CLASSIFICATION, DISTRIBUTION AND GRADE-TONNAGE SUMMARIES OF CANADIAN LEAD-ZINC DEPOSITS

D.F. Sangster

1986

Canada

Geological Survey of Canada
Economic Geology Report 37

CLASSIFICATION, DISTRIBUTION AND GRADE-TONNAGE SUMMARIES OF CANADIAN LEAD-ZINC DEPOSITS

D.F. Sangster

1986

Available in Canada through

authorized bookstore agents and other bookstores

or by mail from

Canadian Government Publishing Centre
Supply and Services Canada
Ottawa, Canada K1A 0S9

and from

Geological Survey of Canada offices:

601 Booth Street
Ottawa, Canada K1A 0E8

3303-33rd Street N.W.,
Calgary, Alberta T2L 2A7

100 West Pender Street
Vancouver, British Columbia V6B 1R8
(mainly B.C. and Yukon)

A deposit copy of this publication is also available
for reference in public libraries across Canada

Cat. No. M43-37/1986E Canada: $12.00
ISBN 0-660-12152-2 Other countries: $14.40

Price subject to change without notice

Cette publication est aussi disponible en français

Cover

Skeletal galena crystal in a matrix of botryoidal sphalerite, Pine Point district, Northwest Territories. Length of crystal is 10 cm. Photographed by G. Lemieux.

Critical Reader

H.E. Dunsmore

Original manuscript submitted for publication: 1983-11
Final version approved for publication: 1984-07

CONTENTS

Appendices

Tables

Illustrations

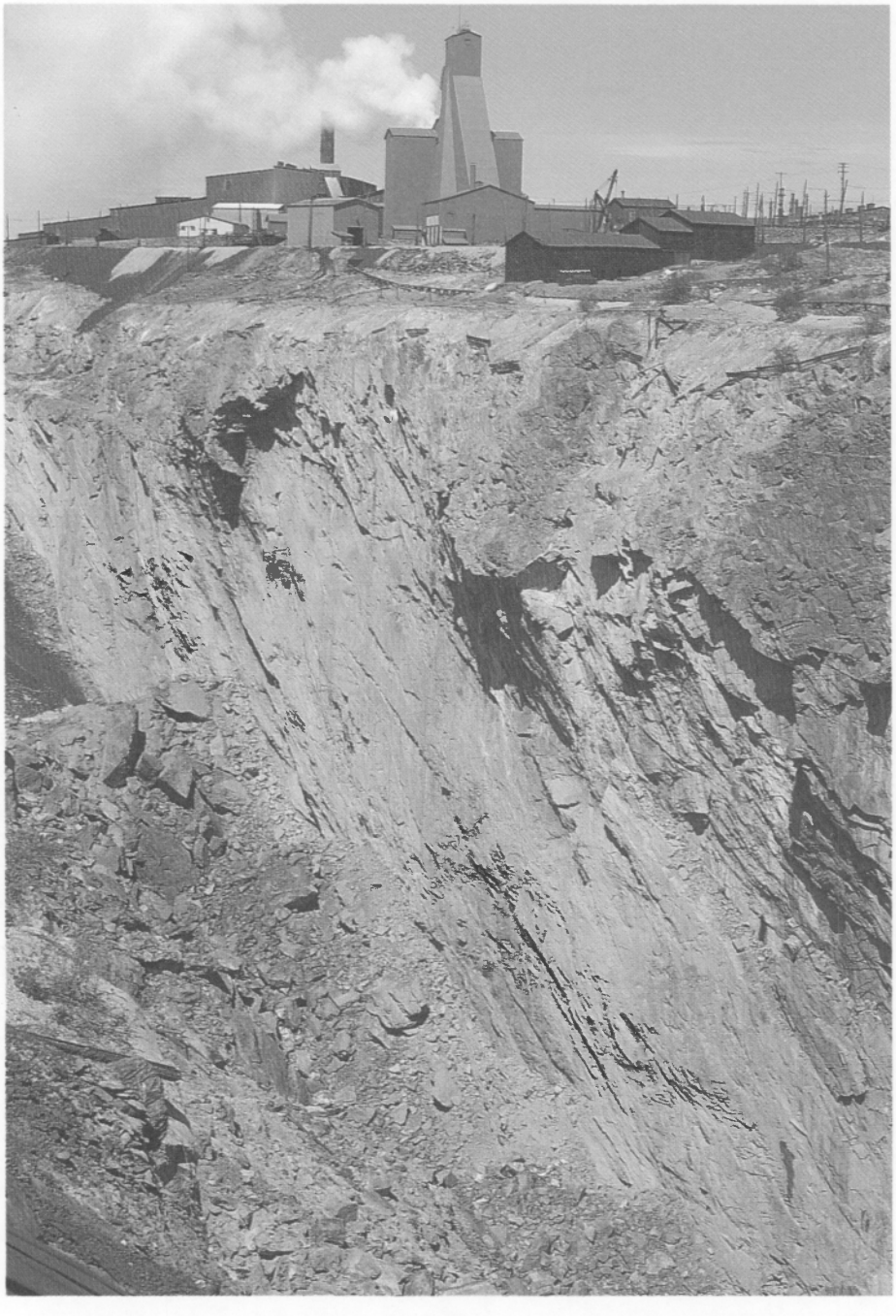

Figure 1. *Flin Flon Mine, Manitoba; North Main Shaft and glory hole. The orebody, a Middle Proterozoic volcanic-associated exhalative deposit, plunges to the south towards, and to the right of, the observer. The deposit was discovered in 1914 and has been in continuous production since 1930.*

CLASSIFICATION, DISTRIBUTION AND GRADE-TONNAGE SUMMARIES OF CANADIAN LEAD-ZINC DEPOSITS

Abstract

A summary overview of certain quantifiable characteristics of Canadian lead-zinc deposits and occurrences is presented by means of maps, graphs and explanatory text.

A total of 378 lead-zinc deposits, defined as mineral concentrations for which grade and tonnage data are available for these elements, have been assigned to one of six deposit-type categories: (i) sandstone-lead; (ii) contact metasomatic; (iii) Mississippi Valley; (iv) sediment-hosted exhalative; (v) volcanic-associated exhalative; and (vi) vein/replacement.

Deposits are plotted on a 1:5 million scale geological map with symbols depicting deposit-type, total (Pb+Zn) content, and Zn/(Zn+Pb) ratio. Crowded areas of deposit-clusters are shown on a series of more detailed geological maps.

The 4900 lead-zinc occurrences (no grade-tonnage data available) recorded in CANMINDEX, the GSC computer-based mineral deposits file, were simply contoured by a moving average technique and are displayed as a density contour map.

The study showed that:

1. *A majority of all deposits are decidedly copper-poor relative to lead-zinc;*
2. *Volcanic-associated deposits, as a group, are largely bimetallic Cu-Zn whereas all other deposit-types are bimetallic Pb-Zn;*
3. *Volcanic-associated exhalative and vein/replacement deposits are the two most abundant deposit-types, constituting 47% and 37%, respectively, of the total deposit population;*
4. *Vein/replacement deposits account for the majority of size less than 100 000 tonnes ore; deposits larger than this are mainly of the exhalative type;*
5. *The median size of all Canadian lead-zinc deposits is 0.5 million tonnes ore;*
6. *A majority of deposits grade less than 18% (Pb+Zn);*
7. *The average (Pb+Zn) grade of sediment-hosted exhalative deposits (10.07%) is more than double that of volcanic-associated exhalative deposits (4.94%); vein/replacement deposits not subjected to hand-picking of ore material average 8.58%.*
8. *Contour plots of 4912 lead-zinc occurrences show that most coincide with deposit-clusters.*

The report includes three appendices which: (i) list deposits by type with cross-referencing by name and deposit-number including latitude, longitude and National Topographic System (NTS) location data for each deposit; (ii) list deposits alphabetically by deposit-type; and (iii) record selected bibliographic references for each deposit for a total of 748 citations.

INTRODUCTION

This report summarizes the distribution and nature of Canadian mineral deposits reported to contain lead and/or zinc. Exploration for lead-zinc in Canada began before Confederation in 1867 and the latest data available (1981) show that the country ranks third and first in the world in lead and zinc mine production, respectively. Some deposits have been producing zinc for over fifty years (Fig. 1). Latest estimates (Energy, Mines and Resources Canada, 1977) of the nation's lead-zinc endowment suggest Canada's continued dominance as a world lead-zinc resource nation.

For this report, Canadian lead-zinc mineral concentrations were divided into two categories: deposits and occurrences. Deposits are those for which grade and tonnage data for lead and/or zinc are available. Published reserves were combined with cumulative production (where applicable) to end 1981 to arrive at combined grade-tonnage figures which were then used for illustration and statistical purposes. A total of 378 deposits were found to fulfill these criteria. Occurrences are those which have been reported to contain lead and/or zinc but without grade-tonnage data and which have been entered into CANMINDEX, the Geological Survey of Canada's computer-based index file of Canadian mineral occurrences and deposits. Of a total of approximately 19 400 entries in CANMINDEX as of early 1984, about 4900 have recorded lead and/or zinc.

The two categories of mineral concentrations (deposits and occurrences) are treated differently in this report. The 378 deposits are plotted on a series of maps (Map 1651A and Fig. 2-10) with symbols depicting deposit-type, total (Pb + Zn) content, and Zn/(Zn + Pb) ratio. In Appendix A, the deposits are listed by deposit-type, cross-referenced by name, and assigned a deposit-number. Appendix B lists the same deposits alphabetically by deposit-type. Appendix C consists of a selected bibliography for all deposits. Furthermore, the distribution of individual deposits throughout Canada is shown in Map 1651A with details of selected districts shown in Figures 2-10. In contrast to the deposits, the 4900 occurrences were simply computer-contoured by a moving average technique and displayed as a density contour map.

DEPOSIT CLASSIFICATION

Compositional types

In the 378 deposits, lead and zinc are not, of course, the only commodities present Many contain significant amounts of silver, gold, and cadmium as potential or actual byproducts. Other commodities present in a few deposits are tin, bismuth, selenium, and barite. Copper is an

Note: reference to Figure 1 in caption for Figures 2-10 should read Map 1651A

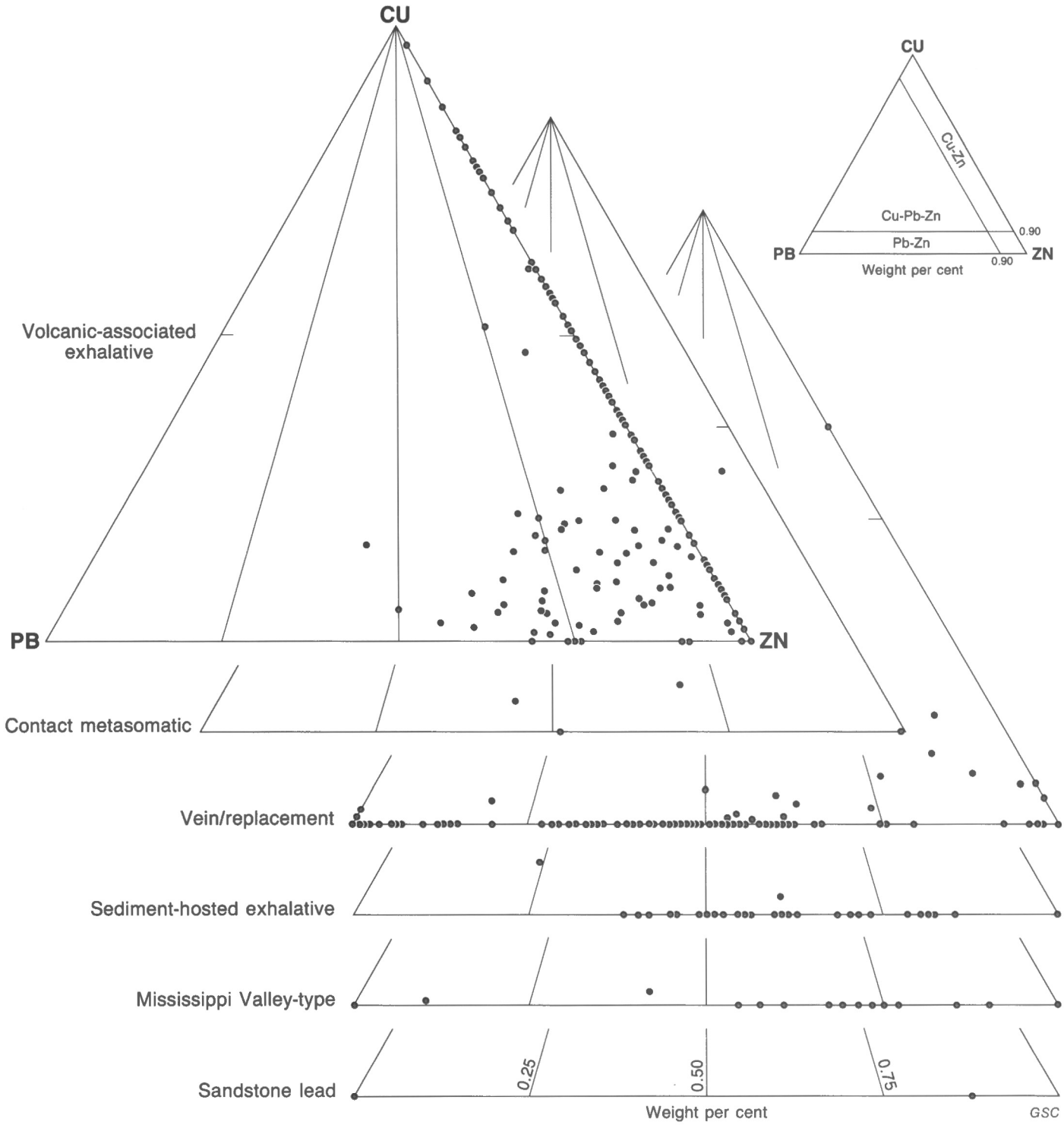

Figure 11. *Ternary plots of relative Cu-Pb-Zn abundances in Canadian lead-zinc deposits. Due to crowding and overlapping of points, the positions of some deposits could not be shown on the diagrams. Radiating lines are same divisions of Zn/(Zn+Pb) ratios as used in deposit-symbols on distribution maps. Small triangle in upper right corner shows compositional divisions discussed in text and used in Table 1.*

accompanying base metal in about one half of the 378 deposits considered in this report (Fig. 11). However, the sole compositional criterion used for inclusion in this report was that the deposits contain lead or zinc. In actual fact, over 92% of them contain more combined lead-zinc than copper (i.e. (Pb+Zn)>Cu). Using the compositional boundaries shown in the upper right corner of Figure 11, Canadian lead-zinc deposits can be grouped into four compositional types: (i) bimetallic Cu-Zn; (ii) bimetallic Pb-Zn; (iii) monometallic Zn; and (iv) polymetallic Cu-Pb-Zn. Table 1 lists the percentage distribution, by deposit-type, in these four compositional types (see following section for definitions of deposit-types).

Metallogenic types

All the lead-zinc deposits considered in this report are regarded by the author to be of the type referred to as "hydrothermal"; that is to say, the metals have been transported in solution by, and deposited from, aqueous solutions. This is not to imply that non-hydrothermal types of lead-zinc deposits do not occur in Canada; quite the contrary. It reflects the fact that other metallogenic types have not been investigated to the point where grade-tonnage calculations have been made and reported.

Within the "hydrothermal" category, a second-order hierarchy classifies the deposits as either "supracrustal" or "infracrustal" (Table 2). Supracrustal deposits are those formed on the Earth's crust whereas infracrustal deposits are formed within the crust. Two types of supracrustal Canadian lead-zinc deposits are recognized: volcanic-associated exhalative deposits and sediment-hosted exhalative deposits. In the infracrustal category, four sub-types are recognized: contact metasomatic; vein/replacement; Mississippi Valley-type; and sandstone-lead.

The 378 deposits of this report were each assigned to one of these six basic metallogenic deposit-types, the geological characteristics of which are described below.

Supracrustal deposits

1. Volcanic-associated and sediment-hosted exhalative

Within the supracrustal category, all Canadian lead-zinc deposits are regarded as being of the type commonly referred to as "exhalative". Deposits of this type are considered to have formed in a subaqueous environment, usually submarine, by precipitation of metal sulphides from hot, aqueous solutions emanating from fissures on the seafloor. The characteristics of these deposits, and the processes as by which they have formed, have been discussed most recently by Franklin et al. (1981), Large (1980; 1981; 1983) and Gustafson and Williams (1981). Canadian supracrustal exhalative deposits are assigned to one of two categories: (i) volcanic-associated, in which volcanic rocks constitute a significant proportion of the host rocks; (ii) sediment-hosted, in which a recognizable volcanic component in the host rocks is negligible and the entire sequence is overwhelmingly sedimentary. Some authors have suggested a complete spectrum of host-rock proportions exists between these two end-members (e.g. Gilmour, 1971, 1976; Klau and Large, 1980). Alternatively, Franklin et al. (1981) have shown that, in terms of Cu-Pb-Zn ratios, exhalative deposits exhibit three main compositional categories: Cu-Zn; Cu-Pb-Zn; and Pb-Zn. The first two of these compositional categories broadly correspond to the volcanic-associated type of the present report and display the characteristics discussed by Franklin et al. (1981). The third compositional category corresponds to the sediment-hosted type of the present report and display the features discussed by Large (1980; 1981; 1983).

Table 1. Compositions of Canadian lead-zinc deposits (see Fig. 11). Numbers refer to percent of total in each deposit type

Deposit type	n	Composition %Pb-Zn	%Cu-Zn	%Zn	%Cu-Pb-Zn
Sandstone-lead	2	100	-	-	-
Contact metasomatic	7	43	14	43	-
Mississippi Valley (MVT)	16	94	-	6	-
Sediment-hosted exhalative	33	85	-	15	-
Volcanic-associated exhalative	180	16	58	16	10
Vein/replacement	140	89	1	9	1
All deposits	378	53	29	13	5

The table above illustrates the following relationships:

1. Sandstone-lead, Mississippi Valley-type (MVT), sediment-hosted exhalative, and vein/replacement deposit types are dominantly of bimetallic Pb-Zn composition;
2. Volcanic-associated exhalative deposits are largely of the bimetallic Cu-Zn type, due, in large part, to the fact that many of the deposits are of Precambrian age and hence characteristically lead-poor;
3. Only five per cent of all deposits are polymetallic Cu-Pb-Zn of which all but one are of the volcanic-associated exhalative type;
4. A majority of all deposits (66%) are decidedly copper-poor relative to lead-zinc (i.e. Cu/(Cu+Pb+Zn)<0.10).

Table 2. Metallogenic classification of Canadian lead-zinc deposits

Classification	Canadian examples
HYDROTHERMAL	
Supracrustal	
1. Volcanic-associated exhalative	Buchans, Brunswick #12
2. Sediment-hosted exhalative	Sullivan, Cirque
Infracrustal	
3. Mississippi Valley-type (MVT)	Pine Point, Newfoundland Zinc
4. Sandstone-lead	Yava
5. Contact metasomatic	Meat Cove, Zip
6. Vein and replacement	Nigadoo, Bluebell

Briefly, exhalative deposits consist of two main portions: massive sulphides and stringer sulphides. The former is a lens of high sulphide content (normally more than 70% sulphide, most of which is iron sulphide), internally layered, and conformable with enclosing rocks. The stringer sulphide portion occurs in the footwall of the massive sulphide lens, is much lower in sulphide content (about 20% total sulphide), discordant to enclosing rocks, and may consist of a vein stockwork, sulphide cement in brecciated host rocks, disseminations, or various proportions of all three. The stringer sulphide portion is characteristically surrounded by an envelope of hydrothermally altered host rocks. For further details of volcanic-associated exhalative deposits, the reader is referred to Franklin et al. (1981). Sediment-hosted exhalative deposits are similar to the volcanic-associated ones except that the stringer sulphide portion is much less common and the massive sulphide portion is usually represented by a series of stacked, thin, conformable sulphide layers rather than a single, lensoid mass (Large, 1980, 1981, 1983; Klau and Large, 1980).

Canadian volcanic-associated deposits include those associated with ophiolitic assemblages (e.g. York Harbour), with tholeiitic and calc-alkaline mafic-to-felsic sequences (e.g. Mattabi), and with mixed volcanic and sedimentary lithologies (e.g. Brunswick #12). This wide range in volcanic rock-types and lithologic assemblages reflects the wide range of depositional and tectonic environments in which these deposits form (Franklin et al., 1981). Similarly, sediment-hosted exhalative deposits are found in radiolarian cherts, shales, and carbonates (e.g. Howard's Pass), in argillites and sandstones of turbidite affiliation (e.g. Sullivan), in carbonates (e.g. Jersey), and calcareous quartzites (e.g. River Jordan). Although there is a degree of consensus that the tectonic environment of sediment-hosted exhalative deposits is some form of intra-cratonic rifting (Large, 1980), the depositional environment ranges from deep-water basins with severly limited clastic input (e.g. Howard's Pass), through basins of moderate water depth receiving large volumes of greywacke-like detritus (e.g. Sullivan), to, finally, relatively shallow-water carbonates and calcareous quartzites (e.g. Jersey, River Jordan).

Infracrustal deposits

1. Vein and replacement

Vein deposits consist most commonly of narrow, subvertical structures such as fractures, shears, faults, etc. which are filled, either partially or completely, with sulphide minerals and associated silicates, carbonates, or sulphates. The veins are discordant where they occur in layered host rocks; veins in plutonic rocks appear to be later than all phases of intrusion.

Host rocks are most commonly clastic metasedimentary rocks and felsic plutonic rocks. Contacts between veins and silicic host rocks are characteristically abrupt and relatively straight, suggesting structural control of the mineralized zone. Under these conditions alteration and replacement of adjacent country rock is minimal. Where the host rock is carbonate (or calcareous), however, ore-host contacts are irregular, structural control is not so apparent, and replacement features are common. Thus, in a mixed sedimentary sequence, a single lode may exhibit both vein and replacement characteristics, depending on adjacent host rock lithology and, for this reason, both forms are grouped together.

A majority of Canadian lead-zinc vein and replacement deposits are associated with felsic plutons although a clear genetic connection has never been established. This type of vein deposit has, as a group, been the most consistent producer in the vein/replacement category. Two districts, in particular, are noteworthy: the Keno Hill district in Yukon Territory (Fig. 10) and the Salmo and Slocan district in southeastern British Columbia (Fig. 8). Both of these districts consist of a collection of individual veins and vein-nets associated with Laramide-age intrusions and hosted in clastic sedimentary rocks. Vein deposits in the Keno Hill district are the most important vein/replacement, silver producers in Canada and, as they also contain high lead-zinc values, constitute a significant lead-zinc resource. The Lucky Jim and Bluebell would be examples of vein deposits contained partially (Lucky Jim) or almost entirely (Bluebell) in carbonate rocks and which, consequently, exhibit both vein and replacement characteristics. However, some deposits, such as the Frontenac and Kingdon, are not associated with igneous rocks of any kind and may be genetically related to the St. Lawrence Rift System (A.L. Sangster, 1970; D.F. Sangster, 1970; Kumarapeli, 1976). Other, non-pluton-associated vein deposits, such as some in the Thunder Bay region (e.g. Dorion), are vein-like in form, but have been proposed (Franklin and Mitchell, 1977) to be genetically similar to sandstone-lead deposits (Bjørlykke and Sangster, 1981). That is to say, the vein constituents (Pb, Zn, Ba, etc.), derived from diagenic breakdown of potash feldspar grains within the host rock sandstones, were moved as soluble complexes in formation fluids to their present locations in dilation zones adjacent to basement paleo-highs at the margins of the sedimentary basin.

2. Contact metasomatic

Although commonly referred to as skarn deposits, contact metasomatic lead-zinc deposits are only one of several types of skarn deposit. They may form by any of three main processes: (i) metamorphic recrystallization of impure carbonate rocks; (ii) bimetasomatic reaction between unlike lithologies; (iii) infiltrational metasomatism involving hydrothermal fluids of magmatic origin (Einaudi et al., 1981).

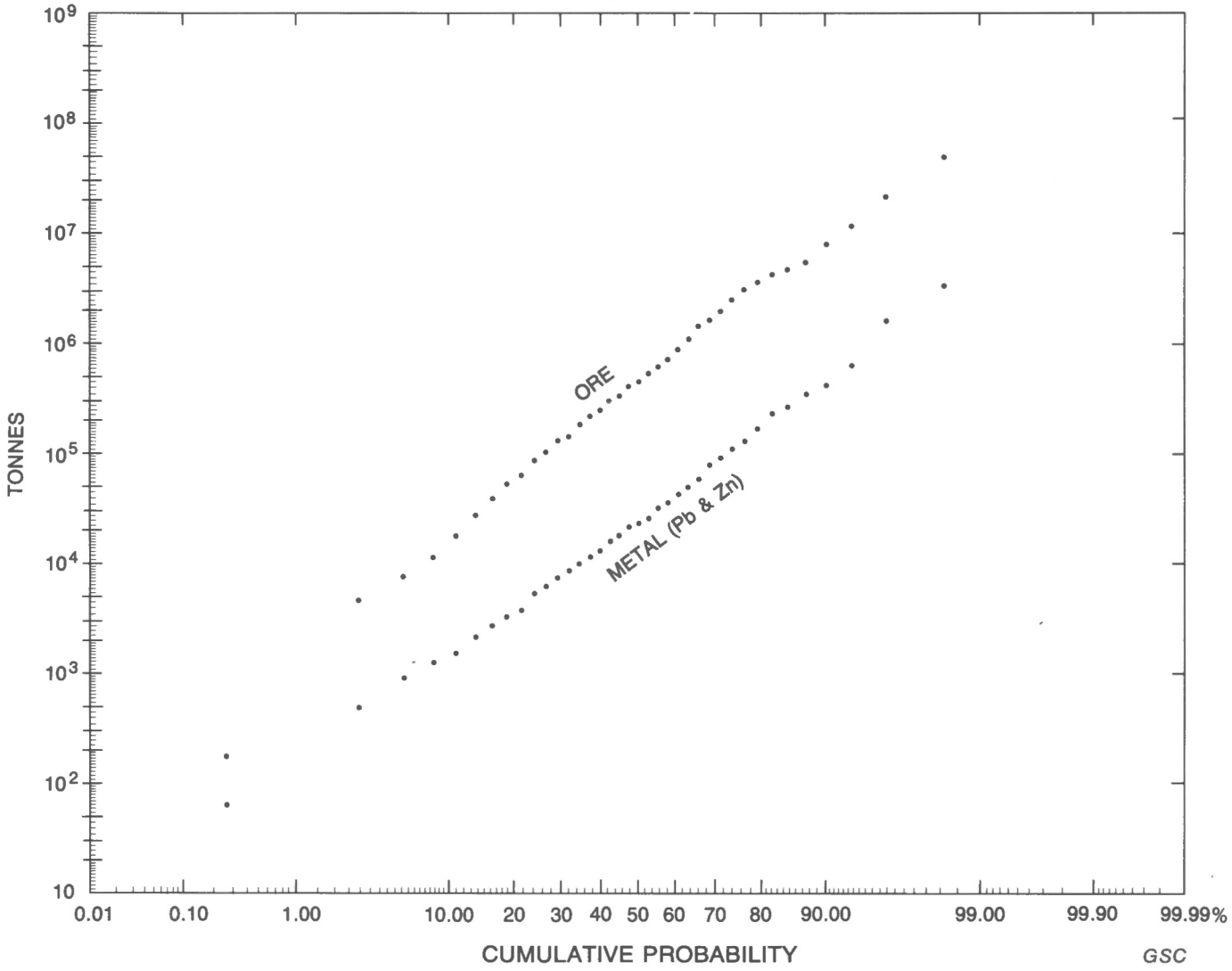

Figure 12. *Probability plot of tonnes ore and contained lead-zinc in 378 Canadian lead-zinc deposits. To avoid clutter of the diagram, only every tenth point has been plotted.*

In the present paper, an attempt is made to separate lead-zinc deposits formed by infiltrational metasomatism (i.e. contact metasomatism) from the other two which the author regards as simply metamorphism of pre-existing lead-zinc deposits and host rocks. An example of the latter would be the Long Lake deposit classified here as a (metamorphosed) sedimentary exhalative deposit. Canada's largest known contact metasomatic lead-zinc deposit is Meat Cove.

3. Mississippi Valley-type

Named after several well-known districts in the Mississippi Valley region of the United States, Mississippi Valley-type (MVT) deposits may be broadly described as low-temperature, epigenetic, open-space fillings in carbonate rocks. The deposits are not normally associated with igneous rocks and alteration of carbonate rock adjacent to the deposits is characteristically lacking. Sulphides of simple mineralogy (pyrite, sphalerite, galena), accompanied by dolomite, calcite and minor quartz, occur as cement to carbonate breccias, usually interpreted as karst-controlled solution collapse breccias.

The geological characteristics of MVT deposits have been discussed by Ohle (1959), Snyder (1968), and Anderson and Macqueen (1982). Sangster (1983) reviewed the geology of MVT deposits and proposed a classification based on metal ratios and local geology.

Canadian MVT deposits are found in rocks ranging in age from Neohelikian to Early Carboniferous. The largest group in Canada is the Pine Point district consisting of about 40 individual deposits within a 10 by 48 km area. It is the only world-class MVT district in Canada; most other deposits of this type in the country are miniscule by comparison with districts in other countries.

4. Sandstone-lead

Occurring as disseminated, pyrite-poor, low-silver, lead-dominant deposits in well-sorted quartzitic sandstones of a transgressive sequence (Bjørlykke and Sangster, 1981), sandstone-lead deposits are relatively unimportant in Canada. Only two have reported tonnage-grade data: the Aphebian George Lake and Late Carboniferous Yava deposits. The George Lake deposit is anomalous in that, despite possessing

all the definitive characteristics of sandstone-lead deposits described by Bjørlykke and Sangster (1981), the deposit is zinc-dominant rather than lead-dominant. The reasons for this are unclear; it could be a function of the association with a relatively lead-poor Archean basement or, conversely, it could simply represent the zinc-rich portion of a zoned deposit. Marked compositional zoning, resulting in portions of orebodies possessing almost complete reversals in lead-zinc ratios relative to the deposit(s) as a whole, are well documented in several deposits of this type elsewhere in the world (see Bjørlykke and Sangster, 1981, p. 201).

DEPOSIT DISTRIBUTION MAPS

Symbols

On Map 1651A and Figures 2-10, the distribution of 378 Canadian lead-zinc deposits are shown by symbols which also convey information about deposit size, deposit type, and metal ratio.

1. Location and deposit-number

The locations of most deposits are shown by the positions of the symbols on Map 1651A and Figures 2 to 10. In crowded areas, the position of the deposit is shown by a dot joined to the appropriate symbol with a short line. Exact locations are listed in Appendices A and B.

Each deposit has also been assigned a unique number consisting of two parts (e.g. 11-042). The first part is the Canadian National Topographic System (NTS) primary block number corresponding to that in which the deposit lies and which is displayed in the centre of the NTS blocks in Map 1651A. The second part is a unique number assigned to each deposit within each NTS block. Thus, for example, all deposits in NTS 31 are preceded by the number 31 and each deposit is assigned a unique number after that e.g. 31-006, 31-012, etc.

Wherever possible, the deposit-number and symbol refers to an individual deposit. In some cases, however, this was not possible and a symbol and number actually represent a group of deposits. The main reason for grouping deposits in this manner is that grade-tonnage data were reported for the group and not for individual deposits. An example is the Pine Point district (85-002) where over 40 geologically distinct deposits are represented by a single symbol.

2. Deposit-type

The six third-order categories of deposit-types (Table 2) are depicted by different symbol shapes as shown in the legend for Map 1651A.

In most instances, little difficulty was experienced in assigning deposits to one type or the other. Provided geological information was available about any individual deposit, either through published descriptions or personal observation by the author, the geological features described previously were sufficient to classify the deposit. Some deposit-types are, by their nature, characterized by features which could be ascribed to two or more of the six deposit-types in Table 2. For example, the footwall stringer zone of exhalative deposits could be said to contain features of vein/replacement deposits. Similarly, virtually all MVT deposits contain at least minor replacement characteristics. However, in order to assign each deposit to only one category, the author classified deposits according to their definitive geological characteristics. Thus, all MVT deposits are mainly open-space fillings in carbonate rocks; replacement and vein-like features are subordinate. All exhalative deposits possess, as their definitive criterion, a massive sulphide zone, usually internally layered but always conformable. In some instances the definitive criteria are not the dominant feature of a deposit. For example, the Sullivan deposit (82-055) is classified as an exhalative deposit even though the discordant footwall tourmalinite zone exceeds in size the massive, layered, lead-zinc zone above it (Hamilton et al., 1983, p. 71).

3. Size

The size of each deposit, calculated as the tonnes of lead and zinc metal in combined reserves plus production, is characterized by the symbol size for that deposit. Before a decision was made on the number of size categories to be depicted and on the tonnage range in each category, a search was made to identify any natural "breaks" in the size population of the 378 deposits. A probability plot (Fig. 12) revealed no significant breaks in the cumulative probability curve, thereby indicating a single population. With no natural divisions apparent, the decision was made to divide the size population into an arbitrary number of size ranges. To depict the smallest and largest deposit-size ranges in Map 1651A, the smallest and largest symbol was selected on an esthetic and cartographic basis. It was then found, by experiment, that three was the optimum number of symbol sizes, between the largest and smallest, that could readily be distinguished by eye. By this process, the number of metal tonnage categories was chosen to be five and the entire metal tonnage range depicted in Figure 12 was consequently divided into five equal size ranges.

4. Metal ratio

Inasmuch as the deposit-size depicted by the symbols in Map 1651A and Figures 2-10 refers to combined lead-zinc, it is important to indicate, as well, the relative proportion of these metals in a given deposit. Accordingly, the $Zn/(Zn + Pb)$ ratio for each deposit was calculated and assigned to one of four categories between 0 and 1: < 0.25, 0.25-0.499, 0.50-0.75 and > 0.75. Each symbol, therefore, depicts these four metal-ratio categories as shown in the legend for Map 1651A. These metal-ratio divisions are also shown by the radiating lines in the ternary plots of relative metal abundances (Fig. 11).

Discussion

Inspection of Map 1651A clearly reveals the very uneven distribution of Canadian lead-zinc deposits, particularly when those deposits shown on the detailed maps (Fig. 2-10) are taken into consideration. Major clusters are evident in NTS blocks 21, 32, 63, 82, and 105, representing major deposit-clusters in the Bathurst, Val d'Or-Noranda-Matagami, Flin Flon-Snow Lake, southeastern British Columbia, and Selwyn Basin-Keno Hill regions respectively.

Deposit-clusters in the Canadian Shield are all composed of volcanic-associated exhalative deposit-types, a characteristic feature of these deposits discussed by Sangster (1980). Clusters shown in NTS block 82 (Fig. 8 and 9) are mostly due to vein-replacement deposits; Sinclair (1974) has reviewed the clustering statistics of some districts. Clusters of MVT deposits are known to occur at Pine Point (85-002), Robb Lake (94-004), and Newfoundland Zinc (12-006) but, because of the nature of reporting grade-tonnage for these districts, they are shown as a single deposit.

Volcanic-associated exhalative deposit-clusters are thought to be at least partly controlled by volcanic centres or caulderas (Sangster, 1980; Harley, 1979; Ohmoto, 1978). Certain vein-replacement clusters are spatially, and probably genetically, related to felsic igneous intrusions (e.g. Keno Hill, Fig. 10).

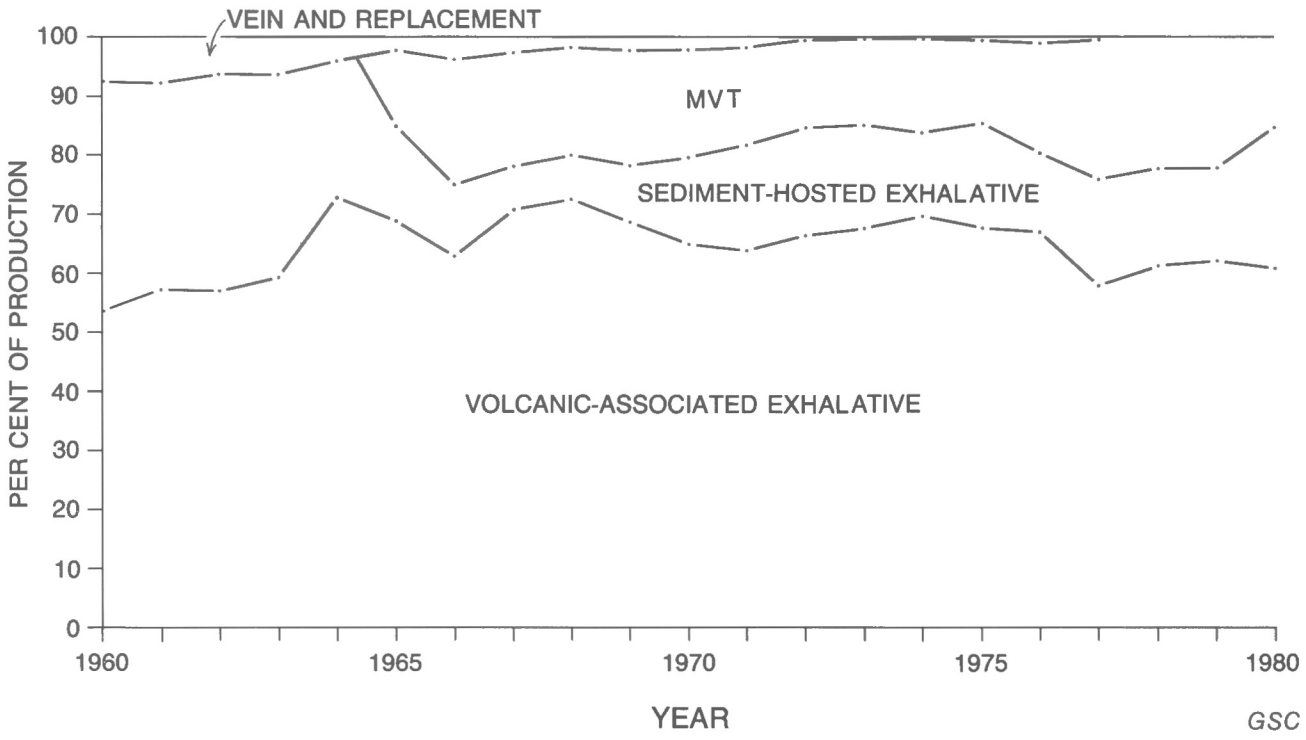

Figure 14. *Canadian mine production of zinc by deposit-type, 1960-80.*

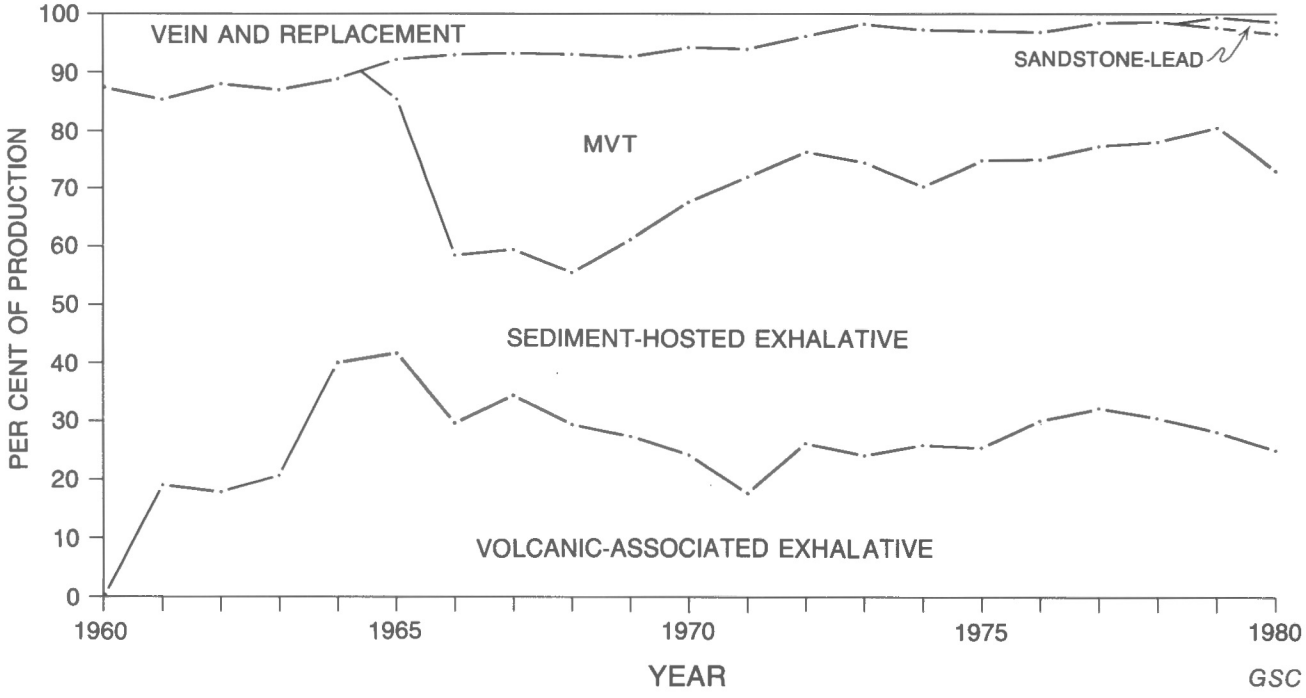

Figure 15. *Canadian mine production of lead by deposit-type, 1960-80.*

Although many occurrences are known, vein-replacement deposits are scarce in, and contact metasomatic deposits totally absent from, the Canadian Shield. Absence of the latter type may be due to the relative paucity of carbonate rocks in Precambrian orogenic belts but the reason for the scarcity of vein-replacement deposits is not obvious. Felsic intrusions in clastic sediments, the association typical of lead-zinc veins in the Cordillera, are abundant in the Shield, but are not as yet accompanied by mining districts comparable to the Keno Hill or Slocan districts in the Cordillera.

