

## THESE TERMS GOVERN YOUR USE OF THIS DOCUMENT

**Your use of this Ontario Geological Survey document (the “Content”) is governed by the terms set out on this page (“Terms of Use”). By downloading this Content, you (the “User”) have accepted, and have agreed to be bound by, the Terms of Use.**

**Content:** This Content is offered by the Province of Ontario’s *Ministry of Northern Development and Mines* (MNDM) as a public service, on an “as-is” basis. Recommendations and statements of opinion expressed in the Content are those of the author or authors and are not to be construed as statement of government policy. You are solely responsible for your use of the Content. You should not rely on the Content for legal advice nor as authoritative in your particular circumstances. Users should verify the accuracy and applicability of any Content before acting on it. MNDM does not guarantee, or make any warranty express or implied, that the Content is current, accurate, complete or reliable. MNDM is not responsible for any damage however caused, which results, directly or indirectly, from your use of the Content. MNDM assumes no legal liability or responsibility for the Content whatsoever.

**Links to Other Web Sites:** This Content may contain links, to Web sites that are not operated by MNDM. Linked Web sites may not be available in French. MNDM neither endorses nor assumes any responsibility for the safety, accuracy or availability of linked Web sites or the information contained on them. The linked Web sites, their operation and content are the responsibility of the person or entity for which they were created or maintained (the “Owner”). Both your use of a linked Web site, and your right to use or reproduce information or materials from a linked Web site, are subject to the terms of use governing that particular Web site. Any comments or inquiries regarding a linked Web site must be directed to its Owner.

**Copyright:** Canadian and international intellectual property laws protect the Content. Unless otherwise indicated, copyright is held by the Queen’s Printer for Ontario.

It is recommended that reference to the Content be made in the following form: <Author’s last name>, <Initials> <year of publication>. <Content title>; Ontario Geological Survey, <Content publication series and number>, <total number of pages>p.

**Use and Reproduction of Content:** The Content may be used and reproduced only in accordance with applicable intellectual property laws. *Non-commercial* use of unsubstantial excerpts of the Content is permitted provided that appropriate credit is given and Crown copyright is acknowledged. Any substantial reproduction of the Content or any *commercial* use of all or part of the Content is prohibited without the prior written permission of MNDM. Substantial reproduction includes the reproduction of any illustration or figure, such as, but not limited to graphs, charts and maps. Commercial use includes commercial distribution of the Content, the reproduction of multiple copies of the Content for any purpose whether or not commercial, use of the Content in commercial publications, and the creation of value-added products using the Content.

### Contact:

FOR FURTHER INFORMATION ON	PLEASE CONTACT:	BY TELEPHONE:	BY E-MAIL:
<b>The Reproduction of Content</b>	MNDM Publication Services	Local: (705) 670-5691 Toll Free: 1-888-415-9845, ext. 5691 (inside Canada, United States)	<a href="mailto:Pubsales@ndm.gov.on.ca">Pubsales@ndm.gov.on.ca</a>
<b>The Purchase of MNDM Publications</b>	MNDM Publication Sales	Local: (705) 670-5691 Toll Free: 1-888-415-9845, ext. 5691 (inside Canada, United States)	<a href="mailto:Pubsales@ndm.gov.on.ca">Pubsales@ndm.gov.on.ca</a>
<b>Crown Copyright</b>	Queen’s Printer	Local: (416) 326-2678 Toll Free: 1-800-668-9938 (inside Canada, United States)	<a href="mailto:Copyright@gov.on.ca">Copyright@gov.on.ca</a>

**LES CONDITIONS CI-DESSOUS RÉGISSENT L'UTILISATION DU PRÉSENT DOCUMENT.**

***Votre utilisation de ce document de la Commission géologique de l'Ontario (le « contenu ») est régie par les conditions décrites sur cette page (« conditions d'utilisation »). En téléchargeant ce contenu, vous (l'« utilisateur ») signifiez que vous avez accepté d'être lié par les présentes conditions d'utilisation.***

**Contenu :** Ce contenu est offert en l'état comme service public par le *ministère du Développement du Nord et des Mines* (MDNM) de la province de l'Ontario. Les recommandations et les opinions exprimées dans le contenu sont celles de l'auteur ou des auteurs et ne doivent pas être interprétées comme des énoncés officiels de politique gouvernementale. Vous êtes entièrement responsable de l'utilisation que vous en faites. Le contenu ne constitue pas une source fiable de conseils juridiques et ne peut en aucun cas faire autorité dans votre situation particulière. Les utilisateurs sont tenus de vérifier l'exactitude et l'applicabilité de tout contenu avant de l'utiliser. Le MDNM n'offre aucune garantie expresse ou implicite relativement à la mise à jour, à l'exactitude, à l'intégralité ou à la fiabilité du contenu. Le MDNM ne peut être tenu responsable de tout dommage, quelle qu'en soit la cause, résultant directement ou indirectement de l'utilisation du contenu. Le MDNM n'assume aucune responsabilité légale de quelque nature que ce soit en ce qui a trait au contenu.

**Liens vers d'autres sites Web :** Ce contenu peut comporter des liens vers des sites Web qui ne sont pas exploités par le MDNM. Certains de ces sites pourraient ne pas être offerts en français. Le MDNM se dégage de toute responsabilité quant à la sûreté, à l'exactitude ou à la disponibilité des sites Web ainsi reliés ou à l'information qu'ils contiennent. La responsabilité des sites Web ainsi reliés, de leur exploitation et de leur contenu incombe à la personne ou à l'entité pour lesquelles ils ont été créés ou sont entretenus (le « propriétaire »). Votre utilisation de ces sites Web ainsi que votre droit d'utiliser ou de reproduire leur contenu sont assujettis aux conditions d'utilisation propres à chacun de ces sites. Tout commentaire ou toute question concernant l'un de ces sites doivent être adressés au propriétaire du site.

**Droits d'auteur :** Le contenu est protégé par les lois canadiennes et internationales sur la propriété intellectuelle. Sauf indication contraire, les droits d'auteurs appartiennent à l'Imprimeur de la Reine pour l'Ontario.

Nous recommandons de faire paraître ainsi toute référence au contenu : nom de famille de l'auteur, initiales, année de publication, titre du document, Commission géologique de l'Ontario, série et numéro de publication, nombre de pages.

**Utilisation et reproduction du contenu :** Le contenu ne peut être utilisé et reproduit qu'en conformité avec les lois sur la propriété intellectuelle applicables. L'utilisation de courts extraits du contenu à des fins *non commerciales* est autorisée, à condition de faire une mention de source appropriée reconnaissant les droits d'auteurs de la Couronne. Toute reproduction importante du contenu ou toute utilisation, en tout ou en partie, du contenu à des fins *commerciales* est interdite sans l'autorisation écrite préalable du MDNM. Une reproduction jugée importante comprend la reproduction de toute illustration ou figure comme les graphiques, les diagrammes, les cartes, etc. L'utilisation commerciale comprend la distribution du contenu à des fins commerciales, la reproduction de copies multiples du contenu à des fins commerciales ou non, l'utilisation du contenu dans des publications commerciales et la création de produits à valeur ajoutée à l'aide du contenu.

**Renseignements :**

<b>POUR PLUS DE RENSEIGNEMENTS SUR</b>	<b>VEUILLEZ VOUS ADRESSER À :</b>	<b>PAR TÉLÉPHONE :</b>	<b>PAR COURRIEL :</b>
<b>la reproduction du contenu</b>	Services de publication du MDNM	Local : (705) 670-5691 Numéro sans frais : 1 888 415-9845, poste 5691 (au Canada et aux États-Unis)	<a href="mailto:Pubsales@ndm.gov.on.ca">Pubsales@ndm.gov.on.ca</a>
<b>l'achat des publications du MDNM</b>	Vente de publications du MDNM	Local : (705) 670-5691 Numéro sans frais : 1 888 415-9845, poste 5691 (au Canada et aux États-Unis)	<a href="mailto:Pubsales@ndm.gov.on.ca">Pubsales@ndm.gov.on.ca</a>
<b>les droits d'auteurs de la Couronne</b>	Imprimeur de la Reine	Local : 416 326-2678 Numéro sans frais : 1 800 668-9938 (au Canada et aux États-Unis)	<a href="mailto:Copyright@gov.on.ca">Copyright@gov.on.ca</a>

**Ontario Geological Survey  
Miscellaneous Paper 95**

**Annual Report of the  
Regional and  
Resident Geologists  
1980**

**Edited by**

**C.R. Kustra**

**1981**



**Ontario**

**Ministry of  
Natural  
Resources**

**Hon. James A.C. Auld  
Minister**

**W.T. Foster  
Deputy Minister**

©OMNR-OGS 1981  
Printed in Canada

This report is published by permission of E.G. Pye, Director, Ontario Geological Survey.

Publications of the Ontario Ministry of Natural Resources and price list are available through the *Map Unit, Public Service Centre, Queen's Park, Toronto* and the *Ontario Government Bookstore, 880 Bay Street, Toronto*. Orders for publications should be accompanied by cheque or money order, payable to the *Treasurer of Ontario*.

Parts of this publication may be quoted if credit is given. It is recommended that reference to this report be made in the following form for each individual author:

Beard, R.C. and Rivett, S.  
1981: 1980 Report of the Northwest Regional Geologist and Kenora Resident Geologist; p. 1-16 *in* Annual Report of the Regional and Resident Geologists, 1980, Edited by C.R. Kustra, Ontario Geological Survey Miscellaneous Paper 95, 158p.

ISSN (O.G.S. Miscellaneous Papers) 0704-2752  
ISSN (Regional and Resident Geologist's Reports) 0704-2736

1000-81-Maracle Press



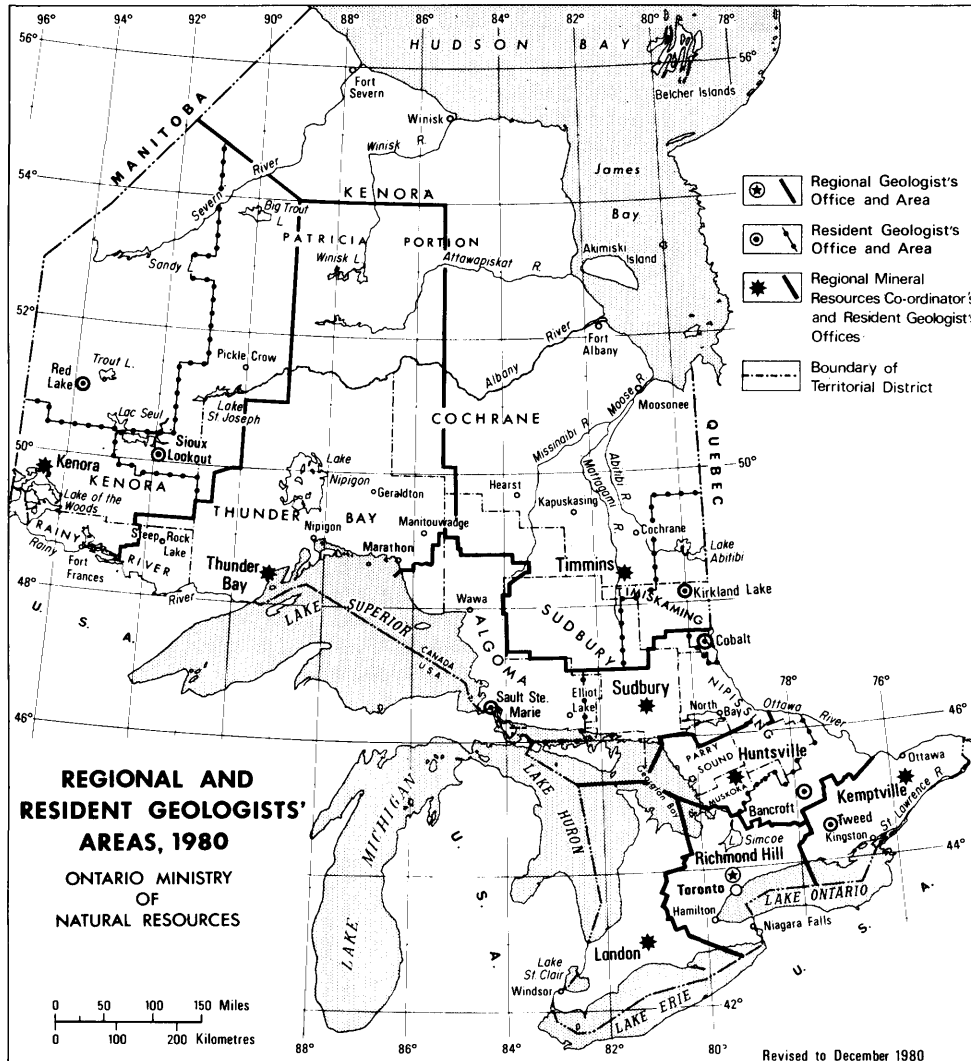
## **PREFACE**

This report, summarizing the activities of Regional and Resident Geologists for the year 1980, is an account of mining and exploration activities in Ontario prepared from information collected and filed in 1980. Listings of new additions to the Assessment Files records, and reports of government survey and university sponsored projects are provided.

Regional and Resident Geologists are located in various centres of the Province to provide geoscience information and advice to the public on the geology and mineral deposits of Ontario. Each office maintains a library of published and unpublished reports including publications of the Ontario Geological Survey, other government agencies, records of exploration activity submitted for assessment work credit, company prospectuses and reports from the files of the Ontario Securities Commission, reports of property visits made by the Regional or Resident Geologist and other staff geologists and information received directly from companies and individuals.

A new Resident Geologists office was opened in Bancroft, staffed by H.D. Meyn. Mineral Resources Coordinators positions were established in Kenora and Thunder Bay; responsibilities for these positions have been assumed by R.C. Beard and K.G. Fenwick, respectively, formerly Regional Geologists. Resident Geologists positions have been created in both offices and will be staffed early in 1981. A Resident Geologists' office, staffed by L. Owsjacki, will be opened at Cobalt on January 15, 1981.

B. Feenstra became Aggregate Geologist for the Southwestern Region.



REGIONAL MINERAL RESOURCES CO-ORDINATORS' OFFICES		TELEPHONE
Northwestern Region	— R.C. Beard	808 Robertson St., Kenora P9N 3X7 (807) 468-3111
North Central Region	— K.G. Fenwick	435 James St. S., Thunder Bay P7C 5G6 (807) 475-1331
Northern Region	— W.O. Mackasey	60 Wilson Ave., Timmins P4N 3W2 (705) 267-1401
Northeastern Region	— J.C. Wilson	10th fl., 199 Larch St., Sudbury P3B 2E5 (705) 675-4128
Algonquin Region	— W.J. Logan	Box 9000, Huntsville P0A 1K0 (705) 789-9611
Eastern Region	— M.A. Klugman	Concession Road, Kemptville K0G 1J0 (613) 258-3413
Central Region	— L.G.D. Thompson	10670 Yonge St., Richmond Hill L4C 3C9 (416) 884-9203
Southwestern Region	— S. Keen	1106 Dearness Drive, London N6E 1N9 (519) 681-5350

REGIONAL/RESIDENT GEOLOGISTS' OFFICES		
Kenora	—	808 Robertson St., Kenora P9N 3X7 (807) 468-3111
Red Lake	— M.E. Durocher	Ont. Govt. Bldg., Box 860, Red Lake P0V 2M0 (807) 727-2252
Sioux Lookout	— D.A. Janes	Box 1089, Sioux Lookout P0V 2T0 (807) 737-1291
Thunder Bay	—	435 James St. S., Thunder Bay P7C 5G6 (807) 475-1331
Timmins	— L.E. Luhta	60 Wilson Av., Timmins P4N 3W2 (705) 267-1401
Kirkland Lake	— H.L. Lovell	4 Government Rd. E., Kirkland Lake P2N 1A2 (705) 567-5242
Sudbury	— P.E. Giblin	10th fl., 199 Larch St., Sudbury P3B 2E5 (705) 675-4128
Sault Ste. Marie	— G.A. Bennett	875 Queen St. E., Sault Ste. Marie P6A 2B3 (705) 942-1414
Cobalt	— L. Owsiaci	Box 799, Presley St., Cobalt P0J 1C0 (705) 679-8313
Huntsville	—	Box 9000, Huntsville P0A 1K0 (705) 789-9611
Bancroft	— H.D. Meyn	Box 500, Bancroft K0L 1C0 (613) 332-3960
Tweed	— P.W. Kingston	255 Metca:f St., Box 70, Tweed K0K 3J0 (613) 478-2330
Richmond Hill	— M. Narain	10670 Yonge St., Richmond Hill L4C 3C9 (416) 884-9203
London	— P.A. Palonen	1106 Dearness Drive, London N6E 1N9 (519) 681-5350

## TABLE OF CONTENTS

NORTHWESTERN REGION	
1980 Report of the Northwestern Regional Geologist and Kenora Resident Geologist .....	1
1980 Report of the Red Lake Resident Geologist .....	17
1980 Report of the Sioux Lookout Resident Geologist .....	30
NORTH CENTRAL REGION	
1980 Report of the North Central Regional Mineral Resources Coordinator .....	43
NORTHERN REGION	
1980 Report of the Timmins Resident Geologist .....	68
1980 Report of the Kirkland Lake Resident Geologist .....	86
NORTHEASTERN REGION	
1980 Report of the Sault Ste. Marie Resident Geologist .....	108
1980 Report of the Sudbury Resident Geologist .....	116
ALGONQUIN REGION	
1980 Report of the Algonquin Regional Mines Coordinator .....	123
EASTERN REGION	
1980 Report of the Eastern Regional Mines Coordinator and Eastern Region Resident Geologist .....	128
CENTRAL REGION	
1980 Report of the Central Regional Geologist .....	136
SOUTHWESTERN REGION	
1980 Report of the Southwestern Regional Geologist .....	154

## LIST OF PUBLICATIONS (back pocket)

1980 Supplement to Bulletin 25, List of Publications.  
Ontario Geological Survey, Ministry of Natural Resources.

# Conversion Factors for Measurements in Ontario Geological Survey Publications

If the reader wishes to convert imperial units to SI (metric) units or SI units to imperial units the following multipliers should be used:

CONVERSION FROM SI TO IMPERIAL			CONVERSION FROM IMPERIAL TO SI		
<i>SI Unit</i>	<i>Multiplied by</i>	<i>Gives</i>	<i>Imperial Unit</i>	<i>Multiplied by</i>	<i>Gives</i>
LENGTH					
1 mm	0.039 37	inches	1 inch	<b>25.4</b>	mm
1 cm	0.393 70	inches	1 inch	<b>2.54</b>	cm
1 m	3.280 84	feet	1 foot	<b>0.304 8</b>	m
1 m	0.049 709 7	chains	1 chain	20.116 8	m
1 km	0.621 371	miles (statute)	1 mile (statute)	<b>1.609 344</b>	km
AREA					
1 cm <sup>2</sup>	0.155 0	square inches	1 square inch	<b>6.451 6</b>	cm <sup>2</sup>
1 m <sup>2</sup>	10.763 9	square feet	1 square foot	<b>0.092 903 04</b>	m <sup>2</sup>
1 km <sup>2</sup>	0.386 10	square miles	1 square mile	2.589 988	km <sup>2</sup>
1 ha	2.471 054	acres	1 acre	0.404 685 6	ha
VOLUME					
1 cm <sup>3</sup>	0.061 02	cubic inches	1 cubic inch	<b>16.387 064</b>	cm <sup>3</sup>
1 m <sup>3</sup>	35.314 7	cubic feet	1 cubic foot	0.028 316 85	m <sup>3</sup>
1 m <sup>3</sup>	1.308 0	cubic yards	1 cubic yard	0.764 555	m <sup>3</sup>
CAPACITY					
1 L	1.759 755	pints	1 pint	0.568 261	L
1 L	0.879 877	quarts	1 quart	1.136 522	L
1 L	0.219 969	gallons	1 gallon	<b>4.546 090</b>	L
MASS					
1 g	0.035 273 96	ounces (avdp)	1 ounce (avdp)	28.349 523	g
1 g	0.032 150 75	ounces (troy)	1 ounce (troy)	<b>31.103 476 8</b>	g
1 kg	2.204 62	pounds (avdp)	1 pound (avdp)	<b>0.453 592 37</b>	kg
1 kg	0.001 102 3	tons (short)	1 ton (short)	<b>907.184 74</b>	kg
1 t	1.102 311	tons (short)	1 ton (short)	<b>0.907 184 74</b>	t
1 kg	0.000 984 21	tons (long)	1 ton (long)	<b>1016.046 908 8</b>	kg
1 t	0.984 206 5	tons (long)	1 ton (long)	<b>1.016 046 908 8</b>	t
CONCENTRATION					
1 g/t	0.029 166 6	ounce (troy)/ ton (short)	1 ounce (troy)/ ton (short)	34.285 714 2	g/t
1 g/t	0.583 333 33	pennyweights/ ton (short)	1 pennyweight/ ton (short)	1.714 285 7	g/t
<b>OTHER USEFUL CONVERSION FACTORS</b>					
	1 ounce (troy)/ton (short)	20.0	pennyweights/ton (short)		
	1 pennyweight/ton (short)	0.05	ounce (troy)/ton (short)		

NOTE—Conversion factors which are in bold type are exact. The conversion factors have been taken from or have been derived from factors given in the Metric Practice Guide for the Canadian Mining and Metallurgical Industries published by The Mining Association of Canada in cooperation with the Coal Association of Canada.

# 1980 Report of the Northwestern Regional Geologist and Kenora Resident Geologist

R. C. Beard<sup>1</sup> and S. Rivett<sup>2</sup>

## Contents

Introduction .....	1
Regional Geologist's Activities .....	1
Mining Activity .....	2
Exploration Activity .....	3
Gold .....	3
Base Metals .....	6
Other Minerals and Commodities .....	6
Bigstone Bay Study .....	6
Gold Creek (East) Occurrence .....	7
Gold Creek (West) Occurrence .....	7
King Mine (Shaft Area) .....	7
King Mine (Adit) .....	7
Maiden Island Occurrence .....	10
Triumph Mine .....	10
Feasibility of Small Gold Mining and Milling Operations in Northwestern Ontario .....	10
Heap Leach Test Program .....	10
Property Examinations .....	11
Echo Bay Adit Occurrence .....	11
Monte Cristo Gold Prospect .....	11
Recommendations for Prospecting and Development .....	12
Gold Exploration Techniques .....	12
Gold In Massive Sulphides .....	12
Mine Centre Gold Deposits .....	13
Heap Leaching of Gold Ores .....	13
Ontario Geological Survey Activities .....	14
Mineral Exploration Assistance Program (MEAP) .....	14
Research by Other Agencies .....	14
University Theses .....	14
Ontario Geoscience Research Grant Program .....	14
Recent Publications and References .....	14

## Tables

1—Maps and Reports Pertaining to the Kenora Mining Division, Issued by The Ontario Geological Survey in 1980 ..	2
2—Exploration Activity in 1980 .....	3
3—Assessment Work and Other Information Received in 1980 .....	4

## Figures

1, 2 Kenora Resident Geologist's District .....	8, 9
---	------

<sup>1</sup>Regional Geologist, and Mineral Resources Coordinator, Ontario Ministry of Natural Resources, Provincial Building, 808 Robertson Street, Kenora, P9N 3X9.

<sup>2</sup>Resource Geologist.

## Introduction

The Regional Geologist's office is staffed by R. C. Beard, Mineral Resources Coordinator, S. Rivett, Resource Geologist, and M. Guderyan, Secretary. A. MacTavish and J. C. Gibson were employed on contract to prepare Data Series Maps. F. Forsgren, Senior Geological Assistant, and A. Kolysnik, Experience '80 student technician, participated in summer field activities.

Although none of the known gold deposits were brought to production during the year and no base-metal discoveries were made, the overall activity level in the Mining Division was significantly higher than in recent years. Much of this increased activity took the form of data research and property acquisition of previously documented gold prospects. As a result, office and phone consultations handled by the Regional staff were exceptionally high during the year, and this tended to restrict the normal field program.

## Regional Geologist's Activities

As part of the regular field program, three operating mines and quarries were visited by the Regional Geologist during the year: Campbell Red Lake Mines Limited, South Bay Mine (Selco Mining Corporation Limited), and the Vermilion Bay Quarry (Universal Granite Company Limited). Several properties were also visited that were undergoing development work or extensive surface exploration. These included the properties of Eco Mining Limited at High Lake, west of Kenora, undergoing underground development work; Goldlund Mines Limited, which saw further diamond drilling, underground sampling, and a feasibility study; Windfall Mines Limited, undergoing an extensive surface diamond drilling program; and Porto Metal Mills Limited at Witch Bay where a small portable mill has been set up to remill tailings. The old Cordova Mine near Marmora in the Eastern Region of Ontario was also visited; (this property was visited as part of the Region's heap leaching investigation). Several other properties undergoing active exploration and a number of other inactive mineral showings were also examined and reported upon during the year.

One special field project was undertaken by the Kenora staff during the year. Scott Rivett, Resource Geologist, assisted by Frank Forsgren, Senior Field Assistant and A. Kolysnik, commenced a gold deposit study in the

**NORTHWESTERN-KENORA**

**TABLE 1** | **MAPS AND REPORTS PERTAINING TO THE KENORA MINING DIVISION. ISSUED BY THE ONTARIO GEOLOGICAL SURVEY IN 1980. SEE LIST OF PUBLICATIONS (BACK POCKET) FOR DETAILS.**

<b>GEOSCIENCE REPORTS</b>		
GR 194		
<b>MISCELLANEOUS PAPERS</b>		
MP 77		MP 92
MP 89		MP 93
MP 91		MP 96
<b>OPEN FILE REPORTS</b>		
OFR 5285		OFR 5298
OFR 5288		OFR 5301
OFR 5289		OFR 5302
OFR 5292		OFR 5307
OFR 5293		
<b>NOEGTS REPORTS</b>		
21		38
22		53
37		68
<b>NOEGTS MAPS</b>		
5058		5061
5059		5069
5060		5071
<b>COLOURED MAPS</b>		
2421		
<b>FEDERAL – PROVINCIAL MAPS</b>		
80 442 to 80 457 inclusive		
<b>PRELIMINARY MAPS (GEOLOGICAL)</b>		
P. 2201		
P. 2202		
<b>PRELIMINARY MAPS (DATA SERIES)</b>		
P. 2030	P. 2042	P. 2060
P. 2031	P. 2043	P. 2061
P. 2032	P. 2044	P. 2062
P. 2033	P. 2045	P. 2063
P. 2034	P. 2046	P. 2097
P. 2035	P. 2047	P. 2098
P. 2036	P. 2048	P. 2099
P. 2037	P. 2058	P. 2100
P. 2041	P. 2059	P. 2334

Bigstone Bay area east of Kenora. This work consisted of examination and sampling of the gold occurrences in the area to provide data and documentation on the deposits, and geological mapping to refine the geology and attempt to relate the gold deposits to the volcanic stratigraphy and structure. This project will be continued next year.

As part of the West Patricia Land Use Plan, two background documents were published by the Ministry in 1980. These documents describe the "Bedrock and Surficial Geology" and "Mineral Resources" of the planning area. Also as part of the land use planning process, two mineral resource components for District Land Use Plans were completed, and a third one is underway. Numerous other mineral potential evaluations were prepared for specific situations, to identify and alleviate resource and land use conflicts.

A total of 30 Data Series Maps were completed during the year. Of these, 26 have been published through the Ontario Geological Survey, and an additional six are in preparation.

Assistance was provided for the annual field trip of the Ontario Geological Survey, which was held in Northwestern Ontario this year.

As part of the Ministry's public information program, geoscience lectures and field trips were provided for a Junior Ranger camp and two High School groups. A 36 hour course on "Prospecting and Mineral Exploration" was also offered through Confederation College in Kenora.

## Mining Activity

In 1980, no metallic mineral production was recorded from any of the mining properties in the Kenora Mining Division.

Quarrying for decorative stone continued at the Rush Bay Quarry west of Kenora, as did quarrying of tombstone material at the Universal Granite Company quarry near Vermilion Bay. Crushed rock for railroad ballast was also quarried at East Hawk Lake east of Kenora and the White quarry northwest of Kenora.

Production of horticultural peat from the Barwick area, by Arctic Peat Moss Corporation Limited, also continued during 1980.

Underground development work was carried out at the Smerchanski Mine site by Eco Exploration Company Limited, a Winnipeg based company. This molybdenite deposit is located at High Lake, west of Kenora. An exploratory shaft was sunk to a depth of 735 feet, and lateral development work is planned on four levels to open up and bulk sample the mineralized zones.

Porto Metal Mills Limited of Sudbury installed a small portable gold mill on the site of the old Wendigo Gold Mine, a past producer located about 24 km southeast of Kenora. The Company plans to remill the old tailings, commencing operations in the Spring of 1981.

Feasibility studies were reportedly carried out during the year or are currently underway on several gold mining properties of the area. These include properties of Con-

solidated Professor Gold Mines Limited (Duport Mine) and Sherritt Gordon Mines Limited (Dubenski property). Preliminary or detailed feasibility studies were probably carried out on a number of other properties in the area, but details are lacking.

## Exploration Activity

There was a significant increase in exploration activity in the Kenora Mining Division in 1980. The number of claims recorded during the year was almost double the number recorded in the previous year, and was the highest it has been in five years. Most of this increased activity was related to gold. The statistics on claim staking are somewhat misleading, however, since much of the activity con-

sisted of intensive data research, surface examination and sampling, and property acquisition. Some increases in actual work did take place during the year, but the major impact will not be felt until 1981 when major work commitments will have to be met.

Exploration for base metals was slightly reduced over previous years. Most of this work resulted from on-going grass roots programs by major companies.

Geographically, the exploration work was fairly evenly distributed across the District, with somewhat more emphasis placed on the Lake of the Woods area and Kakagi Lake area, at least in terms of gold exploration.

## Gold

Interest in gold again ran high in the Kenora Mining Division, significantly more so than in the previous year. Despite the fact that the approximately 300 known deposits in the area are relatively small and widely scattered compared to gold deposits in major gold camps, interest in these less well-documented deposits was intense. Literally every known prospect of any consequence has now been picked up, either by staking or optioning, and programs to assess the economic potential of many of these prospects are either underway or planned for next year.

There are many obvious reasons for this increased level of activity in the area of 1980, but a paper by the authors on "The Potential of Small Gold Mining and Milling Operation in Northwestern Ontario", prepared for the Prospectors and Developers Association annual meeting in March, 1980, hopefully was a contributing factor. Partly as a result of this paper, a number of individuals and major companies have actively pursued the central mill and custom mill concept recommended in the paper.

This activity is directly reflected in the significant increase in the number of claims recorded during the year, as well as the number of patented mining properties optioned or otherwise acquired by these companies.

Two companies were especially active in this regard. Sherritt Gordon Mines Limited, which has an exploration office in Dryden, acquired a number of deposits, both patented and unpatented, during the year. Included in this package is the Dubenski property (the old Caswell-Williams prospect) in the Rowan Lake area. This property has published reserves of over 60 000 tons running 0.3 ounce of gold per ton (Kenora Assessment Files). The company carried out a diamond drilling program and a feasibility study on the property in 1980 but no production decision has yet been announced. Surface exploration programs, including some diamond drilling, were also carried out by the company on a number of other widely scattered deposits.

Denison Mines Limited also had a high profile in Northwestern Ontario over the past year. The company carried out extensive reconnaissance and property examinations and has acquired a number of deposits widely spread over the region. One of its more notable acquisitions was the properties owned by Kenora Prospectors and Miners Limited at Shoal Lake west of Kenora. This package includes two past producers, the

**TABLE 2** | **EXPLORATION ACTIVITY IN 1980**

The following is a list of individuals and companies known to be engaged in exploration within the Kenora Mining Division in 1980, and the type of work undertaken in each case. The numbers correspond to the numbered areas on Figure 1.

Individual or Company	Type of Work
1. Cone, Russell C. Jr.	Trenching in the Bad Vermilion Lake Area.
2. Cymbal Exploration Incorp.	Geophysical surveys and diamond drilling in the Dogpaw Lake area.
3. Euro Dollar Development Limited	Geophysical surveys and diamond drilling in Butler Lake area.
4. Hames, C. Marshall	Geophysical, geochemical and geological surveys in the Clearwater Bay area.
5. Nolan Lake Explorations Inc.	Diamond drilling in the Rowan Lake area.
6. Pitkanen, R.	Diamond drilling in the Little Turtle Lake area.
7. President Mines Limited	Diamond drilling in Kirkup Township.
8. Roberecki, Ed.	Trenching in the Bigstone Bay area
9. St. Joseph Explorations Ltd.	Geophysical surveys and diamond drilling in the Tabor Lake area.
10. Selco Mining Corporation Limited	Geochemical surveys and diamond drilling in Brownridge Township; geophysical surveys in the Bluffpoint Lake area.
11. Szetu, S.S.	Trenching in the Dogpaw Lake area.
12. Teck Explorations Limited	Geophysical surveys in Forgie Township.

NORTHWESTERN-KENORA

TABLE 3 | ASSESSMENT WORK AND OTHER INFORMATION RECEIVED IN 1980.

(See end of table for abbreviations used)

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work	Year	Toronto File No.	Local File No.
Bad Vermilion Lake	52C/10 NE	Cone, R.C. Jr.	Au	Assess	Tr	1980		EE-2
			Au	Assess	Tr	1979		EE-3
		McTavish, Ken	Au	Assess	Tr	1979		FF-1
Bigstone Bay	52E/9 NW	Roberecki, Ed	Au	Assess	Tr	1980		TT-1
Brownridge Twp.	52F/15 SE	Noranda Expl. Selco Mining Corp. Ltd.	BM	Assess	Geol	1978		Q-1
			Li, Ta	Assess	2 DDH (100)	1979		M-7
			Li, Ta	Assess	4 DDH (457)	1980		M-8
			Li	Assess	Geochem	1980		M-9
Butler Lake	52F/10 NE	Euro Dollar Dev. Ltd.	BM	Assess	IP, Mag	1978	2.2983	K-2
			BM	Assess	Geochem – SA	1978		K-3
			BM	Assess	SA	1978		K-4
			BM	Assess	Mag	1979		K-5
			Cu, Zn	Assess	SA	1979-80		K-6
			BM	Assess	EM	1978-79		K-7
			Cu, Zn	Assess	2 DDH (1514)	1979		K-8
			BM	Assess	EM	1979		K-9
			BM	Assess	EM	1980		K-10
			Cu, Zn, Au	Assess	3 DDH (2984)	1980		K-11
			Sherritt Gordon Mines Ltd.	BM	Assess	EM, Mag	1979	2.3098
Dogpaw Lake	52F/5 SW	Calvert Gas & Oil Ltd. Cymbal Explorations Inc.	Au	Pros		1979		MM-1
			Au	Assess	Pros	1979		LL-1
			Au	Assess	EM, Mag	1979	2.3090	LL-2
			Au	Assess	EM, Mag	1980	2.3234	LL-2
			Au	Assess	8 DDH (2857)	1980		LL-3
Szetu, S.A.			Au	Assess	Tr	1980		NN-1
Farrington Twp.	52C/10 NW	Armstrong, George	Cu, Zn	Assess	2 DDH (1748)	1979		H-14
Fisher Lake	52F/12 SE	Barrie Explorco Ltd.	Cu	Assess	1 DDH (133)	1979		G-1
			BM	Assess	EM, Mag	1979	2.3198	G-2
			BM	Assess	EM, Mag	1979	2.3198	G-3
Grassy Lake	52C/10 NE	Pitkanen, R.W.	Au	MEAP	Tr	1979		M-2
Halkirk Twp.	52C/10 NW	Armstrong, George	Cu	Assess	1 DDH (698)	1979		H-15
			Cu	MEAP	4 DDH (2190)	1979		H-16
			Cu, Zn	MEAP	1 DDH (532)	1979		H-17
			Cu, Zn	MEAP	8 DDH (3519)	1979		H-18
Kawaskegamuk Lk.	52F/8 NW	Selco Mining Corp. Ltd.	BM	Assess	EM, Mag	1977		M-2
Kirkup Twp.	52E/9 NW	President Mines Ltd.	Au	Assess	Tr	1979		SS-3
			Au	Assess	5 DDH (924)	1980		SS-2
Little Turtle Lake	52C/15 SE	Pitkanen, R.W.	Au	Assess	Tr	1979		S-1
			Au	Assess	1 DDH (922)	1980		S-2
Lobstick Bay	52F/5 NW	Barrie Explorco Ltd.	BM	Assess	1 DDH (106)	1979		J-1
			BM	Assess	EM, Mag	1979		J-2
			BM	Assess	EM, Mag	1979	2.3198	J-3
			BM	Assess	EM, Mag	1979	2.3198	J-4
			BM	Assess	EM, Mag	1979	2.3198	J-5
			BM	Assess	EM, Mag	1979	2.3198	J-6
MacFie Twp.	52F/9 NW	Beth-Canada Mining Co.	BM	Assess	Mag	1979		J-1
			BM	Assess	EM, Mag	1979		J-2



Table 3 – continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work	Year	Toronto File No.	Local File No.
MacNicol Twp.	52F/13 SW	Rollmac Expl. Corp. Ltd.	U	Assess	Tr	1979		BB-4
Minaki	52L/2 SE	Minorex Ltd.	U	Assess	Geol., Mag & Rad	1979		J-1
Paterson Lake	52L/7 SE	Lesavage, Stephen J.	U	Assess	Mag	1978	2.3005	J-1
Rowan Lake	52F/5 SE	Nolan Lake Expl. Inc.	Au	Assess	Tr	1979		II-1
			Au, Cu	Assess	3 DDH (887)	1980		II-2
			Au	Assess	EM	1979	2.3138	II-3
Sand Lake	52E/15 NE	Minorex Ltd.	U	Assess	Geol, Mag & Rad	1979		B-2
Shoal Lake	52E/10 SW	Tibbo, Harold George	Au	Assess	5 DDH (1015)	1979	2.3213	GG-1
Snowshoe Lake	52L/11 SE	Wahl, W.G. Ltd.	U	Assess	Geol, Rad	1978	2.2943	F-1
Tabor Lake	52F/9 SW	St. Joseph Expl. Ltd.	Au	Assess	4 DDH (3037)	1980		Y-1
			Au	Assess	EM, Mag	1980	2.3279	Y-2
Trapline Lake	52L/10 SW	Wahl, W.G. Ltd.	U	Assess	Geol, Rad	1978	2.2943	B-1
Van Horne Twp.	52F/15 SW	Euro-Dollar Dev. Ltd.	BM	Assess	IP, Mag	1978		D-2
			BM	Assess	Mag	1979		D-3
			Cu, Zn	Assess	SA	1979-80		D-4
			BM	Assess	EM	1979		D-5
Willingdon Twp.	52F/5 NW	Barrie Explorco Ltd.	BM	Assess	1 DDH (144)	1979		J-1
			BM	Assess	EM, Mag	1979		J-2
Zealand Twp.	52F/15 SE	Euro-Dollar Dev. Ltd.	BM	Assess	IP, Mag	1978		P-2
			BM	Assess	SA	1978		P-3
			BM	Assess	Mag	1979		P-4
			Cu, Zn	Assess	SA	1979-80		P-5
			Cu, Zn	Assess	1 DDH (675)	1979		P-6
			BM	Assess	EM	1979		P-7

## Abbreviations

Air	-- Airborne	Geol	-- Geological Survey	Pros	-- Prospectus
Assess	-- Assessment Work	Geochem	-- Geochemical Survey	Rad	-- Radiometric Survey
Au	-- Gold	IP	-- Induced Polarization Survey	SA	-- Sampling
BM	-- Basemetals	Li	-- Lithium	Ta	-- Tantalum
Cu	-- Copper	Tr	-- Trenching	U	-- Uranium
5 DDH (620)	-- 5 Diamond Drill holes totalling 620'	Mag	-- Magnetometer Survey	W	-- Tungsten
EM	-- Electromagnetic Survey	MEAP	-- Mineral Expl. assistance Program Report	Zn	-- Zinc

Mikado Mine and the Cedar Island Mine, as well as several well developed prospects.

Both companies reportedly plan major evaluation programs next year.

Noranda Explorations Limited too, has a long standing interest in the area, especially around Rowan Lake and Kakagi Lake. The Noranda-Pamour family recently acquired the old Dogpaw Lake prospect previously held by Canadian Arrow Mines Limited. This property, which is situated within 1.5 miles of the Sherritt Gordon-Dubenski deposit, has published reserves of 96 650 tons of probable ore averaging 0.3 ounce of gold per ton (Canadian Mines Handbook, 1978-1979). This company has also

acquired a number of other gold properties in the Rowan-Kakagi Lakes area as well as elsewhere in the District.

The reworking of mine tailings received some attention in 1980. Porto Metal Mills Limited, a Sudbury-based company, acquired rights to the tailings of the old Wendigo Mine at Witch Bay, southeast of Kenora. This mine was the largest producing gold mine in the Kenora Mining Division, and during the period 1936 to 1943, the property produced over 67 000 ounces of gold and over 1.8 million pounds of copper for a total value of production in excess of 2.5 million dollars. A portable mill, constructed on a semi-trailer and reportedly having a capacity over 200 tons per day (personal communication,

## NORTHWESTERN-KENORA

company official) was moved onto the property in the fall of 1980, and will reportedly be activated in early 1981. In addition, a base will be established at Witch Bay from which Porto Metal Mills Limited plans to carry out some exploration in 1981 (personal communication). Twenty-eight other past producing gold mines in the Kenora Mining Division are documented in the literature; most undoubtedly have some tailings on-site. Porto Metal Mills Limited, as well as several other small companies and individual entrepreneurs have examined and sampled most of these old tailings areas and rock dumps over the past year. Other than the Wendigo property mentioned above, no specific plans for reworking any of these deposits have been announced.

Several of the tailings areas are situated on Crown land, and the Ministry of Natural Resources is currently preparing policy guidelines to provide for the disposition of these Crown assets.

Additional surface and underground exploration programs were also carried out during the year. In the Mine Centre area, Corporate Oil and Gas Limited carried out a major surface exploration program on a large group of claims east of Bad Vermilion Lake which included the Foley Mine, the Ferguson prospect, and the McKenzie Gray occurrence. The company recently completed 49 diamond-drill holes for a total footage exceeding 11 000 feet.

At the old Pine Portage prospect 6 miles east of Kenora, President Mines Limited dewatered and sampled underground workings and drilled five diamond-drill holes to assess this deposit.

Shoal Lake, west of Kenora, was also the scene of some activity. In addition to the feasibility study by Consolidated Professor Gold Mines Limited on the Duport property, both Denison Mines Limited and Sherritt Gordon Mines Limited, as well as other individuals, carried out surface exploratory work in the area.

Elsewhere in the Kenora Mining Division, diamond drilling was carried out on the Tabor Lake prospect southwest of Dymont; the Avery Lake prospect east of Dinorwic; the Sullivan prospect at Rowan Lake; the Sherritt Gordon Mines property (Dubenski option) and the Flint Lake prospect, both in the Dogpaw Lake area; and the Olive Mine near Mine Centre.

Surface investigations of a general nature were carried out in the Shoal Lake area, the eastern Lake of the Woods area, the Kakagi Lake-Rowan Lake area, the Upper Manitou Lake-Boyer Lake area, and the Straw Lake area.

### Base Metals

As noted above, major companies carried out grass roots exploration programs in several areas in the Mining Division during the year. These areas included the Sioux Narrows area, both east and west of Highway 71; the Dogpaw Lake area; the Bee Lake area north of Kenora; the Wabigoon Lake area; scattered areas in the vicinity of Dryden; and in the Rainy Lake area west of Emo. Companies and individuals engaged in base-metals programs

included; George Armstrong, Beth-Canada Mining Company, Euro-Dollar Development, Geophysical Engineering Limited, Gulf Minerals Canada Limited, Hudbay Mining Limited, and Selco Mining Corporation Limited.

No major discoveries were reported as a result of any of this work. However, in the Fort Frances area, George Armstrong continued to delineate a large, low grade zinc deposit by diamond drilling. This deposit, the Wind Bay Prospect, was described by R. C. Beard and S. Rivett (1980). This year's drilling program tended to confirm the grades reported earlier, and also revealed two additional mineralized zones parallel to the two known zones. Armstrong reported the presence of low grade gold values as well (George Armstrong, personal communication).

### Other Minerals and Commodities

In Brownridge Township east of Dryden, Selco Mining Corporation Limited continued their exploration program on the Mavis Lake lithium-tantalum deposit. Geological and lithochemical surveys were carried out, and additional geochemical anomalies were tested by diamond drilling during the year. Tantalum Mining Corporation of Canada Limited conducted general reconnaissance and field examinations of pegmatite occurrences during the year.

Peat, as a possible energy source, also received attention. Peat Resources Limited of Toronto has expressed an interest in developing a peat gasification plant in the Fort Frances area (Fort Frances Times, September 17, 1980), and has made a number of contacts with the Town of Fort Frances and the Province of Ontario in this regard.

### Bigstone Bay Study

The study area (Figure 1), is located immediately east of the Town of Kenora, partly in Haycock, Jaffray, and Kirkup Townships in the Bigstone Bay area of Lake of the Woods.

Four past producing mines and another 36 or more prospects and occurrences are found in the study area. Nearly all of these properties were discovered at the turn of this century during the Lake of the Woods Gold Rush. With the exception of the larger mines and several of the prospects, there is little documentation of the geology, production, or the exact location of many of the properties. All properties are located near the contact between the Longbow Lake Batholith and mafic volcanic rocks, some occurring in the intrusion and some in the volcanic rocks.

The summer field program by the Kenora geological staff consisted of detailed geological mapping of shorelines and access roads, locating shafts and workings, and examining some of the properties. This examination included detailed geological mapping in the immediate vicinity of the showings, plotting the location of all workings such as shafts, pits, trenches, adits, ore dumps, and

tailings areas, and samplings of the mineralized zones and rock dumps.

Descriptions of several of the properties follows: all analyses were performed by the Geoscience Laboratories, Ontario Geological Survey, Toronto.

### Gold Creek (East) Occurrence

The occurrence is located 600 m east-northeast of the mouth of Gold Creek where it empties into Pine Portage Bay. It is found in the southeast corner of Mining Location 347P, presently owned by L. Moyer.

The property is underlain by several sequences of massive and pillowed mafic volcanic rocks. All showings appear to be in the pillowed volcanic rocks. An intrusive-extrusive contact is found 240 m east of the showings.

The property as active in the early 1890s and again in the early to mid-1930s. Production was limited to 300 tons of ore of undisclosed grade. The workings consist of two shafts, seven pits, and three trenches.

The original (north) shaft was sunk 50 feet on a nine-foot wide, intensely sheared zone striking N45°E and dipping steeply to the east. The shear consists of narrow stringers and lenses of quartz in chlorite schist. Mineralization consists of disseminated sulphides, tellurides, gold, and silver. The chief metallic mineral is tetradymite with considerable pyrite, calaverite, and petzite (Thompson 1936). Galena, sphalerite, chalcopyrite, and native gold have also been observed. Assays prior to this study have ranged from 0.06 to 0.98 ounce of gold per ton. A thirty pound sample of quartz and schist taken this summer over a 1.5 m interval from the west face of the shaft ran 0.14 ounce of gold per ton.

The south shaft is located 120 feet south of the north shaft. It too is located on a shear, striking N15°E and dipping 80° to the east. At the shaft it is about six feet wide, consisting of a three to nine inch sugary quartz-ankerite vein flanked by several feet of moderately to strongly carbonitized, chlorite schist. Assays of two grab samples of quartz off the rock dump ran 0.31 ounce of gold per ton and 0.15 ounce of silver per ton, and 0.31 ounce of gold per ton and 0.13 ounce of silver per ton respectively. Chip sampling across the mineralized zone at the shaft resulted in assays of 0.02 ounce of gold per ton, 0.12 ounce of silver per ton and 0.035 percent Copper over 30 inches of schist; trace gold, trace silver, and 0.02 percent copper over 26 inches of schist; and 0.18 ounce of gold per ton and 0.12 ounce of silver per ton across 30 inches of quartz and schist.

Three observations which might be significant are:

1. The shear zone striking N15°E and passing through the south shaft closely parallels the contact between the massive and pillowed volcanic flows, as well as the contact between the volcanic and the Longbow Lake Batholith.
2. The N15°E and N45°E shear zones appear to intersect at the north shaft.
3. A quartz porphyry dike striking N85°W is located 27 m south of the south shaft.

### Gold Creek (West) Occurrence

The showing, located in mafic volcanic flows just north of the mouth of Gold Creek on mining location 347P, is owned by L. Moyer.

Little is known about this occurrence. Moyer (personal communication) mentioned that a shaft was sunk close to the shore in overburden near a dock used to load barges of ore to be taken to the reduction works. A slight rectangular shaped depression 40 feet from the water's edge in an older thicket may mark the position of the old shaft. Numerous samples of mineralized quartz were found on the shore on the remains of the old loading dock.

Investigations also revealed numerous pits in the overburden 200 to 400 feet northeast of the creek mouth. These pits may have been dug to test the gravel potential of the area, 450 feet up the creek, and immediately west of a deep pit dug in the overburden, an eight foot quartz feldspar porphyry dike striking N30°E was located. L. Moyer (personal communication) reported that gold was panned in the creek. If this is true, the source of gold could be this dike.

### King Mine (Shaft Area)

The King Mine is located near the west shore of a small unnamed lake situated midway between Longbow Lake and Pine Portage Bay, Kirkup Township. This former mining location, 221P is now Crown land and has been staked by L. Moyer.

The only documentation of this property (Coleman 1897) stated that a small shaft had been sunk in quartz and sericite schist, the country rock being coarse red granite.

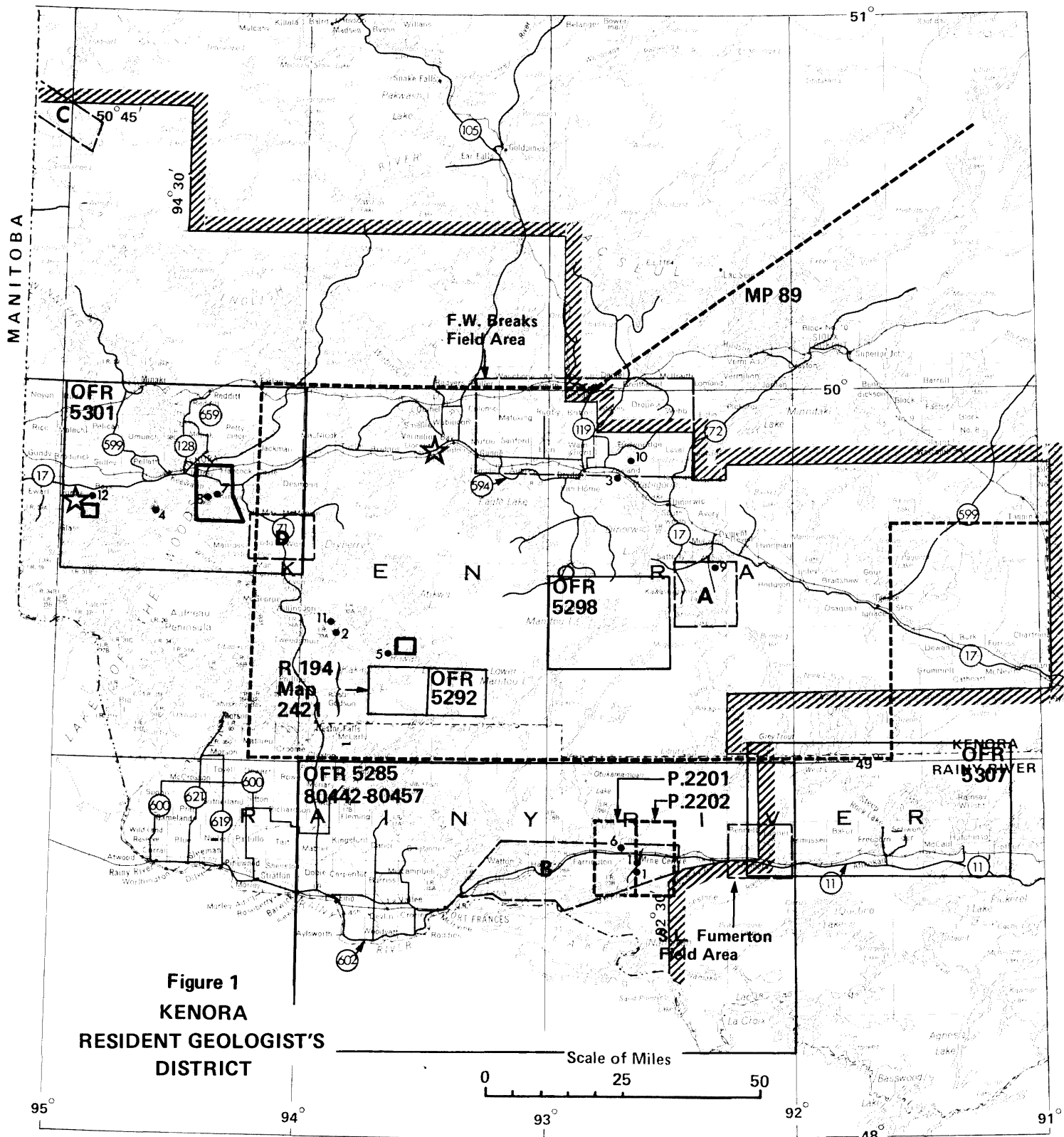
The current investigations revealed a 7 foot x 8 foot inclined shaft dipping 70° NW, which was plumbed to 15 feet. The rock pile contains considerably more rock, suggesting that the shaft is deeper, possibly with some horizontal development work. The shaft has been sunk on a strong, massive 5 to 6-foot wide white quartz vein which occupies a shear zone. The country rock is a dull pink, medium-grained tonalite. The tonalite within the shear is greatly deformed and altered to quartz-sericite schist with stringy quartz veinlets. Fine-grained pyrite is disseminated throughout the schist. Four inches of massive sulphide is found along the footwall of the shaft.

Chip sampling along the northwest face of the shaft resulted in the following assays: 0.02 ounce of gold per ton, trace silver across 2.7 feet of quartz stringers in schist; trace gold and trace silver across 2.1 feet of schist; and trace gold and 0.18 ounce of silver per ton across 5.3 feet of white quartz and minor schist.

### King Mine (Adit)

The adit is located on former mining location 221P, 900 feet southwest of the shaft. There is no mention of this adit in the public record.

# NORTHWESTERN-KENORA



**Figure 1**  
**KENORA**  
**RESIDENT GEOLOGIST'S**  
**DISTRICT**

### EXPLANATION

- ★ Operating quarries
- Exploration activity in 1980 (keyed to Table 2)
- Property examination described in report
- A** Field Parties

- Map or report issued by the Ontario Geological Survey in 1980 (keyed to Table 1)
- P - Preliminary map
- OFR - Open File Report
- R - OGS Report
- MP - Miscellaneous Paper
- 2421 - Colored Map
- 80442 - Federal - Provincial Maps (Geophysical/Geochemical Series)
- ▨ Boundary of Resident Geologist's District

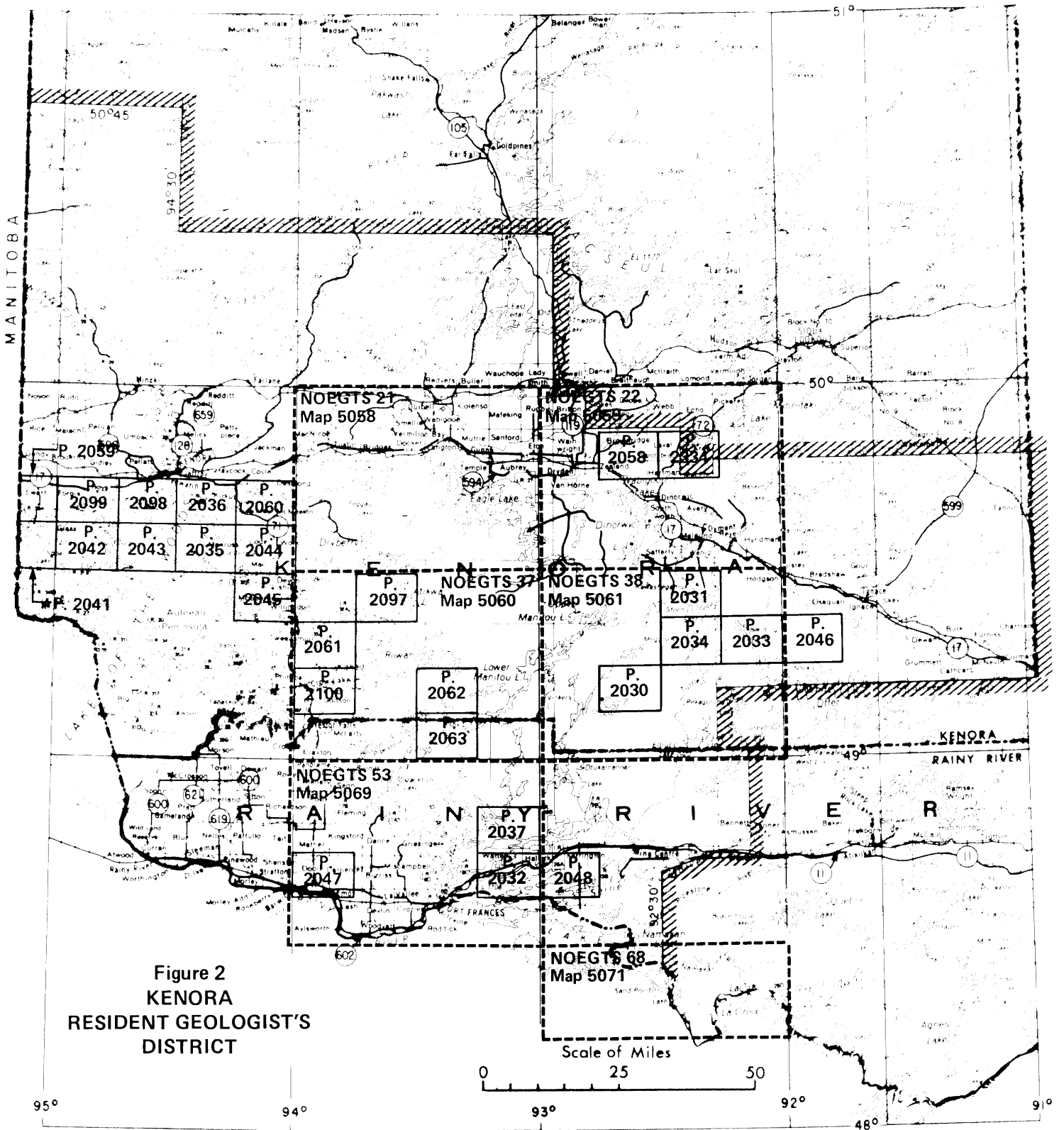


Figure 2  
KENORA  
RESIDENT GEOLOGIST'S  
DISTRICT

EXPLANATION

— P. - Preliminary Map; Data Series  
(Keyed to Table 1)

--- 37  
5060 - NOEGTS Reports and Maps  
(keyed to Table 1)

## NORTHWESTERN-KENORA

The adit has dimensions 4 feet by 6 feet by 100 feet long, and strikes at N50°W into the base of a cliff of tonalite. It intersects an eleven foot wide shear zone at approximately 90 feet. The shear zone strikes N50°E and dips northwesterly at 65°.

The shear zone is composed of a central, 2-foot wide barren white quartz vein, flanked to the northeast by 2.5 feet of mineralized quartz-sericite schist, and to the northwest by four feet of unmineralized, moderately sheared tonalite, and 2.5 feet of mineralized quartz-sericite schist. The mineralized schist is highly sheared, well foliated, silicified, and slightly carbonitized, with narrow stringers of sugary to glassy quartz, and 'eyes' of both quartz and feldspar.

Results of assays of samples taken from the shear zone are as follows: 0.02 ounce of gold per ton and trace silver across 2.4 feet and 2.8 feet respectively of mineralized schist; and trace gold and silver across 2 feet of white quartz.

### Maiden Island Occurrence

Maiden Island (Island 257) is located just off the north shore of Bigstone Bay, Lake of the Woods, approximately 1 mile east of the tip of Heenan's Point.

A pit, 6.5 feet by 8 feet by 12 feet deep was sunk in the early 1880s on an irregular quartz vein (Coste 1885) occupying a 10-inch to 30-inch wide shear zone. The host rock is a fine-grained, slightly fractured mafic volcanic flow. The shearing, which strikes N40°E and dips northwesterly at 75°, appears to have occurred along the contact between two flows. The shear is occupied by lenses, stringers and pods of slightly pyritic, sugary to glassy quartz, and silicified pyritic mafic volcanics.

Two samples were obtained from the pit area: A chip sample across 10 inches assayed 0.02 ounce of gold per ton, 0.10 ounce of silver per ton and 0.44 percent copper; the second, a grab sample, ran 0.24 ounce of gold per ton, trace silver, and 0.41 percent copper. Minerals present are gold, silver, chalcopyrite, pyrite, and possibly covellite.

### Triumph Mine

The property is located in Haycock Township, approximately 3000 feet northeast of the Trilake Timber Company yard on Highway 17 east of Kenora.

A 6 foot by 10 foot shaft is located on former Mining Location 12. Work on this shaft commenced prior to 1896 (Coleman 1897), reaching its ultimate depth of 226 feet, with 78 feet of lateral development on one level (Bow 1899). The shaft is sunk on a mineralized shear zone, striking N60°E at the surface. The shear is composed of 2.4 feet of glassy to slightly sugary barren, white quartz; 0.5 feet of heavily mineralized, vuggy, dark quartz; and 3.4 feet of highly sheared, carbonitized, weakly to moderately mineralized mafic schist. Pyrite is the most abundant sulphide. Minor galena was noted in schist north of the shaft.

The host rock is a medium-grained, fresh, quartz diorite.

Chip samples were taken across the shear zone on the north and south faces on the shaft, all six samples having the same result: trace gold and trace silver. A grab sample of quartz from the rock dump ran 0.01 ounce of gold per ton and trace silver.

## Feasibility of Small Gold Mining and Milling Operations in Northwestern Ontario

In Beard and Rivett (1980), preliminary estimates of the tonnages and grades of gold-bearing rock contained in the documented gold deposits of the area were presented. In 1980, a special consultants' study was commissioned to refine and expand upon these tonnage calculations, and to provide some basic cost data and other economic parameters of various small scale mining and milling alternatives in northwestern Ontario.

This study, funded by the Ministry of Northern Affairs, was carried out by James Neilson and Associates. The report will be published through the Ontario Geological Survey in early 1981.

By publishing tonnage and grade figures of this nature, it is hoped that sufficient incentive will be provided for the private sector to proceed with the construction of one or more central or custom milling facilities, thus facilitating the further development of the mineral resources of the area.

## Heap Leach Test Program

A heap leaching test program, funded by the Ministry of Northern Affairs, was initiated jointly with the North Central Region. Twelve 20- to 40-pound samples, representative of the different types of gold ore in the two Regions, were collected and sent to the Ontario Research Foundation for preliminary test work. Six of the twelve samples are being subjected to more detailed testing to further determine their suitability for heap leaching.

This test work includes chemical analysis and mineralogical examination of the feed, preliminary porosity tests, and leach tests using two inch columns under standard operating conditions with respect to lime and cyanide. Gold extraction versus time curves and reagent consumption will be obtained.

Results will be published through the Ontario Geological Survey in the spring of 1981. Further bench test work and/or demonstration projects on a larger scale are planned for 1981/82.

## Property Examinations

In 1980, the following mining properties or mineral occurrences were examined by the Kenora staff as part of the regular program:

Base metals:

Wind Bay Zinc Occurrence, Halkirk Township.

Gold:

Caswell-Williams (Dubenski-Sherritt Gordon) Prospect-Dogpaw Lake area.

Echo Bay Adit — Echo Bay, Lake of the Woods.

Floyd Lake (Fairservice-Edwards) Occurrence-Straw Lake Area.

Hatmaker Lake Occurrence-Western Peninsula.

Kuryliw-Sullivan Bay Occurrence — Rowan Lake.

Meston Occurrence — Rowan Lake.

Mine Centre Area — several prospects and occurrences including the Foley Mine, Ferguson Prospect, and McKenzie-Grey Occurrence.

Monte Cristo Occurrence — Rowan Lake.

Nonsuch Occurrence-Lake of the Woods.

Straw Lake Occurrence — Straw Lake.

Sullivan Prospect — Rowan Lake.

Victor Occurrence — Rowan Lake.

A number of other properties were examined as part of the Bigstone Project, and are listed elsewhere. Information concerning all of these properties is on file at the Kenora Regional Geologist's office. Two of these prospects are described in the following accounts.

### Echo Bay Adit Occurrence

There is no previous documentation of this gold occurrence, which is located on the north shore of Echo Bay, Lake of the Woods.

Earlier work has exposed gold-bearing quartz veins in a 90-foot long adit and a series of trenches close to the shoreline. The deepest pit, immediately above the adit, is 4 feet deep. The trenches have exposed the vein for a total distance of about 140 feet.

Gold mineralization occurs in two narrow quartz veins each about 6 or 7 inches wide and 15 feet apart. The vein quartz is glassy and contains fine pyrite, carbonate, and some galena. The host rock is a dense, highly schistose, felsic pyroclastic rock. It is coarsely fragmental locally, with stretched fragments producing a banded appearance. The pyroclastic rock contains finely disseminated pyrite. Some cherty chemical sedimentary rocks are also present along the shore, near the adit. A single grab sample representing a width of 4 inches, taken by the authors from the south vein, gave assays of 0.19 ounce of gold per ton and trace silver. Two other samples from the north vein gave 0.01 and 0.04 ounce of gold per ton with trace silver. Analyses were performed by the Geoscience Laboratories, Ontario Geological Survey, Toronto.

### Monte Cristo Gold Prospect

This prospect, situated on the south shore of Rowan Lake, was first discovered in 1900. At that time, a number of trenches were put in to expose the mineralized zone for a length of over 400 feet. In the early 1930s, two pits or shallow shafts were sunk on the zone, 350 feet apart, and in 1937, nine diamond-drill holes totalling 5000 feet were drilled by Lakeport Gold Mines Limited (Regional Geologist Files, Ontario Ministry of Natural Resources, Kenora). No evidence of any further work has been seen on this property since that time.

Gold mineralization occurs in a highly sheared zone of mixed quartz-sericite and quartz-chlorite schist, probably representing sheared felsic to intermediate volcanic tuffaceous rocks. Slight to moderate amounts of quartz are present throughout the schistose zones, both as pervasive silicification and as scattered disconnected stringers and lens of quartz, locally up to 2 feet in width. Quartz makes up about 10 to 15 percent of the rock in the sections exposed in the trenches. Carbonate is also common, occurring both in veinlets and pervasively throughout the schists. About 2 to 3 percent very fine pyrite is disseminated throughout, with occasional narrow stringers and concentrations. Several specks of visible gold were noted in outcrop during the present examination, and some chalcopyrite has been reported in the earlier work. The schists are in contact with the more massive mafic volcanic rocks to the south.

Sampling by Brent in 1900 (Burwash 1934) indicated consistent assay values of between 0.06 and 0.08 ounce of gold per ton over widths of 60 to 85 feet. One 5 foot section near the #2 shaft assayed 0.14 ounce of gold per ton. Burwash (1934) also reports comments by J. G. Cross to the effect that the maximum width of the gold-bearing zone is nearly 200 feet. Thomson (1942) also quoted Cross as saying that "widths of up to 25 feet of low grade material . . . would run between \$5 and \$6 a ton in gold (gold at \$35)". Several of the diamond drill holes put down in 1937 gave good results, with several 12 to 15 foot sections running from 0.14 to 0.21 ounce of gold per ton. (Thomson 1942)

Sampling by the authors in 1980 were encouraging. Of three composite grabs from the rock dump in the vicinity of the #2 shaft, two assayed 0.17 and 0.30 ounce of gold per ton, with the third running only trace amounts. A chip sample across a width of 25 feet in trench #4, immediately north of the #2 shaft, assayed 0.04 ounce of gold per ton. Two grabs from a short trench south of shaft #2 ran 0.29 and 0.02 ounce of gold per ton (analyses by the Geoscience Laboratories, Ontario Geological Surveys, Toronto).

Based on both the current and the earlier assay results, it would appear that this deposit has potential as a large tonnage, low-grade deposit. The highly schistose character of the host-rock also makes this deposit a candidate for the heap leaching process.

L. Kaye, while mapping the area in 1972 for the Ontario Geological Survey (Preliminary Map P831), took a sample of rusty carbonitized basalt schist from an outcrop about 915 m southwest of the Monte Cristo showing.

## NORTHWESTERN-KENORA

This chip sample, taken across a width of approximately 6 feet, assayed 0.10 ounce of gold per ton (Kaye 1973).

An examination of this location by the authors in 1980 revealed a reddish oxidized quartz-sericite-carbonate schist. This schist zone is in contact with dark green mafic volcanic rocks to the south. Two samples were collected and analyzed. The first, a channel sample across a width of 42 inches, assayed 0.08 ounce of gold per ton. The second, a chip sample across a width of 48 inches, assayed 0.01 ounce of gold per ton. (Analysis by the Geoscience Laboratories, Ontario Geological Surveys, Toronto). This showing appears to be nearly on strike with the Monte Cristo Prospect. Other scattered outcrops of sericite and chlorite schist are found along the shore between the two occurrences and to the east of the Monte Cristo. The schists locally contain narrow and irregular quartz-carbonate veins and stringers as well as occasional rusty seams of disseminated pyrite 3 inches to 10 inches wide. Six random composite grab samples from along the shoreline all ran trace to 0.01 ounce of gold per ton.

## Recommendations for Prospecting and Development

### Gold Exploration Techniques

The recent surge in gold exploration in the Province over the past several years has, in some cases, seriously stressed the technical capabilities of mining groups to carry out effective gold exploration and evaluation programs. Few exploration geologists or prospectors with extensive gold experience are still on the scene. Methods and techniques used to assess base-metal prospects are often not adequate to assess gold prospects, and, unless care is taken, gold exploration programs can be unduly costly and ineffective. Based upon local experience over the past several years, the following suggestions are offered:

1—As early as possible in the assessment of a property, determine the nature and distribution of gold values within the mineralized zones. This will have a strong influence on the remainder of the program, especially the sampling methods and techniques to be used.

2—Obtain the maximum amount of geological and assay information in two dimensions (surface) before attempting to assess the deposit in the third dimension. Utilize bulldozers, backhoes, or hand stripping, to expose as much of the deposit at surface as possible, and drilling and blasting to open up the deposit for fresh sampling.

3—When the deposit is well defined in two dimensions and the nature and distribution of the gold mineralization within the ore zone is known, only then should an attempt be made to assess the deposit in the third dimension. Diamond drilling should be carried out as a last resort. The small size of the samples obtained and the lack of information on the relationship of individual intersections to the total mineralized zone make drilling a very chancy tool at best. Many of the deposits in the Kenora

Division were opened up in the past with pits, shallow shafts, and lateral development. Whenever possible, these underground workings should be dewatered and rehabilitated to provide a three dimensional picture. While costs to go underground will probably be somewhat more than a drilling program, the amount and quality of information obtained usually offsets the additional costs.

4—Take large samples (bulk if possible) for assay whenever possible. The erratic distribution of precious metal values in many ore zones makes this essential for a proper assessment of most deposits. Bulk samples removed from old underground workings are preferable. If bulk sampling cannot be done, numerous channel samples should be taken. If diamond drilling is used, BX core or larger (NX preferably) should be taken whenever possible.

5—Take as many samples as possible. The more samples assayed, a more representative picture will be obtained.

6—Portable diamond saws, about the size of chain saws, are now available which can be used in the field for cutting channel samples.

Many of the above suggestions may seem rather obvious, but they must be kept in mind by prospectors working their gold deposits. The deposits of the Kenora Mining Division are especially suited to the kind of approach described since many have been opened up and worked extensively in the past, providing many rock trenches, shafts, underground drifts, rock piles, and tailings areas for sampling.

### Gold in Massive Sulphides

Recent experience in the Malartic area of northwestern Quebec, as well as elsewhere in Canada has shown that disseminated to massive volcanogenic pyrite deposits can, in some instances, contain primary ore-grade gold mineralization, and are especially attractive because of current gold prices. These gold deposits generally occur in felsic volcanic environments, ranging from massive stratiform pyrite in proximal environments to more distal pyritic cherts and reworked volcanoclastic sedimentary rocks. Tonnage and grade figures on deposits of this type, provided at the 1980 CIM Gold Symposium and Field Excursions in Val d'Or, Quebec, confirm that these types of low-grade gold deposits are, or soon will be, mineable at a profit if tonnages are sufficient. At Bigstone Bay, southeast of Kenora, a gold-bearing pyrite zone has been documented that warrants further investigation. This deposit, the Thrasher-Bigstone Bay prospect, was described by R. Thomson in 1946, and G. L. Holbrook of Sylvanite Gold Mines Limited in 1943 (Regional Geologist's Files, Kenora). The gold-bearing zone is extensively rusty and altered at surface and, according to Thomson, consists of brecciated siliceous material containing pyrrhotite and pyrite with traces of chalcopyrite. This zone dips rather flatly to the south and, despite the fact that it occurs in a predominantly mafic volcanic environment, appears to the authors to be a stratabound volcanogenic quartz-sulphide deposit.



Sampling by Sylvanite Gold Mines Limited in 1943 was poorly done in that "many of the samples were incorrectly taken, often down the dip and along the strike" (Holbrook 1943, material in Regional Geologist's Files, Kenora). Even so, of 39 channel or chip samples taken across an area 30 feet wide by 60 feet long, 10 ran over 0.15 ounce of gold per ton, and 17 out of 39 ran over 0.06 ounce of gold per ton.

It is suggested that other presumably 'barren' volcanogenic sulphide zones, especially those found in the vicinity of known gold occurrences, should be systematically resampled and analyzed for anomalous gold values. Many sulphide zones have been intersected by trenching and drilling over the years, especially in the course of anomaly determination. Much drill core is still available in the field, in company warehouses or core storage facilities, or in the offices of the Resident Geologists. Samples of pyrite from these occurrences should be collected and analyzed. Such a resampling program would be relatively easy and inexpensive to carry out, and hopefully will identify sulphide horizons with anomalously high gold values.

Recent analytical work carried out on sulphide-rich material from the Atikokan and Fort Frances area has indicated that significant but low grade cobalt values may also be associated with certain 'barren' sulphide zones of volcanogenic origin (Regional Geologist's Office, Ontario Ministry of Natural Resources, Thunder Bay). It is therefore suggested that samples collected, as described above, be analyzed for cobalt.

## Mine Centre Gold Deposits

A number of gold deposits under active exploration by Corporate Oil and Gas Limited south of Mine Centre were examined by Ministry geological staff during the year.

These properties include the old Foley Mine, the Ferguson Prospect, and the MacKenzie-Grey Occurrence, in addition to others. Several of the properties were the scene of extensive underground development work in the past, and although documentation is limited, most of the gold-bearing veins are well exposed in numerous shafts, deep pits, and trenches throughout the area.

The gold-bearing quartz veins have been described by Poulsen (1980 a and b) as occurring in ductile shear zones cutting a large felsic intrusion located east of Bad Vermilion Lake. Gold occurs within the quartz veins in several modes but, in general, is randomly and widely distributed as relatively coarse "nuggets", associated with galena, within relatively lean or barren quartz veins. Sampling and evaluation of the veins is difficult.

Although overburden is relatively thin over much of the area, and past prospecting has been extensive, the potential for discovery of additional gold-bearing veins within the intrusion is good. Detailed mapping of the known veins followed by structural analysis may lead to the discovery of additional veins.

