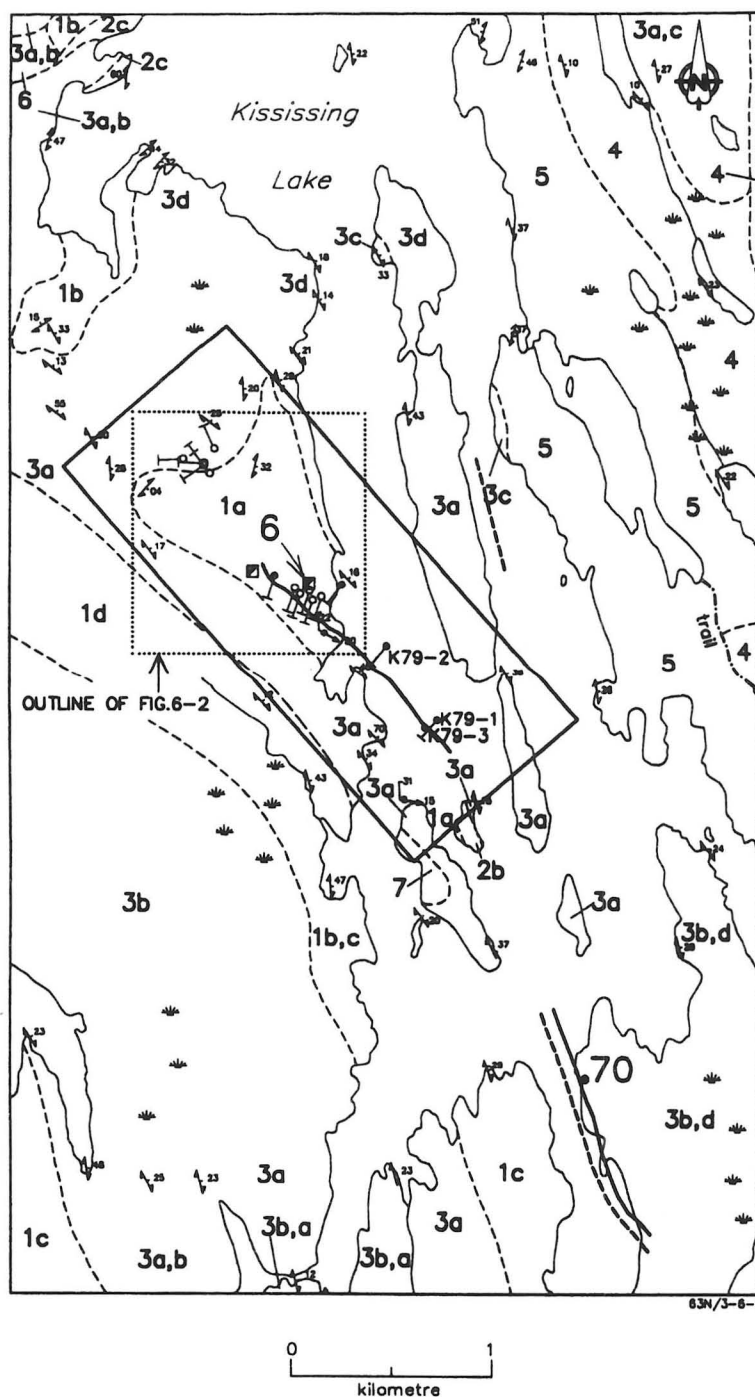
CLASSIFICATION:

Stratabound massive sulphide type deposit; sedimentary rock associated. The position of an 'ore-bearing horizon' (Fig. 1-6) suggested by Froese and Goetz (1981), includes the Fidelity (Location 5), Bob Lake (Location 2) and Cold Lake (Location 4) massive sulphide type deposits, and the mineralization at the Cu-sulphide property in 63N/3 (Ostry and Trembath, 1992).

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Proterozoic Intrusive Rocks

- 7 Pink granitic pegmatite
- 6 Pink and white biotite-muscovite granite
- 5 Monzogranite to granodiorite \pm magnetite
- 4 Orthogneiss

Missi Metamorphic Suite

- 3 a) Magnetite-hornblende (10-25%)-biotite (10-15%)-feldspar-quartz gneiss
- b) Magnetite-biotite (10-20%)-feldspar-quartz gneiss \pm hornblende
- c) Grey to pink fine grained biotite (5-10%)-feldspar-quartz \pm magnetite \pm muscovite
- d) Grey fine grained biotite (8-10%)-feldspar-quartz \pm magnetite \pm hornblende gneiss with epidote-quartz layers

Rocks of Uncertain Age

- 2 Amphibolites and associated rocks
 - a) Massive amphibolite
 - b) Garnetiferous amphibolite
 - c) Garnet-hornblende (5-15%)-biotite-feldspar-quartz gneiss

Burntwood River Metamorphic Suite (Probable Amisk Group equivalent)

- 1 a) Metagreywacke-derived metatextite + graphite \pm sillimanite \pm cordierite \pm garnet
- b) Biotite-diatextite \pm garnet with plagioclase megacrysts and inclusions of garnet-biotite metatextite

----- Geological boundary (approximate, assumed)

- Schistosity
- Gneissosity
- Gneissosity and layering
- Minor fold (Axis, axial plane, S-asymmetry)

Geology by Schledewitz (1988).

===== EM conductor (A.F.90671,92854,92389)

- Drillholes
- (A.F. 91613)
- (A.F. 92854)

- Shaft
- Swamp

.70 Occurrence location

Area encompassed by Mineral Deposit File

Figure 6-1: General geology in the vicinity of the Ideal Lake massive sulphide type deposit

LOCATION: 6

NAME: Ideal (formerly Smith-Pride) Zn-Cu deposit
UTM: 6111413N/361904E
AREA: Approximately 4 km due west of Cold Lake,
Manitoba.
AIRPHOTO: A26387-035
ACCESS: Kississing Lake, from Cold Lake/Sherridon.

EXPLORATION SUMMARY:

The Ideal group of 18 claims was staked in 1927 by various individuals including G. Smith and D. Pride. J.W. Callinan of Callinan-Flin Flon Mines, Limited, optioned the property from 1928 to 1929. A magnetic survey was done in 1928. By 1929, 25 shallow trenches and test-pits were dug and 1219 m of diamond drilling was completed (Wright, 1929). In 1928-1929, a 3-compartment shaft was sunk on Ideal No. 3 and another shaft was sunk on Ideal No. 5, each to a depth of 15 m (Mineral Inventory Card 63N/3 CU 4). In 1929 the property was assigned to Smith-Pride Mines, Limited. The claims were leased in 1931, but the leases were forfeited in 1946. The claims were sold by bid to O. Dickson, D.J. Birse, W.A. Quesnel, and F. Soltys in 1947. In 1948 21-year leases were obtained for the property and an option agreement was made with MacDic Copper Mining and Smelting Company Limited. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). L. Cadesky optioned the property in 1955 and transferred his option to Lake Kississing Mines Limited (N.P.L.), a subsidiary of North American Rare Metals Limited, in 1956. Lake Kississing Mines Limited acquired the property in 1956. In 1956 North American Rare Metals Limited completed a 6-hole (DDH N-1 to DDH N-6) 421 m diamond drill program on Ideal 5 and a 5-hole (DDH N-7 to DDH N-11) 284 m drill program on Ideal 1 (A.F. 91613). An EM survey was done on the surrounding Ice claims for North American Metals in 1956 (A.F. 90671). HBED optioned the property for one year in 1961. The leases were renewed in 1969 and cancelled in 1976. The ground was held by Elken Exploration Limited as Permit 33 in 1979-1981 and by Cominco Ltd. as CB 8207 in 1977 and CB 8209 in 1978. In 1978 Cominco Ltd. carried out geological mapping (1:2000, 1:63 360), rock geochemical sampling, geophysical (HLEM, Magnetic, Apex beam EM double dipole) surveys, and a soil geochemical sampling (A.F. 92853). In 1979 Cominco Ltd. did geophysical (HLEM, Magnetic, gravity) surveys and a 5 hole (DDH K79-1 to DDH K79-5) 435 m diamond drill program (A.F. 92854). The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km². CB 8209 lapsed in 1987; CB 8207 lapsed in 1989. Zit 7 was staked by Granges Exploration Ltd. in 1987 and was restaked as Ideal by W. Bruce Dunlop Limited (N.P.L.) in 1989. Granges Exploration Ltd. (subsequently, Granges Inc.) also staked Zit 8243 in 1989.

GEOLOGICAL SETTING:

The area is underlain by Burntwood Suite (former Burntwood River Metamorphic Suite) biotite-feldspar-quartz paragneiss and/or metatexite, \pm sillimanite, \pm graphite \pm garnet \pm pyrite \pm cordierite and Missi Suite (former Missi Metamorphic Suite) intermediate feldspar - quartz gneiss \pm biotite \pm hornblende \pm magnetite \pm muscovite \pm epidote - quartz layers (Fig. 6-1; Schledewitz, 1988).

DDH N-1 to N-5 (Fig. 6-2) intersected an amphibolite \pm

biotite \pm garnet sequence. DDH N-7 to N-11 (Fig. 6-2) intersected grey feldspathic \pm garnet gneiss, grey hornblende gneiss, and chlorite- and/or biotite- and/or sericite-bearing schistose rock. All K79 drillholes (1-5; Fig. 6-2) intersected grey quartz - feldspar - biotite - garnet gneiss \pm graphite, most likely part of the Burntwood River Metamorphic Suite (Fig. 6-1, 6-2). DDH K79-3 and K79-4 intersected what may be a slightly more felsic and compositionally variable section of quartz - feldspar - biotite rock that contains sporadic concentrations of coarse grained garnet, possible calc-silicate minerals and most of the sulphide mineralization. Garnet - amphibole - biotite \pm quartz rock and quartz - feldspar - amphibole - biotite gneiss that are gradational into amphibolite, and amphibole (anthophyllite?) - talc - biotite gneiss were intersected in DDH K79-5. Quartz - feldspar - biotite - garnet - sillimanite gneiss was documented in the core from DDH K79-4.

Detailed 1:2000 geological mapping by Cominco (A.F. 92853) outlined a 600 m long mineralized zone with a NW strike and NE dip that is immediately structurally overlain by light grey, finely laminated quartzite, calc-silicate rock and dolomitic marble (Fig. 6-3; A.F. 92853) and underlain by coarse grained anthophyllite - garnet - quartz schist. This lithologic sequence occurs within a sequence of garnet- and sillimanite-bearing quartz - plagioclase - biotite gneiss.

Gale (1980) described a mineralized rock sequence that includes a mineralized layer underlain by biotite-anthophyllite \pm cordierite \pm graphite rock and overlain by quartzitic (cherty) gneiss. This rock sequence is structurally overlain by rusty weathered garnet-biotite-quartz gneiss and underlain by garnet-biotite-quartz gneiss and a thinly layered hornblende-quartz gneiss (Fig. 6-4).

MINERALIZATION:

Minor amounts of pyrite and/or pyrrhotite with rare chalcopyrite were documented locally in DDH N-1 to N-5. The sulphides occur as disseminations, blebs and/or thin (<1 cm) veins. A solid pyrrhotite section, 27 cm in core length, was intersected in DDH N-4. All mineralization in DDH N-7 to N-11 is associated with schistose rock described in the drill log from DDH N-7 as a 'zone of shearing, alteration and mineralization'. Disseminated to 'heavy' sulphide mineralization was intersected locally over core distances on the order of 10's of cm in length in DDH N-7 and N-8. The sulphide minerals are predominantly pyrite and/or pyrrhotite and, locally, minor to 'fair' or 'good' chalcopyrite and sphalerite.

Detailed geological mapping by Cominco outlined a 600 m long near solid to solid stratabound pyrrhotite - pyrite - sphalerite - galena - chalcopyrite layer, 50 - 60 cm thick that is structurally underlain by disseminated and stringer (post mineralization mobilize?) chalcopyrite - pyrrhotite - pyrite within the anthophyllite-bearing rock. All K79 drillholes intersected minor amounts of pyrite and/or pyrrhotite mineralization with or without accessory chalcopyrite and/or sphalerite. Distinct mineralized zones that contain pyrite - pyrrhotite - sphalerite and chalcopyrite were intersected in DDH K79-3 and K79-5. Disseminated pyrite - pyrrhotite \pm chalcopyrite \pm sphalerite mineralization and a 20 cm long breccia zone composed of chloritic fragments in a pyrite (up to 40%) and chlorite matrix was documented within an approximately 6 m long intersection of altered rock from DDH K79-5. The altered intersection includes silicified rock, chlorite, talc, coarse grained biotite, amphibole and garnet, and rare plagioclase.

Numerous sulphide-rich intersections, on the order of a few meters to 10's of cm or less in core length, were documented in the log from DDH K79-3. All mineralization is hosted by variably altered and/or sheared quartz - feldspar - biotite gneiss \pm coarse grained garnet. Mineralized intersections include: 1) a 20 cm long zone of sheared rock that contains chlorite, coarse biotite, and up to 40% pyrite; 2) near solid pyrrhotite \pm pyrite \pm chalcopryrite and sphalerite with a chlorite, coarse grained biotite, quartz and fine grained green acicular amphibole gangue; 3) a 50 cm long zone of sheared rock that contains chlorite and sulphides and includes a 15 cm long section of 80% pyrite, pyrrhotite, chalcopryrite and sphalerite; and 4) a 20 cm long zone of near solid pyrite with accessory chlorite and chalcopryrite.

DDH K79-1 intersected a 13 cm long breccia zone composed of chloritic rock fragments in a matrix of pyrite with fine grained aggregates of sphalerite within quartz - feldspar - biotite \pm garnet gneiss. A 1.5 m long zone of 'shear, fracture and chloritization' was intersected in DDH K79-2 and includes a 12 cm quartz - chlorite - pyrite \pm chalcopryrite \pm sericite section. Similarly, a 1.5 m long intersection of fault breccia within a banded quartz - feldspar - biotite \pm garnet gneiss from DDH K79-4 contains 'heavy' pyrite and minor chalcopryrite mineralization and green chloritic rock fragments.

Gale (1980) described a 60 cm thick near solid sulphide layer made up of pyrite, pyrrhotite, chalcopryrite, sphalerite and galena. The anthophyllite-rich rock contains trace amounts of pyrite, pyrrhotite and chalcopryrite mineralization (Fig. 6-4).

GEOCHEMICAL DATA:

Callinan-Flin Flon Mines Limited reported a 3 m long section of drill core from their Smith-Pride property (Ideal) that contained 20% Zn, 4.5% Pb and 189 g/t Ag (Northern Miner, September 15, 1928).

Selected core samples from DDH N-1 to N-11 were assayed for Cu, Zn and occasionally for Au and Ni. Core samples from DDH N-1 to N-5 did not contain anomalous concentrations of these metals. Core samples that contain geochemically anomalous base and/or precious metal concentrations include: 1) 1.65% Cu, 3.88% Zn and 0.65 g/t Au over 1.5 m, and 0.57% Cu with 2.04% Zn over 3 m (DDH N-7); 2) 0.51% Cu, 3.03% Zn and 0.34 g/t Au over 1.9 m (DDH N-8); and, 3) 0.25% Cu, 1.25% Zn and 0.34 g/t Au over 1.8 m, and 1.01% Cu, 0.26% Zn and 0.69 g/t Au over 1.4 m (DDH N-10).

A 60 cm long channel sample of the near solid - solid sulphide mineralization collected by Cominco during their geological mapping program contained 12.5% Zn, 3.7% Pb, 0.76% Cu and 154 g/t Ag. A grab sample of the disseminated and stringer footwall mineralization contained 3.5% Cu, 30 g/t Ag and 6.9 g/t Au. All sulphide bearing core samples from DDH K79-1 to K79-5 contain elevated concentrations of Cu, Zn, Ag and Au (Table 6-1), *i.e.*, up to 690 ppm Au over 12 cm (DDH K79-2), up to 12 ppm Ag over 53 cm (DDH K79-4), up to 8000 ppm Cu over 53 cm (DDH K79-4) and up to 2.2% Zn over 30 cm (DDH K79-3).

CLASSIFICATION:

Stratabound massive sulphide type deposit; sedimentary rock associated. Hydrothermally altered rocks indicated by the lack of plagioclase and local concentrations of silicified rock, chlorite, anthophyllite, talc, cordierite and dissem-

inated Fe-sulphide plus chalcopryrite form the structural and stratigraphic footwall to a polymetallic Zn-rich solid sulphide layer. Possible exhalative chemical sedimentary rocks that include quartzite (meta-chert?), calc-silicate gneiss and dolomitic rock form the immediate hanging wall rocks. The stratigraphic position of the Ideal massive sulphide type mineralization is uncertain and may occur completely within the Burntwood River Metamorphic Suite or, alternatively, at a major lithologic break between the Burntwood rocks and Sherridon Metamorphic Suite or Burntwood rocks and Missi Metamorphic Suite (*cf.* Gale and Ostry, 1984).

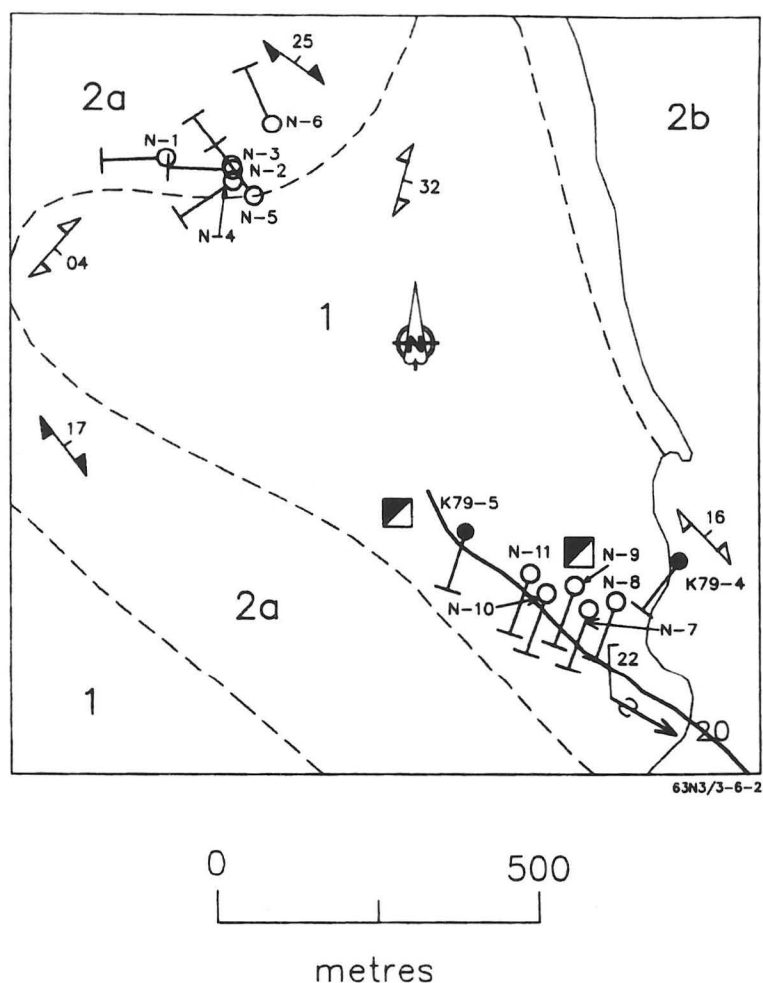
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TABLE 6-1

Drillhole	Core length (cm)	Cu (ppm)	Zn (ppm)	Ag (ppm)	Au (ppm)
K79-1	13	2600	18 000	5	100
K79-2	12	4400	1560	6	690
K79-3	81	4200	7000	2	90
	221	800	1640	0.5	5
	30	5700	22 000	5	420
	53	640	900	0.5	18
	41	2200	8000	2	250
K79-4	53	8000	2800	12	80
K79-5	56	3200	800	0.5	17
	20	4900	1160	2	100
	84	3200	680	0.5	30
	92	2100	560	0.5	60
	122	750	470	0.5	65
	77	460	720	2	19
	76	300	950	1	15
	60	80	240	1	17



Missi Metamorphic Suite

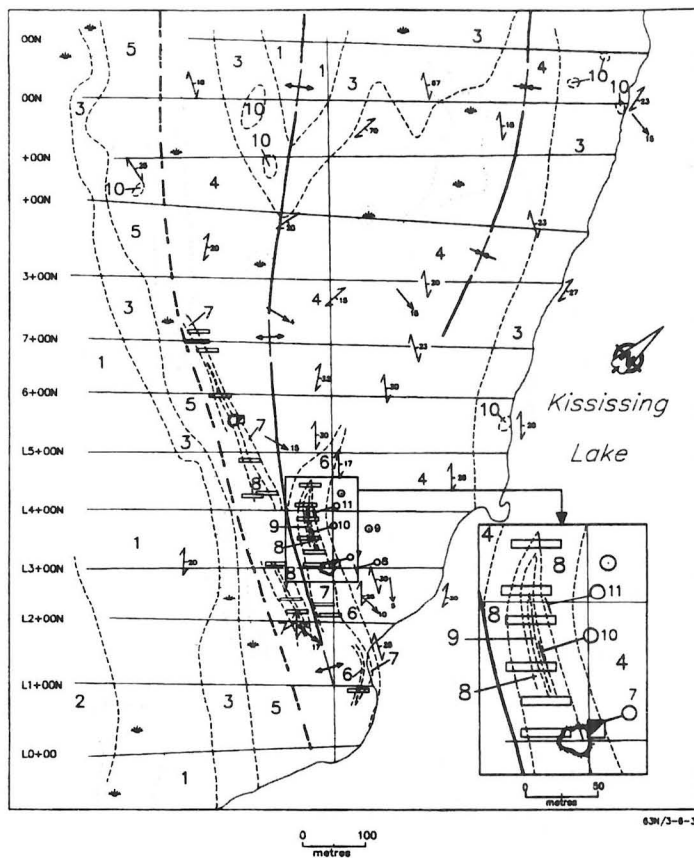
- 2 a) Magnetite-hornblende (10–25%)–
biotite (10–15%)–feldspar–
quartz gneiss
- b) Grey fine grained biotite (8–10%)
feldspar–quartz ± magnetite ±
hornblende gneiss with epidote–
quartz layers

Burntwood River Metamorphic Suite (Probable Amisk Group equivalent)

- 1 a) Metagreywacke–derived metatexite +
graphite ± sillimanite ± cordierite ±
± garnet

- Geological boundary
(approximate, assumed)
- Gneissosity and layering
- Minor fold (Axis, axial plane,
S–asymmetry)
- Geology by Schledewitz (1988).
- EM conductor (A.F. 90671,
92854, 92389)
- Drillholes
- (A.F. 91613)
- (A.F. 92854)
- Shaft

Figure 6-2: Geology at the Ideal Lake massive sulphide type deposit



- 10 K-feldspar gneiss
- 9 Pink garnet gneiss
- 8 Amphibolite
- 7 Brown garnet gneiss
- 6 Sillimanite gneiss
- 5 Disseminated pyrrhotite gneiss
- 4 Quartzite, calc-silicate
- 3 Anthophyllite gneiss
- 2 Massive sulphides
- 1 Pegmatite

- Geological contact (approximate)
- \nearrow Strike and dip of layering (foliation and bedding?)
- \nearrow Axial surface trace of minor fold and plunge of fold axis
- ∇ Axial surface trace of major fold (antiformal, synformal)
- \rightarrow Lincation (mineral and minor fold axis)
- Fault (assumed)

Geology from Cominco (A.F. 92853), 1978.

- ○ Shaft and tailings
- Trench
- Drillholes
- (A.F. 92853)
- Previously unreported drillhole
- ⊕ Swamp

Figure 6-3: Detailed outcrop map in the vicinity of the Ideal Lake massive sulphide type deposit

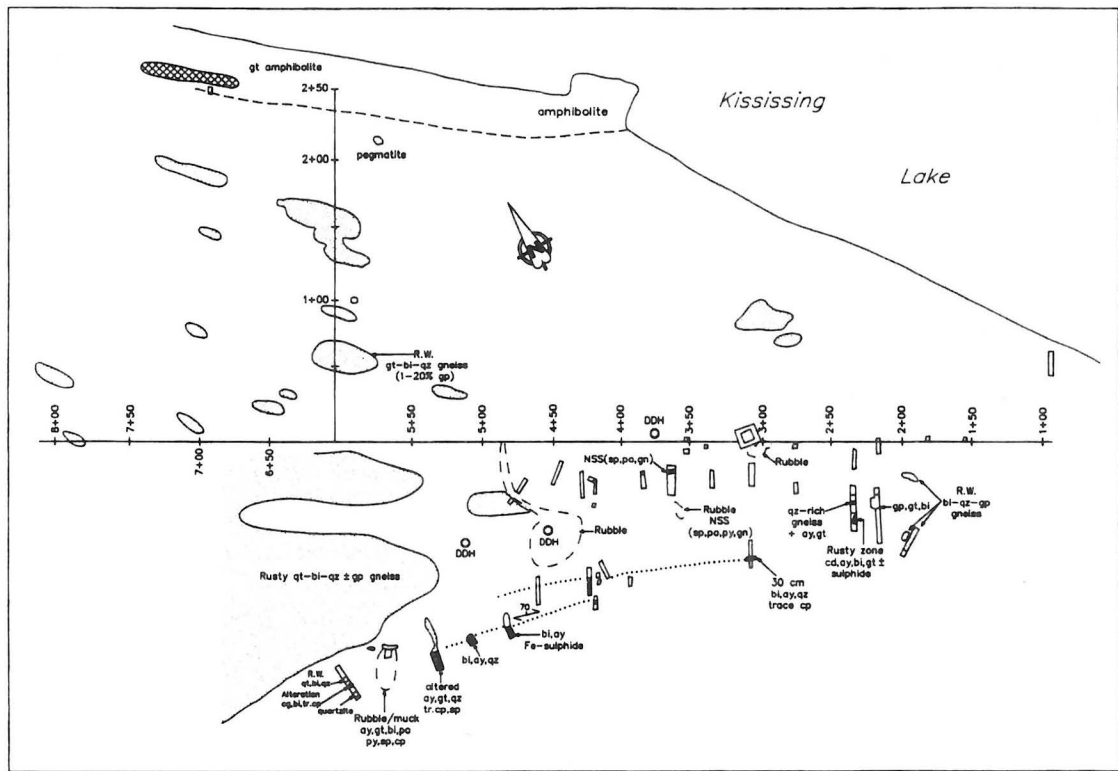
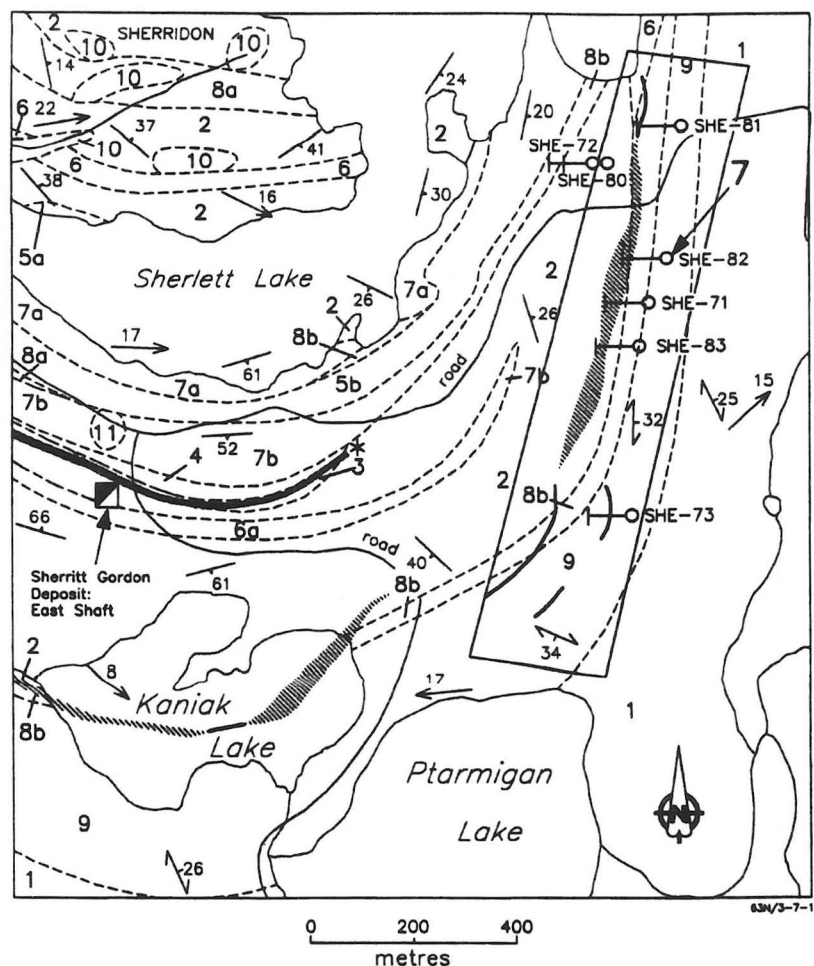


Figure 6-4: Detailed outcrop map in the vicinity of the Ideal Lake massive sulphide type deposit. Geological data (unpublished) courtesy of George Gale



- | | |
|--|---|
| Intrusive Rocks | |
| 11 Pegmatite | |
| Sherridon Group | |
| 10 Meta-granitic rocks | |
| 9 Meta-gabbro | |
| 8a Amphibolite with pillow structures | |
| 8b Massive amphibolite | |
| 7a Amphibolite with clasts and layering | |
| 7b Layered amphibolite | |
| 6 Diopside-bearing amphibolite \pm biotite | |
| *5a Anthophyllite-garnet gneiss \pm cordierite | |
| 5b Biotite-garnet gneiss | |
| 4 Biotite-garnet-sillimanite gneiss | |
| 3 Felsic quartzofeldspathic gneiss | |
| 2 Felsic quartzofeldspathic gneiss \pm garnet with quartz ridges | |
| Nokomis Group | |
| 1 Stratified paragneiss | |
| Geology by Goetz (1980). | |
| | — Solid sulphide lense |
| | - - - Geological contact |
| | 20 Layering with foliation (inclined, vertical) |
| | 25 Foliation (inclined, vertical) |
| | 15 Lineation (plunging) |
| | 34 EM conductor |
| | ○ Drillhole (A.F.92972) |
| | ■ Shaft (abandoned) |
| | □ Area encompassed by Mineral Deposit File |

Figure 7-1: General geology, geophysical conductors and diamond-drill hole locations at occurrence 7

LOCATION: 7

NAME: (A.F. Mineralization intersected by diamond drilling)
UTM: 6110089N/368845E
AREA: Southeast of Sherlett Lake, approximately 1.5 km east of Sherridon, Manitoba.
AIRPHOTO: A26369-177
ACCESS: Jungle Lake siding access road from Sherridon, Manitoba and traverse.

EXPLORATION SUMMARY:

W. Yakushavich staked Rad in 1926, and assigned it to L.B. Norris in 1927. C.J. Pearl staked Rhu Fr. in 1927. Sherritt Gordon Mines Limited acquired the claims in 1928. Leases M-117 and M-181 were issued in 1931, and were cancelled in 1951. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). The ground was partially held as Kan 13 by W. Yakushavich in 1957-1968. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). Sherritt Gordon also held the ground as Crow 2, Crow 3, and Blue-Bird, that were leased as M-1020, M-1021, and M-1019, respectively, from 1929 to 1976. In 1979 HBED staked CB 10525. Shell Canada Resources Limited did an airborne EM/Mag survey in 1980 (A.F. 92513). HBED did an EM survey in 1980, and drilled four holes (DDH SHE-71, DDH SHE-72, DDH SHE-73, DDH SHE-80) in 1987 (A.F. 92972, no logs available). The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km². In 1988 HBED drilled DDH SHE-81 (104 m), DDH SHE-82 (83 m), and DDH SHE-83 (62 m) on the property (A.F. 92972). CB 10525 lapsed in 1990. L. Racic staked Erik 16 in 1991.

GEOLOGICAL SETTING:

The drillholes were collared at, or near, the contact between biotite- or hornblende-bearing quartz-rich quartzofeldspathic gneiss and calc-silicate rocks of the Sherridon Suite (former Sherridon Group) (Fig. 7-1; Goetz, 1980). The drillholes intersected a sequence of interlayered banded quartz - feldspar - hornblende - biotite \pm garnet \pm chlorite gneiss and calc-silicate gneiss. Chlorite is an important local constituent of the drill core. The drillholes are located near the position of an 'ore-bearing horizon' (Fig. 7-1), suggested by Froese and Goetz (1981), that includes the Sherridon massive sulphide type deposit. The Sherridon East orebody occurs immediately west of, and within the same stratigraphic unit as the conductors tested by the drillholes, but appears to occur at a higher structural position.

MINERALIZATION:

Minor amounts of Fe-sulphide occur as blebs, stringers and/or disseminations throughout the core. Trace to minor amounts of chalcopyrite were documented locally within the core and occur as disseminations and, less commonly, as stringers. In DDH SHE-81, up to 5% graphite (associated with Fe-sulphide) was documented locally, and exclusively, in the initial 50 m of core. Down hole, calc-silicate interlayers are less common and chalcopyrite occurs locally with Fe-sulphide. Minor amounts of pyrite and/or pyrrhotite and/or graphite were documented within a garnetiferous quartz - feldspar - hornblende - biotite - chlorite gneiss over 40 m of core from DDH SHE-82. Within that intersection, up to 80% pyrrhotite, up to 5% pyrite, 3% graphite, trace chalcopyrite and trace sphalerite were documented over

approximately 90 cm. Down hole, minor amounts of pyrite and/or pyrrhotite were documented locally. The core from DDH SHE-83 contains scattered blebs, stringers and disseminations of pyrite, pyrrhotite and/or graphite. An approximately 60 cm long intersection contains up to 60% pyrrhotite, up to 30% pyrite and minor amounts of graphite. The near solid sulphide intersections from DDH SHE-82 and SHE-83 contain chlorite, graphite, coarse grained metamorphic pyrite and silicate 'balls' (produced during annealing of the sulphides). Logs were not submitted for DDH SHE-71, SHE-72 and SHE-80, but the accompanying report in A.F. 92972 describes a 1.3 m long near solid to solid sulphide intersection from DDH SHE-71, and 1 m and 2.2 m long intersections of a 'slightly mineralized alteration horizon' from DDH SHE-72 and SHE-80, respectively.

GEOCHEMICAL DATA:

Core samples were submitted for assay from DDH SHE-81, SHE-82 and SHE-83, but results of those analyses were not submitted with the drill logs. The sulphide intersection from DDH SHE-71 contained 2.3% Zn, 5 g/t Ag and 0.3 g/t Au. The 1 m intersection in DDH SHE-72 contains 1.09% Cu, 2.4% Zn, 11 g/t Ag and 0.4 g/t Au. The 2.2 m intersection from DDH SHE-80 contains 1.5% Zn and 0.29% Cu.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. The mineralization is interpreted to be a graphitic sulphide facies iron formation, but the Zn contents are higher than are normally found in this rock type. (cf. Locations 18, 20 and 34). The presence of chlorite within high grade metamorphic rocks of the Kiseynew gneiss belt indicates either a retrograde metamorphic reaction, possibly associated with shearing and/or faulting, or a pre-metamorphic high magnesian content within the rock, as is generated during Fe-Mg metasomatism, commonly associated with massive sulphide deposit type mineralization.

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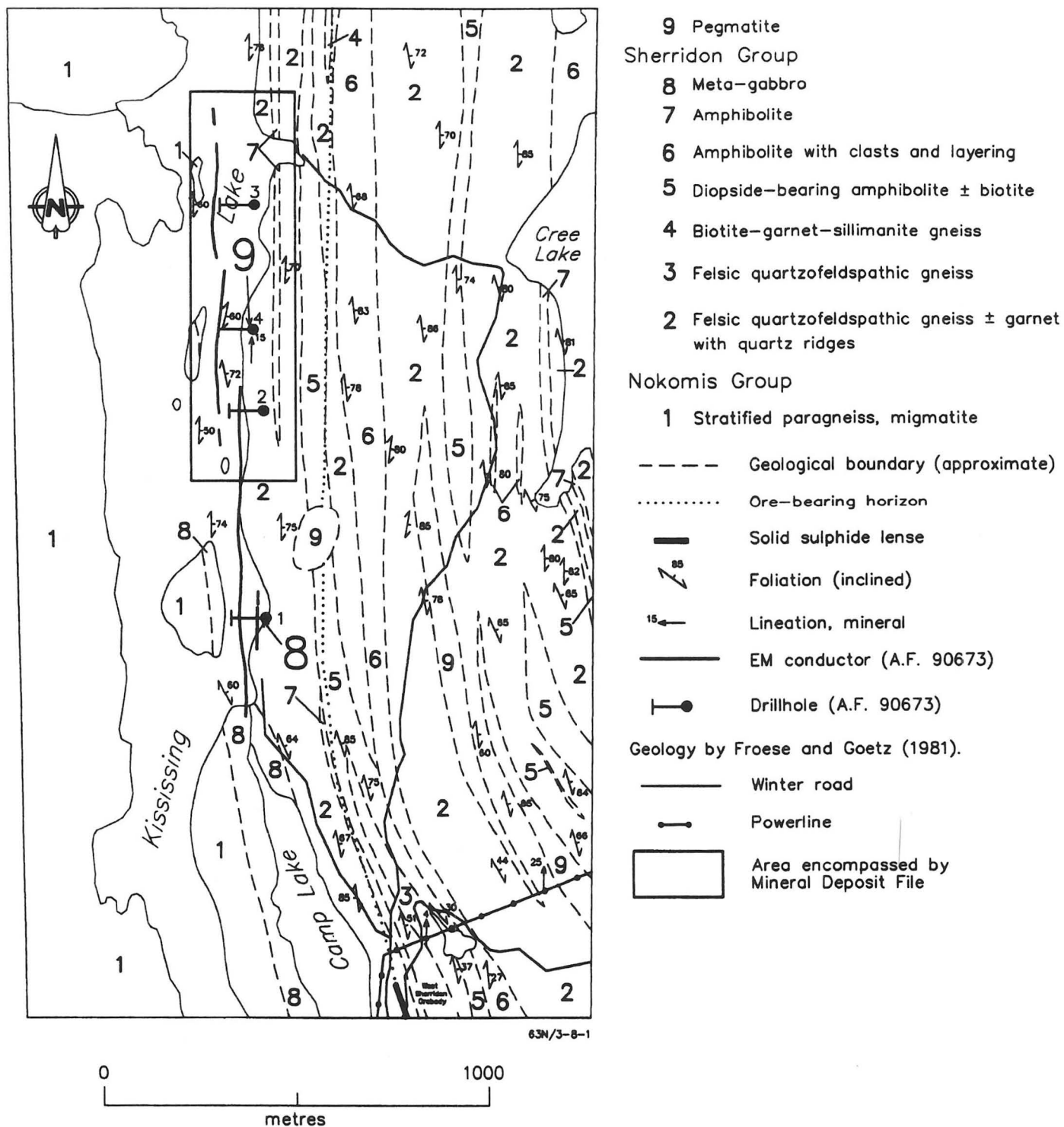


Figure 8-1: General geology, geophysical conductors and diamond-drill hole locations at occurrences 8 and 9

LOCATION: 8

NAME: (A.F. Mineralization intersected by diamond drilling)
 UTM: 6112996N/365178E
 AREA: North of Cold Lake, Manitoba.
 AIRPHOTO: A26397-010
 ACCESS: Kississing Lake.

EXPLORATION SUMMARY:

The area was first staked as Hope and Range prior to 1930 (Mining claim map, 63N/3NE, *circa* 1930). The Range claim was staked by B.M. Stitt in 1926, and transferred to G.L. Selfe in 1927. In 1928 it was transferred to R.J. Jowsey and then to Sherritt Gordon Mines Limited. Lease 1031 was issued for 21 years in 1929. Cold Lake Mines Limited carried out radiore surveys and diamond drilling northwest of Camp Lake in 1928-1929 (Wright, 1929. 1938). The Hope claim was to be drilled in 1929 (Corporation File, Cold Lake Mines Limited). Lease 1031 lapsed in 1950. H.L. Thompson staked Paymaster in 1951. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). In 1955 Cyprus Exploration Corporation, Limited did an EM survey and drilled DDH 1 (89.6 m) on Paymaster (A.F. 90673). The claim lapsed in 1956. The ground was held as Par 365 and Par 366 by HBED from 1958 to 1959 and as Bingo 7 by W.J. Lavoie from 1969 to 1971. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). HBED staked CB 10512 in 1979. An airborne EM/Mag survey was done by Shell Canada Resources Limited in 1980 (A.F. 92513). The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km².

GEOLOGICAL SETTING:

The drillhole was collared on Kississing Lake near or at the contact between Sherridon Suite (former Sherridon Group) biotite- or hornblende-bearing quartz-rich quartzofeldspathic gneiss and massive coarse grained amphibolite/gabbro (Fig. 8-1; Froese and Goetz, 1981). The DDH intersected granitic gneiss \pm garnet and gabbroic gneiss.

MINERALIZATION:

Two mineralized sections, 2 m and 1.2 m in core length, occur within the granite gneiss. The 2 m long intersection contains up to 40% pyrrhotite and 20% pyrite. A graphite schist was intersected over 15 cm within this intersection. Up to 30% pyrrhotite and 5% pyrite was documented in the 1.2 m long section of drill core.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. The mineralization is interpreted to be a graphitic sulphide facies iron formation. Although only graphite may be recorded in the drill log, the majority of this type of occurrence has been found to contain more Fe sulphide than carbon (Gale *et al.*, 1980).

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 1938: Geology and mineral deposits of a part of northwest Manitoba; Geological Survey of Canada, Summary Report 1930, Part C, p. 36.

LOCATION: 9

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

UTM: 6113796N/365178E

AREA: East Kississing Lake, west of Cree Lake.

AIRPHOTO: A26397-010

ACCESS: Kississing Lake.

EXPLORATION SUMMARY:

The area was first staked as Zip Fr., Complex 5, Carefoot and Rose prior to 1930 (Mining claim map, NE 63N/3, *circa* 1930). Cold Lake Mines Limited drilled the Rose claim in 1929 (Winnipeg Tribune, December 31, 1929). W. Yakushavich held the ground as Red 1 and Red 2 from 1943 to 1944. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). H.L. Thompson staked Paymaster 5 and Paymaster 7 in 1954. In 1955 Cyprus Exploration Corporation, Limited performed an EM survey on the Paymaster claims and drilled DDH 2 (116 m) and DDH 4 (77 m) on Paymaster 5 and DDH 3 (76 m) on Paymaster 7 (Fig. 8-1; A.F. 90673). The claims lapsed in 1956. HBED held the ground as Par 341, Par 352, and Par 354 from 1958 to 1959. R.A. de Denus staked Don 7 in 1966 and assigned it to Fidelity Mining Investments Limited in 1969. Work (diamond drilling?) was reported on the Bar, Don and GraceL group in 1967-1970 (Mining claim card, Don 7). Don 7 lapsed in 1971. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). HBED staked CB 10511 and CB 10512 in 1979. In 1980 Shell Canada Resources Limited produced a 1:125 000 scale compilation map of the geology and mineral occurrences within 63N/2 and parts of 63N/3 and 63N/1 (A.F. 92513). The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km².

GEOLOGICAL SETTING:

The drillholes were collared on Kississing Lake near or at the contact between Sherridon Suite (former Sherridon Group) biotite- or hornblende-bearing quartz-rich quartzofeldspathic gneiss and massive coarse grained amphibolite/gabbro (Fig. 8-1; Froese and Goetz, 1981). Granitic gneiss ± garnet and gabbroic gneiss were intersected in the drill-holes.

MINERALIZATION:

The gabbroic gneiss locally contains up to 30% Fe-sulphide and graphite over core lengths of 1-2 m. Minor amounts of disseminated pyrite and/or pyrrhotite and/or

graphite were documented elsewhere within the drill core. A pyrrhotite-pyrite occurrence is shown near this location on the geological compilation map (1:125 000) produced by Shell Canada Resources Limited in 1980 (A.F. 92513).

GEOCHEMICAL DATA:

None. Although geochemical information is not available for the mineralized drill core sections, Ballhaus and Stumpfl (1985) have documented a relationship between graphite content within mafic/ultramafic rocks and platinum group element enrichment. Assessment of these rocks for platinum group elements should be considered.

CLASSIFICATION:

Magmatogenic type deposits associated with mafic/ultramafic rocks; disseminated. Although the mineralization is interpreted to be magmatogenic, it is also possible that during intrusion, the gabbro incorporated sulphide-rich quartzofeldspathic gneiss (*cf.* Location 8). Alternatively, if the gabbroic gneiss is a recrystallized mafic volcanic or limey sedimentary rock, the mineralization may represent sulphide facies iron formation layers.

REFERENCES:

- Assessment File 90673, 91616, 91695, 92513
Manitoba Energy and Mines, Minerals Division.
- Ballhaus, C.G. and Stumpfl, E.F.
1985: Occurrence and petrological significance of graphite in the upper critical zone, western Bushveld Complex, South Africa; *Earth Planet. Sci. Letters*, v. 74, p.58-68
- Bateman, J.D.
1944: Sherritt Gordon Mine area, Manitoba; Geological Survey of Canada, Paper 44-4, Preliminary map with descriptive notes, 1:12 000.
- Bateman, J.D. and Harrison, J.M.
1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.
- Froese, E. and Goetz, P.A.
1981: Geology of the Sherridon group in the vicinity of Sherridon, Manitoba; Geological Survey of Canada, Paper 80-21; 20p.
- Kaszycki, C.A.
1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118.
- Schledewitz, D.
1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

LOCATION: 10

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

UTM: 611487N/365415E

AREA: East Kississing Lake, west of Don Lake.

AIRPHOTO: A26397-008

ACCESS: Kississing Lake.

EXPLORATION SUMMARY:

In 1926 G. Slater staked Premier 1 and transferred it to P.N. McLaren. Atlas Exploration Company Limited did trenching and diamond drilling on Premier 1 in 1928 (Mining Engineering File, Atlas Exploration Company Limited). In 1929 Atlas Exploration acquired the claim and transferred it to Sherritt Gordon Mines Limited. Lease M-55 was issued in 1931, but was cancelled in 1951. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). H.L. Thompson staked Paymaster 9 in 1954. In 1955 Cyprus Exploration Corporation, Limited did an EM survey on the property (A.F. 90673). The claim lapsed in 1956. In 1955 Noranda Mines Limited did an EM survey and drilled DDH 2 (no log) and DDH 3 (46.3 m) on Crow 1 (A.F. 90672; DDH 2, 3, A.F. 90670). HBED held Par 337 in 1958-1959. In 1965-1966 Fidelity Mining Investments Limited carried out magnetic and EM surveys on the Bar claims, east of Don Lake (A.F. 93118). In 1966 R.A. de Denus staked Don 4 and assigned it to R. Brown. Valray Explorations Limited carried out magnetic and electromagnetic surveys in 1966 and drilled DDH 6 (107.3 m) in 1969 (A.F. 90676, A.F. 92055; DDH 6, A.F. 90675). Valray Explorations Limited acquired the property in 1969. Don 4 lapsed in 1971. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). W. Shmon held the ground as Joyce 6 in 1972-1978. HBED staked CB 10511 in 1979. The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km².

GEOLOGICAL SETTING:

The area is underlain by biotite- or hornblende-bearing quartz-rich quartzofeldspathic gneiss and pelitic schist of the Sherridon Suite (former Sherridon Group) (Fig. 10-1; Froese and Goetz, 1981). The DDH intersected interlayered hornblende ± quartz ± feldspar ± garnet gneiss and quartzofeldspathic gneiss ± garnet.

MINERALIZATION:

A 5 cm long piece of core from a garnetiferous hornblende gneiss layer contains 5% disseminated chalcopyrite and a very coarse grained bleb of pyrrhotite. Minor amounts of disseminated chalcopyrite were documented elsewhere in this garnetiferous hornblende gneiss unit. Minor amounts of disseminated Fe-sulphide were documented within a different hornblende gneiss unit and the quartzofeldspathic gneiss. DDH 3 (A.F. 90670) intersected minor amounts of disseminated pyrite and graphite mineralization in quartzofeldspathic gneiss and amphibolite. Pyrite veins/stringers, up to 2.5 cm thick, were documented locally in the core from DDH 3.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

- Assessment File 90670, 90673, 90675, 90676, 91616, 91695, 92055
 Manitoba Energy and Mines, Minerals Division.
- Bateman, J.D.
 1944: Sherritt Gordon Mine area, Manitoba; Geological Survey of Canada, Paper 44-4, Preliminary map with descriptive notes, 1:12 000.
- Bateman, J.D. and Harrison, J.M.
 1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.
 Mining Engineering File, Atlas Exploration Company Limited
 Manitoba Energy and Mines, Minerals Division.
- Kaszycki, C.A.
 1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118.
- Schledewitz, D.C.P.
 1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.
- Wright, J.F.
 1938: Geology and mineral deposits of a part of northwest Manitoba; Geological Survey of Canada, Summary Report 1930, Part C, p. 36.

9 Granodiorite

8 Gabbro

Sherridon Group

7 Layered amphibolite with fragments; probably metamorphosed volcanoclastic rocks

6 Impure marble and calc-silicate rocks

5 Calc-silicate rocks

4 Pelitic schist

3 Biotite-garnet schist

2 Quartz-rich gneisses


Nokomis Group

1 Quartzofeldspathic gneiss, migmatite

— — — Geological boundary (approximate)

..... Ore-bearing horizon

10 Lineation, mineral

52  Foliation (inclined, vertical)

Geology by Froese and Goetz (1981).

—— EM conductor (A.F. 93118)

Drillholes

(A.F. 90670)

—○ (A.F. 90673)

—○ (A.F. 90675)

14. Occurrence location

☐ Area encompassed by Mineral Deposit File

Figure 10-1: General geology, geophysical conductors and drillhole locations at occurrences 10, 11, 12 and 14

LOCATION: 11

NAME: (A.F. Mineralization intersected by diamond drilling)
 UTM: 6114686N/365223E
 AREA: East Kississing Lake, west of Don Lake and southwest of Tap Lake.
 AIRPHOTO: A26397-008
 ACCESS: Kississing Lake.

EXPLORATION SUMMARY:

The area was first staked as Premier 2, Premier 4, Dinty, Sherritt Extn and Ford (Mining claim map, 63N/3NE, *circa* 1930). In 1926-1929 Annie E. Williams, C.A. Henderson, F.R. Cherry, S. Olafson, R.L. Campbell, and M. Joyce held interests in the claims. In 1929 Atlas Exploration acquired the property and transferred it to Sherritt Gordon Mines Limited. Sherritt acquired Victor Fr. 6 in 1929. Leases M-56, M-52, M-73, M-58 and M-1947 were issued in 1931, but were cancelled in 1951. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616).

In 1954 Val Couchie staked Crow 1 and H.L. Thompson staked Paymaster 10. Also in 1955 Cyprus Exploration Corporation, Limited did an EM survey and drilled DDH 5 (88 m) on Paymaster 10 (Fig 10-1; A.F. 90673). The claims lapsed in 1956. HBED held Par 324 in 1958-1959. In 1966 R.A. de Denus staked Don 1 and J. Como staked Sing 18. R. Brown acquired the claims in 1966. Valray Explorations Limited carried out magnetic and electromagnetic surveys in 1966 (A.F. 90676, same data in A.F. 90675, 92055) and acquired Don 1 in 1969. The claims lapsed in 1971. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). W. Shmon staked Joyce 5 in 1972. The claim lapsed in 1978. HBED staked CB 10510 and CB 10511 in 1979. CB 10510 lapsed in 1984. The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km². Sing 6 was staked by Esso Minerals Canada in 1988, and transferred to Esso Resources Canada Limited and then to Homestake Mining (Canada) Limited in 1989. Sing 6 lapsed in 1990. The area is presently (1992) partly covered by CB 10511, held by HBED since 1979.

GEOLOGICAL SETTING:

The area is underlain by biotite- or hornblende-bearing quartz-rich quartzofeldspathic gneiss of the Sherridon Suite (former Sherridon Group) (Fig. 10-1; Froese and Goetz, 1981). The DDH intersected interlayered garnetiferous granitic/quartz - feldspar ± hornblende gneiss and garnetiferous gabbroic/hornblende gneiss.

MINERALIZATION:

Approximately 2% pyrite, 2% graphite and trace amounts of pyrrhotite and chalcopyrite were documented in drill core from an 8.5 m long gabbroic gneiss intersection in DDH 5 (A.F. 90673).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Magmatogenic type deposit associated with mafic/ultramafic rocks; disseminated sulphides. Although the mineralization is interpreted to be magmatogenic, it is possible that the gabbro incorporated sulphide facies iron formation material from the quartzofeldspathic gneiss (*cf.* Location 8) during intrusion. Alternatively, if the gabbroic gneiss is a metamorphosed equivalent of a mafic metavolcanic or limey sedimentary rock, the mineralization could have been deposited during chemical sedimentation.

REFERENCES:

- Assessment File 90672, 90673, 90675, 90676, 91616, 91695, 92055
 Manitoba Energy and Mines, Minerals Division.
- Bateman, J.D.
 1944: Sherritt Gordon Mine area, Manitoba; Geological Survey of Canada, Paper 44-4, Preliminary map with descriptive notes, 1:12 000.
- Bateman, J.D. and Harrison, J.M.
 1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.
- Froese, E. and Goetz, P.A.
 1981: Geology of the Sherridon group in the vicinity of Sherridon, Manitoba; Geological Survey of Canada, Paper 80-21; 20p.
- Gobert, G. and Nielsen, E.
 1989: Till geochemistry of the Kississing Lake area, Manitoba; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1989, p. 41-43.
- Schledewitz, D.C.P.
 1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.
- Wright, J.F.
 1938: Geology and mineral deposits of a part of northwest Manitoba; Geological Survey of Canada, Summary Report 1930, Part C, p. 36.

LOCATION: 12

NAME: (A.F. Mineralization intersected by diamond drilling)
UTM: 6115946N/365386E
AREA: East Kississing Lake, northwest of Tap Lake.
AIRPHOTO: A26397-008
ACCESS: Kississing Lake, traverse.

EXPLORATION SUMMARY:

The area was first staked as Premier 6, Jim, and Dinty (Mining claim map, 63N/3NE, *circa* 1930). In 1926-1929 S. Olafson, R.L. Campbell, P. Johnson, P.N. McLaren, H.W. Willsie, and M. Joyce held partial interests in the claims. In 1929 Atlas Exploration Company Limited acquired the property and transferred it to Sherritt Gordon Mines Limited. Leases M-60, M-53 and M-1947 were issued in 1931 for Premier 6, Jim, and Dinty, respectively. The leases were cancelled in 1951. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). In 1954 H.L. Thompson staked Paymaster 13 and A. Erickson staked Crow 4. Noranda Mines Limited did an EM survey on the Paymaster claims in 1955 (A.F. 90672). The claims lapsed in 1956. HBED held the ground as Par 310 from 1958 to 1959.

In 1966 J. Como staked Sing 17 and transferred it to R. Brown. Valray Explorations Limited did Mag/EM surveys on the Sing claims in 1966 (A.F. 90676; same data in A.F. 90675, 92055) and drilled DDH 5 (155 m) on Sing 17 in 1969 (A.F. 90675; Fig. 10-1). Sing 17 was cancelled in 1971. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). HBED staked CB 10510 in 1979. In 1980 Shell Canada Resources Limited produced a 1:125 000 scale compilation map of the geology and mineral occurrences within 63N/2 and parts of 63N/3 and 63N/1 (A.F. 92513). CB 10510 was cancelled in 1984. The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km². Sing 6 was staked by Esso Minerals Canada in 1988, and transferred to Esso Resources Canada Limited and then to Homestake Mining (Canada) Limited in 1989. Sing 6 lapsed in 1990.

GEOLOGICAL SETTING:

The area is underlain by pelitic schist and biotite- or hornblende-bearing quartz-rich quartzofeldspathic gneiss of

the Sherridon Suite (former Sherridon Group) (Fig. 10-1; Froese and Goetz, 1981). The drillhole intersected hornblende gneiss \pm sillimanite \pm garnet and quartzofeldspathic gneiss.

MINERALIZATION:

An approximately 7.5 m long graphitic- and sulphide-bearing zone that is overlain by hornblende gneiss and underlain by pegmatite was intersected in the drillhole. This sulphide-bearing zone commonly contains 10% Fe-sulphide and graphite, but also includes a 2.7 m long intersection that contains 70% pyrite and pyrrhotite and 10% graphite. A pyrrhotite-pyrite occurrence is shown at this location on the geological compilation map (1:125 000) produced by Shell Canada Resources Limited in 1980 (A.F. 92513).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. The mineralization is interpreted to be a graphitic sulphide facies iron formation.

REFERENCES:

- Assessment File 90672, 90675, 90676, 91616, 91695, 92055, 92513
Manitoba Energy and Mines, Minerals Division.
Bateman, J.D. and Harrison, J.M.
1946 Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.
Kaszycki, C.A.
1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118.
Schledewitz, D.C.P.
1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.
Wright, J.F.
1938: Geology and mineral deposits of a part of northwest Manitoba; Geological Survey of Canada, Summary Report 1930, Part C, p. 36.

LOCATION: 13

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

UTM: 6116517N/365917E

AREA: South of SingSing Lake.

AIRPHOTO: A26397-007

ACCESS: Kississing Lake, traverse.

EXPLORATION SUMMARY:

The area was first staked as Bell, SingSing Fr., Ross and Loon (Mining claim map, 63N/3NE, circa 1930). C.G. Hamelin staked Loon in 1926. S. Olafson, R.L. Campbell, M. Joyce, and Atlas Exploration Company Limited held partial interests in the claim in 1926-1929. Atlas Exploration had an

option on SingSing and did trenching and diamond drilling in 1928 (Mining Engineering File, Atlas Exploration Company Limited). Wright (1929) reported a 7 m deep shaft on the property. Sherritt Gordon Mines Limited acquired Loon in 1929. Lease M-54 was issued in 1931. J. Patrick staked Pat and Jack in 1936 and transferred the claims to E.L. Brown in 1939. Diamond drilling was done on Loon in 1940 (Manitoba Mines and Natural Resources, 1941). Sherritt Gordon Mines Limited acquired leases M-1215 and M-1216 for the Pat and Jack claims in 1942. The leases were cancelled in 1951.

Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). In 1954 A. Erickson staked Crow 6 and H.L. Thompson and G.F. Thompson

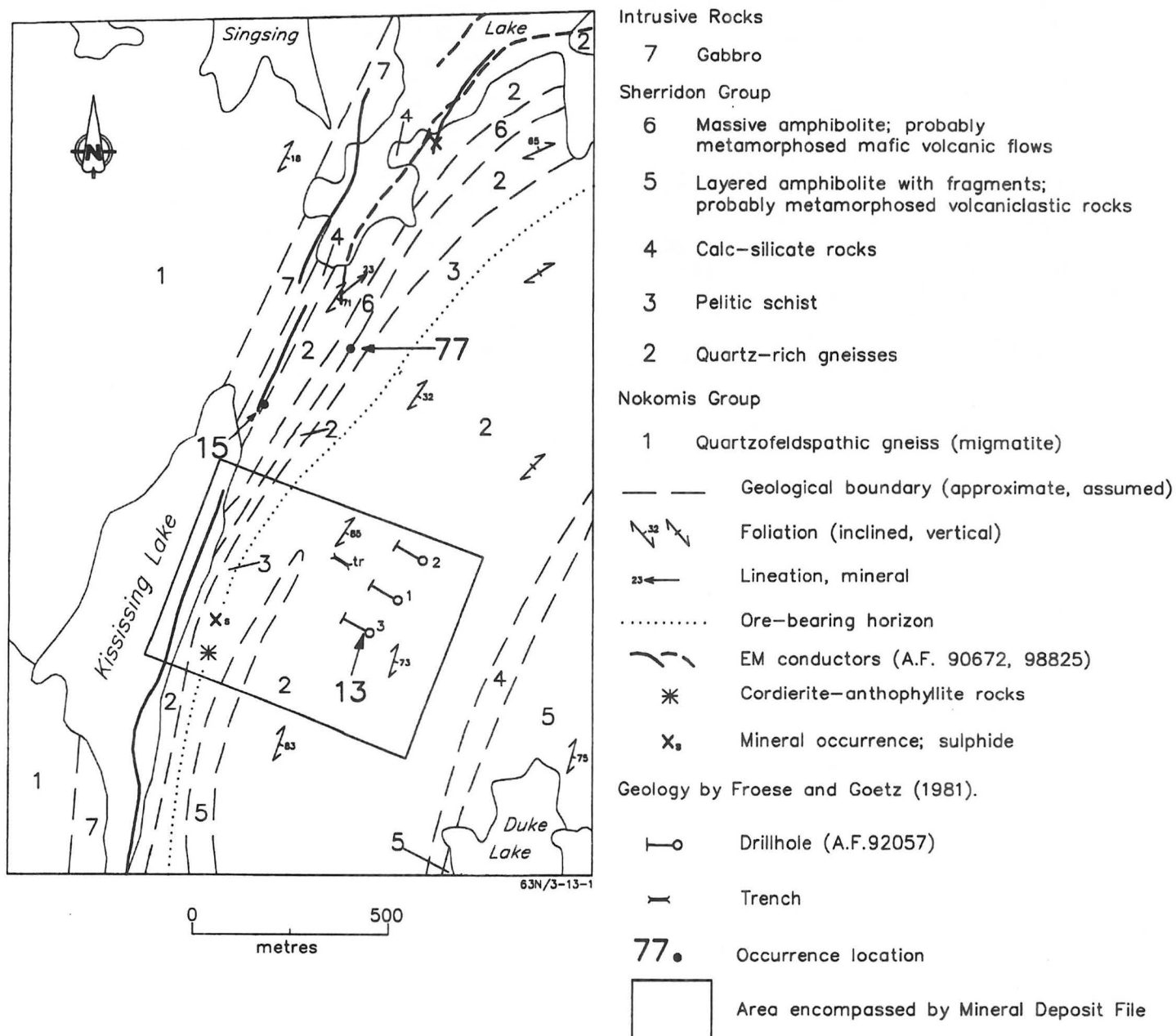


Figure 13-1: General geology, geophysical conductors, trench and diamond-drill hole locations at occurrence 13

staked Paymaster 15 and Paymaster 16. Noranda Mines Limited did some trenching and an EM survey on the Paymaster claims in 1955 (A.F. 90672). The claims lapsed in 1956. HBED held Par 259, Par 273 and Par 274 in 1958-1959. In 1966 E.J. Tycoles staked Nich 6 and Nich 11. Valray Explorations Limited did magnetic and EM surveys in 1966 (A.F. 92055, same data in A.F. 90675, A.F. 90676). W. Shmon acquired the claims in 1970. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). W. Shmon drilled DDH 1 (109 m), DDH 2 (109 m), and DDH 3 (119.7 m) on Nich 11 in 1975 (A.F. 92057). The claims lapsed in 1978. HBED held CB 10509 in 1979-1982 and CB 10510 in 1979-1984. The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km². Sing 6 was staked by Esso Minerals Canada in 1988, and transferred to Esso Resources Canada Limited and then to Homestake Mining (Canada) Limited in 1989. The claim lapsed in 1990.