OCCURRENCE DISTRIBUTION MAP

In addition to the 378 deposits, the distribution of 4912 lead-zinc occurrences is summarized on a computer-contoured map of Canada (Fig. 13).

To produce this contour map, the following steps were taken:

1. the CANMINDEX file (Picklyk et al., 1978) was searched using the criterion that one of the reported commodities must be lead or zinc. Out of 18 387 records in the file, 4912 satisfied this condition;
2. the geographic coordinates for these occurrences were extracted;
3. the data were processed with a program whose output would be directly processible by GPCP (General Purpose Contouring Program);
4. the contour map was then produced by running GPCP on the processed data.

Table 3. Distribution of Canadian lead-zinc deposits by deposit-type

Deposit-type	% of total
Sandstone-lead	0.5
Contact metasomatic	1.9
MVT	4.2
Sediment-hosted exhalative	8.7
Volcanic-associated exhalative	47.6
Vein and replacement	37.0
	99.9

A special program was written, in FORTRAN language, to transform point data extracted from CANMINDEX into gridded data which would represent the density of mineral occurrences within a grid element. After some experimentation with the size of grid cells and contouring intervals, a cell size of 30 km to the side and a map scale of 1:8 870 400 were selected (Fig. 13). For the moving average technique, the value assigned to each grid unit is the arithmetic mean of the nine grid values, the central unit plus the eight surrounding grid units. Contour intervals are successive powers of two: 1, 2, 4, 8, and 16. To avoid having non-zero grid values at the map edge, the border of the grid was tangent to the 44th parallel of latitude; the central north-south line followed the 92nd meridian of longitude.

Discussion

From the data summarized in Figure 13, it is apparent that most concentrations of lead-zinc occurrences coincide with the major deposit-clusters. In several instances, however, the occurrence peaks and deposit clusters do not coincide and it is worthwhile to examine several examples of this anomaly.

The occurrence peak in the Burin Peninsula of Newfoundland (NTS 1) is not mirrored by a cluster of lead-zinc deposits. Examination of the CANMINDEX data reveals that the occurrences reported in this region are, in fact, the fluorite veins of the St. Lawrence fluorspar district (Williamson et al., 1957; Van Alstine, 1944) in which lead and zinc occur as accessory galena and sphalerite.

Other examples include the occurrence peak northeast of Yellowknife (NTS 85) which is produced by a concentration of base-metal-bearing gold veins. The peak of lead-zinc occurrences in the southwest corner of NTS 94 west of the Robb Lake (94-004) and Cirque (94-005) deposits is dominated by a group of base metal vein and contact metasomatic occurrences.

Conversely, some deposit-clusters are not surrounded by occurrence contours such as that in the northwest corner of NTS 82. Situations such as this are very likely caused by one or both of two reasons: (i) the average number of reported occurrences per cell is less than one; or (ii) mineral occurrences in the area in question have not yet been coded and entered into the CANMINDEX file.

Table 4. Percentage distribution of lead-zinc deposits by size and deposit-type

	No. deposits per deposit-type (% of total)						
Tonnes ore	sand-stone lead	contact meta-somatic	vein/ replace-ment	MVT	sediment-hosted exhalative	volcanic-associated exhalative	Total
less than 10^4	0	0	100	0	0	0	100
10^4 to 10^5	0	2.86	75.71	1.43	10.00	10.00	100
10^5 to 10^6	0	2.19	37.23	4.38	3.65	52.55	100
10^6 to 10^7	1.83	1.85	7.34	5.50	12.84	70.64	100
10^7 to 10^8	0	0	0	10.00	16.67	73.33	100
10^8 to 10^9	0	0	0	0	50.00	50.00	100

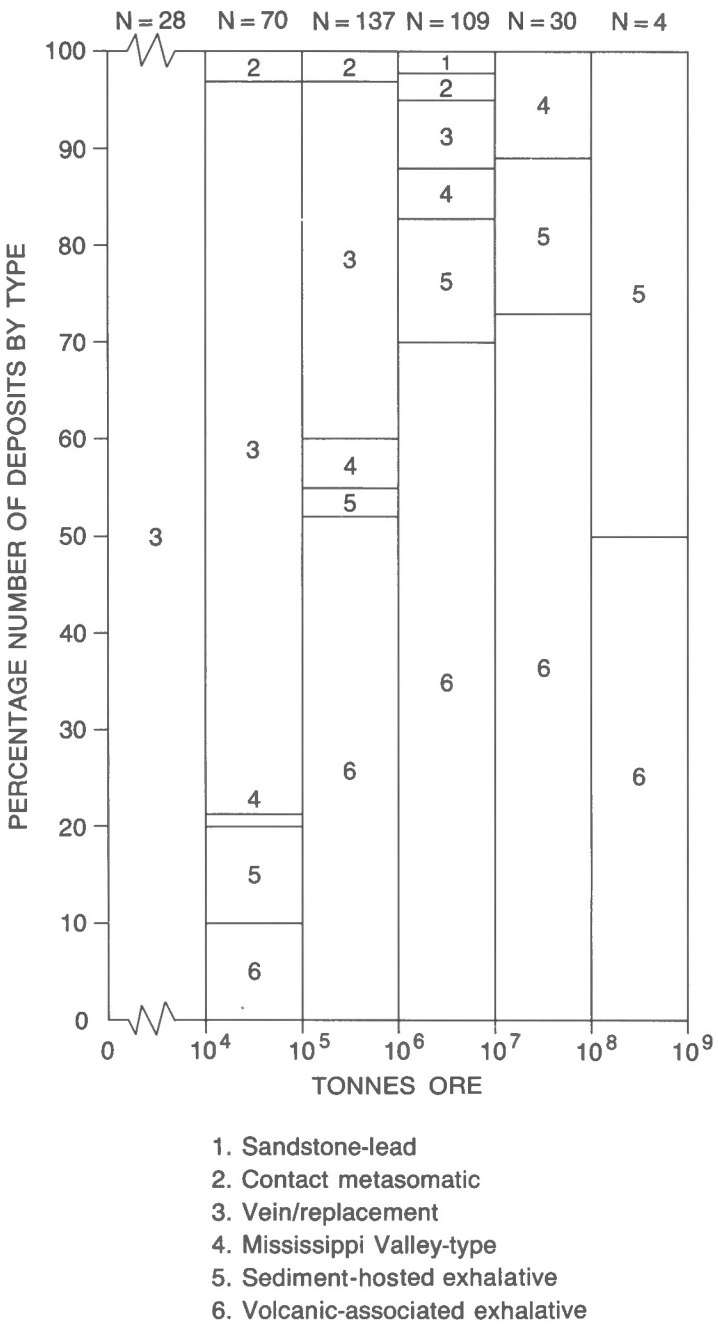

Figure 16. *Distribution of Canadian lead-zinc deposits by size (tonnes ore) and deposit-type. Number of deposits in each size category is given at top of each column.*

STATISTICAL SUMMARY

Production by deposit-type

As noted earlier, Canada has long been one of the leading world producers of both lead and zinc. However, the source of these metals, from a geological stand-point, has changed considerably over the years. Figures 14 and 15 illustrate the percentage of annual production, during the period 1960-80, derived from the deposit-types considered in this study for each of the two metals.

From these summaries, it can be seen that over 90 per cent of zinc production in the period 1960-64, was derived from the two exhalative deposit-types: volcanic-associated and sediment-hosted. After 1965, however, production from Pine Point, a MVT deposit, decreased the percentage zinc production from exhalative deposits by about 10 per cent. The proportion from MVT deposits increased again in 1976 due to two other MVT deposits, Nanisivik and Newfoundland Zinc, coming on-stream. Zinc production from vein and replacement deposits, in the meantime, decreased proportionally from nearly 10 per cent in 1960 to less than one per cent by the late 1970s and into the 80s.

Turning to lead production (Fig. 15), it is immediately obvious that the lead production curves are considerably different than those for zinc. There are several reasons for this: (i) zinc production in Canada is dominated by the volcanic-associated exhalative type, a majority of which occur in the Precambrian and do not contain significant lead; (ii) the 1976 bulge in MVT zinc production is not mirrored in lead production because the two MVT deposits which came on stream about that time produce little or no lead, both deposits having very high Zn/(Zn + Pb) ratios; (iii) vein and replacement type deposits, in general, possess low Zn/(Zn + Pb) ratios and hence contribute proportionately more to lead production than they do to zinc.

Contact metasomatic deposits did not account for any lead or zinc production during the period in question. In fact, the author could find no record of lead or zinc production from this deposit-type at any time in Canada's mining history. This complete lack of exploitation of contact metasomatic lead-zinc deposits is somewhat anomalous when the size and geological diversity of the country is considered.

Percentage distribution by deposit-type

The 378 deposits are distributed by type as shown in Table 3.

Note that vein and replacement deposits, although accounting for only a miniscule proportion of current Canadian lead and zinc production (Fig. 14, 15) make up more than a third of the known lead-zinc deposits in the country. Conversely, the supracrustal group of deposits (volcanic-associated and sediment-hosted exhalative) contribute about 70 per cent of the lead production and 80 per cent of the zinc production (Fig. 15, 14) although together they constitute only about 56% of Canadian lead-zinc deposits. Table 3 also shows that just over 93 per cent of Canada's lead-zinc deposits can be classified into one of three deposit-types namely, sediment-hosted exhalative, volcanic-associated exhalative and vein/replacement.

Ore tonnage distribution by deposit-type

Although the 378 lead-zinc deposits as a group constitute a single population in terms of either tonnes ore or tonnes contained metal (Fig. 11), the deposits are not uniformly distributed by deposit-type in each size category. All deposits below 10 000 tonnes ore, for example, are of the vein and replacement type and all deposits greater than 100 000 000 tonnes are of the exhalative type. Between these two extremes, deposits are distributed by size and type as shown in Table 4 and illustrated in Figure 16. Deposits less than one million (10^6) tonnes in size are predominantly vein/replacement type. Deposits larger than this are predominantly of the exhalative type.

The distribution of deposit sizes for each deposit-type can be examined and compared by calculating selected percentile values for each (Table 5) and by displaying the

Table 5. Tonnes ore per deposit-type for selected percentile values (not shown are sandstone-lead and contact metasomatic deposit-types because of the small population of each of these types)

Deposit-type / Percentile	n	Tonnes ore 5%	25%	50%	75%	95%
MVT	16	93 536	684 467	3 161 411	6 741 431	35 970 415
Sediment-hosted exhalative	33	17 962	412 767	2 812 258	8 527 492	99 921 004
Volcanic-associated exhalative	180	124 284	397 118	1 432 891	4 001 238	25 502 591
Vein/replacement	140	3 329	16 284	63 412	229 630	1 068 613
All deposits	378	7 530	90 945	454 044	2 731 429	18 279 677

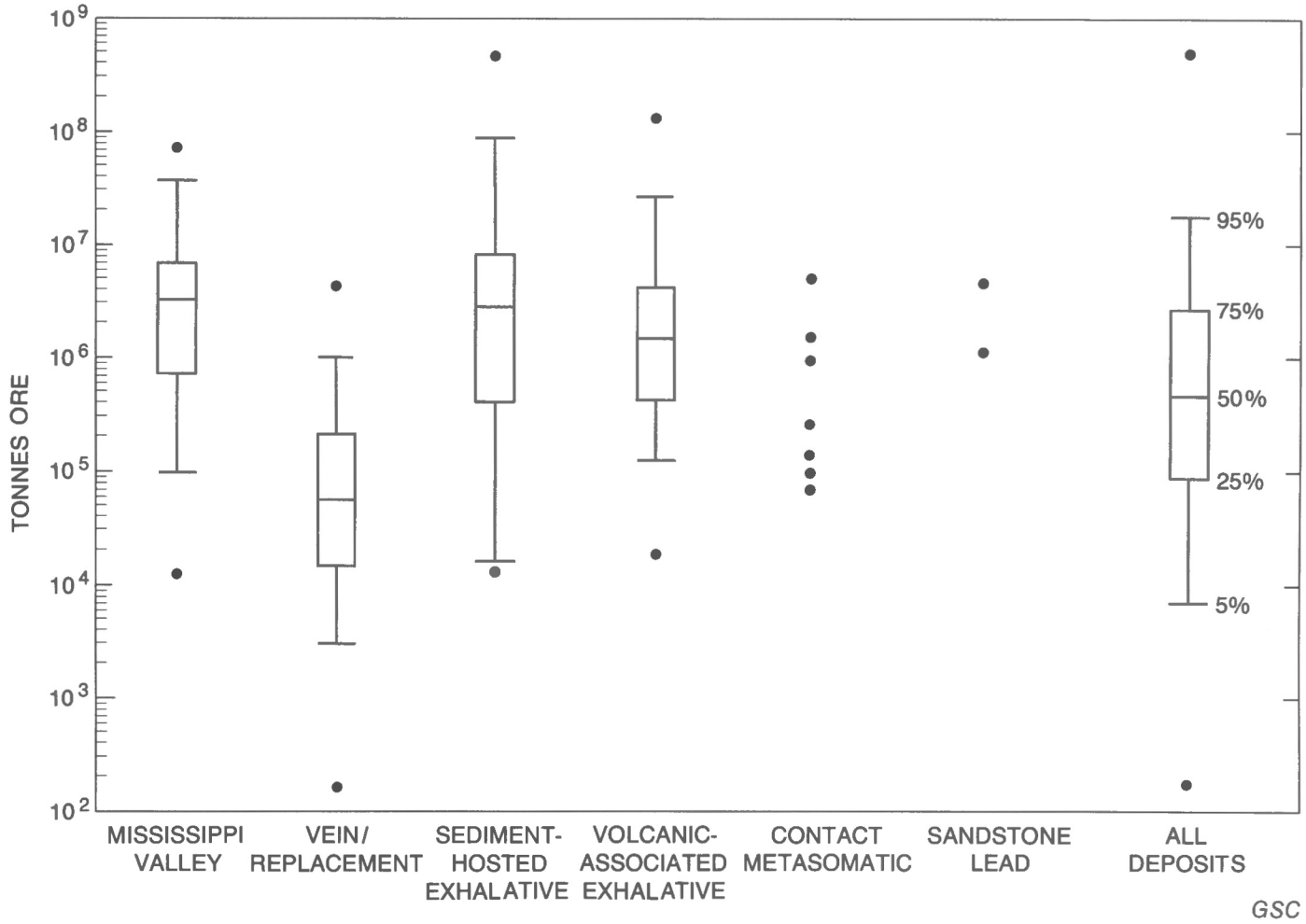

Figure 17. *Box-and-whisker plots of tonnes ore in Canadian lead-zinc deposits. Largest and smallest deposits in each deposit-type are indicated by dots; selected percentile values shown by the box-and-whisker symbol in a manner described by Tukey (1977). Because of small population size, no percentile values were calculated for sandstone-lead and contact metasomatic deposits.*

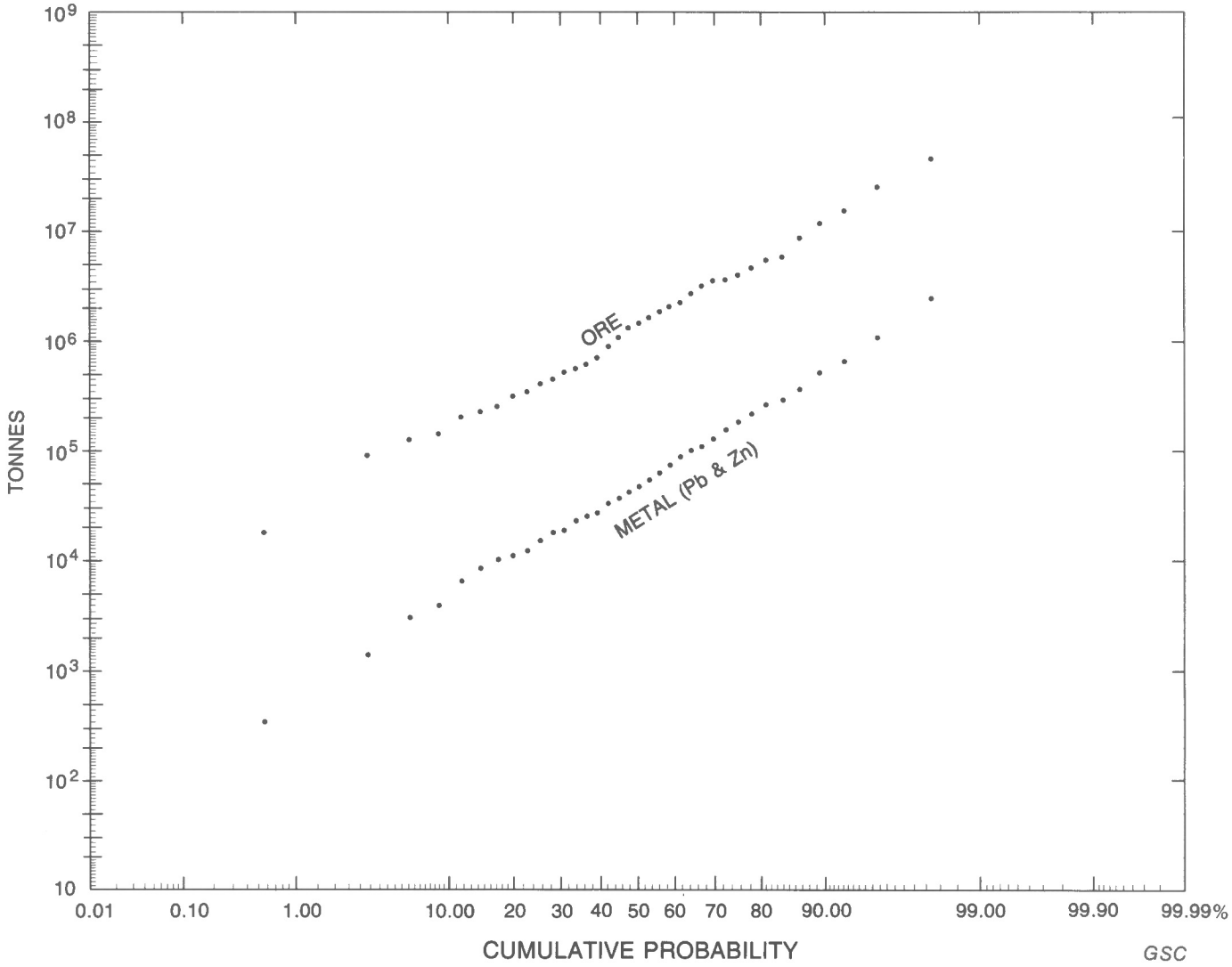

Figure 18. *Probability plot of tonnes ore and contained lead-zinc in 180 Canadian volcanic-associated exhalative deposits (every 5th point plotted).*

results graphically on box-and-whisker plots (Fig. 17). By this method, the median tonnage and size range of the various deposit-types can be compared with each other and with the entire population of 378 deposits.

The data summarized in Table 5 and Figure 17 show the following: 1. all median values are skewed toward the smaller deposit-sizes; 2. vein/replacement deposits have by far the smallest median value and MVT deposits the largest. The latter type may be biased, however, because of the necessity of including a few district size data rather than those for individual deposits; 3. median size of sediment-hosted exhalative deposits is double that of the volcanic-associated exhalative deposits and the 95 percentile value of the former is nearly four times that of the volcanic-associated deposits; 4. the median size of Canadian lead-zinc deposits is about 0.5 million tonnes, obviously influenced by the vein/replacement deposits which constitute 37 per cent of the population; 5. the size range between the 5 and 95 percentile values (constituting 90 per cent of the population) for sediment-hosted exhalative deposits is slightly less than four orders of magnitude and is noticeably larger than those for other deposit-types, all of which display a range slightly more than two orders of magnitude.

Figures 18 to 21 portray the cumulative probability plots of tonnes ore and metal (Pb + Zn) in volcanic-associated exhalative, vein/replacement, sediment-hosted exhalative, and Mississippi Valley-type (MVT) deposits, respectively. In these diagrams, the following points are considered noteworthy:

1. The single populations of size distribution in volcanic-associated exhalative (Fig. 18) and vein/replacement (Fig. 19) deposits relative to sediment-hosted (Fig. 20) and MVT (Fig. 21) deposits are indicated by the straight line distribution of points in the former two diagrams. The difference is very likely due to the higher populations in the first two (n = 180 and 140, respectively) relative to the latter two deposit-types (n = 33 and 16, respectively);
2. The wider separation between the "tonnes ore" and "tonnes metal" lines of the volcanic-associated deposits (Fig. 18) relative to the vein/replacement deposits (Fig. 19) is a function of the lower average grade of the former;

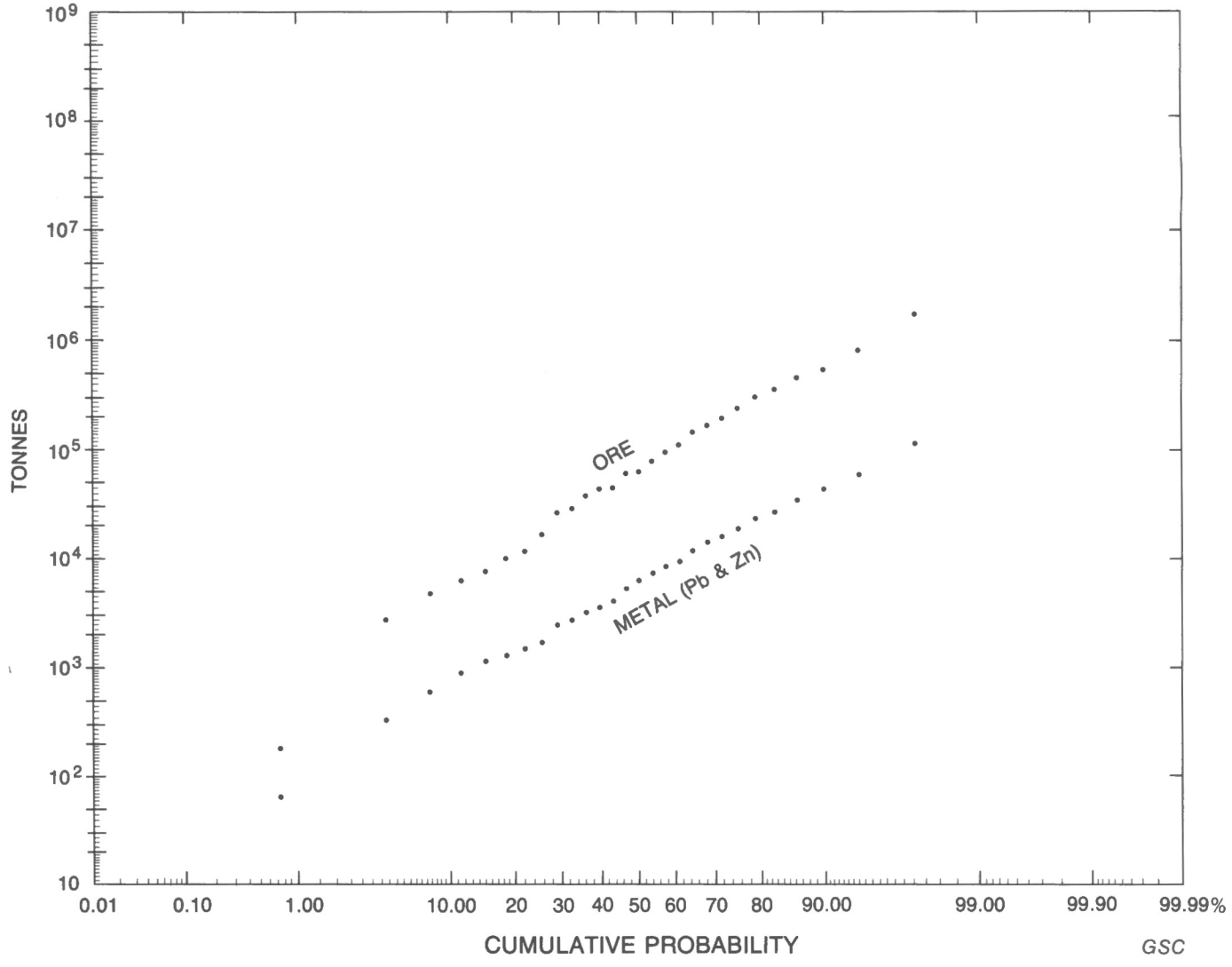

Figure 19. *Probability plot of tonnes ore and contained lead-zinc in 140 Canadian vein/replacement deposits (every 5th point plotted).*

3. In the first three diagrams (Fig. 18 to 20) of large to moderate population size, the distribution of points for contained metal is smoother (i.e. closer to a straight line) than the corresponding ore curve. This suggests that tonnes of metal rather than tonnes of ore should be used when comparing deposits because of the smoother, more uniform population of the former. This technique had been previously used by the author (Sangster, 1980) in examining the sizes of volcanic-associated exhalative deposits surrounding volcanic centres.

Conclusions pertaining to deposit size, based on Tables 4 and 5 and Figures 16 and 17, should be assessed bearing in mind the manner in which tonnage-grade data are reported for some deposits. For example, Pine Point (85-002) is reported as a single grade-tonnage figure for the entire district even though this total is comprised of more than 40 individual deposits. The same applies to other MVT deposits such as Robb Lake (94-004; 12 deposits; 16 by 8 km) and Newfoundland Zinc (12-006; 10 deposits; 5 by 2 km). Another example is the Heath Steele group (21-037; 6 deposits; 4.6 by 1 km), a volcanic-associated exhalative "deposit". Howard's Pass (105-027), a sediment-hosted exhalative "deposit", consists of three individual deposits over a strike length of 20 km.

The above examples are the worst offenders of the "single deposit-single tonnage" approach. Group or district tonnages, when combined with single-deposit data, would tend to slightly bias the statistics toward high values and the reader should be aware of these problems when evaluating the statistics presented here.

Ore grade (Pb + Zn)

The range in ore grades (calculated as per cent combined Pb + Zn) in Canadian lead-zinc deposits is displayed in the histograms shown in Figure 22. These graphs show that a majority of the deposits grade less than 18% (Pb + Zn). The disproportionate number of vein deposits with grades higher than this value is very likely due to selective mining and/or hand-picking of ore in small mining ventures. The author suggests the "natural" population of (Pb + Zn) grades in

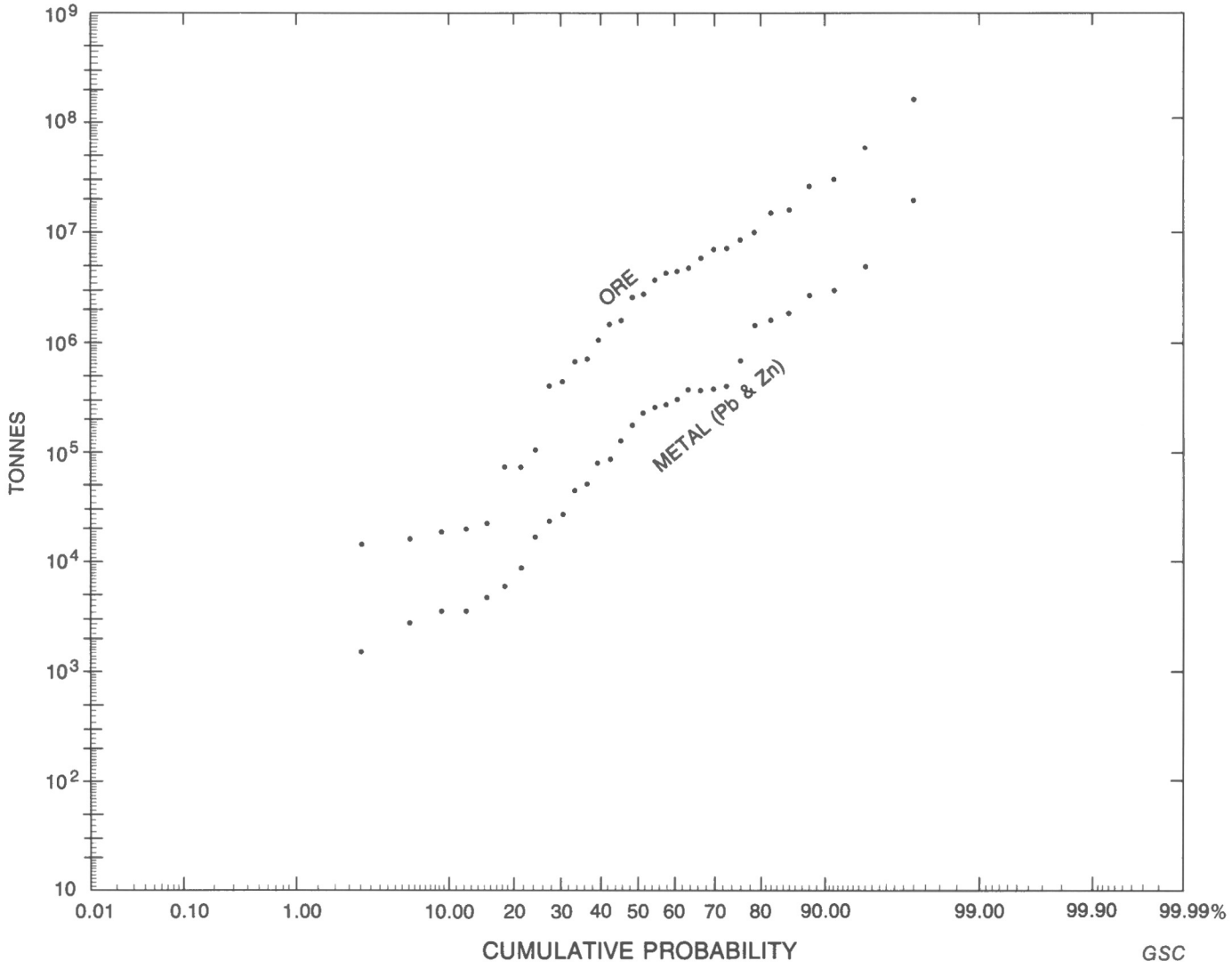

Figure 20. *Probability plot of tonnes ore and contained lead-zinc in 33 Canadian sediment-hosted exhalative deposits (every point plotted).*

vein/replacement deposits to be all those less than 22% and that grades greater than this value are most likely the result of artificial factors (see Fig. 22).

The graphs in Figure 22 emphasize the narrow range of ore grades in all deposits (i.e. a little over one order of magnitude) relative to the range in ore tonnage (six orders of magnitude). The lower grade limit is probably an economic cut-off but the upper limit likely approaches a natural grade maximum. Thus the major variable determining the total metal content of a deposit is its tonnage rather than its grade. The relationship between these two parameters is shown graphically in Figure 23. Here, the constancy of grade relative to ore tonnage is apparent as is the controlling effect exerted by ore tonnage in determining metal content of deposits.

Metal ratio

Histograms depicting metal ratio (Zn/(Zn + Pb)) in Canadian lead-zinc deposits are displayed in Figure 24. Several features are apparent:

1. The zinc-dominant nature of the volcanic-associated exhalative deposits. This is not only due to the inherent zinc-rich nature of this deposit-type as pointed out by Franklin et al. (1981) but the effect is further enhanced by the fact that a significant number of Canadian deposits of this type are of the Cu-Zn compositional type;
2. The extremely wide range in metal ratios of the vein/replacement deposits. Some of the variation is likely artificial because, in the early days of Canadian mining, vein deposits were selectively mined to extract the silver-bearing galena. Sphalerite was largely regarded as a gangue mineral up to and during the early part of this century;
3. The abnormally Pb-rich nature of three MVT deposits, namely Lake Monte (34-001), Silver Basin (82-152) and Silver Giant (82-071). Three possibilities could explain these anomalies: these are mis-classified vein-replacement deposits, they could be MVT deposits which were selectively mined for lead, or they could simply be unusually Pb-rich MVT deposits;

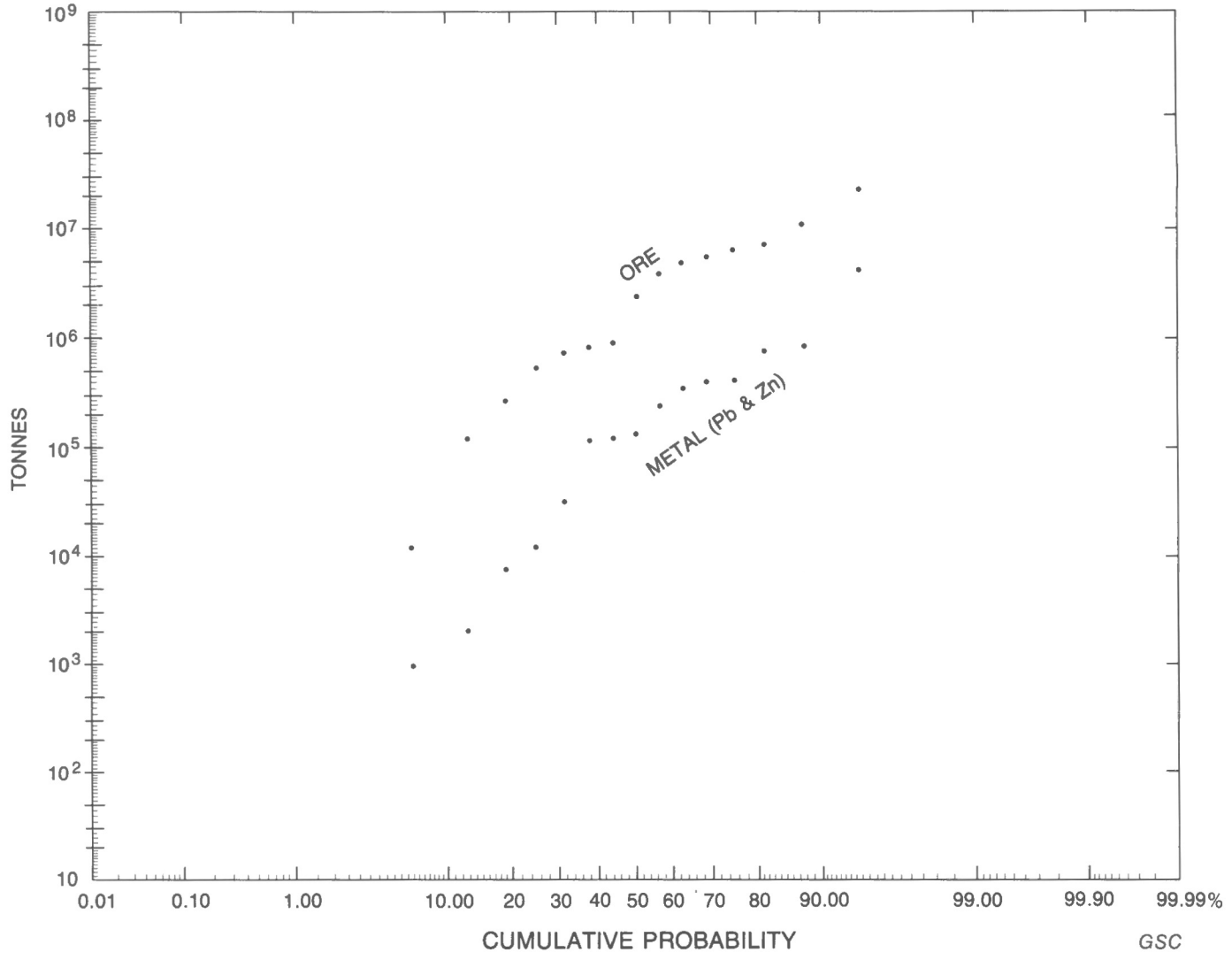

Figure 21. *Probability plot of tonnes ore and contained lead-zinc in 16 Canadian Mississippi Valley-type (MVT) deposits (every point plotted).*

4. The Zn-rich nature of one of the two sandstone-lead deposits (George Lake; 4-010). This deposit, in spite of its unusual composition, is regarded as being of the sandstone-lead type because of its overwhelming geological similarity to other sandstone-lead deposits, as discussed by Bjørlykke and Sangster (1981).