An intrusion of similar character and composition, and probably genetically related, has also been mapped on the west side of Bad Vermilion Lake (Wood 1980 and

Tanton 1936). Few gold deposits have been documented in this area; this may reflect a relative lack of prospecting or more limited outcrop rather than less mineralization. This area should be explored also for similar type quartz veins filling ductile shear zones.

Due to the nature of the distribution of coarse gold in the quartz veins, bulk sampling would provide a true representation of the grade of individual veins throughout the area. This may require extensive surface stripping and trenching, or dewatering of existing underground workings.

## Heap Leaching of Gold Ores

Due to the significant economic advantage available through the use of heap leaching (capital costs approximately 25 percent and operating costs 40 percent of conventional milling costs), this concept has recently received some attention in northwestern Ontario. At least one company has collected samples from a number of local deposits, and run bench tests. The Ministry of Natural Resources and Ministry of Northern Affairs also initiated a similar test program in 1980 (described elsewhere in this report), and plan to continue the program in 1981.

In the Proceedings of the First International Conference on the Future of Small Scale Mining, held in Mexico in 1978, D. W. Kappes (1980) pointed out that a typical small operation of about 200 tons per day would require a capital investment, for the first 10 000 ton heap, of about \$200 000. This figure, in 1978 U.S. dollars, includes "all leach costs and on-site facilities . . . but does not include mining costs and purchase costs of major pieces of construction equipment".

Kappes also described a typical very small, one ton per day operation using heaps of about 60 tons which would require initial set-up costs of only about U.S. \$2000. This figure does not, however, include technical assistance. To set up such a one ton per day operation, Kappes estimated two weeks technical assistance would be required for start-up, and thereafter, one day's assistance every two weeks to keep things running smoothly. He suggested that, at this scale, "even if several properties were being leached in the same geographic locality, it is doubtful that they could carry the cost of (outside) technical assistance and still show a reasonable profit".

Regardless of the above statements, if the initial bench tests on local ores, being carried out by the Ministry of Natural Resources and the Ministry of Northern Affairs do prove to be encouraging, it is recommended that a demonstration project, using a 50 to 100 ton heap, be set up in the field. Costs in the \$10 000 to \$30 000 range could be expected. A demonstration project of this nature would determine if the process is practical on a production scale for Archean gold ores under northwestern Ontario climatic conditions.

## Ontario Geological Survey Activities

Field parties from the Precambrian and Mineral Deposits Sections of the Ontario Geological Survey were again active in the Kenora Mining Division during the 1980 field season.

C. E. Blackburn (Precambrian Section) continued detailed geological mapping in the Kawashegamuk Lake area, about 30 km southeast of Dryden (Blackburn 1980).

F. W. Breaks (Precambrian Section) continued a broad examination of felsic plutonic and metamorphic rocks within the English River and Quetico belts, to determine their importance as economic mineralization environments (Breaks 1980).

S. L. Fumerton (Precambrian Section) commenced and completed detailed geological mapping in the Calm Lake area, 25 km east of Mine Centre (Fumerton 1980).

K. H. Poulsen (Mineral Deposits Section) commenced a comprehensive study of the geological setting of mineralization in the Mine Centre–Fort Frances area (Poulsen 1980a).

P. C. Thurston (Precambrian Section) examined the Bee Lake volcanic belt as part of a continuing project to evaluate the economic potential of felsic volcanic centre in the western Uchi Belt (Thurston 1980).

N. F. Trowell (Precambrian Section) was completing detailed geological mapping in Code, Work, McMeekin, and LeMay Townships (Trowell 1980).

## Mineral Exploration Assistance Program (MEAP)

Three projects falling within the Kenora portion of the Atikokan MEAP area were approved for 1980–1981.

These include G. Armstrong in Farrington and Hal-kirk Townships, K. M. Carlson in the Reed Lake area, and Corporate Oil and Gas Limited in the Bad Vermilion Lake area.

The Ontario MEAP program terminated during the year and has been superceded by the Ontario Mineral Exploration Program (OMEP), an incentive program to stimulate exploration in all parts of the province.

## Research by Other Agencies

### University Theses

Geological theses, related to the Kenora Mining Division believed to be in progress or completed during 1980, are as follows:

M.Sc.

Bald, R. "Pre-volcanism, Archean Sialic Crust Gundy–Tannis Lake Area, Northwestern Ontario" (University of Manitoba).

Car, D. P. "A Volcaniclastic Sequence On The Flank of An Early Precambrian Stratovolcano, Lake of the Woods, Northwestern Ontario" (University of Manitoba).

Poulsen, K. H. "The Stratigraphy, Structure, and Metamorphism of Archean Rocks at Rainy Lake, Ontario" (Lakehead University).

Sutcliffe, R. H. "Evolution of the Rainy Lake Granitoid Complex, Northwest Ontario" (University of Toronto).

Ucakuwun, E. K. "The Mavis–Gullwing Lakes Pegmatite District Near Dryden, Northwestern Ontario" (University of Manitoba).

PhD.

Brown, B. B. "Structural Geology of the Central and Eastern Lake of the Woods Area, Ontario" (University of Manitoba).

Poulsen, K. H. – Commenced an assessment of the economic potential of the Rainy Lake Area (Queen's University).

## Ontario Geoscience Research Grant Program

G. R. Edwards and R. W. Hodder (University of Western Ontario) continued an investigation of the geochronological relationships between evolution and mineralization in a felsic-plutonic complex at Phinney–Dash Lakes east of Nestor Falls (Hodder and Edwards 1980).

## Recent Publications and References

Beard, R. C. and Rivett, S.  
1980: Report of the Northwestern Regional Geologist; p. 1-12 *in* Annual Report of the Regional and Resident Geologists, 1979, Edited by C. R. Kustra, OGS, MP91, 143p.

Beard, R. C. and Rivett, S.  
1980: Potential for Small Gold Mining and Milling Operations in the Kenora Area, Northwestern Ontario; Paper Presented at the 48th Annual Meeting of The Prospectors and Developers Association, Toronto, March 1980, 39p.

Blackburn, C. E.  
1980: Towards a Mobilist Tectonic Model for Part of the Archean of Northwestern Ontario; p. 64-72 *in* Geoscience Canada, June 1980, Volume 7, No. 2.

Blackburn, C. E.  
1980: Kawashegamuk Lake Area, District of Kenora *in* Summary of Field Work, 1980, by the Ontario Geological Survey, Edited by V. G. Milne, O. L. White, R. B. Barlow, J. A. Robertson, and A. C. Colvine, Ontario Geological Survey, MP96, 201p.

Bow, J. A.  
1899: Mines of Northwestern Ontario; p. 55 *in* Ontario Bureau of Mines Annual Report, 1899, Volume 8, Part 1.

Breaks, F. W.  
1980: Lithophile Mineralization in Northwestern Ontario: Rare-Element Granitoid Pegmatites; p. 5-9 *in* Summary of Field Work, 1980, by the Ontario Geological Survey, Edited by V. G. Milne, O. L. White, R. B. Barlow, J. A. Robertson, and A. C. Colvine, Ontario Geological Survey, MP96, 201p.

- Brisbin, W. C., and Green, A. G.  
1980: Gravity Model of the Aulneau Batholith, Northwestern Ontario; p. 968-977 *in* Canadian Journal of Earth Sciences, Volume 17, Number 8, August 1980.
- Brown, Peter A.  
1980: Research Potential of the Mulcahy Lake Gabbro near Dryden in Northwestern Ontario; p. 6 *in* Atomic Energy of Canada Limited, TR-93
- Burwash, E. M.  
1934: Geology of the Kakagi Lake Area, Kenora District, Ontario; Ontario Department of Mines Annual Report, 1933, Volume 42, Part 4, p. 41-92.
- Car, Dwayne Peter  
1980: A Volcaniclastic Sequence on the Flank of an Early Precambrian Stratovolcano. Lake of the Woods, Northwestern Ontario; p. 1-111 *in* Department of Earth Sciences, Master of Science Thesis, Winnipeg, Manitoba, February 1980.
- Coker, W. B., Hornbrook, E. H. W., and Cameron, E. M.  
1979: Lake Sediment Geochemistry Applied to Mineral Exploration, *in* Geophysics and Geochemistry in the Search for Metallic Ores; Peter J. Hood, Editor; Geological Survey of Canada, Economic Geology Report 31, p. 435-478.
- Coleman, A. P.  
1897: Third Report of The West Ontario Gold Region; Ontario Bureau of Mines Annual Report, Volume 6, 1896.
- Coste, E.  
1885: Report on the Gold Mines of the Lake of the Woods; Geological and Natural History Survey of Canada, Report of Progress 1882-83-84, Part K, Number 14.
- Earll, F. N., Stout, K. S., Griswold, G. G., Jr., Smith, R. I., Kelly, F. H., Emblen, D. J., Vine, W. A., and Dahlem, D. H.  
1976: Handbook for Small Mining Enterprises; Prepared for Montana Bureau of Mines and Geology, Bulletin 99, March 1976. 218p.
- Fumerton, S. L.  
1980: Calm Lake Area, District of Rainy River; p. 32-36 *in* Summary of Field Work, 1980, by the Ontario Geological Survey, Edited by V. G. Milne, O. L. White, R. B. Barlow, J. A. Robertson, and A. C. Colvine, Ontario Geological Survey, MP 96, 201p.
- Goldich, S. S. and Peterman, Z. E.  
1980: Geology and Geochemistry of the Rainy Lake Area; *in* Precambrian Research, 11 (1980), p. 207-327.
- Hodder, R. W. and Edwards, G. R.  
1980: Grant 55: Evolution of an Archean Felsic Volcanic-Plutonic Complex; p. 101-110 *in* Geoscience Research Grant Program, Summary of Research, 1979-1980, Edited by E. G. Pye, Ontario Geological Survey, MP93, 262p.
- Hussey, S. J., Salisbury, H. B. and Potter, G. M.  
1979: Carbon-in-Pulp Gold Adsorption from Cyanide Leach Slurries; United States Department of the Interior, Bureau of Mines, Report of Investigations 8368, 22p.
- Kappes, D. W.  
1980: Leaching of Small Gold and Silver Deposits, Chapter 61; p. 381-388 *in* The Future of Small Scale Mining, by UNITAR, Edited by R. F. Meyer and J. S. Carman, 501p.
- Kaye, L.  
1973: Rowan Lake Area, Kenora District, Ontario; Ontario Division of Mines, Preliminary Map P831, Geological Series, Scale 1:15 840 or 1 inch to ¼ mile. Geology 1972.
- Longstaffe, Fred J., McNutt, Robert H., and Schwarcz, Henry P.  
1980: Geochemistry of Archean Meta-Igneous Rocks, Lake Despair Area, Wabigoon Subprovince, Northwestern Ontario; p. 1046-1063 *in* Canadian Journal of Earth Sciences, Volume 17, Number 8, August, 1980.
- Matthews, Stephen R.  
1975: The Contact Nature of the Darlington Bay Porphyritic Granodiorite: Kenora-Keewatin; B.Sc. Thesis, Queen's University, 61p.
- Poulsen, K. H.  
1980a: The Geological Setting of Mineralization in the Mine Centre-Fort Frances Area, District of Rainy River; p. 162-168 *in* Summary of Field Work, 1980, by the Ontario Geological Survey, Edited by V. G. Milne, O. L. White, R. B. Barlow, J. A. Robertson, and A. C. Colvine, Ontario Geological Survey, MP 96, 201p.  
1980b: An Inverted Archean Succession at Rainy Lake, Ontario; p. 1358-1369 *in* Canadian Journal of Earth Sciences, Volume 17, Number 10, October 1980.
- Setterfield, Thomas Neal  
1980: Petrology and Chemistry of Pillowed Metabasalts and Their Copper Mineralization, Maybrun Mine, Ontario; B.Sc. Thesis, Carleton University; 52p.
- Sopuck, V. J., Lavin, O. P., and Nichol, Ian  
1980: Litho-geochemistry as a Guide to Identifying Favourable Areas for the Discovery of Volcanogenic Massive Sulphide Deposits; Canadian Institute of Mining, November, 1980, p. 152-166 *in* Geochemical Exploration, Volume 73, Number 823.
- Tanton, T. L.  
1936: Mine Centre Area, Rainy River District, Ontario; Geological Survey of Canada, Map 334A, scale 1 inch to ½ mile. Geology 1934.
- Thomson, J. E.  
1936: Gold Deposits on the Lake of the Woods, Kenora District; Ontario Department of Mines Annual Report, Volume 44, Part 4, p. 42.  
1942: Gold Discoveries at Rowan Lake, Kenora District, Ontario; Ontario Department of Mines Annual Report, 1938, Volume 47, Part 6, p. 11-13.
- Thurston, P. C.  
1980: Felsic Centres of Volcanism, Uchi and Gods Lake Subprovinces, Northwestern Ontario; p. 28-31 *in* Summary of Field Work, 1980, by the Ontario Geological Survey, Edited by V. G. Milne, O. L. White, R. B. Barlow, J. A. Robertson, and A. C. Colvine, Ontario Geological Survey, MP96, 201p.
- Trowell, N. F., Logothetis, J. and Caldwell, G. F.  
1980: Gibi Lake Area, District of Kenora; p. 17-20 *in* Summary of Field Work, 1980, by the Ontario Geological Survey, Edited by V. G. Milne, O. L. White, R. B. Barlow, J. A. Robertson, and A. C. Colvine, Ontario Geological Survey, MP96, 201p.
- Turnock, A. D.  
1979: 1979 Annual Report, Centre for Precambrian Studies; University of Manitoba, 23 p.
- Wood, John, Dekker, John, Jansen, J.G., Keay, J.P., and Panagapko, Douglas  
1980: Mine Centre Area (Western Half), District of Rainy River; Ontario Geological Survey Preliminary Map P.2201, Geological Series. Scale 1:15 840 or 1 inch to ¼ mile. Geology 1976, 1977.

## *NORTHWESTERN-KENORA*

Wood, John, Dekker, John, Jansen, J.G., Keay, J.P., and Panagapko, Douglas

1980: Mine Centre Area (Eastern Half), District of Rainy River; Ontario Geological Survey Preliminary Map P.2202, Geological Series. Scale 1:15 840 or 1 inch to ¼ mile. Geology 1976, 1977.

Wood, John

1980: Epiclastic Sedimentation and Stratigraphy in the North Spirit Lake and Rainy Lake areas; a Comparison; p. 227 – 255 in Precambrian Research, Volume 12 Numbers 1-4.

Wolff, J. M.

1977: The Geochemical Nature of An Archean Plutonic-Volcanic Suite as Exemplified by the Kakagi-Stephen Lakes Area, N.W. Ontario; M.Sc. Thesis, McMaster University, 137 p.

Meyer, R.F. and Carman, J.S. (Editors)

1980: The Future of Small Scale Mining; UNITAR – The United Nations Institute for Training and Research, 501 p.

# 1980 Report of the Red Lake Resident Geologist

M.E. Durocher<sup>1</sup>

## Contents

Introduction .....	17
Resident Geologist's Activities .....	17
Mining Activity .....	20
Campbell Red Lake Mines Limited .....	21
Dickenson Mines Limited .....	21
The Griffith Mine .....	21
Selco Mining Corporation Limited .....	21
Exploration Activity .....	21
Properties Visited .....	27
Mink Lake Molybdenum Prospect .....	27
Recommendations for Exploration .....	27
Birch Lake Area .....	27
Mineral Exploration Assistance Program .....	28
Ontario Geological Survey Activities .....	28
Research by Other Agencies .....	28
Selected Recent Publications and References .....	28

## Tables

1 - Claims recorded and assessment work received .....	17
2 - Maps and reports issued by the Ontario Geological Survey .....	20
3 - Exploration Activity in 1980 .....	22
4 - Assessment work and other information received in 1980 .....	24

## Figures

1 - Red Lake Resident Geologist's District .....	18
2 - Red Lake Resident Geologist's District .....	19

## Introduction

The Red Lake Resident Geologist's Office is presently staffed by M. Durocher, Resident Geologist, and C.D. Van Leeuwen, secretary. D.A. Panagapko was the Resource Geologist from January until June. J.C. Gibson was assigned to this office on a contract basis from February to July. Two Experience '80 students were employed for eight weeks during the summer.

## Resident Geologist's Activities

As in previous years, a technical advisory service was provided to companies and individuals engaged in mineral exploration within the Red Lake Mining Division. The number of visitors utilizing the available services and facilities totalled about 1 100 during this past year.

Selected mineral properties in the Red Lake, Uchi-Confederation, Birch Lake, and Muskrat Dam Lake, meta-volcanic belts were visited and examined by the staff.

Data series maps for Belanger and Bowerman Townships, Avis Lake, Casummit Lake, Curie Lake, Favourable Lake, Fredart Lake, Hewitt Lake, Keigat Lake, McVicar

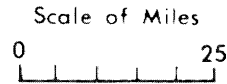
<sup>1</sup>Resident Geologist, Ontario Ministry of Natural Resources, P.O. Box 860, Government Building, Red Lake, POV 2M0.

**TABLE 1** | SUMMARY OF CLAIMS RECORDED AND ASSESSMENT WORK CREDIT RECEIVED  
RED LAKE MINING DIVISION

	Claims Recorded	Claims Active	Diamond Drill (Man Days)	Geophys Surveys (Man Days)	Geological Surveys (Man Days)	Total All Work (Man Days)
1980*	2,201	4,427	43,642	23,680	1,524	68,846
1979	1,068	3,221	21,188	38,380	3,154	62,869
1978	1,207	3,916	25,574	14,793	2,480	50,997
1977	2,324	4,261	12,994	45,080	620	59,196
1976	2,705	4,332	18,680	23,578	380	46,544
1975	1,368	2,957	29,377	12,714	960	44,717
1974	1,339	3,648	47,362	5,660	3,040	57,719
1973	1,616	4,009	60,027	20,474	Nil	83,227
1972	2,219	5,588	34,261	14,858	5,216	56,866
1971	1,541	8,486	72,019	50,920	2,243	127,567
1970	3,971	11,759	73,866	329,065	17,606	427,093
1969	10,999	14,772	49,377	66,032	2,384	120,906
1968	2,451	4,784	15,367	48,800	1,228	64,967

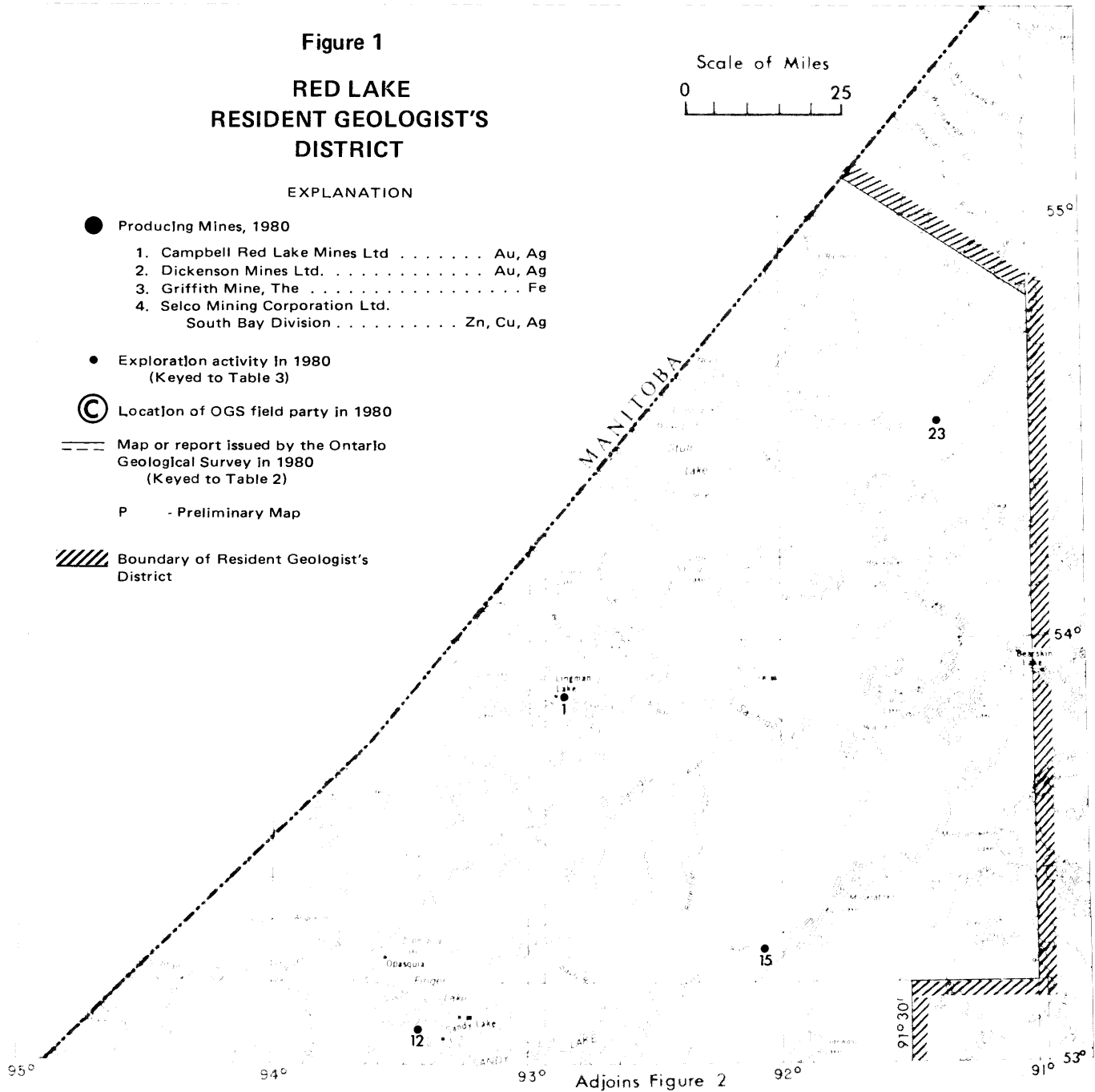
\*January 1, 1980-December 22, 1980

**Figure 1**  
**RED LAKE**  
**RESIDENT GEOLOGIST'S**  
**DISTRICT**



EXPLANATION

- Producing Mines, 1980
  1. Campbell Red Lake Mines Ltd . . . . . Au, Ag
  2. Dickenson Mines Ltd. . . . . Au, Ag
  3. Griffith Mine, The . . . . . Fe
  4. Selco Mining Corporation Ltd.  
 South Bay Division . . . . . Zn, Cu, Ag
- Exploration activity in 1980  
 (Keyed to Table 3)
- ⊙ Location of OGS field party in 1980
- Map or report issued by the Ontario  
 Geological Survey in 1980  
 (Keyed to Table 2)
- P - Preliminary Map
- ▨ Boundary of Resident Geologist's  
 District





## NORTHWESTERN—RED LAKE

Lake, North Spirit Lake, Roadhouse River, Shabu Lake, Shabumeni Lake, Slate Lake and Windigo Lake areas were published in 1980 (see Figure 1 and 2).

Assistance and technical comments were provided for several Ministry programs and land use studies, including the West Patricia Lake Use Plan and various lake plans and management strategies.

Visits were made to the four producing mines in the Red Lake Mining Division.

Assistance and logistical support was extended to four Ontario Geological Survey field parties active in the area in 1980.

Lectures were organized for several local student groups and Junior Rangers.

## Mining Activity

Four mines were in continuous production during 1980 (see Figure 2). The continued improvement in gold prices should yield better returns for the two operating gold mines as compared to 1979, and should also generate programs for possible revival or initiation of gold production on some former gold producers and major prospects.

A summary of the main developments of the various operations follows. The cooperation of the mine managers of each operation in supplying information is gratefully acknowledged.

**TABLE 2** | MAPS AND REPORTS PERTAINING TO THE RED LAKE MINING DIVISION, ISSUED BY THE ONTARIO GEOLOGICAL SURVEY OF THE ONTARIO MINISTRY OF NATURAL RESOURCES IN 1980. "LIST OF PUBLICATIONS" (BACK POCKET) FOR DETAILS.

### MISCELLANEOUS PAPERS

MP 77 (1980 supplement)  
MP 91  
MP 93  
MP 96

### OPEN FILE REPORTS

OFR 5278  
OFR 5293  
OFR 5304

### MISCELLANEOUS PUBLICATIONS

Rocks and Mineral Information 1980

### COLOURED MAPS

Map 2427  
Map 2428

### PRELIMINARY MAPS — GEOLOGICAL SERIES

P.2225  
P.2226  
P.2345

### PRELIMINARY MAPS — DATA SERIES

P.2010	P.2027
P.2011	P.2115
P.2017	P.2116
P.2018	P.2117
P.2019	P.2118
P.2020	P.2119
P.2025	P.2120
P.2026	P.2121



## Campbell Red Lake Mines Limited

Campbell Red Lake operated throughout most of 1980. The company is planning to increase its mill capacity from 820 to 1075 tons per day by 1982. This will involve capital expenditures in the mill, underground and in the townsite. Campbell Red Lake Mines Limited had just completed an exhaustive study of its property. Several potential orebodies have been discovered by surface and underground diamond drilling. These will be evaluated in the near future by exploration drilling. At year end, 385 people were on the payroll. The mine manager is S.M. Reid.

## Dickenson Mines Limited

Dickenson Mines Limited, including Robin Red Lake Mines Limited, operated throughout most of 1980.

The company is in the process of expanding both its surface and underground facilities. The milling capacity of the mill is to be increased from 500 to 700 tons per day (Northern Miner, May 22, 1980). Deepening of the Number 2 internal shaft by 558.0 feet to a total depth below collar of 2336.5 feet has been completed. Also, two long hole stopes have been brought into production. The Mine Manager is R.P. Topper.

## The Griffith Mine

The Griffith Mine, a wholly owned subsidiary of The Steel Company of Canada Limited and managed by Picklands Mather and Company, is situated at Bruce Lake, 50 km southeast of Red Lake. Milling of an estimated 5 216 800 tons (natural) of ore gave an estimated production of 1 500 000 tons (natural) of pellets containing 66.74 percent iron (dry) and 3.53 percent silica. Total ore, waste, and overburden removed in open pit mining is estimated at 13 041 600 long tons.

During 1980, no exploration work was carried out at the Griffith Mine. Ore movement in the south pit started in January 1980, following the completion of the 1979 dredging program.

A total of 492 employees were on the payroll as of year end. J.D. Jeffries is mine manager.

## Selco Mining Corporation Limited

The South Bay Division of Selco Mining Corporation Limited operates a zinc-copper-silver mine located in the southeastern part of Dent Township, 80 km northeast of Ear Falls. The mine operated continuously during 1980. The crown pillars on two cut and fill stopes on the 1050 foot level were removed. Developments on the 1450 foot sub-level include 200 feet of drifting and crosscutting and 220 feet of raising to develop a shrinkage stope. Devel-

opments on the 1950 foot level include 250 feet of drifting to provide a base for deep exploratory diamond drilling. The mine is expected to cease operation in mid-June 1981 due to exhaustion of ore reserves.

The average work force during the year was 135 and the mine superintendent is Mr. W. Fotheringham.

## Exploration Activity

Continued high gold prices throughout 1980 resulted in a considerable increase in exploration activity in the Red Lake Mining Division.

In 1980 a total of 2201 claims were recorded. This represents a 103 percent increase as compared with 1979 figures (Table 1). Assessment work filed in 1980 increased 9.5 percent with 68 846 days being recorded as compared with 62 869 days in the previous year.

Most of the exploration activity was concentrated in the Red Lake "greenstone" belt with lesser amounts of exploration taking place in the Uchi-Confederation, Birch Lake, Favourable Lake, Muskrat Dam Lake, and Lingman Lake "greenstone" belts (Figures 1 and 2).

No new orebodies have been discovered in 1980, but several past producers and promising prospects are being re-evaluated.

Noranda Exploration Limited is currently re-evaluating the Madsen properties (past producer) which they have recently acquired (Northern Miner, September 18, p.A27).

Wilanour Resources Limited is re-evaluating the Cochenour Willans property (past producer), and the associated Ancco, Wilmar and Consolidated Marcus properties. The exploration program currently underway includes geological mapping, geophysical surveys, surface stripping, and diamond drilling. The company has dewatered the Cochenour Willans Mine down to a depth of 1450 feet and underground drilling in the granodiorite zone from the 1300 foot level is expected to start in January (Northern Miner, November 27, p.A11).

The company has also obtained an option on the Consolidated Buffalo gold prospect and is currently conducting diamond drilling on the property.

Getty Mines Limited is currently re-evaluating the Berens River Mine, a former gold-silver producer located in the Favourable Lake "greenstone" belt. The former producer is presently owned by Zahavy Mines Limited (Northern Miner, August 28, p. 1).

St. Joseph Explorations Limited is conducting an evaluation of the Hudson Patricia Mine, a former gold producer located in the Uchi-Confederation "greenstone" belt.

A summary of known mineral exploration activity in the Red Lake Resident Geologists District during 1980 is given in Table 3 and locations are shown on Figures 1 and 2.

*NORTHWESTERN—RED LAKE*

**TABLE 3 | EXPLORATION ACTIVITY IN 1980**

The following is a list of individuals and companies known to be engaged in exploration within the Red Lake Mining Division in 1980, and the type of work undertaken in each case. The numbers correspond to the numbered areas on Figures 1 and 2.

INDIVIDUAL/COMPANY	ACTIVITY/AREA
1. Amoco Canada Petroleum Company	Ground geophysics, and soil geochemistry in the Lingman Lake area.
2. Beth-Canada Mining Company	Ground geophysics and diamond drilling in Balmer and Ranger Townships.
3. Bonanza Red Lake Explorations Inc.	Diamond drilling in Dome Township.
4. Campbell Red Lake Mines Ltd.	Diamond drilling in Balmer Township.
5. Cominco Ltd.	Exploration in the Shabu and Birch Lake areas, and in Baird, Bateman, and McDonough Townships.
6. Crawford, H.	Prospecting in Bateman Township.
7. Desmeulles, M.	Prospecting in Fairlie Township.
8. Dickenson Mines Ltd.	Ground geophysics and diamond drilling in Balmer and Bateman Townships.
9. Dome Exploration (Canada) Ltd.	Diamond drilling in the Nungesser Lake area, and Dome, Todd, and Ball Townships.
10. Dumont Nickel	Exploration in Ball Township.
11. Frank, R.A.	Exploration in Corless and Dent Townships.
12. Gay, E.	Magnetometer survey and prospecting in the Sandy Lake area.
13. Getty Mines Ltd.	Ground geophysics, diamond drilling, and geology in Balmer Township and in the Setting Net Lake area.
14. Gold Fields Mining Corporation	Exploration in Dome and Fairlie Townships.
15. Gulf Minerals Canada Ltd.	Diamond drilling in the Muskrat Dam Lake area.
16. Hager, A.	Prospecting in the Favourable Lake area.
17. Harvey, C.	Prospecting in McDonough Township.
18. Hermiston, W.	Diamond drilling in Ball Township and stripping and trenching in the Dixie Lake area.
19. Knappet, R.	Exploration in Corless and Dent Townships.
20. Koezur, K.	Prospecting in the Birch Lake area.
21. Kostynuk, A.	Exploration in Dome Township, and in the Casummit and Mink Lake areas.
22. Later, W.	Prospecting in Shaver Township.
23. Little Long Lac Mineral Exploration Ltd.	Ground geophysics, and geology in Earngey Township and in the Aljo Lake area.
24. Meekis, D.	Prospecting in the Palsen Lake area.

**TABLE 3** Continued

25. Minorex Ltd.	Exploration in Fairlie, Heyson, Ball, and Goodall Townships.
26. Mount Jamie Mines Ltd.	Ground geophysics and bulk sampling in Todd Township.
27. New Jersey Zinc Exploration Co. (Canada) Ltd.	Exploration in the Birch Lake area.
28. Noranda Exploration Co. Ltd.	Ground geophysics, geology in Heyson, Baird, and Todd Townships.
29. Onaping Resources Ltd.	Diamond drilling in Balmer Township.
30. Peterson, C.W.	Exploration in Dome, Heyson, and Balmer Townships.
31. Powley, M.	Exploration in Knott Township.
32. Redcon Gold Mines Ltd.	Diamond drilling and trenching in Bateman and Balmer Townships.
33. Rivard, O.	Exploration in Todd Township.
34. Rosenthal, L.	Trenching and prospecting in Byshe and Heyson Townships, and the Faulkenham Lake area.
35. Rothenberg, D.	Prospecting in Skinner Township.
36. Selco Mining Corp. Ltd.	Exploration in Mitchell, Earngey, Willans, Fairlie, and Ranger Townships, and in the Otter Lake, South of Otter Lake and Garry Lakes areas.
37. Sherritt Gordon Mines Ltd.	Exploration in Killala, Fairlie, and Byshe Townships.
38. Soltermann, R.	Diamond drilling in Todd Township.
39. Springpole Lake Resources	Diamond drilling in Honeywell Township.
40. St. Joseph Explorations Ltd.	Ground geophysics, geology, geochemistry, and diamond drilling in Mitchell Township and in the Slate Lake area.
41. St. Mary's Exploration Ltd.	Diamond drilling and trenching in Skinner Township.
42. Steel Company of Canada Ltd.	Diamond drilling in the Bruce Lake area.
43. Stoops, O.	Prospecting in the Keigat Lake area.
44. Stupack, W.	Exploration in Ball Township.
45. Tukkanen, V.	Prospecting in the Hammell Lake area.
46. Walsten, D.	Prospecting in Fairlie Township and the Hammell Lake area.
47. Wilanour Resources Ltd.	Ground geophysics, geology, and diamond drilling in Dome and Heyson Townships.
48. Wood, R.	Exploration in Heyson, Byshe, and Todd Townships.

NORTHWESTERN—RED LAKE

**TABLE 4** | ASSESSMENT WORK AND OTHER INFORMATION RECEIVED IN 1980  
RED LAKE MINING DIVISION

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work	Year	Toronto File No.	Local File No.
Agnew Tp. Uchi Lake & Earngey Tp.	52N/2	St. Joseph Explorations Ltd.	BM	Assess	DDH (1) 229'	1980	—	Agnew Tp.
Avis Lake	52K/16	St. Joseph Explorations Ltd.	BM	Assess	DDH (4) 959'	1979	—	52K/NE
Baird Tp.	52K/13	Orelock Explorations Ltd.	Au	MEAP RL-69	DDH (6) 1869'	1979	—	Baird Tp.
Ball Tp.	52M/1	Dome Exploration (Canada) Ltd.	BM	Assess	Mag, EM	1979	2.3038 2.3040	Ball Tp.
Ball Tp.	52M/1	Hermiston, Wayne	Au	MEAP RL-83	DDH (1) 471'	1979	—	Ball Tp.
Ball Tp.	52M/1	Minorex Ltd.	BM	Assess	DDH (3) 705', Mag, EM	1979	2.3055	Ball Tp.
Balmer Tp.	52N/4	Beth-Canada Mining Co.	BM	Assess	DDH (1) 349', VLF, Mag	1980	2.3197 2.3199	Balmer Tp.
Balmer Tp.	52N/4	Dickenson Mines	Au	MEAP RL-78	Mag, EM	1979	—	Balmer Tp.
Balmer Tp.	52N/4	Onaping Resources	Au	MEAP RL-66	DDH (9) 4959' Mag, EM	1979	2.3275	Balmer Tp.
Balmer Tp.	52N/4	Redcon Gold Mines Ltd.	Au, Ag	MEAP RL-76	Geochem, DDH (21) 5412'	1979	—	Balmer Tp.
Balmer, Byshe, Ranger, Willans Tps.	52N/4 52K/13	Beth Canada Mining Co.	BM	Assess	DDH (3) 931' Mag	1980	2.3152	Balmer Tp.
Blackbear Lake	52N/4	Dome Exploration (Canada) Ltd.	BM	Assess	Mag, EM Mag, EM DDH (4) 1464'	1978 1979 1980	2.3065 2.3067 —	52N/SW
Blackbear, Coli, Sobeski Lakes	52N/4, 5, 6	Dome Exploration (Canada) Ltd.	BM	Assess	Mag, EM	1978	2.3072	52N/SW
Bowerman Tp.	52K/15	Selco Mining Corp. Ltd.	BM	Assess	Mag, EM	1980	2.3266 2.3260	Bowerman Tp.
Casummit Lake, Keigat Lake	52N/8	Cominco Limited	Au	Assess	GL	1979	2.3070	52N/SE
Coli Lake	52N/5	Dome Exploration (Canada) Ltd.	BM	Assess	EM	1979	2.3073	52N/SW
Costello Tp.	52N/1	Sherritt-Gordon Mines Ltd.	BM	Assess	DDH (2) 350'	1979	—	Costello Tp.
Culverson, Grist, McInnes Lake	53C/4, 5	Cominco Limited	BM	Assess	DDH (3) 1161'	1979	—	53C/SW
Dome Tp.	52N/2	Bonanza Red Lake Explorations Inc.	Au	Assess MEAP RL-89	DDH (3) 1147'	1980	—	Dome Tp.

TABLE 4 Continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work	Year	Toronto File No.	Local File No.
Dome Tp.	52N/2	Dome Exploration (Canada) Ltd.	BM	Assess	EM	1979	2.3040	Dome Tp.
Fairlie Tp.	52N/4	Minorex Limited	Au, BM	Assess	Mag, EM DDH (5) 995'	1979	2.3046	Fairlie Tp.
Fairlie Tp.	52N/4	Selco Mining Corp. Ltd.	BM	Assess	Mag, EM DDH (1) 215'	1980 1980	2.3268 —	Fairlie Tp.
Fairlie, Todd Tps.	52N/4 52L/16	Minorex Limited	Au	Assess	Mag, EM	1980	2.3044	Fairlie Tp.
Gerry Lake	52K/14	Selco Mining Corp. Ltd.	BM	Assess	DDH (8) 1528'	1978	—	52K/NW
Gerry, Karas Lakes	52K/14	Selco Mining Corp. Ltd.	BM	Assess	DDH (1) 100'	1979	—	52K/NW
Gerry, South of Otter Lakes	52K/14	Selco Mining Corp. Ltd.	BM	Assess	DDH (8) 1940'	1978- 1979	—	52K/NW
Grist, McInnes, Culverson, Cleveland Lakes	53C/4, 5	Cominco Limited	BM	Assess	Mag	1977- 1978	2.2229	53C/SW
Hammell Lake	52L/16	Dome Exploration (Canada) Ltd.	BM	Assess	Mag, EM	1979	2.3039	52L/NE
Hanton Lake	52N/6	Dome Exploration (Canada) Ltd.	BM	Assess	Mag, EM DDH (5) 1930'	1978 1978 1979	2.3066 — 2.3064	52N/SW
Hanton, Nungesser Lakes	52N/ 5, 6	Dome Exploration (Canada) Ltd.	BM	Assess	Mag, EM DDH (1) 403'	1979 1979	2.3002 —	52N/SW
Hanton, Pringle, Nungesser Lakes	52N/ 5, 6	Dome Exploration (Canada) Ltd.	BM	Assess	Mag, EM DDH (7) 2606'	1978 1978		52N/SW
Honeywell Tp.	52N/12	Springpole Resources Ltd.	Au	Assess	DDH (5) 1163'	1980		Honeywell Tp.
Keigat Lake	52N/8	Cominco Limited	Au	Assess	GL	1979	2.3070	52N/SE
Killala, Todd Tps.	52N/8	Beth-Canada Mining Co.	BM	Assess	Mag, HLEM	1979	2.3086	Killala Tp.
McNaughton Tp.	52N/1	Sherritt-Gordon Mines Ltd.	BM	Assess	DDH (4) 1025'	1979	—	McNaughton Tp.
Mitchell Tp.	52N/2	Selco Mining Corp. Ltd.	BM	Assess	Mag, EM DDH (1) 100'	1978 1979	2.3161 —	Mitchell Tp.
Mitchell Tp.	52N/2	St. Joseph Explorations Ltd.	BM	Assess	EM DDH (9) 4425'	1979 1980	— —	Mitchell Tp.
Mulcahy Tp.	52L/16	Minorex Limited	Au	Assess	Mag, EM	1979	2.3047	Mulcahy Tp.

Table 4 — continued on next page

NORTHWESTERN—RED LAKE

TABLE 4 Continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work	Year	Toronto File No.	Local File No.
Mulcahy Tp.	52L/16	Texasgulf Canada Ltd.	BM	Assess	Mag, EM HLEM VLF-EM	1979	2.3119	Mulcahy Tp.
Otter Lake	52N/3	Selco Mining Corp. Ltd.	BM	Assess	HLEM DDH (2) 220'	1980	—	52N/SW
Otter, South of Otter Lakes	52N/3 52K/14	Selco Mining Corp. Ltd.	BM	Assess	Mag, EM	1979	2.3184	52K/NW
Ranger Tp.	52N/4	Beth-Canada Mining Co.	BM	Assess	Mag	1979	2.3088	Ranger Tp.
Ranger Tp.	52N/4	Selco Mining Corp. Ltd.	BM	Assess	Mag, EM	1979- 1980	2.3267	Ranger Tp.
Satterly Lake	52N/8	Sherritt-Gordon Mines Ltd.	BM	Assess	DDH (4) 771'	1979	—	52N/SE
Skinner Tp.	52N/2	Bertram, Andrew	Au	Assess	DDH (2) 303'	1979	—	Skinner Tp.
Slate Lake	52K/15	St. Joseph Explorations Ltd.	BM	Assess	DDH (4) 1496' HLEM, Mag	1980	—	52K/NE
Sobeski Lake	52N/6	Dome Exploration (Canada) Ltd.	BM	Assess	DDH (1) 341'	1979	—	52N/SW
South of Otter Lake	52K/14	Selco Mining Corp. Ltd.	BM	Assess MEAP RL-72	DDH (4) 1120'	1979	—	52K/NW
Uchi Lake & Earngey Tp.	52N/2	Selco Mining Corp. Ltd.	BM	Assess	DDH (1) 240'	1980	—	52N/SE
Uchi Lake & Earngey Tp.	52N/2	St. Joseph Explorations Ltd.	BM	Assess	DDH (2) 579' Mag, EM	1980 1980	— 2.3317	52N/SE
Willans Tp.	52K/13	Dome Exploration (Canada) Ltd.	BM	Assess	Mag, EM	1979	2.3041	Willans Tp.
Willans Tp.	52K/13	Selco Mining Corp. Ltd.	BM	Assess	Mag, EM DDH (2) 340'	1980 1980	— —	Willans Tp.
Cannon, McVicar	52O/11	Cominco Limited	BM	Assess	HLEM, Mag, Gravity	1978	2.3173	52O/NW
Honeywell Tp.	52N/12	St. Joseph Explorations Ltd.	BM	Assess	HLEM, Mag	1980	2.3315	Honeywell Tp.
Agnew Tp.	52N/2	St. Joseph Explorations Ltd.	BM	Assess	HLEM, Mag	1980	2.3316	Agnew Tp.
Avis, Slate Lakes	52K/15, 16	St. Joseph Explorations Ltd.	BM	Assess	HELM, Mag	1980	2.3348	52K/NE
Hammell Lake	52L/16	Soltermann, Rene H.	Au	Assess	DDH (1) 210'	1980	—	52L/NE
Killala, Hammell Lakes	52L/16	Beth-Canada Mining Co.	BM	Assess	EM	1980	—	Killala Tp.

\* Additions to existing list.

\*\*Information from January 1, 1980 — November 30, 1980

TABLE 4 Continued

		Abbreviations	
Assess.	—Assessment Work	HLEM	—Horizontal Loop Electromagnetic
Au	—Gold	Mag.	—Magnetometer Survey
Ag	—Silver	MEAP	—Mineral Exploration Assistance Program
BM	—Base Metal	Mo	—Molybdenum
DDH (6) 295'	—6 Diamond Drill holes totalling 295'	Rad.	—Radiometric Survey
EM	—Electromagnetic Survey	Tr.	—Trenching
Geochem.	—Geochemical Survey	U	—Uranium
GL	—Geological Survey	VLF	—Very Low Frequency Electromagnetic

## Properties Visited

In 1980 the following mining properties were visited by the Red Lake Resident Geologist's staff:

### Base Metals

- 1) Gulf Mineral's Muskrat Dam Lake property.
- 2) Mink Lake Molybdenum prospect, Birch Lake area.
- 3) Selco Mining Corporation's South Bay Mine property.
- 4) St. Joseph Explorations' Fly Lake property.

### Gold:

- 1) Beth-Canada property, Balmer Township.
- 2) Cordoba property, Balmer Township.
- 3) Dome Explorations' Nungesser Lake property.
- 4) Hill-Sloan-Tivy vein, Earngey Township.
- 5) Jackson Manion property, Goodall Township.
- 6) MacMarmac Mine property, Dome Township.
- 7) Marcus property, Dome Township.
- 8) Perma Red Lake property, Todd Township.
- 9) Piper Red Lake prospect, Ball Township.
- 10) Sachigo Mine property, Sherman Lake.
- 11) Skookum Bay prospect, Dome Township.
- 12) St. Mary's Exploration's Bathurst prospect, Skinner Township.
- 13) Uchi Mine property, Earngey Township.
- 14) Wilmar property, Dome Township.

## Mink Lake Molybdenum Prospect

This molybdenum prospect is located 105 km northeast of Red Lake, and approximately 1.0 km south of Mink Lake. The prospect is located in the southeast part of the Mink Lake biotite-quartz monzonite stock. Bralorne Can-Fer Resources Limited did some geological mapping and some trenching on the property in 1969, and subsequently allowed the claims to lapse. The prospect was restaked in 1977 by the Kostynuk brothers of Red Lake, and during the 1980 field season they did a considerable amount of trenching. The property has recently been acquired by Noranda Explorations Limited.

Sulphide mineralization occurs erratically in an area approximately 2 200 feet long in an easterly direction and

approximately 700 feet wide in a northerly direction. The mineralized area is bounded on the north, east, and south by muskeg, and may be more extensive than apparent from surface exposure.

The biotite-quartz monzonite in the mineralized area and the mafic volcanics along the eastern and southeastern contact with the Mink Lake stock have been subjected to varying amounts of potassic, phyllic, and propylitic hydrothermal alteration.

The mineralization consists of molybdenite and pyrite, with minor amounts of chalcopyrite and scheelite. Gold values ranging from 0.04 to 0.15 ounce per ton have been reported from some of the trenches.

The molybdenum has at least three modes of occurrence. It occurs as (1) disseminated small (up to 5 per cent) clusters of rosettes of flakes throughout altered biotite quartz monzonite; (2) as small disseminated clusters and rosettes of molybdenite along the margins of subhorizontal quartz veins; and (3) as very fine coatings along shear surfaces in altered quartz monzonite. Pyrite, carbonate, and minor amounts of chalcopyrite are always intimately associated with the molybdenite mineralization.

The prospect has a number of features such as style of mineralization and types of hydrothermal alteration in common with the larger porphyry copper and molybdenum deposits in western Canada and the western part of the United States of America and should be evaluated in that context.

## Recommendations for Exploration

### Birch Lake Area

Following the discoveries of gold at Red Lake in 1935, and in the Woman-Confederation Lakes area in 1926, prospecting and exploration activity spread northward to the Birch Lake area (Horwood 1937). This resulted in the discovery of the Casey Summit and Richardson Lake orebodies as well as many other gold occurrences and prospects. Prospectors and mining companies were active in this area up until the outbreak of World War II. This period was followed by almost three decades of inactivity. In the

late sixties and early seventies several mining companies had active exploration programs in the area. Since then there has been very little exploration activity in this area.

In this area, gold-bearing quartz and quartz-carbonate veins appear to be structurally controlled and occur in shear zones and fractures in virtually every rock type. Little is known about many of the occurrences and prospects discovered in the 1930s. Several of these occurrences have been explored only by surface trenching, but others have been explored by surface trenching and a limited amount of diamond drilling. Most of these old prospects and occurrences should be re-evaluated.

Much of the area is covered with overburden. Despite several decades of prospecting and mining exploration, the area has excellent potential for hosting vein-type gold deposits.

## Mineral Exploration Assistance Program

Since the program was initiated in August 1971, the Ontario Government's Mineral Exploration Assistance Program (MEAP) to date has provided in excess of \$598 000 for contracts approved within the MEAP boundaries as shown in Figure 2.

During the fiscal year ending March 31, 1980, a total of 16 contracts were approved and work was completed on two of the projects involved, for a total MEAP expenditure of almost \$17 000.

Eight MEAP contracts have been approved for fiscal 1980-81.

## Ontario Geological Survey Activities

The following projects were carried out by the Precambrian Geology Section of the Ontario Geological Survey in 1980 (for location of projects (see Figure 1 and 2).

The Red Lake Synoptic Project was continued during the 1980 field season. The project involved integration of all previous geological data with the objective of producing 1:50 000 scale geological maps and a synoptic report summarizing stratigraphy, structure, and economic geology of the Red Lake Belt (Wallace 1980).

Detailed mapping of the Slate Lake map-area was completed (Bowen 1980).

Felsic volcanic rocks in the Birch Lake area were mapped and sampled to evaluate their economic potential (Thurston 1980).

For additional information on the above listed projects, the reader is invited to consult the Summary of Field Work, 1980 by the Ontario Geological Survey (Ontario Geological Survey Miscellaneous Paper 96).

Dr. V.K. Prest of the Engineering and Terrain Geology Section completed mapping of the surficial geology in the Red Lake-Ear Falls area; the objective is to outline areas of high aggregate potential.

## Research by Other Agencies

In conjunction with the Ontario Geological Survey's Geoscience Research Grant Program, C.J. Hodgson and H. Helmstaedt of Queen's University continued their study of the gold mineralization at the Campbell Red Lake and Dickenson Mine properties. This involved very detailed petrological mapping of selected ore zones in both mines, along with an analysis of the structures of the veins.

Some of the results of their research are presented in Ontario Geological Survey Miscellaneous Paper 93.

## Selected Recent Publications and References

Andrusenko, N.I.

1980: Temperature Zonation of Gold-Silver Deposits; *International Geology Review*, Volume 21, Number 7, p. 815-824.

Beswick, A.E., and Nichol, I.

1980: Alteration in Mineralized and Unmineralized Archean Greenstones: Grant 54 *in* Geoscience Research Grant Program, Summary of Research, 1979-1980, Edited by E.G. Pye, Ontario Geological Survey Miscellaneous Paper 93, 262p.

Bowen, R.P.

1980: Slate Lake Area, District of Kenora (Patricia Portion); p. 13-16 *in* Summary of Field Work, 1980, by the Ontario Geological Survey, Edited by V.G. Milne, O.L. White, R.B. Barlow, J.A. Robertson and A.C. Colvine, Ontario Geological Survey Miscellaneous Paper 96, 201p.

Boyle, R.W.

1980: Gold Deposits: Their Geological and Geochemical Setting; *Episodes* Volume 1980, Number 2, p. 8-14.

Breaks, F.W.

1980: Lithophile Mineralization in Northwestern Ontario: Rare-Element Granitoid Pegmatites; p. 5-9 *in* Summary of Field Work, 1980, by the Ontario Geological Survey, edited by V.G. Milne, O.L. White, R.B. Barlow, J.A. Robertson and A.C. Colvine, Ontario Geological Survey Miscellaneous Paper 96, 201 p.

Gross, G.A.

1980: A Classification of Iron Formation Based on Depositional Environments; *the Canadian Mineralogist*, Volume 18, pt 2, p. 215-222.

Gushova, N.G., and Chapiznaya, E.A.

1980: Radioactive Elements in the Rocks of Some Near Surface Gold-ore deposits; *International Geology Review*, Volume 21, No.6, p. 687-694.

Hillary, E.M., and Ayres, L.D.

1980: Trondhjemitic Basement Enclave Near the Archean Favourable Lake Volcanic Complex, Northwestern Ontario, Canada; *Canadian Journal Earth Sciences*, Volume 17, Number 5, p. 652-667.

Hodder, R.W., and Edwards, G.R.

1980: Evolution of an Archean Felsic Volcanic-Plutonic Complex; Grant 55 *in* Geoscience Research Grant Program, Summary of Research, 1979-1980, Edited by E.G. Pye, Ontario Geological Survey Miscellaneous Paper 93, 262 p.



- Hodgson, C.J., Helmstaedt, H., MacGeehan, P.J., and Rigg, O.M.  
1980: Gold Ore Formation at the Campbell and Dickenson Mines, Red Lake Area; Grant 11 *in* Geoscience Research Grant Program, Summary of Research, 1979-1980, Edited by E.G. Pye, Ontario Geological Survey Miscellaneous Paper 93, 262 p.
- Horwood H.C.  
1937: Geology of Superior Junction – Sturgeon Lake Area; Ontario Department of Mines, Annual Report Volume 46, Part 6.
- Kerrick, R., Gorman, B.E., and Fyfe, W.S.  
1980: Geochemistry and Field Relations of Lode Gold Deposits in Felsic Igneous Intrusions; Grant 56 *in* Geoscience Research Grant Program, Summary of Research, 1979-1980, edited by E.G. Pye, Ontario Geological Survey Miscellaneous Paper 93, 262 p.
- Kenrick, R., Robinson, D.J., Hutchinson, R.W., and Hodder, R.W.  
1980: Field Relations and Geochemistry of Au, Ni, and Cr Deposits in Ultramafic-Mafic Volcanic Rocks; Grant 27 *in* Geoscience Research Grant Program, Summary of Research, 1979-1980, Edited by E.G. Pye, Ontario Geological Survey Miscellaneous Paper 93, 262 p.
- Khitrunov, A.T., and Meltser, M.L.  
1980: Geochemistry of Gold in the Granitoid Process; *Geochemistry International* Volume 16, Number 5, p. 37-42.
- Mareschal, J.C., and West, G.F.  
1980: A Model for Archean Tectonism. Part 2. Numerical Models of Vertical Tectonism in Greenstone Belts; *Canadian Journal Earth Sciences*, Volume 17, Number 1, p. 60-71.
- Nekrasova, A.N., Krasil'nikov, A.A., Denim, G.P.  
1980: Endogenic Ore Zonation in a Volcanogenic Gold-Silver Deposit; *International Geology Review*, Volume 22, Number 7, p. 864-868.
- Nunes, P.D., and Thurston, P.C.  
1980: Two Hundred and Twenty Million Years of Archean Evolution: A Zircon U-Pb Age Stratigraphy Study of the Uchi-Confederation Lakes Greenstone Belt, North-western Ontario; *Canadian Journal Earth Sciences*, Volume 17, Number 6, p. 710-721.
- Prest, V.K.  
1980: Quaternary Geology of Red Lake and Madsen Areas (52N/4, 52K/13), District of Kenora (Patricia Portion); p. 107-108 *in* Summary of Field Work, 1980, by the Ontario Geological Survey, Edited by V.G. Milne, O.L. White, R.B. Barlow, J.A. Robertson, and A.C. Colvine, Ontario Geological Survey Miscellaneous Paper 96, 201 p.
- Sangster, D.F.  
1980: Quantitative Characteristics of Volcanogenic Massive Sulfide Deposits; Metal Content and Size Distribution of Massive Sulfide Deposits in Volcanic Centres; *Canadian Institute of Mining and Metallurgy Bulletin*, Volume 73, Number 814, p. 74-81.
- Sopuck, V.J., Lavin, O.P., and Nichol, I.  
1980: Litho-geochemistry as a Guide to Identifying Favourable Areas For the Discovery of Volcanogenic Massive Sulfide Deposits; *Canadian Institute of Mining and Metallurgy Bulletin* Volume 73, Number 823, p. 152-166.
- Thurston, P.C.  
1980: Felsic Centres of Volcanism, Uchi and Gods Lake Subprovinces, Northwestern Ontario; p. 28-31 *in* Summary of Field Work, 1980 by the Ontario Geological Survey, edited by V.G. Milne, O.L. White, R.B. Barlow, J.A. Robertson, and A.C. Colvine, Ontario Geological Survey Miscellaneous Paper 96, 201 p.
- 1980: Subaerial Volcanism in the Archean Uchi-Confederation Volcanic Belt; *Precambrian Research* Volume 12, p. 79-98.
- Wallace, H.  
1980: Red Lake Synoptic Project, District of Kenora; p. 10-12 *in* Summary of Field Work, 1980 by the Ontario Geological Survey, Edited by V.G. Milne, O.L. White, R.B. Barlow, J.A. Robertson, and A.C. Colvine, Ontario Geological Survey Miscellaneous Paper 96, 201 p.
- Wood, J.  
1980: Epiclastic Sedimentation and Stratigraphy in the North Spirit Lake and Rainy Lake Areas; A Comparison; *Precambrian Research*, 12, p. 227-255.
- Wooden, J.L., and Goodwin, A.M.  
1980: A Rb-Sr Isotopic Study of the Archean Rocks of the Eastern Lake Seul Region, English River Subprovince, North-western Ontario, *Canadian Journal Earth Sciences*, Volume 17, Number 5, p. 569-576.

# 1980 Report of the Sioux Lookout Resident Geologist

D.A. Janes<sup>1</sup>

## Contents

Introduction .....	30
Resident Geologist's Activities .....	30
Mining Activity .....	31
Industrial Minerals .....	31
Sand and Gravel .....	31
Mineral Exploration Activity .....	31
Properties Visited, Under Evaluation and/or Exploration .....	34
1 - Goldlund Mines Limited .....	34
2 - Windfall Mines and Oil .....	34
3 - Nahanni Mines (Quyta Properties) .....	34
4 - Pidgeon Molybdenum Mines Limited (Rio Tinto Canadian Exploration Limited) .....	34
5 - Kasheowagama Lake Showings .....	34
6 - F. Hoey Showing .....	34
7 - S. Johnson Showing .....	35
8 - Savant and Sturgeon Lakes .....	35
Recommendations for Exploration .....	40
Sturgeon Lake-Savant Lake Area .....	40
Mavis Lake-Gullwing Lake Area .....	40
Research By Other Agencies .....	40
Masters Theses .....	40
Bachelor Theses .....	40
Recent Publications and References .....	40

## Tables

1 - Claims Recorded and Assessment Work Credit Received Patricia Mining Division from 1974 to 1980 .....	31
2 - Assay Values from Kasheowagama Lake .....	34
3 - Assay Values from Sturgeon and Savant Lakes .....	35
4 - Maps and Reports Issued by the Ontario Geological Survey in 1980 .....	36
5 - Exploration Activity in 1980 .....	37
6 - Assessment Work and Other Information Received in 1980 .....	38

## Figures

1 - Sioux Lookout Resident Geologist's District .....	32
2 - Sioux Lookout Resident Geologist's District .....	33

<sup>1</sup>Resident Geologist, Ontario Ministry of Natural Resources, 18½ 4th Avenue North, Sioux Lookout, Ontario P0V 2T0.

## Introduction

The Sioux Lookout office is staffed by D. A. Janes, Resident Geologist, and Mrs. E. Fraser, secretary. A. Speed resigned as Resource Geologist in October, 1980 to take a position in mineral exploration.

Exploration for base metals continued in the Houghton-Hough Lakes area and in the Echo Township to Sandybeach Lake area. The activity is at a lower level than in previous years, but has been compensated for by the increased exploration for gold. Virtually all known gold prospects have been acquired in the Minnitaki Lake-Sturgeon Lake part of the Wabigoon Volcanic Belt. Activity has increased in the Savant Lake-Kasheowagama Lake areas, but these districts are not as well explored and high potential areas are still available. Most high gold potential areas in the Pickle Lake district are on leased or privately held land. This, and the deep overburden have limited gold exploration activity. Considerable staking has taken place around Opapimiskan Lake. This area hosts iron-formation related gold deposits and has good long term prospects.

Uranium exploration has not been active in the district in 1980. Both the Bluett Lake and Bamaji Lake areas are inactive.

Ontario Geological Survey maps of Echo Township and Zarn Lake areas have been released and cover high gold potential areas.

Goldlund Mines Limited announced an agreement with Hollinger Mines Limited for a mill feasibility study. On the adjoining property, Windfall Mines and Oil Limited have completed intensive surface drilling and is planning an underground development program.

Sturgeon Lake Mines Limited has exhausted its ore reserves and has shut down. The mill was running tailings up till shut down near year end.

## Resident Geologist's Activities

Two operating base-metal mines were visited during the year. Several visits were made to both the Goldlund and Windfall sites. A. Speed conducted a geological mapping project on Southeast Bay of Minnitaki Lake with the aid of summer assistant Ms. P. Storey. D. Janes visited and examined in excess of 20 properties and prospects on Sturgeon, Savant, and Kasheowagama Lakes during the course of a gold property study designed to increase the data base for these areas. M. Luchenski assisted in

this study. Some curtailment of field activities was caused by the forest fire situation during June and all field targets could not be met.

A consultant was engaged to perform an aggregate supply study in the Sioux Lookout area. This program was designed to provide a planning base for the aggregate supply to the Sioux Lookout area. The tight supply position was confirmed and a program to recognize the deal with this situation will be drawn up in the coming year.

The Data Series coverage for the Sioux Lookout area is essentially complete. All areas with significant exploration activity have been covered. Thirty Data Series Maps were published in 1980, and future efforts will be mainly directed to up-dating the first issues of this series.

Some time and effort were spent on the West Patricia Land Use Plan and associated planning activities. Office personnel visited two Junior Ranger camps, presented lectures, and conducted site visits.

## Mining Activity

Three mines remained in production in 1980, and one operation closed down. In the Sturgeon Lake camp, the Sturgeon Lake Mine (Falconbridge Copper Limited) exhausted its ore and ceased mining operations. The mill remained in operation almost to year end re-running tailings and mill clean-up. The Mattabi Mine continued at a 3000 tons per day rate while converting to an underground operation. Some underground development ore has been milled and another 20 foot bench will be taken out of the open pit. The Lyon Lake Mine, (Noranda Mines Limited) is now in production and is shipping ore to the Mattabi Mine. The "Group F" deposit development (Noranda Mines Limited) is proceeding on schedule and a waste bench should be removed in the summer of 1981 with possible initial shipments to the Mattabi mill.

Thierry Mine at Pickle Lake (Union Miniere Exploration and Mining Corporation Limited) is mining at 3600 tons per day. Preparations are underway to strip a new open pit on the property. Development of the underground operations are continuing and a decline is planned to open new mining areas underground.

## Industrial Minerals

Du-Nor Products of Sioux Lookout is attempting to expand the market for its potting soil product line. The company is developing markets for peat and marl related products. The packaging plant is running at less than rated capacity.

## Sand and Gravel

The aggregate demand this year was reduced from that of 1979. This is caused by the completion of a number of highway projects. Demand is expected to increase in 1981 because of road building and repair projects. An aggregate study was done for the Sioux Lookout town area and confirmed the limited supply of coarse aggregate. This study, conducted by Geo-Analysis Limited of Ottawa, will be released on open file at Sioux Lookout in early 1981. This study was funded by the Ministry of Northern Affairs.

## Mineral Exploration Activity

Claim staking was at a nine year high in 1980 at 3473. Not since 1971 have claims staked exceeded the 4000 mark. Gold exploration at Sturgeon and Savant Lakes in the south and Opapimiskan Lake in the north have been responsible for most of the increase over 1979. Base-metals exploration and exploration for molybdenum, tantalum, and lithium, however, have remained at significant levels. Should gold prices rise or remain at present levels, the increase in gold exploration at the "grass roots" level should increase the number of the claims staked. The other indicators of exploration activity, namely diamond drilling and geophysical surveys, show conflicting trends. Diamond drilling has remained at a constant level because development drilling for gold has tended to compensate for the lower base-metal activity. Geophysical surveys reported on have declined; this is certainly related to the lower level of staking in the previous five year period and reflects also the lesser emphasis on geophy-

**TABLE 1 Claims Recorded and Assessment Work Credit Received Patricia Mining Division from 1974 to 1980**

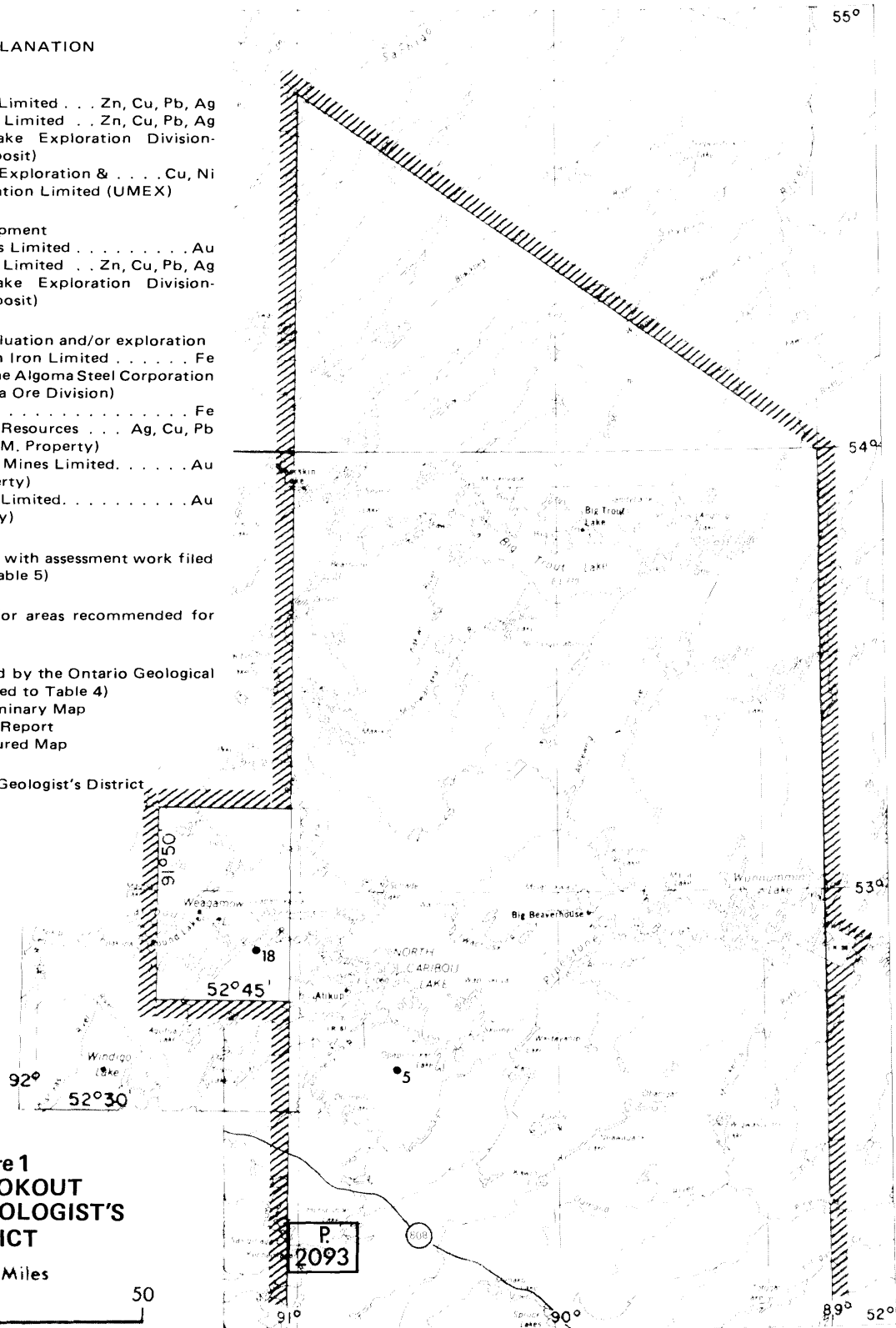
Year	Claims Recorded	Claims Cancelled	Claims Active	Diamond Drilling (Man Days)	Geophysical Survey (Man Days)	Geological Survey (Man Days)
1974	1,811	3,223	3,059	58,049.0	6,255	102
1975	1,019	2,489	3,903	58,492.7	18,953	1,838
1976	1,186	1,120	3,958	27,111.0	11,555	185
1977	1,261	1,329	3,760	17,880.1	13,931	346
1978	2,018	763	3,094	33,371.3	57,501	633
1979	1,012	1,061	3,043	30,869	27,605.4	1,949
1980	3,473*	372*	8,806*	32,739.75*	13,873.6*	1,239*

\*All 1980 totals are for an 11 month period (January - November)

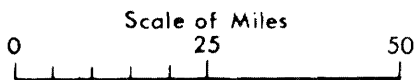
# NORTHWESTERN - SIOUX LOOKOUT

## EXPLANATION

- Producing Mines
  1. Mattabi Mines Limited . . . Zn, Cu, Pb, Ag
  2. Noranda Mines Limited . . . Zn, Cu, Pb, Ag (Mattagami Lake Exploration Division-Lyon Lake Deposit)
  3. Union Miniere Exploration & . . . Cu, Ni Mining Corporation Limited (UMEX)
- Mines Under Development
  1. Goldlund Mines Limited . . . . . Au
  2. Noranda Mines Limited . . . Zn, Cu, Pb, Ag (Mattagami Lake Exploration Division-Group "F" Deposit)
- ▲ Properties under evaluation and/or exploration
  1. Lake St. Joseph Iron Limited . . . . . Fe (optioned to The Algoma Steel Corporation Limited-Algoma Ore Division)
  2. Ramsay, R.G. . . . . Fe
  3. Canadian Gold Resources . . . . . Ag, Cu, Pb (Thompson, W.M. Property)
  4. Windfall Oils & Mines Limited. . . . . Au (Windfall Property)
  5. Nahanni Mines Limited. . . . . Au (Quyta Property)
- Exploration activity with assessment work filed in 1980 (keyed to Table 5)
- ◆ Property visits and/or areas recommended for exploration
- == Map or report issued by the Ontario Geological Survey in 1980 (keyed to Table 4)
  - P. - Preliminary Map
  - R - OGS Report
  - 2398 - Coloured Map
- /// Boundary Resident Geologist's District



**Figure 1  
SIOUX LOOKOUT  
RESIDENT GEOLOGIST'S  
DISTRICT**



Adjoins Figure 2

Adjoins Figure 1

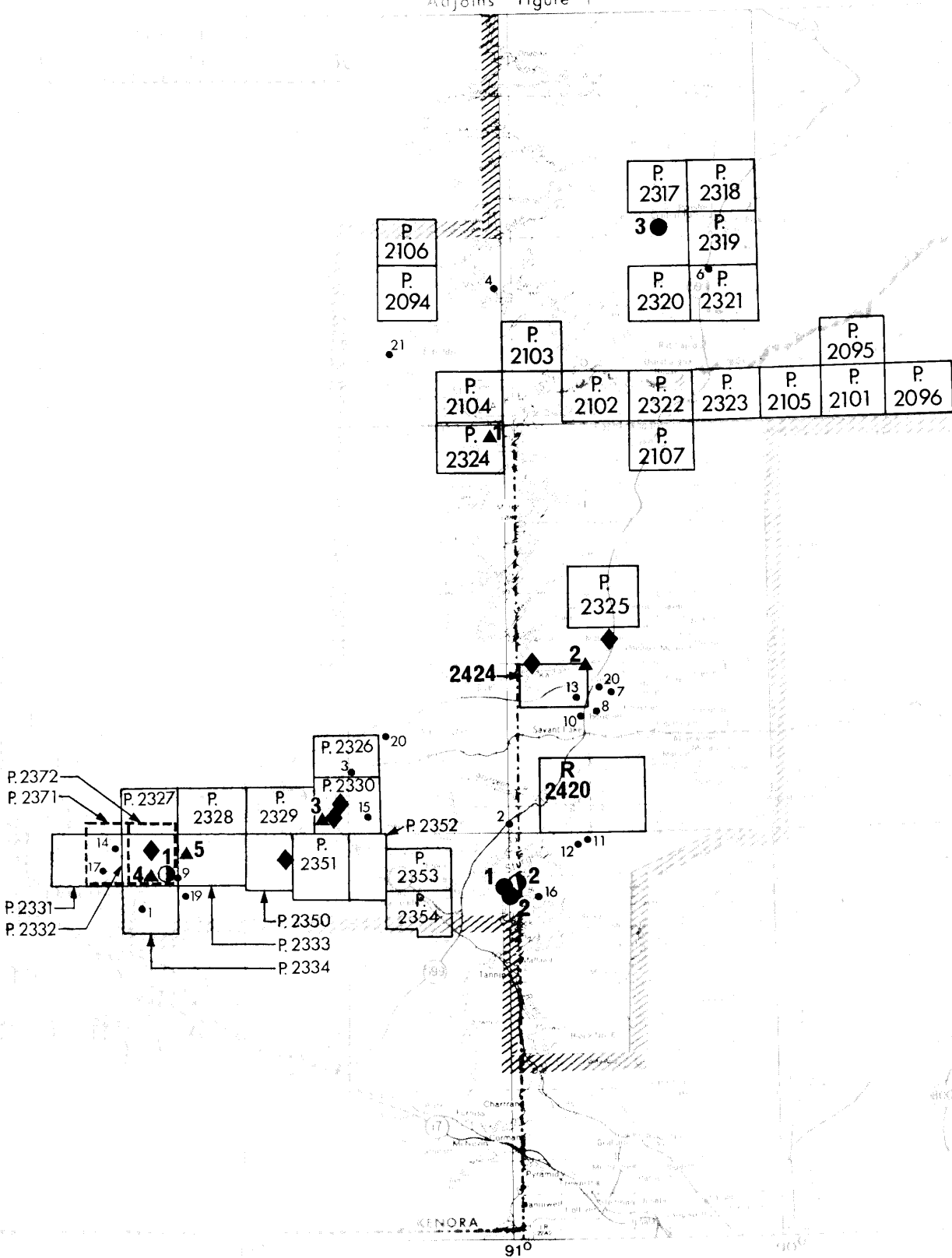


Figure 2

## NORTHWESTERN - SIOUX LOOKOUT

sics in gold exploration. Geochemical surveys, not reported on here, have increased as has the level of geological surveys, undoubtedly for the same reasons.

The statistics in Table 1 were compiled for the Patricia Mining Division for January to November of 1980.

## Properties Visited, Under Evaluation and/or Exploration

### Goldlund Mines Limited

During 1980 Goldlund Mines Limited (Figure 2, Number 1) completed underground and surface drilling programs and published ore reserve calculations (Northern Miner, June 12, 1980). A decline was completed, and a high voltage power line to the site was repaired. In December, an agreement with Hollinger Gold Mines Limited was reached and approved by the Goldlund share-holders. This agreement commits Hollinger Gold Mines Limited to a feasibility study for an initial 500 tons per day mill and underground development to support it. This company has the option of deciding to proceed with development on completion of the study and will gain a 60 percent interest if it proceeds.

### Windfall Mines and Oil Limited

The Windfall property (Figure 2, Number 4) was visited several times during 1980. An extensive surface drill program, using up to four drills, outlined significant ore intersections. The company announced tentative plans for a mill and is completing a major report to support financing of underground development and possible mill site preparation. The Windfall zones are extensions of the Goldlund zones and are open to the west. (Northern Miner, November 6, 1980).

### Nahanni Mines Limited (Quyta Property)

This property (Figure 2, Number 5) was visited briefly on two occasions. Work was interrupted during the summer by travel restrictions and site preparation and mapping were delayed. At year end, geological mapping had been completed. A diamond drill program, financed by successful drill fund offering, is planned to start in the new year to sample interesting sections in trenches and in drill holes.

### Pidgeon Molybdenum Mines Limited (Rio Tinto Canadian Exploration Limited)

This property is located near Lateral Lake in Webb and Echo Townships. An extensive diamond drill program was conducted to increase reserves on the long tabular ore zone on the south flank of the Lateral Lake granodiorite stock. Rio Tinto Canadian Exploration Limited has released a new tonnage calculation of 15.8 million tons at 0.08 percent molybdenum disulphide. Indications are that this tonnage could be increased, but the grade would not improve.

### Kasheowagama Lake Showings

Recent large scale claim staking in this area prompted a closer examination of several of the older showings.