GEOLOGICAL SETTING:

The area is underlain by Sherridon Suite (former Sherridon Group) biotite- or hornblende-bearing quartz-rich quartzofeldspathic gneiss with interlayered amphibolite, pelitic gneiss and cordierite-anthophyllite rock (Fig. 13-1; Froese and Goetz, 1981). The drillholes intersected diorite gneiss ± quartz ± chlorite ± garnet. DDH 3 intersected approximately 7.6 m of anthophyllite-bearing mafic rock and anthophyllite schist ± garnet. Granodiorite was intersected near the hole end in DDH 3. The position of an 'ore-bearing horizon', suggested by Froese and Goetz (1981), occurs proximal to the drillhole collar locations. Froese and Goetz (1981) place the Sherritt Gordon (Location 1) and the Park Lake (Location 3) massive sulphide type deposits, and the Jungle Lake massive sulphide type deposit (Ostry and Trembath, 1992) immediately to the east in NTS 63N/2 at the same stratigraphic position.

MINERALIZATION:

Minor amounts of disseminated pyrite, pyrrhotite and chalcopyrite were documented locally in the drillholes. Approximately 5 m of core that intersected the anthophyllite-bearing layer in DDH 3 is 'mineralized' with pyrite, pyrrhotite and chalcopyrite. The drillholes were collared close to the position of an 'ore bearing horizon' suggested by Froese and Goetz (1981) and an occurrence of cordierite-anthophyllite rock. Wright (1929) observed minor amounts of chalcopyrite and sphalerite within pegmatite rock that was exposed in the shaft.

GEOCHEMICAL DATA:

'Excellent values' in copper were reported from the SingSing group (Corporation File, Sherritt Gordon Mines Limited).

CLASSIFICATION:

Stratabound massive sulphide type deposit; sedimentary rock associated; alteration zone. The unusual mineralogy of the conformable anthophyllite sequence/layer may reflect: 1) a transposed Fe-Mg alteration zone like that commonly associated with massive sulphide type deposits; 2)

alteration by hydrothermal fluid flow along a structure such as a fault or shear zone and transposition; 3) sedimentary material that underwent *in situ* chloritization prior to high grade metamorphism; 4) the chemistry of a chemical sedimentary precipitate, with or without mixing during sedimentation; or 5) a pelitic composition high in alumina and magnesium.

REFERENCES:

- Assessment File 90672, 90675, 90676, 91616, 91695, 92055, 92057, 92513
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- Bateman, J.D. and Harrison, J.M.
1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.
Corporation File: Sherritt Gordon Mines Limited
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- 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, p. 92-103.
- Froese, E. and Goetz, P.A.
1976: Petrological studies in the Sherridon area, Manitoba; Geological Survey of Canada, Report of Activities, Part A, Paper 76-1A, p. 171-172.
- Froese, E. and Goetz, P.A.
1981: Geology of the Sherridon Group in the vicinity of Sherridon, Manitoba; Geological Survey of Canada, Paper 80-21, 20p.
- Froese, E.
1985: Anthophyllite-bearing rocks in the Flin Flon-Sherridon area, Manitoba; Geological Survey of Canada, Current Research, Part B, Paper 85-1B, p. 541-544.
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1949: Kississing, Saskatchewan-Manitoba; Geological Survey of Canada, Map 970A with descriptive notes, 1:253 440.
Manitoba Mines and Natural Resources
1941: 13th Annual Report on Mines and Minerals, p. 93.
- Kaszycki, C.A.
1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118.
Mining Engineering File, Atlas Exploration Company Limited
Manitoba Energy and Mines, Minerals Division.
- Ostry, G. and Trembath, G.D.
1992: Mineral Deposits and occurrences in the Batty Lake area, NTS 63N/2; Mineral Deposit Series Report No. 19, Manitoba Energy and Mines, 264p.
- Schledewitz, D.C.P.
1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.
- Wright, J.F.
1929: Kississing Lake, Manitoba; Geological Survey of Canada, Summary Report 1928, Part B, p. 99-100.

LOCATION: 14

NAME: (A.F. Mineralization intersected by diamond drilling)
 UTM: 6115878N/366454E
 AREA: East of Premier Lake.
 AIRPHOTO: A26387-160
 ACCESS: Kississing Lake, traverse.

EXPLORATION SUMMARY:

The area was first staked as Bonanza 11, Duke, and Victor Fr. 9 (Mining claim map, 63N/3NE, circa 1930). T.G. Willsie staked Duke in 1927, and transferred it to Atlas Exploration Company Limited in 1929. In 1929 H.C. Shields staked Victor Fr. 9. Sherritt Gordon Mines Limited acquired the claims in 1929. Leases M-31 and M-76 were issued for Duke and Victor Fr. 9, respectively, in 1931. In 1938 H. Stephens staked Elb Fr. and transferred it to E.L. Brown. Diamond drilling was done on Duke in 1940 (Manitoba Mines and Natural Resources, 1941). Lease M-1359 was issued for Elb Fr. in 1943 and was transferred to Sherritt Gordon Mines Limited in 1944. The leases lapsed in 1951. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). The ground was held as Raymar 5 by R. Enright in 1954-1955 and as Par 312 and Par 313 by HBED in 1958-1959. In 1966 E.J. Tycoles staked Nich 17. Fidelity Mining Investments Limited did magnetic and EM surveys and a 4-hole 310 m diamond drill program on the Bar claims in 1965-1966 (A.F. 93118; DDH 54, 55, 55A, 57, A.F. 92007). Claim maps indicate that the actual drilling was done west of Bar 35 and Bar 36, partly on Nich 17. W. Shmon acquired Nich 17 in 1970. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). Nich 17 lapsed in 1978. HBED held CB 10517 in 1979-1985. The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km². Louis Racic staked Rub 10 in 1992.

GEOLOGICAL SETTING:

The drillholes were collared near the contact between a layered to massive amphibolite and intermediate gneiss sequence, and calcareous gneiss and marble of the Sherridon Suite (former Sherridon Group) (Fig. 14-1; Froese and Goetz, 1981). The DDH intersected quartz - hornblende \pm garnet gneiss and quartzofeldspathic gneiss \pm biotite \pm hornblende.

MINERALIZATION:

Minor amounts of disseminated pyrite, pyrrhotite and/or graphite were documented locally in the drill core.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

- Assessment File 91616, 91695, 92007, 93118
 Manitoba Energy and Mines, Minerals Division.
 Bateman, J.D. and Harrison, J.M.
 1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.
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 1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118. Manitoba Mines and Natural Resources
 1941: 13th Annual Report on Mines and Minerals, p. 93.
 Schledewitz, D.C.P.
 1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

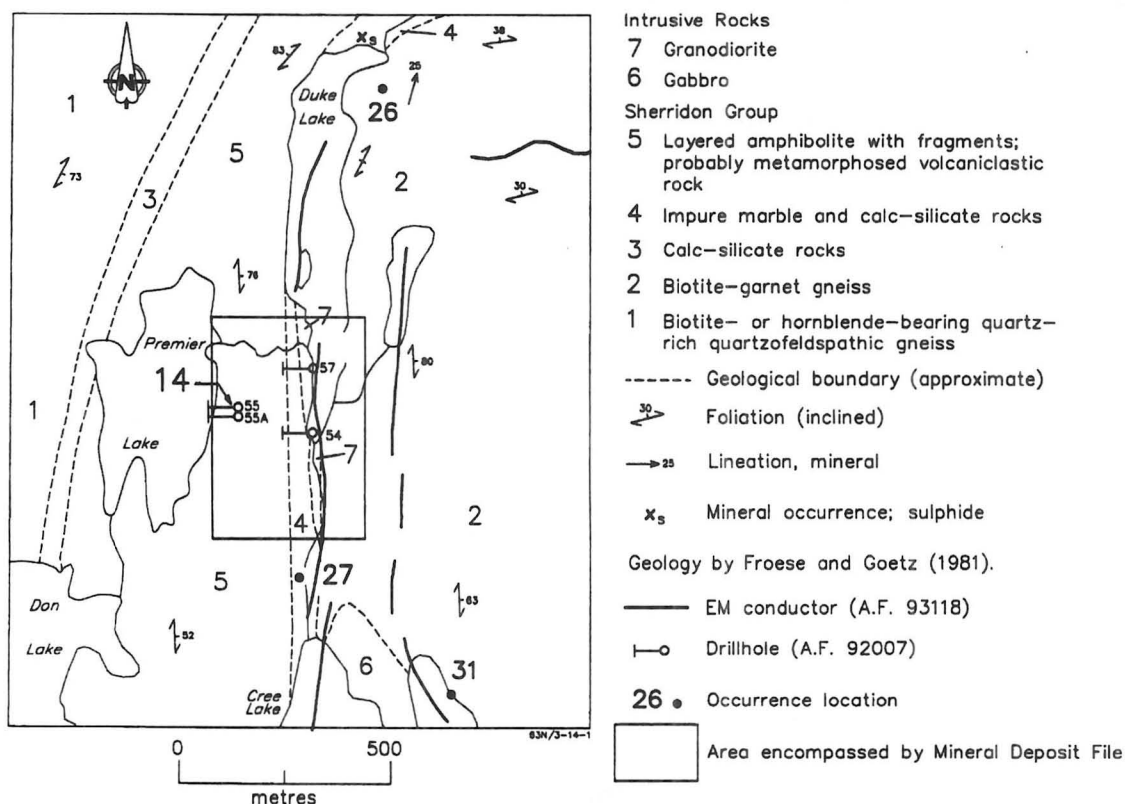


Figure 14-1: General geology, geophysical conductors and diamond-drill hole locations at occurrence 14

LOCATION: 15

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

UTM: 6117160N/365631E

AREA: South of Singing Lake.

AIRPHOTO: A26397-006

ACCESS: Kississing Lake, traverse; bush aircraft to Singing Lake.

EXPLORATION SUMMARY:

In 1926 N. Markoed staked Sing Sing 1 and transferred it to C.H. Willsie. In 1929 Atlas Exploration Company Limited acquired the claim and transferred it to Sherritt Gordon Mines Limited. Lease M-65 was issued in 1931. The lease was cancelled in 1951. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). In 1954 G.F. Thompson staked Paymaster 17. Noranda Mines Limited did an EM survey on the Paymaster claims in 1955 (A.F. 90672). The claim lapsed in 1956. HBED held the ground as Par 236 in 1958-1959. HBED drilled DDH P57 in the vicinity *circa* 1960, but the drill logs were not submitted (A.F. 98825). In 1966 E.J. Tycoles staked Nich 4 and Nich 5. Valray Explorations Limited did magnetic and EM surveys in 1966 (A.F. 92055, A.F. 90675, A.F. 90676). W. Shmon acquired the property in 1970. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). The Nich claims lapsed in 1978. HBED held CB 10509 in 1979-1982. The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km². Sing 2 was staked by Esso Minerals Canada in 1988, and transferred to Esso Resources Canada Limited and then to Homestake Mining (Canada) Limited in 1989. The claim lapsed in 1990.

GEOLOGICAL SETTING:

The area is underlain by Sherridon Suite (former Sherridon Group) quartz-rich gneiss, massive amphibolite, calc-silicate rocks and gabbro (Fig. 15-1; Froese and Goetz, 1981).

MINERALIZATION:

Trenches expose a 'schisted pyrite-pyrrhotite zone with graphite' (A.F. 90672) near the contact between Sherridon Metamorphic Suite quartz-rich gneiss and massive amphibolite (Fig. 15-1). Disseminated pyrrhotite occurs in outcrop approximately 760 m NE of the trenches (A.F. 90672).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment File 90672, 90675, 90676, 91616, 91695, 92055
Manitoba Energy and Mines, Minerals Division.

Bateman, J.D. and Harrison, J.M.

1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.

Froese, E. and Goetz, P.A.

1981: Geology of the Sherridon group in the vicinity of Sherridon, Manitoba; Geological Survey of Canada, Paper 80-21; 20p.

Kaszycki, C.A.

1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118.

Schledewitz, D.C.P.

1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

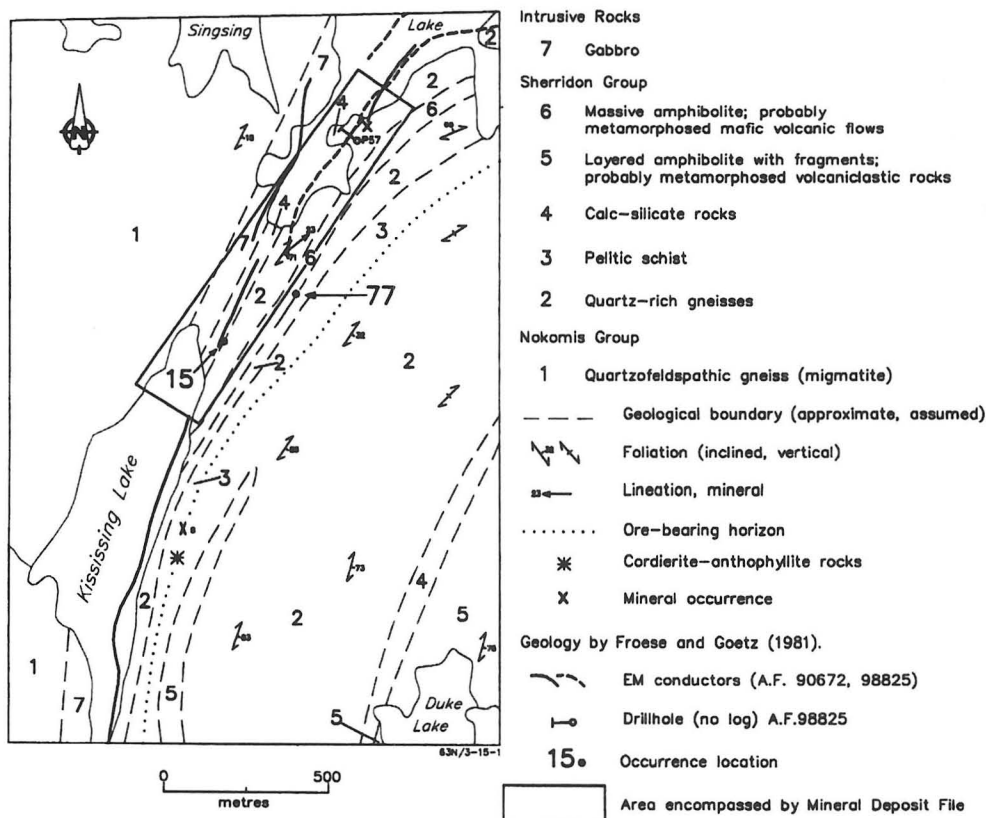


Figure 15-1: General geology, geophysical conductors and diamond-drill hole locations at occurrence 15

LOCATION: 16

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

UTM: 6118283N/366649E

AREA: Northeast Singsing Lake.

AIRPHOTO: A26397-006

ACCESS: Bush aircraft to Singsing Lake.

EXPLORATION SUMMARY:

The area was first staked as Joseph 1 and Joseph 2 (Mining claim map, 63N/3NE, *circa* 1930). In 1938 Elb 13 and Elb 14 were staked by Mrs. L. Hone and G.E. Webber, respectively, and were transferred to E.L. Brown. Leases M-1399 and M-1400 were issued in 1943, and assigned to Sherritt Gordon Mines Limited in 1944. The leases lapsed in 1951. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). A. McKenzie staked Paymaster 21 and Paymaster 22 in 1955. Noranda Mines Limited did an EM survey in 1955 (A.F. 90672). The claims lapsed in 1956. HBED drilled DDH P56 in the vicinity *circa* 1960, but the drill logs were not submitted (A.F. 98825). In 1966 Sing 3, Sing 4, Sing 9 and Sing 10 were staked by J. Como, and assigned to R. Brown. Valray Explorations Limited did magnetic (Sharpe MF1 fluxgate) and EM (Sharpe S-250) surveys in 1966 (A.F. 90676, same data in A.F. 92055). In 1969 Valray drilled DDH 4 (91.7 m) on Sing 10 (A.F. 90675). The claims lapsed in 1971. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). HBED held the ground as CB 10509 and CB 10519 in 1979-1982. The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km². Sing 1 and Sing 2 were staked by Esso Minerals Canada in 1988, and transferred to Esso Resources Canada Limited and then to Homestake Mining (Canada) Limited in 1989. Sing 1 lapsed in 1990. L. Racic staked Rub 11 in 1992.

GEOLOGICAL SETTING:

The drillhole was collared near the contact between biotite- or hornblende-bearing quartz-rich quartzofeldspathic gneiss and calc-silicate gneiss of the Sherridon Suite

(former Sherridon Group) (Fig. 16-1; Froese and Goetz, 1981). Interlayered light green, dark green and black hornblende - feldspar ± garnet gneiss, and quartz - hornblende - feldspar gneiss were intersected in the drillhole. Calcite filled fractures and carbonate stringers/veins were documented locally in the drill core.

MINERALIZATION:

The drillhole intersected 35-50% pyrite and pyrrhotite and 10-30% graphite over approximately 1.8 m within hornblende gneiss. Minor amounts of disseminated Fe-sulphide and/or graphite were documented elsewhere in the drill core.

GEOCHEMICAL DATA:

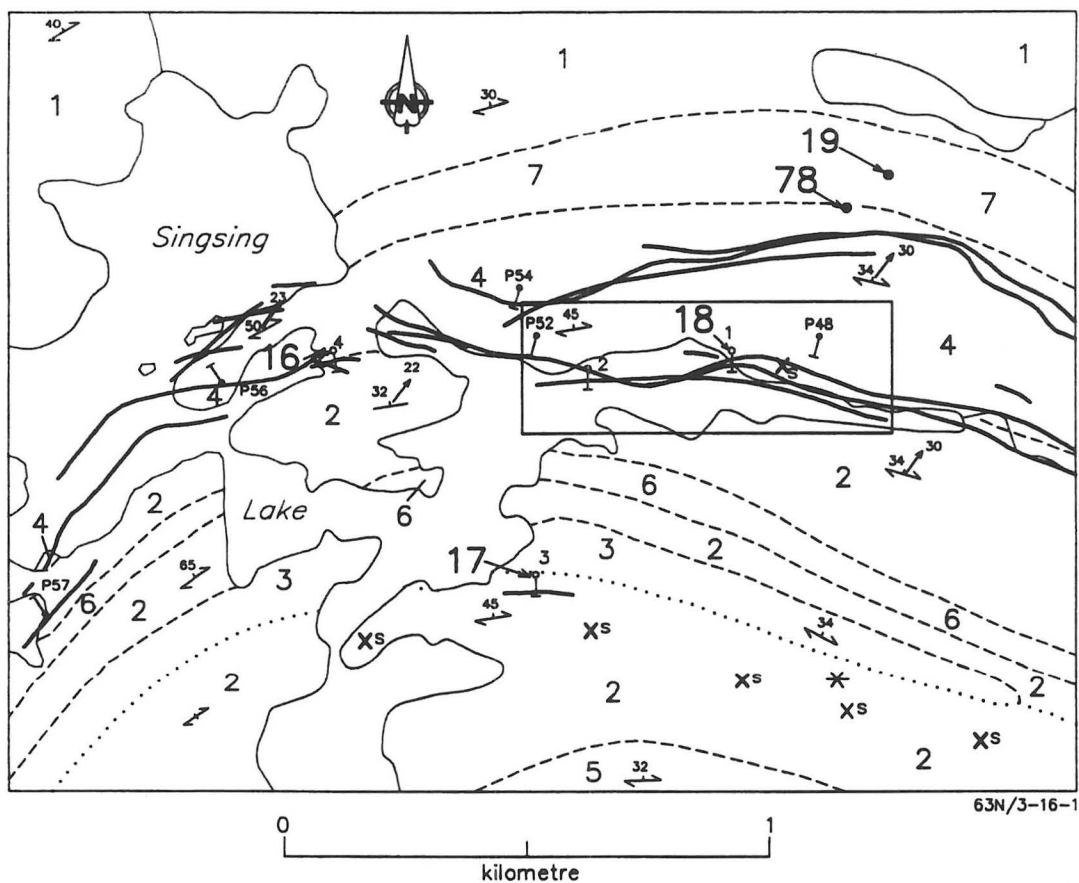
None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. The mineralization is interpreted to be a graphitic sulphide facies iron formation (*cf.* Location 20).

REFERENCES:

- Assessment File 90672, 90675, 90676, 91616, 91695, 92055, 98825
Manitoba Energy and Mines, Minerals Division.
Bateman, J.D. and Harrison, J.M.
1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.
Froese, E. and Goetz, P.A.
1981: Geology of the Sherridon group in the vicinity of Sherridon, Manitoba; Geological Survey of Canada, Paper 80-21; 20p.
Kaszycki, C.A.
1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118.
Schledewitz, D.C.P.
1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.



Intrusive Rocks

7 Gabbro

Sherridon Group

6 Massive amphibolite; probably metamorphosed mafic volcanic flows

5 Layered amphibolite with fragments; probably metamorphosed volcanoclastic rock

4 Calc-silicate rocks

3 Pelitic schist

2 Quartz-rich gneisses

Nokomis Group

1 Quartzofeldspathic gneiss

----- Geological boundary (approximate)

32 ↗ ↘ Foliation (inclined, vertical)

→²² Lineation, mineral

..... Ore-bearing horizon

* Cordierite-anthophyllite rocks

X^s Mineral occurrence; sulphide

Geology by Froese and Goetz (1981).

— EM conductor (A.F. 90675, 98825)

Drillholes

⊥ (A.F. 90675)

⊥ (A.F. 98825; DDH P52, 54, 56, and 57 do not have logs)

16• Occurrence location

□ Area encompassed by Mineral Deposit File

Figure 16-1: General geology, geophysical conductors and diamond-drill hole locations at occurrences 16, 17 and 18

LOCATION: 17

NAME: (A.F. Mineralization intersected by diamond drilling)
UTM: 6117769N/367070E
AREA: East of Singing Lake.
AIRPHOTO: A26387-162
ACCESS: Bush aircraft to Singing Lake.

EXPLORATION SUMMARY:

SingSing 5 and SingSing 6 were staked in 1926. S. Olafson, H.W. Willsie, J. Westman, M. Martin, R. Campbell, and C.A. Henderson held partial interests in the claims in 1926. In 1929 the claims were assigned to Atlas Exploration Company Limited and then to Sherritt Gordon Mines Limited. Leases M-33 and M-32 were issued in 1931, and were cancelled in 1951. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). HBED held the ground as Par 238 in 1958-1964. In 1966 E.J. Tycoles staked Nich 2. Valray Explorations Limited did magnetic (Sharpe MF1 fluxgate) and EM (Sharpe S-250) surveys in 1966 and drilled DDH 3 (93.3 m) in 1969 (A.F. 92055, A.F. 90675; DDH 3, A.F. 92056). W. Shmon acquired Nich 2 in 1970. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). Nich 2 lapsed in 1978. HBED held the ground as CB 10518 in 1979-1985. The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km². Sing 1 was staked by Esso Minerals Canada in 1988, and transferred to Esso Resources Canada Limited and then to Homestake Mining (Canada) Limited in 1989. Sing 1 lapsed in 1990. L. Racic staked Rub 11 in 1992.

GEOLOGICAL SETTING:

The area is underlain by biotite- or hornblende-bearing quartz-rich quartzofeldspathic gneiss of the Sherridon Suite (former Sherridon Group) (Fig. 16-1; Froese and Goetz, 1981). The drillhole intersected quartz - feldspar - biotite ± garnet gneiss. The position of an 'ore-bearing horizon', suggested by Froese and Goetz (1981), occurs proximate to the drillhole collar location. Froese and Goetz (1981) place the Sherritt Gordon (Location 1) and the Park Lake (Location 3) massive

sulphide type deposits, and the Jungle Lake massive sulphide type deposit (Ostry and Trembath, 1992), immediately to the east in NTS 63N/2, at the same stratigraphic position. The drillhole intersected quartz - feldspar - biotite gneiss ± garnet and quartz - feldspar - hornblende gneiss.

MINERALIZATION:

Minor to moderate amounts of Fe-sulphide blebs and disseminations occur throughout the drill core. An approximately 15 cm long section of core contains 50% vuggy pyrite and quartz crystals. Sulphide mineralization occurs in outcrop near this location (Fig. 16-1; Froese and Goetz, 1981).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

- Assessment File 90675, 91616, 91695, 92055, 92056
Manitoba Energy and Mines, Minerals Division.
- Bateman, J.D. and Harrison, J.M.
1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.
- Froese, E. and Goetz, P.A.
1981: Geology of the Sherridon Group in the vicinity of Sherridon, Manitoba; Geological Survey of Canada, Paper 80-21, 20p.
- Kaszycki, C.A.
1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118.
- Ostry, G. and Trembath, G.D.
1992: Mineral Deposits and occurrences in the Batty Lake area, NTS 63N/2; Mineral Deposit Series Report No. 19, Manitoba Energy and Mines, 264p.
- Schledewitz, D.C.P.
1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

LOCATION: 18

NAME: (A.F. Mineralization intersected by diamond drilling)
 UTM: 6118275N/367494E
 AREA: East Singing Lake.
 AIRPHOTO: A26387-162
 ACCESS: Bush aircraft to Singing Lake.

EXPLORATION SUMMARY:

In 1926 SingSing 7 and SingSing 9 were staked by N. Markoed and T.G. Willsie, respectively. H.W. Willsie acquired SingSing 7 in 1926. In 1929 the claims were assigned to Atlas Exploration Company Limited and then to Sherritt Gordon Mines Limited. Leases M-220 and M-222 were issued in 1932. The leases lapsed in 1951. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). The ground was held as Chal 26 by M. Rapson in 1954-1957. HBED staked Par 218 in 1958, and drilled DDH P48 (60.6 m) in 1959 (A.F. 98825). HBED drilled DDH P52 and P54 in the vicinity *circa* 1960, but the drill logs were not submitted (A.F. 98825). Par 218 lapsed in 1964. In 1966 Sing 5, Sing 6, Sing 11 and Sing 12 were staked by J. Como, and assigned to R. Brown. Valray Explorations Limited did magnetic (Sharpe MF1 fluxgate) and EM (Sharpe S-250) surveys in 1966 (A.F. 90676). In 1969 Valray drilled DDH 1 (186 m) on Sing 6 and Sing 12 and DDH 2 (60.6 m) on Sing 11 (A.F. 90675). The claims lapsed in 1971. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). HBED held the ground as CB 10519 in 1979-1982. In 1980 Shell Canada Resources Limited produced a 1:125 000 scale compilation map of the geology and mineral occurrences within 63N/2 and parts of 63N/3 and 63N/1 (A.F. 92513). The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km². Sing 1 was staked by Esso Minerals Canada in 1988, and transferred to Esso Resources Canada Limited and then to Homestake Mining (Canada) Limited in 1989. Sing 1 lapsed in 1990. L. Racic staked Rub 8 and Rub 11 in 1992.

GEOLOGICAL SETTING:

The Valray drillholes were collared near the contact between biotite- or hornblende-bearing quartz-rich quartzofeldspathic gneiss and calc-silicate gneiss of the Sherridon Suite (former Sherridon Group) (Fig. 16-1; Froese and Goetz, 1981). These holes intersected hornblende ± biotite ± garnet gneiss, quartz - feldspar ± biotite ± garnet gneiss, quartzite, quartz - hornblende gneiss ± garnet ± biotite and quartz - biotite ± garnet gneiss. Chromium mica within pegmatite

occurs in the drill core from DDH 2. The pegmatite occurs within sheared quartz - hornblende - biotite gneiss. A quartz - hornblende - biotite gneiss layer in DDH 1 contains light gray-green garnets. Calcite and chlorite were documented locally in the drill core. DDH P48 intersected hornblende ± garnet, quartz - feldspar ± biotite ± hornblende ± garnet gneiss, hornblende - feldspar - biotite ± garnet gneiss.

MINERALIZATION:

A 6.7 m long sulphide bearing intersection in a quartz - chlorite gneiss and hornblende - biotite - chlorite gneiss sequence was documented in the core from DDH 1. A 2 m long intersection within the sequence contains 50% pyrite and up to 10% graphite. Up to 35% pyrite and pyrrhotite mineralization within a hornblende ± quartz gneiss was documented over approximately 2.4 m of core from DDH 2. Minor amounts of disseminated Fe-sulphide and/or graphite occur locally throughout the core from both Valray holes. Layers that contain 'abundant' pyrrhotite and graphite, and locally, solid pyrrhotite or graphite were intersected in DDH P48. These layers range from 0.9 m to 5 m in core length. A pyrrhotite-pyrite occurrence is shown near this location on the geological compilation map (1:125 000) produced by Shell Canada Resources Limited in 1980 (A.F. 92513).GEO-CHEMICAL DATA:

None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. The mineralization is interpreted to be a graphitic sulphide facies iron formation. (*cf.* Locations 7, 20 and 34).

REFERENCES:

- Assessment File 90675, 90676, 91616, 91695, 92513, 98825
 Manitoba Energy and Mines, Minerals Division.
 Bateman, J.D. and Harrison, J.M.
 1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.
 Froese, E. and Goetz, P.A.
 1981: Geology of the Sherridon group in the vicinity of Sherridon, Manitoba; Geological Survey of Canada, Paper 80-21; 20p.
 Kaszycki, C.A.
 1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118.
 Schledewitz, D.C.P.
 1988: Kissinging Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

LOCATION: 19

NAME: (A.F. Mineralization intersected by diamond drilling)
UTM: 6118639N/367810E
AREA: Northeast of Singing Lake and northwest of Park Lake.
AIRPHOTO: A26387-163
ACCESS: Bush aircraft to Singing Lake or Park Lake, traverse.

EXPLORATION SUMMARY:

The area was first staked as SingSing 9 prior to 1930 (Mining claim map, 63N/3NE, *circa* 1930). The claim was leased (M-222) for 21 years by Sherritt Gordon Mines Limited in 1932. Ken 5 and Elb 10 were staked prior to 1940 and were leased for 21 years (M-1317, M-1396) by Sherritt Gordon Mines Limited in 1943. The leases were cancelled in 1951. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). In 1954 Mrs. M. Rapson staked Chal 24 and Chal 25. G. Rapson did a 6-hole 274 m diamond drill program on Chal 25 in 1955 (DDH 1 to 6; A.F. 90668). Two trenches were noted on the claims (A.F. 90668). The claims lapsed in 1957. Par 201 lapsed in 1964. Par 202 lapsed in 1966. In 1966 John Como staked Sing 6 for Robert Brown. Valray Explorations Limited did a VLEM survey and a magnetic (Sharpe Fluxgate MF1) survey in 1966 (A.F. 90675, 90676). Sing 6 lapsed in 1971. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). HBED held the ground as CB 10519 from 1979 to 1982. The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km². Esso Minerals Canada staked Sing 1 in 1988, and transferred it to Esso Resources Canada Limited in March 1989. Homestake Mining (Canada) Limited acquired the claim in April 1989. It was cancelled in 1990.

GEOLOGICAL SETTING:

The mineralization occurs near or at the contact between quartzofeldspathic gneisses and gabbro (Fig. 19-1; Froese and Goetz, 1981). All DDH intersected 'pseudo-diorite' ± garnet. Most holes intersected calcareous hornblende-biotite gneiss, sheared feldspathic quartzite and siliceous biotite gneiss ± garnet. Chlorite was observed locally within the drill core from DDH 2 and 3.

MINERALIZATION:

DDH 4, 5 and 6 intersected garnetiferous pseudo-diorite 'mineralized' with pyrite, pyrrhotite and chalcopyrite over core lengths of 4 m, 4.5 m and 5.5 m. All DDH intersected minor amounts of disseminated pyrite, pyrrhotite and chalcopyrite within calcareous hornblende - biotite gneiss or pseudo-diorite. DDH 6 intersected disseminated pyrite, pyrrhotite and chalcopyrite mineralization within siliceous biotite gneiss.

GEOCHEMICAL DATA:

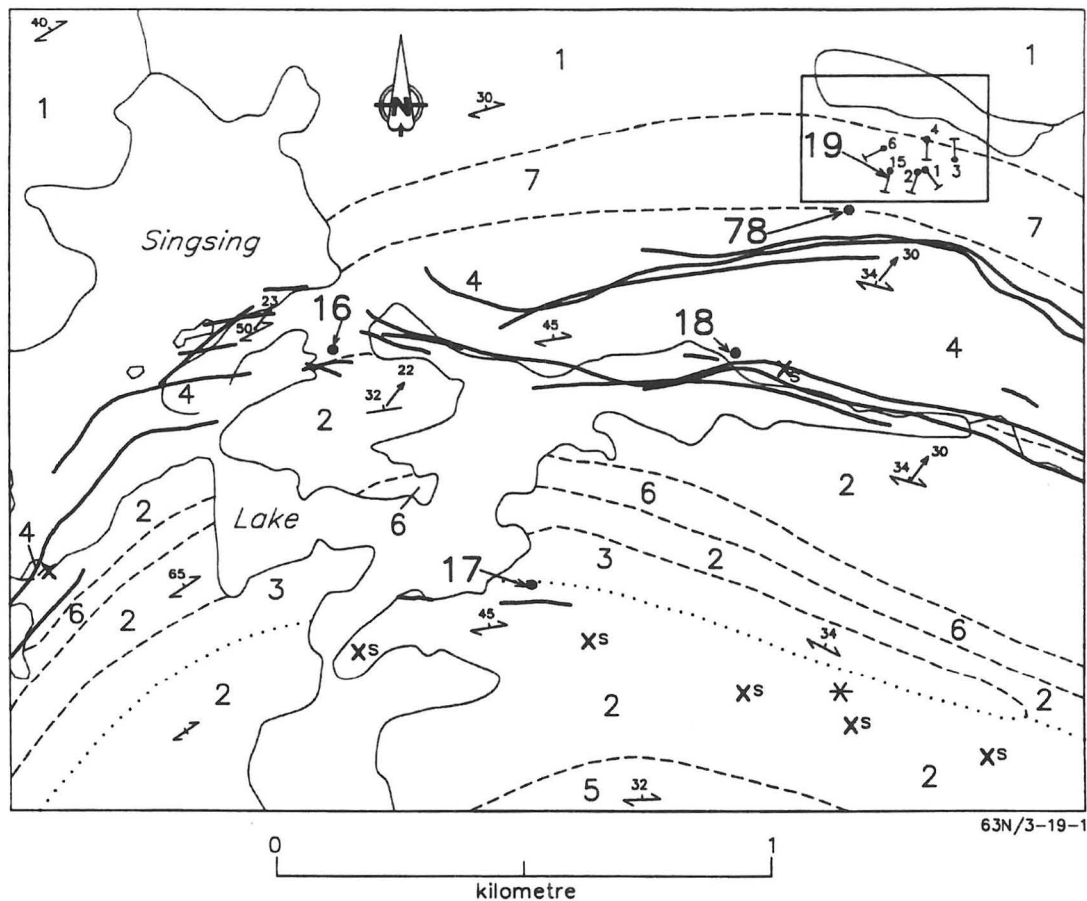
None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

- Assessment File 90668, 90675, 90676, 91616, 91695.
Manitoba Energy and Mines, Minerals Division.
Bateman, J.D. and Harrison, J.M.
1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.
Kaszycki, C.A.
1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118.
Schledewitz, D.C.P.
1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.



Intrusive Rocks

7 Gabbro

Sherridon Group

6 Massive amphibolite; probably metamorphosed mafic volcanic flows

5 Layered amphibolite with fragments; probably metamorphosed volcanoclastic rock

4 Calc-silicate rocks

3 Pelitic schist

2 Quartz-rich gneiss

Nokomis Group

1 Quartzofeldspathic gneiss

----- Geological boundary (approximate)

$\nearrow \nwarrow$ Foliation (inclined, vertical)

\rightarrow^{22} Lineation, mineral

..... Ore-bearing horizon

* Cordierite-anthophyllite rocks

X^s Mineral occurrence; sulphide

Geology by Froese and Goetz (1981).

———— EM conductor (A.F. 90675, 98825)

└─ Drillhole (A.F. 98825)

19. Occurrence location

□ Area encompassed by Mineral Deposit File

Figure 19-1: General geology, geophysical conductors and diamond-drill hole locations at occurrence 19

LOCATION: 20

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

UTM: 6117433N/370679E

AREA: East of Park Lake.

AIRPHOTO: A26369-173

ACCESS: Bush aircraft to Park Lake, traverse.

EXPLORATION SUMMARY:

The area was first staked as Bruce 1, Bruce 4, Elf, Pansy, BlackBird 1, BlueBird, Columbia 2, and Ozark 2 (Mining claim map, 63N/3NE, circa 1930). Ken 20, Ken 22, Ken 23, Ken 28 to 30, and Ken 37 were staked by A. Flett, Norma W. Brown, J. Hone, J.K. Whatmough in 1937, and transferred to E.L. Brown in 1938. Leases M-1332, M-1334, M-1335, M-1340 to M-1342, and M-1349 were assigned to Sherritt Gordon Mines Limited in 1943. The leases lapsed in 1951. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). The ground was held as Chal 17 to Chal 20 by G. Rapson and M. Rapson in 1954-1957. HBED staked Par 244 to Par 249 in 1958, and drilled DDH P7 (46 m), DDH P9 (88.4 m) and DDH P11 (no log) in 1959 (A.F. 98825). The claims lapsed in 1966. J. Michelle staked Mat 4 to Mat 6, Mat 8 and Mat 9 in 1966. R. de Denus staked Roly 2 in 1967. Kimberly Copper Mines Limited acquired the claims and carried out magnetic and EM-16 surveys in 1967-1968 and drilled DDH 8 (67.9 m) on Mat 5 and DDH 9 (64.9 m) on Mat 4 in 1969 (A.F. 90674; A.F. 90663; DDH 8, 9, A.F. 91027). Kimberly Copper acquired Alla 2 in 1969. The claims lapsed in 1969-1971. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). In 1980 Shell Canada Resources Limited produced a 1:125 000 scale compilation map of the geology and mineral occurrences within 63N/2 and parts of 63N/3 and 63N/1 (A.F. 92513). HBED held CB 10530 in 1979-1983 and CB 10529 in 1979-1984. The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km². In 1992 L. Racic restaked the area as Rub 7.

GEOLOGICAL SETTING:

The drillholes are collared at or near the contact between Sherridon Suite (former Sherridon Group) biotite- or hornblende-bearing quartz-rich quartzofeldspathic gneiss and calc-silicate gneiss at or near the contact between granitoid gneisses and the calc-silicate gneiss (Fig. 20-1; Froese and Goetz, 1981). The drillholes intersected a sequence of quartz - hornblende ± chlorite gneiss and quartz - feldspar - biotite ± hornblende ± garnet gneiss. Calcite filled fractures were noted locally in the drill core. Pyroxenite was intersected in DDH 8. Quartzite was intersected in DDH P9. DDH P7 intersected hornblende - plagioclase ± garnet gneiss, gneissic quartz-feldspar porphyry and quartz - feldspar - biotite gneiss.

MINERALIZATION:

The drillholes intersected graphite - pyrite/pyrrhotite layers that range in core length from 2 - 6.5 m. A 4.5 m section

that contains up to 80% pyrite and minor amounts of graphite, and a 2.5 m section that contains near solid graphite with minor amounts of pyrite were intersected in DDH 8. Near solid graphite with minor amounts of pyrite was intersected over approximately 5 m in DDH 9. DDH P 9 intersected 5.8 m of near solid to solid pyrrhotite mineralization with minor amounts of pyrite and rare grains of chalcopyrite, and an approximately 6.5 m long section composed of 2.5 m of solid pyrrhotite ± pyrite and 4 m of solid graphite. Both intersections were interpreted by the core logger to delineate mineralized shear zones. Two pyrrhotite-pyrite occurrences, shown near this location (Fig. 20-1) are taken from a geological compilation map (1:125 000) produced by Shell Canada Resources Limited in 1980 (Fig. 20-1; A.F. 92513).

GEOCHEMICAL DATA:

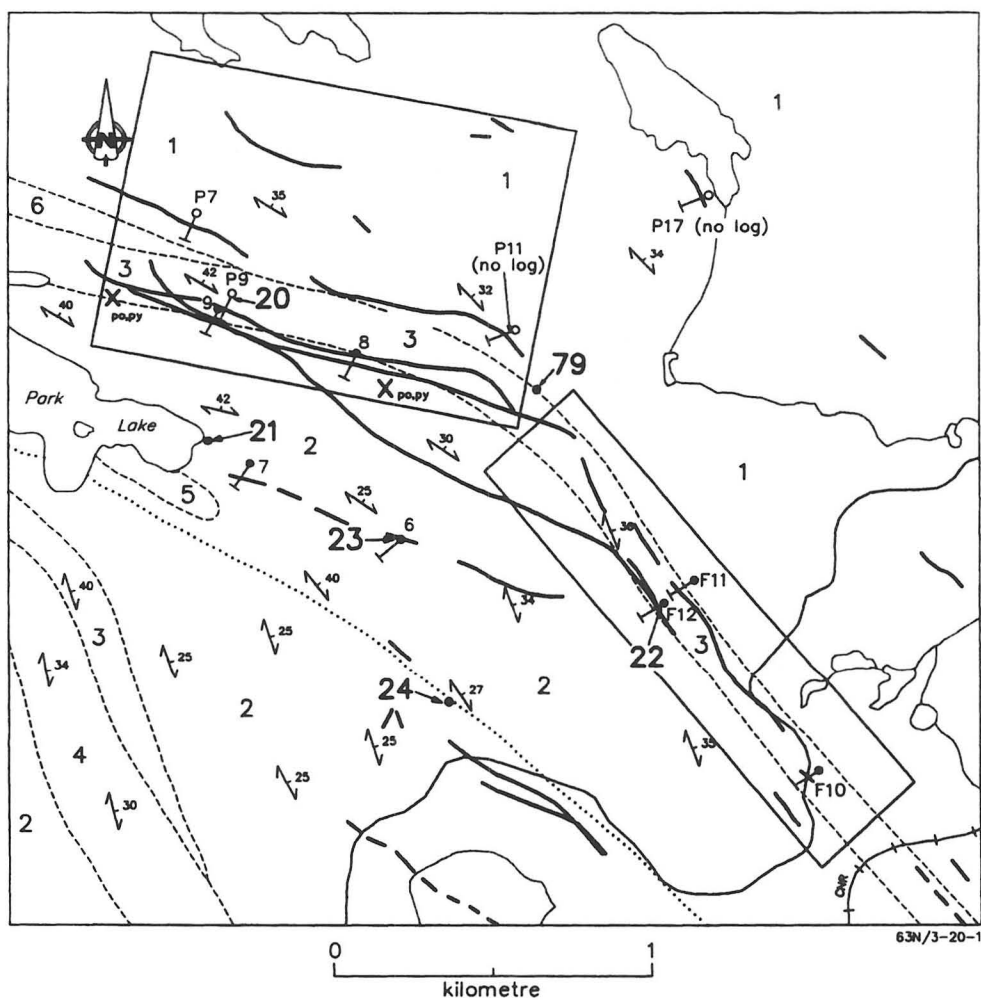
None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. The mineralization is interpreted to be a graphitic sulphide facies iron formation (*cf.* Locations 7, 18, and 34). Although only graphite may be recorded in the drill log, the majority of this type of occurrence has been found to contain more Fe sulphide than carbon (Gale *et al.*, 1980). The 5.8 m intersection of near solid to solid pyrrhotite with accessory pyrite and rare chalcopyrite is interpreted as a non-graphitic sulphide facies iron formation.

REFERENCES:

- Assessment File 90663, 90674, 91027, 91616, 91695, 92513, 98825
Manitoba Energy and Mines, Minerals Division.
Bateman, J.D. and Harrison, J.M.
1945: Sherridon, Manitoba; Geological Survey of Canada, Paper 45-15, Preliminary map with descriptive notes, 1:31 680.
Bateman, J.D. and Harrison, J.M.
1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.
Froese, E. and Goetz, P.A.
1981: Geology of the Sherridon group in the vicinity of Sherridon, Manitoba; Geological Survey of Canada, Paper 80-21; 20p.
Harrison, J.M.
1949: Kississing, Saskatchewan-Manitoba; Geological Survey of Canada, Map 970A with descriptive notes, 1:253 440.
Kaszycki, C.A.
1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118.
Schledewitz, D.C.P.
1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.



Intrusive Rocks

- 6 Gabbro
- 5 Massive amphibolite; probably metamorphosed mafic volcanic flows

Sherridon Group

- 4 Layered amphibolite with fragments; probably metamorphosed volcanoclastic rock
- 3 Calc-silicate rocks
- 2 Quartz-rich gneiss

Nokomis Group

- 1 Granitoid gneiss

----- Geological boundary (approximate)

\nearrow_{34} Foliation (inclined)

..... Ore-bearing horizon

X_{po,py} Mineral occurrence

———— EM conductors (A.F. 98825, 90674)

Geology by Froese and Goetz (1981).

Drillholes

—•— (A.F. 90663)

—○— (A.F. 98825)

———— Winter road

20. Occurrence location

□ Area encompassed by Mineral Deposit File

Figure 20-1: General geology, geophysical conductors and diamond-drill hole locations at occurrences 20, 21, 22, 23 and 24

LOCATION: 21**NAME:**

UTM: 6117043N/370218E

AREA: East of Park Lake.

AIRPHOTO: A26369-173

ACCESS: Bush aircraft to Park Lake, traverse.

EXPLORATION SUMMARY:

The area was first staked as Flynn 4 and Blackbird 1 (Mining claim map, 63N/3NE, *circa* 1930). Norma W. Brown and J. Hone staked Ken 23 and Ken 28 in 1937, and transferred the claims to E.L. Brown in 1938. Leases M-1335 and M-1340 were assigned to Sherritt Gordon Mines Limited in 1943. The leases lapsed in 1951. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). The ground was held as Chal 14 and Chal 15 by G. Rapson in 1954-1957 and as Par 250 by HBED in 1958-1964. J. Michelle staked Mat 7 in 1966. Kimberly Copper Mines Limited acquired the claim in 1967 and carried out magnetic and EM-16 surveys in 1967-1968 and drilled DDH 7 (91.7 m) in 1969 (A.F. 90674; DDH 7, A.F. 90663). Mat 7 lapsed in 1971. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). In 1980 Shell Canada Resources Limited produced a 1:125 000 scale compilation map of the geology and mineral occurrences within 63N/2 and parts of 63N/3 and 63N/1 (A.F. 92513). HBED held CB 10529 in 1979-1984. The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km². In 1992 L. Racic restaked the area as Rub 7.

GEOLOGICAL SETTING:

The area is underlain by biotite- or hornblende-bearing quartz-rich quartzofeldspathic gneiss (Fig. 20-1; Froese and

Goetz, 1981). The drillhole intersected a sequence of quartz - hornblende ± biotite ± garnet gneiss, quartz - feldspar ± biotite ± hornblende gneiss and quartzite.

MINERALIZATION:

A pyrrhotite-pyrite-chalcopyrite-sphalerite occurrence is shown at or near the shore of Park Lake on the geological compilation map (1:125 000) produced by Shell Canada Resources Limited in 1980 (A.F. 92513). Mineralization was not recorded in the drill log.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment File 90663, 90674, 91616, 91695, 92513
Manitoba Energy and Mines, Minerals Division.

Bateman, J.D. and Harrison, J.M.

1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.

Froese, E. and Goetz, P.A.

1981: Geology of the Sherridon group in the vicinity of Sherridon, Manitoba; Geological Survey of Canada, Paper 80-21; 20p.

Kaszycki, C.A.

1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118.

Schledewitz, D.C.P.

1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

LOCATION: 22

NAME: (A.F. Mineralization intersected by diamond drilling)
UTM: 6116539N/371649E
AREA: Southeast of Park Lake.
AIRPHOTO: A26369-200
ACCESS: Bush aircraft to Narrows or Park Lake, traverse.

EXPLORATION SUMMARY:

The area was first staked as B.C. Copper 2, Columbia 3, Dimond 7, and Dimond 8 (Mining claim map, 63N/3NE, *circa* 1930). Elb 44 to Elb 46 were staked by Iris Love and Violet MacKay in 1938, and transferred to E.L. Brown in 1939. Leases M-1418 to M-1420 were issued in 1943, and cancelled in 1951. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). HBED staked Fin 514, Fin 578 and Fin 579 in 1957. In 1958 HBED did an HLEM survey and drilled DDH F10 (42.4 m) on Fin 578, and DDH F11 (35.7 m) and DDH F12 (41.1 m) on Fin 514 (A.F. 91598). The claims lapsed in 1963. Dan 5, Dan 7, Dan 9 and Dan 10 were staked by E. Caribou in 1966, and transferred to C.C. Rollins in 1967. Kimberly Copper Mines Limited acquired the claims in 1967 and carried out magnetic and EM-16 surveys in 1967-1968 (A.F. 90674, A.F. 90663). The claims lapsed in 1971. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). HBED held the ground as CB 10531 in 1979-1984. The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km². In 1991 L. Racic staked Erik 3 over the property.

GEOLOGICAL SETTING:

The DDH were collared in an area underlain by granitoid gneiss (tonalite, granodiorite or granite orthogneiss) adjacent to Sherridon Suite (former Sherridon Group) calc-silicate gneiss (Fig. 20-1; Froese and Goetz, 1981). The

drillholes intersected a sequence of quartz - hornblende ± garnet ± biotite, quartz - biotite gneiss and quartz - feldspar ± hornblende ± biotite ± garnet gneiss. Hornblende ± biotite gneiss was intersected in DDH F12. Chlorite was noted in the drill logs from all holes.

MINERALIZATION:

A 1.5 m long section within an 'altered zone' that contains 'considerable' pyrite, quartz, biotite, chlorite and carbonate was documented in the drill core from DDH F12. Minor amounts of disseminated graphite and/or pyrite occur locally in the drill core from DDH F10 and F11.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

- Assessment File 90663, 90674, 91598, 91616, 91695, 92513
Manitoba Energy and Mines, Minerals Division.
- Bateman, J.D. and Harrison, J.M.
1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.
- Froese, E. and Goetz, P.A.
1981: Geology of the Sherridon group in the vicinity of Sherridon, Manitoba; Geological Survey of Canada, Paper 80-21; 20p.
- Kaszycki, C.A.
1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118.
- Schledewitz, D.C.P.
1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

LOCATION: 23

NAME: (A.F. Mineralization intersected by diamond drilling)
 UTM: 6116754N/372083E
 AREA: Southeast of Park Lake and east of Narrows Lake.
 AIRPHOTO: A26369-174
 ACCESS: Bush aircraft to Narrows or Park Lake, traverse.

EXPLORATION SUMMARY:

The area was first staked as Flynn 8 (Mining claim map, 63N/3NE, *circa* 1930). Rene E. Brown staked Ken 26 and Ken 27 in 1937, and transferred the claims to E.L. Brown in 1938. Leases M-1338 and M-1339 were assigned to Sherritt Gordon Mines Limited in 1943. The leases lapsed in 1951. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). The ground was held as Chal 2 by G. Rapson in 1954-1957 and as Par 283 and Par 284 by HBED in 1958-1959. J. Michelle staked Mat 10 in 1966. Kimberly Copper Mines Limited acquired the claim in 1967 and carried out magnetic and EM-16 surveys in 1967-1968 and drilled DDH 6 (85.3 m) in 1969 (A.F. 90663, A.F. 90674; DDH 6, A.F. 91027). Mat 10 lapsed in 1971. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). HBED held CB 10528 in 1979-1983. The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km². In 1991 L. Racic restaked the area as Erik 2.

GEOLOGICAL SETTING:

The area is underlain by biotite- or hornblende-bearing quartz-rich quartzofeldspathic gneiss (Fig. 20-1; Froese and Goetz, 1981). The drillhole intersected quartz - hornblende ± biotite ± garnet gneiss, quartz - biotite ± garnet gneiss and quartz - feldspar - chlorite rock. Sillimanite was observed locally in the drill core.

MINERALIZATION:

Minor amounts of disseminated Fe-sulphides were documented over approximately 48 m of core that terminate, down hole, in a 3 m long intersection that contains near solid Fe-sulphide layers. An increase in sulphide content, from approximately 5% to 70%, and decrease in feldspar content (Na, Ca depletion?) was documented over the last 7 m of drill core in this mineralized section.

Sillimanite, garnet and siliceous (silicified?) sections were also documented within this intersection. Sulphide mineralization is virtually absent down hole from the solid sulphide layers except for the rare grain of pyrite or pyrrhotite observed in a quartz - feldspar - biotite gneiss. Graphite was not documented in the drill log.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Stratabound massive sulphide type deposit; sedimentary rock associated. The presence of disseminated sulphides, garnet, chlorite, sillimanite and siliceous (silicified?) sections, and lack of feldspar up hole from nongraphitic near solid sulphide is suggestive of alteration that is commonly associated with massive sulphide type deposits. The mineralization is also proximal to the position of an 'ore-bearing horizon' suggested by Froese and Goetz (1981) that includes the Bob Lake (Location 2), Cold Lake (Location 4) and Fidelity (Location 5) massive sulphide type deposits, and the mineralization at the Cu-sulphide property in 63N/3 (Ostry and Trembath, 1992).

REFERENCES:

- Assessment File 90663, 90674, 91027, 91616, 91695
 Manitoba Energy and Mines, Minerals Division.
 Bateman, J.D. and Harrison, J.M.
 1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.
 Froese, E. and Goetz, P.A.
 1981: Geology of the Sherridon group in the vicinity of Sherridon, Manitoba; Geological Survey of Canada, Paper 80-21; 20p.
 Kaszycki, C.A.
 1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118.
 Ostry, G. and Trembath, G.D.
 1992: Mineral Deposits and occurrences in the Batty Lake area, NTS 63N/2; Mineral Deposit Series Report No. 19, Manitoba Energy and Mines, 264p.
 Schledewitz, D.C.P.
 1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

LOCATION: 24**NAME:**

UTM: 6116207N/370965E

AREA: Southeast of Park Lake.

AIRPHOTO: A26369-200

ACCESS: Bush aircraft to Narrows Lake or Park Lake, traverse.

EXPLORATION SUMMARY:

The area was first staked as Lynn (Mining claim map, 63N/3NE, *circa* 1930). In 1938 Ken 32 was staked by Mrs. Irene W. Carr and transferred to E.L. Brown. In 1943 E.L. Brown acquired 21 year lease M-1344 and transferred it to Sherritt Gordon Mines Limited. The lease was cancelled in 1951. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). G. Rapson staked Chal 1 and Chal 16 in 1954. The claims lapsed in 1957. HBED held the ground as Par 284 and Par 286 from 1958 to 1959. John Michelle staked Mat 11 and Mat 14 in 1966. Kimberly Copper Mines Limited acquired the claims in 1967 and carried out magnetometer (Sharpe MF1 fluxgate) and EM-16 surveys in 1967-1968 (A.F. 90674, A.F. 90663). The claims lapsed in 1971. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). HBED staked CB 10528 in 1979. A sulphide showing is indicated at this location on a geology map (1:20 000) by Froese and Goetz (1981). CB 10528 was cancelled in 1983. The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km². In 1991 L. Racic staked Erik 2 over the property.

GEOLOGICAL SETTING:

The area is underlain by biotite- or hornblende-bearing quartz-rich quartzofeldspathic gneiss (Froese and Goetz, 1981).

MINERALIZATION:

An occurrence of sulphide is documented at this location (Froese and Goetz, 1981).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified. This sulphide occurrence is coincident with the position of an 'ore-bearing horizon' (Fig. 20-1), suggested by Froese and Goetz (1981), that includes the Sherridon (Location 1) and Park Lake (Location 3) massive sulphide type deposits, and the Jungle Lake massive sulphide type deposit (Ostry and Trembath, 1992) immediately to the east in NTS 63N/2. The mineralization may be at the periphery of the massive sulphide type mineralization and alteration system interpreted at Location 23.

REFERENCES:

Assessment File 90663, 90674, 91616, 91695
Manitoba Energy and Mines, Minerals Division.

Bateman, J.D. and Harrison, J.M.

1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.

Froese, E. and Goetz, P.A.

1981: Geology of the Sherridon group in the vicinity of Sherridon, Manitoba; Geological Survey of Canada, Paper 80-21; 20p.

Kaszycki, C.A.

1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118.

Ostry G. and Trembath, G. D.

1992: Mineral Deposits and Occurrences in the Batty Lake Area, NTS 63N/2; Manitoba Energy and Mines, Mineral Deposit Series, Report No. 19; 276p.

Schledewitz, D.C.P.

1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

LOCATION: 25

NAME: (A.F. Mineralization intersected by diamond drilling)
 UTM: 6115590N/369697E
 AREA: South of Narrows Lake.
 AIRPHOTO: A26369-174
 ACCESS: Bush aircraft to Narrows Lake, traverse.

EXPLORATION SUMMARY:

The area was first staked as Cananac 15 and Cananac 16 (Mining claim map, 63N/3NE, *circa* 1930). The Cananac group was staked for P. Hopkins in 1927 and was sold to Manitoba Basin Mining Co., Limited in 1928 (Wright, 1929). Prospecting was done on the property in 1928 (Corporation File, Manitoba Basin Mining Co., Limited). D.C. Barr staked Crescent 5 Fr. in 1939. A. McVeigh staked Spud 1 Fr. in 1941 and assigned it to E.L. Brown in 1942. In 1948 Sherritt Gordon Mines Limited acquired lease M-1875 for Spud 1 Fr. and optioned Crescent 5 Fr. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). Crescent 5 Fr. was leased under M-2612 from 1949 to 1960. W. Shmon held Bar 4 in 1961-1965 and Bar 2 and Bar 3 in 1965. In 1965-1966 Fidelity Mining Investments Limited did magnetic and EM surveys and drilled DDH 1 (137.8 m) on Bar 3 and DDH 2 (124 m) on Bar 2 (A.F. 93118; DDH 1, 2, A.F. 92007). Fidelity Mining acquired the Bar claims in 1969. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). Bar 2 lapsed in 1973. M-1875 became part of ten year explored area lease EAL 15A in 1975. Bar 3 lapsed in 1976. HBED held CB 10528 in 1979-1983 and CB 10521 in 1979-1984. The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km². L. Racic staked Erik 2 in 1991 and Rub 9 in 1992. The ground is also partly covered by EAL 15A that was assigned to Hayes Resources Inc. and then to LynnGold Resources Inc. in 1988.

GEOLOGICAL SETTING:

The area is underlain by biotite- or hornblende-bearing quartz-rich quartzofeldspathic gneiss of the Sherridon Suite (former Sherridon Group) (Fig. 25-1; Froese and Goetz, 1981). The DDH intersected interlayered quartz - feldspar - biotite ± garnet gneiss and quartzite (A.F. 92007). A mineralized quartzite layer, intersected in both holes, is underlain by mafic biotite - garnet gneiss. A green vitreous mineral (diopside?) was documented locally within the quartzite layers.

MINERALIZATION:

DDH 1 intersected a quartzite layer that contains approximately 30% pyrite and 40% graphite over approximately 4 m. Up to 30% pyrite and 30% graphite within quartzite was documented over approximately 9 m in DDH 2. Down hole, an approximately 20 cm section within a biotite- and garnet-bearing quartzite contains 40% pyrite. Minor amounts of disseminated Fe-sulphide were documented locally, elsewhere in the core.