CONCLUDING REMARKS

The maps and graphs displayed in this report present a summary overview of certain quantifiable characteristics of Canadian lead-zinc deposits and occurrences. The report should be regarded as a companion summary to the popular geological, deposit-type, overviews mentioned in the text (e.g. Franklin et al., 1981; Bjørlykke and Sangster, 1981; Large, 1983).

Categorized by deposit-type, the grade-tonnage, metal content, and distribution maps may be of use and interest to mineral economists, resource planners and others, particularly when viewed in a historical context as displayed in Figures 14 and 15. Mineral exploration geologists, also, may find the grade-tonnage and metal content statistics useful in long-range planning for viable targets in remote areas of the country. Geologists engaged in genetic modelling of lead-zinc deposits should build into their models the distribution and grade-tonnage features summarized in this report; they are as much a characteristic of a particular deposit-type as are those of a geological nature.

Statistical summaries such as these are, of course, only as good as the data used. Although every effort was made to use the best production and reserve data available, these may or may not approximate the true "in-ground" situation. Among the many reasons for this are: corporate differences in the manner in which reserves data are reported and the cut-off grades used; differing metal recovery rates among mines will affect production grades reported; the problem of individual geological entities versus groups of deposits in reporting production and reserves. These complications are obviously beyond the control of the author. However, the correct classification of individual deposits or districts according to their geological characteristics is the responsibility of the author. Although the classifications reported here are the result of over 15 years of study of Canadian lead-zinc deposits, not all deposits can be easily

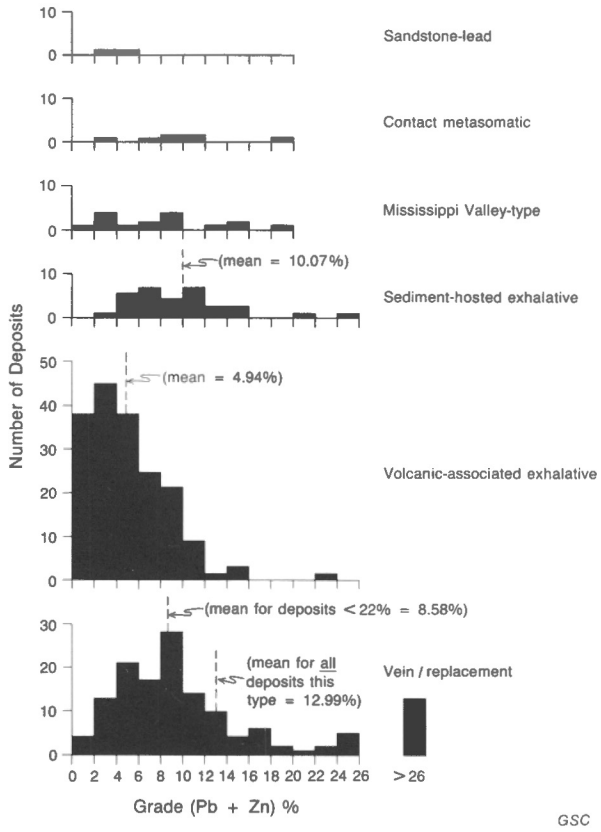

Figure 22. Frequency plots of % (Pb + Zn) in Canadian Pb-Zn deposits.

classified due to either lack of data or conflicting geological criteria. In some instances, compromises had to be made in assigning deposits to one class or the other. Consequently, classification errors could compound the variations in statistical summaries due solely to grade-tonnage reporting problems. Nevertheless, the data summarized here are the result of several years of research and are regarded as best-available at the time of compilation (1983). Data are recorded on computer and are altered as new or better information becomes available. Future summaries such as these may be published if feasible.

ACKNOWLEDGMENTS

A compilation of this nature obviously cannot be accomplished solely by an individual and the author is indebted to many people and institutions for assistance and guidance prior to, and during, preparation of this report.

First and foremost the author gratefully acknowledges the support and assistance of the Canadian mineral industry. For a decade and a half, mining and exploration companies operating in Canada have graciously permitted the author access to their mines and prospects to examine critical geological features. In addition their staffs have freely given of their time in guiding the author around these properties and engaging in candid and informative discussions during and after such examinations. Without assistance of this nature, the present report, particularly that part dealing with deposit classification, would not have been possible.

Within the Economic Geology and Mineralogy Division of the Geological Survey of Canada, the author is pleased to acknowledge the assistance and advice received from the following: Dave Garson, Jennifer Shaw, Robert Bretzlaff, Andy Douma, and Robert Laramée of the Mineral Resource Information Service Section; Janet Carrière of Mineral Deposits Geology Section; C.F. Chung and F.P. Agterberg of

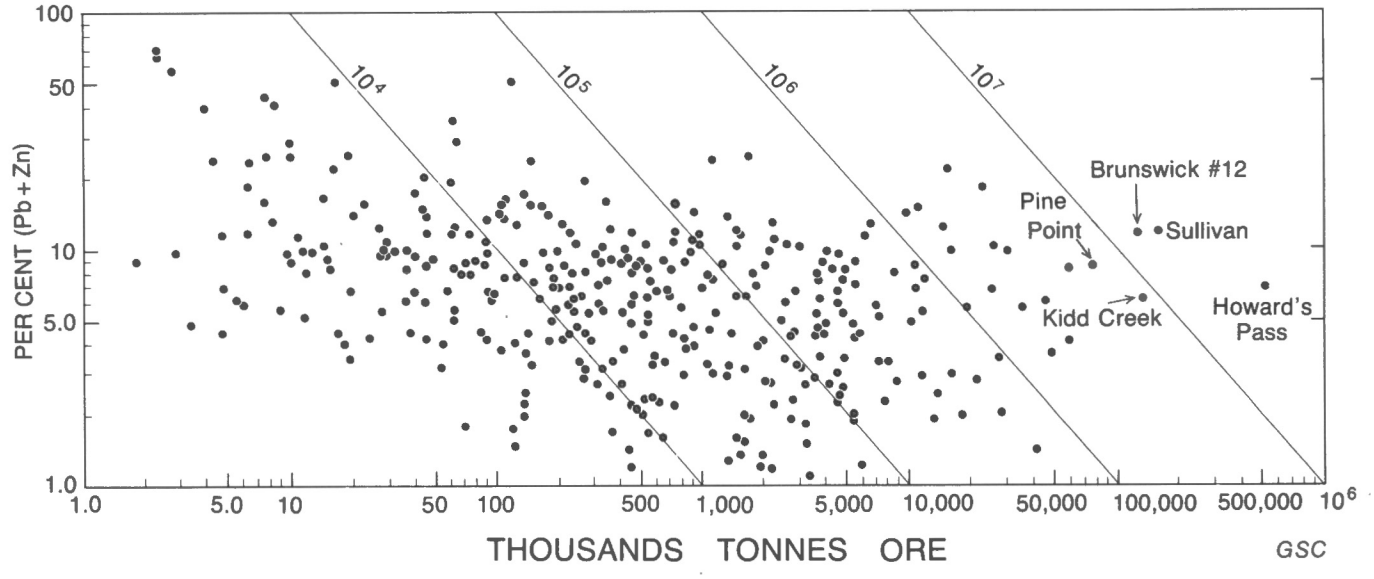

Figure 23. Scatter diagram of % (Pb + Zn) versus tonnes ore in 378 Canadian lead-zinc deposits. Diagonal lines show tonnes of contained metal (Pb + Zn) for various grade-tonnage combinations; values selected are the same as those used in size range categories in Map 1651A and Figures 2-10. Also identified are the five largest lead-zinc deposits and districts in Canada.

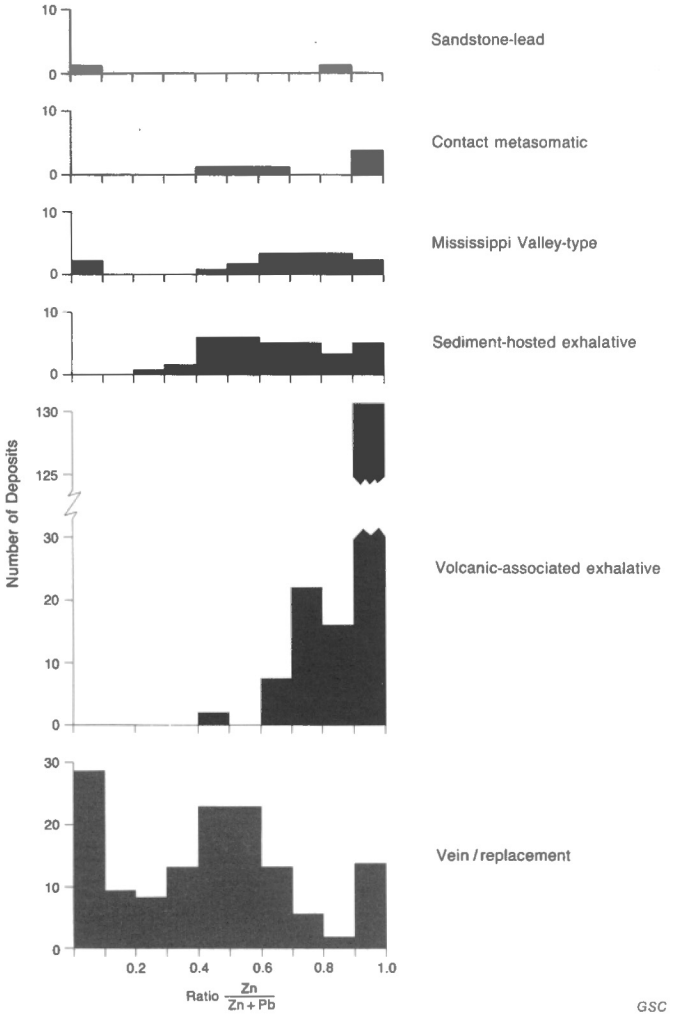

Figure 24. *Frequency plots of Zn/(Zn + Pb) ratios in Canadian Pb-Zn deposits.*

the Mathematical Applications in Geology Section. These people assisted in data and bibliographic compilation, computer processing and plotting of data, map compilation, and final checking of all maps and plots.

Valuable assistance and advice was provided by J.O. Wheeler, - Cordilleran Geology Division, in the compilation of Figures 8 and 9.

The manuscript received the benefit of a critical and thoughtful review by H.E. Dunsmore of the Mineral Deposits Geology Section.

REFERENCES

Anderson, G.M. and Macqueen, R.W.
1982: Ore deposit models-6. Mississippi Valley-type lead-zinc deposits; Geoscience Canada, v. 9, p. 108-117.

Bailes, A.H.
1971: Preliminary compilation of the geology of the Snow Lake-Flin Flon Sherridon area; Manitoba Department of Mines and Natural Resources, Mines Branch, Geological Paper 1/71.

Boyle, R.W.
1965: Geology, geochemistry, and origin of the lead-zinc-silver deposits of the Keno Hill-Galena Hill area, Yukon Territory; Geological Survey of Canada, Bulletin 111.

Bjørlykke, A. and Sangster, D.F.
1981: An overview of sandstone lead deposits and their relation to red-bed copper and carbonate-hosted lead-zinc deposits; in Economic Geology, 75th Anniversary Volume, p. 179-213.

Davies, J.L.
1977: Geological map of northern New Brunswick; New Brunswick Department of Natural Resources, Plate 78-20.

Dugas, J. and Latulippe, M.
1961: Noranda-Senneterre Mining Belt; Quebec Department of Natural Resources, Map No. 1388.

Einaudi, M.T., Meinert, L.D., and Newberry, R.J.
1981: Skarn deposits; in Economic Geology, 75th Anniversary Volume, p. 317-391.

Energy, Mines and Resources
1977: A summary view of Canadian reserves and additional resources of nickel, copper, zinc, lead, and molybdenum; Canada, Energy, Mines and Resources, Mineral Bulletin MR 169, 23 p.

Franklin, J.M., Lydon, J.W., and Sangster, D.F.
1981: Volcanic-associated massive sulfide deposits; in Economic Geology, 75th Anniversary Volume, p. 485-627.

Franklin, J.M. and Mitchell, R.H.
1977: Lead-zinc-barite veins of the Dorion area, Thunder Bay District, Ontario; Canadian Journal of Earth Sciences, v. 14, p. 1963-1979.

Fyles, J.T.
1967: Geology of the Ainsworth-Kaslo area, British Columbia; British Columbia Department of Mines and Petroleum Resources, Bulletin 53, 125 p.

Gilmour, P.
1971: Strata-bound massive sulfide deposits – a review; Economic Geology, v. 66, p. 1239-1244.

1976: Some transitional types of mineral deposits in volcanic and sedimentary rocks; in Handbook of strata-bound and stratiform ore deposits, v. 9 (K.H. Wolf, ed.), Elsevier Scientific Publishing Company, Amsterdam, p. 111-160.

Gustafson, L.B. and Williams, N.
1981: Sediment-hosted stratiform deposits of copper, lead, and zinc; in Economic Geology, 75th Anniversary Volume, p. 139-178.

Hamilton, J.M., Delaney, G.D., Hauser, R.L., and Ransom, P.W.
1983: Geology of the Sullivan deposit, Kimberley, B.C., Canada; p. 31-83 in Mineralogical Association of Canada, Short Course in Sediment-hosted stratiform lead-zinc deposits, Victoria, B.C. (D.F. Sangster, editor), 309 p.

Harley, D.N.
1979: A mineralized Ordovician resurgent caldera complex in the Bathurst-Newcastle mining district, New Brunswick, Canada; Economic Geology, v. 74, p. 786-796.

Höy, T
1980: Geology of the Riondel area, central Kootenay Arc, southeastern British Columbia; British Columbia Ministry of Energy, Mines and Petroleum Resources, Bulletin 73, 93 p.

Klau, W. and Large, D.E.
1980: Submarine exhalative Cu-Pb-Zn deposits, a discussion of their classification and metallogenesis; Geologisches Jahrbuch, sec. D, no. 40, p. 13-58.

Kumarapeli, P.S.
1976: The St. Lawrence rift system, related metallogeny and plate tectonics models of Appalachian evolution; in Metallogeny and plate tectonics (D.F. Strong, ed.), Geological Association of Canada, Special Paper No. 14, p. 299-318.

Large, D.E.
1980: Geological parameters associated with sediment-hosted, submarine exhalative Pb-Zn deposits: an empirical model for mineral exploration; Geologisches Jarbuch, sec. D, no. 40, p. 59-129.

1981: Sediment-hosted submarine exhalative lead-zinc deposits – A review of their geological characteristics and genesis; in Handbook of strata-bound and stratiform ore deposits, v. 9 (K.H. Wolf, ed.), Elsevier Scientific Publishing Company, Amsterdam, p. 469-507.

1983: Sediment-hosted massive sulphide lead-zinc deposits: an empirical model; p. 1-30 in Mineralogical Association of Canada, Short Course in Sediment-hosted stratiform lead-zinc deposits (D.F. Sangster, ed.), 309 p.

Little, H.W.
1960: Nelson map-area, West Half, British Columbia; Geological Survey of Canada, Memoir 308.

1964: Geology of Ymir map-area (Nelson, East Half), British Columbia; Geological Survey of Canada, Map 1144A.

1965: Geology of Salmo map-area, British Columbia; Geological Survey of Canada, Map 1145A.

Ohle, E.L.
1959: Some considerations in determining the origin of ore deposits of the Mississippi Valley type; Economic Geology, v. 54, p. 769-789.

Ohmoto, H.
1978: Submarine calderas – a key to the formation of volcanogenic massive sulphide deposits?; Mining Geology, v. 28, p. 219-231.

Parrish, R.R.
1981: Geology of the Nemo Lakes belt, northern Valhalla Range, southeast British Columbia; Canadian Journal of Earth Sciences, v. 18, no. 5, p. 944-958.

Picklyk, D.D., Rose, D.G., and Laramée, R.M.
1978: Canadian mineral occurrence index (CANMINDEX) of the Geological Survey of Canada; Geological Survey of Canada, Paper 78-8, 27 p.

Read, P.B.
1977: Mineral deposits of Lardeau west-half map-area (82K W/2), British Columbia; Geological Survey of Canada, Open File 464.

Rice, H.M.
1941: Nelson map-area, East Half, British Columbia; Geological Survey of Canada, Memoir 228.

Sangster, A.L.
1970: Metallogeny of the Grenville Province of south-central Ontario; unpublished Ph.D. thesis, Queen's University, Kingston, Ont.

Sangster, D.F.
1970: Metallogenesis of some Canadian lead-zinc deposits in carbonate rocks; Geological Association of Canada, Proc. v. 22, p. 27-36.

1980: Quantitative characteristics of volcanogenic massive sulphide deposits. 1 Metal content and size distribution of massive sulphide deposits in volcanic centres; Canadian Institute of Mining and Metallurgy Bulletin, v. 73, p. 74-81.

1983: Mississippi Valley-type deposits: A geological mélange pp. 1-19 in International Conference on Mississippi Valley Type Lead-Zinc Deposits (G. Kisvarsanyi, S.K. Grant, W. Pratt, and J.W. Koenis, editors), University of Missouri-Rolla, Rolla, MO., 601 p.

Sharpe, J.I.
1967a: Geology and sulphide deposits of the Matagami area; Quebec Department of Natural Resources, Geological Report 137.

1967b: Mineral deposits map of the Rouyn-Noranda area; Quebec Department of Natural Resources, Map No. 1653.

Sinclair, A.J.
1974: Probability graphs of ore tonnages in mining camps – A guide to exploration; Canadian Institute of Mining and Metallurgy Bulletin, v. 67, no. 750, p. 71-75.

Snyder, F.G.
1968: Geology and mineral deposits, midcontinent United States; in Ore deposits of the United States, v. 1 (J.D. Ridge, ed.), American Institute Mining, Metallurgical and Petroleum Engineers, Inc, p. 257-286.

Tukey, G.W.
1977: Box-and-whisker plots, pp. 39-43 in Exploratory data analysis; Addison-Wesley Pub. Co., 688 p.

Van Alstine, R.E.
1944: The fluorspar deposits of St. Lawrence, Newfoundland; Economic Geology, v. 39, p. 109-132.

Williamson, D.H., Jooste, R.F., and Baird, D.M.
1957: The St. Lawrence fluorite district; in The geology of Canadian industrial mineral deposits, 6th Commonwealth Mining and Metallurgical Congress, p. 90-96.

APPENDIX A

LISTING OF CANADIAN LEAD-ZINC DEPOSITS BY DEPOSIT-TYPE AND DEPOSIT-NUMBER

CONTACT METASOMATIC

DEP NUM	DEPOSIT NAME	NTS AREA	LATITUDE	LONGITUDE
011-007	LIME HILL	011 F 14	45 46 35	061 09 00
011-009	MEAT COVE	011 N 02	47 00 20	060 35 24
092-008	LYNN CREEK	092 G 06	49 25 30	123 03 56
092-010	CALEDONIA	092 L 12	50 38 45	127 36 30
092-013	ZIP	092 L 07	50 21 50	126 54 40
095-006	VIECO WHIPSAW/ RAM & ROD	095 E 11	61 33 40	127 27 15
104-001	MCDAME BELLE	104 P 06	59 16 18	129 22 20

MISSISSIPPI VALLEY

DEP NUM	DEPOSIT NAME	NTS AREA	LATITUDE	LONGITUDE
011-001	GAY'S RIVER	011 E 03	45 01	063 21 50
012-006	NEWFOUNDLAND ZINC	012 I 06	50 17 42	057 28 00
033-001	RUBY LAKE	033 N 15	55 56 42	076 44
033-002	NANCY ISLAND	033 N 15	55 57 30	076 48
034-001	LAKE MONTE	034 C 02	56 06	076 32
048-001	NANISIVIK	048 C 01	73 03 40	084 30 30
068-001	POLARIS	068 H 08	75 23 10	096 56
068-002	ECLIPSE	068 H 09	75 31 30	096 08
082-071	GIANT / SILVER GIANT	082 K 16	50 56 06	116 28 18
082-097	KICKING HORSE / MONARCH	082 N 08	51 25 30	116 26 45
082-152	SILVER BASIN	082 K 10	50 41 20	116 44 40
085-002	PINE POINT DISTRICT	085 B 15	60 47 00	114 35 00
085-009	WESTMIN (AX GROUP)	085 B 11	60 44 32	115 03 20
094-004	ROBB LAKE	094 B 13	56 56 30	123 43 40
106-003	BEAR-TWIT	106 A 03	64 02	129 19
106-007	GAYNA	106 B 15	64 57	130 43

SANDSTONE LEAD

DEP NUM	DEPOSIT NAME	NTS AREA	LATITUDE	LONGITUDE
011-012	YAVA (SILVERMINE)	011 F 16	45 52	060 23 45
064-010	GEORGE LAKE	064 E 05	57 28 30	103 45 15

APPENDIX A (CONT.)

SEDIMENT-HOSTED EXHALATIVE

DEP NUM	DEPOSIT NAME	NTS AREA	LATITUDE	LONGITUDE
011-003	SMITHFIELD	011 E 06	45 16 20	063 04 30
021-030	WALTON	021 H 01	45 12 20	064 02 30
031-005	LONG LAKE	031 C 10	44 41 23	076 46 20
031-007	RENMAC	031 F 07	45 24 45	076 42 20
031-030	LEITCH	031 J 04	46 06 50	075 57 12
031-031	LAFONTAINE	031 J 04	46 05 50	075 57 15
082-002	ANNEX	082 F 03	49 00 48	117 22 18
082-003	REEVES MACDONALD (REMAC)	082 F 03	49 01 12	117 22 15
082-004	JERSEY	082 F 03	49 05 55	117 13 15
082-005	H.B.	082 F 03	49 08 48	117 12 00
082-055	SULLIVAN	082 F 09	49 42 30	116 00 20
082-062	DUNCAN	082 K 07	50 22 12	116 57 00
082-065	MINERAL KING	082 K 08	50 20 45	116 25 35
082-066	PARADISE	082 K 08	50 28 25	116 18 20
082-070	WIGWAM	082 K 13	50 52 48	117 58 48
082-073	RIVER JORDAN	082 M 01	51 07 48	118 24 36
082-079	COTTON BELT	082 M 07	51 27 00	118 49 12
082-117	KOOTENAY KING	082 G 12	49 44 35	115 36 40
082-127	MOSQUITO KING	082 M 04	51 02 30	119 31
082-128	COLBY	082 L 10	50 43 45	118 44
094-002	FERGUSON	094 C 11	56 41 20	125 10 30
094-005	CIRQUE	094 F 11	57 31	125 09
095-004	QUARTZ LAKE (MCMILLAN)	095 D 05	60 29 55	127 56 50
095-005	MEL GROUP	095 D 06	60 21 05	127 24 15
105-001	SWIM LAKE	105 K 03	62 12 30	133 02 00
105-002	FARO	105 K 06	62 21 30	133 22 00
105-003	TOM	105 O 01	63 10 10	130 08 20
105-005	VANGORDA	105 K 06	62 15 10	133 11 00
105-027	HOWARD'S PASS	105 I 06	62 27	129 11
105-032	GRUM	105 K 06	62 16 10	133 13 20
105-033	DY	105 K 03	62 14	133 02
105-034	JASON	105 O 01	63 08 50	130 15 40
106-005	GOZ	106 C 07	64 25	132 32

APPENDIX A (CONT.)

VEIN AND REPLACEMENT

DEP NUM	DEPOSIT NAME	NTS AREA	LATITUDE	LONGITUDE
001-001	SILVER CLIFF	001 N 05	47 18 15	053 56 45
001-003	LA MANCHE	001 N 12	47 41 20	053 56 15
011-002	DUNBRACK	011 D 14	44 49 08	063 11 31
012-022	ROUND POND	012 P 08	51 16 05	056 15 15
021-011	PANET	021 L 09	46 35 15	070 13 10
021-018	KEYMET	021 P 13	47 48 00	065 48 38
021-019	NIGADOO	021 P 12	47 43 40	065 47 54
021-032	MOUNT PLEASANT NORTH AREA	021 G 07	45 26 34	066 49 16
021-096	QUEBEC STURGEON - HALF MILE	021 P 12	47 40 42	065 53 22
021-097	QUEBEC STURGEON - SHAFT	021 P 12	47 40 21	065 54 46
021-098	QUEBEC STURGEON - HACHEY	021 P 12	47 40 16	065 54 53
021-099	QUEBEC STURGEON - PINE TREE	021 P 12	47 40 46	065 52 55
022-007	FEDERAL	022 B 16	48 46 24	066 08 12
022-008	CANDEGO	022 G 01	49 03 48	066 04 06
022-011	ARSENAULT LAKE	022 A 06	48 22 12	065 13 20
031-002	WRIGHT	031 M 06	47 25 24	079 29 30
031-003	KINGDON	031 F 08	45 24 00	076 13 00
031-004	FRONTENAC	031 C 07	44 28 29	076 31 17
031-022	UPTON	031 H 10	45 41	072 40
032-024	ODYNO / NEW NORZONE	032 D 03	48 07 36	079 10 48
032-270	QUEBEC CHIBOUGAMAU(MERRILL IS)	032 G 16	49 52 18	074 19 18
041-003	FENSOM PROSPECT/ELLA LAKE	041 I 05	46 18 18	081 32 26
041-010	JARDUN	041 K 09	46 38 10	084 08 09
041-016	DELHI PACIFIC	041 P 01	47 08 40	080 21 40
041-022	STACKPOOL / JEFFERSON	041 O 16	47 50 04	082 12 16
041-023	MATARROW	041 P 15	47 54 30	080 44 20
042-011	HANNAM	042 D 15	48 48 24	086 41 28
052-003	DORION	052 A 15	48 50 05	088 39 32
053-003	BERENS RIVER	053 C 13	52 50 30	093 38 22
063-047	HANSON LAKE	063 L 10	54 40 30	102 51 00
075-004	O'CONNOR LAKE	075 E 05	61 19 36	111 47 30
082-013	HIGHLAND BELL	082 E 06	49 26	119 03 45
082-016	ORE HILL	082 F 03	49 07 30	117 08 40
082-020	KOOTENAY FLORENCE	082 F 15	49 46	116 55 30
082-022	YANKEE GIRL	082 F 06	49 17 23	117 11 10
082-028	WHITEWATER	082 K 03	50 02 57	117 07 58
082-031	NORTH STAR	082 F 09	49 40 53	116 01 30
082-032	HIGHLANDER	082 F 10	49 43 09	116 54 30
082-033	MOLLY GIBSON	082 F 11	49 44 12	117 09 00
082-034	CORK PROVINCE	082 F 14	49 54 31	117 04 26
082-036	VICTOR / VIOLAMAC	082 F 14	49 59 54	117 16 19
082-037	MAMMOTH	082 F 14	49 57 42	117 17 15
082-038	RUTH-HOPE	082 F 14	49 58 10	117 13 50
082-039	NOBLE FIVE	082 F 14	49 59 31	117 12 01
082-040	GALENA FARM	082 F 14	49 55 48	117 21 25
082-041	VAN ROI	082 F 14	49 55 50	117 17 13
082-043	RICHMOND EUREKA	082 F 14	49 58 01	117 13 04

VEIN AND REPLACEMENT (CONT.)

DEP NUM	DEPOSIT NAME	NTS AREA	LATITUDE	LONGITUDE
082-044	SILVERSMITH	082 F 14	49 58 00	117 13 22
082-046	HEWITT	082 F 14	49 55 35	117 18 00
082-047	SURPRISE	082 F 14	49 59 55	117 11 42
082-048	BOSUN	082 F 14	49 58 25	117 21 43
082-050	STANDARD	082 F 14	49 57 22	117 19 08
082-051	IVANHOE	082 F 14	49 57 28	117 14 23
082-052	BLUEBELL	082 F 15	49 45 33	116 51 43
082-053	HIGHLAND	082 F 15	49 45 30	116 56 30
082-054	ST. EUGENE	082 G 05	49 17 00	115 49 06
082-056	ESTELLA	082 G 13	49 46 20	115 37
082-059	RAMBLER-CARIBOO	082 K 03	50 00 44	117 11 33
082-061	LUCKY JIM	082 K 03	50 01 56	117 11 59
082-068	TRUE FISSURE	082 K 11	50 42 15	117 30
082-069	SPIDER & ECLIPSE	082 K 13	50 46 25	117 37 40
082-074	MASTODON	082 M 01	51 14 07	118 07 05
082-087	SNOWFLAKE / STANN TR	082 N 04	51 11 45	117 44 00
082-089	IDAHO-ALAMO	082 F 14	49 59 08	117 18 15
082-104	PAYNE	082 K 03	50 00 25	117 13 49
082-105	WONDERFUL	082 F 14	49 58 50	117 14 50
082-106	CARNATION	082 F 14	49 58 06	117 16 25
082-107	RUTH VERMONT	082 K 15	50 56 55	116 58 55
082-108	ALTOONA GROUP	082 F 14	49 59 34	117 14 40
082-109	MONTEZUMA GROUP	082 F 14	49 56 20	117 03 20
082-110	SCRANTON	082 F 14	49 47 15	117 03 35
082-111	UTICA	082 F 14	49 58 35	117 07 35
082-113	TEDDY GLACIER	082 K 13	50 51 45	117 45 10
082-118	JACKSON	082 K 03	50 00 14	117 09 42
082-119	WASHINGTON	082 K 03	50 00 18	117 13 04
082-120	NETTIE LAKE	082 K 11	50 41 17	117 26 55
082-121	SILVER CUP	082 K 11	50 38 10	117 23 10
082-123	HAWK CREEK / ALBION	082 N 01	51 06 10	116 02 40
082-126	ANTOINE SILVER	082 K 03	50 00 09	117 11 53
082-129	BELL	082 F 14	49 59 28	117 09 45
082-130	SUNSET	082 F 14	49 59 20	117 09 56
082-131	VIGILANT	082 F 15	49 47	116 56
082-132	RECO (1,2,3,4)	082 F 14	49 59 35	117 11 18
082-133	NAMELESS & AUGUST FRACTIONS	082 F 15	49 47	116 55
082-135	LUCKY THOUGHT	082 F 14	49 56 20	117 18 05
082-136	QUEEN BESS	082 F 14	49 59 28	117 16 45
082-137	ENTERPRISE	082 F 14	49 49 12	117 19 35
082-138	AMERICAN BOY	082 F 14	49 59 24	117 12 18
082-139	LAST CHANCE	082 F 14	49 59 40	117 12 08
082-140	SPOKANE	082 F 10	49 44 08	116 55 06
082-143	BANKER	082 F 10	49 43 42	116 54 52
082-144	ARLINGTON	082 F 14	49 47 30	117 21 38
082-145	WELLINGTON-BOUNTY	082 E 06	49 26	119 06 30
082-146	GOODENOUGH	082 F 06	49 19 12	117 11 00

APPENDIX A (CONT.)

VEIN AND REPLACEMENT (CONT.)

DEP NUM	DEPOSIT NAME	NTS AREA	LATITUDE	LONGITUDE
082-147	ADAMS PLATEAU / LUCKY COON	082 M 04	51 04 00	119 37 10
082-148	KEYSTONE	082 K 03	50 03 15	117 07 54
082-149	BROADVIEW	082 K 11	50 41 50	117 29 30
082-150	CALEDONIA	082 K 03	50 01 40	117 06 02
082-151	SILMONAC	082 F 14	49 58	117 14 45
092-004	PLANET / STUMP	092 I 08	50 20	120 23 30
092-005	SUNSHINE	092 I 07	50 18 42	120 45 42
092-006	BRANDYWINE-NORTHAIR	092 J 03	50 07 30	123 06
092-012	PILGRIM, CATHERINE	092 L 06	50 26 07	127 24 00
093-001	EMERALD-GLACIER	093 E 11	53 44 20	127 15 45
093-002	CRONIN-BABINE	093 L 15	54 55 00	126 48 20
093-003	SILVER STANDARD	093 M 05	55 19 02	127 37 35
093-004	BRADINA	093 L 02	54 07 20	126 43 00
093-005	DUTHIE	093 L 14	54 46 23	127 21 20
093-006	COPPER CROWN	093 L 10	54 33 30	126 43 45
093-008	LUSTDUST	093 N 11	55 33 30	125 25
093-009	SILVER CUP	093 M 05	55 21 09	127 30 45
095-003	PRAIRIE CREEK	095 F 10	61 33 35	124 47 30
103-003	NORTH STAR	103 P 12	55 41 10	129 30 50
103-004	DUNWELL	103 P 13	55 59 45	129 55 25
103-007	PROSPERITY	103 P 13	55 54 12	129 56 00
103-009	PORTLAND CANAL	103 P 13	55 58 21	129 54 50
103-010	PORTER IDAHO	103 P 13	55 54 02	129 55 46
104-007	BIG CANYON	104 N 12	59 44 10	133 31
104-008	SILVER QUEEN/MAGNO/MARBLE CK	104 P 05	59 15 30	129 49 35
104-009	INDIAN	104 B 01	56 04 45	130 02
105-006	KENO HILL	105 M 14	63 55 45	135 14 30
105-008	LUCKY QUEEN	105 M 14	63 57 11	135 15 00
105-011	BARB - MATT BERRY	105 H 06	61 28 00	129 25 00
105-012	VENUS	105 D 02	60 01 13	134 37 45
105-013	STUMP	105 F 09	61 31 30	132 11 00
105-014	HECTOR-CALUMET	105 M 14	63 55 06	135 23 36
105-015	HUSKY	105 M 13	63 54 35	135 30 35
105-016	ONEK	105 M 14	63 54 47	135 17 22
105-017	GALKENO	105 M 14	63 55 42	135 21 30
105-018	COMSTOCK KENO	105 M 14	63 56 23	135 12 15
105-019	SILVER KING	105 M 13	63 53 48	135 34 03
105-020	NO CASH	105 M 14	63 55 17	135 25 54
105-021	ELSA	105 M 14	63 54 37	135 28 42
105-022	WHIPSAW-EUREKA	105 M 14	63 54 25	135 15 35
105-023	SADIE-LADUE	105 M 14	63 57 07	135 16 54
105-024	FORMO	105 M 14	63 56 41	135 21 57
105-025	DIXIE	105 M 14	63 54 48	135 27 51
105-026	TOWNSITE	105 M 14	63 54 50	135 24 30
106-002	PESO-REX	106 D 04	64 00 45	135 57 20
106-006	CLARK	106 D 02	64 07 22	134 57 06

APPENDIX A (CONT.)

VOLCANIC-ASSOCIATED EXHALATIVE

DEP NUM	DEPOSIT NAME	NTS AREA	LATITUDE	LONGITUDE
002-023	POINT LEAMINGTON	002 E 05	49 17 15	055 35 35
011-006	STIRLING	011 F 09	45 43 40	060 26 15
012-008	CONSOLIDATED RAMBLER MAIN	012 H 16	49 53 33	056 05 00
012-009	BUCHANS	012 A 15	48 49 20	056 51 52
012-010	YORK HARBOUR	012 G 01	49 02 53	058 18 28
012-021	TULK'S POND	012 A 11	48 30 54	057 12 12
021-002	CLINTON COPPER	021 E 07	45 27 36	070 54 30
021-004	WEEDON	021 E 11	45 42 15	071 22 23
021-005	SUFFIELD	021 E 05	45 19 09	071 57 35
021-007	MOULTON HILL	021 E 05	45 25 35	071 48 48
021-009	CUPRA-D'ESTRIE	021 E 14	45 46 20	071 18 40
021-010	SOLBEC	021 E 14	45 49 00	071 18 30
021-014	MURRAY BROOK	021 O 09	47 31 06	066 25 54
021-015	RESTIGOUCHE/THIRD PORTAGE LAKE	021 O 10	47 30 12	066 33 42
021-016	CARIBOU	021 O 09	47 33 43	066 17 48
021-017	ORVAN BROOK	021 O 09	47 37 42	066 08 11
021-022	HALF MILE LAKE (T.G.S.)	021 O 08	47 18 23	066 19 32
021-023	ROCKY TURN	021 O 09	47 37 59	066 04 18
021-024	KEY ANACON /MIDDLE LANDING	021 P 05	47 26 12	065 42 00
021-026	CHESTER	021 O 01	47 05 58	066 13 48
021-028	TEAHAN	021 H 10	45 43	064 59 30
021-035	BRUNSWICK #6	021 P 05	47 24 20	065 49 17
021-036	BRUNSWICK #12	021 P 05	47 28 28	065 53 24
021-037	HEATH STEELE GROUP	021 O 08	47 17 28	066 04 55
021-038	AUSTIN BROOK	021 P 05	47 23 52	065 49 24
021-041	LINGWICK	021 E 11	45 39 18	071 23
021-045	NEPISGUIT	021 O 08	47 22 26	066 02 10
021-047	STRATMAT MAIN	021 O 08	47 19 13	066 06 45
021-048	STRATMAT WEST	021 O 08	47 18 31	066 08 03
021-049	CANOE LANDING	021 O 08	47 24 38	066 06 16
021-050	WEDGE	021 O 08	47 23 40	066 07 58
021-051	HALF MILE LAKE (KEEVIL)	021 O 08	47 19 20	066 18 07
021-053	HALF MILE LAKE(CONWEST)	021 O 08	47 18 57	066 18 39
021-054	ARMSTRONG ZONE A-SOUTH LENS	021 O 09	47 36 05	066 02 31
021-085	NINEMILE BROOK	021 P 05	47 23 29	065 55 50
021-091	PABINEAU RIVER	021 P 05	47 26 48	065 54 38
021-100	STRATMAT-CENTRAL	021 O 08	47 19 11	066 06 25
021-101	HEATH STEELE BOUNDARY ZONE	021 O 08	47 18 24	066 07 48
024-001	SOUCY NO 1	024 K 05	58 19 19	069 52 06
024-002	PRUDHOMME NO 1	024 K 05	58 15 36	069 54 18
031-009	TETREAULT	031 I 16	46 49 30	072 20 54
031-020	UNITED MONTAUBAN	031 I 16	46 50 24	072 20 42
031-027	CALUMET	031 F 10	45 42 00	076 40 48
031-029	PENN-COBALT (FOSTER)	031 M 05	47 22 20	079 39 55
032-010	MANITOU BARVUE	032 C 04	48 05 12	077 36 36
032-012	VENDOME	032 C 05	48 25 24	077 39 42
032-013	BARVALLEE	032 C 05	48 25 42	077 40 50

APPENDIX A (CONT.)

VOLCANIC-ASSOCIATED EXHALATIVE (CONT.)