### F. Hoey Showing

This showing is located at Kasheowagama Lake, Armit Lake sheet (M-2744), and is found on claim Pa 437149 presently held by S. Johnson of Sioux Lookout. The property is underlain by strongly sheared mafic metavolcanics. The schistosity trends N30°E and dips vertically to steeply northwest. In places, silicified and carbonate

**TABLE 2** Assay Values from Kasheowagama Lake

Sample Number	Location and Rock Type	Au (oz/ton)	Ag (oz/ton)
DJ-80/011 (grab)	F. Hoey showing; quartz vein material from farthest east pit; quartz with sphalerite, pyrite and arsenopyrites	1.12	0.58
DJ-80/012 (grab)	S. Johnson showing, central group of trenches; sheared quartz veins, sparse pyrite	.01	tr
DJ-80/013 (grab)	S. Johnson showing, central group of trenches; sheared andesite with cubic pyrite	.01	.13
DJ-80/014 (grab)	S. Johnson showing, west group of trenches; sheared andesite, veined with quartz and containing galena	.03	3.51
DJ-80/015 (grab)	Unnamed showing; pits near contact of granodiorite on north shore of Lake Kasheowagama near rapids; sheared quartz vein, pyrite and fuchsite.	tr	tr

zones are present, and a large number of shallow trenches have been blasted out normal to the strike of foliation. Several thin, lenticular quartz veins are exposed, and vary from inches to two feet in width. Euhedral pyrite cubes are present in the sheared, silicified zones within the metavolcanics. Three grab samples (reported in Table 2) run from 0.01 to 0.03 ounce of gold per ton. Several samples containing visible gold have been reported from this site, but none were found during this visit. The size of the showing as evidenced by the zone of silicification and the extent of trenching suggests that a systematic examination and sampling program should be done. If gold prices increase, the site would be suitable for open pit mining should gold distribution permit.

### S. Johnson Showing

This showing is located on the north shore of Kasheowagama Lake on claim Pa. 437150 of the Armit Lake sheet (M-2744). The site is underlain by a sequence of altered metagreywacke; thin, lean iron formation, and a conglomeritic sandstone of mainly pyroclastic origin. The rocks are strongly sheared and highly altered in part with the schistosity striking N70°E and dipping 80° to the north. The mineralization is in several sheared to lenticular quartz veins ranging in thickness from six to ten inches. Several of these veins are exposed in pits or trenches and have a zone of alteration or bleaching present in the wall-rock. Visible minerals are galena, pyrite, arsenopyrite, and fuchsite. A reported grab sample ran 0.6 ounce per ton of gold and 2.2 ounces per ton of silver. A grab sample collected by the author (reported in Table 3), ran 1.12 ounces per ton of gold and 0.58 ounce per ton of silver. The zone can be traced approximately 200 feet to the west where it trends under the lake. The eastern extension, if any, is not exposed.

### Savant and Sturgeon Lakes

A study of the gold/silver mineralization in these areas is underway. Because of the fire situation during June of the past year, the field part of this study was curtailed. However, the work to date has allowed some general observations, which are presented as preliminary conclusions only.

Several types of gold and silver occurrences have been noted on Sturgeon Lake:

(1) Relatively large dilatant zones at granitoid-volcanic rock contacts. These zones may host one, several or many quartz veins with simple mineralogy. Typical minerals are galena, sphalerite, pyrite, and gold, but not arsenopyrite. These veins frequently have an envelope of sericitized and carbonate veined wall rock. Veins may extend into the volcanic rocks or the granitoid for some distance from the contact. A type example is the St. Anthony Mine, the sole commercially successful past producer.

(2) Shear zone hosted sulphide deposits and associated simple quartz veins. Several of these deposits, the Iron Duke and the "Triangle" zone are located on the peninsula separating the northeast and northwest bays of Sturgeon Lake. These appear to occupy first and second order fault systems related to the granitoid-volcanic rock contacts. The deposits have massive sulphide zones of simple mineralogy consisting of pyrite, galena, chalcopyrite, and pyrrhotite. The companion quartz veins are sparsely mineralized with pyrite and chalcopyrite and run from trace to 0.02 ounce per ton of gold. These occurrences do not appear to have economic potential.

(3) Grey to black quartz veins associated with shear zones. The veins have simple quartz vein mineralogy and do not have an associated massive sulphide zone. The minerals are usually sparse pyrite, chalcopyrite, galena, and sphalerite. The gold-rich prospects, and several are spectacular, appear to be copper-rich, and the visible

**TABLE 3** Assay Values from Sturgeon and Savant Lake

Sample Number	Location and Rock Type	Au (oz/ton)	Ag (oz/ton)
01-80/005	Wiggle Creek, McCubbin Twp. East pits; quartz vein in iron formation with pyrite, arsenopyrite	0.56	tr
01-80/007	Wiggle Creek, McCubbin Twp. west pits; massive arsenopyrite	0.20	tr
01-80/008	Wiggle Creek, McCubbin Twp. west pits; arsenopyrite in lean iron formation	.09	tr
01-80/010	Wiggle Creek, west pits area quartz vein with arsenopyrite	.10	tr
01-80/026	Sturgeon Lake, "Triangle 1" showing -peninsula between north-east and north west Bays shear volcanic rock contact of quartz vein	.02	tr
01-80/030	Sturgeon lake, "Triangle 2" showing rusty massive sulphide zone-chip sample over four feet	tr	tr
01-80/032	Sturgeon lake, Iron Duke showing -quartz vein	.02	tr

*NORTHWESTERN - SIOUX LOOKOUT*

gold is associated with chalcopyrite. The L. W. Green prospect and BG 136 occurrence appear to belong to this group. The gold-rich veins are found in metavolcanics near granitoid contacts. The gold-poor veins appear to extend into the granitoid rocks.

(4) Iron formation hosted gold occurrences. Only one of these has been studied on Sturgeon Lake and this appears to be atypical in that it does not have arsenopyrite. The Savant Lake showings occur in association with trace to massive arsenopyrite in or replacing magnetite-hematite iron formation. W. D. Bond (1977) reported on the Wiggle Creek occurrence in McCubbin Township.

A mineralized zone in trenches assayed 0.22 ounce per ton of gold in massive arsenopyrite. In other trenches 700 feet to the east, a grab sample of lean iron formation with thin quartz veins assayed 0.56 ounce of gold per ton. These veinlets contain sparse pyrite and arsenopyrite. Several samples of iron formation with thin quartz bands gave anomalous gold values ranging from 135 parts per

billion to 0.1 ounce of gold per ton. Iron formations remote from this site were analyzed for gold and arsenic. The regional background level varies from less than 2 to 5 parts per billion of gold and from 2 to 8 parts per million of arsenic. Several of the McCubbin Township iron formation samples gave values for gold and arsenic several orders of magnitude higher than the regional background.

It appears from this date that arsenic at the parts per million level is an excellent pathfinder element in the Savant Lake area, especially if iron formation hosted deposits are sought.

(5) The final gold occurrence studied is a quartz-tourmaline vein deposit as typified by the Darkwater Mine. At the Darkwater Mine, veins cut the granitoids near Beidelman Bay and are associated with the contact of the granitoids and the Sturgeon Lake volcanics. The quartz veins contain variable amounts of tourmaline and very sparse sulphides, usually pyrite, though chalcopyrite and sphalerite are present in minor amounts.

**TABLE 4 | Maps and Reports pertaining to the Patricia Mining Division, issued by the Ontario Geological Survey of the Ministry of Natural Resources in 1980.**

GEOLOGICAL REPORTS

GR 195

MISCELLANEOUS PAPERS

89

91

92

96

MISCELLANEOUS PUBLICATIONS

Rocks and Minerals Information, 1980

OPEN FILE REPORTS

OFR 5297

OFR 5304

OFR 5306

OFR 5314

COLOURED MAPS

2420

2424

PRELIMINARY MAPS

P. 2093	P. 2102	P. 2107	P. 2318	P. 2323	P. 2328	P. 2333	P. 2353
P. 2094	P. 2103	P. 2223	P. 2319	P. 2324	P. 2329	P. 2334	P. 2354
P. 2095	P. 2104	P. 2298	P. 2320	P. 2325	P. 2330	P. 2350	P. 2371
P. 2096	P. 2105	P. 2299	P. 2321	P. 2326	P. 2331	P. 2351	P. 2372
P. 2101	P. 2106	P. 2317	P. 2322	P. 2327	P. 2332	P. 2352	



TABLE 5 Exploration Activity in 1980

Number Priority	Individual or Company	Activity
1.	Gold Canada Mining Company	Induced Polarization, Resistivity, Ground Magnetometer and Electromagnetic survey in Keikewabik Lake area. Diamond drilling and Geochemistry survey in MacFie Township. Diamond drilling in McAree Township.
2.	Comdex Mining Corporation	Property and Prospectus reports - Non-Assessment Data in the Sixmile Lake area.
3.	Canadian Gold Resources Limited	Diamond drilling in the Sharon Lake area.
4.	Canine Limited	Ground Magnetometer and Electromagnetic survey in the Kawashe Lake, Keen Lake and Nabonak Lake areas.
5.	Can Exploration (Canada) Limited	Trenching in the Wesleyan Lake area.
6.	Can Explorations Limited	Diamond drilling in the Tarp Lake area.
7.	Can Mining Corp. Limited	Ground Electromagnetic and Magnetometer survey and diamond drilling in the Evans Lake, Ground Magnetometer and Electromagnetic survey in Shebo Lake, Houghton Lake, areas. Ground Magnetometer, Electromagnetic and Geological survey in the Great Lake area.
8.	Geophysical Engineering Limited	Diamond drilling in the Evans Lake area.
9.	Canadian Mines Limited	Diamond drilling and soils test drilling in the Echo Township area.
10.	Haley, Eric	Ground Magnetometer and Electromagnetic survey in the Evans Lake area.
11.	Hilborn, Wilfred H.	Diamond drilling in the Squaw Lake area.
12.	Hixon, J. R.	Diamond drilling in the Squaw Lake area.
13.	Noranda Exploration Limited	Ground Magnetometer and Electromagnetic survey in Houghton Lake area. Diamond drilling in the Johnston Bay and a Geological survey in the Sixmile Lake and Trist Lake areas.
14.	His Mine Canadian Exploration Limited	Diamond drilling in Breithaupt, Drope and Echo Townships.
15.	Rosenblat, B. J.	Ground Magnetometer and Electromagnetic survey, diamond drilling, assays and Progress Report in the Zarn Lake area.
16.	Santa Maria Mines Limited	A Prospectus Report in the Bell Lake area.
17.	Selec Mining Corporation Limited	Diamond drilling in Breithaupt, Drope Townships. Ground Magnetometer and Electromagnetic survey and diamond drilling in Lenond Township and diamond drilling in McIlrath and Webb Townships.
18.	St. Joseph Explorations Limited	Diamond drilling in Keeyask Lake area, diamond drilling and Geological Report in the Randall Lake area.
19.	Surveyis Limited	Geological Report in the Kabik Lake and Pickeral Township area.
20.	Union Miniere Explorations & Mining Corporation Limited	Diamond drilling in the Armit Lake, Evans Lake, Houghton Lake and Watin Lake areas.
21.	UranGesellschaft Canada Limited	Airborne Magnetometer and Electromagnetic survey Radiometric survey and Geological survey in the Fry Lake area.
22.	Wilkinson, Don	Ground Magnetometer and Electromagnetic survey in Echo Township area.

NORTHWESTERN - SIOUX LOOKOUT

TABLE 6 Assessment Work and other Information Received in 1980

PATRICIA MINING DIVISION SYMBOLS AND ABBREVIATIONS								
Au-gold	sp-sphalerite	b-boulders, bouldery	IP-Induced Polarization Survey					
Ag-silver	mag-magnetite	p-peat, muck	STD 3-75-soils test drilling					
Cu-copper	hem-hematite	t-till	3 holes 75 foot total					
Fe-iron	gn-galena	rtr-rock trenching	Mag-Ground Magnetometer Survey					
Pb-lead	cp-chalcopyrite	tr-trace amounts	VEM-Vertical Loop Survey					
Zn-zinc	gf-graphite	DD 10-12,640-diamond drilling	VLF-Very Low Frequency Survey					
S-sulphides	c-clay, clayey	10 holes 12,640 foot total	HEM-Horizontal Loop Survey					
py-pyrite	m-silt, silty	Assess-Assessment Data	Geol-Geological Survey					
po-pyrrhotite	s-sand, sandy	Non-Assess-Non-Assessment Data	AEM-Airborne Electromagnetic Survey					
mo-molybdenite	g-gravel, gravelly	BS-Beneficiation Studies	AM-Airborne Magnetometer Survey					
Local	NTS	File Name	Commodity Found	Type of Report	Type of Work	Year	Toronto File No.	Local File No.
Armit Lake	52 J/7 NW	Union Miniere Exploration & Mining Corporation Limited	Cu,py,po	Assess.	DD 1-267	1980		14
Bell Lake	52 G/15 SW	Santa Maria Mines Limited	Cu,Ag,Au	Assess.	Pros.	1980		37
Breithaupt Township	52 F/15 NE	Rio Tinto Canadian Exploration Limited	py,po,cpy	Assess.	DD 4-1207	1980		22
	52 F/15 NE	Selco Mining Corporation Limited	py,po	Assess.	DD 1-202	1979		19
Drope Township	52 F/15 NE	Selco Mining Corporation Limited	py,po	Assess.	DD 2-537	1979		21
Echo Township	52 F/16 NW	Goldlund Mines Limited	py	Assess.	DD 3-667	1980		47
	52 F/16 NW	Goldlund Mines Limited		Assess.	STD 6-371	1980		48
	52 F/16 NW	Rio Tinto Canadian Explorations Limited	mo,py	Assess.	DD 13-4556	1980		49
	52 F/16 NW	Wilkinson, Don		Assess.	EM, MAG	1980	2.3281	50
Evans Lake	52 J/7 SE	Falconbridge Copper Limited		Assess.	Mag, VLF	1979	2.3007	74
	52 J/7 SE	Hadley, Eric		Assess.	Mag, EM	1979	2.3080	75
	52 J/7 SE	Falconbridge Copper Limited		Assess.	Mag, VLF	1979	2.3087	76
	52 J/7 SE	Union Miniere Exploration & Mining Corporation Limited	sp,gn,py,cpy	Assess.	DD 6-1622	1977		77
	52 J/7 SE	Geophysical Engineering Limited	py,po	Assess.	DD 1-421	1978		78
	52 J/7 SE	Union Miniere Exploration & Mining Corporation Limited	cpy,cp,sp	Assess.	DD 2-1268	1977-78		79
	52 J/7 SE	Union Miniere Exploration & Mining Corporation Limited	py,cpy,gn,sph	Assess.	DD 2-1208	1980		80
	52 J/7 SE	Union Miniere Exploration & Mining Corporation Limited	py,cpy,gn,sph	Assess.	DD 2-806	1980		81
	52 J/7 SE	Union Miniere Exploration & Mining Corporation Limited	py,po,cpy	Assess.	DD 1-400	1980		82
	52 J/7 SE	Corporation Falconbridge Copper	py,po,cpy	Assess.	DD 3-2548	1980		83
Fry Lake	52 O/3 NW	Urangesellschaft Canada Limited	U	Assess.	AM, AEM, Rad., Geol.	1979	2.2941	28
Grebe Lake	52 J/7 NE	Falconbridge Copper Limited		Assess.	Mag, VLF	1979	2.3007	40 (52 J/7SE)
Houghton Lake	52 J/7 SW	Falconbridge Copper Limited		Assess.	Mag, VLF	1979	2.3007	16 (52 J/7SE)
	52 J/7 SW	Union Miniere Exploration & Mining Corporation Limited	py,po,cpy	Assess.	DD 1-400	1979		17
	52 J/7 SW	Union Miniere Exploration & Mining Corporation Limited	py,po	Assess.	DD 1-562	1980		18
	52 J/7 SW	Noranda Exploration Company Limited		Assess.	Mag, VLF	1978	2.3185	19

Table 6 continued

Locality	STR	File Name	Commodity Found	Type of Report	Type of Work	Year	Report File No.	Level Plot No.
Johnston Bay	52 O/3 SE	Noranda Exploration Company Limited	py,po	Assess.	DD 1-295	1978		14
Kabik Lake & Pickorel Township	52 P/16 NE	Surveyors Limited		Assess.	Geol	1980	2.3354	36
Kawashe Lake	52 Q/6 SE	Cominco Limited		Assess.	Mag, HLEM, Gravity	1980	2.3237	19
Keeyask Lake	53 L/14 NE	St. Joseph Exploration Limited		Assess.	DD 5-1511	1979		4
Keikewabik Lake	52 P/16 SE	Beth Canada Mining Company		Assess.	IP & Res	1979	2.3036	17
	52 P/16 SE	Beth Canada Mining Company		Assess.	Mag, HLEM	1979	2.3169	13
Leland Township	52 P/14 NW	Selco Mining Corporation		Assess.	Mag, HLEM	1979	2.3026	44
	52 P/14 NW	Selco Mining Corporation	py,po,cpy,sph	Assess.	DD 1-407	1979		46
MacVie Township	52 P/16 SE	Beth Canada Mining Company	py,po,cpy	Assess.	DD 3-1375	1979		28
	52 P/16 SE	Beth Canada Mining Company		Assess.	Geochem	1979		30
McAree Township	42 N/11 SE	Beth Canada Mining Company	py,po,cpy	Assess.	DD 3-1734	1979		29
Melipitah Township	52 R/15 NE	Selco Mining Corporation Limited	py,po,sph	Assess.	DD 1-317	1979		16
	52 P/16 NE	Selco Mining Corporation Limited	py,po	Assess.	DD 1-410	1979		45
Neen Lake	52 Q/6 NE	Cominco Limited		Assess.	HLEM, Mag, Gravity	1980	2.3037	8 (52 O/6SW)
Nabemkoseza Lake	52 Q/6 SW	Cominco Limited		Assess.	HLEM, Mag, Gravity	1980	2.3037	13 (52 O/6SW)
Quest Lake	52 R/14 NE	Falconbridge Copper Limited		Assess.	VLP, Geol.	1979	2.3157	25
Randall Lake	53 Q/14 SE	St. Joseph Exploration Limited		Assess.	Geol.	1979	2.3188	11
	53 R/14 SE	St. Joseph Exploration Limited	py,asp	Non-Assess.	DD 1-277	1979		17
	53 R/14 SE	St. Joseph Exploration Limited	py,cpy	Assess.	DD 3-1198	1979		13
Shannon Lake	52 Q/4 SE	Canadian Gold Resources Limited	Au,Ag	Assess.	DD 8-2280	1980		19
	52 Q/4 SE	Canadian Gold Resources Limited	Au,Ag	Assess.	DD 2-606	1980		20
Sixmile Lake	52 Q/14 NW	Noranda Exploration Company Limited		Assess.	Geol.	1979	2.3074	111
	52 Q/15 NW	Canadex Mining Corporation		Non-Assess.	Pr, Pros	1974 & 1980		112
Squaw Lake	52 T/2 SE	Higgins, Wilfred H.	cpy,py	Assess.	DD 1-102	1979		46
	52 T/2 SE	Nixon, J. R.	py	Assess.	DD 1-163	1979		47
Tapp Lake	52 Q/9 SE	Dora Explorations Limited	py,cpy	Assess.	DD 4-1357	1979		37
	52 Q/9 SE	Dora Explorations Limited	py,asp,Au	Assess. Non-Assess.	DD 16-6936 DD 4-1405	1979 1979		38 35
Trist Lake	52 J/14 NE	Noranda Exploration Company Limited		Assess.	Geol.	1977	2.3253	11
Watin Lake	52 J/6 SE	Union Miniere Exploration & Mining Corporation Limited	py,cpy,po	Assess.	DD 1-266	1980		7
Webb Township	52 P/16 NE	Selco Mining Corporation Limited	po,sph,cpy	Assess.	DD 1-228	1979		20
Wesleyan Lake	52 Q/4 NE	Dome Exploration (Canada) Limited		Assess.	rtr	1965-66		11
Worn Lake	52 J/4 SE	Rosenblat, R. S. (Oriana Resources)	Au,Ag	Assess.	DD 9-1260	1979		11
	52 J/4 SE	Rosenblat, R. S.		Assess.	VLP	1979	2.3139	10

## NORTHWESTERN - SIOUX LOOKOUT

More properties are scheduled for visits in 1981 and the geochemical base will be enlarged. It is hoped that diagnostic geochemical and geological indicators will be developed to aid exploration in this interesting but relatively unexplored region.

## Recommendations for Exploration

### Sturgeon Lake-Savant Lake Area

The best potential area for new discoveries of readily accessible gold deposits appears to be the Sturgeon Lake-Savant Lake region. Most of the outcropping vein deposits there (and on Minnitaki Lake) have been sampled, but there appears to be considerable scope for geochemical investigation. In this regard, the northern part of the Wabigoon Volcanic Belt, centred on Savant Lake, has considerable potential for iron formation hosted deposits, and it appears from preliminary work reported here that the geochemical indicator method is the most promising. In general, most outcropping gold deposits have been known for some time in the accessible parts of the Superior Province. Virtually all gold development has been on these outcropping deposits. To develop new deposits, non-traditional methods must be used and Savant Lake-Sturgeon Lake appears to be an excellent test area because of the variety of environments available, good access and relatively good outcrop.

### Mavis Lake-Gullwing Lake Area

As suggested in the 1979 Report of the Sioux Lookout Resident Geologist, the area between Mavis Lake and Gullwing Lake had good potential for tantalum-bearing pegmatites and was suitable for geochemical exploration techniques using lithochemical methods. In 1980, several new occurrences of tantalum-bearing pegmatites have been discovered to the south-east of Gullwing Lake. This area, centred around the Ghost Lake Batholith (Breaks 1980) and north to Gullwing Lake has potential for economic tantalum and lithium deposits. Considering the continuing high price of tantalum, lithochemical exploration studies in this and other high potential areas is highly recommended. Several exploration companies are using this technique for exploration and have had good initial success in outlining buried drill targets.

## Research by other Agencies

Field work for graduate and undergraduate theses projects in the Sioux Lookout area was conducted by students of several universities. Some of the projects which have resulted in published reports are listed below.

## Ph. D. Research

- Patterson, Geo. C.  
The Geology of the Kapichi Lake Ultramafic-Mafic Bodies and Related Cu-Ni Mineralization Pickle Lake, Ontario; A thesis submitted to the Faculty of Graduate Studies in partial fulfillment of the requirements for the Degree of Doctor of Philosophy, Carlton University, Ottawa, 331p.
- Sopuck, Vladimir, Joseph  
A Lithochemical Approach in Search Areas of Felsic Volcanic Rocks Associated with Mineralization in the Canadian Shield; A thesis submitted to the Department of Geology, Sciences in conformity with the requirements for the Degree of Doctor of Philosophy, Queen's University, Kingston, Ontario.

## M. Sc. Research

- McCarter, Paul  
An Abstract of the Thesis of Geology and Mineralization of the Lateral Lake Stock, District of Kenora, Northwestern Ontario; 141p., 1 geologic map, Oregon State University.

## B. Sc.

- McMullan, Steven, R.  
Geology and Petrology of the Pickerel Arm Body Minnitaki Lake, Northwestern Ontario. Submitted to the Department of Earth Sciences, University of Waterloo, in partial fulfillment of the Honours Baccalaureate of Science.
- Turner, Gordon W.  
A Paragenetic Study of the Hadley Prospect, A zinc-lead Occurrence, Savant Lake Area, Ontario; A thesis submitted in partial fulfillment for the Honours Bachelor of Science Degree, Lakehead University.

## Recent Publications and References

- Blackburn, C. E.  
1980: Towards a Mobilist Tectonic Model for part of the Archean of Northwestern; p. 64-72 in *Geoscience Canada*, Volume 7, Number 2, June, 1980.
- Bond, W. D.  
1977: The Geology of McCubbin, Poisson, and McGillis Townships (Savant Lake Area), District of Thunder Bay; Ontario Division of Mines, Geological Report 160, 78 p. Accompanied by Map 2357, scale 1:31 680 or 1 inch to 1/2 mile.
- 1980: Geology of the Houghton-Hough Lakes Area (Savant Lake Area), District of Thunder Bay; Ontario Geological Survey Report 195, 112p. Accompanied by Map 2424, scale 1:31 680 or 1 inch to 1/2 mile.
- Breaks, F. W.  
1980: No. 1 Lithophile Mineralization in Northwestern Ontario, Rare Element Granitoid Pegmatites; p.5-9 in *Summary of Field Work, 1980*, by the Ontario Geological Survey, edited by V. G. Miine, O. L. White, R. B. Barlow, J.A. Robertson, and A. C. Colvine, Ontario Geological Survey Miscellaneous Paper 96, 201p.

- Burr, S. V., and Sun, S.  
1980: Mineral Exploration Assistance Program (MEAP), Fiscal Year 1979-1980; Ontario Geological Survey Open File Report 5304, 32p.
- Davis, D.W., Blackburn, C.E., Trowell, N.F. and Edwards, G.R.  
1980: Geochronology of the Savant-Crow Lakes Area, Western Wabigoon Subprovince, Districts of Kenora, Rainy River and Thunder Bay; p.24-33 *in* Summary of Geochronology Studies 1977-1979 edited by E.G.Pye, Ontario Geological Survey, Miscellaneous Paper 92, 45p.
- Gordon, J.B.  
1980: Vein Silver Deposits of Ontario, Northwest Sheet, District of Kenora (Patricia Portion), Ontario Geological Survey Preliminary Map P.2298, Mineral Deposit Series, scale 1:1 013 760 or 1 inch to 16 miles. Compilation 1975, 1977, 1978.  
1980: Vein Silver Deposits of Ontario, West Central Sheet, Districts of Kenora (Patricia Portion), Thunder Bay, Algoma and Cochrane. Ontario Geological Survey Preliminary Map P.2299, Mineral Deposit Series, scale 1: 1 013 760 or 1 inch to 16 miles. Compilation 1975, 1977, 1978.
- Janes, D. A. and Speed, A. A.  
1980: 1979 Report of the Sioux Lookout Resident Geologist; p.23-37 *in* Annual Report of the Regional and Resident Geologists, 1979 Edited by C. R. Kustra, Ontario Geological Survey, Miscellaneous Paper 91, 143p.
- Meyn, H. D. and Palonen, P. A.  
1980: Stratigraphy of an Archean Submarine Fan; Precambrian Research 12, p.257-285.
- Ministry of Natural Resources  
1980: Background Information, Ignace District, Land Use Plan Northwestern Region, April, 1980, 92p.
- Page, R. O. and Christie, B. J.  
1980: Lateral Lake Area (West Half), District of Kenora; Ontario Geological Survey Preliminary Map P.2371, Geological Series, scale 1:15 840 or 1 inch to ¼ mile. Geology 1979.  
1980: Lateral Lake Area (East Half) District of Kenora; Ontario Geological Survey Preliminary Map P.2372, Geological Series, scale 1:15 840 or 1 inch to ¼ mile. Geology 1979.
- Speed, A. A.  
1980a: Parnes Lake Area, District of Kenora; p.25-27 *in* Summary of Field Work 1980 by the Ontario Geological Survey Edited by V. G. Milne, O. L. White, R. B.Barlow, J. A. Robertson, and A. C. Colvine, Ontario Geological Survey Miscellaneous Paper 96, 201p.  
1980b: Kecheokagan Lake Area, District of Kenora (Patricia Portion); Ontario Geological Survey Preliminary Map P.2093, Sioux Lookout Data Series, scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1980.  
1980c: Nabemakoseka Lake Area, District of Kenora (Patricia Portion); Ontario Geological Survey Preliminary Map P.2094, Sioux Lookout Data Series, scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1980.  
1980d: Achapi Lake Area, District of Kenora (Patricia Portion); Ontario Geological Survey Preliminary Map P.2095, Sioux Lookout Data Series, scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1980.  
1980e: Greenmantle Lake Area, District of Kenora (Patricia Portion); Ontario Geological Survey Preliminary Map P.2096, Sioux Lookout Data Series, scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1980.  
1980f: August Lake Area, District of Kenora (Patricia Portion); Ontario Geological Survey Preliminary Map P.2101, Sioux Lookout Data Series, scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1980.
- 1980g: Carling Island-Lake St. Joseph Area, District of Kenora (Patricia Portion); Ontario Geological Survey Preliminary Map P.2102, Sioux Lookout Data Series, scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1980.
- 1980h: Duffell Lake Area, District of Kenora (Patricia Portion); Ontario Geological Survey Preliminary Map P.2103, Sioux Lookout Data Series, scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1980.
- 1980i: Johnston Bay-Lake St. Joseph Area, District of Kenora (Patricia Portion); Ontario Geological Survey Preliminary Map P.2104, Sioux Lookout Data Series, scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1980.
- 1980j: Lowry Lake Area, District of Kenora (Patricia Portion); Ontario Geological Survey Preliminary Map P.2105, Sioux Lookout Data Series, scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1980.
- 1980k: Meen Lake Area, District of Kenora (Patricia Portion); Ontario Geological Survey Preliminary Map P.2106, Sioux Lookout Data Series, scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1980.
- 1980l: Pashkokogan Lake Area, District of Kenora (Patricia Portion); Ontario Geological Survey Preliminary Map P.2107, Sioux Lookout Data Series, scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1980.
- Speed, A. A. and Maxwell, G. J.  
1980a: Ponsford Lake Area, District of Kenora (Patricia Portion); Ontario Geological Survey Preliminary Map P.2317, Sioux Lookout Data Series, scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1979.  
1980b: Tarp Lake Area, District of Kenora (Patricia Portion); Ontario Geological Survey Preliminary Map P.2318, Sioux Lookout Data Series, scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1979.  
1980c: Dona Lake Area, District of Kenora (Patricia Portion); Ontario Geological Survey Preliminary Map P.2319, Sioux Lookout Data Series, scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1979.  
1980d: Little Ochig Lake Area, District of Kenora (Patricia Portion); Ontario Geological Survey Preliminary Map P.2320, Sioux Lookout Data Series, scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1979.  
1980e: Coucheemoskog Lake Area, District of Kenora (Patricia Portion); Ontario Geological Survey Preliminary Map P.2321, Sioux Lookout Data Series, scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1979.  
1980f: Riach Lake Area, Districts of Kenora (Patricia Portion) and Thunder Bay; Ontario Geological Survey Preliminary Map P.2322, Sioux Lookout Data Series, scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1979.  
1980g: Caron Lake Area, District of Kenora (Patricia Portion); Ontario Geological Survey Preliminary Map P.2323, Sioux Lookout Data Series, scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1979.  
1980h: Trist Lake Area, District of Kenora (Patricia Portion); Ontario Geological Survey Preliminary Map P.2324, Sioux Lookout Data Series, scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1979.  
1980i: Solitude Lake Area, District of Kenora (Patricia Portion); Ontario Geological Survey Preliminary Map P.2325, Sioux Lookout Data Series, scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1979.

## NORTHWESTERN - SIOUX LOOKOUT

- 1980j: Sharron Lake Area, District of Kenora (Patricia Portion); Ontario Geological Survey Preliminary Map P.2326, Sioux Lookout Data Series, scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1979.
- 1980k: Whipper Lake Area, District of Kenora (Patricia Portion); Ontario Geological Survey Preliminary Map P.2327, Sioux Lookout Data Series, scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1979.
- 1980l: Vermilion Township-Hudson Area, District of Kenora (Patricia Portion); Ontario Geological Survey Preliminary Map P.2328, Sioux Lookout Data Series, scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1979.
- 1980m: Drayton Township, District of Kenora (Patricia Portion); Ontario Geological Survey Preliminary Map P.2329, Sioux Lookout Data Series, scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1979.
- 1980n: Zarn Lake Area, District of Kenora (Patricia Portion); Ontario Geological Survey Preliminary Map P.2330, Sioux Lookout Data Series, scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1979.
- 1980o: Gullwing Lake Area, District of Kenora (Patricia Portion); Ontario Geological Survey Preliminary Map P.2331, Sioux Lookout Data Series, scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1979.
- 1980p: Echo Township Area, District of Kenora (Patricia Portion); Ontario Geological Survey Preliminary Map P.2332, Sioux Lookout Data Series, scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1979.
- 1980q: Kabik Lake-Pickerel Township Area, District of Kenora (Patricia Portion); Ontario Geological Survey Preliminary Map P.2333, Sioux Lookout Data Series, scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1979.
- 1980r: Sandybeach Lake Area, District of Kenora (Patricia Portion); Ontario Geological Survey Preliminary Map P.2334, Sioux Lookout Data Series, scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1979.
- Tanman, A. D.  
1979: An Up-Date on Mattabi Mines Geology, Northwestern Ontario presented on the occasion of : The Annual C.I.M. District Four Meeting, September 27-29, 1979, Winnipeg, Manitoba, p.1-11, 8 figs.
- Trowell, N. F.  
1977: Squaw Lake, Ontario Geological Survey Map 2420, Precambrian Geology Series, scale 1 inch to ¼ mile, 1:31 680. Geology 1972, 1973.
- Trowell, N. F., Bartlett, J.R., and Sutcliffe, R. H.  
1980a: Geology of the Flying Loon Lake Area, District of Kenora; Ontario Geological Survey Open File Report 5297, 97p., 12 tables, 12 figures, 5 photos (xerox copies).
- 1980b: Flying Loon Lake Area, Parnes Lake Sheet, District of Kenora; Ontario Geological Survey Preliminary Map P. 2350, Geological Series, scale 1:15 840 or 1 inch to ¼ mile. Geology 1977, 1978.
- 1980c: Flying Loon Lake Area, Loggers Lake Sheet, District of Kenora; Ontario Geological Survey Preliminary Map P. 2351, Geological Series, scale 1:15 840 or 1 inch to ¼ mile. Geology 1977, 1978.
- 1980d: Flying Loon Lake Area, Smock Lake Sheet, District of Kenora; Ontario Geological Survey Preliminary Map P. 2352, Geological Series, scale 1:15 840 or 1 inch to ¼ mile. Geology 1977, 1978.
- 1980e: Flying Loon Lake Area, Wyatt Lake Sheet, District of Kenora; Ontario Geological Survey Preliminary Map P. 2353, Geological Series, scale 1:15 840 or 1 inch to ¼ mile. Geology 1977, 1978.
- 1980f: Flying Loon Lake Area, Press Lake Sheet, District of Kenora; Ontario Geological Survey Preliminary Map P. 2354, Geological Series, scale 1:15 840 or 1 inch to ¼ mile. Geology 1977, 1978.
- Trowell, N.F., Blackburn, C.E., and Edwards, G.R.  
1980: Preliminary Synthesis of the Savant Lake-Crown Lake Metavolcanic-Metasedimentary Belt, Northwestern Ontario and Its Bearing upon Mineral Exploration; Ontario Geological Survey Miscellaneous Paper 89, 30p. Accompanied by Chart A.
- Trowell, N.F., Sage, R.P., Wright, W., Chamois, P., and Higgens, C.  
1979: Sturgeon Narrows and Squaw Lake Alkalic Rock Complexes District of Thunder Bay; Ontario Geological Survey Preliminary Map P.2223, Geological Series, scale 1:15 840 or 1 inch to ¼ mile. Geology 1976.
- Wallace, Henry  
1980: Geology of the Slate Falls Area; District of Kenora (Patricia Portion); Ontario Geological Survey Open File Report 5314, 145p., 8 figures, 5 tables, 8 photos, 4 maps.
- Whittaker, Peter J.  
1980: Chromite Deposits in Ontario; Ontario Geological Survey Open File Report 5306, 152p.
- Wooden, J. L. and Goodwin, A. M.  
1980: A Rb-Sr Isotopic Study of the Archean Rocks of the Eastern Lac Seul Region English River Subprovince, Northwestern Ontario; p. 569-576 in Canadian Journal of Earth Sciences, Volume 17, Number 5, May, 1980.

# 1980 Report of the North Central Regional Mineral Resources Coordinator

K.G. Fenwick<sup>1</sup>, J.F. Scott<sup>2</sup>, J.K. Mason<sup>2</sup>,  
and W.H. McIlwaine<sup>3</sup>

## Contents

Introduction .....	43
Regional Mineral Resources Coordinators Activities .....	43
Mining and Exploration Activities .....	43
Platinum Group Metals Exploration .....	44
Uranium Exploration .....	53
Base-Metal Exploration .....	53
Molybdenum Exploration .....	54
Gold Exploration .....	54
Property Examinations .....	58
Teck Corporation–Leitch Division .....	58
Elizabeth Prospect .....	58
Atiko Gold Mine .....	59
Hamel–Doyon Occurrence .....	59
Northern Concentrators–Custom Mill .....	60
Acker Occurrence .....	60
Thunderbrick Limited .....	60
Drilling in the Sibley Group Rocks .....	61
Recommendations for Exploration .....	61
Recommendations for Exploration in the Atikokan Area .....	61
Ontario Geological Surveys Activities .....	65
Selected References .....	65

## Tables

1 – Assessment Work and Other Information Received 1980 ..	45
2 – Exploration Activities in 1980 .....	51
3 – Maps and Reports Pertaining to the North Central Region issued in 1980 by the Ontario Geological Survey, Ministry of Natural Resources .....	64

## Figures

1, 2, and 3 – North Central Region .....	55, 56, 57
4 and 4a – Atikokan Project .....	62, 63

## Introduction

The Regional Mineral Resources Coordinator's Office is staffed by K.G. Fenwick, Regional Mineral Resources Coordinator; J.F. Scott, Resource Geologist; A.R. Dowton, Secretary; W.H. McIlwaine, Geologist assigned to District

<sup>1</sup> Regional Mineral Resources Co-ordinator  
Ontario Government Building, 435 James Street S.,  
Box 5000, Thunder Bay, Ontario, P7C 5G6

<sup>2</sup> Resource Geologist.

<sup>3</sup> Geologist

Land Use Plans; B.R. Schnieders, Resource Geologist in charge of the Atikokan Project; J.K. Mason, Resource Geologist in charge of data series maps project and limestone study; and H. Brown and C. McConnell, Geological Assistants assigned to various projects. G. Sobering, S. Frazer, and L. Battiston were Experience '80 students hired during the summer. C.R. Larsen, Geologist, the Atikokan Project, resigned July 31, 1980.

## Regional Mineral Resources Coordinator's Activities

Up to the end of October, 1980, the staff of the Regional Mineral Resources Coordinator's Office replied to 667 queries on various aspects of geology, mineral and aggregate potential, and exploration activities from prospectors, mining company and industry personnel, government agencies, consulting geologists, schools and universities, and the general public. Mining company personnel, prospectors and government agencies accounted for approximately 84 percent of the total inquiries.

Visits were made to four Ontario Geological Survey field parties. Office staff toured the following active mines: Noranda Mines Limited (Geco Division); Teck Corporation (Leitch Division); Algoma Ore Properties (Helen Mine); Atiko Gold Mine; Inco Metals Company, Shebandowan Mine; Steep Rock Iron Mines Limited; Ontario Gem Company and Thunder Bay Amethyst Mining Company Limited. In addition, several past producers in the Beardmore–Geraldton area and the Schreiber area were also visited.

The office staff continued to be involved in strategic land use planning by providing geoscience input into proposed land and park reserves, environmental assessment plans, road placements, proposed transmission line placements, earth science inventories, park master plans, and gravel pits.

## Mining and Exploration Activities

As of November 26, 1980, a total of 5 242 mining claims were recorded in the North Central Region. This repre-

## NORTH CENTRAL

sents a 69 percent increase over the number of claims recorded in 1979 and is the highest recorded number of claims since 1970. Approximately 82 500 man days of assessment credit has been filed with the Mining Recorder's Office. Man days assessment credit from diamond drilling is up from 11 528 in 1979 to 33 797 man days in 1980 (Mining Recorder, Thunder Bay, personal communication).

This large increase in mineral exploration activity reflects the continued high interest in gold exploration coupled with a strong steady increase in exploration for base metals.

The distribution of assessment work credits (Table 1) and exploration activity (Table 2) is shown on Figures 1, 2, and 3. From the figures, it is apparent that mineral exploration activity is localized in specific areas. In general terms, the emphasis in the Mine Centre-Atikokan area has been on gold exploration with a subordinate interest in base metals. Activity in the Shebandowan Lakes area has been directed toward the search for base metals and gold. Exploration for uranium has been concentrated in the Black Sturgeon area, west of Nipigon. In the Terrace Bay-Marathon area, emphasis has been on exploration for base metals, gold, platinum, and palladium. Tantalum, lithium, and copper is the object of efforts in the Georgia Lake-Barbara Lake area. Spurred by Teck Corporation's Leitch operation, exploration activity for gold in the Beardmore area intensified dramatically and the Onaman Lake-Marshall Lake area once again is the focus for major efforts in base-metal exploration. Other pockets of activity are the Caribou Lake area for base metals and gold, the Miminiska Lake area for gold and antimony, and the O'Sullivan Lake area for gold and base metals.

Caland Ore Company Limited ceased work in their open pit and ore preparation area in November of 1979. The company terminated their pelletizing plant operation on April 30, 1980. The total shipment of fine, coarse and pelletized ore for 1980 was 1 900 000 tons. The last load of fines was shipped on October 18, 1980 thus cleaning up all the ore that was stockpiled at the plant (Atikokan Progress, October 22, 1980, p. 1).

From May 1 to October 15, 1980, Steep Rock Iron Mines Limited shipped 12 000 tons of ore in gondola cars to Winnipeg and other destinations. The ore will be used in the cement industry (Atikokan Progress, April 16, 1980, p. 8).

Noranda Mines Limited, Geco Division, plans to spend 2.4 million dollars on mill improvements, mill environment control, underground equipment, and underground ventilation at their copper-zinc-silver-lead property in Manitouwadge, Ontario between 1980 and 1982 (Canadian Mining Journal, October 1980, p. 64).

The Thunder Bay Amethyst Mining Company Limited, an open pit mine, located in Shuniah Township, has been purchased by Precious Purple Gem Stones Limited which is owned by Thunder Bay businessman and lawyer Steven Lukinuk. Under the new owner, one million dollars in mine equipment and development will be invested. Among the purchases would be a new machine to grade, select, and classify the amethyst. According to Lukinuk, the mine has a minimum 50-year supply of amethyst, and

already 275 000 tons of the stone has been blocked out in preparation for mining (Chronicle-Journal, July 11 1980, p. 11).

Teck Corporation, Leitch Division, was in production on the old Leitch Gold Mine near Beardmore this fall. Screened material from the waste dump was transported to Teck's Lamaque mill in Val d'Or, Quebec. The operation is described elsewhere in this report.

Consolidated Louanna Gold Mines Limited has entered into a joint venture with Cumo Resources Limited to bring the former's 36-claim gold property at O'Sullivan Lake, 39 km northwest of Nakina, into production. Production is planned for the end of 1981, at 140 tons per day. Reserves total 113 000 tons with a mineable grade of 0.30 ounce of gold per ton. The new work program scheduled to begin in May of 1981 will include driving a decline to connect the two underground levels. The high arsenic content of the ore inhibits cyanidation, requiring the use of a standard sulphide flotation system. The concentrate is expected to be shipped to the smelter of Asarco Incorporated in Helena, Montana for final processing (The Northern Miner, November 4 1980, p. 1 & 15).

Algoma Development Company mined and trucked 130 tons of high-grade gold ore from its property in Pifher Township to the Northern Concentrators custom mill in Thunder Bay for processing (Sol Cowan, personal communication).

## Platinum Group Metals Exploration

Most of the exploration for platinum group metals has been concentrated in two major areas, the Port Coldwell Alkalic Complex at Marathon, Ontario, and the Lac des Iles area, 100 km north of Thunder Bay. The property of Commerce Nickel Mines Limited at Puddy Lake, 175 km north of Thunder Bay, is also being reassessed for its platinum group metals.

Denison Mines Limited has entered into an agreement with Parlake Resources Limited where Denison can earn a 60 percent interest in Parlake's Marathon property by spending \$500 000 on exploration and development by December 31, 1983 (The Northern Miner, July 17 1980). Previous work on the property identified a high tonnage, low grade deposit that contained copper, nickel, precious metals, rare earths. The current investigation is designed to assess the platinum metals and apatite potential of the property.

Placer Development Limited has optioned a block of claims from D. Fairbairn, 16 km north of Marathon. An access road has been rebuilt and a cross-sectional drilling program has been completed. The major interest here is the platinum and apatite potential of the property.

The Anaconda Company Limited has been re-evaluating its copper-platinum-palladium property, north of Marathon, Ontario.

Boston Bay Mines Limited continues to seek financing to bring its platinum-palladium-copper-nickel-gold property at Lac des Iles into production. The planned mining method would be by the open pit method and a 3 000 ton per day mill appears feasible (The Northern Miner, October 4 1979, p. 15).



**TABLE 1** | ASSESSMENT WORK AND OTHER INFORMATION RECEIVED 1980.

LOCATION	NTS	FILE NAME	COMMODITY SOUGHT	TYPE OF WORK	YEAR DONE	MAP REFERENCE
Castlewood Lake Area (M1850) Coughlan Lake Area (M1409)	42L13/NE	Abitibi-Price Inc.	BM	22 DDH-5933'	1980	1
Gzowski Township (M1939)	42L5/SE	Amax of Canada Ltd.	BM	3 DDH-1699'	1980	2a
Metcalfe Lake Area (M1408) Gzowski Township (M1939)	42L4/NE 42L5/SE	Amax of Canada Ltd.	BM	Air EM	1979	2b
Metcalfe Lake Area (M1408)	42L4/NE	Amax of Canada Ltd.	BM	6 DDH-2463'	1979	2c
Metcalfe Lake Area (M1408)	42L4/NE	Amax of Canada Ltd.	BM	Air EM, EM, 2 DDH-1094' 4 DDH-2093'	1979 1980	2d
Willet Lake Area (M1407) Metcalfe Lake Area (M1408)	42L5/SE 42L4/NE	Amax of Canada Ltd.	BM	Air EM 5 DDH-1186'	1979 1980	2e
Willet Lake Area (M1407)	42L5/SE	Amax of Canada Ltd.	BM	1 DDH-236'	1980	2f
Oboshkegan Township (M1413)	42L4/NE	Amax of Canada Ltd.	BM	1 DDH-557'	1980	2g
Oboshkegan Township (M1413)	42L4/NE	Amax of Canada Ltd.	BM	Air EM, 1 DDH-397'	1979	2h
Oboshkegan Township (M1413)	42L4/SW	Amax of Canada Ltd.	BM	EM, Mag., 1 DDH-465'	1980	2i
Oboshkegan Township (M1413)	42L4/NE	Amax of Canada Ltd.	BM	1 DDH-363'	1980	2j
Gillies Township (M1728) O'Connor Township (M1843)	52A5/SE	Animikie Mines	Ag	Geol.	1934-1968	3
Priske Township (M1932)	42D4/SW	Archibald, John C.	BM	EM, Mag.	1980	4
Shillabeer Lake (M3035) Wolf Lake (McMaster Twp.) (M1926)	52H2/SE+SW 52A15/NE	Asarco Explor. Co. of Can.	U	Rad., Geol., Geochem. Rad., Geol., Geochem., Trenching	1979 1980	5a
Wolf Lake Area (M1926)	52A15/NE	Asarco Explor. Co. of Can.	U	2 DDH-1177'	1980	5b
Mann Lake Area (M36)	42F12/SW	A.S. Bayne & Co. Consulting Engineers	Cu, Ag	Geol.	1972	6
Empire Lake Area (M2812)	52G9/NE	Beth-Canada Mining Co.	BM	Mag., 2 DDH-405'	1979	7a
Hutchinson Township (M1823), Crooked Pine Lake Area (M2368)	52B4/SE+SW	Beth-Canada Mining Co.	BM	Mag.	1979	7b

Table 1 continued on next page.

NORTH CENTRAL

TABLE 1 Continued

LOCATION	NTS	FILE NAME	COMMODITY SOUGHT	TYPE OF WORK	YEAR DONE	MAP REFERENCE
Sand River (M1905)	52H9/SE	Camel Resources Ltd.	Au	Geol. (MEAP BG-70)	1980	8
Crescent Lake Area (M2609)	52I8/NW	Cominco Limited	Li, Ta, Cs	Geol.	1980	9
Boot Bay Area (M2448)	52B15/SE	Coyne, Glen H.	BM	EM, Mag.	1979	10
Lybster Township (M1800)	52A4/NW	Crown Point Mine & East End Silver Mountain	Ag	Geol.	1919	11
Kokwash Township (M1623)	42L6/SW	Dodds Gold Occurrence (Matalore) Resources Option)	Au	Geol.	1915-1916	12
Kaby Lake Area (M1873)	42E13/SE	Dome Explor. (Canada) Ltd.	Au	6 DDH-2379'	1980	13a
Elmhirst Twp. (M1873), Rickaby Twp., Colter Twp. (M1679) Irwin Twp. (M1760), Lapierre Twp. (M1791), Leduc Twp. (M1794), Legault Twp. (M1795), Lindsley Twp. (M1797), Walters Twp. (M1917)	42E13/SE 42E11/NE+NW 42E12/NE+NW 42E14/NW	Dome Explor. (Can.) Ltd.	Au, BM	Air Mag.	1979	13b
Hanson Lake Area (M2565)	52H1/NE	Donner, John	Li	Assaying	1978	14
Henderson Lake Area (M2399) Bell Township (M1650)	42F14/NW	Ellard, K.G. (Grubstake)	Au, BM	EM, Mag., Geochem.	1971	15
Arrell Lake Area (M2504)	42E5/SE	Essex Minerals Co.	U	Geol., 4 DDH-1121'	1979 1980	16a
Dorion Township (M1701), Greenwich Lake Area (M2621)	52A15/SE+SW	Essex Minerals Co.	U, BM	Air EM + Mag. + Rad.	1979	16b
Tartan Lake Area (M2634)	52A10/NW	Essex Minerals Co.	U, BM	Air EM + Mag. + Rad.	1979	16c
Pays Plat Lake Area (M2522), Rope Lake Area (M2525)	42D14/NW	Falconbridge Copper Ltd.	BM	EM, Mag.	1979	17
Orbit Lake Area (M1731)	52A13/NW	Forsgren, W.	BM	1 DDH-208'	1980	18
Greenwich Lake Area (M2621)	52A15/SW	Greenwich Lake Explor. Ltd.	BM	EM	1979	19
Walsh Township (M1928)	42D15/SE	Gulf Minerals Canada Ltd.	BM	2 DDH-710'	1978	20

TABLE 1 Continued

LOCATION	NTS	FILE NAME	COMMODITY SOUGHT	TYPE OF WORK	YEAR DONE	MAP REFERENCE
Keezhik Lake Area (M2330)	52P16/SW	Hamilton, John	Au	5 DDH-2413.5'	1978	21
Block Lake Area (M2753)	42M11/SE	Hanna Mining Co., The	BM	1 DDH-197'	1979	22a
Calamity Lake Area (M2724)	42M11/NW	Hanna Mining Co., The	BM	2 DDH-754'	1979	22b
Calamity Lake Area (M2724), Crump Lake Area (M2758)	42M11/NW+NE	Hanna Mining Co., The	BM	1 DDH-277'	1979	23c
Crump Lake Area (M2758)	42M11/NE	Hanna Mining Co., The	BM	2 DDH-719'	1979	22d
Crump Lake Area (M2758)	42M11/NE	Hanna Mining Co., The	BM	1 DDH-263'	1979	22e
Gourlie Creek Area (M2764)	42M10/SW	Hanna Mining Co., The	BM	1 DDH-237'	1979	22f
Metcalfe Lake Area (M1408)	42L4/NE	Hollinger Argus Ltd.	BM	EM	1980	23a
Oboshkegan Township (M1413)	42L4/NE	Hollinger Argus Ltd.	BM	4 DDH-665'	1980	23b
Linklater Lake Area (M2521)	52I10/SW	Hollingsworth Mines Ltd.	Fe	5 DDH-1941'	1971	24
Summers Township (M1905)	42E12/SW	Hopkins, Albert P.	Au	Stripping	1979	25a
Summers Township (M1905)	42E12/SW	Hopkins, Albert P.	Au	Stripping	1979	25b
Aguasabon Lake Area (M2518), Santoy Lake Area (M2676)	42D14/NE 42D15/NW	Hudson Bay Explor. & Dev. Co. Ltd.	BM	9 DDH-1323.5'	1973	26a
Conacher Township (M1681)	52B9/NE	Hudson Bay Explor. & Dev. Co. Ltd.	BM	EM	1979	26b
Hagey Twp. (M1741), Kashabowie Lake Area (M2405), Drift Lake Area (M2404)	52B9/NE+NW	Hudson Bay Explor. & Dev. Co. Ltd.	BM	EM	1979	26c
Kashabowie Lake Area (M2405), Haines Township (M1742)	52B9/NE+NW	Hudson Bay Explor. & Dev. Co. Ltd.	BM	EM	1979	26d
Leduc Twp. (M1794), Legault Twp. (M1795), Lapiere Twp. (M1791)	42E12/NE 42E13/SE, NW+NE 42E11/NW, 42E14/SW, 42L4/SW	Hudson Bay Explor. & Dev. Co. Ltd.	Au, BM	17 DDH-5306'	1973	26e

Table 1 continued on next page.

*NORTH CENTRAL*

**TABLE 1** Continued

LOCATION	NTS	FILE NAME	COMMODITY SOUGHT	TYPE OF WORK	YEAR DONE	MAP REFERENCE
Tuuri Township (M1929)	42D15/SW	Hudson Bay Oil & Gas Mining Ltd.	BM	1 DDH-165'	1977	26f
Rich Lake Area (M2322)	52P9/SE	Lachib Mines Ltd. (Mountain View Explor.)	Au	Geol., EM, Mag. 3 DDH-587'	1979 1980	27
Priske Township (M1932)	42D14/SE	Lormac Explor. Ltd. (Vega Gold Explor. Ltd.)	Au	Mag., EM	1980	28
Moss Township (M1826)	52B10/SE+SW	Lundmark, Harry	Au	4 DDH-1906'	1979	29
Summit Lake Area (M1406)	42L5/NE	Mattagami Lake Mines Ltd.	BM	IP, Res.	1979	30
Makokibatan Lake Area (M2084)	42M5/SE	J. McDonough & B. Knox Group	Au	Geol.	1959	31
Pardee Twp. (M1856), Crooks Twp. (M1688)	52A4/SE	Midland Nickel Corp. Ltd.	BM	3 DDH-893', Grav., Mag.	1974	32
Freeborn Township (M2361)	52B13/SE	Moffatt, Robert C. (Fern Elizabeth Gold Explor. Ltd.)	Au	2 DDH-300'	1980	33
Beardmore Area (M2498)	42E12/SW	Montane Contractors Ltd. (Northern Empire Mine)	Au	Geol., Assays (MEAP-CB71)	1979	34
Vincent Township (M1914)	42E12/SE	Nelson, Bernhard I.	Au	Mag.	1979	35
Summers Township (M1905)	42E12/SW	Nelson, John E.	Au	Dredging	1979	36
Ferguson Lake Area (M2326)	52P9/NW	New Jersey Zinc Explor. Co. of Canada Ltd.	BM	3 DDH-149'	1979	37a
Miminiska Lake Area (M2324), Snowdrift Lake Area (M3186), Ferguson Lake Area (M2326), Nesting Lake Area (M2329)	52P10/SE,SW,NE 42P9/NW	New Jersey Zinc Explor. Co. of Canada Ltd.	BM	Air Mag.	1979	37b
Miminiska Lake Area (M2324), Nesting Lake Area (M2329)	52P10/SE,NE	New Jersey Zinc Explor. Co. of Canada Ltd.	BM	3 DDH-877'	1979	37c
Snowdrift Lake Area (M3186)	52P10/SW	New Jersey Zinc Explor. Co. of Canada Ltd.	BM	3 DDH-549' 2 DDH-746'	1979 1980	37d
Nakina Township (M1831)	42L7/NW	Newman-Gauthier showing	Cu	Geol.	1955	38
Adrian Township (M1625)	52A5/NW	Noranda Explor. Co. Ltd.	BM	Geol., Geochem.	1979	39a

TABLE 1 Continued

LOCATION	NTS	FILE NAME	COMMODITY SOUGHT	TYPE OF WORK	YEAR DONE	MAP REFERENCE
Eva Lake Area (M2374)	52B11/NE	Noranda Explor. Co. Ltd.	BM	EM, Mag.	1980	39b
Lampport Township (M1790)	52B9/SE	Noranda Explor. Co. Ltd.	BM	Geol.	1980	39c
Laurie Township (M1792)	52A12/SW	Noranda Explor. Co. Ltd.	BM	Mag.	1979	39d
Shillabeer Lake Area (M3035), Cockeram Twp. (M1825), McMaster Twp. (M1926)	52H2/SE 52A15/NE	Norcen Energy Resources Ltd.	U	Geol., Rad.	1979	40a
McMaster Twp. (M1926), Shillabeer Lake Area (M3034)	52A15/NE 52H2/SE	Norcen Energy Resources Ltd.	U	Geol.	1979	40b
Caramat Lake Area (M2285)	42E9/SE	Onesime, Albert	U	Blasting, Plugger drilling	1969	41
Klotz Lake Area (M2868)	42F13/SW	Otto, H.H., & L.J.	Au	4 DDH-864'	1980	42
O'Sullivan Lake Area (M1415)	42L7/NW	Peterson, W.	BM	Geol.	1955	43
Castlebar Lake Area (M2477)	42E16/SE	Placer Dev. Ltd.	BM	4 DDH-1261', Mag. EM	1979	44a
Seeley Lake Area (M1861)	42D16/SW	Placer Dev. Ltd. (Fairbairn Option)	BM	4 DDH-3289'	1980	44b
Walsh Township (M1928)	42D15/SE	Placer Dev. Ltd.	BM	Geol., Geochem.	1980	44c
Gillies Township (M1728)	52A5/SE	Porcupine Mine	Ag	Geol.	1919	45
Summit Lake Area (M1406)	42L5/NE	Price Co. Ltd., The	BM	IP	1979	46
Lybster Township (M1800)	52A5/SW	Redden, J.W.	Au	Mag	1980	47
Lac des Mille Lacs Area (M2448), Bedivere Lake Area (M1647), Crooked Pine Lake Area (M2368), Weaver Township (M2066)	52B15/SE,SW 52B14/SE	Rio Tinto Can. Explor. Ltd.	BM, Au	Air Mag.	1979	48
Priske Township (M1932)	42D4/SW	Schreiber Gold Mines	Au	Geol.	1933	49
Gravel Lake Area (M1735), Rope Lake Area (M2525)	42E4/SE, 42E3/SW	Selco Mining Corp. Ltd.	BM	EM, Mag.	1979	50a
Rope Lake Area (M2525)	42E3/SW	Selco Mining Corp. Ltd.	BM	EM, Mag.	1979	50b

Table 1 continued on next page.

*NORTH CENTRAL*

**TABLE 1** Continued

LOCATION	NTS	FILE NAME	COMMODITY SOUGHT	TYPE OF WORK	YEAR DONE	MAP REFERENCE
Anders Lake Area (M2624), Wolf Lake Area (M1926), Greenwich Lake Area (M2621), Dorion Twp. (M1701)	52A15/NE,NW, SE,SW	Shell Canada Resources Ltd.	U	Air Rad., Geol., Geochem., Rad.	1979	51
Common Township (M1237)	42C11/NW	Sperle, Kasper	U	Rad.	1979	52
McCaul Twp. (M2382) Hutchinson Twp. (M1823)	52B14/SW	Staines, Leon Bruce	Au, BM	3 DDH-718', Met. prog. 2 DDH-1205.7'	1979 1980	53a
McCaul Twp. & Sabawi Lake Area (M2382)	52B14/SW	Staines, Leon Bruce	Au	EM, Mag. 2 DDH-651'	1979 1980	53b
Pic Township (M1860)	42D9/SW	Stenlund, Victor		2 DDH-720' 1 DDH-660'	1979 1980	54
Dorion Township (M1701)	52A15/SE	Ternowesky, John	U	Geol., Geochem., Rad., Benif.	1979	55a
Orbit Lake Area (M1731)	52A13/NW	Ternowesky, John	BM	5 DDH-1142'	1980	55b
Cockeram Township (M1825)	52H2/SE	Urnerz Explor. & Mining Ltd.	U	3 DDH-2397'	1980	56
Lybster Township (M1800)	52A4/NW	West End Silver Mountain	Ag	Geol.	1919	57
Metcalf Lake Area (M1408)	42L4/NE	Yzerdraat, Walter	Au	Rad., Mag., Geol.	1979	58

Abbreviations

Air	Airborne Survey
Benif.	Benification Studies
2 DDH-1177'	2 diamond drill holes totalling 1177'
Geochem.	Geochemical Survey
Geol.	Geological Survey
Geophys.	Geophysical Survey
EM	Electromagnetic Survey
IP	Induced Polarization Survey
Mag.	Magnetometer Survey
Rad.	Radiometric Survey
Res.	Resistivity Survey
Met. Prog.	Metallurgical Progress Report
BM	Base Metals (Cu, Zn, Pb)
Cu	Copper
Ag	Silver
Au	Gold
U	Uranium
Fe	Iron
Li	Lithium
Ta	Tantalum
Cs	Cesium

TABLE 2 | EXPLORATION ACTIVITIES IN 1980.

Number on Figure	Company or Individual	Type of Work
1	Acker, Walter	Exploration, gold occurrence, Priske Twp.
2	A.E.C. Ltd.	Stripping, deep diamond drilling, Forsberg Lake area
3	Albert, Onesime	Diamond drilling, NE of Paguachuan Lake
4a	Amax of Canada Ltd.	Mineral exploration, geological mapping
4b	Amoco	Mineral exploration, Heaven Lake area
5	Bagdad Exploration Assoc. Ltd.	Geochemical survey, Marshall Lake
6	Bazinet, Ernest	Mag, EM, Lac des Mille Lac area
7	Bernatchez, Ray	Mineral exploration, Sapawe area
8	Beth Canada Mining Co.	Mineral exploration, Hutchinson Township
9	Blair, Hope	Stripping and drilling, Hutchinson Twp. area
10	Brinklow, Lonnie	Mineral exploration, Walters Township
11	Brown, Phillip	Diamond drilling, Fort Hope area
12	Bruce, Gerald	Mineral exploration, Hipel Township
13	Canady, Edward	Trenching, Walters Township
14	Cominco Ltd.	IP survey, Drurer Lake-Ogoki Lake area
15	Cowan, Sol	Ore extraction, Empress Gold Mine
16	Dome Exploration Canada Ltd.	Mag, Em, Legault Township
17	Dome Exploration Canada Ltd.	Exploration, Lindsley Township
18	Dungarvon Resources Ltd.	Geological sampling, Marshall Lake area
19	Esso Minerals Canada	Geological mapping, Caribou-Linklater Lakes
20	Esso Minerals Canada	Mineral exploration, Duck Lake area
21	Esso Minerals Canada	Mineral exploration, Jackfish-Middleton area
22	Esso Minerals Canada	Geological mapping, van Nostrand Lake
23	Exchange Mining Holdings Ltd.	Trenching, Klotz Lake area
24	Falconbridge Nickel Mines	Exploration work, Kaby Lake
25	Gledhill, Peter	Mineral exploration, Sand River Gold Mine, Eva Township
26	Gulf Minerals Canada	Atwood Lake
27	Hopkins, Albert	Geophysical, geological, diamond drilling, McComber Township
28	Hudson Bay Exploration & Develop. Co.	Exploration, White River area

Table 2 continued on next page.

## NORTH CENTRAL

**Table 2 – continued**

Number on figure	Company or Individual	Type of Work
29	Hudson Bay Exploration & Develop. Co.	Linecutting, Black Sturgeon Lake
30	Independent Exploration Services	Claim staking, Caribou Lake area
31	Lundmark, H. & McAteer, W.	Geological, Eaglehead Lake area
32	Lundmark, H.	Trenching, Bamooos Lake area
33	Maki, Neil	Exploration, Vincent Township
34	Mattagami Lake Exploration Ltd.	Geological, geochem., Elmhirst Township
35	Mattagami Lake Exploration Ltd.	Exploration, Onaman Lake area
36	Nephin, Ken	Trenching, Norway Lake area
37	Nuinsco Resources	Prospecting, Prairie Lake
38	Noranda Exploration Company Ltd.	Prospecting, geological mapping, O'Sullivan Lake
39	Noranda Exploration Company Ltd.	Mining exploration, Cairngorm Lake area
40	Noranda Exploration Company Ltd.	Mag, EM, Rope Lake area
41	NWT Copper Mines Ltd.	Diamond drilling, Marshall Lake area
42	Petrunka, Dave	Bulk samples – Burrows Lake
43	Placer Development Ltd.	Linecutting, diamond drilling, Marathon area
44	President Mines Ltd.	Diamond drilling, Kabamichigama Lake
45	Prospectation Ltd.	Diamond drilling, Norton Lake
46	Randa, Ty	Geological, O'Sullivan Lake area
47	Redden, J. W.	Mag., Gorham Township
48	Rio Tinto Exploration Ltd.	Mineral exploration, Caribou Lakes area
49	Schiralli, Rocco	Radiometric survey, Mussy Lake area
50	Selco Mining Corp.	Exploration, Nakina
51	Selco Mining Corp.	Mineral Exploration, Auden area
52	Shell Canada Resources Ltd.	Mag., Factor Lake area
53	Shell Canada Resources Ltd.	Geological, geophysical, Old Man Lake
54	Shell Canada Resources Ltd.	Geophysical, Abrey Township
55	Shell Canada Resources Ltd.	Mining exploration, Skinner Lake
56	Sherritt Gordon Mines Ltd.	Diamond drilling, Marshall Lake
57	Skalesky, P. & Peterson	Linecutting, geological, Goldie Township
58	Steep Rock Iron Mines Ltd.	Geological, geophysical, Sapawe Lake
59	Surveymin Ltd.	Geological mapping, Ramsay-Wright Township



**Table 2 — continued**

Number on figure	Company or Individual	Type of Work
60	Sylvia Exploration Ltd.	Diamond drilling, Tuuri Township
61	Tantalum Mining Corp.	Diamond drilling, Lilypad Lake area
62	Tindale Drilling Ltd.	Diamond drilling, Norton Lake
63	Wilson, George	Prospecting, Hutchinson Township
64	W. G. Langley Ltd.	Mineral exploration, Croon Lake
65	Wenzoski, Julius	Mining exploration, Summers Township

## Uranium Exploration

Uranium exploration activities have been concentrated in the Greenwich Lake-Black Sturgeon River area. Uranerz Exploration and Mining Limited and Asarco Exploration Company of Canada Limited drilled several deep holes to test the Sibley Group rocks at depth (see write-up in this report on drilling in the Sibley Group). No analytical results are available from this drilling.

In September of 1980, Uranerz Exploration and Mining Limited staked 236 claims in Adamson Township, northeast of Thunder Bay.

Nuinsco Resources Limited plans to continue exploration activities on its uranium-niobium property in the Prairie Lake area. Their program has been aided by the fact that the Deadhorse Creek Forest access road now passes through a part of the Prairie Lake carbonatite. A 30 000 foot drilling program is contemplated.

Greenwich Lake Explorations Limited and Tenacity Explorations are evaluating claims in the Greenwich Lake area; Essex Minerals Company have drilled four diamond-drill holes for a total of 1 121 feet on their Croon Lake property. The source of high grade uranium float found on the property is still the object of the exploration. Analysis of these boulders indicates a grade of from 4.2 pounds to 6.0 pounds of uranium per ton (North Central Region Assessment Files). Eldorado Nuclear Limited is assessing all basins that resemble the Athabasca Basin, and have shown an interest in the Sibley Basin.

## Base-Metal Exploration

Exploration for base metals was very widespread in the North Central Region, and the bulk of the activity concentrated in the Onaman Lake-Marshall Lake area and in the Jackfish-Middleton area east of Terrace Bay. The Shebandowan Lake-Burchell Lake area was also the focus of some exploration activity.

Abitibi-Price Incorporated optioned a large claim group, located 4 km west of Onaman Lake, from D. Thorsteinson and N. Cox. Two newly discovered copper-gold-silver occurrences were located on claim TB383681.

Since January of 1980, the company drilled a total of 22 holes (5 933 feet) in this area (Resident Geologist's Files, Thunder Bay).

Sherritt Gordon Mines Limited optioned N.W.T. Copper Mine Limited's copper-zinc-lead-silver property near Marshall Lake. The property was previously optioned to Imperial Oil Limited which outlined 2.2 million tons averaging 1.22 percent copper, 4.20 percent zinc, 2.45 ounces of silver per ton and 0.012 ounce of gold per ton (The Northern Miner, April 10 1980, p. 12). Sherritt Gordon Mines Limited plans 2 300 feet of diamond drilling.

Boliden Canada Limited stated that the new technologies, developed by its parent company Bolden Atiebolag in Sweden, would allow Great Lakes Nickel to achieve considerably higher rates of recovery from its complex concentrates. Benefits would be less costly ore treatment processes coupled with higher profits as more nickel and precious metals are recovered. Boliden will undertake new engineering studies related to the development of the Great Lakes Nickel property in Pardee Township (The Northern Miner, May 8 1980, p. 1 and 23).

Gulf Minerals Canada Limited has optioned 32 claims from Belore Mines Limited in the area south of Burchell Lake. In 1980, the company was involved in detailed ground geophysics and diamond drilling. For a brief description of this property see K.G. Fenwick and J.F. Scott (1977, p. 43-44).

Hollinger Argus Limited, in joint venture with Amax Minerals Exploration, has mounted a major base-metal exploration program in the Oboshkegan Township-Tashota area.

Several major companies have shown an interest in the Caribou-Linklater Lakes area, northeast of Armstrong, during the past year. New Jersey Zinc Exploration Company (Canada) Limited has acquired approximately 600 claims. Rio Tinto Canadian Exploration Limited staked approximately 240 claims. Esso Minerals Canada conducted mineral exploration in this area.

New Jersey Zinc Exploration Company (Canada) Limited, Sylvia Exploration Limited, Inco Limited, and Esso Minerals Canada have been very active for base metals in the Jackfish-Middleton area. Falconbridge Cop-

## NORTH CENTRAL

per Limited have an option agreement to investigate Zenmac Explorations Limited old zinc mine north-northwest of Schreiber. Noranda Exploration Company Limited has staked and optioned a large block of claims in the Big Duck Lake area.

Mining Corporation of Canada Limited has dismantled the old Zenmac mill west of Schreiber. Grab samples from the mill tailings pond ran 4560 ppm zinc, 1150 ppm copper, 54 ppm cobalt, and 18 ppm cadmium. A sample of earth from the base of the mill ran 8.20 percent zinc, 2680 ppm copper, 72 ppm cobalt and 190 ppm cadmium (Resident Geologist's Files, Thunder Bay).

President Mines Limited drilled a copper occurrence near Kabamichigama Lake, 45 km northeast of Nipigon. Copper mineralization is concentrated in Late Precambrian faults which transect the area. Phendler (Resident Geologist's Files, Thunder Bay) records that the zone shows an average grade of 1.07 percent copper across a width of 18.2 feet for a strike length of 600 feet; the structure is open to the northwest and the southeast.

Wasabi Resources Limited staked over 40 claim groups in the Norton Lake area, 60 km northeast of Fort Hope. An area approximately 89 km long by 16 km wide was flown by an "INPUT" airborne system with ground geophysics follow-up. Several anomalies have an interpreted surface width of 90 to 140 m and lengths up to 600 m (The Northern Miner, November 13 1980, p. 3). A drilling program is underway.

### Molybdenum Exploration

Eldorado Gold Mines Limited extracted a 1 500 ton bulk sample from a molybdenum occurrence at Burrows Lake, 26 km north-northeast of Geraldton. The sample will be trucked to the company's proposed mill site at High Lake, west of Kenora, for mill testing. The company is also attempting to option a molybdenum occurrence in the west-central part of McTavish Township, and has plans to extract a 5 000 to 30 000 ton bulk sample, also for mill testing (personal communication, D. Petrunka).

### Gold Exploration

Spurred on by the continued high price for gold, mineral exploration for the metal has not slackened in the North Central Region. Many past producers, as well as properties with established reserves, are being re-evaluated for potential reopening.

Mattagami Lake Exploration Limited has taken a two year option on the 25 claim property of Band-Ore Gold Mines Limited in the Shebandowan area. Linecutting, a geophysical survey, and diamond drilling were completed this year. Indicated reserves on this property are 687 500 tons of 0.265 ounce of gold per ton (Canadian Mines Handbook, 1980, p. 35).

Dome Mines Limited initiated a large gold exploration program in the Beardmore-Geraldton area. More than 400 claims have been staked and an airborne geophysical survey was completed. Follow-up ground sur-

veys and diamond drilling were done. The company also optioned and drilled Metalore Resources Limited's gold prospect in Elmhirst Township.

New Jersey Zinc Exploration Company Limited is still very active in the Miminiska Lake area where it holds 516 claims. Mineralization consists of gold and stibnite and minor copper values, contained in silicified and carbonized zones near an unconformity between clastic meta-sediments and mafic volcanic rocks.

Longlac Mineral Exploration Limited is currently evaluating the MacLeod-Mosher Gold Mines in the Geraldton area. As of December 1969, when the mines closed, proven and probable ore reserves were 869 873 tons averaging 0.107 ounce of gold per ton (0.09 ounce of gold per ton recovered). At the Hardrock Gold Mine, 664 000 tons of ore remain in various quartz stringer zones that average 0.08 ounce of gold per ton. Tests on the mill tailings revealed that the tailings assayed 0.02 ounce of gold per ton or lower (written communications, C. Pegg).

Belore Mines Limited are reassessing the former Ardeen Mine in Moss Township. Lacana Mining Corporation sampled the mill tailings and dump (personal communication, H. Hauf). Selected grab samples taken from the dump by Resident Geologist's Office staff in 1975 yielded the following results: 0.70 ounce of gold per ton, 5.06 ounces of silver per ton, 0.41 percent copper, 1.23 percent lead and 1.52 percent zinc. One sample of mill tailings ran 0.02 ounce of gold per ton, 0.22 ounce of silver per ton, 0.11 percent copper, 0.10 percent lead. The assays were performed by the Geoscience Laboratories, Ontario Geological Survey.