GEOCHEMICAL DATA:

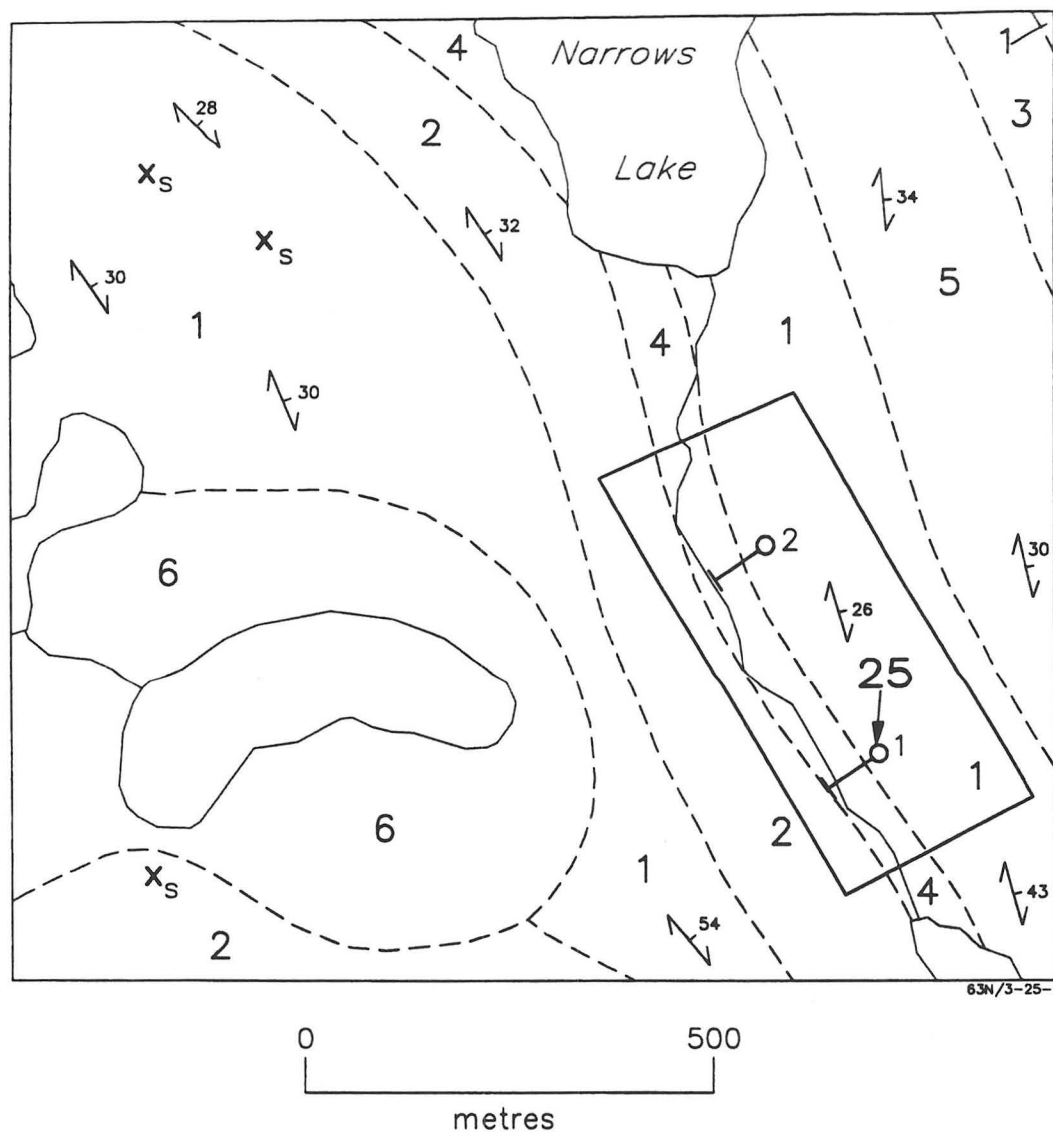
Both mineralized quartzite layers were sampled for Cu and Zn assay, but results of the assays were not reported.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. The mineralization is interpreted to be a graphitic sulphide facies iron formation.

REFERENCES:

- Assessment File 91616, 91695, 92007, 93118
 Manitoba Energy and Mines, Minerals Division.
- Bateman, J.D.
 1944: Sherritt Gordon Mine area, Manitoba; Geological Survey of Canada, Paper 44-4, Preliminary map with descriptive notes, 1:12 000.
- Bateman, J.D. and Harrison, J.M.
 1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.
 Corporation File, Manitoba Basin Mining Co., Limited
 Manitoba Energy and Mines, Minerals Division.
- Froese, E. and Goetz, P.A.
 1981: Geology of the Sherridon group in the vicinity of Sherridon, Manitoba; Geological Survey of Canada, Paper 80-21; 20p.
- Kaszycki, C.A.
 1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118.
- Schledewitz, D.C.P.
 1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.
- Wright, J.F.
 1929: Kississing Lake, Manitoba; Geological Survey of Canada, Summary Report 1928, Part B, p. 101.



Intrusive Rocks

6 Gabbro

Sherridon Group

5 Layered amphibolite with fragments;
probably metamorphosed volcanoclastic
rocks

4 Impure marble and calc-silicate rocks

3 Calc-silicate rocks

2 Biotite-garnet schist

1 Quartz-rich gneisses

--- Geological boundary

↘₃₀ Foliation (inclined)

x_s Mineral occurrence; sulphide

Geology after Froese and Goetz (1981).

○ Drillhole (A.F. 92007)

25 Occurrence location

□ Area encompassed by
Mineral Deposit File

Figure 25-1: General geology and diamond-drill hole locations at occurrence 25

LOCATION: 26

NAME: (A.F. Mineralization intersected by diamond drilling)
UTM: 6116619N/366816E
AREA: North end of Duke Lake.
AIRPHOTO: A26387-161
ACCESS: Bush aircraft to Singing Lake, traverse.

EXPLORATION SUMMARY:

The area was first staked as Avery 2 (Mining claim map, 63N/3NE, circa 1930). In 1938 W.A. Brown staked Elb 5 and transferred it to E.L. Brown. Lease M-1391 was issued in 1943 and was transferred to Sherritt Gordon Mines Limited in 1944. The lease was cancelled in 1951. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). The ground was held as Big Cambrian 6 by W. Shmon in 1955-1956 and as Par 276 by HBED in 1958-1959. In 1965 Bar 38 was staked by R. Chaboyer and transferred to W. Shmon. Fidelity Mining Investments Limited did magnetic and EM surveys and drilled DDH 58 (182.9 m) in 1965-1966 (A.F. 93118; DDH 58, A.F. 92007). The property was transferred to Fidelity Mining Investments Limited in 1969. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). Bar 38 lapsed in 1973. HBED held CB 10517 in 1979-1985. The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km². Louis Racic staked Rub 10 in 1992.

GEOLOGICAL SETTING:

The area is underlain by biotite - garnet schist of the Sherridon Suite (former Sherridon Group) (Fig. 26-1; Froese and Goetz, 1981). DDH 58 intersected quartz - feldspar - biotite gneiss ± garnet, quartz - biotite - hornblende gneiss and two graphite and sulphide layers.

MINERALIZATION:

The two 'graphite and sulphide zones' were intersected over core lengths of approximately 30 m and 54 m and contain minor to 'very high' amounts of graphite and pyrite. The 54 m long intersection is described as dirty grey in colour

(earthy pyrite?) and locally contains chlorite and magnetite. Portions of the other mineralized intersection are described as cherty in appearance. Froese and Goetz (1981) documented a sulphide occurrence near the north shore of an unnamed lake north of the diamond-drill hole location (Fig. 26-1).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. The mineralization is interpreted to be a graphitic sulphide facies iron formation (cf. Locations 27, 28 29 and 30). Although only graphite may be recorded in the drill log, the majority of this type of occurrence has been found to contain more Fe sulphide than carbon (Gale *et al.*, 1980).

REFERENCES:

- Assessment File 91616, 91695, 92007, 93118
Manitoba Energy and Mines, Minerals Division.
- Bateman, J.D. and Harrison, J.M.
1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.
- Froese, E. and Goetz, P.A.
1981: Geology of the Sherridon Group in the vicinity of Sherridon, Manitoba; Geological Survey of Canada, Paper 80-21, 20p.
- Gale, G.H., Baldwin, D.A. and Koo J.
1980: A geological evaluation of Precambrian massive sulphide deposit potential in Manitoba; Manitoba Energy and Mines, Economic Geology Report ER79-1, 137p.
- Kaszycki, C.A.
1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118.
- Schledewitz, D.C.P.
1988: Kissinging Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

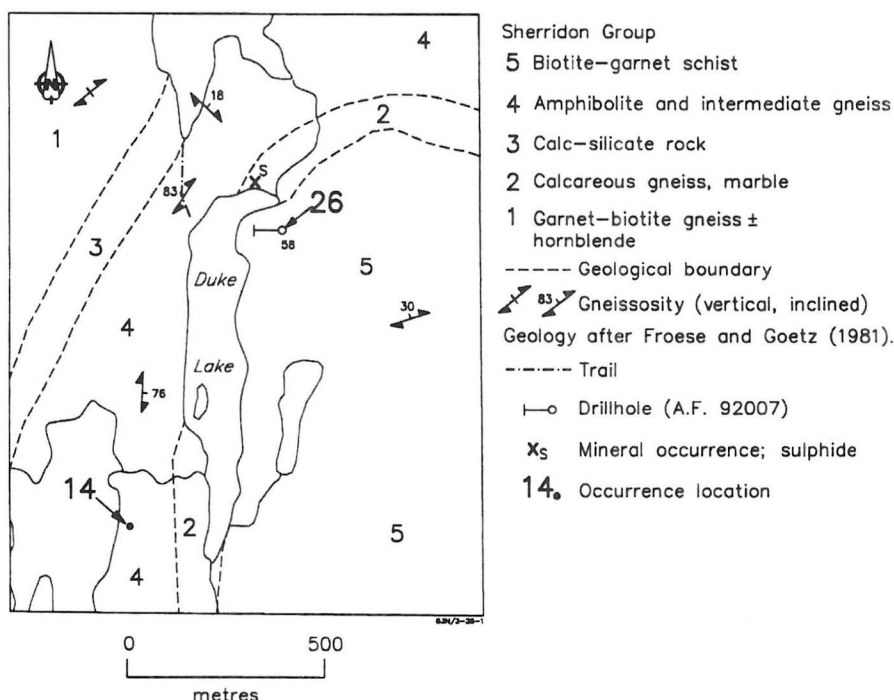
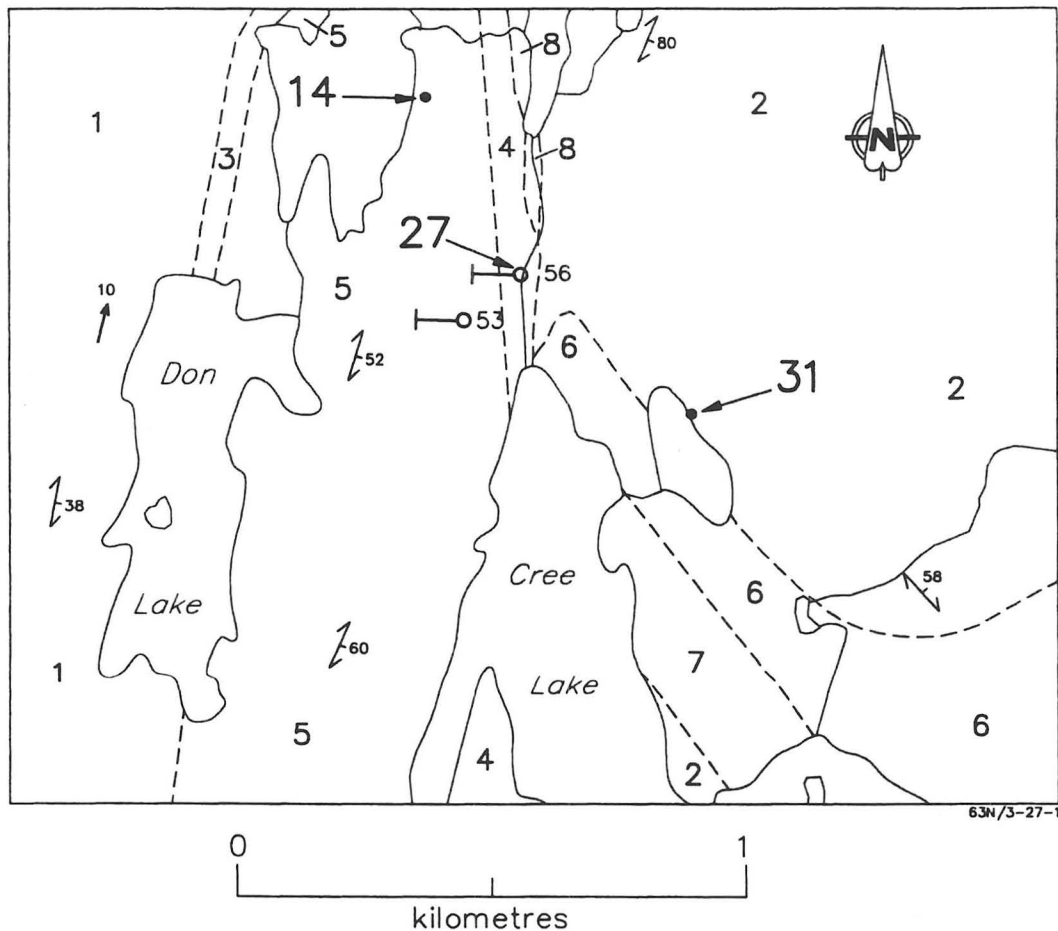


Figure 26-1: General geology and diamond-drill hole location at occurrence 26



Intrusive Rocks


- 8 Granodiorite
- 7 Pyroxenite
- 6 Gabbro

Sherridon Group

- 5 Layered amphibolite with fragments; probably metamorphosed volcanoclastic rock
- 4 Impure marble and calc-silicate rocks
- 3 Calc-silicate rocks
- 2 Biotite-garnet schist
- 1 Quartz-rich gneisses

----- Geological boundary

 Foliation (inclined)

 Lineation, mineral

Geology by Froese and Goetz (1981).

 Drillhole (A.F. 92007)

27 Occurrence location

Figure 27-1: General geology and diamond-drill hole locations at occurrences 14, 27 and 31

LOCATION: 27

NAME: (A.F. Mineralization intersected by diamond drilling)
 UTM: 6115516N/366632E
 AREA: North of Cree Lake and east of Don/Premier Lake.
 AIRPHOTO: A26387-160
 ACCESS: Bush aircraft to Cree Lake, traverse.

EXPLORATION SUMMARY:

M. Joyce staked Dave in 1927. The claim was assigned to Atlas Exploration Company Limited, and then to Sherritt Gordon Mines Limited in 1929. Lease M-46 was issued in 1931, and cancelled in 1951. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). The ground was held as Mink 4 by O. Lax in 1954-1955 and as Par 312, Par 313 and Par 322 by HBED in 1958-1959. In 1965 W. Shmon acquired Bar 35 from R. Chaboyer. In 1965-1966 Fidelity Mining Investments Limited carried out magnetic and EM surveys and drilled DDH 53 (91.4 m) and DDH 56 (150.3 m) on Bar 35 (A.F. 93118; DDH 53, DDH 56, A.F. 92007). Claim maps indicate that the drilling was actually done west of Bar 35, partly on Nich 18. Valray Explorations Limited did magnetic and EM surveys in 1966 (A.F. 92055, A.F. 90675). E.J. Tycoles staked Nich 18 in 1968 and assigned it to W. Shmon in 1970. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). Bar 35 and Nich 18 lapsed in 1973. The ground was held by W. Shmon as Nich 18 in 1974-1978, and by HBED as CB 10510 in 1979-1984 and CB 10517 in 1979-1985. In 1980 Shell Canada Resources Limited produced a 1:125 000 scale compilation map of the geology and mineral occurrences within 63N/2 and parts of 63N/3 and 63N/1 (A.F. 92513). The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km². The area was restaked as Rub 10 by L. Racic in 1992.

GEOLOGICAL SETTING:

The area is underlain by Sherridon Suite (former Sherridon Group) calc-silicate gneiss and impure marble (Fig. 27-1; Froese and Goetz, 1981). DDH 56 intersected a layered sequence of quartz - feldspar - hornblende ± garnet gneiss, quartz - feldspar gneiss and quartz - feldspar - biotite gneiss. DDH 53 intersected quartz - hornblende ± garnet gneiss and garnet - quartz - hornblende gneiss. Garnets can

constitute up to 50% of this rock type. Locally, carbonate is an important constituent of the drill core from both DDH.

MINERALIZATION:

A 3-4 m long intersection within a 'mixed' quartz - feldspar ± biotite gneiss and quartz - hornblende gneiss unit in DDH 56 contained up to 10% graphite, 10% pyrite and 30% pyrrhotite. Minor amounts of disseminated pyrite and/or pyrrhotite were documented elsewhere in the core. Mineralization was not intersected in DDH 53. A pyrite occurrence is shown at this location on the geological compilation map (1:125 000) produced by Shell Canada Resources Limited in 1980 (A.F. 92513).

GEOCHEMICAL DATA:

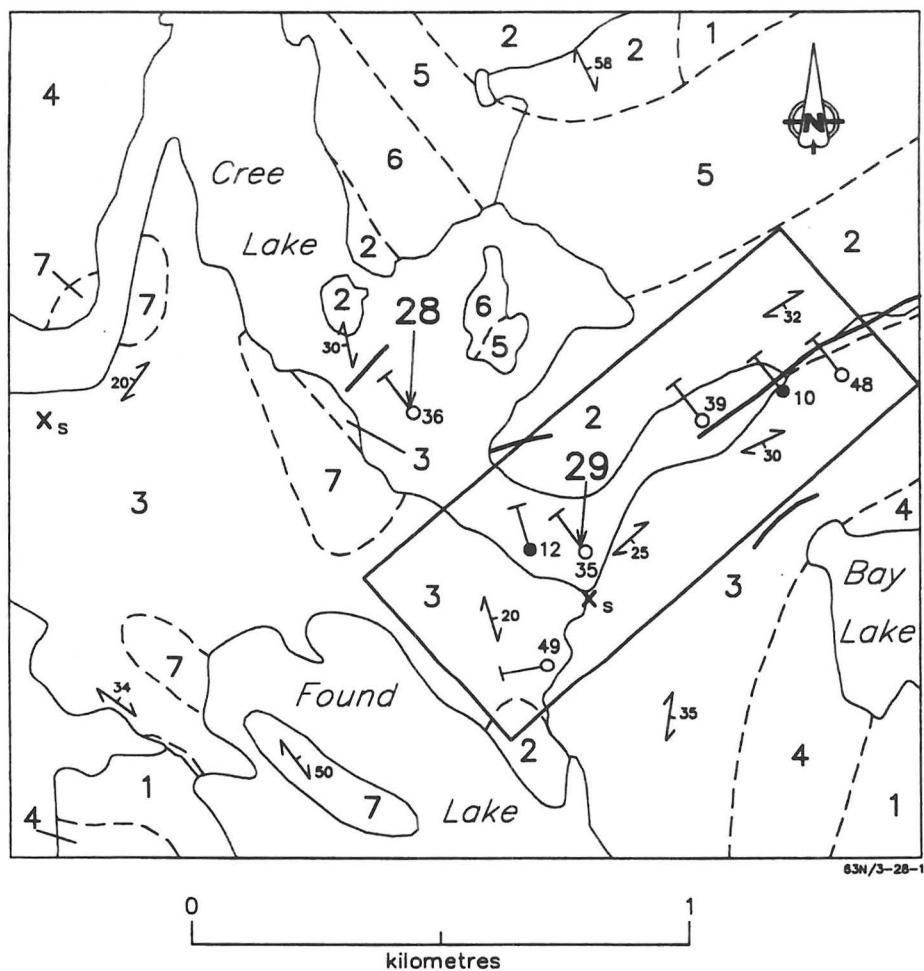
None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. The mineralization is interpreted to be a graphitic sulphide facies iron formation (*cf.* Locations 26, 28, 29 and 30).

REFERENCES:

- Assessment File 90675, 91616, 91695, 92007, 92055, 93118, 92513
 Manitoba Energy and Mines, Minerals Division.
 Bateman, J.D.
 1944: Sherritt Gordon Mine area, Manitoba; Geological Survey of Canada, Paper 44-4, Preliminary map with descriptive notes, 1:12 000.
 Bateman, J.D. and Harrison, J.M.
 1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.
 Froese, E. and Goetz, P.A.
 1981: Geology of the Sherridon group in the vicinity of Sherridon, Manitoba; Geological Survey of Canada, Paper 80-21; 20p.
 Kaszycki, C.A.
 1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118.
 Schledewitz, D.C.P.
 1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.



Intrusive Rocks

- 7 Granodiorite
- 6 Pyroxenite
- 5 Gabbro

Sherridon Group

- 4 Layered amphibolite with fragments; probably metamorphosed volcanoclastic rock
- 3 Impure marble and calc-silicate rocks
- 2 Biotite-garnet schist
- 1 Quartz-rich gneisses

----- Geological boundary

 Foliation (inclined)

X_s Mineral occurrence; sulphide

— EM conductor (A.F. 93118)

Geology by Froese and Goetz (1981).

Drillholes

 (A.F. 92007)

 (A.F. 90669)

 Area encompassed by Mineral Deposit File

Figure 28-1: General geology, geophysical conductors and diamond-drill hole locations at occurrences 28 and 29

LOCATION: 28

NAME: (A.F. Mineralization intersected by diamond drilling)
UTM: 6114166N/367012E
AREA: East Cree Lake.
AIRPHOTO: A26387-159
ACCESS: Bush aircraft to Cree Lake.

EXPLORATION SUMMARY:

D.C. Barr held Bonanza 4 and Bonanza 5 in 1928, and Bonanza 11 Fr. in 1940. Leases M-1122 and M-1206 were issued in 1939 and 1942 for Bonanza 5 and Bonanza 4, respectively. Sherritt Gordon Mines Limited took a 3-year option on the property in 1948. Bonanza 11 Fr. was leased as M-2622 in 1949. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). The leases lapsed in 1960. W. Shmon held Bar 13 and Bar 15 in 1961-1965 and acquired Bar 29 and Bar 33 from R. Chaboyer in 1965. In 1965-1966 Fidelity Mining Investments Limited carried out magnetic and EM surveys on the Bar claims and drilled DDH 36 (126.6 m) on Bar 33 (A.F. 93118; DDH 36, A.F. 92007). Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). The Bar claims lapsed in 1976. HBED restaked the area as CB 10516 in 1979. Shell Canada Resources Limited did airborne magnetic and EM surveys in 1980 (A.F. 92513). The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km².

GEOLOGICAL SETTING:

DDH 36 was collared on Cree Lake. Sherridon Suite (former Sherridon Group) calc-silicate gneiss, impure marble and granodiorite crops out south and west of the collar location; biotite - garnet schist, intruded by gabbro and pyroxenite, crops out to the north and east (Fig. 28-1; Froese and Goetz, 1981). The DDH intersected quartz - biotite - garnet gneiss, mafic quartz - hornblende gneiss and quartz - biotite - graphite gneiss.

MINERALIZATION:

A 2 m long intersection within the quartz - hornblende gneiss contained up to 10% (average 2%) disseminated pyrrhotite and pyrite. Graphite constitutes approximately 30% of the quartz - biotite - graphite gneiss. Minor amounts of disseminated graphite were documented elsewhere in the core.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified (cf. Locations 26, 27, 29 and 30).

REFERENCES:

Assessment File 91616, 91695, 92007, 92513, 93118
Manitoba Energy and Mines, Minerals Division.

Bateman, J.D.

1944: Sherritt Gordon Mine area, Manitoba; Geological Survey of Canada, Paper 44-4, Preliminary map with descriptive notes, 1:12 000.

Bateman, J.D. and Harrison, J.M.

1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.

Froese, E. and Goetz, P.A.

1981: Geology of the Sherridon group in the vicinity of Sherridon, Manitoba; Geological Survey of Canada, Paper 80-21; 20p.

Kaszycki, C.A.

1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118.

Schledewitz, D.C.P.

1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

LOCATION: 29

NAME: (A.F. Mineralization intersected by diamond drilling)
 UTM: 6113887N/367374E
 AREA: East Cree Lake.
 AIRPHOTO: A26387-159
 ACCESS: Bush aircraft to Cree Lake.

EXPLORATION SUMMARY:

The area was first staked as Tom 3, Johnston, Bonanza 2, Bonanza 4 and Bonanza 9 (Mining claim map, 63N/3NE, *circa* 1930). The Bonanza claims were staked by D. Stratton, P.C. Barr, and L.R. Barr in 1926-1928. D.C. Barr acquired Bonanza 2 and 4 in 1928. In 1940 D.C. Barr acquired Bonanza 9 and staked Bonanza 12 Fr. to Bonanza 14. Sherritt Gordon Mines Limited took a 3-year option on the property in 1948, and drilled DDH 10 (147.5 m) on Bonanza 14 and DDH 12 (56.4 m) on Bonanza 4 (A.F. 90669, no logs available). Leases M-1200, M-1206, M-1207 were issued in 1941-1942 and leases M-2623 to M-2625 were issued in 1949. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). The leases lapsed in 1960.

W. Shmon held Bar 12 and Bar 14 to Bar 17 in 1961-1965 and acquired Bar 18, Bar 30, Bar 32 and Bar 33 from E. Shmon and R. Chaboyer in 1965. In 1965-1966 Fidelity Mining Investments Limited carried out magnetic and EM surveys on the Bar claims and drilled DDH 35 (149 m) on Bar 33, DDH 39 (109 m) on Bar 18, DDH 48 (133.5 m) on Bar 17, and DDH 49 (126.8 m) on Bar 32 (A.F. 93118; DDH 35, 39, 48, 49, A.F. 92007). Claim maps indicate that DDH 48 was drilled on Bar 18. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). Magnetic (Scintrex MF2) and HLEM (Geonics EM-17) surveys were done on part of the Bar claims by Sherritt Gordon Mines Limited in 1973 (A.F. 92009, A.F. 92006). The Bar claims lapsed in 1976-1977.

HBED staked CB 10515, CB 10516 and CB 10522 in 1979. Shell Canada Resources Limited did airborne magnetic and EM surveys in 1980 (A.F. 92513). The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km². CB 10522 lapsed in 1986. Esso Minerals Canada staked Asong in 1988, and transferred it to Esso Resources Canada Limited and then to Homestake Mining (Canada) Limited in 1989. Asong and CB 10515 lapsed in 1990. L. Racic staked Erik 4 and Erik 6 in 1991. The ground is also partially held by HBED as CB 10516.

GEOLOGICAL SETTING:

DDH 35 and 39 were collared on Cree Lake near or at the contact between a Sherridon Suite (former Sherridon Group) calc-silicate gneiss and impure marble unit, and biotite - garnet schist (Fig. 28-1; Froese and Goetz, 1981). DDH 48 and 49 were collared within the calc-silicate gneiss and impure marble unit. The DDH intersected quartz - hornblende - feldspar gneiss, quartz - feldspar - biotite gneiss, quartz - biotite - garnet gneiss, mafic hornblende - biotite - quartz ± garnet gneiss and quartz - biotite - graphite gneiss. Carbonate is locally an important constituent of the drill

core. White fibrous lamellar flakes, possibly sillimanite, were documented within quartz - biotite - garnet gneiss in DDH 35.

MINERALIZATION:

DDH 35, 39 and 48 intersected units described as fine grained and dirty grey or dark grey in colour that contain variable amounts of graphite and pyrite and/or pyrrhotite (earthy pyrite?). Unspecified lengths of drill core from a quartz - feldspar gneiss unit intersected in DDH 35 contain up to 60% graphite and 10% pyrrhotite and/or pyrite. A fine grained quartz - graphite - pyrite unit was intersected over 14 m in DDH 48. This unit contains up to 10% graphite and 5% pyrite. DDH 49 intersected a quartz - feldspar - graphite unit over 3-4 m in core length that contained up to 20% graphite and patchy pyrite mineralization. Froese and Goetz (1981) documented a sulphide occurrence near the south shore of Cree Lake in the vicinity of the diamond drilling (Fig. 28-1).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. The mineralization is interpreted to be a graphitic sulphide facies iron formation (*cf.* Locations 26, 27, 28 and 30). Although only graphite may be recorded in the drill log, the majority of this type of occurrence has been found to contain more Fe sulphide than carbon (Gale *et al.*, 1980).

REFERENCES:

- Assessment File 90669, 91616, 91695, 92006, 92007, 92009, 92513, 93118
 Manitoba Energy and Mines, Minerals Division.
 Bateman, J.D.
 1944: Sherritt Gordon Mine area, Manitoba; Geological Survey of Canada, Paper 44-4, Preliminary map with descriptive notes, 1:12 000.
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 1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.
 Froese, E. and Goetz, P.A.
 1981: Geology of the Sherridon group in the vicinity of Sherridon, Manitoba; Geological Survey of Canada, Paper 80-21; 20p.
 Gale, G.H., Baldwin, D.A. and Koo J.
 1980: A geological evaluation of Precambrian massive sulphide deposit potential in Manitoba; Manitoba Energy and Mines, Economic Geology Report ER79-1, 137p.
 Kaszycki, C.A.
 1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118.
 Schledewitz, D.C.P.
 1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

LOCATION: 30

NAME: (A.F. Mineralization intersected by diamond drilling)
UTM: 6114815N/368734E
AREA: East of Jonah Lake.
AIRPHOTO: A26387-160
ACCESS: Bush aircraft to Jonah or Bob Lake, traverse.

EXPLORATION SUMMARY:

The area was first staked as Plutarch 3 and Plutarch 4 (Mining claim map, 63N/3NE, *circa* 1930). D.C. Barr staked Crescent 7 and Crescent 10 in 1939. Rock trenching was reported in 1938-1946. In 1948 Sherritt Gordon Mines Limited took a 3-year option on the property and drilled DDH Barr 3 (127 m) on Crescent 10 (A.F. 90669). A 3-hole 374 m diamond drill program was done on Crescent 7 and Crescent 10, but the logs are not available (DDH 2A, 4, 6, A.F. 90669). Leases M-2614 and M-2617 were issued in 1949. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). The leases lapsed in 1960.

W. Shmon held Bar 7 and Bar 8 from 1961 to 1965. E. Shmon staked Bar 7 and assigned it to W. Shmon in 1965. In 1965-1966 Fidelity Mining Investments Limited carried out magnetic and EM surveys on the Bar claims and a 5-hole 588 m diamond drill program on Bar 7 (A.F. 93118; DDH 3, DDH 22, DDH 23, DDH 26, DDH 30, A.F. 92007). Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). In 1973-1974 Sherritt Gordon Mines Limited carried out magnetic (Scintrex MF2) and HLEM (Geonics EM-17) surveys on the Bar claims (A.F. 92009, A.F. 92006). Bar 7 lapsed in 1977. HBED held CB 10522 in 1979-1986. The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km². Esso Minerals Canada staked Asong in 1988, and transferred it to Esso Resources Canada Limited and then to Homestake Mining (Canada) Limited in 1989. Asong lapsed in 1990. L. Racic restaked the area as Erik 4 in 1991.

GEOLOGICAL SETTING:

The area is underlain by Sherridon Suite (former Sherridon Group) calc-silicate and impure marble, biotite- or hornblende-bearing quartz-rich quartzofeldspathic gneiss and biotite - garnet schist (Fig. 30-1; Froese and Goetz, 1981). The DDH intersected a sequence of quartz - feldspar - biotite ± garnet gneiss and quartz - feldspar - hornblende ± garnet gneiss. Pyrite - graphite - quartz layers occur in the drill core from DDH 3, 26 and 30. Epidote occurs locally in the drill core.

MINERALIZATION:

The pyrite - graphite - quartz layers range in core length from approximately 2.5 m to 40 m. The composition of these layers is variable and locally may include pegmatitic sections and minor amounts of chlorite, biotite and chalcopryrite. Graphite and pyrite contents also vary. The 40 m long mineralized intersection in DDH 26 contains from 5 - 70% pyrite and up to 80% graphite. Minor amounts of disseminated pyrite and/or pyrrhotite ± chalcopryrite are docu-

mented throughout the drill core. A 17 m long intersection of 'fine grained gneiss containing muscovite' contained minor amounts of disseminated chalcopryrite. Immediately down hole from this unit a 'dark fine grained gneiss carrying graphite sulphides' (earthy pyrite?) was intersected over 4 m in core length. Further down hole, a 'gneiss carrying consid graphite and chalco' was intersected over 1.5 m (A.F. 92007).

GEOCHEMICAL DATA:

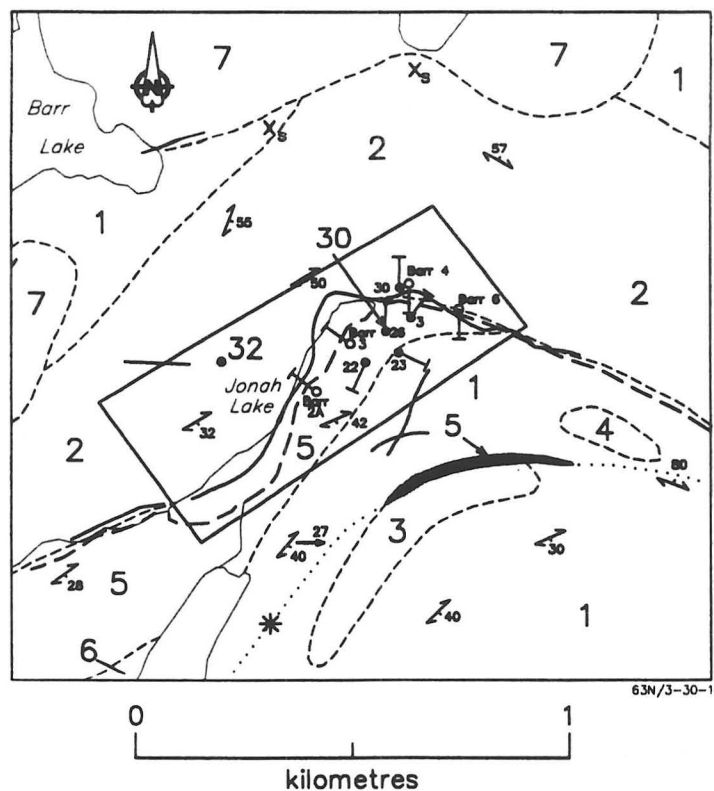
A core sample from the 1.5 m intersection from DDH Barr 3 that contained graphite and chalcopryrite was assayed for Zn, Cu, Au and Ag. Anomalous concentrations were not reported (A.F. 90669)

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. The mineralization is interpreted to be a graphitic sulphide facies iron formation (*cf.* Locations 26, 27, 28 and 29). Although only graphite may be recorded in the drill log, the majority of this type of occurrence has been found to contain more Fe sulphide than carbon (Gale *et al.*, 1980).

REFERENCES:

- Assessment File 90669, 91616, 91695, 92006, 92007, 92009, 93118
Manitoba Energy and Mines, Minerals Division.
Bailes, A.H.
1971: Preliminary compilation of the geology of the Snow Lake-Flin Flon-Sherridon area; Manitoba Mines Branch, Geological Paper 1/71, p. 27p.
Bateman, J.D.
1944: Sherritt Gordon Mine area, Manitoba; Geological Survey of Canada, Paper 44-4, Preliminary map with descriptive notes, 1:12 000.
Bateman, J.D. and Harrison, J.M.
1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.
Froese, E. and Goetz, P.A.
1976: Petrological studies in the Sherridon area, Manitoba; Geological Survey of Canada, Report of Activities, Part A, Paper 76-1A, p. 171-172.
Froese, E. and Goetz, P.A.
1981: Geology of the Sherridon group in the vicinity of Sherridon, Manitoba; Geological Survey of Canada, Paper 80-21; 20p.
Gale, G.H., Baldwin, D.A. and Koo J.
1980: A geological evaluation of Precambrian massive sulphide deposit potential in Manitoba; Manitoba Energy and Mines, Economic Geology Report ER79-1, 137p.
Kaszycki, C.A.
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Schledewitz, D.C.P.
1988: Kissing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.



- | | |
|--|--|
| Intrusive Rocks | ----- Geology boundary |
| 7 Gabbro | Ore-bearing horizon |
| Sherridon Group | EM conductors |
| 6 Layered amphibolite with fragments; probably metamorphosed volcani-clastic rocks | —— (A.F. 92006) |
| 5 Impure marble and calc-silicate rocks | - - - (A.F. 93118) |
| 4 Calc-silicate | Foliation (inclined) |
| 3 Pelitic schist | Lineation, mineral |
| 2 Biotite-garnet schist | * Cordierite-anthophyllite rocks |
| 1 Quartz-rich gneisses | Xs Mineral occurrence; sulphide |
| Geology by Froese and Goetz (1981). | Massive sulphide deposit |
| | Drillholes |
| | (A.F. 90669) |
| | (A.F. 92007) |
| | 32 • Occurrence location |
| | Area encompassed by Mineral Deposit File |

Figure 30-1: General geology, geophysical conductors and diamond-drill hole locations at occurrences 30 and 32

LOCATION: 31

NAME: (A.F. Mineralization intersected by diamond drilling)
UTM: 6115237N/366971E
AREA: North end of Cree Lake.
AIRPHOTO: A26387-160
ACCESS: Bush aircraft to Cree Lake.

EXPLORATION SUMMARY:

T.C. McVeigh staked Cree 2 in 1927 and transferred it to Sherritt Gordon Mines Limited in 1928. Bonanza 6 and Bonanza 8 were staked by M.E. Barr and P.C. Barr in 1928. D.C. Barr acquired Bonanza 6 in 1928. Wright (1929) examined the Cree group. Cree 2 was leased as M-119 in 1931. D.C. Barr acquired Bonanza 8 in 1940 and 21 year leases M-1201 and M-1208 in 1941-1942. Sherritt Gordon Mines Limited took a 3-year option on the Bonanza claims in 1948. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). The Bonanza claims lapsed in 1960. W. Shmon acquired Bar 35 from R. Chaboyer in 1965. In 1965-1966 Fidelity Mining Investments Limited carried out magnetic and EM surveys on the Bar claims and drilled DDH 50 (152.7 m), DDH 51 (154.2 m), and DDH 52 (147.2 m) on Bar 35 (A.F. 93118; DDH 50 to DDH 52, A.F. 92007). Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). Bar 35 lapsed in 1973. Cree 2 lapsed in 1976. HBED restaked the area as CB 10516 in 1979. In 1980 Shell Canada Resources Limited produced a 1:125 000 scale compilation map of the geology and mineral occurrences within 63N/2 and parts of 63N/3 and 63N/1 (A.F. 92513). The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km².

GEOLOGICAL SETTING:

The area is underlain by gabbro, bounded to the north-east by biotite - garnet schist and to the southwest by pyroxenite (Fig. 31-1; Froese and Goetz, 1981). All DDH intersected quartz - biotite - garnet \pm graphite gneiss. Pyroxenite/peridotite was intersected in DDH 50 and 51. Quartz - hornblende \pm garnet gneiss was documented in the core from DDH 51.

MINERALIZATION:

A 2.5 m long intersection composed predominantly of pyrrhotite and minor amounts of pyrite and 'moderate' amounts of graphite occurs between quartz-rich quartzofeldspathic gneiss and quartz - biotite - garnet gneiss in DDH 50. Further down hole, a chloritic zone, approximately

7 m in core length, contains 10% pyrite and 10% graphite. Two variably mineralized zones/layers, approximately 35 m and 3.5 m in core length were documented in the core from DDH 52. Both zones occur within quartz - biotite - garnet \pm graphite gneiss and contain up to 90% pyrrhotite and/or pyrite, and up to 20% graphite. A pyrrhotite-pyrite occurrence is shown at this location on the geological compilation map (1:125 000) produced by Shell Canada Resources Limited in 1980 (A.F. 92513).

GEOCHEMICAL DATA:

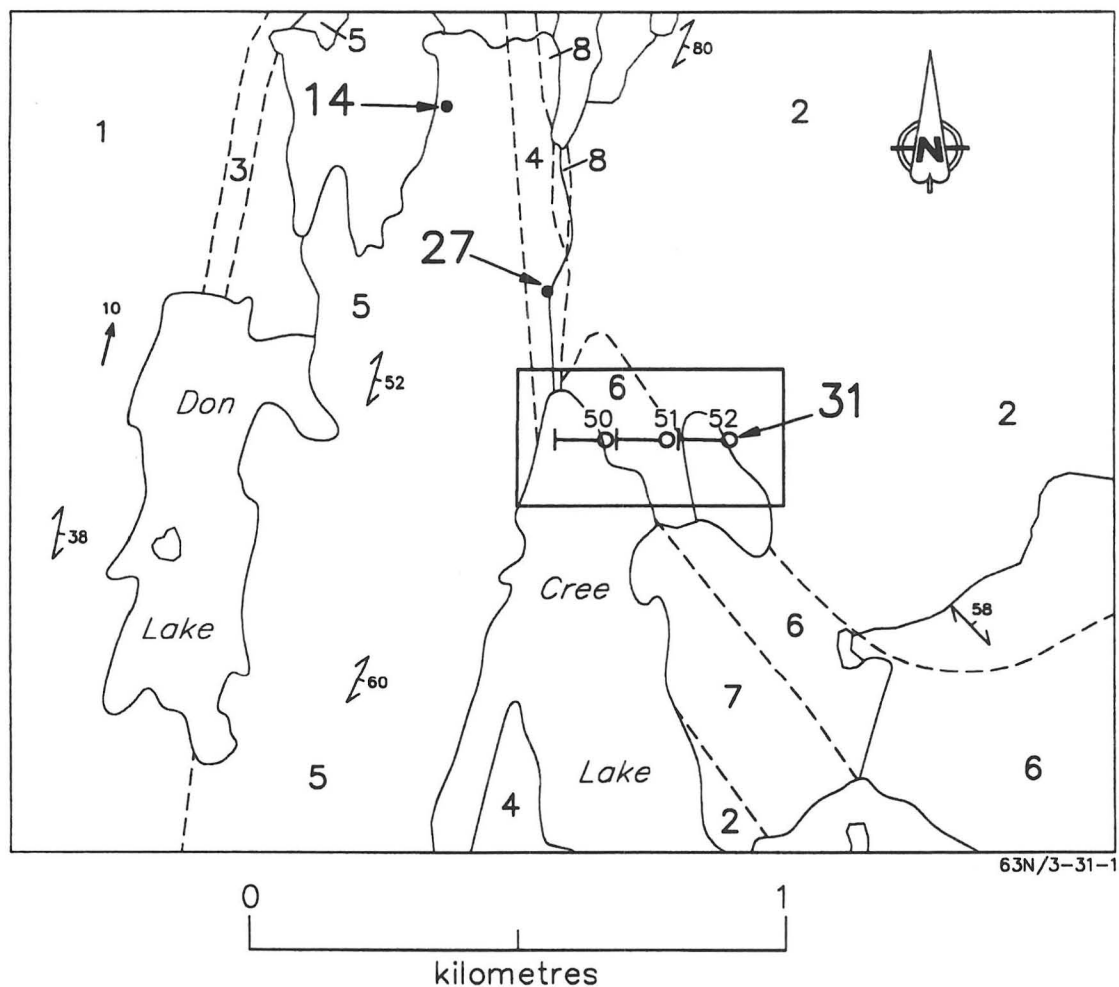
The sulphide-rich zones/layers in DDH 52 were sampled for assay, but results were not reported.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. The mineralization is interpreted to be a graphitic sulphide facies iron formation.

REFERENCES:

- Assessment File 91616, 91695, 92007, 92513, 93118
Manitoba Energy and Mines, Minerals Division.
Bateman, J.D.
1944: Sherritt Gordon Mine area, Manitoba; Geological Survey of Canada, Paper 44-4, Preliminary map with descriptive notes, 1:12 000.
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1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.
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, p. 92-103.
Froese, E. and Goetz, P.A.
1981: Geology of the Sherridon group in the vicinity of Sherridon, Manitoba; Geological Survey of Canada, Paper 80-21; 20p.
Kaszycki, C.A.
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Schledewitz, D.C.P.
1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.
Wright, J.F.
1929: Kississing Lake, Manitoba; Geological Survey of Canada, Summary Report 1928, Part B, p. 101.



Intrusive Rocks

- 8 Granodiorite
- 7 Pyroxenite
- 6 Gabbro

Sherridon Group

- 5 Layered amphibolite with fragments;
probably metamorphosed volcanoclastic
rock
- 4 Impure marble and calc-silicate rocks
- 3 Calc-silicate rocks
- 2 Biotite-garnet schist
- 1 Quartz-rich gneisses

----- Geological boundary

 Foliation (inclined)

 Lineation, mineral

Geology by Froese and Goetz (1981).

 Drill hole (A.F. 92007)

31. Occurrence location


 Area encompassed by
Mineral Deposit File

Figure 31-1: General geology and diamond-drill hole locations at occurrences 14 and 31

LOCATION: 32

NAME: (A.F. Mineralization intersected by diamond drilling)
UTM: 6114756N/368365E
AREA: West of Jonah Lake.
AIRPHOTO: A26387-160
ACCESS: Bush aircraft to Jonah or Cree Lake, traverse.

EXPLORATION SUMMARY:

The area was first staked as Ajax 2 (Mining claim map, 63N/3NE, *circa* 1930). D.C. Barr staked Bonanza 17 Fr. in 1941. Sherritt Gordon Mines Limited took a 3-year option on the property in 1948. Leases M-2628 was issued in 1949. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). The lease lapsed in 1960. W. Shmon held Bar 11 in 1961-1965 and acquired Bar 16 from E. Shmon in 1965. In 1965-1966 Fidelity Mining Investments Limited carried out magnetic and EM surveys on the Bar claims and drilled DDH 45 (153 m) on Bar 15 (A.F. 93118; DDH 45, A.F. 92007). Claim maps indicate that DDH 45 was drilled on Bar 16. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). Magnetic (Scintrex MF2) and HLEM (Geonics EM-17) surveys were done on part of the Bar claims by Sherritt Gordon Mines Limited in 1973 (A.F. 92009, A.F. 92006). Bar 16 lapsed in 1977. HBED held CB 10522 in 1979-1986. The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km². Esso Minerals Canada staked Asong in 1988, and transferred it to Esso Resources Canada Limited and then to Homestake Mining (Canada) Limited in 1989. Asong lapsed in 1990. L. Racic restaked the area as Erik 4 in 1991.

GEOLOGICAL SETTING:

The area is underlain by biotite - garnet schist (Fig. 32-1; Froese and Goetz, 1981). DDH 45 intersected quartz - biotite - garnet gneiss and quartz - feldspar - biotite \pm garnet \pm hornblende gneiss.

MINERALIZATION:

A 13 m long intersection from DDH 45 composed of quartz and feldspar, with carbonate and hornblende as important local constituents, contains approximately 10% pyrite. Minor amounts of disseminated pyrite and/or pyrrhotite were documented elsewhere in the drill core.

GEOCHEMICAL DATA:

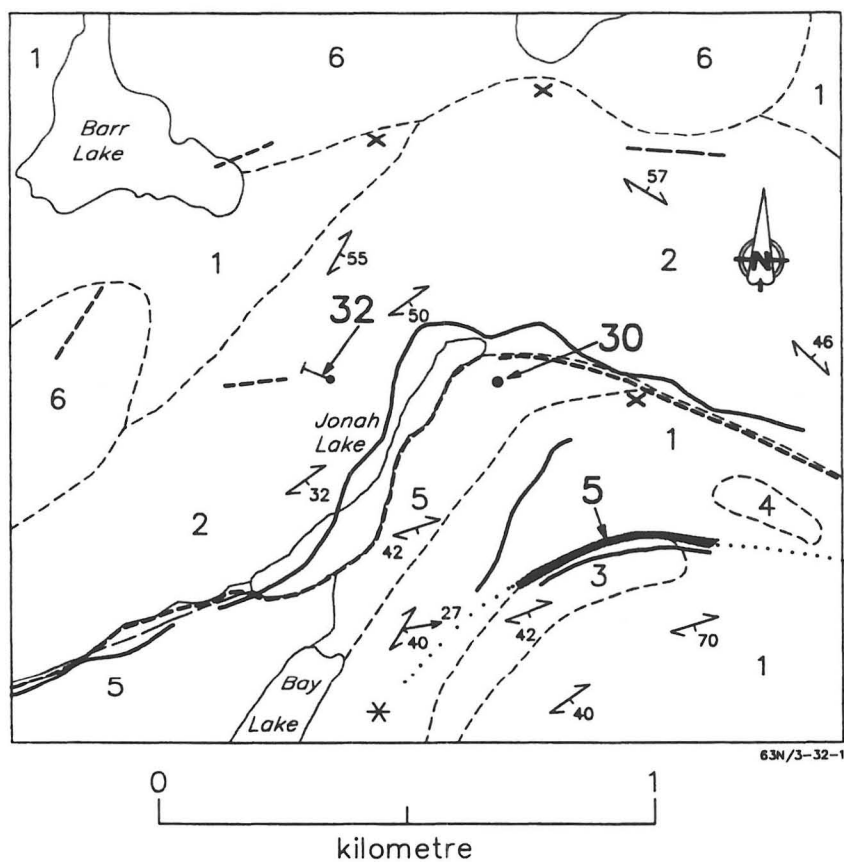
The quartz - feldspar - sulphide zone/layer was sampled for assay, but results of the analyses were not reported.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

- Assessment File 91616, 91695, 92006, 92007, 92009, 93118
Manitoba Energy and Mines, Minerals Division.
- Bateman, J.D.
1944: Sherritt Gordon Mine area, Manitoba; Geological Survey of Canada, Paper 44-4, Preliminary map with descriptive notes, 1:12 000.
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- Kaszycki, C.A.
1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118.
- Schledewitz, D.C.P.
1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.



Intrusive Rocks

6 Gabbro

Sherridon Group

5 Impure marble and calc-silicate rocks

4 Calc-silicate rocks

3 Pelitic schist

2 Biotite-garnet schist

1 Quartz-rich gneisses

----- Geological boundary
(approximate, assumed)

..... Ore-bearing horizon

————— Solid sulphide lense

*

Cordierite-anthophyllite rocks

↗ 42 ↘

Foliation (inclined, vertical)

→ 28

Lineation, mineral

Geology by Froese and Goetz (1981).

EM conductors

—————

(A.F. 92006)

(A.F. 93118)

*^S

Mineral occurrence

—•—

Drillhole (A.F. 92007)

• 32

Occurrence location

Figure 32-1: General geology, geophysical conductors and diamond-drill hole locations at occurrence 32

LOCATION: 33**NAME:**

UTM: 6112671N/367140E

AREA: 'Near the shore of the southeast bay of Found Lake' (Wright, 1931).

AIRPHOTO: A26387-157

ACCESS: North along railway track from Sherridon, Manitoba to Found Lake, west on powerline, traverse.

EXPLORATION SUMMARY:

The area was first staked as Red Rock and Found lake (Mining claim map, 63N/3NE, *circa* 1930). In 1928 Ramon Mining Corporation Limited did 305 m of trenching and a 5 hole 939 m diamond drill program on the Found Lake group (Mining Engineering File, Ramon Mining Corporation Limited). Scotia Manitoba Mines Limited had a 50% interest in the Found Lake group. Wright (1931) reported that 6 holes had been drilled 'on showings near the shore of the south-east bay of Found Lake' by Ramon Syndicate in the winter of 1929.

E.L. Brown staked A.B.C. 2 and A.B.C. 3 in 1940. In 1946 leases M-1745 and M-1746 were issued to E.L. Brown, and transferred to Sherritt Gordon Mines Limited. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). The A.B.C. claims lapsed in 1976. HBED staked CB 10515 in 1979. Shell Canada Resources Limited did airborne magnetic and EM surveys in 1980 (A.F. 92513). The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km². CB 10515 lapsed in 1990. The ground was restaked as Erik 6 by L. Racic in 1991.

GEOLOGICAL SETTING:

The area is underlain by quartz-rich quartzofeldspathic gneiss, impure marble/calc-silicate rocks and granodiorite (Fig. 33-1; Froese and Goetz, 1981). Wright (1929) describes gneissic quartzite, quartz - mica gneisses and quartz - hornblende gneisses in the vicinity of the mineralization.

MINERALIZATION:

The 1928 drill program by Ramon Syndicate that included drillholes 1 (261 m), 2 (161 m), 3 (131 m), and 4 (145 m) intersected an 8-16 m wide sulphide-bearing zone(s) that is 'heavily mineralized and shows copper sulphides' at depths ranging from 33 m to 137 m (Mining Engineering File, Scotia Manitoba Mines Limited). The trenches expose a 30 m wide and 60 m long zone of sheared gneiss that contains 'some' pyrite and pyrrhotite across widths of approximately 6 m within the zone (Wright, 1929). Two occurrences of sulphide mineralization were documented in the vicinity (Froese and Goetz, 1981).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified. The position of the trenches and diamond-drill hole collars are not known. We speculate that either they are near the surface sulphide occurrences, within quartz-rich gneiss, mapped along the south shore of Found Lake by Froese and Goetz (1981), or within quartz-rich gneiss just east of Found Lake near the position of an 'ore-bearing horizon' (Fig. 33-1; Froese and Goetz, 1981). The 'ore-bearing horizon' includes the Bob Lake (Location 2), Cold Lake (Location 4) and Fidelity (Location 5) massive sulphide type deposits.

REFERENCES:

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Corporation Files: Ramon Mining Corporation Limited; Scotia Manitoba Mines Limited
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 Mines and Natural Resources, Mines Branch, p. 92-103.

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Harrison, J.M.

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Kaszycki, C.A.

1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118.

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Manitoba Energy and Mines, Minerals Division.

Schledewitz, D.C.P.

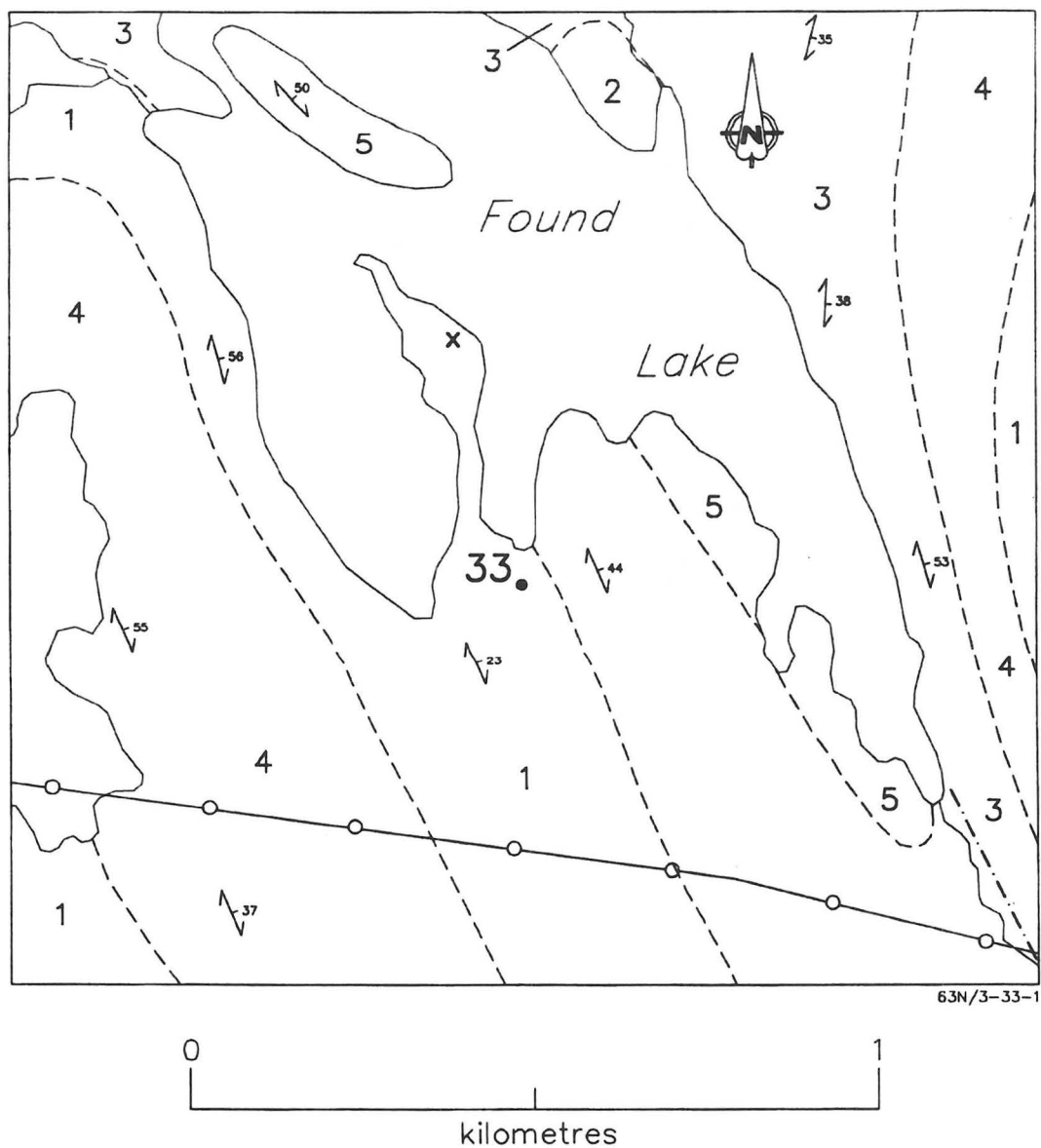
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Wright, J.F.

1929: Kississing Lake, Manitoba; Geological Survey of Canada, Summary Report 1928, Part B, p. 100-101.

Wright, J.F.

1931: Geology and mineral deposits of a part of northwest Manitoba; Geological Survey of Canada, Summary Report 1930, Part C, p. 36.



Intrusive Rocks

5 Granodiorite

Sherridon Group

4 Layered amphibolite with fragments; probably metamorphosed volcanoclastic rock

3 Impure marble and calc-silicate rocks

2 Biotite-garnet schist

1 Quartz-rich gneisses

----- Geological boundary

↗₃₇ Foliation (inclined)

x Mineral occurrence

Geology after Froese and Goetz (1981).

○—○ Powerline

-.-.- Trail

33. Occurrence location

Figure 33-1: General geology at occurrence 33

LOCATION: 34

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

UTM: 6111853N/370024E

AREA: North of Molly Lake.

AIRPHOTO: A26369-177

ACCESS: Jungle Lake siding access road from Sherridon, Manitoba to Molly Lake, traverse.

EXPLORATION SUMMARY:

The area was first staked as Gem, Spade, Pick, Sage, Elma, Cananac Ext. 1, and Cananac Ext. 3 (Mining claim map, 63N/3NE, *circa* 1930). Manitoba Basin Mining Co., Limited did prospecting on the Cananac group in 1928 (Wright, 1929). E.L. Brown staked Ern 21, Ern 22, and Ern 26 in 1942 and held Ben 17-Ben 19 in 1943-1945. In 1947-1948 leases M-1898, M-1899, and M-1903 were assigned to Sherritt Gordon Mines Limited. The leases lapsed in 1951. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). HBED staked Nok 195 to 198, Nok 269, and Nok 270 in 1957. In 1958 HBED did an HLEM survey and a 5-hole 318 m diamond drill program (DDH N1 to N5; A.F. 91598). The Nok claims lapsed in 1960-1961. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). The ground was held by Grace L. Gillies as Grace L 8, Grace L 12, and Grace L 13 in 1966-1974, and by HBED as CB 10526 in 1979-1984 and CB 10527 in 1979-1986. The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km². In 1988 Esso Minerals Canada staked Tome and Noko Resources Inc. staked Angie 9. Tome was assigned to Esso Resources Canada Limited and then to Homestake Mining (Canada) Limited in 1989; it lapsed in 1990. Angie 9 was assigned to Varna Gold inc. in 1991. In 1991 L. Racic restaked the area as Erik 8 and Erik 10.

GEOLOGICAL SETTING:

The area is underlain by Sherridon Suite (former Sherridon Group) biotite- or hornblende-bearing quartz-rich quartzofeldspathic gneiss and calc-silicate rocks (Fig. 34-1; Froese and Goetz, 1981). All DDH intersected hornblende - plagioclase \pm biotite \pm garnet gneiss. Chlorite-mica-graphite schist was intersected in DDH N4. With the exception of DDH N2 chlorite was documented locally within the drill core.