DEP NUM	DEPOSIT NAME	NTS AREA	LATITUDE	LONGITUDE
032-014	BELFORT ROYMONT	032 C 05	48 25 47	077 40 54
032-018	CONSOLIDATED PERSHCOURT	032 C 12	48 31 24	077 41 06
032-019	MONPAS (ALBARMONT)	032 C 12	48 36 54	077 52 12
032-020	ABITIBI SILVER / FREBERT	032 C 12	48 31 42	077 41 54
032-021	NORTH TRINITY	032 C 12	48 42 30	077 45 36
032-022	BARVUE	032 C 12	48 31 18	077 40 30
032-023	LYNX (OBASKA)	032 F 12	49 38 48	077 43 18
032-026	NORBEC	032 D 06	48 21 12	079 03 18
032-027	OLD WAITE	032 D 06	48 20 20	079 05 12
032-028	LAKE DUFAULT NO 2	032 D 06	48 18 12	079 03 48
032-029	VAUZE	032 D 06	48 21 48	079 04 42
032-030	EAST WAITE	032 D 06	48 20 36	079 04 42
032-031	MINES GALLEN (WEST MACDONALD)	032 D 07	48 19 36	078 57 12
032-032	QUEMONT	032 D 06	48 15 30	079 00 24
032-033	AMULET F	032 D 06	48 19 00	079 04 42
032-034	AMULET A	032 D 06	48 18 15	079 04 00
032-035	DELBRIDGE	032 D 07	48 15 54	078 57 48
032-036	MOBRUN	032 D 07	48 23 24	078 54 00
032-039	NORMETAL	032 D 14	49 00	079 22
032-040	KELLY DESMOND	032 E 08	49 26 06	078 19 52
032-041	POIRIER	032 E 08	49 26 43	078 23 03
032-042	JOUTEL COPPER	032 E 08	49 28	078 23
032-046	EMPIRE OIL LETAC	032 F 08	49 26 48	076 09 30
032-048	CONIAGAS	032 F 08	49 29 54	076 09 48
032-052	MATTAGAMI LAKE	032 F 12	49 43 00	077 43 00
032-053	BELL ALLARD SOUTH GROUP	032 F 12	49 41 18	077 41 54
032-055	ORCHAN	032 F 12	49 42 30	077 42 30
032-056	NORITA (RADIORE A)	032 F 13	49 46 00	077 39 18
032-057	RADIORE EAST	032 F 13	49 45 06	077 33 36
032-058	BELL CHANNEL	032 F 13	49 46 12	077 37 30
032-059	GARON LAKE	032 F 13	49 46 10	077 34 04
032-060	NEW HOSCO	032 F 13	49 47 24	077 50 06
032-063	ANTOINETTE LAKE GROUP TACHE LK	032 G 16	49 56 30	074 24 20
032-070	MILLENBACH	032 D 06	48 18 04	079 03 15
032-243	SOMA ALTA	032 F 08	49 25 31	076 08 12
032-257	LOUVEM	032 C 04	48 05 54	077 31 12
032-258	LEMOINE TWP.	032 G 16	49 45 44	074 06 10
032-259	LA GAUCHETIERE	032 E 16	49 46 29	078 09 19
032-260	MAGUSI RIVER	032 D 06	48 26 27	079 22 21
032-261	LESSARD OPTION	032 J 10	50 38 30	074 38 30
032-262	LES MINES SELBAIE(A-1,B ZONES)	032 E 15	49 47	078 55
032-263	AMULET C	032 D 06	48 18 20	079 04 15
032-264	NEWCONEX FIGUERY	032 D 08	48 28 45	078 10 15
032-265	CORBET	032 D 06	48 18 00	079 04 54
032-266	SCOTT TWP (SELCO)	032 G 15	49 51 52	074 37 47
032-267	D-266 (LD-75)	032 D 06	48 18 14	079 03 39
032-268	LA RIBOURDE-SAUSSURE	032 G 13	49 48 30	075 32

APPENDIX A (CONT.)

VOLCANIC-ASSOCIATED EXHALATIVE (CONT.)

DEP NUM	DEPOSIT NAME	NTS AREA	LATITUDE	LONGITUDE
032-269	TONNANCOURT-3	032 C 15	48 51 48	076 59 00
032-271	CONIGO - WEST CU-ZN-AG ZONE	032 D 09	48 35 49	078 03 30
032-272	CONIGO - WEST UPPER AG-ZN ZONE	032 D 09	48 35 49	078 03 28
041-004	ERRINGTON	041 I 11	46 32 00	081 16 28
041-007	STRALAK	041 I 13	46 48 09	081 41 50
041-008	LAKE GENEVA	041 I 13	46 47 24	081 30 55
041-019	SHUNSBY	041 O 10	47 42 48	082 39 30
041-024	VERMILION LAKE	041 I 11	46 31 00	081 21 00
042-002	KIDD CREEK	042 A 11	48 41 30	081 21 55
042-003	CANADIAN JAMIESON	042 A 12	48 32 06	081 34 06
042-004	JAMELAND	042 A 12	48 35 00	081 35 00
042-005	KAM KOTIA	042 A 12	48 35 36	081 37 00
042-006	ZENMAC	042 D 14	48 58 50	087 21 30
042-012	WILLECHO	042 F 04	49 10 30	085 52 48
042-013	BIG NAMA CREEK	042 F 04	49 09 51	085 50 46
042-014	WILLROY	042 F 04	49 09 27	085 49 28
042-015	GECO	042 F 04	49 09 15	085 47 40
042-017	HEADVUE	042 L 04	50 01 14	087 39 38
042-018	KENDON	042 L 05	50 25 30	087 36 40
042-022	POTTER (MUNRO)	042 A 09	48 36 00	080 12 40
042-023	MARSHALL LAKE	042 L 05	50 25 25	087 35 20
052-006	MATTABI	052 G 15	49 52 36	090 58 06
052-007	TROUT BAY	052 M 01	51 00 32	094 12
052-008	SOUTH BAY	052 N 02	51 06 35	092 40 45
052-015	STURGEON LAKE	052 G 15	49 52 35	090 52 53
052-016	LYON LAKE	052 G 15	49 53 06	090 53 30
052-017	COPPER LODE-E ZONE	052 K 15	50 58 00	092 52 40
052-020	CREEK ZONE	052 G 15	49 52 54	090 53 07
063-004	COPPER-MAN	063 J 12	54 39 00	099 52 30
063-005	ROD(STALL) LAKE	063 J 13	54 51 36	099 54 12
063-007	OSBORNE LAKE	063 J 13	54 57 15	099 43 24
063-008	WILDNEST	063 M 01	55 03 35	102 14 50
063-011	SPRUCE POINT	063 K 09	54 34 30	100 24 00
063-012	CUPRUS	063 K 12	54 43 12	101 42 48
063-013	CENTENNIAL	063 K 12	54 42 03	101 39 59
063-014	MANDY	063 K 12	54 43 40	101 49 56
063-015	SCHIST LAKE	063 K 12	54 43 10	101 49 35
063-016	WHITE LAKE	063 K 12	54 42 50	101 43 40
063-021	FLIN FLON	063 K 13	54 45 39	101 52 42
063-029	VAMP LAKE	063 K 14	54 56 13	101 10 20
063-032	RAIL LAKE	063 K 10	54 44 30	100 35 25
063-033	CHISEL LAKE	063 K 16	54 49 48	100 06 45
063-034	GHOST LAKE	063 K 16	54 49 18	100 04 48
063-035	DICKSTONE	063 K 16	54 51 12	100 29 50
063-036	POT LAKE	063 K 16	54 45 17	100 09 00
063-037	BOMBER	063 K 16	54 51 50	100 10 45
063-039	JUNGLE	063 N 02	55 10	100 58

VOLCANIC-ASSOCIATED EXHALATIVE (CONT.)

DEP NUM	DEPOSIT NAME	NTS AREA	LATITUDE	LONGITUDE
063-041	BOB LAKE	063 N 03	55 09 30	101 02 45
063-042	SHERRIDON	063 N 03	55 08 22	101 06 25
063-044	RAMSAY	063 L 10	54 44 20	102 45 30
063-045	SCHOTTS LAKE	063 M 01	55 05 45	102 13 35
063-049	LOST LAKE	063 K 16	54 49	100 05
063-051	DYCE SIDING (SYLVIA ZONE)	063 K 08	54 24 25	100 08 57
063-052	WESTARM	063 K 12	54 38 30	101 50 12
063-053	ANDERSON	063 J 13	54 51 35	099 59 35
063-054	STALL	063 J 13	54 51 20	099 56 30
063-055	EMBURY (TROUT) LAKE	063 K 13	54 49 45	101 49 30
063-056	COPPER REEF	063 K 12	54 36 45	101 36 24
064-002	RUTTAN	064 B 05	56 28 36	099 38 06
064-003	KNOBBY LAKE (SAND 4)	064 B 13	56 53 30	099 54
064-006	FOX LAKE	064 C 12	56 38 05	101 37 50
064-007	DH-FL GROUP	064 C 14	56 50 00	101 00 30
064-011	PEG	064 D 04	56 07 20	103 42 00
064-012	LYNN LAKE,Z-DEPOSIT	064 C 14	56 49 57	101 01 30
065-001	HENINGA LAKE(GEMEX)	065 H 16	61 46 25	096 12 10
075-003	INDIAN MOUNTAIN	075 M 02	63 01 57	110 56 57
076-002	HACKETT RIVER (MAIN ZONE)	076 F 16	65 55 55	108 27 30
076-003	HACKETT RIVER (EAST CLEAVER)	076 F 16	65 55 00	108 27 29
076-004	HIGH LAKE	076 M 07	67 22 45	110 51 20
076-005	YAVA	076 G 12	65 36 40	107 56 11
076-006	HACKETT RIVER (BOOT LAKE)	076 F 16	65 54 46	108 26 15
082-078	HOMESTAKE	082 M 04	51 06 35	119 49 20
082-122	GOLDSTREAM	082 M 09	51 36 45	118 23 30
086-001	IZOK	086 H 10	65 39	112 49 00
086-002	HOOD RIVER #10	086 I 02	66 04	112 45
086-003	HOOD RIVER #41	086 I 02	66 02 30	112 48
092-002	WESTMIN (LYNX,MYRA,PRICE)	092 F 12	49 34 32	125 36 07
092-007	TEDI(BRANDYWINE) VAN SILVER	092 J 03	50 05	123 08 30
092-014	CHU-CHUA	092 P 08	51 23	120 03
092-015	TWIN J	092 B 13	48 52	123 47
092-016	WESTMIN (HW)	092 F 12	49 34 00	125 35 15
103-001	ECSTALL RIVER	103 H 13	53 52 12	129 30 36
104-003	TULSEQUAH CHIEF	104 K 12	58 44 20	133 34 30
104-005	BIG BULL	104 K 12	58 40	133 32 20
104-010	KUTCHO CREEK	104 I 01	58 12 10	128 21 40
116-001	HART RIVER	116 A 10	64 38 10	136 49 00

APPENDIX B

LISTING OF CANADIAN LEAD-ZINC DEPOSITS, ALPHABETICALLY BY DEPOSIT TYPE

CONTACT METASOMATIC

DEPOSIT NAME	DEP NUM	NTS AREA	LATITUDE	LONGITUDE
CALEDONIA	092-010	092 L 12	50 38 45	127 36 30
LIME HILL	011-007	011 F 14	45 46 35	061 09 00
LYNN CREEK	092-008	092 G 06	49 25 30	123 03 56
MCDAME BELLE	104-001	104 P 06	59 16 18	129 22 20
MEAT COVE	011-009	011 N 02	47 00 20	060 35 24
VIECO WHIPSAW/ RAM & ROD	095-006	095 E 11	61 33 40	127 27 15
ZIP	092-013	092 L 07	50 21 50	126 54 40

MISSISSIPPI VALLEY

DEPOSIT NAME	DEP NUM	NTS AREA	LATITUDE	LONGITUDE
BEAR-TWIT	106-003	106 A 03	64 02	129 19
ECLIPSE	068-002	068 H 09	75 31 30	096 08
GAY'S RIVER	011-001	011 E 03	45 01	063 21 50
GAYNA	106-007	106 B 15	64 57	130 43
GIANT / SILVER GIANT	082-071	082 K 16	50 56 06	116 28 18
KICKING HORSE / MONARCH	082-097	082 N 08	51 25 30	116 26 45
LAKE MONTE	034-001	034 C 02	56 06	076 32
NANCY ISLAND	033-002	033 N 15	55 57 30	076 48
NANISIVIK	048-001	048 C 01	73 03 40	084 30 30
NEWFOUNDLAND ZINC	012-006	012 I 06	50 17 42	057 28 00
PINE POINT DISTRICT	085-002	085 B 15	60 47 00	114 35 00
POLARIS	068-001	068 H 08	75 23 10	096 56
ROBB LAKE	094-004	094 B 13	56 56 30	123 43 40
RUBY LAKE	033-001	033 N 15	55 56 42	076 44
SILVER BASIN	082-152	082 K 10	50 41 20	116 44 40
WESTMIN (AX GROUP)	085-009	085 B 11	60 44 32	115 03 20

SANDSTONE LEAD

DEPOSIT NAME	DEP NUM	NTS AREA	LATITUDE	LONGITUDE
GEORGE LAKE	064-010	064 E 05	57 28 30	103 45 15
YAVA (SILVERMINE)	011-012	011 F 16	45 52	060 23 45

APPENDIX B (CONT.)

SEDIMENT-HOSTED EXHALATIVE

DEPOSIT NAME	DEP NUM	NTS AREA	LATITUDE	LONGITUDE
ANNEX	082-002	082 F 03	49 00 48	117 22 18
CIRQUE	094-005	094 F 11	57 31	125 09
COLBY	082-128	082 L 10	50 43 45	118 44
COTTON BELT	082-079	082 M 07	51 27 00	118 49 12
DUNCAN	082-062	082 K 07	50 22 12	116 57 00
DY	105-033	105 K 03	62 14	133 02
FARO	105-002	105 K 06	62 21 30	133 22 00
FERGUSON	094-002	094 C 11	56 41 20	125 10 30
GOZ	106-005	106 C 07	64 25	132 32
GRUM	105-032	105 K 06	62 16 10	133 13 20
H.B.	082-005	082 F 03	49 08 48	117 12 00
HOWARD'S PASS	105-027	105 I 06	62 27	129 11
JASON	105-034	105 O 01	63 08 50	130 15 40
JERSEY	082-004	082 F 03	49 05 55	117 13 15
KOOTENAY KING	082-117	082 G 12	49 44 35	115 36 40
LAFONTAINE	031-031	031 J 04	46 05 50	075 57 15
LEITCH	031-030	031 J 04	46 06 50	075 57 12
LONG LAKE	031-005	031 C 10	44 41 23	076 46 20
MEL GROUP	095-005	095 D 06	60 21 05	127 24 15
MINERAL KING	082-065	082 K 08	50 20 45	116 25 35
MOSQUITO KING	082-127	082 M 04	51 02 30	119 31
PARADISE	082-066	082 K 08	50 28 25	116 18 20
QUARTZ LAKE (MCMILLAN)	095-004	095 D 05	60 29 55	127 56 50
REEVES MACDONALD (REMAC)	082-003	082 F 03	49 01 12	117 22 15
RENMAC	031-007	031 F 07	45 24 45	076 42 20
RIVER JORDAN	082-073	082 M 01	51 07 48	118 24 36
SMITHFIELD	011-003	011 E 06	45 16 20	063 04 30
SULLIVAN	082-055	082 F 09	49 42 30	116 00 20
SWIM LAKE	105-001	105 K 03	62 12 30	133 02 00
TOM	105-003	105 O 01	63 10 10	130 08 20
VANGORDA	105-005	105 K 06	62 15 10	133 11 00
WALTON	021-030	021 H 01	45 12 20	064 02 30
WIGWAM	082-070	082 K 13	50 52 48	117 58 48

APPENDIX B (CONT.)

VEIN AND REPLACEMENT

DEPOSIT NAME	DEP NUM	NTS AREA	LATITUDE	LONGITUDE
ADAMS PLATEAU / LUCKY COON	082-147	082 M 04	51 04 00	119 37 10
ALTOONA GROUP	082-108	082 F 14	49 59 34	117 14 40
AMERICAN BOY	082-138	082 F 14	49 59 24	117 12 18
ANTOINE SILVER	082-126	082 K 03	50 00 09	117 11 53
ARLINGTON	082-144	082 F 14	49 47 30	117 21 38
ARSENAULT LAKE	022-011	022 A 06	48 22 12	065 13 20
BANKER	082-143	082 F 10	49 43 42	116 54 52
BARB - MATT BERRY	105-011	105 H 06	61 28 00	129 25 00
BELL	082-129	082 F 14	49 59 28	117 09 45
BERENS RIVER	053-003	053 C 13	52 50 30	093 38 22
BIG CANYON	104-007	104 N 12	59 44 10	133 31
BLUEBELL	082-052	082 F 15	49 45 33	116 51 43
BOSUN	082-048	082 F 14	49 58 25	117 21 43
BRADINA	093-004	093 L 02	54 07 20	126 43 00
BRANDYWINE-NORTHAIR	092-006	092 J 03	50 07 30	123 06
BROADVIEW	082-149	082 K 11	50 41 50	117 29 30
CALEDONIA	082-150	082 K 03	50 01 40	117 06 02
CANDEGO	022-008	022 G 01	49 03 48	066 04 06
CARNATION	082-106	082 F 14	49 58 06	117 16 25
CLARK	106-006	106 D 02	64 07 22	134 57 06
COMSTOCK KENO	105-018	105 M 14	63 56 23	135 12 15
COPPER CROWN	093-006	093 L 10	54 33 30	126 43 45
CORK PROVINCE	082-034	082 F 14	49 54 31	117 04 26
CRONIN-BABINE	093-002	093 L 15	54 55 00	126 48 20
DELHI PACIFIC	041-016	041 P 01	47 08 40	080 21 40
DIXIE	105-025	105 M 14	63 54 48	135 27 51
DORION	052-003	052 A 15	48 50 05	088 39 32
DUNBRACK	011-002	011 D 14	44 49 08	063 11 31
DUNWELL	103-004	103 P 13	55 59 45	129 55 25
DUTHIE	093-005	093 L 14	54 46 23	127 21 20
ELSA	105-021	105 M 14	63 54 37	135 28 42
EMERALD-GLACIER	093-001	093 E 11	53 44 20	127 15 45
ENTERPRISE	082-137	082 F 14	49 49 12	117 19 35
ESTELLA	082-056	082 G 13	49 46 20	115 37
FEDERAL	022-007	022 B 16	48 46 24	066 08 12
FENSOM PROSPECT/ELLA LAKE	041-003	041 I 05	46 18 18	081 32 26
FORMO	105-024	105 M 14	63 56 41	135 21 57
FRONTENAC	031-004	031 C 07	44 28 29	076 31 17
GALENA FARM	082-040	082 F 14	49 55 48	117 21 25
GALKENO	105-017	105 M 14	63 55 42	135 21 30
GOODENOUGH	082-146	082 F 06	49 19 12	117 11 00
HANNAM	042-011	042 D 15	48 48 24	086 41 28
HANSON LAKE	063-047	063 L 10	54 40 30	102 51 00
HAWK CREEK / ALBION	082-123	082 N 01	51 06 10	116 02 40
HECTOR-CALUMET	105-014	105 M 14	63 55 06	135 23 36
HEWITT	082-046	082 F 14	49 55 35	117 18 00
HIGHLAND	082-053	082 F 15	49 45 30	116 56 30

APPENDIX B (CONT.)

VEIN AND REPLACEMENT (CONT.)

DEPOSIT NAME	DEP NUM	NTS AREA	LATITUDE	LONGITUDE
HIGHLAND BELL	082-013	082 E 06	49 26	119 03 45
HIGHLANDER	082-032	082 F 10	49 43 09	116 54 30
HUSKY	105-015	105 M 13	63 54 35	135 30 35
IDAHO-ALAMO	082-089	082 F 14	49 59 08	117 18 15
INDIAN	104-009	104 B 01	56 04 45	130 02
IVANHOE	082-051	082 F 14	49 57 28	117 14 23
JACKSON	082-118	082 K 03	50 00 14	117 09 42
JARDUN	041-010	041 K 09	46 38 10	084 08 09
KENO HILL	105-006	105 M 14	63 55 45	135 14 30
KEYMET	021-018	021 P 13	47 48 00	065 48 38
KEYSTONE	082-148	082 K 03	50 03 15	117 07 54
KINGDON	031-003	031 F 08	45 24 00	076 13 00
KOOTENAY FLORENCE	082-020	082 F 15	49 46	116 55 30
LA MANCHE	001-003	001 N 12	47 41 20	053 56 15
LAST CHANCE	082-139	082 F 14	49 59 40	117 12 08
LUCKY JIM	082-061	082 K 03	50 01 56	117 11 59
LUCKY QUEEN	105-008	105 M 14	63 57 11	135 15 00
LUCKY THOUGHT	082-135	082 F 14	49 56 20	117 18 05
LUSTDUST	093-008	093 N 11	55 33 30	125 25
MAMMOTH	082-037	082 F 14	49 57 42	117 17 15
MASTODON	082-074	082 M 01	51 14 07	118 07 05
MATARROW	041-023	041 P 15	47 54 30	080 44 20
MOLLY GIBSON	082-033	082 F 11	49 44 12	117 09 00
MONTEZUMA GROUP	082-109	082 F 14	49 56 20	117 03 20
MOUNT PLEASANT NORTH AREA	021-032	021 G 07	45 26 34	066 49 16
NAMELESS & AUGUST FRACTIONS	082-133	082 F 15	49 47	116 55
NETTIE LAKE	082-120	082 K 11	50 41 17	117 26 55
NIGADOO	021-019	021 P 12	47 43 40	065 47 54
NO CASH	105-020	105 M 14	63 55 17	135 25 54
NOBLE FIVE	082-039	082 F 14	49 59 31	117 12 01
NORTH STAR	103-003	103 P 12	55 41 10	129 30 50
NORTH STAR	082-031	082 F 09	49 40 53	116 01 30
O'CONNOR LAKE	075-004	075 E 05	61 19 36	111 47 30
ODYNO / NEW NORZONE	032-024	032 D 03	48 07 36	079 10 48
ONEK	105-016	105 M 14	63 54 47	135 17 22
ORE HILL	082-016	082 F 03	49 07 30	117 08 40
PANET	021-011	021 L 09	46 35 15	070 13 10
PAYNE	082-104	082 K 03	50 00 25	117 13 49
PESO-REX	106-002	106 D 04	64 00 45	135 57 20
PILGRIM, CATHERINE	092-012	092 L 06	50 26 07	127 24 00
PLANET / STUMP	092-004	092 I 08	50 20	120 23 30
PORTER IDAHO	103-010	103 P 13	55 54 02	129 55 46
PORTLAND CANAL	103-009	103 P 13	55 58 21	129 54 50
PRAIRIE CREEK	095-003	095 F 10	61 33 35	124 47 30
PROSPERITY	103-007	103 P 13	55 54 12	129 56 00
QUEBEC CHIBOUGAMAU(MERRILL IS)	032-270	032 G 16	49 52 18	074 19 18
QUEBEC STURGEON - HACHEY	021-098	021 P 12	47 40 16	065 54 53

APPENDIX B (CONT.)

VEIN AND REPLACEMENT (CONT.)

DEPOSIT NAME	DEP NUM	NTS AREA	LATITUDE	LONGITUDE
QUEBEC STURGEON - HALF MILE	021-096	021 P 12	47 40 42	065 53 22
QUEBEC STURGEON - PINE TREE	021-099	021 P 12	47 40 46	065 52 55
QUEBEC STURGEON - SHAFT	021-097	021 P 12	47 40 21	065 54 46
QUEEN BESS	082-136	082 F 14	49 59 28	117 16 45
RAMBLER-CARIBOO	082-059	082 K 03	50 00 44	117 11 33
RECO (1,2,3,4)	082-132	082 F 14	49 59 35	117 11 18
RICHMOND EUREKA	082-043	082 F 14	49 58 01	117 13 04
ROUND POND	012-022	012 P 08	51 16 05	056 15 15
RUTH VERMONT	082-107	082 K 15	50 56 55	116 58 55
RUTH-HOPE	082-038	082 F 14	49 58 10	117 13 50
SADIE-LADUE	105-023	105 M 14	63 57 07	135 16 54
SCRANTON	082-110	082 F 14	49 47 15	117 03 35
SILMONAC	082-151	082 F 14	49 58	117 14 45
SILVER CLIFF	001-001	001 N 05	47 18 15	053 56 45
SILVER CUP	082-121	082 K 11	50 38 10	117 23 10
SILVER CUP	093-009	093 M 05	55 21 09	127 30 45
SILVER KING	105-019	105 M 13	63 53 48	135 34 03
SILVER QUEEN/MAGNO/MARBLE CK	104-008	104 P 05	59 15 30	129 49 35
SILVER STANDARD	093-003	093 M 05	55 19 02	127 37 35
SILVERSMITH	082-044	082 F 14	49 58 00	117 13 22
SNOWFLAKE / STANN TR	082-087	082 N 04	51 11 45	117 44 00
SPIDER & ECLIPSE	082-069	082 K 13	50 46 25	117 37 40
SPOKANE	082-140	082 F 10	49 44 08	116 55 06
ST. EUGENE	082-054	082 G 05	49 17 00	115 49 06
STACKPOOL / JEFFERSON	041-022	041 O 16	47 50 04	082 12 16
STANDARD	082-050	082 F 14	49 57 22	117 19 08
STUMP	105-013	105 F 09	61 31 30	132 11 00
SUNSET	082-130	082 F 14	49 59 20	117 09 56
SUNSHINE	092-005	092 I 07	50 18 42	120 45 42
SURPRISE	082-047	082 F 14	49 59 55	117 11 42
TEDDY GLACIER	082-113	082 K 13	50 51 45	117 45 10
TOWNSITE	105-026	105 M 14	63 54 50	135 24 30
TRUE FISSURE	082-068	082 K 11	50 42 15	117 30
UPTON	031-022	031 H 10	45 41	072 40
UTICA	082-111	082 F 14	49 58 35	117 07 35
VAN ROI	082-041	082 F 14	49 55 50	117 17 13
VENUS	105-012	105 D 02	60 01 13	134 37 45
VICTOR / VIOLAMAC	082-036	082 F 14	49 59 54	117 16 19
VIGILANT	082-131	082 F 15	49 47	116 56
WASHINGTON	082-119	082 K 03	50 00 18	117 13 04
WELLINGTON-BOUNTY	082-145	082 E 06	49 26	119 06 30
WHIPSAW-EUREKA	105-022	105 M 14	63 54 25	135 15 35
WHITEWATER	082-028	082 K 03	50 02 57	117 07 58
WONDERFUL	082-105	082 F 14	49 58 50	117 14 50
WRIGHT	031-002	031 M 06	47 25 24	079 29 30
YANKEE GIRL	082-022	082 F 06	49 17 23	117 11 10

APPENDIX B (CONT.)

VOLCANIC-ASSOCIATED EXHALATIVE

DEPOSIT NAME	DEP NUM	NTS AREA	LATITUDE	LONGITUDE
ABITIBI SILVER / FREBERT	032-020	032 C 12	48 31 42	077 41 54
AMULET A	032-034	032 D 06	48 18 15	079 04 00
AMULET C	032-263	032 D 06	48 18 20	079 04 15
AMULET F	032-033	032 D 06	48 19 00	079 04 42
ANDERSON	063-053	063 J 13	54 51 35	099 59 35
ANTOINETTE LAKE GROUP TACHE LK	032-063	032 G 16	49 56 30	074 24 20
ARMSTRONG ZONE A-SOUTH LENS	021-054	021 O 09	47 36 05	066 02 31
AUSTIN BROOK	021-038	021 P 05	47 23 52	065 49 24
BARVALLEE	032-013	032 C 05	48 25 42	077 40 50
BARVUE	032-022	032 C 12	48 31 18	077 40 30
BELFORT ROYMONT	032-014	032 C 05	48 25 47	077 40 54
BELL ALLARD SOUTH GROUP	032-053	032 F 12	49 41 18	077 41 54
BELL CHANNEL	032-058	032 F 13	49 46 12	077 37 30
BIG BULL	104-005	104 K 12	58 40	133 32 20
BIG NAMA CREEK	042-013	042 F 04	49 09 51	085 50 46
BOB LAKE	063-041	063 N 03	55 09 30	101 02 45
BOMBER	063-037	063 K 16	54 51 50	100 10 45
BRUNSWICK #12	021-036	021 P 05	47 28 28	065 53 24
BRUNSWICK #6	021-035	021 P 05	47 24 20	065 49 17
BUCHANS	012-009	012 A 15	48 49 20	056 51 52
CALUMET	031-027	031 F 10	45 42 00	076 40 48
CANADIAN JAMIESON	042-003	042 A 12	48 32 06	081 34 06
CANOE LANDING	021-049	021 O 08	47 24 38	066 06 16
CARIBOU	021-016	021 O 09	47 33 43	066 17 48
CENTENNIAL	063-013	063 K 12	54 42 03	101 39 59
CHESTER	021-026	021 O 01	47 05 58	066 13 48
CHISEL LAKE	063-033	063 K 16	54 49 48	100 06 45
CHU-CHUA	092-014	092 P 08	51 23	120 03
CLINTON COPPER	021-002	021 E 07	45 27 36	070 54 30
CONIAGAS	032-048	032 F 08	49 29 54	076 09 48
CONIGO - WEST CU-ZN-AG ZONE	032-271	032 D 09	48 35 49	078 03 30
CONIGO - WEST UPPER AG-ZN ZONE	032-272	032 D 09	48 35 49	078 03 28
CONSOLIDATED PERSHCOURT	032-018	032 C 12	48 31 24	077 41 06
CONSOLIDATED RAMBLER MAIN	012-008	012 H 16	49 53 33	056 05 00
COPPER LODE-E ZONE	052-017	052 K 15	50 58 00	092 52 40
COPPER REEF	063-056	063 K 12	54 36 45	101 36 24
COPPER-MAN	063-004	063 J 12	54 39 00	099 52 30
CORBET	032-265	032 D 06	48 18 00	079 04 54
CREEK ZONE	052-020	052 G 15	49 52 54	090 53 07
CUPRA-D'ESTRIE	021-009	021 E 14	45 46 20	071 18 40
CUPRUS	063-012	063 K 12	54 43 12	101 42 48
D-266 (LD-75)	032-267	032 D 06	48 18 14	079 03 39
DELBRIDGE	032-035	032 D 07	48 15 54	078 57 48
DH-FL GROUP	064-007	064 C 14	56 50 00	101 00 30
DICKSTONE	063-035	063 K 16	54 51 12	100 29 50
DYCE SIDING (SYLVIA ZONE)	063-051	063 K 08	54 24 25	100 08 57
EAST WAITE	032-030	032 D 06	48 20 36	079 04 42

VOLCANIC-ASSOCIATED EXHALATIVE (CONT.)

DEPOSIT NAME	DEP NUM	NTS AREA	LATITUDE	LONGITUDE
ECSTALL RIVER	103-001	103 H 13	53 52 12	129 30 36
EMBURY (TROUT) LAKE	063-055	063 K 13	54 49 45	101 49 30
EMPIRE OIL LETAC	032-046	032 F 08	49 26 48	076 09 30
ERRINGTON	041-004	041 I 11	46 32 00	081 16 28
FLIN FLON	063-021	063 K 13	54 45 39	101 52 42
FOX LAKE	064-006	064 C 12	56 38 05	101 37 50
GARON LAKE	032-059	032 F 13	49 46 10	077 34 04
GECO	042-015	042 F 04	49 09 15	085 47 40
GHOST LAKE	063-034	063 K 16	54 49 18	100 04 48
GOLDSTREAM	082-122	082 M 09	51 36 45	118 23 30
HACKETT RIVER (BOOT LAKE)	076-006	076 F 16	65 54 46	108 26 15
HACKETT RIVER (EAST CLEAVER)	076-003	076 F 16	65 55 00	108 27 29
HACKETT RIVER (MAIN ZONE)	076-002	076 F 16	65 55 55	108 27 30
HALF MILE LAKE (KEEVIL)	021-051	021 O 08	47 19 20	066 18 07
HALF MILE LAKE (T.G.S.)	021-022	021 O 08	47 18 23	066 19 32
HALF MILE LAKE(CONWEST)	021-053	021 O 08	47 18 57	066 18 39
HART RIVER	116-001	116 A 10	64 38 10	136 49 00
HEADVUE	042-017	042 L 04	50 01 14	087 39 38
HEATH STEELE BOUNDARY ZONE	021-101	021 O 08	47 18 24	066 07 48
HEATH STEELE GROUP	021-037	021 O 08	47 17 28	066 04 55
HENINGA LAKE(GEMEX)	065-001	065 H 16	61 46 25	096 12 10
HIGH LAKE	076-004	076 M 07	67 22 45	110 51 20
HOMESTAKE	082-078	082 M 04	51 06 35	119 49 20
HOOD RIVER #10	086-002	086 I 02	66 04	112 45
HOOD RIVER #41	086-003	086 I 02	66 02 30	112 48
INDIAN MOUNTAIN	075-003	075 M 02	63 01 57	110 56 57
IZOK	086-001	086 H 10	65 39	112 49 00
JAMELAND	042-004	042 A 12	48 35 00	081 35 00
JOUTEL COPPER	032-042	032 E 08	49 28	078 23
JUNGLE	063-039	063 N 02	55 10	100 58
KAM KOTIA	042-005	042 A 12	48 35 36	081 37 00
KELLY DESMOND	032-040	032 E 08	49 26 06	078 19 52
KENDON	042-018	042 L 05	50 25 30	087 36 40
KEY ANACON /MIDDLE LANDING	021-024	021 P 05	47 26 12	065 42 00
KIDD CREEK	042-002	042 A 11	48 41 30	081 21 55
KNOBBY LAKE (SAND 4)	064-003	064 B 13	56 53 30	099 54
KUTCHO CREEK	104-010	104 I 01	58 12 10	128 21 40
LA GAUCHETIERE	032-259	032 E 16	49 46 29	078 09 19
LA RIBOURDE-SAUSSURE	032-268	032 G 13	49 48 30	075 32
LAKE DUFAULT NO 2	032-028	032 D 06	48 18 12	079 03 48
LAKE GENEVA	041-008	041 I 13	46 47 24	081 30 55
LEMOINE TWP.	032-258	032 G 16	49 45 44	074 06 10
LES MINES SELBAIE(A-1,B ZONES)	032-262	032 E 15	49 47	078 55
LESSARD OPTION	032-261	032 J 10	50 38 30	074 38 30
LINGWICK	021-041	021 E 11	45 39 18	071 23
LOST LAKE	063-049	063 K 16	54 49	100 05
LOUVEM	032-257	032 C 04	48 05 54	077 31 12

APPENDIX B (CONT.)

VOLCANIC-ASSOCIATED EXHALATIVE (CONT.)

DEPOSIT NAME	DEP NUM	NTS AREA	LATITUDE	LONGITUDE
LYNN LAKE,Z-DEPOSIT	064-012	064 C 14	56 49 57	101 01 30
LYNX (OBASKA)	032-023	032 F 12	49 38 48	077 43 18
LYON LAKE	052-016	052 G 15	49 53 06	090 53 30
MAGUSI RIVER	032-260	032 D 06	48 26 27	079 22 21
MANDY	063-014	063 K 12	54 43 40	101 49 56
MANITOU BARVUE	032-010	032 C 04	48 05 12	077 36 36
MARSHALL LAKE	042-023	042 L 05	50 25 25	087 35 20
MATTABI	052-006	052 G 15	49 52 36	090 58 06
MATTAGAMI LAKE	032-052	032 F 12	49 43 00	077 43 00
MILLENBACH	032-070	032 D 06	48 18 04	079 03 15
MINES GALLEN (WEST MACDONALD)	032-031	032 D 07	48 19 36	078 57 12
MOBRUN	032-036	032 D 07	48 23 24	078 54 00
MONPAS (ALBARMONT)	032-019	032 C 12	48 36 54	077 52 12
MOULTON HILL	021-007	021 E 05	45 25 35	071 48 48
MURRAY BROOK	021-014	021 O 09	47 31 06	066 25 54
NEPISGUIT	021-045	021 O 08	47 22 26	066 02 10
NEW HOSCO	032-060	032 F 13	49 47 24	077 50 06
NEWCONEX FIGUERY	032-264	032 D 08	48 28 45	078 10 15
NINEMILE BROOK	021-085	021 P 05	47 23 29	065 55 50
NORBEC	032-026	032 D 06	48 21 12	079 03 18
NORITA (RADIORE A)	032-056	032 F 13	49 46 00	077 39 18
NORMETAL	032-039	032 D 14	49 00	079 22
NORTH TRINITY	032-021	032 C 12	48 42 30	077 45 36
OLD WAITE	032-027	032 D 06	48 20 20	079 05 12
ORCHAN	032-055	032 F 12	49 42 30	077 42 30
ORVAN BROOK	021-017	021 O 09	47 37 42	066 08 11
OSBORNE LAKE	063-007	063 J 13	54 57 15	099 43 24
PABINEAU RIVER	021-091	021 P 05	47 26 48	065 54 38
PEG	064-011	064 D 04	56 07 20	103 42 00
PENN-COBALT (FOSTER)	031-029	031 M 05	47 22 20	079 39 55
POINT LEAMINGTON	002-023	002 E 05	49 17 15	055 35 35
POIRIER	032-041	032 E 08	49 26 43	078 23 03
POT LAKE	063-036	063 K 16	54 45 17	100 09 00
POTTER (MUNRO)	042-022	042 A 09	48 36 00	080 12 40
PRUDHOMME NO 1	024-002	024 K 05	58 15 36	069 54 18
QUEMONT	032-032	032 D 06	48 15 30	079 00 24
RADIORE EAST	032-057	032 F 13	49 45 06	077 33 36
RAIL LAKE	063-032	063 K 10	54 44 30	100 35 25
RAMSAY	063-044	063 L 10	54 44 20	102 45 30
RESTIGOUCHE/THIRD PORTAGE LAKE	021-015	021 O 10	47 30 12	066 33 42
ROCKY TURN	021-023	021 O 09	47 37 59	066 04 18
ROD(STALL) LAKE	063-005	063 J 13	54 51 36	099 54 12
RUTTAN	064-002	064 B 05	56 28 36	099 38 06
SCHIST LAKE	063-015	063 K 12	54 43 10	101 49 35
SCHOTTS LAKE	063-045	063 M 01	55 05 45	102 13 35
SCOTT TWP (SELCO)	032-266	032 G 15	49 51 52	074 37 47
SHERRIDON	063-042	063 N 03	55 08 22	101 06 25

APPENDIX B (CONT.)

VOLCANIC-ASSOCIATED EXHALATIVE (CONT.)