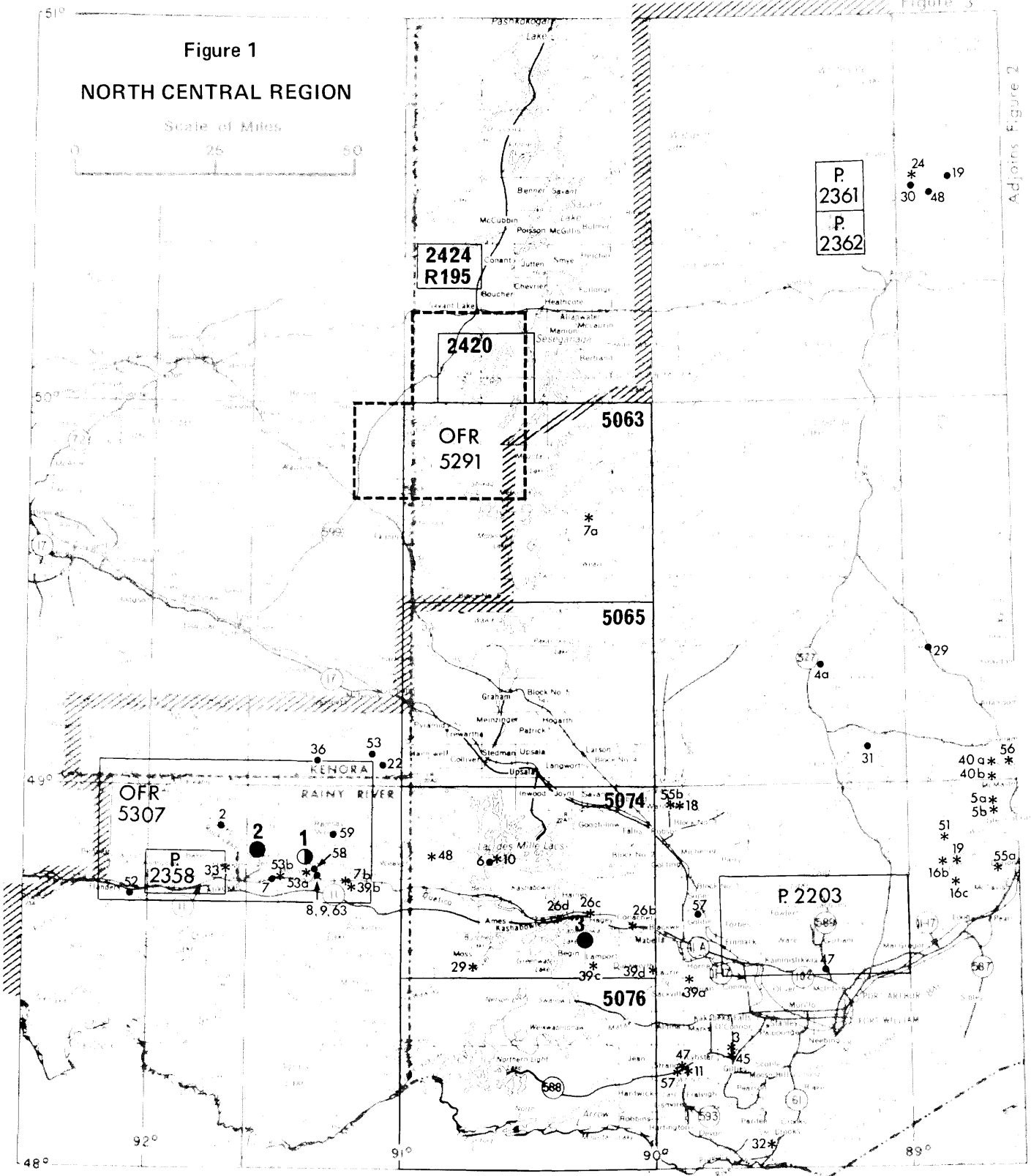
Phoenix Gold Mines Limited is considering reopening the Sturgeon River Gold Mine in Irwin Township to determine if mining is warranted (written communication, O.A. Seeber). Reserves have been quoted at 102 285 tons grading 0.324 ounce of gold per ton over an average width of 2.6 feet (1979 Annual Report, Quebec Sturgeon River Mines Limited).

Roxmark Mines Limited is re-assessing the Magnet Gold Mine, 8 km west-southwest of Geraldton. A program of linecutting, magnetometer, and electromagnetic surveys is scheduled (written communication, M. Malouf).

Lynx Canada Explorations Limited optioned a gold occurrence in the Dawson Road Lots. Samples taken from the occurrence indicated a weighted average of 0.13 ounce of gold per ton over an average width of 8.6 feet along a 270 foot strike length. Two thousand feet of diamond drilling is planned for the property. Lynx Canada Explorations Limited also plan to drill their property at the Tashota-Nipigon Mine (personal communication, M. Watson).

Northern Empire Syndicate constructed a small headframe on the Northern Empire Mine property, east of Beardmore. The company dewatered the shaft to the 300 foot level and remapped and resampled the underground workings. A drill program was in progress in late 1980.

Numerous gold prospects and showings in the Atikokan area are receiving much attention. A need was recognized to provide advice to prospectors on the nature of gold deposits in the area. Therefore, the Thunder Bay



EXPLANATION

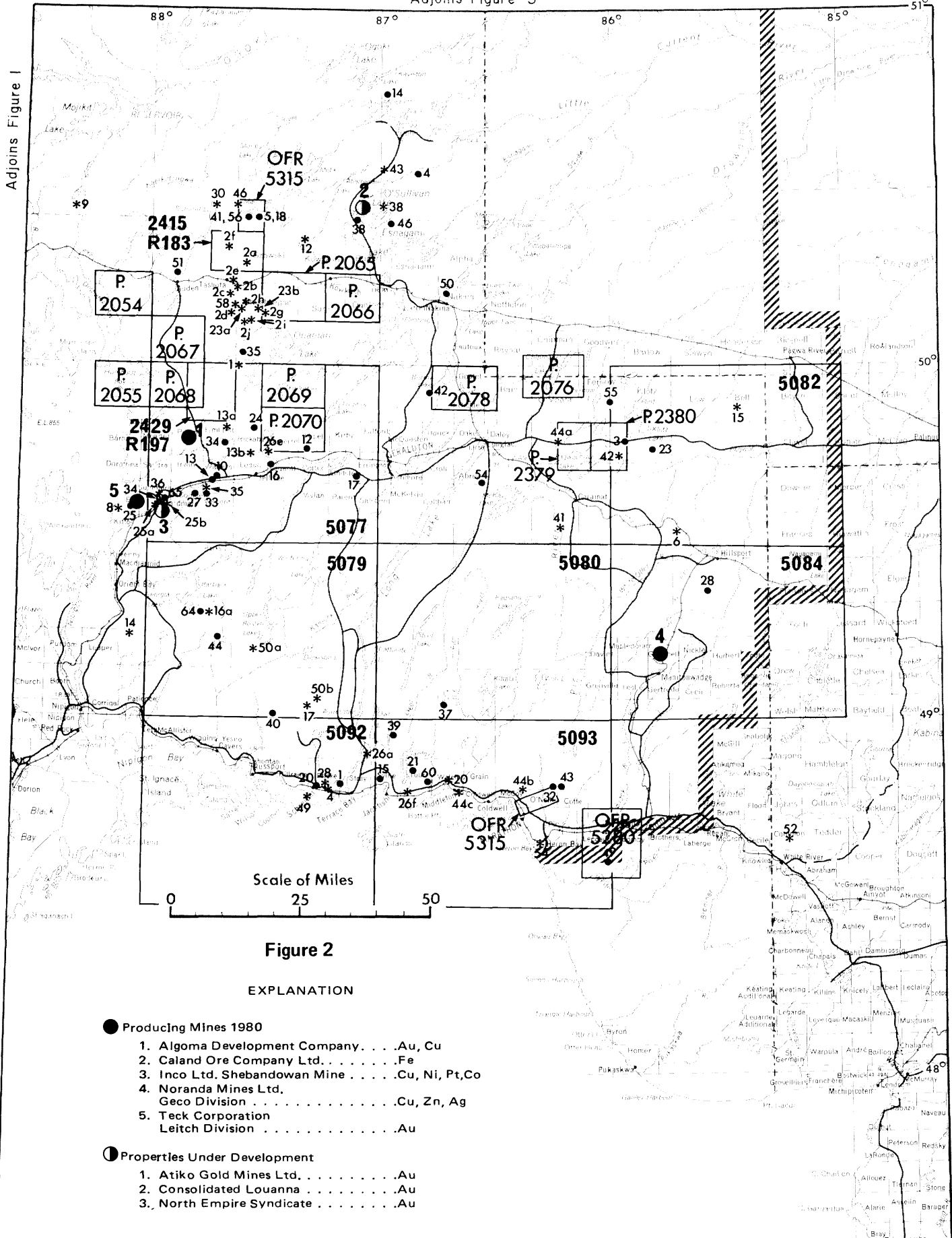


Map issued by the Ontario Geological Survey in 1980 (keyed to Table 3)  
 P Preliminary Map  
 2424 Coloured Geological Map  
 5063 Coloured Noegts Map  
 R195 OGS Report  
 OFR Open File Report



Boundary of North Central Region  
 ● Exploration activity in 1980 (keyed to Table 2)  
 \* Assessment work filed in 1980 (keyed to Table 1)

Adjoins Figure 1



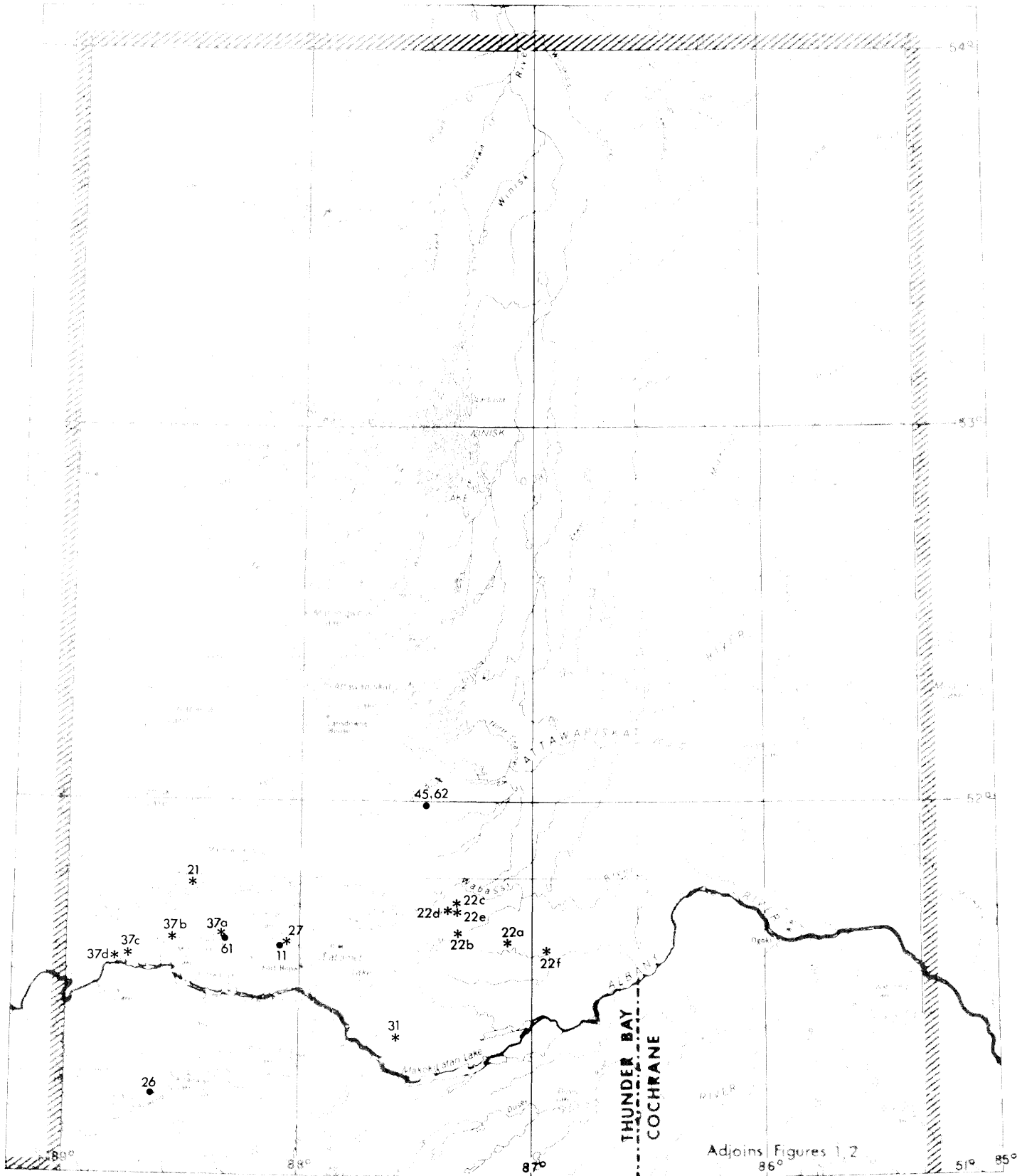




Figure 3

**NORTH CENTRAL REGION**

**EXPLANATION**

- |  |  |
|--|--|
|  Map issued by the Ontario Geological Survey in 1980 (keyed to Table 3) |  Boundary of North Central Region |
| P Preliminary Map  | ● Exploration activity in 1980 (keyed to Table 2)  |
| 2424 Coloured Geological Map   | * Assessment work filed in 1980 (keyed to Table 1)   |
| 5063 Coloured Noegts Map   |  |
| R195 OGS Report  |  |
| OFR Open File Report   |  |

## NORTH CENTRAL

Resident Geologist's office set up a multi-year project, beginning in 1979, and funded by the Ministry of Northern Affairs to assist prospectors working in the area extending from Rainy Lake to the western end of the Shebandowan Lakes. Advice on geology, mineralization, and exploration techniques is given. Also, some analysis is done, and new mineral occurrences are documented.

During the 1980 field season, B.R. Schnieders, the project geologist, made visits to numerous properties, two of which merit mention here. The description is provided by B.R. Schnieders under the heading "Property Examinations".

## Property Examinations

### Teck Corporation – Leitch Division

A reassessment of the old Leitch Gold Mine near Beardmore by Teck Corporation resulted in a waste dump reclamation operation. The following information was provided by R.G. Ohler, Project Superintendent of the operation.

The "waste" rock is dumped onto 6-inch grizzlies. The material less than 6 inches in size is then passed by belt through 3-inch screens. The 3-inch fines are stockpiled as ore; the rejects, together with the grizzly rejects are returned to the dump. While field assays from the 3-inch screened material varied from 0.14 to 0.17 ounce of gold per ton, mill returns for the first 29 000 tons milled averaged 0.235 ounce of gold per ton. Preliminary analyses of culled quartz have been between 2 to 3 ounces of gold per ton.

Of a total of 70 000 tons recovered, 50 000 tons of ore were trucked to Val d'Or, Quebec, and 20 000 tons had been stockpiled at the Leitch site. Hacquoil Construction Limited have the screening contract and used two screening units and four front end loaders. The trucking contractor, Wiles Transport Company Limited of Orillia, used a fleet of 28 to 29 trucks. Due to Ministry of Transportation and Communications regulations, loads were restricted to 40 tons.

The ore was trucked to Virginiatown where it was transferred to Quebec licensed trucks for shipment to Teck's Lamaque mill in Val d'Or. Screening and trucking operations terminated in October and November, respectively. In addition to the dump reclamation project, Teck undertook a comprehensive program to locate and trench the quartz veins on the property. Numerous veins were found, presumed to be surface extensions of veins mined underground. A diamond drilling program was started in late 1980, (personal communication, R. Ohler, Property Manager).

### Elizabeth Prospect

The Elizabeth prospect consists of mining claims TB385606 to TB385609 inclusive, and these claims are

presently held by R. Moffatt and M. Wicheruk of Atikokan. The property is located 2 km north of the northern shore of Modred Lake, approximately 10 km northwest of Atikokan.

Fenwick *et al.* (1980, p. 49) described the property as follows:

Gold was discovered on the property in 1900. By 1902, a 10 stamp mill was constructed; No. 1 shaft had been sunk to 28 m with a level at 24 m and No. 2 shaft was 72 m deep, inclined at 75 degrees east for the first 19.5 m, then vertical, with levels at 19.5 m, 40.8 m, and 70.8 m. This work was done by Anglo-Canadian Gold Estates Limited. Between 1911 and 1914, Elizabeth Gold Mines Limited extensively drifted and crosscut on Number 2 shaft (Resident Geologist's Files, Ministry of Natural Resources, Thunder Bay). In 1935, Elizabeth Gold Syndicate dewatered and re-examined the mine (Moore 1939, p. 24). Limited surface diamond drilling and trenching has occurred on the property up until 1956. Recently, some trenching and geological mapping have been carried out in the vicinity of this occurrence.

Production of gold from the mine in 1912 was 50 tons or ore worth \$400.00 (Moore 1939, p. 24).

Gold mineralization occurs within a series of quartz-carbonate veins associated with the contact between granitic rocks of the Dashwa Lake Batholith and volcanic rocks of the Steep Rock Lake Metavolcanic Belt. The veins generally strike north-northeast, parallel to the contact, dip nearly vertical, and are extremely variable in width and exposed strike length. Visible mineralization includes pyrite, chalcopyrite, and galena.

Many grade and tonnage estimates have been reported on the Elizabeth Mine property. Moore (1939) reported 20 000 tons of ore grading 10 dollars per ton gold had been blocked out in 1903. 1935 assay sheets from the mine indicate gold and silver values as high as 9.38 ounces per ton, and 21.99 ounces per ton respectively (Resident Geologist's Files, Ministry of Natural Resources, Thunder Bay). (See Fenwick's article for the references).

During the 1980 field season, extensive trenching, sampling, prospecting, geological, and minor drilling programs were performed by Fern Elizabeth Gold Exploration Limited with help from the Mineral Exploration Assistance Program.

Two distinct types of quartz veins are present on the property; the first type, a saccharoidal (sugary) white quartz, the second a smokey bluish quartz.

The Contact Vein on which the Number 2 Shaft has been sunk has been referred to as the most important vein on the property. The vein is of the smokey blue quartz variety and strikes at 30 degrees and dips 85 degrees east. The vein has a maximum width of 5 m, an average width of 1 m, and a reported strike length of 274 m. Mineralization includes visible chalcopyrite, pyrite, and gold. Previous records indicate high grade (glory hole) pockets of gold from the vein.

The Number 1 Vein on which the Number 1 Shaft is sunk, is similar to the contact vein, striking 228 degrees and dipping 83 degrees northwest. The vein is similar in texture and mineralogy to the contact vein.

Quartz veins of the sugary variety were also observed on the property, one of which, discovered by M. Wicheruk and B.R. Schnieders, is located approximately 100 m from the Number 2 Shaft. This vein (Bernie-Mitch vein) is as much as 75 cm in width and is in contact with a

major fault plane parallel to the strike of the vein. Exposure of the quartz is poor; however, initial measurements indicated a 250 degree strike and a near vertical dip. Two exposures of quartz vein are separated by several metres of metavolcanic and chlorite-rich host rock. The northern exposure contains visible ankerite, pyrite, chalcopyrite, malachite, galena, and silver. The southern exposure is relatively barren of sulphides; however, spectacular wire and leaf gold is evident from the initial trenching. Analysis of one sample indicated greater than 28 ounces per ton gold and much higher grade samples were observed. The vein strike length is unknown due to overburden coverage. Further trenching and stripping on the exposures will likely produce one single quartz vein. The sugary quartz veins are of a different generation than the sulphide rich smokey blue variety; however, a determination has not been made which variety is primary or secondary enrichment.

Eighteen other veins are reported (Huycke 1943, p. 3), many of which have had little or no development or exploration. Several of these veins were observed and sampled, some containing impressive gold and silver values, and others carried trace values. These veins were not thoroughly sampled. Various selected grab samples were collected. Two samples taken from the Bernie-Mitch vein gave the following results: 0.02 ounce of gold per ton, 3.60 ounces of silver per ton and 28.97 ounces of gold per ton, *nil* silver. The latter sample was taken from the southern exposure of the Bernie-Mitch vein (Assays by Geoscience Laboratories, Ontario Geological Surveys, Toronto).

F.G. Huycke (1943) reported 7.48 percent tungsten from the Contact Vein. Previous Ontario Geological Survey reports on the property include those of Wilkinson (1980, p. 97 to 101; and 1979, p. 208 to 212).

## Atiko Gold Mine

The Atiko Gold Mine, formerly the Sapawe Gold Mine is Located in McCaul Township approximately 16 km east-northeast of Atikokan. The mine has been described by Fenwick *et al.* (1980, page 48):

Gold was originally discovered on the property, around the turn of the century. In 1950, E. Corrigan and D.R. Young diamond drilled 10 holes (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay). In 1960, Lindsay Exploration Limited optioned the property and did extensive exploratory and development work. In 1963 the name was changed to Sapawe Gold Mines Limited, a mill was installed, and production commenced (Riddell 1963, p. 62). Production continued until 1966 when both mining and milling ceased. When this operation terminated, 33 016 tons of ore had been milled for a total production of \$173 420 (Riddell, 1967, p. 51).

The gold-bearing quartz veins of the Atiko Gold Mine are situated in the contact zone between the granitic rocks of the Marmion Lake granitoid to the north and the volcanic rocks of the Sapawe Lake metavolcanic belt to the south. The contact zone contains sheared and brecciated rocks of both types. The mineralized veins appear to be associated with an extensive east-west trending shear zone that dips steeply northwards. Two types of quartz veining appear to be present on the property. One is a milky white quartz, and the other a blue quartz. Gold mineraliza-

tion appears to be associated with the latter veins that varies in width by as much as 1.5 m and in length by as much as 60 m, (Resident Geologist's Files, Ministry of Natural Resources, Thunder Bay).

Many tonnage and grade estimates have been given for this property. The Canadian Mines Handbook (under Sapawe Gold Mines Limited) lists 30 000 tons of 1.0 ounces per ton of gold.

In 1974, this ground was acquired by the Atiko Gold Mines Corporation Limited, an affiliate of Bayard Resources of Montreal. Magnetic and detailed geological surveys were completed on the property, that year. The following year, some of the mine buildings were rebuilt, and 28 additional claims were staked. However, work was discontinued at this point due to financial restraints (Resident Geologist's Files, Ministry of Natural Resources, Thunder Bay). (See Fenwick paper for the references).

During 1979 and 1980 Atiko Gold Mines has been active on the property. Mine rehabilitation includes the hoist, headframe, mine buildings, and roads. A diesel generator has been set up for electrical power; however, rehabilitation of the hydro lines and transformers will likely be under way shortly. Presently, the shaft and underground workings are being dewatered. At the time of publication, the dewatering was completed to a depth of 133 m including the first two mine levels. The entire underground workings should be completely dewatered within several months. Underground exploration and sampling are just commencing.

Plans are also being made to rehabilitate the 100 ton per day mill on the property. Possibilities of custom milling ore from other nearby prospects also exist (personal communication, Eric Pearson, President, Atiko Gold Mine).

## Hamel-Doyon Occurrence

R. Hamel and R. Doyon hold a gold-silver property east of Terrace Bay. The showing occurs on mining claim TB557812, 0.8 km northeast of Highway 17 in the Jackfish Lake area of Syine Township. The property is accessible by means of a good path from the highway. Seven additional claims have been staked.

J.W.R. Walker (1967) indicated the occurrence to be a sulphide showing in mafic metavolcanics. The host rock is chlorite schist mineralized with pyrite. It has been intruded by a narrow erratic quartz vein which is mineralized with chalcopyrite and galena. The vein ranges from 5.0 to 30.0 cm wide by 6.0 m long. It was located by tracing float up a creek bed.

Assay results from two selected grab samples from the Geoscience Laboratories, Ontario Geological Survey, are as follows:

Sample	oz/ton Gold	oz/ton Silver	Percent Lead	Percent Zinc	Percent Copper
1	0.70	2.92	8.2	1.57	2.14
2	0.56	3.02	15.5	0.9	4.25

A sample taken from the vicinity of a gold showing marked on Walker's map 0.6 km east of the sulphide showing, was submitted for assay, but analyses have not been completed to date.

## Northern Concentrators—Custom Mill

The Northern Concentrators custom mill, owned by Sol Cowan of Thunder Bay and Ben Cowan of Montreal, has been set up near Abitibi-Price's Provincial Paper mill in Thunder Bay. The mill is capable of handling one ton of ore per hour, operating 8 to 10 hours a day. B. Cowan has stated that the mill cost \$300 000 and was constructed of used equipment that had to be rebuilt in order to obtain a copper concentrate.

Feed for the mill is 130 tons of ore from Sol Cowan's Algoma Development mine in Pifher Township. This feed grades between 2 to 3 ounces per ton gold. When this feed has been processed, the mill will be shut down for the winter, but March 1981 is a tentative re-opening date. The ore is concentrated approximately ten times. The recovered copper-gold-silver concentrate runs 10 to 15 percent copper, 16 to 18 ounces per ton gold and 8 ounces per ton silver (S. Cowan, personal communication). It is stored in 45 gallon drums, each grossing 1 000 pounds. The concentrate will be sent to the Temiscaming Laboratory for an umpire assay and then probably will be sent to Noranda's smelter for further processing.

The mill will be available for custom milling in the spring of 1981 to process ore grading 1 ounce per ton gold or higher. The custom milling charge will be a percentage of the concentrate. This method should eliminate such problems as variations in ore grade estimations between the ore owner and mill operator; the up front money from the prospector, who probably does not have the advance, and accusations that the mill gets poor recovery.

The Cowans have two other gold properties, the Empress Mine east of Terrace Bay and an occurrence at Watson Lake in Irwin Township from which they plan to extract ore to feed the mill.

## Acker Occurrence

The Acker gold-silver occurrence, on claim TB465332, is the former Gold Range Mine which was worked from 1934 to 1941. It is located 3 km east of Schreiber and just north of Highway 17. In the mid 1930s, three adits were driven into the side of a northeast-trending ridge composed of mafic metavolcanics, felsic and mafic intrusive rocks. In all, seven quartz veins were noted on the property. Channel samples taken by Sylvanite Gold Mines Limited in 1939 in the Number 3 adit from the Number 2 vein indicated 0.494 ounce of gold per ton across 27.7 cm for a 7.6 m vein length or 0.313 ounce gold per ton across 50.3 cm for 7.6 m vein length. A 7.62 m shaft was sunk on the Number 7 vein and the vein was reported to widen from 5 cm at the collar to 1.5 m at the bottom. It assayed 0.343 ounce of gold per ton across this 1.5 m. In 1941, approximately 39 tons of ore from this property were milled at the Magnet Consolidated Mines Limited's custom mill near Geraldton and produced 17.35 ounces of gold (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay).

The Resident Geologist's staff visited this property in 1980 and sampled the Number 2 vein at the entrance to

the Number 1 adit. The quartz vein varied from 0.3 to 0.46 m in width and was mineralized with large pyrite cubes and minor galena. Three grab samples of the quartz assayed 8.66, 5.02, and 25.82 ounces of gold per ton and 2.11, 2.53, and 11.13 ounces of silver per ton. A grab sample of a thin gossan zone on the hanging wall of the vein assayed 15.80 ounces of gold per ton and 7.48 ounces of silver per ton (Assays by Geoscience Laboratories, Ontario Geological Survey). This adit is located at the southwest corner of claim TB465332. Samples of the quartz were slabbed and native gold was noted in the pyrite cubes. There is no record of drilling on this property.

The vein appears to trend into the old Harkness-Hays Mine property (TB3327 & 3354). Channel samples taken by Sylvanite Gold Mines Limited in 1939 from a vein on this property indicated 0.655 ounce of gold per ton across 17.8 cm for 33.2 m of vein length or 0.458 ounce of gold per ton across 25.4 cm for 33.2 m of vein length (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay).

## Thunderbrick Limited

Thunderbrick Limited at Rosslyn Village, 13 km west of Thunder Bay, is in the process of adding potassium feldspar, as a raw material, to its split-tile manufacturing process. The feldspar would be used as an additive to shale and recycle tiles, to extend the firing range of the tiles and to act as a bonding agent for the other two components. A \$150 000 changeover, including installation of a new crusher, is underway at Thunderbrick to accommodate the addition of feldspar (Knut-Bucker Flurenbrock Jr., personal communications).

A large pegmatite dike outcropping between mile-age 23 and 24 on Highway 527, approximately 50 km north of Thunder Bay, has been staked by the company.

The dike is estimated to contain 2 000 tonnes of feldspar. Four tonnes of feldspar per day (roughly 10 percent of the total raw material used in the split-tile process) will be needed at the plant.

The mining method employed would be to blast and use a backhoe with a pick attached to remove the feldspar from the pegmatite body and to eliminate the quartz and biotite.

The current source of plant raw material is a pit in Rove Formation shale located west of Highway 587, northwest of Pass Lake, and approximately 45 km north-east of Thunder Bay. The rock is a black fissile shale overlain by a thin cover of overburden. The operator of the front end loader removes the overburden, rips up the top weathered part of the shale until solid material is reached, and then piles the shale in large mounds. After several months of rain or more preferably, a winter of snow and freeze-thaw action, much of the calcium and sulphur in the shale will be washed out making the shale suitable for tiles. Estimated annual tonnage to be removed from the property is 30 000 to 40 000 tonnes per year. Cost for Thunderbrick to load and transport shale to their plant is \$5 to \$6 per tonne (Knut-Bucker Flurenbrock Jr., personal communication).



## Drilling in the Sibley Group Rocks

The Sibley Group has been receiving attention from several companies because of the uranium potential. Diamond drilling by Asarco Exploration Company of Canada Limited (two holes) and Uranerz Exploration and Mining Limited (three holes) provided additional information on the stratigraphy of the Sibley Group, in particular the RosSPORT Formation. J.M. Franklin *et al.*, (1980), proposed a thickness of 135 for the RosSPORT Formation. The deepest hole by Uranerz Exploration on the east side of Eagle Mountain in Cockeram Township indicated a thickness of more than 305 m of RosSPORT Formation. Drilling terminated in the RosSPORT Formation sandstone. This drill hole indicates a maximum thickness of more than twice the previous estimate. The other two holes by Uranerz Exploration were also put down on the east side of Eagle Mountain and both of these bottomed in RosSPORT Formation.

The two holes drilled by Asarco Exploration Company were put down in McMaster Township, east of the south end of Wolfpup Lake, both bottomed in the underlying granitoid basement and indicated a thickness of 158 and 162 m respectively for the RosSPORT Formation; these figures are also in excess of that indicated by Franklin *et al.*, (1980).

The lithologies encountered in the holes were similar to those described by Franklin *et al.*, (1980). The central chert-carbonate unit was recognized in just two of the holes indicating that it may not be as continuous as once suggested. The remaining lithologies comprise mainly red mudstone with numerous buff coloured zones of reduction; these zones occur as blotches or as spheres. Intraformational breccias occur locally. Red and buff coloured sandstones are common, especially near the base of the section.

## Recommendations for Exploration

In spite of the higher prices for silver, the exploration for this metal has lagged behind the exploration for gold. The Thunder Bay Region has had a colourful history of silver mining, and since the demise of the silver market in the early 1920s, relatively few exploration initiatives have been undertaken in the region for this commodity. It is suggested that the silver area around Thunder Bay be re-examined in light of higher prices for the commodity and available new exploration technology. Two interesting published reserves of silver in the area are: the Silver Islet Mine, 1 050 000 ounce minimum (The Northern Miner, October 18 1979, p. B28), at which one drill hole, S-3 drilled by Q.C. Exploration Limited, intersected 8.6 feet grading 18.6 ounces of silver per ton and 10.1 feet grading 108.1 ounces of silver per ton (The Northern Miner, February 10 1977, p. 3); and the Silver Mountain Mine,

with 60 000 tons grading 5.0 ounces of silver per ton, 12 percent fluorspar (Annis *et al.*, 1978).

Because of renewed drilling for oil and gas, there has been a growing demand for barite, the major component in drilling muds. The current price for the drilling mud is around \$122 per ton. The price for high quality point grade barite is \$290 per ton (Industrial Minerals, November 1980, p. 71). Barite is found in most veins of the silver type and of lead-zinc type in the Thunder Bay area. The most promising barite occurrences in the Thunder Bay Region are the McKellar Island occurrence, currently held by Extender Minerals, and Spar Island, Jarvis Island, and perhaps the Dorion lead-zinc mine structure in Dorion Township. Additional exploration might result in further barite discoveries. Prospectors should be aware of a paper by Franklin and Mitchell, 1977, entitled "Lead-Zinc-Barite Veins of the Dorion Area, Thunder Bay District, Ontario". This report is available at the Regional Geologist's Office.

The area between Schreiber and Marathon is receiving much exploration activity this year and certainly will continue to do so in the future. Mineral exploration in the area should concentrate on gold and base metals. The immediate Schreiber-Terrace Bay area should be investigated for gold, copper, and molybdenum. Most major known gold occurrences and past producing properties appear to be peripheral to the Terrace Bay Batholith (Hopkins 1921, p. 7) a large elongate mass of granite-syenite 34 km long and 11 km wide. This intrusion is also host to numerous quartz veins containing copper, molybdenum, gold, and silver (Carter 1980, p. 43-36; Hopkins 1921, p. 7; Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay).

The sulphide iron formations as mapped by J.W.R. Walker (1967), in the Jackfish-Middleton area, should be investigated for base metals. A recent government geochemical survey, (OGS-GSC 1978; *the reader should consult MP77 and supplement for reference*) has indicated major cobalt anomalies over at least three of these iron formations. A significant regional zinc anomaly exists south of Santoy and Owl Lakes.

The Beardmore-Geraldton Metavolcanic Belt in LeGault, Colter, and Lindsley Townships and surrounding area should be prospected for gold. The apparent paucity of gold mineralization in this area may be a function of lack of prospecting and/or outcrop. Efforts should be directed towards gold exploration in this area.

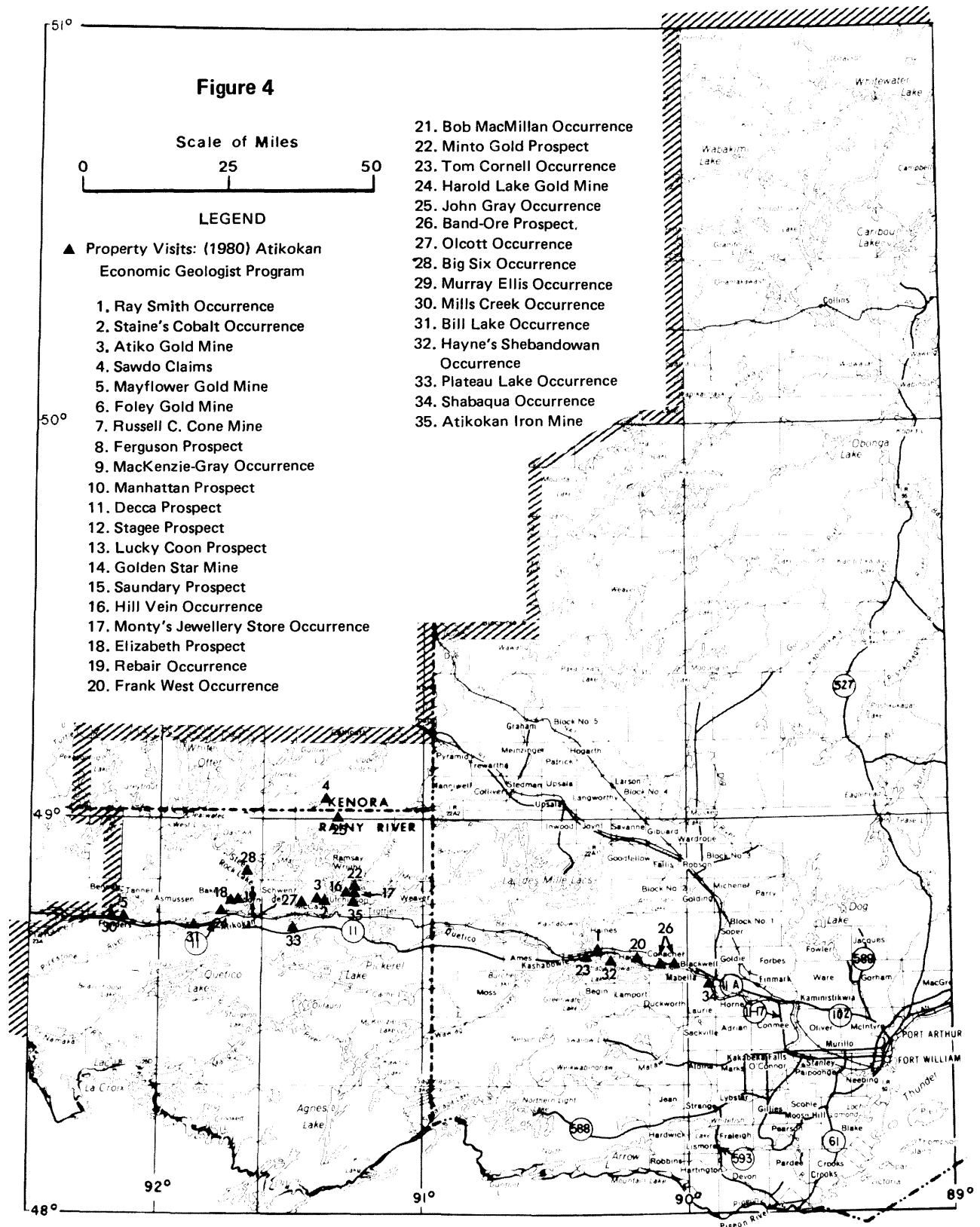
## Recommendations for Exploration in the Atikokan Area

The following recommendations are suggested by B.R. Schnieders, as a result of his work in the Atikokan area.

### a) Gold Exploration

The 1980 world market prices for gold have helped to maintain a high level of exploration in the Atikokan area. The Mineral Exploration Assistance Program and Ontario Mineral Exploration Program have provided incentives for prospecting and exploration.

NORTH CENTRAL



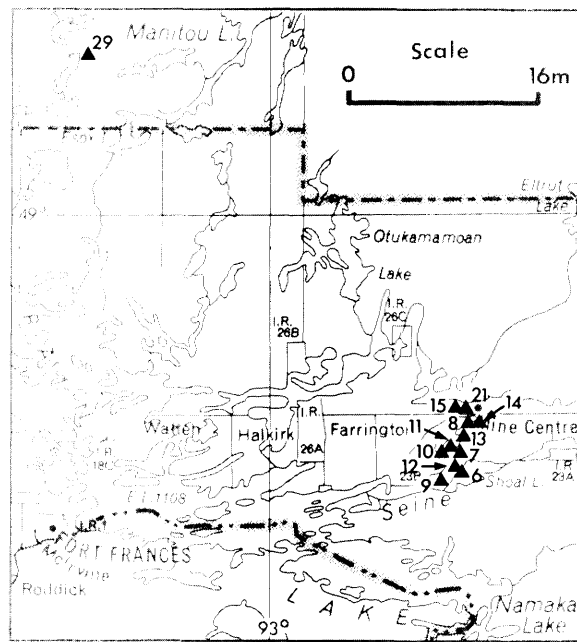


Figure 4a

## NORTH CENTRAL

Gold potential in the Atikokan area has been considered high since the late 1800s and over 100 occurrences, prospects, and past producers have been documented from the Mine Centre area east to Shebandowan Lake.

During 1980 several new encouraging visible gold occurrences were discovered through prospecting and exploration. The importance of prospecting in favourable geological environments cannot be over-emphasized.

The granitic-metavolcanic contact zones constitute one primary geological environment for gold exploration in the Atikokan area. Quartz and quartz-carbonate veins occupy faults and ductile shear zones in intrusive granitic rocks, metavolcanics, or both rock types.

Suggested theories indicate that the intrusion of granite plutons created sufficient heat sources and fluids to "bake" the gold from the surrounding metavolcanic host rocks, (Fenwick *et al.* 1980, p. 53). The contact zones are not sharp and may vary up to several kilometres in width, and contain localized shear zones and fault systems.

Sodium-rich granitoids (trondhjemite) such as the Marmion Lake Batholith are commonly associated with the gold bearing veins in the Atikokan area. Accessory minerals present with these contact veins include arsenite, pyrite, chlorite, chalcopyrite, sphalerite, scheelite, galena, sericite, tourmaline, and green mica (Wilkinson 1979, p. 210).

**TABLE 3** | MAPS AND REPORTS PERTAINING TO THE NORTH CENTRAL REGION ISSUED IN 1980 BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES.

<u>Ontario Geological Survey Reports</u>	<u>Coloured Maps</u>	
GR 195	2420	
GR 197	2424	
	2429	
<u>Open File Reports</u>	<u>Northern Ontario Engineering Geology Terrain Studies</u>	
OFR 675-676		
OFR 5280	(Map)	(Report)
OFR 5291		
OFR 5293	5063	NOEGTS 24
OFR 5299	5065	NOEGTS 40
OFR 5302	5074	NOEGTS 56
OFR 5304	5076	NOEGTS 70
OFR 5306	5077	NOEGTS 27
OFR 5307	5079	NOEGTS 43
OFR 5315	5080	NOEGTS 44
	5082	NOEGTS 29
	5084	NOEGTS 45
	5092	NOEGTS 59
	5093	NOEGTS 60
<u>Preliminary Maps</u>	<u>Mineral Resources Branch Publications</u>	
P. 2054	MPBP10	
P. 2055		
P. 2065		
P. 2066		
P. 2067		
P. 2068		
P. 2069		
P. 2070		
P. 2076		
P. 2078	MPBP11	
P. 2203		
P. 2358		
P. 2361		
P. 2362		
P. 2379		
P. 2380		
	<u>Geological Survey of Canada Open Files</u>	
	706	

The major shear zones constitute another primary exploration target genetically associated with northeast-trending faults. These shear zones are commonly occupied by quartz ( $\pm$  carbonate) veins and occur in both the Marmion Lake Batholith rocks (e.g. Hammond Reef Property) and in the metavolcanic belts (e.g. Olcott Occurrence). Common accessory minerals include ankerite, chlorite, pyrite, and chalcopyrite with minor arsenopyrite, sphalerite, galena, and scheelite, (Wilkinson 1979, p. 210).

Other primary exploration targets are the stratigraphically banded quartz (chert) and carbonate lenses in sulphide-rich metavolcanics. Occurrences of this type have been observed in the Lumby Lake and Flanders areas and described by Wilkinson (1979, p. 211).

Vein mineralization in the Mine Centre area has been described by K.H. Poulsen (1980, p. 167). Northeast-striking shear zones and quartz veins hosted by granitic rocks of the Bad Vermillion Intrusion are the main gold exploration targets in the area. The intrusion is fault bounded by the Quetico and Seine River faults.

Other areas to be considered for exploration targets include: contact zones of the Canoe Lake Intrusion located northeast of Shoal Lake, and the Bad Vermillion Intrusion parallel to the northwest shore of Bad Vermillion Lake. These intrusions and their contact with the adjacent metavolcanics should be fully explored.

The major shear zones and structural lineaments throughout all rock units should be thoroughly examined along with the major east-trending granitic-metavolcanic contact zone with which the Olive Gold Mine and Saundary Prospect are associated.

Many of the gold properties discovered in the late 1800s and early 1900s have remained dormant for several decades. Exploration in the Atikokan area should include re-examination of these properties as well as detailed prospecting and exploration in favourable adjacent environments. Stripping and trenching in order to get a two dimensional understanding of the mineralized vein is required. Drilling can often tend to be misleading because of the erratic nature of the deposits.

Various simplified models have been suggested as gold exploration targets; however, one must remember the age old adage, "gold is where you find it".

#### b) Base Metal Exploration

Base metal potential in the Atikokan area must also be noted, because the Atikokan iron formation contains encouraging amounts of copper, zinc, nickel, iron, and cobalt.

Base-metal occurrences in the Lumby Lake, Finlayson Lake, and Mine Centre areas are documented, and these metavolcanic belts should be further explored. The mafic and ultramafic plutons containing base and precious metals are good exploration targets; examples of these include the Plateau Lake and Kawene Lake intrusions.

For further recommendations on the Mine Centre area, refer to this publication (R. Beard, Northwestern Region).

## Ontario Geological Survey's Activities

M.W. Carter completed the second year of a three year mapping project in the Schreiber-Terrace Bay area.

F.W. Breaks continued to examine felsic plutonic and metamorphic rocks within the English River and Quetico Belts to determine their importance as mineralized environments.

S.L. Fumerton carried out detailed mapping of the Calm Lake area, west of Atikokan.

R.H. Sutcliffe continued detail mapping of the Caribou Lake Greenstone Belt, north of Armstrong.

The Atikokan Project, under the direction of B. Schnieders continued to stimulate mineral exploration in the Atikokan area.

J.K. Mason initiated a study of sources of lime in the North Central Region.

The latter two projects are funded by the Ontario Ministry of Northern Affairs.

## Selected References

- Annis, R.C., Cranstone, D.A., and Vallee, M.  
1978: A Survey of Known Mineral Deposits in Canada that are Not Being Mined; Energy, Mines, and Resources Canada, Mineral Bulletin MR 181, 92 p.
- Beard, R.C., and Garatt, G.L.  
1976: Gold Deposits of the Kenora-Fort Frances Area. Districts of Kenora and Rainy River; Ontario Division of Mines, Mineral Deposit Circular 16, 46 p. Accompanied by Chart A, scale 1:253 440 or 1 inch to 4 miles.
- Bow, J.A.  
1899: Mines of Northwestern Ontario; Ontario Bureau of Mines, Volume 8, Part 1, p. 91.  
1900: Mines of Northwestern Ontario; Ontario Bureau of Mines, Volume 9, p. 35-88.
- Brummer, J.J.  
1980: Agate Collecting Around Lake Superior; Lapidary Journal, February/1980, p. 2368-2379.
- Carter, M.W.  
1980: Terrace Bay Area, District of Thunder Bay; p. 42-46 in Summary of Field Work, 1980, by the Ontario Geological Survey, Edited by V.G. Milne, O.L. White, R.B. Barlow, J.A. Robertson, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 96, 201 p.
- Duke, J.M. and Naidrett, A.J.  
1980: Platinum Metals in Magmatic Sulfide Ores; Science, Volume 208, No. 4451, p. 1417-1424.
- Dunning, G. and Watkinson, D.H.  
1979: Geology and Platinum-Group Mineralization, Lac Des-Iles Complex, Northwestern Ontario; Canadian Mineralogist, Volume 17, p. 453-462.
- Farmer, R.D.  
1980: Structure and Stratigraphy of an Archean Succession, Gorham Township, Thunder Bay, Ontario; Unpublished Honours B.Sc. Thesis, 72 p., Lakehead University, Thunder Bay, Ontario.

## NORTH CENTRAL

- Fenwick, K.G. and Scott, J.F.  
1977: 1976 Report of the North Central Regional Geologist; p. 42-56 in Annual Report of the Regional and Resident Geologists, 1976, Edited by C.R. Kustra, Ontario Geological Survey, Miscellaneous Paper 71, 142 p.
- Fenwick, K.G., Larson, C.R., Scott, J.F., Mason M.K., and Schnieiders, B.  
1980: 1979 Report of North Central Regional Geologist; p. 38-61 in Annual Report of the Regional and Resident Geologists, 1979, Edited by C.R. Kustra, Ontario Geological Survey, Miscellaneous Paper 91, 143 p.
- Ferguson, S.A., Groen, H.A., and Haynes, R.  
1971: Gold Deposits of Ontario: Ontario Department of Mines and Northern Affairs, Mineral Resources Circular 13, Part 1, 315 p.
- Franklin, J.M., McIlwaine, W.H., Poulsen, K.H., and Wanless, R.K.  
1980: Stratigraphy and Depositional Setting of the Sibley Group, Thunder Bay District, Ontario, Canada; Canadian Journal of Earth Sciences, Volume 17, Number 5, p. 633-651.
- Fumerton, S.L.  
1980: Geology of the Righteye Lake Area, District of Rainy River; Ontario Geological Survey, Open File Report 5299, 82 p. Accompanied by Preliminary Map P.2358, scale 1:15 840 or 1 inch to ¼ mile.
- Grabowski, G.P.B.  
1975: The Geology and Geochemistry of the Atikokan Iron Mine; Unpublished Honours B.Sc. Thesis, 83 p., Lakehead University, Thunder Bay, Ontario.
- Halls, H.C.  
1979: The Slate Islands Meteorite Impact Site: a Study of Shock Remnant Magnetization; Geophys. J.R. astr. Soc., Volume 59, p. 553-591.
- Hopkins, P.E.  
1921: Schreiber-Duck Lake Area: Ontario Department of Mines, Volume 30, Part 4, p. 1-26. Accompanied by Map 30a, scale 1 inch to 2 miles.
- Huycke, F.G.  
1943: Report on the Elizabeth Gold Mines Limited; 9 p. in Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay.
- Jargo, B.C.  
1980: Geology of a Portion of the Western Contact Margin: The Coldwell Complex; Unpublished Honours B.Sc. Thesis, 98 p., Lakehead University, Thunder Bay, Ontario.
- Kennedy, M.C.  
1980: Metamorphism and Structure Across the Quetico Structural Subprovince, Raith, Ontario; Unpublished Honour B.Sc. Thesis, 101 p., Lakehead University, Thunder Bay, Ontario.
- Lucko, W. M.  
1980: The Pegmatites of the Quetico Gneiss Belt, Northwestern Ontario, and their Uranium Potential; Unpublished Honours B.Sc., Thesis, 49 p., Lakehead University, Thunder Bay, Ontario.
- Maunula, T.L.  
1979: Geology and Mineralogy of the Little Pig Vein, Mainland Belt Silver Region, Thunder Bay District; Unpublished Honours B.Sc., Thesis, 48 p., Lakehead University, Thunder Bay, Ontario.
- McGill, M.K.  
1980: The Coldwell Complex Western Margin-Petrology and Intrusive Relationships; Unpublished Honours B.Sc. Thesis, 98 p., Lakehead University, Thunder Bay, Ontario.
- Moore, E.S.  
1939: Geology and Ore Deposits of the Atikokan Area; Ontario Department of Mines Annual Report, Volume 48, Part 2, p. 1-34.
- Morin, J.A.  
1973: Geology of the Lower Shebandowan Lake Area, District of Thunder Bay; Ontario Division of Mines, Geological Report 110, 45 p. Accompanied by Map 2267, scale 1:31 680 or 1 inch to ½ mile.
- Morton, P.  
1980: Differentiating Ultramafic Flows from Sills in the Shebandowan Mine Area, Northwestern Ontario, Canada; Proceedings and Abstracts, 26th Annual Institute on Lake Superior Geology, University of Wisconsin, May 6-10/1980.
- Parker, J.R.  
1980: The Structure and Environment of Deposition of the Finmark Metasediments, Thunder Bay, Ontario; Unpublished Honours B.Sc. Thesis, 90 p., Lakehead University, Thunder Bay, Ontario.
- Pesonen, L.J.  
1980: Paleomagnetism of Late Precambrian Keweenaw Igneous and Baked Contact Rocks from Thunder Bay District, Northern Lake Superior; Bulletin Geological Society of Finland, Volume 51, p. 27-44.
- Poulsen, K.H.  
1980: The Geological Setting of Mineralization in the Mine Centre-Fort Frances Area, District of Rainy River; p. 162-168 in Summary of Field Work, 1980, by the Ontario Geological Survey, Edited by V.G. Milne, O.L. White, R.B. Barlow, J.A. Robertson, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 96, 201 p.  
1980: The Stratigraphy, Structure, and Metamorphism of Archean Rocks at Rainy Lake, Ontario; Unpublished M.Sc. Thesis, 99 p., Lakehead University, Thunder Bay, Ontario.
- Rogers, J.A.  
1979: The Southeastern Margin of the Mackenzie Granite Northwestern Ontario; Unpublished Honours B.Sc. Thesis, 68 p., Lakehead University, Thunder Bay.
- Sage, R.P.  
1980: Diatremes and Shock Features in Precambrian Rocks of the Slate Islands, Northeastern Lake Superior: Reply; Geological Society of America Bulletin, Volume 91, Part I, p. 315-316.
- Sharpe, R.J.  
1979: A Petrological Study of Some Archean Metamorphic Rocks from the Miminiska Lake Area, Northwestern Ontario; Unpublished M.Sc. Thesis, 282 p., University of Toronto, Toronto, Ontario.
- Shegelski, R.J.  
1980: Stratigraphy of the Gunflint Formation, Current River Area, Thunder Bay; Proceedings and Abstracts, 26th Annual Institute on Lake Superior Geology, University of Wisconsin, May 6-10, 1980.

Walker, J.W.R.

1967: Geology of the Jackfish-Middleton Area, District of Thunder Bay; Ontario Department of Mines Geological Report 50, 37 p. Accompanied by Maps 2107 and 2112, scale 1:31 680 or 1 inch to ½ mile.

Wilkinson, S.J.

1979: Gold Mineralization of the Atikokan Area; p. 208-212 *in* summary of Field Work, 1979, by the Ontario Geological Survey, Edited by V.G. Milne, O.L. White, R.B. Barlow, and C.R. Kustra, Ontario Geological Survey, Miscellaneous Paper 90, 245 p.

1980: Gold Deposits of the Atikokan Area, Rainy River and Kenora Districts; Ontario Geological Survey, Open File Report 5307, 125 p.

# 1980 Report of the Timmins Resident Geologist

L. E. Luhta<sup>1</sup> and P. J. Sangster<sup>2</sup>

## Contents

Resident and Resource Geologists Activities .....	68
Claim Staking Activity .....	68
Exploratory Licenses of Occupation .....	68
Exploration Activity .....	69
Base Metals Exploration .....	70
Precious Metal Exploration .....	83
Other Activities .....	83
Ontario Geological Survey Activities .....	84
Ontario Geoscience Research Grants Program .....	84
Operating Mines .....	84
Base Metals .....	84
Precious Metals .....	84
Industrial Minerals .....	85

## Tables

1 – Maps and reports pertaining to the Porcupine Mining Division issued by the Ontario Geological Survey, Ministry of Natural Resources, January to November, 1980 .....	69
2 – Exploration Activity in 1980 .....	70
3 – Additions to Regional Diamond-drill core library, January to November 1980 .....	70
4 – Assessment work and other information received in 1980 for the period 1, 1979 to November 30, 1980, Porcupine Mining Division .....	71

## Figures

1, 2, 3, 4 – Timmins Resident Geologist's District ...	78, 79, 80, 81
5 – Timmins Area .....	82

## Resident and Resource Geologists' Activities

Present staff at the Timmins office include: W. O. Mackasey, Mineral Resources Coordinator, L. E. Luhta, Resident Geologist, P. Sangster, Resource Geologist, and K. Burke, Secretary. In addition, during the past year D. Maharaj and E. Carey were employed on contract to produce data series maps. B. MacRae was also employed under contract to assist in producing these maps and other projects. E. Frey was under contract for a brief period to produce geology reports for District Land Use Plans.

<sup>1</sup>Resident Geologist, Timmins.

<sup>2</sup>Resource Geologist, Timmins.

Owing to the large amount of mining and exploration activity in the area, emphasis was placed on examining properties currently under exploration and on visiting producing and developing mines. Also, because of the activity in the area, staff were largely involved in consultative duties. Other activities included conducting and attending geological field trips, participating in geological discussion group sessions, and providing geological input to lake plans, municipal, and other land-use plans.

At present, a temporary core storage facility is being constructed at the Timmins District office since the space at the Resident Geologist's office is full. The core retrieval program will be actively resumed after this additional space is available.

## Claim Staking Activity

At the time of writing (December 29, 1980) over 10 500 claims have been staked in the Porcupine Mining Division in 1980. This year has had the highest staking activity since the "staking rush" of 1964. The most active stakers in the Porcupine Mining Division were Selco Mining Corporation Limited (Byrnes Lake, Dent Lake, Ridge Lake, Crawford Lake, Squirrel River, and Pivabiska River areas), Canadian Gold and Metals Limited (Chester, Benneweis, Yeo, and Osway Townships), Believers Syndicate Limited (Denton, Bristol, Whitesides, and Carscallen Townships) and Maurice Hibbard (Detour Lake area).

In total there are over 18 500 active claims in the Division, or over 740 000 acres of land, presently being explored. This does not include the areas granted by exploratory licences of occupation or the numerous patented claims being worked on.

## Exploratory Licenses of Occupation

The Cretaceous Basin has received much attention during 1980. A number of companies have applied for exploration licences of occupation for various areas within the Basin. At the time of this writing, Selco Mining Corporation Limited had been granted 243 000 acres, and a five year term, in an area between the Mattagami River and the Abitibi River just north of Otter Rapids. Hudbay Mining Limited is in their second year of a three-year term



for an area of 102 025 acres in the townships of Bourassa, Maund, McAlpine, Mewhinney, and Tolmie, and areas to the east. Exploratory licenses are pending for Ontario Energy Corporation, Lignasco Resources Limited, and 452829 Ontario Incorporated which would involve a total of 1 102 680 acres.

## Exploration Activity

Emphasis during 1980 was placed on the exploration for gold deposits in the Timmins area. Although base metal exploration activity increased over the previous years it was overshadowed by individuals and companies searching for gold.

## Base Metals Exploration

Some of the more significant base-metal exploration projects in the Timmins area in 1980 are as follows:

Gulf Minerals Canada Limited carried out an extensive diamond-drilling program as a follow-up to their overburden drilling program in Reid and Loveland Townships (Assessment Files, Timmins; personal communication Gulf Minerals). Hudson Bay Exploration and Development Company Limited diamond-drilled in both Duff and Evelyn Townships (Hudson Bay Exploration and Development Company Limited staff, personal communication). Rosario Resources Canada Limited and Utah Mines Limited under a joint venture agreement drilled in Reid and Mahaffy Townships (Assessment Files, Timmins). Shell Canada Resources Limited carried out a

**TABLE 1** MAPS AND REPORTS PERTAINING TO THE PORCUPINE MINING DIVISION ISSUED BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES, JANUARY TO NOVEMBER, 1980.

### Northern Ontario Engineering Geology Terrain Studies

NOEGTS 29 – Taradale Area  
 NOEGTS 45 – Obakamiga Lake Area  
 NOEGTS 46 – Hornepayne Area  
 NOEGTS 80 – Chapleau Area  
 NOEGTS 81 – Ridout Area  
 NOEGTS 82 – Gogama Area  
 NOEGTS 87 – Biscotasing Area  
 NOEGTS 88 – Westree Area

### Open File Reports

O.F.R. 5281 – Geology of the Timmins Area  
 O.F.R. 5290 – Geology of the Watabeag Lake Area  
 O.F.R. 5309 – Geology of the Rotunda Lake-Percy Lake Area  
 O.F.R. 5310 – Talc, Magnesite and Asbestos Deposits in the Kirkland Lake – Timmins Area.

### Coloured Geological Maps

Map 5014 – NOETS Data Base Map – Chaplain Area  
 Map 5015 – NOETS Data Base Map – Ridout Area  
 Map 5017 – NOETS Data Base Map – Biscotasing Area  
 Map 5018 – NOETS Engineering Capability Map – Chapleau Area  
 Map 5019 – NOETS Data Base Map – Gogama Area  
 Map 5022 – NOETS Data Base Map – Westree Area  
 Map 5082 – NOEGTS Data Base Map – Taradale Area  
 Map 5084 – NOEGTS Data Base Map – Obakamiga Lake Area  
 Map 5085 – NOEGTS Data Base Map – Hornepayne Area

### Preliminary Maps (Timmins Data Series = TDS)

P. 478 – TDS – Wark Twp.  
 P. 486 – TDS – Kidd Twp.  
 P. 699 – TDS – Tully Twp.  
 P. 700 – TDS – Reid Twp.  
 P. 704 – TDS – Carnegie Twp.

P. 728 – TDS – Duff Twp.  
 P. 729 – TDS – Gowan Twp.  
 P. 730 – TDS – Macdiarmid Twp.  
 P. 739 – TDS – Geary Twp.  
 P. 740 – TDS – Mahaffy Twp.  
 P. 755 – TDS – Mann Twp.  
 P. 767 – TDS – Reaume Twp.  
 P. 839 – TDS – Loveland Twp.  
 P. 2029 – TDS – Dundonald Twp.  
 P. 2057 – TDS – Evelyn Twp.  
 P. 2071 – TDS – Macklem Twp.  
 P. 2072 – TDS – Bond Twp.  
 P. 2073 – TDS – Thomas Twp.  
 P. 2074 – TDS – Sheraton Twp.  
 P. 2088 – TDS – Hoyle Twp.  
 P. 2089 – TDS – Matheson Twp.  
 P. 2090 – TDS – Cody Twp.  
 P. 2091 – TDS – Shaw Twp.  
 P. 2092 – TDS – Carman Twp.  
 P. 2113 – TDS – Adams Twp.  
 P. 2114 – TDS – Eldorado Twp.  
 P. 2221 – Shenango Twp. Alkalic Rock Complex  
 P. 2295 – TDS – Lower Detour Lake Area  
 P. 2306 – TDS – Calvert Twp.  
 P. 2307 – TDS – Hanna Twp.  
 P. 2308 – TDS – Little Twp.  
 P. 2309 – TDS – Newmarket Twp.  
 P. 2335 – TDS – Clergue Twp.  
 P. 2336 – Nassau Lake Area, Quaternary Geology of  
 P. 2339 – Cunningham Twp., Geology of  
 P. 2340 – Garnet Twp., Geology of  
 P. 2341 – Benton Twp., Geology of  
 P. 2342 – Mallard Twp., Geology of  
 P. 2360 – Timmins Area, Quaternary Geology of  
 P. 2363 – Rotunda Lake – Percy Lake Area (E), Geology of  
 P. 2364 – Rotunda Lake – Percy Lake Area (W), Geology of  
 P. 2369 – Jerome Area (W), Geology of  
 P. 2370 – Jerome Area (E), Geology of

NORTHERN-TIMMINS

**TABLE 2** | EXPLORATION ACTIVITY IN 1980.

Number on Figure	Individual or Company	Activity
27	Andex Mines Ltd.	DD
28	Archer, T.	DD
29	Asarco Exploration of Canada Ltd.	DD, GP
30	Augdome Corporation	DD
31	Bonhomme, J. V.	DD
32	Bridgeview Resources	GP
33	Brown-McDade Mines Ltd.	DD
34	Canadian Crest Gold Mines Ltd.	rTr, sTr
35	Canadian Nickel Company Ltd.	GP
36	Carlson Mines Ltd.	manual labour
37	Cominco Ltd.	DD, GP
38	Dalhousie Oil Company Ltd.	DD
39	Domego Resources Ltd.	DD
40	Gold Shield Syndicate	GP
41	Gulf Minerals Canada Ltd.	DD
42	Hollinger Argus Ltd.	DD
43	Hudson Bay Exploration Ltd.	DD
44	Ingamar Explorations Ltd.	GP
45	J-Dex Exploration Company of Canada Ltd.	DD, GP
46	Killeen, V.	rTr
47	Lytle, L.	DD
48	Macdonnell, A.	sTr
49	Mattagami Lake Exploration Ltd.	DD, GP
50	Noranda Exploration Company Ltd.	DD
51	Norcen Energy Resources Ltd.	DD
52	Pamour Porcupine Mines Ltd.	OVD
53	Rosario Resources Canada Ltd.	DD
54	St. Joseph Exploration Ltd.	GP, OVD
55	Shell Canada Resources Ltd.	DD

**TABLE 2** Continued

Number on Figure	Individual or Company	Activity
56	Steetley Talc Ltd.	DD
57	Teck Exploration Ltd.	DD
58	Texasgulf Exploration Ltd.	GP, OVD
59	Vukmirovich, S.	DD
60	Whitmarsh, B.	manual labour

Abbreviations

DD	–	Diamond drilling
GP	–	Geophysical survey
OVD	–	Overburden drilling
rTr	–	Trenching
sTr	–	Stripping

small drilling program in Lucas Township (Shell Canada Resources, personal communication). Texasgulf Incorporated is doing an extensive diamond-drill program in Kidd and Carnegie Townships, which includes drilling on property owned by Chance Mining and Exploration Company Limited (Northern Miner February 21/80, April 13/80, personal communication, Texasgulf). Placer Development Limited drilled the property of MW Resources Limited in Cunningham Township. Nothing of economic significance was found and the option was dropped (Northern Miner November 13/80). Mattagami Lake Exploration Division of Noranda Mines Limited carried out an extensive diamond-drill program in Alexandra and Hurdman Townships last winter. The program is being resumed this winter. Mattagami Lake also drilled in Mahaffy Township in 1980. (Mattagami Lake Exploration Division of Noranda Mines Limited staff, personal communication).

**Precious Metal Exploration**

Due to the high price of gold during 1980, many companies turned their attention to gold exploration. Some com-

**TABLE 3** | Additions to Regional Diamond Drill Core Library, January to November, 1980.

Location	Company or Individual	Hole Number
Whitney Twp.	Rosario Resources Canada Ltd.	W-80-1
		W-80-2
		W-80-3
		W-80-4
		W-80-5

**TABLE 4** ASSESSMENT WORK AND OTHER INFORMATION RECEIVED IN 1980 FOR THE PERIOD DECEMBER 1, 1979, TO NOVEMBER 30, 1980, PORCUPINE MINING DIVISION.

Abbreviations used in table

AMag	— airborne magnetometer survey	GC	— geochemical survey or study	PEM	— pulse electromagnetic survey
Au	— gold	HLEM	— horizontal loop electromagnetic survey	Res	— resistivity survey
Cu	— copper	IP	— induced polarization survey	rTr	— trenching
DD	— diamond drilling (the numbers following "DD" indicate the number of holes drilled and the total length drilled and total length drilled respectively)	Mag	— magnetometer survey	sTr	— stripping
GL	— Geological Surveys	OVD	— overburden drilling (the numbers following "OVD" indicate the number of holes drilled and the total length drilled (respectively))	VLEM	— vertical loop electromagnetic survey
				VLF	— very low frequency electromagnetic survey
				XRD	— X-ray diffraction

Note: Donated information where indicated.

Location	NTS	File Name	Commodity Sought	Work Done	Year	Timmins File No.	Toronto File No.	Remarks
Adams Twp.	42A/6	Amax Minerals Exploration Ltd.		AMag	1979	T-1978	2.3367	Also Carman, Cody, Deloro, Eldorado, Langmuir, Ogden, Shaw, Whitney Twps.
	42A/6	Utah Mines Ltd.	Zn	DD-1-49.7 ft.	1979	T-1943		
Alexandra Twp.	45H/5W	Mattagami Lake Expl. Ltd.	Ag, Au	DD-2-928 ft.	1980	T-1983	2.3264	
	45H/5E	Mattagami Lake Expl. Ltd.	Ag, Au	HLEM, Mag	1979/80	T-1989	2.3309	
Avon Twp.	42H	Hudbay Mining Ltd.	Base Metals	DD-16-1547 ft. GC, HLEM, Mag, VLEM	1979	T-1900		
Beardmore Twp.	42H/12W	Mattagami Lake Expl. Ltd.		HLEM, Mag	1979	T-1980	2.3245	
Benneweis Twp.	41P/12	Wm. Sims Industries Ltd. (Erana Mines Ltd.)	Au	AMag, rTr, sTr	1979	T-1947	2.3048	
Bourrassa Twp.	42H/12W	Hudbay Mining Ltd.	Base Metals					See Avon Twp., T-1900
Bristol Twp.	42A/5	Cominco Limited		HLEM, Mag	1979	T-1948	2.3045	
	42A/5E	Croxall, J and Miller, D.	Ag, Au, Base Metals	Assays, EM, Mag, XRD	1979	T-1950	2.3171	
	42A/5E	Holmer Gold Mines Ltd.	Ag, Au	DD-4-1354 ft. GC, sTr	1979	T-842	2.1329 2.2816 2.3153	
	42A/5,6	Texasgulf Canada Ltd.	Ag, Au	DD-5-2242 ft. OVD-74-7297 ft.	1979	T-1941	2.3085 2.3003	
Caithness Twp.	42G/3	Vukmirovich, S., Prop.		DD-1-101 ft.	1980	T-2209		
	42G/4E	Wabano, M., Prop.		manual labour	1979	T-1955		
Carman Twp.	42A/6	Amax Minerals Expl. Ltd.	AMag	1979	T-1978			See Adams Twp., also Cody, Deloro, Eldorado, Langmuir, Ogden, Shaw, Whitney
Carnegie Twp.	42A/11W	Texasgulf Canada		OVD-26-4100 ft.	1978	T-1869	2.2627 2.3010	Also Reid Twp.

Table 4 continued on next page.

NORTHERN-TIMMINS

TABLE 4 Continued

Location	NTS	File Name	Commodity Sought	Work Done	Year	Timmins File No.	Toronto File No.	Remarks
Carnegie Twp. cont'd.	42A/11W	Texasgulf Canada Ltd.		OVD-17-2029 ft.	1978	T-1872	2.3233, 2.3226, 2.2645	Also Reid Twp.
Carscallen Twp.	42A/5E 42A/5,6	Speculators Guild Inc. Texasgulf Canada Ltd.	Ag, Au	EM, GC, Mag DD-5-2242.7 ft., OVD-74-7297 ft.	1979 1979	T-1981 T-1941	— 2.3085 2.3003	Also Denton Twp. See Bristol Twp.
Casselman Twp.	42G/1W	Arsenault, J., Prop.		manual labour	1979	T-1962	—	
Chester Twp.	41P/12W  41P/12W	Canadian Crest Gold Mines Ltd. (Baxter Mines Ltd.) Lytle, L.K.	Au, Cu  Au, Cu	sTr, rTr  DD-2-204 ft.	1980  1980	T-1751  T-1969 T-1934	—  —	Also Yeo Twp.
Clergue Twp.	42A/10	Dalhousie Oil Co. Ltd.		DD-1-603 ft.	1980	T-1970	—	
Deloro Twp.	42A/6	Amax Minerals Expl. Ltd.		AMag	1979	T-1978	2.3367	See Adams Twp.
Denton Twp.	42A/5E  42A/5E  42A/5,6	Canadian Nickel Co. Ltd. Speculators Guild Inc. Texasgulf Canada Ltd.	Au, Base Metals	GC  EM, GC, Mag, VLF	1979  1979 1979	T-1980  T-1981 T-1941	2.3096   —	  See Carscallen Twp. See Bristol Twp.
Denyes Twp.	41O/15E	Mangotich, G.		DD-1-170 ft.	1979	T-1722	—	Also Swayze Twp.
Duff Twp.	42A/14E	Canadian Nickel Co. Ltd.	Au, Base Metals	Mag	1980	T-1834	2.3288	
Eldorado Twp.	42A/6  42A/6E	Amax Minerals Expl. Ltd. Utah Mines Ltd.	  Ni, Cu	  DD-8-3108 ft., GC, HLEM, Mag	  1977-79	T-1978  T-1785	  2.2876	See Adams Twp. donated information
Evelyn Twp.	42A/10,11	Rosario Resources Canada Ltd.		DD-1-590 ft., HLEM, Mag, AMag	1979,80	T-1946	2.3077 2.3101	Also Little & Tully Twps.
Foch Twp.	42F/3	Brinex Ltd.	Base Metals	GC	1978	T-1919	2.3094 2.2864 2.3095	
German Twp.	42A/10W  42A/11E	Asarco Exploration Co. of Canada Ltd. Asarco Exploration Co. of Canada Ltd.	Base Metals, Ag, Au Ag,Au, Base Metals	OVD-22-8222 ft.  OVD-14-1658 ft.	1979,80  1979	T-1959  T-1967	2.3092  2.3191, 2.3156	Also Macklam Twp. Also Matheson and Stock Twps.
Godfrey Twp.	42A/5 42A/5E  42A/12E  42A/12E	Cominco Ltd. Noranda Exploration Co. Ltd. Noranda Exploration Co. Ltd. Noranda Exploration Co. Ltd.		HLEM, Mag GC  GC  GC	1979 1972  1976  1976	T-1948 T-1513  T-1669  T-1671	2.3045 2.953  2.1745  2.1726	See Bristol Twp. donated information donated information also Turnbull Twp. donated information

TABLE 4 Continued

Location	NTS	File Name	Commodity Sought	Work Done	Year	Timmins File No.	Toronto File No.	Remarks
Godfrey Twp. cont'd.	42A	Norcen Energy Resources Ltd.	Base Metals	DD-8-1478 m, AMag, Mag	1980	T-1966	2.3030	also Jamieson, Jessop, Little, Macdiarmid, Mountjoy, Murphy, Tully Twps.
	42A/5E	Texasgulf Canada Ltd.	Base Metals	DD-2-1206 ft., HLEM, Mag	1980	T-1867	2.2615 2.2898	
Greenlaw Twp.	410/10W	Granges Exploration AB	Ag, Base Metals	DD-14-3311 ft.	1979	T-1940		also Tooms Twp.
Hassard Twp.	42A/4E	Killeen, V.L.		rTr	1979,80	T-1937		
Hawkins Twp.	42C 42G/4	MacDonnell, A. St. Joseph Exploration		Manual labour HLEM, Mag, VLF	1980 1979	T-1963 T-1957	2.3293 2.3135	
Homuth Twp.	42H	Hudbay Mining Ltd.	Base Metals	DD-1-114.7m, GC	1978	T-1900		
Hopper Lake	32L/4 32E/13	Gold Shield Syndicate	Au, Base Metals	EM, VLF	1978	T-1924	2.2897	
Hoyle Twp.	42A/11E	Gold Shield Syndicate		EM, Mag	1980	T-1975	2.3240	
	42A/11	Rosario Resources Canada Ltd.	Base Metals	DD-5-2165 ft., HLEM, IP	1978,79	T-1928	2.3170	also Murphy Twp.
Hurdman Twp.	42H/12	Mattagami Lake Expl. Ltd.		DD-1-437 ft., HLEM, Mag	1979,80	T-1972		
Horwood Twp.	42B/1W	Ingamar Explorations Ltd.		EM, Mag, VLF	1980	T-1976	2.3366	
Jamieson Twp.	42A/11,12	Asarco Expl. Co. of Can. Ltd.		DD, assays	1975	T-1746		donated information
	42A/12E	Noranda Expl. Co. Ltd.		EM, Mag	1968	T-1973		donated information
	42A	Norcen Energy Resources Ltd.			1979	T-1966	2.3030	See Godfrey Twp., also Jessop, Little, Macdiarmid, Murphy, Mountjoy, and Tully Twps.
	42A/12	The Sulphide Syndicate	Base Metals	Mag, PEM	1978,79	T-1936	2.2986	also Robb Twp.
Jessop Twp.	42A/11,12	Asarco Exploration Co. of Canada Ltd.		DD, assays	1975	T-1746		donated information
	42A	Norcen Energy Resources Ltd.			1979	T-1966	2.3030	see Godfrey Twp.
Keith Twp.	42B/1W	Noranda Expl. Co. Ltd.		DD-1-601 ft.	1980	T-1646	2.1840 2.1548	
Kenogaming Twp.	42A/4W	Utah Mines Ltd.	Base Metals	Mag	1979	T-1988	2.3332	
Langmuir Twp.	42A/6	Amax Minerals Expl. Ltd.		AMag	1979	T-1978	2.3367	see Adams Twp.
Lessard Twp.	42F/3	Brinex Ltd.	Base Metals	GC	1978	T-1919	2.3094, 2.2864, 2.3095	

Table 4 continued on next page.