MINERALIZATION:

Minor amounts of disseminated and/or stringer pyrite and/or pyrrhotite plus graphite were documented locally in all the drill core. Numerous near solid graphite intersections with accessory Fe-sulphides were documented in the drill core

from DDH N1, N2 and N5. Core lengths of these intersections range from approximately 30 cm to 7.5 m. Two sections, 30 cm and 55 cm in core length, intersected 'well mineralized' to near solid pyrite in DDH N1. A 12 m long intersection in DDH N4 is composed of 2 m of graphite schist \pm pyrite and chalcopyrite between 4 m (up hole) and 6 m (down hole) of chlorite mica graphite schist with minor amounts of disseminated pyrite. Sulphide mineralization was documented in the vicinity (Fig. 34-1; Froese and Goetz, 1981).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. The mineralization is interpreted to be a graphitic sulphide facies iron formation (*cf.* Locations 7, 18 and 20). Although only graphite may be recorded in the drill log, the majority of this type of occurrence has been found to contain more Fe sulphide than carbon (Gale *et al.*, 1980).

REFERENCES:

Assessment File 91598, 91616, 91695

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Bateman, J.D.

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

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Kaszycki, C.A.

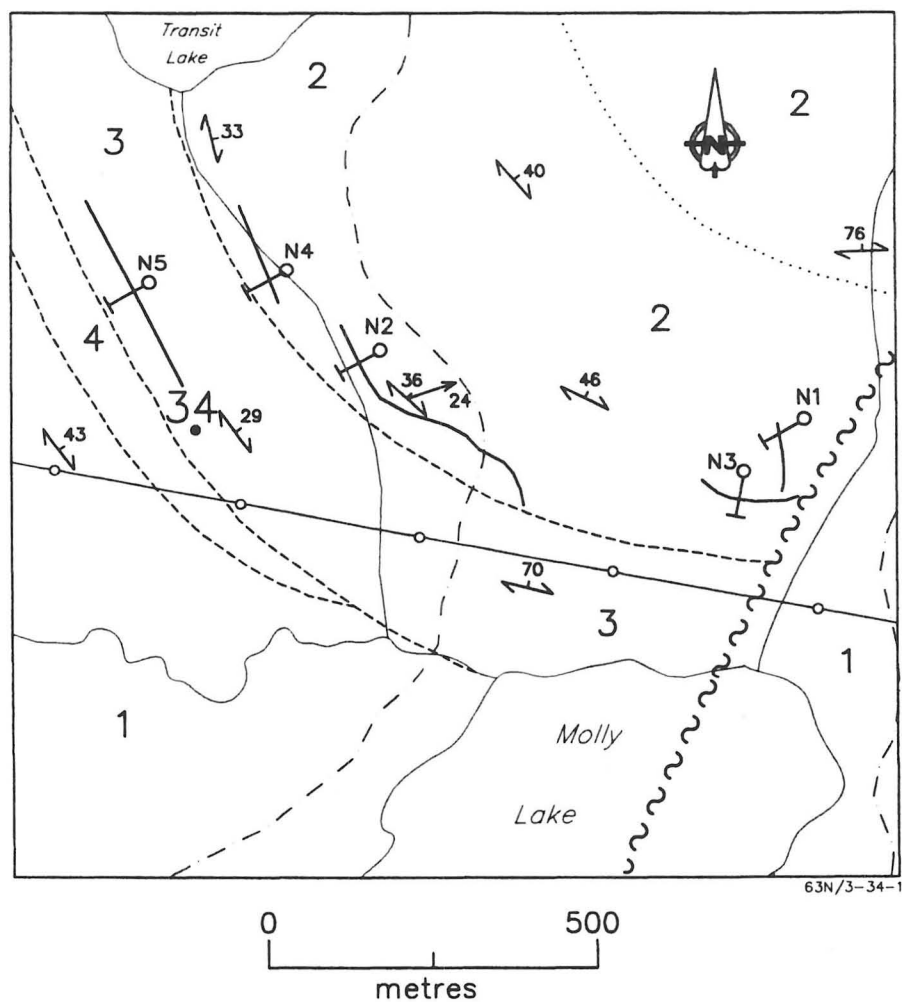
1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118.

Schledewitz, D.C.P.

1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

Wright, J.F.

1929: Kississing Lake, Manitoba; Geological Survey of Canada, Summary Report 1928, Part B, p. 101.



- | | |
|------------------------------|--------------------------------------|
| Intrusive Rocks | → ²⁴ Lineation, mineral |
| 4 Gabbro | ↖ ⁷⁰ Foliation (inclined) |
| Sherridon Group | ~ ~ Fault |
| 3 Calc-silicate rocks | Geology by Froese and Goetz (1981). |
| 2 Quartz-rich gneisses | —○ Drillhole (A.F. 91598) |
| Nokomis Group | ○—○ Powerline |
| 1 Migmatite | — — Trail |
| ----- Geology boundary | 34• Occurrence location |
| —— EM conductor (A.F. 91598) | |
| Ore-bearing horizon | |

Figure 34-1: General geology, geophysical conductors and diamond-drill hole locations at occurrence 34

LOCATION: 35**NAME:**

UTM: 6113502N/369457E

AREA: East of Sheila Lake.

AIRPHOTO: A26369-177

ACCESS: Bush aircraft to Sheila or Transit Lake, traverse; north along railway tracks from Sherridon, Manitoba.

EXPLORATION SUMMARY:

The area was first staked as Cananac 5 (Mining claim map, 63N/3NE, *circa* 1930). The Cananac group was staked for Percy Hopkins in 1927 and was transferred to Manitoba Basin Mining Co., Limited in 1928 (Wright, 1929). Bob 11 was staked by R.W. Johns in 1940, and transferred to E.L. Brown in 1941. In 1947 E.L. Brown acquired 21 year lease M-1783 and transferred it to Sherritt Gordon Mines Limited. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). Lease M-1783 was cancelled in 1978. HBED staked CB 10523 in 1979. Shell Canada Resources Limited did an airborne EM and magnetic survey over the area in 1980 (A.F. 92513). In 1980 Shell Canada Resources Limited produced a 1:125 000 scale compilation map of the geology and mineral occurrences within 63N/2 and parts of 63N/3 and 63N/1 (A.F. 92513). The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km². CB 10523 lapsed in 1990. Louis Racic staked Erik 7 and Erik 8 in 1991.

GEOLOGICAL SETTING:

The area is underlain by Sherridon Suite (former Sherridon Group) calc-silicate rocks (Fig. 35-1; Froese and Goetz, 1981).

MINERALIZATION:

A pyrrhotite-pyrite-chalcopyrite-sphalerite occurrence is shown at this location on the geological compilation map

done by Shell Canada Resources Limited (A.F. 92513). Sulphide occurrences near this location are also indicated by Froese and Goetz (1981).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment File 91616, 91695, 92513

Manitoba Energy and Mines, Minerals Division.

Bateman, J.D.

1944: Sherritt Gordon Mine area, Manitoba; Geological Survey of Canada, Paper 44-4, Preliminary map with descriptive notes, 1:12 000.

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1962: Geology and mineral resources of Manitoba; Manitoba Mines and Natural Resources, Mines Branch, p. 92-103.

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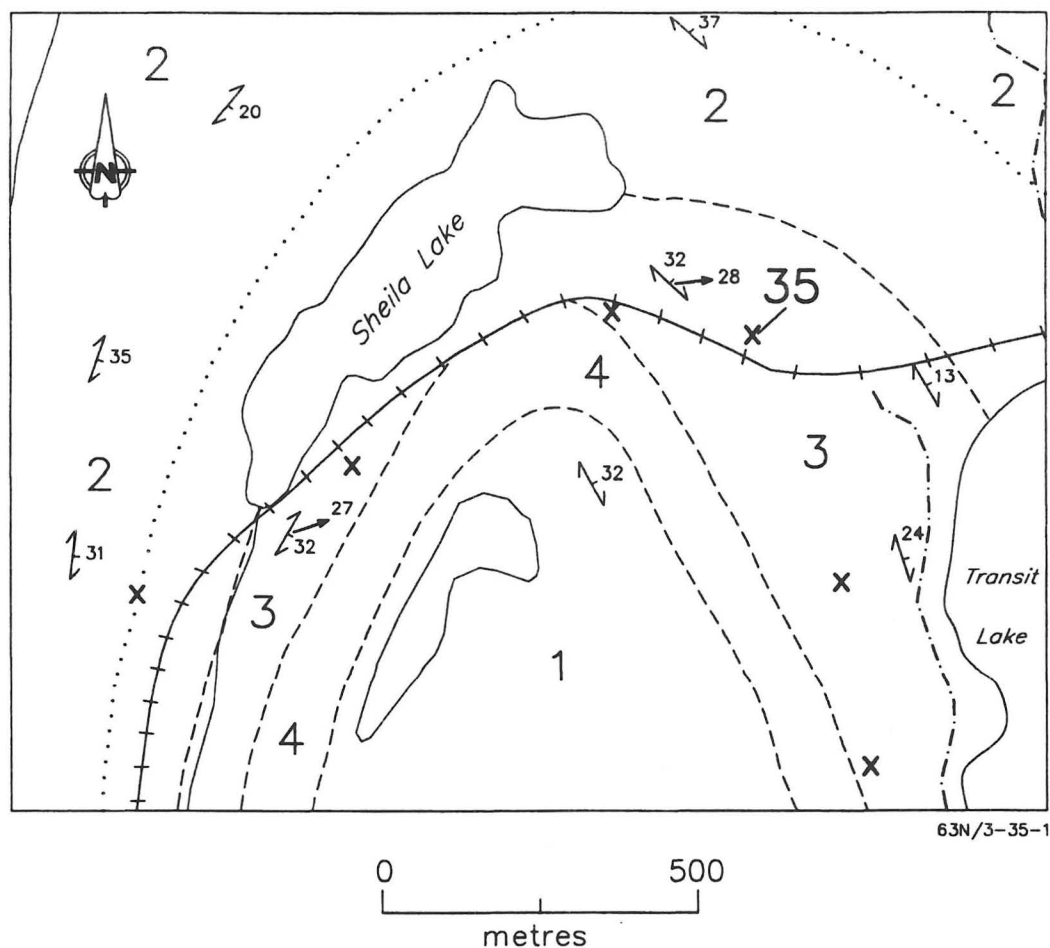
1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118.

Schledewitz, D.C.P.

1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

Wright, J.F.

1929: Kississing Lake, Manitoba; Geological Survey of Canada, Summary Report 1928, Part B, p. 101.



Intrusive Rocks

4 Gabbro

Sherridon Group

3 Calc-silicate rocks

2 Quartz-rich gneisses

Nokomis Group

1 Migmatite

---- Geological boundary

\nearrow^{32} Foliation (inclined)

\rightarrow^{27} Lineation, mineral

..... Ore-bearing horizon

x Mineral occurrence

Geology by Froese and Goetz (1981).

+ + + Railway

- - - - Trail

35 Occurrence location

Figure 35-1: General geology in the vicinity of occurrence 35

LOCATION: 36

NAME: (A.F. Mineralization intersected by diamond drilling)
 UTM: 6113127N/372460E
 AREA: Northeast of Molly Lake.
 AIRPHOTO: A26369-198
 ACCESS: Jungle Lake siding access road from Sherridon, Manitoba to Molly Lake or an unnamed lake approximately 2 km northeast of Molly Lake, traverse.

EXPLORATION SUMMARY:

The area was first staked as Duke, Ole, Peter, Kalle, Cap Fr., and Cananac Extension 9 (Mining claim map, 63N/3NE, circa 1930). Ben 48 and Ben 49 were held by H.H. Hales and E.L. Brown in 1943-1944. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). HBED staked Nok 128 and Nok 130 in 1957. In 1958 HBED did an HLEM survey and drilled DDH N8 (51.8 m) on Nok 127 and DDH N9 (84.1 m) on Nok 130 (A.F. 91598). According to claim maps, DDH N8 was drilled on Nok 128. The claims lapsed in 1962. D. Brightnose and E. Caribou staked Sal 1, Sal 2 and Dan 18 in 1966. Kimberly Copper Mines Limited did magnetic and EM-16 surveys in 1967-1968 and drilled DDH 1 (186.5 m) and DDH 5 (91.7 m) on Sal 2 in 1968 (A.F. 90674; DDH 1,5, A.F. 90663). According to claim maps, DDH 1 and DDH 5 were drilled on Dan 18. The claims lapsed in 1971. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). In 1980 Shell Canada Resources Limited produced a 1:125 000 scale compilation map of the geology and mineral occurrences within 63N/2 and parts of 63N/3 and 63N/1 (A.F. 92513). The ground was held as CB 9777 by Elken Exploration Limited in 1979-1981 and as CB 13358 by HBED in 1981-1986. The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km². Angie 8 was staked by Noko Resources Inc. in 1988, and assigned to Varna Gold Inc. in 1991. L. Racic restaked the area as Erik 9 in 1991.

GEOLOGICAL SETTING:

The area is underlain by biotite- or hornblende-bearing quartz-rich quartzofeldspathic gneiss of the Sherridon Suite (former Sherridon Group) (Fig. 36-1; Froese and Goetz, 1981). The drillholes intersected a sequence of quartz - feldspar ± biotite ± hornblende ± garnet gneiss. Chlorite and sillimanite are locally important constituents of the drill core. A sericite filled 'slip' (fault plane?) was documented in the core from DDH 5 and carbonate filled fractures were observed in the core from DDH N9.

MINERALIZATION:

DDH 1, N8 and N9 intersected one or more graphite - sulphide zones/graphite schist layers that range in core

length from 1 m to 12 m. These zones/layers contain near solid sections of pyrite with accessory graphite and, locally, chlorite. Minor amounts of pyrite that occurs as stringers and disseminations, with or without pyrrhotite, were observed locally throughout the drill core. A pyrrhotite-pyrite occurrence is shown near this location on the geological compilation map (1:125 000) produced by Shell Canada Resources Limited in 1980 (A.F. 92513).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. The mineralization is interpreted to be a graphitic sulphide facies iron formation. This mineralization is possibly the lateral equivalent of graphitic sulphide facies iron formation(s) identified to the east in 63N/2 (Ostry and Trembath, 1992). At Location 5 in NTS 63N/2 Ostry and Trembath (1992) interpret similar graphitic sulphide facies iron formation layers to occur within the structural footwall to massive sulphide type mineralization.

REFERENCES:

- Assessment File 90663, 90674, 91598, 91616, 91695, 92513
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 Ostry, G. and Bieri, M.
 1990: Investigation of base metal potential in the Sherridon area (NTS 63N/2); in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1990, p. 95-97.
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 1992: Mineral Deposits and Occurrences in the Batty Lake Area, NTS 63N/2; Manitoba Energy and Mines, Mineral Deposit Series, Report No. 19; 276p.
 Schledewitz, D.C.P.
 1988: Kissinging Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

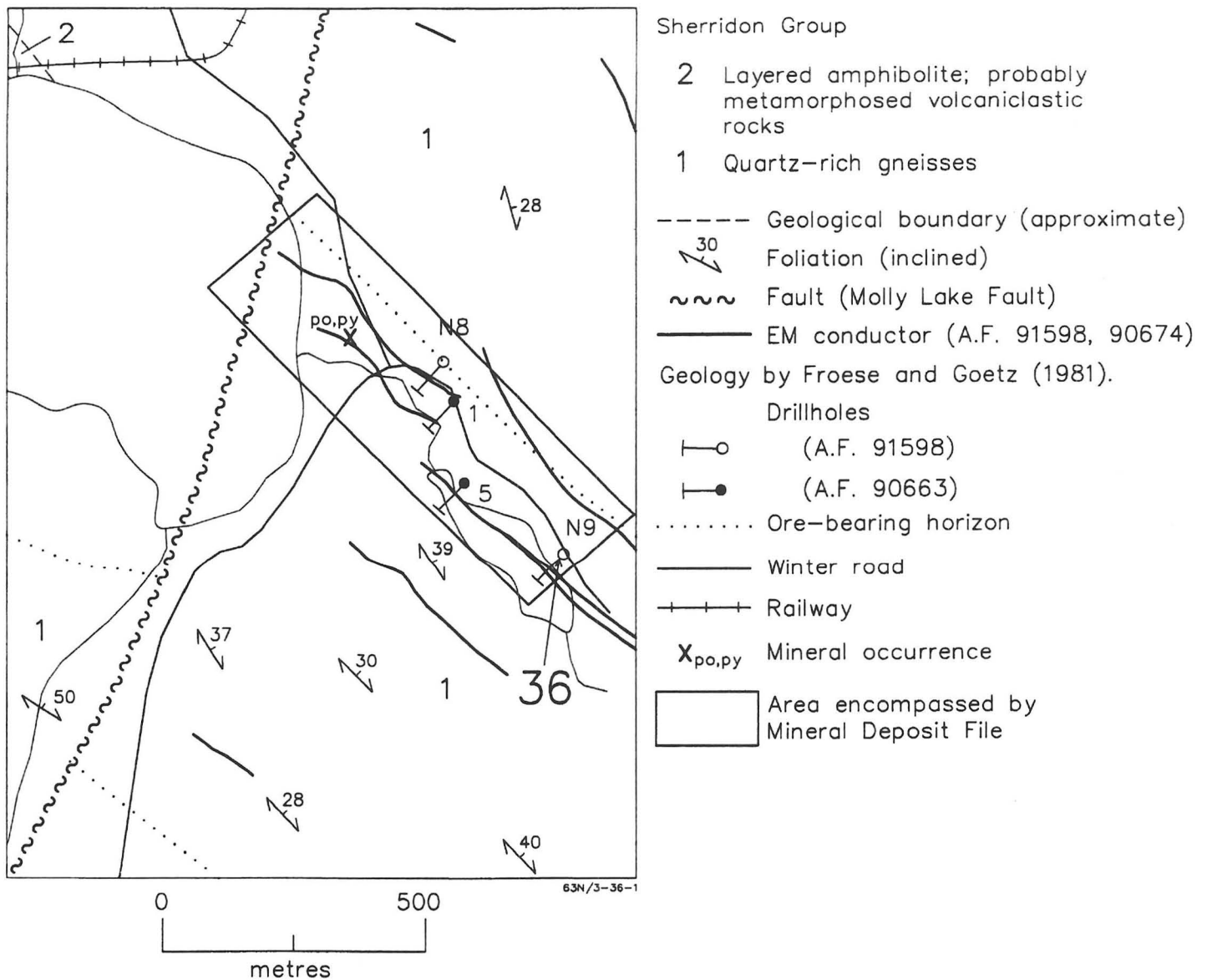


Figure 36-1: General geology, geophysical conductors and diamond-drill hole locations at occurrence 36

LOCATION: 37

NAME: (A.F. Mineralization intersected by diamond drilling)
 UTM: 6112057N/371983E
 AREA: Northeast of Molly Lake.
 AIRPHOTO: A26369-196
 ACCESS: Jungle Lake siding access road from Sherridon, Manitoba to Molly Lake or powerline, traverse.

EXPLORATION SUMMARY:

The area was first staked as Larry 1, Anna, Bullion, Lode, and Newstrike (Mining claim map, 63N/3NE, *circa* 1930). In 1943 W.J. Farley and C.D. Brown staked Ben 21, Ben 28 and Ben 29 and assigned the claims to E.L. Brown. The claims lapsed in 1945. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). HBED staked Nok 194, Nok 200 and Nok 201 in 1957. HBED did an HLEM survey and drilled DDH N6 (119.5 m) on Nok 200 in 1958 (A.F. 91598). The claims lapsed in 1962. D. Brightnose staked Sal 5 and Sal 6 in 1966. Kimberly Copper Mines Limited acquired the property and carried out magnetic and EM-16 surveys in 1967-1968 (A.F. 90674, A.F. 90663). The ground was partly held as Rad 142 by R.A. DeDenus in 1968-1969 and Pinnacle Mines Ltd. (NPL) in 1969-1970. The Sal claims lapsed in 1971. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). Elken Exploration Limited staked CB 9779 and CB 9785 in 1979. Selco Inc. carried out magnetic and HLEM surveys on behalf of Elken Exploration Limited in 1981 (A.F. 92940, Map 3227B). The claims lapsed in 1982. The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km². Noko Resources Inc. staked Angie 9 in 1988 and transferred it to Varna Gold Inc. in 1991. L. Racic restaked the area as Erik 9 and Erik 11 in 1991.

GEOLOGICAL SETTING:

The area is underlain by biotite- or hornblende-bearing quartz-rich quartzofeldspathic gneiss (Fig. 37-1; Froese and Goetz, 1981). A sequence of quartz - feldspar - hornblende - biotite gneiss, quartz - feldspar - biotite gneiss and a dacitic rock unit, structurally underlain by garnetiferous gabbro, pyroxenite and diorite was intersected in the drillhole. A graphitic schist layer occurs within the sequence of quartzofeldspathic gneiss.

MINERALIZATION:

The graphite schist layer was intersected over a core length of 60 cm, contains minor amounts of disseminated pyrite, and is interlayered with quartz - feldspar - biotite ± hornblende gneiss. Minor amounts of disseminated graphite and pyrite were documented up hole from the schist layer. Disseminated pyrite with or without pyrrhotite was documented locally within gabbro/diorite rocks that were intersected down hole from the schist layer.

GEOCHEMICAL DATA:

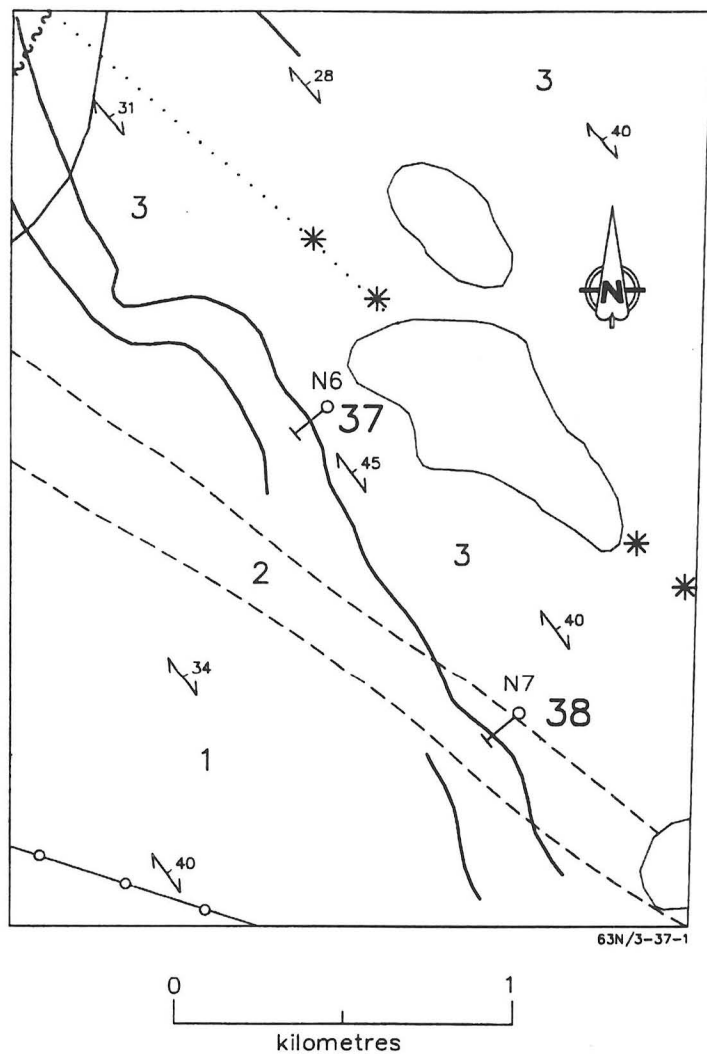
None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. The mineralization is interpreted to be a graphitic sulphide facies iron formation. Although only graphite may be recorded in the drill log, the majority of this type of occurrence has been found to contain more Fe sulphide than carbon (Gale *et al.*, 1980).

REFERENCES:

- Assessment File 90663, 90674, 91598, 91616, 91695, 92940
 Manitoba Energy and Mines, Minerals Division.
- Bateman, J.D. and Harrison, J.M.
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- Froese, E.
 1985: Anthophyllite-bearing rocks in the Flin Flon-Sherridon area, Manitoba; Geological Survey of Canada, Current Research, Part B, Paper 85-1B, p. 541-544.
- Froese, E. and Goetz, P.A.
 1981: Geology of the Sherridon group in the vicinity of Sherridon, Manitoba; Geological Survey of Canada, Paper 80-21; 20p.
- Kaszycki, C.A.
 1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118.
- Schledewitz, D.C.P.
 1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.



Sherridon Group

3 Quartz-rich gneiss

2 Calc-silicate rocks

Nokomis Group

1 Granitoid gneisses

--- Geological boundary (approximate)

40° Foliation (inclined)

— EM conductor (A.F. 91598, 90674)