DEPOSIT NAME	DEP NUM	NTS AREA	LATITUDE	LONGITUDE
SHUNSBY	041-019	041 O 10	47 42 48	082 39 30
SOLBEC	021-010	021 E 14	45 49 00	071 18 30
SOMA ALTA	032-243	032 F 08	49 25 31	076 08 12
SOUCY NO 1	024-001	024 K 05	58 19 19	069 52 06
SOUTH BAY	052-008	052 N 02	51 06 35	092 40 45
SPRUCE POINT	063-011	063 K 09	54 34 30	100 24 00
STALL	063-054	063 J 13	54 51 20	099 56 30
STIRLING	011-006	011 F 09	45 43 40	060 26 15
STRALAK	041-007	041 I 13	46 48 09	081 41 50
STRATMAT MAIN	021-047	021 O 08	47 19 13	066 06 45
STRATMAT WEST	021-048	021 O 08	47 18 31	066 08 03
STRATMAT-CENTRAL	021-100	021 O 08	47 19 11	066 06 25
STURGEON LAKE	052-015	052 G 15	49 52 35	090 52 53
SUFFIELD	021-005	021 E 05	45 19 09	071 57 35
TEAHAN	021-028	021 H 10	45 43	064 59 30
TEDI(BRANDYWINE) VAN SILVER	092-007	092 J 03	50 05	123 08 30
TETREAULT	031-009	031 I 16	46 49 30	072 20 54
TONNANCOURT-3	032-269	032 C 15	48 51 48	076 59 00
TROUT BAY	052-007	052 M 01	51 00 32	094 12
TULK'S POND	012-021	012 A 11	48 30 54	057 12 12
TULSEQUAH CHIEF	104-003	104 K 12	58 44 20	133 34 30
TWIN J	092-015	092 B 13	48 52	123 47
UNITED MONTAUBAN	031-020	031 I 16	46 50 24	072 20 42
VAMP LAKE	063-029	063 K 14	54 56 13	101 10 20
VAUZE	032-029	032 D 06	48 21 48	079 04 42
VENDOME	032-012	032 C 05	48 25 24	077 39 42
VERMILION LAKE	041-024	041 I 11	46 31 00	081 21 00
WEDGE	021-050	021 O 08	47 23 40	066 07 58
WEEDON	021-004	021 E 11	45 42 15	071 22 23
WESTARM	063-052	063 K 12	54 38 30	101 50 12
WESTMIN (HW)	092-016	092 F 12	49 34 00	125 35 15
WESTMIN (LYNX,MYRA,PRICE)	092-002	092 F 12	49 34 32	125 36 07
WHITE LAKE	063-016	063 K 12	54 42 50	101 43 40
WILDNEST	063-008	063 M 01	55 03 35	102 14 50
WILLECHO	042-012	042 F 04	49 10 30	085 52 48
WILLROY	042-014	042 F 04	49 09 27	085 49 28
YAVA	076-005	076 G 12	65 36 40	107 56 11
YORK HARBOUR	012-010	012 G 01	49 02 53	058 18 28
ZENMAC	042-006	042 D 14	48 58 50	087 21 30

APPENDIX C

SELECTED BIBLIOGRAPHY FOR CANADIAN LEAD-ZINC DEPOSITS, ARRANGED ALPHABETICALLY BY DEPOSIT-NAME

CONTACT METASOMATIC

CALEDONIA 092-010

Gunning, H.C.
1930: Geology and mineral deposits of Quatsino-Nimpkish area, Vancouver Island, British Columbia; in Geological Survey of Canada, Summary Report 1929, Part A, p. 122-124.

Northcote, K.E.
1971: Caledonia, Bluebell, Cascade; British Columbia, Geology Exploration and Mining, 1970, p. 265.

LIME HILL 011-007

Kelley, D.G.
1967: Baddeck and Whycocomagh map-areas; Geological Survey of Canada, Memoir 351, p. 58.

Milligan, G.C.
1970: Geology of the George River series, Cape Breton; Nova Scotia Department of Mines, Memoir 7, p. 97-99.

LYNN CREEK 092-008

Alscope Consolidated Ltd.
1963: Zinc mine on Burrard Inlet; Western Miner and Oil Review, v. 36, no. 11, p. 32-34.

Armstrong, J.E.
1954: Preliminary map Vancouver North, British Columbia; Geological Survey of Canada, Paper 53-28, p. 7.

MCDAME BELLE 104-001

Gabrielse, H.
1963: McDame map-area, Cassiar District, British Columbia; Geological Survey of Canada, Memoir 319, p. 114.

Holland, S.S.
1966: McDame Belle, Bar, Yellowjack, etc. (Ventures Mining Ltd.); British Columbia, Minister of Mines and Petroleum Resources, Annual Report 1965, p. 14-15.

MEAT COVE 011-009

Chatterjee, A.K.
1979: Geology of the Meat Cove zinc deposit, Cape Breton Island, Nova Scotia; Nova Scotia Department of Mines, Paper 79-3, 27p.

Milligan, G.C.
1970: Geology of the George River series, Cape Breton; Nova Scotia Department of Mines, Memoir 7, p. 82-85, 95-97.

VIECO WHIPSAW/ RAM & ROD 095-006

Padgham, W.A., Kennedy, M.W., Jefferson, C.W., Hughes, D.R., and Murphy, J.D.
1975: Mineral industry report 1971 and 1972, Northwest Territories; Indian and Northern Affairs, EGS 1975-8, p. 156-157.

ZIP 092-013

Gunning, H.C.
1932: Preliminary Report on the Nimpkish Lake quadrangle, Vancouver Island, B.C.; in Geological Survey of Canada, Summary Report 1931, Part A, p. 30-32.

Hoadley, J.W.
1953: Geology and mineral deposits of the Zeballos-Nimpkish area, Vancouver Island, British Columbia; Geological Survey of Canada, Memoir 272, p. 73-75.

APPENDIX C (CONT.)

MISSISSIPPI VALLEY

BEAR-TWIT 106-003

Dawson, K.M.
1975: Carbonate-hosted zinc-lead deposits of the northern Canadian Cordillera; in Report of Activities, Part A, Geological Survey of Canada, Paper 75-1A, p. 239-241.

Gibbins, W.A., Seaton, J.B., Laporte, P.J., Murphy, J.D., Hurdle, E.J. and Padgham, W.A.
1977: Mineral industry report 1974, Northwest Territories; Indian and Northern Affairs, EGS 1977-5, p. 214-215.

Padgham, W.A., Seaton, J.B., Laporte, P.J. and Murphy, J.D.
1976: Godlin Lakes District; in Mineral industry report 1973, Northwest Territories; Indian and Northern Affairs, EGS 1976-9, p. 167-168.

ECLIPSE 068-002

Gibbins, W.A., Seaton, J.B., Laporte, P.J., Murphy, J.D., Hurdle, E.J. and Padgham, W.A.
1977: Mineral industry report 1974, Northwest Territories; Indian and Northern Affairs, EGS 1977-5, p. 55-57.

GAY'S RIVER 011-001

Akande, S.O. and Zentilli, M.
1983: Genesis of the lead zinc mineralization at Gays River, Nova Scotia, Canada; in International Conference on Mississippi Valley Type Lead-Zinc Deposits, G. Kisvarsany, S.K. Grant, W.P. Pratt, and J.W. Koenig (eds.), University of Missouri-Rolla, Rolla, Missouri, U.S.A., p. 546-557.

Akande, S.O. and Zentilli, M.
1984: Geologic, fluid inclusion, and stable isotope studies of the Gays River lead-zinc deposit, Nova Scotia, Canada; Economic Geology, v. 79, p. 1187-1211.

Hatt, B.L.
1978: An interpretation of the carbonate geology exposed in the decline at Gay's River, Nova Scotia; M.Sc. thesis, Dalhousie University, Halifax, Nova Scotia, 134p.

MacEachern, S.B. and Hannon, P.
1974: The Gays River discovery - A Mississippi Valley type lead-zinc deposit in Nova Scotia; Canadian Institute of Mining and Metallurgy, Bulletin, v. 67, no. 750, p. 61-66.

MacLeod, J.L.
1975: Diagenesis and sulphide mineralization at Gay's River, Nova Scotia; B.Sc. thesis, Dalhousie University, Halifax, Nova Scotia, 138p.

GAYNA 106-007

Hardy, J.L.
1979: Stratigraphy, brecciation, and mineralization, Gayna River, Northwest Territories; M.Sc. thesis, University of Toronto, Toronto, 467p.

Hewton, R.S.
1982: Gayna River: A Proterozoic Mississippi Valley-type zinc-lead deposit; in Precambrian Sulphide Deposits, R.W. Hutchinson, C.D. Spence, and J.M. Franklin (eds.), Geological Association of Canada, Special Paper 25, p. 667-700.

GIANT / SILVER GIANT 082-071

Evans, C.S.
1933: Briscoe-Dogtooth map-area, B.C.; in Geological Survey of Canada, Summary Report 1932, pt. A II, p. 173-175.

Hedley, M.S.
1950: Silver Giant Mines, Limited; British Columbia, Minister of Mines, Annual Report 1949, p. 200-204.

KICKING HORSE / MONARCH 082-097

Hedley, M.S.
1950: Monarch and Kicking Horse (Base Metals Mining Corporation Limited); British Columbia, Minister of Mines, Annual Report 1949, p. 205-208.

Ney, C.S.
1951: Ore deposits at Field, B.C. (Geology of the Monarch and Kicking Horse Mines); Western miner, v. 24, no. 6, p. 51-60.

LAKE MONTE 034-001

Harewood, T.A.
1949: The lead zinc deposits of Richmond Gulf; B.A.Sc. thesis University of Toronto, Toronto.

Stevenson, I.M.
1968: A geological reconnaissance of Leaf River map-area, New Quebec and Northwest Territories; Geological Survey of Canada, Memoir 356, p. 86.

NANCY ISLAND 033-002

Harewood, T.A.
1949: The lead zinc deposits of Richmond Gulf; B.A.Sc. thesis University of Toronto, Toronto.

Stevenson, I.M.
1968: A geological reconnaissance of Leaf River map-area, New Quebec and Northwest Territories; Geological Survey of Canada, Memoir 356, p. 86.

NANISIVIK 048-001

Anonymous
1981: Award-winning Polaris mine nears production; Canadian Mining Journal, v. 102, no. 5 (May), p. 125-150.

Clayton, R.H. and Thorpe, L.
1982: Geology of the Nanisivik zinc-lead deposit; in Precambrian Sulphide Deposits, R.W. Hutchinson, C.D. Spence, and J.M. Franklin (eds.), Geological Association of Canada, Special Paper 25, p. 739-758.

Goodwin, J.A.
1981: Nanisivik mine; in Mineral Industry Report 1978, Northwest Territories, Indian and Northern Affairs, EGS 1981, p. 11-13.

Lord, C., Laporte, P.J., Gibbins, E.J., Hurdle, E.J., Seaton, J.B., and Padgham, W.A.
1978: Mineral industry report 1976, Northwest Territories; Indian and Northern Affairs, EGS 1978-11, p. 9-11.

Olson, R.A.
1977: Geology and genesis of zinc-lead deposits within a late Proterozoic dolomite, northern Baffin Island, N.W.T.; Ph.D. thesis, University of British Columbia, Vancouver, 371p.

Olson, R.A.
1984: Genesis of paleokarst and strata-bound zinc-lead sulfide deposits in a Proterozoic dolostone, Northern Baffin Island, Canada; Economic Geology, v. 79, p. 1056-1103.

NEWFOUNDLAND ZINC 012-006

Collins, J.A. and Smith L.
1972: Lithostratigraphic controls of some Ordovician sphalerite; in Ores in Sediments, G.C. Amstutz and A.J. Bernard (eds.), Springer-Verlag, Berlin, Heidelberg, New York, p. 79-91.

APPENDIX C (CONT.)

MISSISSIPPI VALLEY (CONT.)

Collins, J.A. and Smith L.
1972: Sphalerite as related to the tectonic movements, deposition, diagenesis and karstification of a carbonate platform; 24th International Geological Congress, Montreal, 1972, Section 6, p. 208-215.

Coron, C.R.
1981: Facies relations and ore genesis of the Newfoundland Zinc Mines deposits, Daniel's Harbour, Western Newfoundland; Ph.D. thesis, University of Toronto, 167p.

Dean, P.L.
1974: The sphalerite deposits near Daniel's Harbour; in Metallogeny and Plate Tectonics, D.F. Strong (ed.), A Guidebook for the NATO Advanced Studies Institute on Metallogeny and Plate Tectonics, May 1974, p. 139-142.

PINE POINT DISTRICT 085-002

Irvine, W.T. and Gondhi, J.
1972: Major lead-zinc deposits of western Canada; 24th International Geological Congress, Field Excursion A24-C24, p. 3-20.

Kyle, J.R.
1981: Geology of the Pine Point lead-zinc district; in Handbook of Stratabound and Stratiform Ore Deposits, v. 9, K.H. Wolf (ed.), Elsevier Publishing Company, New York-Amsterdam, p. 643-741.

Rhodes, D., Lantos, E.A., Lantos, J.A., Webb, R.J., and Owens, D.C.
1984: Pine Point orebodies and their relationship to the stratigraphy, structure, dolomitization, and karstification of the Middle Devonian barrier complex; Economic Geology, v. 79, p. 991-1055.

Skall, H.
1975: The paleoenvironment of the Pine Point lead-zinc district; Economic Geology, v. 70, no. 1, p. 22-47.

POLARIS 068-001

Gibbins, W.A., Seaton, J.B., Laporte, P.J., Murphy, J.D., Hurdle, E.J. and Padgham, W.A.
1977: Mineral industry report 1974, Northwest Territories; Indian and Northern Affairs, EGS 1977-5, p. 55-57.

Jowett, E.C.
1975: Nature of the ore-forming fluids of the Polaris lead-zinc deposit, Little Cornwallis Island, N.W.T., from fluid inclusion studies; Canadian Institute of Mining and Metallurgy, Bulletin, v. 68, no. 755, p. 124-129.

Kerr, J. Wm.
1977: Cornwallis lead-zinc district; Mississippi Valley-type deposits controlled by stratigraphy and tectonics; Canadian Journal of Earth Sciences, v. 14, no. 6, p. 1402-1426.

ROBB LAKE 094-004

McQueen, R.W. and Thompson, R.I.
1978: Carbonate-hosted lead-zinc occurrences in northeastern British Columbia with emphasis on the Robb Lake deposit; Canadian Journal of Earth Sciences, v. 15, no. 11, p. 1736-1762.

Sangster, D.F.
1973: Geology of Canadian lead and zinc deposits; in Report of Activities, Part A, Geological Survey of Canada, Paper 73-1A, p. 129.

Thompson, R.I.
1973: Robb Lake property; British Columbia, Geology, Exploration and Mining, 1972, p. 463-476.

RUBY LAKE 033-001

Harewood, T.A.
1949: The lead zinc deposits of Richmond Gulf; B.A.Sc. thesis University of Toronto, Toronto.

Stevenson, I.M.
1968: A geological reconnaissance of Leaf River map-area, New Quebec and Northwest Territories; Geological Survey of Canada, Memoir 356, p. 86.

SILVER BASIN 082-152

Anonymous
1974: Silver Basin; British Columbia, Geology, Exploration and Mining, 1973, p. 93.

WESTMIN (AX GROUP) 085-009

Lord, C., Laporte, P.J., Gibbins, E.J., Hurdle, E.J., Seaton, J.B., and Padgham, W.A.
1978: Mineral industry report 1976, Northwest Territories; Indian and Northern Affairs, EGS 1978-11, p. 56.

APPENDIX C (CONT.)

SANDSTONE LEAD

GEORGE LAKE 064-010

Karup-Møller, S., and Brummer, J.J.
1970: The George Lake zinc deposit, Wollaston Lake area, Northeastern Saskatchewan; Economic Geology, v. 65, no. 7, p. 862-874.

YAVA (SILVERMINE) 011-012

Bonham, O.J.H.
1983: Mineralization controls at the Yava lead deposit, Salmon River, Cape Breton county, Nova Scotia; M.Sc. thesis, Dalhousie University, Halifax, Nova Scotia, 282p.

Patterson, J.M.
1979: Salmon River lead deposit of Yava Mines, Nova Scotia; Canadian Mining Journal, v. 100, no. 5, p. 54-57.

Scott, P.
1980: Geochemistry and petrography of the Salmon River lead deposit, Cape Breton Island, Nova Scotia; M.Sc. thesis, Acadia University, Wolfville, Nova Scotia, 111p.

Scott, P.
1981: Salmon River lead project; Nova Scotia Department of Mines and Energy, Mineral Resources Division Report of Activities 1979, Report 80-1, p. 91-93.

APPENDIX C (CONT.)

SEDIMENT HOSTED EXHALATIVE

ANNEX 082-002

Lang, J.B.C.
1975: Annex, Reeves Macdonald mine; British Columbia Department of Mines and Mineral Resources, British Columbia Geology Exploration and Mining, 1974, p. 68-69.

CIRQUE 094-005

Jefferson, C.W., Kelly, D.B., Pigage, L.C., and Roberts, W.I.
1983: The Cirque barite-zinc-lead deposits, northeastern British Columbia; in Sediment-Hosted Stratiform Lead-Zinc Deposits, D.F. Sangster, (ed.), Mineralogical Association of Canada, Short Course Handbook, Victoria, British Columbia, p. 121-140.

MacIntrye, D.G.
1982: Geologic setting of recently discovered stratiform barite-sulphide deposits in northeastern British Columbia; Canadian Institute of Mining and Metallurgy, Bulletin, v. 75, no. 840, p. 99-113.

MacIntyre, D.G.
1980: Cirque barite-zinc-lead-silver deposit; British Columbia, Ministry of Energy, Mines and Petroleum Resources, Geological Fieldwork 1979, Paper 80-1, p. 69-74.

COLBY 082-128

Höy, T.
1975: Kingfisher, Brightstar; British Columbia, Geology Exploration and Mining, 1974, p. 91-94.

Höy, T.
1976: FX, FC, Colby; British Columbia Department of Mines and Petroleum Resources, Geological Fieldwork 1975, p. 11-18.

COTTON BELT 082-079

Höy, T.
1982: Stratigraphic and structural setting of stratabound lead-zinc deposits in southeastern B.C.; Canadian Institute of Mining and Metallurgy, Bulletin, v. 75, no. 840, p. 114-134.

Nichols, H.G.
1928: Cotton Belt; British Columbia, Minister of Mines Annual Report 1927, p. 195-197.

Wheeler, J.O.
1965: Big Bend map-area, British Columbia; Geological Survey of Canada, Paper 64-32, p. 28.

DUNCAN 082-062

Fyles, J.T.
1964: Geology of the Duncan Lake area, Lardeau district, British Columbia; British Columbia Department of Mines and Petroleum Resources, Bulletin No. 49, p. 71-75.

McDonald, J.D. and Fyles, J.T.
1961: Duncan (The Consolidated Mining and Smelting Company of Canada, Limited); British Columbia, Minister of Mines and Petroleum Resources, Annual Report 1960, p. 79-82.

Muraro, T.W.
1962: Stratigraphy, structure and mineralization at the Duncan mine, Lardeau district, British Columbia; M.Sc. thesis, Queen's University, Kingston, Ontario.

DY 105-033

Hall, B.V.
1979: DY deposit- An update; Paper presented at Geoscience Conference, Whitehorse, Yukon Territory, December 1979.

Morin, J.A., Marchand, M., and Debicki, R.L.
1980: Mineral industry report 1978, Yukon Territory; Indian and Northern Affairs, p. 40.

FARO 105-002

Findlay, D.C.
1969: The mineral industry of Yukon Territory and southwestern District of Mackenzie, 1968; Geological Survey of Canada, Paper 69-55, p. 29-30.

Gondi, J.
1972: Geology of the Anvil mine; in Major Lead-Zinc Deposits of Western Canada, 24th International Geological Congress, Montreal 1972, Field Excursion A24-C24, p. 20-26.

Templeman-Kluit, D.J.
1972: Geology and origin of the Faro, Vangorda and Swim concordant zinc-lead deposits, Central Yukon Territory; Geological Survey of Canada, Bulletin 208, p. 49-59.

FERGUSON 094-002

Dolmage, V.
1928: Finlay River district, B.C.; in Geological Survey of Canada, Summary Report, 1927, Part A, p. 37-40.

Roots, E.F.
1954: Geology and mineral deposits of Aiken Lake map-area, British Columbia; Geological Survey of Canada, Memoir 274, p. 204-208.

GOZ 106-005

Reeve, A.F.
1977: The Goz Creek zinc deposit, Yukon Territory; in Mineral Industry Report 1976, Yukon Territory, Indian and Northern Affairs, EGS 1977-1, p. 6-19.

GRUM 105-032

Sinclair, W.D., Maloney, J.M. and, Craig, D.B.
1975: Mineral industry report 1974, Yukon Territory; Indian and Northern Affairs, EGS 1975-9, p. 130-131.

Sirola, W.M.
1977: Kerr Addison's Grum deposit: Exploration in the Yukon's Anvil Range; Canadian Mining Journal, v. 98, no. 4., p. 40-45.

H.B. 082-005

Fyles, J.T. and Hewlett, C.G.
1959: Stratigraphy and structure of the Salmo lead-zinc area; British Columbia Department of Mines, Bulletin No. 41, p. 101-103.

Irvine, W.T.
1957: The H.B. Mine; in Structural Geology of Canadian Ore Deposits, v. 2, Canadian Institute of Mining and Metallurgy, p. 124-131.

Warning, G.F.
1960: Geology of the H.B. mine; Canadian Institute of Mining and Metallurgy, Transactions, v. 63, p. 520-523.

HOWARD'S PASS 105-027

Ainsworth, B., Kowalchuk, J.M. and Rotherham, D.C.
1980: The Howard's Pass Pb/Zn deposit: A geochemical case history; Preprint of paper presented at Canadian Institute of Mining and Metallurgy, Annual General Meeting, Toronto, April 1980.

Morganti, J.M.
1979: The geology and ore deposits of the Howards Pass area; Ph.D. thesis, University of British Columbia, Vancouver.

APPENDIX C (CONT.)

SEDIMENT HOSTED EXHALATIVE (CONT.)

Morin, J.A., Marchand, M., and Debicki, R.L.
1980: Mineral industry report 1978, Yukon Territory; Indian and Northern Affairs, p. 69.

JASON 105-034

Carne, R.C.
1979: Geological setting and stratiform mineralization, Tom claims, Yukon Territory; Indian and Northern Affairs, EGS 1979-4, p. 3, 15, 19, 23.

Indian and Northern Affairs Canada
1981: Jason; in Yukon, Geology and Exploration 1979-1980, p. 216.

Lydon, J.W., Lancaster, R.D., and Karkkainen, P.
1979: Genetic controls of Selwyn Basin stratiform barite/sphalerite/galena deposits: An investigation of the dominant barium mineralogy of the Tea deposit, Yukon; in Current Research, Part B, Geological Survey of Canada, Paper 79-1B, p. 223-229.

JERSEY 082-004

Bradley, D.E.
1970: Geology of the Jersey lead-zinc mine, Salmo, British Columbia; in Lead-Zinc Deposits in the Kootenay Arc, Northeasteren Washington and Adjacent British Columbia, State of Washington, Department of Natural Resources, Bulletin No. 61, p. 89-98.

Fyles, J.T. and Hewlett, C.G.
1959: Stratigraphy and structure of the Salmo lead-zinc area; British Columbia Department of Mines, Bulletin No. 41, p. 113-119.

Little, J.D., Ball, C.W., Whishaw, Q.C., and Mylrea, F.H.
1953: The lead-zinc and tungsten properties of Canadian Exploration Limited, Salmo, B.C.; Canadian Institute of Mining and Metallurgy, Transactions, v. 56, p. 228-236.

KOOTENAY KING 082-117

Ney, C.S.
1957: Kootenay King mine; in Structural Geology ofCanadian Ore Deposits, v. 2, Canadian Institute of Mining and Metallurgy, p. 153-158.

Rice, H.M.A.
1937: Cranbrook map-area, British Columbia; Geological Survey of Canada, Memoir 207, p. 45-47.

LAFONTAINE 031-031

Gauthier, M.
1982: Métallogénie du zinc dans la région de Maniwaki-Gracefield, Québec; Ph.D. thesis, Ecole Polytechnique, Université de Montréal, Montréal, Quebec, 210p.(p. 81)

LEITCH 031-030

Gauthier, M.
1982: Métallogénie du zinc dans la région de Maniwaki-Gracefield, Québec; Ph.D. thesis, Ecole Polytechnique, Université de Montréal, Montréal, Quebec, 210p (p. 81)

LONG LAKE 031-005

Brown, A.C.
1976: The Long Lake zinc mine, Frontenac County, Ontario; Mineral Exploration Research Institute, Case History 76-2, (Department of Mineral Engineering, Ecole Polytechnique, University of Montreal), 32p.

Wolff, J.M.
1982: The Long Lake zinc deposit, description and classification; Economic Geology, v. 77, p. 488-496.

MEL GROUP 095-005

Carne, R.C.
1976: Geology of the stratabound barite-lead-zinc deposits on the Mel and Jean claim groups, Coal River, Yukon; Indian and Northern Affairs, Open File Report, EGS 1976-16, p. 33-41.

Ginn, R.M.
1981: Mel barite-lead-zinc deposit, Yukon Territory; Canadian Institute of Mining and Metallurgy, 83rd Annual General Meeting, Calgary, May 1981, 16p.

MINERAL KING 082-065

Fyles, J.T.
1960: Windermere, Mineral King (Sheep Creek Mines Limited); British Columbia, Minister of Mines, Annual Report 1959, p. 74-89.

Magee, J.B. and Cummings, W.W.
1960: The Mineral King mine; Canadian Institute of Mining and Metallurgy, Bulletin, v. 53, no. 578, p. 389-391.

MOSQUITO KING 082-127

Bacon, W.R.
1950: Mosquito King; British Columbia, Minister of Mines, Annual Report 1949, p. A134-A136.

PARADISE 082-066

Atkinson, S.J.
1975: Surface geology of the Paradise basin; Geology in British Columbia, British Columbia Department of Mines and Petroleum Resources, p. G7-G12.

Hedley, M.S.
1950: Paradise (Sheep Creek Gold Mines, Limited); British Columbia, Minister of Mines, Annual Report 1949, p. 196-199.

Walker, J.F.
1926: Geology and mineral deposits of Windermere map-area, British Columbia; Geological Survey of Canada, Memoir 148, p. 46.

QUARTZ LAKE (MCMILLAN) 095-004

Morin, J.A.
1981: The McMillan deposit - A stratabound lead-zinc-silver deposit in sedimentary rocks of upper Proterozoic age; in Yukon, Geology and Exploration 1979-80, Indian and Northern Affairs, p. 105-109.

Vaillancourt, P. de G.
1982: Geology and genesis of pyrite-sphalerite-galena concentrations in Proterozoic quartzite at Quartz Lake, Yukon Territory: M.Sc. thesis, University of Western Ontario, London, Ontario, 178p.

REEVES MACDONALD (REMAC) 082-003

Addie, G.G.
1970: The Reeves Macdonald mine, Nelway, British Columbia; in Lead-Zinc Deposits in the Kootenay Arc, Northeastern Washington and Adjacent British Columbia, State of Washington, Department of Natural Resources, Bulletin No. 61, p. 79-88.

Fyles, J.T. and Hewlett, C.G.
1957: Reeves Macdonald mine; in Structural Geology of Canadian Ore Deposits, v. 2, Canadian Institute of Mining and Metallurgy p. 110-116.

Green, L.H.
1954: Wall-rock alteration at certain lead-zinc replacement deposits in limestone, Salmo map area, British Columbia; Geological Survey of Canada, Bulletin 29, p. 12-16.

APPENDIX C (CONT.)

SEDIMENT HOSTED EXHALATIVE (CONT.)

RENMAC 031-007

Carter, T.R., Colvine, A.C. and Meyn, H.D.
1980: Geology of base metal, precious metal, iron, and molybdenum deposits in the Pembroke-Renfrew area; Ontario Geological Survey, Mineral Deposits Circular 20, p. 17-22.

Stewart, J.P.
1979: The geology and mineralogy of the Renprior zinc deposit; B.Sc. thesis 1979, Carleton University, Ottawa.

RIVER JORDAN 082-073

Fyles, J.T.
1970: The Jordan River area near Revelstoke, British Columbia; British Columbia, Department of Mines and Petroleum Resources, Bulletin No. 57, p. 45-48.

Riley, C.
1961: The River Jordan lead zinc deposit, Revelstoke Mining Division, B.C.; Canadian Institute of Mining and Metallurgy, Transactions, v. 64, p. 268-272.

Wheeler, J.O.
1965: Big Bend map-area, British Columbia; Geological Survey of Canada, Paper 64-32, p. 29.

SMITHFIELD 011-003

Alcock, F.J.
1930: Zinc and lead deposits of Canada; Geological Survey of Canada, Economic Geology Series No. 8, p. 56-60.

Felderhof, G.W.
1978: Barite, celestite and fluorite in Nova Scotia; Nova Scotia Department of mines, Bulletin 4, p. 163-170.

Stevenson, I.M.
1958: Truro map-area, Colchester and Hants Counties Nova Scotia; Geological Survey of Canada, Memoir 297, p. 93-98.

SULLIVAN 082-055

Campbell, F.A. and Ethier, V.G.
1983: Environment of deposition of the Sullivan orebody; Mineralium Deposita, v. 18, p. 39-55.

Carswell, H.T.
1961: Origin of the Sullivan lead-zinc-silver deposit, British Columbia; Ph.D. thesis, Queen's University, Kingston, Ontario, 150p.

Ethier, V.G., Campbell, F.A., Both, R.A., and Krouse, H.R.
1976: Geological setting of the Sullivan orebody and estimates of temperatures and pressure of metamorphism, Economic Geology, v. 71, no. 8, p. 1570-1587.

Hamilton, J.M., Bishop, D.T., Morris, H.C., and Owens, O.E.
1982: Geology of the Sullivan orebody, Kimberly, B.C., Canada; in Precambrain Sulphide Deposits, R.W. Hutchinson, C.D. Spence, and J.M. Franklin (eds.), Geological Association of Canada, Special Paper 25, p. 597-665.

Hamilton, J.M., Delaney, G.D., Havsen, R.L., and Ransom, P.W.
1983: Geology of the Sullivan deposit, Kimberly, B.C., Canada; in Sediment-Hosted Stratiform Lead-Zinc Deposits, D.F. Sangster (ed.), Mineralogical Association of Canada, Short Course Handbook, Victoria, B.C., p. 31-83.

Höy, T., Edmunds, F.R., Hamilton, J.M., Hauser, R.L., Muraro, T.W., and Ransom, P.W.
1981: Lead-zinc and copper-zinc deposits in southeastern British Columbia; Geological Association of Canada, Annual Meeting, Calgary, 1981, Field Guides to Geology and Mineral Deposits, p. 41-67.

Irvine, W.T. and Gondi, J.
1972: An outline of the geology of the Sullivan mine, Kimberley, British Columbia; 24th International Geological Congress, Field Excursion A24-C24, p. 26-34.

SWIM LAKE 105-001

Sinclair, W.D., Maloney, J.M. and, Craig, D.B.
1975: Mineral industry report 1974, Yukon Territory; Indian and Northern Affairs, EGS 1975-9, p. 134.

Templeman-Kluit, D.J.
1972: Geology and origin of the Faro, Vangorda and Swim concordant zinc-lead deposits, Central Yukon Territory; Geological Survey of Canada, Bulletin 208, p. 42-46.

TOM 105-003

Carne, R.C.
1979: Geological setting and stratiform mineralization, Tom claims, Yukon Territory; Indian and Northern Affairs, EGS 1979-4, 30p.

Carne, R.C.
1979: Upper Devonian stratiform barite-lead-zinc-silver mineralization at Tom claims, MacMillan Pass, Yukon Territory; M.Sc. thesis, University of British Columbia, Vancouver, 149p.

Large, D.E.
1980: On the geology, goechemistry and genesis of the Tom Pb-Zn-barite deposit, Yukon Territory, Canada; Ph.D. thesis, Technische Universitat Braunschweig, Braunschweig, West Germany, 137p.

VANGORDA 105-005

Templeman-Kluit, D.J.
1972: Geology and origin of the Faro, Vangorda and Swim concordant zinc-lead deposits, Central Yukon Territory; Geological Survey of Canada, Bulletin 208, p. 46-49.

WALTON 021-030

Boyle, R.W.
1972: The geology, geochemistry, and origin of the barite, manganese and lead-zinc-copper-silver deposits of the Walton-Cheverie area, Nova Scotia; Geological Survey of Canada, Bulletin 166, p. 23-27.

Boyle, R.W. and Jambor, J.L.
1966: Mineralogy, geochemistry, and origin of the Magnet Cove barite-sulphide deposit, Walton, N.S.; Canadian Institute of Mining and Metallurgy, Bulletin, v. 59, no. 654, p. 1209-1228.

Boyle, R.W. and Jambor, J.L.
1966: Mineralogy, geochemistry, and origin of the Magnet Cove barite-sulphide deposit, Walton, N.S.; Canadian Institute of Mining and Metallurgy, Bulletin, v. 59, no. 654, p. 1209-1228.

WIGWAM 082-070

Thompson, R.I.
1978: Geology of the Akolkolex River area; British Columbia, Ministry of Energy, Mines and Petroleum Resources, Bulletin 60, p. 70-71.

Walker, J.F., Bancroft, M.F. and, Gunning, H.C.
1930: Lardeau map-area, British Columbia; Geological Survey of Canada, Memoir 161, p. 101-103.

APPENDIX C (CONT.)

VEIN AND REPLACEMENT

ADAMS PLATEAU / LUCKY COON 082-147

Stevenson, J.S.
1937: Lucky Coon (McGillivray Group); British Columbia, Minister of Mines, Annual Report 1936, p. D41-D43.

ALTOONA GROUP 082-108

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 4-5.

AMERICAN BOY 082-138

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 5-11

ANTOINE SILVER 082-126

Hedley, M.S. and Olsen, P.E.
1964: Antoine (Antoine Silver Mines); British Columbia, Minister of Mines, Annual Report 1963, p. 74-88.

ARLINGTON 082-144

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 168.

Olson, P.E.
1971: Arlington; British Columbia, Geology Exploration and Mining, 1970, p. 448-449.

ARSENAULT LAKE 022-011

Skidmore, W.B.
1965: Honorat-Reboul area, Bonaventure County; Quebec Department of Natural Resources, Geological Report 107, p. 25.

BANKER 082-143

Eastwood, G.E.P.
1952: Highlander-Hot Springs area; British Columbia, Minister of Mines, Annual Report 1951, p. 144-156.

Rice, H.M.A.
1941: Banker Mine - Nelson map-area, East Half, B.C.; Geological Survey of Canada, Memoir 228, p. 77-78.

BARB - MATT BERRY 105-011

Craig, D.B. and Milner, M.W.
1975: Mineral industry report 1971 and 1972, Yukon Territory; Indian Affairs and Northern Development EGS 1975-6, v. 1, p. 122-123.

Findlay, D.C.
1969: The mineral industry of Yukon Territory and southwestern District of Mackenzie, 1968; Geological Survey of Canada, Paper 69-55, p. 47-48.

Kuo, S.L.
1976: Geology and geochemistry of stratabound ore deposits in south central Yukon Territory and District of Mackenzie, Northwest Territories, Ph.D. thesis, University of Alberta, Calgary, p. 107.

BELL 082-129

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 141.

BERENS RIVER 053-003

Adams, G.W.
1976: Precious metal veins of the Berens River mine, Northwestern Ontario; M.Sc. thesis, 1976, University of Western Ontario, London.

Ayers, L.D.
1972: Setting Net and Northwind Lakes areas, District of Kenora (Patricia Portion); in Summary of Field Work, 1972, V.G. Milne and D.F. Hewitt (eds.), Ontario Department of Mines, Miscellaneous Paper 53, p. 6-13.

Keys, M.R.
1948: Berens River mine; in Structural Geology of Canadian Ore Deposits, Canadian Institute of Mining and Metallurgy, Jubilee Volume (v. 1), p. 365-368.

BIG CANYON 104-007

Aitken, J.D.
1959: Atlin map-area, British Columbia; Geological Survey of Canada, Memoir 307, p. 71-72.

Cockfield, J.E.
1926: Silver-lead deposits in Atlin District; in Summary Report, 1925, Part A, Geological Survey of Canada, p. 15-24.

BLUEBELL 082-052

Höy, T.
1980: Geology of Riondel area, central Kootenay Arc, southeastern British Columbia; British Columbia, Ministry of Energy, Mines and Petroleum Resources, Bulletin 73, p. 79-85.

Irvine, W.T.
1957: The Bluebell mine; in Structural Geology of Canadian Ore Deposits, v. 2, Canadian Institute of Mining and Metallurgy, p. 95-104.

Ohmoto, H. and Rye, R.O.
1970: The Bluebell mine, British Columbia. I. Mineralogy, paragenesis, fluid inclusions, and the isotopes of hydrogen, oxygen, and carbon; Economic Geology, v. 65, no. 4, p. 417-437.

BOSUN 082-048

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 20-23.

Little, H.W.
1960: Nelson map area, West half, British Columbia; Geological Survey of Canada, Memoir 308, p. 134-135.

BRADINA 093-004

Church, B.N.
1970: Silver Queen (Nadina); British Columbia, Geology, Exploration and Mining, 1969, Department of Mines and Petroleum Resources p. 126-139.

Holland, S.S.
1966: Silver Queen (Nadina Explorations Limited); British Columbia, Geology, Exploration and Mining, 1965, p. 81-84.

BRANDYWINE-NORTHAIR 092-006

Ditson, G.M.
1978: Metallogeny of the Vancouver-Hope area, British Columbia; M.Sc. thesis, University of British Columbia, Vancouver, p. 58-63.

Little, L.M.
1974: The geology and mineralogy of the Brandywine property lead-zinc-gold-silver deposit, Brandywine map-area, south-western British Columbia; B.Sc. thesis, University of British Columbia, Vancouver, 96p.

BROADVIEW 082-149

Fyles, J.T. and Eastwood, G.E.P.
1962: Geology of the Ferguson area; British Columbia, Department of Mines and Petroleum Resources, Bulletin No. 45, p. 58-59.

APPENDIX C (CONT.)

VEIN AND REPLACEMENT (CONT.)

CALEDONIA 082-150

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 200.

Hedley, M.S.
1945: Geology of the Whitewater and Lucky Jim mine areas, Slocan District, British Columbia; British Columbia Department of Mines, Bulletin No. 22, p. 31.

CANDEGO 022-008

Wolofsky, L.
1957: Candego property of East Macdonald Mines Ltd.; in Structural Geology of Canadian Ore Deposits, v. 2, Canadian Institute of Mining and Metallurgy, p. 477-484.

CARNATION 082-106

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 28-30.

Hedley, M.S.
1952: Geology and ore deposits of the Sandon area, Slocan mining camp, British Columbia; British Columbia Department of Mines, Bulletin No. 29, p. 70-74.