NORTHERN-TIMMINS

TABLE 4 Continued

Location	NTS	File Name	Commodity Sought	Work Done	Year	Timmins File No.	Toronto File No.	Remarks
Little Twp.	42A	Norcen Energy Resources Ltd.	Base Metals		1980	T-1966	2.3030	see Godfrey Twp.
	42A/10,11	Rosario Resources Canada Ltd.			1979	T-1946	2.3077	see Evelyn Twp.
Lizar Twp.	42C/15,16	Nickel Rim Mines Ltd.		GC, Mag	1978	T-1890	2.3209	
Loveland Twp.	42A/12, 13,14	Gulf Minerals Canada Ltd.	Base Metals	Mag	1979,80	T-1929	2.2972 2.3270	also Mahaffy, Thorburn, Reid
Lower Detour Lake	32E/13	Noranda Expl. Co. Ltd.		HLEM, Mag	1979	T-1965		
Lucas Twp.	42A/14E	Canadian Nickel Co. Ltd.	Base Metals	Mag.	1980	T-1977	2.3287	
Maddiarmid Twp.	42A	Norcen Energy Resources Ltd.				T-1966		see Jamieson Twp.
	42A	Norcen Energy Resources Ltd.		AEM (input)	1979	T-1944	2.3031	
Macklem Twp.	42A/10W	Asarco Expl. Co. of Can. Ltd.	Base Metals, Ag, Au	DD-10-6281 ft., OVD-11-1941 ft., Mag, EM, VLF	1979	T-1959	2.3263 2.3092	
Mahaffy Twp.	42A/12, 13,14	Gulf Minerals Canada Ltd.	Base Metals	IP, Mag	1979	T-1929	2.3270 2.2972	see Loveland Twp.
	42A/13E	Mattagami Lake Expl. Co. Ltd. and Terra Nova Expl. Ltd.	Base Metals	DD-2-1734 ft., IP Mag	1978 1979,80	T-1974	2.3195	
	42A/13E	Rosario Resources Canada Ltd.	Base Metals	DD-5-2517 ft.	1980	T-1841		
Marion Twp.	410/16W	Domego Resources Ltd.	Au, Base Metals	DD-6-1438 ft.	1980	T-1932	2.3037	
Matheson Twp.	42A/11E	Asarco Expl. Co. of Can. Ltd.			1979	T-1967	2.3156 2.3191	see German Twp.
	42A/11E	J.V. Bonhomme	Au	DD-1-978 ft.	1980	T-261		
	42A/11E	Texasgulf Canada Ltd.		OVD-5-187.2 ft.		T-1942	2.3151	
	42A/11E	Texasgulf Canada Ltd.		OVD-5-2056 ft.	1980	T-1984	2.3163, 2.3154, 2.3159	
	42A/9,10	Texasgulf Canada Ltd.		OVD-4-1961 ft.	1979	T-541	2.3051	
Maund Twp. & McAlpine Twp.	42H	Hudbay Mining Ltd.	Base Metals			T-1900		see Avon Twp.
McArthur Twp.	42A/3E	Noranda Expl. Co. Ltd.	Au,Ag,Base Metals	DD-1-175 ft., GC	1977	T-1670	2.1733	donated information
	42A/3W	Westfield Minerals Ltd.		EM,GC,Mag., VLF		1980	T-1956	2.3137
	42A/3E	Whitmarsh, B., Prop.		rTr	1980	T-616		
Mewhinney Twp.	42H	Hudbay Mining Ltd.	Base Metals			T-1900		see Avon Twp.
Minipuka Twp.	42B/13	Amax Minerals Expl. Co. Ltd.		AMag	1979	T-1961	2.3283	

TABLE 4 Continued

Location	NTS	File Name	Commodity Sought	Work Done	Year	Timmins File No.	Toronto File No.	Remarks
Montcalm Twp.	42B/9E	Geophysical Engineering Ltd.	Base Metals	DD-5-1709.6m	1976,77,78	T-1835	2.2454	
Mountjoy Twp.	42A	Norcen Energy Resources Ltd.				T-1966		see Godfrey Twp.
Murphy Twp.	42A	Norcen Energy Resources Ltd.				T-1966		see Godfrey Twp.
	42A/11	Rosario Resources Canada Ltd.	Au, Base Metals			T-1928		see Hoyle Twp.
Ogden Twp.	42A/6	Amax Minerals Expl. Ltd.				T-1978		see Adams Twp.
	42A/6W	J.V. Bonhomme, Prop.	Au	DD-6-4238 ft.		T-1916	2.2875	
	42A/6W	J.V. Bonhomme, Prop.	Au	DD-1-301 ft.	1980	T-1968		
	42A/6	Carlson, H.D.		IP, Res	1978	T-1887		
Prosser Twp.	42A/14E	Gold Shield Syndicate		EM, Mag	1980	T-1915	2.3243 2.2872	also Tully Twp.
	42A/14E	Western Mines Ltd.		OVD-14-1582.5 ft.	1980	T-1885	2.2595	also Tully Twp.
Raney Twp.	41O/15W	J-Dex Exploration Ltd.	Au, Base Metals	rTr	1980	T-2180	2.1612	
Reeves Twp.	42B/1E	Texasgulf Canada Ltd.		HLEM, Mag	1979	T-1945	2.3042	
	42B/1E	Steeley Talc Ltd.		DD-1-451 ft.	1980	T-1985		
Reid Twp.	42A/12, 13,14	Gulf Minerals Can. Ltd.	Base Metals	DD-1-587 ft., Mag	1980	T-1929	2.2972	see Loveland Twp.
	42A/13E	Rosario Resources Can. Ltd. & Utah Mines Ltd.	Base Metals	DD-5-2517 ft.	1980	T-1841		see Mahaffy Twp.
	42A/11W	Texasgulf Canada Ltd.	Base Metals			T-1872		see Carnegie Twp.
Robb Twp.	42A/12	The Sulphide Syndicate				T-1936		see Jamieson Twp.
Rollo Twp.	41O/15E	Carlson Mines Ltd.	Au, Ag	rTr	1980	T-1987		
Sewell Twp.	42B/1E	Texasgulf Canada Ltd.	Base Metals	HLEM, Mag, VLF		T-1945		see Reeves Twp.
Shaw Twp.	42A/6	Asarco Expl. Co. of Can. Ltd.				T-1978		see Adams Twp.
Slack Twp.	42G/1W	Arsenault, R. G.	Base Metals	Manual labour	1979	T-1935		
Stock Twp.	42A/6	Asarco Expl. Co. of Can. Ltd.				T-1978		see Adams Twp.
	42A/11E	Asarco Expl. Co. of Can. Ltd.		OVD-14-1658 ft.	1979	T-1967	2.3191 2.3156	see German Twp.
	42A/10E	Dalhousie Oil Co. Ltd.		DD-4-1555 ft.	1980	T-1971		
	42A/10E	Hollinger Argus Ltd.		DD-1-899 ft.	1980	T-1960		
	42A/10E	Hollinger Mines Ltd.		Mag	1979	T-1952	2.3147	

Table 4 continued on next page.

NORTHERN-TIMMINS

TABLE 4 Continued

Location	NTS	File Name	Commodity Sought	Work Done	Year	Timmins File No.	Toronto File No.	Remarks
Strachan Twp.	42B/9E	Geophysical Engineering Ltd.		DD-5-1709.6m	1976,77, 78	T-1835	2.2454	see Montcalm Twp.
Sunday Lake, Area of	32L/4	Noranda Expl. Co. Ltd.		Mag, VLEM	1979	T-1986	2.3246	
Sunday Lake, Area West of	32L/4, 32E/14	Gold Shield Syndicate	Au, Base Metals	EM, VLF	1978	T-1924	2.2897	
Swayze Twp.	410/15E	Mangotich, G., Moore, H.				T-1722		see Denyes Twp.
Thorburn Twp.	42A/12, 13,14	Gulf Minerals Can. Ltd.	Base Metals			T-1929		see Loveland Twp.
Thornloe Twp.	42A/5,6	Texasgulf Canada Ltd.				T-1941		see Bristol Twp.
Tisdale Twp.	42A/6W 42A/11W	Meunier, D. Pamour Porcupine Mines Ltd.		sTr, rTr mechanical equipment	1979 1980	T-1861 T-1954		
Tolmie Twp.	42H	Hudbay Mining Ltd.	Base Metals			T-1900		see Avon Twp.
Tooms Twp.	410/10W	Granges Exploration AB	Base Metals	DD-2-434 ft.	1979	T-1938		
	410/10W	Granges Exploration AB	Base Metals	DD-14-3311 ft.	1979	T-1940		see Greenlaw Twp.
	410/10W	Granges Exploration AB	Base Metals	DD-2-442 ft.	1979	T-1939		
Tully Twp.	42A/14E	Gold Shield Syndicate	Base Metals, Au			T-1915		see Prosser Twp.
	42A	Norcen Energy Resources Ltd.				T-1966		see Godfrey Twp.
	42A/10,11	Rosario Resources Can. Ltd.				T-1946		see Evelyn Twp.
	42A/14E	Western Mines Ltd.	Base Metals			T-1885		see Prosser Twp.
Walls Twp.	42B/13	Amx Minerals Expl. Ltd.				T-1961		see Minnipuka Twp.
	42G/4	St. Joseph Expl. Ltd.				T-1957		see Hawkins Twp.
Whitney Twp.	42A/6E	Allerston, R.	talc, magnesite, Base Metals		1980	T-1052	2.2925	
	42A/11E	Rosario Resources Can. Ltd.		DD-2-537 ft. DD-3-2119 ft.	1979 1980	T-1052 T-1052		
	42A/6	Amx Minerals Expl. Ltd.				T-1978		see Adams Twp.
	42A/11E	Archer, T.		DD-1-200 ft.	1980	T-1951		
	42A/11E	Rosario Resources Can. Ltd.	Au	DD-1-130 ft.	1979	T-1958		
Yeo Twp.	41P/12W	Canadian Crest Gold Mines Ltd.	Au	rTr, sTr	1980	T-1751		see Chester Twp.
	41O/9E	Cominco Ltd.	Au	DD-3-818 ft., GC, Mag	1980	T-1953	2.3220	
	41P/12W	Cominco Ltd.	Au	GC, Mag	1979	T-1982	2.3238	



panies re-examined older, previously uneconomic, deposits, and others were exploring new areas for gold, using advanced technical methods such as overburden drilling and sophisticated geophysics in areas of extensive overburden cover.

Extensive underground development and diamond-drilling was done at the site of the Detour Lake Joint Venture, 200 km northeast of Timmins. Amoco Canada Petroleum Company Limited is in partnership with Dome Mines Limited and Campbell Red Lake Mines Limited on the project. Approximately 9000 feet of drifting and cross-cutting and 30 000 feet of underground diamond-drilling was done to establish the parameters of the deposit on the 340 and 400 foot levels. A geological study and a feasibility study with respect to mining is being done. No production decision had been made at the time of this writing (personal communication, Campbell Red Lake Mines).

Texasgulf Incorporated has driven a decline to the 350 foot level at the Owl Creek gold deposit in Hoyle Township 3.5 km west of the company's concentrator. Ore type material has been reached by drifting westward at this level. Texasgulf has an agreement with INCO Limited, the original discoverer of the property. An open pit is being planned to mine one million tons on the western part of the deposit. Drilling indicated reserves of the deposit to be 2.5 million tons at 0.15 ounce Au per ton. A new deposit was found by Texasgulf Incorporated just east of the Owl Creek deposit. Named the Hoyle Pond deposit, Texasgulf Incorporated is presently diamond-drilling to further delineate this gold zone on property wholly owned by the company (Northern Miner October 23/80, personal communication, Texasgulf Incorporated staff).

Quebec Sturgeon River Mines Limited began shaft sinking at its Stock Township gold deposit. The current program will include deepening the shaft 170 feet below the existing shaft bottom to a depth of 230 feet and driving a 1000 foot drift at the 200 foot level. Underground diamond-drilling will also be carried out (personal communication, staff of Quebec Sturgeon River Mines Limited).

Extensive stripping to further evaluate the Holmer Gold Mines Limited gold deposit in Bristol Township was done in 1980. Surface sampling and mapping was done and another diamond-drill program was completed. Reported drill indicated reserves for the main zone are 722,000 tons at a grade of 0.103 ounce Au per ton. The company began a feasibility study on the property (Timmins Daily Press, December 15/80).

Four companies expressed plans to possibly re-activate past producing mines in the Timmins Resident Geologist's area: Bridgeview Resources has started to dewater the shaft of the old Jerome Gold Mine in Osway Township and is planning to mine reserves which remain within the underground workings. Geophysical surveying has started on the property to locate additional targets for diamond-drilling. (Northern Miner October 9/80; Bridgeview Resources staff, personal communication).

Associated Porcupine Mines Limited began a cost study on the former Paymaster Mine in Tisdale and Dello Township. Known reserves are estimated at 795,000 tons at 0.23 ounce Au per ton (Northern Miner December 18/80).

Diepdaume Mines started a rehabilitation program on the formerly-producing Preston East Dome Mine. Current plans are to dewater the old workings down to the 1000 foot level (Northern Miner June 12/80; personal observations).

Vedron Limited, which holds the option on the Fuller property in Tisdale Township, proposes to open-pit mine this gold deposit (Northern Miner November 6/80).

Aside from Texasgulf's Hoyle Pond discovery mentioned above, four additional gold deposits were reported to have been discovered in the area during 1980. Asarco Exploration of Canada confirmed a find 35 km east of Timmins in Macklem Township. Reported to occur in quartz veins, the gold mineralization seems erratic and no continuity has yet been established. The discovery was made by follow-up diamond-drilling of an overburden drill program in an area of deep overburden (up to 250 feet) (personal communication, Asarco Exploration of Canada; Northern Miner September 4/80).

A new gold zone was discovered on Broulan Reef Mines Limited's 8-claim Hoyle Township property by Joint Venture partners Rosario Resources Canada Limited and DuPont of Canada Explorations Limited. The location of this discovery is approximately 400 km south of the original Broulan Reef discovery on which Broulan Reef Mines Limited encountered gold values several years ago and upon which Rosario Resources Canada Limited and DuPont of Canada Explorations Limited have lately been doing further work (Northern Miner July 31/80, December 4/80; personal communication, Rosario Resources.)

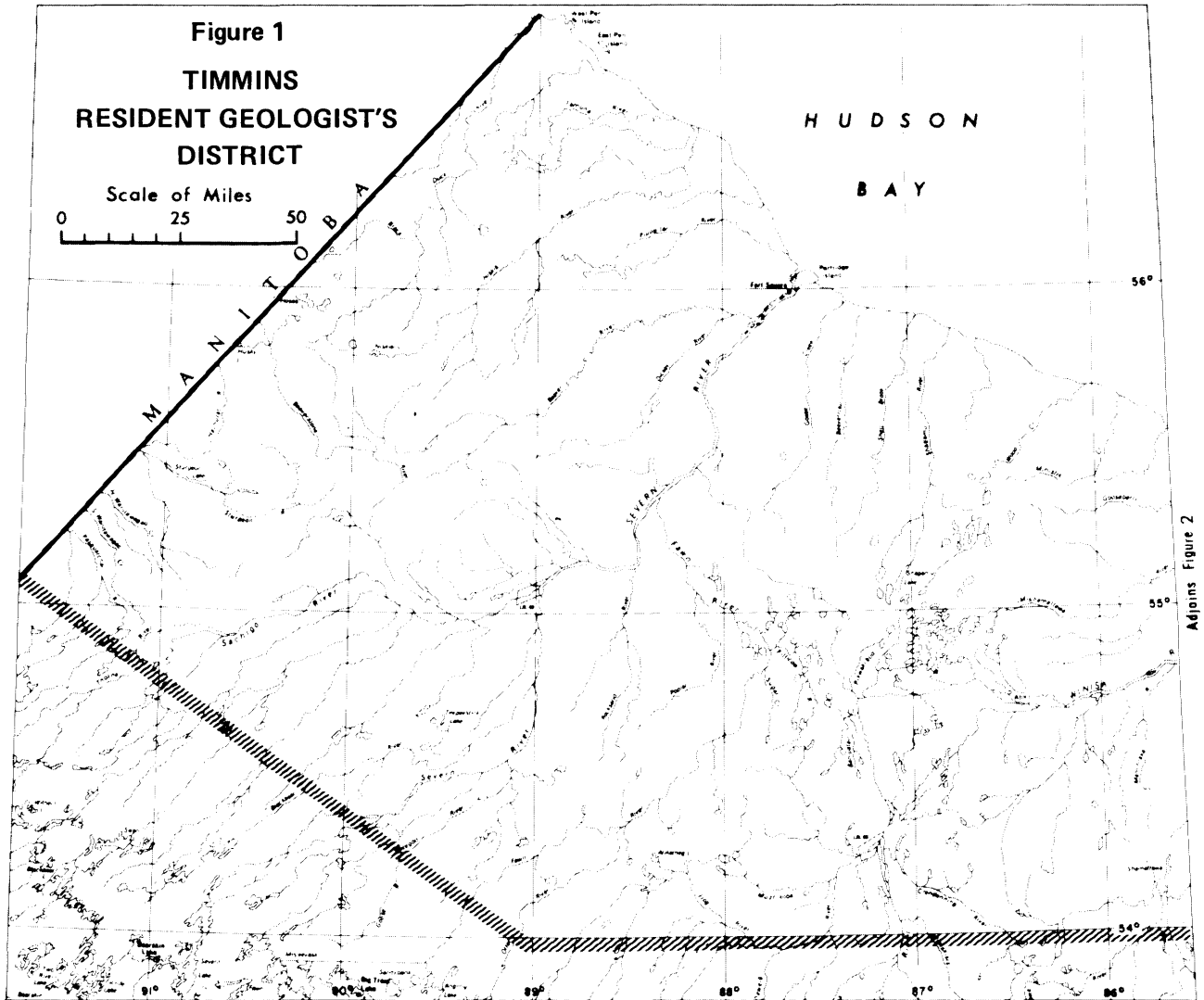
Abitibi Price Incorporated intersected gold mineralization in diamond-drill holes in Lucas Township 40 km north of Timmins (Northern Miner December 18/80).

Augdome Corporation Limited, late in 1980, reported intersecting gold mineralization near the boundary with Diepdaume Mines Limited (the old Preston East Dome property) in Tisdale Township (Northern Miner December 4/80).

Many re-evaluation programs of old gold properties occurred in the Timmins area in 1980. Northgate Exploration Limited drilled approximately 23 000 feet in the shaft area at the Consolidated Orofino Mines Limited property in Horwood Township. A new zone was reported to have been found, with a total reserve estimate of 896 000 tons at 0.21 ounce Au per ton (Northern Miner December 4/80; personal communication, Northgate Exploration).

Nickel Offsets Limited completed a 10 000 foot diamond-drill program on their gold property in Tully Township in the winter of 1980. Indicated reserves are reported to be 750 000 tons grading between 0.10 and 0.20 ounce Au per ton (Northern Miner July/80).

Sunmist Energy Resources Limited (formerly Sundance) carried out a diamond-drill program on the M&M Porcupine property in Shaw Township (personal observations).



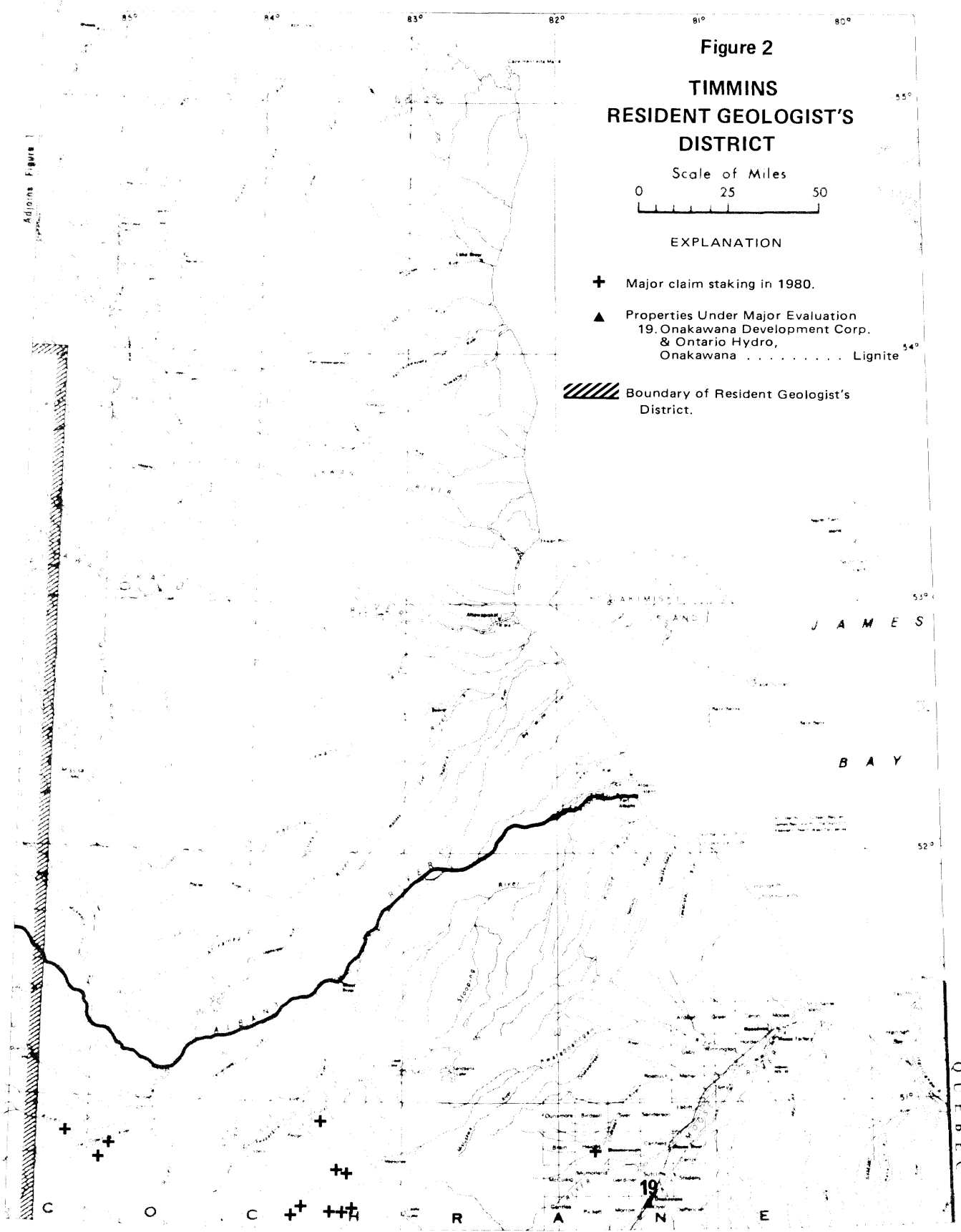


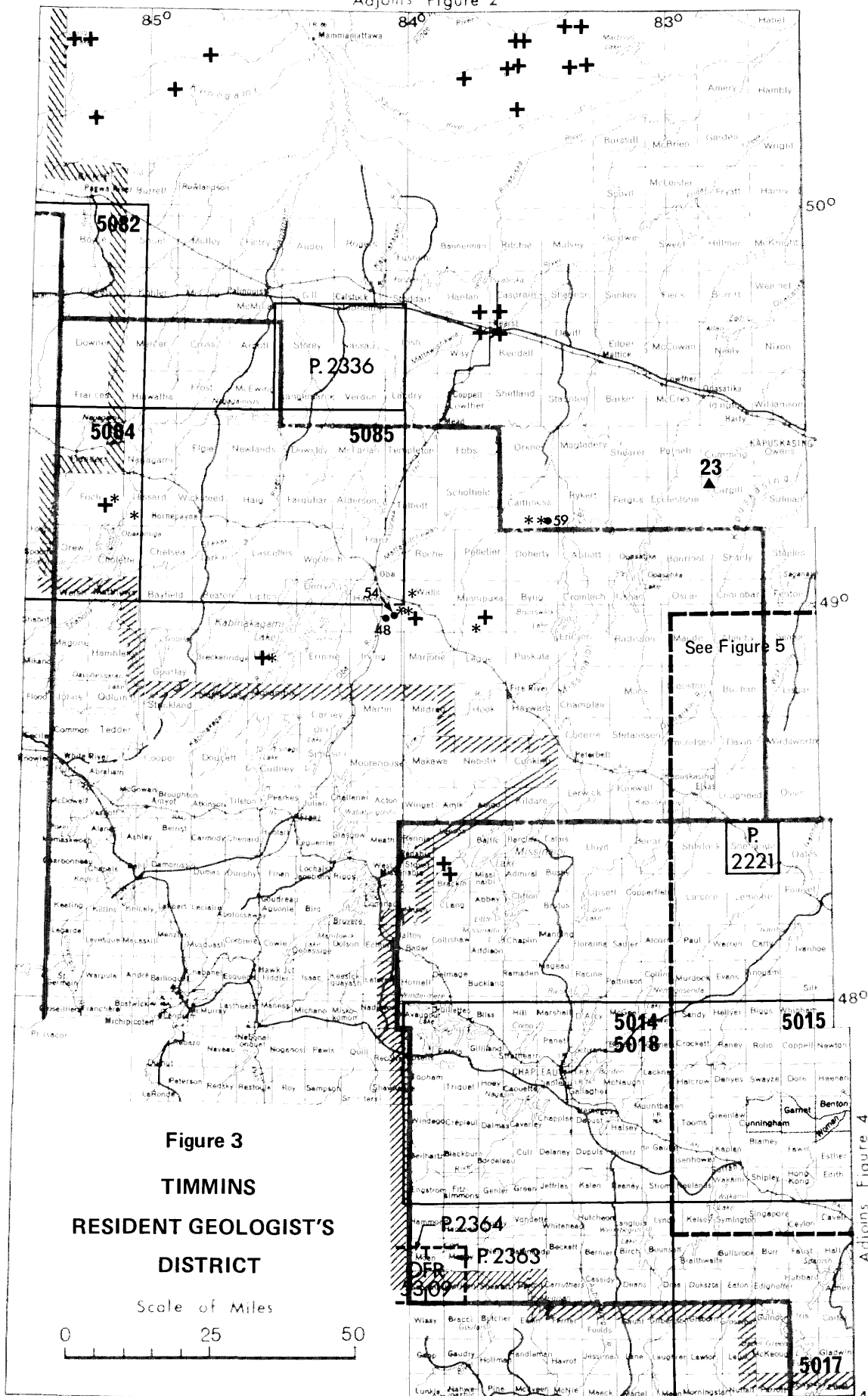
Figure 2

**TIMMINS  
RESIDENT GEOLOGIST'S  
DISTRICT**

Scale of Miles  
0 25 50

EXPLANATION

- + Major claim staking in 1980.
- ▲ Properties Under Major Evaluation  
19. Onakawana Development Corp.  
& Ontario Hydro,  
Onakawana . . . . . Lignite
- ▨ Boundary of Resident Geologist's  
District.



**Figure 3**  
**TIMMINS**  
**RESIDENT GEOLOGIST'S**  
**DISTRICT**

Scale of Miles

Adjoins Figure 2

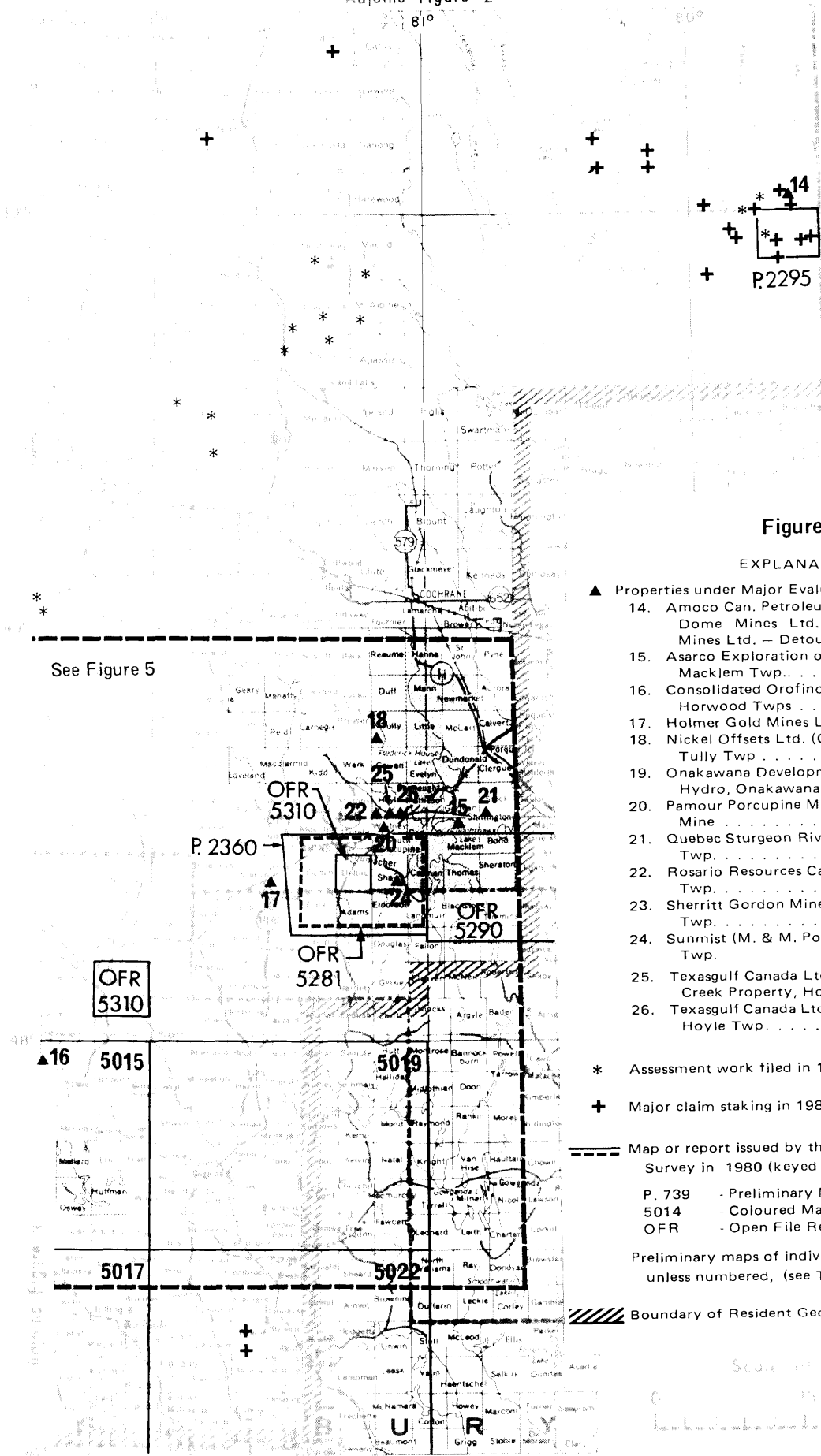


Figure 4

EXPLANATION

- ▲ Properties under Major Evaluation
  - 14. Amoco Can. Petroleum Co. Ltd., Dome Mines Ltd., Campbell Red Lake Mines Ltd. - Detour Gold Property Au, Cu
  - 15. Asarco Exploration of Canada Co. Ltd., Macklem Twp. . . . . Au
  - 16. Consolidated Orofino Resources, Silk and Horwood Twps . . . . . Au
  - 17. Holmer Gold Mines Ltd., Bristol Twp . . Au
  - 18. Nickel Offsets Ltd. (Cromarty Exploration), Tully Twp . . . . . Au
  - 19. Onakawana Development Corp. & Ontario Hydro, Onakawana . (see Fig. 2) . Lignite
  - 20. Pamour Porcupine Mines Ltd., No. 2 Mine . . . . . Au
  - 21. Quebec Sturgeon River Mines Ltd., Stock Twp. . . . . Au
  - 22. Rosario Resources Canada Ltd., Hoyle Twp. . . . . Au
  - 23. Sherritt Gordon Mines Ltd., Cargill Twp. . . . . Au
  - 24. Sunmist (M. & M. Porcupine), Shaw Twp. . . . . Au
  - 25. Texasgulf Canada Ltd., INCO Ltd., Owl Creek Property, Hoyle Twp . . . . . Au
  - 26. Texasgulf Canada Ltd., Hoyle Pond Property Hoyle Twp. . . . . Au

- \* Assessment work filed in 1980. (see Table 4)
- + Major claim staking in 1980.

==== Map or report issued by the Ontario Geological Survey in 1980 (keyed to Table 1)

P. 739 - Preliminary Map  
 5014 - Coloured Map  
 OFR - Open File Report

Preliminary maps of individual townships unless numbered, (see Table 1).

////// Boundary of Resident Geologist's District.

SEARCHED INDEXED

6 15 50

See Figure 5

OFR 5310

P. 2360

OFR 5310

OFR 5290

OFR 5281

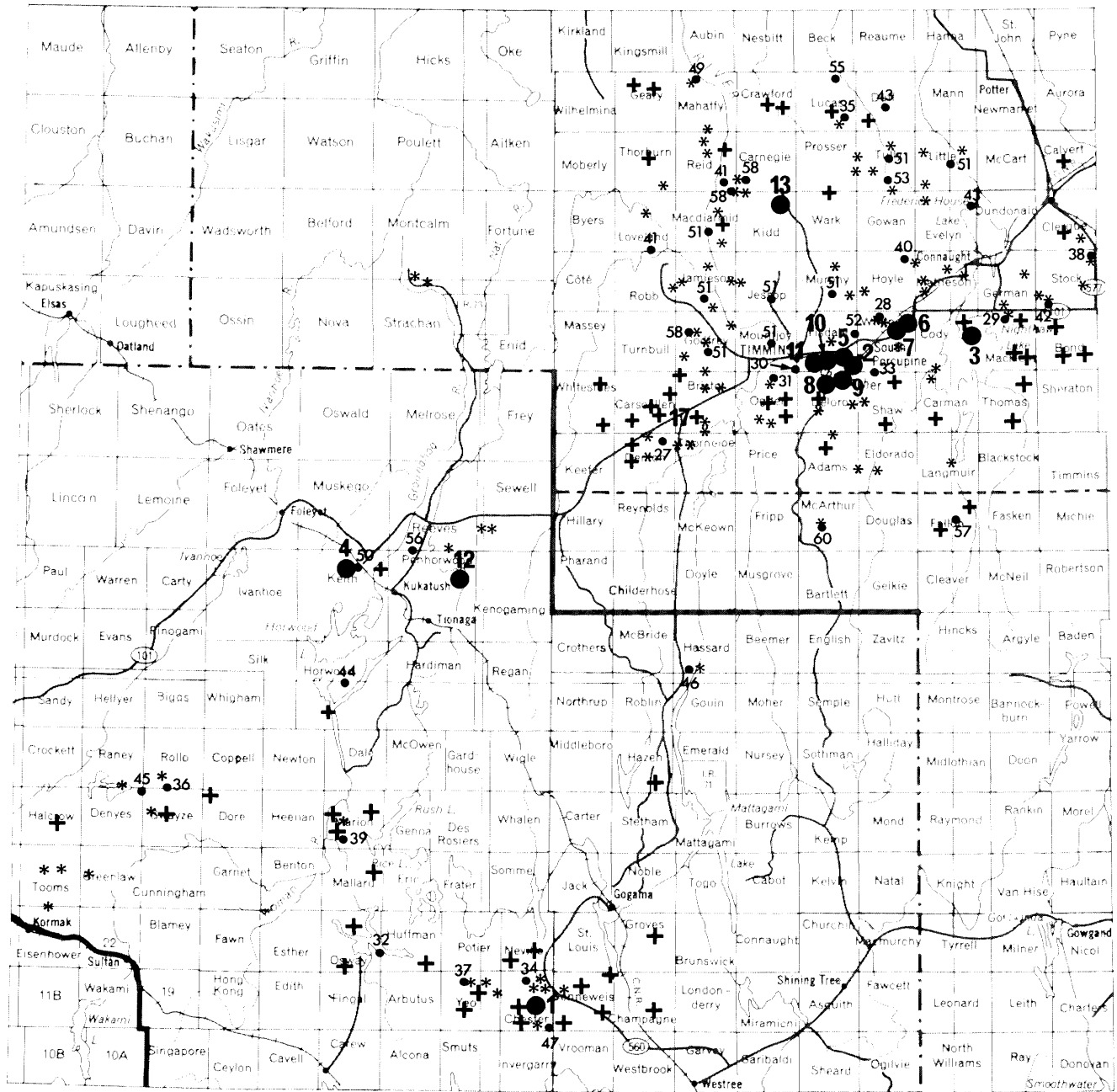
▲ 16 5015

5019

5017

5022

U R



**Figure 5**

**EXPLANATION**

- Producing Mines, 1980
  1. Canadian Crest Gold Mines - Chester Twp. property . . . . . Au, Cu
  2. Dome Mines Ltd. - Dome Mine . . . . . Au, Ag
  3. Gold Hawk Porcupine Mines Ltd. . . . . Au
  4. Mining Corp. - New Joburke Mine . . . . . Au, Ag
  - 5 - 11 Pamour Porcupine Mines Ltd.
    5. Carium Property . . . . . Au, Cu, Mo
    6. Hoyle Property . . . . . Au, Ag
    7. No. 1 Property . . . . . Au, Ag
    8. No. 3 Property . . . . . Au, Ag
    9. Romfield Property . . . . . Au, Ag
    10. Schumacher Property. . . . . Au, Ag, Cu
    11. Timmins Property. . . . . Au, Ag
  12. Steeley Talc Ltd. - Penhorwood Mine . . . . . talc
  13. Texasgulf Canada Ltd. - Kidd Creek Mine . . . . . Cu, Zn, Ag, Pb, Cd, Sn
- \* Assessment work filed in 1980 (see Table 4)
- ⊕ Major claim staking in 1980.
- Exploration Activity in 1980. (see Table 2)

J. V. Bonhomme is having a diamond-drilling program carried out in the old DeSantis Mine property in Ogden Township. (J. V. Bonhomme, personal communication).

Almost 13 000 feet of diamond-drilling was completed by Andex Mines Limited on the old Aumo property in Denton township. Narrow high grade intersections of gold, silver, copper, and molybdenum were obtained (Northern Miner, November 13/80).

Some of the other gold exploration programs carried out in this area were: J. V. Bonhomme completed a diamond-drill program in Matheson Township (personal communication, J. V. Bonhomme). Brown-McDade Mines Limited carried out a stripping and sampling program and a geophysical program in Denton Township. The company also completed a drilling program on its six claims in Whitney Township (Northern Miner, November 20/80). Cominco Limited completed a small drill program in Yeo Township (personal communication, Cominco Limited). Davidson Tisdale Mines Limited conducted a minor stripping program on its claims in Tisdale Township (personal observation; Northern Miner February 14/80). Esso Resources Canada Limited and Hollinger Argus Limited were active in a diamond-drill program in Stock and Taylor Townships (personal communication, Hollinger Argus Limited). Mining Corporation of Canada Limited drilled one hole in Keith Township alongside its Joburke Mine, a current gold producer (personal communication, Mining Corporation). Norcen Energy Resources Limited diamond-drilled in Tully Township (Assessment Files). INCO diamond-drilled in Denton Township (Northern Miner, November 13/80). A stripping and surface sampling program was carried out on the Faymar property (a former gold producer) in Deloro Township. The property is presently owned by Great Northern Pulp and Paper Group Limited (personal observations). Nahanni Mines Limited reported drilling a hole and intersecting gold values on one of its claim blocks along the Pipestone Fault (Northern Miner, October 30/80). Teck Corporation completed a mapping project and a small drill program in Fallon Township (personal communication, staff, Teck Corporation). Rosario Resources Canada Limited diamond-drilled in Whitney Township (personal observations). Murgold Mines Limited sampled the underground workings and carried out a surface sampling program of the old Strathmore and Gomak properties in Chester Township (Murray Watts, personal communications).

### Other Activities

Sherritt Gordon Mines Limited optioned the interests of International Minerals and Chemical Corporation (Canada) Limited known as IMC of a phosphate property in Cargill Township 37 km southeast of Kapuskasing. The property is owned by Continental Copper Mines Limited who optioned the property to IMC in 1975. Last winter Sherritt Gordon Mines Limited extracted a 400-ton bulk sample using a large 45-ton auger with bits up to 4 feet in diameter. This bulk sample was sent to the Texasgulf

metallurgical site in Timmins for testing. The company is presently drilling 6-inch diameter holes on the zone for further re-evaluation. (Timmins Daily Press March 25/80; Sherritt Gordon Mines Limited staff, personal communication).

A \$7.7 million environmental assessment is presently being done by Onakawana Development Limited and Ontario Hydro on the development of a lignite-fired electrical generating station 95 km south of Moosonee. The rationale for the development of the project is to develop an indigenous resource contributing to the energy self-sufficiency of the province and to provide for economic development in the area. No decision has yet been made to go ahead with the project, which would include an \$850 million generating station. Actual lignite reserves are 182 million tonnes, which would give the generating station a 30 year life span. Onakawana Development Limited is presently studying the possibility of economically manufacturing methanol from the lignite as a possible alternative. (Onakawana Development Limited, Ontario Hydro, personal communications).

Selco Mining Corporation Limited has been very active in 1980 staking claims in the Cretaceous Basin north of Hearst. An extensive diamond-drill program was done by the company in that area in 1980 (Selco Mining Corporation Limited, personal communication).

Steeley Talc carried out minor diamond-drilling close to its open pit talc mine in Reeves Township.

## Ontario Geological Survey Activities

Under the Precambrian Geology program, G. M. Siragusa carried out mapping and an investigation of previous exploration work in an area which included Chester Township, a large part of Yeo Township, and the southern parts of Neville and Potier Townships.

Two special projects were carried out by the Engineering and Terrain Geology Section. These projects were funded by the Ontario Ministry of Northern Affairs, within the Timmins Resident Geologist's area. C. M. Tucker mapped the Dana Lake area and began a reconnaissance investigation in the Pamour area. In the Dana Lake area five eskers, which contain the bulk of the sand and gravel deposits in the area, were identified. W. D. Scott and J. Z. Fraser investigated the aggregate resource potential in the vicinity of Hearst and Kapuskasing. In both areas most of the sand and gravel deposits are covered by till. Crushable aggregate does not appear to be plentiful. It was recommended that potentially useful deposits be set aside for aggregate extraction before other uses of the land are approved.

A special three year project, funded by the Ontario Ministry of Northern Affairs through the Northern Industrial Minerals Studies (NIMS) Program, is being undertaken by M. A. Vos. The purpose of this project is to study alkalic complexes with the aim of improving the evaluation of their industrial mineral potential. Of the seven structures examined in 1980 two were within the Timmins

## NORTHERN-TIMMINS

Resident Geologist's area; the alkaline complex in Cargill Township and the complex in the Clay-Howells Township area.

Open File Report 5310, a progress report on a study of Talc-Magnesite and Asbestos Deposits in the Kirkland Lake-Timmins Area by Ulrich and Diane Kretschmar was published this year. Work on the project continued in 1980. This project was funded by the Ontario Ministry of Northern Affairs.

## Ontario Geoscience Research Grants Program

The Ontario Geoscience Research Grants Program was initiated in 1978 as a means of supporting research at Ontario universities to complement work by the Ontario Geological Survey. Of the 27 projects which received funding in 1979/80, 19 were new projects. Research projects funded by this program, directly related to the Timmins area, listed under the principal applicant, are:

Crocket, J.H., McMaster University	Stable Isotope Studies – Gold Metallogeny, Timmins.
Fyfe, W. S., University of Western Ontario	Lode Gold Deposits in Felsic Igneous Intrusions.
Norris, G., University of Toronto	Mesozoic Polynostratigraphy, Moose River Basin.
Roberts, R.G., University of Waterloo	Hydrothermal Alteration and Gold Vein Environments
Whitehead, R.E., Laurentian University	Gold Exploration Using CO <sub>2</sub> , H <sub>2</sub> O and Alkalic "Anomalies".

Research projects funded by the Ontario Geoscience Research Grant Program with reference to the Timmins Resident Geologist's area, are:

Bell, K., Carleton University	Rb – Sr Geochronology of Alkalic Complexes.
Hutchinson, R.W., University of Western Ontario	Au, Ni, and Cr Deposits in Ultramafic-Mafic Volcanic Rocks.
West, G.F., University of Toronto	Interpretation Support for Electromagnetic Prospecting.
York, D., University of Toronto	Direct Dating of Ore Minerals.

## Operating Mines

### Base Metals

Major activity at Texasgulf Metals Company's base metal mine centred around the construction of the new \$300 million copper smelter and refinery complex which will be capable of initial annual production of 65 000 tons of refined copper. It is expected to be completed by mid-1981.

Although the 1980 production figures are unavailable at the time of this writing, the forecast tonnage was scheduled to be 4.3 million, and it is reported that this figure will be met. This is an increase from the 4 057 451 tons milled in 1979, from which the operation produced 284 776 tons of copper concentrates, 13 781 tons of lead concentrates, 341 542 tons of zinc concentrates, and 117 580 tons of zinc concentrates from which 117 580 tons of zinc metal were obtained. They also produced 5.8 million ounces of silver, 1 035 121 pounds of cadmium, and 209 643 pounds of tin from concentrates.

The company has reported the discovery of a new ore zone from drilling the 3400 foot level. Preliminary drilling to date indicates that the zone is very small compared to the main orebody. Its relationship to the main zone is not yet known.

In 1980 development footage at the No. 1 Mine was 19 000 feet, and 27 500 feet at the No. 2 Mine. This compares with the 1979 figures of 18 402 and 15 016 feet respectively. Total underground diamond-drill footage was 74 000 feet, of which 28 000 feet were defined as exploratory drilling. This compares to the 1979 figures of 66 000 and 11 000 feet respectively.

Total employment by Texasgulf Metals Company in mining and metallurgy increased from the 1979 total of 2265 to 2540 people in 1980 (Texasgulf Metals Company, personal communication).

### Precious Metals

With the current high gold price, Dome Mines Limited is optimistic in extending its mine's long life as a major gold producer. In 1979 the company produced 663 900 tons, from which 94 702 ounces of gold were recovered. This represents an average grade of 0.148 ounce Au per ton. The 1980 production figures are unavailable at the time of this writing, however, a similar tonnage with a slightly lower gold grade is expected. All production was above the 26th level that is 3550 feet below surface. A minor amount of development material came from the 29th level. A total of 17 200 feet of development was done in 1980 compared to 13 884 feet done in 1979. Diamond-drill footage totalled 61 700 feet compared to 37 637 feet in 1974. Of this, 18 650 feet was deep exploration drilling from the 29th level, 5000 feet was categorized as exploratory drilling in other areas, and the remainder was done for ore definition purposes and mine development. Presently, there are 680 people employed by Dome at its South Porcupine operation, up from 650 a year ago. It was announced this year that the Dome mine will undergo a \$75 million expansion over a four year period. A new 5400 foot shaft will be sunk from the surface to the 37th level (5200 feet below surface) and the mill will be expanded from the current capacity of 2000 tons per day to 3000 tons per day. The work force is expected to increase by 200 employees (Dome Mines Limited, personal communication).

In 1980 Pamour Porcupine Mines Limited produced gold and copper ore from 9 separate properties, with milling done at its two 3000 tons per day capacity mills lo-



cated at the Schumacher Division Mine and the Pamour No. 1 Mine. Ore was mined from the old Matachewan Consolidated property (open pit) near Matachewan, the Canadian Arrow property (open pit), and the Ross Mine (underground) in Hislop township. These are all within the Kirkland Lake Resident Geologist's Area. Production from the Timmins area included: the Gold Hawk Property (open pit) in Macklem-Cody Townships. Falconbridge Copper Limited owned Hoyle property (underground and open pit), Pamour No. 1 (underground) in Whitney Township, Schumacher Division (underground) formerly the McIntyre and Coniaurum mines in Tisdale Township, Timmins Property (open pit) formerly Hollinger Mine in Tisdale Township, and Pamour No. 3 (formerly Aunor Mine) in Deloro Township. Minor underground production came from the Delnite property and the Romfield (formerly Buffalo Ankerite) property through the Pamour No. 3 workings. A minor amount of underground development ore was milled from the recently reopened Pamour No. 2 (Hallnor) Mine. Pamour Porcupine Mines Limited announced that it will reopen and begin mining from the underground workings of the Timmins property (Hollinger). A headframe and hoisting equipment has been purchased for the Main Shaft. A letter of intent has been signed between Pamour Porcupine Mines Limited, Broulan Reef Mines Limited, and Hugh-Pam Porcupine Mines Limited for Pamour Porcupine Mines Limited to possibly explore for and mine gold ore from the properties of these former producers. If an agreement is reached, access will be from the adjacent Pamour No.2 workings (formerly Hallnor mine), which is currently under development, however, ore close to the surface near the old Broulan shaft may be mined underground by driving a decline down. Pamour Porcupine Mines Limited has significantly increased its exploration efforts in the Timmins area. Emphasis is placed on exploring for new ore on its presently

owned and optioned properties at this time (Pamour Porcupine Mines Limited owns and controls approximately 14,000 acres of mineral property in Northern Ontario). Pamour Porcupine Mines Limited presently employes 1282 people in its mining and milling operations. (Pamour Porcupine Mines Limited staff, personal communication).

Pamour Porcupine Mines Limited custom milled a minor amount of material in 1980 from other non-company sources including: Tisdale Davidson (Timmins area) 914 tons, Rose Gold (Sudbury area), 2909 tons, and Sirola (Gowganda area) 1962 tons (Pamour Porcupine Mines Limited, personal communication).

The Joburke Mine in Keith Township is optioned to Noranda Mines Limited and operated by Mining Corporation of Canada Limited. The ore is trucked to, and processed at, the Pamour No. 1 mill. This underground mine is being operated by 45 people and produces 400 tons per day at an average grade of just over 0.10 ounce per Au per ton. The operation is scheduled to close in mid-1981. (Mining Corporation of Canada Limited staff, personal communication).

## Industrial Minerals

Steeley Talc, wholly-owned subsidiary of the Steeley Company of the United Kingdom processed 8200 tons of talc product from 31 500 tons of ore in 1980. This is an increase from 3000 tons of product from 12 000 tons of ore produced in 1979. The talc-magnesite ore is mined and milled in Penhorwood Township, and further processing is carried out in Timmins. The company's product is obtained from one of the few talc beneficiating plants in the world. Steeley Talc employs 30 people in the Timmins area, an increase from 22 people employed in 1979 (Steeley Talc staff, personal communication).

# 1980 Report of The Kirkland Lake Resident Geologist

H. L. Lovell<sup>1</sup> and G. P. B. Grabowski<sup>2</sup>

## Contents

Introduction .....	86
Resident Geologist's Office Activities .....	87
Mining Activity .....	88
Cobalt Area .....	88
Agnico-Eagle Mines Limited .....	88
Langis Mine .....	88
Canadaka Mines Limited .....	88
Pansilver Partnership .....	88
"Mud Mine" .....	88
Silver Century Explorations Limited .....	88
King Edward Mine .....	88
Teck Corporation Limited .....	88
Silver Summit Mine .....	88
Teledyne Canada Limited .....	88
Consolidated Professor Mine .....	88
Gowganda Area .....	89
Agnico-Eagle Mines Limited .....	89
Castle-Trethewey Mine .....	89
Northern Silver Fox Resources Incorporated .....	89
Big Jackpot Mine .....	89
Peerless Silver and Cobalt Exploration Limited .....	89
Coleroy Mine .....	89
Sandy K Explorations .....	89
Lower Bonsall Mine .....	89
Si-Balt Associates Limited .....	89
Rusty Lake Mine .....	89
Tut Explorations Incorporated .....	89
Lake Caswell Mine .....	89
Kirkland Lake Area .....	89
Thunderwood Explorations Limited .....	89
Martin-Bird Mine .....	89
Silcon Holdings .....	89
Matachewan Area .....	89
Camart Mines Limited .....	89
Pamour Porcupine Mines Limited .....	89
Matachewan Consolidated Mine .....	89
Young Davidson Mine .....	89
United Asbestos Incorporated .....	89
Midlothian Mine .....	89
Matheson Area .....	89
Larder Resources Incorporated .....	89
Hardill Property (Blue Quartz Mine) .....	89
Pamour Porcupine Mines Limited .....	103
Canadian Arrow Mine .....	103
Property Examinations .....	103

R. Allerston Gold Occurrence (1) .....	103
Zavitz and Hincks Townships .....	103
Dex Minerals Limited Lithium Occurrence (2) .....	103
Steele Township, Concession V, Lot 5 .....	103
M. Dymont and J. Kidston Gold Occurrence (3) .....	103
Teck Township .....	103
Edomar Resources Incorporated Gold Occurrence (4) ..	103
McVittie Township .....	103
Gateford Mines Limited Gold-Silver Past Producer (5) ...	104
Teck Township .....	104
Kirkland Lake-to-Murdock Creek Drainage Tunnel	
Gold Occurrence (6) .....	104
Teck Township .....	104
Laguerre Gold-Silver Prospect (7) .....	104
McVittie Township .....	104
Silcon Holdings – Gold Occurrence (8) .....	104
Playfair Township .....	104
Solomino Gold Occurrence (9) .....	105
Chamberlain-Dack Townships Boundary Area .....	105
S. Welsh and R. Sheedy Gold Occurrence (10) .....	105
Cairo Township .....	105
Ontario Geological Survey Activities .....	105
Kirkland Lake Incentive Program (KLIP) Projects .....	105
Northern Ontario Geological Survey (NOGS) Projects .....	105
Research by Other Agencies .....	105
Recommendations for Exploration .....	106
Selected References .....	107

## Tables

1 – Summary of Activity in the Larder Lake Mining	
Division – 1955 to Present .....	87
2 – Maps and Reports Pertaining to the Kirkland Lake	
Resident Geologist's District .....	88
3 – Assessment Work and Other Information Received	
in 1980 .....	90

## Figures

1, 1a, 2 – Resident Geologist's District .....	98, 99, 100
3 – Resident Geologist's District and Cobalt Embayment	
Paleoplacer Gold Potential .....	101
4 – Claims Graph .....	102

## Introduction

Claim staking rose to its highest level since 1967, and mineral exploration assessment work rose to its highest level since 1968 (Table 1). In 1967 and 1968 activity

<sup>1</sup>Resident Geologist, Ontario Ministry of Natural Resources, 4 Government Road East, Kirkland Lake, P2N 1A2, telephone (705)567-5242.

<sup>2</sup>Resource Geologist.

was high, primarily because of the spillover from Texasgulf Incorporated's Timmins discovery. In 1980, activity was high, primarily because the price of gold approximately doubled from the 1979 average price, and because of the combined federal-provincial release of Kirkland Lake Initiatives Program (KLIP) airborne geophysical maps etc., stimulating claim staking and resultant follow-up work. Gold and silver-cobalt exploration, however, was retarded by the ongoing Bear Island Indian Caution, which prevented recording new mining claims in the high mineral potential areas of Matachewan, Shining Tree, Gowganda, Elk Lake, Cobalt, and Silver Centre.

The graph (see Figure 4) illustrates exploration trends since 1907.

## Resident Geologist's Office Activities

Permanent staff at the Kirkland Lake office included: H.L. Lovell, Resident Geologist, G.P.B. Grabowski, Resource Geologist, and Faye M. St. Jean, Secretary.

**TABLE 1** | SUMMARY OF ACTIVITY IN THE LARDER LAKE MINING DIVISION -- 1955 TO PRESENT.

Year	Claims Recorded	Claims Cancelled	Diamond Drilling	Geophys. Surveys	Geological Surveys	Power Equip.	Manual Labour	Other Work	Total Man Days
1980*	5,095	1,498	49,051	82,017	10,861	5,920	3,788	5,759	157,396
1979	4,261	1,452	29,714	25,352	4,960	4,990	2,617	1,130	68,763
1978	1,710	2,065	32,602	38,100	8,887	3,876	1,583	2,096	87,144
1977	1,826	2,834	37,101	45,436	1,820	3,763	1,779	9,093	98,992
1976	2,350	2,979	47,724	42,338	6,220	3,871	1,654	1,129	102,936
1975	2,916	5,010	45,880	38,047	6,738	3,079	3,257	1,623	98,624
1974	4,757	2,296	40,678	55,716	4,441	5,006	3,688	636	110,165
1973	3,260	3,214	34,113	35,811	8,150	8,618	5,036	888	92,616
1972	3,253	4,740	39,371	52,351	3,358	3,819	3,554	3,573	106,026
1971	4,065	3,846	29,433	48,785	4,764	7,678	4,287	2,100	97,047
1970	4,315	3,704	25,615	28,683	4,133	6,795	5,891	2,040	73,157
1969	3,404	5,273	50,892	45,713	15,829	6,163	8,018	3,570	130,185
1968	4,171	7,909	74,649	82,637	5,799	5,085	9,067	3,200	180,437
1967	5,450	7,341	79,172	29,073	4,032	9,688	15,261	6,260	143,600
1966	7,606	11,101	117,544	30,971	8,050	7,430	15,357	3,000	182,352
1965	9,331	6,906	123,129	88,259	6,530	15,551	17,610	5,990	257,029
1964	12,842	3,884	77,807	32,644	11,725	9,045	12,113	2,764	149,198
1963	4,710	3,895	95,696	16,241	4,226	7,790	12,914	1,760	138,627
1962	4,675	4,028	63,003	5,494	5,099	5,716	15,227	2,680	97,219
1961	3,749	4,451	47,862	5,494	1,118	8,577	12,364	3,960	79,375
1960	5,024	6,747	75,123	7,296	4,751	3,739	12,563	960	104,632
1959	6,419	5,594	22,947	3,792	1,404	2,857	13,276	2,680	80,322
1958	8,582	7,108	37,381	7,481	1,941	4,776	12,564	2,640	66,783
1957	4,664	8,212	95,934	12,593	3,948	3,474	18,283	5,560	139,891
1956	9,673	3,594	77,879	20,982	6,693	3,425	15,975	5,940	130,894
1955	4,182	3,999	75,561	3,389	3,529	1,326	18,024	4,190	105,925

\* to Nov. 30

NOTE: 1955 to 1967 includes Larder Lake, Montreal River and Timiskaming Mining Divisions. In 1968, Montreal River and Timiskaming Divisions were combined with the Larder Lake Division.

## NORTHERN — KIRKLAND LAKE

Activities of the Resident Geologist's Office included:

- 1 – Continuing work on a geological map and Miscellaneous Paper on Gauthier Township.
- 2 – Preparation of Data Series maps for 27 townships.
- 3 – Examination of, and reporting on, 40 active and inactive mineral properties and areas.
- 4 – Evaluation of bedrock and aggregate mineral potential for four land use plans (James, Armstrong, and Coleman Townships official Municipal plans, and Lake Abitibi plan).
- 5 – Examination and collection of about 3000 m of diamond-drill core.
- 6 – Monitoring 12 Ontario Geological Survey and other field parties.
- 7 – Guiding economic geological field trips in the Kirkland Lake and Cobalt areas for mineral explorationists, government, university, and foreign geologists, and Junior Forest Rangers.
- 8 – Responding to 2100 inquiries from the mining and exploration industry, government personnel, and the general public.

**TABLE 2** | MAPS AND REPORTS PERTAINING TO THE KIRKLAND LAKE RESIDENT GEOLOGIST'S DISTRICT, ISSUED BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES, IN 1980.

**OGS REPORTS**  
Report 190

**MISCELLANEOUS PAPERS**  
MP 88    MP 91    MP 92    MP 96

**OPEN FILE REPORTS**  
OFR 5289   OFR 5302   OFR 5304   OFR 5310  
OFR 5290   OFR 5303   OFR 5306

**MINERAL POLICY BACKGROUND PAPER**  
MPBP 10   MPBP 11

**COLOURED MAPS**  
Map 2445   Map 5021   Map 5024   Map 5031   Map 5037  
Map 5019   Map 5022   Map 5025   Map 5034   Map 5038  
Map 5020   Map 5023   Map 5028   Map 5035   Map 5039

**PRELIMINARY MAPS**  
P. 866    P. 872    P. 881    P. 2300   P. 2381  
P. 871    P. 879    P. 2296   P. 2313   P. 2382

## Mining Activity

In 1980 operations in the Kirkland Lake Area increased to a total of 15 mines, 15 developing mines, eight mills, and two refineries, producing gold-silver bullion, gold-silver ore containing by-product copper, silver-cobalt concentrates, refined silver, iron ore pellets, serpentine filler, and barite. In addition many gravel pits were operated.

### Cobalt Area

#### Agnico-Eagle Mines Limited

##### Langis Mine

A new headframe was raised at the No.3 shaft, and the underground workings were de-watered to facilitate exploration and development of silver-cobalt ore.

#### Canadaka Mines Limited

By the end of 1980 all underground operations were suspended. Milling of the Chambers-Ferland silver-cobalt tailings is planned during the warm months of 1981.

#### Pansilver Partnership

##### "Mud Mine"

The shaft was re-collared and a new headframe was raised. The underground workings were de-watered, and development of the silver-cobalt ore was started.

#### Silver Century Explorations Limited

##### King Edward Mine

The adit was renovated and the underground shaft was rehabilitated before developing silver ore.

#### Teck Corporation Limited

##### Silver Summit Mine

Underground drifting and diamond-drilling were begun from Teck Corporation's adjoining Silverfields Mine to evaluate ore-making potential.

#### Teledyne Canada Limited

##### Consolidated Professor Mine

A decline ramp was begun that is designed for scoop tramping cobalt ore. The ramp is developed next to the past cobalt producer, the Agnico.

## **Gowganda Area**

### **Agnico-Eagle Mines Limited**

#### **Castle-Trethewey Mine**

Ore from the Castle Number 3 shaft area, a past producer of silver, was mined and trucked to Agnico's Penn Mill near Cobalt.

### **Northern Silver Fox Resources Incorporated**

#### **Big Jackpot Mine**

As funds became available, the adit drive was extended into the vein which was assayed at 86 ounces of silver per ton across 10 cm (J. Willars, personal communication).

### **Peerless Silver and Cobalt Exploration Limited**

#### **Coleroy Mine**

A new headframe was raised and the underground workings were de-watered to the 388-foot level.

### **Sandy K Explorations**

#### **Lower Bonsall Mine**

A new headframe was raised, the underground workings were de-watered, and development of ore was begun on the former producing silver property of Siscoe Metals of Ontario Limited.

### **Si-Balt Associates Limited**

#### **Rusty Lake Mine**

The shaft and underground workings were renovated preparatory to beginning the mining and trucking of ore to a Cobalt silver mill. The ore reserves had been inferred during prior years. Operations were suspended by the end of 1980.

### **Tut Explorations Incorporated**

#### **Lake Caswell Mine**

Renovation of the old mine site began, preparatory to de-watering and going underground in 1981 to explore and develop gold-silver ore.

### **Kirkland Lake Area**

### **Thunderwood Explorations Limited**

#### **Martin-Bird Mine**

An access road and bridge were built and soil stripping

was begun preparatory to open cut mining gold-silver ore.

### **Silcon Holdings**

During the winter of 1979-1980 a decline ramp was driven under a vein zone that had been trenched and sampled at the surface. The stockpile of development muck totals about 700 tons of gold and copper-bearing material (M. Gray, personal communication).

### **Matachewan Area**

### **Camart Mines Limited**

The decline shaft portal of the Ashley Mine was renovated. During the summer of 1980 ore was mined, handcobbed, and stockpiled.

### **Pamour Porcupine Mines Limited**

#### **Matachewan Consolidated Mine**

Open pit mining at this former gold-silver producer continued into December 1980. The ore, grading in the range of 0.1 ounce of gold per ton, was trucked 175 km to the Pamour No. 1 mill. Considerable air track and diamond-drilling work was done, and the shaft was de-watered.

#### **Young Davidson Mine**

Air track and diamond-drilling was done by Pamour Porcupine Mines Limited at this gold and silver producer, which adjoins the Matachewan Consolidated Mine.

### **United Asbestos Incorporated**

#### **Midlothian Mine**

The mill was cleaned up, and the pilot mill was put into operation to process some of the 5000 tons of ore remaining in the dry storage (J. Hagen, personal communication).

### **Matheson Area**

### **Larder Resources Incorporated**

#### **Hardill Property (Blue Quartz Mine)**

The shaft collar was renovated and the underground workings de-watered preparatory to undertaking planned underground exploration and development.

NORTHERN — KIRKLAND LAKE

**TABLE 3** ASSESSMENT WORK AND OTHER INFORMATION RECEIVED TO NOVEMBER 30, 1980, KIRKLAND LAKE RESIDENT GEOLOGIST'S DISTRICT, NORTHERN REGION.

[For abbreviations used, see end of Table]

LOCATION	NTS	FILE NAME	COM-MODIFY SOUGHT	TYPE OF REPORT	TYPE OF WORK	YEAR	TORONTO FILE NO.
ALMA	42-A-2	Ames, B.F.		Assessment	HEM	1979	2.3230
ALMA	42-A-2	Sylva Exploration Limited (Beverdam Group)		Assessment	VLF-EM, Mag. Gc	1979	2.3177
				Assessment	VLF-EM, Mag	1979	2.3206
ARNOLD & KATRINE	32-D-4	Long Lac Mineral Exploration Limited "Perry Project"		Assessment	DDH (8)	1980	
ASQUITH	41-P-11	Annett, R.		Assessment	DDH (1)	1980	
ASQUITH	41-P-11	Dome Exploration Canada Limited		Assessment	Mag.	1980	2.3261
ASQUITH & CHURCHILL	41-P-11	Patino Mines Limited		Assessment	Mag. VLF-EM	1979	
ASQUITH	41-P-11	Sullivan, Wm. J.		Assessment	DDH (2)	1980	
BEATTY	42-A-9	Amax Minerals Exploration "Beatty 1"		Assessment	AEM, AM	1979	2.2951
BEATTY	42-A-9	Amax Minerals Exploration "Beatty 2"		Assessment	GL DDH (2)	1979	2.3114
BEATTY	42-A-9	Foster, W.		Assessment	DDH (1)	1980	
BEATTY	42-A-9	Gulf Minerals Canada Limited		Assessment	DDH (2)	1979	
BEN NEVIS	32-D-5	Harper, H.G.		Assessment	Mag. VLF-EM	1979	2.3118
BEULAH	41-P-3	Vermillion Placers, Incorporated	Au	Donation	Gc	1980	
GARIBALDI	41-P-6						
HODGETTS							
MARSHAY							
MOFFAT							
BLACK	42-A-8	Card Lake Copper Mines Limited	Au, Zn, Cu	Assessment	DDH (20)	1980	
BLACK	42-A-8	McKinnon, D.		Assessment	DDH (3)	1980	
BLACK	42-A-8	Teck Explorations Limited	Au	Assessment	VLF-EM	1980	2.3351
BOSTON	32-D-4	Parsons, G.E.		Assessment	VLF-EM	1980	2.3277
BUCKE	31-M-5	Armstrong, J.	Ag, Co	Assessment	DDH (1)	1980	
BRYCE	41-P-9	Gore, J.A.		MEAP CG-167	Mag. VLF, HEM	1980	2.3292
CABOT	41-P-11	Amax Minerals Exploration		Assessment	AM	1980	2.3284
CAIRO & POWELL	41-P-15	Extender Products Limited	Barite	MEAP CG-145 CG-148	GL, DDH (1)	1979	
CAIRO	41-P-15	Matachewan Consolidated Mines Limited		Donation	u/g	1941	
CAIRO	41-P-15	Newmont Exploration of Canada Limited		Assessment	VLF-EM, Mag	1979	2.3016
				Assessment	GL	1979	2.3027
				Assessment	Mag, VLF-EM	1979	2.3078
				Assessment	IP	1979	2.3326
				Assessment	Mag	1979	2.3330

Table 3 – Continued

LOCATION	NTS	FILE NAME	COM-MODITY SOUGHT	TYPE OF REPORT	TYPE OF WORK	YEAR	TORONTO FILE NO.
CAIRO	41-P-15	Sylva Explorations Limited "Cairo West Group"		Assessment	Mag, VLF-EM, Gc	1979	2.3050
CANE	41-P-9	Cane Consolidated Explorations Limited	Ag	Assessment	DDH (9)	1980	
CATHARINE	31-M-13	Link, D.S.; Link W.O.	Au, Ag	Assessment	DDH (1)	1979	2.3022
CATHARINE	31-M-13	MacGregor, R.A.		Assessment	DDH (1)	1979	2.3333
CATHARINE	31-M-13	MacGregor, R.A.		MEAP KL-135	VLF-EM, Mag	1980	2.3232
CHESNEY BAY & NORTHEAST BAY, IROQUOIS POINT, RAYNER LAKE, SULPHUR ISLAND, PURVIS	32-D-12, 13 42-A-9, 16	Rio Tinto Canadian Exploration		Assessment	AM	1980	3.3242
CHURCHILL	41-P-11	Dome Exploration Canada Limited		Assessment	Mag	1980	2.3262
CHURCHILL & ASQUITH	41-P-11	Patino Mines Limited		SEE UNDER ASQUITH TOWNSHIP			
COLEMAN	31-M-5	Armstrong, J.E.		Assessment	DDH (5)	1980	
COLEMAN	31-M-5	Malouf, M.		Assessment	VLF-EM	1979	2.3174
COLEMAN	31-M-5	St. Joseph Explorations "North Gillies Lake Claims"		Assessment	Mag. HEM	1980	2.3208
COLEMAN	31-M-5	Silverfields Mining Corporation Limited		Donation	u/g, GL	1980	
COLEMAN	42-A-9	Amax Minerals Exploration "Coulson-1"		Assessment	GL	1979	2.3112
DACK	31-M-13	Mowat, A.		Assessment	Mag, VLF-EM	1979	2.3091
EBY	42-A-1	Harrington, P.		Assessment	DDH (2)	1980	
EBY	42-A-1	Reed, J.D.		Assessment	DDH (2)	1980	
EDWARDS	42-A-15	Great Bear Silver Mines Limited "Frodac Consolidated Energy Resources Limited"		OSC	Pros.	1980	
FIRSTBROOK	31-M-5	St. Joseph Explorations Limited		Assessment	Mag. HEM	1979	2.3190
FRECHEVILLE	32-D-12	Britton, W.		Assessment	HEM, VLF-EM, Mag	1979	2.3155
GALNA & KERRS	42-A-16	Dome Exploration Canada Limited		Assessment	Mag, HEM, DDH (7)	1979	2.3001
GARIBALDI	41-P-6	Vermillion Placers, Incorporated		SEE UNDER BEULAH TOWNSHIP			
GARRISON	32-D-5	Amax Minerals Exploration "Garrison-1"		Assessment	GL	1979	2.3111
GARRISON	32-D-5	Amax Minerals Exploration "Garrison-2"		Donation	DDH (1)	1980	
GARRISON	32-D-5	Amax Minerals Exploration "Garrison-2"		Assessment	GL	1979	2.3122
GARRISON	32-D-5	Windjammer Power and Gas		Assessment	DDH (2)	1980	
GAUTHIER	32-D-4	Brock Gold Mines Limited		Donation	u/g	1941	
GAUTHIER	32-D-4	International Nickel Company of Canada Limited		MEAP KL-123	DDH (5)	1979	
GAUTHIER	32-D-4	MacGregor, R.A.		MEAP KL-133	Mag. GL	1979	2.3028
GAUTHIER	32-D-4	MacGregor, R.A.		KL-134	GL	1980	2.3211
GAUTHIER	32-D-4	Queenston Gold Mines Limited		Donation	Annual report	1979	

Table 3 – Continued on next page

*NORTHERN — KIRKLAND LAKE*

**Table 3 — Continued**

LOCATION	NTS	FILE NAME	COM-MODITY SOUGHT	TYPE OF REPORT	TYPE OF WORK	YEAR	TORONTO FILE NO.
GAUTHIER	32-D-4	Upper Canada Mines Limited		Donation	u/g	1942	
GRENFELL	42-A-1	Sirola, J.		MEAP KL-141	GL	1980	
GUIBORD & MICHAUD	42-A-89	Cominco Limited — Gib Property	Au	Assessment	DDH (6)	1979	
GUIBORD	42-A-9	Cominco Limited — Gib Property	Au	Assessment	DDH (4)	1980	
HALLIDAY & SOTHMAN	41-P-14	Allerston, R.E.	Cu, Zn	Assessment	DDH (1)	1979	
HALLIDAY	41-P-14	Northgate Exploration Limited "Allerston Option"		Assessment	DDH (2)	1979	
HARKER	32-D-12	Amax Minerals Exploration "Harker-1"		Assessment Assessment	Mag, AEM GL	1979 1979	2.3132 2.3165
HARKER	32-D-12	Amax Minerals Exploration "Harker-2"		Assessment	GL	1979	
HARKER	32-D-12	Amax Minerals Exploration "Harker-3"		Assessment Assessment	GL DDH (1)	1979 1980	2.3141
HEARST & MCELROY	32-D-4	Falconbridge Copper Limited		Assessment	Mag. HEM GL, Gc rtr	1978 1979 1980	2.2614
HEARST	32-D-4	Falconbridge Copper Limited		Assessment	DDH (2)	1979	
HEARST	32-D-4	Falconbridge Copper Limited "Cunningham Option"		MEAP KL-121	GL, rtr	1980	
HEARST	32-D-4	Ingamar Explorations Limited		Assessment	Mag, VLF-EM	1980	2.3421
HEARST & MCFADDEN	32-D-4	MacGregor, R.A. "Group 3"		Assessment	DDH (1)	1980	
HEARST	32-D-4	MacGregor, R.A. "Group 2" East		Assessment	DDH (3)	1980	
HEARST	32-D-4	Robbins, C.D. (Quoddy Investment Company)	Au	Assessment	Mag	1980	2.3197
HEARST	32-D-4	Sudbury Contact Mines Limited	Au	Assessment	A	1980	2.3273
HINCKS	42-A-3	Newmont Exploration of Canada Limited, "Blocks A & B" Zavitz Project		Assessment Assessment Assessment	Mag. DDH (1) Mag.	1980 1980 1980	2.3180 2.3327
HINCKS	42-A-3	Newmont Exploration of Canada Limited "Blocks C & D" Zavitz Project		Assessment	Mag. VLF-EM	1980	2.3328
HISLOP	42-A-9	Ginn, A.P.	Au	MEAP KL-145	DDH (16)	1980	
HISLOP	42-A-9	Ginn, A.P.		Assessment	GL Mag	1979	2.3182
HISLOP	42-A-9	Ginn, A.P.		Assessment	DDH (2)	1980	
HISLOP	42-A-9	Ginn, A.P.	Au	MEAP KL-125	DDH (4)	1978	
HODGETTS	41-P-3, 6	Vermillion Placers Incorporated		SEE UNDER BEULAH TOWNSHIP			
HOLMES	42-A-2	Sylva Explorations Limited "Group of Seven"		MEAP CG-150	GL, HEM	1980	2.3271
				MEAP CG-150	rtr	1979	
HOLLOWAY	32-D-12	Amax Minerals Exploration "Holloway-1"		Assessment	GL	1979	2.3140
INGRAM	31-M-13	Marshall, F.		Assessment	DDH (2)	1980	
IROQUOIS POINT	32-D-12, 13 42-A-9, 16	Rio Tinto Explorations Limited		SEE UNDER CHESNEY BAY			



Table 3 – Continued

LOCATION	NTS	FILE NAME	COM-MODITY SOUGHT	TYPE OF REPORT	TYPE OF WORK	YEAR	TORONTO FILE NO.
KATRINE	32-D-4	Long Lac Mineral Exploration Limited "Perry Project"		SEE UNDER ARNOLD TOWNSHIP			
KATRINE & OSSIAN	32-D-4	Walsh-Katrine Gold Mines Limited	Au	Donation	u/g	1929	
KERRS	42-A-9	Dome Exploration (Canada) Limited		SEE UNDER GALNA TOWNSHIP			
KERRS	42-A-9, 16	Dome Exploration (Canada) Limited "Camp Creek Group"		Assessment	DDH (4)	1979	
	42-A-16			Assessment	EM, Mag	1979	2.3149
KERRS & RAYNER LAKE AREA	42-A-9	Noranda Explorations Company Limited		Assessment	Mag	1979	2.3025
KERRS	42-A-9	Noranda Explorations Company Limited		Assessment	OV DH (15)	1980	2.3241
KNIGHT & TYRRELL	41-P-11	Tyranite Mines Limited	Au	Donation	u/g	1941	
KNOX	42-A-9	Dome Exploration (Canada) Limited		Assessment	DDH (11)	1979	
LAMPLUGH	32-D-12	Amex Minerals Exploration "Lamplugh-1"		Assessment	GL	1979	2.3142
				Assessment	GL	1979	
LEBEL	32-D-4	Bidgood Kirkland Gold Mine Limited	Au	Donation	u/g	1941	
LEBEL	32-D-4	Canadian Nickel Company Limited "Lebel Oro"		Assessment	Mag	1979	2.3310
LEBEL & TECK	42-A-1	Dane Copper	Cu	Donation	DDH (2)	1979	
LEBEL	32-D-4	International Nickel Company of Canada Ltd.	Au	SEE UNDER GAUTHIER TOWNSHIP			
LEBEL	32-D-4	Labine, M.J.		Assessment	Mag	1979	2.3310
LEBEL	32-D-4	Morris-Kirkland Gold Mine Limited	Au	Donation	u/g	1940	1941
LEBEL	32-D-4	Northgate Exploration Limited (Lebel Lode Prop.)	Au	Assessment	DDH (4) Ra, Gc Mag, VLF-EM	1979	
LEBEL	32-D-4	Queenston Gold Mines Limited (McTavish Group)		Assessment	DDH (2)	1980	
LEBEL & TECK	42-A-1	Toburn Mines Limited	Au	Donation	u/g	1941	
LORRAIN	31-M-5	Armstrong, J.E.	Ag	Assessment	DDH (1)	1980	
LORRAIN	31-M-5	Teck Explorations Ltd. "MacAllister option"	Ag, Cu, Ni, Co	Assessment	DDH (2) DDH (3) GL, Mag	1979 1980	
MAISONVILLE	42-A-1, 8	Bronson Mines Limited		Assessment	VLF-EM	1980	2.3274
MAISONVILLE	42-A-8	Lacana Mining Corporation		Assessment	DDH (4)	1980	
MARSHAY		Vermillion Placers Incorporated		SEE UNDER BEULAH TOWNSHIP			
MELBA	42-A-8	Rosario Resources Canada Ltd.	Cu, Zn	MEAP KL-124	DDH (2), IP, VLF-EM, Gr, GL	1979	