..... Ore-bearing horizon

* Cordierite-anthophyllite rocks

~~~ Fault (Molly Lake)

Geology by Froese and Goetz (1981).

○ Drill hole (A.F. 91598)

— Winter road

○—○ Powerline

**Figure 37-1:** General geology, geophysical conductors and diamond-drill hole locations at occurrences 37 and 38

**LOCATION: 38**

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

UTM: 6111602N/372290E

AREA: Northeast of Molly Lake.

AIRPHOTO: A26369-196

ACCESS: Jungle Lake siding access road from Sherridon, Manitoba to Molly Lake or to powerline north of Molly Lake, traverse.

**EXPLORATION SUMMARY:**

The area was first staked as Larry 2 (Mining claim map, 63N/3NE, *circa* 1930). E.L. Brown held the ground as Ben 27 in 1943-1945. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). HBED staked Nok 266 in 1957. HBED did an HLEM survey and drilled DDH N7 (148.4 m) in 1958 (A.F. 91598). The claim lapsed in 1962. D. Brightnose staked Sal 6 in 1966. Kimberly Copper Mines Limited acquired the property and carried out magnetic and EM-16 surveys in 1967-1968 (A.F. 90674, A.F. 90663). Sal 6 lapsed in 1971. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). Elken Exploration Limited staked CB 9785 in 1979. Selco Inc. carried out magnetic and HLEM surveys on behalf of Elken Exploration Limited in 1981 (A.F. 92940, Map 3227B). The claim lapsed in 1982. The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km<sup>2</sup>. Noko Resources Inc. staked Angie 9 in 1988 and transferred it to Varna Gold Inc. in 1991. L. Racic restaked the area as Erik 11 in 1991.

**GEOLOGICAL SETTING:**

The area is underlain by biotite- or hornblende-bearing quartz-rich quartzofeldspathic gneiss (Fig. 37-1; Froese and Goetz, 1981). The drillhole intersected a sequence of hornblende - plagioclase - quartz - biotite  $\pm$  garnet gneiss, granitoid gneiss and quartz - feldspar - hornblende - biotite gneiss, structurally underlain by garnetiferous gabbro and diorite. The gabbro and diorite contain a hornblende - biotite - feldspar  $\pm$  quartz gneiss sequence. A graphitic schist layer occurs within the sequence of quartzofeldspathic gneiss up hole from the gabbroic rocks.

**MINERALIZATION:**

The graphite schist layer contains minor amounts of disseminated pyrite and was documented over a core length

of 1.1 m. Within the hornblende - biotite - feldspar  $\pm$  quartz gneiss sequence a number of intersections that are 'well mineralized' with pyrite, pyrrhotite and minor amounts of chalcopyrite were documented over approximately 4.5 m.

**GEOCHEMICAL DATA:**

None.

**CLASSIFICATION:**

Chemical sediment type deposit; sulphide facies iron formation. Two mineralization types were intersected in the drillhole: 1) a nongraphitic sulphide facies iron formation (*cf.* Location 8, Ostry and Trembath, 1992) and 2) a graphitic sulphide facies iron formation (*cf.* Location 37).

**REFERENCES:**

- Assessment File 90663, 90674, 91598, 91616, 91695, 92940  
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- Bateman, J.D. and Harrison, J.M.  
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1976: Petrological studies in the Sherridon area, Manitoba; Geological Survey of Canada, Report of Activities, Part A, Paper 76-1A, p. 171-172.
- Froese, E. and Goetz, P.A.  
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- Ostry G. and Trembath, G. D.  
1992: Mineral Deposits and Occurrences in the Batty Lake Area, NTS 63N/2; Manitoba Energy and Mines, Mineral Deposit Series, Report No. 19; 276p.
- Schledewitz, D.C.P.  
1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

**LOCATION: 39**

NAME: (A.F. Mineralization intersected by diamond drilling)  
 UTM: 6119639N/350456E  
 AREA: West of Yakushavich Island, Kississing Lake (Fig. 39).  
 AIRPHOTO: A26362-069  
 ACCESS: Kississing Lake.

**EXPLORATION SUMMARY:**

Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). E.C. Jacka staked Col 32 to Col 39 in 1959. Prospectors Airways Company, Limited acquired Col 32, 33, 36, 37 and 40 in 1960. The claims lapsed in 1960-1962. In 1979 Elken Exploration Limited staked CB 9802. Selco Inc. did magnetometer (Scintrex MP-2, MFD-4) and HLEM (Apex MaxMin II) surveys and drilled DDH 11-4-1 (79.2 m), DDH 11-4-2 (50.8 m) and DDH 11-5-1 (61 m) in 1980 (A.F. 93002, A.F. 93025). A 6-hole 544 m diamond drill program was done by Selco Inc. in 1981 (DDH 11-11-1 to DDH 11-11-6; A.F. 93002). The HLEM survey was repeated and DDH 11-11-7 (107.80 m) was drilled in 1982 (A.F. 93002, Map 3426B). The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km<sup>2</sup>. Selco Inc. did an airborne Input (Mark VI) survey in 1983 (A.F. 93048), and HLEM, magnetic (EDA PPM 350) and pulse EM surveys in 1984 (A.F. 93046, Map 3709B, Map 3784). The pulse EM survey results were not submitted. BP Resources Canada Limited acquired CB 9802 in 1986. The claim was cancelled in 1990. Fer 1, 2, 4 and 5 were staked by W.S. Ferreira Ltd. in 1991. In 1992 the claims were transferred to 2460122 Manitoba Ltd. The same year 2460122 Manitoba Ltd. changed its name to Canmine Holdings Ltd. (now Canmine Resources Corporation). From 1993-1995 Canmine conducted geological mapping, geophysical surveys and diamond drilling in the Yakushavich Island and Collins Point area.

**GEOLOGICAL SETTING:**

The pre-Canmine drillholes were collared on Kississing Lake. Greywacke derived gneiss, possibly part of the Burntwood River Metamorphic Suite, crop out to the east along the west shoreline of Yakushavich Island and southwest along the north shoreline of an unnamed island (Schledewitz, 1988; Fig. 39-1). The DDH intersected a layered sequence of siliceous biotite paragneiss ± garnet ± calc-silicate minerals ± graphite and pelitic fine- to coarse-grained garnet/biotite paragneiss ± graphite. More typical fine grained Burntwood type quartzofeldspathic biotite and garnet gneiss with disseminated graphite was intersected in DDH 11-11-1 and 11-11-2 and possibly in DDH 11-11-5 and 11-5-1. Anthophyllite was identified in the core from DDH 11-4-1, 11-4-2, 11-11-5, 11-11-6. Chlorite was identified in the core from all holes and locally, sillimanite and muscovite form important constituents of the core.

Drilling by Canmine in the Yakushavich Island and Collins Point area intersected near solid to solid sulphides and gneisses altered to anthophyllite-cordierite and quartz-sericite-chlorite rock (Canmine Press Releases, January 17, 1994 and January 9, 1995).

**MINERALIZATION:**

Three predominant styles of mineralization were intersected in the pre-Canmine drillholes, these are: 1) near solid to solid sulphide layers usually with associated disseminated sulphide mineralization; 2) disseminated sulphide mineralization; and 3) disseminated and near solid sulphide mineralization associated with quartz monzonite rock. All DDH, with the exception of DDH 11-11-7 and 11-11-1 intersected near solid pyrite/pyrrhotite - chalcopyrite - sphalerite ± galena mineralization. DDH 11-4-1 and 11-4-2 intersected 'well mineralized' to near solid polymetallic sulphides over core lengths of 2.4 and 12.7 m, respectively. Siliceous biotite paragneiss that contains minor amounts of disseminated pyrite and chalcopyrite associated with thin chloritic layers was intersected down hole, over a core length of approximately 4 m, from the near solid sulphide intersection in DDH 11-4-2. Approximately 18 m of siliceous biotite paragneiss that contains erratic concentrations of garnet and disseminated graphite and chalcopyrite was intersected down hole from the sulphide intersection in DDH 11-4-1. Both holes also intersected disseminated and/or near solid pyrite/pyrrhotite - chalcopyrite - sphalerite sulphide mineralization associated with a locally chloritic and/or anthophyllitic matrix within quartz monzonitic sections. Near solid mineralization within the quartz monzonite was intersected over core lengths of 70 cm and 1.3 m in DDH 11-4-2. DDH 11-11-2 also intersected two zones/layers of polymetallic sulphide mineralization, i.e., up to 30% disseminated pyrite/pyrrhotite - chalcopyrite - sphalerite sulphide mineralization within a 12 m long altered chloritic section, and approximately 2 m of 'well mineralized' to near solid pyrite/pyrrhotite - chalcopyrite - sphalerite sulphide mineralization down hole. Both mineralized intersections occur within siliceous biotite/garnet paragneiss. The 12 m section contains near solid sulphide intersections of 24 and 60 cm and the 2 m section contains a 90 cm long solid sulphide intersection. Minor amounts of disseminated pyrite and galena were documented within the siliceous biotite/garnet paragneiss elsewhere in the core. DDH 11-11-6 and 11-11-1 intersected disseminated sulphide mineralization within siliceous biotite paragneiss over core lengths of 29 and 26 m, respectively. Up to 10% disseminated pyrrhotite and rare galena, and possibly arsenopyrite, was documented in the core from DDH 11-11-1. Three near solid sulphide intersections, 15, 4 and 46 cm in core length, that consist of pyrite ± sphalerite ± chalcopyrite occur within the mineralized section from DDH 11-11-6. A biotite/anthophyllite section that contains disseminated chalcopyrite was documented immediately down hole from the near solid sulphide layers. Approximately 10% disseminated chalcopyrite and galena within quartz monzonite was intersected over 1.3 m in DDH 11-11-1. DDH 11-11-5 and 11-5-1 intersected near solid pyrite/pyrrhotite - chalcopyrite - sphalerite sulphide mineralization within siliceous biotite ± garnet paragneiss over core lengths of 2.7 and 2.8 m, respectively. Disseminated pyrite/pyrrhotite - chalcopyrite mineralization was documented within siliceous paragneiss up hole from the near solid sulphide intersections in the core from both holes. With the exception of DDH 11-11-7, DDH 11-11-3 was drilled at approximately 90 degrees to the aforementioned holes and intersected 'well mineralized' to near solid pyrite/pyrrhotite - chalcopyrite - sphalerite sulphide mineralization over 3 m in core length. This section includes a 10 cm long solid sphalerite intersection. In addition a crude, down



hole, metal zonation was documented within this section that consists of disseminated chalcopyrite to disseminated sphalerite and, lastly, solid sphalerite. Siliceous biotite  $\pm$  garnet  $\pm$  graphite paragneiss that contains minor amounts of disseminated pyrrhotite, and pyrite along fracture surfaces, occurs for approximately 6 m up hole from the well mineralized section. Further up hole disseminated pyrite - chalcopyrite - sphalerite mineralization was documented within a 7.6 m long siliceous biotite paragneiss intersection. The best mineralized section contains 20% sulphide (pyrite, sphalerite and chalcopyrite) over 1.2 m. Exploration by Canmine has identified 8 zinc-copper rich zones in the vicinity of Yakushavich Island and Collins Point (Fig 39-2). Location 39 comprises the Fer Zone, Fer South Zone and Ruby Zone.

#### GEOCHEMICAL DATA:

Core samples from the mineralized intersections were assayed for Au, Ag, Cu, and Zn and selectively for Pb. All near solid sulphide layers contained anomalous concentrations of Zn, Ag and, locally, high concentrations of Cu and Au. Some of the higher metal concentrations include: 1) 6.8% Zn, 1.16% Cu and 10.29 g/t Ag over 1.7 m (DDH 11-4-2); 2) 3.6% Zn over 2.37 m (DDH 11-4-1); 3) 4.8% Zn, 0.8% Cu and 9.26 g/t Ag over 3.04 m (DDH 11-11-2); 4) 3.99% Zn, 0.66% Cu and 7.89 g/t Ag over 1.82 m (DDH 11-11-2); 5) 2.68% Zn, 0.64% Cu and 4.46 g/t Ag over 1.53 m (DDH 11-11-2); 6) 1.54% Zn and 3.09 g/t Ag over 1.52 m (DDH 11-11-6); 7) 1.1% Zn, 0.8% Cu and 6.86 g/t Ag over 1.4 m (DDH 11-5-1); and 8) 0.81% Cu, 1.17 g/t Au and 2.06 g/t Ag over 1.52 m (DDH 11-11-5).

Sulphide mineralization associated with quartz monzonitic rock were locally anomalous in Ag, Au, Cu and/or Zn. The highest metal concentrations include: 1) 147.77 g/t Ag and 11.66 g/t Au over 1.52 m (DDH 11-11-1); 2) 3.43 g/t Ag, 1.05% Zn and 0.33% Cu over 1.6 m (DDH 11-4-1); 3) 5.4% Zn and 0.36% Cu over 1.3 m (DDH 11-4-2); and 4) 4% Zn and 0.88% Cu over 70 cm (DDH 11-4-2).

Disseminated sulphide mineralization was locally anomalous in Ag, Au and/or Zn. A 1.52 m core sample from DDH 11-11-1 contained 19.2 g/t Ag and 0.69 g/t Au, and a 1.53 m core sample from DDH 11-11-3 contained 1.91% Zn, and 3.77 g/t Ag.

Canmine reports the Fer Zone contains 1 700 000 tonnes of 0.61% Cu, 3.21% Zn, 0.34% Pb, 0.029 oz/ton Au, and 0.45 oz/ton Ag, and the nearby Island Zone (Fig. 39-2) contains 300 000 tonnes of 1.01% Cu and 5.02% Zn (Canmine Resources Corporation (CMR) Newsletter, August, 1995). Combined reserves from the 8 zinc-copper rich zones is 2.6 million tonnes of 2.95% Zn, 0.71% Cu, 0.33 oz/ton Ag and 0.008 oz/ton Au (Karen Ferreira, Canmine Resources Corporation, written communication, January 13, 1997).

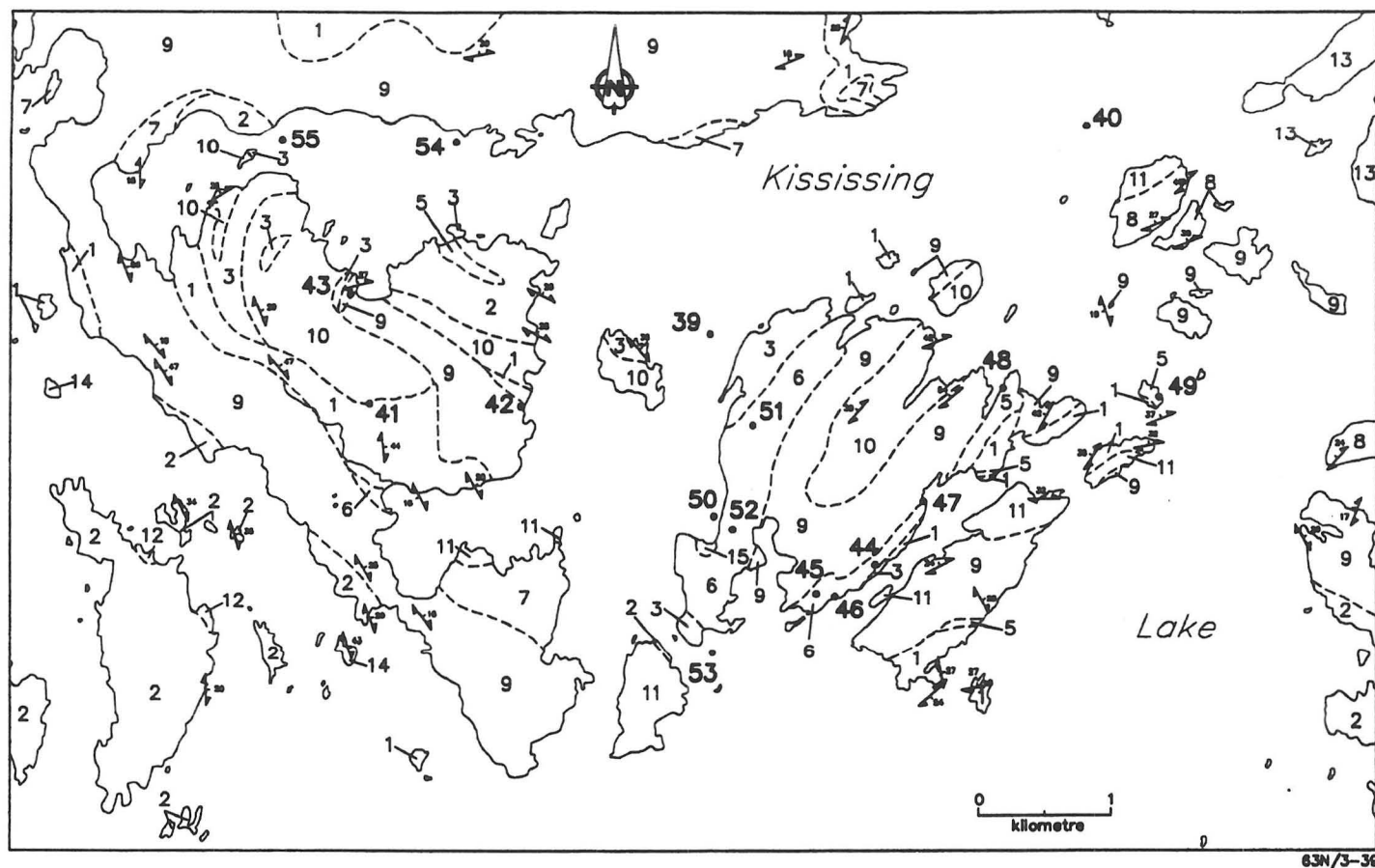
#### CLASSIFICATION:

Stratabound massive sulphide type deposit; sedimentary rock associated. The local concentrations of chlorite, anthophyllite, sillimanite and muscovite (sericite?) that are associated with disseminated chalcopyrite and pyrite/pyrrhotite mineralization and proximate to the near solid and solid sulphide layers is suggestive of alteration like that commonly associated with massive sulphide type deposits. A complex deformational history in this area is indicated by variability in EM conductor trends and the possible reversals in stratigraphic tops that could be interpreted from the position of hydrothermally altered rocks and disseminated sulphide mineralization with respect to the near solid to solid sulphide layers. Host rocks to the mineralization, as described in the drill logs, are analogous to the quartz-rich quartzofeldspathic gneisses of the Sherridon Metamorphic Suite. It is also possible that the quartz monzonitic rocks are anatectic in origin and derived *in situ*.

Canmine Resources Corporation interprets the mineralization at Location 39 (the Fer, Fer South and Ruby Zones) to occur at the same stratigraphic position as the mineralization at Location 41 (Spruce Zone), Location 44 (Yak Zone), the Prism Zone, the Bay Zone and the Island Zone. Furthermore, Canmine suggests that this mineralized layer(s) outlines a trough shaped synformal structure, approximately 3 km across (Fig. 39-2).

#### REFERENCES:

- Assessment File 91616, 93002, 93025, 93046, 93048  
Manitoba Energy and Mines, Minerals Division.
- Canmine Resources Corporation (CMR) Newsletter, August, 1995
- Frarey, M.J.  
1961: Collins Point, Manitoba; Geological Survey of Canada, Map 1068A with descriptive notes, 1:63 360.
- Gale, G.H.  
1980: Mineral deposit studies - Flin Flon/Kisseynew; in Manitoba Energy and Mines, Mineral Resources Division, Report of Field Activities, 1980, p. 54, 60-61.
- Kaszycki, C.A.  
1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118, 73p.
- 1985: Kisseynew Project: Kississing Lake, Big Island-Yakushavich Island region; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 54-56.
- 1986: Kisseynew Project: Kississing Lake; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1986, p. 92-95.
- Schledewitz, D.C.P.  
1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.



63N/3-39

#### Intrusive Rocks

- 15 Two-mica leucogranite
- 14 Biotite leucogranite, pegmatite
- 13 Foliated monzogranite and granodiorite
- 12 Coarse grained amphibolite, metagabbro
- 11 Mesocratic hornblende-biotite gneiss
- 10 Tonalitic to granodioritic gneiss

#### Missi Metamorphic Suite

- 9 Quartz-feldspar-hornblende-biotite gneiss
- 8 Quartz-rich paragneiss
- 7 Varicoloured paragneiss

#### Unnamed Gneisses

- 6 Uniform amphibolite

- 5 Garnetiferous amphibolite

- 4 Rusty biotite-plagioclase-quartz gneiss

- 3 Garnet-hornblende-biotite-graphite gneiss

#### Burntwood Metamorphic Suite

- 2 Garnet-biotite gneiss, metagreywacke

- 1 Metatextite derived from greywacke

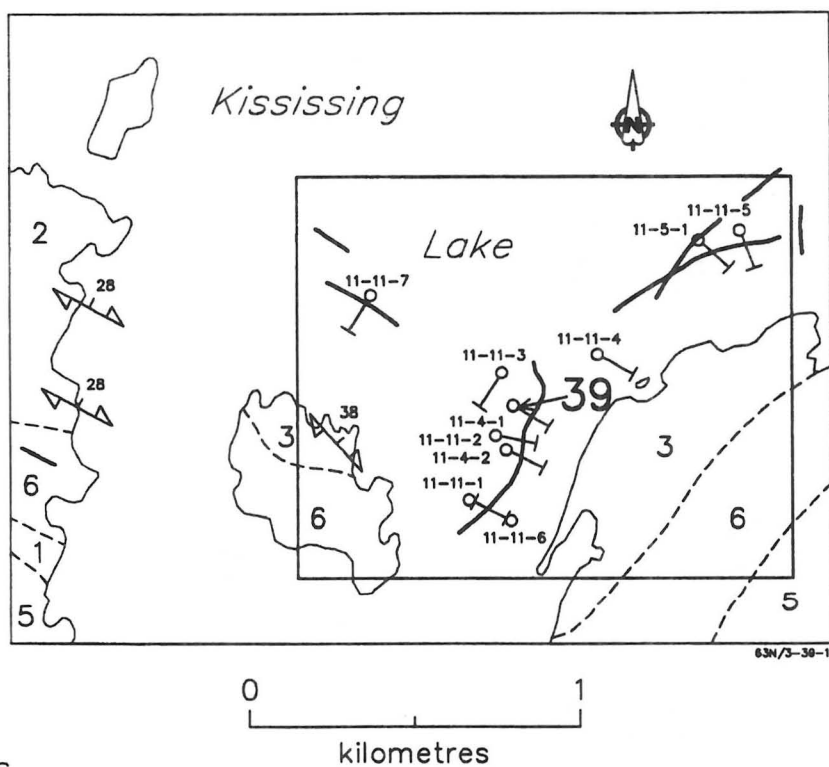
----- Geological boundary (approximate)

↖ Schistosity and layering

Geology after Schledewitz (1988).

42. Occurrence location

Figure 39: General geology in the vicinity of occurrences 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54 and 55



## Intrusive Rocks

6 Tonalitic to granodioritic gneiss

Missi Metamorphic Suite

5 Quartz-feldspar-hornblende-biotite gneiss

## Unnamed Gneisses

4 Uniform amphibolite

### 3 Garnet–hornblende–biotite–graphite gneiss

Burntwood River Metamorphic Suite

2 Garnet-biotite gneiss, metagreywacke

1 Metatexite derived from greywacke

----- Geological boundary  
(approximate)

28

## Schistosity and layering

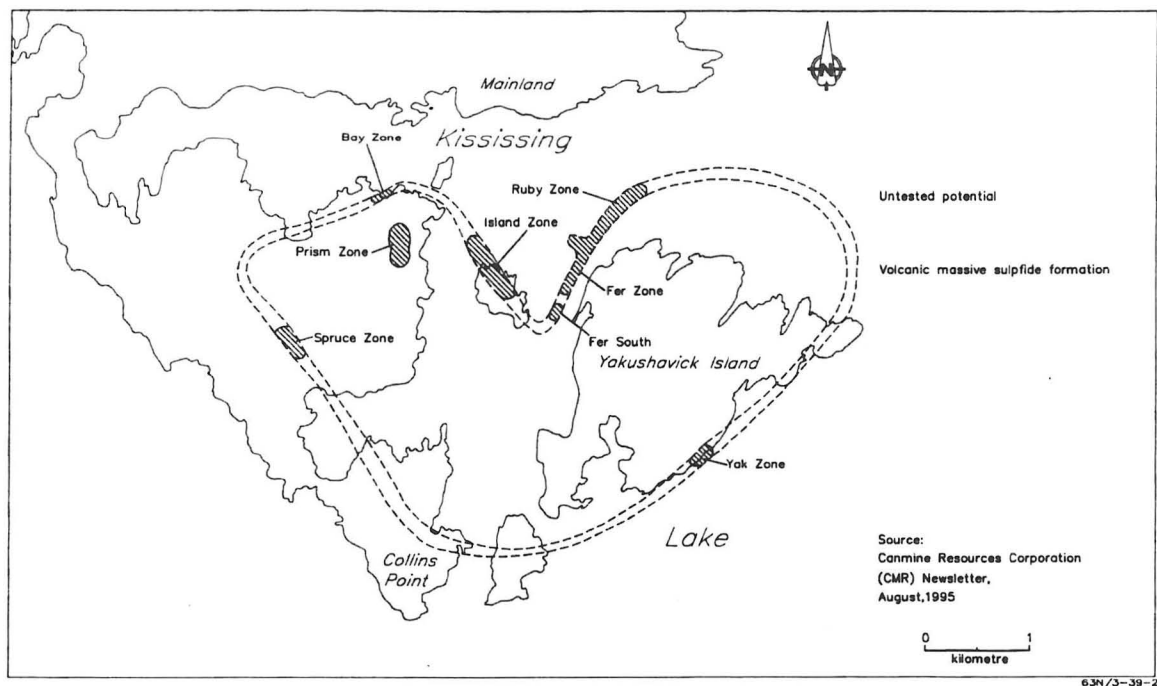
Geology after Schledewitz (1988).

———— EM conductor (A.F. 93002)

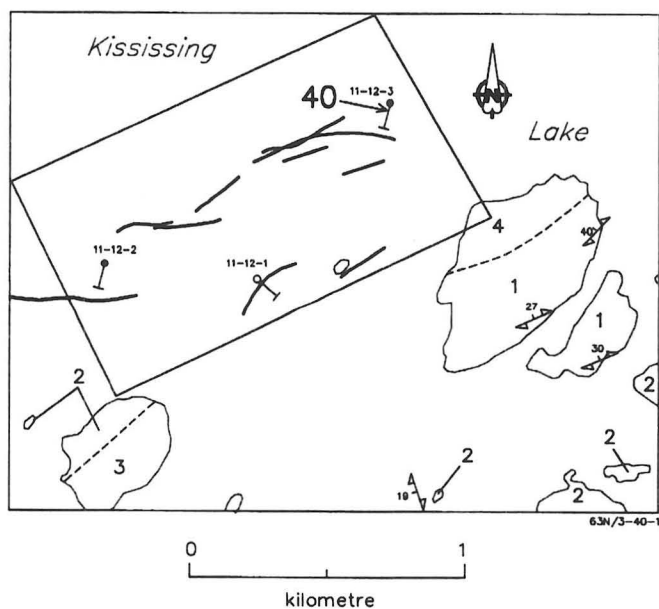
○— Drillhole (A.F. 93002)

☐ Area encompassed by Mineral Deposit File

**Figure 39-1: General geology, geophysical conductors and diamond-drill hole locations at occurrence 39**



**Figure 39-2:** Location of zinc-copper rich sulphide mineralization in the Collins Point and Yakushavick Island area, Kississing Lake, Manitoba



#### Intrusive Rocks

- 4 Mesocratic hornblende-biotite gneiss
- 3 Tonalitic to granodioritic gneiss

#### Missi Metamorphic Suite

- 2 Quartz-feldspar-hornblende-biotite gneiss
- 1 Quartz-rich paragneiss

----- Geological boundary (approximate)

25 Schistosity and layering

#### Geology after Schledewitz (1988).

— EM conductors (A.F. 93002, 93049)

○ Drillholes (A.F. 93002)  
● (A.F. 93049)

40 Occurrence location

□ Area encompassed by Mineral Deposit File

**Figure 40-1:** General geology, geophysical conductors and diamond-drill hole locations at occurrence 40

#### LOCATION: 40

NAME: (A.F. Mineralization intersected by diamond drilling)  
UTM: 6121352N/353329E  
AREA: North of Yakushavich Island (Fig. 39).  
AIRPHOTO: A26362-163  
ACCESS: Kississing Lake.

#### EXPLORATION SUMMARY

Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). In 1959 G. Zimmer staked Big 55 and Rachael Campbell staked Big 56 to Big 60. In 1959 Prospectors Airways Company, Limited acquired Big 56 and did an EM survey on the Big group of claims (A.F. 90681). The claims lapsed in 1960-1961. In 1980 Elken Exploration Limited staked CB 10411. In 1981 Selco Inc. did magnetometer (Geometrics G816) and HLEM (Apex MaxMin II) surveys and drilled DDH 11-12-1 (49.07 m) on CB 10411 (A.F. 93002, Grid 12). The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km<sup>2</sup>. Elken Exploration staked the Pem claim in 1984. In 1984 Selco Inc. did magnetic (EDA PPM 350) and Pulse EM surveys, and drilled DDH 11-12-2 (261.21 m) on CB 10411 and DDH 11-12-3 (236.83 m) on PEM (A.F. 93046, Map 3784; A.F. 93049, Map 3816D). BP Resources Canada Limited acquired the property in 1986. The claims were cancelled in 1990. Fer 12 was staked by Canmine Holdings Ltd. (now Canmine Resources Corporation) in 1993. From 1993-1995 Canmine conducted geological mapping, geophysical surveys and diamond drilling in the Yakushavich Island and Collins Point area.

#### GEOLOGICAL SETTING:

The drillholes were collared on Kississing Lake. Missi Suite (former Missi Metamorphic Suite) intermediate feldspar - quartz gneiss ± biotite ± hornblende ± magnetite ± muscovite ± epidote - quartz layers, felsic to intermediate intrusive units, and amphibolite ± garnet ± diopside ± calcite, calc-silicate gneiss ± carbonate layers and/or hornblende-plagioclase gneiss (Fig. 40-1; Schledewitz, 1988) crop out in the vicinity. DDH 11-12-1 did not intersect bedrock. The other drillholes intersected garnet-biotite ± graphite gneiss, siliceous quartzofeldspathic biotite ± garnet ± hornblende ± magnetite gneiss, granodiorite/quartz monzonite, and amphibolite/hornblende - feldspar gneiss with pegmatitic and/or calc-silicate interlayers (A.F. 93049). Thin calc-silicate rich intersections were documented locally, predominantly within the quartzofeldspathic gneiss.

Drilling by Canmine in the Yakushavich Island and Collins Point area intersected near solid to solid sulphides and gneisses altered to anthophyllite-cordierite and quartz-sericite-chlorite rock (Canmine Press Releases, January 17, 1994 and January 9, 1995).

#### MINERALIZATION:

Disseminated graphite ± pyrite were documented locally within the garnet-biotite gneiss layers. Up to 60% graphite within three intersections, each approximately 10 cm in core length, occur within the graphite-biotite gneiss encountered in DDH 11-12-3. Disseminated pyrite, pyrrhotite ± chalcopyrite mineralization occurs at or near the contact

between granodioritic intrusive rocks and garnet-biotite gneiss. Near solid pyrite + chalcopyrite mineralization was intersected over approximately 60 cm in core length (DDH 11-12-3) and occurs within a quartzofeldspathic gneiss inclusion in granodioritic (anatectic?) rock. Disseminations and 'scattered thin' layers of pyrrhotite and pyrite ± chalcopyrite commonly occur within the amphibolite/hornblende - feldspar layers in both drillholes. Exploration by Canmine has identified 8 zinc-copper rich zones in the vicinity of Yakushavich Island and Collins Point (Fig 39-2).

#### GEOCHEMICAL DATA:

Core samples that contained sulphide mineralization were analyzed for Cu, Zn, Au and Ag. All analyses of samples from the drillholes contained elevated concentrations of Cu (up to 3300 ppm), Zn (12-330 ppm) and, locally, Au (up to 180 ppb). Core samples of 70 cm and 60 cm in length from the near solid pyrite ± chalcopyrite mineralization in DDH 11-12-3 contained 3300 and 2000 ppm Cu, respectively. A 22 cm long core sample of amphibolite intersected in DDH 11-12-3 that includes thin pyrrhotite and pyrite ± chalcopyrite layers contains 1300 ppm Cu.

Combined reserves from the 8 zinc-copper rich zones is 2.6 million tonnes of 2.95% Zn, 0.71% Cu, 0.33 oz/ton Ag and 0.008 oz/ton Au (Karen Ferreira, Canmine Resources Corporation, written communication, January 13, 1997).

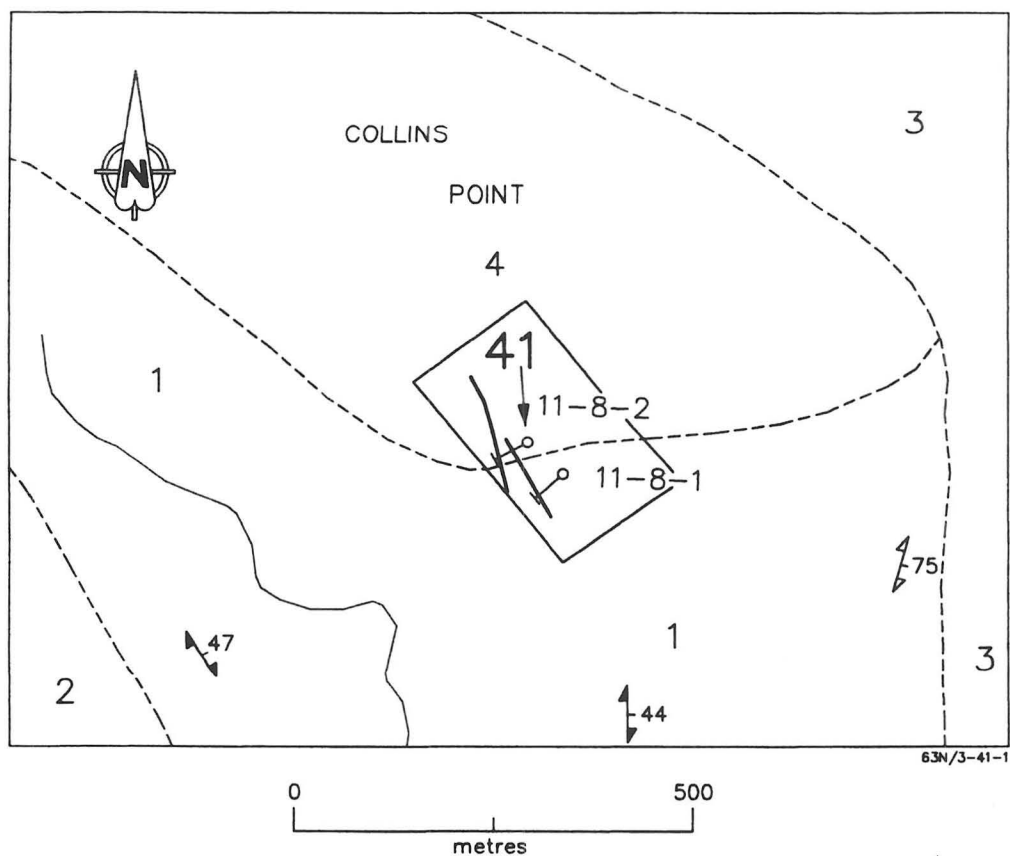
#### CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. The near solid pyrite - chalcopyrite mineralization may be the along strike equivalent of the mineralization at Location 39. The graphitic intersections are interpreted to be graphitic sulphide facies iron formation. Although only graphite may be recorded in the drill log, the majority of this type of occurrence has been found to contain more Fe sulphide than carbon (Gale *et al.*, 1980). Canmine Resources Corporation interprets the mineralization at Location 39 (the Fer, Fer South and Ruby Zones) to occur at the same stratigraphic position as the mineralization at Location 41 (Spruce Zone), Location 44 (Yak Zone), the Prism Zone, the Bay Zone and the Island Zone. Furthermore, Canmine suggests that this mineralized layer(s) outlines a trough shaped synformal structure, approximately 3 km across (Fig. 39-2).

#### REFERENCES:

- Assessment File 90681, 91616, 93002, 93046, 93049  
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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.  
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1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.





Intrusive Rocks  
Orthogneisses

4 Tonalitic to granodioritic  
gneiss

Missi Metamorphic Suite

3 Quartz-feldspar-hornblende-  
biotite gneiss

2 Varicoloured gneiss

Burntwood River Metamorphic Suite

1 Metatextite derived from  
greywacke

----- Geological boundary  
(approximate)

75

Schistosity and layering

47

Gneissosity (inclined)

Geology after Schledewitz (1988).

———— EM conductors (A.F. 93025,  
A.F. 93002)

—○— Drillholes (A.F. 93025,93002)

□ Area encompassed by  
Mineral Deposit File

**Figure 41-1:** General geology, geophysical conductors and diamond-drill hole locations at occurrence 41

#### LOCATION: 41

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

UTM: 6119107N/347842E

AREA: Collins Point, Kissinging Lake (Fig. 39).

AIRPHOTO: A26331-221

ACCESS: Kissinging Lake.

#### EXPLORATION SUMMARY:

The area was first staked as Dome 3, 4, 6 and 14 (Mining claim map, 63N/3 NW, *circa* 1930). The ground was also partly covered by Capital 5 leased (M-273) by M.J. Isman in 1934. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). A. Erickson staked Hu 9 in 1956. Pre-Cam Exploration & Development Ltd. did a magnetic (Sharpe A2) survey on the Hu claims in 1957 (A.F. 90682). Hu 9 was cancelled in 1958. Lease M-273, covering Capital 5, was cancelled in 1976. In 1979 Elken Exploration Limited staked CB 9804. Selco Inc. did magnetometer (Scintrex MFD-4, MP2) and HLEM (Apex MaxMin II) surveys, and drilled DDH 11-8-1 (39.7 m) and DDH 11-8-2 (71.63 m) in 1980-1981 (A.F. 93025; A.F. 93002). The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km<sup>2</sup>. BP Resources Canada Limited acquired the claim in 1986. CB 9804 was cancelled in 1990. Fer 8 was staked by W.S. Ferreira Ltd. in 1991 and was transferred to 2460122 Manitoba Ltd. in 1992. The same year 2460122 Manitoba Ltd. changed its name to Canmine Holdings Ltd. (now Canmine Resources Corporation). From 1993-1995 Canmine conducted geological mapping, geophysical surveys and diamond drilling in the Yakushavich Island and Collins Point area.

#### GEOLOGICAL SETTING:

The area is underlain by felsic intrusive rocks; monzogranite, granodiorite, tonalite and Burntwood Suite (former Burntwood River Metamorphic Suite) greywacke derived metatexite (Fig. 41-1; Schledewitz, 198). Both DDH were apparently collared in quartz monzonite and intersected an interlayered sequence of fine grained siliceous biotite-plagioclase-quartz  $\pm$  garnet  $\pm$  sillimanite paragneiss and quartz monzonite.

Drilling by Canmine in the Yakushavich Island and Collins Point area intersected near solid to solid sulphides and gneisses altered to anthophyllite-cordierite and quartz-sericite-chlorite rock (Canmine Press Releases, January 17, 1994 and January 9, 1995).

#### MINERALIZATION:

DDH 11-8-1 intersected approximately 6 m of siliceous paragneiss that contains anthophyllite with galena, and sillimanite as important local constituents. This gneiss is underlain by a near solid sulphide layer, approximately 70 cm in core length, that consists of 45% pyrrhotite and 5% chalcopyrite within a siliceous medium grained rock. This inter-

section contains abundant chlorite and a dark green silicate mineral, possibly gahnite. Further down hole a 5 cm intersection within siliceous paragneiss contains massive pyrrhotite  $\pm$  chalcopyrite with minor amounts of gahnite (?). DDH 11-8-2 intersected up to 50% pyrrhotite  $\pm$  chalcopyrite  $\pm$  gahnite mineralization within a siliceous paragneiss layer over core lengths of 46 and 90 cm. Exploration by Canmine has identified 8 zinc-copper rich zones in the vicinity of Yakushavich Island and Collins Point (Fig 39-2). Location 41 comprises the Spruce Zone.

#### GEOCHEMICAL DATA:

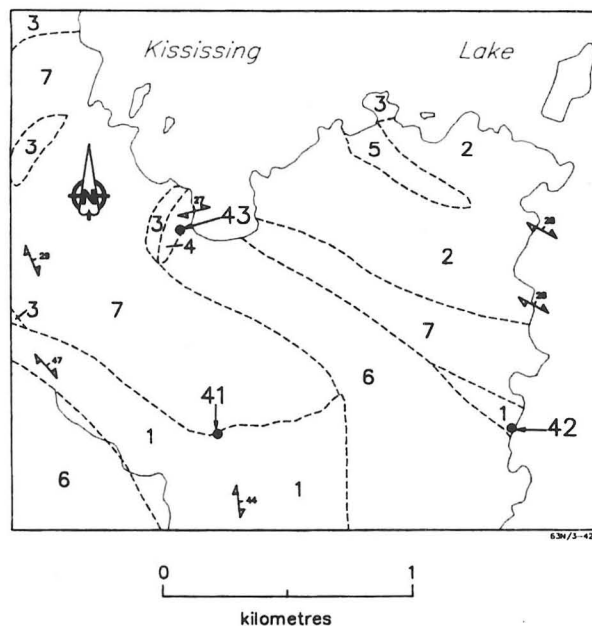
A core sample, that includes the near solid sulphide intersection, in DDH 11-8-1 contained 1.28% Cu, 0.18% Zn, 0.24% Pb, 3.42 g/t Au and 6.17 g/t Ag over 1.77 m. The overlying siliceous paragneiss locally contains anomalous concentrations of Cu, Zn, Pb, Au and Ag. The near solid sulphide intersections in DDH locally contain high concentrations of Cu, Zn, Pb, Au and Ag. Combined reserves from the 8 zinc-copper rich zones is 2.6 million tonnes of 2.95% Zn, 0.71% Cu, 0.33 oz/ton Ag and 0.008 oz/ton Au (Karen Ferreira, Canmine Resources Corporation, written communication, January 13, 1997).

#### CLASSIFICATION:

Stratabound massive sulphide type deposit; sedimentary rock associated. The local concentrations of chlorite, anthophyllite and possibly sillimanite exclusively up hole from the near solid sulphide mineralization is suggestive of alteration like that commonly associated with massive sulphide type deposits. Canmine Resources Corporation interprets the mineralization at Location 41 (Spruce Zone) to occur at the same stratigraphic position as the mineralization at Location 39 (the Fer, Fer South and Ruby Zones), Location 44 (Yak Zone), the Prism Zone, the Bay Zone and the Island Zone. Furthermore, Canmine suggests that this mineralized layer(s) outlines a trough shaped synformal structure, approximately 3 km across (Fig. 39-2).

#### REFERENCES:

- Assessment Files 90682, 91616, 93002, 93025  
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- Frarey, M.J.  
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- 1988: Kissinging Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.



**Figure 42-1: General geology at occurrences 41, 42 and 43**

**Intrusive Rocks**

- 7 Tonalitic to granodioritic gneiss

**Missi Group**

- 6 Quartz-feldspar-hornblende-biotite gneiss  
5 Garnetiferous amphibolite  
4 Rusty biotite-plagioclase-quartz gneiss  
3 Garnet-hornblende-biotite-graphite gneiss

**Burntwood River Metamorphic Suite**

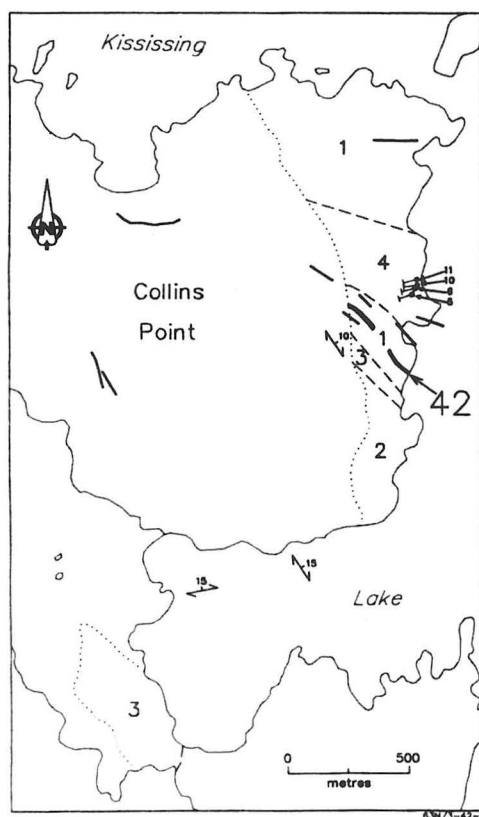
- 2 Garnet-biotite gneiss, metagreywacke  
1 Metatextite derived from greywacke

----- Geological boundary (approximate)

25 Schistosity and layering

Geology after D. Schledewitz (1988).

42 ● Occurrence location



- 4 Granite  
3 Layered amphibolite  
2 Quartzofeldspathic gneiss ± hornblende ± magnetite; contains minor calc-silicate layers  
1 Biotite-quartz gneiss ± garnet ± graphite
- Sulphide layer  
----- Geological boundary (approximate)  
..... Limit of mapping  
—— EM conductor ( A.F. 93025, 93002)  
15 Foliation (inclined)  
— Drillhole (A.F. 90679)

Geology after Gale (1980).

**Figure 42-2: Detailed geology and geophysical conductors in the vicinity of occurrence 42**

**LOCATION: 42****NAME:**

UTM: 6119089N/348982E

AREA: Collins Point on Kississing Lake (Fig. 39).

AIRPHOTO: A26331-220

ACCESS: Kississing Lake.

**EXPLORATION SUMMARY:**

The area was first staked as Poyne, Dome 1, 2, 5, 9 and 12 (Mining claim map, 63N/3 NW, *circa* 1930). Sherritt Gordon Mines Limited optioned the property in 1928 and did considerable surface work (Wright, 1929). Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). B.R. Richards staked Hu 1 to Hu 6 in 1956. In 1957 Pre-Cam Exploration & Development Ltd. did a magnetic (Sharpe A2) survey, and outlined a magnetic anomaly on Hu 1 and Hu 4 (A.F. 90682). A pit on the lake shore was also sampled (A.F. 90682). The Hu claims lapsed in 1958. The ground was held as Col 5, Col 52, Col 53 and Col 54 by Prospectors Airways Company, Limited in 1958-1959. In 1959 Prospectors Airways Company, Limited did an EM survey, and outlined a 122 m long conductor that dips 30-40 north (A.F. 90681). A 4-hole 38 m diamond drill program was done on Col 54 in 1959 (DDH Packsack 5, 6, 10, 11; A.F. 90679). The claims lapsed in 1960-1962. In 1979 Elken Exploration Limited staked CB 9803 and CB 10409. Selco Inc. did magnetometer (Scintrex MFD-4) and HLEM (Apex MaxMin II) surveys in 1980 (A.F. 93025, grid 30-11-9). Gale (1980) examined fourteen trenches in the area. Selco Inc. did an airborne Input EM (Mark VI) survey over the property in 1983 (A.F. 93048). The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km<sup>2</sup>. BP Resources Canada Limited acquired the claims in 1986. CB 9803 and CB 10409 were cancelled in 1990. Fer 6 and Fer 8 were staked by W.S. Ferreira Ltd. in 1991 and were transferred to 2460122 Manitoba Ltd. in 1992. The same year 2460122 Manitoba Ltd. changed its name to Canmine Holdings Ltd. (now Canmine Resources Corporation). From 1993-1995 Canmine conducted geological mapping, geophysical surveys and diamond drilling in the Yakushavich Island and Collins Point area.

**GEOLOGICAL SETTING:**

The area is underlain by Missi Suite (former Missi Group) intermediate feldspar - quartz gneiss  $\pm$  biotite  $\pm$  hornblende  $\pm$  magnetite (Fig. 42-1; Schledewitz, 1988). The drillholes (Fig. 42-2) intersected granite and/or hornblende - biotite  $\pm$  garnet gneiss. The trenches expose rusty weathered biotite-quartz gneiss  $\pm$  garnet  $\pm$  graphite (Gale, 1980).

Drilling by Canmine in the Yakushavich Island and Collins Point area intersected near solid to solid sulphides and gneisses altered to anthophyllite-cordierite and quartz-sericite-chlorite rock (Canmine Press Releases, January 17, 1994 and January 9, 1995).

**MINERALIZATION:**

Rubble adjacent to the east trenches contained disseminated to near solid pyrite, pyrrhotite, sphalerite and galena mineralization associated with quartzose layers (Fig. 42-2; Gale, 1980). The quartzose layers are from 10-15 cm thick and were traced for approximately 500 m along strike. Minor amounts of disseminated pyrite within hornblende - biotite - garnet gneiss were intersected in DDH Packsack 5. Exploration by Canmine has identified 8 zinc-copper rich zones in the vicinity of Yakushavich Island and Collins Point (Fig 39-2).

**GEOCHEMICAL DATA:**

None.

**CLASSIFICATION:**

Chemical sediment type deposit; sulphide facies iron formation. Gale (1980) suggested that the mineralization exposed in the trenches and at Location 43 may represent the same mineralized layer.

**REFERENCES:**

- Assessment File 90679, 90681, 90682, 91616, 93025, 93048  
Manitoba Energy and Mines, Minerals Division.
- Frarey, M.J.  
1949: Collins Point, Manitoba; Geological Survey of Canada, Paper 49-9, Preliminary map with descriptive notes, 1:31 680.  
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- Froese, E.  
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- Gale, G.H.  
1980: Mineral deposit studies - Flin Flon/Kisseynew; in Manitoba Energy and Mines, Mineral Resources Division, Report of Field Activities, 1980, p. 51, 56, 59, 64.
- Harrison, J.M.  
1949: Kississing, Saskatchewan-Manitoba; Geological Survey of Canada, Map 970A with descriptive notes, 1:253 440.
- Kaszycki, C.A.  
1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118, 73p.
- Schledewitz, D.C.P.  
1986: Kisseynew Project: Kississing Lake; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1986, p. 92-95.  
1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.
- Wright, J.F.  
1929: Kississing Lake, Manitoba; Geological Survey of Canada, Summary Report 1928, Part B, p. 102-103.

**LOCATION: 43****NAME:**

UTM: 6119954N/347694E

AREA: Collins Point on Kississing Lake (Fig. 39).

AIRPHOTO: A26331-221

ACCESS: Kississing Lake.

**EXPLORATION SUMMARY:**

The area was first staked as Dome 7 and Capital 3 (Mining claim map, 63N/3 NW, *circa* 1930). Lease M-271 covering Capital 3 was issued to M.J. Isman in 1934. Trenches were noted by Frarey (1949). Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). Lease M-271 was cancelled in 1976. In 1979 Elken Exploration Limited staked CB 9804 and CB 10406. Selco Inc. did magnetometer (Scintrex MFD-4) and HLEM (Apex MaxMin II) surveys on the property in 1980 (A.F. 93025, Map 2947B). Gale (1980) examined four trenches in the area. The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km<sup>2</sup>. A magnetometer (EDA PPM 350) survey was done by Selco Inc. on CB 10406 in 1984 (A.F. 93046, Map 3732). BP Resources Canada Limited acquired the claims in 1986. CB 9804 and CB 10406 were cancelled in 1990. Fer 6 and Fer 7 were staked by W.S. Ferreira Ltd. in 1991 and were transferred to 2460122 Manitoba Ltd. in 1992. The same year 2460122 Manitoba Ltd. changed its name to Canmine Holdings Ltd. (now Canmine Resources Corporation). From 1993-1995 Canmine conducted geological mapping, geophysical surveys and diamond drilling in the Yakushavich Island and Collins Point area.

**GEOLOGICAL SETTING:**

The area is underlain by rusty biotite-plagioclase-quartz gneiss  $\pm$  pyrrhotite  $\pm$  pyrite that contains layers or lenses of plagioclase-hornblende-pyrite  $\pm$  chlorite  $\pm$  calcite rock, and Missi Suite (former Missi Group) intermediate feldspar - quartz gneiss  $\pm$  biotite  $\pm$  hornblende  $\pm$  magnetite (Fig. 42-1; Schledewitz, 1988). Gale (1980) documented rusty weathered biotite-quartz gneiss  $\pm$  garnet  $\pm$  graphite in the vicinity.

Drilling by Canmine in the Yakushavich Island and Collins Point area intersected near solid to solid sulphides and gneisses altered to anthophyllite-cordierite and quartz-

sericite-chlorite rock (Canmine Press Releases, January 17, 1994 and January 9, 1995).

**MINERALIZATION:**

Rubble adjacent to the trenches contained disseminated to near solid galena and pyrrhotite mineralization associated with a quartz-feldspar pegmatite (Gale, 1980). Exploration by Canmine has identified 8 zinc-copper rich zones in the vicinity of Yakushavich Island and Collins Point (Fig 39-2). The mineralization at Location 43 may represent mobilizate derived from the Prism Zone.

**GEOCHEMICAL DATA:**

None.

**CLASSIFICATION:**

Vein type deposit. Multiple veins or lenses. Gale (1980) suggested that the mineralization could be mobilizate derived from the sulphide bearing layer(s) that are exposed at Location 42.

**REFERENCES:**

- Assessment File 91616, 93025, 93046  
Manitoba Energy and Mines, Minerals Division.
- Frarey, M.J.  
1949: Collins Point, Manitoba; Geological Survey of Canada, Paper 49-9, Preliminary map with descriptive notes, 1:31 680.
- 1961: Collins Point, Manitoba; Geological Survey of Canada, Map 1068A with descriptive notes, 1:63 360.
- Gale, G.H.  
1980: Mineral deposit studies - Flin Flon/Kisseynew; in Manitoba Energy and Mines, Mineral Resources Division, Report of Field Activities, 1980, p. 51, 56, 64.
- Kaszycki, C.A.  
1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118, 73p.
- Schledewitz, D.C.P.  
1986: Kisseynew Project: Kississing Lake; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1986, p. 92-95.
- 1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.



**LOCATION: 44****NAME:**

UTM: 6117854N/351732E

AREA: Southeast Yakushavich Island, Kississing Lake (Fig. 44).

AIRPHOTO: A26362-161

ACCESS: Kississing Lake.

**EXPLORATION SUMMARY:**

The area was first covered by the Cat, Loon, and Cold claims (Mining claim map, 63N/3 NW, *circa* 1930). W. Yakushavich staked the Cat claim in 1925, and transferred it to H.L. Weber (trustee of Cold Lake Syndicate) in 1926. The claim reverted to Yakushavich in 1926 and was optioned by R.J. Jowsey from 1928 to 1929. Wright (1929) examined trenches on the Cat and Loon claims. Lease M-837 was issued for the Cat claim in 1937. The ground was partly held as Royal 1 and Royal 8 by J.M. Wanless in 1942-1943, and as Win 8 and Win 12 by E. Rapson and G. Rapson in 1952-1953. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). Lease M-837 was cancelled in 1958. The ground was held as Yak 1 and Yak 2 by G. Rapson in 1959-1960, as Col 62 and Col 65 by J.W. Campbell in 1960-1961, as CB 3924 by G. Rapson in 1971-1973, and as CB 6287 by H.L. Thompson in 1974-1976. In 1979 Elken Exploration Limited staked CB 9806. Selco Inc. did magnetometer (Scintrex Fluxgate MFD-4) and HLEM (Apex MaxMin II) surveys, and drilled DDH 11-1-3 (48.19 m) in 1980 (A.F. 93025, grid 1). Gale (1980) mapped three trenches in the area. The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km<sup>2</sup>. Selco Inc. did HLEM, magnetic (EDA PPM 350) and pulse EM surveys in 1984 (A.F. 93046, Grid 11-1). The pulse EM survey results were not submitted. BP Resources Canada Limited acquired CB 9806 in 1986. The claim was cancelled in 1990. Fer 3 was staked by W.S. Ferreira Ltd. in 1991 and was transferred to 2460122 Manitoba Ltd. in 1992. The same year 2460122 Manitoba Ltd. changed its name to Canmine Holdings Ltd. (now Canmine Resources Corporation). From 1993-1995 Canmine conducted geological mapping, geophysical surveys and diamond drilling in the Yakushavich Island and Collins Point area.

**GEOLOGICAL SETTING:**

The area is underlain by rusty biotite-plagioclase-quartz gneiss ± pyrrhotite ± pyrite that may contain layers or lenses of plagioclase-hornblende-pyrite rock ± chlorite ± calcite and Burntwood Suite (former Burntwood River Metamorphic Suite) biotite-feldspar-quartz paragneiss and/or metatexite ± sillimanite ± graphite ± garnet ± pyrite ± cordierite (Fig. 44-1; Schledewitz, 1988). Gale (1980) mapped a northwest dipping homoclinal sequence that includes, from southeast (shoreline) to northwest, biotite and anthophyllite bearing rock, a sulphide-rich layer, quartz-rich (cherty) layers, garnet-biotite-quartz gneiss, layered garnetiferous amphibolite and pegmatite (Fig. 44-2, 44-3). The drillhole (Fig. 44-1) intersected, down hole: 1) approximately 17.5 m of garnet-biotite paragneiss ± graphite; 2) 25 m of siliceous biotite paragneiss ± sillimanite that contains bands/zones of biotite-rich ± graphite material, and very siliceous rock (with diopside?) layers that are on the order of 10's of cm thick; 3) a 90 cm thick near solid to solid sulphide layer; 4) a 45 cm thick biotite-anthophyllite zone; 5) 1.5 m of siliceous biotite paragneiss that contains a 'few' biotite/chlo-

rite veinlets; and 6) quartz monzonite to hole end.

Drilling by Canmine in the Yakushavich Island and Collins Point area intersected near solid to solid sulphides and gneisses altered to anthophyllite-cordierite and quartz-sericite-chlorite rock (Canmine Press Releases, January 17, 1994 and January 9, 1995).

**MINERALIZATION:**

Gale (1980) documented a near solid sulphide layer composed of sphalerite, pyrite and chalcopyrite that is 25 cm or more thick. The drillhole intersected minor amounts of pyrrhotite/pyrite that occur as disseminations and veinlets within the siliceous biotite paragneiss. The siliceous biotite paragneiss is underlain by approximately 1 m of near solid to solid pyrite, sphalerite and chalcopyrite in a fine grained dark green chlorite matrix. Exploration by Canmine has identified 8 zinc-copper rich zones in the vicinity of Yakushavich Island and Collins Point (Fig 39-2). Location 44 comprises the Yak Zone.

**GEOCHEMICAL DATA:**

Sulphide mineralization intersected by the drillhole was sampled and assayed for Cu, Zn, Pb, Ag and Au. A 1.5 m long sample from the siliceous biotite paragneiss contained 5.49 g/t Au. The sulphide-rich layer contained 5.29% Zn and 0.25% Cu. The biotite-anthophyllite zone contained 0.12% Zn and anomalous Cu.

Exploration by Canmine has identified 8 zinc-copper rich zones in the vicinity of Yakushavich Island and Collins Point (Fig 39-2). Location 39 comprises the Fer Zone, Fer South Zone and Ruby Zone.

**CLASSIFICATION:**

Stratabound massive sulphide type deposit; sedimentary rock associated. The stratigraphic sequence at this locality, *i.e.*, from structural bottom to top: 1) biotite-anthophyllite (altered) rock; 2) stratabound sulphides; and 3) quartz-rich (cherty) layers (possibly exhalative in origin) is one that is usually associated with massive sulphide type mineralization. However, Gale (1980) notes that a definite crosscutting relationship between the anthophyllite-bearing altered rock and the host rocks has not been established.

Canmine Resources Corporation interprets the mineralization at Location 44 (Yak Zone) to occur at the same stratigraphic position as the mineralization at Location 39 (the Fer, Fer South and Ruby Zones), Location 41 (Spruce Zone), the Prism Zone, the Bay Zone and the Island Zone. Furthermore, Canmine suggests that this mineralized layer(s) outlines a trough shaped synformal structure, approximately 3 km across (Fig. 39-2).

**REFERENCES:**

Assessment File 91616, 93025, 93046  
Manitoba Energy and Mines, Minerals Division.

Frarey, M.J.

1949: Collins Point, Manitoba; Geological Survey of Canada, Paper 49-9, Preliminary map with descriptive notes, 1:31 680.

1961: Collins Point, Manitoba; Geological Survey of Canada, Map 1068A with descriptive notes, 1:63 360.

Gale, G.H.

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Gobert, G. and Nielsen, E.

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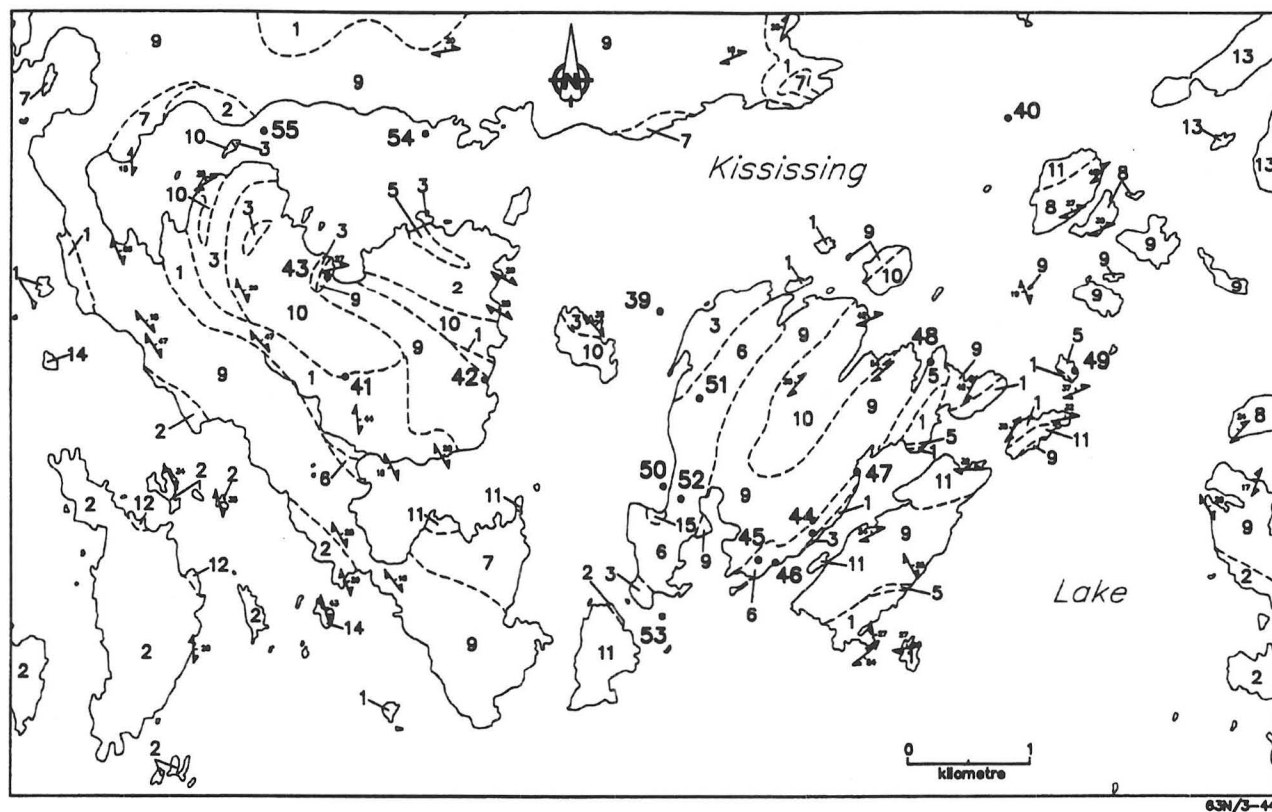
Schledewitz, D.C.P.

1986: Kisseynew Project: Kississing Lake; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1986, p. 92-95.

1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

Wright, J.F.

1929: Kississing Lake, Manitoba; Geological Survey of Canada, Summary Report 1928, Part B, p. 103.



#### Intrusive Rocks

- 15 Two-mica leucogranite
- 14 Biotite leucogranite, pegmatite
- 13 Foliated monzogranite and granodiorite
- 12 Coarse grained amphibolite, metagabbro
- 11 Mesocratic hornblende-biotite gneiss
- 10 Tonalitic to granodioritic gneiss

#### Missi Metamorphic Suite

- 9 Quartz-feldspar-hornblende-biotite gneiss
- 8 Quartz-rich paragneiss
- 7 Varicoloured paragneiss

#### Unnamed Gneisses

- 6 Uniform amphibolite

- 5 Garnetiferous amphibolite

- 4 Rusty biotite-plagioclase-quartz gneiss

- 3 Garnet-hornblende-biotite-graphite gneiss

#### Burntwood Metamorphic Suite

- 2 Garnet-biotite gneiss, metagreywacke

- 1 Metatextite derived from greywacke

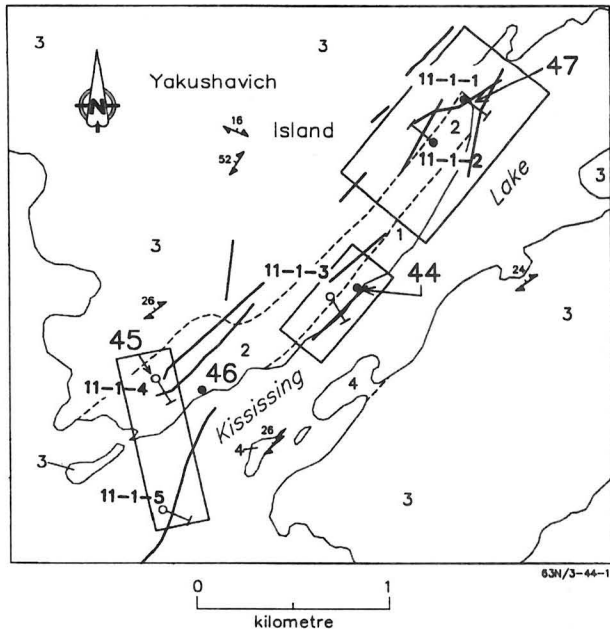
--- Geological boundary (approximate)

↗ Schistosity and layering

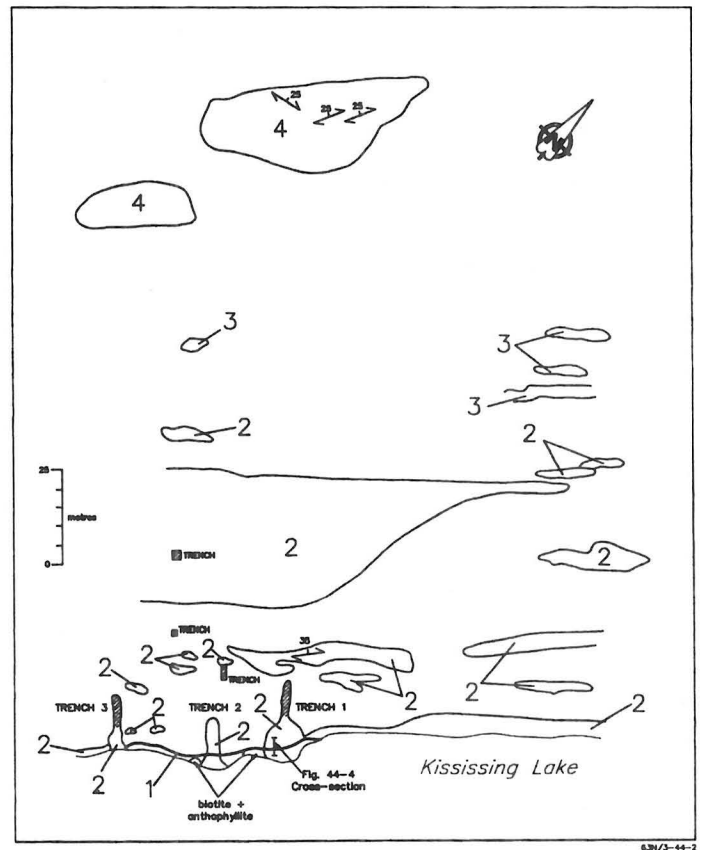
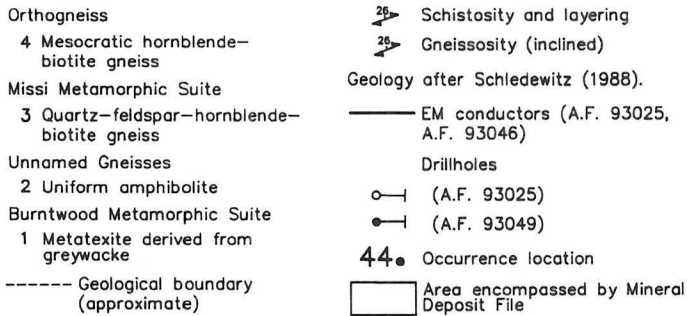
Geology after Schledewitz (1988).

42 • Occurrence location

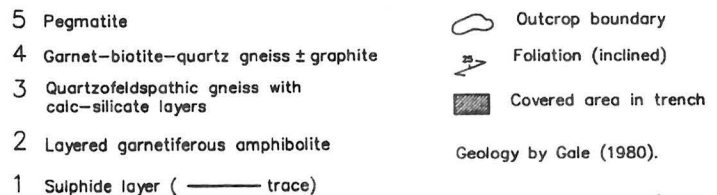
Figure 44: General geology in the vicinity of occurrences 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54 and 55

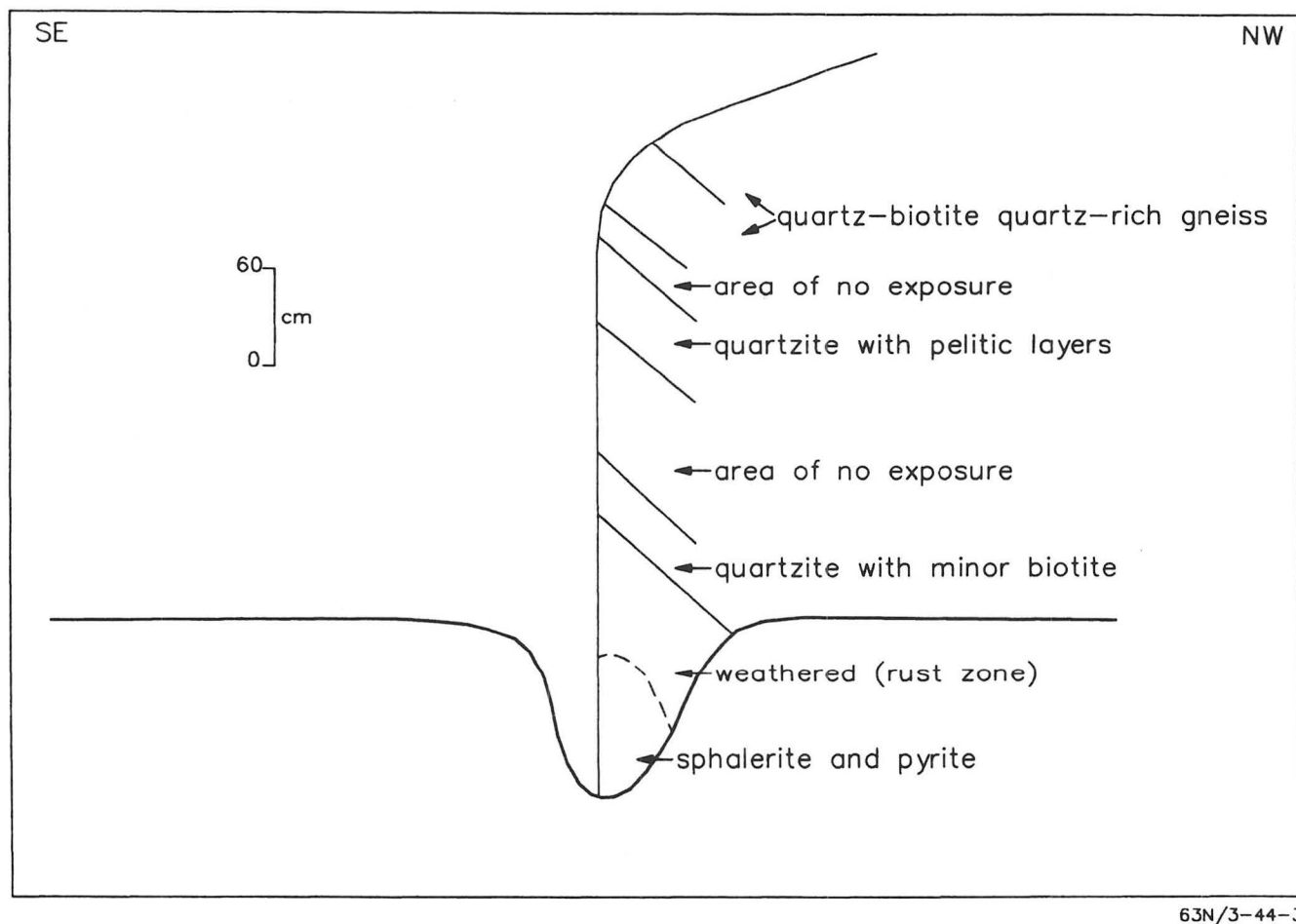


**Figure 44-1: General geology, geophysical conductors and diamond-drill hole locations at occurrences 44, 45, 46 and 47**



**Figure 44-2: Detailed geology and trench locations at Location 44, Yakushavich Island**





**Figure 44-3:** Geological cross-section at trench 1, location 44, Yakushavich Island

#### LOCATION: 45

NAME: (A.F. Mineralization intersected by diamond drilling)  
UTM: 6117620N/351276E  
AREA: Southeast Yakushavich Island, Kississing Lake. (Fig. 44).  
AIRPHOTO: A26362-070  
ACCESS: Kississing Lake.