CLARK 106-006

Sinclair, W.D. and Gilbert, G.W.
1975: Clark Lakes; in Mineral Industry Report 1973, Yukon Territory, Indian and Northern Affairs, EGS 1975-7, p. 15-16.

COMSTOCK KENO 105-018

Boyle, R.W.
1965: Geology, geochemistry, and origin of the lead-zinc-silver deposits of the Keno Hill-Galena Hill area, Yukon Territory; Geological Survey of Canada, Bulletin 111, p. 42.

COPPER CROWN 093-006

Black, J.M.
1952: Cassiar Crown, Lakeview (Copper Ridge Silver Zinc Mines Limited); British Columbia, Minister of Mines, Annual Report 1951, p. 113-117.

Church, B.N.
1973: Geology of the Grouse Mountain area, Omineca Mining Division; British Columbia, Geology, Exploration and Mining, 1972, p. 397-417.

CORK PROVINCE 082-034

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 206-210.

CRONIN-BABINE 093-002

Anonymous
1979: Cronin mine; Exploration in British Columbia 1978, British Columbia, Ministry of Energy Mines and Petroleum Resources, p. E221.

Black, J.M.
1950: Cronin Babine Mines Limited; British Columbia, Minister of Mines, Annual Report 1949, p. 94-98.

DELHI PACIFIC 041-016

Card, K.D., McIlwaine, W.H. and Meyn, H.D.
1973: Geology of the Maple Mountain area; Ontario Department of Mines, Geological Report 106, p. 98-99.

Lawton, K.D.
1955: Geology of Delhi township; Ontario Department of Mines, Annual Report 1954, v. 63, pt. 4, p. 15-19.

DIXIE 105-025

Boyle, R.W.
1965: Geology, geochemistry, and origin of the lead-zinc-silver deposits of the Keno Hill-Galena Hill area, Yukon Territory; Geological Survey of Canada, Bulletin 111, p. 74-75.

Marchand, M., Morin, J.A., and Craig, D.B.
1979: Mayo mining district; in Mineral Industry Report 1977, Yukon Territory; Indian and Northern Affairs, EGS 1978-9, p. 30-31.

DORION 052-003

Franklin, J.M. and Mitchell, R.H.
1977: Lead-zinc-barite veins of the Dorion area, Thunder Bay District, Ontario; Canadian Journal of Earth Sciences, v. 14, no. 9, p. 1963-1979.

Shklanka, R.
1969: Copper, nickel, lead and zinc deposits of Ontario; Ontario Department of Mines, Mineral Resources Circular No. 12, p. 285.

DUNBRACK 011-002

Alcock, F.J.
1930: Zinc and lead deposits of Canada; Geological Survey of Canada, Economic Geology Series No. 8, p. 61-67.

Dickie, J.R.
1978: Geological, mineralogical and fluid-inclusion studies at the Dunbrack lead-silver deposit, Musquodoboit Harbour, Halifax county, Nova Scotia; B.Sc. thesis, Dalhousie University, Halifax, Nova Scotia, 59p.

MacMichael, T.P.
1975: The origin of the lead-zinc-silver ores and alteration of the surrounding granite at the Dunbrack mine, Musquodoboit Harbour, Nova Scotia; B.Sc. thesis, Dalhousie University, Halifax, Nova Scotia, 27p.

DUNWELL 103-004

Grove, E.W.
1971: Geology and mineral deposits of the Stewart area, northwestern British Columbia; British Columbia, Department of Mines and Petroleum Resources, Bulletin No. 58, p. 129-130.

Hanson, G.
1929: Bear River and Stewart River map-areas, Cassiar District, British Columbia; Geological Survey of Canada, Memoir 159, p. 54-56.

DUTHIE 093-005

Black, J.M.
1949: Duthie Mines (1946), Ltd.; British Columbia, Minister of Mines, Annual Report 1948, p. A82-A85.

Kerr, F.A.
1936: Mineral resources along the Canadian National Railway, between Prince Rupert and Prince George, B.C.; Geological Survey of Canada, Paper 36-20, p. 88-90.

Kindle, E.D.
1954: Mineral resources, Hazelton and Smithers areas, Cassiar and Coast Districts, British Columbia; Geological Survey of Canada, Memoir 223 (Revised Edition), p. 84-92.

APPENDIX C (CONT.)

VEIN AND REPLACEMENT (CONT.)

ELSA 105-021

Boyle, R.W.
1965: Geology, geochemistry, and origin of the lead-zinc-silver deposits of the Keno Hill-Galena Hill area, Yukon Territory; Geological Survey of Canada, Bulletin 111, p. 72-74.

Marchand, M., Morin, J.A., and Craig, D.B.
1979: Mayo mining district; in Mineral Industry Report 1977, Yukon Territory; Indian and Northern Affairs, EGS 1978-9, p. 80-81.

EMERALD-GLACIER 093-001

Duffell, S.
1959: Whitesail Lake map-area, British Columbia; Geological Survey of Canada, Memoir 299, p. 84-87.

Sutherland Brown, A.
1968: Emerald Glacier mine; British Columbia, Minister of Mines and Petroleum Resources Annual Report 1967, p. 110-113.

ENTERPRISE 082-137

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 172-173.

Little, H.W.
1960: Nelson map area, West half, British Columbia; Geological Survey of Canada, Memoir 308, p. 142-145.

ESTELLA 082-056

Hedley, M.S.
1964: Estella (Copper Soo Mining Company Limited); British Columbia, Minister of Mines and Petroleum Resources, Annual Report 1963, p. 82-84.

Starck, L.P.
1966: Newest base-metal producer in British Columbia; Western Miner, v. 39, no. 10, p. 28-34.

FEDERAL 022-007

Alcock, F.J.
1930: Zinc and lead deposits of Canada; Geological Survey of Canada, Economic Geology Series No. 8, p. 92-104.

Beidelman, J.C.
1924: Developing zinc and lead deposits in Gaspé peninsula; Canadian Institute of Mining and Metallurgy, Transactions, v. 27, p. 258-277.

Gill, J.E. and Auger, P.E.
1943: Zinc deposits of the Federal area, Gaspé, Quebec; Canadian Institute of Mining and Metallurgy, Transactions, v. 46, p. 456-473.

FENSOM PROSPECT/ELLA LAKE 041-003

Ginn, R.
1965: Geology of Nairn and Lorne townships; Ontario Department of Mines, Geological Report 35, p. 38-40.

Shklanka, R.
1969: Copper, nickel, lead and zinc deposits of Ontario; Ontario Department of Mines, Mineral Resources Circular No. 12, p. 253.

FORMO 105-024

Boyle, R.W.
1965: Geology, geochemistry, and origin of the lead-zinc-silver deposits of the Keno Hill-Galena Hill area, Yukon Territory; Geological Survey of Canada, Bulletin 111, p. 67-68.

FRONTENAC 031-004

Alcock, F.J.
1930: Zinc and lead deposits of Canada; Geological Survey of Canada, Economic Geology Series No. 8, p. 142-145.

GALENA FARM 082-040

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 43-48.

Little, H.W.
1960: Nelson map area, West half, British Columbia; Geological Survey of Canada, Memoir 308, p. 187-188

GALKENO 105-017

Boyle, R.W.
1965: Geology, geochemistry, and origin of the lead-zinc-silver deposits of the Keno Hill-Galena Hill area, Yukon Territory; Geological Survey of Canada, Bulletin 111, p. 58-59.

GOODENOUGH 082-146

Cockfield, W.E.
1936: Lode gold deposits of Ymir-Nelson area, British Columbia; Geological Survey of Canada, Memoir 191, p. 34-37.

HANNAM 042-011

Shklanka, R.
1969: Copper, nickel, lead and zinc deposits of Ontario; Ontario Department of Mines, Mineral Resources Circular No. 12, p. 303-304.

Walker, J.R.W.
1967: Geology of the Jackfish Middleton area; Ontario Department of Mines, Geological Report 50, p. 35.

HANSON LAKE 063-047

Byers, A.R.
1957: Geology and mineral deposits of the Hanson Lake area, Saskatchewan; Saskatchewan Department of Mineral Resources, Report No. 30 (Reprinted 1972), p. 38-40.

Coleman, L.C., Gaskarth, J.W., and Smith, J.R.
1970: Geology and geochemistry of the Hanson Lake area, Saskatchewan; Saskatchewan Research Council, Geology Division, Report No. 10, p. 83-84.

Kennedy, D.S.
1971: A textural and chemical analysis of the Hanson Lake ore deposit, Saskatchewan; M.Sc. thesis, University of Saskatchewan, Regina, 97p.

HAWK CREEK / ALBION 082-123

Evans, T.L., Campbell, F.A., and Krouse, H.R.
1968: A reconnaissance study of some western Canadian lead-zinc deposits; Economic Geology, v. 63, no. 4, p. 349-359.

Henderson, G.G.L.
1954: Hawk Creek; British Columbia, Minister of Mines, Annual Report 1953, p. 155-156.

HECTOR-CALUMET 105-014

Boyle, R.W.
1965: Geology, geochemistry, and origin of the lead-zinc-silver deposits of the Keno Hill-Galena Hill area, Yukon Territory; Geological Survey of Canada, Bulletin 111, p. 60-67.

Carmichael, A.D.
1957: United Keno Hill Mines; in Structural Geology of Canadian Ore Deposits, v. 2, Canadian Institute of Mining and Metallurgy, p. 60-77.

APPENDIX C (CONT.)

VEIN AND REPLACEMENT (CONT.)

HEWITT 082-046

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 51-58.

HIGHLAND 082-053

Schofield, S.J.
1920: Geology and ore deposits of Ainsworth mining camp, British Columbia; Geological Survey of Canada, Memoir 117, p. 37-40.

HIGHLAND BELL 082-013

Kidd, D.F.
1948: The amazing Highland-Bell; Western Miner, v. 21, no. 12, p. 158-159.

White, W.H.
1950: The Beaverdell silver camp; British Columbia, Minister of Mines, Annual Report 1949, p. 138-148.

HIGHLANDER 082-032

Eastwood, G.E.P.
1952: Highlander-Hot Springs area; British Columbia, Minister of Mines, Annual Report 1951, p. 144-156.

Schofield, S.J.
1920: Geology and ore deposits of Ainsworth mining camp, British Columbia; Geological Survey of Canada, Memoir 117, p. 45-49.

HUSKY 105-015

Marchand, M., Morin, J.A., and Craig, D.B.
1979: Mayo mining district; in Mineral Industry Report 1977, Yukon Territory; Indian and Northern Affairs, EGS 1978-9, p. 30-31.

Morin, J.A., Marchand, M., and Debicki, R.L.
1980: Mineral industry report 1978, Yukon Territory; Indian and Northern Affairs, p. 7.

IDAHO-ALAMO 082-089

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 59-62.

Hedley, M.S.
1952: Geology and ore deposits of the Sandon area, Slocan mining camp, British Columbia; British Columbia Department of Mines, Bulletin No. 29, p. 79-82.

INDIAN 104-009

Grove, E.W.
1971: Geology and mineral deposits of the Stewart area, northwestern British Columbia; British Columbia, Department of Mines and Petroleum Resources, Bulletin No. 58, p. 133-135.

IVANHOE 082-051

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 63-64.

Hedley, M.S.
1952: Geology and ore deposits of the Sandon area, Slocan mining camp, British Columbia; British Columbia Department of Mines, Bulletin No. 29, p. 82-84.

JACKSON 082-118

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 224-227.

JARDUN 041-010

Alcock, F.J.
1930: Zinc and lead deposits of Canada; Geological Survey of Canada, Economic Geology Series No. 8, p. 183-184.

Hay, R.E.
1963: The Geology of the Sault Ste. Marie map-area; Ph.D. thesis McGill University, Montreal, p. 281-295.

Shklanka, R.
1969: Copper, nickel, lead and zinc deposits of Ontario; Ontario Department of Mines, Mineral Resources Circular No. 12, p. 32.

KENO HILL 105-006

Boyle, R.W.
1965: Geology, geochemistry, and origin of the lead-zinc-silver deposits of the Keno Hill-Galena Hill area, Yukon Territory; Geological Survey of Canada, Bulletin 111, p. 53-55.

Carmichael, A.D.
1957: United Keno Hill Mines; in Structural Geology of Canadian Ore Deposits, v. 2, Canadian Institute of Mining and Metallurgy, p. 60-77.

Marchand, M., Morin, J.A., and Craig, D.B.
1979: Mayo mining district; in Mineral Industry Report 1977, Yukon Territory; Indian and Northern Affairs, EGS 1978-9, p. 30-31.

KEYMET 021-018

McAllister, A.L.
1957: Keymet Mine; in Structural Geology of Canadian Ore Deposits, v. 2, Canadian Institute of Mining and Metallurgy, p. 492-494.

Williams, D.A.
1974: Keymet (Zn-Pb-Ag-Cu); New Brunswick, Mineral Occurrence Report 21-P/13-W(c-4) Q-4.

KEYSTONE 082-148

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 201-203.

KINGDON 031-003

Alcock, F.J.
1930: Zinc and lead deposits of Canada; Geological Survey of Canada, Economic Geology Series No. 8, p. 136-138.

Carter, T.R., Colvine, A.C. and Meyn, H.D.
1980: Geology of base metal, precious metal, iron, and molybdenum deposits in the Pembroke-Renfrew area; Ontario Geological Survey, Mineral Deposits Circular 20, p. 29-31.

KOOTENAY FLORENCE 082-020

Hedley, M.S.
1952: Kootenay Florence (Western Mines Limited); British Columbia, Minister of Mines, Annual Report 1951, p. 156-159.

Schofield, S.J.
1920: Geology and ore deposits of Ainsworth mining camp, British Columbia; Geological Survey of Canada, Memoir 117, p. 40-41.

LA MANCHE 001-003

McCartney, W.D.
1967: Whitebourne map-area, Newfoundland; Geological Survey of Canada, Memoir 341, p. 115-118.

APPENDIX C (CONT.)

VEIN AND REPLACEMENT (CONT.)

LAST CHANCE 082-139

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 5-11.

LUCKY JIM 082-061

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 69-73.

Hedley, M.S.
1945: Geology of the Whitewater and Lucky Jim mine areas, Slocan District, British Columbia; British Columbia Department of Mines, Bulletin No. 22, p. 31-43.

Hedley, M.S.
1947: Geology of the Lucky Jim mine; Western Miner, V. 20, no. 2, p. 34-40.

LUCKY QUEEN 105-008

Alcock, F.J.
1930: Zinc and lead deposits of Canada; Geological Survey of Canada, Economic Geology Series No. 8, p. 233-235.

Boyle, R.W.
1965: Geology, geochemistry, and origin of the lead-zinc-silver deposits of the Keno Hill-Galena Hill area, Yukon Territory; Geological Survey of Canada, Bulletin 111, p. 34-37.

LUCKY THOUGHT 082-135

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 73-74.

LUSTDUST 093-008

Armstrong, J.E.
1949: Fort St. James map-area, Cassiar and Coast Districts, British Columbia; Geological Survey of Canada, Memoir 252, p. 172-173.

Sutherland Brown, A.
1966: Lustdust (Takla Silver Mines, Limited); British Columbia, Minister of Mines and Petroleum Resources, Annual Report 1965, p. 105.

MAMMOTH 082-037

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 75-78.

Hedley, M.S.
1952: Geology and ore deposits of the Sandon area, Slocan mining camp, British Columbia; British Columbia Department of Mines, Bulletin No. 29, p. 86-90.

MASTODON 082-074

Fyles, J.T.
1960: Windermere, Mineral King (Sheep Creek Mines Limited); British Columbia, Minister of Mines, Annual Report 1959, p. 106-117.

Pike, A.E.
1953: Development of the Mastodon zinc mine; Canadian Institute of Mining and Metallurgy, Bulletin, v. 46, no. 495, p. 403-410.

Wheeler, J.O.
1965: Big Bend map-area, British Columbia; Geological Survey of Canada, Paper 64-32, p. 29-30.

MATARROW 041-023

Shklanka, R.
1969: Copper, nickel, lead and zinc deposits of Ontario; Ontario Department of Mines, Mineral Resources Circular No. 12, p. 373-374.

MOLLY GIBSON 082-033

McKechnie, N.D. and Olson, P.E.
1968: Molly Gibson, Homestake Silver Ltd.; British Columbia, Minister of Mines, Annual Report 1967, p. 241-242.

MONTEZUMA GROUP 082-109

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 237-238.

MOUNT PLEASANT NORTH AREA 021-032

McAllister, A.L. and Lamarche, R.Y.
1972: Mt. Pleasant deposits and related volcanic rocks; in Mineral Deposits of Southern Quebec and New Brunswick, 24th International Geological Congress, Montreal, Field Excursion A58, p. 82-91.

Parrish, I.S. and Tully, J.V.
1978: Porphyry tungsten zones at Mt. Pleasant, N.B.; Canadian Institute of Mining and Metallurgy, Bulletin, v. 71, no. 794, p. 93-100.

NAMELESS & AUGUST FRACTIONS 082-133

Hedley, M.S.
1950: Woodbury Group; British Columbia, Minister of Mines, Annual Report 1949, p. 181-182.

NETTIE LAKE 082-120

Fyles, J.T. and Eastwood, G.E.P.
1962: Geology of the Ferguson area; British Columbia, Department of Mines and Petroleum Resources, Bulletin No. 45, p. 67-73.

Walker, J.F., Bancroft, M.F. and, Gunning, H.C.
1930: Lardeau map-area, British Columbia; Geological Survey of Canada, Memoir 161, p. 68-69.

NIGADOO 021-019

Davies, J.L., Tupper, W.M., Bachinski, D., Boyle, R.W., and Martin, G.
1969: Geology and mineral deposits of the Nigadoo River-Millstream River area, Gloucester County, New Brunswick; Geological Survey of Canada, Paper 67-49, 70p.

Suensilpong, S. and Stumpfl, E.F.
1971: The Nigadoo River base metal deposit, New Brunswick, Canada; Institution of Mining and Metallurgy, Transactions, Section B, v. 80, Bulletin no. 744, p. B95-B107.

NO CASH 105-020

Boyle, R.W.
1965: Geology, geochemistry, and origin of the lead-zinc-silver deposits of the Keno Hill-Galena Hill area, Yukon Territory; Geological Survey of Canada, Bulletin 111, p. 75-76.

Marchand, M., Morin, J.A., and Craig, D.B.
1979: Mayo mining district; in Mineral Industry Report 1977, Yukon Territory; Indian and Northern Affairs, EGS 1978-9, p. 30-31.

Morin, J.A., Marchand, M., and Debicki, R.L.
1980: Mineral industry report 1978, Yukon Territory; Indian and Northern Affairs, p. 7.

NOBLE FIVE 082-039

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 91-97.

NORTH STAR 082-031

Alcock, F.J.
1930: Zinc and lead deposits of Canada; Geological Survey of Canada, Economic Geology Series No. 8, p. 325-327.

APPENDIX C (CONT.)

VEIN AND REPLACEMENT (CONT.)

NORTH STAR 103-003

Black, J.M.
1951: North Star; British Columbia, Minister of Mines, Annual Report 1950, p. A103-A105.

Hanson, G.
1935: Portland Canal area, British Columbia; Geological Survey of Canada, Memoir 175, p. 74.

O'CONNOR LAKE 075-004

McGlynn, J.C.
1971: Metallic mineral industry, District of Mackenzie, Northwest Territories; Geological Survey of Canada, Paper 70-17, p. 142-143.

ODYNO / NEW NORZONE 032-024

Claveau, J., Ingham, W.N., and Robinson, W.G.
1951: Mining properties and development in Abitibi and Temiscamingue counties during 1948 and 1949; Quebec Department of Mines Preliminary Report 256, p. 50-51.

Van de Walle, M.
1971: Geology of the north half of Montbeillard township; Quebec Department of Natural Resources, Preliminary Report 602, p. 12-13.

ONEK 105-016

Boyle, R.W.
1965: Geology, geochemistry, and origin of the lead-zinc-silver deposits of the Keno Hill-Galena Hill area, Yukon Territory; Geological Survey of Canada, Bulletin 111, p. 43-46.

ORE HILL 082-016

Mathews, W.H.
1953: Geology of the Sheep Creek camp; British Columbia Department of Mines, Bulletin No. 31, p. 63, 65, 77.

Walker, J.F.
1934: Geology and mineral deposits of Salmo map-area, British Columbia; Geological Survey of Canada, Memoir 172, p. 80.

PANET 021-011

Béland, J.
1957: Régions de Saint-Magloire et de Rosaire-Saint-Pamphile; Québec, Ministère des Mines, Rapport Géologique 76, p. 50.

PAYNE 082-104

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 98-100.

Hedley, M.S.
1952: Geology and ore deposits of the Sandon area, Slocan mining camp, British Columbia; British Columbia Department of Mines, Bulletin No. 29, p. 98-100.

PESO-REX 106-002

Green, L.H.
1972: Geology of Nash Creek, Larsen Creek, and Dawson map-areas, Yukon Territory; Geological Survey of Canada, Memoir 364, p p. 134-137.

Skinner, R.
1962: Mineral industry of Yukon Territory and southwestern District of Mackenzie 1961; Geological Survey of Canada, Paper 62-27, p. 31-34.

PILGRIM, CATHERINE 092-012

Gunning, H.C.
1930: Geology and mineral deposits of Quatsino-Nimpkish area, Vancouver Island, British Columbia; in Geological Survey of Canada, Summary Report 1929, Part A, p. 138.

PLANET / STUMP 092-004

Cockfield, W.E.
1948: Geology and mineral deposits of Nicola map-area, B.C.; Geological Survey of Canada, Memoir 249, p. 47-57.

Hedley, M.S.
1937: Stump Lake area; British Columbia, Minister of Mines, Annual Report 1936, p. D14-D21.

PORTER IDAHO 103-010

Grove, E.W.
1971: Geology and mineral deposits of the Stewart area, northwestern British Columbia; British Columbia, Department of Mines and Petroleum Resources, Bulletin No. 58, p. 148-150.

Hanson, G.
1929: Bear River and Stewart River map-areas, Cassiar District, British Columbia; Geological Survey of Canada, Memoir 159, p. 61-65.

PORTLAND CANAL 103-009

Grove, E.W.
1971: Geology and mineral deposits of the Stewart area, northwestern British Columbia; British Columbia, Department of Mines and Petroleum Resources, Bulletin No. 58, p. 147-148.

Hanson, G.
1929: Bear River and Stewart River map-areas, Cassiar District, British Columbia; Geological Survey of Canada, Memoir 159, p. 48-53.

PRAIRIE CREEK 095-003

Padgham, W.A., Kennedy, M.W., Jefferson, C.W., Hughes, D.R., and Murphy, J.D.
1975: Mineral industry report 1971 and 1972, Northwest Territories; Indian and Northern Affairs, EGS 1975-8, p. 162-165.

Thorpe, R.I.
1972: Mineral Exploration and Mining Activities, Mainland Northwest Territories, 1966 to 1968 (excluding the Coppermine River Area); Geological Survey of Canada, Paper 70-70, p. 130-139.

PROSPERITY 103-007

Grove, E.W.
1971: Geology and mineral deposits of the Stewart area, northwestern British Columbia; British Columbia, Department of Mines and Petroleum Resources, Bulletin No. 58, p. 148-150.

Hanson, G.
1929: Bear River and Stewart River map-areas, Cassiar District, British Columbia; Geological Survey of Canada, Memoir 159, p. 61-65.

QUEBEC CHIBOUGAMAU(MERRILL IS) 032-270

Graham, R.B., Ingham, W.N., Robinson, W.G., and Weber, W.
1953: Mining properties and development in Abitibi East, Abitibi West and Rouyn-Noranda Counties during 1950 and 1951; Quebec Department of Mines, Preliminary Report 283, p. 45-47.

APPENDIX C (CONT.)

VEIN AND REPLACEMENT (CONT.)

QUEBEC STURGEON - HACHEY 021-098

Davies, J.L., Tupper, W.M., Bachinski, D., Boyle, R.W., and Martin, G.
1969: Geology and mineral deposits of the Nigadoo River-Millstream River area, Gloucester County, New Brunswick; Geological Survey of Canada, Paper 67-49, p. 18-21.

Skinner, R.
1974: Geology of Tetagouche Lakes, Bathurst and Nepisiguit Falls map-areas; Geological Survey of Canada, Memoir 371, p. 82.

QUEBEC STURGEON - HALF MILE 021-096

Davies, J.L., Tupper, W.M., Bachinski, D., Boyle, R.W., and Martin, G.
1969: Geology and mineral deposits of the Nigadoo River-Millstream River area, Gloucester County, New Brunswick; Geological Survey of Canada, Paper 67-49, p. 18-21.

QUEBEC STURGEON - PINE TREE 021-099

Davies, J.L., Tupper, W.M., Bachinski, D., Boyle, R.W., and Martin, G.
1969: Geology and mineral deposits of the Nigadoo River-Millstream River area, Gloucester County, New Brunswick; Geological Survey of Canada, Paper 67-49, p. 18-21.

QUEBEC STURGEON - SHAFT 021-097

Skinner, R.
1974: Geology of Tetagouche Lakes, Bathurst and Nepisiguit Falls map-areas; Geological Survey of Canada, Memoir 371, p. 82.

QUEEN BESS 082-136

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 100-103.

Hedley, M.S.
1952: Geology and ore deposits of the Sandon area, Slocan mining camp, British Columbia; British Columbia Department of Mines, Bulletin No. 29, p. 98-102.

RAMBLER-CARIBOO 082-059

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 103-107.

RECO (1,2,3,4) 082-132

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 107-112.

RICHMOND EUREKA 082-043

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 113-115.

ROUND POND 012-022

Knight, I.
1980: Geological mapping of parts of the Eddie's Cove-Salmon River and adjacent map-areas; in Current Research, C.F. Driscoll and R.V. Gibbons (eds.), Newfoundland Department of Mines and Energy Report 80-1, p. 7-8.

National Mineral Inventory Section
1981: Canadian mineral deposits not being mined in 1981; Department of Energy, Mines and Resources, National Mineral Inventory Section, Mineral Policy Sector Internal Report MRI 80/7 (update).

RUTH VERMONT 082-107

Fyles, J.T.
1967: Ruth Vermont mine (Columbia River Mines Ltd.); British Columbia, Minister of Mines and Petroleum Resources, Annual Report 1966, p. 230-235.

RUTH-HOPE 082-038

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 116-122.

Hedley, M.S.
1952: Geology and ore deposits of the Sandon area, Slocan mining camp, British Columbia; British Columbia Department of Mines, Bulletin No. 29, p. 103-107.

SADIE-LADUE 105-023

Boyle, R.W.
1965: Geology, geochemistry, and origin of the lead-zinc-silver deposits of the Keno Hill-Galena Hill area, Yukon Territory; Geological Survey of Canada, Bulletin 111, p. 31-34.

SCRANTON 082-110

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 243-244.

Little, H.W.
1960: Nelson map area, West half, British Columbia; Geological Survey of Canada, Memoir 308, p. 123-124.

SILMONAC 082-151

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 79.

Hedley, M.S.
1952: Geology and ore deposits of the Sandon area, Slocan mining camp, British Columbia; British Columbia Department of Mines, Bulletin No. 29, p. 90.

SILVER CLIFF 001-001

McCartney, W.D.
1967: Whitebourne map-area, Newfoundland; Geological Survey of Canada, Memoir 341, p. 118-121.

SILVER CUP 082-121

Fyles, J.T. and Eastwood, G.E.P.
1962: Geology of the Ferguson area; British Columbia, Department of Mines and Petroleum Resources, Bulletin No. 45, p. 75-78.

Walker, J.F., Bancroft, M.F. and, Gunning, H.C.
1930: Lardeau map-area, British Columbia; Geological Survey of Canada, Memoir 161, p. 63-65.

SILVER CUP 093-009

Kindle, E.D.
1954: Mineral resources, Hazelton and Smithers areas, Cassiar and Coast Districts, British Columbia; Geological Survey of Canada, Memoir 223 (Revised Edition), p. 64-67.

Lay, D. and Caddy, F.P.
1930: Northeastern mineral survey district (No. 2); British Columbia, Minister of Mines, Annual Report 1929, p. C156-C158.

SILVER KING 105-019

Boyle, R.W.
1965: Geology, geochemistry, and origin of the lead-zinc-silver deposits of the Keno Hill-Galena Hill area, Yukon Territory; Geological Survey of Canada, Bulletin 111, p. 68-72.

SILVER QUEEN/MAGNO/MARBLE CK 104-008

Gabrielse, H.
1963: McDame map-area, Cassiar District, British Columbia; Geological Survey of Canada, Memoir 319, p. 220-222.

APPENDIX C (CONT.)

VEIN AND REPLACEMENT (CONT.)

National Mineral Inventory Section
1980: Canadian Mineral deposits not being mined in 1980; Canada, Department of Energy, Mines and Resources, National Mineral Inventory Section, Mineral Policy Sector Internal Report MRI 80/7, p. 231.

SILVER STANDARD 093-003

Black, J.M.
1951: Glen and Nine Mile Mountains area, (Silver Standard); British Columbia, Minister of Mines, Annual Report 1950, p. A82-A95.

Kindle, E.D.
1954: Mineral resources, Hazelton and Smithers areas, Cassiar and Coast Districts, British Columbia; Geological Survey of Canada, Memoir 223 (Revised Edition), p. 68-76.

Smith, A.
1957: Silver Standard mine; in Structural Geology of Canadian Ore Deposits, v. 2, Canadian Institute of Mining and Metallurgy, p. 20-27.

SILVERSMITH 082-044

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 124-129.

Hedley, M.S.
1952: Geology and ore deposits of the Sandon area, Slocan mining camp, British Columbia; British Columbia Department of Mines, Bulletin No. 29, p. 108-116.

SNOWFLAKE / STANN TR 082-087

Lord, C.S.
1948: Regal Silver mine; in Structural Geology of Canadian Ore Deposits, Canadian Institute of Mining and Metallurgy, Jubilee Volume (v.1), p. 196-199.

Wheeler, J.O.
1963: Rogers Pass map-area, British Columbia and Alberta; Geological Survey of Canada, Paper 62-32, p. 28.

SPIDER & ECLIPSE 082-069

Walker, J.F., Bancroft, M.F. and, Gunning, H.C.
1930: Lardeau map-area, British Columbia; Geological Survey of Canada, Memoir 161, p. 85-88.

SPOKANE 082-140

Eastwood, G.E.P.
1953: Black Diamond townsite area; British Columbia, Minister of Mines, Annual Report 1952, p. 156-162.

Schofield, S.J.
1920: Geology and ore deposits of Ainsworth mining camp, British Columbia; Geological Survey of Canada, Memoir 117, p. 44-45.

ST. EUGENE 082-054

Schofield, S.J.
1915: Geology of the Cranbrook map-area; Geological Survey of Canada, Memoir 76, p. 118-123.

STACKPOOL / JEFFERSON 041-022

Goodwin, A.M.
1965: Geology of Heenan, Marion, and the northern part Genoa townships; Ontario Department of Mines, Geological Report No. 38, p. 35.

STANDARD 082-050

Little, H.W.
1960: Nelson map area, West half, British Columbia; Geological Survey of Canada, Memoir 308, p. 185-187.

Starr, C.C.
1948: Geology of the Standard mine; Western Miner, v. 21, no. 7, p. 64-69.

STUMP 105-013

Findlay, D.C.
1969: The mineral industry of Yukon Territory and southwestern District of Mackenzie 1967; Geological Survey of Canada, Paper 68-68, p. 75-76.

Findlay, D.C.
1969: The mineral industry of Yukon Territory and southwestern District of Mackenzie, 1968; Geological Survey of Canada, Paper 69-55, p. 44-46.

Morin, J.A., Marchand, M., and Debicki, R.L.
1980: Mineral industry report 1978, Yukon Territory; Indian and Northern Affairs, p. 61.

SUNSET 082-130

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 141-145.

SUNSHINE 092-005

McKechnie, N.D.
1968: Sunshine, Lo, Lee; British Columbia, Minister of Mines and Petroleum Resources, Annual Report 1967, p. 162-163.

SURPRISE 082-047

Fyles, J.T.
1964: Geology of the Duncan Lake area, Lardeau district, British Columbia; British Columbia Department of Mines and Petroleum Resources, Bulletin No. 49, p. 80-83.

Walker, J.F., Bancroft, M.F. and, Gunning, H.C.
1930: Lardeau map-area, British Columbia; Geological Survey of Canada, Memoir 161, p. 97-98.

TEDDY GLACIER 082-113

Walker, J.F., Bancroft, M.F. and, Gunning, H.C.
1930: Lardeau map-area, British Columbia; Geological Survey of Canada, Memoir 161, p. 92-94.

TOWNSITE 105-026

Boyle, R.W.
1965: Geology, geochemistry, and origin of the lead-zinc-silver deposits of the Keno Hill-Galena Hill area, Yukon Territory; Geological Survey of Canada, Bulletin 111, 302p.

Sinclair, W.D., Maloney, J.M. and, Craig, D.B.
1975: Mineral industry report 1974, Yukon Territory; Indian and Northern Affairs, EGS 1975-9, p. 11

TRUE FISSURE 082-068

Fyles, J.T. and Eastwood, G.E.P.
1962: Geology of the Ferguson area; British Columbia, Department of Mines and Petroleum Resources, Bulletin No. 45, p. 79-85.

Walker, J.F., Bancroft, M.F. and, Gunning, H.C.
1930: Lardeau map-area, British Columbia; Geological Survey of Canada, Memoir 161, p. 70-75.

APPENDIX C (CONT.)

VEIN AND REPLACEMENT (CONT.)

UPTON 031-022

Bancroft, J.A.
1915: The copper deposits of the Eastern Townships of the province of Quebec; Quebec Department of Colonization, Mines and Fisheries, Mines Branch, p. 16, 90-98.

UTICA 082-111

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 252-256.

Little, H.W.
1960: Nelson map area, West half, British Columbia; Geological Survey of Canada, Memoir 308, p. 137-138.

VAN ROI 082-041

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 149-153.

Little, H.W.
1960: Nelson map area, West half, British Columbia; Geological Survey of Canada, Memoir 308, p. 136-137.

VENUS 105-012

Craig, D.B. and Milner, M.W.
1975: Mineral industry report 1971 and 1972, Yukon Territory; Indian Affairs and Northern Development EGS 1975-6, v. 1, p. 54-55.

Findlay, D.C.
1969: The mineral industry of Yukon Territory and southwestern District of Mackenzie 1967; Geological Survey of Canada, Paper 68-68, p. 62-64.

Wheeler, J.O.
1961: Whitehorse map-area, Yukon Territory; Geological Survey of Canada, Memoir 312, p. 129-130.

VICTOR / VIOLAMAC 082-036

Ambrose, J.W.
1957: Violamac mine, Slocan District B.C.; in Structural Geology of Canadyan Ore Deposits, v. 2, Canadian Institute of Mining and Metallurgy, p. 88-94.

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 153-155.

Hedley, M.S.
1952: Geology and ore deposits of the Sandon area, Slocan mining camp, British Columbia; British Columbia Department of Mines, Bulletin No. 29, p. 117-120.

VIGILANT 082-131

Peck, J.W. and Eastwood, G.E.P.
1953: Vigilant; British Columbia, Minister of Mines, Annual Report 1952, p. 170.

WASHINGTON 082-119

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 159-162.

WELLINGTON-BOUNTY 082-145

McKechnie, N.D.
1968: Wellington, Bounty, Tiger, Ruby Silver, etc.; British Columbia, Minister of Mines and Petroleum Resources, Annual Report 1967, p. 244.

White, W.H.
1950: The Beaverdell silver camp; British Columbia, Minister of Mines, Annual Report 1949, p. 143-145.

WHIPSAW-EUREKA 105-022

Boyle, R.W.
1965: Geology, geochemistry, and origin of the lead-zinc-silver deposits of the Keno Hill-Galena Hill area, Yukon Territory; Geological Survey of Canada, Bulletin 111, p. 47-50.

WHITEWATER 082-028

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 260-265.

Hedley, M.S.
1945: Geology of the Whitewater and Lucky Jim mine areas, Slocan District, British Columbia; British Columbia Department of Mines, Bulletin No. 22, p. 18-27.

WONDERFUL 082-105

Cairns, C.E.
1935: Descriptions of properties, Slocan mining camp, British Columbia; Geological Survey of Canada, Memoir 184, p. 163-165.

Hedley, M.S.
1952: Geology and ore deposits of the Sandon area, Slocan mining camp, British Columbia; British Columbia Department of Mines, Bulletin No. 29, p. 122-126.

WRIGHT 031-002

Alcock, F.J.
1930: Zinc and lead deposits of Canada; Geological Survey of Canada, Economic Geology Series No. 8, p. 116-120.

YANKEE GIRL 082-022

Cockfield, W.E.
1936: Lode gold deposits of Ymir-Nelson area, British Columbia; Geological Survey of Canada, Memoir 191, p. 26-31.

Wright, L.B. and Morrell, L.G.
1940: Ymir Yankee Girl Gold Mines Ltd.; American Institute of Mining and Metallurgical Engineers, Transactions, v. 141, p. 81-106.

APPENDIX C (CONT.)

VOLCANIC-ASSOCIATED EXHALATIVE

ABITIBI SILVER / FREBERT 032-020

Weber, W.W.
1951: La Morandière and parts of Duverny, Landrienne, and Barraute townships; Quebec Department of Mines, Preliminary Report 255, p. 19-20.

Weber, W.W. and Latulippe, M.
1964: Amos-Barraute area; Quebec Department of Natural Resources, Geological Report 109, p. 41-42.

AMULET A 032-034

Kelly, J.M.
1975: Geology, wall rock alteration and contact metamorphism associated with massive sulfide mineralization at the Amulet Mine, Noranda District, Quebec; Ph.D. thesis, University of Wisconsin, Madison, Wisconsin, U.S.A, 234p.

Spence, C.D. and deRosen-Spence, A.F.
1975: The place of sulfide mineralization in the volcanic sequence at Noranda, Quebec; Economic Geology, v. 70, no. 1, p. 90-101.

Suffel, G.G.
1948: Waite Amulet mine: Amulet section; in Structural Geology of Canadian Ore Deposits, Canadian Institute of Mining and Metallurgy, Jubilee Volume (v.1), p. 757-763.

AMULET C 032-263

Kelly, J.M.
1975: Geology, wall rock alteration and contact metamorphism associated with massive sulfide mineralization at the Amulet Mine, Noranda District, Quebec; Ph.D. thesis, University of Wisconsin, Madison, Wisconsin, U.S.A, 234p.

Spence, C.D. and deRosen-Spence, A.F.
1975: The place of sulfide mineralization in the volcanic sequence at Noranda, Quebec; Economic Geology, v. 70, no. 1, p. 90-101.