Table 3 – Continued on next page

NORTHERN — KIRKLAND LAKE

Table 3 — Continued

LOCATION	NTS	FILE NAME	COM-MODITY SOUGHT	TYPE OF REPORT	TYPE OF WORK	YEAR	TORONTO FILE NO.
MICKLE	41-P-9, 10	Cameron Silver, Cobalt Property	Ag, Co	Assessment	VLF-EM, Mag, GL	1979	2.3160
MICHAUD	42-A-9	Amax Minerals Exploration "Michaud 2"		Assessment	GL	1979	2.3108
MICHAUD	42-A-9	Amax Minerals Exploration "Michaud-3"		Assessment	GL	1979	2.3143
MICHAUD	42-A-8, 9	Cominco Limited (Gib Property)		SEE UNDER GUIBORD TOWNSHIP			
MICHAUD	42-A-8	Falconbridge Nickel Mines Ltd. (Marchaud Option)		MEAP KL-139	DDH (1) OV DH (8) Mag, VLF-EM, IP rtr	1980	2.3248
MICHAUD	42-A-8	Windjammer Power & Gas		SEE UNDER GARRISON TOWNSHIP			
MILLIGAN	42-A-9	Amax Minerals Exploration "Warden 2"		Assessment	GL	1979	2.3106
MOFFAT	41-P-6	Vermillion Placers Incorporated		SEE UNDER BEULAH TOWNSHIP			
MONTROSE	41-P-15	Golden Bounty Mining Company Limited		OSC	Pros.	1980	
MORRISETTE	32-D-4	Rosario Resources Canada Limited		Assessment	DDH (4)	1979	
MUNRO & MCCOOL	42-A-9	Amax Minerals Exploration "Munro-1"		Assessment	AEM, AM, GL	1979	2.3115
MUNRO & WARDEN	42-A-9	Amax Minerals Exploration "Munro-2"		Assessment	AM, AEM GL	1979 1979	2.3299 2.3131
MUNRO	42-A-9	Amax Minerals Exploration "Munro-3"		Assessment	GL	1979	2.3113
MUNRO	42-A-9	Amax Minerals Exploration "Munro-4"		Assessment	DDH (1)	1980	
MCCOOL	42-A-9	Amax Mineals Exploration "McCool-1"		Assessment	AM, AEM GL	1979 1979	2.3298 2.3110
MCCOOL	42-A-9	Amax Minerals Exploration "McCool-2"		Assessment	GL DDH (1)	1979 1979	2.3107
MCCOOL	42-A-9	Amax Minerals Exploration "McCool-3"		Assessment	GL	1979	2.3133
MCCOOL	42-A-9	Amax Minerals Exploration "McCool-4"		Assessment	GL	1979	
MCCOOL	42-A-9	Amax Minerals Exploration "McCool-6"		Assessment	GL AM, AEM	1979 1979	2.3121 2.3382
MCCOOL	42-A-9	Amax Minerals Exploration "McCool-7"		Assessment	DDH (2)	1979	
MCCOOL	42-A-9	Amax Minerals Exploration "McCool-8"		Assessment	GL DDH (1)	1979	2.3109
MCCOOL	42-A-9	Amax Minerals Exploration "Munro 1"		SEE UNDER MUNRO TOWNSHIP			
MCELROY	32-D-4	Cathroy Larder Mines Limited		Donation	u/g	1941	
MCELROY	32-D-4	Chorzepa, E.		Assessment	DDH (1)	1980	2.2167
MCELROY	32-D-4	Falconbridge Copper Limited		SEE UNDER HEARST TOWNSHIP			
MCELROY	32-D-4	Falconbridge Copper Limited "Misema River North"		MEAP KL-121	Mag, VLF-EM	1980	2.3328

Table 3 — Continued on next page

Table 3 – Continued

LOCATION	NTS	FILE NAME	COM-MODIFY SOUGHT	TYPE OF REPORT	TYPE OF WORK	YEAR	TORONTO FILE NO.
MCFADDEN	32-D-4	MacGregor, R.A.		SEE UNDER HEARST TOWNSHIP			
MCGARRY	32-D-4	Chesterville Mines Limited	Au	Donation	u/g	1942	
MCGARRY & MCVITTIE	32-D-4	Edomar Resources Incorporated	Au	O.S.C.	Pros.	1980	3.3715
MCGARRY	32-D-4	Lee Geo-Indicators Limited	Au	Assessment	GL	1979	2.3006
MCGARRY	32-D-4	Walker, J.O.		MEAP KL-122	GL	1979	
MCNEIL	42-A-2	King, M.; Weekley, L.		Assessment	DDH (4)	1980	
MCNEIL	42-A-2	King, M.; Weekley, L.		Assessment	Mag. VLF-EM Sp.	1980	2.3349
MCVITTIE	32-D-4	Edomar Resources Incorporated		SEE UNDER MCGARRY TOWNSHIP			
MCVITTIE	32-D-4	Lenora Exploration	Au	MEAP KL-138	rtr	1979	
MCVITTIE	32-D-4	Omega Gold Mines Limited	Au	Donation	u/g	1941	
MCVITTIE	32-D-4	Queenston Gold Mines Limited	Au	Assessment	DDH (7)	1980	
MCVITTIE	32-D-4	Rio Tinto Canadian Exploration		Assessment	DDH (5)	1979	
MCVITTIE	32-D-4	Smith, L.		Assessment	DDH (2)	1980	
NORTHEAST BAY	32-D-12, 13 42-A-9, 16	Rio Tinto Canadian Exploration		SEE UNDER CHESNEY BAY			
OSSIAN	32-D-4	Walsh-Katrine Gold Mines		SEE UNDER KATRINE TOWNSHIP			
OTTO	42-A-1	Gateford Mines Limited		Donation	GL	1950	
OTTO	42-A-1	Kirkland Golden Gate Mines		Donation	GL	1950	
OTTO & TECK	42-A-1	Queenston Gold Mines Limited	Au	Assessment	GL, DDH (2)	1979 1980	
OTTO	42-A-1	Reed, J.D.		SEE UNDER EBY TOWNSHIP			
PACAUD	41-P-16	Laskowski, H.		Assessment	IP, Mag, VLF-EM	1979	2.2987
POWELL	41-P-15	Extender Products Limited		SEE UNDER CAIRO TOWNSHIP			
POWELL	41-P-15	Fiset, R.; Campbell, D.; King, H.		Assessment	VLF-EM, Mag	1979	2.3116
POWELL	41-P-15	King, H.	Au	MEAP CG-158	rtr	1978	
POWELL	41-P-15	Matachewan Consolidated Mines Limited		SEE UNDER CAIRO TOWNSHIP			
POWELL	41-P-15	Sylva Explorations "Bloom Lake Group"		Assessment	GL	1980	2.3215
POWELL	41-P-15	Young-Davidson Mines Limited		Donation	u/g	1941	
PURVIS	32-D-12, 13 42-A-9, 16	Rio Tinto Explorations Limited		SEE UNDER CHESNEY BAY			
RAYNER LAKE	42-A-9	Noranda Exploration Company Limited		SEE UNDER KERRS TOWNSHIP			
RAYNER LAKE	32-D-12, 13 42-A-9, 16	Rio Tinto Explorations Limited		SEE UNDER CHESNEY BAY			
RICKARD	42-A-10	Hollinger Mines Limited "Rickard-1"		Assessment	Mag.	1979	2.3103
SKEAD	31-M-13 32-D-4	MacGregor, R.A. "Group B1"		MEAP KL-131	VLF-EM Mag, GL	1979 1980	2.2956 2.3203
SKEAD	31-M-13 32-D-4	MacGregor, R.A. "Group C1"		Assessment	VLF-EM, GL Mag	1979 1980	2.3035 2.3252

Table 3 – Continued on next page

NORTHERN — KIRKLAND LAKE

Table 3 — Continued

LOCATION	NTS	FILE NAME	COM-MODITY SOUGHT	TYPE OF REPORT	TYPE OF WORK	YEAR	TORONTO FILE NO.
SKEAD	31-M-13 32-D-4	MacGregor, R.A. "Group G1"		MEAP KL-131	VLF-EM	1979	2.2956
SKEAD	31-M-13	MacGregor, R.A.		MEAP KL-131	Mag VLF-EM	1980 1980	2.3236 2.3130
SKEAD	31-M-13	Rio-Tinto Canadian Exploration Limited "S.N.I. option"		Assessment	DDH (8) GL A	1979	2.3320
SOTHMAN	41-P-14	Allerston, R.E.		SEE UNDER HALLIDAY TOWNSHIP			
SOTHMAN	41-P-14	Sirola, D.	Au, Ag	MEAP CG-154	GL rtr	1979	
STOUGHTON	32-D-12	Noranda Exploration Company Limited		Assessment	Mag, VLF-EM	1980	2.3319
SULPHUR ISLAND	32-D-12, 13 42-A-9, 16	Rio Tinto Explorations Ltd.		SEE UNDER CHESNEY BAY			
TECK	42-A-1	Forbes, C.; Leahy, M.		Assessment	DDH (1)	1980	
TECK	42-A-1	Chorzepa, E.		Assessment	DDH (1)	1979	
TECK	42-A-1	Dane Copper		SEE UNDER LABEL TOWNSHIP			
TECK	42-A-1	Gateford Mines Limited		SEE UNDER OTTO TOWNSHIP			
TECK	42-A-1	Golden Gate Mining Company Limited		Donation	u/g	1941	
TECK	42-A-1	Jomi Minerals & Expediting Limited "Dyment, Kidston Claims"		Assessment	ra, VLF-EM	1979	2.3222
TECK	42-A-1	Kirkland Lake Gold Mining Company Limited		Donation	u/g	1941	
TECK	42-A-1	Kirkland Gold Rand Mines Limited		Donation	u/g	1926	
TECK	42-A-1	Lake Shore Mines Limited		Donation	u/g	1941	
TECK	42-A-1	Queenston Gold Mines Limited (Teck Project)		SEE UNDER OTTO TOWNSHIP			
TECK	42-A-1	Sylvanite Gold Mines Limited		Donation	u/g	1941-42	
TECK	42-A-1	Toburn Gold Mines Limited		SEE UNDER LABEL TOWNSHIP			
TECK	42-A-1	Willroy Mines (Macassa Division)		MEAP KL-130	GL, rtr	1980	
TECK	42-A-1	Willroy Mines (Macassa Division)		Donation	u/g	1940	
THACKERY	32-D-5	Noranda Exploration Company Limited "Thackeray 1-79"		Assessment	Mag, HEM	1979	2.3295
TYRRELL	41-P-11	Dome Exploration Canada Limited		Assessment	Mag	1979	2.3278
TYRRELL	41-P-11	Tyrante Mines Limited		SEE UNDER KNIGHT TOWNSHIP			
WALKER	42-A-10	Falconbridge Nickel Mines Limited		Assessment	Mag, VLF-EM	1980	2.3235
WALKER	42-A-10	Hollinger Mines Limited "Walker-1"	Cu, Au	Assessment Assessment	DDH (2) Mag	1979 1979	2.3102
WARDEN	42-A-9	Amax Minerals Exploration "Munro-2"		SEE UNDER MUNRO TOWNSHIP			
WARDEN	42-A-9	Amax Minerals Exploration "Warden-2"		SEE UNDER MILLIGAN TOWNSHIP			
WARDEN	42-A-9	Amax Minerals Exploration "Warden-3"		Assessment	GL	1979	2.1344

Table 3 — Continued on next page

**Table 3 – Continued**

LOCATION	NTS	FILE NAME	COM-MODITY SOUGHT	TYPE OF REPORT	TYPE OF WORK	YEAR	TORONTO FILE NO.
WARDEN	42-A-9	Amax Minerals Exploration "Warden-4"		Assessment	GL	1980	2.3482
WILKIE	42-A-9	Hollinger Mines Limited		Assessment	DDH (2)	1980	
YARROW	41-P-15	Newmont Explorations of Canada Limited		Assessment	Mag, VLF-EM	1979	2.3015
ZAVITZ	42-A-3	Newmont Exploration of Canada Limited "Blocks A & B" Zavitz Project		SEE UNDER HINCKS TOWNSHIP			
ZAVITZ	42-A-3	Newmont Exploration of Canada Limited "Block E" Zavitz Project		Assessment	Mag	1980	2.3328

ABBREVIATIONS

A – assay values  
 AEM – airborne EM  
 AM – airborne Mag.  
 DDH (2) – diamond drill hole (number of holes)  
 Gc – geochemical  
 GL – geological  
 Gr – gravity  
 HEM – horizontal loop EM  
 IP – induced polarization  
 Mag – magnetometer  
 MEAP – Mineral Exploration Assistance Program

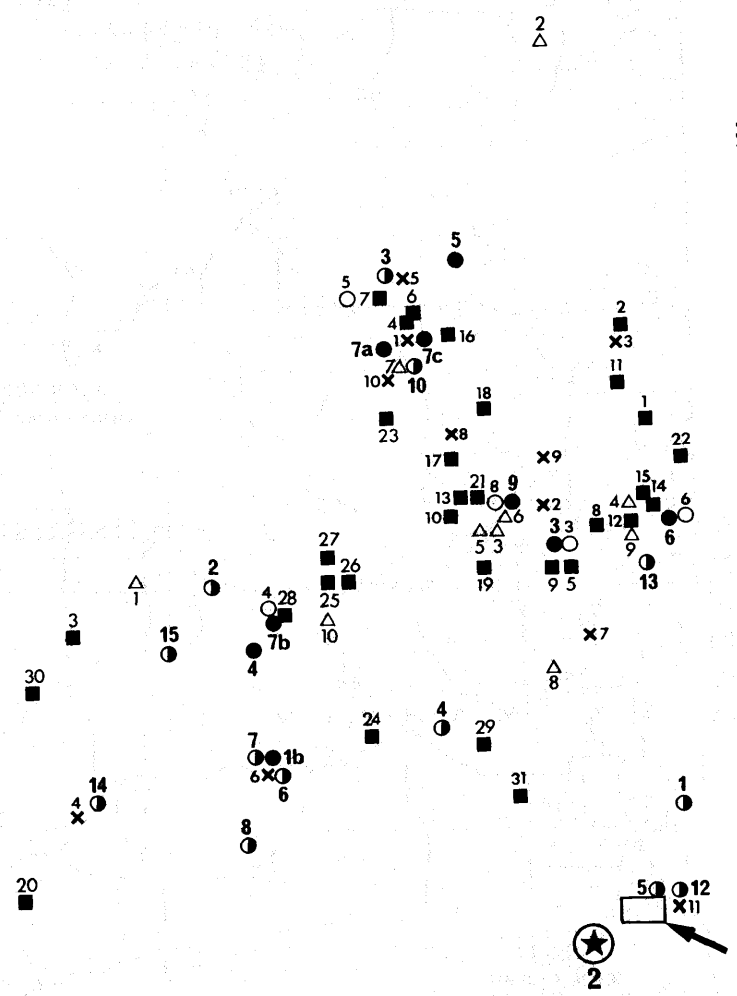
Ov DH – overburden drill hole  
 Pros. – prospectus  
 R – resistivity  
 sTr – soil trenching or stripping  
 rTr – rock trenching  
 Ra – radiometric  
 u/g – underground work  
 VEM – vertical loop EM  
 SP – self potential  
 VLF-EM – very low frequency EM  
 OSC – Ontario Securities Commission

COMMODITIES

Ag – silver  
 asb – asbestos  
 Au – gold  
 Co – cobalt  
 Cu – copper  
 Mo – molybdenum  
 Ni – nickel  
 Pb – lead  
 Zn – zinc

Figure 1  
KIRKLAND LAKE  
RESIDENT GEOLOGIST'S  
DISTRICT

 Boundary of Resident Geologist's District



**Figure 2**  
**KIRKLAND LAKE**  
**RESIDENT GEOLOGIST'S**  
**DISTRICT**

**EXPLANATION**

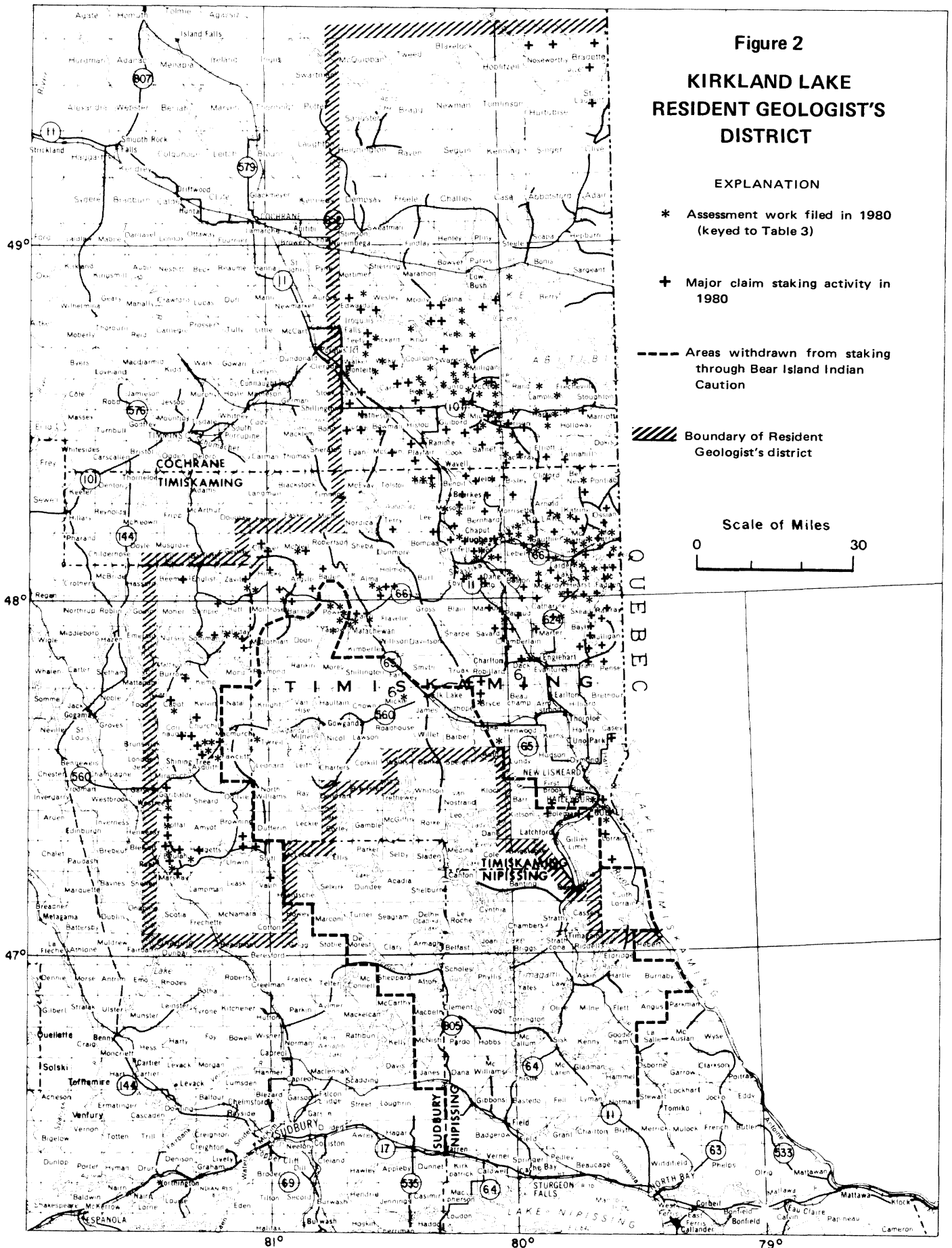
\* Assessment work filed in 1980  
 (keyed to Table 3)

+ Major claim staking activity in  
 1980

--- Areas withdrawn from staking  
 through Bear Island Indian  
 Caution

▨ Boundary of Resident  
 Geologist's district

Scale of Miles



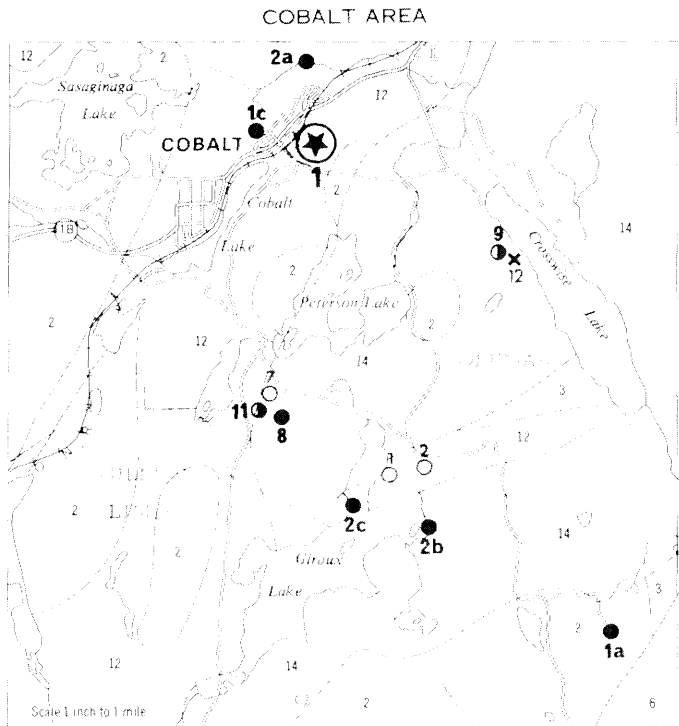


Figure 1a (from ODM Map 2188)

■ Kirkland Lake MEAP Contracts 1980-1981

- |     |          |                           |
|-----|----------|---------------------------|
| 1.  | (KL-142) | H. Grant Harper           |
| 2.  | (KL-143) | Bill Hennessy             |
| 3.  | (KL-144) | Shore Acres Enterprises   |
| 4.  | (KL-145) | G.E. Parsons              |
| 5.  | (KL-146) | Jack Simard               |
| 6.  | (KL-147) | A. Peter Ginn             |
| 7.  | (KL-148) | Reginald Barnes           |
| 8.  | (KL-149) | R.A. MacGregor            |
| 9.  | (KL-150) | Charles Marshall          |
| 10. | (KL-151) | D.E. Sirola               |
| 11. | (KL-152) | Mac Clarke Exploration    |
| 12. | (KL-153) | Lenora Exploration        |
| 13. | (KL-154) | John Sirola               |
| 14. | (KL-155) | Dorothy E. Furlong        |
| 15. | (KL-156) | Lyman Smith               |
| 16. | (KL-157) | H.E. Neal                 |
| 17. | (KL-158) | Sui S. Szeu               |
| 18. | (KL-159) | Otto Kleven               |
| 19. | (KL-160) | Glen C. Kasner            |
| 20. | (KL-161) | John A. Honsberger        |
| 21. | (KL-162) | Alain Matte               |
| 22. | (KL-163) | Lacana Mining Corporation |
| 23. | (KL-164) | Artglad Company Limited   |

● Cobalt Gowganda MEAP Contracts 1980-1981

- |     |          |                                       |
|-----|----------|---------------------------------------|
| 24. | (CG-160) | Jack Willars                          |
| 25. | (CG-161) | Robert Sheedy                         |
| 26. | (CG-162) | G.L. Taman                            |
| 27. | (CG-163) | Bruce F. Ames                         |
| 28. | (CG-164) | Barry Boyd Ames                       |
| 29. | (CG-167) | Clifford Bush                         |
| 30. | (CG-169) | W.O. Karvinen & Associates Limited    |
| 31. | (CG-170) | Cane Consolidated Exploration Limited |

● Producing Mines

1. Agnico Eagle Mines Limited
  - a. Beaver-Timiskaming Mine . . . . . Ag, Co, Pb, Cu
  - b. Castle-Trethewey Mine . . . . . Ag, Co
  - c. Coniagas Trethewey Mine . . . . . Ag, Co
2. Canadaka Mines Limited
  - a. Chambers Ferland tailings . . . . . Ag, Co
  - b. Conisil Mine . . . . . Ag, Co
  - c. University Mine . . . . . Ag, Co
3. Dominion Foundries and Steel Company Limited Cliffs of Canada Limited Adams Mine . . . . . Fe
4. Extender Minerals of Canada Limited . . . . . Barite
5. Hedman Mines Limited . . . . . Serpentine filler
6. Kerr Addison Mines Limited . . . . . Au, Ag
7. Pamour Porcupine Mines Limited
  - a. Canadian Arrow Mine . . . . . Au, Ag
  - b. Matachewan Consolidated Mine . . . . . Au, Ag
  - c. Ross Mine . . . . . Au, Ag, Cu
8. Teck Corporation Silverfields Mine . . . . . Ag, Co
9. Willroy Mines Limited Macassa Mine . . . . . Au, Ag

○ Operating Mills

1. Agnico-Eagle Mines Limited - Penn Mill . . . . . Ag, Co
2. Canadaka Mines Limited . . . . . Ag, Co
3. Dominion Foundries and Steel Company Limited Cliffs of Canada Limited Adams Mine . . . . . Fe
4. Extender Minerals of Canada Limited . . . . . Barite
5. Hedman Mines Limited . . . . . Serpentine filler
6. Kerr Addison Mines Limited . . . . . Au, Ag
7. Teck Corporation - Silver Summit Mill . . . . . Ag, Co
8. Willroy Mines Limited . . . . . Au, Ag

★ Refinery

1. Canadian Smelting and Refining (1974) Limited
2. Cobalt Refinery Limited

△ Properties examined.

✕ OMEP Applications

	Applicant	Mineral	Township
1.	Pancontinental	Au	Hislop
2.	Canadian Minerals	Au	Lebel
3.	Lightval Mines	Au	Harker & Holloway
4.	Joe Sauve	Au	Asquith
5.	Lynco Resources	Au	Beatty
6.	Peerless Silver	Ag	Nicol & Haultain
7.	Terry Gold Exploration	Au	Marter
8.	Robert Portelance	Au	Benoit
9.	John T. Ward	Au	Morrisette
10.	Cunning Exploration	Au	Playfair
11.	Teledyne Canada Limited	Ag	Bucke & Lorrain
12.	Silver Century	Ag	Coleman




○ Mines Under Development

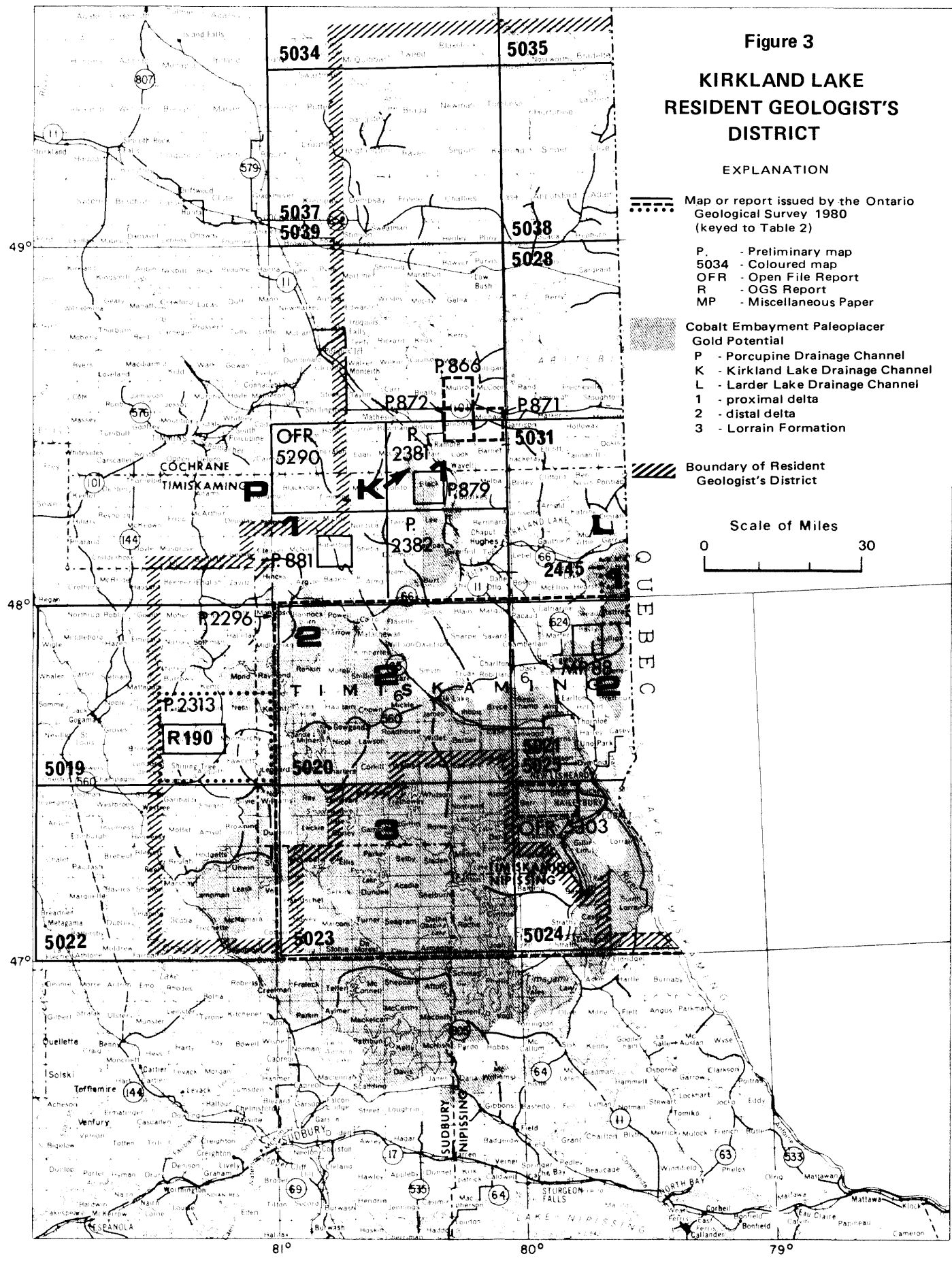
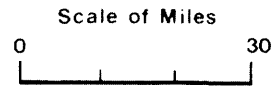
1. Agnico Eagle Mines Limited - Langis Mine . . . . . Ag, Co
2. Camart Mines Limited - Ashley Mine . . . . . Au
3. Larder Resources Incorporated - Hardill Property (Blue Quartz Mine) . . . . . Au
4. Northern Silver Fox Resources Incorporated . . . . . Ag, Co
5. Pansilver Partnership - Mud Mine . . . . . Ag, Co
6. Peerless Silver and Cobalt Explorations . . . . . Ag, Co
7. Sandy K Explorations - Lower Bonsall Mine . . . . . Ag, Co
8. Si-Balt Associates Limited - Rusty Lake Mine . . . . . Ag, Co
9. Silver Century Explorations Limited King Edward Mine . . . . . Ag, Co
10. Silcon Holdings . . . . . Au
11. Teck Corporation - Silver Summit Mine . . . . . Ag, Co
12. Teledyne Canada Limited - Consolidated Professor Property . . . . . Co, Ag
13. Thunderwood Explorations Limited Martin Bird Mine . . . . . Au
14. Tut Explorations Incorporated Lake Caswell Mine . . . . . Au
15. United Asbestos Incorporated Midlothian Mine . . . . . asb



**Figure 3**  
**KIRKLAND LAKE**  
**RESIDENT GEOLOGIST'S**  
**DISTRICT**

**EXPLANATION**

-  Map or report issued by the Ontario Geological Survey 1980 (keyed to Table 2)
- P** - Preliminary map
- 5034** - Coloured map
- OFR** - Open File Report
- R** - OGS Report
- MP** - Miscellaneous Paper
-  Cobalt Embayment Paleoplacer Gold Potential
- P** - Porcupine Drainage Channel
- K** - Kirkland Lake Drainage Channel
- L** - Larder Lake Drainage Channel
- 1** - proximal delta
- 2** - distal delta
- 3** - Lorrain Formation
-  Boundary of Resident Geologist's District



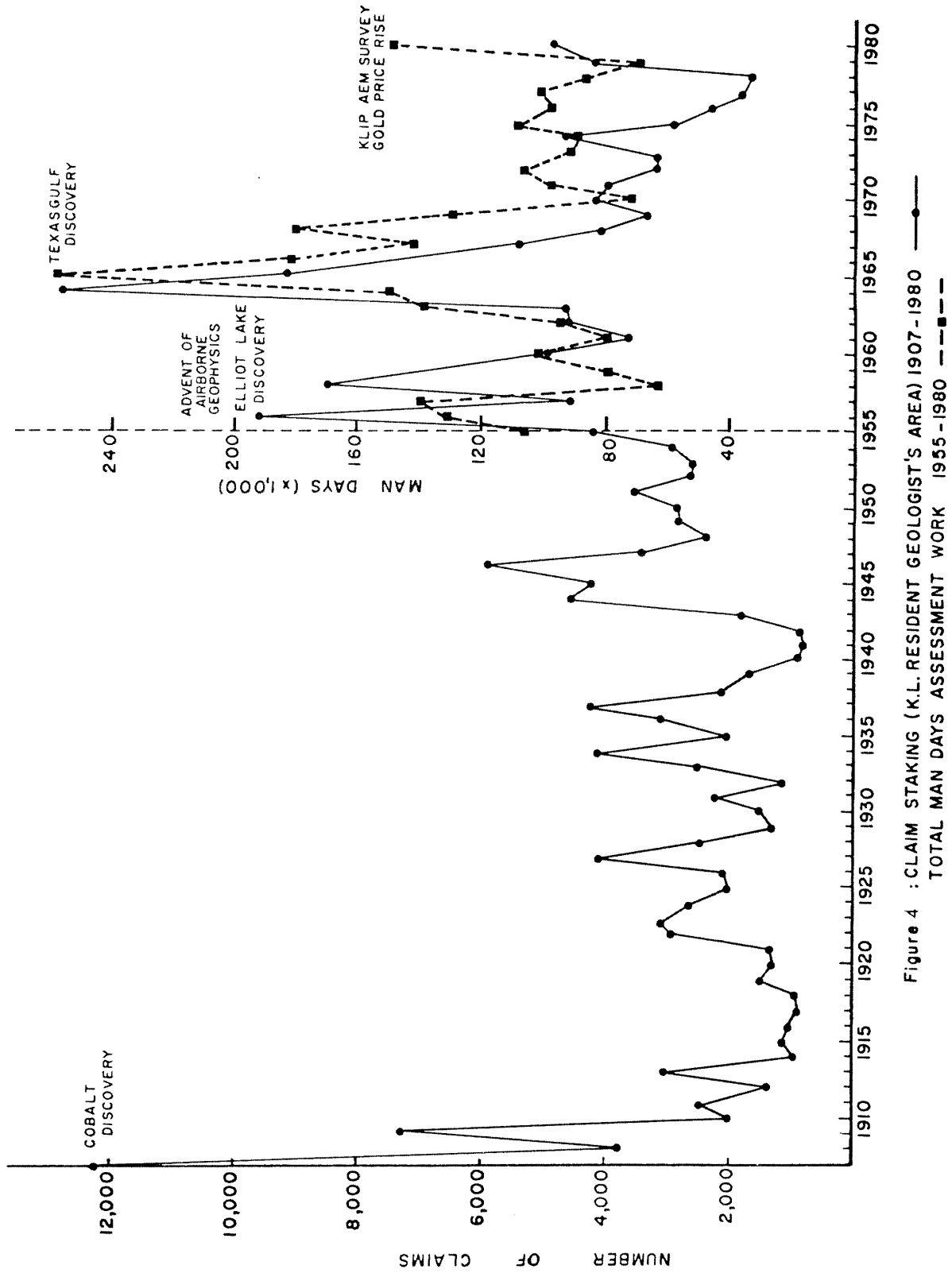


Figure 4 : CLAIM STAKING (K.L. RESIDENT GEOLOGIST'S AREA) 1907-1980  
TOTAL MAN DAYS ASSESSMENT WORK 1955-1980

## **Pamour Porcupine Mines Limited**

### **Canadian Arrow Mine**

Mining of ore averaging more than 0.05 ounce of gold per ton, and some silver, began in 1980. The ore was trucked 60 km to the Pamour No. 1 mill.

Dark grey tholeiitic basalt of the Kinojevis Group is cut by reddish syenitic dikes. Gold is associated with fine-grained pyrite in fractured and silicified syenitized areas, and is concentrated in quartz-carbonate veins in and near the syenitic rock. Pyrite, chalcopyrite, galena, and tourmaline occur in mineralized areas.

## **Property Examinations**

### **R. Allerston Gold Occurrence (1) Zavitz and Hincks Townships**

Diamond drilling (1500 m in length, mostly 'N' core), by Newmont Exploration of Canada Limited, intersected ultramafic (some carbonatized) to mafic country rocks, iron formation, and graphitic limestone containing 1 to 2 percent pyrite, cut by fracture-filling hypabyssal syenitic rocks. The syenitic rocks are grey feldspar porphyry with abundant amphibole, and pink felsic syenite. The pink syenite rock is typically low in pyrite, but in its peripheral areas contains fine-grained galena. Where the rock is cut by galena-bearing quartz veins, gold tends to be present.

### **Dex Minerals Limited Lithium Occurrence (2)**

#### **Steele Township, Concession V, Lot 5**

The Case Township batholith, an intrusion consisting of leucocratic quartz monzonite and granodiorite, is cut by lithium-bearing pegmatite and aplite dikes. Metamorphosed pelitic paragneiss and garnet schist outcrop within 100 m of the intrusion.

In the 1970's, the occurrence was explored by Dex Minerals Limited. An east-west length of 125 m was stripped, and plugger hole drilling and blasting, and sampling were completed.

During the same period, crushing and screening facilities were set up by the property owner in a former Hollinger gold mine building Timmins. The quartz monzonite is greyish white with dark nodular inclusions of biotite and quartz. Lithium-bearing dikes are composed of white feldspar typically fractured in gridiron pattern; brown mica, quartz, small brownish pink sub-spherical (and some dodecahedral) garnet, and pale greenish white spodumene crystals attain a maximum length of 0.5 m. In contrast to a more typical 2 to 3 percent lithium content characteristic of spodumene occurrences elsewhere, a sample of spodumene selected from this occurrence contained 7.63 percent  $\text{Li}_2\text{O}$  (Ontario Department of Mines GR Number 8, p. 45).

## **M. Dyment and J. Kidston Gold Occurrence (3)**

### **Teck Township**

The Dyment-Kidston claim group is located along the southern edge of the Murdock Creek Stock, an east-west elongated intrusion of syenite, situated approximately 2 km south of Kirkland Lake.

A gold zone, similar to that of the Larder Lake Fault zone along the north contact of the stock, has been recognized by the author. The zone extends from the Dyment-Kidston claims east past the south end of the Lake Shore Slimes Basin Dam. (see Jas. E. Thomson 1948, Map Number 1945-1).

The stratigraphy of the southern zone resembles that of the Larder Lake Fault zone. From north to south, that is, from the lower to the upper strata, except where locally folded, it consists of the following:

- Diorite, mainly magnetic, cut by reddish feldspathic stringers possibly emanating from the Murdock Creek Stock syenite.
- Magnesium-rich ultramafic flow or dike rock, mostly sheared, cut by more quartz veins than are other rock types, except the green carbonate rock.
- Cherty tuff (graphite-pyrite iron formation), generally trends east-west. Magnetism is minimal; very little magnetite or pyrrhotite is present.
- Pillowed basalt (tops south) and variolitic basalt that form Porcupine and Kerr Addition gold mines type of marker stratum is concordant with the cherty tuff.
- Komatiite with spinifex and polysuture textures, possibly indicate tops north.
- Green carbonate rock, cut by quartz veins (some large).

The green carbonate rock was trenched by prospectors many years ago and deserves much further exploration for its gold potential. To the south, the outcrop is covered by swampy ground.

## **Edomar Resources Incorporated Gold Occurrence (4)**

### **McVittie Township**

Gold is concentrated near the contact of mafic volcanic rock with feldspar porphyry and aplite. In places, banded interflow metasediments are present in which grain gradation indicates south facing tops. The mafic volcanic rock is a pillow-topped variolitic magnesian Kinojevis Group tholeiitic basalt flow having pale green fresh surfaces. The early (Sylvanite) exploration called this rock 'Timiskaming', perhaps mistaking variolites for pseudo-leucite grains or tachytic volcaniclasts. Timiskaming Group fluvialite jasper pebble-bearing conglomerate is present. The porphyry contains white feldspar grains in a reddish brown (hematite-stained) matrix, chloritic slips,

## NORTHERN — KIRKLAND LAKE

and, in places, buff coloured inclusions. The gold is concentrated in zones containing quartz and pyrite, some of the zones constitute quartz veins which fill fractures. The fracture pattern changes across the contact between the feldspathic intrusive rock with its characteristic blocky joints, and the mafic volcanic country rock, with its more arcuate joints.

### Gateford Mines Limited Gold-Silver Past Producer (5)

#### Teck Township

In 1980, the property was diamond-drilled by Steeprock Iron Mines Limited. The drilling encountered rock types characteristic of the 'Larder Lake Fault' extending west from the Quebec boundary through the Kerr Addison Mine and south of the Kirkland Lake gold-silver mines to the Matachewan gold-silver mines area. A typical stratigraphic section across the Larder Lake Fault, intersected by the Steeprock drilling, consists of the following rock-types, from south to north.

- Spinifex textured magnetic talc-serpentine-bearing basaltic komatiite.
- Biotite lamprophyre dike.
- Syenitic feldspar porphyry (white feldspar phenocrysts in brown matrix). The upper contact of the porphyry is bleached and contains a relatively high percentage of vein quartz, a little pyrite, and few blebs of chalcopyrite. The down-hole contact part of the porphyry dike is fine grained, but is characterized by less quartz and bleaching than the upper contact. Both upper and lower contacts of the porphyry are sharp.
- Reddish syenitized talc-chlorite schist.
- Brownish red syenitized banded sedimentary rock intercalated with green (chrome muscovite) carbonate rock along the 'Larder Lake Fault'.
- Buff coloured albitite tuff, foliated inasmuch as a few dark magnetite flakes are aligned parallel to each other.
- Massive thick bedded Timiskaming Group wacke interbedded with conglomerate or trachytic agglomerate. Quartz-carbonate veins on the Gateford property contain pyrite, galena, molybdenite, and gold. Bands of blackish material (graphite?) in a disseminated pyrite-bearing zone of siliceous carbonate rock in contact with reddish quartz syenite porphyry contain the greatest concentrations of gold.

### Kirkland Lake-to-Murdock Creek Drainage Tunnel Gold Occurrence (6)

#### Teck Township

This tunnel exposes a complete stratigraphic section in the hanging wall and extends south from the Kirkland Lake Main Break for one mile. The tunnel transects syeni-

tic rock, the main host rock of the Kirkland Lake gold-silver mines. A map of the tunnel indicates several intersections yielding high gold assays. Most of the syenitic rocks are rather massive homogeneous dikes containing white feldspar phenocrysts. The dikes are cut by quartz and carbonate (some of the latter pink coloured) veins having greenish black chloritic slips along vein walls. Quartz veins branch from some of the carbonate veins. Conglomerate is the most abundant rock type in the tunnel. In places the contact of syenitic rocks with conglomerate is gradational across 20 cm or so. The syenitic rocks display a transition from pink to grey with white feldspar phenocrysts and appreciable disseminated pyrite into distinctive conglomerate. The conglomerate is more highly fractured and contains more numerous quartz-carbonate veins. Pebbles (predominantly of alkalic hypabyssal porphyries, jasper, and other source rocks characteristic of Timiskaming Group conglomerate) range mainly from 0.5 to 2 cm long.

Black iron sulphide, brownish black manganese wad, purple potassium permanganate (?), blueberry-hued cobalt (?) compound, and buff calcite slime emanate from fractures.

### Laguerre Gold-Silver Prospect (7)

#### McVittie Township

R. A. MacGregor optioned this prospect to Sudbury Contact Mines Limited.

Country rocks are hard pale grey wacke interbedded with soft talc-chlorite schist, chlorite schist, green carbonate rock, buff albitite tuff and a magnetic iron formation marker stratum. The rocks are cut by pink syenitic dikes and white quartz-carbonate veins.

Old underground workings included 250 and 750 foot levels. In 1980, exploration by Sudbury Contact Mines Limited included more than 4500 feet of diamond drilling from surface.

Gold is concentrated in quartz veins, both steeply dipping and relatively flat, and is associated with pyrite in and near the syenitic rocks.

### Silcon Holdings — Gold Occurrence (8)

#### Playfair Township

The country rock is Kinojevis Group dark grey tholeiitic basalt and some aquagene tuff (hyaloclastite). The central parts of flows are medium grained; the upper parts are fine grained, and contain more pink feldspar, carbonate, epidote and pyritic stringers than the lower parts. A decline ramp drift, striking N25°W, follows a quartz-carbonate vein zone of similar strike and dipping 75°E. Vein material is white quartz and carbonate, pyritized "greenstone" wallrock inclusions, disseminated pyrite, chalcopyrite, bornite, galena, hematite, and in places visible gold. Grab samples of vein material and wallrocks also

assayed gold (M. Gray, personal communication). This vein zone resembles numerous Ramore area gold occurrences. A stockpile consisting of drift development muck totals about 700 tons. Plans are to set up a small mill at the mine site and recover gold and silver (M. Gray, personal communication).

## **Solomino Gold Occurrence (9)**

### **Chamberlain-Dack Townships Boundary Area**

Gold is present in somewhat different environments on each side of the "granite-greenstone" contact between the Round Lake granitic mass and the Pacaud Tuffs. The tuffs are black banded amphibolite which face south and are overturned to the north.

In the Pacaud Tuffs, gold occurs in "burns", gossan areas in pyritic cherty and carbonatized interflow sedimentary rocks that are interbedded with the tuffs. The pyrite is fine- and medium-grained. The cherty material is present in two forms, one being black and fine-grained, the other being grey and coarser-grained sugary chert or quartzite. Interbanded with the tuff bands, and elsewhere filling fractures, is carbonate that contains some quartz and rare malachite. It is epigenetic, and may be remobilized.

Inside the contact of the Round Lake granitic mass gold occurs in quartz veins and in inclusions of host rock. Inclusions are of quartz veined green (chromic muscovite) carbonate rock, and are of fine-grained volcanic rock having pale buff weathered surfaces and greyish white fresh surfaces. Adjacent to the inclusion of volcanic rock is a quartz "dome", 2 m wide, consisting of banded quartz that resembles re-crystallized chert. Some of the chert may have been partly re-mobilized to form local epigenetic quartz lenses and veins.

## **S. Welsh and R. Sheedy Gold Occurrence (10)**

### **Cairo Township**

The Ontario Hydroelectric Power Commission cleared a right-of-way exposing a small outcrop which was subsequently stripped by Newmont Exploration of Canada Limited.

The following stratigraphic section was exposed overlying the ultramafic flow base:

- Carbonaceous ('graphitic') chert.
- Interbedded green chloritic and buff 'limestone'.
- Ultramafic (talc-chlorite) flow, spinifex-textured upper part.
- Ultramafic flow, cumulate-textured lower part.
- Carbonaceous pyritic chert.
- Interbedded pale green chloritic mudstone and buff Early Precambrian limestone (each bed 1 cm thick).

The highest gold concentrations occur where the chert is cut by Cairo Stock-type reddish quartz syenite and second and third generation quartz-carbonate veins.

## **Ontario Geological Survey Activities**

Stratigraphic Synthesis of the Kirkland Lake-Larder Lake area was continued by L. S. Jensen.

John Wood carried out the second phase of a program initiated in 1979 to examine the component parts of the Gowganda Formation in the northern part of the Cobalt Embayment.

Gamma-ray mapping of alteration zones associated with gold-bearing horizons at the Kerr Addison Mine, Virginiatown, was done by Ian Thomson.

Ulrich and Diane Kretschmar studied the talc-magnetite and asbestos deposits in the Kirkland Lake-Timmins area.

## **Kirkland Lake Incentives Program (KLIP) Projects**

N. F. Trowell examined various lithologies near the Kirkland Lake-Larder Lake "break" as part of a stratigraphic mapping of the "break" begun in 1979 by M. Downes.

Mapping the Quaternary geology of the Magusi River area (32D/5), regional till sampling of the Kirkland Lake area, and studying of an esker delta complex of the Munro Esker was undertaken by C. L. Baker.

Reconnaissance basal till surveys and related detailed geochemical research in the Kirkland Lake area was continued by Ian Thomson and D. Wadge.

F. R. Ploeger began a gold study of the alkalic rocks of the Kirkland Lake area.

## **Northern Ontario Geological Survey (NOGS) Projects**

The Abitibi alteration study by E. C. Grunsky is in the second year of a three-year project.

G. W. Johns mapped the Hill Lake Area.

The Quaternary geology of the Cobalt area (31M/5) was mapped by Marjatta Pertunen.

Alterations and mineralization in "Archean" rocks of the Cobalt area is in the initial phase of a two-year study by H. Dillon-Leitch.

## **Research by Other Agencies**

Laurentian University

1. A.E. Beswick: Alteration in mineralized and unmineralized Archean 'greenstones'.
2. R.E.S. Whitehead, J.F. Davies, and R.A. Cameron: Carbonate and alkali alteration patterns in the Timmins gold mining area.

## NORTHERN — KIRKLAND LAKE

3. D. Gamble: Trace elements in the quartz veins, and effects of wall-rock alteration (major elements), in the Macassa mine at Kirkland Lake.

McMaster University

4. F.R. Ploeger and J.H. Crockett: Gold in the alkalic rocks of the Kirkland Lake area.
5. L.A. Tihor: Gold distribution in the Kirkland Lake-Larder Lake area, with emphasis on Kerr Addison-type ore deposits.

University of Ottawa

6. J. LaFleur: Geology of the Round Lake Batholith.

University of Saskatchewan

7. L.S. Jensen: Archean rocks of the area from Lake Abitibi to Kirkland Lake.

University of Toronto

8. J.W. Geissman, J. Bambrick, S. Letros, A.M. Tasillo, and D.W. Strangway: Magnetism and stratigraphy in the Blake River volcanics.
9. T.C. Kenney and K.C. Lau: Investigation of the use of horizontal deep drains to stabilize clay slopes, New Liskeard area.

University of Waterloo

10. E.C. Appleyard: A preliminary metasomatic assessment of laminated siltstones at the Silverfields Mine, Cobalt.

University of Western Ontario

11. R. Kerrich, B.E. Gorman, and W.S. Fyfe: Geochemistry and Field Relations of Lode Gold Deposits in Felsic Igneous Intrusions.
12. R. Kerrich, D.J. Robinson, R.W. Hutchinson, and R.W. Hodder: Field Relations and Geochemistry of Au, Ni, and Cr Deposits in Ultramafic-Mafic Volcanic Rocks.
13. M. Warwick and R.W. Hutchinson: A study of the flow ore at the Kerr Addison Mine, Virginiatown.

University of Windsor

14. D.T.A. Symons and M. Stupavsky: Component Magnetization of the Algoman iron formations at the Adams and Griffiths mines.

'P' on accompany Figure 3), Kirkland Lake (tributary 'K'), and Larder Lake (tributary 'L'). Transport direction for the deposition of the Cobalt Embayment sedimentary rocks was from north to south (Roscoe 1969, p.16). The age of Temiskaming Group trachytes related to the syenitic host rocks of the Kirkland Lake area gold ores was found by H.W. Fairbairn *et al.* (1966) to be  $2368 \pm 48$  m.y. The age determined for Cobalt Group Gowganda Formation wacke some distance about the unconformity with "Archean" basement rocks was determined to be  $2288 \pm 87$  m.y. (Fairbairn *et al.* 1969).

The Espanola Formation of the Quirke Lake Group (underlying the Cobalt Group) is present at least as far north as the Shining Tree area (Carter 1980, p.5). Less than 80 m.y. may have transpired between the time of formation of the Kirkland Lake gold deposits and the deposition nearby of the basal conglomerate at the unconformity between "Archean" basement rocks and the overlying rocks of the Cobalt Embayment. During this interval erosion and re-deposition may have concentrated paleoplacer gold deposits, perhaps in some way in an analogous manner to those of the Witwatersrand. Also, subsequent sedimentation in the Cobalt Embayment may have preserved such paleoplacer gold concentrations from erosion.

Placer gold may have concentrated in cover rocks that formed deltas and basement-trough in-fillings transverse to the north-to-south transport direction of sediments. The configuration of the distribution of Cobalt Embayment rocks show that paleoplacers proximal to the gold camps may be located where the numbers '1' are on accompanying Figure 3. Cover rocks forming deltas and in transverse troughs in basement also may be present near the Cobalt Embayment central basin margin at the numbers '2' on Figure 3. These 1 and 2 deposits, depending on how far gold would have been transported, might be expected in basal conglomerates not far above the unconformity between basement and cover rocks. Gold paleoplacers may be present farther from the gold camps, in the general region of the number 3 on Figure 3, in Lorrain quartzite that forms the deltaic or river channel deposits or Western Australian desert-type auriferous soil horizons.

When searching for paleoplacer gold in the Cobalt Embayment, the answers to the following questions would help guide exploration:

How far might economic concentrations of the detrital gold have travelled from their original bedrock sources? The Witwatersrand may be as much as 300 km from basement source rocks.

Were appreciable amounts of gold in solution precipitated on detrital grains, as a result of either organic or inorganic activity? Possibly gold in solution concentrates at different locations from placer gold.

Is radioactivity (uranium) typically associated with the gold, as in the Witwatersrand and some parts of the Cobalt Embayment (Meyn and Mathews 1980)? If so, radioactivity detecting techniques might lead quickly and inexpensively to target areas.

## Recommendations for Exploration

Several exploration organizations have begun to search for gold in the Cobalt Embayment. The Ontario Geological Survey has also started an integrated project to aid exploration in the Cobalt Embayment for gold as well as silver and base metals. The Ontario Geological Survey project includes bedrock and surficial geological mapping, basement rock alteration studies, metallogeny, seismic tracing of buried valleys in basement rock, and gravity surveys.

The three main tributaries of the Cobalt Embayment drained the three main gold mining areas of northeastern Ontario, and the Noranda Quebec base metals-gold mining area. This may have aided possible paleoplacer gold transportation, concentration and preservation. From west to east, the tributaries are the Porcupine (tributary

## Selected References

- Anhaeusser, C. R.  
1976: The Nature and Distribution of the Archean Gold Mineralization in Southern Africa; Minerals Science Engineering, Volume 8, Number 1, p. 46-84.
- Carter, M. W.  
1980: Terrace Bay Area, District of Thunder Bay; p. 42-46 *in* Summary of Field Work, 1980, by the Ontario Geological Survey, Edited by V. G. Milne, O. L. White, R. B. Barlow, J. A. Robertson, and A. C. Colvine, Ontario Geological Survey, Miscellaneous Paper 96, 201 p.
- Fairbairn, H. W., P. M. Hurley, K. D. Card, and C. J. Knight  
1969: Correlation of Radiometric Ages of Nipissing Diabase and Huronian Metasediments with Proterozoic Orogenic Events in Ontario; Canadian Journal of Earth Sciences, Volume 6, p. 489-497.
- Fairbairn, H. W., Pinson Jr., W. H. and P. M. Hurley  
1966: Age Relation of Volcanics at Kirkland Lake Ontario with the Round Lake Pluton; Massachusetts Institute of Technology, Progress Report, p. 141-143.
- Meyn, H.D., and Mathews, M.K.  
1980: Uranium Deposits of the Southern Cobalt Embayment; p. 195-199 *in* Summary of Field Work, 1980, by the Ontario Geological Survey, Edited by V. G. Milne, O. L. White, R. B. Barlow, J. A. Robertson, and A. C. Colvine, Ontario Geological Survey, Miscellaneous Paper 96, 201 p.
- Pretorius, D. A.  
1979: Gold-Uranium Deposits of Southern Africa; Ore Deposits Workshop, Volume II, University of Toronto, 104 p.
- Roscoe, S. M.  
1969: Huronian Rocks and Uraniferous Conglomerates in the Canadian Shield; Geological Survey of Canada, Paper 68-40, 205 p.
- Schenk, P. E.  
1965: Depositional Environment of the Gowganda Formation (Precambrian) at the South End of Lake Timagami, Ontario; Journal of Sedimentary Petrology, Volume 35, Number 2, p. 309-318.
- Thomson, Jas. E.  
1948: Geology of Teck Township and the Kenogami Gold Area, Ontario Department of Mines, Volume 47, Part V, 53 p.
- Wood, John  
1980: Regional Geology of the Cobalt Embayment, Districts of Sudbury, Nipissing and Timiskaming; p. 61-63 *in* Summary of Field Work, 1980, by the Ontario Geological Survey, Edited by V. G. Milne, O. L. White, R. B. Barlow, J. A. Robertson, and A. C. Colvine, Ontario Geological Survey, Miscellaneous Paper 96, 201 p.
- Young, G. M.  
1973: Huronian Stratigraphy and Sedimentation; The Geological Association of Canada, Special Paper 12, 271 p.

# 1980 Report of the Sault Ste. Marie Resident Geologist

G. Bennett<sup>1</sup> and E. J. Leahy<sup>2</sup>

## Contents

Introduction .....	108
Resident Geologist's Activities .....	108
Mining Activity .....	108
Exploration Activity .....	109
Gold and Silver .....	109
Tungsten-Molybdenum-Copper .....	111
Base Metals .....	112
Suggestions to Prospectors .....	112
Ontario Geological Survey Activities .....	114
Recent Publications and Theses .....	114
References .....	115

## Tables

1—Maps and Reports Issued by the Ontario Geological Survey .....	109
2—Exploration Activity in 1980 .....	111
3—Assessment Work and Other Information Received in 1980 .....	113

## Figures

1—Sault Ste. Marie Resident Geologist's District .....	110
2—Number of Claims Staked from 1950 to 1980 .....	112

## Introduction

Gold and silver price increases in 1979 resulted in a noticeable increase in exploration for these metals in the Sault Ste. Marie Mining Division in 1980. The Michipicoten "Greenstone" Belt which extends from Lake Superior near Wawa to Missinabie Lake in the east, is receiving renewed attention from both major and junior mining companies interested in acquiring gold properties.

Prospectors were active in the Sault Ste. Marie silver area where several of the known argentiferous galena deposits were restaked and actively prospected.

Denison Mines Limited and Rio Algom Mines Limited continued with major expansion programs in the Elliot Lake uranium camp.

Two former precious metal producers, Rengold Mines Limited and Prace Mining Limited, are preparing for renewed production in 1981.

## Resident Geologist's Activities

The staff in the Sault Ste. Marie office consists of G. Nivins, Secretary; E. J. Leahy, Resource Geologist; and G. Bennett, Resident Geologist.

Lorry J. Ashick joined the office in April, 1980, primarily to assist with the production of Data Series Maps.

Following many discussions with industry and OGS staff, it is felt that there might be a better alternative to Data Series Maps. E.J. Leahy and Miss Ashick spent much time in developing a more useful and cost-effective format for Data Series Maps.

Land use planning has also taken a considerable amount of time of the Resource Geologist. The Blind River, Wawa, and Sault Ste. Marie administrative districts are at different stages in the development of Strategic Land Use Plans for their respective areas. The Sault Ste. Marie District is at the stage of developing options for different areas within the district, and in the spring of 1981 these will be introduced for public consideration. The Resource Geologist attended fairly regular meetings with district personnel to discuss mineral potential with the objective to ensure that as much land as possible is kept open to exploration and future development.

E. J. Leahy and the writer presented lectures on local geology to Sault Ste. Marie grade schools, high schools, and the Sault College of Applied Arts and Technology, as well as leading field trips for visiting geologists and students.

The writer provided input for a brochure and display pertaining to the archeological and geological features of the Agawa Promontory Area, Lake Superior Provincial Park.

In addition to the above noted activities, regular administrative duties and specific land use concerns, the writer visited 18 active properties, 17 mineral occurrences, and 3 operating mines.

During the summer of 1980 a student assistant, Mr. J. Kral, under the writer's supervision, began an assessment of mineral occurrences of the Goulais River area, north of Sault Ste. Marie.

## Mining Activity

The Algoma Ore Division of The Algoma Steel Corporation Limited continued production of iron ore at Wawa, providing 1 456 173 tons of sinter from January 1 to December 16, 1980.

<sup>1</sup>Resident Geologist, Ontario Ministry of Natural Resources.

<sup>2</sup>Resource Geologist, Ontario Ministry of Natural Resources.



Denison Mines Limited and Rio Algom Mines Limited continued their expanded production of uranium oxide at Elliot Lake. Production from the Panel Mine of Rio Algom Mines Limited, which began in late 1979, continued through 1980.

Hy-Tower Mines Incorporated began shipments of silica and chalcopyrite to Inco Limited at Sudbury. About 1 500 tons were shipped from an open pit operation in Parkinson Township.

Rengold Mines Limited, reorganized and refinanced as Renabie Mines Limited, is preparing for production from their Leeson Township gold mine in late 1981.

Prace Mining Limited is preparing for production of argentiferous galena concentrates from their property in Vankoughnet Township in early 1981.

## Exploration Activity

During 1980, exploration activity in the Sault Ste. Marie Division was focused mainly on gold and silver, while uranium exploration between Sault Ste. Marie and Elliot Lake continued to decline.

The over-all level of mineral exploration activity in 1980 was generally higher than in 1979 and for several years previous to that year. One thousand two hundred and forty-three claims were staked in the Sault Ste. Marie Mining Division up to December 15, 1980. This compares with 541 claims staked during a similar period in 1979. A glance at Figure 2 will reveal that this recent increase in claim staking activity still falls far short of that during the late 1960s. However, by far most of the claims staked in peak years were intended to cover blanket uranium deposits of large areal extent. Recent staking is aimed at specific gold or silver properties of limited area. Much of the recent exploration activity has taken place on patented land.

## Gold and Silver

The former gold producing areas of Wawa, Goudreau, and Missinabi saw renewed exploration activity in 1980.

Dunraine Mines Limited, which acquired the old Parkhill Gold Mine in McMurray Township in 1979, added the adjoining Van Sickle and Darwin properties in 1980. Geophysical and geological surveys, and a diamond drilling program were carried out in 1980. Dunraine Mines Limited plans to go underground at the Parkhill property in the spring of 1981 and continue their exploration program by underground drilling.

The Pursides Gold Mine (formerly Surluga), the most recent producer in the Wawa area, is undergoing reorganization and refinancing and was not active in 1980.

Amex Exploration Incorporated carried out geophysical, geological surveys, and about 1 000 m of diamond drilling in the vicinity of the old Alden-Goudreau Gold Mine in Cowie Township, about 10 km southeast of Goudreau. The results of the exploration program are being assessed and a decision on further work will be made before next spring.

Ego Resources Limited carried out 1 200 m of diamond drilling on its copper-gold prospect in Abotossaway Township in the fall of 1980.

Golden Spoke Exploration Limited acquired the old Kozak gold-silver prospect in Abotossaway Township in 1980 and carried out a surface sampling program. Diamond drilling is planned for early 1981.

Several companies were active in the Missinabi area in 1980. The report that Renabie Mines Limited will begin production in 1981 should enhance the outlook of known low tonnage deposits in the Missinabi area.

Coniagas Mines Limited carried out surface sampling and about 1 000 m of diamond drilling on its gold property in Leeson Township in the fall of 1980. The results of that program are currently being assessed.

**TABLE 1** | MAPS AND REPORTS PERTAINING TO THE SAULT STE. MARIE MINING DIVISION, ISSUED BY THE ONTARIO GEOLOGICAL SURVEY IN 1980. SEE "LIST OF PUBLICATIONS" (BACK POCKET) FOR DETAILS.

### GEOSCIENCE REPORTS

GR 192

### OPEN FILE REPORTS

OFR 5277  
OFR 5309

### OGS NORTHERN ONTARIO ENGINEERING GEOLOGY TERRAIN STUDIES

NOEGTS 45  
NOEGTS 79  
NOEGTS 80  
NOEGTS 85  
NOEGTS 86  
NOEGTS 91  
NOEGTS 92  
NOEGTS 93  
NOEGTS 97  
NOEGTS 98

### PRELIMINARY MAPS

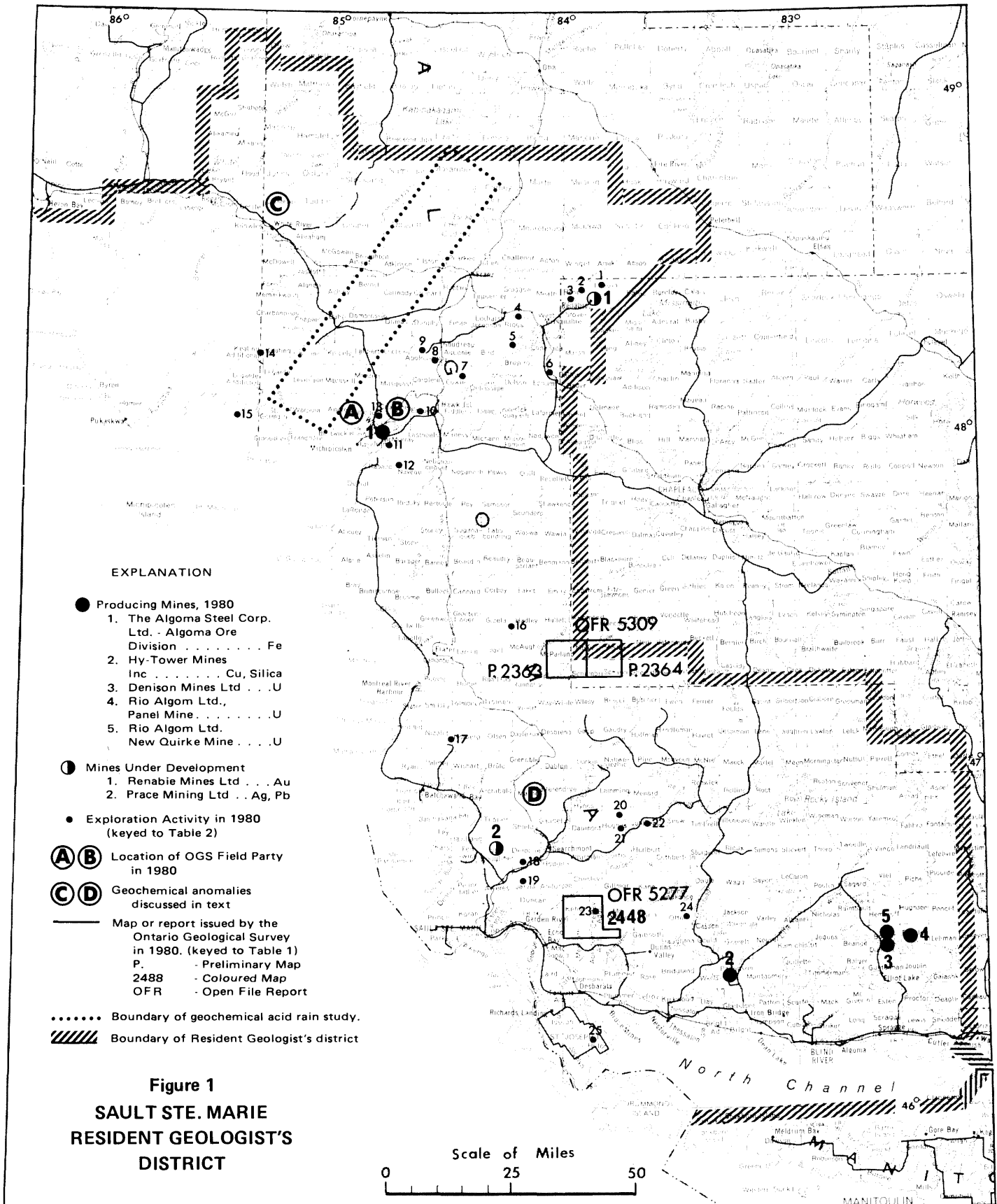
P. 2363  
P. 2364

### FINAL COLOURED MAPS

2449

### OGS NORTHERN ONTARIO ENGINEERING GEOLOGY TERRAIN STUDIES DATA BASE MAP

5006  
5007  
5009  
5010  
5011  
5012  
5013  
5014  
5017  
5018



The present attractive silver prices (relative to 1970) prompted Westfield Minerals Limited to re-evaluate its silver-zinc prospect in Rennie Township. Geochemical and geophysical surveys were undertaken and 2 000 m of diamond drilling was done.

Exploration activity in the Sault Ste. Marie area in 1980 was confined mainly to known silver occurrences in the Goulais River area, about 30 km to 60 km north and northeast of Sault Ste. Marie.

Mattagami Lake Mines Limited optioned the old Kirby-Legge and Kerr-Scott argentiferous galena prospects in Deroche Township in 1979 and completed a ground electromagnetic survey and three diamond drill-holes in 1980.

The Elsa Don Syndicate acquired the old Conway argentiferous galena deposit in Hughes Township. The Syndicate plans to bring the property to lease in early 1981, with shipments to begin soon after. This would be a small operation employing a few men with concentration

of ore by hand cobbing. The same group has staked a group of claims in Hughes Township to cover a new discovery of disseminated pyrite, chalcopyrite, and minor galena in Keweenawan felsite dikes.

The Prace Mining Company completed a ground electromagnetic survey of its argentiferous galena vein in the spring of 1980.

Most of the known silver occurrences in the Goulais River area were restaked during 1979 and 1980. The work done on these is summarized in Table 2.

## Tungsten-Molybdenum-Copper

In 1979 the D. K. Syndicate (wholly owned subsidiary of the DeKalb Mining Corporation) acquired the former Tri-bag property in Nicolet Township, about 60 km north of Sault Ste. Marie. During the summer of 1980, the company sank a decline about 150 m in length to assess the

**TABLE 2** | EXPLORATION ACTIVITY IN 1980.

The following is a list of individuals and companies known to be engaged in exploration within the Sault Ste. Marie Mining Division in 1980, and the type of work undertaken in each case.

Number on Figure	Individual or Company	Activity
1	Coniagas Mines Ltd.	Trenching, drilling, Leeson Township.
2	Westfield Minerals Ltd.	Geophysical survey, and geochemical survey, drilling, Rennie Township.
3	Noranda Exploration Company Ltd.	Geophysical survey, trenching, drilling, Rennie Township.
4	Noranda Exploration Company Ltd.	Geophysical survey, mapping, Riggs Township.
5	Kingswood Explorations Ltd.	Trenching, sampling, Bruyere Township.
6	Noranda Exploration Company Ltd.	Geophysical survey, geological mapping, Echum Township.
7	Amax Exploration Inc.	Geophysical survey, geological mapping, drilling, Cowie Township.
8	Golden Spoke Exploration Ltd.	Trenching, sampling, Abotossaway Township.
9	Ego Mines Ltd.	Diamond drilling, Abotossaway Township.
10	Firespur Explorations Ltd.	Stripping, trenching, sampling, drilling, Esquega Township.
11	Dunraine Mines Ltd.	Geophysical survey, drilling, McMurray Township.
12	Monk, W.	Surface work, bulk sampling, Naveau Township.
13	Algoma Steel Corp. Ltd.	Geophysical survey, geological mapping, prospecting several areas between Michipicoten and Hawk Junction.
14	Noranda Exploration Company Ltd.	Trenching, drilling, Keating Add'l. Township.
15	Amoco Canada Petroleum Co. Ltd.	Drilling, Mishibishu Lake Area.
16	Phateon Exploration Ltd.	Geophysical survey, prospecting, trenching, Gryzela and Hadley Tps.
17	D.K. Syndicate	Drilling, underground exploration, bulk sampling, Nicolet Township.
18	Mattagami Lake Exploration Ltd.	Geophysical survey, drilling, Deroche Township.
19	Paynter, R.	Claim staking, trenching, sampling, Jarvis Township.
20	Elsa Don Syndicate	Shaft sinking, bulk sampling, prospecting, Hughes Township.
21	S. Powley and Associates	Claim staking, prospecting, sampling, Hughes Township.
22	Billingsley, R. & Watkins, J.	Trenching, sampling, Jollineau Township.
23	A. McDonald and Associates	Trenching, sampling, drilling, Chesley Add'l. Township.
24	Baxter Minerals Ltd.	Drilling, Otter Township.
25	Lacana Mining Corporation	Drilling, claim staking, Hilton and Jocelyn Townships.

## NORTHEASTERN — SAULT STE. MARIE

tungsten potential of a Keweenaw age breccia pipe (the "West Breccia" of a group of five breccia pipes on the Tribag property). Fine to very coarse scheelite and minor wolframite occurs in a vaguely defined carbonate vein structure within the breccia pipe. The sporadic nature of the scheelite mineralization necessitated a bulk sampling program to obtain reliable grade and tonnage information. The program was completed in the fall of 1980 and a decision on further work is expected by mid-1981.

Concurrent with the exploration of the "West Breccia", a percussion drilling program was carried out to assess the East Breccia for copper, molybdenum, and silver. In the fall of 1980 a drilling program was undertaken to test geochemical anomalies found during soil sampling surveys carried out by the Tribag Mining Company Limited in the 1960s. This program is expected to continue in 1981.

### Base Metals

Exploration for base metals was very much subordinate to precious metals exploration during 1980. Noranda Mines Limited continued ground follow-up of airborne geophysical anomalies in the Missinabi-Dalton area.

Algoma Steel Corporation continued a geological mapping and prospecting program between Lake Superior and Goudreau.

Firespur Explorations Limited continued surface work and diamond drilling on the Lakemount copper-nickel deposit in Esquega Township.

## Suggestions to Prospectors

The Geological Survey of Canada recently published the results of a geochemical orientation survey in the Montreal River area on the east shore of Lake Superior, about 115 km north of Sault Ste. Marie (Coker 1980). The survey indicates that reconnaissance exploration for uranium and base metals can be accomplished efficiently by lake sediment geochemical surveys. Detailed base-metal and uranium exploration can be carried out by sampling lake sediments and/or stream sediments.

The techniques and conclusions of the GSC survey should be generally applicable to other areas along the east shore of Lake Superior as far south as Sault Ste. Marie, where the physiography and unconsolidated deposits are comparable to those of the study area. Helicopter supported lake sediment geochemical surveys and stream sediment follow-up of anomalies may be the best presently available method to explore for mineralized breccia pipes of the Tribag type.