#### EXPLORATION SUMMARY:

The area was first covered by the Cat, Loon, and Cold claims (Mining claim map, 63N/3 NW, *circa* 1930). W. Yakushavich staked the Cat claim in 1925, and transferred it to H.L. Weber (trustee of Cold Lake Syndicate) in 1926. The claim reverted to Yakushavich in 1926 and was optioned by R.J. Jowsey from 1928 to 1929. Wright (1929) examined trenches on the Cat and Loon claims. Lease M-837 was issued for the Cat claim in 1937. The ground was partly held as Royal 1 and Royal 8 by J.M. Wanless in 1942-1943, and as Win 8 and Win 12 by E. Rapson and G. Rapson in 1952-1953. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). Lease M-837 was cancelled in 1958. The ground was held as Yak 1 and Yak 2 by G. Rapson in 1959-1960, as Col 62 and Col 65 by J.W. Campbell in 1960-1961, as CB 3924 by G. Rapson in 1971-1973, and as CB 6287 by H.L. Thompson in 1974-1976. In 1979 Elken Exploration Limited staked CB 9806. Selco Inc. did magnetometer (Scintrex Fluxgate MFD-4) and HLEM (Apex MaxMin II) surveys, and drilled DDH 11-1-4 (39.65 m) in 1980 (A.F. 93025, grid 1). The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km<sup>2</sup>. Selco Inc. did HLEM, magnetic (EDA PPM 350) and pulse EM surveys, and completed DDH 11-1-5 in 1984 (A.F. 93046, Grid 11-1). The pulse EM survey results were not submitted. BP Resources Canada Limited acquired CB 9806 in 1986. The claim was cancelled in 1990. Fer 3 was staked by W.S. Ferreira Ltd. in 1991 and was transferred to 2460122 Manitoba Ltd. in 1992. The same year 2460122 Manitoba Ltd. changed its name to Canmine Holdings Ltd. (now Canmine Resources Corporation). ). From 1993-1995 Canmine conducted geological mapping, geophysical surveys and diamond drilling in the Yakushavich Island and Collins Point area.

#### GEOLOGICAL SETTING:

The area is underlain by amphibolite and Burntwood River Metamorphic Suite biotite-feldspar-quartz paragneiss and/or metatexite ± sillimanite ± graphite ± garnet ± pyrite ± cordierite (Fig 44-1; Schledewitz, 1988). DDH 11-1-4 intersected grey to dark grey hornblende-biotite ± garnet gneiss with up to 3 cm thick quartzofeldspathic interlayers. DDH 11-1-5 intersected garnet-biotite gneiss, amphibolite/hornblende - plagioclase gneiss and biotite-bearing quartzofeldspathic gneiss ± magnetite ± hornblende.

Drilling by Canmine in the Yakushavich Island and Collins Point area intersected near solid to solid sulphides and gneisses altered to anthophyllite-cordierite and quartz-sericite-chlorite rock (Canmine Press Releases, January 17, 1994 and January 9, 1995).

#### MINERALIZATION:

Disseminations and thin (up to 2 cm thick) near solid veins of pyrrhotite and pyrite ± chalcopyrite were documented over approximately 7 m of core length within hornblende - biotite gneiss from DDH 11-1-4. An approximately 50 cm long intersection of quartz monzonite that occurs within the amphibolite unit in DDH 11-1-5 contains approximately 3% disseminated chalcopyrite and a red metallic mineral. Minor amounts of pyrite and/or pyrrhotite mineralization were documented elsewhere in the drill core. Exploration by Canmine has identified 8 zinc-copper rich zones in the vicinity of Yakushavich Island and Collins Point (Fig 39-2).

#### GEOCHEMICAL DATA:

Sulphide mineralization intersected by the drillholes was sampled and assayed for Cu, Zn, Pb, Ag and Au. Anomalous concentrations were not reported from DDH 11-1-4, but a 35 cm core sample from the mineralized quartz monzonite intersection encountered in DDH 11-1-5 contained 3800 ppm Cu and 94 ppm Zn.

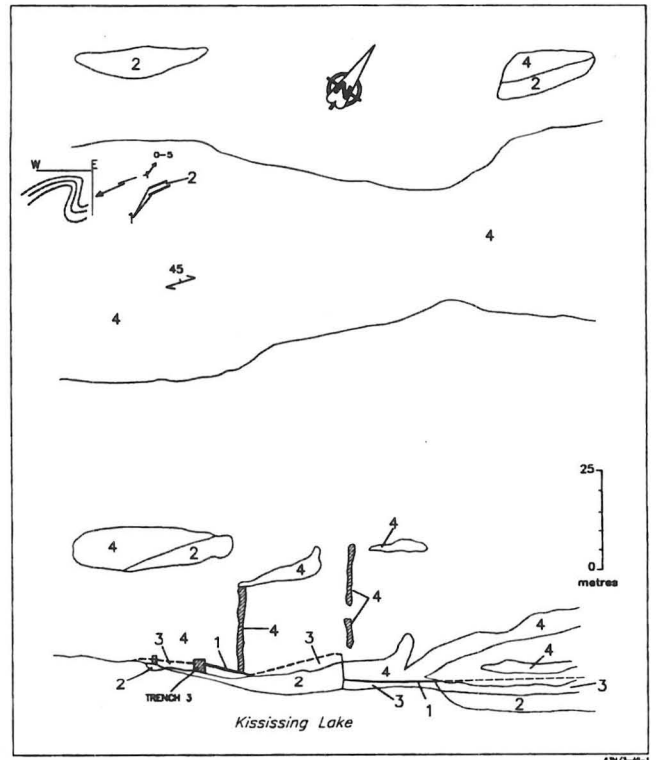
#### CLASSIFICATION:

Vein type deposit. Multiple veins or lenses.

#### REFERENCES:

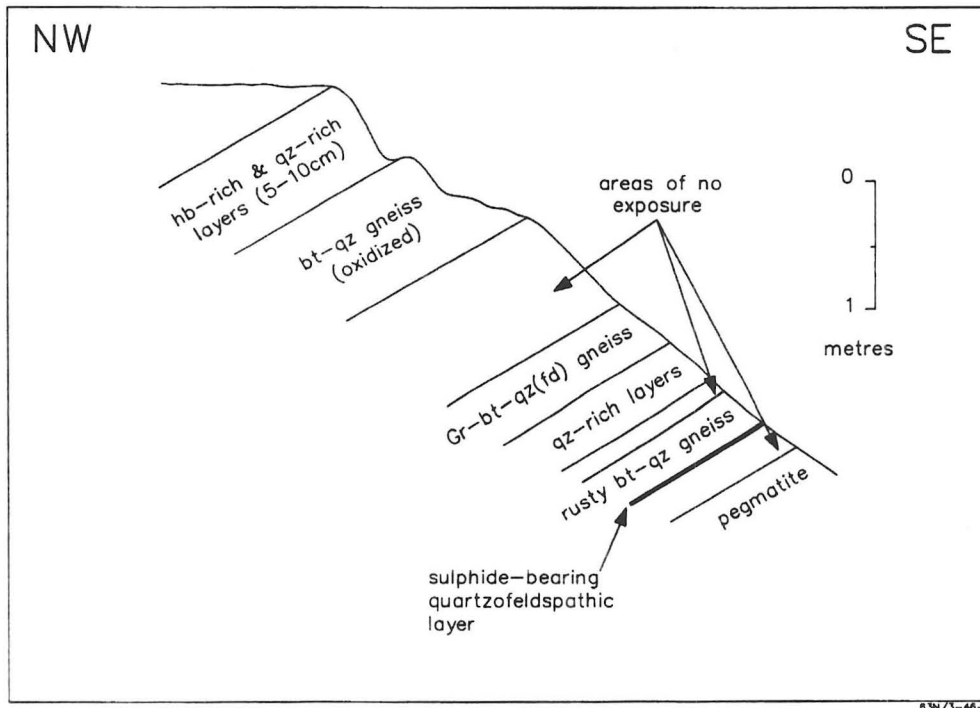
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Manitoba Energy and Mines, Minerals Division.
- Frarey, M.J.  
1949: Collins Point, Manitoba; Geological Survey of Canada, Paper 49-9, Preliminary map with descriptive notes, 1:31 680.
- 1961: Collins Point, Manitoba; Geological Survey of Canada, Map 1068A with descriptive notes, 1:63 360.
- Gale, G.H.  
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- Gobert, G. and Nielsen, E.  
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- Kaszycki, C.A.  
1989: Surficial geology and till composition, northwestern Manitoba; Geological Survey of Canada, Open File 2118, 73p.
- Schledewitz, D.C.P.  
1985: Kisseynew Project: Kississing Lake, Big Island-Yakushavich Island region; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 54-56.
- Schledewitz, D.C.P.  
1986: Kisseynew Project: Kississing Lake; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1986, p. 92-95.
- 1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.
- Wright, J.F.  
1929: Kississing Lake, Manitoba; Geological Survey of Canada, Summary Report 1928, Part B, p. 103.





**Figure 46-1: Detailed geology at occurrence 46, Yakushavich Island**

- 4 Layered amphibolite
  - 3 Garnet-biotite-quartz gneiss  $\pm$  graphite
  - 2 Pegmatite
  - 1 Sulphide layer ( — trace, ——— projected )
  - 45 Foliation (inclined)
  - o-s F<sub>2</sub> fold axis and plunge (degrees)
  - Trench
- Geology by Gale (1980).



**Figure 46-2: Geological detail of trench 3, occurrence 46**

**LOCATION: 46****NAME:**

UTM: 6117582N/351416E

AREA: Southeast Yakushavich Island, Kississing Lake (Fig. 44).

AIRPHOTO: A26362-160

ACCESS: Kississing Lake.

**EXPLORATION SUMMARY:**

The area was first covered by the Cat, Loon, and Cold claims (Mining claim map, NW 63N/3, *circa* 1930). W. Yakushavich staked the Cat claim in 1925, and transferred it to H.L. Weber (trustee of Cold Lake Syndicate) in 1926. The claim reverted to Yakushavich in 1926 and was optioned by R.J. Jowsey from 1928 to 1929. Wright (1929) examined trenches on the Cat and Loon claims. Lease M-837 was issued for the Cat claim in 1937. The ground was partly held as Royal 1 and Royal 8 by J.M. Wanless in 1942-1943, and as Win 8 and Win 12 by E. Rapson and G. Rapson in 1952-1953. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). Lease M-837 was cancelled in 1958. The ground was held as Yak 1 and Yak 2 by G. Rapson in 1959-1960, as Col 62 and Col 65 by J.W. Campbell in 1960-1961, as CB 3924 by G. Rapson in 1971-1973, and as CB 6287 by H.L. Thompson in 1974-1976. In 1979 Elken Exploration Limited staked CB 9806. Selco Inc. did magnetometer (Scintrex Fluxgate MFD-4) and HLEM (Apex MaxMin II) surveys in 1980 (A.F. 93025, grid 1). Gale (1980) examined and mapped the trenches and outcrop in the area. The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km<sup>2</sup>. Selco Inc. did HLEM, magnetic (EDA PPM 350) and pulse EM surveys in 1984 (A.F. 93046, Grid 11-1). The pulse EM survey results were not submitted. BP Resources Canada Limited acquired CB 9806 in 1986. The claim was cancelled in 1990. Fer 3 was staked by W.S. Ferreira Ltd. in 1991 and was transferred to 2460122 Manitoba LTD in 1992. The same year 2460122 Manitoba Ltd. changed its name to Canmine Holdings Ltd. (now Canmine Resources Corporation). ). From 1993-1995 Canmine conducted geological mapping, geophysical surveys and diamond drilling in the Yakushavich Island and Collins Point area.

**GEOLOGICAL SETTING:**

The area is underlain by amphibolite ± garnet ± diopside ± calcite, calc-silicate gneiss ± carbonate layers and/or hornblende-plagioclase gneiss (Fig. 44-1; Schledewitz, 1988). Gale (1980) mapped a northwest dipping sequence that includes, from southeast (shoreline) to northeast, pegmatite, rusty weathered biotite-quartz gneiss that includes a sulphide-bearing quartzofeldspathic layer, garnet-biotite-quartz-feldspar ± graphite gneiss and layered amphibolite (Fig. 46-1; 46-2).

Drilling by Canmine in the Yakushavich Island and Collins Point area intersected near solid to solid sulphides

and gneisses altered to anthophyllite-cordierite and quartz-sericite-chlorite rock (Canmine Press Releases, January 17, 1994 and January 9, 1995).

**MINERALIZATION:**

Trench 3 (Fig. 46-1; 46-2) exposes 1-5% disseminated pyrite and pyrrhotite within, up to 1 m thick, quartzofeldspathic interlayers (Gale, 1980). Exploration by Canmine has identified 8 zinc-copper rich zones in the vicinity of Yakushavich Island and Collins Point (Fig 39-2).

**GEOCHEMICAL DATA:**

None.

**CLASSIFICATION**

Disseminated mineralization - not classified.

**REFERENCES:**

Assessment File 91616, 93025, 93046

Manitoba Energy and Mines, Minerals Division.

Frarey, M.J.

1949: Collins Point, Manitoba; Geological Survey of Canada, Paper 49-9, Preliminary map with descriptive notes, 1:31 680.

1961: Collins Point, Manitoba; Geological Survey of Canada, Map 1068A with descriptive notes, 1:63 360.

Gale, G.H.

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Schledewitz, D.C.P.

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1986: Kisseynew Project: Kississing Lake; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1986, p. 92-95.

Schledewitz, D.C.P.

1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

Wright, J.F.

1929: Kississing Lake, Manitoba; Geological Survey of Canada, Summary Report 1928, Part B, p. 103.

**LOCATION: 47**

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

UTM: 6118361N/352090E

AREA: East Yakushavich Island, Kississing Lake (Fig. 44).

AIRPHOTO: A26362-161

ACCESS: Kississing Lake.

**EXPLORATION SUMMARY:**

The area was first staked as Red, Fox Fr., Rats and Bar (Mining claim map, NW 63N/3, *circa* 1930). J.W. Wedge staked the Bar claim in 1925, and transferred it to J.A. Turner and A.E. Haskin in 1926. J. Zuk staked Rats in 1925, and transferred it to H.L. Weber (trustee of Cold Lake Syndicate) in 1926. J.M. Wanless acquired the Rats claim in 1928. In 1928 Sherritt Gordon Mines Limited optioned the property, and drilled five shallow holes about halfway between the north and south ends of the island (Wright, 1929). Lease M-182 covering the Bar claim was issued in 1931. Work (trenching?) was reported on Bar in 1926-1930 and on Rats in 1926-1936 (Mining claim card, Bar, Rats). Lease M-723 was issued for the Rats claim in 1937. The Bar claim was leased (M-1854) for ten years by Gods Lake Gold Mines Ltd. in 1947. The ground was partly held as Royal 3 and Royal 4 by J.M. Wanless in 1942-1943, and as Win 6 and Win 7 by Evelyn Rapson in 1952-1953. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). In 1957 Lease M-1854 was renewed for 21 years and transferred to R.J. Jowsey Mining Company Limited. Lease M-723 was cancelled in 1958. The ground was held as Yak 3 by G. Rapson in 1959-1960, as CB 3924 by G. Rapson in 1971-1973, and as CB 6287 by H.L. Thompson in 1974-1976. Lease M-1854 (covering the Bar claim) was cancelled in 1975. In 1979 Elken Exploration Limited staked CB 9806. Selco Inc. did magnetometer (Scintrex Fluxgate MFD-4) and HLEM (Apex MaxMin II) surveys, and drilled DDH 11-1-1 (73 m) and DDH 11-1-2 (44.84 m) in 1980 (A.F. 93025, grid 1). The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km<sup>2</sup>. Selco Inc. did HLEM, magnetic (EDA PPM 350) and pulse EM surveys in 1984 (A.F. 93046, Grid 11-1). The pulse EM survey results were not submitted. BP Resources Canada Limited acquired CB 9806 in 1986. The claim was cancelled in 1990. Fer 3 was staked by 2460122 Manitoba Ltd. in 1991 and was transferred to 2460122 Manitoba Ltd. in 1992. The same year 2460122 Manitoba Ltd. changed its name to Canmine Holdings LTD was cancelled in 1993. Canmine Holdings Ltd. (now Canmine Resources Corporation) staked Fer 36 in 1993. From 1993-1995 Canmine conducted geological mapping, geophysical surveys and diamond drilling in the Yakushavich Island and Collins Point area.

**GEOLOGICAL SETTING:**

The area is underlain by Burntwood Suite (former Burntwood Metamorphic Suite) biotite-feldspar-quartz paragneiss and/or metatexite ± sillimanite ± graphite ± garnet ± pyrite ± cordierite and amphibolite (Fig. 44-1; Schledewitz, 1988). The drillholes intersected garnet-biotite paragneiss ± graphite with siliceous quartzofeldspathic ± muscovite ± sillimanite interlayers.

Drilling by Canmine in the Yakushavich Island and Collins Point area intersected near solid to solid sulphides and gneisses altered to anthophyllite-cordierite and quartz-sericite-chlorite rock (Canmine Press Releases, January 17, 1994 and January 9, 1995).

**MINERALIZATION:**

Approximately 10% pyrite in a chlorite-graphite matrix was intersected over core lengths of 50 and 90 cm in DDH 11-1-1. A 8 cm intersection in DDH 11-1-2 contains disseminated pyrrhotite/pyrite and 'abundant' graphite. Minor amounts of disseminated pyrite and/or pyrrhotite and/or graphite occur locally within the core. Exploration by Canmine has identified 8 zinc-copper rich zones in the vicinity of Yakushavich Island and Collins Point (Fig 39-2).

**GEOCHEMICAL DATA:**

Sulphide mineralization intersected by the drillhole was sampled and assayed for Cu, Zn, Pb, Ag and Au. A 1.5 m long intersection within a graphitic quartz - feldspar - biotite ± garnet gneiss (metagreywacke) contains 0.34 g/t Au and a 90 cm long core sample from a siliceous quartz - feldspar paragneiss contains 3.42 g/t Ag. Anomalous concentrations of Cu, Zn and Pb were not reported.

**CLASSIFICATION:**

Disseminated mineralization - not classified. The intersection of abundant graphite could also be interpreted to be a graphitic sulphide facies iron formation.

**REFERENCES:**

Assessment File 91616, 93025, 93046

Manitoba Energy and Mines, Minerals Division.

Frarey, M.J.

1949: Collins Point, Manitoba; Geological Survey of Canada, Paper 49-9, Preliminary map with descriptive notes, 1:31 680.

1961: Collins Point, Manitoba; Geological Survey of Canada, Map 1068A with descriptive notes, 1:63 360.

Froese, E.

1985: Anthophyllite-bearing rocks in the Flin Flon-Sherridon area, Manitoba; Geological Survey of Canada, Current Research, Part B, Paper 85-1B, p. 541-544.

Gobert, G. and Nielsen, E.

1989: Till geochemistry of the Kississing Lake area, Manitoba; **in** Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1989, p. 41-43.

Harrison, J.M.

1949: Kississing, Saskatchewan-Manitoba; Geological Survey of Canada, Map 970A with descriptive notes, 1:253 440.

Kaszycki, C.A.

1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118, 73p.

Mining claim card: Bar (36528); Rats (36540)  
Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Schledewitz, D.C.P.

1985: Kiskeynew Project: Kississing Lake, Big Island-Yakushavich Island region; **in** Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 54-56.

1986: Kiskeynew Project: Kississing Lake; **in** Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1986, p. 92-95.

Schledewitz, D.C.P.

1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

Wright, J.F.

1929: Kississing Lake, Manitoba; Geological Survey of Canada, Summary Report 1928, Part B, p. 103.

# LOCATION: **48**

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

UTM: 6119262N/352707E

AREA: Yakushavich Island, Kississing Lake (Fig. 44).

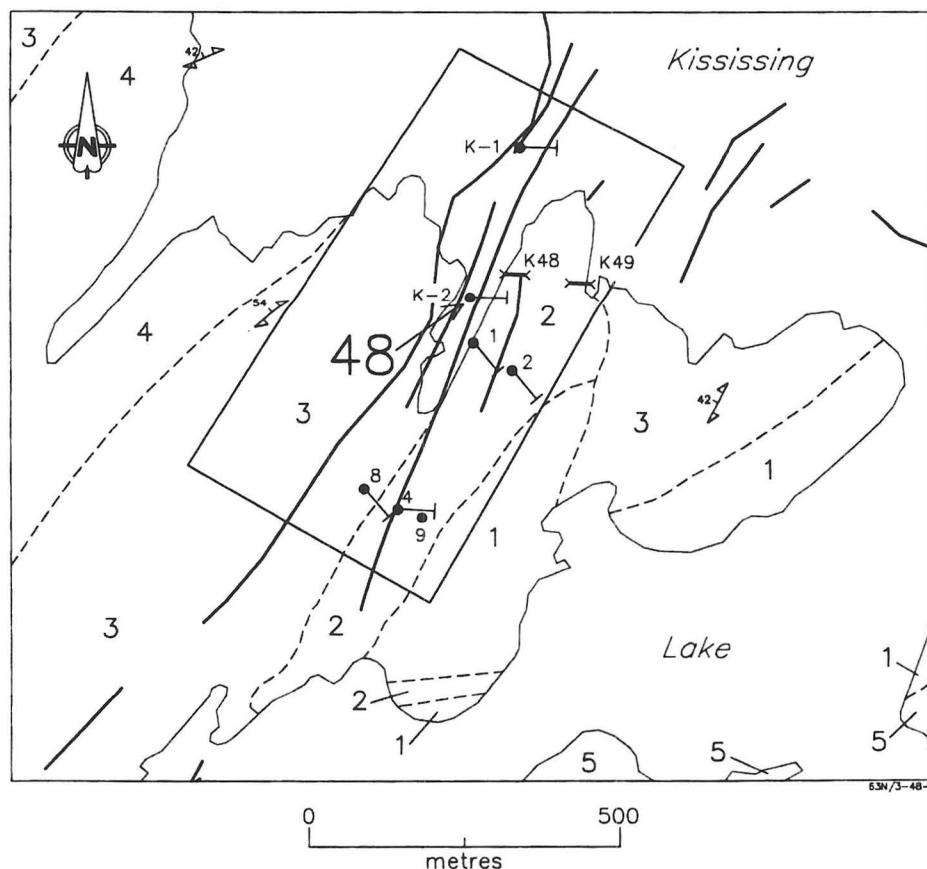
AIRPHOTO: A26362-162

ACCESS: Kississing Lake.

## EXPLORATION SUMMARY:

The area was first staked as Moon, SourDough 1, and Bare (Mining claim map, 63N/3 NW, circa 1930). The ground

was staked in 1925 and optioned to Sherritt Gordon Mines Limited in 1928 (Wright, 1929). Bare was recorded from 1937 to 1958 (Mining claim maps, 63N/3 NW). Moon was staked by A. Corman in 1941, and was transferred to Squall Lake Gold Mines Limited in 1944. It was leased in 1949 as M-2190. The ground was partly held by E. Rapson as Win 2 from 1952 to 1953. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). In 1959 Big 41 and Big 42 were staked by G. Zimmer, and assigned to Prospectors Airways Company Limited. An EM survey was done in 1959, and a 914 m long EM conductor dipping 50-60 northwest was



Intrusive Rocks

5 Mesocratic hornblende-biotite gneiss

4 Tonalitic to granodioritic gneiss

Missi Metamorphic Suite

3 Quartz-feldspar-hornblende-biotite gneiss

Unnamed Gneisses

2 Garnetiferous amphibolite

Burntwood Metamorphic Suite

1 Metatexite derived from greywacke

----- Geological boundary (approximate)

———— EM conductors (A.F. 93046, 90681)

●— Drillholes (A.F. 90679)

X Trench (Gale, 1980)

↘ Schistosity and layering

Geology after Schledewitz (1988).

□ Area encompassed by Mineral Deposit File

Figure 48-1: General geology, geophysical conductors, trenches and diamond-drill hole locations at occurrence 48

outlined on the Big claims (A.F. 90681). Ronka HLEM and Sharpe A-3 magnetometer surveys were also done, but the results were not submitted. A 5-hole 100 m diamond drill program was done on Big 41 in 1959, followed by a 2-hole 245 m drill program on Big 42 in 1960 (DDH Packsack 2, 4, 7 to 9, DDH K-1, K-2; A.F. 90679). The Big claims lapsed in 1962-1963. The Moon claim lapsed in 1977. Elken Exploration Limited staked CB 9801 and CB 9807 in 1979. Gale (1980) examined trenches in the area (K48 and K49 on Figure 48-1). Selco Inc. did magnetometer (Scintrex MFD-4) and HLEM (Apex MaxMin II) surveys in 1980 (A.F. 93025, Grid 6), and magnetic (EDA PPM 350), pulse-EM (results not submitted) and HLEM surveys in 1984 (A.F. 93046, Grid 11-6). The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km<sup>2</sup>. BP Resources Canada Limited acquired the claims in 1986. The claims lapsed in 1990. Fer 11 was staked for 2460122 Manitoba Ltd. in 1991, transferred to Canmine Holdings Corp. in 1992, and cancelled in 1993. Fer 30 was staked by Canmine Holdings Ltd. (now Canmine Resources Corporation) in 1993. From 1993-1995 Canmine conducted geological mapping, geophysical surveys and diamond drilling in the Yakushavich Island and Collins Point area.

#### GEOLOGICAL SETTING:

The area is underlain by amphibolite ± garnet ± diopside ± calcite, calc-silicate gneiss ± carbonate layers and/or hornblende-plagioclase gneiss (Fig. 48-1; Schledewitz, 1988). The trenches expose layered amphibolite and garnetiferous amphibolite (Gale, 1980). The Packsack drillholes intersected hornblende - biotite ± garnet gneiss. DDH K1 and K2 intersected layered/banded quartz - hornblende ± biotite gneiss/schist with numerous grey siliceous and 'basic schist' interlayers/bands, and quartz - biotite ± garnet gneiss/schist with numerous hornblende or biotite schist interlayers/bands. These interlayers/bands are commonly on the order of 10's of cms or less in core length. Garnet-rich layers/bands, 20 and 55 cm in core length, occur within the quartz - biotite gneiss from DDH K1.

Drilling by Canmine in the Yakushavich Island and Collins Point area intersected near solid to solid sulphides and gneisses altered to anthophyllite-cordierite and quartz-sericite-chlorite rock (Canmine Press Releases, January 17, 1994 and January 9, 1995).

#### MINERALIZATION:

Minor to moderate amounts of pyrite and/or pyrrhotite mineralization (locally up to 25% - Packsack 2) were documented in all the Packsack holes over core lengths of 3-9 m. Specks of chalcopyrite were documented in the logs from DDH Packsack 7 and 8, and minor amounts of graphite were observed in the core from DDH Packsack 9. Erratically distributed minor to moderate amounts of pyrite and/or pyrrhotite mineralization with or without chalcopyrite, locally up to 50% (60 cm) occur within an approximately 60 m long intersection of quartz - hornblende ± biotite gneiss/schist and quartz - biotite gneiss from DDH K1. The sulphide mineralization consists of disseminations, coarse grained aggregates, fracture fillings and veins and is associated with the

siliceous, basic schist and biotite schist interlayers/bands. Erratically distributed minor to moderate amounts of pyrite and/or pyrrhotite mineralization with or without chalcopyrite occur within an approximately 50 m long intersection of quartz - biotite - hornblende gneiss/schist from DDH K2. The sulphide mineralization consists of disseminations, coarse grained aggregates, fracture fillings and veins and is associated with interlayers/bands of hornblende schist, commonly with siliceous sections. Up to 20% pyrrhotite in rusty weathered layers within layered amphibolite is exposed in the trenches (Gale, 1980). Exploration by Canmine has identified 8 zinc-copper rich zones in the vicinity of Yakushavich Island and Collins Point (Fig 39-2).

#### GEOCHEMICAL DATA:

Numerous intersections from DDH K1 and K2 were analyzed for Au, Cu, Zn, Ni and locally for Mo, but anomalous concentrations were not reported.

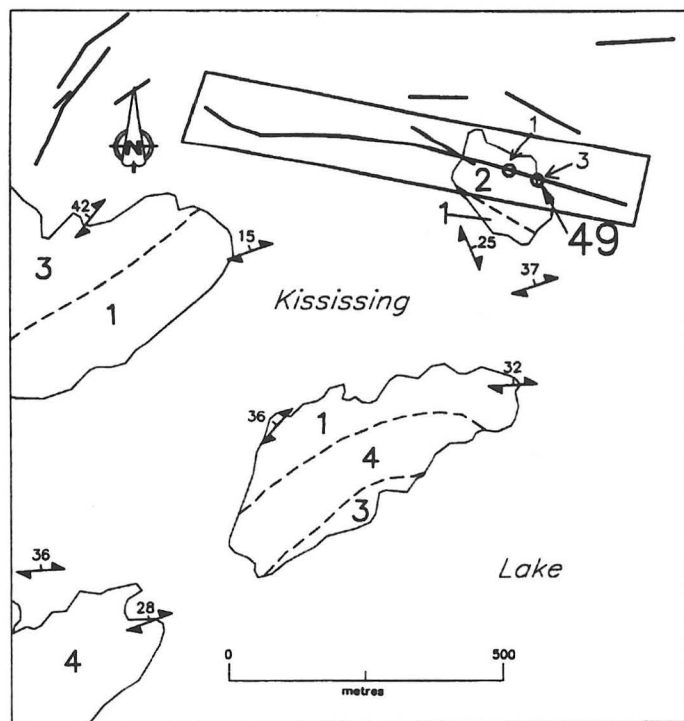
#### CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. The mineralization is interpreted to represent a series of sulphide-rich layers within an amphibolite sequence.

#### REFERENCES:

- Assessment File 90679, 90681, 91616, 93025, 93046  
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- Frarey, M.J.  
1949: Collins Point, Manitoba; Geological Survey of Canada, Paper 49-9, Preliminary map with descriptive notes, 1:31 680.
- 1961: Collins Point, Manitoba; Geological Survey of Canada, Map 1068A with descriptive notes, 1:63 360.
- Gale, G.H.  
1979: Reconnaissance of the Flin Flon-Sherridon area; in Manitoba Mines, Natural Resources and Environment, Report of Field Activities, 1979, p. 40-41.
- 1980: Mineral deposit studies - Flin Flon/Kisseynew; in Manitoba Energy and Mines, Mineral Resources Division, Report of Field Activities, 1980, p. 51-64.
- Kaszycki, C.A.  
1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118, 73p.
- Schledewitz, D.C.P.  
1985: Kisseynew Project: Kississing Lake, Big Island-Yakushavich Island region; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 54-56.
- 1986: Kisseynew Project: Kississing Lake; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1986, p. 92-95.
- Schledewitz, D.C.P.  
1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.
- Wright, J.F.  
1929: Kississing Lake, Manitoba; Geological Survey of Canada, Summary Report 1928, Part B, p. 102-103.





#### Proterozoic

##### Intrusive Rocks

4 Mesocratic hornblende-biotite gneiss

##### Missi Metamorphic Suite

3 Quartz-feldspar-hornblende-biotite gneiss

##### Unnamed Gneiss

2 Garnetiferous amphibolite

##### Burntwood River Metamorphic Suite

1 Metatexite derived from greywacke

----- Geological boundary (approximate)

———— EM conductor (93025, 93046)

Geology by Schledewitz (1988).

32 Gneissosity (dip unknown, vertical, inclined)

○ 3 Vertical drillhole (A.F. 90679)

□ Area encompassed by Mineral Deposit File

**Figure 49-1:** General geology, geophysical conductors and diamond-drill hole locations at occurrence 49

**LOCATION: 49**

NAME: (A.F. Mineralization intersected by diamond drilling)  
 UTM: 6119170N/353883E  
 AREA: An island east of Yakushavich Island, Kississing Lake (Fig. 44).  
 AIRPHOTO: A26362-162  
 ACCESS: Kississing Lake.

**EXPLORATION SUMMARY:**

The Top and Mars claims were the first recorded claims in the area (Mining claim map, 63N/3 NW, *circa* 1930). Wright (1929) indicates that claims in the vicinity were staked in 1925 and optioned to Sherritt Gordon Mines Limited in 1928. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). Sure Thing was recorded from 1956 to 1957 (Mining claim maps, 63N/3 NW). In 1959 Big 13 was staked by G. Zimmer and assigned to Prospectors Airways Company Limited. Prospectors Airways Company Limited performed an EM survey on the Big claims in 1959 (A.F. 90681). A 2-hole 245 m drill program was completed on Big 13 in 1959 (DDH Packsack 1 and 3; A.F. 90679). The Big claims lapsed in 1962-1963. Elken Exploration Limited staked CB 9843 in 1980. Selco Inc. did magnetometer (Scintrex MFD-4) and HLEM (Apex MaxMin II) surveys in 1980 (A.F. 93025), and magnetic (EDA PPM 350), pulse-EM (results not submitted) and HLEM surveys in 1984 (A.F. 93046). The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km<sup>2</sup>. BP Resources Canada Limited acquired the claims in 1986. The claims lapsed in 1991. Fer 14 was staked for 2460122 Manitoba Ltd. in 1991, transferred to Canmine Holdings Corp. in 1992, and cancelled in 1993. Canmine Holdings (now Canmine Resources Corporation) staked Fer 33 in 1993. From 1993-1995 Canmine conducted geological mapping, geophysical surveys and diamond drilling in the Yakushavich Island and Collins Point area.

**GEOLOGICAL SETTING:**

The area is underlain by garnetiferous amphibolite (Fig. 49-1; Schledewitz, 1988). The DDH intersected 'altered' hornblende - biotite gneiss (DDH Packsack 1) and hornblende gneiss and pegmatite (DDH Packsack 3).

**MINERALIZATION:**

Up to 5% pyrite and pyrrhotite mineralization within a siliceous 'zone' was intersected over 1.5 m in DDH Packsack

1. A 1.5 m long intersection of hornblende gneiss from DDH Packsack 3 contains 20% pyrrhotite and a 2 cm section of graphite. Exploration by Canmine has identified 8 zinc-copper rich zones in the vicinity of Yakushavich Island and Collins Point (Fig 39-2).

**GEOCHEMICAL DATA:**

None.

**CLASSIFICATION:**

Disseminated mineralization - not classified.

**REFERENCES:**

- Assessment File 90679, 90681, 91616, 93025, 93046  
 Manitoba Energy and Mines, Minerals Division.
- Frarey, M.J.  
 1949: Collins Point, Manitoba; Geological Survey of Canada, Paper 49-9, Preliminary map with descriptive notes, 1:31 680.  
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- Gale, G.H.  
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- Schledewitz, D.C.P.  
 1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.
- Wright, J.F.  
 1929: Kississing Lake, Manitoba; Geological Survey of Canada, Summary Report 1928, Part B, p. 103.

**LOCATION: 50**

NAME: (A.F. Mineralization intersected by diamond drilling)  
 UTM: 6118225N/350479E  
 AREA: Southwest Yakushavich Island, Kississing Lake (Fig. 50).  
 AIRPHOTO: A26362-070  
 ACCESS: Kississing Lake.

**EXPLORATION SUMMARY:**

The area was first staked as Helen and Rosie prior to 1930 (Mining claim map, 63N/3 NW, *circa* 1930). Trenches were noted by Frarey (1949). Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). Prospectors Airways Company, Limited staked Col 10 and Col 14 in 1958. In 1959 Prospectors did an EM survey, Ronka HLEM and magnetic check surveys (check survey results were not submitted), and drilled DDH 12 (17.4 m) to test an EM conductor (associated with a 6000 gamma magnetic anomaly) on Col 14 (A.F. 90681; A.F. 90680). J.W. Campbell staked Col 61 in 1960. Col 61 was cancelled in 1961, Col 10 in 1962, Col 14 in 1964. The ground was held as CB 3924 by Glen Rapson from 1971 to 1973 and as CB 6287 by H.L. Thompson from 1974 to 1976. Elken Exploration Limited staked CB 9805 in 1979. Gale (1980) examined two trenches (1.5 x 3 x 5 m; 1 x 1 x 4 m) in the area. Selco Inc. did magnetometer (Scintrex Fluxgate MFD-4, Geometrics G816) and HLEM (Apex MaxMin II) surveys and drilled DDH 11-13-1 (78.64 m) and DDH 11-13-2 (64.62 m) in 1980-1981 (A.F. 93025, Grid 30-11-3; A.F. 93002). In 1983 Selco Inc. did an airborne Input (Mark VI) survey (A.F. 93048). The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km<sup>2</sup>. BP Resources Canada Limited acquired CB 9805 in 1986. The claim was cancelled in 1990. Fer 17 was staked by 2460122 Manitoba Ltd. in 1991 and was cancelled in 1993. Canmine Holdings Ltd. (now Canmine Resources Corporation) staked Fer 36 in 1993. From 1993-1995 Canmine conducted geological mapping, geophysical surveys and diamond drilling in the Yakushavich Island and Collins Point area.

**GEOLOGICAL SETTING:**

The area is underlain by amphibolite ± garnet ± diopside ± calcite, calc-silicate gneiss ± carbonate layers and/or hornblende-plagioclase gneiss (Fig. 50; Schledewitz, 1988). The DDH intersected amphibolite ± biotite ± quartz ± garnet. Siliceous biotite paragneiss and garnet interlayers were intersected in DDH 11-13-1. Quartz monzonite was intersected in both holes. The trenches at K36 (Fig. 50-1; Gale, 1980) expose a layered amphibolite sequence. Elsewhere, Gale (1980) identified garnetiferous amphibolite and calc-silicate interlayers within the amphibolite sequence.

Drilling by Canmine in the Yakushavich Island and Collins Point area intersected near solid to solid sulphides and gneisses altered to anthophyllite-cordierite and quartz-sericite-chlorite rock (Canmine Press Releases, January 17, 1994 and January 9, 1995).

**MINERALIZATION:**

DDH 11-13-1 intersected 4 zones/layers of near solid sulphide mineralization. A 14 cm intersection that contains 60% pyrrhotite and a 30 cm intersection that contains up to 50% pyrrhotite ± chalcopyrite occur within amphibolite. A 5 m long intersection that contains 'well mineralized' pyrite ± chalcopyrite in vugs within a quartz monzonitic section and a 31 cm long intersection of greater than 50% pyrrhotite were documented within the siliceous biotite paragneiss. Minor amounts of disseminated Fe sulphide ± specks of chalcopyrite occur locally in the core. Numerous up to 1 cm thick concordant layers of pyrrhotite/pyrite ± chalcopyrite and a 46 cm long solid sulphide intersection composed of pyrrhotite plus pyrite ± chalcopyrite within amphibolite, were intersected in DDH 11-13-2. Approximately 10% disseminated pyrrhotite within a 1.4 m thick rusty weathered hornblende-bearing quartzose interlayer is exposed in the trenches at K36 and was traced along strike in outcrop to K37 (Fig. 50-1). Exploration by Canmine has identified 8 zinc-copper rich zones in the vicinity of Yakushavich Island and Collins Point (Fig 39-2).

**GEOCHEMICAL DATA:**

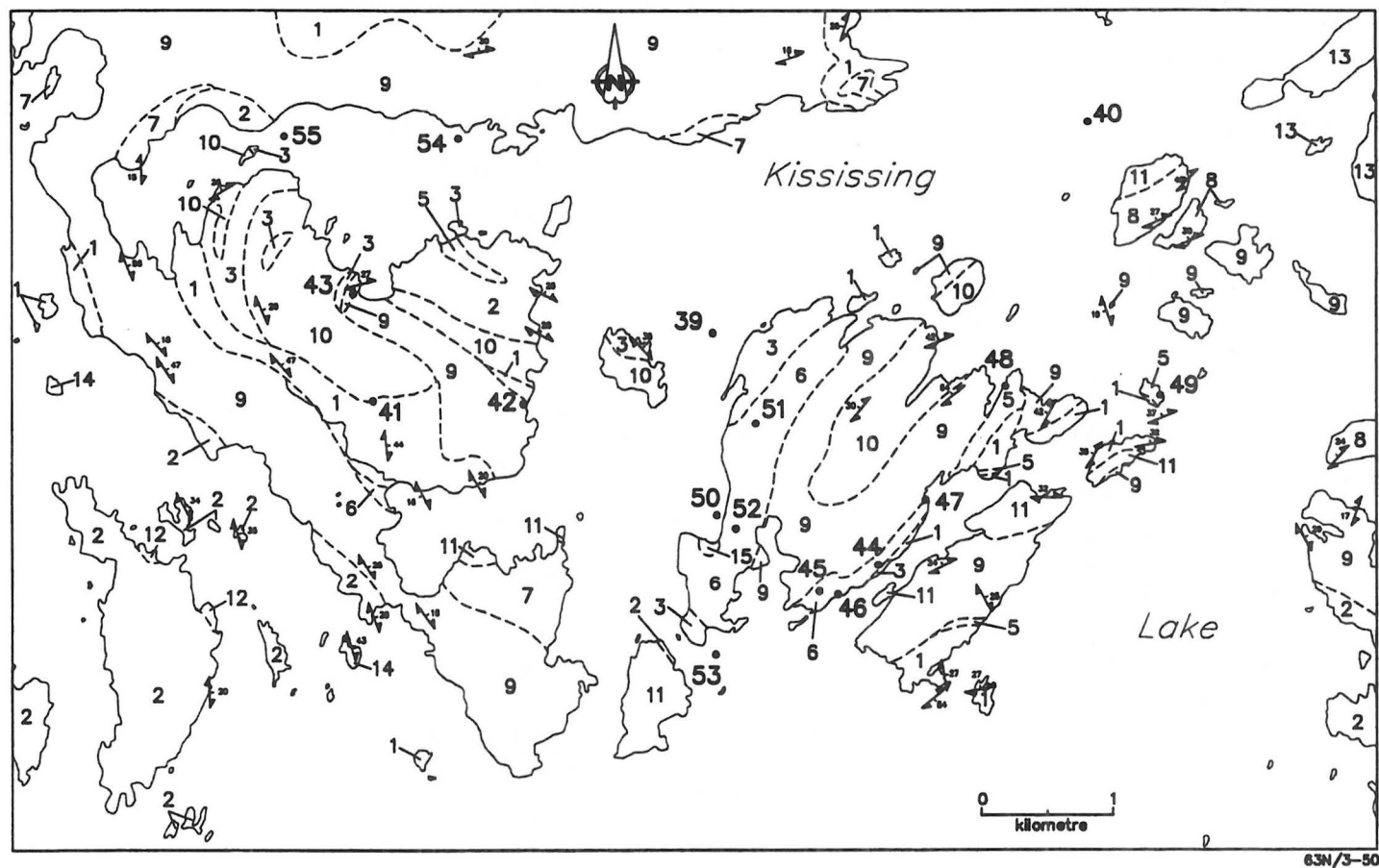
Mineralized core was assayed for Au, Ag, Cu, Zn and Pb. A 1.53 m long sample of biotite paragneiss with minor amounts of disseminated Fe-sulphide contains 0.171 g/t Au.

**CLASSIFICATION:**

Chemical sediment type deposit; sulphide facies iron formation.

**REFERENCES:**

- Assessment File 90680, 90681, 91616, 93002, 93025, 93048  
 Manitoba Energy and Mines, Minerals Division.
- Frarey, M.J.  
 1949: Collins Point, Manitoba; Geological Survey of Canada, Paper 49-9, Preliminary map with descriptive notes, 1:31 680.
- 1961: Collins Point, Manitoba; Geological Survey of Canada, Map 1068A with descriptive notes, 1:63 360.
- Gale, G.H.  
 1980: Mineral deposit studies - Flin Flon/Kisseynew; in Manitoba Energy and Mines, Mineral Resources Division, Report of Field Activities, 1980, p. 51-64.
- Kaszycki, C.A.  
 1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118, 73p.
- Schledewitz, D.C.P.  
 1985: Kisseynew Project: Kississing Lake, Big Island-Yakushavich Island region; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 54-56.
- 1986: Kisseynew Project: Kississing Lake; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1986, p. 92-95.
- 1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.



63N/3-50

#### Intrusive Rocks

- 15 Two-mica leucogranite
- 14 Biotite leucogranite, pegmatite
- 13 Foliated monzogranite and granodiorite
- 12 Coarse grained amphibolite, metagabbro
- 11 Mesocratic hornblende-biotite gneiss
- 10 Tonalitic to granodioritic gneiss

#### Missi Metamorphic Suite

- 9 Quartz-feldspar-hornblende-biotite gneiss
- 8 Quartz-rich paragneiss
- 7 Varicoloured paragneiss

#### Unnamed Gneisses

- 6 Uniform amphibolite

- 5 Garnetiferous amphibolite

- 4 Rusty biotite-plagioclase-quartz gneiss

- 3 Garnet-hornblende-biotite-graphite gneiss

#### Burntwood Metamorphic Suite

- 2 Garnet-biotite gneiss, metagreywacke

- 1 Metatextite derived from greywacke

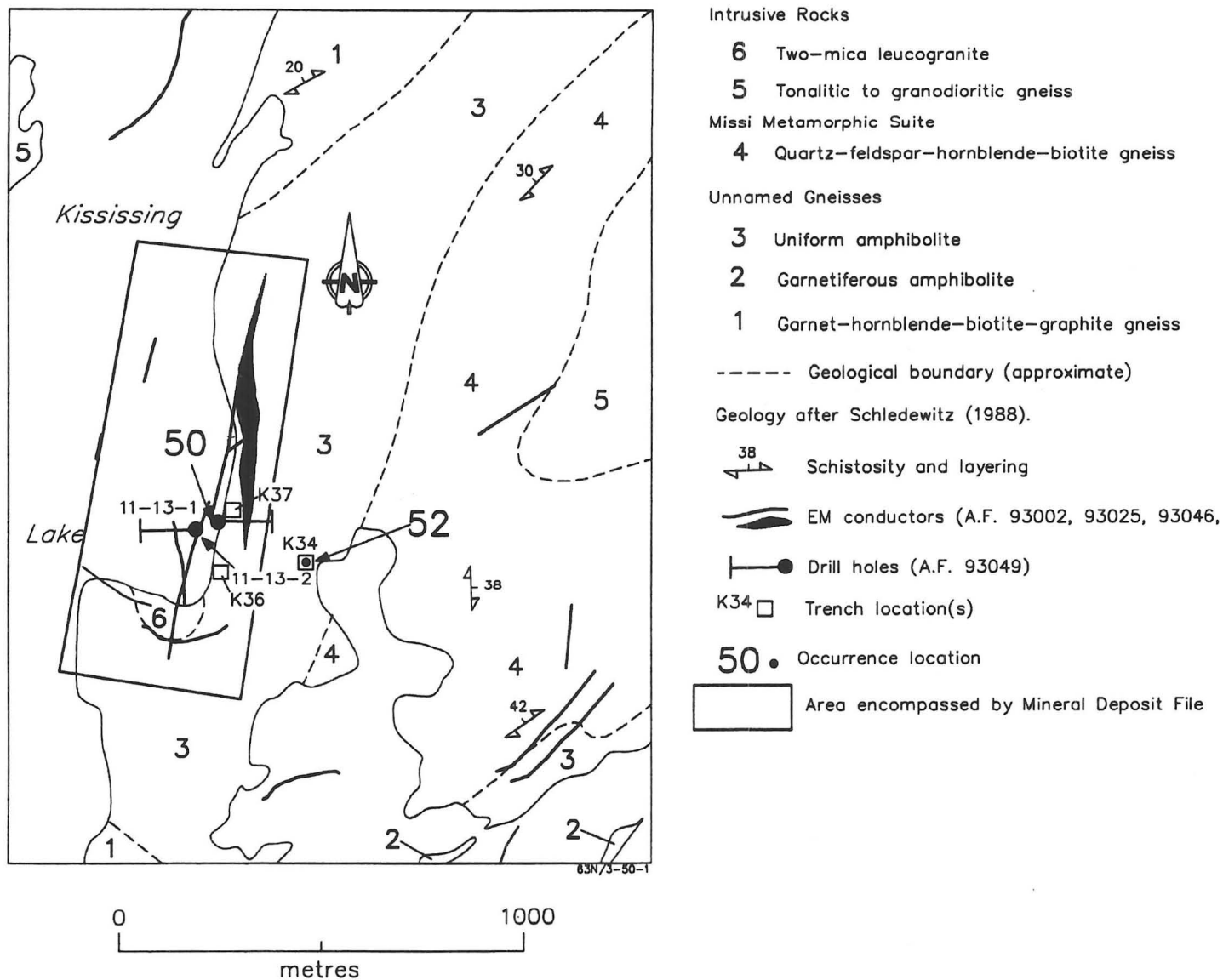
----- Geological boundary (approximate)

↗ Schistosity and layering

Geology after Schledewitz (1988).

42. Occurrence location

Figure 50: General geology in the vicinity of occurrences 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54 and 55



**Figure 50-1:** General geology, geophysical conductors, trenches and diamond-drill hole locations at occurrence 50

**LOCATION: 51****NAME:**

UTM: 6118942N/350780E

AREA: West Yakushavich Island (Fig. 50).

AIRPHOTO: A26362-070

ACCESS: Kississing Lake.

**EXPLORATION SUMMARY:**

Pickeral was staked by Mary Zuk in 1925, and assigned to J.M. Wanless in 1928. Work (trenching?) was reported in 1926-1936 (Mining claim card, Pickeral). Lease M-722 was issued in 1937. Trenches were noted by Frarey (1949). Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). Lease M-722 was cancelled in 1958. J.W. Campbell held the ground as Col 63 from 1959 to 1961. Prospectors Airways Company, Limited did an EM survey on the Col claims in 1959 (A.F. 90681). The ground was held as CB 3924 by Glen Rapson from 1971 to 1973 and as CB 6287 by H.L. Thompson from 1974 to 1976. In 1980 Elken Exploration Limited staked CB 9805. Gale (1980) examined a trench (2 x 2 x 3 m) in the area. In 1981 Selco Inc. did magnetometer (Geometrics G816) and HLEM (Apex MaxMin II) surveys (A.F. 93002, Grid 13). The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km<sup>2</sup>. BP Resources Canada Limited acquired the claim in 1986. CB 9805 was cancelled in 1990. Canmine Holdings Ltd. (now Canmine Resources Corporation) staked Fer 36 in 1993. From 1993-1995 Canmine conducted geological mapping, geophysical surveys and diamond drilling in the Yakushavich Island and Collins Point area.

**GEOLOGICAL SETTING:**

The area is underlain by amphibolite ± garnet ± diopside ± calcite, calc-silicate gneiss ± carbonate layers and/or hornblende-plagioclase gneiss (Fig. 51-1; Schledewitz, 1988). The trench (K38, Fig. 51-1; Gale, 1980) exposes biotite-quartz-feldspar pegmatite and amphibolite.

Drilling by Canmine in the Yakushavich Island and Collins Point area intersected near solid to solid sulphides and gneisses altered to anthophyllite-cordierite and quartz-sericite-chlorite rock (Canmine Press Releases, January 17, 1994 and January 9, 1995).

**MINERALIZATION:**

Approximately 1% chalcopyrite occurs within pegmatite that is exposed in the trench. Locally, malachite stain was observed within the pegmatite. Exploration by Canmine has identified 8 zinc-copper rich zones in the vicinity of Yakushavich Island and Collins Point (Fig 39-2).

**GEOCHEMICAL DATA:**

None.

**CLASSIFICATION:**

Disseminated mineralization - not classified.

**REFERENCES:**

Assessment File 90681, 91616, 93002

Manitoba Energy and Mines, Minerals Division.

Frarey, M.J.

1949: Collins Point, Manitoba; Geological Survey of Canada, Paper 49-9, Preliminary map with descriptive notes, 1:31 680.

1961: Collins Point, Manitoba; Geological Survey of Canada, Map 1068A with descriptive notes, 1:63 360.

Gale, G.H.

1980: Mineral deposit studies - Flin Flon/Kisseynew; in Manitoba Energy and Mines, Mineral Resources Division, Report of Field Activities, 1980, p. 51, 56, 64.

Kaszycki, C.A.

1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118, 73p.

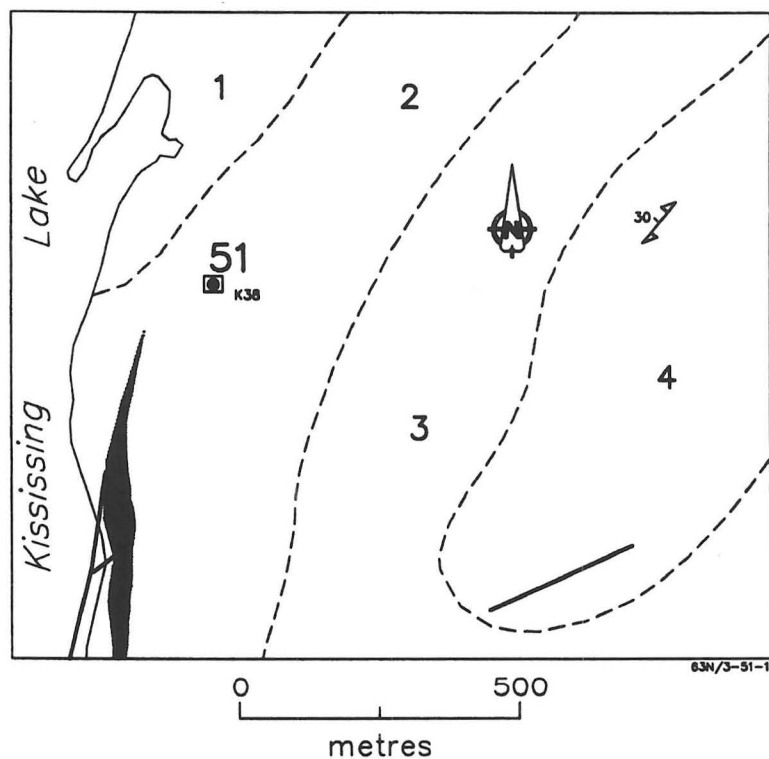
Schledewitz, D.C.P.

1985: Kisseynew Project: Kississing Lake, Big Island-Yakushavich Island region; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 54-56.

1986: Kisseynew Project: Kississing Lake; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1986, p. 92-95.

1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.





#### Intrusive Rocks

- 4 Tonalitic to granodioritic gneiss

#### Missi Metamorphic Suite

- 3 Quartz-feldspar-hornblende-biotite gneiss

#### Unnamed Gneisses

- 2 Uniform amphibolite
- 1 Garnet-hornblende-biotite-graphite gneiss

----- Geological boundary (approximate)



25 Schistosity and layering



EM conductors (A.F. 93049, 93002, 93025)

Geology after Schledewitz (1988).



K38 Trench

51 • Occurrence location

**Figure 51-1:** General geology, geophysical conductors and trench locations at occurrence 51

**LOCATION: 52****NAME:**

UTM: 6118125N/350641E

AREA: Southwest Yakushavich Island (Fig. 50).

AIRPHOTO: A26362-070

ACCESS: Kississing Lake.

**EXPLORATION SUMMARY:**

Lillian was staked by Ruby E. Hamilton in 1925, and assigned to Charles McLeod in 1926. In 1928 A.F. Blanchard staked the Mary claim. J.M. Wanless acquired the claims in 1928. Work (trenching?) was reported on Lillian in 1926-1936 and on Mary in 1929-1936 (Mining claim card, Lillian, Mary). Leases M-717 and M-718, covering the Mary and Lillian claims, were issued in 1937. Trenches were noted by Frarey (1949). Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). The leases were cancelled in 1958. J.W. Campbell held the ground as Col 60, Col 63 and Col 64 from 1959 to 1961. Prospectors Airways Company, Limited did an EM survey on the Col claims in 1959 (A.F. 90681). The ground was held as CB 3924 by Glen Rapson from 1971 to 1973 and as CB 6287 by H.L. Thompson from 1974 to 1976. In 1980 Elken Exploration Limited staked CB 9805. Gale (1980) examined two trenches (0.5 x 1 x 7 m; 1 x 1 x 5 m) in the area. In 1981 Selco Inc. did magnetometer (Geometrics G816) and HLEM (Apex MaxMin II) surveys (A.F. 93002, Grid 13). The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km<sup>2</sup>. BP Resources Canada Limited acquired the claim in 1986. CB 9805 was cancelled in 1990. Fer 17 was staked by 2460122 Manitoba Ltd. in 1991 and was cancelled in 1993. Canmine Holdings Ltd. (now Canmine Resources Corporation) staked Fer 36 in 1993. From 1993-1995 Canmine conducted geological mapping, geophysical surveys and diamond drilling in the Yakushavich Island and Collins Point area.

**GEOLOGICAL SETTING:**

The area is underlain by amphibolite ± garnet ± diopside ± calcite, calc-silicate gneiss ± carbonate layers and/or hornblende-plagioclase gneiss (Fig. 50-1; Schledewitz, 1988). Gale (1980; trench K34; Fig. 50-1) describes a 40 cm thick rusty weathered hornblende-quartz layer within amphibolite exposed in the trenches.

Drilling by Canmine in the Yakushavich Island and Collins Point area intersected near solid to solid sulphides

and gneisses altered to anthophyllite-cordierite and quartz-sericite-chlorite rock (Canmine Press Releases, January 17, 1994 and January 9, 1995).

**MINERALIZATION:**

Gale (1980) documented 1-2% disseminated pyrite mineralization within the rusty weathered hornblende-quartz layer. Exploration by Canmine has identified 8 zinc-copper rich zones in the vicinity of Yakushavich Island and Collins Point (Fig 39-2).

**GEOCHEMICAL DATA:**

None.

**CLASSIFICATION:**

Disseminated mineralization - not classified.

**REFERENCES:**

Assessment File 90681, 91616, 93002

Manitoba Energy and Mines, Minerals Division.

Frarey, M.J.

1949: Collins Point, Manitoba; Geological Survey of Canada, Paper 49-9, Preliminary map with descriptive notes, 1:31 680.

1961: Collins Point, Manitoba; Geological Survey of Canada, Map 1068A with descriptive notes, 1:63 360.

Gale, G.H.

1980: Mineral deposit studies - Flin Flon/Kisseynew; in Manitoba Energy and Mines, Mineral Resources Division, Report of Field Activities, 1980, p. 51, 56, 63. Mining claim card: Lillian (36505); Mary (878) Manitoba Energy and Mines, Mines Branch, The Pas Mining Recording Office.

Kaszycki, C.A.

1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118, 73p.

Schledewitz, D.C.P.

1985: Kisseynew Project: Kississing Lake, Big Island-Yakushavich Island region; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 54-56.

1986: Kisseynew Project: Kississing Lake; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1986, p. 92-95.

1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

**LOCATION: 53**

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

UTM: 6117106N/350439E

AREA: South of Yakushavich Island, Kississing Lake (Fig. 53).

AIRPHOTO: A26362-071

ACCESS: Kississing Lake.

**EXPLORATION SUMMARY:**

The area was first staked as Tusk (Mining claim map, 63N/3 NW, *circa* 1930). Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). In 1959 Prospectors Airways Company, Limited staked Col 19 and Col 20 and carried out an EM survey on the property (A.F. 90681). The claims lapsed in 1962. The ground was held as CB 3924 by G. Rapson in 1971-1973. In 1979 Elken Exploration Limited staked CB 9808. Selco Inc. carried out magnetometer (Scintrex MFD-4, MP 2) and HLEM (Apex MaxMin II) surveys, and drilled DDH 11-2-1 (61.6 m) and DDH 11-2-2 (63.09 m) in 1980-1981 (A.F. 93025, Grid 11-2; A.F. 93002). The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km<sup>2</sup>. BP Resources Canada Limited acquired the claim in 1986. CB 9808 was cancelled in 1990. Fer 3 was staked in 1991 by W. S. Ferreira Ltd. and transferred to 2460122 Manitoba Ltd. in 1992. The same year 2460122 Manitoba Ltd. changed its name to Canmine Holdings Ltd. (now Canmine Resources Corporation). From 1993-1995 Canmine conducted geological mapping, geophysical surveys and diamond drilling in the Yakushavich Island and Collins Point area.

**GEOLOGICAL SETTING:**

The DDH were collared on Kississing Lake immediately south of Yakushavich Island in proximity to shoreline exposures of garnet-hornblende-biotite-feldspar-quartz gneiss, Burntwood Suite (former Burntwood River Metamorphic Suite) garnet-biotite-feldspar-quartz paragneiss, and intermediate feldspar - quartz gneiss (Fig. 53-1; Schledewitz, 1988). Both DDH intersected a sequence of siliceous biotite paragneiss  $\pm$  feldspar  $\pm$  muscovite  $\pm$  garnet  $\pm$  graphite  $\pm$  sillimanite  $\pm$  carbonate.

Drilling by Canmine in the Yakushavich Island and Collins Point area intersected near solid to solid sulphides

and gneisses altered to anthophyllite-cordierite and quartz-sericite-chlorite rock (Canmine Press Releases, January 17, 1994 and January 9, 1995).

**MINERALIZATION:**

Approximately 10-15% pyrite that occurs within a biotite-chlorite-graphite rich section, was intersected over a core length of approximately 2 m in DDH 11-2-1. Minor amounts of disseminated pyrite and graphite occur locally elsewhere in the drill core. Concordant bands/layers of graphite and pyrite (up to 1 cm in core length) within a garnet-biotite paragneiss were intersected over approximately 2.7 m in DDH 11-2-2. Exploration by Canmine has identified 8 zinc-copper rich zones in the vicinity of Yakushavich Island and Collins Point (Fig 39-2).

**GEOCHEMICAL DATA:**

The mineralization was sampled and assayed for base and precious metals. Anomalous concentrations were not reported.

**CLASSIFICATION:**

Chemical sediment type deposit; sulphide facies iron formation. The mineralization is interpreted to be a graphitic sulphide facies iron formation.

**REFERENCES:**

Assessment File 90681, 91616, 93002, 93025  
Manitoba Energy and Mines, Minerals Division.

Frarey, M.J.

1961: Collins Point, Manitoba; Geological Survey of Canada, Map 1068A with descriptive notes, 1:63 360.

Kaszycki, C.A.

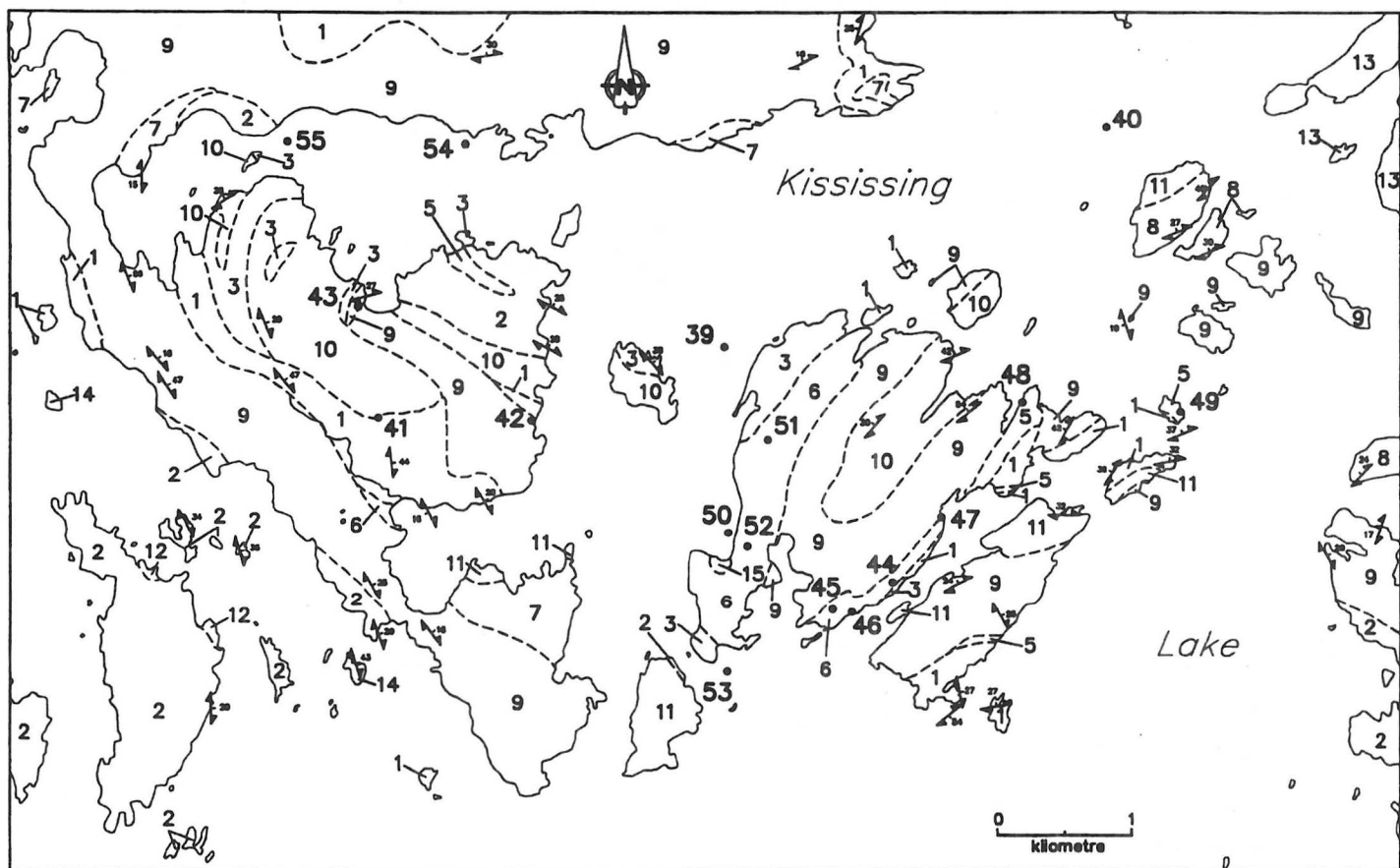
1989: Surficial geology and till composition northwestern Manitoba; Geological Survey of Canada Open File 2118, 73p.

Schledewitz, D.C.P.

1985: Kisseynew Project: Kississing Lake, Big Island-Yakushavich Island region; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 54-56.

1986: Kisseynew Project: Kississing Lake; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1986, p. 92-95.

1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.



63N/3-53

#### Intrusive Rocks

- 15 Two-mica leucogranite
- 14 Biotite leucogranite, pegmatite
- 13 Foliated monzogranite and granodiorite
- 12 Coarse grained amphibolite, metagabbro
- 11 Mesocratic hornblende-biotite gneiss
- 10 Tonalitic to granodioritic gneiss

#### Misil Metamorphic Suite

- 9 Quartz-feldspar-hornblende-biotite gneiss
- 8 Quartz-rich paragneiss
- 7 Varicoloured paragneiss

#### Unnamed Gneisses

- 6 Uniform amphibolite

- 5 Garnetiferous amphibolite

- 4 Rusty biotite-plagioclase-quartz gneiss

- 3 Garnet-hornblende-biotite-graphite gneiss

#### Burntwood Metamorphic Suite

- 2 Garnet-biotite gneiss, metagreywacke

- 1 Metatextite derived from greywacke

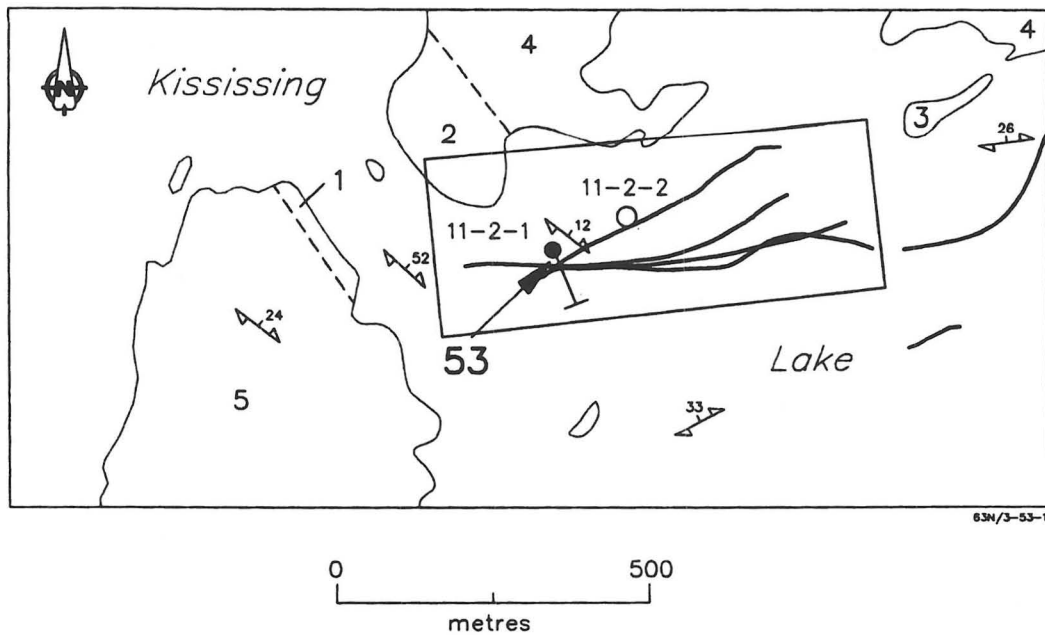
--- Geological boundary (approximate)

↗ Schistosity and layering

Geology after Schledewitz (1988).

42. Occurrence location

Figure 53: General geology in the vicinity of occurrences 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54 and 55



#### Intrusive Rocks

- 5 Mesocratic hornblende–biotite gneiss

#### Unnamed Gneisses

- 4 Uniform amphibolite  
3 Intermediate gneiss  
2 Garnet–hornblende–biotite–graphite gneiss

#### Burntwood River Metamorphic Suite

- 1 Garnet–biotite metagreywacke gneiss

Geology after Schledewitz (1988).

----- Geological boundary (approximate)

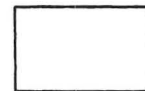


Schistosity and layering

— EM conductors  
( A.F. 93025,93002,93046,90681)



Drillhole (A.F. 93049)



Area encompassed by Mineral  
Deposit File

**Figure 53-1:** General geology, geophysical conductors and diamond-drill hole location at occurrence 53

**LOCATION: 54**

NAME: (A.F. Mineralization intersected by diamond drilling)  
UTM: 6121140N/348506E  
AREA: North of Collins Point, Kississing Lake (Fig. 53).  
AIRPHOTO: A26331-222  
ACCESS: Kississing Lake.

**EXPLORATION SUMMARY:**

The area was first staked as NOR 9 and NOR 10 in 1959 (Mining claim map, 63N/3 NW, 1959) and were cancelled the following year. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km<sup>2</sup>. In 1984 Elken Exploration Limited staked CB 13564. Selco Inc. performed a Crone Deepem survey on the property in 1984 and drilled DDH 11-9-1 in 1985 (A.F. 93049). BP Resources Canada Limited acquired the claims in 1986. CB 13564 was cancelled in 1990. Fer 6 was staked by W.S. Ferreira Ltd. in 1991 and in 1992 the claim was transferred to 2460122 Manitoba Ltd. The same year 2460122 Manitoba Ltd. changed its name to Canmine Holdings Ltd. (now Canmine Resources Corporation). From 1993-1995 Canmine conducted geological mapping, geophysical surveys and diamond drilling in the Yakushavich Island and Collins Point area.

**GEOLOGICAL SETTING:**

The drillhole was collared on Kississing Lake. Missi Suite (former Missi Metamorphic Suite) intermediate feldspar - quartz gneiss ± biotite ± hornblende ± magnetite ± muscovite ± epidote - quartz layers is exposed on the shoreline north of the drillhole, and Burntwood Suite (former Burntwood River Metamorphic Suite) biotite-feldspar-quartz paragneiss and/or metatexite ± sillimanite ± graphite ± garnet ± pyrite ± cordierite crops out to the south along the north shore of Collins Point (Fig. 54-1; Schledewitz, 1988). The drillhole intersected a sequence of biotite - garnet - sillimanite gneiss, amphibolite ± garnet ± chlorite, biotite - garnet gneiss, quartzitic biotite gneiss, granodiorite and mineralized siliceous biotite gneiss with green pegmatitic and/or calc-silicate interlayers (A.F. 93049).

Drilling by Canmine in the Yakushavich Island and Collins Point area intersected near solid to solid sulphides and gneisses altered to anthophyllite-cordierite and quartz-sericite-chlorite rock (Canmine Press Releases, January 17, 1994 and January 9, 1995).