Suffel, G.G.
1948: Waite Amulet mine: Amulet section; in Structural Geology of Canadian Ore Deposits, Canadian Institute of Mining and Metallurgy, Jubilee Volume (v.1), p. 757-763

AMULET F 032-033

Buck, M.J.
1981: Hydrothermal alteration and volcanogenic sulphide mineralization near Amulet 'F' Shaft, Noranda Area, Quebec; B.Sc. thesis, Carleton University, Ottawa.

Spence, C.D. and deRosen-Spence, A.F.
1975: The place of sulfide mineralization in the volcanic sequence at Noranda, Quebec; Economic Geology, v. 70, no. 1, p. 90-101.

Suffel, G.G.
1948: Waite Amulet mine: Amulet section; in Structural Geology of Canadian Ore Deposits, Canadian Institute of Mining and Metallurgy, Jubilee Volume (v.1), p. 757-763.

ANDERSON 063-053

Bailes, A.H.
1971: Preliminary compilation of the geology of the Snow Lake-Flin Flon Sherridon area; Manitoba Department of Mines and Natural Resources, Mines Branch, Geological Paper 1/71, 27p.

Bell, C.K.
1978: Geology, Wekusko Lake map-area, Manitoba; Geological Survey of Canada, Memoir 384, p. 70, 72.

Price, D.
1977: Flin FLon-Snow Lake geology; Canadian Institute of Mining and Metallurgy and Hudson Bay Mining and Smelting Company Limited, Field Trip October 1977, p. 48-52.

Walford, P.C. and Franklin, J.M.
1982: The Anderson Lake mine, Snow Lake, Manitoba; in Precambrian Sulphide Deposits, R.W. Hutchinson, C.D. Spence, and J.M. Franklin (eds.), Geological Association of Canada, Special Paper 25, p. 481-523.

ANTOINETTE LAKE GROUP TACHE LK 032-063

Graham, R.B., Ingham, W.N., Robinson, W.G., and Weber, W.
1953: Mining properties and development in Abitibi East, Abitibi West and Rouyn-Noranda Counties during 1950 and 1951; Quebec Department of Mines, Preliminary Report 283, p. 34-36.

Smith, J.R. and Allard, G.
1960: South half of Mackenzie township; Quebec Department of Natural Resources, Geological Report 95, p. 37-38.

ARMSTRONG ZONE A-SOUTH LENS 021-054

Williams, D.A.
1974: Armstrong A (Zn-Cu-Pb); New Brunswick, Mineral Occurrence Report 21-0/9-E(a-5) 0/5.

AUSTIN BROOK 021-038

Boyle, R.W. and Davies, J.L.
1964: Geology of the Austin Brook and Brunswick No. 6 sulphide deposits, Gloucester County, New Brunswick; Geological Survey of Canada, Paper 63-24, 23p.

Jambour, J.L.
1979: Mineralogical evaluation of proximal-distal features in New Brunswick massive-sulphide deposits; Canadian Mineralogist, v. 17, p. 649-664.

Skinner, R.
1974: Geology of Tetagouche Lakes, Bathurst and Nepisiguit Falls map-areas; Geological Survey of Canada, Memoir 371, p. 94-96.

BARVALLEE 032-013

Jones, R.E.
1964: Northwest quarter of Fiedmont township; Quebec Department of Natural Resources; Geological Report 108, p. 24-25.

BARVUE 032-022

Weber, W.W.
1951: La Morandière and parts of Duverny, Landrienne, and Barraute townships; Quebec Department of Mines, Preliminary Report 255 p. 17-18.

Weber, W.W. and Latulippe, M.
1964: Amos-Barraute area; Quebec Department of Natural Resources, Geological Report 109, p. 43-44.

BELFORT ROYMONT 032-014

Doig, R.
1963: SE 1/4 of Landrienne township and SW 1/4 of Barraute township; Quebec Department of Natural Resources, Preliminary Report 510, p. 10.

Geoffroy, P.R. and Koulomzine, T.
1960: Mogador sulphide deposit; Canadian Institute of Mining and Metallurgy, Transactions, v. 63, p. 180-185.

BELL ALLARD SOUTH GROUP 032-053

Sharpe, J.I.
1968: Geology and sulfide deposits of the Matagami area; Quebec Department of Natural Resources, Geological Report 137, p. 61-63.

APPENDIX C (CONT.)

VOLCANIC-ASSOCIATED EXHALATIVE (CONT.)

BELL CHANNEL 032-058

Quebec Department of Natural Resources
1967: Annoted bibliography on metallic mineralization in the regions of Noranda, Matagami, Val D'Or, Chibougamau; Quebec Department of Natural Resources Special Paper 2, p. 131.

Sharpe, J.I.
1968: Geology and sulfide deposits of the Matagami area; Quebec Department of Natural Resources, Geological Report 137, p. 76-78.

BIG BULL 104-005

Irvine, W.T.
1957: Tulsequah Chief and Big Bull Mines; in Structural Geology of Canadian Ore Deposits, v. 2, Canadian Institute of Mining and Metallurgy, p. 7-16.

Kerr, F.A.
1948: Taku River map-area, British Columbia; Geological Survey of Canada, Memoir 248, p. 61-63.

BIG NAMA CREEK 042-013

Pye, E.G.
1960: Geology of the Manitouwadge area; Ontario Department of Mines, Annual Report 1957, v. 66, pt. 8, p. 95-96.

Shklanka, R.
1969: Copper, nickel, lead and zinc deposits of Ontario; Ontario Department of Mines, Mineral Resources Circular No. 12, p. 294-295.

BOB LAKE 063-041

Davies, J.F. Bannatyne, B.B., Barry, G.S., and McCabe, H.R.
1962: Geology and mineral resources of Manitoba; Manitoba Department of Mines and Natural Resources, Mines Branch, 1962, p. 100.

Farley, W.J.
1948: Sherritt Gordon mine; in Structural Geology of Canadian Ore Deposits, Canadian Institute of Mining and Metallurgy, Jubilee Volume (v.1), p. 292-295.

Froese, E. and Goetz, P.A.
1980: Geology of the Sherridon Group in the vicinity of Sherridon, Manitoba; Geological Survey of Canada, Paper 80-21, 20p.

Goetz, P.A.
1980: Depositional environment of the Sherridon group and related mineral deposits near Sherridon, Manitoba; Ph.D. thesis, Carleton University, Ottawa.

BOMBER 063-037

Davies, J.F. Bannatyne, B.B., Barry, G.S., and McCabe, H.R.
1962: Geology and mineral resources of Manitoba; Manitoba Department of Mines and Natural Resources, Mines Branch, 1962, p. 85.

Harrison, J.M.
1949: Geology and mineral deposits of File-Tramping Lakes area, Manitoba; Geological Survey of Canada, Memoir 250, p. 53.

BRUNSWICK #12 021-036

Goodfellow, W.D.
1975: Rock geochemical exploration and ore genesis at Brunswick # 12 deposit, New Brunswick; Ph.D. thesis, University of New Brunswick, Fredericton, 411p.

Luff, W.M.
1977: Geology of Brunswick No. 12 mine; Canadian Institute of Mining and Metallurgy, Bulletin, v. 70, no. 782, p. 109-119.

McAllister, A.L. and Lamarche, R.Y.
1972: Brunswick Mining and Smelting Corporation Nos. 6 and 12 mines; in Mineral Deposits of Southern Quebec and New Brunswick, 24th International Geological Congress, Montreal, Field Excursion A58, p. 58-67.

Skinner, R.
1974: Geology of Tetagouche Lakes, Bathurst and Nepisiguit Falls map-areas; Geological Survey of Canada, Memoir 371, p. 89-90.

Stockwell, C.H. and Tupper, W.M.
1966: Geology of the Brunswick No. 6 and No. 12 mining area, Gloucester County, New Brunswick; Geological Survey of Canada, Paper 65-13, 191 p.

BRUNSWICK #6 021-035

Boyle, R.W. and Davies, J.L.
1964: Geology of the Austin Brook and Brunswick No. 6 sulphide deposits, Gloucester County, New Brunswick; Geological Survey of Canada, Paper 63-24, 191p.

McAllister, A.L.
1960: Massive sulphide deposits in New Brunswick; Canadian Institute of Mining and Metallurgy, Transactions, v. 63, p. 50-60.

McAllister, A.L. and Lamarche, R.Y.
1972: Brunswick Mining and Smelting Corporation Nos. 6 and 12 mines; in Mineral Deposits of Southern Quebec and New Brunswick, 24th International Geological Congress, Montreal, Field Excursion A58, p. 58-67.

Skinner, R.
1974: Geology of Tetagouche Lakes, Bathurst and Nepisiguit Falls map-areas; Geological Survey of Canada, Memoir 371, p. 87-89.

Stockwell, C.H. and Tupper, W.M.
1966: Geology of the Brunswick No. 6 and No. 12 mining area, Gloucester County, New Brunswick; Geological Survey of Canada, Paper 65-13, 191 p.

BUCHANS 012-009

Binney, W.P., Thurlow, J.G., and Swanson, E.A.
1983: The MacLean Extension orebody, Buchans, Newfoundland, in Current Research, Part A, Geological Survey of Canada, Paper 83-1A, p. 313-319.

Swanson, E.A., Strong, D.F., and Thurlow, J.G. (editors)
1981: The Buchans orebodies: Fifty years of geology and mining; Geological Association of Canada Special Paper Number 22, 350p.

CALUMET 031-027

Alcock, F.J.
1930: Zinc and lead deposits of Canada; Geological Survey of Canada, Economic Geology Series No. 8, p. 121-126.

Armstrong, P.
1941: The exploration and development of Calumet mine, Quebec; Canadian Institute of Mining and Metallurgy, Transactions, v. 44, p. 396-412.

Sangster, A.L.
1967: Metamorphism at the New Calumet mine Quebec; M.Sc. thesis, Carleton University, Ottawa, 356p.

CANADIAN JAMIESON 042-003

Middleton, R.S.
1975: Geology of Turnbull and Godfrey townships, District of Thunder Bay; Ontario Department of Mines, Open File Report 5118, p. 234-248.

Mine Staff, Canadian Jamieson Mines Limited
1968: Base metal mine in the Porcupine area; Western Miner, v. 41, no. 5, p. 31-36.

APPENDIX C (CONT.)

VOLCANIC-ASSOCIATED EXHALATIVE (CONT.)

CANOE LANDING 021-049

Williams, D.A.
1974: Canoe Landing Lake (Zn-Cu-Au-Ag-Pb); New Brunswick, Mineral Occurrence Report 21-O/8-E(h-2) O/7.

CARIBOU 021-016

Davies, G.H.
1972: Deformational history of the Caribou stratabound sulfide deposit, Bathurst, New Brunswick, Canada; Economic Geology, v. 67, no. 5, p. 634-655.

Jambour, J.L.
1979: Mineralogical evaluation of proximal-distal features in New Brunswick massive-sulphide deposits; Canadian Mineralogist, v. 17, p. 649-664.

Roscoe, W.E.
1971: Geology of the Caribou deposit, Bathurst, New Brunswick; Canadian Journal of Earth Sciences, v. 8, no. 9, p. 1125-1136.

CENTENNIAL 063-013

Price, D.
1977: Flin FLon-Snow Lake geology; Canadian Institute of Mining and Metallurgy and Hudson Bay Mining and Smelting Company Limited, Field Trip October 1977, p. 38-43.

Provins, N.M.
1982: Geology of the Centennial copper-zinc deposit; in Flin Flon Volcanic Belt: Geology and Ore Deposits at Flin FLon and Snow Lake, Manitoba, Geological Association of Canada, Field Trip Guidebook, Winnipeg'82, Trip 6, p. 77-91.

CHESTER 021-026

McAllister, A.L.
1960: Massive sulphide deposits in New Brunswick; Canadian Institute of Mining and Metallurgy, Transactions, v. 63, p. 50-60.

Petruk, W.
1959: The Clearwater copper-zinc deposit and its setting, with a special study of mineral zoning around such deposits; Ph.D. thesis, McGill University, Montreal.

CHISEL LAKE 063-033

Martin, P.L.
1966: Structural analysis of the Chisel Lake orebody; Canadian Institute of Mining and Metallurgy, Transactions, v. 69, p. 208-214.

Price, D.
1977: Flin FLon-Snow Lake geology; Canadian Institute of Mining and Metallurgy and Hudson Bay Mining and Smelting Company Limited, Field Trip October 1977, p. 44-48.

Williams, H.
1966: Geology and mineral deposits of the Chisel Lake map-area, Manitoba; Geological Survey of Canada, Memoir 342, p. 30-34.

CHU-CHUA 092-014

McMillan, W.J.
1980: CC Prospect, Chu Chua Mountain; British Columbia, Ministry of Energy, Mines and Petroleum Resources, Geological Fieldwork 1979, Paper 1980-1, p. 37-48.

CLINTON COPPER 021-002

Chevé, S.
1978: Région du sud-est des Cantons de l'est; Québec, Ministère des Richesses Naturelles, Rapport Intérimaire DP-613, p. 68-75.

Marleau, R.-A.
1968: Woburn-East Megantic-Armstrong area, Frontenac and Beauce Counties; Quebec Department of Natural Resources, Geological Report 131, p. 42-44.

CONIAGAS 032-048

Duquette, G.
1972: The Chibougamau-Chapais greenstone belt; in Precambrian Geology and Mineral Deposits of the Noranda-Val D'Or and Matagami-Chibougamau Greenstone Belts, Quebec; 24th International Geological Congress, Montreal, Field Excursion A41-C41 p. 10, 59-60.

CONIGO - WEST CU-ZN-AG ZONE 032-271

Waddington, G.W.
1969: Copper in Quebec; Quebec Department of Natural Resources, Special Paper 4, p. 100.

Weber, W.W. and Latulippe, M.
1964: Amos-Barraute area; Quebec Department of Natural Resources, Geological Report 109, p. 49-52.

CONIGO - WEST UPPER AG-ZN ZONE 032-272

Waddington, G.W.
1969: Copper in Quebec; Quebec Department of Natural Resources, Special Paper 4, p. 100.

Weber, W.W. and Latulippe, M.
1964: Amos-Barraute area; Quebec Department of Natural Resources, Geological Report 109, p. 49-52.

CONSOLIDATED PERSHCOURT 032-018

Weber, W.W.
1951: La Morandière and parts of Duverny, Landrienne, and Barraute townships; Quebec Department of Mines, Preliminary Report 255 p. 18-19.

Weber, W.W. and Latulippe, M.
1964: Amos-Barraute area; Quebec Department of Natural Resources, Geological Report 109, p. 39-42.

CONSOLIDATED RAMBLER MAIN 012-008

Heenan, P.R.
1973: The discovery of Ming Zone, Consolidated Rambler Mines Limited, Baie Verte, Newfoundland; Canadian Institute of Mining and Metallurgy Bulletin, v. 66, no. 729, p. 78-88.

Tuach, J. and Kennedy, M.J.
1978: The geologic setting of the Ming and other sulfide deposits, Consolidated Rambler Mine, Northeast Newfoundland; Economic Geology, v. 73, no. 2, p. 192-206.

COPPER LODE-E ZONE 052-017

Fenwick, K.G.
1973: Geology of the Fredart-Whitemud Lakes area, Kenora (Patricia Portion); Ontario Department of Mines, Open File Report 5095, p. 69-87.

Shklanka, R.
1969: Copper, nickel, lead and zinc deposits of Ontario; Ontario Department of Mines, Mineral Resources Circular No. 12, p. 145-146.

COPPER REEF 063-056

Gale, G.H., Baldwin, D.A., and Koo, J.
1980: A geological evaluation of Precambrian massive sulphide deposit potential in Manitoba; Manitoba Department of Energy and Mines, Mineral Resources Division, Economic Geology Report ER79-1, p. 102.

COPPER-MAN 063-004

Bailes, A.H.
1971: Preliminary compilation of the geology of the Snow Lake-Flin Flon Sherridon area; Manitoba Department of Mines and Natural Resources, Mines Branch, Geological Paper 1/71, 27p.

APPENDIX C (CONT.)

VOLCANIC-ASSOCIATED EXHALATIVE (CONT.)

Bell, C.K.
1978: Geology, Wekusko Lake map-area, Manitoba; Geological Survey of Canada, Memoir 384, p. 73.

Gale, G.H., Baldwin, D.A., and Koo, J.
1980: A geological evaluation of Precambrian massive sulphide deposit potential in Manitoba; Manitoba Department of Energy and Mines, Mineral Resources Division, Economic Geology Report ER79-1, p. 91.

CORBET 032-265

Gibson, H.L. and Watkins, D.H.
1981: Volcanic stratigraphy of the Amulet-Millenbach area; Handout distributed to visitors to Corbet Mine, 7 pages plus figures.

Knuckey, M.J. and Watkins, D.H.
1982: The geology of the Corbet massive sulphide deposit, Noranda District, Quebec, Canada; in Precambrian Sulphide Deposits, R.W. Hutchinson, C.D. Spence, and J.M. Franklin (eds.), Geological Association of Canada, Special Paper 25, p. 297-317.

CREEK ZONE 052-020

Harvey, J.D. and Hinzer, J.C.
1981: Geology of the Lyon Lake ore deposits, Noranda Mines Limited, Sturgeon Lake area, Ontario; Canadian Institute of Mining and Metallurgy, Bulletin, v. 74, no. 833, p. 77-84.

Hinzer, J.C.
1977: Geological and geochemical study of Lyon Lake and Creek ore zones, Sturgeon Lake area, Northwestern Ontario; M.Sc. thesis, University of Western Ontario, London.

Trowell, N.F.
1974: Geology of the Glitter Lake area, District of Thunder Bay; Ontario Department of Mines, Geological Report 120, p. 26.

CUPRA-D'ESTRIE 021-009

Gentile, F.
1972: Nature et origine de la minéralisation cupro-zincifère de la formation des schistes de Weedon, Québec; Ph.D. thesis, Ecole Polytechnique, Université de Montréal, Quebec, 151p.

Sauvé, P., Cloutier, J.P., and Genois, G.
1972: The Cupra-d'Estrie deposit; in Base Metal Deposits of Southeastern Quebec, 24th International Geological Congress, Montreal, Field Excursion B-07, p. 6-12.

CUPRUS 063-012

Cairns, R.B., Miller, C.R.D., Troop, A.J., Camsell, G.C., Gibson, J.A. and Koffman, A.A.
1957: Cuprus mine; in Structural Geology of Canadian Ore Deposits, v. 2, Canadian Institute of Mining and Metallurgy, p. 253-258.

Davies, J.F. Bannatyne, B.B., Barry, G.S., and McCabe, H.R.
1962: Geology and mineral resources of Manitoba; Manitoba Department of Mines and Natural Resources, Mines Branch, 1962, p, 73, 74.

D-266 (LD-75) 032-267

Gibson, H.L. and Watkins, D.H.
1981: Volcanic stratigraphy of the Amulet-Millenbach area; Handout distributed to visitors to Corbet Mine, 7 pages plus figures.

DELBRIDGE 032-035

Boldy, J.
1968: Geological observations on the Delbridge massive sulphide deposit; Canadian Institute of Mining and Metallurgy, Bulletin v. 61, no. 677, p. 1045-1054.

DH-FL GROUP 064-007

Emslie, R.F. and Moore, J.M.
1961: Geological studies of the area between Lynn Lake and Fraser Lake; Manitoba Department of Mines and Natural Resources, Mines Branch, Publications 59-4, p. 53-55.

DICKSTONE 063-035

Harrison, J.M.
1949: Geology and mineral deposits of File-Tramping Lakes area, Manitoba; Geological Survey of Canada, Memoir 250, p. 54-55.

DYCE SIDING (SYLVIA ZONE) 063-051

Gale, G.H., Baldwin, D.A., and Koo, J.
1980: A geological evaluation of Precambrian massive sulphide deposit potential in Manitoba; Manitoba Department of Energy and Mines, Mineral Resources Division, Economic Geology Report ER79-1, p. 115.

EAST WAITE 032-030

Price, P. and Bancroft, W.L.
1948: Waite Amulet mine; Waite section; in Structural Geology of Canadian Ore Deposits, Canadian Institute of Mining and Metallurgy, Jubilee Volume (v. 1), p. 748.

Spence, C.D. and deRosen-Spence, A.F.
1975: The place of sulfide mineralization in the volcanic sequence at Noranda, Quebec; Economic Geology, v. 70, no. 1, p. 90-101.

Suffel, G.G.
1948: Waite Amulet mine: Amulet section; in Structural Geology of Canadian Ore Deposits, Canadian Institute of Mining and Metallurgy, Jubilee Volume (v.1), p. 757-763.

ECSTALL RIVER 103-001

Bacon, W.R.
1953: Ecstall (Sulgas Properties Ltd.); British Columbia, Minister of Mines, Annual Report 1952, p. A81-A84.

Roddick, J.A.
1970: Douglas Channel-Hecate Strait map-area; Geological Survey of Canada Paper 70-41, p. 50-51.

EMBURY (TROUT) LAKE 063-055

Muzylowski, M.
1979: Copper-zinc discovery, Flin FLon, Manitoba; Canadian Mining Journal, v. 100, no. 5, p. 65-67.

EMPIRE OIL LETAC 032-046

Quebec Department of Natural Resources
1967: Annoted bibliography on metallic mineralization in the regions of Noranda, Matagami, Val D'Or, Chibougamau; Quebec Department of Natural Resources Special Paper 2, p. 168.

ERRINGTON 041-004

Martin, W.C.
1957: Errington and Vermillion Lake mines; in Structural Geology of Canadian Ore Deposits, v. 2, Canadian Institute of Mining and Metallurgy, p. 363-376.

Thomson, J.E.
1956: Geology of the Sudbury Basin; Ontario Department of Mines, Annual Report, v. 65, pt. 3, p. 46-54.

FLIN FLON 063-021

Coats, C.J.A., Quirke, T.T., Bell, C.K., Cranstone, D.A., and Campbell, F.H.A.

APPENDIX C (CONT.)

VOLCANIC-ASSOCIATED EXHALATIVE (CONT.)

1972: Geology and mineral deposits of the Flin Flon, Lynn Lake and Thompson areas, Manitoba, and the Churchill-Superior front of the western Precambrian Shield; 24th International Geological Congress, Field Excursion A31-C31, p. 27-35.

Koo, J.
1973: Origin and metamorphism of the Flin Flon Cu-Zn sulphide deposit, Northern Saskatchewan and Manitoba, Canada; Ph.D. thesis, University of Saskatchewan, Saskatoon, 154p.

Koo, J. and Mossman, D.J.
1975: Origin and metamorphism of the Flin Flon stratabound Cu-Zn sulfide deposit, Saskatchewan and Manitoba; Economic Geology, v. 70, no. 1, p. 48-62.

FOX LAKE 064-006

Coats, C.J.A., Quirke, T.T., Bell, C.K., Cranstone, D.A., and Campbell, F.H.A.
1972: Geology and mineral deposits of the Flin Flon, Lynn Lake and Thompson areas, Manitoba, and the Churchill-Superior front of the western Precambrian Shield; 24th International Geological Congress, Field Excursion A31-C31, p. 45-52.

Lustig, G.N.
1976: The stratigraphic and structural setting of the Fox Mine, Lynn Lake district, Manitoba; University of Manitoba, Centre for Precambrian Studies, 1976 Annual Report, Paper No. 6, p. 60-64.

Lustig, G.N.
1979: Geology of the Fox orebody, Northern Manitoba; M.Sc. thesis, University of Manitoba, Winnipeg, 81p.

GARON LAKE 032-059

Maclean, W.H. and MacGeehan, P.J.
1976: Garon Lake mine, Matagami, Quebec; Mineral Exploration Research Institute, Case History 76-1, Ecole Polytechnique de Montreal and McGill University, 67p.

GECO 042-015

Brown, W.L. and Bray, R.C.E. and Mine Staff
1960: Geology of the Geco mine; Canadian Institute of Mining and Metallurgy, Transactions, v. 63, p. 1-9.

Friesen, R.G., Pierce, G.A., and Weeks, R.M.
1982: Geology of the Geco base metal deposit; in Precambrian Sulphide Deposits, R.W. Hutchinson, C.D. Spence, and J.M. Franklin (eds.), Geological Association of Canada, Special Paper 25, p. 343-363.

Pye, E.G.
1960: Geology of the Manitouwadge area; Ontario Department of Mines, Annual Report 1957, v. 66, pt. 8, p. 81-87.

Watson, D.W.
1970: Geology and structural evolution of the Geco massive sulphide deposit at Manitouwadge, Northwestern Ontario, Canada; Ph.D. thesis, University of Michigan, Ann Arbor, Michigan, U.S.A., 272p.

GHOST LAKE 063-034

Stephansson, A.E.
1975: Development and production at Hudson Bay's Ghost Lake mine; Canadian Institute of Mining and Metallurgy, Bulletin, v. 68, no. 753, p. 45-50.

Williams, H.
1966: Geology and mineral deposits of the Chisel Lake map-area, Manitoba; Geological Survey of Canada, Memoir 342, p. 35.

GOLDSTREAM 082-122

Höy, T.
1979: Geology of the Goldstream area; British Columbia, Ministry of Energy, Mines and Petroleum Resources, Bulletin 71, p. 34-44.

HACKETT RIVER (BOOT LAKE) 076-006

Casselman, M.J. and Mioduszewska, B.M.
1982: The Bathurst Norsemines sulphide deposits, Hackett River, N.W.T.; in Precambrian Sulphide Deposits, R.W. Hutchinson, C.D. Spence, and J.M. Franklin (eds.), Geological Association of Canada, Special Paper 25, p. 365-402.

Frith, R.A. and Roscoe, S.M.
1980: Tectonic setting and sulphide deposits of the Hackett River Belt, Slave Province; Canadian Institute of Mining and Metallurgy, Bulletin, v. 73, no. 815, p. 143.

HACKETT RIVER (EAST CLEAVER) 076-003

Casselman, M.J. and Mioduszewska, B.M.
1982: The Bathurst Norsemines sulphide deposits, Hackett River, N.W.T.; in Precambrian Sulphide Deposits, R.W. Hutchinson, C.D. Spence, and J.M. Franklin (eds.), Geological Association of Canada, Special Paper 25, p. 365-402.

Frith, R.A. and Roscoe, S.M.
1980: Tectonic setting and sulphide deposits of the Hackett River Belt, Slave Province; Canadian Institute of Mining and Metallurgy, Bulletin, v. 73, no. 815, p. 143-153.

HACKETT RIVER (MAIN ZONE) 076-002

Casselman, M.J. and Mioduszewska, B.M.
1982: The Bathurst Norsemines sulphide deposits, Hackett River, N.W.T.; in Precambrian Sulphide Deposits, R.W. Hutchinson, C.D. Spence, and J.M. Franklin (eds.), Geological Association of Canada, Special Paper 25, p. 365-402.

Frith, R.A. and Roscoe, S.M.
1980: Tectonic setting and sulphide deposits of the Hackett River Belt, Slave Province; Canadian Institute of Mining and Metallurgy, Bulletin, v. 73, no. 815, p. 143-153.

HALF MILE LAKE (KEEVIL) 021-051

McAllister, A.L.
1960: Massive sulphide deposits in New Brunswick; Canadian Institute of Mining and Metallurgy, Transactions, v. 63, p. 50-60.

HALF MILE LAKE (T.G.S.) 021-022

McAllister, A.L.
1960: Massive sulphide deposits in New Brunswick; Canadian Institute of Mining and Metallurgy, Transactions, v. 63, p. 50-60.

Williams, D.A.
1974: Half Mile Lake (Texasgulf-Conwest) (Zn-Pb-Cu); New Brunswick, Mineral Occurrence Report 21-O/8-W(c-3) N-8.

HALF MILE LAKE(CONWEST) 021-053

McAllister, A.L.
1960: Massive sulphide deposits in New Brunswick; Canadian Institute of Mining and Metallurgy, Transactions, v. 63, p. 50-60.

Williams, D.A.
1974: Half Mile Lake (Texasgulf-Conwest) (Zn-Pb-Cu); New Brunswick, Mineral Occurrence Report 21-O/8-W(c-3) N-8.

APPENDIX C (CONT.)

VOLCANIC-ASSOCIATED EXHALATIVE (CONT.)

HART RIVER 116-001

Morin, J.A.
1979: A preliminary report on Hart River (116A/10) - A Proterozoic massive sulphide deposit; in Mineral Industry Report 1977, Yukon Territory, Indian and Northern Affairs, EGS 1978-9, p. 22-24.

HEADVUE 042-017

Thurston, P.C.
1976: Geology of North Onaman area; Ontario Geological Survey, Report 208 (Open File Report 5197, p. 79-86), p. 49-52.

HEATH STEELE BOUNDARY ZONE 021-101

Dechow, E.W.C.
1959: The Geology of the Heath Steele Mine, Newcastle, New Brunswick, Canada; Ph.D. thesis, Yale University.

Dechow, E.W.C.
1960: Geology, sulfur isotopes and the origin of the Heath Steele ore deposits, Newcastle, N.B., Canada, Economic Geology, v. 55, no. 4. p. 539-556.

Gates, W.G.
1970: Geology and geological aides to production at the Heath Steele mine; AIME World Symposium on Mining and Metallurgy of Lead and Zinc, v. 1, New York, p. 108-122.

McBride, D.E.
1976: Geology of Heath Steele mines, New Brnswick, Ph.D. thesis, University of New Brunswick, Fredericton, N.B., 227p.

HEATH STEELE GROUP 021-037

Dechow, E.W.C.
1959: The Geology of the Heath Steele Mine, Newcastle, New Brunswick, Canada; Ph.D. thesis, Yale University.

Dechow, E.W.C.
1960: Geology, sulfur isotopes and the origin of the Heath Steele ore deposits, Newcastle, N.B., Canada, Economic Geology, v. 55, no. 4, p. 539-556.

Gates, W.G.
1970: Geology and geological aides to production at the Heath Steele mine; AIME World Symposium on Mining and Metallurgy of Lead and Zinc, v. 1, New York, p. 108-122.

McBride, D.E.
1976: Geology of Heath Steele mines, New Brnswick, Ph.D. thesis, University of New Brunswick, Fredericton, N.B., 227p.

Owsiacki, L.
1980: The Heath Steele mine area; in Geology and Massive Sulphides of the Bathurst area, New Brunswick, J.L. Davies and A.L. McAllister (eds.), Geological Association of Canada, Field Trip Guidebook, Halifax '80, Trip 16, p. 21-30.

Owsiacki, L. and McAllister, A.L.
1979: Fragmental massive sulphides at the Heath Steele mine, New Brunswick; Canadian Institute of Mining and Metallurgy, Bulletin, v. 72, no. 811, p. 83-100.

HENINGA LAKE(GEMEX) 065-001

Laporte, P.J., Gibbins, W.A., Hurdle, E.J., Lord, C., Padgham, W.A., and Seaton, J.B.
1978: Mineral industry report 1975, Northwest Territories, Indian and Northern Affairs EGS 1978-5, p. 14-15.

HIGH LAKE 076-004

Johnson, W.
1974: Geology of two base-metal deposits in the Slave structural province; Geological Survey of Canada, Open File 239, 16p.

McGlynn, J.C.
1971: Metallic mineral industry, District of Mackenzie, Northwest Territories; Geological Survey of Canada, Paper 70-17, p. 84-86.

HOMESTAKE 082-078

Stevenson, J.S.
1937: Homestake (Squaam Bay); British Columbia, Minister of Mines, Annual Report 1936, p. D32-D36.

HOOD RIVER #10 086-002

Gill, J.W.
1976: The Takiyuak metavolcanic belt: geology, geochemistry and mineralization; Ph.D. thesis, Carleton University, Ottawa, Ontario.

HOOD RIVER #41 086-003

Laporte, P.J., Gibbins, W.A., Hurdle, E.J., Lord, C., Padgham, W.A., and Seaton, J.B.
1978: Mineral industry report 1975, Northwest Territories, Indian and Northern Affairs EGS 1978-5, p. 78.

INDIAN MOUNTAIN 075-003

Heywood, W.W. and Davidson, A.
1969: Geology of Benjamin Lake map-area, District of Mackenzie; Geological Survey of Canada, Memoir 361, p. 32.

Johnson, W.
1974: Geology of two base-metal deposits in the Slave structural province; Geological Survey of Canada, Open File 239, 16p.

Thorpe, R.I.
1972: Mineral Exploration and Mining Activities, Mainland Northwest Territories, 1966 to 1968 (excluding the Coppermine River Area); Geological Survey of Canada, Paper 70-70, p. 37-39.

IZOK 086-001

Money, P.L. and Heslop, J.B.
1976: Geology of the Izok Lake massive sulphide deposit; Canadian Mining Journal, v. 97, no. 5, p. 24-27.

JAMELAND 042-004

Pye, E.G., Lovell, H.L., Bright, E.G., and Petruk, W.
1972: Jameland mine; in Precambrian Geology and Mineral Deposits of the Timagami, Cobalt, Kirkland Lake and Timmins Region, Ontario, 24th International Geological Congress, Montreal, Field Excursion A39-39b-C-39, p. 79-81.

Shklanka, R.
1969: Copper, nickel, lead and zinc deposits of Ontario; Ontario Department of Mines, Mineral Resources Circular No. 12, p. 126-127.

JOUTEL COPPER 032-042

Quebec Department of Natural Resources
1967: Annoted bibliography on metallic mineralization in the regions of Noranda, Matagami, Val D'Or, Chibougamau; Quebec Department of Natural Resources Special Paper 2, p. 136.

Tanton, T.L.
1919: The Harricanaw-Turgeon basin, Northern Quebec; Geological Survey of Canada, Memoir 109.

JUNGLE 063-039

Davies, J.F. Bannatyne, B.B., Barry, G.S., and McCabe, H.R.
1962: Geology and mineral resources of Manitoba; Manitoba Department of Mines and Natural Resources, Mines Branch, 1962, p. 100.

APPENDIX C (CONT.)

VOLCANIC-ASSOCIATED EXHALATIVE (CONT.)

Froese, E. and Goetz, P.A.
1980: Geology of the Sherridon Group in the vicinity of Sherridon, Manitoba; Geological Survey of Canada, Paper 80-21, 20p.

Goetz, P.A.
1980: Depositional environment of the Sherridon group and related mineral deposits near Sherridon, Manitoba; Ph.D. thesis, Carleton University, Ottawa.

KAM KOTIA 042-005

Ferguson, S.A.
1946: Some copper properties in Robb, Jamieson and Godfrey townships; Ontario Department of Mines, Annual Report 1944, v. 53, pt. 4, p. 17, 27-29.

Pye, E.G., Lovell, H.L., Bright, E.G., and Petruk, W.
1972: Kam Kotia mine; in Precambrian Geology and Mineral Deposits of the Timagami, Cobalt, Kirkland Lake and Timmins Region, Ontario, 24th International Geological Congress, Montreal, Field Excursion A39-39b-C-39, p. 78-79.

Somerville, R.
1967: Kam-Kotia mine; Canadian Institute of Mining and Metallurgy, Centennial Field Excursion Northwest Quebec and Northern Ontario, October 1967, p. 132-134.

KELLY DESMOND 032-040

Quebec Department of Natural Resources
1967: Annoted bibliography on metallic mineralization in the regions of Noranda, Matagami, Val D'Or, Chibougamau; Quebec Department of Natural Resources Special Paper 2, p. 215.

KENDON 042-018

Langford, F.F.
1959: Geology of the Gripp Lake area; Ontario Department of Mines, Annual Report 1958, v. 67, pt. 3, p. 18-19.

Shklanka, R.
1969: Copper, nickel, lead and zinc deposits of Ontario; Ontario Department of Mines, Mineral Resources Circular No. 12, p. 336.

KEY ANACON /MIDDLE LANDING 021-024

Saif, S.I. and McAllister, A.L.
1978: Geology of the Key Anacon mine area, Bathurst, New Brunswick; Canadian Institute of Mining and Metallurgy, Bulletin, v. 71, no. 791, p. 161-168.

Skinner, R.
1974: Geology of Tetagouche Lakes, Bathurst and Nepisiguit Falls map-areas; Geological Survey of Canada, Memoir 371, p. 90.

KIDD CREEK 042-002

CIM Bulletin v. 67, no. 745
1974: The Ecstall story; Canadian Institute of Mining and Metallurgy, Bulletin, v. 67, no. 745, p. 50-142.

Walker, R.R., Matulich, A., Amos, A.C. Watkins, J.J., and Mannard, G.W.
1975: The geology of the Kidd Creek mine; Economic Geology, v. 70, no. 1, p. 80-89.

KNOBBY LAKE (SAND 4) 064-003

Gale, G.H., Baldwin, D.A., and Koo, J.
1980: A geological evaluation of Precambrian massive sulphide deposit potential in Manitoba; Manitoba Department of Energy and Mines, Mineral Resources Division, Economic Geology Report ER79-1, p. 129.

Hinds, R.W.
1972: Opachuanau Lake - Fraser Lake - Lemay Island area; Manitoba, Department of Mines, Resources and Environmental Management, Mines Branch Publication 71-2G, p. 43-46.

KUTCHO CREEK 104-010

Panteleyev, A.
1975: Cry Lake, (Jeff, SMRB); British Columbia, Geology, Exploration and Mining, 1974, p. 343-348.

Pearson, D.E. and Panteleyev, A.
1975: Cupriferous iron sulphide deposits, Kutcho Creek map-area; British Columbia, Ministry of Energy, Mines and Petroleum Resources, Geological Fieldwork 1975, p. 86-92.

LA GAUCHETIERE 032-259

Remick, J.H.
1969: Harricana-Turgeon area; Quebec Department of Natural Resources, Preliminary Report-564, p. 107.

Tanton, T.L.
1919: The Harricanaw-Turgeon basin, Northern Quebec; Geological Survey of Canada, Memoir 109.

LA RIBOURDE-SAUSSURE 032-268

Gilbert, J.E.
1955: Braussat-Daine area; Quebec Department of Mines, Geological Report 64.

Ministère des Richesses Naturelles du Québec
1969: Fiche de Gîte, No. 1115-600-32G-14-02, La-Ribourde-02.

LAKE DUFAULT NO 2 032-028

Sakrison, H.C.
1966: Chemical studies of the host rocks of the Lake Dufault mine Quebec; Ph.D. thesis, McGill University, Montreal, 138p.

Spence, C.D. and deRosen-Spence, A.F.
1975: The place of sulfide mineralization in the volcanic sequence at Noranda, Quebec; Economic Geology, v. 70, no. 1, p. 90-101.

LAKE GENEVA 041-008

Alcock, F.J.
1930: Zinc and lead deposits of Canada; Geological Survey of Canada, Economic Geology Series No. 8, p. 169-175.

Card, K.D. and Innes, D.G.
1978: Geology of the Benny area, District of Sudbury; Ontario Geological Survey, Open File Report 5256, p. 107-112.