The Tribag breccias are related to Keweenaw felsic volcanism (Norman 1977). Keweenaw felsic dikes, probably feeders to Keweenaw felsic volcanic rocks

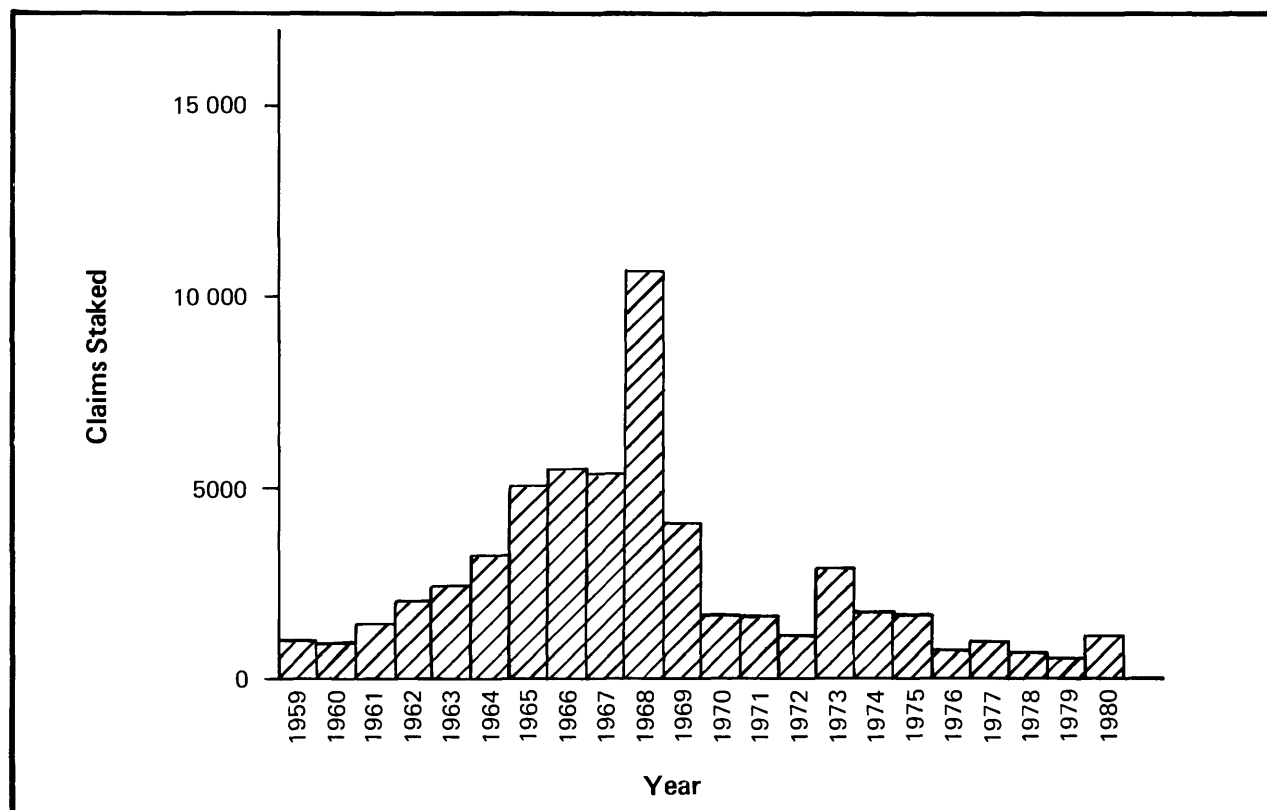


Figure 2 Number of claims staked in the Sault Ste. Marie Mining Division from 1950 to 1980.

TABLE 3 | ASSESSMENT WORK AND OTHER INFORMATION RECEIVED IN 1980

Sault Ste. Marie Mining Division.							
Township or Claim Map Area	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File No.	Local File No.
Buckles	North American Nuclear Ltd.	U <sub>3</sub> O <sub>8</sub>	Assess.	AMag & ARA	1979	2.2938	SSM-2045
Jogues	Fort Norman Explorations Inc.	U	Assess.	1 DDH (2,058')	1979		SSM-1915
Joubin	North American Nuclear Ltd.	U <sub>3</sub> O <sub>8</sub>	Assess.	AMag & ARA	1979	2.2938	SSM-2045
Kamichisitit	North American Nuclear Ltd.	U <sub>3</sub> O <sub>8</sub>	Assess.	AMag & ARA	1979	2.2938	SSM-2045
Keating Add'l.	Noranda Exploration Co. Ltd.		Asses.	1 DDH (500')	1979		SSM-1935
Lastheels	Amax of Canada Ltd.		Assess.	GMag	1979	2.3265	SSM-2100
McMurray	Pango Gold Mines		Assess.	GMag	1980	2.3290	SSM-1650
	Parkhill Gold Mines Ltd.	Au	D	GL	1930, 1944		SSM-305
	Van Sickle, L.A.	Au	D	GL	1937		SSM-1129
Naveau	Canabec Explorations Ltd.		Assess.	GEM	1979	2.3126	SSM-2021
			Assess.	GL	1979	2.3089	SSM-2021
Nouvel	North American Nuclear Ltd.	U <sub>3</sub> O <sub>8</sub>	Assess.	AMag & ARA	1979	2.2938	SSM-2045
Otter	Baxter Minerals Ltd.		Assess.	3 DDH (704')	1980		SSM-2062
Poulin	Patrie, J.P.	Cu,Au	Assess.	1 DDH (112'), SA	1979		SSM-1643
Rabazo	Canabec Explorations Ltd.	Au	Assess.	2 DDH (607')	1979		SSM-2021
			Assess.	GEM	1979	2.3126	SSM-2021
Rennie	Noranda Exploration Co. Ltd.		Assess.	GEM & Mag	1978	2.3082	SSM-1655
		Au,Ag,Cu	Assess. Assess.	GEM & Mag 4 DDH (385'), SA	1979 1979, 1980	2.3282	SSM-2094 SSM-2094
Ryan	Amax Explorations Ltd.	Au,Ag,Cu, Zn,Mo	Assess.	GL	1979	2.3239	SSM-2061
			Assess.	GMag	1980	2.3258	SSM-2061
St. Germain	Amoco Canada Petroleum Co. Ltd.	Ag,Cu,Zn	Assess.	1 DDH (392')	1980		SSM-2056
Slater	Streamside Mines Inc.	Cu	Assess.	GMag, GVLF & GL	1978	2.3021	SSM-1775
Stover	Carbrew Explorations	Au,Ag	Assess.	GMag & GL, SA	1978	2.2925	SSM-1978
Plan M-7, Mishibishu Lake	Amoco Canada Petroleum Co. Ltd.	Ag,Cu,Zn	Assess.	4 DDH (1,258')	1980		SSM-2055
	Hollinger Consolidated Gold Mines Ltd.		D	GL	1938		SSM-2119

TABLE 3 continued

Township or Claim Map Area	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File No.	Local File No.
Plan M-33, Molson Lake	Ollmann-Williams Group	Au	Assess.	GL	1947	63A.31	SSM-2118

Abbreviations

A	- Airborne	IP	- Induced Polarization
Assess.	- Assessment Work	Mag	- Magnetometer
CS	- Core Samples	OSC	- Ontario Securities Commission
D	- Donated by Company or Individual	Pros.	- Prospectus
DDH	- Diamond Drill Hole	RA	- Radioactive, Radiometric
DN	- Dip Needle Survey	SA	- Assaying
EM	- Electromagnetic	Tr	- Trenching
G	- Ground	VLF	- Very Low Frequency
GL	- Geological		

have been identified in the Sault Ste. Marie area (Bennett 1977). Similar felsic dikes bearing disseminated pyrite, chalcopyrite, and minor galena have been found in Hughes Township, about 50 km northeast of Sault Ste. Marie. An occurrence of chalcopyrite, argentiferous galena, and sphalerite in the same area has associated breccias, including intrusive breccias, which have been compared to breccia found in the Tribag area (Resident Geologist's Files, Ontario Ministry of Natural Resources, Sault Ste. Marie).

In summary, the writer suggests that the granitic terrain along the east shore of Lake Superior for a distance of up to 60 km inland from the lake has been intruded by Keweenawan felsic rocks and has potential for copper-molybdenum-tungsten-bearing breccia pipes. It has potential as well for vein-type argentiferous galena deposits and vein-type polymetallic base-metal deposits.

The results of reconnaissance lake sediment geochemical surveys published in 1979 (ODM-GSC 1979a) revealed that the bottom sediment and waters of a number of lakes in the vicinity of Marne Township, about 40 km north of Sault Ste. Marie, contain anomalously high contours of uranium (D, Figure 1). The area is underlain mainly by granitic rocks. The elevated uranium content of the lakes reflects bedrock concentration because the anomalous zone is a westward extension of airborne radiometric anomalies shown on Geological Survey of Canada radiometric maps released in 1975, for the area adjoining to the east (Richardson *et al* 1975).

The writer made a few traverses in the area of the lake sediment anomalies during the summer of 1980, but rock exposures are not abundant in the area and the source of the anomalies was not identified.

Similar uranium anomalies with coincident copper and fluorine anomalies were found in lake sediments and in the White River area (C, Figure 1; ODM-GSC 1979b). Interested readers are advised to consult the original data.

These lake sediment anomalies could provide prospectors with target areas or outline areas for more detailed geochemical surveys.

## Ontario Geological Survey Activities

R. P. Sage carried out geological mapping in Chabanel and Esquega Townships in the Wawa area at a scale of 1 inch to ¼ mile (B, Figure 1).

Z. L. Mandziuk carried out 1 inch to ¼ mile geological mapping in the Molybdenite Lake Area (André and Bailloquet Townships) northwest of Wawa (H, Figure 1).

In 1980, the Ontario Geological Survey took part in integrated studies of acid lakes north of Lake Superior.

The affects of acid precipitation on 20 lakes between the north shore of Lake Superior near Wawa and Kabinakagami Lake, 100 km to the northeast, were measured by a number of biological and geochemical parameters.

Preliminary results of the above studies are published in Summary of Field Work, 1980, by the Ontario Geological Survey.

## Recent Publications and Theses

Armbrust, G. A.  
1980: Geology of the Jogran Disseminated Cu-Mo Deposit, Ryan Township, Ontario; Grant 48; p.11-15 *in* Geoscience Research Grant Program, Summary of Research, 1979-1980, edited by E. G. Pye, Ontario Geological Survey, M.P. 93, 262p.

- Brown, J. R., Fyfe, W. S., Murray, F., and Krondberg, B. I.  
1980: Immobilization of U-Th-Ra in Mine Wastes, Grant 28; p.48-57 *in* Geoscience Research Grant Program, Summary of Research, 1979-1980, Edited by E. G. Pye, Ontario Geological Survey, M.P. 93, 262p.
- Garagon, Tom  
1980: Mineralization and Alteration of Basalts at the Jogran Occurrence, District of Algoma, Ontario; Unpublished B.Sc. Thesis, University of Ottawa, 90p.
- Kimberley, M. M.  
1980: Chemical and Magnetic Mineral Characterization of the Elliot Lake Group; p.125-163 *in* Ontario Geoscience Research Grant Program, Final Research Reports, 1978-1979; Ontario Geological Survey, Open File Report 5302, 166p.
- Kirkham, R. V., and Franklin, J. M.  
1980: Native Copper on Superior Shoal, Ontario; *in* Current Research, Part C, p. 160-161, Geological Survey of Canada Paper 80-1C, 248p.
- Mandziuk, Z. L.  
1980: Molybdenite Lake Area, District of Algoma; p.70-73 *in* Summary of Field Work, 1980, by the Ontario Geological Survey, Edited by V. G. Milne, O. L. White, R. B. Barlow, J. A. Robertson, and A. C. Colvine, Ontario Geological Survey, Miscellaneous Paper 96, 201p.
- Sage, R. P.  
1980: Wawa Area, District of Algoma; p.47-50 *in* Summary of Field Work, 1980, by the Ontario Geological Survey, Edited by V. G. Milne, O. L. White, R. B. Barlow, J. A. Robertson, and A. C. Covine, Ontario Geological Survey, Miscellaneous Paper 96, 201p.
- Thomson, Ian  
1980: Acid Lakes North of Lake Superior: Integrated Studies in the Wawa Area, District of Algoma, to Examine the Effects of Acid Precipitation; p.140-144 *in* Summary of Field Work, 1980, by the Ontario Geological Survey, Edited by V. G. Milne, O. L. White, R. B. Barlow, J. A. Robertson, and A. C. Covine, Ontario Geological Survey, Miscellaneous Paper 96, 201p.

## References

- Bennett, G.  
1977: Garden River Indian Reserve Area, District of Algoma; p.104-106 *in* Summary of Field Work, 1977, by the Geological Branch, Edited by V. G. Milne, O. L. White, R. B. Barlow, and J. A. Robertson, Ontario Geological Survey, Miscellaneous Paper 75, 208p.
- Coker, W. B.  
1980: A Geological (Geochemical) Orientation Survey for Uranium of the Montreal River Area, District of Algoma, Ontario; Geological Survey of Canada Paper 79-18, 27p.
- Norman, David I.  
1977: Geology and Geochemistry of Tribag Mine, Batchawana Bay, Ontario; Unpublished Ph.D. Thesis, University of Minnesota, 257p.
- OGS-GSC  
1979a: Regional Lake Sediment and Water Geochemical Reconnaissance Data; Eastern Shore of Lake Superior, Ontario NTS 41K, 41N; Ontario Geological Survey Open File Report 5266, 56p., 16 maps. Scale 1:250 000.
- 1979b: Regional Lake Sediment and Water Geochemical Reconnaissance Data; Eastern Shore of Lake Superior, Ontario NTS 42C, 42F (S-2); Ontario Geological Survey Open File Report 5267, 85p., 16 maps. Scale 1:250 000.
- Richardson, K. A., Holman, P. B., Elliot, B. E.  
1975: Airborne Radioactivity Map with Profiles, Blind River, Ontario, 41J; Geological Survey of Canada Open File Report 262. Scale 1:250 000.

# 1980 Report of the Sudbury Resident Geologist

P. E. Giblin<sup>1</sup> and J. M. Martins<sup>2</sup>

## Contents

Introduction .....	116
Resident Geologist's Activities .....	116
Mining Activities .....	116
Copper-Nickel .....	116
Gold .....	116
Iron .....	117
Uranium .....	118
Industrial Minerals .....	118
Exploration Activities .....	118
Ontario Geological Survey Activities .....	119
Engineering and Terrain Geology Section .....	119
Geophysics/Geochemistry Section .....	119
Precambrian Geology Section .....	119
Mineral Deposits Section .....	119
Some Recent Publications .....	119

## Tables

1—Maps and Reports Pertaining to the Sudbury Resident Geologist's Division Issued by the Ontario Geological Survey in 1980 .....	117
2—Exploration Activity in 1980, Sudbury Area .....	117
3—Assessment Work and Other Information received in 1980, Sudbury District .....	118

## Figures

1—Sudbury Resident Geologist's District .....	120
2—Sudbury Resident Geologist's District .....	121
3—Sudbury Nickel Irruptive Area .....	122

## Introduction

Exploration activity in the area showed a marked increase over that in 1979, sparked primarily by a resurgence of interest in gold deposits. The number of claims recorded to the end of November 1980, was virtually double the number recorded in all of 1979. Most of the activity centred on the area south and east of Lake Wanapitei, particularly in Scadding and Davis Townships.

## Resident Geologist's Activities

During the year, the office was moved into the new Ontario Government Building in downtown Sudbury. In this new location, the Resident Geologist's office is adjacent

<sup>1</sup>Resident Geologist, Sudbury.

<sup>2</sup>Resource Geologist, Sudbury.

to the Mining Recorder's office, providing greater convenience for the public who wish to visit both offices.

In addition to normal duties, the staff investigated mineral occurrences in the area and participated in various land use planning projects. Staff in the office consist of Y. M. Paquette, Secretary; J. M. Martins and R. Adlington, Resource Geologists, and P. E. Giblin, Resident Geologist. During the year, D. G. Innes, formerly a geologist with the Mineral Deposits Section of the Ontario Geological Survey, and stationed in Sudbury, resigned from the Survey.

## Mining Activities

Mining activity in the area is dominated by the production of copper, nickel and precious metals from the Sudbury-area mines of Falconbridge Nickel Mines Limited and Inco Metals Company. Other commodities produced within the area covered by this report are iron ore, uranium, gold, silica, and decorative stone.

## Copper-Nickel

Falconbridge Nickel Mines Limited produced ore from the Falconbridge, Fecunis, East, Lockerby, Onaping, and Strathcona Mines. Development work was carried out at the Fraser Mine.

Inco Metals Company produced ore from the Clara-belle Number 2 Open-Pit Mine, and from nine underground mines, these are the Coleman, Copper Cliff South, Creighton, Froot, Garson, Levack, Little Stobie, McCreedy West (formerly Levack West), and Stobie Mines.

## Gold

Anglesea Development Limited shipped gold-bearing material from a dump on the former property of Alwyn Porcupine Mines Limited, Scadding Township, to a custom mill in the Gogama area.

An open-pit was started on the Rose gold property in Davis Township by 439948 Ontario Limited. About 3 000 tons of gold-bearing material were shipped to the Pamour mill in the Timmins area for custom milling. Mining operations ceased before the end of the year.



**TABLE 1** | MAPS AND REPORTS PERTAINING TO THE SUDBURY RESIDENT GEOLOGIST'S DIVISION ISSUED BY THE ONTARIO GEOLOGICAL SURVEY IN 1980.

ONTARIO GEOLOGICAL SURVEY REPORTS

Report 196

OPEN FILE REPORTS

OFR 5287  
OFR 5288  
OFR 5302  
OFR 5304

MISCELLANEOUS PAPERS

MP 91  
MP 93  
MP 96

PRELIMINARY MAPS

P. 2228  
P. 2300  
P. 2301  
P. 2347  
P. 2348  
P. 2349  
P. 2377  
P. 2378

GEOPHYSICAL SERIES MAPS

P. 2296  
P. 2297

NORTHERN ONTARIO ENGINEERING GEOLOGY TERRAIN STUDY REPORTS

83  
87  
88  
89  
90  
93  
94  
95  
96  
98  
99  
100  
101

NORTHERN ONTARIO ENGINEERING GEOLOGY TERRAIN STUDY MAPS

5006  
5008  
5017  
5020  
5022  
5023  
5024  
5040  
5041  
5044

**TABLE 2** | EXPLORATION ACTIVITY IN 1980, SUDBURY AREA.

The following is a list of companies and individuals known to have conducted exploration within the Sudbury Resident Geologist's district in 1980, exclusive of exploration work on the Sudbury Nickel Irruptive. The numbers correspond to the numbered areas on Figures 1 and 2.

Number on Figure	Individual or Company	Activity
1.	Anglesea Development Ltd.	Trenching, sampling, gold prospects, Scadding Township
2.	Brady, J.	Trenching, sampling, silver prospect, Donovan Township
3.	Butler, R., and Laaksonen, A.	Trenching, gold prospect, Scadding Township
4.	Canadian Nickel Company Ltd.	Drilling, uranium prospect, Demorest Township
5.	Canadian Nickel Company Ltd.	Airborne electro-magnetic, magnetic, and radiometric surveys, Scadding Township
6.	Curtin Mines Ltd.	Drilling, copper-nickel prospect, Curtin Township
7.	Foubert, A.	Drilling, Clement Township
8.	Groundstar Resources Ltd.	Drilling, gold-copper prospect, Davis Township
9.	Kerr Addison Mines Ltd.	Magnetometer survey, drilling, gold prospect, Hutton and Parkin Townships
10.	Northgate Exploration Ltd.	Drilling, gold prospect, Scadding Township
11.	Owen, J.	Trenching, copper-nickel prospect, Baldwin Township
12.	Plexman, E. J.	Drilling, Davis Township
13.	St. Joseph Explorations Ltd.	Drilling, tungsten prospect, Foster Township
14.	430127 Ontario Ltd.	Electro-magnetic and magnetic surveys, gold prospect, McKinnon Township
15.	439948 Ontario Ltd.	Drilling, gold prospect, Davis Township

**Iron**

Production of iron-ore pellets continued at Dofasco's Sherman Mine, located at Temagami. The annual production rate is about 1 million tons of pellets.

## Uranium

Agnew Lake Mines Limited continued production on a salvage leach basis during the year. Production of uranium during the first half of the year amounted to 253 000 lbs. (Northern Miner Press, August 7, 1980).

## Industrial Minerals

The largest producer of industrial minerals in the area continued to be Indusmin Limited. The company mines quartzite on Badgeley Island in Georgian Bay. The annual production rate is about 400 000 tons.

Seeley and Arnill Construction Limited carried out pre-production development at the west end of Manitou-

lin Island. The company plans to ship crushed dolomite to southern Ontario.

Decorative stone was quarried intermittently by several operators. In the Sudbury area, Telteck Exploration Limited and Erana Mines Limited operated in Aylmer and MacLennan Townships, respectively. Dana Black Granite Limited operated in the River Valley area, and McLaren's Bay Mica Stone Quarries and Garmak Holding Limited operated quarries northeast of North Bay.

## Exploration Activities

Most exploration work within the Sudbury Resident Geologist's district was devoted to exploration for copper-

**TABLE 3** | ASSESSMENT WORK AND OTHER INFORMATION RECEIVED IN 1980 SUDBURY DISTRICT.

Abbreviations							
Assess	—	Assessment Work	GL	—	Geological		
DD	—	Diamond drill hole	GP	—	Geophysical		
EM	—	Electromagnetic	RA	—	Radioactive, radiometric		
Mag	—	Magnetometer					
Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work	Year	Toronto File No.
Clement	41 I/16	Foubert, A.		Assess.	DD 1-402'	1980	
Curtin	41 I/4	Curtin Mines Ltd.	Ni, Cu, Au	Assess.	DD 4-1328'	1979	
	41 I/4	Curtin Mines Ltd.	Ni, Cu, Au	Assess.	DD 1-254'	1980	
Davis	41 I/10	Rose, E. A. & Sylla, N.	Au	Assess.	GP, EM, Mag, GL	1974	2.1723
	41 I/10	Rose, E. A. & Sylla, N.	Au, Cu	Assess.	Assay, DD 8-310.5'	1975	2.1513
	41 I/10 41 I/10	Rose, E. A. & Sylla, N. Plexman, Eric J.	Au	Assess. Assess.	Assay DD 1-101.3'	1975 1980	2.1092
Demorest & Telfer	41 P/2 41 I/15	Canadian Nickel Company Ltd.	U <sub>3</sub> O <sub>8</sub>	Assess.	GP, EM, Mag, GL DD 2-5819'	1979	
Foster	41 I/4	Union Carbide Exploration Corp.	W, Mo	Assess.	GL	1979	
Fraleck	41 I/15	TX Resources Limited	U <sub>3</sub> O <sub>8</sub>	Assess.	GP, RA	1979	
May	41 J/1	Alexander, Alvin J.	U <sub>3</sub> O <sub>8</sub>	Assess.	DD 1-52.1'	1979	
Parkin	41 I/15	Ike Burns Exploration Corp.	Ni, Cu	Assess.	GP, Mag	1978	
	41 I/15	Midpines Explorations Inc.	Au	Assess.	DD 4-1242'	1979	
Roosevelt	41 I/4	Lashbrook Claim Group		Assess.	GP, Mag, EM	1979	2.3075
Shakespeare	41 I/5	Blue, Peter G.	Au	Assess.	Assay	1979	2.3205
	41 I/5	Blue, Peter G.	Au	Assess.	Assay	1979	2.3049
	41 I/5	Galbraith, John	Au	Assess.	DD 1-30'	1979	
Scadding	41 I/10	Canadian Nickel Company Ltd.	Base metals, Au	Assess.	GP, EM, Mag	1980	2.3405
	41 I/10	Watt, D. R.	Au	Assess.	DD 12-2706'	1979	

nickel-precious metals deposits related to the Sudbury Irruptive. Falconbridge Nickel Mines Limited and Inco Metals Company carried out drilling at several localities in the Sudbury area. Elsewhere in the district, copper-nickel-precious metals deposits associated with the Nipissing Diabase were explored by Curtin Mines Limited in Curtin Township, and by J. Owen in Baldwin Township.

The sharp increase in the price of gold over the year sparked a great deal of interest in the gold occurrences of the district. Anglesea Development Limited dewatered and sampled old workings on the former property of Alwyn Porcupine Mines Limited, and carried out a trenching on a second gold prospect, both located in Scadding Township. Drilling was done on a gold occurrence in Davis Township by 439948 Ontario Limited. The gold-copper deposit at the former Norstar Lake Mine in Davis Township was drilled by Groundstar Resources Limited. Kerr Addison Mines Limited carried out a magnetometer survey and diamond drilling on a placer gold prospect on the Vermilion River in Hutton and Parkin Townships. Northgate Exploration Limited optioned the McLean-Watt gold prospect in Scadding Township (briefly described in last year's report), and is currently carrying out a detailed drilling program. R. Butler and A. Laaksonen trenched a gold showing in Scadding Township. Several companies carried out regional reconnaissance prospecting of the Huronian Supergroup to assess its potential as a host for Witwatersrand-type gold deposits.

In work directed at other commodities, St Joseph Explorations Limited drilled a tungsten prospect in Foster Township. Canadian Nickel Company Limited and partners carried out drilling in DeMorest Township as part of a uranium exploration project. J. Brady conducted trenching and sampling of underground workings on a silver prospect in Donovan Township.

## Ontario Geological Survey Activities

### Engineering and Terrain Geology Section

J. Z. Fraser and D. W. Scott carried out an aggregate inventory of the City of North Bay (A, Figure 2). M. D. Johnson and P. G. Telford continued stratigraphic studies, including field mapping and core drilling, on the west end of Manitoulin Island (B, Figure 1).

### Geophysics/Geochemistry Section

V. K. Gupta carried out a gravity survey in the Onaping Lake area (C, Figure 1).

### Precambrian Geology Section

Burkhardt O. Dressler continued a detailed study of the footwall and sub-layer of the Sudbury Irruptive (D, Figure 1). T. L. Muir mapped parts of Morgan, Lumsden, and Bowell Townships, covering the north-central part of the Irruptive (E, Figure 1). J. Wood continued a regional study of the stratigraphy, structure, and sedimentology of the Cobalt Embayment (F, Figure 1).

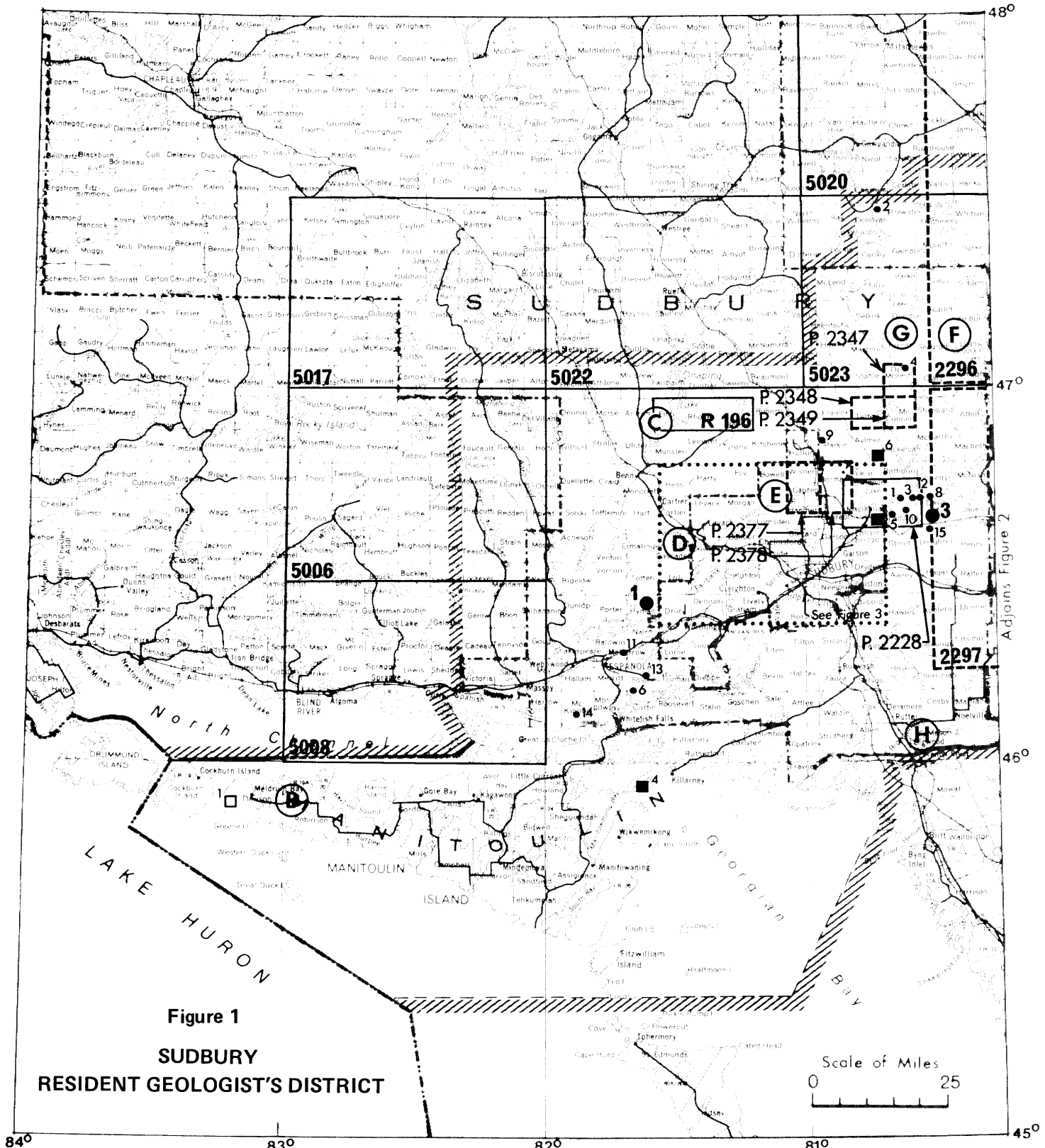
### Mineral Deposits Section

H. Meyn and M. K. Mathews continued a study of uranium deposits in the southern part of the Cobalt Embayment (G, Figure 1). M. A. Vos mapped and sampled the nepheline syenite body located in Bigwood Township (H, Figure 1).

## Some Recent Publications

- Baer, A. J.  
1980: Foliated and Recrystallized Granites from the Timberlake Pluton, Ontario; p.201-205 in *Current Research Part C*; Geological Survey of Canada Paper 80-1c.
- Card, K. D.  
1980: *Geological Survey of Canada Preliminary Maps, Central Superior Province Compilation – Sudbury (41P), Blind River (41J), Gogama (41P)*. Scale 1:250 000.
- Dupuis, L.  
1979: *The Nature and Origin of Sudbury Breccia near Lake Laurentian*; Unpublished M.Sc. thesis, Laurentian University, 149p.
- Fleet, M. E.  
1977: *Origin of Disseminated Cu-Ni Sulphide Ore at Frood, Sudbury, Ontario*; *Economic Geology*, Volume 72, p.1449-1456.
- Gwyn, Q. H. J., and Dreimanis, A.  
1979: *Heavy Mineral Assemblages in Tills and Their Use in Distinguishing Glacial Lobes in the Great Lakes Region*; *Canadian Journal of Earth Sciences*, Volume 16, p.2219-2235.
- Krogh, T. E., Davis, D. W., McNutt, R. H., and Davis, G. L.  
1979: *U-Pb Systematics of the Sudbury Norite Zircons, Complex and Simple Discordia*; Report 39, Annual Report for 1979, Department of Geology, University of Toronto, p.59.
- Kuo, H. Y., and Crocket, J. H.  
1979: *Rare Earth Elements in the Sudbury Nickel Irruptive: Comparison with Layered Gabbros and Implications for Nickel Irruptive Petrogenesis*; *Economic Geology*, Volume 74, p.590-605.
- Morris, W. A.  
1980: *Tectonic and Metamorphic History of the Sudbury Norite: the Evidence from Paleomagnetism*; *Economic Geology*, Volume 75, p.260-277.
- Mott, R. J., and Harrison, J. E.  
1979: *Boulter Lake Series*; p.13 in *Geological Survey of Canada, Radiocarbon Dates XIX*, Paper 79-7.
- Rousell, D. H.  
1980: *Kink Bands in the Onaping Formation, Sudbury Basin, Ontario*; *Tectonophysics*, Volume 66, p.83-97.
- Stevenson, J. S.  
1979: *Geological Concepts Developed in the Precambrian of Sudbury, Ontario*; p.224-244 in *History of Concepts in Precambrian Geology*, Editors W. O. Kupsch and W. A. S. Sargeant, Geological Association of Canada Special Paper 19.
- Stevenson, J. S., and Stevenson, L. S.  
1980: *Sudbury, Ontario, and the Meteorite Theory*; *Geoscience Canada*, Volume 7 (3), p.103-108.
- Wolf, R., Woodrow, A. B., and Grieve, R. A. F.  
1980: *Meteorite Material at Four Canadian Impact Craters*; *Geochimica Cosmochimica Acta*; Volume 44, p.1015-1022.

NORTHEASTERN — SUDBURY



Adjoins Figure 2

**Figure 1**  
**SUDBURY**  
**RESIDENT GEOLOGIST'S DISTRICT**

Scale of Miles  
0 25

EXPLANATION

- Exploration activity in 1980 (keyed to Table 2)
- A Location of OGS field party in 1980
- ▨ Boundary of Resident Geologist's district.
- Map or report issued by the Ontario Geological Survey (keyed to Table 1)
  - P. - Preliminary Map.
  - 5040 - Coloured Map.
  - R. - OGS Report.

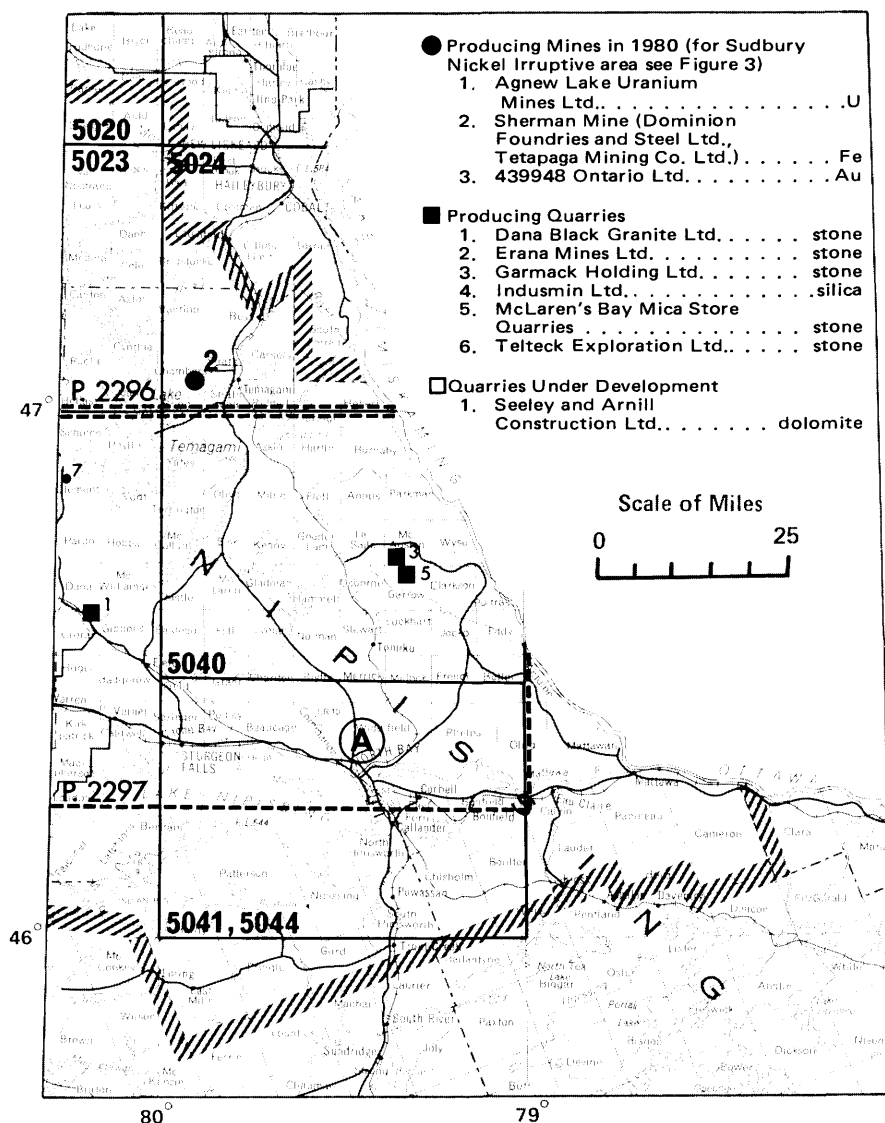


Figure 2  
SUDBURY RESIDENT GEOLOGIST'S DISTRICT

NORTHEASTERN — SUDBURY

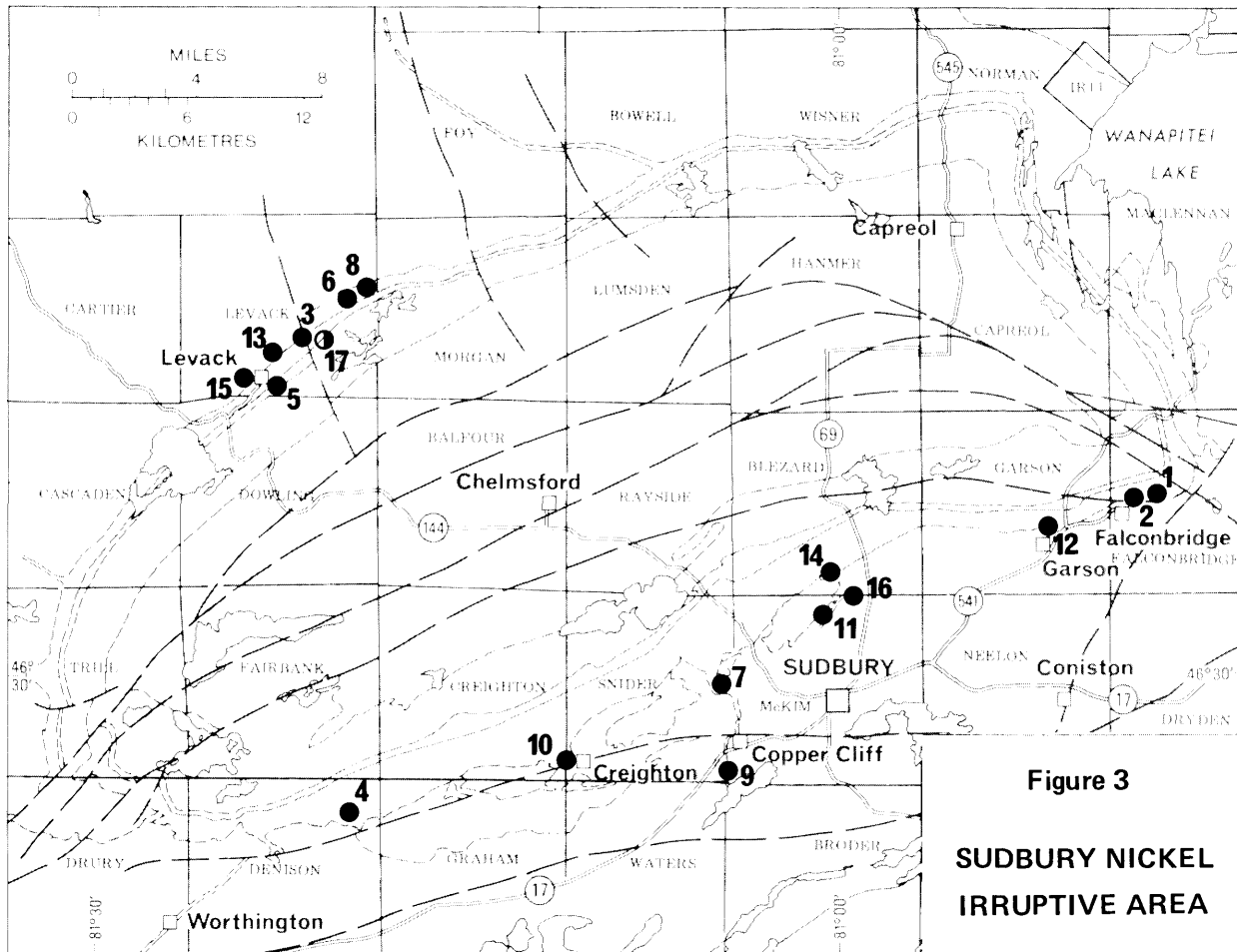


Figure 3

SUDBURY NICKEL  
IRRUPTIVE AREA

EXPLANATION

- Producing Mines
  - Falconbridge Nickel Mines, Ltd. . . . . Ni, Cu, Pt, Co, Au, Ag
  - 1. East Mine
  - 2. Falconbridge Mine
  - 3. Fecunis Mine
  - 4. Lockerby Mine
  - 5. Onaping Mine
  - 6. Strathcona Mine
  - INCO Ltd. (Inco Metals Co.) . . . Ni, Cu, Pt, Se, Te, Co, Au, Ag, Fe
  - 7. Clarabelle No. 2 Open Pit
  - 8. Coleman Mine
  - 9. Copper Cliff South Mine
  - 10. Creighton Mine
- Mines Under Development
  - Falconbridge Nickel Mines Ltd.
  - 11. Frood Mine
  - 12. Garson Mine
  - 13. Levack Mine
  - 14. Little Stobie Mine
  - 15. McCreedy West Mine (formerly Levack West) Mine
  - 16. Stobie Mine
  - 17. Fraser Mine

# 1980 Report of the Algonquin Regional Mines Coordinator

W. J. Logan<sup>1</sup> and H. D. Meyn<sup>2</sup>

## Contents

Introduction .....	123
Exploration and Mining Activities .....	123
Ontario Geological Survey Activities .....	123
Ministry of Natural Resources and Other Activities .....	127
Selected References .....	127

## Tables

1-Assessment work and other information received in 1980 ..	124
2-Maps and Reports issued by the Ontario Geological Survey .....	127

## Figure

1-Algonquin Region .....	126
--------------------------	-----

## Introduction

The Regional Mines Coordinator's office in Huntsville is staffed by W. J. Logan, Regional Mines Coordinator and D. J. Villard, Resource Geologist. In June, the position of Resident Geologist was filled by H. D. Meyn. H. D. Meyn will be responsible for the Bancroft, Minden, and Pembroke Districts and is located in the Bancroft District Office. Temporary staff were on contract for a specific project and four students were employed for the summer in the Experience '80 Program.

The field part of the detailed mapping project in the Parry Sound area initiated in 1979 was completed in 1980. The report on this activity, for publication by the Ontario Geological Survey, is in preparation. Several Ontario Geological Survey field parties and a Geological Survey of Canada field party were active in the Region this year. Their activities are described elsewhere in the report.

<sup>1</sup>Regional Mines Coordinator, Ontario Ministry of Natural Resources, Huntsville, Ontario, P0A 1K0.

<sup>2</sup>Resident Geologist, Ontario Ministry of Natural Resources, Bancroft, Ontario, K0L 1C0.

## Exploration and Mining Activities

Staking activity compared to 1979 remained constant. Due to the high percentage of patented land in the Region, exploration activities have been difficult to monitor. Uranium exploration again was centred in the Bancroft area with some activity in Renfrew County. Rare Earth Resources Limited removed a bulk sample of uranium mineralization from its Halo Mine, near Wilberforce, for metallurgical studies. A decision is pending on further work at the Halo and the company's other properties.

Madawaska Mines Limited, southwest of Bancroft, operated continuously throughout 1980, maintaining a production capacity of 1 500 tons of uranium ore per day based on a five day mine and mill work week. Production was temporarily interrupted at Chromasco Limited, near Haley, in August due to a failure in the substation. Full production was resumed within four weeks. Nepheline syenite production was maintained by Indusmin Limited at Nephton and by IMC Chemical Group (Canada) Limited near Blue Mountain. IMC is presently upgrading its facilities to broaden their range of products.

The Mill Lake quarry near Parry Sound is producing and marketing a ½-inch veneer stone for wallboard facing. Veneer and flagstone with some marble for stucco are produced in most of the other quarries in the region.

For the mineral collector, the Princess quarry near Bancroft is producing sodalite. Beryl can be obtained from Wal-Gem Lapidary near Quadville; unfortunately, the company's rose quartz quarry near Quadville was closed. "Gemborees" were held in August at Bancroft and at Wilberforce. The Resident Geologist will be participating in mineral collecting activities throughout his district.

## Ontario Geological Survey Activities

E. G. Bright extended his previous studies of the area by a synoptic reconnaissance mapping project of the Burleigh Falls Area (31D/9).

N. G. Culshaw mapped the Drag Lake Area (31E/1). J. R. Bartlett, J. M. Moore, and M. J. Murray mapped Belmont Township and part of Methuen Township, Peterborough County (31C/12).

# ALGONQUIN

## TABLE 1 | ASSESSMENT WORK AND OTHER INFORMATION RECEIVED IN 1980

### Abbreviations used

D.D.(2-715')	– Diamond drilling, 2 holes, 715 feet total	Geol.	– Geological Survey
EM	– Electromagnetic Survey	Geophys.	– Geophysical Survey
Geochem.	– Geochemical Survey	Mag.	– Magnetic Survey
Rad.	– Radiometric Survey	MEAP	– Mineral Exploration Assistance Program
Str.	– Stripping	IP	– Induced Polarization
Tr.	– Trenching		

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work	Year	Toronto File No.	Local File No.
Haliburton Co. Cardiff Twp.	31D/16	W.S. Vaughan	Uranium	Drill Logs	D.D.H. (2-766')	1980		Cardiff 202
	31E/1	Carbrew Explorations Ltd.	Uranium	Geology	Str. Mapping	1978	63.3573	Cardiff 203
	31E/1	Opawica Explorations Ltd.	Uranium	Geophys. Geol.	EM, Mag. Mapping	1979	2.3129	Cardiff 204
Haliburton Co. Dysart Twp.	31E/2	Silver Acorn Developments Ltd.	Uranium	Geol. Geophys.	Tr., Rad. D.D.H. (6-855')	1980		Dysart 2
Haliburton Co. Glamorgan Twp.	31D/15	Canadian Smelting & Refining (1974) Ltd.	?	Drill Log	D.D.H. (1-172.7m)	1980		Glamorgan 22
	31D/16	Canadian Smelting & Refining (1974) Ltd.	Base Metals	Geophys.	VLF-EM	1980	2.3214	Snowdon 17
Haliburton Co. Lutterworth Twp.	31D/15	Jorex Ltd.	Uranium	Drill Logs	D.D.H. (1-113m)	1979	63.3610	Somerville 2
	31D/15	St. Joseph Explorations Ltd.	Base Metals	Geophys.	IP	1976	2.2924	Lutterworth 5
Haliburton Co. Monmouth Twp.	31D/16	Western Mines Limited	Uranium	Geophys.	VLF-EM -Mag. -Rad.	1979	2.3081	Monmouth 105
Haliburton Co. Monmouth Twp.	31D/16	Esso Resources Canada Ltd.	Uranium	Geol. Geophys.	Str. Rad.	1980	2.3257	Monmouth 106
	31D/16	Thomas J. Czuppon	?	Sketch	Manual	1979		Monmouth 107
Haliburton Co. Snowdon Twp.	31D/15	St. Joseph Explorations Ltd.	Base Metals	Drill Log	D.D.H. (3-586.4m)	1978		Snowdon 15
	31D/15	St. Joseph Explorations Ltd.	Base Metals	Geophys.	VLF, Mag.	1979	2.3059	Snowdon 16
	31D/15	Canadian Smelting & Refining (1974) Ltd.	Base Metals	Geophys.	VLF-EM	1980	2.3214	Snowdon 17
Hastings Co. Faraday Twp.	31F/4	Mercier Explorations Ltd.	Uranium	Geophys.	Rad.	1978	2.2932	Faraday 69
	31F/4	Mercier Explorations Ltd.	Uranium	Geophys.	Rad.	1979	2.3084	Faraday 70
	31F/4	Mercier Explorations Ltd.	Uranium	Geophys.	Mag. Rad.	1980	2.3223	Faraday 71
	31F/4	R.L.V. Ekstrom	?	Drill Logs	D.D.H. (3-201')	1980		Faraday 72
	31F/4	Roger Mercier	Uranium	Sketch	Sample Collection	1978		Faraday 73
	31F/4	Roger Mercier	Uranium	Geophys.	Rad.	1979		Faraday 74
Nipissing Dist. Butt Twp.	31E/11	Jack McVittie	?	Sketch	Tr.	1979		Butt 17
	31E/11	Harold Barry	?	Sketch	Tr.	1979		Butt 18



TABLE 1 Continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work	Year	Toronto File No.	Local File No.
Parry Sound Dist. Ferrie Twp.	31E/12	E. Jones	Copper	Sketch	Tr.	1979		Ferrie 10
	31E/12	E. Jones	Copper	Sketch	Tr.	1979		Ferrie 11
	31E/12	E. Jones	Copper	Drill Logs	D.D.H. (3-75')	1979		Ferrie 12
Parry Sound Dist. Lount Twp.	31E/13	Jack McVittie	Limestone	Geophys.	Mag., Rad.	1979		Lount 9
Peterborough Co. Anstruther Twp.	31D/16	W.A. Blott	Uranium	Drill Logs	D.D.H. (4-1859')	1980		Anstruther 80
	31D/16	W.A. Blott	Uranium	Drill Logs	D.D.H. (1-120')	1979		Anstruther 81
	31D/16	W.A. Blott	Uranium	Drill Logs	D.D.H. (1-280')	1980		Anstruther 82
	31D/16	Esso Resources Canada Ltd.	Uranium	Geophys. Geol.	Rad. Mapping	1979	2.3068	Anstruther 83
	31D/16	Northgate Explorations Ltd.	Uranium	Geophys. Geol.	Radon, Rad. Mapping	1979	2.3295	Anstruther 84
	31D/16	Esso Resources Canada Ltd.	Uranium	Drill Logs	D.D.H. (3-452')	1980		Anstruther 85
Peterborough Co. Cavendish Twp.	31D/16	St. Joseph Explorations Ltd.	Base Metals	Geophys.	EM, Mag.	1979	2.3061	Cavendish 79
	31D/16	St. Joseph Explorations Ltd.	Base Metals	Geol. Geochemistry	Mapping Sampling	1980		Cavendish 80
	31D/16	Mountainview Explorations	Uranium	Geophys.	Mag., Rad.	1979	2.3150	Cavendish 81
	31D/16	C.R. Bowdidge	Uranium	Property	Expl. Proposal	1978		Cavendish 82
Peterborough Co. Galway Twp.	31D/10	St. Joseph Explorations Ltd.	Base Metals	Geophys.	VLF-EM Mag.	1980	2.3285	Galway 27
Peterborough Co. Methuen Twp.	31C/12	Preussag Canada Ltd.	Base Metals	Drill Logs	D.D.H. (3-200.3m)	1980		Methuen 26
Renfrew Co. Lyndoch Twp.	31F/6	Cominco Ltd.	Uranium	Geol.	Mapping	1979	2.3225	Lyndoch 20
	31F/6	R.J. Crawford	?	Sketch	Bulldozing	1980		Lyndoch 21
Victoria Co. Laxton Twp.	31D/10	J. Haahti	Molyb- denite	Geophys.	VLF-EM Mag.	1979	2.3063	Laxton 4
Victoria Co. Somerville Twp.	31D/15	Jorex Ltd.	Uranium	Drill Logs	D.D.H. (10-485.25m)	1979	63.3610	Somerville 2
	31D/15	St. Joseph Explorations Ltd.	Base Metals	Geophys.	VLF-EM Mag.	1979	2.3167	Somerville 3
	31D/10	St. Joseph Explorations Ltd.	Base Metals	Geophys.	VLF-Mag.	1979	2.3062	Somerville 4



P. F. Finamore mapped the Quaternary geology of the Coe Hill Area. (31C/13).

T. R. Carter continued a study of the Metallic Mineral Deposits of the Grenville Province, Southeastern Ontario.

S. L. Masson and J. B. Gordon completed a detailed mapping study of the controls of uranium mineralization in the Bancroft Area (31F/4).

## Ministry of Natural Resources and other Activities

R. Keevil, of the Leslie M. Frost Natural Resources Centre, and the Resident Geologist lectured at four junior ranger camps. A bedrock geological map of the Centre has been published and is available at the Centre. A limited amount of diamond drilling was carried out on the model mining claim as a teaching aid in the Centre's interpretation program.

Dr. A. Davidson of the Superior-Grenville Section of the Geological Survey of Canada has commenced mapping the Grenville Province between 45°N and 46°N from Byng Inlet to Pembroke. This year's mapping was in the Parry Sound area.

Dr. W. M. Schwerdtner of the University of Toronto received a Geoscience Research Grant to investigate structural controls of uranium deposits in the Bancroft-Gooderham area. Dr. Schwerdtner presented his initial findings at the Geoscience Research Seminar in December 1980.

The Ministry of Transportation and Communications conducted a series of tests into the problem of Muskoka-Haliburton area aggregates for use in concrete exposed to freeze-thaw conditions and de-icing chemicals. Although results were encouraging, the tests are

being replicated this winter before a decision on the use of these aggregates is made. This decision is expected by the spring of 1981.

During the 1980 field season, the Quaternary geology of approximately 15 natural zones and part of the wilderness zone in Algonquin Park was mapped by J. Cronin. The completed mapping will be done at a scale of 1:150 000. A number of properties, scattered across the Algonquin Region, were geologically inventoried by C. Spek. Some of the areas studied include the Hardy Lake property in the Township of Muskoka Lakes, Petawawa Fish Hatchery, and proposed addition, and several islands in Black Donald Lake.

## Selected References

Bartlett, J. R., Moore, J. M., and Murray, M. J.  
1980: Belmont and Southern Methuen Townships, Peterborough County; p.92-95 *in* Summary of Field Work, 1980, by the Ontario Geological Survey, Edited by V. G. Milne, O. L. White, R. B. Barlow, J. A. Robertson and A. C. Colvine, Ontario Geological Survey, Miscellaneous Paper 96, 201 p.

Bright, E. G.  
1980: Regional Structure and Stratigraphy of the Burleigh Falls Area, Peterborough County; p. 67-69 *in* Summary of Field Work, 1980, by the Ontario Geological Survey, Edited by V. G. Milne, O. L. White, R. B. Barlow, J. A. Robertson and A. C. Colvine, Ontario Geological Survey, Miscellaneous Paper 96, 201 p.

Carter, T. R.  
1980: Metallic Mineral Deposits of the Grenville Province, Southeastern Ontario; p. 169-174 *in* Summary of Field Work, 1980, by the Ontario Geological Survey, Edited by V. G. Milne, O. L. White, R. B. Barlow, J. A. Robertson and A. C. Colvine, Ontario Geological Survey, Miscellaneous Paper 96, 201 p.

Culshaw, N. G.  
1980: Drag Lake Area, Haliburton County; p. 169-174 *in* Summary of Field Work, 1980, by the Ontario Geological Survey, Edited by V. G. Milne, O. L. White, R. B. Barlow, J. A. Robertson and A. C. Colvine, Ontario Geological Survey, Miscellaneous Paper 96, 201 p.

Finamore, P. F.  
1980: Quaternary Geology of the Coe Hill Area (31C/13), Hastings, Peterborough and Haliburton Counties, Southern Ontario; p. 117-118 *in* Summary of Field Work, 1980, by the Ontario Geological Survey, Edited by V. G. Milne, O. L. White, R. B. Barlow, J. A. Robertson and A. C. Colvine, Ontario Geological Survey, Miscellaneous Paper 96, 201 p.

Geological Survey of Canada  
1980: Map 40072 G, 31K/3d, High Resolution Aeromagnetic Vertical Gradient, Scale 1:25 000.  
1980: Map 20238 G, 31K/3d, High Resolution Aeromagnetic Total Field, Scale 1:25 000.

Masson, S. L. and Gordon, J. B.  
1980: Uranium Mineralization and its Controls in the Bancroft Area, Southern Ontario; p. 175-178 *in* Summary of Field Work, 1980, by the Ontario Geological Survey, Edited by V. G. Milne, O. L. White, R. B. Barlow, J. A. Robertson and A. C. Colvine, Ontario Geological Survey, Miscellaneous Paper 96, 201 p.

**TABLE 2** | MAPS AND REPORTS PERTAINING TO THE ALGONQUIN REGION ISSUED BY THE ONTARIO GEOLOGICAL SURVEY IN 1980. SEE "LIST OF PUBLICATIONS" (BACK POCKET) FOR DETAILS.

Preliminary Maps		
P 1980	P 2337	P 2366
P 2205	P 2343	P 2367
P 2209	P 2344	P 2376
P 2210	P 2374	P 5317
P 2211	P 2365	
Colored Maps		
2433		
Open File Reports		
5286		
5294		
5295		
5296		
5300		
5302		
5304		
5317		

# 1980 Report of the Eastern Regional Mines Coordinator and Eastern Region Resident Geologist

P.W. Kingston<sup>1</sup>, M.A. Klugman<sup>2</sup>, and A.F. Young<sup>3</sup>

## Contents

Introduction .....	128
Resident Geologist's Activities .....	128
Kemptville Office Activities .....	129
Mining Activity .....	129
Exploration Activity .....	129
Uranium .....	129
Gold .....	131
Base Metals .....	132
Mica .....	132
Silica .....	132
Industrial Minerals Program .....	132
Graphite .....	132
Marble (Calcium Carbonate) .....	132
Talc .....	132
Silica .....	132
Vermiculite .....	132
Aggregate Resources .....	132
Ontario Geological Survey Activities .....	133
Geological Mapping .....	133
Mineral Education Program .....	133
Research by Other Agencies .....	133

## Table

1 – Assessment Work and Other Information Received in 1980 .....	130
---	-----

## Figures

1 – Exploration Work, Studies and Mining Activities .....	134
---	-----

## Introduction

The office of the Regional Mines Coordinator is located in Kemptville. T.W. Fletcher, Mineral Resources Manager, and A.E. McKay, Resource Geologist, also work from the Kemptville office.

The office of the Resident Geologist, is located in

Tweed; the Resident Geologist is responsible for the Precambrian in all of the Eastern Region.

A number of temporary staff were on contract for specific projects and eight students were employed for the summer in the Experience '80 program.

## Resident Geologist's Activities

The primary function of the Resident Geologist's program is to provide a professional-technical advisory service to the public, to mining and exploration companies, and to various government agencies. The office also maintains a technical library, and keeps assessment records submitted under the requirements of the Mining Act.

Much of the winter was spent on a preliminary 1:250 000 scale geological compilation map of the Kingston sheet (NTS/31C) and part of the field season (April – November) was spent on field-checking for this project. Most of the remainder of the field season was spent on the Canada-Ontario, Eastern Ontario, and Subsidiary Agreement industrial mineral programs concerning marble, graphite, and talc. Additionally, the more significant zinc and gold properties were examined, and a number of properties undergoing exploration by mining companies and prospectors were visited by the Resident Geologist.

The Resident Geologist also provided data for resource planning purposes. Mineral resource, geological, and mineral potential maps were prepared for the Hinchinbrooke Municipal Planning Area, the Oso Municipal Planning Area, the Bedford Township Plan, the Lennox and Addington County Plan, and the Ministry of Natural Resources Tweed District Strategy.

All of the townships in the Tweed District were designated under the Pits and Quarries Control Act on January 1, 1981. In preparation for this, a major public information program was undertaken in the last three months of 1980 to inform County and Municipal Councils and pit and quarry operators, of the implications and requirements of this new legislation.

During the year, additional office space was built in the Tweed office for a Resource Geologist and a pit and quarry inspector who will be hired in early 1981, and an office for the public consultation of assessment records. Lynx-Canada Explorations Limited very kindly donated the core building and drill core from their Long Lake Zinc Mine in Olden Township. The Long Lake Mine was closed in 1974, the three ore bodies have been depleted. This

<sup>1</sup> Resident Geologist (Eastern Region), Tweed, Ontario, K0K 3J0.

<sup>2</sup> Regional Mines Coordinator (Eastern Region), Kemptville, Ontario K0G 1J0.

<sup>3</sup> Project Geologist (Eastern Region), Kemptville, Ontario, K0G 1J0.

building has been moved to Tweed and will serve as the start of a drill core library for the Ministry in eastern Ontario.

During 1980, the Resident Geologist attended a number of professional technical conferences. He also participated in two field trips, one to the Balmat Zinc mine in New York, U.S.A., which is the only producing zinc mining camp in the Grenville, and the other to the Dryden – Sioux Lookout area in northwestern Ontario. Two Ontario Geological Survey field mapping parties were visited during the summer.

## Kemptville Office Activities

During the past year, the staff of the Kemptville office continued in their primary role to provide a consultive service to industry, other government agencies, and the public, in order to encourage the development of mineral properties, and to ensure that geological and geotechnical engineering factors were taken into considerations in development.

In encouraging mineral development, this included working with companies on the exploration and development of silica sand for the foundry industry and glass industry; gold; graphite; vermiculite; magnetite for heavy media; peat; lead; zinc; talc; calcium carbonate; cement; lime; and aggregate.

In geotechnical engineering, it involved working with consultants, municipalities and other government agencies in the design of protective and remedial measures for slope stabilization, foundations, and river crossings.

Other staff activities included the presentation of papers, by M.A. Klugman, on industrial mineral development, "A Ministry of Natural Resources Initiative on the Development of Industrial Minerals in Eastern Ontario", at the annual CIMM Convention in Toronto, the presentation of a paper by T.W. Fletcher, on aggregate classification, "Aggregate Assessment in Eastern Ontario" at the annual AEG Convention in Dallas, Texas, and M.A. Klugman chaired a session at the annual Canadian Geotechnical Society Convention in Toronto. T.W. Fletcher is a member of the Engineering Mapping Symbols Committee of AEG and M.A. Klugman serves on an international ad hoc committee in blasting. M.A. Klugman attended an inter-provincial workshop on industrial minerals, convened by the Federal Government, in Ottawa, along with S.E. Yundt and D.G. Minnes from the Mineral Resources Branch in Toronto.

On January 1, 1981, the entire Eastern Region was designated under the Pits and Quarries Control Act (1971), resulting in the administration of an additional 97 townships under the Act from the present 20. This has required a major modification in the Eastern Region's program in the latter part of 1980 as a massive public information program was undertaken to inform county and municipal Councils and pit and quarry operators of the implications and requirements of this new legislation. The field aspects of this program are being coordinated by T.W. Fletcher who is also participating in the meetings.

Underground Space Utilization, as an Eastern Re-

gion energy initiative, is being investigated by the region in cooperation with the Regional Municipality of Ottawa-Carleton and the Ministry of Natural Resources in Toronto.

## Mining Activity

Producing mines in eastern Ontario are shown on Figure 1. The three cement producers continued production except for some shutdowns in the late summer or fall, resulting in part from lower construction activity. Grenville Aggregates and Stoklosar Marble Quarries (1969) Limited continued production of marble speciality products and terrazzo chips. The William R. Barnes Company Limited continued expanded operations at their Tatlock marble quarry and Perth crushing and screening plant. Ram Petroleum Limited completed construction of a mill for processing tremolite from their Palmerston Township open pit mine. The tremolite products are to be used as additives for asphalt road construction and production is expected to commence in 1981.

Peat production by Diamond Peat Moss in Stormont Township continued in 1980.

## Exploration Activity

In 1980, approximately 335 new claims were recorded in eastern Ontario, almost double the number recorded in 1979. The increased exploration activity is related to higher gold prices, and a renewed interest in industrial minerals, notably talc, tremolite, and mica.

Figure 1 shows area of claim staking activity during the year as well as the location of properties on which assessment work has been filed.

Since much of the exploration work undertaken in eastern Ontario is on private land, there is no obligation on the part of the company to report its activities. However, the companies have been cooperative in keeping the Ministry informed on their activities, and in many cases voluntarily supplied information on a confidential basis. It is therefore not possible to report all of the exploration activity in the Eastern Region.

## Uranium

Exploration for uranium centred in the Palmerston Township area near Sharbot Lake. A.J.M. Exploration Limited and Groundstar Resources Limited, both completed drilling programs outlining radioactive pegmatite zones in granodiorite gneiss and metasediments. The pegmatites are sill-like bodies ranging up to several tens of metres thick.

Exploration for uranium is also being undertaken in the Nepean sandstone. Among several companies, Gulf Minerals Canada Limited undertook a diamond drilling program in the Newboyne area of Leeds County this past year.

EASTERN

TABLE 1 | ASSESSMENT WORK AND OTHER INFORMATION RECEIVED IN 1980.

Location	NTS ●	File Name	Commodity Sought	Type of Report	Type of Work	Year	Toronto File No.	Local File No.
Assess — Assessment Work			GC — Geochemical Survey			QP — Quarry Permit		
Au — Gold			GL — Geological Survey			SA — Sampling, Assays		
CaCO <sub>3</sub> — Calcium Carbonate			GP — Geophysical Survey			TR — Trenching		
5DDH-1000 — 5 diamond-drill holes totalling 1000 feet.			mb — Marble			U — Uranium		
			MEAP — Mineral Exploration Assistance Program			Zn — Zinc		
Anglesea	31C/14	Ultimate Energy & Resources Ltd.	Au	Lease		1980		Anglesea 6
Anglesea	31C/14	Ultimate Energy & Resources Ltd.	Au	MEAP	DDH SA	1979		Anglesea 7
Barrie	31C/14	Russell J. Crawford	mb		QP	1979		Barrie 39
Barrie	31C/14	Henry F. Cook	Sulphides	Assess	SA	1979	2.3100	Barrie 40
Barrie	31C/14	Henry F. Cook	Sulphides	Assess	4DDH-153	1979		Barrie 41
Barrie	31C/14	Donald Hardie	Au	MEAP	GL	1980		Barrie 42
Barrie	31C/14	Donald A. Hardie	Au	Assess	3DDH-65	1980		Barrie 43
Barrie	31/C14	Canreos Minerals (1980) Ltd.	Au	Assess	GL, TR	1980		Barrie 44
Belmont	31C/12	Preussag Canada Ltd.	CaCO <sub>3</sub>	Assess	6DDH-1774	1980		CaCO <sub>3</sub> file
Clarendon	31C/15	Selco Mining Corp. Ltd.		Assess	GC	1980		Clarendon 11
Clarendon	31C/15	Selco Mining Corp. Ltd.		Assess	GP	1980	2.3307	
Darling	31F/2	W.R. Barnes Co. Ltd.	mb	Assess	2DDH-868	1980		Darling 7
Darling	31F/2	H. Pharaoh		Assess	GC	1980		Darling 8
Grimsthorpe	31C/11,14	W.C. Shough & R. Buchanan	Au	Assess	TR	1980		Grimsthorpe 2
Grimsthorpe	31C/14	W.C. Shough & R. Buchanan	Au	Assess	SA	1980		Grimsthorpe 3
Grimsthorpe	31C/11,14	W.C. Shough & R. Buchanan	Au	Assess	SA	1980	2.3356	Grimsthorpe 4
Kennebec	31C/15	Clarendon Mining Corp.	U	Assess	GP	1978/1979	2.3176	Kennebec 5
Kennebec	31C/15	Clarendon Mining Corp.		Assess	GP	1979		Kennebec 6
Kennebec	31C/15	Clarendon Mining Corp.		Assess	DDH	1979		Kennebec 7
Lake/Belmont/Methuen	31C	Engelhard Minerals & Chemicals Corp.	mb			1976		Lake 9
Madoc	31C/11	Earl Clinton Sager	Au	Assess	1DDH187+	1980		Madoc 34
Marmora	31C/5	James R. Harrington		Assess	GP	1980		Marmora 10
Marmora		Inco Ltd.		Reversion of mining rights to Crown		1979		Marmora 11
North Burgress	31C/16	Indusmin Ltd.	Silica	Assess	9DDH-267	1980		North Burgress 2

TABLE 1 Continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work	Year	Toronto File No.	Local File No.
North Canonto	31F/2	Norman Pilotzke		Assess	TR	1979		North Canonto 3
Olden	31C/15	G.W. Harvey		Lease		1980		Olden 35
Olden	31C/10	Selco Mining Corp.	Zn	Assess	GC	1979	2.3058	Olden 36
Palmerston	31C/15	Consolidated Imperial Resources Ltd.	U	Prospectus	GP, GL	1978		Palmerston 42
Palmerston/Olden	31C/15	AJM Explorations Ltd.	U	Assess	Airborne GP	1979		Palmerston 43
Palmerston	31C/15	AJM Explorations Ltd.	U	Assess	16DDH-2206	1980		Palmerston 44
Palmerston	31C/15	Groundstar Resources Ltd.	U	Assess	5DDH-1982	1980		Palmerston 45
Palmerston	31C/15	AJM Explorations Ltd.	U	Assess	6DDH-999.6	1980		Palmerston 47
Richmond	31C/6	Harold A. McConnell	CaCO <sub>3</sub>	Notre re high calcium limestone	SA	1980		Richmond 1
Tudor	31C/12	J.L. Montgomery		Assess	GL	1980	2.3272	Rudor 18
Tudor, Limerick	31C/12, 13	Domtar Chemicals Group		Inco mining rights + info on Domtar-Crown land exchange		1980		Tudor 19

## Gold

Considerable exploration for gold took place during the year, and nearly all of the old gold properties and past-producing mines saw some activity, ranging from diamond drilling to dewatering of shafts.

Ultimate Energy and Resources Limited carried out a trenching and drilling program in Anglesea Township near the former O'Donnell properties, and have converted the claims to lease.

D. Hardie (personal communication) reported good grades of gold in quartz veins in trenches and diamond drill core at the east end of Mississagon Lake in Barrie Township, at the former Gough property.

Canreos Minerals (1980) Limited own a block of claims surrounding the Star of the East Gold Mine about three miles northeast of Cloyne in Barrie Township. This company has carried out surface geological work and trenching. The Canreos property includes the former Buckhorn Mines property.

Cox Mining Limited of Timmins carried out some shaft rehabilitation and dewatering activities, and sampled the dumps at the old Ore Chimney Mine (formerly Bey Mines Limited) property in the operations, allowed the mine to flood, and has recapped the shaft. The working levels were not reached.

E. Sager carried out limited drilling near the former Sophia (Diamond) Mine in Madoc Township.

Messrs. Shough and Buchanan (Orion Explorations) have been carrying out surface exploration, sampling, and assaying at the former Gilmore Gold Mine in Grimsthorpe Township. Five shafts and three levels have been developed on this past producer.

E and B Explorations Incorporated of Vancouver optioned the Addington Mine (Golden Fleece Deposit) from Cominco. The company is currently conducting a drilling program to test possible extensions of the mineralized zone outlined by Cominco between 1935 and 1939. Cominco developed the zone underground on the 300-foot level along a strike length of 3200 feet and to a proved depth of 775 feet level over a shorter strike length. Approximately 250 000 tons of marginal grade ore was developed by 1938; the property was allowed to flood in 1939 and no significant exploration had been carried out in the interval until this year.

The Cordova gold mine in Belmont Township is undergoing continuing exploration. Since the property lies just outside the Eastern Region boundary the description of exploration activities is found in the report of the Central Regional Geologist, this volume.

The area in the vicinity of the Boerth gold mine in Clarendon Township is also undergoing considerable exploration work; T. Carter (Ontario Geological Survey) reports high gold values from veins and old dumps in the area.

## **EASTERN**

### **Base Metals**

A number of properties in Barrie, Olden, and Tudor Townships were explored during the year for base metals. Selco Mining Corporation Limited, and St. Joseph Explorations Limited continued exploration for zinc.

### **Mica**

A muscovite mica property in Kaladar Township is undergoing exploration and development work. This fine-grained mica deposit appears to be suitable for the production of mica fillers for the plastics industry. The property was visited during the summer. The mica zone has a strike length in excess of one mile, and a width of several hundred feet. The rock is a muscovite-quartz phyllite which at the test pit appears to contain in excess of 50 percent muscovite.

### **Silica**

Exploration for silica continued in Lanark, Leeds, and Frontenac Counties this year with three new companies joining the search for viable deposits in the areas identified as "High Potential" in Open File Report 5265 (Silica Sand Potential in Eastern Ontario – Preliminary Report I).

## **Industrial Minerals Program**

This program is a joint Government of Ontario and Government of Canada program, which is part of the Canada-Ontario, Eastern Ontario Subsidiary Agreement. The program seeks to identify, catalogue, and direct attention to the industrial mineral potential of south-eastern Ontario. This is a combined program of geological, geophysical, and mineral potential studies, mineral economics, and commodity appraisals undertaken to encourage the private sector to explore for industrial minerals in high potential target areas. The programs carried out this year are described in the following paragraphs.

### **Graphite**

V.C. Papertzain and P.W. Kingston undertook a literature study of graphite occurrences in eastern Ontario. The study encompassed 53 deposits, of which 17 warranted field examination (see Figure 1), and further study. Ten deposits were identified that merit further exploration and may have some development potential, should the local market develop because of shortfall by foreign suppliers.

### **Marble (Calcium Carbonate)**

V.C. Papertzain carried out a marble survey in the western part of the region. The boundary of the survey area is shown on Figure 1. More than 700 samples were collected from lithologically homogeneous stratigraphic

marble units. These samples are not yet analyzed. The purpose of the survey is to identify areas of high-calcium marble suitable as an industrial mineral source, to assess the variability of the marbles, and to determine the Ca/Mg ratio for each marble belt as a guide to industrial mineral and base-metal mineralization.

This program is a continuation of the Calcium Carbonate feasibility studies originally funded under the Regional Priority Budget of the Ministry of Treasury and Economics in 1978. The earlier studies considered the economics and potential markets for a calcium carbonate industry in eastern Ontario.

The sale of the William R. Barnes Company calcium carbonate mine and plant in Lanark County, to Steep Rock Iron Mines was announced on December 23, 1980.

### **Talc**

Nine talc deposits were examined by S. VanHaften and A.F. Young, and were mapped in detail and sampled during the fall of 1980. Two deposits appear to have some potential for large tonnage-low grade development and a third, although smaller, has good white colour and reasonably high purity.

### **Silica**

The silica program, funded by the Ministry of Treasury and Economics, continued this year with the publication of Open File Report 5305 (Silica Sand Potential in Eastern Ontario – Preliminary Report II – Beneficiation). The studies leading to this report consisted of bench tests to determine the amenability of selected sandstone samples to beneficiation, to meet glass sand and foundry sand specifications. The tests proved positive.

Studies on the markets and economics of silica sand in eastern Ontario are continuing.

### **Vermiculite**

Studies of potential vermiculite properties were carried out in 1979 and further refined in 1980. One of the properties studies in Lanark County, has been optioned and bench tests have been completed by the company, with plans to develop the property.

## **Aggregate Resources**

The aggregate assessment program of the natural sand and gravel deposits is being funded jointly by the Governments of Ontario and Canada under the Eastern Ontario Subsidiary Agreement.

The United Counties of Prescott and Russell study,



the United Counties of Stormont, Dundas and Glengarry study, and the United Counties of Leeds and Grenville study have been completed and are now being prepared for publication.

The Lanark County field work has now been completed. The office work on this program will be completed this winter with plans for publication in 1981/82. The field work involved a detailed mapping program of the county, a geophysical program (seismic and electro-magnetic) to establish preliminary economic boundaries of the deposits followed by a drilling program which totalled 1100 m in length to determine final boundaries and volumes, and to obtain samples for quality testing.

A start was made on the aggregate assessment of Renfrew County and Hastings County. As Renfrew County and north Hastings County are in Algonquin Region, these programs are being carried out in cooperation with that Region, and are assisted by previous work by the Ontario Geological Survey.

The aggregate assessment of Renfrew County was started in the eastern part of the county. Twenty townships were studied this year, of which ten were carried to the final stage of drilling. In these areas, geophysical surveys and 1050 m of drilling were completed to establish the volumes, quality, and boundaries of deposits.