**MINERALIZATION:**

An approximately 8 cm core intersection that contains 60% pyrite and 30% pyrrhotite ± sphalerite occurs within a 6.5m long siliceous biotite ± muscovite ± sillimanite ± chlorite ± plagioclase gneiss layer. This siliceous also contains up to 30% pyrite over core lengths of 8 cm and 7 cm, and disseminated pyrrhotite ± pyrite ± sphalerite mineralization associated with numerous thin green pegmatitic (amazonite-bearing ?) interlayers (veins?). Down hole, a similar rock type, approximately 2.8 m in core length, contains a 2 cm intersection with up to 50% pyrite, 45% chlorite and 5% sphalerite, a 20 cm intersection that contains 20% pyrrhotite, and disseminated sphalerite and galena, and a 10 cm intersection that contains 75% pyrrhotite. Exploration by Canmine has identified 8 zinc-copper rich zones in the vicinity of Yakushavich Island and Collins Point (Fig 39-2).

**GEOCHEMICAL DATA:**

Core samples that contained sulphide mineralization were analyzed for Cu, Zn, Pb, Au and Ag. A 50 cm long sample from the 6.5 long siliceous biotite gneiss layer contained 1500 ppm Zn and 140 ppm Cu. Down hole, a 20 cm long sample from the 2.8 m long siliceous biotite gneiss layer contained 7.4% Zn, 730 ppm Cu and 4000 ppm Pb.

Combined reserves from the 8 zinc-copper rich zones is 2.6 million tonnes of 2.95% Zn, 0.71% Cu, 0.33 oz/ton Ag and 0.008 oz/ton Au (Karen Ferreira, Canmine Resources Corporation, written communication, January 13, 1997).

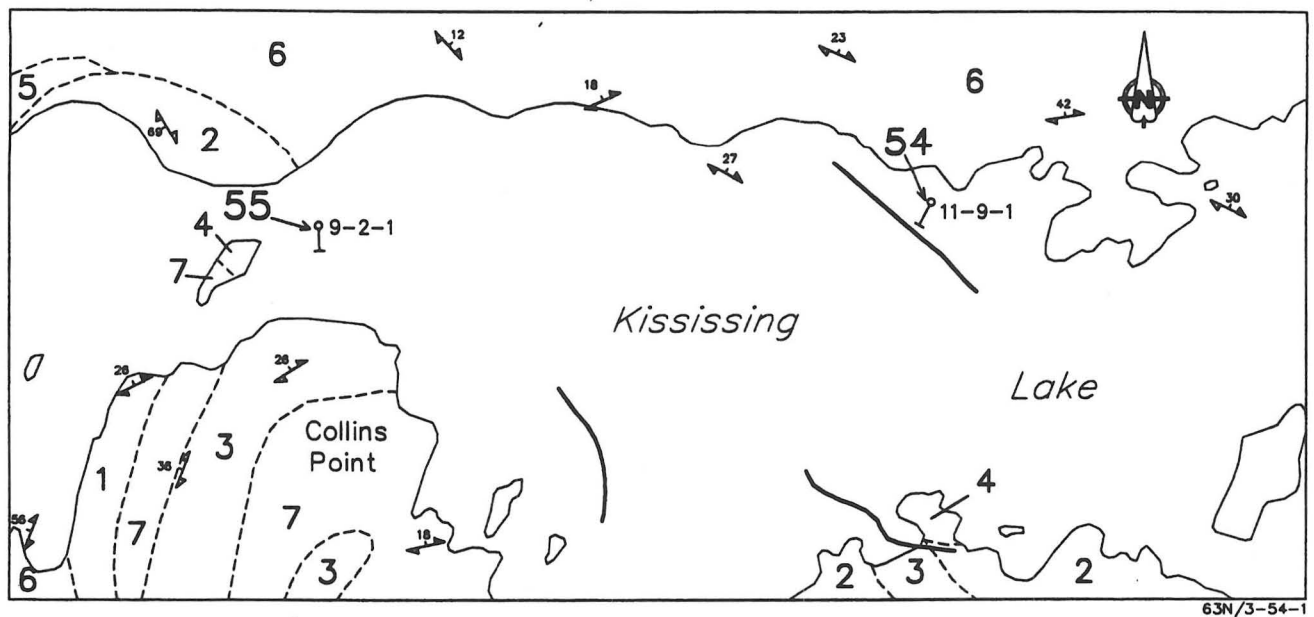
**CLASSIFICATION:**

Chemical sediment type deposit; sulphide facies iron formation. Alternatively, the high Zn and Pb concentrations may depict distal massive sulphide type deposit mineralization. Polymetallic massive sulphide type mineralization is interpreted to occur in the vicinity (*cf.* Location 39). Canmine Resources Corporation interprets the mineralization at Location 39 (the Fer, Fer South and Ruby Zones) to occur at the same stratigraphic position as the mineralization at Location 41 (Spruce Zone), Location 44 (Yak Zone), the Prism Zone, the Bay Zone and the Island Zone. Furthermore, Canmine suggests that this mineralized layer(s) outlines a trough shaped synformal structure, approximately 3 km across (Fig. 39-2).

**REFERENCES:**

- Assessment File 91616, 93049  
Manitoba Energy and Mines, Minerals Division.  
Schledewitz, D.C.P.  
1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.





#### Orthogneisses

- 7 Tonalitic to granodioritic gneiss

#### Missi Metamorphic Suite

- 6 Quartz-feldspar-hornblende-biotite gneiss

- 5 Varicoloured paragneiss

#### Unnamed Gneisses

- 4 Rusty biotite-plagioclase-quartz gneiss

- 3 Garnet-hornblende-biotite-graphite gneiss

#### Burntwood River Metamorphic Suite

- 2 Garnet-biotite gneiss, metagreywacke

- 1 Metatexite derived from greywacke

----- Geological boundary (approximate)

 Schistosity and layering

 Gneissosity (inclined)

Geology after Schledewitz (1988).

———— EM conductor (A.F. 93049)

 Drillhole (A.F. 93049)

**Figure 54-1:** General geology, geophysical conductors and diamond-drill hole locations at occurrences 54 and 55

**LOCATION: 55**

NAME: (A.F. Mineralization intersected by diamond drilling)  
UTM: 6121172N/347178E  
AREA: North of Collins Point, Kississing Lake (Fig. 53).  
AIRPHOTO: A26331-129  
ACCESS: Kississing Lake.

**EXPLORATION SUMMARY:**

Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). The area was first staked as CB 9799 in 1979 (Mining claim map, 63N/3 NW, 1979). The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km<sup>2</sup>. Selco Inc. performed a Crone Deepem survey on the property in 1984 and drilled DDH 9-2-1 in 1985 (A.F. 93049). BP Resources Canada Limited acquired the claims in 1986. CB 9799 was cancelled in 1991. W.S. Ferreira Ltd. staked Fer 7 the same year and in 1992 transferred the claim to 2460122 Manitoba Ltd. The same year 2460122 Manitoba Ltd. changed its name to Canmine Holdings Ltd. (now Canmine Resources Corporation). From 1993-1995 Canmine conducted geological mapping, geophysical surveys and diamond drilling in the Yakushavich Island and Collins Point area.

**GEOLOGICAL SETTING:**

The drillhole was collared on Kississing Lake. Burntwood Suite (former Burntwood River Metamorphic Suite) biotite-feldspar-quartz paragneiss and/or metatexite, Missi Suite (former Missi Metamorphic Suite) intermediate feldspar - quartz gneiss, amphibolite ± garnet ± diopside ± calcite, and calc-silicate gneiss ± carbonate layers and/or hornblende-plagioclase gneiss, crop out in the vicinity (Fig. 54-1; Schledewitz, 1988). The drillhole intersected a sequence of biotite - quartz - plagioclase gneiss ± garnet ± graphite and granodiorite/quartz monzonite gneiss (A.F. 93049).

Drilling by Canmine in the Yakushavich Island and Collins Point area intersected near solid to solid sulphides and gneisses altered to anthophyllite-cordierite and quartz-

sericite-chlorite rock (Canmine Press Releases, January 17, 1994 and January 9, 1995).

**MINERALIZATION:**

Numerous thin concordant graphite and/or pyrite intersections, probably on the order of a mm or mm's thick, were documented locally throughout the core. Two concordant layers, 4-6 cm in core length, contain 50-60% pyrite and 30% graphite. Near the end of the drillhole a 3.5 cm long intersection contains a 2 cm long concordant mafic zone (layer?) of very fine grained euhedral tourmaline and minor amounts of pyrite. The mafic zone is rimmed by a white-green chlorite- and muscovite-bearing quartzofeldspathic zone (layer?) that contains rare anhedral grains of arsenopyrite. Exploration by Canmine has identified 8 zinc-copper rich zones in the vicinity of Yakushavich Island and Collins Point (Fig 39-2).

**GEOCHEMICAL DATA:**

None.

**CLASSIFICATION:**

Chemical sediment type deposit; sulphide facies iron formation. The mineralization is interpreted to be a graphitic sulphide facies iron formation. Although only graphite may be recorded in the drill log, the majority of this type of occurrence has been found to contain more Fe sulphide than carbon (Gale *et al.*, 1980). Although the tourmaline-, pyrite- and arsenopyrite-bearing zone is concordant, it may represent vein material.

**REFERENCES:**

Assessment File 91616, 93049

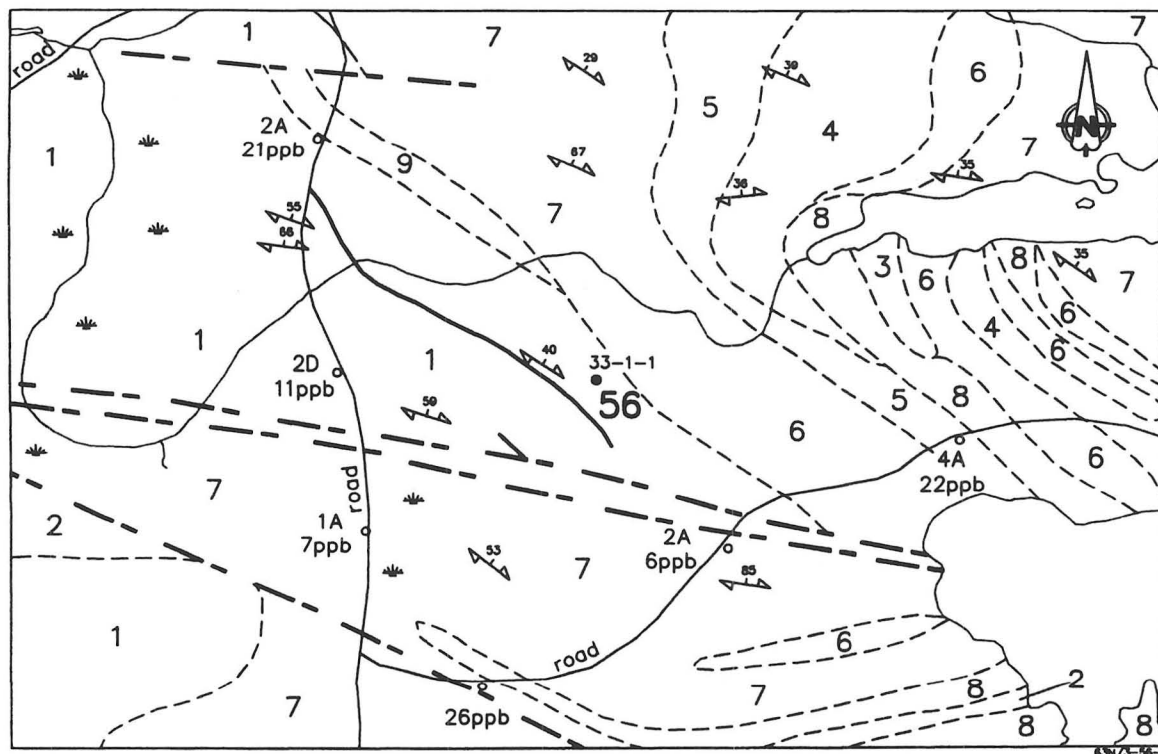
Manitoba Energy and Mines, Minerals Division.

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.

Schledewitz, D.

1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.



#### Intrusive Rocks

- 9 Two-mica leucogranite

#### Missi Metamorphic Suite

- 8 Quartz-feldspar-hornblende-biotite gneiss  
7 Quartz-rich paragneiss  
6 Meta-arkose  
5 Varicoloured paragneiss  
4 Pink felsic gneiss, felsic metavolcanic rocks  
3 Metaconglomerate and metasandstone  
2 Amphibolite, mafic volcanic and intrusive rocks

#### Burntwood River Metamorphic Suite

- 1 Diatexite derived from greywacke

----- Geological boundary (approximate)

———— EM conductors (A.F. 92678)

▲ Schistosity (inclined)

--- Fault zone (assumed)

● 33-1-1 Drillhole (A.F. 92678)

Geology after Schledewitz (1988).

4A  
22ppb ° Till sample location; 22 ppb Au  
in the heavy mineral fraction  
(4A: 4 abraded grains Au;  
2D: 2 delicate grains Au)

~ Swamp

**Figure 56-1:** General geology, geophysical conductors and diamond-drill hole location at occurrence 56

#### LOCATION: 56

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

UTM: 6098472N/344060E

AREA: South of Barrett Bay, Kississing Lake.

AIRPHOTO: A26331-018

ACCESS: Kississing Lake road, Duval Lake road.

#### EXPLORATION SUMMARY:

HBED staked Oz 942 in 1960, and did an airborne geophysical survey over the property in 1961 (Mining claim card, Oz 942). The claim lapsed in 1962. In 1980 an airborne Mark VI Input survey was done by Questor Surveys Limited for Cominco Limited, and three sub-parallel conductors were outlined (A.F. 92423). Elken Exploration Limited staked CB 13456 in 1981, performed a magnetometer (GSM-8 Proton) survey and an HLEM (Apex MaxMin II) survey, and drilled DDH 33-1-1 (58.52 m) on the property in 1982 (A.F. 92678). The area was included in a regional till sampling program that was conducted between 1983-1989 by Kaszycki (1989). Sampling was carried out at a density of approximately 2-3 samples per 100 km<sup>2</sup>. In 1986, the area was restaked as Kew 12 by Kidd Creek Mines Ltd. Falconbridge Limited acquired the claim in 1988. The same year Neilsen and Gobert (1988) collected till samples along road traverses in the area.

#### GEOLOGICAL SETTING:

The area is underlain by Burntwood Suite (former Burntwood River Metamorphic Suite) paragneiss in proximity to a mylonitic zone that separates the Burntwood Suite rocks from those of the Missi Suite (former Missi Metamorphic Suite; Fig. 56-1; Schledewitz, 1988). The drill-hole intersected interlayered plagioclase - quartz - biotite - garnet gneiss and plagioclase - quartz - biotite gneiss. Garnet porphyroblasts are commonly subhedral and up to 1 mm in diameter.

#### MINERALIZATION:

The drillhole intersected four solid graphite layers that range in core length from 6-60 cm. Visible sulphides were not recognized. Till samples from the area contain up to 4 visible grains of gold, and gold concentrations in the heavy mineral fraction (specific gravity greater than 2.96) of up to 26 ppb Au (Neilsen and Gobert, 1988). However, Neilsen and Gobert (1988) suggest that the abraded nature of the grains and their wide distribution reflect background gold concentrations for this part of the Kiseynew gneiss belt.

#### GEOCHEMICAL DATA:

Two drillhole intersections were assayed for Au, Ag, Cu, Zn and Pb, but anomalous concentrations were not reported.

#### CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. The mineralization is interpreted to be a graphitic sulphide facies iron formation. Although only graphite may be recorded in the drill log, the majority of this type of occurrence has been found to contain more Fe sulphide than carbon (Gale *et al.*, 1980).

#### REFERENCES:

Assessment File 92423, 92678

Manitoba Energy and Mines, Minerals Division.

Frarey, M.J.

1949: Collins Point, Manitoba; Geological Survey of Canada, Paper 49-9, Preliminary map with descriptive notes, 1:31 680.

1961: Collins Point, Manitoba; Geological Survey of Canada, Map 1068A with descriptive notes, 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.

Kaszycki, C.A.

1989: Surficial geology and till composition, northwestern Manitoba; Geological Survey of Canada, Open File 2118, 73p.

Mining claim card, Oz 942 (P 83672)

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

Nielsen, E. and Gobert, G.

1988: Till geochemistry in northwest Manitoba; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1988, p. 161-166.

Schledewitz, D.C.P.

1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:20 000.

Zwanzig, H.V.

1983: Kiseynew Project: Lobstick Narrows; in Manitoba Energy and Mines, Mineral Resources Division, Report of Field Activities, 1983, p. 15-22.

1984: Lobstick Narrows-Cleunion Lake; Manitoba Energy and Mines, Preliminary Map 1984K-1, 1:20 000.

Zwanzig, H.V.

1985: Kiseynew Project; in Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 51-53.

**LOCATION: 57****NAME:**

UTM: 6111099N/352069E

AREA: North of South Bay and Sasayskikwan Island, Kississing Lake.

AIRPHOTO: A26362-156

ACCESS: Kississing Lake.

**EXPLORATION SUMMARY:**

Eldorado Mining and Refining Limited did an airborne radiation survey over the area in 1954 (A.F. 91616). The ground was held as Ale 968 and Ale 971 by HBED from 1961 to 1962. Elken Exploration Limited staked Permit 33 in 1979. Selco Mining Corporation Limited did VLF-EM, magnetic (Scintrex Fluxgate MFD-4) and HLEM (Apex MaxMin II) surveys and a geological survey (1:2500), and drilled DDH 80-8 (61.6 m?) for Elken Exploration in 1979-1980 (A.F. 92366, Grid 1, Grid 3). Permit 33 lapsed in 1981.

**GEOLOGICAL SETTING:**

The drillhole was collared on Kississing Lake in an area of Burntwood Suite (former Burntwood River Metamorphic Suite) and Missi Suite (former Missi Metamorphic Suite) rocks (Fig. 57-1; Schledewitz, 1988). The drill log was not submitted with

the assessment work, but the assessment report indicates that the drillhole intersected greywacke paragneiss (A.F. 92366).

**MINERALIZATION:**

The drill core contains minor amounts of graphite. Disseminated graphite was documented within Burntwood River Metamorphic Suite rocks in the immediate vicinity (Schledewitz, 1988).

**GEOCHEMICAL DATA:**

None.

**CLASSIFICATION:**

Disseminated mineralization - not classified.

**REFERENCES:**

Assessment File 91616, 92366

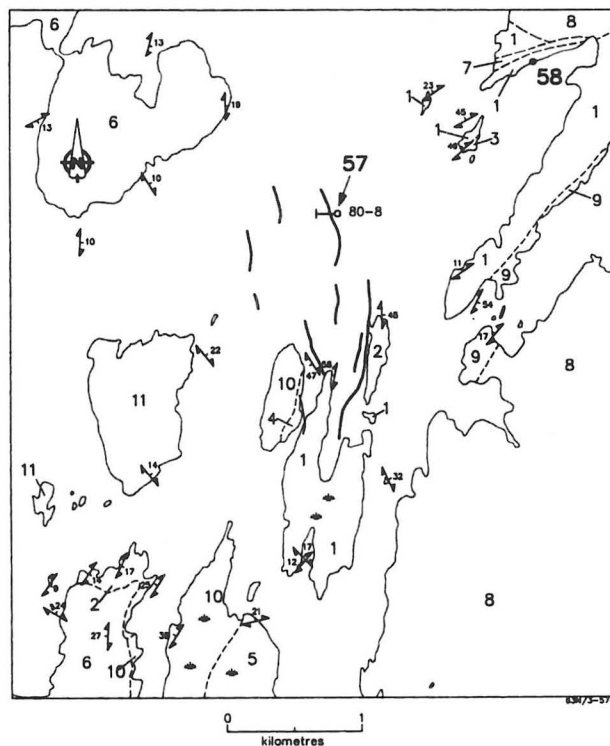
Manitoba Energy and Mines, Minerals Division.

Frarey, M.J.

1961: Collins Point, Manitoba; Geological Survey of Canada, Map 1068A with descriptive notes, 1:63 360.

Schledewitz, D.C.P.

1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

**Intrusive Rocks**

11 Pink granitic pegmatite

10 Two-mica leucogranite

9 Mesocratic hornblende-biotite gneiss

8 Tonalitic to granodioritic gneiss

7 Granodioritic to granitic gneiss

**Missi Metamorphic Suite**

6 Quartz-feldspar-hornblende-biotite gneiss

5 Meta-arkose

4 Varicoloured paragneiss

**Unnamed Gneisses**

3 Rusty biotite-plagioclase-quartz gneiss

**Burntwood River Metamorphic Suite**

2 Garnet-biotite gneiss, metagreywacke

1 Metatextite derived from greywacke

----- Geological boundary (approximate)

——— EM conductor (A.F. 92366)

↗ Gneissosity (inclined)

Geology after Schledewitz (1988).

○ Drillhole (A.F. 92366)

⬮ Swamp

★ 58 Occurrence location

Figure 57-1: General geology, geophysical conductors and diamond-drill hole location at occurrence 57

**LOCATION: 58****NAME:****UTM:** 6112076N/353529E**AREA:** Groves Island, Kississing Lake.**AIRPHOTO:** A26362-157**ACCESS:** Kississing Lake road, Kississing Lake.**EXPLORATION SUMMARY:**

The area was first staked as the Star claim prior to 1930 (Mining claim map, 63N/3 NW, *circa* 1930). Eldorado Mining and Refining Limited did an airborne radiation survey over the area in 1954 (A.F. 91616). Elken Exploration Limited staked Permit 33 in 1979. In 1979-1980 Selco Mining Corporation Limited carried out a VLF-EM survey and a geological survey (1:2500) on behalf of Elken Exploration (A.F. 92366, Grid 2). Permit 33 lapsed in 1981.

**GEOLOGICAL SETTING:**

The area is underlain by Burntwood Suite (former Burntwood River Metamorphic Suite) paragneiss and Missi Suite (former Missi Metamorphic Suite) quartzofeldspathic gneiss (Fig. 58-1; Schledewitz, 1988).

**MINERALIZATION:**

An arsenopyrite occurrence is documented at this location by Schledewitz (1988).

**GEOCHEMICAL DATA:**

A grab sample of the arsenopyrite mineralization contained trace amounts of gold (Schledewitz, 1987).

**CLASSIFICATION:**

Disseminated mineralization - not classified.

**REFERENCES:**

Assessment File 91616, 92366

Manitoba Energy and Mines, Minerals Division.

Frarey, M.J.

1961: Collins Point, Manitoba; Geological Survey of Canada, Map 1068A with descriptive notes, 1:63 360.

Gale, G.H. and Ostry, G.

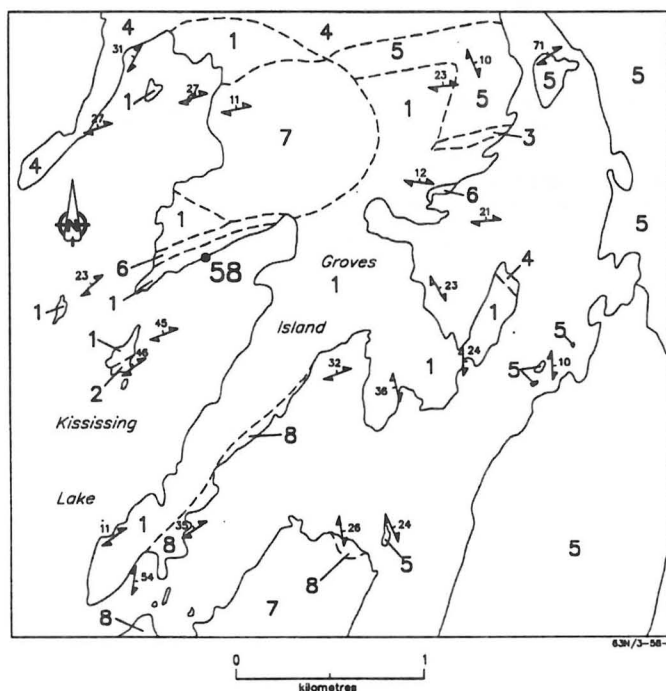
1984: Stratabound gold mineralization in the Kiseynew gneiss terrain; in Manitoba Energy and Mines, Mineral Resources Division, Report of Field Activities, 1984, p. 73-80.

Schledewitz, D.C.P.

1986: Kiseynew Project: Kississing Lake; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1986, p. 92-95.

1987: Kiseynew Project: Kississing Lake; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1987, p. 51-54.

1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

**Intrusive Rocks**

8 Mesocratic hornblende-biotite gneiss

7 Tonalitic to granodioritic gneiss

6 Granodioritic to granitic gneiss

**Missi Metamorphic Suite**

5 Quartz-rich paragneiss

4 Varicoloured paragneiss

**Unnamed Gneisses**

3 Diopside-bearing amphibolite

2 Rusty biotite-plagioclase-quartz gneiss

**Burntwood River Metamorphic Suite**

1 Metatexite derived from greywacke

----- Geological boundary (approximate)

↘ Schistosity (inclined) and layering

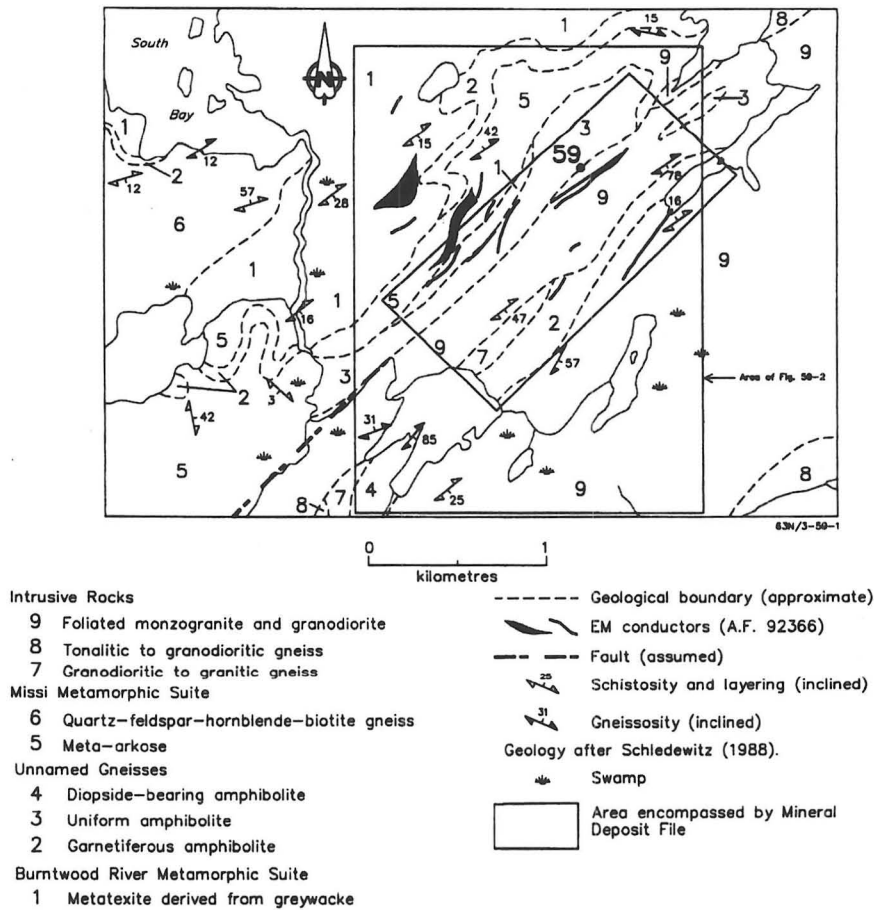
↘ Gneissosity (inclined)

Geology after Schledewitz (1988).

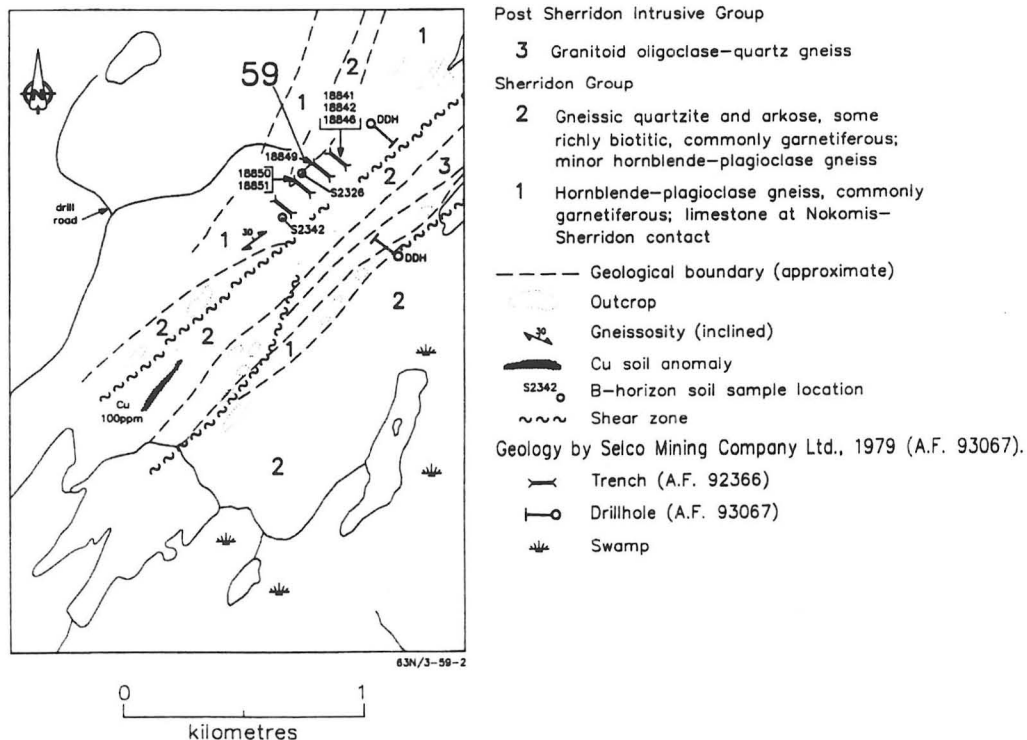
● 58 Occurrence location

**Figure 58-1: General geology in the vicinity of occurrence 58**





**Figure 59-1: General geology and geophysical conductors at occurrence 59**



**Figure 59-2: Detailed geology, trench locations, Cu soil anomaly, B horizon soil sample location and diamond-drill hole locations at occurrence 59**

**LOCATION: 59****NAME:**

UTM: 6103928N/354939E

AREA: Southeast of South Bay, Kississing Lake.

AIRPHOTO: A26362-249

ACCESS: Kississing Lake, traverse.

**EXPLORATION SUMMARY:**

The area was first staked as Bow 1-8, Bow 10-13, Bee 5-6 and Peg 1-6 prior to 1930 (Mining claim map, 63N/3 SW, *circa* 1930). HBED staked Ale 1013 to Ale 1039 in 1961. The claims lapsed in 1962. Elken Exploration Limited held the ground as Permit 33 from 1979 to 1981 and as CB 9795 from 1979 to 1984. In 1979 Selco Mining Corporation Limited located a series of trenches, and performed magnetometer and VLF-EM surveys, geological mapping (1:5000), and soil geochemical surveys on Permit 33 on behalf of Elken Exploration (A.F. 92366, Grid 4). Bess 13, Bess 15 and Bess 16 were staked by 294401 Alberta Ltd. in 1983 and optioned by Catear Resources Ltd. in 1985-1986. In 1986 Noko Resources Inc. acquired the claims and carried out prospecting, stripping, geological mapping (1:5 000), and rock and soil (B horizon) geochemical surveys on Bess 13 and Bess 15 (A.F. 93067). Bess 16 lapsed in 1986. Noko Resources Inc. staked Bruce 1 in 1987. In 1987 Varna Gold Inc. did linecutting on Bruce 1, Bess 13 and Bess 15 for Noko Resources Inc. (A.F. 93065). The claims lapsed in 1990.

**GEOLOGICAL SETTING:**

The area is underlain by Burntwood Suite (former Burntwood River Metamorphic Suite) paragneiss, Missi Suite (former Missi Metamorphic Suite) paragneiss, felsic intrusive rocks and amphibolite (Fig. 59-1; Schledewitz, 1988). The trenches (Fig. 59-2) expose hornblende - plagioclase - garnet (amphibolite) gneiss or limestone (A.F. 93067) and hornblende - biotite - plagioclase  $\pm$  garnet gneiss (A.F. 92366).

**MINERALIZATION:**

Near solid to solid pyrrhotite and pyrite with trace amounts of chalcopyrite is exposed in three of the trenches, and disseminated pyrrhotite, pyrite and possibly chalcopyrite is exposed in all other trenches (Fig. 59-2; A.F. 93067). The mineralization is hosted by 'sheared and/or silicified' amphibolitic rocks that contain minor to moderate amounts of Fe-sulphide (A.F. 93067). Drill core located, presumably, near or at the drill collar locations contained disseminated pyrrhotite  $\pm$  chalcopyrite mineralization within amphibolite (Fig. 59-2; A.F. 92366).

**GEOCHEMICAL DATA:**

All samples of the near solid sulphide that are exposed in the trenches contain elevated concentrations of Cu and

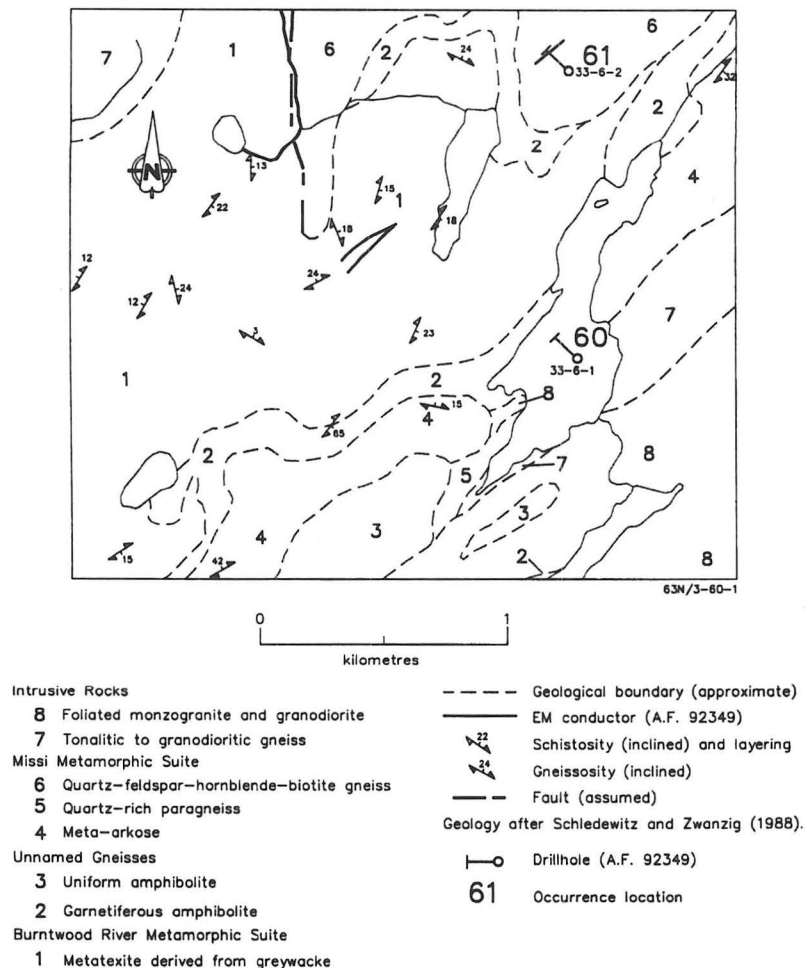
Zn, *i.e.*, up to 1690 ppm Zn (sample 18850) and 662 ppm Cu (sample 18851; Fig. 59-2). Coincident Cu, Zn and Ag anomalies within 'B' horizon soil samples were delineated in the vicinity of the mineralization. The position of the 'B' soil horizon Cu anomaly (A.F. 92366) is illustrated on Figure 59-2. Sheared and/or silicified amphibolite, also exposed in the trenches, locally contain up to 865 ppm As (sample 18846) and 248 ppm W (sample 18842; possible contamination from sample preparation with a W-carbide disk?). 'B' horizon soil samples (A.F. 93067) taken from the area around the trenches contain anomalous concentrations of base metals, *e.g.*, up to 196 ppm Cu (sample S2326) and 587 ppm Zn (sample S2342). Soil sample S2326 also contained 100 ppb Au and 535 ppm As.

**CLASSIFICATION:**

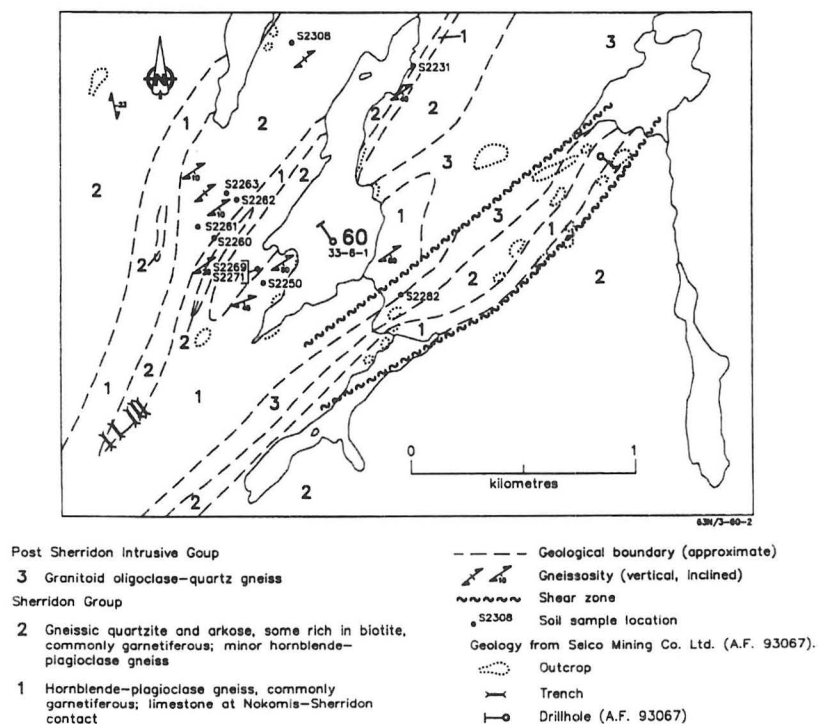
Chemical sediment type deposit; sulphide facies iron formation. Elsewhere on the south flank of the Kiseynew gneiss belt (*cf.* Nokomis Lake, Evans Lake; Ostry and Trembath (1992)) gold, arsenopyrite and scheelite mineralization in association with amphibolites occurs locally at the Missi Suite - Burntwood Suite contact (Gale and Ostry, 1984).

**REFERENCES:**

- Assessment File 92366, 93065, 93067  
Manitoba Energy and Mines, Minerals Division.  
Bateman, J.D. and Harrison, J.M.  
1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.  
Frarey, M.J.  
1961: Collins Point, Manitoba; Geological Survey of Canada, Map 1068A with descriptive notes, 1:63 360.  
Gale, G.H. and Ostry, G.  
1984: Stratabound gold mineralization in the Kiseynew gneiss terrain; in Manitoba Energy and Mines, Mineral Resources Division, Report of Field Activities, 1984, p. 73-80.  
Ostry G. and Trembath, G. D.  
1992: Mineral Deposits and Occurrences in the Batty Lake Area, NTS 63N/2; Manitoba Energy and Mines, Mineral Deposit Series, Report No. 19; 276p.  
Schledewitz, D.C.P.  
1987: Kiseynew Project: Kississing Lake; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1987, p. 51-54.  
1987: Kississing Lake East (63N/3); Manitoba Energy and Mines, Preliminary Map 1987K-2, 1:20 000.  
1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.



**Figure 60-1: General geology, geophysical conductors and diamond-drill hole locations at occurrences 60 and 61**



**Figure 60-2: Detailed geology, trench locations and drillhole location at occurrence 60**

**LOCATION: 60**

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

UTM: 6105010N/355849E

AREA: East of South Bay, Kississing Lake.

AIRPHOTO: A26362-248

ACCESS: Kississing Lake, traverse.

**EXPLORATION SUMMARY:**

The area was first staked as Bow 9 prior to 1930 (Mining claim map, 63N/3 SW, *circa* 1930). HBED staked Rap 468 in 1959, and restaked it as Ale 1007 in 1961. The claim lapsed in 1962. Elken Exploration Limited staked Permit 33 in 1979. In 1981 Selco Inc. carried out magnetometer (Geometrics G816) and HLEM (Apex MaxMin II) surveys, and drilled DDH 33-6-1 (67.36 m) on behalf of Elken Exploration (A.F. 92349, Grid 6). Permit 33 lapsed in 1981. Bess 10 was staked by 294401 Alberta Ltd. in 1983 and optioned to Catear Resources Ltd. in 1985-1986. In 1986 Noko Resources Inc. acquired the claim and carried out prospecting, stripping, geological mapping (1:5000), and rock and soil geochemical surveys (A.F. 93067). Varna Gold Inc. did some linecutting on Bess 10 in 1987 (A.F. 93065). Bess 10 lapsed in 1990.

**GEOLOGICAL SETTING:**

The drillhole was collared on a small unnamed lake and occurs at, or near, the Burntwood Suite (former Burntwood River Metamorphic Suite) and Missi Suite (former Missi Metamorphic Suite) contact. Burntwood Suite rocks, Missi Suite rocks, tonalitic orthogneiss and amphibolite are exposed on the shoreline of the lake (Fig. 60-1; Schledewitz, 1988). The drillhole intersected interlayered graphitic biotite paragneiss, hornblende - plagioclase gneiss and siliceous, locally garnetiferous, biotite paragneiss.

**MINERALIZATION:**

Thin, up to 2 cm thick, bands/layers of pyrite  $\pm$  arsenopyrite were intersected within the siliceous biotite paragneiss

**GEOCHEMICAL DATA:**

Four 1.52 m long core samples that incorporate an approximately 5 m long mineralized intersection within the siliceous biotite gneiss were assayed for Au, Ag, Cu, Zn and Pb. One intersection contained 0.69 g/t Au and 0.69 g/t Ag.

Lithogeochemical samples 18831, 18869 and 18871 contained 0.16, 0.45 and 0.46 g/t Au respectively (Fig. 60-2; A.F. 93067) and up to 162 ppm As. Concentrations of 200 - 425 ppm Zn were detected in 'B' horizon soil samples S2261-S2263, S2273 and S2282 (A.F. 93067). Other metal concentrations in 'B' horizon soil samples include up to 107 ppm Cu (sample S2260), 120 ppb Au (sample S2308), and 539 ppm As (sample S2250).

**CLASSIFICATION:**

Vein type deposit; multiple veins or lenses. Pyrite veins that contain minor amounts of arsenopyrite contain elevated amounts of gold and silver. Elsewhere on the south flank of the Kiseynew gneiss belt (*cf.* Nokomis Lake, Evans Lake; Ostry and Trembath (1992)) gold and arsenopyrite mineralization is associated with amphibolites that occur locally at the Missi Metamorphic Suite - Burntwood River Metamorphic Suite contact (Gale and Ostry, 1984).

**REFERENCES:**

- Assessment File 92349, 93065, 93067  
Manitoba Energy and Mines, Minerals Division.  
Bateman, J.D. and Harrison, J.M.  
1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.  
Frarey, M.J.  
1961: Collins Point, Manitoba; Geological Survey of Canada, Map 1068A with descriptive notes, 1:63 360.  
Gale, G.H. and Ostry, G.  
1984: Stratabound gold mineralization in the Kiseynew gneiss terrain; in Manitoba Energy and Mines, Mineral Resources Division, Report of Field Activities, 1984, p. 73-80.  
Ostry G. and Trembath, G. D.  
1992: Mineral Deposits and Occurrences in the Batty Lake Area, NTS 63N/2; Manitoba Energy and Mines, Mineral Deposit Series, Report No. 19; 276p.  
Schledewitz, D.C.P.  
1987: Kiseynew Project: Kississing Lake; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1987, p. 51-54.  
1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

**LOCATION: 61**

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

UTM: 6106208N/355816E

AREA: East of South Bay, Kissinging Lake.

AIRPHOTO: A26362-247

ACCESS: Kissinging Lake, traverse.

**EXPLORATION SUMMARY:**

Eldorado Mining and Refining Limited did an airborne radiation survey over the area in 1954 (A.F. 91616). HBED staked Ale 998 in 1961. The claim lapsed in 1962. Elken Exploration Limited staked Permit 33 in 1979. In 1981 Selco Inc. carried out magnetometer (Geometrics G816) and HLEM (Apex MaxMin II) surveys, and drilled DDH 33-6-2 (76.50 m) on behalf of Elken Exploration (A.F. 92349, Grid 6). Permit 33 lapsed in 1981. Bess 8 was staked by 294401 Alberta Ltd. in 1983 and optioned to Catear Resources Ltd. in 1985-1986. The claim lapsed in 1986.

**GEOLOGICAL SETTING:**

The drillhole collar is located at or near the Burntwood Suite (former Burntwood River Metamorphic Suite) and Missi Suite (former Missi Metamorphic Suite) contact. The drillhole intersected hornblende - plagioclase gneiss, siliceous biotite gneiss, garnet amphibolite and greywacke gneiss (Fig. 60-1; Schledewitz, 1988).

**MINERALIZATION:**

Minor amounts of pyrite and pyrrhotite mineralization were observed within the siliceous biotite gneiss and a 30 cm long intersection within hornblende - plagioclase gneiss contains 30 per cent pyrite and pyrrhotite.

**GEOCHEMICAL DATA:**

Intersections within the siliceous biotite gneiss that contain disseminated sulphide mineralization were assayed

for Cu, Zn, Pb, Au and Ag. Anomalous concentrations of base or precious metals were not reported. A 1.52 m long core sample taken from the hornblende - plagioclase gneiss that contains the Fe-sulphide mineralization was assayed and contains 0.34 g/t Ag.

**CLASSIFICATION:**

Chemical sediment type deposit; sulphide facies iron formation. Elsewhere on the south flank of the Kiseynew gneiss belt (*cf.* Nokomis Lake, Evans Lake; Ostry and Trembath (1992)) gold and arsenopyrite mineralization is associated with amphibolites that occur locally at the Missi Metamorphic Suite - Burntwood River Metamorphic Suite contact (Gale and Ostry, 1984).

**REFERENCES:**

Assessment File 91616, 92349

Manitoba Energy and Mines, Minerals Division.

Bateman, J.D. and Harrison, J.M.

1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.

Frarey, M.J.

1961: Collins Point, Manitoba; Geological Survey of Canada, Map 1068A with descriptive notes, 1:63 360.

Gale, G.H. and Ostry, G.

1984: Stratabound gold mineralization in the Kiseynew gneiss terrain; in Manitoba Energy and Mines, Mineral Resources Division, Report of Field Activities, 1984, p. 73-80.

Ostry, G. and Trembath, G.D.

1992: Mineral Deposits and occurrences in the Batty Lake area, NTS 63N/2; Mineral Deposit Series Report No. 19, Manitoba Energy and Mines, 264p.

Schledewitz, D.C.P.

1988: Kissinging Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

**LOCATION: 62**

NAME: (A.F. Mineralization intersected by diamond drilling)  
UTM: 6115313N/359852E  
AREA: East Kississing Lake.  
AIRPHOTO: A26363-170  
ACCESS: Kississing Lake.

**EXPLORATION SUMMARY:**

The area was first staked as Helen 1 prior to 1930 (Mining claim map, 63N/3 NW, *circa* 1930). Eldorado Mining and Refining Limited did an airborne radiation survey over the area in 1954 (A.F. 91616). The ground was held as Rap 231 by HBED from 1959 to 1960. In 1979 Elken Exploration Limited staked Permit 33. Selco Mining Corporation Limited carried out magnetometer (Scintrex Fluxgate MFD-4) and HLEM (Apex MaxMin II) surveys, and drilled DDH 33-5-1 (57.04 m) for Elken Exploration in 1980 (A.F. 92366, Grid 5). Permit 33 lapsed in 1981.

**GEOLOGICAL SETTING:**

The area is underlain by amphibolite at the Burntwood Suite (former Burntwood River Metamorphic Suite) and Missi Suite (former Missi Metamorphic Suite) contact. The drillhole intersected hornblende - biotite - quartz gneiss, siliceous biotite gneiss, garnet amphibolite and greywacke gneiss (Fig. 62-1; Schledewitz, 1988).

**MINERALIZATION:**

Four near solid pyrrhotite/pyrite  $\pm$  chalcopyrite intersections that range from 'thin' to 20 cm in length were documented in the drill core. The mineralization occurs predominantly within the hornblende - biotite - quartz gneiss. Disseminated pyrrhotite and pyrite  $\pm$  chalcopyrite  $\pm$  sphalerite mineralization were noted elsewhere in the drill core. Minor amounts of disseminated graphite occur in the greywacke gneiss.

**GEOCHEMICAL DATA:**

The core that contains sulphide mineralization was assayed for Cu, Zn, Pb, Au and Ag. Anomalous concentrations of base or precious metals were not reported.

**CLASSIFICATION:**

Chemical sediment type deposit; sulphide facies iron formation. Disseminated sulphide mineralization and disseminated graphite are also documented in the drill core.

**REFERENCES:**

Assessment File 91616, 92366

Manitoba Energy and Mines, Minerals Division.

Bateman, J.D. and Harrison, J.M.

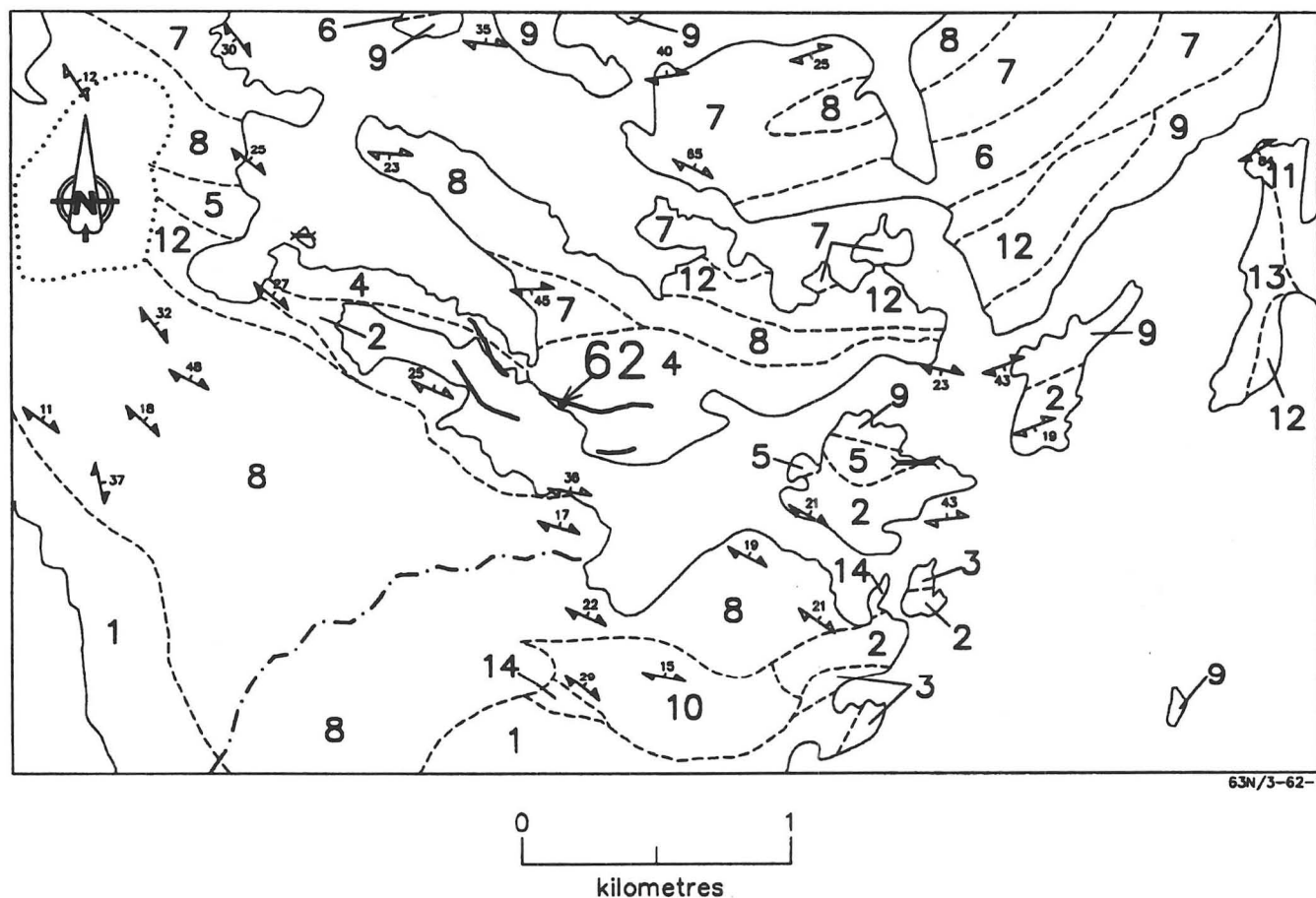
1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.

Schledewitz, D.C.P.

1986: Kisseynew Project: Kississing Lake; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1986, p. 92-95.

1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.





#### Orthogneisses

- 13 Pink granitic pegmatite
- 12 Two-mica leucogranite
- 11 Coarse grained amphibolite, metagabbro
- 10 Tonalitic to granodioritic gneiss

#### Missi Metamorphic Suite

- 9 Quartz-feldspar-hornblende-biotite gneiss
- 8 Quartz-rich paragneiss
- 7 Meta-arkose
- 6 Pink felsic gneiss, felsic volcanic rocks

#### Unnamed Gneisses

- 5 Uniform amphibolite
- 4 Garnetiferous amphibolite

- 3 Garnet-hornblende-biotite-graphite gneiss

#### Burntwood River Metamorphic Suite

- 2 Metatexite derived from greywacke
- 1 Diatexite derived from greywacke

----- Geological boundary

———— EM conductor (A.F. 92366)

 Schistosity and layering

 Gneissosity (inclined)

Geology after Schledewitz (1988).

 Area of no outcrop, swamp

- . - . - Trail

 Trench

62. Occurrence location

Figure 62-1: General geology, geophysical conductors, and trench locations at occurrence 62

**LOCATION: 63****NAME:**

UTM: 6121966N/364996E

AREA: Northeast Kississing Lake.

AIRPHOTO: A26397-258

ACCESS: Kississing Lake.

**EXPLORATION SUMMARY:**

The area was first staked as Harriett and Star (Mining claim map, 63N/3NE, circa 1930). The Harriett group was staked by Jacob Cook in 1927 (Wright, 1929). Trenching was done prior to 1945 (Bateman and Harrison, 1945). Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). HBED held the ground as Par 72 from 1958 to 1959. In 1980 Shell Canada Resources Limited produced a 1:125 000 scale compilation map of the geology and mineral occurrences within 63N/2 and parts of 63N/3 and 63N/1 (A.F. 92513).

**GEOLOGICAL SETTING:**

The area is underlain by amphibolite  $\pm$  garnet  $\pm$  diopside  $\pm$  calcite, hornblende - plagioclase gneiss, Burntwood Suite (former Burntwood River Metamorphic Suite) biotite - feldspar - quartz  $\pm$  garnet  $\pm$  graphite  $\pm$  sillimanite  $\pm$  cordierite paragneiss, and Missi Suite (former Missi Metamorphic Suite) feldspar - quartz  $\pm$  biotite  $\pm$  hornblende  $\pm$  magnetite  $\pm$  epidote  $\pm$  muscovite gneiss (Fig. 63-1; Schledewitz, 1988).

**MINERALIZATION:**

A pyrrhotite-pyrite-chalcopyrite occurrence is shown at this location on the geological compilation map (1:125 000) produced by Shell Canada Resources Limited in 1980 (A.F. 92513).

**GEOCHEMICAL DATA:**

None.

**CLASSIFICATION:**

Disseminated mineralization - not classified.

**REFERENCES:**

Assessment File 91616, 92513

Manitoba Energy and Mines, Minerals Division.

Bateman, J.D. and Harrison, J.M.

1945: Sherridon, Manitoba; Geological Survey of Canada, Paper 45-15, Preliminary map with descriptive notes, 1:31 680.

1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.

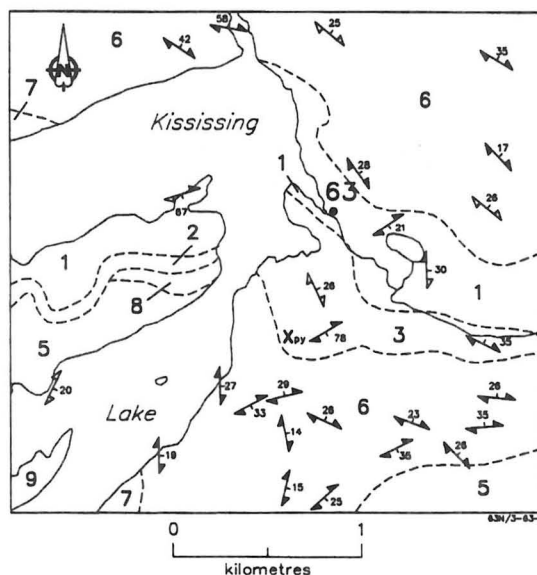
Schledewitz, D.C.P.

1986: Kisseynew Project: Kississing Lake; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1986, p. 92-95.

1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

Wright, J.F.

1929: Kississing Lake, Manitoba; Geological Survey of Canada, Summary Report 1928, Part B, p. 102.

**Orthogneisses**

- 9 Pink granitic pegmatite
- 8 Biotite leucogranite, pegmatite
- 7 Mesocratic hornblende-biotite gneiss

**Missi Metamorphic Suite**

- 6 Quartz-feldspar-hornblende-biotite gneiss
- 5 Varicoloured paragneiss

**Unnamed Gneisses**

- 4 Diopside-bearing amphibolite
- 3 Uniform amphibolite
- 2 Garnetiferous amphibolite

**Burntwood River Metamorphic Suite**

- 1 Metatexite derived from greywacke

----- Geological boundary

Schistosity and layering

Gneissosity (inclined)

Geology after Schledewitz (1988).

X<sup>py</sup> Mineral occurrence

63. Occurrence location

**Figure 63-1: General geology at occurrence 63**

**LOCATION: 64**

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

UTM: 6101301N/359026E

AREA: Adamson Lake/Bartlett Lake area.

AIRPHOTO: A26397-180

ACCESS: Kississing Lake to Bartlett Lake.

**EXPLORATION SUMMARY:**

The ground was held as Rap 428 by HBED from 1959 to 1960. Elken Exploration Limited staked CB 9824 in 1979. Selco Mining Corporation Limited carried out magnetometer (Scintrex Fluxgate MFD-4) and HLEM (Apex MaxMin II) surveys, and drilled DDH 25-1-1 (58.20 m) for Elken Exploration Limited in 1980 (A.F. 92372, Grid 1). CB 9824 was cancelled in 1982.

**GEOLOGICAL SETTING:**

The drillhole was collared on Bartlett Lake in an area underlain by Missi Suite (former Missi Metamorphic Suite) rocks (Fig. 64-1; Schledewitz, 1988). The drillhole intersected layered siliceous biotite paragneiss with chlorite- and/or biotite-rich sections. Minor amounts of felsic intrusive material were documented in the drill core.

**MINERALIZATION:**

A 1.4 m intersection of 'well mineralized' to near solid pyrrhotite and pyrite mineralization  $\pm$  disseminated graphite occurs within the biotite paragneiss. Minor amounts of disseminated Fe sulphide  $\pm$  graphite occur elsewhere in the hole.

**GEOCHEMICAL DATA:**

The 1.4 m long near solid Fe sulphide intersection was assayed for Cu, Zn, Ag and Au. The sample contains 3.43 g/t Ag. Anomalous concentrations of Cu, Zn, and Au were not reported.

**CLASSIFICATION:**

Chemical sediment type deposit; sulphide facies iron formation. The mineralization is interpreted to be a graphitic sulphide facies iron formation.

**REFERENCES:**

Assessment File 92372

Manitoba Energy and Mines, Minerals Division.

Bateman, J.D. and Harrison, J.M.

1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.

Schledewitz, D.C.P.

1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

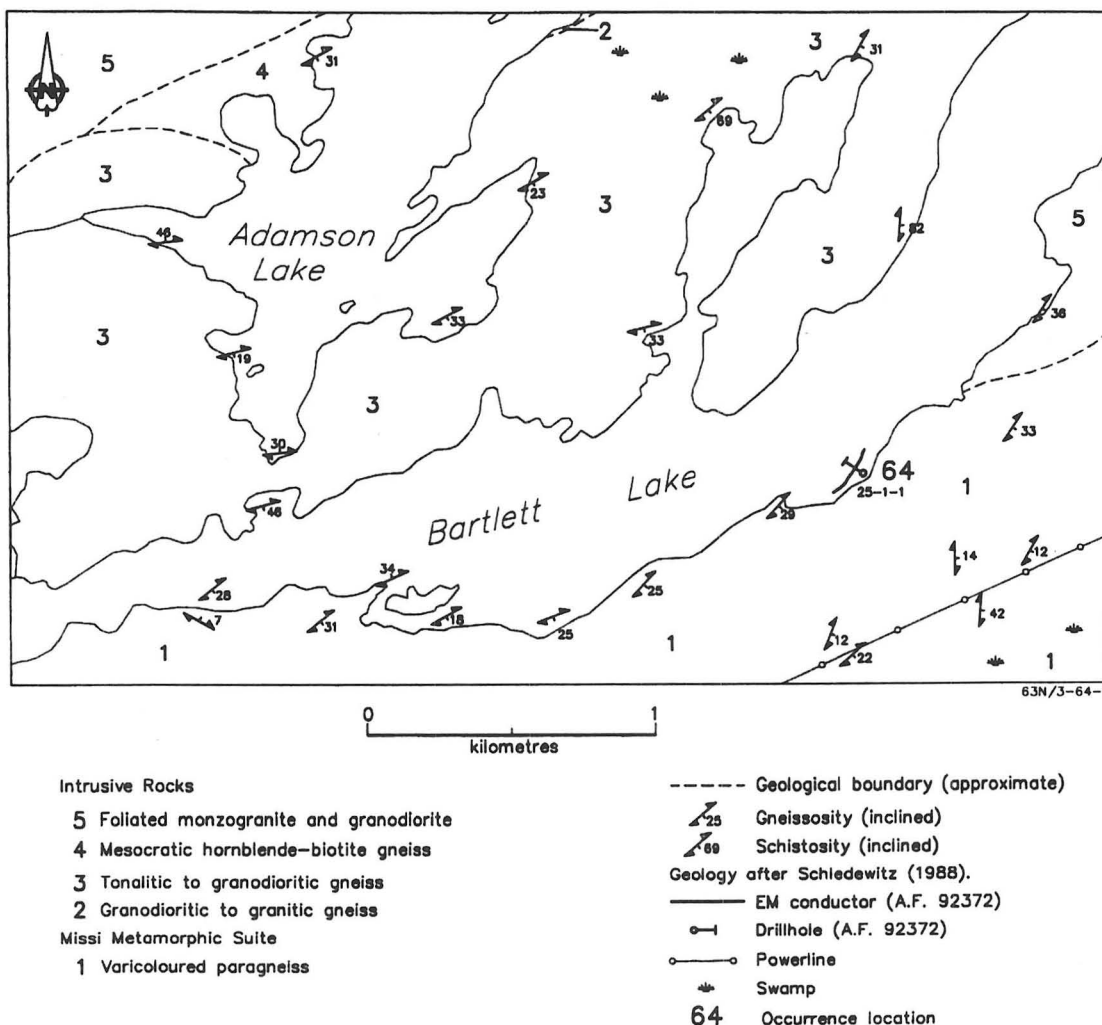


Figure 64-1: General geology, geophysical conductor and diamond-drill hole location at occurrence 64

**LOCATION: 65****NAME:**

UTM: 6109638N/360107E

AREA: East of Maltman Lake.

AIRPHOTO: A26363-175

ACCESS: Kississing Lake, traverse; Bush aircraft to Maltman Lake, traverse.

**EXPLORATION SUMMARY:**

The area was first staked as Victor 3 and Victor 6 (Mining claim map, 63N/3 SE, *circa* 1930). The Victor group was staked in 1927 and held by C.E. Johnson. Wright (1938) examined trenches on the property. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). The ground was held as Rex 3 by B. Knutson from 1956 to 1957 and as Rap 343 by HBED from 1959 to 1960. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). Elken Exploration Limited staked CB 9782 and CB 10410 in 1979. Gale (1980) examined four trenches in the area. The claims were cancelled in 1981.

**GEOLOGICAL SETTING:**

The area is underlain by amphibolite  $\pm$  garnet  $\pm$  diopside  $\pm$  calcite, hornblende - plagioclase gneiss, Missi Suite (former Missi Metamorphic Suite) feldspar - quartz  $\pm$  biotite  $\pm$  hornblende  $\pm$  magnetite  $\pm$  epidote  $\pm$  muscovite gneiss, and Burntwood Suite (former Burntwood River Metamorphic Suite) biotite - feldspar - quartz  $\pm$  garnet  $\pm$  graphite  $\pm$  sillimanite  $\pm$  cordierite paragneiss (Fig. 65-1; Schledewitz, 1988). Near solid sulphide layers and quartzose layers within garnet - amphibolite are exposed in several trenches Gale (1980).

**MINERALIZATION:**

The near solid sulphide layers comprise pyrrhotite  $\pm$  pyrite with trace sphalerite and chalcopyrite.

**GEOCHEMICAL DATA:**

None.

**CLASSIFICATION:**

Chemical sediment type deposit; sulphide facies iron formation.

**REFERENCES:**

Assessment File 91616, 91695

Manitoba Energy and Mines, Minerals Division.

Bateman, J.D. and Harrison, J.M.

1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.

Gale, G.H.

1979: Reconnaissance of the Flin Flon-Sherridon area; in Manitoba Mines, Natural Resources and Environment, Mineral Resources Division, Report of Field Activities, 1979, p. 40-41.

1980: Mineral deposit studies - Flin Flon/Kisseynew; in Manitoba Energy and Mines, Mineral Resources Division, Report of Field Activities, 1980, p. 51-64.

Schledewitz, D.C.P.

1986: Kisseynew Project: Kississing Lake; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1986, p. 92-95.

1987: Kisseynew Project: Kississing Lake; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1987, p. 51-54.

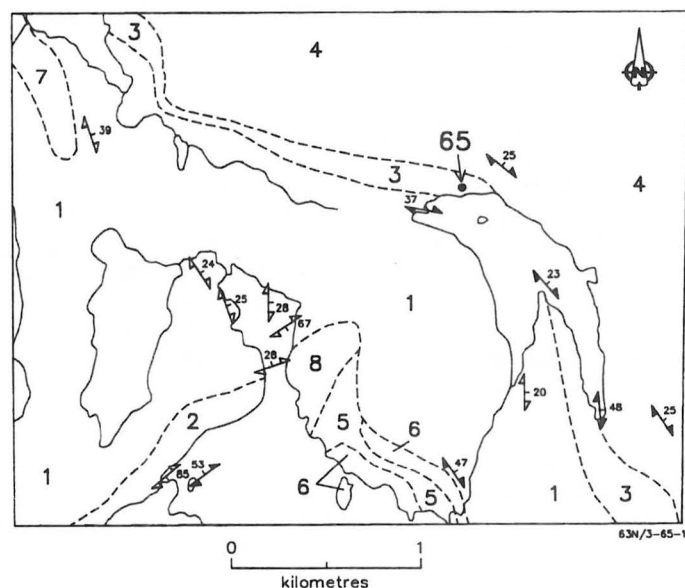
1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

Tuckwell, K.

1979: Stratigraphy and mineral deposits of the Sherridon area; in Manitoba Mines, Natural Resources and Environment, Mineral Resources Division, Report of Field Activities, 1979, p. 42-45.

Wright, J.F.

1938: Geology and mineral deposits of a part of northwest Manitoba; Geological Survey of Canada, Summary Report 1930, Part C, p. 38.



Intrusive Rocks, Orthogneisses

8 Pink granitic pegmatite

7 Biotite leucogranite, pegmatite

6 Tonalitic to granodioritic gneiss

Missi Metamorphic Suite

5 Quartz-feldspar-hornblende-biotite gneiss

4 Quartz-rich paragneiss

Unnamed Gneisses

3 Diopside-bearing amphibolite

2 Garnetiferous amphibolite

Burntwood River Metamorphic Suite

1 Metatexite derived from greywacke

----- Geological boundary

A 24 Schistosity and layering

A 25 Gneissosity (inclined)

Geology after Schledewitz (1988).

65. Occurrence location

**Figure 65-1: General geology at occurrence 65**

**LOCATION: 66**

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

UTM: 6108896N/363275E

AREA: East Kissinging Lake.

AIRPHOTO: A26397-013

ACCESS: Kissinging Lake.

**EXPLORATION SUMMARY:**

Eldorado Mining and Refining Limited did an airborne radiation survey over the area in 1954 (A.F. 91616). The ground was held as Rap 481 and Rap 484 by HBED from 1959 to 1960. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). In 1979 Elken Exploration Limited staked CB 10218. Selco Mining Corporation Limited carried out magnetometer (Scintrex Fluxgate MFD-4) and HLEM (Apex MaxMin II) surveys, and drilled DDH 19-1-1 (54.50 m) for Elken Exploration in 1980 (A.F. 92389). CB 10218 was cancelled in 1982. Maverick Mountain Resources Limited staked Vega 6 in 1985. Pioneer Metals Corporation acquired the property in 1986 and drilled DDH PUF 398-88 (185 m) and DDH PUF 399-88 (116 m) from the same collar in 1988 (A.F. 92925). Vega 6 was cancelled in 1990.

**GEOLOGICAL SETTING:**

The drillhole was collared on Kissinging Lake (Fig. 66-1). Missi Suite (former Missi Metamorphic Suite) feldspar - quartz  $\pm$  biotite  $\pm$  hornblende  $\pm$  magnetite  $\pm$  epidote  $\pm$  muscovite gneiss and Burntwood Suite (former Burntwood River Metamorphic Suite) biotite - feldspar - quartz  $\pm$  garnet  $\pm$  graphite  $\pm$  sillimanite  $\pm$  cordierite paragneiss crop out in the vicinity (Fig. 66-1; Schledewitz, 1988). The drillholes intersected interlayered biotite  $\pm$  chlorite gneiss  $\pm$  garnet, amphibolite  $\pm$  biotite  $\pm$  garnet, and siliceous biotite paragneiss  $\pm$  garnet  $\pm$  calc-silicate.

**MINERALIZATION:**

Veins of solid graphite forming a net like matrix to quartzofeldspathic rock were intersected over 10 m of core in DDH 19-1-1. Minor amounts of disseminated pyrite and graphite occur elsewhere in the core. In DDH 398-99 a graphitic biotite-hornblende-quartz gneiss unit includes a 1.5 m long quartz-graphite breccia intersection. The breccia contains 35% graphite and 5% fine grained pyrite. Locally, trace to 2% pyrite and/or pyrrhotite, and/or trace to 1% chalcopyrite, and/or arsenopyrite (fine grained graphite?) occurs elsewhere in the core.

**GEOCHEMICAL DATA:**

Selected intersections that contain pyrite or graphite plus pyrite were assayed for Cu, Zn, Au and Ag. Trace amounts of Cu, Zn and Au were reported.

**CLASSIFICATION:**

Chemical sediment type deposit; sulphide facies iron formation. The mineralization is interpreted to be a brecciated graphitic sulphide facies iron formation. Although only graphite may be recorded in the drill log, the majority

of this type of occurrence has been found to contain more Fe sulphide than carbon (Gale *et al.*, 1980).

**REFERENCES:**

Assessment File 91616, 91695, 92389, 92925  
Manitoba Energy and Mines, Minerals Division.

Bateman, J.D. and Harrison, J.M.

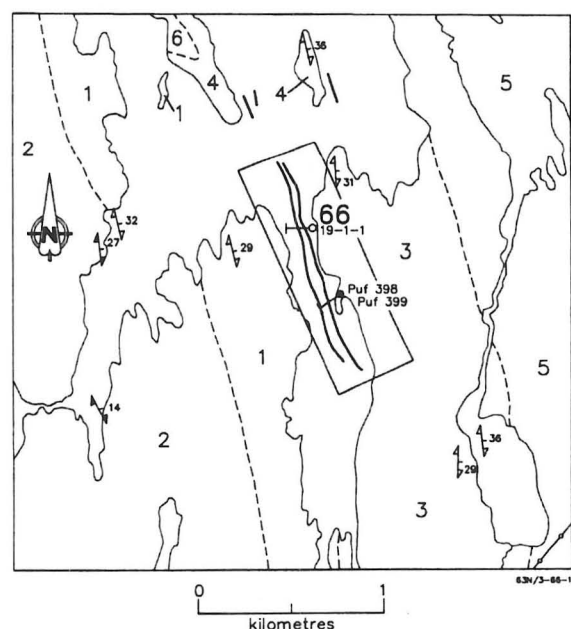
1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.

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.

Schledewitz, D.C.P.

1988: Kissinging Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.



- |                                             |                                          |
|---------------------------------------------|------------------------------------------|
| Orthogneisses                               | ----- Geological boundary                |
| 6 Pink granitic pegmatite                   | Schistosity and layering                 |
| 5 Foliated monzogranite and granodiorite    | Gneissosity (inclined)                   |
| Missi Metamorphic Suite                     | ----- EM conductor (A.F. 92389)          |
| 4 Quartz-feldspar-hornblende-biotite gneiss | Geology after Schledewitz (1988).        |
| 3 Quartz-rich paragneiss                    | Drillholes                               |
| 2 Varicoloured paragneiss                   | (A.F. 92925)                             |
| Burntwood River Metamorphic Suite           | (A.F. 92389)                             |
| 1 Metatextite derived from greywacke        | Powerline                                |
|                                             | Area encompassed by Mineral Deposit File |

**Figure 66-1: General geology, geophysical conductors and diamond-drill hole location at occurrence 66**

**LOCATION: 67****NAME:**

UTM: 6102087N/366058E

AREA: South of Bess Lake.

AIRPHOTO: A26364-037

ACCESS: Bush aircraft to Bess Lake.

**EXPLORATION SUMMARY:**

The area was first staked as Ruby 9 prior to 1930 (Mining claim map, 63N/3 SE, *circa* 1930). G.F. Thompson held the ground as Tim 4 from 1954 to 1960. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). Bess 3 was staked by 294401 Alberta Ltd. in 1983 and optioned by Catear Resources Ltd. in 1985-1986. In 1986 Noko Resources Inc. acquired the claim and carried out rock sampling in the vicinity of an old 2-3 m deep pit, geological mapping (1:5000), and prospecting (A.F. 92797). Noko Resources Inc. restaked the area as Bess 30 in 1988. Varna Gold Inc. acquired the claim in January, 1991. The claim lapsed in August, 1991.

**GEOLOGICAL SETTING:**

The area is underlain by Missi Suite (former Missi Metamorphic Suite) feldspar - quartz gneiss  $\pm$  biotite  $\pm$  hornblende  $\pm$  magnetite  $\pm$  muscovite  $\pm$  epidote and quartz layers (Fig. 67-1; Schledewitz, 1988). The trench exposes quartz-carbonate-pyrite alteration within fine grained pelitic gneiss. A complex shear structure was mapped immediately east of the occurrence (Fig. 67-2; A.F. 92797).

**MINERALIZATION:**

Up to 5% disseminated pyrite occurs within a highly fractured quartz-carbonate-pyrite alteration zone (A.F.

92797). This zone is up to 3 m wide and was traced for over 120 m along strike.

**GEOCHEMICAL DATA:**

A grab sample of pyrite-bearing quartz vein material contains 15 ppb Au and 33 ppm As (A.F. 92797).

**CLASSIFICATION:**

Vein type deposit; multiple veins or lenses. The geological assessment report in A.F. 92797 interprets the mineralization, described above, to be part of a 'thin mineralized horizon' within the amphibolite unit and may represent a chemical sedimentary unit (*cf.* Locations 2 (Nokomis Lake) and 4 (Evans Lake) in 63N/2 (Ostry and Trembath, 1992)).

**REFERENCES:**

Assessment File 91695, 92797

Manitoba Energy and Mines, Minerals Division.

Bateman, J.D. and Harrison, J.M.

1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.

Ostry G. and Trembath, G. D.

1992: Mineral Deposits and Occurrences in the Batty Lake Area, NTS 63N/2; Manitoba Energy and Mines, Mineral Deposit Series, Report No. 19; 276p.

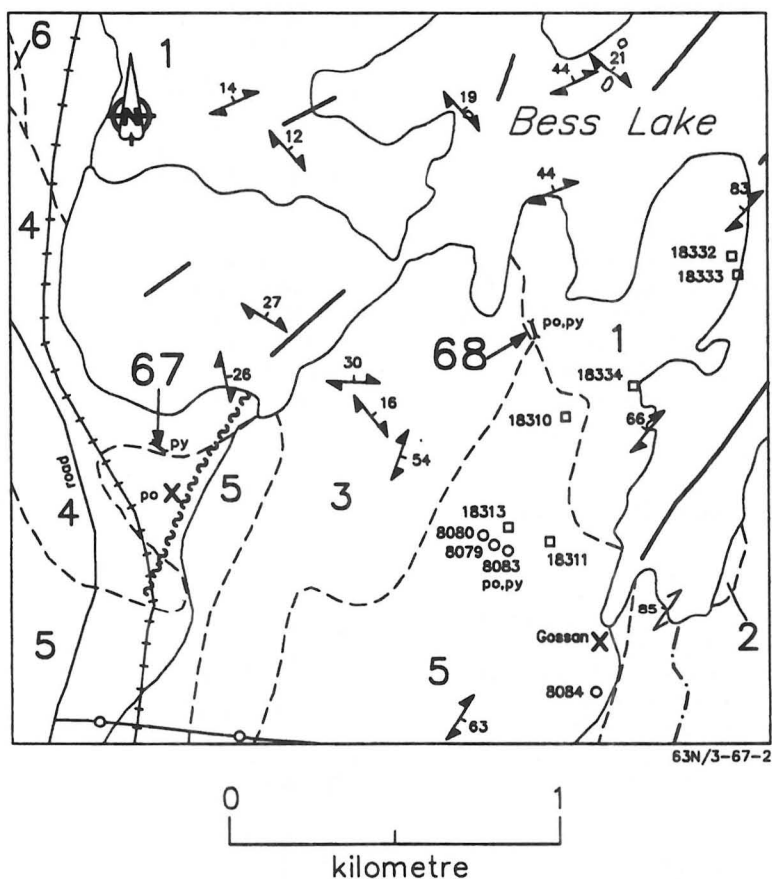
Schledewitz, D.C.P.

1988: Kisseynew Project: Kississing Lake; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1988, p. 43-48.

1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.







#### Orthogneisses

6 Foliated monzogranite and granodiorite

5 Tonalitic to granodioritic gneiss

#### Missi Metamorphic Suite

4 Quartz-rich paragneiss

3 Varicoloured paragneiss

#### Unnamed Gneisses

2 Uniform amphibolite

#### Amisk Group

1 Amphibolite, metabasalt, metagabbro

----- Geological boundary (approximate)

30 Schistosity (inclined)

28 Gneissosity (inclined)