Hawley, J.E.
1948: Lake Geneva mine; in Structural Geology of Canadian Ore Deposits, Canadian Institute of Mining and Metallurgy, Jubilee Volume (v.1), p. 590-596.

Pearson, W.N.
1978: Copper metallogeny, Lake Huron area, Ontario; in Report of Activities, Part A, Geological Survey of Canada, Paper 78-1A, p. 266, 263-268.

LEMOINE TWP. 032-258

Allard, G.O.
1976: Doré Lake complex; Quebec Department of Natural Resources, DP-368, p. 356-358.

Gobeil, A.
1980: Etude lithogéochimique des roches volcaniques dans la région de la mine Lemoine, district de Chibougamau, Québec; Canadian Institute of Mining and Metallurgy, Bulletin, v. 73, no. 817, p. 86-95.

LES MINES SELBAIE(A-1,B ZONES) 032-262

Deptuck, R., Squair, H. and Wierzbick, V.
1982: Geology of the Detour zinc-copper deposits, Brouillan township, Quebec; in Precambrian Sulphide Deposits, R.W. Hutchinson, C.D.

APPENDIX C (CONT.)

VOLCANIC-ASSOCIATED EXHALATIVE (CONT.)

Spence, and J.M. Franklin (eds.) Geological Association of Canada, Special Paper 25, p. 319-342.

Deptuck, R., Wierzbicki, V., and Squair, H.
1979: Geology of the Detour zinc-copper-silver deposits, Brouillan township, Quebec; Quebec'79, GAC/MAC Annual Meeting, May 1979, Université Laval, Quebec, Program with Abstracts, v. 4, p. 46.

LESSARD OPTION 032-261

Murphy, D.L.
1966: Frotet Lake-Troilus Lake area; Quebec Department of Natural Resources, Geological Report 123.

LINGWICK 021-041

Harron, G.A.
1973: The metallogeny of sulphide deposits in the Eastern Townships; Quebec Department of Natural Resources DP-253, 36 p.

LOST LAKE 063-049

Froese, E. and Moore, J.M.
1980: Metamorphism in the Snow Lake area, Manitoba; Geological Survey of Canada, Paper 78-27, p. 7-8.

Gale, G.H. and Koo, J.
1977: Evaluation of massive sulphide environments; in Canada-Manitoba Non-Renewable Resource Evaluation Program, 2nd Annual Report 1976-1977, Manitoba Department of Mines, Resources, and Environmental Management, p. 43-62.

LOUVEM 032-257

Spitz, G.
1973: Etude pétrographique et pétrochimique des roches volcaniques autour du gisements de Louvem; M.Sc. thesis, Ecole Polytechnique, Université de Montréal, Montréal, P.Q..

Spitz, G. and Darling, R.
1973: Pétrographie des roches encaissantes du gisement cuprifère de Louvem; Canadian Journal of Earth Sciences, v. 10, no. 5, p. 760-776.

Spitz, G. and Darling, R.
1975: The petrochemistry of altered volcanic rocks surrounding the Louvem copper deposit, Val D'Or, Quebec; Canadian Journal of Earth Sciences, v. 12, no. 11, p. 1820-1849.

LYNN LAKE,Z-DEPOSIT 064-012

Allan, J.D.
1948: Geological studies of the Lynn Lake area, Northern Manitoba; Ph.D. thesis, Massachusetts Institute of Technology, Cambridge, Massachusetts, U.S.A, 167 p., p. 67.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Department of Mines and Natural Resources, Mines Branch Publication 57-1, p. 180.

Ruttan, G.D.
1955: Geology of Lynn Lake; Canadian Institute of Mining and Metallurgy, Bulletin, v. 48, no. 518, p. 339-348.

LYNX (OBASKA) 032-023

Quebec Department of Natural Resources
1964: Preliminary Report - 529, 1964, Description of mining properties examined in 1961 and 1962 (exclusive of producing mines), p. 21.

LYON LAKE 052-016

Harvey, J.D. and Hinzer, J.C.
1981: Geology of the Lyon Lake ore deposits, Noranda Mines Limited, Sturgeon Lake area, Ontario; Canadian Institute of Mining and Metallurgy, Bulletin, v. 74, no. 833, p. 77-84.

Hinzer, J.C.
1977: Geological and geochemical study of Lyon Lake and Creek ore zones, Sturgeon Lake area, Northwestern Ontario; M.Sc. thesis, University of Western Ontario, London.

MAGUSI RIVER 032-260

Jones, H.
1973: The Copperfields-Iso, Magusi River deposit; Prospectors and Developers Association, Paper, 41st Annual Meeting and Convention, March 14, 1973, 13p.

MANDY 063-014

Alcock, F.J.
1930: Zinc and lead deposits of Canada; Geological Survey of Canada, Economic Geology Series No. 8, p. 208-214.

Bruce, E.L.
1933: Mandy copper-zinc mine; in Mineral Deposits of the Canadian Shield, MacMillan Co., Toronto, p. 391-396.

Spurr, J.E.
1923: The Ore Magmas; v. 1, McGraw-Hill Book Co., New York, p. 110-121.

MANITOU BARVUE 032-010

Popov, V.
1976: Manitou-Barvue Mines Limited; in Geological Excursion Val-D'Or-Malartic, M. Latulippe, (ed.), Québec Ministère des Richesses Naturelles, DP-367(v), p. 90-94.

MARSHALL LAKE 042-023

Amukun, S.E., Foster, J.R., and MacDonald, J.A.
1978: Little Marshall Lake area, District of Thunder Bay; Ontario Geological Survey, Preliminary Map P1561, Geology Series (Marginal Notes).

Shklanka, R.
1969: Copper, nickel, lead and zinc deposits of Ontario; Ontario Department of Mines, Mineral Resources Circular No. 12, p. 337.

MATTABI 052-006

Franklin, J.M., Gibb, W., Poulsen, K.H., and Severin, P.
1977: Archean metallogeny and stratigraphy of the south Sturgeon Lake area; Institute on Lake Superior Geology, Field guidebook, 23rd Annual Meeting, Thunder Bay, Ontario, 73p.

Franklin, J.M., Kasarda, J., and Poulsen, K.H.
1975: Petrology and chemistry of the alteration zone of the Mattabi massive sulfide deposit; Economic Geology, v. 70, no. 1, p. 63-79.

MATTAGAMI LAKE 032-052

Roberts, R.G.
1975: The geological setting of the Mattagami Lake mine, Quebec: A volcanogenic massive sulfide deposit; Economic Geology, v. 70, no. 1, p. 115-129.

Sharpe, J.I.
1968: Geology and sulfide deposits of the Matagami area; Quebec Department of Natural Resources, Geological Report 137, p. 42-55.

MILLENBACH 032-070

Comba, C.D.A.
1975: Copper-zinc zonation in tuffaceous exhalites, Millenbach mine, Noranda, Quebec; M.Sc. thesis, Queens University, Kingston, Ontario, 107p.

APPENDIX C (CONT.)

VOLCANIC-ASSOCIATED EXHALATIVE (CONT.)

Knuckey, M.J., Comba, C.D.A., and Riverin, G.
1982: Structure, metal zoning and alteration at the Millenbach deposit; in Precambrian Sulphide Deposits, R.W. Hutchinson, C.D. Spence, and J.M. Franklin (eds.), Geological Association of Canada, Special Paper 25, p. 255-295.

Riverin, G. and Hodgson, C.J.
1980: Wall-rock alteration at the Millenbach Cu-Zn mine, Noranda, Quebec; Economic Geology, v. 75, no. 3, p. 424-444.

Simmons, B.D.
1973: Geology of the Millenbach massive sulphide deposit, Noranda, Quebec; Canadian Institute of Mining and Metallurgy Bulletin, v. 66, no. 739, p. 67-78.

MINES GALLEN (WEST MACDONALD) 032-031

Claveau, J., Ingham, W.N., and Robinson, W.G.
1951: Mining properties and development in Abitibi and Temiscamingue counties during 1948 and 1949; Quebec Department of Mines Preliminary Report 256, p. 25-27.

MOBRUN 032-036

Quebec Department of Natural Resources
1967: Annoted bibliography on metallic mineralization in the regions of Noranda, Matagami, Val D'Or, Chibougamau; Quebec Department of Natural Resources Special Paper 2, p. 86.

Seigel, H.O., Winkler, H.A. and, Boniwell, J.B.
1957: Discovery of the Mobrun Copper Ltd. sulphide deposit, Noranda mining district, Quebec; in Methods and Case Histories in Mining Geophysics, 6th Commonwealth Mining and Metallurgical Congress 1957, p. 237-245.

MONPAS (ALBARMONT) 032-019

Weber, W.W.
1949: Duverny and Landrienne townships; Quebec Department of Mines Preliminary Report 228, p. 14-15.

Weber, W.W. and Latulippe, M.
1964: Amos-Barraute area; Quebec Department of Natural Resources, Geological Report 109, p. 56.

MOULTON HILL 021-007

Hawley, J.E. and Martison, N.W.
1948: Moulton Hill deposit; in Structural Geology of Canadian Ore Deposits, Canadian Institute of Mining and Metallurgy, Jubilee Volume (v.1), p. 902-909.

Lamarche, R-Y.
1965: Geologie de la région de Sherbrooke, Comte de Sherbrooke, Québec; Ph.D. thesis, Université Laval, Québec.

Lamarche, R-Y.
1967: Geology of Beauvoir-Ascot Corner area; Quebec Department of Natural Resources, Preliminary Report 560, p. 13.

MURRAY BROOK 021-014

McAllister, A.L.
1960: Massive sulphide deposits in New Brunswick; Canadian Institute of Mining and Metallurgy, Transactions, v. 63, p. 50-60.

Skinner, R.
1974: Geology of Tetagouche Lakes, Bathurst and Nepisiguit Falls map-areas; Geological Survey of Canada, Memoir 371, p. 93-94.

Williams, D.A.
1974: Murray Brook (Zn-Cu-Pb-Ag); New Brunswick, Mineral Occurrence Report 21-O/9-W(d-1) M-6.

NEPISIGUIT 021-045

McAllister, A.L.
1960: Massive sulphide deposits in New Brunswick; Canadian Institute of Mining and Metallurgy, Transactions, v. 63, p. 50-60.

Williams, D.A.
1974: Nepisiguit A, B, C, (Zn-Cu-Pb-Ag); New Brunswick, Mineral Occurrence Report 21-O/8-E(h-1) O/8.

NEW HOSCO 032-060

Mamen, C.
1964: Orchan mines and New Hosco mines; Canadian Mining Journal, v. 85, no. 1, p. 31-35.

Sharpe, J.I.
1968: Geology and sulfide deposits of the Matagami area; Quebec Department of Natural Resources, Geological Report 137, p. 65-71.

NEWCONEX FIGUERY 032-264

Sharpe, J.I.
1961: South half of Figuery and the southwest quarter of Landrienne township, Abitibi-East County; Quebec Department of Natural Resources, Preliminary Report 446, p. 8-9.

NINEMILE BROOK 021-085

Williams, D.A.
1974: Nine Mile Brook (Ag-Cu-Zn-Pb-Au); New Brunswick, Mineral Occurrence Report 21-P/5-W(e-1) P-8.

NORBEC 032-026

Johnson, A.E.
1966: Mineralogy and textural relationships in the Lake Dufault ores, Northwestern Quebec; M.Sc. thesis, University of Western Ontario, London, (Abstract in Canadian Mining Journal, v. 87, no. 11), p. 102.

Purdie, J.J.
1967: Geology of the West Norbec operation, Lake Dufault Mines Limited; Canadian Institute of Mining and Metallurgy, Field Excursion 1967.

Spence, C.D. and deRosen-Spence, A.F.
1975: The place of sulfide mineralization in the volcanic sequence at Noranda, Quebec; Economic Geology, v. 70, no. 1, p. 90-101.

NORITA (RADIORE "A") 032-056

MacGeehan, P.J., MacLean, W.H., and Bonenfant, A.J.
1981: Exploration significance of the emplacement and genesis of massive sulphides in the Main Zone at the Norita mine, Matagami, Quebec; Canadian Institute of Mining and Metallurgy, Bulletin, v. 74, no. 828, p. 59-75.

Sharpe, J.I.
1968: Geology and sulfide deposits of the Matagami area; Quebec Department of Natural Resources, Geological Report 137, p. 71-75.

NORMETAL 032-039

Bertrand, C, and Hutchinson, R.W.
1973: Metamorphism at the Normetal mine, northwestern Quebec; Canadian Institute of Mining and Metallurgy Bulletin, v. 66, no. 740, p. 68-76.

Gilman, W.F.
1977: Desméloizes township; Quebec Department of Natural Resources, Geological Report 186, p. 68-76.

Tolman, C.
1951: Normetal mine area, Abitibi-West County; Quebec Department of Mines, Geological Report 34, p. 19-29.

APPENDIX C (CONT.)

VOLCANIC-ASSOCIATED EXHALATIVE (CONT.)

NORTH TRINITY 032-021

Sharpe, J.I.
1961: Descriptions of mining properties; Quebec Department of Natural Resources, Preliminary Report - 443, p. 25.

Weber, W.W. and Latulippe, M.
1964: Amos-Barraute area; Quebec Department of Natural Resources, Geological Report 109, p. 64.

OLD WAITE 032-027

Price, P. and Bancroft, W.L.
1948: Waite Amulet mine; Waite section; in Structural Geology of Canadian Ore Deposits, Canadian Institute of Mining and Metallurgy, Jubilee Volume (v. 1), p. 756.

Spence, C.D. and deRosen-Spence, A.F.
1975: The place of sulfide mineralization in the volcanic sequence at Noranda, Quebec; Economic Geology, v. 70, no. 1, p. 90-101.

Suffel, G.G.
1948: Waite Amulet mine: Amulet section; in Structural Geology of Canadian Ore Deposits, Canadian Institute of Mining and Metallurgy, Jubilee Volume (v.1), p. 757-763.

ORCHAN 032-055

Jenney, C.P.
1961: Geology and ore deposits of the Mattagami area, Quebec; Economic Geology, v. 56, no. 4, p. 740-757.

Mamen, C.
1964: Orchan mines and New Hosco mines; Canadian Mining Journal, v. 85, no. 1, p. 31-35.

Sharpe, J.I.
1968: Geology and sulfide deposits of the Matagami area; Quebec Department of Natural Resources, Geological Report 137, p. 55-61.

ORVAN BROOK 021-017

Lovell, H.L.
1966: Petrology, mineralogy and trace element chemistry of the Orvan Brook sulphide deposit, Restigouche County, New Brunswick; M.Sc. thesis, Carleton University, Ottawa.

Tupper, W.M.
1969: The geology of the Orvan Brook sulphide deposit, Restigouche County, New Brunswick; Geological Survey of Canada, Paper 66-59, 11 p.

OSBORNE LAKE 063-007

Bell, C.K.
1978: Geology, Wekusko Lake map-area, Manitoba; Geological Survey of Canada, Memoir 384, p. 70, 72.

Gale, G.H., Baldwin, D.A., and Koo, J.
1980: A geological evaluation of Precambrian massive sulphide deposit potential in Manitoba; Manitoba Department of Energy and Mines, Mineral Resources Division, Economic Geology Report ER79-1, p. 39, 41.

Sangameshwar, S.R.
1969: Trace element and ore mineralogy of the Osborne Lake mine, Manitoba; M.Sc. thesis, University of Saskatchewan, Saskatoon.

PABINEAU RIVER 021-091

Williams, D.A.
1974: Pabineau (Zn-Pb); New Brunswick, Mineral Occurrence Report 21-P/5-W(e-4) P-7.

PEG 064-011

Johnston, W.G.Q.
1972: Base metal geochemistry, Brabant Lake area, Saskatchewan; Saskatchewan Department of Mineral Resources, Geological Survey, Report No. 148, p. 14-19.

Kirkland, S.J.T.
1959: The geology of the Brabant Lake area, Saskatchewan; Saskatchewan Department of Mineral Resources, Report No. 33, p. 25-29.

PENN-COBALT (FOSTER) 031-029

Shklanka, R.
1969: Copper, nickel, lead and zinc deposits of Ontario; Ontario Department of Mines, Mineral Resources Circular No. 12, p. 354.

POINT LEAMINGTON 002-023

Dean, P.L.
1976: Geology of Roberts Arm map-area, Newfoundland; Geological Survey of Canada, Open File 374, Map 1-63360.

Noranda Mines Ltd.
1974: The Point Leamington sulphide deposit; in Metallogeny and Plate Tectonics, D.F. Strong, (ed.), A guidebook to Newfoundland mineral deposits, NATO Advanced Studies Institute, May 1974, p. 60-61.

POIRIER 032-041

Boniwell, J.B. and Dujardin, B.A.
1964: Discovery and exploration of the Poirier ore deposit; Canadian Institute of Mining and Metallurgy, Bulletin, v. 57, no. 629, p. 945.

POT LAKE 063-036

NO REFERENCES AVAILABLE

POTTER (MUNRO) 042-022

Satterley, J.
1952: Geology of Munro township, District of Cochrane; Ontario Department of Mines, Annual Report 1951, v. 60, pt. 8, p. 36-40.

Shklanka, R.
1969: Copper, nickel, lead and zinc deposits of Ontario; Ontario Department of Mines, Mineral Resources Circular No. 12, p. 124-125.

PRUDHOMME NO 1 024-002

Sauvé, P. and Bergeron, R.
1965: Gerido Lake - Thévenet Lake area, New Quebec; Quebec Department of Natural Resources, Geological Report 104, p. 86-87.

Slipp, R.M.
1957: Base metal deposits in the Labrador Trough, Ph.D. thesis, McGill University, Montreal, 127p.

QUEMONT 032-032

Taylor, B.
1957: Quemont Mine; in Structural Geology of Canadian Ore Deposits, v. 2, Canadian Institute of Mining and Metallurgy, p. 405-413.

Weeks, R.
1967: Quemont Mining Corporation, Limited; Canadian Institute of Mining and Metallurgy, Centennial Field Excursion Northwestern Quebec-Northern Ontario, October 1967, p. 46-51.

RADIORE EAST 032-057

Sharpe, J.I.
1968: Geology and sulfide deposits of the Matagami area; Quebec Department of Natural Resources, Geological Report 137, p. 79-82.

APPENDIX C (CONT.)

VOLCANIC-ASSOCIATED EXHALATIVE (CONT.)

RAIL LAKE 063-032

Gale, G.H., Baldwin, D.A., and Koo, J.
1980: A geological evaluation of Precambrian massive sulphide deposit potential in Manitoba; Manitoba Department of Energy and Mines, Mineral Resources Division, Economic Geology Report ER79-1, p. 103.

RAMSAY 063-044

Beck, L.S.
1959: Mineral occurrences in the Precambrian of northern Saskatchewan; Saskatchewan Department of Mineral Resources, Report No. 36, p. 108-109.

Byers, A.R.
1957: Geology and mineral deposits of the Hanson Lake area, Saskatchewan; Saskatchewan Department of Mineral Resources, Report No. 30 (Reprinted 1972), p. 40-43.

National Mineral Inventory Section
1980: Canadian Mineral deposits not being mined in 1980; Canada, Department of Energy, Mines and Resources, National Mineral Inventory Section, Mineral Policy Sector Internal Report MRI 80/7, p. 172.

RESTIGOUCHE/THIRD PORTAGE LAKE 021-015

Helmstaedt, H.
1971: Structural geology of Portage Lakes area, Bathurst-Newcastle distrcit, New Brunswick; Geological Survey of Canada, Paper 70-28, 52p.

Williams, D.A.
1974: Restigouche (Zn-Pb-Ag-Cu-Au); New Brunswick, Mineral Occurrence Report 21-0/10-E(a-1)
M-6, M-7.

ROCKY TURN 021-023

Williams, D.A.
1974: Rocky Turn (Zn-Ag-Au-Pb-Cu); New Brunswick, Mineral Occurrence Report 21-0/9-E(h-2)
0-5.

ROD(STALL) LAKE 063-005

Coats, C.J.A., Clark, L.A., Buchan, R., and Brummer, J.J.
1970: Geology of the copper-zinc deposits of Stall Lake Mines Ltd., Snow Lake area, N. Manitoba; Economic Geology, v. 65, no. 8, p. 970-984.

Gale, G.H., Baldwin, D.A., and Koo, J.
1980: A geological evaluation of Precambrian massive sulphide deposit potential in Manitoba; Manitoba Department of Energy and Mines, Mineral Resources Division, Economic Geology Report ER79-1, p. 39, 41.

RUTTAN 064-002

Baldwin, D.A.
1982: Mineral deposits in the Ruttan Lake, Karsakuwigamak Lake, Muskayak Lake areas, Manitoba; Manitoba Mineral Resources Division, Open File Report 81-4, 60p.

Gale, G.H., Somerville, R.C., Chornoby, J., Haystead, B., Provins, N. Braun, D., Mundy, D., and Walker, A.
1982: Geological setting of the Ruttan copper-zinc deposit; in Geological Setting of the Mineral Deposits of Ruttan, Thompson, Snow Lake and Flin Flon, Geological Association of Canada, Field Trip Guidebook, Winnipeg'82 Trip 14, p. 11-16.

Speakman, D.S., Chornoby, P.J. Haystead, B.C.W., and Holmes, G.F.
1982: Geology of the Ruttan deposit, Northern Manitoba; in Precambrian Sulphide Deposits, R.W. Hutchinson, C.D. Spence, and J.M. Franklin (eds.), Geological Association of Canada, Special Paper 25, p. 525-555.

Steeves, M.A. and Lamb, C.F.
1972: Geology of the Issett-Opachuanau-Pemichigamau-Earp Lakes area; Manitoba Department of Mines, Resources and Environmental Management Mines Branch Publication 71-2F, p. 48.

SCHIST LAKE 063-015

Cairns, R.B., Miller, C.R.D., Troop, A.J., Camsell, G.C., Gibson, J.A., and Koffman, A.A.
1957: Schist Lake mine; in Structural Geology of Canadian Ore Deposits, v. 2, Canadian Institute of Mining and Metallurgy, p. 258-262.

Davies, J.F. Bannatyne, B.B., Barry, G.S., and McCabe, H.R.
1962: Geology and mineral resources of Manitoba; Manitoba Department of Mines and Natural Resources, Mines Branch, 1962, p. 71, 73-74.

SCHOTTS LAKE 063-045

Beck, L.S.
1959: Mineral occurrences in the Precambrian of northern Saskatchewan; Saskatchewan Department of Mineral Resources, Report No. 36, p. 112-113.

SCOTT TWP (SELCO) 032-266

Gobeil, A.
1977: Rapport d'activité des géologues résidents 1977; Ministère des Richesses Naturelles du Québec, DPV-578 (Open File QDNR), p. 57-58.

SHERRIDON 063-042

Bruce, E.L.
1933: Sherritt-Gordon deposits; in Mineral Deposits of the Canadian shield, MacMillan Co., Toronto, p. 396-403.

Farley, W.J.
1949: Geology of the Sherritt Gordon orebody; Canadian Institute of Mining and Metallurgy, Bulletin, v. 42, no. 441, p. 25-30.

Froese, E. and Goetz, P.A.
1980: Geology of the Sherridon Group in the vicinity of Sherridon, Manitoba; Geological Survey of Canada, Paper 80-21, 20p.

Goetz, P.A.
1980: Depositional environment of the Sherridon group and related mineral deposits near Sherridon, Manitoba; Ph.D. thesis, Carleton University, Ottawa.

Goetz, P.A. and Froese, E.
1982: The Sherritt Gordon massive sulphide deposit; in Precambrian Sulphide Deposits, R.W. Hutchinson, C.D. Spence, and J.M. Franklin (eds.), Geological Association of Canada, Special Paper 25, p. 557-569.

SHUNSBY 041-019

Thurston, P.C., Siragusa, G.M. and, Sage, P.P.
1974: Operation Chapleau (Algoma District, Sudbury and Cochrane); Ontario Department of Mines, Open File Report 5079, Pt. (a), p. 312-324.

SOLBEC 021-010

Gentile, F.
1972: Nature et origine de la minéralisation cupro-zincifère de la formation des schistes de Weedon, Québec; Ph.D. thesis, Ecole Polytechnique, Université de Montréal, Quebec, 151p.

Sauvé, P., Cloutier, J.P., and Genois, G.
1972: The Solbec deposit; in Base Metal Deposits of Southeastern Quebec, 24th International Geological Congress, Montreal, Field Excursion B-07, p. 19-22.

APPENDIX C (CONT.)

VOLCANIC-ASSOCIATED EXHALATIVE (CONT.)

SOMA ALTA 032-243

Quebec Department of Natural Resources
1967: Annoted bibliography on metallic mineralization in the regions of Noranda, Matagami, Val D'Or, Chibougamau; Quebec Department of Natural Resources Special Paper 2, p. 169.

SOUCY NO 1 024-001

Gilders, R.
1975: Geology and textural relationships of the Soucy Lake massive sulphide deposit, B.Sc. thesis, University of Ottawa, Ottawa, 21p.

Murphy, M.J.
1975: A petrographic study of the Soucy No. 1 ore deposit; B.Sc. thesis, St. Francis Xavier University, Antigonish, Nova Scotia, 24p.

Sauvé, P. and Bergeron, R.
1965: Gerido Lake - Thévenet Lake area, New Quebec; Quebec Department of Natural Resources, Geological Report 104, p. 93-95.

SOUTH BAY 052-008

Ashbury, B.C.
1975: Sulfide and wall rock deformation at the South Bay mine, Northwestern Ontario; M.Sc. thesis, University of Toronto, Toronto.

Corkery, M.T.
1977: A study of the geology of the sulphide ore bodies at South Bay Mines, Northwestern Ontario; M.Sc. thesis, University of Manitoba, Winnipeg, 97p.

Pollock, G.D., Sinclair, I.G.L., Warburton, A.F., and Wierzbicki, V.
1972: The Uchi orebody - A massive sulphide deposit in an Archean siliceous volcanic environment; 24th International Geological Congress, 1972, Section 4, p. 299-300.

SPRUCE POINT 063-011

Gale, G.H. and Koo, J.
1977: Evaluation of massive sulphide environments; in Canada-Manitoba Non-Renewable Resource Evaluation Program, 2nd Annual Report 1976-1977, Manitoba Department of Mines, Resources, and Environmental Management, p. 43-62.

Gale, G.H., Baldwin, D.A., and Koo, J.
1980: A geological evaluation of Precambrian massive sulphide deposit potential in Manitoba; Manitoba Department of Energy and Mines, Mineral Resources Division, Economic Geology Report ER79-1, p. 98.

STALL 063-054

Bell, C.K.
1978: Geology, Wekusko Lake map-area, Manitoba; Geological Survey of Canada, Memoir 384, p. 70-72.

STIRLING 011-006

Watson, K.D.
1957: Mindamar mine; in Structural Geology of Canadian Ore Deposits, v. 2, Canadian Institute of Mining and Metallurgy, p. 495-502.

Weeks, L.J.
1954: Southeast cape Breton Island, Nova Scotia; Geological Survey of Canada, Memoir 277, p. 98-103.

STRALAK 041-007

Card, K.D. and Innes, D.G.
1978: Geology of the Benny area, District of Sudbury; Ontario Geological Survey, Open File Report 5256, p. 112-117.

Osborne, F.F.
1930: The Cartier-Stralak area, District of Sudbury; Ontario Department of Mines, Annual Report, v. 38, pt. 7, p. 52-68.

STRATMAT MAIN 021-047

McAllister, A.L.
1960: Massive sulphide deposits in New Brunswick; Canadian Institute of Mining and Metallurgy, Transactions, v. 63, p. 50-60.

Williams, D.A.
1974: Stratmat Main (east) zone; Stratmat west-Heath Steele N; New Brunswick, Mineral Occurrence Report 21-O/8-E(a-3) O/8 21-O/8-E(b-4) O/8.

STRATMAT WEST 021-048

McAllister, A.L.
1960: Massive sulphide deposits in New Brunswick; Canadian Institute of Mining and Metallurgy, Transactions, v. 63, p. 50-60.

Williams, D.A.
1974: Stratmat Main (east) zone; Stratmat west-Heath Steele N; New Brunswick, Mineral Occurrence Report 21-O/8-E(a-3) O/8 21-O/8-E(b-4) O/8.

STRATMAT-CENTRAL 021-100

NO REFERENCES AVAILABLE

STURGEON LAKE 052-015

Severin, P.W.A.
1978: Geology of the Sturgeon Lake Cu-Zn-Pb-Ag deposit, Sturgeon Lake area, Ontario, Canada; Prospectors and Developers Association, 46th Annual Convention, March 1978, 18p.

Severin, P.W.A.
1982: Geology of the Sturgeon Lake copper-zinc-lead-silver-gold deposit; Canadian Institute of Mining and Metallurgy, Bulletin, v. 75, no. 846, p. 107-123.

Wittrup, M.B.
1979: Geology of the Falconbridge Copper Limited volcanogenic massive sulphide deposit, Sturgeon Lake, Ontario; B.Sc. thesis, Lakehead University, Thunder Bay, Ontario.

SUFFIELD 021-005

Carrière, G.
1957: Suffield mine; in Structural Geology of Canadian Ore Deposits, v. 2, Canadian Institute of Mining and Metallurgy, p. 466-469.

Lamarche, R-Y.
1965: Geologie de la région de Sherbrooke, Comte de Sherbrooke, Québec; Ph.D. thesis, Université Laval, Québec.

St. Julien, P. and Lamarche, R.Y.
1965: Mine Suffield-Géologie de la région de Sherbrooke; Québec Ministère des Richesses Naturelles Rapport Préliminaire 530, p. 27-30.

TEAHAN 021-028

Ruitenberg, A.A., Giles, P.S., Venugopal, D.V., Buttimer, S.M., McCutcheon, S.R. and, Chandra, J.
1979: Geology and mineral deposits Caledonia area; New Brunswick Department of Natural Resources, Memoir 1, p. 135-140.

Wright, W.J.
1940: Teahan prospect, Albert County New Brunswick; New Brunswick Department of Lands and Mines Paper 40-4, 15p.

TEDI(BRANDYWINE) VAN SILVER 092-007

Dickson, M.P. and McLeod, D.A.
1975: Northair Mines: Grass roots to senior financing; Canadian Mining Journal, v. 96, no. 4, p. 79-82.

APPENDIX C (CONT.)

VOLCANIC-ASSOCIATED EXHALATIVE (CONT.)

Ditson, G.M.
1978: Metallogeny of the Vancouver-Hope area, British Columbia; M.Sc. thesis, University of British Columbia, Vancouver, p. 58-63.

Little, L.M.
1974: The geology and mineralogy of the Brandywine property lead-zinc-gold-silver deposit, Brandywine map-area, south-western British Columbia; B.Sc. thesis, University of British Columbia, Vancouver, 96p.

TETREAULT 031-009

O'Neill, J.J. and Osborne, F.F.
1939: Tetreault mine, Montauban-Les Mines, Portneuf County; Quebec, Department of Mines and Fisheries, P.R. No. 136, 20p.

Osborne, F.F.
1939: The Montauban mineralized zone, Quebec; Economic Geology, v. 34, no. 6, p. 712-726.

Smith, J.R.
1956: Montauban-Les-Mines Area; Quebec Department of Mines, Geological Report 65, p. 22-35.

TONNANCOURT-3 032-269

Ministère des Richesses Naturelles du Québec
1972: Fiche de Gîte, No. 1115-0612-32C-6-03, Tonnancourt-3.

TROUT BAY 052-007

Riley, R.A.
1968: No. 3 Mulcahy township (North Half), District of Kenora (Patricia Portion); Ontario Department of Mines, Miscellaneous Paper 22, p. 10-12.

Shklanka, R.
1969: Copper, nickel, lead and zinc deposits of Ontario; Ontario Department of Mines, Mineral Resources Circular No. 12, p. 154.

TULK'S POND 012-021

Cooper, G.E.
1967: Geology of the Tulk's Hill Area, Central Newfoundland; M.Sc. thesis, Memorial University St. John's, Newfoundland, 111p.

TULSEQUAH CHIEF 104-003

Cominco Management and Staff
1954: Tulsequah Mines Limited; Canadian Mining Journal, v. 75, May, 1954, p. 180-184.

Irvine, W.T.
1957: Tulsequah Chief and Big Bull Mines; in Structural Geology of Canadian Ore Deposits, v. 2, Canadian Institute of Mining and Metallurgy, p. 7-16.

Kerr, F.A.
1948: Taku River map-area, British Columbia; Geological Survey of Canada, Memoir 248, p. 58-61.

TWIN "J" 092-015

Stevenson, J.S.
1945: Geology of the Twin "J" mine; Canadian Institute of Mining and Metallurgy, Transactions, v. 48, p. 294-308.

UNITED MONTAUBAN 031-020

Osborne, F.F.
1939: The Montauban mineralized zone, Quebec; Economic Geology, v. 34, no. 6, p. 712-726.

Prabhu, M.K.
1982: Geology, geochemistry and genesis of Montauban lead-zinc deposits; Ph.D. thesis, McGill University, Montreal.

Pyke, D.R.
1966: Geology of Montauban-Colbert area; Quebec Department of Natural Resources, Preliminary Report 545, 15p.

Stamatelopoulou-Seymour, K.
1975: Metamorphosed volcanogenic Pb-Zn deposits at Montauban, Quebec; M.Sc. thesis, McGill University, Montreal, 230p.

Stamatelopoulou-Seymour, K. and MacLean, W.H.
1977: The geochemistry of possible metavolcanic rocks and their relationship to mineralization at Montauban-Les Mines, Quebec; Canadian Journal of Earth Sciences, v. 14, no. 11, p. 2440-2452.

VAMP LAKE 063-029

NO REFERENCES AVAILABLE

VAUZE 032-029

Lickus, R.J.
1965: Geology and geochemistry of the ore deposits at the Vauze mine, Noranda district, Quebec; Ph.D. thesis, McGill University, Montreal, 135 p.

Spence, C.D.
1975: Volcanogenic features of the Vauze sulfide deposit, Noranda, Quebec; Economic Geology, v. 70, no. 1, p. 102-114.

VENDOME 032-012

Geoffroy, P.R. and Koulomzine, T.
1960: Mogador sulphide deposit; Canadian Institute of Mining and Metallurgy, Transactions, v. 63, p. 180-185.

Jones, R.E.
1964: Northwest quarter of Fiedmont township; Quebec Department of Natural Resources; Geological Report 108, p. 26.

VERMILLION 041-024

Martin, W.C.
1957: Errington and Vermillion Lake mines; in Structural Geology of Canadian Ore Deposits, v. 2, Canadian Institute of Mining and Metallurgy, p. 363-376.

Thomson, J.E.
1956: Geology of the Sudbury Basin; Ontario Department of Mines, Annual Report, v. 65, pt. 3, p. 46-54.

WEDGE 021-050

Douglas, R.P.
1965: The Wedge mine - Newcastle-Bathurst area, N.B.; Canadian Institute of Mining and Metallurgy, Transactions, v. 68, p. 80-86.

McAllister, A.L.
1960: Massive sulphide deposits in New Brunswick; Canadian Institute of Mining and Metallurgy, Transactions, v. 63, p. 50-60.

WEEDON 021-004

Cooke, H.C.
1950: Geology of a southwestern part of Eastern Townships of Quebec; Geological Survey of Canada, Memoir 257, 142p.

Gentile, F.
1972: Nature et origine de la minéralisation cupro-zincifere de la formation des schistes de Weedon, Québec; Ph.D. thesis, Ecole Polytechnique, Université de Montréal, Quebec, 151p.

Sauvé, P., Cloutier, J.P., and Genois, G.
1972: Geology of the Weedon mine; in Base Metal Deposits of Southeastern Quebec, 24th International Geological Congress, Montreal, Field Excursion B-07, p. 12-19.

APPENDIX C (CONT.)

VOLCANIC-ASSOCIATED EXHALATIVE (CONT.)

WESTARM 063-052

Ko, C.B. and Trevor, S.M.
1982: The Westarm massive sulphide deposit; Abstract in Geological Association of Canada, Joint Annual Meeting May 17-19, 1982, p. 60.

WESTMIN (HW) 092-016

Westmin
1981: HW orebody; in Westmin Resources Limited Annual Report 1981.

WESTMIN (LYNX,MYRA,PRICE) 092-002

Jeffrey, W.G.
1965: Lynx, Paramount, Price (Western Mines Ltd); British Columbia, Minister of Mines, Annual Report 1964, p. 157-166.

Padgham, W.A.
1981: Western Mines - Myra, Lynx and Price deposits; Canadian Institute of Mining and Metallurgy, Bulletin, v. 74, no. 833, p. 106-108.

Seraphim, R.H.
1980: Western Mines - Myra, Lynx and Price deposits; Canadian Institute of Mining and Metallurgy, Bulletin, v. 73, no. 824, (Includes discussion by R.R. Walker and Reply by R.H. Seraphim), p. 71-90.

WHITE LAKE 063-016

Gale, G.H., Baldwin, D.A., and Koo, J.
1980: A geological evaluation of Precambrian massive sulphide deposit potential in Manitoba; Manitoba Department of Energy and Mines, Mineral Resources Division, Economic Geology Report ER79-1, p. 104.

WILDNEST 063-008

Beck, L.S.
1959: Mineral occurrences in the Precambrian of northern Saskatchewan; Saskatchewan Department of Mineral Resources, Report No. 36, p. 113.

WILLECHO 042-012

Pye, E.G.
1960: Geology of the Manitouwadge area; Ontario Department of Mines, Annual Report 1957, v. 66, pt. 8, p. 89-92.

Shklanka, R.
1969: Copper, nickel, lead and zinc deposits of Ontario; Ontario Department of Mines, Mineral Resources Circular No. 12, p. 295.

WILLROY 042-014

Pye, E.G.
1960: Geology of the Manitouwadge area; Ontario Department of Mines, Annual Report 1957, v. 66, pt. 8, p. 98-109.

Timms, P.D. and Marshall, D.
1959: The geology of the Willroy Mines base metal deposits; Geological Association of Canada, Proceedings, v. 11, p. 55-65.

YAVA 076-005

Frith, R.A. and Roscoe, S.M.
1980: Tectonic setting and sulphide deposits of the Hackett River Belt, Slave Province; Canadian Institute of Mining and Metallurgy, Bulletin, v. 73, no. 815, p. 143-153.

Seliken, L.
1976: The Yava deposit; paper presented at the Geoscience Forum, Yellowknife, December 1976.

YORK HARBOUR 012-010

Duke, N.A. and Hutchinson, R.W.
1974: Geological relationship between massive sulfide bodies and ophiolitic volcanic rocks near York Harbour, Newfoundland; Canadian Journal of Earth Sciences, v. 11, no. 1, p. 53-69.

ZENMAC 042-006

Pye, E.G.
1964: Mineral deposits of the Big Duck Lake area; Ontario Department of Mines, Geological Report No. 27, p. 39-43.