Aggregate assessment of the north and central parts of Hastings County was also started this year. The study, located in Tweed and Bancroft Districts consisted of a pit and quarry inventory reconnaissance, as a prelude to the detailed aggregate assessment programs. Information was collected on pit and quarry locations, and location of potential sand and gravel deposits. Grab samples were taken to provide a preliminary aggregate classification. The final stage of this study and the preliminary stage for southern Hastings (Napanee District) will be carried out in the 1981 field season.

Samples derived from drilling and from the preliminary investigation will aid in establishing areas of sand and gravel economically suitable for use in construction.

## Ontario Geological Survey Activities

Field parties from the Precambrian, Mineral Deposits, and Engineering and Terrain Geology Sections of the Ontario Geological Survey were active in Eastern Region during the 1980 field season:

- (a) Detailed mapping at 1:15 840 scale in the Ardoch area was carried out by Liba Pauk and assistants. This area is adjacent to the areas previously mapped by J.M. Wolff (P.2273) and by J.M. Moore (P.2278), and has potential for gold, base metals, and uranium mineralization.
- (b) J.R. Bartlett, J.M. Moore, and M.J. Murray mapped Belmont township at a scale of 1:15 840. This is the first half of the Belmont-Marmora mapping project. This map-area contains the former pro-

ducing Cordova and Delora gold mines, and a number of significant base-metal prospects.

- (c) T.R. Carter continued a study to determine the setting of mineralization in the Grenville Supergroup of Southeastern Ontario, in order to establish metallogenic relationships as guides to exploration.
- (d) P.F. Finamore and assistants mapped Quaternary geology in the Coe Hill area at 1:50 000 scale. Mapping has revealed an abundance of coarse aggregate in four locations within the map area.
- (e) D.M. Carson carried out mapping of Paleozoic geology in the Belleville-Kingston area at 1:50 000 scale.
- (f) J.G. Leyland, D.R. Sharpe, and P.J. Barnett mapped Quaternary geology in the Campbellford-Trenton-Consecon areas at 1:50 000 scale.

## Geological Mapping

Mapping along the St. Lawrence River corridor continued this year. Bedrock and surficial geology was mapped at a scale of 1:15 000 between Adolphustown and Kingston. Led by C.R. Papertzian, the field crew began mapping west of Morrisburg as the final segment of this on-going project. The detailed mapping of the entire area will serve as base data for an interpretation of earth science features by the St. Lawrence Parks Commission.

## Mineral Education Program

Again this year, Regional Mines staff visited the three Junior Rangers Camps in the Region. S. VanHaften gave a talk on geology and led a local field trip at each of the camps.

## Research by Other Agencies

Gadd, N.R.

1980: Ice Flow Patterns, Montreal-Ottawa Lowland Areas; p 375-376 in *Current Research, Part A; Paper 80-1A, Geological Survey of Canada.*

From field studies in 1979, N.R. Gadd detected glacial striae that indicate the last major glaciation comprised two lobes. The size and direction of the striae and the distribution of erratics provided the basis for this hypothesis.

Sinha, A.K.

1980: Electromagnetic Resistivity Mapping of the Area Around Alfred, Ontario, with Geonics EM-34 System, p 293-300 in *Current Research, Part A, Paper 80-1A, Geological Survey of Canada.*

A.K. Sinha carried out electromagnetic resistivity mapping in 1979 to determine the thickness of clay in the Alfred area.

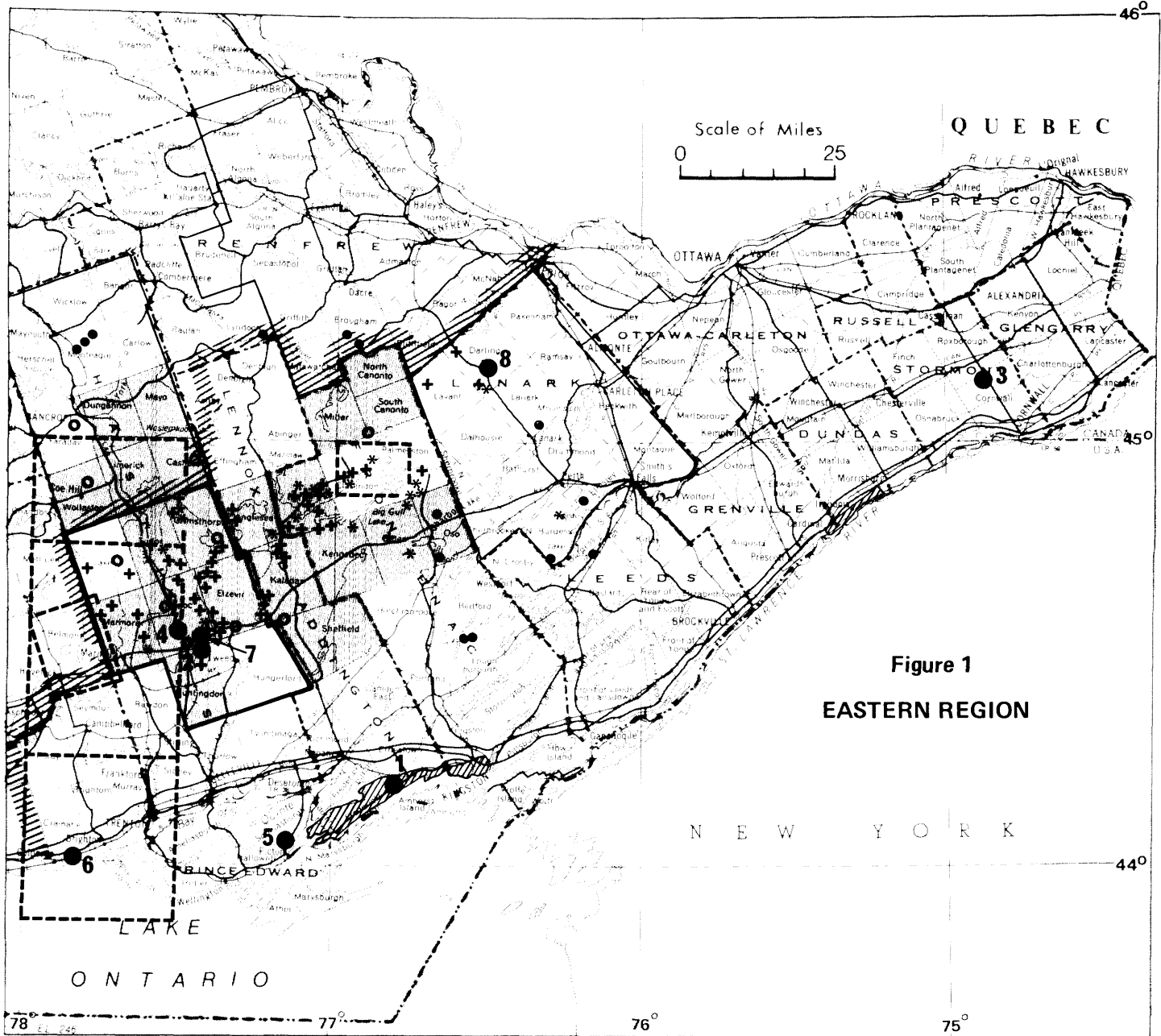


Figure 1  
EASTERN REGION

- Producing mines (excepting clay and aggregate extractive operations).
  1. Canada Cement Lafarge Ltd . . . limestone (cement)
  2. Canada Talc Industries Ltd . . . . . talc
  3. Diamond Peat Moss . . . . . peat
  4. Grenville Aggregates . . . . . marble
  5. Lake Ontario Cement Co. Ltd. limestone (cement)
  6. St. Lawrence Cement Co. Ltd.
  - Odgen Point Quarry . . . . . limestone (cement)
  7. Stoklosar Marble Quarries (1969) Ltd . . . . . marble
  8. William R. Barnes Co. Ltd . . . . . calcium carbonate

- + Claim staking activity in 1980
- \* Assessment work filed in 1980

- Preliminary Pit Inventory
- Aggregate Assessment
- - - O.G.S. Mapping Field Parties
- ▨ Marble Survey.
- ▨ St. Lawrence River Corridor mapping
- Graphite Deposits studied
- Talc Deposits studied
- ▨ Boundary of Eastern Region



# 1980 Report of The Central Regional Geologist

Mahendra Narain<sup>1</sup>

## Contents

Introduction .....	136
Regional Geologist's Activities .....	136
Resources and Land Use Planning .....	136
Consultation and Educational Services .....	150
Pits and Quarries .....	150
Property Examinations .....	150
Staking and Exploration Activities .....	151
Recommendations for Exploration .....	151
Mining and Related Industrial Activity .....	151
Cordova Gold Mines, Belmont Township .....	151
3M Canada Incorporated, Havelock .....	151
St. Mary's Cement Company, Bowmanville .....	152
Steed and Evans Limited, Fonthill .....	152
Franceschini Bros. Aggregates Limited, Mississauga .....	152
Regional Geological Evaluation Projects .....	152
Abandoned Pits and Quarries Studies .....	152
Licensed Operations Study .....	152
Regional/District Strategy .....	152
Niagara Escarpment Plan .....	152
Township Aggregate Inventory Reports .....	153
Public Awareness Programs .....	153
Activities of the Ontario Geological Survey .....	153
Geoscience Research .....	153
Recent Publications and References .....	153
Other Articles of Interest .....	153

## Tables

1 – Licensed Pits and Quarries .....	136
2 – Reported Aggregate Production .....	137
3 – Summary of Resource Estimates .....	140
4 – Summary of Resources by Commodities .....	141
5 – Summary of Resource Estimates .....	144
6 – Proposed Niagara Escarpment Planning Area .....	147
7 – Maps and Reports Pertaining to the Central Region .....	150

## Figures

1 – Central Region .....	148
2 – Niagara Escarpment .....	149

## Introduction

The Regional Geologist's Office at Richmond Hill, and the five District Offices at Midhurst, Maple, Lindsay, Cambridge, and Niagara, continued providing geoscience information and consultative services to various government agencies, private consultants, mining and aggregate industry, and the general public.

Mining activity in the Region continued, as usual, with the three operating gypsum mines and 851 licenced pit and quarry operations.

The Regional geoscience library acquired additional reference material, and is well equipped for providing geoscience information and geological land use planning services to all concerned parties and the general public.

Intra-program and inter-ministry consultations have been on the increase during the last several years at the Regional and District levels.

The Regional Geologist administered the geological programs related to geoscience information, data collection, and mineral resources management.

The staff at the Regional Office included Murthy Ghandikota, Resource Geologist, and Debby McMullen, Secretary. The geological staff at the District Offices included Dennis Billings (Lindsay), Bill Fitzgerald (Huron), Amar Mukherjee (Maple), Ted Harvey (Cambridge), and Bernie Feenstra (Niagara).

## Regional Geologist's Activities

### Resources and Land Use Planning

The Ministry's input to the Niagara Escarpment planning process continued at an accelerated rate during the year. Also, the Regional/District Strategy exercise is presently in the analysis phase and is expected to terminate in

**TABLE 1** | LICENCED PITS AND QUARRIES IN THE CENTRAL REGION.

District	Licensed quarries	Licensed quarries PNEPA*	Licensed Pits	Licensed Pits PNEPA*
Maple	9	3	146	15
Huron	8	1	176	8
Niagara	17	4	15	6
Cambridge	23	11	198	14
Lindsay	11	—	248	—
TOTALS	68	19	783	43

Footnote

\*Proposed Niagara Escarpment Planning Area, November 1979

<sup>1</sup>Regional Geologist.

**TABLE 2** | REPORTED AGGREGATE PRODUCTION BY TOWNSHIP FROM LICENCED OPERATIONS IN CENTRAL REGION.

## LINDSAY DISTRICT

TOWNSHIP	1977	1978	1979
	TONS	TONS	TONS
Alnwick	63,765	43,101	87,875
Asphodel	427,209	368,015	410,519
Belmont	345,917	379,324	467,834
Bexley-Carden	97,260	249,780	375,465
Cavan	211,248	125,896	79,703
Douro	107,880	32,479	53,795
Dummer	184,772	251,836	237,247
Eldon	106,058	43,530	43,980
Emily	487,963	337,481	301,780
Ennismore	296,583	93,286	125,596
Fenelon	670,919	510,718	715,461
Haldimand	72,700	143,413	147,819
Hamilton	221,332	334,331	266,263
Harvey	79,024	100,524	126,642
Hope	78,853	70,675	66,089
Manvers	1,286,897	1,715,238	1,453,654
Mariposa	384,504	366,893	250,007
Town of Newcastle:			
Former Twp. of Clarke	443,763	487,363	532,168
Former Twp. of Darlington	878,358	1,323,989	1,376,840
North and South Monaghan	194,192	82,369	13,393
Ops	14,145	NIL	24,934
City of Oshawa	NIL	NIL	66,844
Otonabee	164,615	178,074	100,472
Scugog:			
Former Twp. of Cartwright	281,609	402,549	275,066
Former Twp. of Reach	1,019,635	878,418	1,128,015
Smith	358,323	398,337	374,672
Verulam	153,943	318,311	347,165
Whitby	437,154	450,380	276,182
<b>TOTALS</b>	<b>9,068,622</b>	<b>9,686,310</b>	<b>9,725,481</b>

## MAPLE DISTRICT

Brock	1,145,018	1,260,929	979,157
Pickering	426,965	411,190	485,275
Uxbridge	3,305,053	3,435,788	3,236,678
East Gwillimbury	434,973	234,911	214,559
East York	110,116	104,658	102,228
Georgina	564,600	362,438	311,967
King	295,513	301,174	556,092
Markham	2,800	NIL	NIL
Richmond Hill	12,450	16,455	13,508
Vaughan	1,596,686	1,689,362	1,429,694
Whitchurch-Stouffville	3,208,352	3,837,273	3,814,411
Brampton	1,519,024	1,757,291	1,678,752
Caledon	4,848,363	5,248,651	5,338,818
Mississauga	726,842	713,095	664,222
<b>TOTALS</b>	<b>18,196,755</b>	<b>19,373,215</b>	<b>18,825,361</b>

CENTRAL

TABLE 2 Continued

HURONIA DISTRICT

TOWNSHIP	1977	1978	1979
	TONS	TONS	TONS
Adjala	307,999	634,926	618,000
Amaranth	2,850	69,424	35,000
Essa	65,536	56,455	40,700
Flos	326,169	225,894	248,100
East Garafraxa	467,600	286,340	267,900
West Gwillimbury	32,381	49,410	26,000
Innisfil	304,040	206,028	190,000
Mara	352,162	221,858	646,200
Matchedash	NIL	7,150	4,200
Medonte	205,998	148,430	233,000
Melancthon	69,111	40,001	65,500
Mono	711,828	377,797	603,900
Mulmur	80,905	85,674	73,800
Nottawasaga	307,486	351,420	336,000
Orillia	2,282,619	2,320,631	2,358,300
Oro	393,007	389,476	373,400
Rama	50,378	55,401	71,600
Sunnidale	263,766	273,661	261,400
Tay	542,425	718,907	609,500
Tecumseth	100,251	67,347	124,600
Tiny	115,394	227,815	231,400
Tosorontio	98,883	105,450	88,100
Vespra	535,050	429,063	446,200
TOTALS	7,615,838	7,348,558	7,952,800

CAMBRIDGE DISTRICT

Brantford	1,543,502	1,638,264	1,301,612
South Dumfries	383,514	305,922	16,236
Onondaga	17,898	3,651	NIL
Ancaster	238,607	190,615	138,021
Flamborough	2,538,230	3,289,553	2,949,728
Stoney Creek	538,089	624,926	439,486
Blenheim	235,238	226,374	168,099
Waterloo: Kitchener, Cambridge, Woolwich	—	—	1,802,175
North Dumfries	1,341,183	1,177,113	1,148,898
Wellesley	939,455	942,439	1,218,700
Wilmot	135,114	117,404	286,826
Woolwich	773,434	645,032	247,843
Arthur	82,769	132,394	160,732
Maryborough	61,920	28,744	70,888
Peel	43,014	51,641	8,331
Nichol	NIL	NIL	NIL
Pilkington	325,204	593,445	415,435
West Luther	58,459	68,332	
West Garafraxa	53,245	57,234	59,537
Eramosa	106,245	119,750	49,265
Erin	89,535	93,292	144,576
Guelph (City and Township)	279,563	104,892	340,985
Puslinch	1,773,613	1,787,154	2,150,872
Burlington	2,447,775	3,261,210	2,918,596
Oakville	NIL	NIL	NIL

**TABLE 2** Continued

CAMBRIDGE DISTRICT (Continued)

TOWNSHIP	1977	1978	1979
	TONS	TONS	TONS
Milton	343,060	5,438,542	5,395,209
Halton Hills	4,417,563	2,070,400	2,184,127
East Luther	44,535	44,011	72,645
Tuscarora	—	—	—
Town of Dundas	—	—	—
Glanbrook	—	—	—
City of Cambridge	741,599	469,617	—
City of Kitchener	959,483	1,012,678	—
City of Waterloo	101,562	23,164	—
<b>TOTALS</b>	<b>20,613,408</b>	<b>24,517,793</b>	<b>23,689,330</b>

NIAGARA DISTRICT

Town of Dunnville	196,000	285,000	405,160
Town of Fort Erie	541,000	525,000	1,531,669
Town of Haldimand	1,256,000	1,303,000	1,471,073
Town of Lincoln	1,253,000	1,174,000	—
City of Niagara Falls	1,073,000	1,040,000	902,708
Town of Niagara-on-the-Lake	419,000	534,000	365,792
Town of Pelham	859,000	801,000	783,251
City of Port Colborne	1,271,000	1,461,000	1,371,781
Township of Wainfleet	334,000	474,000	448,449
<b>TOTALS</b>	<b>7,202,000</b>	<b>7,597,000</b>	<b>7,279,883</b>

SOURCES: MNR DISTRICT OFFICES OF CENTRAL REGION

**TABLE 3** | HIGH PRIORITY MINERAL RESOURCE PROTECTION AREAS, PROPOSED NIAGARA ESCARPMENT PLANNING AREA NOVEMBER 79 (PNEPA) SUMMARY OF RESOURCE ESTIMATES BY COMMODITIES IN NEC DESIGNATIONS.

PNEPA Commodities Map No.	Escarpment Natural Area		Escarpment Protection Area		Escarpment Rural Area		Escarpment Recreation Area		Estimated Total Acreage & Resource*		Estimated Effective Resource**	
	Acres	Tons	Acres	Tons	Acres	Tons	Acres	Tons	Acres	Tons	Acres	Tons
1, 2, 3, 4, 5, 6, 7, 8, 9	3786	227,467,000	7004	393,486,000	7716	494,057,500	93	3,450,000	18599	1,118,460,500		223,692,100
1, 3, 4, 5, 7, 8	3224	638,676,000	5664	1,075,734,000	13119	2,534,472,000	Nil	Nil	22007	4,248,882,000		849,776,400
3, 4, 5, 6	855	109,440,000	3444	440,832,000	1589	203,392,000	1242	158,976,000	7130	912,640,000		182,528,000
<b>GRAND TOTAL</b>	<b>7865</b>	<b>975,583,000</b>	<b>16112</b>	<b>1,910,052,000</b>	<b>22424</b>	<b>3,231,921,500</b>	<b>1335</b>	<b>162,426,000</b>	<b>47736</b>	<b>6,279,982,500</b>		<b>1,255,996,500</b>

**NOTES:** \*Resource, as used in this table, is resource "IN SITU" and indicates the presence of suitable commodities for which extraction is currently economically feasible and approximates to the sum of proven, probable and possible economic resources of the engineer.  
 \*\*Estimated effective resource, is resource "IN SITU" as defined above minus the resource sterilized by existing development or which may be sterilized as a result of geological, social, planning, economic and legislative constraints. Experience indicates that approximately one-fifth of the total resource in any given area is actually available after application of all the constraints.



**TABLE 4 HIGH PRIORITY MINERAL RESOURCE PROTECTION AREAS, PROPOSED NIAGARA ESCARPMENT PLANNING AREA NOVEMBER 79 (PNEPA) SUMMARY OF RESOURCES BY COMMODITIES IN NEC DESIGNATIONS BY REGIONAL MUNICIPALITIES/COUNTIES.**

**ESTIMATED RESOURCE IN PROPOSED DESIGNATIONS (EXCLUDING LICENCED AREAS)**

PNEPA Map No.	Regional Municipality/ County	Commodities	No. of Areas	Escarpment Natural Area		Escarpment Protection Area		Escarpment Rural Area		Escarpment Recreation Area		Estimated Total Acreage & Resource*		Estimated Effective Resource**	
				Acres	Tons	Acres	Tons	Acres	Tons	Acres	Tons	Acres	Tons	Acres	Tons
1	Regional Municipality of Niagara	Sand & Gravel	2	48	7,200,000	248	34,750,000	359	43,175,000	Nil	Nil	655	85,125,000	Nil	17,025,000
		Crushed Stone	3	146	21,024,000	408	58,752,000	484	69,696,000	Nil	Nil	1038	149,472,000	Nil	29,894,400
2	Regional Municipality of Hamilton-Wentworth	Sand & Gravel	3	762	35,725,000	208	10,187,500	852	41,100,000	Nil	Nil	1822	87,012,500	Nil	17,025,500
3	Regional Municipality of Halton	Sand & Gravel	5	1381	95,279,500	1641	110,086,000	1132	90,407,500	Nil	Nil	4154	295,773,000	Nil	59,154,600
		Crushed Stone	6	1493	309,366,000	2347	427,572,000	5615	1033,398,000	Nil	Nil	9455	1770,336,000	Nil	354,067,200
		Clay & Shale	1	Nil	Nil	449	57,472,000	714	91,392,000	Nil	Nil	1163	148,864,000	Nil	29,772,800

NOTES: \* Resource, as used in this table, is resource "IN SITU" and indicates the presence of suitable commodities for which extraction is currently economically feasible and approximates to the sum of proven, probable and possible economic resources of the engineer.

\*\* Estimated Effective Resource, is resource "IN SITU" as defined above minus the resource sterilized by existing development or which may be sterilized as a result of geological, social, planning, economic and legislative constraints. Experience indicates that approximately one-fifth of the total resource in any given area is actually available after application of all the constraints.

TABLE 4 Continued

ESTIMATED RESOURCE IN PROPOSED DESIGNATIONS (EXCLUDING LICENCED AREAS)

PNEPA Map No.	Regional Municipality/ County	Commodities	No. of Areas	Escarpment Natural Area		Escarpment Protection Area		Escarpment Rural Area		Escarpment Recreation Area		Estimated Total Acreage & Resource*		Estimated Effective Resource**
				Acres	Tons	Acres	Tons	Acres	Tons	Acres	Tons	Acres	Tons	
4	Regional Municipality of Peel	Sand & Gravel	4	170	12,387,500	627	47,312,500	2199	169,612,500	3	262,500	2299	229,575,000	45,915,000
		Crushed Stone	1	610	98,820,000	575	93,150,000	975	157,950,000	Nil	Nil	2160	349,920,000	69,984,000
		Clay & Shale	1	226	28,928,000	292	37,376,000	348	44,544,000	Nil	Nil	866	110,848,000	22,169,600
4 & 5	County of Dufferin	Sand & Gravel	8	1172	65,975,000	1744	95,662,500	2079	97,250,000	Nil	Nil	4995	258,887,500	51,777,500
		Crushed Stone	1	21	3,402,000	146	23,652,000	598	96,876,000	Nil	Nil	765	123,930,000	24,786,000
		Clay & Shale	1	198	25,344,000	320	40,960,000	52	6,656,000	Nil	Nil	570	72,960,000	14,592,000
5	County of Simcoe	Sand & Gravel	2	69	3,450,000	1028	51,400,000	564	28,200,000	Nil	Nil	1661	83,050,000	16,610,000
		Crushed Stone	1	800	172,800,000	338	73,008,000	997	215,352,000	Nil	Nil	2135	461,160,000	92,232,000
		Clay & Shale	3	248	31,744,000	1679	214,912,000	472	60,416,000	Nil	Nil	2399	307,072,000	61,444,400

TABLE 4 Continued

ESTIMATED RESOURCE IN PROPOSED DESIGNATIONS (EXCLUDING LICENCED AREAS)

PNEPA Map No.	Regional Municipality/ County	Commodities	No. of Areas	Escarpment Natural Area		Escarpment Protection Area		Escarpment Rural Area		Escarpment Recreation Area		Estimated Total Acreage & Resource*		Estimated Effective Resource**
				Acres	Tons	Acres	Tons	Acres	Tons	Acres	Tons	Acres	Tons	
6 & 7	County of Grey	Sand & Gravel	8	142	5,875,000	1503	43,900,000	271	11,312,500	45	1,125,000	1961	62,212,500	12,442,500
				50	10,800,000	1360	293,760,000	3930	848,880,000	Nil	Nil	5340	1153,440,000	230,688,000
				183	23,424,000	704	90,112,000	3	384,000	1242	158,976,000	2132	272,896,000	54,579,200
8 & 9	County of Bruce	Sand & Gravel	2	42	1,575,000	5	187,500	260	13,000,000	45	2,062,500	352	16,825,000	3,365,000
				104	22,464,000	490	105,840,000	520	112,320,000	Nil	Nil	1114	240,624,000	48,124,800
TOTAL				3786	227,467,000	7004	393,486,000	7716	494,057,500	93	3,450,000	18599	1118,460,500	223,692,100
				3224	638,676,000	5664	1075,734,000	13119	2534,472,000	Nil	Nil	22007	4248,882,000	849,776,400
				855	109,440,000	3444	440,832,000	1589	203,392,000	1242	158,976,000	7130	912,640,000	182,528,000

**TABLE 5** HIGH PRIORITY MINERAL RESOURCE PROTECTION AREAS, PROPOSED NIAGARA ESCARPMENT PLANNING AREA NOVEMBER 79 (PNEPA) SUMMARY OF RESOURCE ESTIMATES BY NEC DESIGNATIONS AND MUNICIPALITIES.

ESTIMATED RESOURCE IN PROPOSED DESIGNATIONS (EXCLUDING LICENCED AREAS)

PNEPA Map No.	Regional Municipality/County	Township/Town/City	No. of Areas	Escarpment Natural Area		Escarpment Protection Area		Escarpment Rural Area		Escarpment Recreation Area		Estimated Total Acreage & Resource*		Estimated Effective Resource**	
				Acres	Tons	Acres	Tons	Acres	Tons	Acres	Tons	Acres	Tons	Acres	Tons
1	Regional Municipality of Niagara	Town of Niagara-on-the-Lake, City of Niagara Falls, Town of Pelham, Town of Lincoln	5	194	28,224,000	656	93,502,000	843	112,871,000	Nil	Nil	1693	234,597,000		46,919,400
2	Regional Municipality of Hamilton and Wentworth	Town of Ancaster and Township of Flamborough	3	762	35,725,000	208	10,187,500	852	41,100,000	Nil	Nil	1822	87,012,500		17,402,500
3	Regional Municipality of Halton	City of Burlington, Town of Milton, Town of Halton Hills	12	2874	404,645,500	4437	595,130,000	7461	1,215,197,500	Nil	Nil	14772	2,214,973,000		442,994,600

NOTES: \* Resource, as used in this table, is resource "IN SITU" and indicates the presence of suitable commodities for which extraction is currently economically feasible and approximates to the sum of proven, probable and possible economic resources of the engineer.  
 \*\* Estimated Effective Resource, is resource "IN SITU" as defined above minus the resource sterilized by existing development or which may be sterilized as a result of geological, social, planning, economic and legislative constraints. Experience indicates that approximately one-fifth of the total resource in any given area is actually available after application of all the constraints.

**TABLE 5** Continued

ESTIMATED RESOURCE IN PROPOSED DESIGNATIONS (EXCLUDING LICENCED AREAS)

PNEPA Map No.	Regional Municipality/ County	Township/ Town/City	No. of Areas	Escarpment Natural Area		Escarpment Protection Area		Escarpment Rural Area		Escarpment Recreation Area		Estimated Total Acreage & Resource*		Estimated Effective Resource**
				Acres	Tons	Acres	Tons	Acres	Tons	Acres	Tons	Acres	Tons	
4	Regional Municipality of Peel	Town of Caledon	6	1006	140,135,500	1494	177,838,500	3522	372,106,500	3	262,500	6025	690,343,000	138,068,600
4 & 5	County of Dufferin	Township of Mono, Township of Mulmur, Township of Melancthon	8	1391	94,721,000	2210	160,274,500	2729	200,782,000	Nil	Nil	6330	455,777,500	91,155,500
5	County of Simcoe	Township of Nottawasaga	6	1117	207,994,000	3045	339,320,000	2033	303,968,000	Nil	Nil	6195	851,282,000	170,256,400

TABLE 5 Continued

ESTIMATED RESOURCE IN PROPOSED DESIGNATIONS (EXCLUDING LICENCED AREAS)

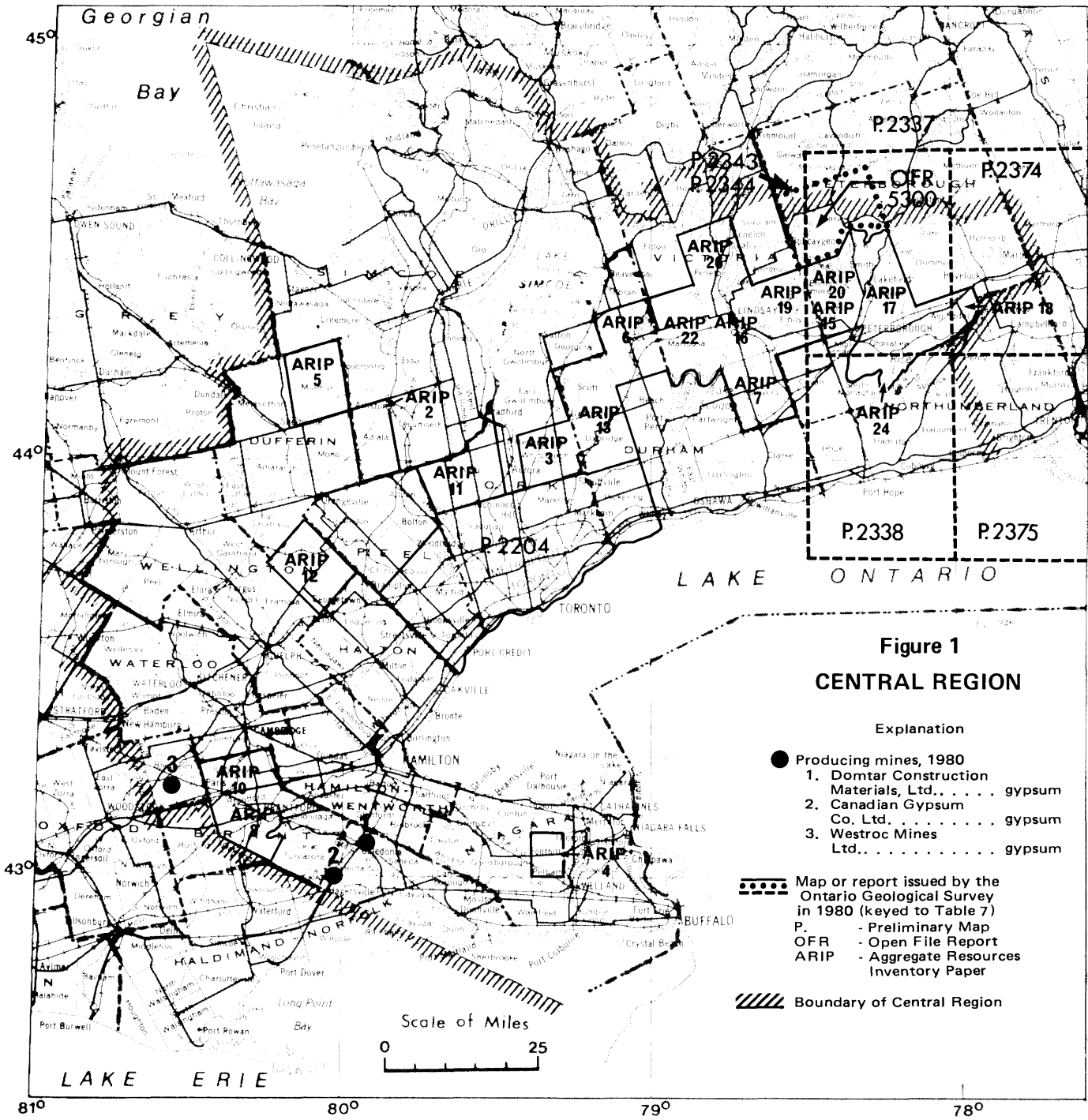
PNEPA Map No.	Regional Municipality/County	Township/Town/City	No. of Areas	Escarpment Natural Area		Escarpment Protection Area		Escarpment Rural Area		Escarpment Recreation Area		Estimated Total Acreage & Resource*		Estimated Effective Resource**
				Acres	Tons	Acres	Tons	Acres	Tons	Acres	Tons	Acres	Tons	
6 & 7	County of Grey	Township of Osprey, Township of Collingwood, Township of Holland, Township of Derby, Township of Sydenham, Township of Sarawak, Township of Keppel	15	375	40,099,000	3567	427,772,000	4204	860,576,500	1287	160,101,000	9433	1,488,548,500	297,709,700
8 & 9	County of Bruce	Township of Albemarle, Township of Eastnor, Township of Lindsay	3	146	24,039,000	495	106,027,500	780	125,320,000	45	2,062,500	1466	257,449,000	51,489,800
GRAND TOTAL				58	7865	975,583,000	1,910,052,000	22424	3,231,921,500	1335	162,426,000	47736	6,279,982,500	1,255,996,500

**TABLE 6** PROPOSED NIAGARA ESCARPMENT PLANNING AREA, NOVEMBER 1979 (PNEPA).

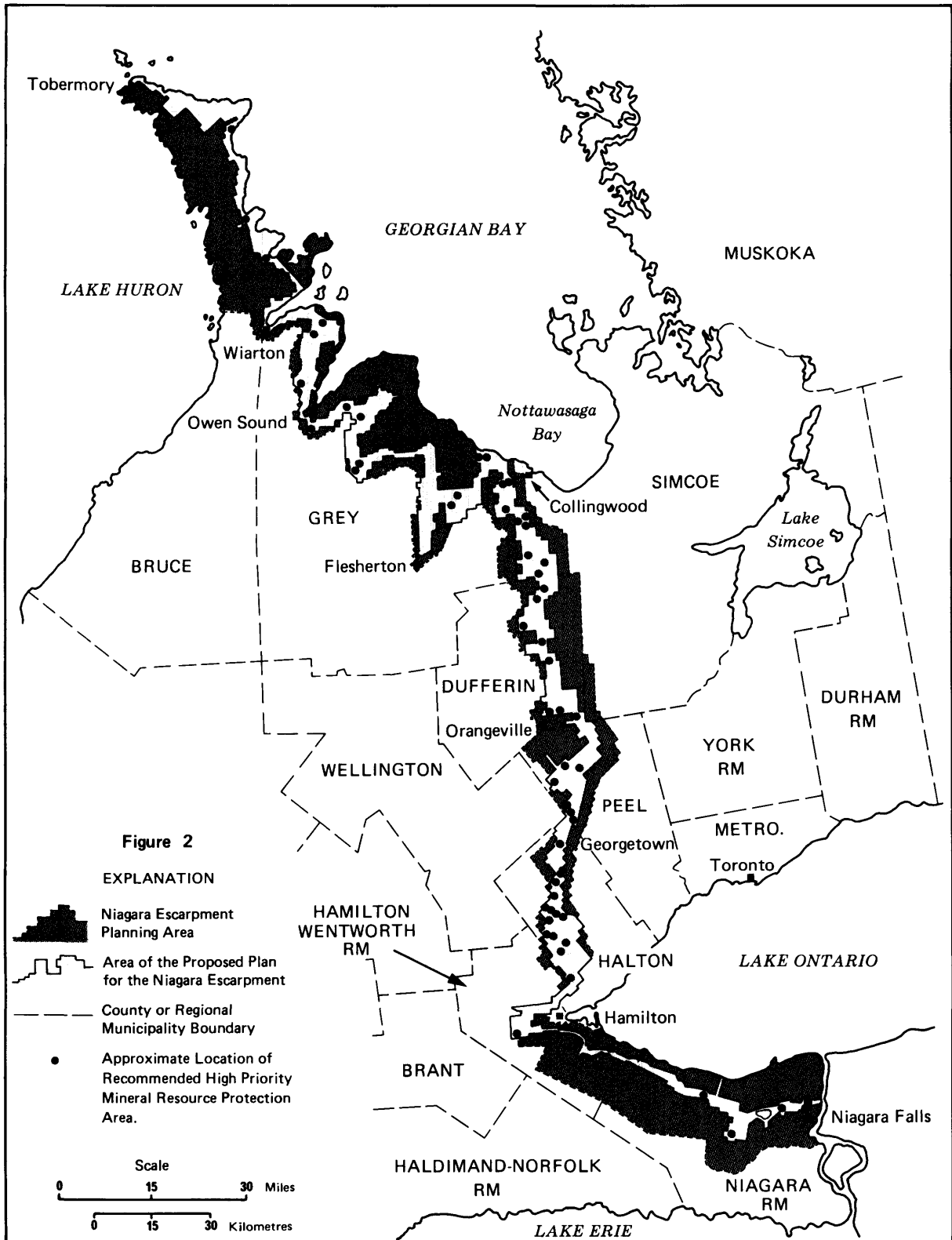
Regional Municipality/County	Name of Township/ Town/City	1978		Township/Town/City Total Production in Tons		Production in Tons from Licenced Operations in PNEPA	
		Number of Licences in PNEPA	Outside PNEPA	1976	1977	1976	1977
Reg. Mun. Hamilton-	Ancaster	1	2	288,577	238,607	190,615	171,357
	Flamborough	2	9	518,168	2,538,230	3,289,553	22,761
	Town of Stoney Creek	1	2	600,505	538,089	624,926	200
	Town of Halton Hills	8	6	2,226,779	2,090,659	2,070,400	1,890,921
Reg. Mun. Halton	Town of Milton	9	1	4,245,534	4,367,323	5,438,542	5,404,259
	City of Burlington	4	3	3,519,677	2,447,773	3,261,210	3,131,670
	Town of Caledon	18	12	5,531,600	4,848,363	5,248,649	4,565,390
Reg. Mun. Peel	Twp. of Nottawasaga	3	6	329,022	307,486	351,420	200,606
Simcoe County	Twp. of Mono	5	6	580,447	711,828	377,797	169,996
	Twp. of Mulmur	2	1	159,559	84,318	85,674	44,153
Dufferin County	City of Niagara Falls	5	Nil	1,238,700	1,073,050	1,039,650	1,039,650
	Town of Niagara-on-the-Lake	1	1	475,000	419,000	534,000	507,000
County of Grey	Town of Pelham	2	1	1,126,000	859,000	801,000	800,000
	Town of Lincoln	2	2	1,575,000	1,253,000	1,174,000	756,000
	Collingwood	1	8	223,865	270,569	390,755	2,457
County of Bruce	Derby	1	17	300,927	634,542	364,383	390
	Sydenham	1	2	261,148	206,014	153,679	142,241
	Keppel	1	5	102,962	106,428	159,200	1,290
	Albamarle	2	4	17,571	32,551	42,504	27,320
	Eastnor	2	6	163,948	129,108	94,267	51,155
	Lindsay	1	1	20,103	37,371	33,934	15,035

NOTE: a) Due to rearrangement in municipal boundaries, 1976, 1977 production figures may not relate well to 1978 figures, e.g. Town of Milton.  
 b) One licence was cancelled in 1979, so total number of licences will not tally with the maps (March 1980).  
 c) Column #3 indicates status as of 1978.

CENTRAL







## CENTRAL

April, 1981. Inputs to the Southern Ontario Coordinated Program Strategy (SOCPS) have been completed. The Regional Geologist continued to supervise geological workshops, as and when required, to discuss geological and related problems.

A large part of the Regional Geologist's time was spent in coordinating the Ministry's mineral resources input to the proposed Niagara Escarpment Plan, and in preparations to appear as an expert mineral resources witness for the Ministry at the public hearings on the Proposed Plan in Owen Sound. New mineral resources data were prepared in support of the Ministry's position on mineral resources within the proposed plan area. The Ministry's response to the proposed plan along with the new mineral resources data was presented in November

**TABLE 7** | MAPS AND REPORTS PERTAINING TO THE CENTRAL REGION ISSUED BY THE ONTARIO MINISTRY OF NATURAL RESOURCES IN 1980. SEE "LIST OF PUBLICATIONS" (BACK POCKET) FOR DETAILS.

### MISCELLANEOUS PAPERS

MP 77  
MP 91  
MP 93  
MP 96

### OPEN FILE REPORTS

OFR 5300  
OFR 5302  
OFR 5313

### INDUSTRIAL MINERAL REPORT

IMR 33 (reprint)

### AGGREGATE RESOURCES INVENTORY PAPERS

ARIP 2	ARIP 13
ARIP 3	ARIP 15
ARIP 4	ARIP 16
ARIP 5	ARIP 17
ARIP 6	ARIP 18
ARIP 7	ARIP 19
ARIP 8	ARIP 20
ARIP 10	ARIP 22
ARIP 11	ARIP 24
ARIP 12	ARIP 26

### MISCELLANEOUS PUBLICATION

Rocks and Minerals Information 1980

### PRELIMINARY MAPS

P. 2204  
P. 2337  
P. 2338  
P. 2343  
P. 2344  
P. 2374  
P. 2375

### MINERAL RESOURCES BRANCH PUBLICATIONS

Pit and Quarry Rehabilitation, the Stage of the Art in Ontario.  
Trees and Shrubs for the Improvement and Rehabilitation of Pits and Quarries in Ontario.

to the hearing officers appointed by the Niagara Escarpment Commission.

The new mineral resources data were also made available to the Niagara Escarpment Commission and the public and is in the form of maps and tables as listed below: (a) land use maps titled "Recommended High Priority Mineral Resources Protection Areas"; (b) criteria used in selection of the areas; (c) resource estimates by commodities, NEC proposed designations, and municipalities (see Tables 3, 4, 5, and 6); (d) preliminary estimates of aggregate resources in the unextracted parts of licensed operations in the proposed plan area; (e) location of licensed pits and quarries; (f) projections of mineral aggregate outputs to the year 2001 and 2025; and other relevant data.

The approximate locations of the mineral resource protection areas are shown in Figure 2.

The following are some projects and reports for which geological review, comments, and inputs were provided by the Regional and District staff:

NEC Proposed Plan; Copeland Forest Study; Draft Township Aggregate Resources Inventory Reports; District Strategy Reports; Nonquon Provincial Wildlife Area Interim Management Plan; Official Plans for Monaghan, Caledon, East Gwillimbury, Georgina, Whitchurch-Stouffville; and numerous zoning by-laws.

## Consultation and Educational Services

The Regional and District Offices continued providing consultation related to geology and mineral resources legislation. Lindsay District Office reported an increase in inquiries pertaining to the location of old gold properties, claim staking, and refinery licences. Both public and consultant inquiries have been on the increase during the year. Information related to the mineral resources program was provided to: the Ministries of Transportation and Communications, Housing, Labour, Industry and Tourism, and Government Services; Conservation Authorities; Ontario Hydro; local and regional municipal governments; and the Niagara Escarpment Commission. The nature of consultations included mineral resource potential, identification of rock and mineral samples, claim staking, and watertable problems. Students, as usual, received assistance and guidance in preparation of term papers related to mineral resources and geology. Several inquiries related to proposed mineral resources legislation, the Mining Tax Act, and OMEP were received.

## Pits and Quarries

The Regional Geologist provided input and consultation to proposed mineral aggregate policies and other related matters.

## Property Examinations

The Regional Geologist examined each of the recommended mineral resources protection areas, (see Figure

2), within the Proposed Niagara Escarpment Planning Area, as to their suitability for production of aggregates in the future. District geologists have also been engaged in field examination of both licenced and unlicenced aggregate resource areas.

## Staking and Exploration Activities

Three new mining claims were recorded in Belmont Township in Lindsay District. Currently, there are 15 unpatented mining claims, two patented claims for mining rights only, and four mining leases in the Belmont Township.

Two leases in Lot 31, Concession VI are held by The Northumberland Mines Limited, and are under exploration option to Preussag Canada Limited. Mr. Bill Elliot, Mining Coordinator of Preussag, reports that the company has spent in excess of \$50 000 on exploratory work. Nine holes, totalling 854 m in length, were drilled this year.

The other two leases, in Lot 27, Concession I, are held by Metalridge Mining Corporation Limited, who report no activity during the year.

## Recommendations for Exploration

In view of the current geological data, the extreme north-eastern parts of this Region deserve attention for uranium, base metals, precious metals, and industrial minerals.

## Mining and Related Industrial Activity

The Central Region still stands out as the largest producer of structural materials in Ontario. The main raw materials produced are sand, gravel, shale, dolostone, limestone, sandstone, gypsum, and peat.

Three gypsum mines, operated by Westroc Industries Limited near Drumbo, Canadian Gypsum Mines Limited at Caledonia, and Domtar Construction materials Limited at Hagersville, continued operations during 1980.

Some gold was recovered from the mine tailings at the Cordova Gold Mine site by Laisir Gold Incorporated.

During this year there were 851 licenced operations (Table 1) under The Pits and Quarries Control Act, 1971, which is an increase over 1979, when the licenced operations numbered 843. Generally, the depressed level of construction activity was reflected in 1979 production (Table 2), which is estimated at 68.4 million tons, including wayside operations, (District Offices, Central Region), valued at approximately \$136 million. This indicates a slight decrease in volume, but an increase in dollar value. Increased fuel costs are a major factor in the increased costs of aggregates, in addition to costs associated with mining, environmental protection, rehabilitation, etc.

The following are highlights of some mining operations in the Central Region. Information and data was provided by the respective companies.

### **Cordova Gold Mines, Belmont Township.**

Some gold was recovered at the mine site by Laisir Gold Incorporated.

As reported in last year's report, the group has been experimenting with a cyanide heap leaching process for treatment of gold ores and tailings. According to Walter Hood, a mining engineer with Laisir, the company has concluded that general climatic conditions and problems encountered with natural evaporation does not lend itself to practical application of the heap leaching process. Consequently, this year the company began experiments using -140 mesh and smaller sized ore material. A cyanide leach is now collected and passed through an activated charcoal media. Field and laboratory experiments involve stripping the gold values from the carbon and putting them in solution. The solution, in turn, is put through an electrolytic cell and the gold is deposited on the cathode of the cell. The company is also carrying out experiments making a zinc precipitate from the solution after the charcoal is stripped.

Mr. Hood also advises that a conventional mill, using a carbon and pulp milling process, is being designed by the company. Approximately 20 000 tons of surface material could be treated immediately while the underground reserves are being developed for extraction. Gold values in the surface material range from 0.04 to 0.08 ounce of gold per ton, averaging about 0.06 ounce of gold per ton. Current plans call for the mill to be completed in 1981. Although the company presently has a 5 ton batching facility for extracting gold from ground ore the company does not have any grinding facilities.

### **3M Canada Incorporated, Havelock.**

The company operates a 20 ha basalt rock quarry that employs about 125 people. It also operates a mill and a colouring plant located approximately 3 miles east of Havelock, immediately north of Highway 7.

The original mill was started in 1907 by Ontario Rock Limited to produce aggregates for road surfacing. In 1948, Building Products Canada Limited took over the operations and built a colouring plant to produce artificially coloured roofing granules. 3M Canada Incorporated bought the operation in 1960. The original mill was destroyed by fire and a new mill was erected in 1962. Major additions were made to the new mill in 1979 which increased the crushing and screening capacity by 50 percent. Modifications were also made to the colouring plant which increased mixing capacity by 30 percent.

About 1800 tonnes of quarried rock are crushed daily. The crushed rock is fired and ceramically coated to give colour to the granules. About 1100 tonnes of finished product are produced daily. The company is currently supplying all of the demand for the eastern Canadian markets and about half of the western Canadian markets for artificially coloured granules. A small amount of the

## CENTRAL

product is also exported to Belgium and France. About 75 percent of the product is shipped by rail and 25 percent by truck.

The \$50 million facilities of 3M Canada Incorporated are the only one of their kind in Canada. The company also owns and operates four other plants in the United States.

### **St. Mary's Cement Company, Bowmanville.**

The St. Mary's Cement Company operates a cement plant and a limestone-shale quarry near Bowmanville. The company facilities are located immediately south of Highway 401 at Waverly Road.

In 1963 the company undertook extensive drilling and testing of bedrock in the Bowmanville area to establish stone quality and reserve potential. In 1968, a cement plant was constructed at the site consisting of one kiln of 325 000 tonnes per year capacity. Plant operations began in 1969 utilizing the wet process of manufacturing. An identical kiln unit was added in 1973, thus doubling production capacity to 650 000 tonnes.

The rock quarry is about 8 ha in area and is worked in three benches. The uppermost bench is in Whitby Formation (shale) which ranges from 3.5 to 5.5 m in thickness. The underlying Lindsay Formation (limestone) is mined in two 15 m benches. The lower bench is very high in calcium carbonate content, and about 5 percent shale is added to dilute it. Currently St. Mary's is mining in excess of one million tonnes annually from the quarry. The cement plant has been operating at full capacity for the past several years.

Shot rock from the quarry at the plant site is fed to a 54 inch, 900 tonnes per hour, gyratory primary crusher, capable of crushing the material down to -20 cm in size. The crushed material is then segregated and stockpiled by carbonate designation. A 500 tonnes per hour secondary crusher reduces the material down to -20 mm in size, and again the crushed material is segregated by calcium carbonate content, and stored in feed silos adjacent to the milling operation.

The crushed rock is fed to a tube mill, measuring about 10.3 m long and about 3.6 m in diameter where approximately 30 percent water is added. The resulting slurry is pumped to one of the three raw material storage basins, from where it is transferred to the feed end of either one of the coal-fired kilns. The kilns, which are rated at 1000 tonnes per day, boil out the water, and continually raise the temperature of the material to 1400 degrees C. At this point, a physical structure change takes place, and the new crystal formation gives the sintered material its strength. To lock in the new crystal form the sintered clinker is rapidly cooled. Cement is produced by grinding the clinker balls to extremely fine sizes and adding 5 percent gypsum to control the setting time. The cement is stored in silos which have a storage capacity of 41 000 tonnes.

Most of the cement is shipped by bulk tank truck, and some by rail. The company is also shipping clinker by boat to its plant in Wyandotte, Michigan. About half of St. Mary's total production is shipped to the United

States. Most of the remaining production is shipped to the Metropolitan Toronto market.

### **Steed and Evans Limited, Fonthill.**

The company produced about 400 000 tonnes of aggregate from the Heidelberg Pit and suffered a production setback due to the slow down in the building industries.

From the Fonthill Pit, the company extracted about 300 000 tonnes, about 25 percent less than last year's production. As a result of extensive rehabilitation at this site the company opened a nine-hole golf course which proved to be an instant success. Four additional fairways on the second nine holes have been sloped and seeded and trees were planted.

The company is in the process of licencing additional property in the area as the reserves in the Fonthill Pit are being depleted.

### **Franceschini Bros. Aggregates Limited, Mississauga.**

In spite of an overall decline in aggregate production, the company reports a banner year of production and sale from its operations in the Brampton-Caledon area due to their proximity to expanding markets in the Mississauga area. There are no immediate plans for expansion of its operations.

## **Regional Geological Evaluation Projects**

### **Abandoned Pits and Quarries Studies**

Both Huronia and Lindsay Districts are nearing completion of their studies, while other Districts are in the process of updating their data. Lindsay District has identified about 300 former sites of extraction and is collecting resource information at these sites.

### **Licensed Operations Study**

All Districts are in the process of estimating resources in the unextracted portions of the licensed operations. Maple District has carried out some mapping during the summer to outline productive resources in the licensed area.

### **Regional/District Strategy**

All Districts have reasonable background geological and mineral resource data for this exercise and are now in the analysis phase. The draft strategies for all Districts are expected to be complete by March 1981.

### **Niagara Escarpment Plan**

The Phase I hearings are in the final stage now at Owen Sound. The Ministry's response to the proposed plan was examined by the lawyers for The Niagara Escarpment Commission, The Aggregate Producer's Association of Ontario, and the Coalition on the Niagara Escarpment. Mineral resources policies and resource data came under close scrutiny and survived.

## Township Aggregate Inventory Reports

All District geological staff are involved in the review of the draft reports being prepared by the Ontario Geological Survey staff. Lindsay, Maple, Huronia, and Cambridge Districts geological staff are involved in the preparation of some reports. The Ontario Geological Survey has published 20 reports for the Central Region.

## Public Awareness Programs

Geological talks were given to Junior Ranger Camps in Huronia, Lindsay, and Maple Districts. Lindsay District staff participated in a guest lecture to the students of Sir Sandford Fleming College, Peterborough, and also prepared newsletters on OMEP, Bill 127, claim staking, etc. Maple District staff conducted a tour of operating pits in their District for the Federation of Ontario Naturalists and the Sand and Gravel Association of the United Kingdom. Cambridge District staff have prepared a significant display on the mineral resources program at Bronte Creek Provincial Park.

E.B. Freeman of the Ontario Geological Survey organized the yearly basic geology and mineral exploration and special topic courses attended by 282 registrants in the McDonald Block, Queen's Park, Toronto. These courses will again be held in February, 1981. The Special Topics Course will be held at the Best Building, 110 College Street, Toronto. E.B. Freeman also gave two talks to the Rocks and Minerals Club of Brantford and Brampton, organized two field trips to Scarborough Bluffs and the Don Valley brick yard, conducted a tour of the lab and other facilities at the Ontario Geological Survey for Sir Sandford Fleming College students, and served as Science Fair judge at Scarborough and Toronto.

## Activities of the Ontario Geological Survey

The Engineering and Terrain Geology Section of the Ontario Geological Survey carried out some drilling programs in Huronia, Maple, and Cambridge Districts for stratigraphic control of sand and gravel deposits. Huronia District received most benefit from this program. It is expected that significant sand and gravel resources may be identified in Huronia District as a result of this program.

D.R. Sharpe completed part of the quaternary geology mapping of the Brampton area (Sharpe 1980), consisting of the Regional Municipalities of Halton, Peel, and York, Metropolitan Toronto, and Wellington County.

E.G. Bright carried out a synoptic reconnaissance mapping of Burleigh Falls area (Bright 1980) at a scale of 1:63 360. This map area covers parts of Belmont Township in the Central Region.

J.R. Bartlett, J.M. Moore, and M.J. Murray of Carleton University, Ottawa, completed a special project in Bel-

mont Township of the region (Bartlett, Moore and Murray 1980).

## Geoscience Research

J.E. Gale and R. Nadon, of the University of Waterloo, are conducting a field, laboratory, and numerical modelling study to determine the impact of groundwater on surface mining activities in the Niagara Escarpment area (Gale and Nadon 1980). The field site is located near Dufferin Quarry, about 8 km north of Milton, Ontario.

## Recent Publications and References

Anderson, R.C.

1980: Geology for Planning in Rock Island County, Illinois; Circular 510, Illinois State Geological Survey, Urbana, Illinois, U.S.A.

Bartlett, J.R., Moore, J.M., and Murray, M.J.

1980: Belmont and Southern Methuen Townships, Peterborough County; p. 92-95 *in* Summary of Field Work, 1980, by the Ontario Geological Survey, edited by V.G. Milne, O.L. White, R.B. Barlow, J.A. Robertson, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 96, 201 p.

Bright, E.G.

1980: Regional Structure and Stratigraphy of the Burleigh Falls Area, Peterborough County; p. 67-69 *in* Summary of Field Work, 1980, by the Ontario Geological Survey, edited by V.G. Milne, O.L. White, R.B. Barlow, J.A. Robertson and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 96, 201 p.

Gale, J.E., and Nadon, R.

1980: Impact of Groundwater on Mining Activities in the Niagara Escarpment Area (Abstract); p. 7 *in* Geoscience Research Seminar, December 10-11, 1980, Abstracts, Ontario Geological Survey, 21 p.

Sharpe, D.R.

1980: Quaternary Geology of the Brampton Area (30M/12) Southern Ontario; p. 104-105 *in* Summary of Field Work, 1980, by the Ontario Geological Survey, edited by V.G. Milne, O.L. White, R.B. Barlow, J.A. Robertson and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 96, 201 p.

## Other Articles of Interest

Slade, M.E.

1980: The effects of Higher Energy Prices and Declining Ore Quality; p. 225-239 *in* Resources Policy, Volume 6, No. 3,

Watts, T.

1980: Plate Tectonics: Where Is It Going?; p. 360-363 *in* New Scientist, November 1980,

1980: Mineral Processing – Responding to Economic and Environmental Pressures; p. 534-545 *in* Mining Engineering, May 1980.

Wood, R.M.

1980: The Fight Between Land and Sea; *in* New Scientist, August 1980, p. 512-515.

# 1980 Report of the Southwestern Regional Geologist

P. A. Palonen,<sup>1</sup> R. E. Booth-Horst<sup>2</sup>, and B. H. Feenstra<sup>3</sup>

## Contents

Introduction .....	154
Ontario Geological Survey Activities .....	154
Oil and Natural Gas .....	155
Industrial Minerals .....	155
Pits and Quarries .....	157
Theses Projects .....	157
M.Sc. Research .....	157
B.Sc. Research .....	158
References .....	158

## Tables

1 – Publications Applicable to the Southwestern Region .....	155
2 – Aggregate Production from Licensed Pits and Quarries in the Southwestern Region During 1979 .....	157

## Figures

1, 1a – Southwestern Regional Geologist's Area .....	156, 157
--	----------

## Introduction

A significant number of changes have taken place in staffing and positions within the Southwestern Region during the year. Separation of personnel between the Petroleum Resources Laboratory and the Regional office has resulted in a division of functions. Administrative, petroleum engineering, and enforcement duties are carried out at the Regional office. New staff responsible for these functions are: S. Keen, Director; G. Tanton, Engineering Technologist; and A. M. Martyniuk, Secretary. Previous staff include: P. Wright, Geological Assistant; R. Laceby, Senior Draftsman; and I. Cameron, Draftsman. Inspectors responsible for enforcement of the Petroleum Resources Act are located in the District Offices at Chatham, Aylmer, and Simcoe.

Geotechnical functions, including petroleum, mineral and aggregate exploration are carried out by staff at the Petroleum Resources Laboratory. The Laboratory is the repository for samples of Phanerozoic rocks that are a re-

sult of drilling throughout Ontario. In addition, exploration information, well records, and access to the computerized Ontario Well Data System are available. Expertise in aggregate resources evaluation will be provided by B. H. Feenstra. Existing staff are: P. A. Palonen, Chief Geologist; R. E. Booth-Horst, Senior Petroleum Geologist; C. Hesselmanns, Secretary, and Computer Operator; and M. Campbell, Laboratory Technician.

Enforcement of the Pits and Quarries Act is carried out by appropriate inspectors located at each of the District offices. In preparation for designation of all remaining townships under the Pits and Quarries Control Act effective as of January 1st, 1981, five additional staff were hired. Initial duties for these inspectors consist of familiarizing both the public and the gravel pit operators with the new regulations and procedures.

## Ontario Geological Survey Activities

Two field parties, under the direction of the Engineering and Terrain Geology Section gathered data during 1980 in the Southwestern Region. Surface mapping of the Quaternary geology of the Essex-Windsor area done by U. Vagners was updated by E. Sado. To confirm stratigraphic interpretations resulting from this work, an overburden drilling program was conducted in the Leamington, Chatham, and London areas. The drilling program to investigate potential subsurface sand and gravel deposits will be continued in 1981. Because of significant positive results in the London area, an open file report entitled "Sand and Gravel in North Dorchester Township, Middlesex County, Ontario" (Sado 1980) was released in August.

A second project, initiated by the Engineering and Terrain Geology Section, involves surface cratering related to brine extraction activities in the Windsor area. The purpose of the project, developed in conjunction with the United States Geological Survey, is to test the role of the Sylvania Formation in producing surface subsidence features. Under the direction of D. Russell, three wells were drilled, cored, and logged in the Windsor area. Samples of the Detroit River Group and Sylvania and Bois Blanc Formations will be tested for compressive strength. The working hypothesis is that poorly cemented sandstone of the Sylvania Formation disintegrates under compressive stress and moves into fractures within the Bois

<sup>1</sup>Chief Geologist, Petroleum Resources Laboratory, 458 Central Ave., London.

<sup>2</sup>Senior Petroleum Geologist, Petroleum Resources Laboratory.

<sup>3</sup>Mineral Resources Geologist, Southwestern Region, 458 Central Ave., London.

Blanc Formation. Fracturing of the Bois Blanc Formation is believed to be related to salt extraction from the Salina Formation.

Maps and reports pertaining to the Southwestern Region and released during 1980 by the Mineral Resources Group of the Ministry of Natural Resources are listed in Table 1. A complete list of publications released during 1980 is available as a supplement in the back pocket.

## Oil and Natural Gas

The following preliminary statistics include data obtained from wells drilled between January 1st and December 6th, 1980. The 1980 figures are compared with data for wells drilled from January 1st to December 6th, 1979, as published in the 1979 Report of the Southwestern Regional Geologist. Final figures are available in the "Oil and Gas Exploration Drilling and Production Summary" for each year. Additional data for Ontario exploration is available for 1979 in Robertson *et al.* (1980).

Most petroleum and natural gas exploration and development in Ontario was conducted in the Southwestern Region. A total of 238 wells including nine lost holes were drilled in 1980 as compared to 226 wells with eight lost holes in 1979. The total length drilled was 120 701.2 m compared to 120 597.0 m in 1979.

During 1980, 99 exploratory and 116 development wells were completed showing an increase of 38 percent

in the exploratory class and a decrease of 13 percent in the development class as compared to the holes drilled in 1979. In addition, 14 wells including one deepening well were completed for other purposes. These included one liquefied petroleum products, one gas storage, five brine, one suspended storage, one stratigraphic test, one disposal, one petroleum products storage, and two test wells.

Offshore drilling for natural gas in Lake Erie increased 6 percent from 117 wells in 1979 to 124 wells in 1980 (not including six lost holes). By December 6, 1980, 1 370 wells had been drilled in Lake Erie. The increase in the drilling rate would have been more dramatic except for an accidental fire aboard the *Mr. Niel* which rendered the rig unserviceable for half of the season.

Of the 124 lake wells drilled in 1980, 47 were classified as exploratory wells and 77 were classified as development wells of known fields. Of the total, 58 were gas producers, whereas 66 were dry for a success ratio of 47 percent as opposed to 39 percent in 1979. A total length of 64 745.5 m of section was penetrated under Lake Erie during 1980, up slightly from 63 459.9 m drilled in 1979.

Almost all of the available gas exploration and production rights continue to be held in Lake Erie. Of the approximately 1.1 million ha available, 213 633 ha are presently under lease, but 886 390 ha are under exploratory Licence of Occupation. Significant changes in these figures are expected to take place when many of the original Licences of Occupation, originally issued for ten years, expire at the end of 1980. Companies interested in obtaining gas exploration rights on Lake Erie should direct their enquiries to the Petroleum Resources Section in London.

On land, a total of 108 exploratory wells including 14 "other" and three lost holes were drilled for a total length of 55 955.7 m. Eighteen of 52 exploratory wells and 26 of 39 development wells were successful for a success ratio of 48 percent on land. The combined land and lake success ratio for Ontario for 1980 was 47.5 percent up from 43 percent for 1979. Ten wells including three exploratory and seven development wells were completed as oil producers on land in 1980. No oil production is permitted from Lake Erie under international agreement.

**TABLE 1** | PUBLICATIONS APPLICABLE TO SOUTHWESTERN REGION.

Ontario Geological Survey	
ARIP 9	— Blanshard Township. Aggregate Resources Inventory Paper.
IMR 33	— Guide to Site Development and Rehabilitation of Pits and Quarries. Industrial Mineral Report.
OFR 5308	— Quaternary Geology of the Tillsonburg Area.
OFR 5312	— Sand and Gravel in North Dorchester Township.
P. 291	— Bedrock Topography of the Lucan Area. Preliminary Map (revised).
P. 2359	— Drift Thickness of the Lucan Area. Preliminary Map.
P. 2368	— Quaternary Geology of the Wallaceburg - St. Clair Flats Area. Preliminary Map.

### Mineral Resources Branch

Pits and Quarry Rehabilitation, The Stage of the Art in Ontario. Trees and Shrubs for the Improvement and Rehabilitation of Pits and Quarries in Ontario.

## Industrial Minerals

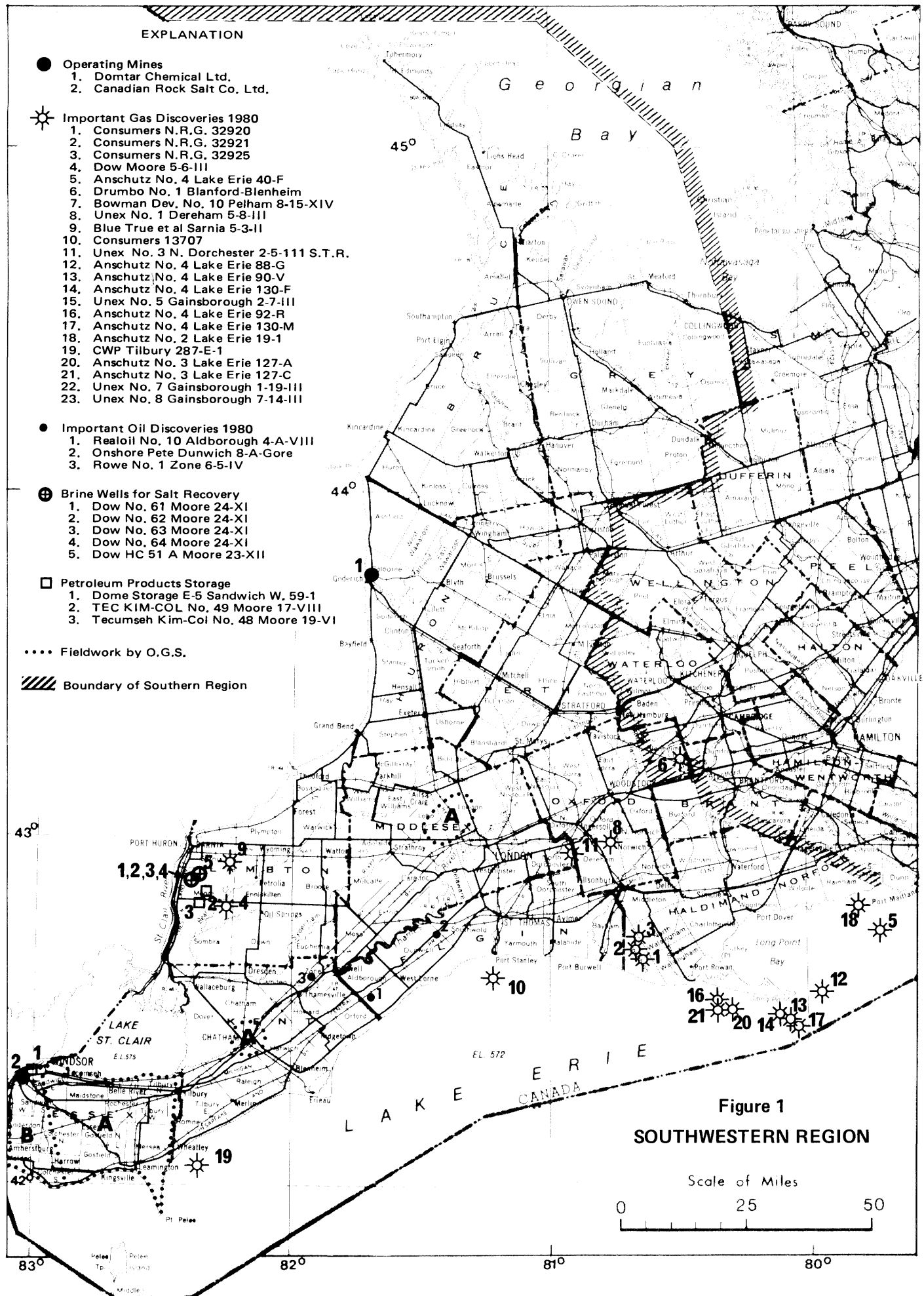
Two underground salt mines continued to operate in the region in 1980. The Canadian Rock Salt Company's Ojibway Mine near Windsor produced approximately 2.0 million metric tonnes in 1980 at a rate of 9 500 metric tonnes per day using a staff of 262 people. Production is from the F-salt member of the Salina Formation at a depth of 305 m. Conventional room and pillar methods are employed with rooms 6 m high by 12 m wide. Drilling and blasting of a 6 m face is followed by roof bolting of the upper 1 m of salt. Salt is transferred from trackless LHD equipment to a primary jaw crusher and conveyor belt and then to a hopper for hoisting to the surface. Ray Upham is mine manager and Paul Blair is mine superintendent.

**EXPLANATION**

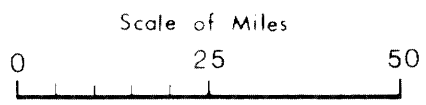
- **Operating Mines**
  1. Domtar Chemical Ltd.
  2. Canadian Rock Salt Co. Ltd.
- ☀ **Important Gas Discoveries 1980**
  1. Consumers N.R.G. 32920
  2. Consumers N.R.G. 32921
  3. Consumers N.R.G. 32925
  4. Dow Moore 5-6-III
  5. Anschutz No. 4 Lake Erie 40-F
  6. Drumbo No. 1 Blanford-Blenheim
  7. Bowman Dev. No. 10 Pelham 8-15-XIV
  8. Unex No. 1 Dereham 5-8-III
  9. Blue True et al Sarnia 5-3-III
  10. Consumers 13707
  11. Unex No. 3 N. Dorchester 2-5-111 S.T.R.
  12. Anschutz No. 4 Lake Erie 88-G
  13. Anschutz No. 4 Lake Erie 90-V
  14. Anschutz No. 4 Lake Erie 130-F
  15. Unex No. 5 Gainsborough 2-7-III
  16. Anschutz No. 4 Lake Erie 92-R
  17. Anschutz No. 4 Lake Erie 130-M
  18. Anschutz No. 2 Lake Erie 19-1
  19. CWP Tilbury 287-E-1
  20. Anschutz No. 3 Lake Erie 127-A
  21. Anschutz No. 3 Lake Erie 127-C
  22. Unex No. 7 Gainsborough 1-19-III
  23. Unex No. 8 Gainsborough 7-14-III
- **Important Oil Discoveries 1980**
  1. Realoil No. 10 Aldborough 4-A-VIII
  2. Onshore Pete Dunwich 8-A-Gore
  3. Rowe No. 1 Zone 6-5-IV
- ⊕ **Brine Wells for Salt Recovery**
  1. Dow No. 61 Moore 24-XI
  2. Dow No. 62 Moore 24-XI
  3. Dow No. 63 Moore 24-XI
  4. Dow No. 64 Moore 24-XI
  5. Dow HC 51 A Moore 23-XII
- **Petroleum Products Storage**
  1. Dome Storage E-5 Sandwich W. 59-1
  2. TEC KIM-COL No. 49 Moore 17-VIII
  3. Tecumseh Kim-Col No. 48 Moore 19-VI

..... Fieldwork by O.G.S.

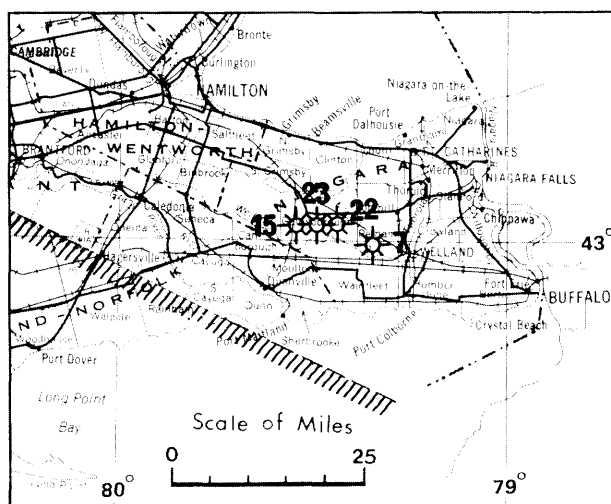
▨ Boundary of Southern Region



**Figure 1**  
**SOUTHWESTERN REGION**







**Figure 1a**

Domtar Chemicals Limited produced approximately 2 million metric tonnes of salt at its Sifto Salt Division near Goderich. Daily production by 250 employees is approximately 9 000 metric tonnes from the A-2 Salt at a depth of 536.5 m. Rooms are 12.8 m high by 13.7 m wide. During 1980 Domtar Chemicals Limited began to sink a third shaft which should increase production to 3.2 million tonnes annually. The 6.7 m diameter shaft is scheduled for completion in 1983 at a cost of seven million dollars. Mine manager is J. Brady and B. Chapman is production superintendent.

The Canadian Salt Company also operates a brining operation near Windsor under the direction of Works Manager, Art Letts. Production in 1980 was approxi-

mately 153 000 metric tonnes at 600 metric tonnes per day, employing 145 people.

Total production value for 1980 of the two mines and brine operation increased by 8 percent from 1979 to \$32 400 000.00.

## Pits and Quarries

Aggregate production from 455 licenced pits and quarries in 72 designated townships in Southwestern Region for 1979 is summarized in Table 2. The total aggregate production of 22 445 407 tonnes is an increase of about 2 million tonnes over 1978. Production of aggregate from 45 wayside pit and quarry operations in the Owen Sound District equals about 60 percent of the total production from licenced operations in this District (Table 2).

An estimated 300 new pit and quarry licence applications are expected in the Region from 68 additional townships to be designated in January, 1981. The Wingham District, where 30 new townships will be designated, anticipates about half the total new licence applications.

## Theses Projects

Several students enrolled at Ontario universities are presently working on geoscience projects applicable to the Southwestern Region.

## M.Sc. Research

Heagy, M.—University of Western Ontario. Natural re-

**TABLE 2** | AGGREGATE PRODUCTION FROM LICENCED PITS AND QUARRIES IN THE SOUTHWESTERN REGION DURING 1979.

District	No. of Designated Townships	No. of Licenced Pits & Quarries	Sand & Gravel Tonnes	Stone Tonnes	Clay & Shale Tonnes	Total Tonnes
Aylmer	20	170	8045 713	3269 576	6825	11 322 114
Chatham	16	90	3172 765	2630 898	21 507	5825 170
Owen Sound	19	127	2052 962	205 787	5223	2263 972
Simcoe	15	34	515 812	834 885	561	1351 258
Wingham	2	34	*	*	*	1682 893
TOTAL	72	455	13 787 252†	6941 146†	34 116†	22 445 407

\* Not available at this time of compilation

† Wingham excluded

## *SOUTHWESTERN*

vegetation of selected abandoned gravel pit slopes near London, Ontario.

Klein, K.—University of Windsor, 1980. Combined lithofacies and biofacies study of the Formosa Reef complex.

### **B.Sc. Research**

Riddiger, C.—University of Waterloo, 1980. Pyrolysis of Organic Matter in the Whitby Formation – Collingwood and Darlington Nuclear Power Generator Site.

Bloomendal, J.—University of Western Ontario. Stratigraphic correlation of the Grimsby-Cabot Head Formations using Gamma Ray logs.

Grapes, K. J.—University of Western Ontario. Interlobate Glacial Deposits south of London, Ontario.

## **References**

Sado, E.

1980: Sand and Gravel in North Dorchester Township, Middlesex County, Ontario; Ontario Geological Survey, Open File Report 312, 18 p.

Robertson, D. C., Bryant, R. G., and Roliff, W. A.

1980: Developments in Eastern Canada in 1979; American Association of Petroleum Geology Bulletin, Volume 64 Number 9, p. 1518-1528.