~~~~~ Shear zone

Geology after Schledewitz (1988).

———— EM conductor (A.F. 91695)

X_{po} Mineral occurrence

— Trench

+++++ Railway

—○— Powerline

-.-.-.- Trail

18313 □ Lithogeochemical sample

8080 ○ B-horizon soil sample

67 Occurrence location

Figure 67-2: Detailed geology and geophysical conductors, trench locations, lithogeochemical sample and B-horizon soil sample locations at occurrences 67 and 68

LOCATION: 68**NAME:**

UTM: 6102518N/367230E

AREA: South of Bess Lake.

AIRPHOTO: A26364-038

ACCESS: Bush aircraft to Bess Lake.

EXPLORATION SUMMARY:

The area was first staked as Ruby 4 prior to 1930 (Mining claim map, 63N/3 SE, *circa* 1930). G.F. Thompson held the ground as Tim 7 from 1954 to 1960. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). Bess 4 was staked by 294401 Alberta Ltd. in 1983 and optioned by Catear Resources Ltd. in 1985-1986. In 1986 Noko Resources Inc. acquired the claim and carried out rock and soil sampling in the vicinity of an old trench, geological mapping (1:5000), and prospecting (A.F. 92797). Noko Resources Inc. restaked the area as Bess 40 in 1988. Varna Gold Inc. acquired the claim in January, 1991. The claim was cancelled in August, 1991.

GEOLOGICAL SETTING:

The area is underlain by Missi Suite (former Missi Metamorphic Suite) feldspar - quartz gneiss \pm biotite \pm hornblende \pm magnetite \pm muscovite \pm epidote and quartz layers and Amisk Group amphibolite (Fig. 67-1; Schledewitz, 1988). The trench exposes a locally sheared amphibolite unit. A 20 cm thick quartz vein crosscuts the amphibolite in the nose of a northeast plunging fold (Fig 67-2; A.F. 92797).

MINERALIZATION:

A 3.3 m wide section of the amphibolite, exposed in the west trench, contains 1-3% finely disseminated pyrrhotite.

GEOCHEMICAL DATA:

Grab samples from the trench contained up to 25 ppb Au and 6 ppm As. Mineralized amphibolite on strike from the trench (lithogeochemical samples 18310 and 18313 contained 29 and 73 ppb Au, respectively (Fig. 67-2). 'B' soil horizon samples from the same stratigraphic position, *i.e.* samples S 079, S 080 and S 083 contained 18, 14 and 64 ppb Au respectively.

CLASSIFICATION:

Disseminated mineralization - not classified. The amphibolite unit may be geochemically enriched in Au, or a layer(s) within it (*cf.* stratabound Au-As mineralization within amphibolite at Locations 2 (Nokomis Lake) and 4 (Evans Lake) in 63N/2 (Ostry and Trembath, 1992)).

REFERENCES:

Assessment File 91695, 92797

Manitoba Energy and Mines, Minerals Division.

Bateman, J.D. and Harrison, J.M.

1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.

Ostry G. and Trembath, G. D.

1992: Mineral Deposits and Occurrences in the Batty Lake Area, NTS 63N/2; Manitoba Energy and Mines, Mineral Deposit Series, Report No. 19; 276p.

Schledewitz, D.C.P.

1988: Kisseynew Project: Kissinging Lake; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1988, p. 43-48.

1988: Kissinging Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

LOCATION: 69**NAME:**

UTM: 6102948N/367972E

AREA: South of Bess Lake.

AIRPHOTO: A26364-037

ACCESS: Bush aircraft to Bess Lake.

EXPLORATION SUMMARY:

The area was first staked as the Pony and HorseBlanket claims prior to 1930 (Mining claim map, 63N/3 SE, *circa* 1930). Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). Bess 4 was staked by 294401 Alberta Ltd. in 1983 and optioned by Catear Resources Ltd. in 1985-1986. In 1986 Noko Resources Inc. acquired the claim and carried out rock and soil geochemical surveys, geological mapping (1:5000), and prospecting (A.F. 92797). Noko Resources Inc. restaked the area as Bess 40 in 1988. Varna Gold Inc. acquired the claim in January, 1991. The claim was cancelled in August, 1991.

GEOLOGICAL SETTING:

The area is underlain by Missi Metamorphic Suite feldspar - quartz gneiss \pm biotite \pm hornblende \pm magnetite \pm muscovite \pm epidote and quartz layers (Fig. 67-1; Schledewitz, 1988). The trenches expose a locally sheared amphibolite unit. A 'system of quartz-carbonate veins' crosscuts the amphibolite in the nose of a northeast plunging fold (Fig 67-2; A.F. 92797).

MINERALIZATION:

The quartz-carbonate veins contain 1-2 % pyrite.

GEOCHEMICAL DATA:

Grab samples from the trench contained up to 240 ppb Au and 221 ppm As. Lithogeochemical sample 18811 contained 76 ppm W (possible contamination from sample preparation with a W-carbide disk?), and samples 18832, 18833 and 18834 contained 105, 39 and 419 ppm As, respectively (Fig. 67-2). 'B' horizon soil sample 8084 contained 44 ppb Au. All lithogeochemical samples specified were taken from the amphibolitic unit.

CLASSIFICATION:

Vein type deposit; multiple veins or lenses. The amphibolite unit may be geochemically enriched in Au, or a layer(s) within it (*cf.* Location 244, and stratabound Au-As mineralization within amphibolite at Locations 2 (Nokomis Lake) and 4 (Evans Lake) in 63N/2 (Ostry and Trembath, 1992)).

REFERENCES:

Assessment File 91695, 92797

Manitoba Energy and Mines, Minerals Division.

Bateman, J.D. and Harrison, J.M.

1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.

Ostry G. and Trembath, G. D.

1992: Mineral Deposits and Occurrences in the Batty Lake Area, NTS 63N/2; Manitoba Energy and Mines, Mineral Deposit Series, Report No. 19; 276p.

Schledewitz, D.C.P.

1988: Kisseynew Project: Kississing Lake; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1988, p. 43-48.

1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

LOCATION: 70**NAME:**

UTM: 6099197N/366675E

AREA: North of Lilyroot Lake.

AIRPHOTO: A26364-035

ACCESS: Kississing Lake road to Puffy Lake mine road, traverse.

EXPLORATION SUMMARY:

The area was first staked as Cuprite 8 prior to 1930 (Mining claim map, 63N/3 SE, *circa* 1930). Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). Elken Exploration Limited held the ground as CB 13453 from 1981 to 1985. In 1982 Selco Inc. did a magnetometer (GSM-8 Proton) survey and an HLEM (Apex MaxMin II) survey on the property (A.F. 92568, Block 30-31, Grid 1). Maverick Mountain Resources Limited staked Burn 1 in 1985, and transferred it to Pioneer Metals Corporation in 1986. The claim lapsed in 1989.

GEOLOGICAL SETTING:

The area is underlain by Amisk Group metabasalt, amphibolite, metagabbro (Fig. 70-1; Schledewitz, 1988).

MINERALIZATION:

Schledewitz (1988) documented arsenopyrite and pyrite mineralization at this location.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment File 91695, 92568

Manitoba Energy and Mines, Minerals Division.

Bateman, J.D. and Harrison, J.M.

1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.

Schledewitz, D.C.P.

1988: Kisseynew Project: Kississing Lake; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1988, p. 43-48.

1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

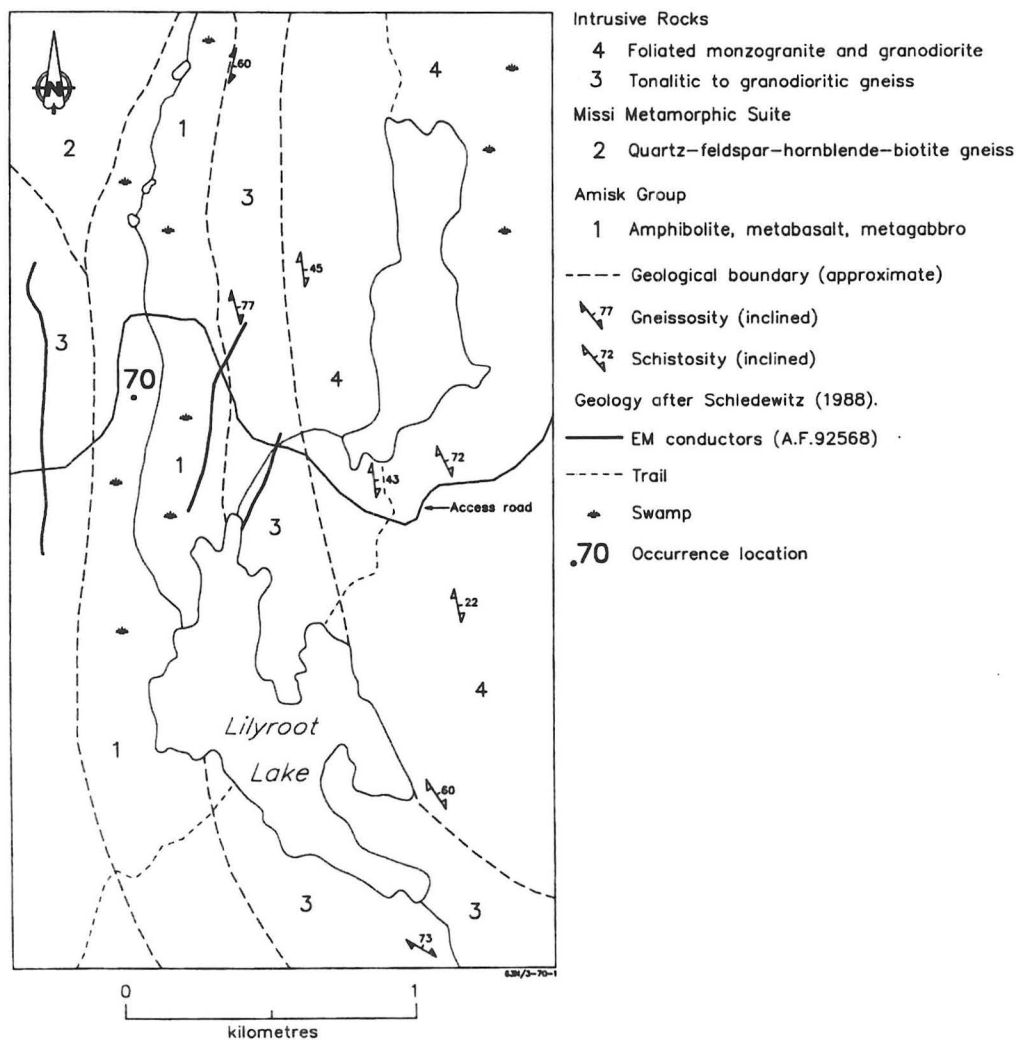


Figure 70-1: General geology and location of geophysical conductors in the vicinity of occurrence 70

LOCATION: 71

NAME: (A.F. Mineralization intersected by diamond drilling)
UTM: 6103981N/369812E
AREA: Northeast of Bess Lake.
AIRPHOTO: A26369-182
ACCESS: Bush aircraft to an unnamed lake east of Bess Lake, traverse.

EXPLORATION SUMMARY:

The area was first staked as Wadena 9 to 12 (Mining claim map, 63N/3 SE, *circa* 1930). The Wadena group was explored by Scotia Manitoba Mines Limited in 1928 (Mining Engineering File, Scotia Manitoba Mines Limited). W. Shiflet held Lodestar 1 in 1956-1957. W. Shmon staked Emily 4, Emily 7 and Emily 8 in 1957 and Klondike 1 in 1959. In 1960 HBED optioned the property and carried out an HLEM survey, that outlined a 2 km long conductor on Emily 4, 7 and 8, Klondike 1 and Judy 1 and a weak 61 m long conductor on Emily 8 (A.F. 91626). HBED drilled DDH Shmon 1 (58.2 m) on Emily 8, DDH Shmon 2 (60.6 m) and DDH Shmon 4 (112.5 m) on Emily 7, and DDH Shmon 3 (52.7 m) on Klondike 1 in 1960 (A.F. 91525). Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). The claims lapsed in 1976. Elken Exploration Limited held the ground as CB 9787 and CB 9788 in 1979-1981. HBED staked CB 13428, CB 13429, and CB 13430 in 1983.

GEOLOGICAL SETTING:

The area is underlain by amphibolite and monzogranite to granodiorite \pm magnetite (Fig. 71-1; Schledewitz, 1988). The drillholes intersected a sequence of hornblende gneiss

\pm garnet, quartz - biotite gneiss, and garnet - quartz - hornblende gneiss (A.F. 91525).

MINERALIZATION:

All drillholes intersected 'mineralized zones' composed of disseminated to near solid pyrrhotite \pm pyrite \pm chalcopyrite. These zones or layers range from 27 cm to 4.15 m in core length and locally contain intersections of a metre or more of solid pyrrhotite \pm chalcopyrite. Disseminated arsenopyrite and pyrite were intersected within one of these zones in DDH Shmon 3.

GEOCHEMICAL DATA:

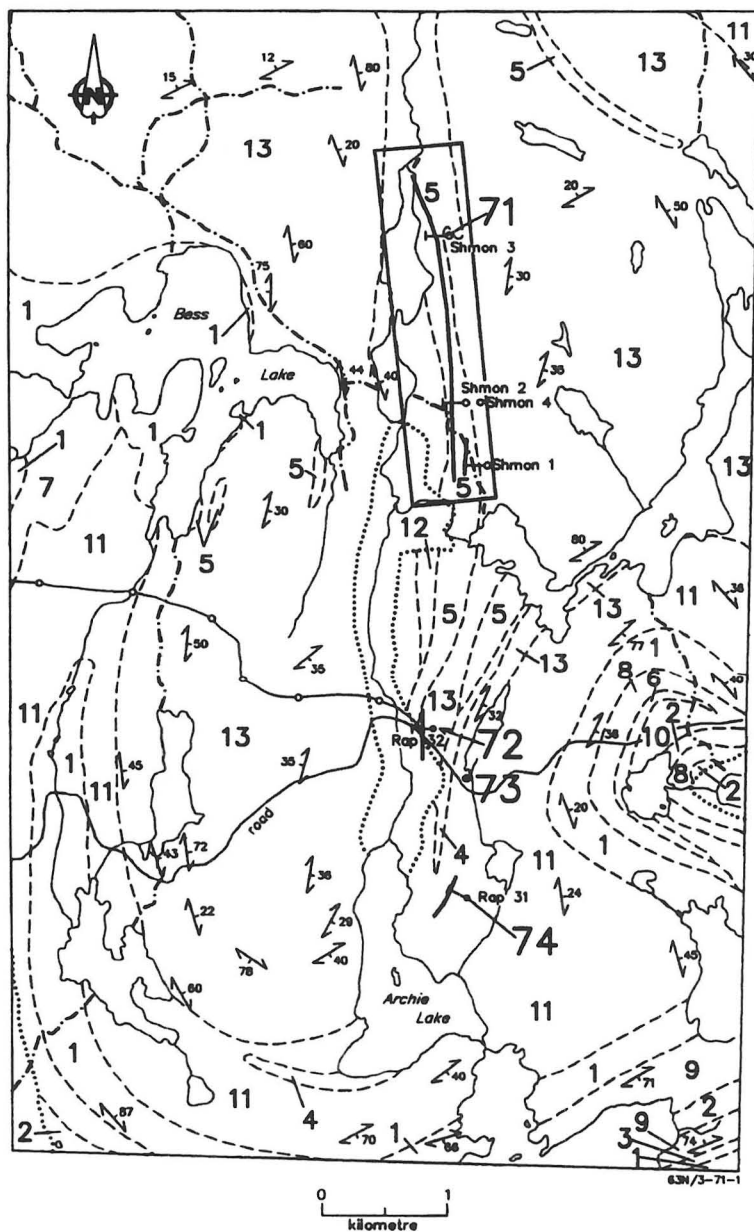
None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation.

REFERENCES:

- Assessment File 91525, 91626, 91695
Manitoba Energy and Mines, Minerals Division.
Bateman, J.D. and Harrison, J.M.
1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.
Mining Engineering File, Scotia Manitoba Mines Limited
Manitoba Energy and Mines, Minerals Division.
Schledewitz, D.C.P.
1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.



Orthogneisses

- 13 Foliated monzogranite and granodiorite
- 12 Mesocratic hornblende-biotite gneiss
- 11 Tonalitic to granodioritic gneiss

Missi Metamorphic Suite

- 10 Undivided paragneiss \pm magnetite, migmatite
- 9 Quartz-feldspar-hornblende-biotite gneiss
- 8 Meta-arkose
- 7 Varicoloured paragneiss
- 6 Amphibolite, mafic volcanic and intrusive rocks

Unnamed Gneisses

- 5 Uniform amphibolite
- 4 Rusty biotite-plagioclase-quartz gneiss

Burntwood River Metamorphic Suite

- 3 Undivided, metagreywacke, migmatite
- 2 Garnet-biotite gneiss, metagreywacke

Amisk Group

- 1 Amphibolite, metabasalt, metagabbro

--- Geological boundary

\nearrow Schistosity (inclined)

Geology after Schledewitz (1988).

..... Area of no outcrop, swamp

— EM conductor (A.F. 91525, 91526, 91695)

— Powerline

--- Trail

Drillholes

— (A.F. 90662)

— (A.F. 91525, 91526)

□ Area encompassed by Mineral Deposit File

Figure 71-1: General geology, geophysical conductors and diamond-drill hole location at occurrences 71, 72, 73 and 74

LOCATION: 72

NAME: (A.F. Mineralization intersected by diamond drilling)
 UTM: 6099957N/369657E
 AREA: East of Archie Lake.
 AIRPHOTO: A26369-185
 ACCESS: Kississing Lake road to Puffy Lake mine road, traverse; bush aircraft to Archie Lake. traverse.

EXPLORATION SUMMARY:

HBED staked Rap 590 in 1959. In 1960 HBED did an HLEM survey and two ABEM surveys (3520 cps, 880 cps), and drilled a 50.6 m deep hole (DDH Rap 32, A.F. 90662). The claim lapsed in 1961. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). The ground was held as Judy 5 by 294401 Alberta Ltd. in 1984-1986 and Noko Resources Inc. in 1986-1989. In 1986-1987 Dearin Geological Consulting Ltd. carried out prospecting, geological mapping (1:5000), and rock and soil sampling (A.F. 92874). Noko Resources Inc. restaked the area as Judy 7 in 1989. Varna Gold Inc. acquired the claim in January, 1991, but cancelled it in October, 1991.

GEOLOGICAL SETTING:

The area is underlain by massive amphibolite and felsic intrusive rocks (Fig. 71-1; Schledewitz, 1988). The drill-hole intersected hornblende gneiss and quartz - biotite - garnet \pm hornblende gneiss (A.F. 90662).

MINERALIZATION:

Minor amounts of pyrite occur locally in the drill core.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment File 90662, 91695, 92874
 Manitoba Energy and Mines, Minerals Division.
 Bateman, J.D. and Harrison, J.M.
 1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.
 Schledewitz, D.C.P.
 1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

LOCATION: 73

NAME:
 UTM: 6099593N/369932E
 AREA: Northeast of Archie Lake.
 AIRPHOTO: A26369-185
 ACCESS: Kississing Lake road to Puffy Lake mine road, traverse; bush aircraft to Archie Lake. traverse.

EXPLORATION SUMMARY:

HBED staked Rap 591 and Rap 595 in 1959, and carried out an HLEM survey and two ABEM surveys in 1960 (A.F. 90662). The claims lapsed in 1961. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). Judy 6 was staked by 294401 Alberta Ltd. in 1984, and was transferred to Noko Resources Inc. in 1986. In 1986-1987 Dearin Geological Consulting Ltd. carried out prospecting, geological mapping (1:5000) and rock sampling (A.F. 92874). Noko Resources Inc. staked Judy 8 in 1989, and transferred it to Varna Gold Inc. in January, 1991. The claim was cancelled in October, 1991.

GEOLOGICAL SETTING:

The area is underlain by tonalite, granodiorite or granite orthogneiss (Fig. 71-1; Schledewitz, 1988). The occurrence is underlain by medium grained red syenite (A.F. 92874).

MINERALIZATION:

The syenite is malachite stained and contains hematite. Approximately 1% chalcopyrite fills fractures within the syenite (A.F. 92874).

GEOCHEMICAL DATA:

A sample of the mineralized syenite contained 450 ppb Au, 2120 ppm Cu, 50 ppm Bi, 41 ppm Mo and 30 ppm W (A.F. 92874).

CLASSIFICATION:

Vein type deposit; multiple veins or lenses.

REFERENCES:

Assessment File 90662, 91695, 92874
 Manitoba Energy and Mines, Minerals Division.
 Bateman, J.D. and Harrison, J.M.
 1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.
 Schledewitz, D.C.P.
 1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

LOCATION: 74

NAME: (A.F. Mineralization intersected by diamond drilling)
UTM: 6098639N/369926E
AREA: East of Archie Lake.
AIRPHOTO: A26369-186
ACCESS: Kississing Lake road to Puffy Lake mine road, traverse; bush aircraft to Archie Lake. traverse.

EXPLORATION SUMMARY:

HBED staked Rap 602 and Rap 603 in 1959. In 1960 HBED performed an HLEM survey and drilled a 65 m deep hole (DDH Rap 31) on Rap 603 (A.F. 90662). The claims were cancelled in 1961. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). The ground was held as Judy 6 by 294401 Alberta Ltd. in 1984-1986 and Noko Resources Inc. in 1986-1989. In 1986-1987 Dearin Geological Consulting Ltd. did a geological reconnaissance survey and collected a sludge sample (S1020) from a drillhole collar (A.F. 92874). Noko Resources Inc. restaked the area as Judy 8 in 1989. Varna Gold Inc. acquired the claim in January, 1991, but cancelled it in October, 1991.

GEOLOGICAL SETTING:

The area is underlain by tonalite, granodiorite or granite orthogneiss (Fig. 71-1; Schledewitz, 1988). The drillhole intersected hornblende \pm biotite gneiss, quartz - biotite - hornblende gneiss, quartz - biotite - feldspar gneiss and quartz - biotite gneiss.

MINERALIZATION:

Five graphite layers with minor amounts of pyrite that range in core length from 0.5 to 7.5 m were documented in the drill log.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. The mineralization is interpreted to be a graphitic sulphide facies iron formation. Although only graphite may be recorded in the drill log, the majority of this type of occurrence has been found to contain more Fe sulphide than carbon (Gale *et al.*, 1980).

REFERENCES:

- Assessment File 90662, 91695, 92874
Manitoba Energy and Mines, Minerals Division.
Bateman, J.D. and Harrison, J.M.
1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 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.
Schledewitz, D.C.P.
1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

LOCATION: 75**NAME:**

UTM: 6099246N/371819E

AREA: West of Puffy Lake.

AIRPHOTO: A26369-189

ACCESS: Kississing Lake road to Puffy Lake mine road, traverse; bush aircraft to Puffy Lake, traverse.

EXPLORATION SUMMARY:

The area was partly covered by Pas 22 and Pas 23, staked by John Moody in 1954-1955. HBED staked Rap 652, Rap 654 and Rap 655 in 1959. In 1960 HBED did an HLEM survey and drilled two holes (DDH Rap 29; DDH Rap 30) on Rap 654 (A.F. 90662, no logs available). The Rap claims lapsed in 1961. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). Granges Exploration Aktiebolag staked CB 12237 and CB 11210 in 1980, and optioned the property to Maverick Mountain Resources Limited in 1983. Maverick acquired a 60% interest in the property in 1984, and a further 40% interest in 1986. Pioneer Metals Corporation acquired CB 12237 and CB 11210 in 1986. CB 11210 was cancelled in 1992.

GEOLOGICAL SETTING:

The area is underlain by Burntwood Suite (former Burntwood River Metamorphic Suite) greywacke gneiss and Missi Suite (former Missi Metamorphic Suite) quartzofeldspathic gneiss (Schledewitz, 1988).

MINERALIZATION:

Zwanzig (1984) documented arsenopyrite mineralization at this locality (Fig. 75-1). Ostry (1986) describes a poorly exposed 1 m thick, conformable, mineralized, rusty weathered zone hosted by very fine grained siliceous gneiss near or at the structural top of a quartz - feldspar - biotite -

garnet (metagreywacke) gneiss unit (Fig. 75-2). The mineralized zone contains up to 15% disseminated pyrite, pyrrhotite and arsenopyrite and is exposed in discontinuous outcrop over approximately 100 m along strike.

GEOCHEMICAL DATA:

Two grab samples from the mineralized zone/layer were taken for geochemical analysis. Both samples contained elevated gold concentrations, *i.e.*, 320 ppb and 2990 ppb gold. Tungsten concentrations were 9 and 14 ppm, respectively.

CLASSIFICATION:

Disseminated mineralization - not classified. However, a chemical sedimentary origin is possible due to the apparent stratabound nature of the pyrite, pyrrhotite and arsenopyrite mineralization.

REFERENCES:

Assessment File 90662, 91695

Manitoba Energy and Mines, Minerals Division.

Bateman, J.D. and Harrison, J.M.

1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.

Ostry, G.

1986: Mineral investigations in the Kisseynew gneiss terrain; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1986, p. 100-106.

Schledewitz, D.C.P.

1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

Zwanzig, H.V.

1984: Puffy Lake (Parts of 63K/14, 15 and 63N/2, 3); Manitoba Energy and Mines, Preliminary Map 1984K-2, 1:20 000.

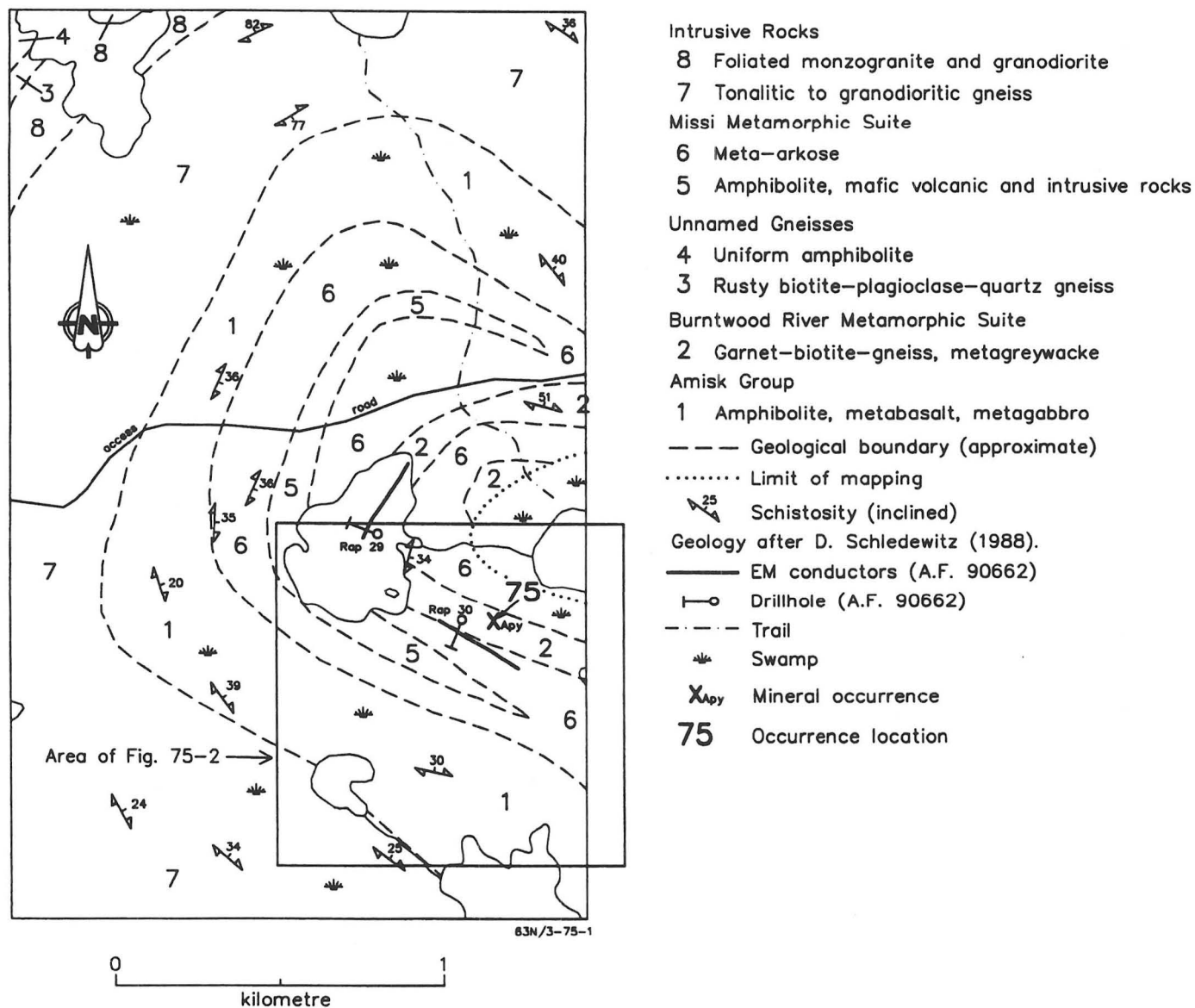
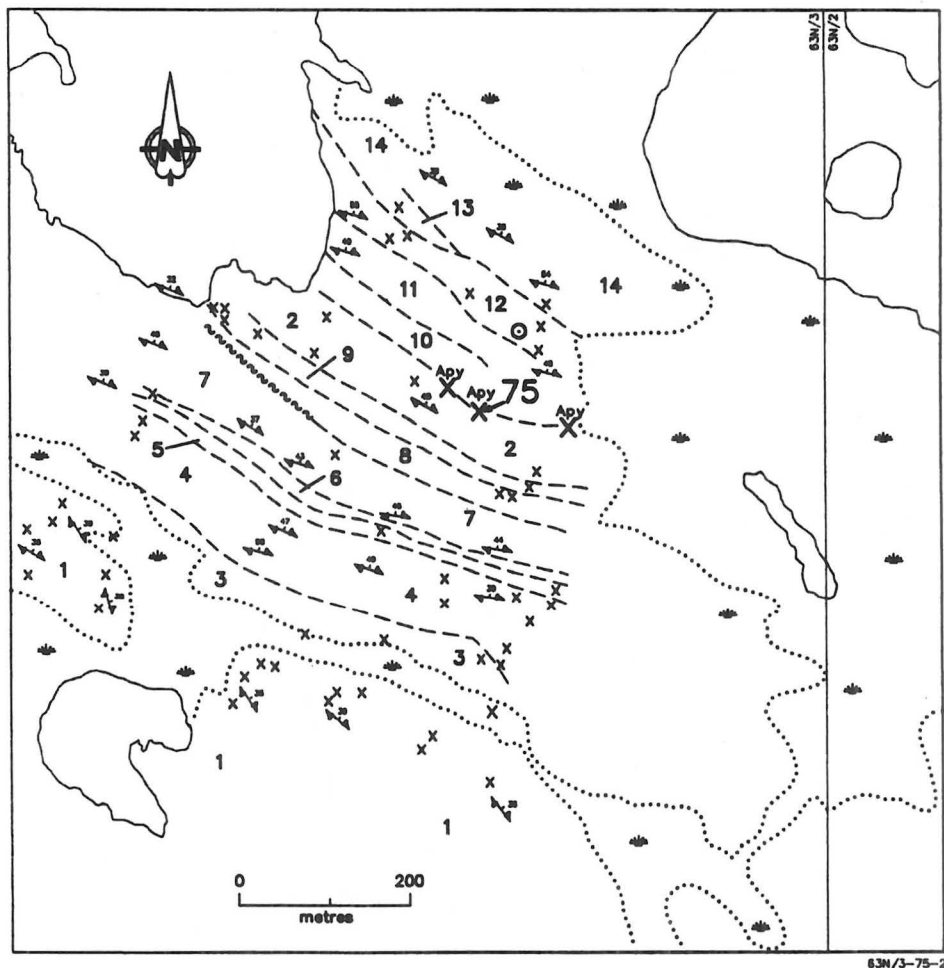
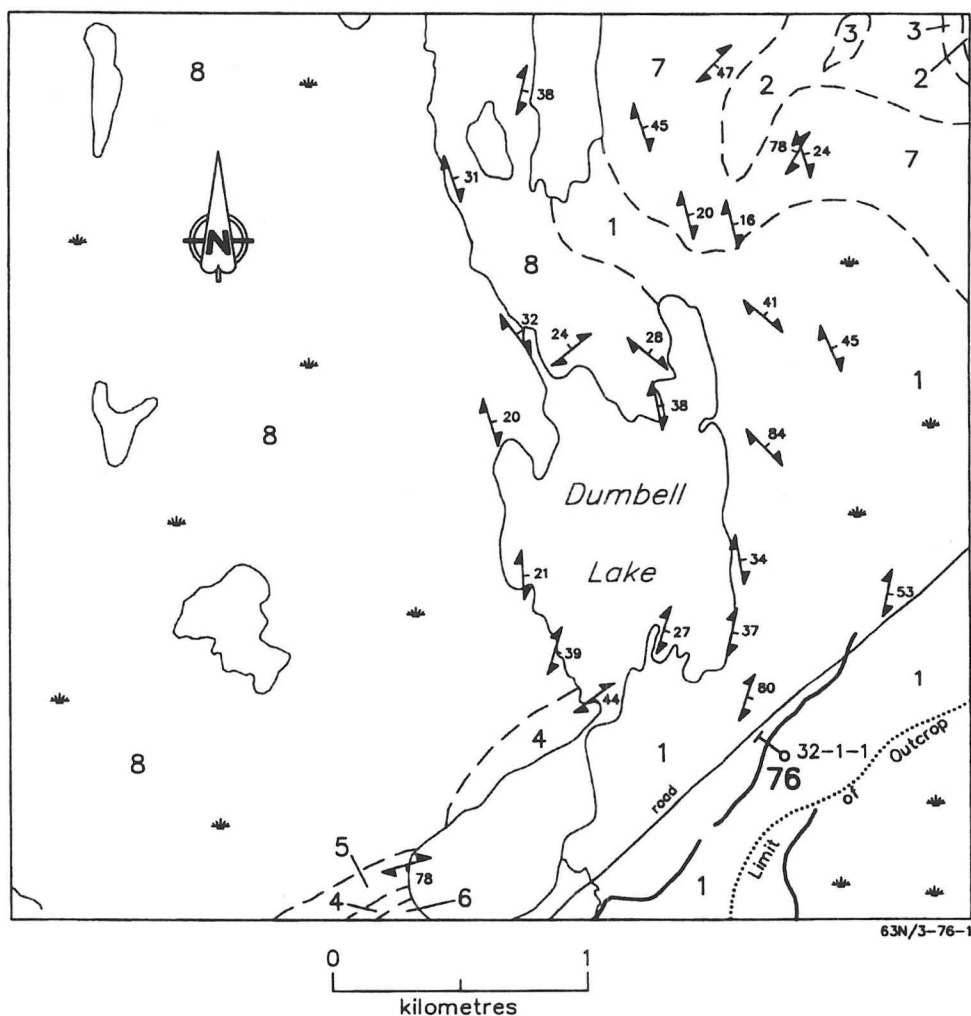


Figure 75-1: General geology, geophysical conductors and diamond-drill hole locations at occurrence 75



- | | |
|--|---|
| 14 Felsic, massive to layered, quartz-feldspar-biotite, magnetite gneiss (pink weathered) | 3 Felsic quartz-feldspar-muscovite |
| 13 Intermediate feldspar-hornblende-quartz gneiss | 2 Quartz-feldspar-biotite-garnet gneiss (metagreywacke) |
| 12 Banded felsic quartz-feldspar-hornblende gneiss (green weathered) | 1 Mafic metavolcanic rocks |
| 11 Layered intermediate feldspar-hornblende-quartz-garnet gneiss | --- Geological boundary (approximate) |
| 10 Rusty weathered, felsic to intermediate, interlayered, quartz-feldspar-biotite and quartz-feldspar-hornblende gneiss | ↗ Gneissosity (inclined) |
| 9 Intermediate, banded, feldspar-hornblende-quartz gneiss with hornblende laminae | Shear zone |
| 8 Massive to banded, felsic, quartz-feldspar-biotite gneiss | x Small outcrop |
| 7 Intermediate hornblende-feldspar-quartz-magnetite gneiss | X Mineral occurrence |
| 6 Banded felsic quartz-feldspar-biotite-magnetite gneiss | Limit of mapping |
| 5 Layered intermediate hornblende-garnet gneiss | Geology from Ostry (1986). |
| 4 Massive felsic quartz-feldspar-biotite-magnetite gneiss with interlayers of intermediate feldspar-hornblende-quartz-magnetite gneiss | ○ Drillhole collar |
| | ☼ Swamp |

Figure 75-2: Detailed geology, locations of arsenopyrite mineralization and diamond-drill hole location in the vicinity of occurrence 75



Intrusive Rocks

- 8 Foliated monzogranite and granodiorite

Missi Metamorphic Suite

- 7 Quartz-feldspar-hornblende-biotite gneiss
- 6 Quartz-rich paragneiss
- 5 Meta-arkose

Unnamed Gneisses

- 4 Diopside-bearing amphibolite
- 3 Garnetiferous amphibolite

Burntwood River Metamorphic Suite

- 2 Diatexite derived from greywacke
- 1 Muscovite-biotite gneiss, metagreywacke

--- Geological boundary (approximate)

— EM conductors (A.F. 92604)

↗ Gneissosity (inclined)

Geology after Schledewitz (1988).

—○— Drillhole (A.F. 92604)

☼ Swamp

Figure 76-1: General geology, geophysical conductors and diamond-drill hole location at occurrence 76

LOCATION: 76

NAME: (A.F. Mineralization intersected by diamond drilling)
UTM: 6097312N/363935E
AREA: East of Dumbell Lake.
AIRPHOTO: A26397-021
ACCESS: Kississing Lake road, traverse.

EXPLORATION SUMMARY:

The ground was held as Dum 5 and Dum 6 by HBED from 1962 to 1963. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). Granges Exploration Aktiebolag staked CB 13460 in 1981. Selco Inc. carried out magnetometer (GSM-8 Proton) and HLEM (Apex MaxMin II) surveys, and drilled DDH 32-1-1 (93.57 m) for Elken Exploration Limited in 1982 (A.F. 92604, Grid 1). CB 13460 was cancelled in 1985.

GEOLOGICAL SETTING:

The area is underlain by Burntwood Suite (former Burntwood River Metamorphic Suite) greywacke gneiss (Fig. 76-1; Schledewitz, 1988).

MINERALIZATION:

The drillhole intersected felsic intrusive rocks and plagioclase - quartz - biotite - garnet \pm graphite (greywacke) gneiss. Three intersections of near solid graphite and Fe sulphides that range in core length from 77 cm to 3.5 were recorded in the drill log. These layers are described as dark and aphanitic (earthy pyrite?). Visible pyrite occurs as scattered stringers and constitutes up to 20 per cent of the graphite layers.

GEOCHEMICAL DATA:

The mineralized layers were sampled and assayed for Cu, Zn, Pb, Au and Ag. The 3.5 m long graphite and pyrite intersection contains up to 0.69 g/t Ag. Anomalous Cu, Zn, Pb and Au concentrations were not reported.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. The mineralization is interpreted to be a graphitic sulphide facies iron formation. Although only graphite may be recorded in the drill log, the majority of this type of occurrence has been found to contain more Fe sulphide than carbon (Gale *et al.*, 1980).

REFERENCES:

- Assessment File 91695, 92604
Manitoba Energy and Mines, Minerals Division.
Bateman, J.D. and Harrison, J.M.
1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 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.
Schledewitz, D.C.P.
1988: Kisseynew Project: Kississing Lake; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1988, p. 43-48.
1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

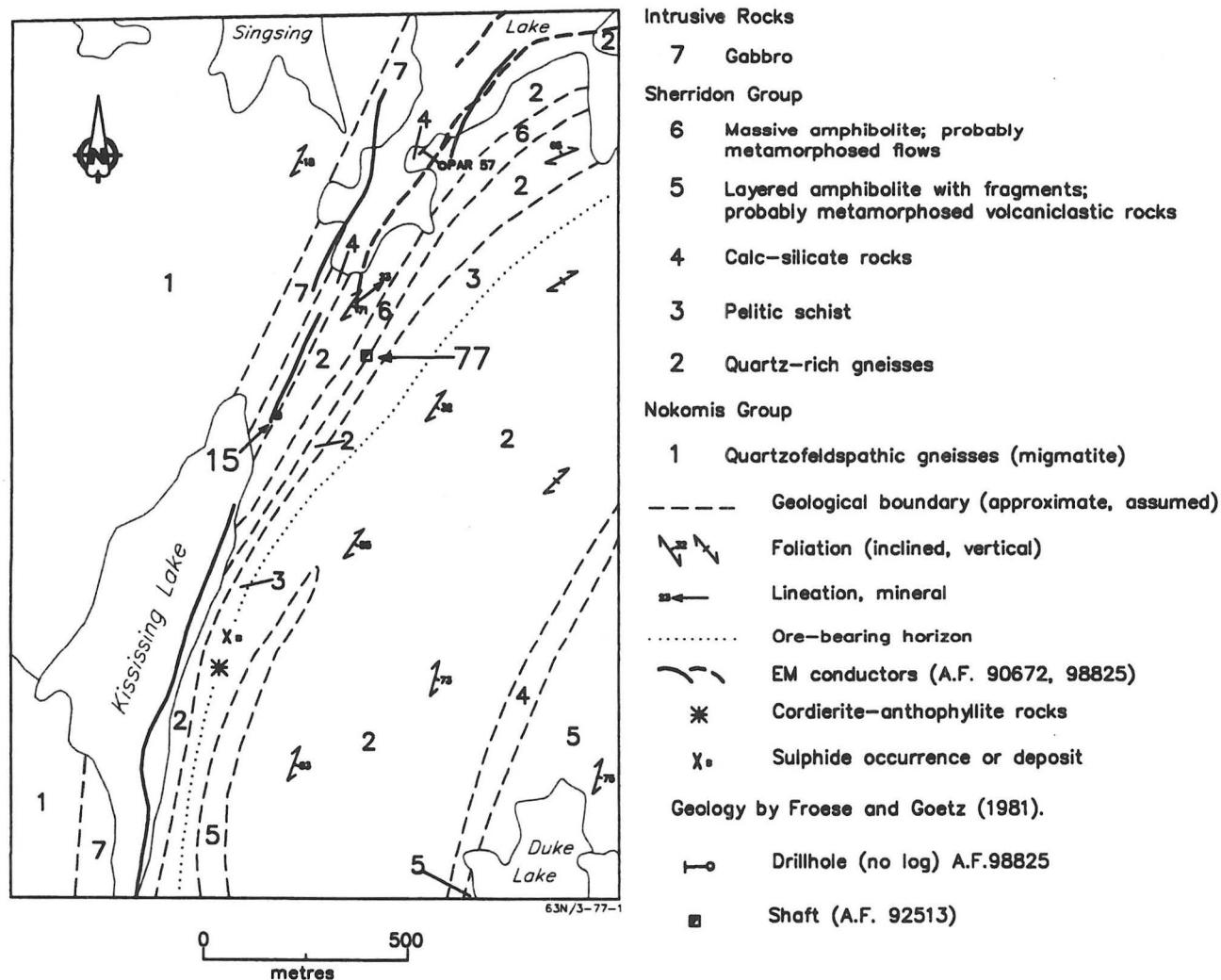


Figure 77-1: General geology, geophysical conductors and diamond-drill hole location at occurrence 77

LOCATION: 77**NAME:**

UTM: 6117257N/365879E

AREA: South of Singsing Lake.

AIRPHOTO: A26369-007

ACCESS: Kississing Lake, traverse; bush aircraft to Singsing Lake.

EXPLORATION SUMMARY:

The Bell and Loon claims were staked in the area *circa* 1926 by C.G. Hamelin. In 1929 Atlas Exploration Company Limited acquired the claims and transferred them to Sherritt Gordon Mines Limited. J. Patrick staked the Jack claim in 1936 and transferred it to Sherritt Gordon Mines Limited in 1942. The Bell, Loon and Jack claims lapsed by 1951. In 1954 G.F. Thompson staked Paymaster 16. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). Noranda Mines Limited did an EM survey on the Paymaster claims in 1955 (A.F. 90672). The claim lapsed in 1956. HBED held the ground as Par 259 in 1958-1959. In 1966 E.J. Tycoles staked Nich 6. Valray Explorations Limited did magnetic and EM surveys in 1966 (A.F. 92055, A.F. 90675, A.F. 90676). W. Shmon acquired the property in 1970. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). The Nich claims lapsed in 1978. HBED held CB 10509 from 1979-1982. Sing 6 was staked by Esso Minerals Canada in 1988, and transferred to Esso Resources Canada Limited and then to Homestake Mining (Canada) Limited in 1989. The claim lapsed in 1990. In 1980 Shell Canada Resources Limited produced a 1:125 000 scale compilation map of the geology and mineral occurrences within 63N/2 and parts of 63N/3 and 63N/1 (A.F. 92513).

GEOLOGICAL SETTING:

The area is underlain by Sherridon Suite (former Sherridon Group) quartz-rich gneiss, massive amphibolite, calc-silicate rocks and gabbro (Fig. 77-1; Froese and Goetz, 1981). The position of a shaft is shown on a compilation map produced by Shell (A.F. 92513) and indicates that the shaft was sunk in cordierite- and anthophyllite-bearing hornblende - plagioclase gneiss, but when the position of the shaft is

transferred to the geology map by Froese and Goetz (1981) the shaft occurs at the contact between massive amphibolite and quartz-rich gneiss of the Sherridon Suite (Fig 77-1).

MINERALIZATION:

Chalcopyrite is exposed in a shaft (A.F. 92513).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Replacement type deposit. This occurrence is interpreted to occur within cordierite- and anthophyllite-bearing hornblende - plagioclase gneiss as indicated on the compilation map produced by Shell (A.F. 92513). The unusual mineralogy of the conformable anthophyllite sequence/layer may reflect: 1) a transposed Fe-Mg alteration zone like that commonly associated with massive sulphide type deposits; 2) alteration by hydrothermal fluid flow along a structure such as a fault or shear zone and transposition; 3) sedimentary material that underwent *in situ* chloritization prior to high grade metamorphism; 4) the chemistry of a chemical sedimentary precipitate, with or without mixing during sedimentation; or 5) a pelitic composition high in alumina and magnesium.

REFERENCES:

- Assessment File 90672, 90675, 90676, 91616, 91695, 92055, 92513.
Manitoba Energy and Mines, Minerals Division.
Bateman, J.D. and Harrison, J.M..
1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.
Froese, E. and Goetz, P.A.
1981: Geology of the Sherridon Group in the vicinity of Sherridon, Manitoba; Geological Survey of Canada, Paper 80-21, 20p.
Schledewitz, D.C.P.
1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

LOCATION: 78

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

UTM: 6118516N/367679E

AREA: Northeast of Singsing Lake.

AIRPHOTO: A26387-162

ACCESS: Bush aircraft to Singsing Lake.

EXPLORATION SUMMARY:

Joseph 3 was staked in the vicinity *circa* 1926. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). The ground was held as Chal 25 by M. Rapson in 1954-1957. HBED staked Par 201 in 1958, and drilled DDH P50 (75.6 m) in 1959 (A.F. 98825). Par 201 lapsed in 1964. In 1966 Sing 5 and Sing 6 were staked by J. Como, and assigned to R. Brown. Valray Explorations Limited did magnetic (Sharpe MF1 fluxgate) and EM (Sharpe S-250) surveys in 1966 (A.F. 90676). The claims lapsed in 1971. Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). HBED held the ground as CB 10519 in 1979-1982. Sing 1 was staked by Esso Minerals Canada in 1988, and transferred to Esso Resources Canada Limited and then to Homestake Mining (Canada) Limited in 1989. Sing 1 lapsed in 1990. L. Racic staked Rub 8 and Rub 11 in 1992.

GEOLOGICAL SETTING:

The drillhole was collared near the contact between gabbro and calc-silicate gneiss of the Sherridon Suite (former Sherridon Group) (Fig. 78-1; Froese and Goetz, 1981) and intersected hornblende ± garnet, quartz - feldspar ± biotite ± garnet gneiss, and hornblende - feldspar - biotite

gneiss. Quartz and calcite stringers were documented locally in the drill core.

MINERALIZATION:

The drillhole intersected four zones of minor to near solid pyrrhotite and/or pyrite and graphite mineralization that range in core length from 85 cm to 2.8 m; and one intersection of 'abundant' pyrrhotite and graphite with slight pyrite over 16.7 m in core length.

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Chemical sediment type deposit; sulphide facies iron formation. The mineralization is interpreted to be a graphitic sulphide facies iron formation. (cf. Locations 7, 16, 20 and 34).

REFERENCES:

Assessment File 90675, 90676, 91616, 91695, 92513, 98825
Manitoba Energy and Mines, Minerals Division.

Bateman, J.D. and Harrison, J.M.

1946: Sherridon, Manitoba; Geological Survey of Canada, Map 862A with descriptive notes, 1:63 360.

Froese, E. and Goetz, P.A.

1981: Geology of the Sherridon Group in the vicinity of Sherridon, Manitoba; Geological Survey of Canada, Paper 80-21, 20p.

Schledewitz, D.C.P.

1988: Kississing Lake; Manitoba Energy and Mines, Preliminary Map 1988K-1, 1:50 000.

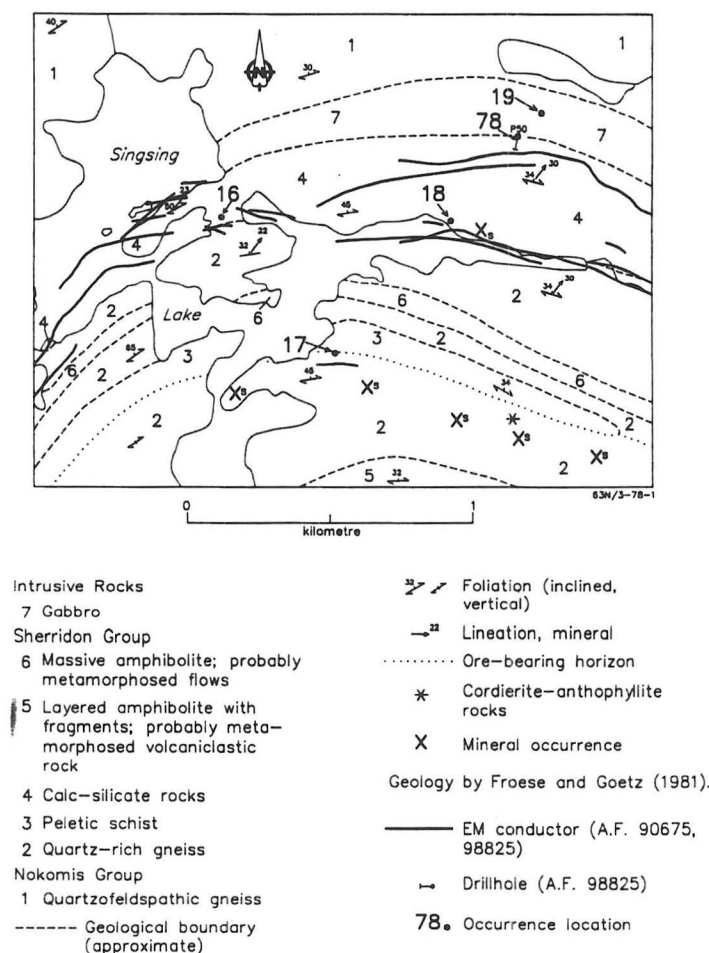


Figure 78-1: General geology, geophysical conductors and diamond-drill hole locations at occurrences 16, 17, 18 and 78

LOCATION: 79**NAME:**

UTM: 6117182N/371213E

AREA: East of Park Lake.

AIRPHOTO: A26369-200

ACCESS: Bush aircraft to Park Lake, traverse.

EXPLORATION SUMMARY:

The area was first staked as the Pansy and Blackbird claims (Mining claim map, 63N/3NE, *circa* 1930). Norma W. Brown and J. Hone staked Ken 30 and Ken 31 in 1937, and transferred the claims to E.L. Brown in 1938. Leases M-1342 and M-1343 were assigned to Sherritt Gordon Mines Limited in 1943. The leases lapsed in 1951. Eldorado Mining and Refining Limited did an airborne radiation survey in 1954 (A.F. 91616). The ground was held as Par 248 by HBED in 1958-1964. J. Michelle staked Mat 9 in 1966. Kimberly Copper Mines Limited acquired the claim in 1967 and carried out magnetic and EM-16 surveys in 1967-1968 (A.F. 90674). Mat 9 lapsed in 1971. Shell Canada Resources Limited produced a geological compilation map (1:125 000) of the area in 1980 (A.F. 92513). Sherritt Gordon Mines Limited did an airborne EM survey in 1972 (A.F. 91695). HBED held CB 10529 in 1979-1984.

GEOLOGICAL SETTING:

The mineral occurrence is located at or near the contact between granitoid gneisses and Sherridon Suite (former

Sherridon Group) calc-silicate gneiss (Fig. 79-1; Froese and Goetz, 1981).

MINERALIZATION:

A pyrrhotite-pyrite-chalcopyrite-sphalerite occurrence is shown at this location on the geological compilation map produced by Shell Canada Resources Limited (A.F. 92513).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment File 90663, 90674, 91616, 91695, 92513
Manitoba Energy and Mines, Minerals Division.

Bateman, J.D. and Harrison, J.M.

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Froese, E. and Goetz, P.A.

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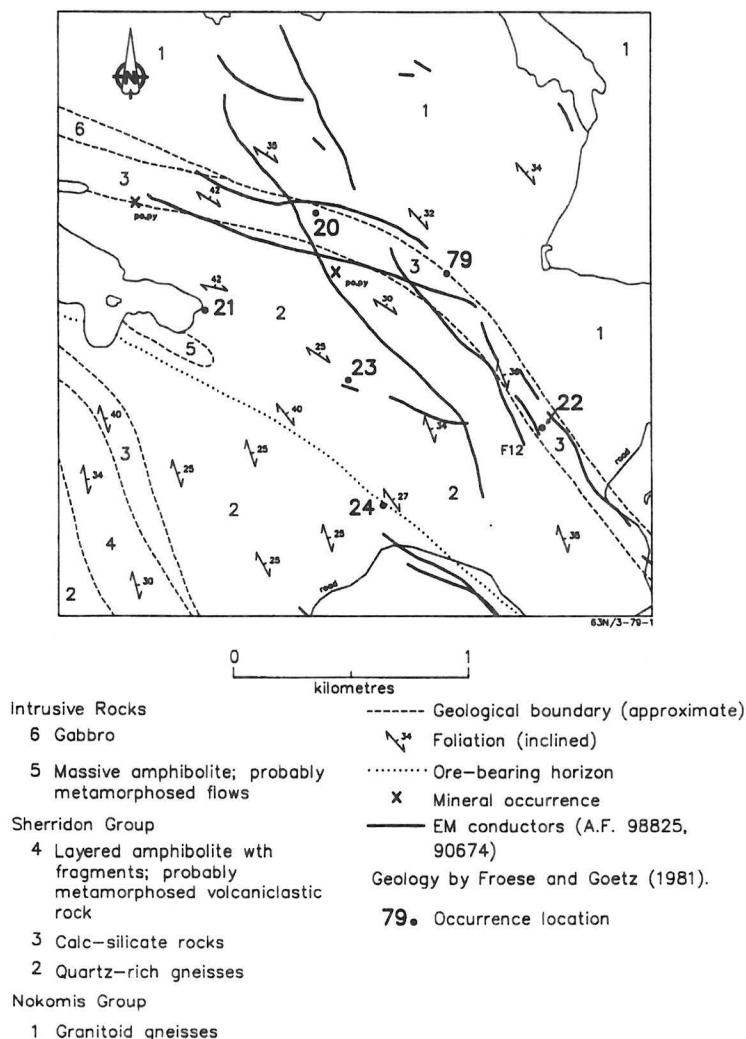


Figure 79-1: General geology and geophysical conductors at occurrence 79